Docusign Envelope ID: 8CD4D8A1-AE80-83EB-82DD-EFEEE46B97D8

SITE DATA

PROJECT:	HAVEN AT GRIFFITH MEADOWS
ENGINEER:	TIMMONS GROUP 5410 TRINITY ROAD, SUITE 102 RALEIGH, NC 27607 PHONE: (919) 532-3271 FAX: 919-833-8124 TYLER CROSS, PE EMAIL: TYLER.CROSS@TIMMONS.COM
DEVELOPER:	MERITAGE HOMES WILLIAM ROBINSON 3300 PARAMOUNT PARKWAY, SUITE 120 MORRISVILLE, NC 27560 PHONE: (919) 322-2289 EMAIL: BILL.ROBINSON@MERITAGEHOMES.COM
PROPERTY LOCATION:	8613 POOLE ROAD KNIGHTDALE, NC 27545
OWNERS ON RECORD:	TPG AG EHC III (MTH) MULTI STATE 4 LLC 8585 E HARTFORD DR, STE 118 SCOTTSDALE, AZ 85255 PIN #: 1752-59-7507 DB: 19824 PG: 1748 TPG AG EHC III (MTH) MULTI STATE 4 LLC 8585 E HARTFORD DR, STE 118 SCOTTSDALE, AZ 85255 PIN #: 1752-59-9261 DB: 19824 PG: 1748

PERMIT TRACKER:

NCDOT DRIVEWAY	D051-092-25-00100	12/18/2025
NCDOT TWO-PARTY	E051-092-25-00675	03/10/2026
NCDOT THREE-PARTY	E051-092-25-00723	10/10/2025
KNIGHTDALE SEC	SEC-000010-2025	02/23/2026
KNIGHTDALE CD	TBD	TBD
NCG01 REFERENCE CERTIFICATE OF COVERAGE	NCG01-2025-3883 NCC253883	12/23/2025 12/23/2025
401/404	DWR#20250600	07/14/2025
WELL ABANDONMENT SEPTIC ABANDONMENT	GW-159515-2025 WWA-159514-2025	11/20/2025 11/20/2025

ZONING:	GR-3 PUD GENERAL RESIDENTIAL 3
TOWNSHIP:	ST. MATTHEWS
PROPOSED USE:	SINGLE FAMILY RESIDENTIAL
TOTAL SITE AREA:	60.15 ACRES
FIRM MAP#:	3720175200K & 3720175300K EFFECTIVE 07/19/2022

LOT TYPE BREAKDOWN:
TOTAL PROPOSED NUMBER OF LOTS = 180
PROPOSED DENSITY = 2.99 DU/A

FRONT LOAD SINGLE FAMILY LOTS = 72
MINIMUM LOT SIZE REQUIRED: 7,100 SF
MINIMUM LOT SIZE PROVIDED: 7,102 SF
AVERAGE LOT SIZE PROVIDED: 8,469 SF
LOT WIDTH: 60'
FRONT SETBACK: 10'
DRIVEWAY LENGTH: 25'
SIDE SETBACK: 5'
CORNER SIDE SETBACK: 10'
REAR SETBACK: 20'

REAR LOAD SINGLE FAMILY LOTS = 55
MINIMUM LOT SIZE REQUIRED: 4,100 SF
MINIMUM LOT SIZE PROVIDED: 4,101 SF
AVERAGE LOT SIZE PROVIDED: 4,614 SF
LOT WIDTH: 38'
FRONT SETBACK: 10'
SIDE SETBACK: 3'
CORNER SIDE SETBACK: 10'
REAR SETBACK: 20'
DRIVEWAY LENGTH: 20'

REAR LOAD TOWNHOME LOTS = 53
MINIMUM LOT SIZE REQUIRED: 2,000 SF
MINIMUM LOT SIZE PROVIDED: 2,000 SF
AVERAGE LOT SIZE PROVIDED: 2,032 SF
MINIMUM LOT WIDTH: 20'
FRONT SETBACK:10'
BUILDING SEPARATION: 10'
REAR SETBACK: 20'
DRIVEWAY LENGTH: 20'

UTILITY DEMANDS:
SEWAGE USAGE: 54,000 GPD
WATER USAGE: 86,400 GPD

STREET TYPE SUMMARY:
70' W/ PARALLEL PARKING:
70' ROW W/ MEDIAN:
54' ROW:
32' ROW (ONE WAY):

GENERAL NOTES:
1. FIELD TOPOGRAPHIC SURVEY PERFORMED BY TIMMONS GROUP DATED MARCH 19, 2022.
2. THE CONTRACTOR SHALL CONTACT NC ONE CALL CENTER PRIOR TO ANY DIGGING.
3. ALL PUBLIC WATER IMPROVEMENTS SHALL CONFORM TO ALL CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT AND NCDEQ PWS STANDARDS AND SPECIFICATIONS. ALL SANITARY SEWER IMPROVEMENTS SHALL CONFORM TO ALL CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT AND NCDEQ DWR STANDARDS AND SPECIFICATIONS.
4. THE CONTRACTOR SHALL CHECK PLANS AND FIELD CONDITIONS FOR CONFLICTS AND DISCREPANCIES PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY CONFLICT BEFORE PERFORMING WORK IN THE AFFECTED AREA.
5. THE CONTRACTOR IS RESPONSIBLE FOR REPAIRING ANY DAMAGE TO EXISTING FACILITIES, ABOVE AND BELOW GROUND THAT MAY OCCUR AS A RESULT OF THE WORK PERFORMED BY THE CONTRACTOR.
6. IT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO COMPLY WITH AND ENFORCE ALL APPLICABLE SAFETY REGULATIONS.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING EXCAVATION AGAINST COLLAPSE AND SHALL PROVIDE BRACING, SHEETING, OR SHORING AS NECESSARY. TRENCHES SHALL BE KEPT DRY WHILE PIPE ARE BEING PLACED, DEWATERING SHALL BE USED AS REQUIRED., AND PERMITTED THROUGH LOCAL GOVERNMENT AGENCIES AND WATER MANAGEMENT DISTRICT PER CURRENT REGULATIONS AT THE SOLE COST OF THE CONTRACTOR.
8. WORK BEING PERFORMED UNDER THIS CONTRACT SHALL INTERFACE SMOOTHLY WITH OTHER WORK BEING PERFORMED IN THE AREA BY OTHER CONTRACTORS AND UTILITY COMPANIES. IT WILL BE NECESSARY FOR THE CONTRACTOR TO COORDINATE AND SCHEDULE HIS ACTIVITIES, WHERE NECESSARY, WITH OTHER CONTRACTORS AND UTILITY COMPANIES.
9. PIPE SPECIFICATIONS SHALL CONFORM TO CITY OF RALEIGH PUBLIC UTILITY STANDARDS.
   - 9.1. WATER MAIN: 8" DUCTILE IRON PIPE, AWWA STND. C-150
   - 9.2. WATER SERVICE: SOFT COPPER TYPE 'K' 3/4" TO 2" IN PUBLIC RIGHT-OF-WAY
   - 9.3. SANITARY SEWER MAIN: DEPTHS 3' - 5' IN TRAFFIC AREAS: DUCTILE IRON PIPE, AWWA STND. C-150; DEPTHS >5' IN TRAFFIC AREAS: SDR 26 PVC; DEPTHS 3' – 12' IN NON-TRAFFIC AREAS: SDR 35 PVC; DEPTHS 12' - 20' IN NON-TRAFFIC AREAS: SDR 26 PVC
   - 9.4. SANITARY SEWER SERVICE: SCHEDULE 40 PVC
   - 9.5. SANITARY SEWER MANHOLES: DEPTHS 0' - 12': 4' DIAMETER; DEPTHS 12' - 20' : 5' DIAMETER; DEPTHS 20' OR GREATER: 6' DIAMETER

ZONING CONDITIONS:
1. RESIDENTIAL DRIVEWAYS SHALL BE A MINIMUM OF 25-FEET LONG ON FRONT-LOADED LOTS AND 20-FEET LONG ON REAR-LOADED LOTS.
2. FRONT-LOADED SINGLE-FAMILY LOTS SHALL BE A MINIMUM OF 60-FEET WIDE.
3. REAR SETBACKS FOR SINGLE-FAMILY SHALL BE A MINIMUM OF 20-FEET.
4. FRONT-LOADED SINGLE-FAMILY LOTS IDENTIFIED ON THE MASTER PLAN AS LOTS 86-99 AND 113-118 SHALL NOT BE MASS GRADED. ALL OTHER SINGLE-FAMILY LOTS SHALL BE ELIGIBLE FOR MASS GRADING.
5. USES WITHIN THE DEVELOPMENT SHALL BE DISTRIBUTED AS FOLLOWS: 11% OF THE DEVELOPMENT SHALL BE TOWNHOMES, 74% SHALL BE SINGLE-FAMILY LOTS, AND 15% SHALL BE DEDICATED TOWARDS MIXED-USE/COMMERCIAL USES.
6. ALLEYS A AND E AS DEPICTED ON THE MASTER PLAN SHALL BE DEDICATED AS PUBLIC 32-FOOT-WIDE PUBLIC-RIGHTS-OF-WAY.
7. EVERY HOME SHALL CONTAIN AN ELECTRICAL CONDUIT CONNECTING THE ROOF TO AN ELECTRICAL SUPPLY PANEL TO FACILITATE THE FUTURE INSTALLATION OF SOLAR PHOTOVOLTAIC SYSTEMS.
8. THE FIRST TWO MODEL HOMES OPEN TO THE PUBLIC FOR VIEWING SHALL INCLUDE A SOLAR PHOTOVOLTAIC SYSTEM.
9. THE CLUBHOUSE BUILDING SHALL CONTAIN A SOLAR PHOTOVOLTAIC SYSTEM.
10. TO CONTINUE THE FARMING TRADITION IN THIS AREA, A COMMUNITY GARDEN, INCLUDING RAISED PLANTING BEDS, SHALL BE INSTALLED AND ADMINISTERED BY THE HOMEOWNERS ASSOCIATION FOR USE BY RESIDENTS.
11. ALL STORMWATER DEVICES SHALL BE SCREENED FROM VIEW OF A PUBLIC RIGHT-OF-WAY WITH PLANT MATERIALS MEETING THE TYPE A BUFFER STANDARD IN THE KNIGHTDALE UDO.
12. NO BUILDING PERMIT FOR A RESIDENTIAL STRUCTURE SHALL BE ISSUED BEFORE MARCH 1, 2025.
13. THE SUBMITTED PLANNED UNIT DEVELOPMENT DOCUMENT AND SUBMITTED MASTER PLAN WILL SERVE AS THE SITE-SPECIFIC DEVELOPMENT PLAN. THE APPLICANT MUST SUBMIT CONSTRUCTION DRAWINGS TO THE TOWN THAT CONFORM TO THE APPROVED CONDITIONS OF THE GR3-PUD ZONING DISTRICT, MASTER PLAN COMMENTS, UNIFIED DEVELOPMENT ORDINANCE, AND COMMENTS FROM THE DECEMBER 20, 2022 DRC MEETING

HAVEN AT GRIFFITH MEADOWS

CONSTRUCTION DRAWINGS

TOWN OF KNIGHTDALE, ST. MATTHEWS TOWNSHIP, WAKE COUNTY, NORTH CAROLINA

KNIGHTDALE PROJECT: #ZMA -12-22

ORDINANCE: #23-11-15-002



VICINITY MAP

1"=500'

IMPERVIOUS AREA DATA

TOTAL SITE AREA	60.15 AC	2,619,964.71 SF
IMPERVIOUS IN 127 SINGLE FAMILY LOTS (3200 SF/LOT)	9.3 AC	406,400 SF
IMPERVIOUS IN 53 TOWNHOME LOTS (1900 SF/LOT)	2.3 AC.	100,700 SF
IMPERVIOUS IN ROADWAY	9.4 AC	408,915 SF
TOTAL IMPERVIOUS	21.0	916,015 SF
PERCENT IMPERVIOUS		35%

PER THE ZONING CONDITIONS OF THE REZONING APPROVAL, NO BUILDING PERMIT FOR A RESIDENTIAL STRUCTURE WILL BE ISSUED PRIOR TO MARCH 1, 2025.

RALEIGH WATER - PLANS AUTHORIZED FOR CONSTRUCTION
Any work authorized by this approval must proceed in accordance with the plans. This electronic approval may not be edited once issued. Any modification to this approval once issued will invalidate this approval.

Cydney Terry
2026.05.18 20:46:48-04'00'

RALEIGH WATER INSPECTIONS QUANTITIES TABLE

RALEIGH WATER INSPECTIONS QUANTITIES SUBDIVISIONS AND SITE PLANS			
Phase Number(s)	PHASE1	PHASE2	TOTAL
Number of Lots	120	60	180
Number of Units	120	60	180
Public Water (LF)	4,823	4,388	9,212
Public Sewer* (LF)	6,276	2,510	8,786
Water Service Stubs (Quantity)	121	60	181
Sewer Service Stubs (Quantity)	121	60	181
Average Daily Flow Water	57,600	28,800	86,400
Average Daily Flow Sewer**	36,000	18,000	54,000

*Sewer mains and manholes as part of a collection system
**Entire Project Flow. Based on 75 GPD per bedroom for residential (Apartments, single Family dwelling, townhouse for condos)
The meter size must match domestic service size (Exemption - 3/4" service tap with 5/8" meter)

CONTRACTOR IS SOLELY RESPONSIBLE FOR ALL MATERIALS ORDERED PRIOR TO FINAL, APPROVED PLANS THAT ARE RELEASED FOR CONSTRUCTION, AND IS RESPONSIBLE FOR MAKING ALL ADJUSTMENTS TO THOSE MATERIALS TO MEET THE FINAL, APPROVED DESIGN, SUCH AS STRUCTURE HEIGHTS, ANGLES, PIPE MATERIALS, ETC., WITHOUT ADDITIONAL COST TO DEVELOPER OR ENGINEER.

Sheet List Table

Sheet Number	Sheet Title
C0.0	COVER SHEET
C1.0	OVERALL EXISTING CONDITIONS
C1.1	DETAILED EXISTING CONDITIONS - SHEET 1 OF 3
C1.2	DETAILED EXISTING CONDITIONS - SHEET 2 OF 3
C1.3	DETAILED EXISTING CONDITIONS - SHEET 3 OF 3
C1.4	EXISTING CONDITIONS TREE SURVEY - SHEET 1 OF 3
C1.5	EXISTING CONDITIONS TREE SURVEY - SHEET 2 OF 3
C1.6	EXISTING CONDITIONS TREE SURVEY - SHEET 3 OF 3
C2.0	OVERALL SITE PLAN
C2.1	DETAILED SITE PLAN - SHEET 1 OF 3
C2.2	DETAILED SITE PLAN - SHEET 2 OF 3
C2.3	DETAILED SITE PLAN - SHEET 3 OF 3
C2.4	OVERALL SIGNS & MARKINGS PLAN
C2.5	DETAILED SIGNS & MARKINGS PLAN SHEET 1 OF 2
C2.6	DETAILED SIGNS & MARKINGS PLAN SHEET 2 OF 2
C2.7	DETAILED ROUNDABOUT VEHICLE TRACKING SHEET
C2.8	ROUNDABOUT SIGHT DISTANCE
C2.9	PHASING PLAN
C3.0	OVERALL UTILITY PLAN
C3.1	DETAILED UTILITY PLAN - SHEET 1 OF 3
C3.2	DETAILED UTILITY PLAN - SHEET 2 OF 3
C3.3	DETAILED UTILITY PLAN - SHEET 3 OF 3
C3.4	SANITARY SEWER SCHEDULE
C4.0	OVERALL GRADING & DRAINAGE PLAN
C4.1	DETAILED GRADING & DRAINAGE PLAN - SHEET 1 OF 3
C4.2	DETAILED GRADING & DRAINAGE PLAN - SHEET 2 OF 3
C4.3	DETAILED GRADING & DRAINAGE PLAN - SHEET 3 OF 3
C4.4	STORM SEWER SCHEDULE
C4.5	DETAILED ROUNDABOUT GRADING
C5.0	ROAD A PROFILE - SHEET 1 OF 2
C5.1	ROAD A PROFILE - SHEET 2 OF 2
C5.2	ROAD B PROFILE
C5.3	ROAD C PROFILE
C5.4	ROAD D PROFILE - SHEET 1 OF 2
C5.5	ROAD D PROFILE - SHEET 2 OF 2
C5.6	ROAD E PROFILE - SHEET 1 OF 2
C5.7	ROAD E PROFILE - SHEET 2 OF 2
C5.8	ROAD F PROFILE
C5.9	ROAD G PROFILE
C5.10	ROAD H PROFILE
C5.11	ALLEY A PROFILE
C5.12	ALLEY B PROFILE
C5.13	ALLEY C PROFILE
C5.14	ALLEY D PROFILE
C5.15	ALLEY E PROFILE
C5.16	ALLEY F PROFILE
C5.17	SEWER OUTFALL PLAN & PROFILE
C5.18	GREENWAY PROFILE - SHEET 1 OF 2
C5.19	GREENWAY PROFILE - SHEET 2 OF 2
C6.1	STORM OUTFALL PROFILES
C6.2	STORM OUTFALL PROFILES
C6.3	CULVERT PLAN & PROFILE
C7.0	SCM NOTES AND DETAILS
C7.1	SCM 1 PLAN & PROFILE
C7.2	SCM 2 PLAN & PROFILE
C7.3	SCM 3 PLAN & PROFILE
C8.0	OVERALL LIGHTING PLAN
C8.1	DETAILED LIGHTING PLAN
C8.2	DETAILED LIGHTING PLAN
C8.3	DETAILED LIGHTING PLAN
C9.0	OVERALL LANDSCAPE PLAN
C9.1	DETAIL LANDSCAPE PLAN - SHEET 1 OF 3
C9.2	DETAIL LANDSCAPE PLAN - SHEET 2 OF 3
C9.3	DETAIL LANDSCAPE PLAN - SHEET 3 OF 3
C10.0	DETAILED ROADWAY WIDENING PLAN
C10.1	DETAILED ROADWAY WIDENING GRADING PLAN
C10.2	DETAILED ROADWAY WIDENING DETIALS
C10.3	ROAD WIDENING CROSS SECTIONS - SHEET 1 OF 4
C10.4	ROAD WIDENING CROSS SECTIONS - SHEET 2 OF 4
C10.5	ROAD WIDENING CROSS SECTIONS - SHEET 3 OF 4
C10.6	ROAD WIDENING CROSS SECTIONS - SHEET 4 OF 4
C12.0	SITE DETAILS - SHEET 1 OF 3
C12.1	SITE DETAILS - SHEET 2 OF 3
C12.2	SITE DETAILS - SHEET 3 OF 3
C12.3	WATER AND SEWER DETAILS
C12.4	STORM DETAILS
C12.5	LANDSCAPE DETAILS
C12.6	NCDOT DETAILS
C12.7	LOT FIT TYPICALS
C(A)1.0	COVER SHEET
C(A)1.1	GENERAL NOTES
C(A)2.0	EXISTING CONDITIONS AMENITY CENTER
C(A)2.1	EXISTING CONDITIONS TOT LOT & PLAZA
C(A)3.0	EROSION CONTROL PH1 AMENITY CENTER
C(A)3.1	EROSION CONTROL PH1 TOT LOT & PLAZA
C(A)3.2	EROSION CONTROL PH2 AMENITY CENTER
C(A)3.3	EROSION CONTROL PH2 TOT LOT & PLAZA
C(A)3.4	EROSION CONTROL DETAILS
C(A)3.5	EROSION CONTROL NOTES
C(A)4.0	SITE PLAN AMENITY CENTER
C(A)4.1	SITE PLAN TOT LOT & PLAZA
C(A)5.0	GRADING PLAN AMENITY CENTER
C(A)5.1	GRADING PLAN TOT LOT & PLAZA
C(A)6.0	UTILITY PLAN
C(A)8.0	DETAILS PLAN
C(A)8.1	DETAILS PLAN
L1.0	PLANTING PLAN
L1.1	PLANTING PLAN
L1.2	PLANTING PLAN
L1.3	HARDSCAPE DETAILS
L1.4	HARDSCAPE DETAILS
L1.5	PLANTING DETAILS AND NOTES
EC0.0	COVER SHEET
EC1.0	EXISTING CONDITIONS
EC2.01	EROSION & SEDIMENT CONTROL CALCULATIONS
EC2.0	OVERALL EROSION CONTROL PLAN - STAGE 1
EC2.1	EROSION CONTROL PLAN - STAGE 1 (SHEET 1 OF 3)
EC2.2	EROSION CONTROL PLAN - STAGE 1 (SHEET 2 OF 3)
EC2.3	EROSION CONTROL PLAN - STAGE 1 (SHEET 3 OF 3)
EC2.4	SEWER OUTFALL EROSION CONTROL - STAGE 1
EC2.5	CULVERT STREAM CROSSING
EC2.6	STAGE 1 DRAINAGE AREA
EC3.0	OVERALL EROSION CONTROL PLAN - STAGE 2
EC3.1	EROSION CONTROL PLAN - STAGE 2 (SHEET 1 OF 3)
EC3.2	EROSION CONTROL PLAN - STAGE 2 (SHEET 2 OF 3)
EC3.3	EROSION CONTROL PLAN - STAGE 2 (SHEET 3 OF 3)
EC3.4	SEWER OUTFALL EROSION CONTROL - STAGE 2
EC3.5	STAGE 2 DRAINAGE AREA
EC4.0	NCG01 NOTES & DETAILS
EC4.1	EROSION CONTROL NOTES & DETAILS
EC4.2	EROSION CONTROL NOTES & DETAILS
EC4.3	CULVERT STREAM CROSSING NOTES & DETAILS
C7.0	SCM NOTES AND DETAILS
C7.1	SCM 1 PLAN & PROFILE
C7.2	SCM 2 PLAN & PROFILE
C7.3	SCM 3 PLAN & PROFILE

NAD 83

KNOW WHAT'S BELOW.
CALL 811 BEFORE YOU DIG.

ATTENTION CONTRACTORS

The Contractor responsible for the extension of water, sewer, and/or reuse, as approved in these plans, is responsible for contacting the Public Utilities Inspector at 919-996-3245 or https://cityworks.raleighnc.gov/pucontractors/New and schedule a Pre-construction meeting prior to beginning any construction.
Raleigh Water must be contacted at (919) 996-4540 at least twenty-four hours prior to beginning any work activity around critical water and sewer infrastructure.

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

Failure to call for Inspection, install a downstream plug, have permitted plans on the jobsite, or any other violation of City of Raleigh Standards will result in a fine and possible exclusion from future work in the City of Raleigh.

a. 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 plat(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.

b. 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.

Tyler Cross, PE, certify that the Standard Specifications of the Knightdale have been thoroughly checked and found to be acceptable for 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 No. C2.0 of these drawings.

By: _____, PE
Date: 5/19/2026

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 TYLER JEFFREY CROSS

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: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

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

BY: Gideon Smith DATE: _____
LAND USE 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-4142

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-5503

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 TYLER JEFFREY CROSS
3/31/2026

THIS DRAWING PREPARED AT THE
RALEIGH OFFICE
5410 Trinity Road, Suite 102 | Raleigh, NC 27607
TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION

DATE

DATE 03/31/2026
DRAWN BY 331
DESIGNED BY 331
CHECKED BY T. CROSS
SCALE 1" = 500'

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA
COVER SHEET

JOB NO. 51557
SHEET NO. C0.0

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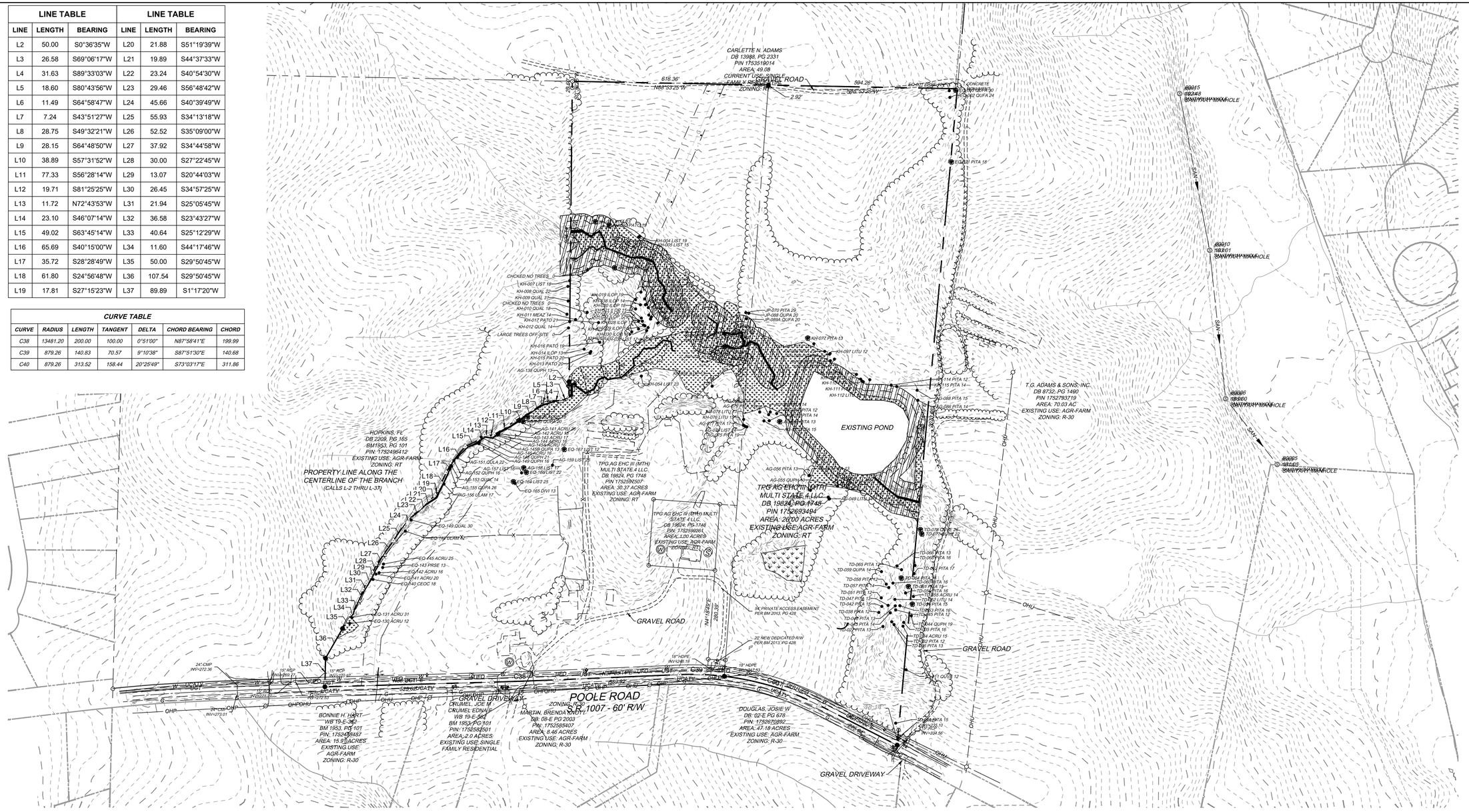
LINE TABLE			LINE TABLE		
LINE	LENGTH	BEARING	LINE	LENGTH	BEARING
L2	50.00	S0°36'35"W	L20	21.88	S51°19'39"W
L3	26.58	S69°06'17"W	L21	19.89	S44°37'33"W
L4	31.63	S89°33'03"W	L22	23.24	S40°54'30"W
L5	18.60	S80°43'56"W	L23	29.46	S56°48'42"W
L6	11.49	S64°58'47"W	L24	45.66	S40°39'49"W
L7	7.24	S43°51'27"W	L25	55.93	S34°13'18"W
L8	28.75	S49°32'21"W	L26	52.52	S35°09'00"W
L9	28.15	S64°48'50"W	L27	37.92	S34°44'58"W
L10	38.89	S57°31'52"W	L28	30.00	S27°22'45"W
L11	77.33	S56°28'14"W	L29	13.07	S20°44'03"W
L12	19.71	S81°25'25"W	L30	26.45	S34°57'25"W
L13	11.72	N72°43'53"W	L31	21.94	S25°05'45"W
L14	23.10	S46°07'14"W	L32	36.58	S23°43'27"W
L15	49.02	S63°45'14"W	L33	40.64	S25°12'29"W
L16	65.69	S40°15'00"W	L34	11.60	S44°17'46"W
L17	35.72	S28°28'49"W	L35	50.00	S29°50'45"W
L18	61.80	S24°56'48"W	L36	107.54	S29°50'45"W
L19	17.81	S27°15'23"W	L37	89.89	S1°17'20"W

CURVE TABLE						
CURVE	RADIUS	LENGTH	TANGENT	DELTA	CHORD BEARING	CHORD
C38	13481.20	200.00	100.00	0°51'00"	N87°58'41"E	199.99
C39	879.26	140.83	70.57	9°10'38"	S87°51'30"E	140.68
C40	879.26	313.52	158.44	20°25'49"	S73°03'17"E	311.86


CARLETTE N. ADAMS
DB 13998, PG 2331
PIN 1753519014
AREA: 49.08
CURRENT USE: SINGLE FAMILY RESIDENTIAL
ZONING: R-30
616.36'
N88°53'25"W
594.26'
N88°53'25"W
2.92'
EXISTING POND
T.G. ADAMS & SONS, INC.
DB 8732, PG 1490
PIN 1752793719
AREA: 70.03 AC
EXISTING USE: AGR-FARM
ZONING: R-30
HOPKINS, FL
DB 2208, PG 165
BM1953, PG 101
PIN: 1752496412
EXISTING USE: AGR-FARM
ZONING: RT
PROPERTY LINE ALONG THE CENTERLINE OF THE BRANCH
(CALLS L-2 THRU L-37)
TPG AG EHC III (MTH) MULTI STATE 4 LLC,
DB 19824, PG 1748
PIN 1752592507
AREA: 30.37 ACRES
EXISTING USE: AGR-FARM
ZONING: RT
TPG AG EHC III (MTH) MULTI STATE 4 LLC
DB 19824, PG 1748
PIN 1752592494
AREA: 26.00 ACRES
EXISTING USE: AGR-FARM
ZONING: RT
TPG AG EHC III (MTH) MULTI STATE 4 LLC
DB 19824, PG 1748
PIN 1752596261
AREA: 1.00 ACRES
EXISTING USE: AGR-FARM
ZONING: RT
94' PRIVATE ACCESS EASEMENT PER BM 2013, PG 428
20' NEW DEDICATED R/W PER BM 2013 PG 428
GRAVEL ROAD
GRAVEL DRIVEWAY
POOLE ROAD
SR 1007 - 60' R/W
BONNIE H. HART
WB T9-E-362
BM 1953, PG 101
PIN: 1752496467
AREA: 15.01 ACRES
EXISTING USE: AGR-FARM
ZONING: R-30
CRUMEL, JOE M
CRUMEL, EDNA W
WB 19-E-582
BM 1953, PG 101
PIN: 1752592501
AREA: 2.0 ACRES
EXISTING USE: SINGLE FAMILY RESIDENTIAL
MARTIN, BRENDA KNOTT
DB: 08-E PG 2003
PIN: 1752585407
AREA: 8.46 ACRES
EXISTING USE: AGR-FARM
ZONING: R-30
DOUGLAS, JOSIE W
DB: 02-E PG 678
PIN: 1752670892
AREA: 47.18 ACRES
EXISTING USE: AGR-FARM
ZONING: R-30
80615
SANITARY MANHOLE
80610
SANITARY MANHOLE
80606
SANITARY MANHOLE
80605
SANITARY MANHOLE
CHOKED NO TREES
LARGE TREES OFF-SITE
AG-136 QUPH 17
AG-141 ACRU 21
AG-142 ACRU 16
AG-143 ACRU 18
AG-144 ACRU 19
AG-145 QUPH 18
AG-146 QUPH 21
AG-148 QUPH 18
AG-151 QULA 22
AG-152 QUPH 16
AG-153 QUAL 14
AG-155 QUPA 26
AG-156 LIUM 17
EQ-131 ACRU 31
EQ-130 ACRU 12
EQ-149 QUAL 30
EQ-150 QUAL 30
EQ-145 ACRU 25
EQ-143 PRSE 13
EQ-142 ACRU 16
EQ-141 ACRU 20
EQ-140 CEOC 18
IP-070 PITA 29
IP-088 QUPA 20
IP-089A QUPA 20
KH-107Z PITA 13
KH-097 LITU 12
KH-115 PITA 14
KH-116 PITA 12
KH-117 PITA 14
KH-112 LITU 12
AG-085 PITA 15
AG-086 PITA 14
AG-078 LITU 12
AG-079 LITU 14
AG-077 PITA 17
AG-056 PITA 13
AG-055 QUPH 13
AG-049 LITU 12
TD-065 PITA 13
TD-064 PITA 16
TD-063 PITA 17
TD-058 PITA 14
TD-057 PITA 14
TD-051 PITA 12
TD-047 PITA 15
TD-042 PITA 13
TD-038 PITA 12
TD-040 PITA 13
TD-027 PITA 13
TD-059 QUPA 14
TD-061 PITA 13
TD-066 PITA 15
TD-062 LITU 14
TD-067 PITA 15
TD-033 PITA 15
TD-035 PITA 12
TD-044 QUPH 19
TD-045 PITA 16
TD-034 ACRU 15
TD-032 PITA 12
TD-046 PITA 13
TD-028 PITA 15
TD-029 PITA 10
TD-030 PITA 56
TD-031 LITU 12
KH-004 LIST 19
KH-005 LIST 15
KH-007 LIST 18
KH-008 QUAL 22
KH-009 QUAL 35
KH-010 QUAL 18
KH-011 MEAZ 14
KH-011 PATO 21
KH-012 QUAL 14
KH-016 PATO 19
KH-014 ILOP 13
KH-015 PATO 20
KH-013 PATO 20
KH-019 ILOP 19
KH-018 ILOP 12
KH-020 ILOP 13
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KH-064 LIST 19
KH-065 LIST 19
KH-066 LIST 19
KH-067 LIST 19

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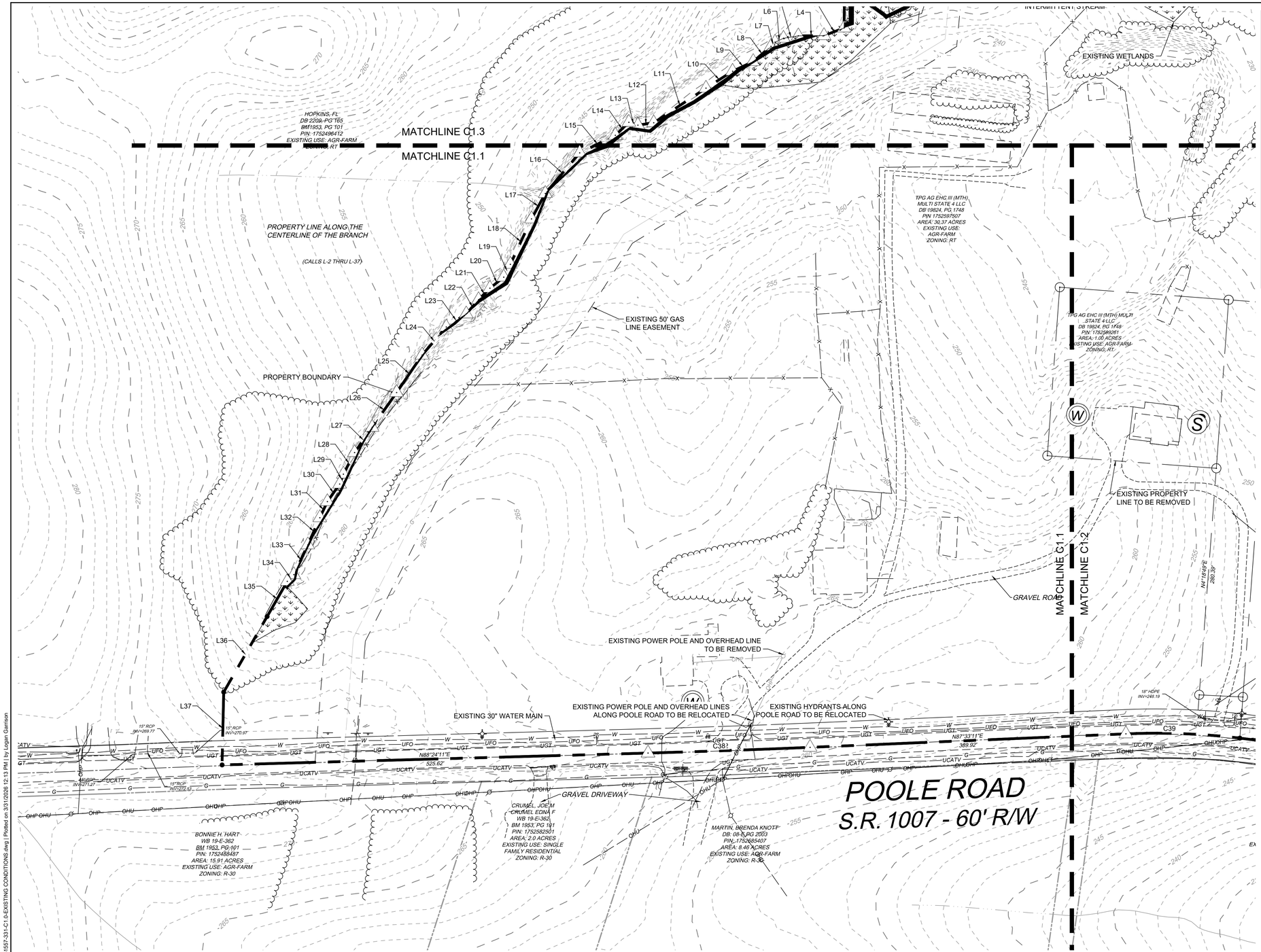

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ENVIRONMENTAL LEGEND

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- WETLANDS

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SCALE 1"=60'
0 60' 120'

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: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

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

BY: Gideon Smith DATE: _____
LAND USE 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-4142

Public
Sewer Collection / Extension System
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City of Raleigh
Public Utilities Department Permit # S-5503

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 ENGINEER TYLER JEFFREY CROSS
3/31/2026

THIS DRAWING PREPARED AT THE
RALEIGH OFFICE
5410 Trinity Road, Suite 102 | Raleigh, NC 27607
TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION	DATE

DATE: 03/31/2026
DRAWN BY: 331
DESIGNED BY: 331
CHECKED BY: T. CROSS
SCALE: 1" = 60'

TIMMONS GROUP

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA
DETAILED EXISTING CONDITIONS - SHEET 1 OF 3
NORTH CAROLINA LICENSE NO. C-1652

JOB NO. 51557
SHEET NO. C1.1

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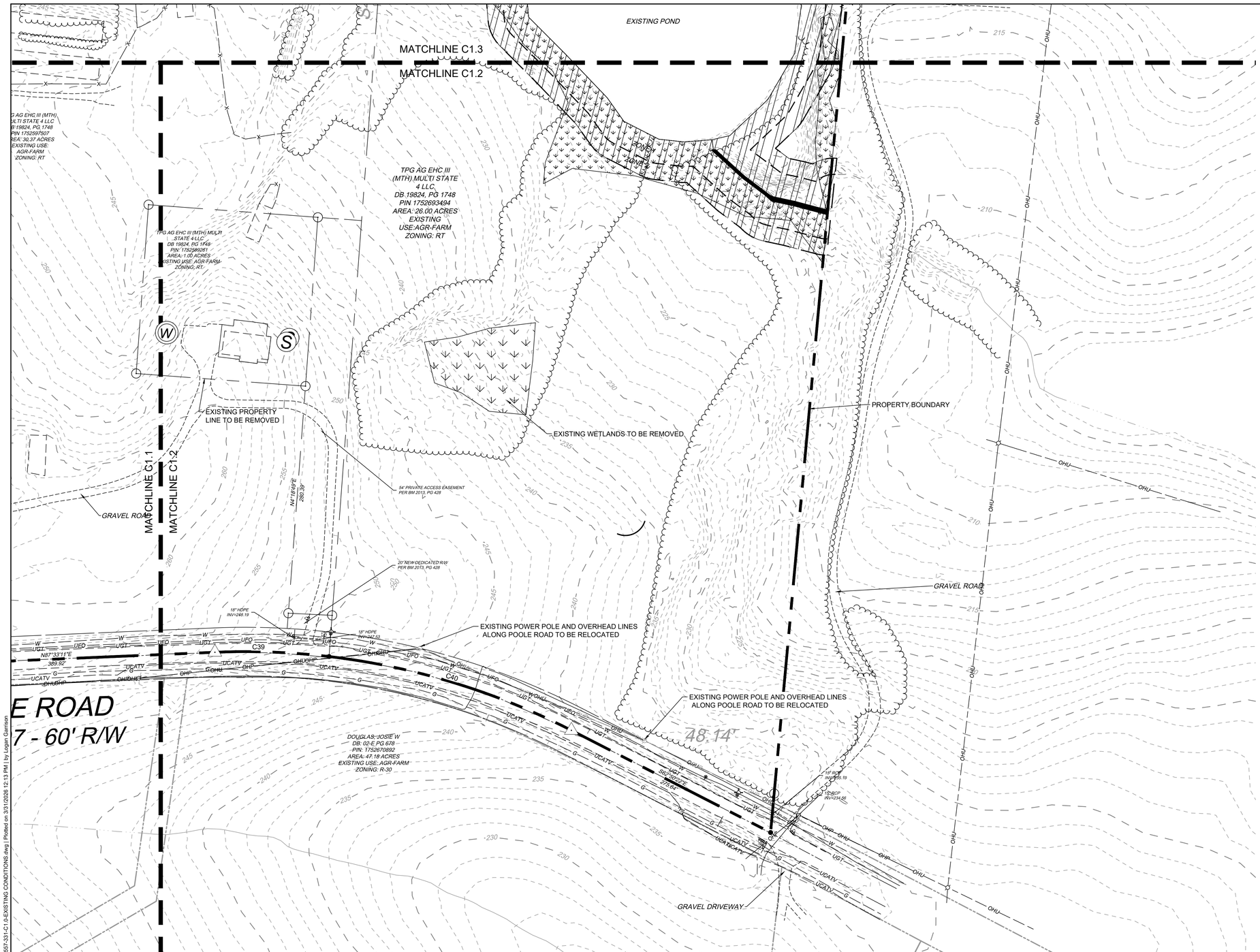

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ENVIRONMENTAL LEGEND

- NEUSE RIPARIAN BUFFER ZONE 1
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NOTES:

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811 Know what's below. Call before you dig.

NAD 83

SCALE 1"=60'
0 60' 120'

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: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

Digitally signed by Samuel A. MacDonald
DN: cn=Samuel A. MacDonald, o=Timmons Group, ou=Transportation Engineers, Inc., l="Old Raleigh A. MacDonald
Date: 2026.03.30 08:56:34 -04'00'

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

Digitally signed by Gideon Smith
DN: cn=Gideon Smith, o=Town of Knightdale, ou=Development Services, email=gsmith@knightdalenc.gov, c=Town of Knightdale, Ou=Development Services
Reason: I am approving this document
Date: 2026.03.30 08:51:13 -04'00'

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-4142

Public
Sewer Collection / Extension System

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City of Raleigh
Public Utilities Department Permit # S-5503

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 ENGINEER TYLER JEFFREY CROSS

3/31/2026

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YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION	DATE

DATE: 03/31/2026
DRAWN BY: 331
DESIGNED BY: 331
CHECKED BY: T. CROSS
SCALE: 1" = 60'

TIMMONS GROUP

NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS

KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

DETAILED EXISTING CONDITIONS - SHEET 2 OF 3

JOB NO. 51557
SHEET NO. C1.2

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CARLETTE N. ADAMS
DB 13988, PG 2331
PIN 1753519014
AREA: 49.08
CURRENT USE: SINGLE FAMILY RESIDENTIAL
ZONING: RT

GRAVEL ROAD

616.36'
N88°43'25"W

594.26'
N88°53'26"W

2.92'

CONCRETE MONUMENT

PROPERTY BOUNDARY

20" GAS MAIN TEST HOLE 2
PIPE CROWN ELEV: 239.82'

EXISTING 50' GAS LINE EASEMENT

20" GAS MAIN TEST HOLE 1
PIPE CROWN ELEV: 228.91'

ZONE 1
ZONE 2

PERENNIAL STREAM

INTERMITTENT STREAM

PERENNIAL STREAM

INTERMITTENT STREAM

INTERMITTENT STREAM

EXISTING WETLANDS

PERENNIAL STREAM

EXISTING POND

S42°15'56"W 267.08'

MATCHLINE C1.1

MATCHLINE C1.3

MATCHLINE C1.2

MATCHLINE C1.2

TPG AG EHG III (MTH) MULTI STATE 4 LLC

L2 L3 L4 L5 L6 L7 L8 L9

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City of Raleigh
Public Utilities Department Permit # W-4142

Public
Sewer Collection / Extension System
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City of Raleigh
Public Utilities Department Permit # S-5503

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 ENGINEER TYLER JEFFREY CROSS
3/31/2026

THIS DRAWING PREPARED AT THE
RALEIGH OFFICE
5410 Trinity Road, Suite 102 | Raleigh, NC 27607
TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION

DATE

DATE 03/31/2026
DRAWN BY 331
DESIGNED BY 331
CHECKED BY T. CROSS
SCALE 1" = 60'

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

DETAILED EXISTING CONDITIONS - SHEET 3 OF 3

JOB NO. 51557
SHEET NO. C1.3

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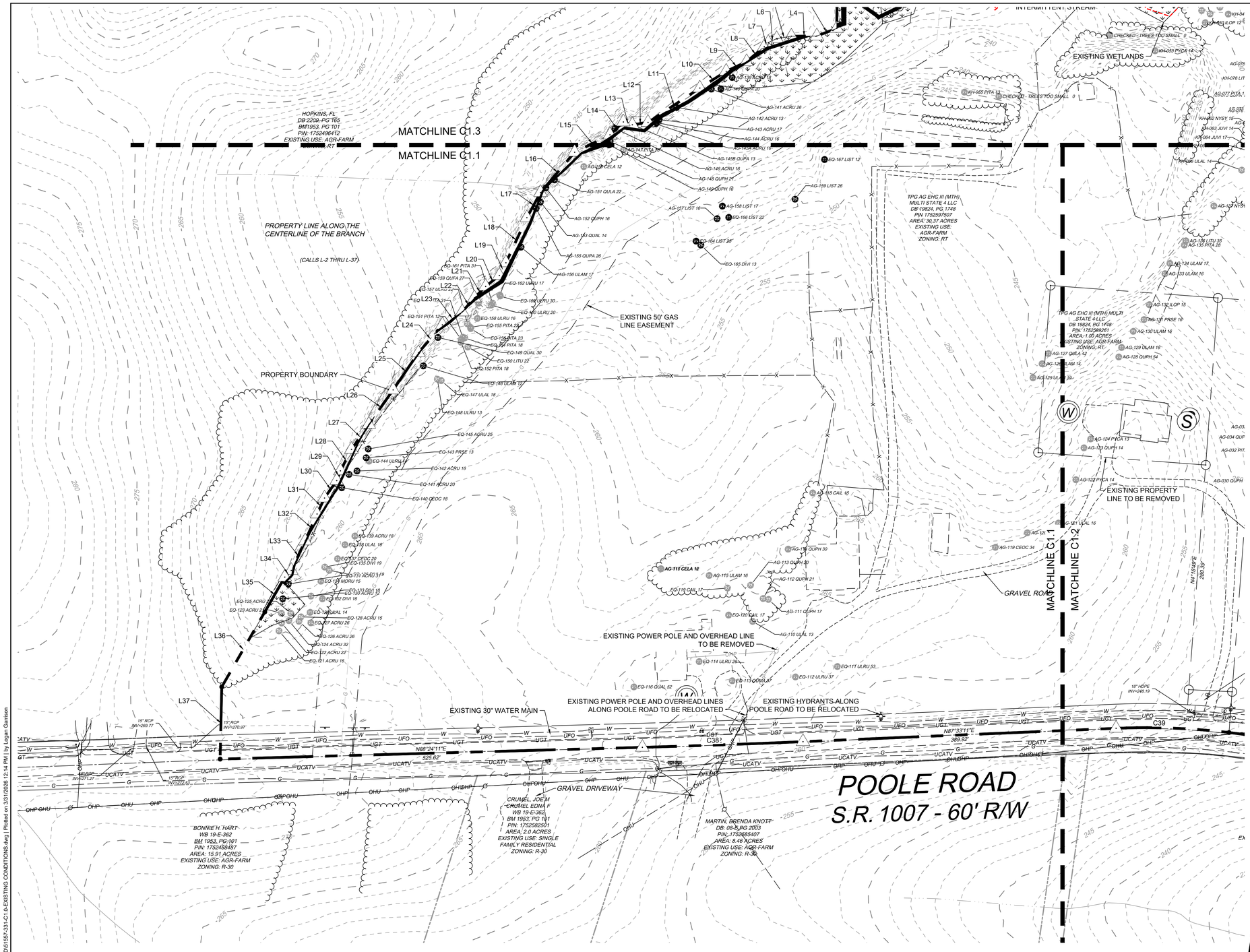

LEGEND

IPF - IRON PIPE FOUND
IRF - IRON ROD FOUND
IPS - IRON PIPE SET
CP - COMPUTED EASEMENT POINT
CMF - CONCRETE MONUMENT
MNF - MAG NAIL FOUND
CP - COMPUTED POINT
CSF - COTTON SPINDLE FOUND
BFP - BACKFLOW PREVENTER
WV - WATER VAULT
TV - TELEPHONE VAULT
TC - TRAFFIC CONTROL BOX
PV - POWER VAULT
UV - UTILITY VAULT
WF - WETLAND FLAG
RCP - REINFORCED CONCRETE PIPE
CMP - CORRUGATED METAL PIPE
VCP - VITRIFIED CLAY PIPE
DIP - DUCTILE IRON PIPE
HDPE - HIGH DENSITY POLYETHYLENE PIPE
FES - FLARED END SECTION
MKF - FIBER OPTIC MARKER
MKG - GAS MARKER
TVP - TELEVISION PEDESTAL
SIGP - SIGNAL POLE
HVAC - HEATING, VENTILATION AND AIR CONDITIONING
LSA - LANDSCAPED AREA
R / W - RIGHT-OF-WAY
P / L - PROPERTY LINE
C / L - CENTERLINE
NTS - NOT TO SCALE
GV - GAS VALVE
CB - CATCH BASIN
GI - GRATE INLET
YI - YARD INLET
CI - CURB INLET
EP - EDGE OF PAVING
TBC - TOP BACK OF CURB
DEED - WAKE/DURHAM COUNTY RECORDS
WCR - WAKE COUNTY RECORDS
DB - DEED BOOK
PB - PLAT BOOK
PG - PAGE
SF - SQUARE FEET
XXXX - SITE ADDRESS

MH DRAINAGE
MH SANITARY
MH ELECTRIC
MH TELEPHONE
MH WATER
STORM INLET
ELECTRIC BOX
TELEPHONE PEDESTAL
CABLE TV PEDESTAL
SIGN
ELECTRIC METER
WATER METER
WATER VALVE
FIRE HYDRANT
POWER POLE
LIGHT POLE
YARD LIGHT
GROUND LAMP

SPRINKLER BOX
SPRINKLER HEAD
SPRINKLER VALVE
GAS TEST LOCATION
GAS METER
GAS VALVE
FLAG POLE
TREE
BOLLARD
BOREHOLE
AC UNIT
MAILBOX
CLEAN OUT
GUY
HC HANDICAP PARKING
WELL
MONITORING WELL
ROOF DRAIN
WATER SPIGOT

DEED LINE
LINE NOT SURVEYED
STORM LINE
SANITARY LINE
PAINTED WATER LINE
WETLAND BUFFER ZONE
PAINTED STORM LINE
CREEK TOP OF BANK
50' CREEK BUFFER (ZONE 1)
50' CREEK BUFFER (ZONE 2)
FLOODPLAIN
FEMA 100-YEAR FLOODPLAIN
FEMA 500-YEAR FLOODPLAIN

TREE SPECIES LEGEND

Species Acronym	Scientific Name	Common Name
ACRU	*Acer rubrum*	red maple
CAIL	*Carya illinoinensis*	pecan
CELA	*Celtis laevigata*	sugarberry
CEOC	*Celtis occidentalis*	common hackberry
DIVI	*Diospyros virginiana*	common persimmon
ILOP	*Ilex opaca*	American holly
JUVI	*Juniperus virginiana*	eastern red-cedar
LIST	*Liquidambar styraciflua*	sweetgum
LITU	*Liriodendron tulipifera*	tulip-poplar
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MEAZ	*Melia azedarach*	chinaberrytree
MORU	*Morus rubra*	red mulberry
NYSY	*Nyssa sylvatica*	black tupelo
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PITA	*Pinus taeda*	loblolly pine
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PYCA	*Pyrus calleryana*	callery pear
QUAL	*Quercus alba*	white oak
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QUMA	*Quercus marilandica*	blackjack oak
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QURU	*Quercus rubra*	northern red oak
QUVE	*Quercus velutina*	black oak
ULAL	*Umus alata*	winged elm
ULAM	*Umus americana*	American elm
ULRU	*Umus rubra*	slippery elm

ENVIRONMENTAL LEGEND

NEUSE RIPARIAN BUFFER ZONE 1
NEUSE RIPARIAN BUFFER ZONE 2
WETLANDS
EX TREE TO BE REMOVED
EX TREE TO REMAIN
TREE SAVE BOUNDARY

ENVIRONMENTAL SURVEY NOTES:
1. LANDSCAPED AREAS REQUIRED BY CHAPTER 7 OF THE UDO SHALL NOT CONTAIN ANY DEVELOPMENT, IMPERVIOUS SURFACES, OR SITE FEATURES THAT DO NOT FUNCTION TO MEET THE APPLICABLE STANDARDS FOR THAT AREA OR THAT REQUIRE REMOVAL OF EXISTING SIGNIFICANT VEGETATION [UDO, SEC. 7.4.E.1].
2. NO GRADING, DEVELOPMENT, OR LAND-DISTURBING ACTIVITIES SHALL OCCUR WITHIN A BUFFER YARD IF FOREST CANOPY, SPECIMEN TREES, OR SIGNIFICANT VEGETATION EXISTS WITHIN THESE AREAS, UNLESS APPROVED BY THE LAND USE ADMINISTRATOR. IF GRADING WITHIN A BUFFER YARD IS PROPOSED, SLOPES OF 1:3 OR LESS ARE ENCOURAGED TO ENSURE THE PROPER TRANSITION OF GRADES TO THE ADJACENT PROPERTY AND TO FACILITATE LANDSCAPING AND MAINTENANCE [UDO, SEC. 7.4.E.2].
3. ALL AREAS WITHIN REQUIRED BUFFER YARDS, STREAM BUFFERS, SLOPE AREAS GREATER THAN 25%, AND WETLANDS ARE TREE SAVE AREAS AND ALL VEGETATION AND SOIL IS TO REMAIN UNDISTURBED [UDO, SEC. 7.4.H.1].
4. ALL TREES GREATER THAN 12" DBH WITHIN FRONT SETBACK AREAS, STREET TREE PLANTING STRIP, AND SLOPE AREAS OF 15-25% ARE TO REMAIN UNDISTURBED OR REPLACEMENT TREES ARE REQUIRED AT A RATE OF 1 TREE PER 12" DBH, AND SHOULD BE INCORPORATED INTO OPEN SPACE AMENITIES/PUBLIC GATHERING AREAS/PEDESTRIAN PLAZA WHEREVER POSSIBLE. REQUIRED STREET TREES, PARKING LOT LANDSCAPING, AND BUFFER YARD PLANTINGS ARE NOT TO BE COUNTED TOWARDS REPLACEMENT REQUIREMENTS [UDO, SEC. 7.4.H.1].
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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: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

NOTES:
1. BOUNDARY TAKEN FROM SURVEY BY TIMMONS GROUP, DATED MARCH 19, 2022.
2. TOPOGRAPHIC INFORMATION TAKEN FROM SURVEY BY TIMMONS GROUP DATED MARCH 19, 2022. WITH SUPPLEMENTAL SURVEY BY TIMMONS GROUP DATED DECEMBER 12, 2024.
3. WETLAND AND STREAM DELINEATION BY TIMMONS GROUP DATED DECEMBER 26, 2024.
4. THE SUBJECT PROPERTY IS LOCATED WITHIN ZONE X, IN ACCORDANCE WITH FIRM MAP #3720175200K & #3720175300K EFFECTIVE 07/19/2022.

NAD 83
SCALE 1"=60'
0 60' 120'

811 Know what's below. Call before you dig.

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-4142

Public
Sewer Collection / Extension System
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City of Raleigh
Public Utilities Department Permit # S-5503

NORTH CAROLINA REGISTERED LANDSCAPE ARCHITECT SEAL 051879 ENGINEER TYLER JEFFREY CROSS
3/31/2026

THIS DRAWING PREPARED AT THE RALEIGH OFFICE
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TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION

DATE
03/31/2026
DRAWN BY
331
DESIGNED BY
331
CHECKED BY
T. CROSS
SCALE
1" = 60'
JOB NO.
51557
SHEET NO.
C1.4

TIMMONS GROUP

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA
EXISTING CONDITIONS TREE SURVEY - SHEET 1 OF 3
NORTH CAROLINA LICENSE NO. C-1652

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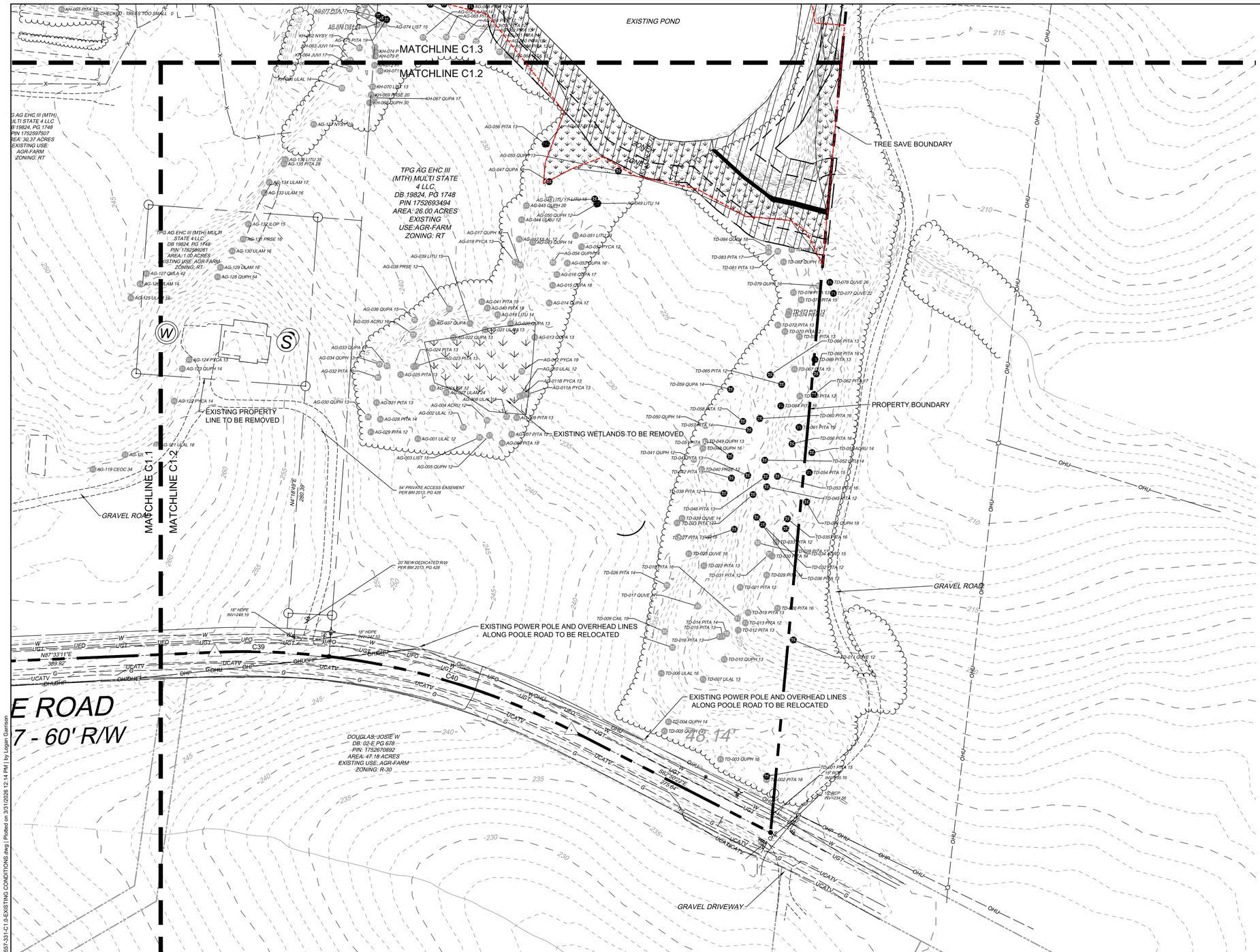

TREE SPECIES LEGEND

Species Acronym	Scientific Name	Common Name
ACRU	*Acer rubrum*	red maple
CAIL	*Carya illinoinensis*	pecan
CELA	*Celtis laevigata*	sugarberry
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ENVIRONMENTAL LEGEND

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- NEUSE RIPARIAN BUFFER ZONE 2
- WETLANDS
- EX TREE TO BE REMOVED
- EX TREE TO REMAIN
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BY: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

Digitally signed by Samuel A. MacDonald
DN: cn=Samuel A. MacDonald, o=Timmons Group, ou=Engineering, ou=Engineering, ou=Engineering

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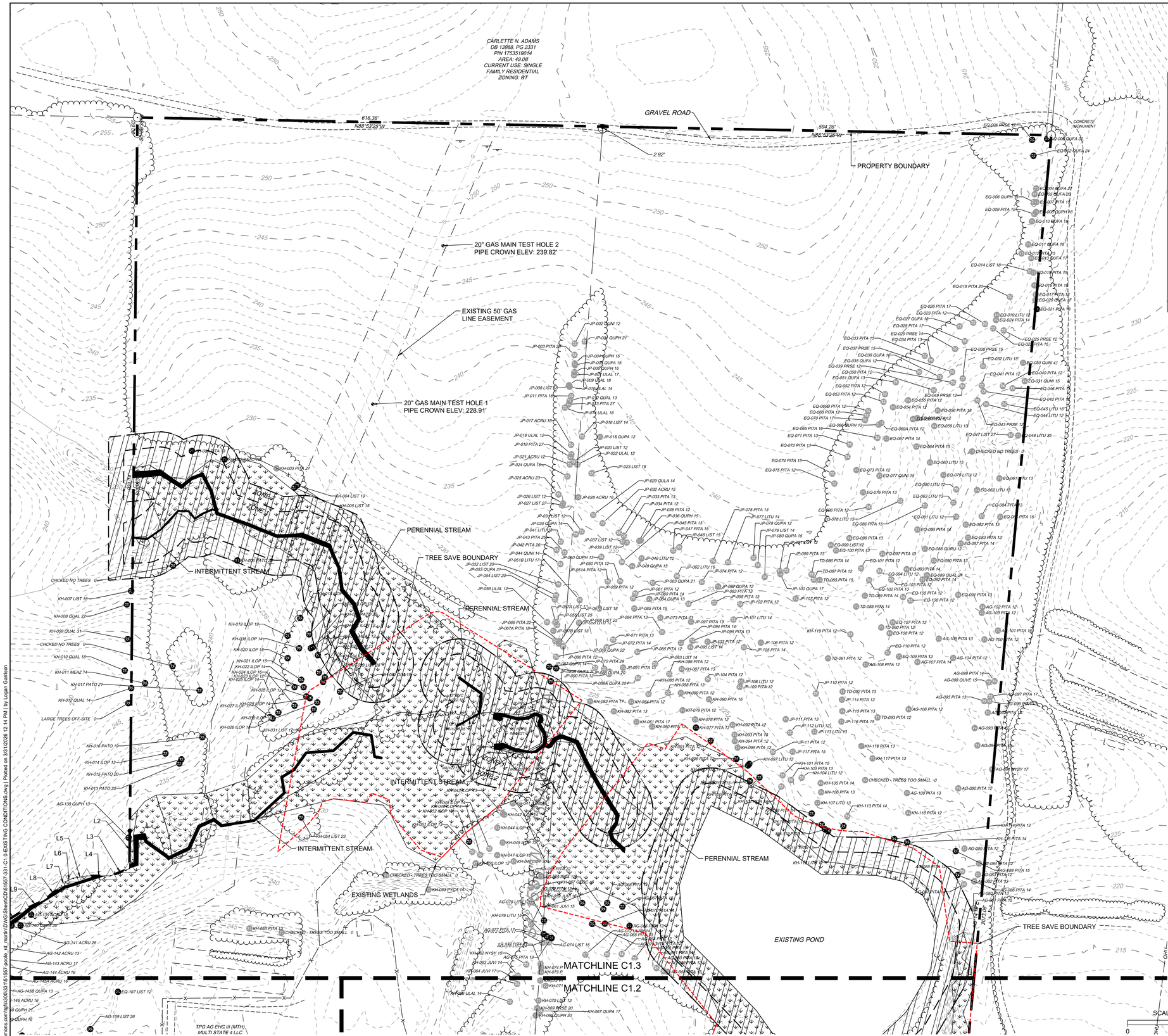

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- NEUSE RIPARIAN BUFFER ZONE 1
- NEUSE RIPARIAN BUFFER ZONE 2
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- EX TREE TO BE REMOVED
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BY: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

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BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

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Water Distribution / Extension System
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City of Raleigh
Public Utilities Department Permit # W-4142

Public
Sewer Collection / Extension System
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City of Raleigh
Public Utilities Department Permit # S-5503

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 ENGINEER TYLER JEFFREY CROSS
3/31/2026

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REVISION DESCRIPTION	DATE

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DRAWN BY: 331
DESIGNED BY: 331
CHECKED BY: T. CROSS
SCALE: 1" = 60'

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA
EXISTING CONDITIONS TREE SURVEY - SHEET 3 OF 3

JOB NO. 51557
SHEET NO. C1.6

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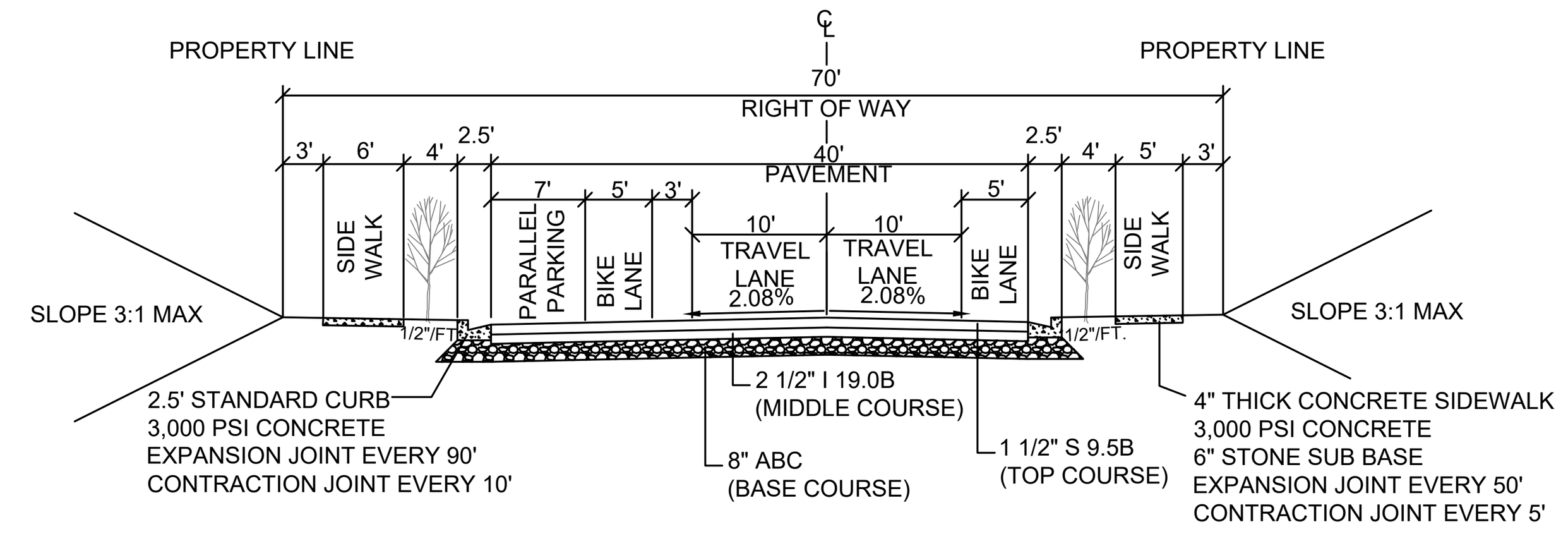
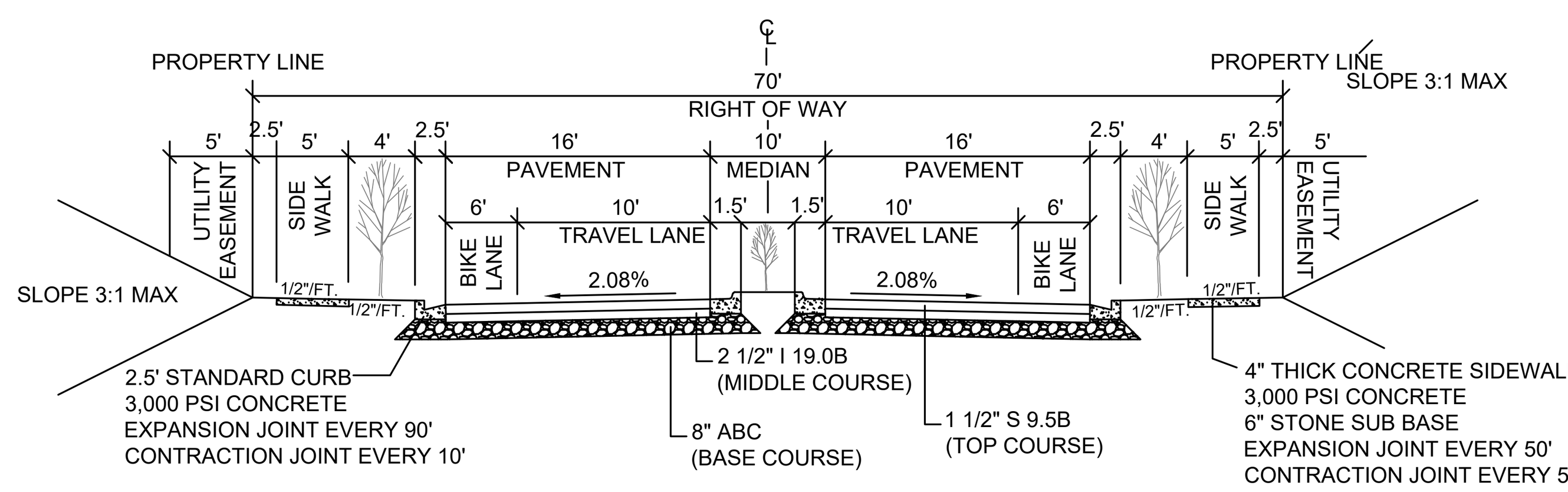


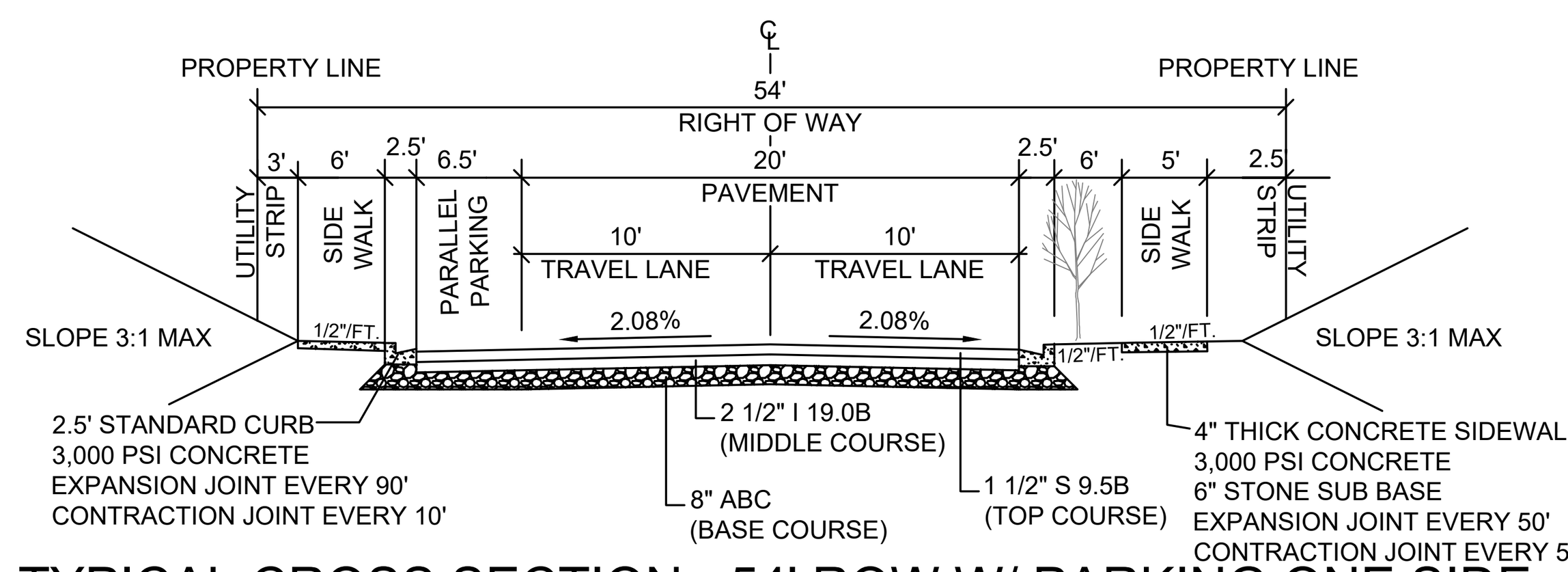
TYPICAL MODIFIED MAIN STREET CROSS SECTION - 70' W/ PARALLEL PARKING

NOT TO SCALE



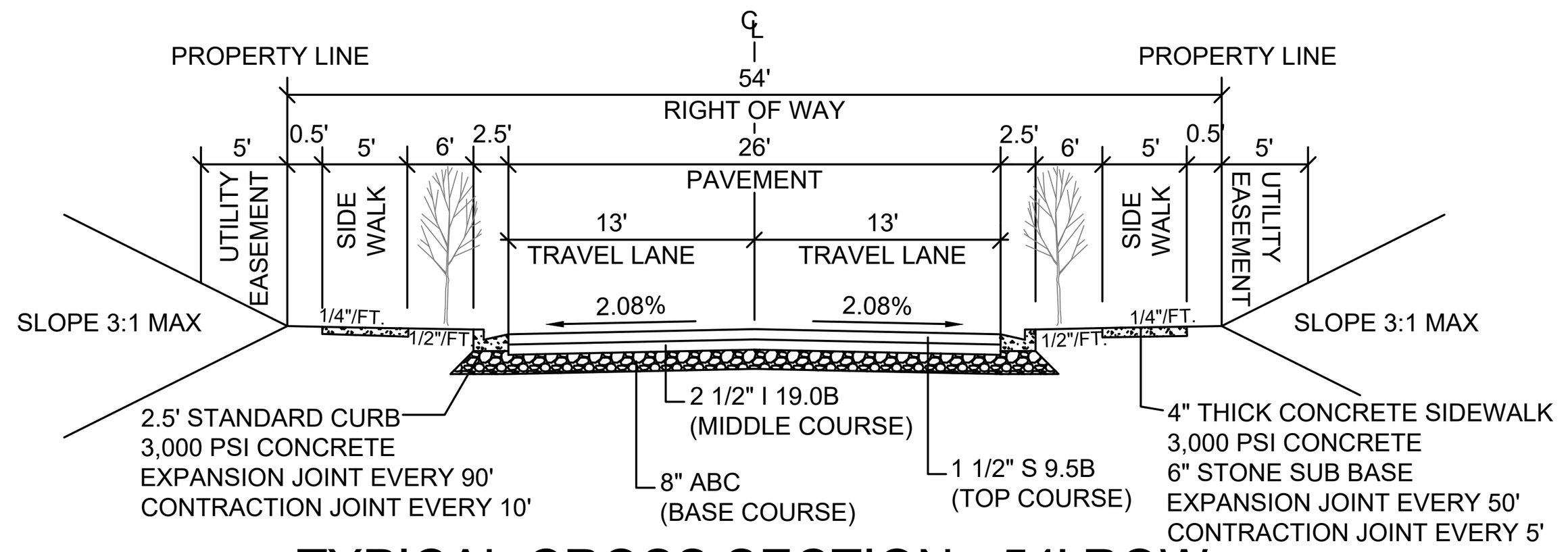
TYPICAL MAIN STREET CROSS SECTION - 70' ROW W/ MEDIAN

NOT TO SCALE



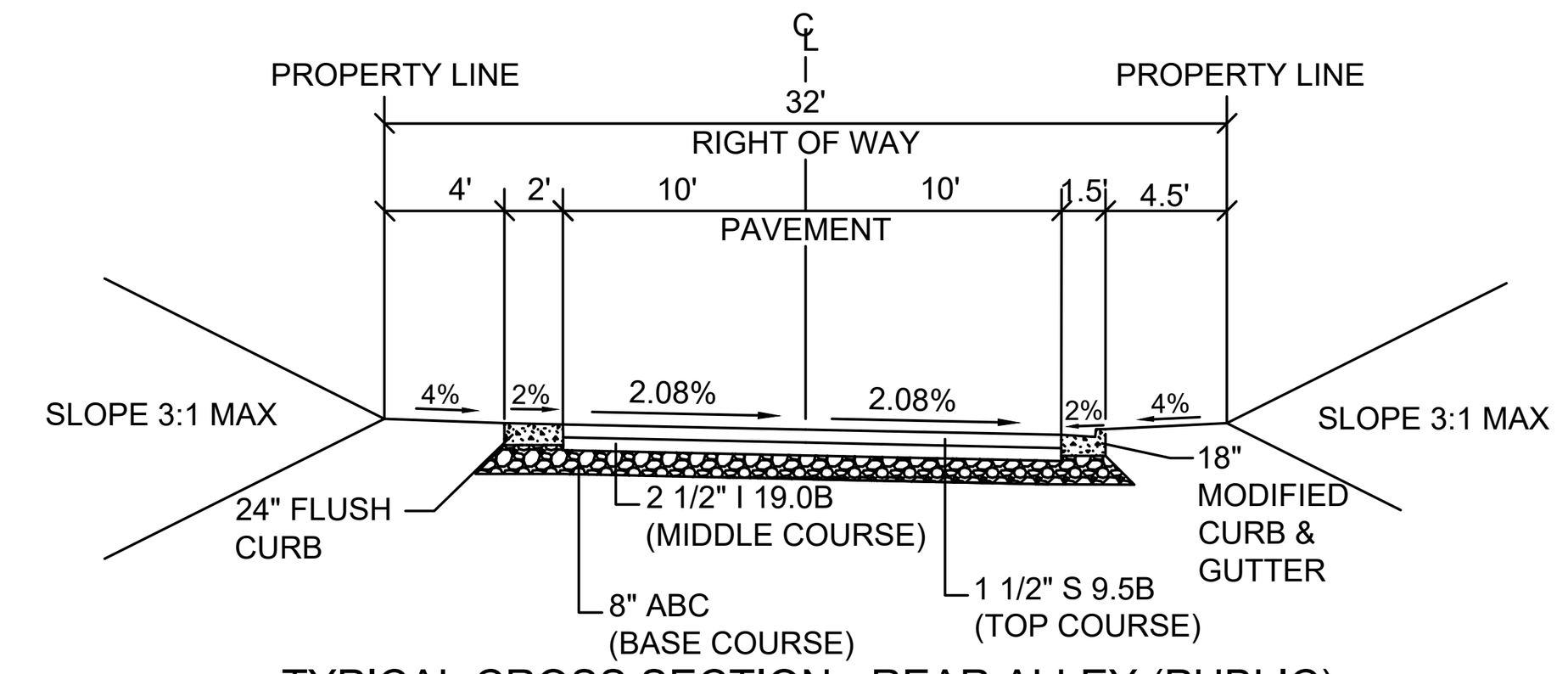
TYPICAL CROSS SECTION - 54' ROW W/ PARKING ONE SIDE

NOT TO SCALE



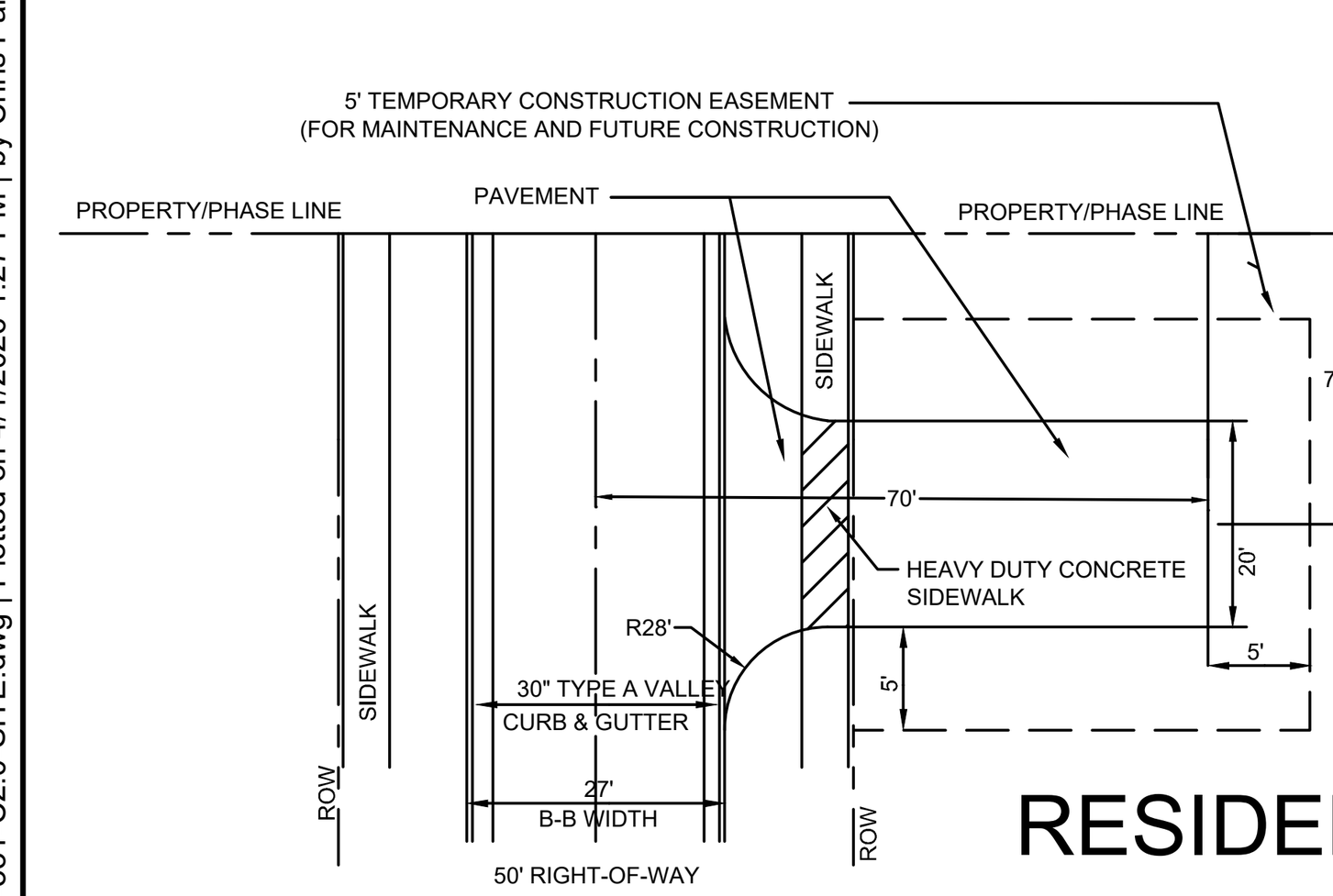
TYPICAL CROSS SECTION - 54' ROW

NOT TO SCALE

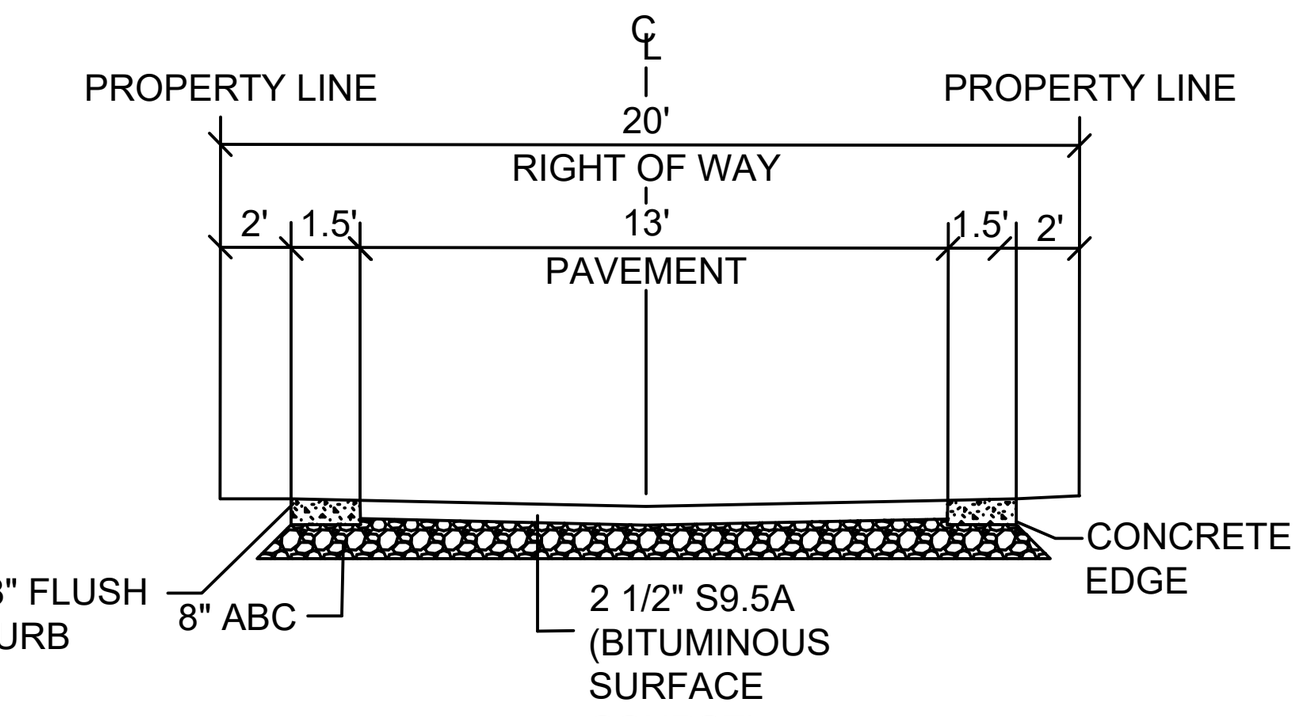


TYPICAL CROSS SECTION - REAR ALLEY (PUBLIC)

NOT TO SCALE



TEMPORARY TURNAROUND



TYPICAL CROSS SECTION - REAR ALLEY

NOT TO SCALE

RESIDENTIAL LANDSCAPING NOTES

FIRE NOTE:
WHEN FUEL TANKS ARE DELIVERED FOR MOBILE FUELING OPERATIONS OF CONSTRUCTION VEHICLES, PLEASE CONTACT THE KNIGHTDALE FIRE MARSHAL'S OFFICE AT (919) 217-2292 OR RONNIE.PRIVETTE@KNIGHTDALENC.GOV TO SCHEDULE AN INSPECTION. WE HAVE ISSUE A FIRE SERVICE OPERATIONAL PERMIT AND THEY WILL NEED TO BE INSPECTED

SITE DATA

DEVELOPER:
MERITAGE HOMES
WILLIAM ROBINSON
3300 PARAMOUNT PARKWAY, SUITE 120
MORRISVILLE, NC 27560
EMAIL: (919) 322-2289
PHONE: BILL.ROBINSON@MERITAGEHOMES.COM

ENGINEER:
TIMMONS GROUP
TYLER CROSS, PE
5410 TRINITY ROAD, STE 102
RALEIGH, NC 27607
PHONE: (919) 532-3271
FAX: (919) 859-5663
EMAIL: TYLER.CROSS@TIMMONS.COM

OWNER ON RECORD
TPG AG EHC III (MTH) MULTI STATE 4 LLC
8585 E HARTFORD DR, STE 118
SCOTTSDALE, AZ 85255
PIN #: 1752-59-7507
DB: 19824
PG: 1748

TPG AG EHC III (MTH) MULTI STATE 4 LLC
8585 E HARTFORD DR, STE 118
SCOTTSDALE, AZ 85255
PIN #: 1752-59-9261
DB: 19824
PG: 1748

FIRM MAP# = 3720175200K & 3720175300K
EFFECTIVE 07/19/2022

CBU PARKING
CBU PARKING MAXIMUM: 8 SPACES
CBU PARKING MINIMUM: 4 SPACES
CBU PARKING PROVIDED: 7 SPACES
ON-STREET PARKING PROVIDED: 62 SPACES

TOTAL EXISTING TRACT = 60.15 ACRES
EXISTING ZONING = GR-3 PUD

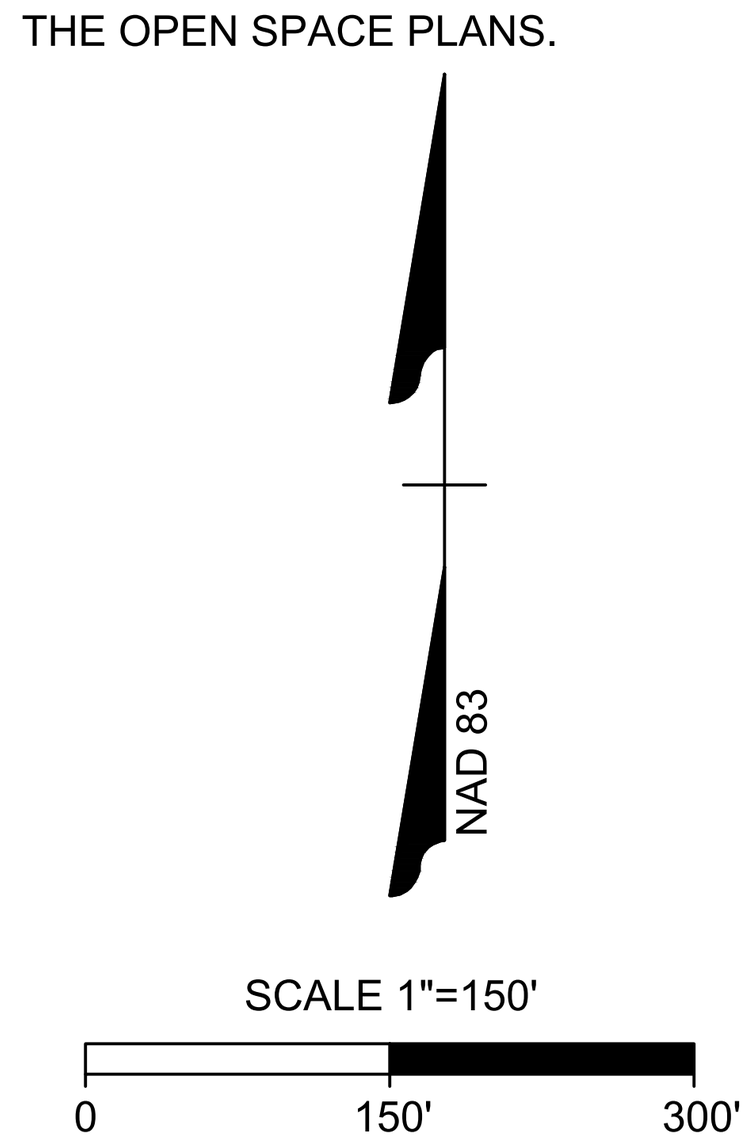
TOTAL PROPOSED NUMBER OF LOTS = 180
PROPOSED DENSITY = 2.99 DU/A

FRONT LOAD SINGLE FAMILY LOTS = 72
MINIMUM LOT SIZE REQUIRED: 7,100 SF
MINIMUM LOT SIZE PROVIDED: 7,102 SF
AVERAGE LOT SIZE PROVIDED: 8,469 SF
LOT WIDTH: 60'
FRONT SETBACK: 10'
DRIVEWAY LENGTH: 25'
SIDE SETBACK: 5'
CORNER SIDE SETBACK: 10'
REAR SETBACK: 20'

REAR LOAD SINGLE FAMILY LOTS = 55
MINIMUM LOT SIZE REQUIRED: 4,100 SF
MINIMUM LOT SIZE PROVIDED: 4,101 SF
AVERAGE LOT SIZE PROVIDED: 4,614 SF
LOT WIDTH: 38'
FRONT SETBACK: 10'
SIDE SETBACK: 3'
CORNER SIDE SETBACK: 10'
REAR SETBACK: 20'
DRIVEWAY LENGTH: 20'

REAR LOAD TOWNHOME LOTS = 53
MINIMUM LOT SIZE REQUIRED: 2,000 SF
MINIMUM LOT SIZE PROVIDED: 2,000 SF
AVERAGE LOT SIZE PROVIDED: 2,032 SF
MINIMUM LOT WIDTH: 20'
FRONT SETBACK:10'
BUILDING SEPARATION: 10'
REAR SETBACK: 20'
DRIVEWAY LENGTH: 20'

NOTE:
COMPLIANCE WITH THE CBU PARKING REQUIREMENTS WILL BE CONFIRMED DURING REVIEW OF THE OPEN SPACE PLANS.



STREET TABLE

	LENGTH (LF)	ROW	DEDICATION TYPE	SPEED LIMIT (MPH)
ROAD A	1,776	64	PUBLIC	25
ROAD B	609	54	PUBLIC	20
ROAD C	751	54	PUBLIC	20
ROAD D	2,039	54	PUBLIC	20
ROAD E	1,212	64	PUBLIC	25
ROAD F	904	54	PUBLIC	20
ROAD G	345	54	PUBLIC	20
ROAD H	573	54	PUBLIC	20
ALLEY A	858	32	PUBLIC	10
ALLEY B	143	20	PRIVATE	10
ALLEY C	639	20	PRIVATE	10
ALLEY D	147	20	PRIVATE	10
ALLEY E	339	32	PUBLIC	10
ALLEY F	414	20	PRIVATE	10
TOTAL	**10,749**			
TOTAL W/O ALLEYS	**8,209**			

LEGEND

PROPERTY LINE
ADJACENT PROPERTY LINE
PERIMETER BUFFER
PROPOSED RIGHT-OF-WAY
PROPOSED LOT LINE
BUILDING SETBACK
PROPOSED ROAD
CENTER PHASE LINE
DRAINAGE EASEMENT
SANITARY SEWER EASEMENT
POWER LINE EASEMENT
NATURAL GAS EASEMENT
EXISTING WETLANDS
NEUSE RIPARIAN BUFFER
ACTIVE OPEN SPACE
PASSIVE OPEN SPACE
COMMON AREA
PROPOSED 4' FENCE
PROPOSED SIDEWALK
PROPOSED 10' MUP
PROPOSED ASPHALT
GREENWAY PROPOSED MULCH
TRAIL LANDSCAPE BUFFER
FEE-IN-LIEU ROADWORK
30" STANDARD CURB & GUTTER

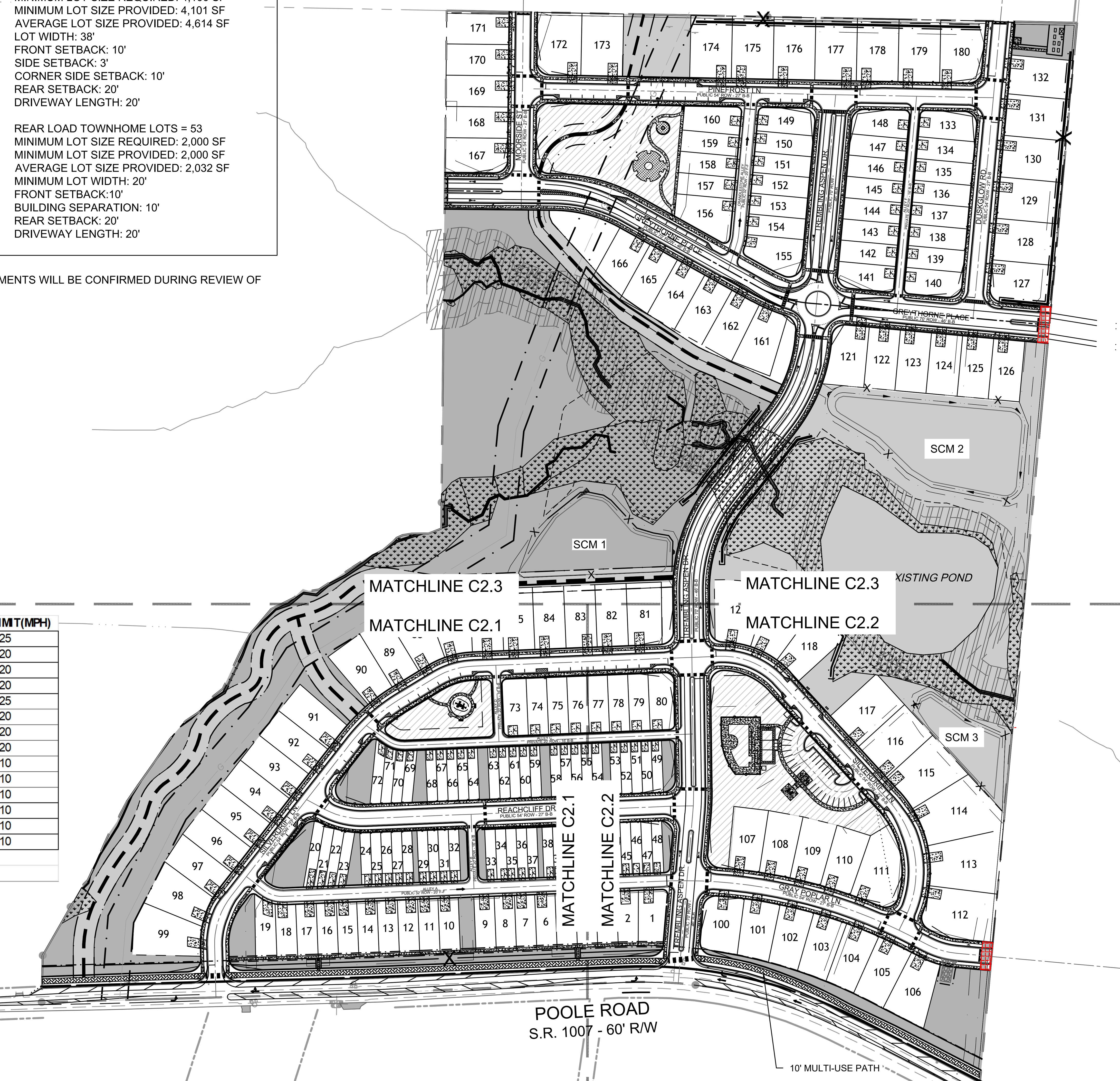
IMPERVIOUS AREA DATA

TOTAL SITE AREA	60.15 AC	2,619,964.71 SF
IMPERVIOUS IN 127 SINGLE FAMILY LOTS (3200 SF/LOT)	9.3 AC	406,400 SF
IMPERVIOUS IN 53 TOWNHOME LOTS (1900 SF/LOT)	2.3 AC.	100,700 SF
IMPERVIOUS IN ROADWAY	9.4 AC	408,915 SF
TOTAL IMPERVIOUS	21.0	916,015 SF
PERCENT IMPERVIOUS		35%

USPS NOTE

CLUSTER MAILBOXES TO BE LOCATED WITHIN NEIGHBORHOOD ACTIVE OS 1. KIOSK LOCATION SHALL BE APPROVED BY USPS PRIOR TO SUBDIVISION APPROVAL. IF TEMPORARY LOCATIONS ARE REQUIRED, APPROVAL OF LOCATIONS SHALL BE RECEIVED FROM USPS AND TOWN OF KNIGHTDALE. MAIL KIOSK WILL HAVE ADA COMPLIANT RAMPS AND PARKING SPACES.

A HOMEOWNER'S ASSOCIATION (HOA) WILL OWN AND MAINTAIN ALL OPEN SPACE PARCELS, PRIVATE ALLEYS, AND WILL BE RESPONSIBLE FOR MAINTAINING ALL LANDSCAPING REQUIRED BY TOWN OF KNIGHTDALE UNIFIED DEVELOPMENT ORDINANCE (UDO).



RETAINING WALL NOTES:

1. ALL RETAINING WALLS TO BE DESIGNED AND PERMITTED BY OTHERS.
2. ALL RETAINING WALLS GREATER THAN 30" IN HEIGHT SHALL INCLUDE A MINIMUM 4' HIGH BLACK ALUMINUM FENCE.
3. CONTRACTOR SHALL COORDINATE DESIGN AND SUBMIT SEALED PLAN(S) FOR REVIEW AND APPROVAL FROM CITY OF SANFORD INSPECTIONS DEPARTMENT.
4. PRIOR TO CONSTRUCTION CONTRACTOR TO FIELD VERIFY BOTTOM OF WALL AND ALL OTHER ASSOCIATED ELEVATIONS.
5. CONTRACTOR TO PROVIDE SHOP DRAWINGS TO THE ENGINEER OF RECORD FOR COORDINATION PURPOSED WITH FIELD CONDITIONS. UNSEEN CONFLICTS AND ASSOCIATED DRAINAGE AS NEEDED.
6. ALL RETAINING WALLS WILL REQUIRE A BUILDING PERMIT FROM THE JURISDICTIONS INSPECTIONS DEPARTMENT.
7. TOP OF WALL SPOT GRADES PROVIDE 6" ELEVATION DIFFERENCE ABOVE GRADE SHOWN.
8. CONTRACTOR WILL BE REQUIRED TO MITIGATE ANY LOCALIZED LOW POINTS THAT MAY LEAD TO PONDING ALONG THE TOP OF WALL.
9. DRAINAGE SWALES TO BE LINED WITH RIP RAP AT END OF WALLS TO PREVENT EROSION.

GENERAL SITE NOTES

1. ALL CONSTRUCTION SHALL CONFORM TO TOWN OF KNIGHTDALE AND CITY OF RALEIGH STANDARDS AND SPECIFICATIONS.
2. ROADS AND DRIVEWAYS SHALL COMPLY WITH NCDOT AND TOWN OF KNIGHTDALE STANDARDS.
3. SIGN PERMITS SHALL BE REQUIRED FOR ANY ENTRANCE SIGNAGE. PERMITS SHALL BE REQUIRED PRIOR TO FABRICATION OR INSTALLATION OF SIGNS. SIGNAGE SHALL BE RESTRICTED TO AN ON-SITE LOCATION.
4. THE WATER AND SEWER SYSTEMS SHALL COMPLY WITH CITY OF RALEIGH STANDARDS.
5. ALL DESIGN AND CONSTRUCTION METHODS SHALL COMPLY WITH THE TOWN OF KNIGHTDALE'S SEDIMENTATION AND EROSION CONTROL REGULATIONS. AN EROSION CONTROL PLAN SHALL BE APPROVED BY THE TOWN OF KNIGHTDALE PRIOR TO CONSTRUCTION DRAWINGS APPROVAL AND ANY GRADING.
6. CONSTRUCTION DRAWINGS SHALL BE SUBMITTED AND APPROVED BY THE TOWN OF KNIGHTDALE AND CITY OF RALEIGH PRIOR TO CONSTRUCTION.
7. RESTRICTIVE COVENANTS SHALL BE APPROVED AND RECORDED PRIOR TO RECORDING OF FINAL PLAT.
8. STORMWATER CONTROL MEASURES SHALL BE CONTAINED IN AND ACCESSED VIA OPEN SPACE MAINTAINED AND OWNED BY THE HOMEOWNER'S ASSOCIATION. A MAINTENANCE PLAN MUST BE DEVELOPED TO ADDRESS THE STORMWATER CONTROL MEASURES.
9. PRIVATE STORM DRAINAGE EASEMENTS SHALL BE MAINTAINED BY THE HOA.
10. SUBDIVISION LOTS MUST BE LOTS OF RECORD PRIOR TO RECEIVING A BUILDING PERMIT.
11. PER UDO SEC 6.4.H, ALL UTILITES SHALL BE PLACED UNDERGROUND.

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: Samuel A. MacDonald (Digitally signed by Samuel A. MacDonald; Date: 2026.04.16 09:48:35-04'00') DATE: ____________
TOWN ENGINEER

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

BY: Gideon Smith (Digitally signed by Gideon Smith; Date: 2026.05.19 08:47:19-04'00') DATE: ____________
LAND USE ADMINISTRATOR

811 Know what's below. Call before you dig.

PHASE 1 SITE QUANTITIES

Sewer		
48" Manholes	23	EA
60" Manholes	16	EA
72" Inside Drop Manhole	1	EA
8" Public Sanitary Sewer	0	LF
Sewer Services	121	EA
Water		
8" Public Watermain	4,603	LF
Water Services	121	EA
Fire Hydrant Assemblies	14	EA
8" Gate Valves	26	EA
8" X 8" Cross	2	EA
8" X 8" Tees	6	EA
8" Blow Off Assemblies	1	EA
Concrete/Asphalt		
Private Alleys	929	LF
Public Alleys	858	LF
Public Streets	4,078	LF
Public Sidewalk	8,558	LF
10' Multi-Use Path	1,738	LF
30" Curb & Gutter	9,980	LF
24" Flush Curb	789	LF
18" Modified Curb & Gutter	2,394	LF
Site Data		
Number of Lots	120	
GPD Usage Water	57,600	
GPD Usage Sewer	36,000	
Calculation for GPD Water (per Unit)	480	
Calculation for GPD Sewer (per Unit)	300	
Combo Silt/ Tree Protection Fence	9,130	LF
Public Storm Drainage	4,395	LF

PHASE 2 SITE QUANTITIES

Sewer		
48" Manholes	14	EA
60" Manholes	2	EA
72" Inside Drop Manhole	1	EA
8" Public Sanitary Sewer	0	LF
Sewer Services	60	EA
Water		
8" Public Watermain	4,114	LF
6" Private Watermain	339	LF
Water Services	60	EA
Fire Hydrant Assemblies	9	EA
8" Gate Valves	25	EA
8" X 8" Cross	1	EA
8" X 8" Tees	7	EA
8" Blow Off Assemblies	4	EA
Concrete/Asphalt		
Private Alleys	414	LF
Public Alleys	339	LF
Public Streets	4,131	LF
Public Sidewalk	8,026	LF
30" Curb & Gutter	8,262	LF
24" Flush Curb	295	LF
18" Modified Curb & Gutter	990	LF
Site Data		
Number of Lots	60	
GPD Usage Water	28,800	
GPD Usage Sewer	18,000	
Calculation for GPD Water (per Unit)	480	
Calculation for GPD Sewer (per Unit)	300	
Tree Protection Fence (LF)	6,555	LF
Public Storm Drainage	3,900	LF

NOTE: CALCULATIONS FOR GPD SEWER IS BASED ON 75 GPD/BR ASSUMING 4 BEDROOMS PER LOT.

FEE-IN-LIEU NOTE: COST OF ROADWAY FEATURE CONSTRUCTION WITHIN RED HATCHED AREA IS TO BE PAID TO TOWN OF KNIGHTDALE. THAT ROAD WORK SHALL NOT BE COMPLETED DURING ROADWAY CONSTRUCTION. REFERENCE PROJECT OVERVIEW #1671635.

FIRE NOTE:

1. WHEN FUEL TANKS ARE DELIVERED FOR MOBILE FUELING OPERATIONS OF CONSTRUCTION VEHICLES, PLEASE CONTACT THE KNIGHTDALE FIRE MARSHAL'S OFFICE AT (919) 217-2292 OR RONNIE.PRIVETTE@KNIGHTDALENC.GOV TO SCHEDULE AN INSPECTION. A FIRE SERVICE OPERATIONAL PERMIT IS REQUIRED AND WILL NOT BE GRANTED WITHOUT AN INSPECTION.

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-4142

Public
Sewer Collection / Extension System
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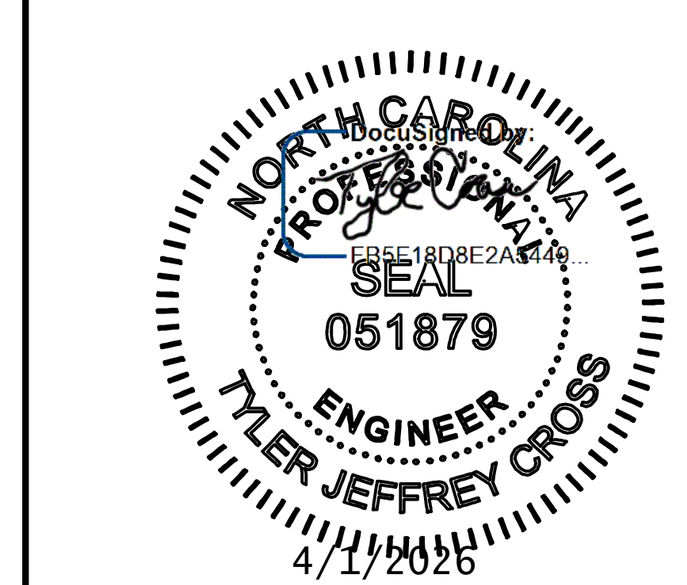
City of Raleigh
Public Utilities Department Permit # S-5503



THIS DRAWING PREPARED AT THE
RALEIGH OFFICE
5410 Trinity Road, Suite 102 | Raleigh, NC 27607
TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION	DATE

DATE	03/31/2026
DRAWN BY	331
DESIGNED BY	331
CHECKED BY	T. CROSS
SCALE	1" = 150'

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS

KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

OVERALL SITE PLAN

JOB NO. 51557
SHEET NO. C2.0

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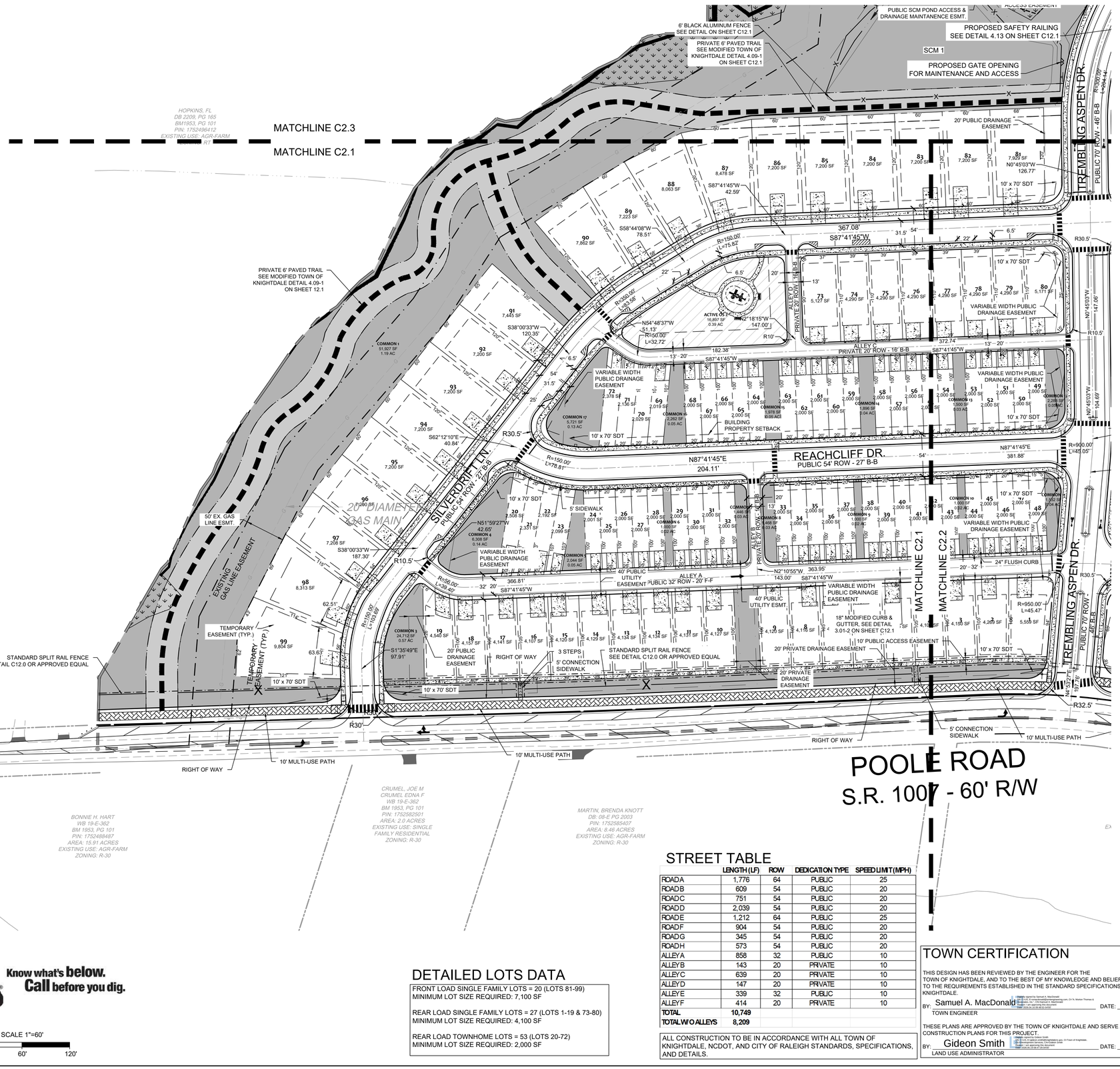
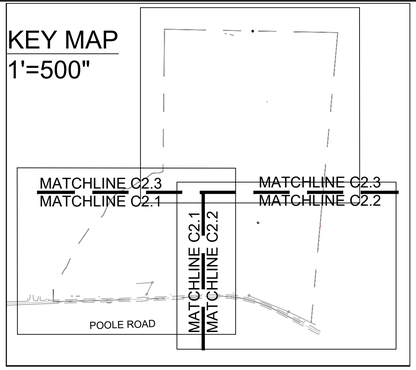


KEY MAP

1'=500"



NOTES:

1. FIELD TOPOGRAPHIC SURVEY PERFORMED BY TIMMONS GROUP ON MARCH, 2022.
2. THE CONTRACTOR SHALL CONTACT NC ONE CALL CENTER PRIOR TO ANY DIGGING.
3. ALL PUBLIC WATER IMPROVEMENTS SHALL CONFORM TO ALL CITY OF RALEIGH PUBLIC UTILITIES DEPT. AND NCDENR DEH PWS STANDARDS AND SPECIFICATIONS. ALL SANITARY SEWER IMPROVEMENTS SHALL CONFORM TO ALL CITY OF RALEIGH PUBLIC UTILITIES DEPT. AND NCDENR DWQ STANDARDS AND SPECIFICATIONS
4. **THE CONSTRACTOR SHALL CHECK PLANS AND FIELD CONDITIONS FOR CONFLICTS AND DISCREPANCIES PRIOR TO CONSTRUCTION. THE CONCTRACTOR SHALL NOTIFY THE ENGINEER OF ANY CONFLICT BEFORE PERFORMING WORK IN THE AFFECTED AREA.**
5. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH TOWN OF KNIGHTDALE, CITY OF RALEIGH, AND NCDOT STANDARDS AND SPECIFICATIONS.
6. WETLAND AND RIPARIAN BUFFER DELINEATION BY TIMMONS GROUP DATED JUNE 2, 2022.
7. ALL STREETS SHALL BE PUBLIC. ALLEYS SHALL BE PRIVATE WITH THE EXCEPTION OF PROPOSED PUBLIC ALLEYS A AND E.
8. ALL UTILITIES SHALL BE UNDERGROUND.
9. EACH LOT WILL BE SERVED BY CITY OF RALEIGH PUBLIC WATER SYSTEM.
10. EACH LOT WILL BE SERVED BY CITY OF RALEIGH PUBLIC SEWER SYSTEM.
11. TOWN OF KNIGHTDALE STORMWATER PERMITS WILL BE REQUIRED.
12. TOWN OF KNIGHTDALE EROSION CONTROL REGULATIONS SHALL BE COMPLIED WITH.
13. CONSTRUCTION DRAWINGS MUST BE APPROVED PRIOR TO ANY WORK BEGINNING.
14. SIGNAGE SHALL BE APPROVED THROUGH A SEPARATE PROCESS. APPROVAL OF CDS DOES NOT GRANT APPROVAL OF ANY SIGNAGE
15. NCDOT DRIVEWAY PERMIT WILL BE REQUIRED PRIOR TO FINAL PLAT APPROVAL.
16. STREET NAMES MUST BE APPROVED BY WAKE COUNTY GIS PRIOR TO FINAL PLAT.
17. DEDICATED OPEN SPACE AREAS WILL BE OWNED AND MAINTAINED BY THE HOMEOWNERS ASSOCIATION
18. OPEN SPACE SHALL BE DEDICATED FOR PROVISION OF ACTIVE AND/OR PASSIVE OUTDOOR RECREATION OPPORTUNITIES FOR THE SUBDIVISION'S RESIDENTS AND THEIR GUESTS.
19. VERTICAL CLEARANCE OF 13 FEET 6 INCHES REQUIRED FOR ALL ROADWAYS.
20. AREAS OF DISCONNECTED IMPERVIOUS SHALL BE SHOWN ON THE RECORDED PLAT.
21. A FINANCIAL GUARANTEE FOR INCOMPLETE PUBLIC IMPROVEMENTS REQUIRED PRIOR TO FINAL PLAT.

LEGEND

- PROPERTY LINE
- ADJACENT PROPERTY LINE
- PERIMETER BUFFER
- PROPOSED RIGHT-OF-WAY
- PROPOSED LOT LINE
- BUILDING SETBACK
- PROPOSED ROAD
- CENTER PHASE LINE
- DRAINAGE EASEMENT
- SANITARY SEWER EASEMENT
- POWER LINE EASEMENT
- NATURAL GAS EASEMENT
- EXISTING WETLANDS
- NEUSE RIPARIAN BUFFER
- ACTIVE OPEN SPACE
- PASSIVE OPEN SPACE
- COMMON AREA
- PROPOSED 4' FENCE
- PROPOSED SIDEWALK
- PROPOSED 10' MUP
- PROPOSED ASPHALT
- GREENWAY PROPOSED MULCH
- TRAIL LANDSCAPE BUFFER
- 30" STANDARD CURB & GUTTER

STREET TABLE

	LENGTH (LF)	ROW	DEDICATION TYPE	SPEED LIMIT (MPH)
ROAD A	1,776	64	PUBLIC	25
ROAD B	609	54	PUBLIC	20
ROAD C	751	54	PUBLIC	20
ROAD D	2,039	54	PUBLIC	20
ROAD E	1,212	64	PUBLIC	25
ROAD F	904	54	PUBLIC	20
ROAD G	345	54	PUBLIC	20
ROAD H	573	54	PUBLIC	20
ALLEY A	858	32	PUBLIC	10
ALLEY B	143	20	PRIVATE	10
ALLEY C	639	20	PRIVATE	10
ALLEY D	147	20	PRIVATE	10
ALLEY E	339	32	PUBLIC	10
ALLEY F	414	20	PRIVATE	10
TOTAL	**10,749**			
TOTAL W/O ALLEYS	**8,209**			

DETAILED LOTS DATA

FRONT LOAD SINGLE FAMILY LOTS = 20 (LOTS 81-99)
MINIMUM LOT SIZE REQUIRED: 7,100 SF

REAR LOAD SINGLE FAMILY LOTS = 27 (LOTS 1-19 & 73-80)
MINIMUM LOT SIZE REQUIRED: 4,100 SF

REAR LOAD TOWNHOME LOTS = 53 (LOTS 20-72)
MINIMUM LOT SIZE REQUIRED: 2,000 SF

ALL CONSTRUCTION TO BE IN ACCORDANCE WITH ALL TOWN OF KNIGHTDALE, NCDOT, AND CITY OF RALEIGH STANDARDS, SPECIFICATIONS, AND 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: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

Digitally signed by Samuel A. MacDonald
DN: cn=Samuel A. MacDonald, o=Timmons Group, ou=Knightdale Gov't, ou=Town of Knightdale, ou=Engineering Services, l=Knightdale, st=North Carolina, c=US
Date: 2022.07.19 09:52:29 -04'00'

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

Digitally signed by Gideon Smith
DN: cn=Gideon Smith, o=Timmons Group, ou=Knightdale Gov't, ou=Town of Knightdale, ou=Environmental Services, l=Knightdale, st=North Carolina, c=US
Date: 2022.08.10 08:47:29 -04'00'

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Water Distribution / Extension System

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City of Raleigh
Public Utilities Department Permit # W-4142

Public
Sewer Collection / Extension System

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City of Raleigh
Public Utilities Department Permit # S-5503

811 Know what's below. Call before you dig.

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 TYLER JEFFREY CROSS

3/31/2026

THIS DRAWING PREPARED AT THE
RALEIGH OFFICE
5410 Trinity Road, Suite 102 | Raleigh, NC 27607
TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION

DATE

DATE: 03/31/2026
DRAWN BY: 331
DESIGNED BY: 331
CHECKED BY: T. CROSS
SCALE: 1" = 60'

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS

KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

DETAILED SITE PLAN - SHEET 1 OF 3

JOB NO. 51557
SHEET NO. C2.1

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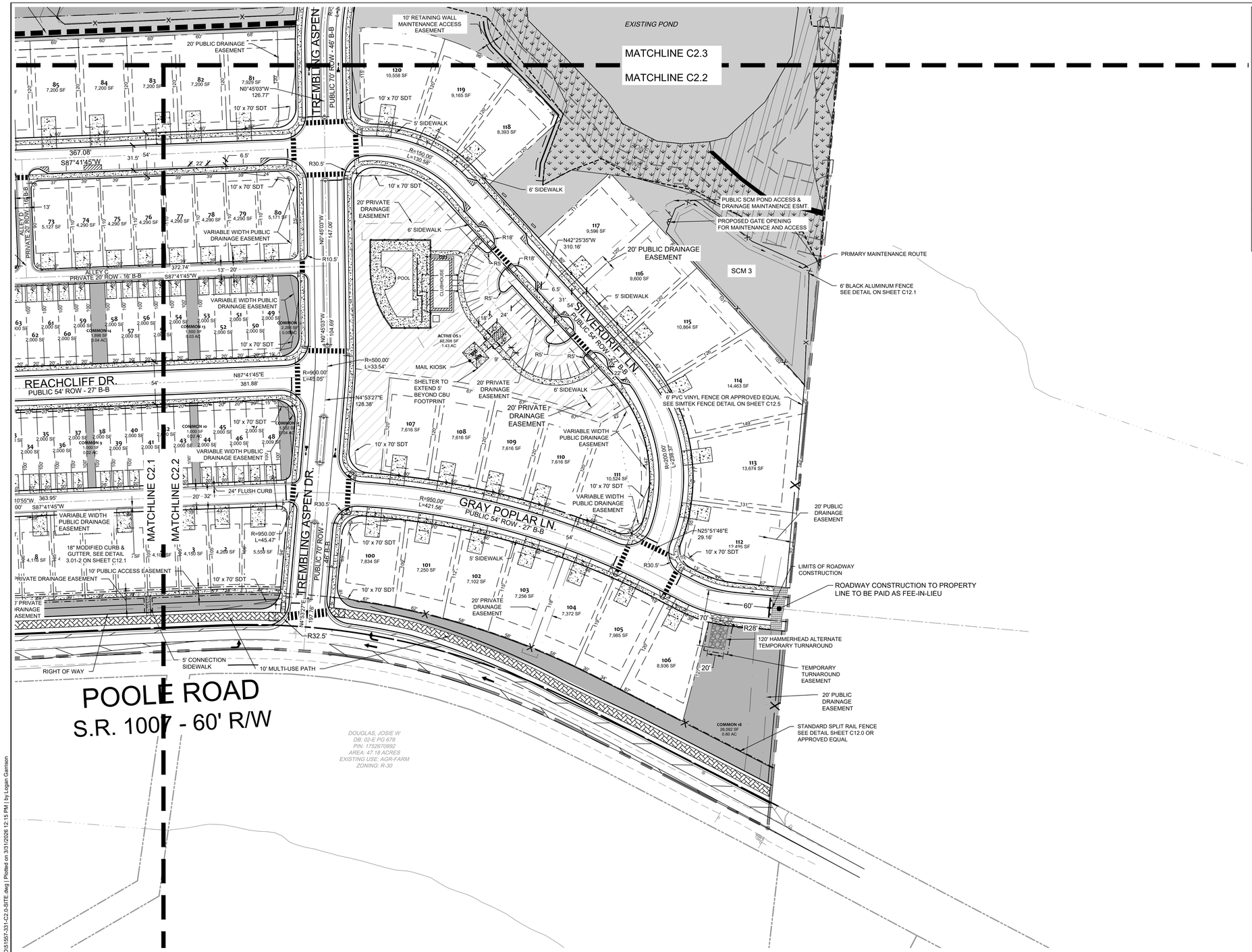
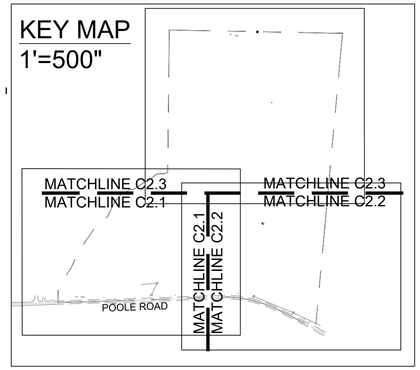


KEY MAP
1'=500"



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20. AREAS OF DISCONNECTED IMPERVIOUS SHALL BE SHOWN ON THE RECORDED PLAT.
21. A FINANCIAL GUARANTEE FOR INCOMPLETE PUBLIC IMPROVEMENTS REQUIRED PRIOR TO FINAL PLAT.

LEGEND

- PROPERTY LINE
- ADJACENT PROPERTY LINE
- PERIMETER BUFFER
- PROPOSED RIGHT-OF-WAY
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- PROPOSED ROAD
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- EXISTING WETLANDS
- NEUSE RIPARIAN BUFFER
- ACTIVE OPEN SPACE
- PASSIVE OPEN SPACE
- COMMON AREA
- PROPOSED 4' FENCE
- PROPOSED SIDEWALK
- PROPOSED 10' MUP
- PROPOSED ASPHALT
- GREENWAY PROPOSED MULCH
- TRAIL LANDSCAPE BUFFER
- 30" STANDARD CURB & GUTTER

DETAILED LOTS DATA

FRONT LOAD SINGLE FAMILY LOTS = 21 (LOTS 100-120)
MINIMUM LOT SIZE REQUIRED: 7,100 SF

NAD 83

SCALE 1"=60'
0 60' 120'

ALL CONSTRUCTION TO BE IN ACCORDANCE WITH ALL TOWN OF KNIGHTDALE, NCDOT, AND CITY OF RALEIGH STANDARDS, SPECIFICATIONS, AND DETAILS.

811 Know what's below. Call before you dig.

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: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

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

BY: Gideon Smith DATE: _____
LAND USE 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-4142

Public
Sewer Collection / Extension System
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City of Raleigh
Public Utilities Department Permit # S-5503

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 ENGINEER TYLER JEFFREY CROSS
3/31/2026

THIS DRAWING PREPARED AT THE
RALEIGH OFFICE
5410 Trinity Road, Suite 102 | Raleigh, NC 27607
TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

DATE	REVISION DESCRIPTION

DATE 03/31/2026
DRAWN BY 331
DESIGNED BY 331
CHECKED BY T. CROSS
SCALE 1" = 60'

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

DETAILED SITE PLAN - SHEET 2 OF 3

JOB NO. 51557
SHEET NO. C2.2

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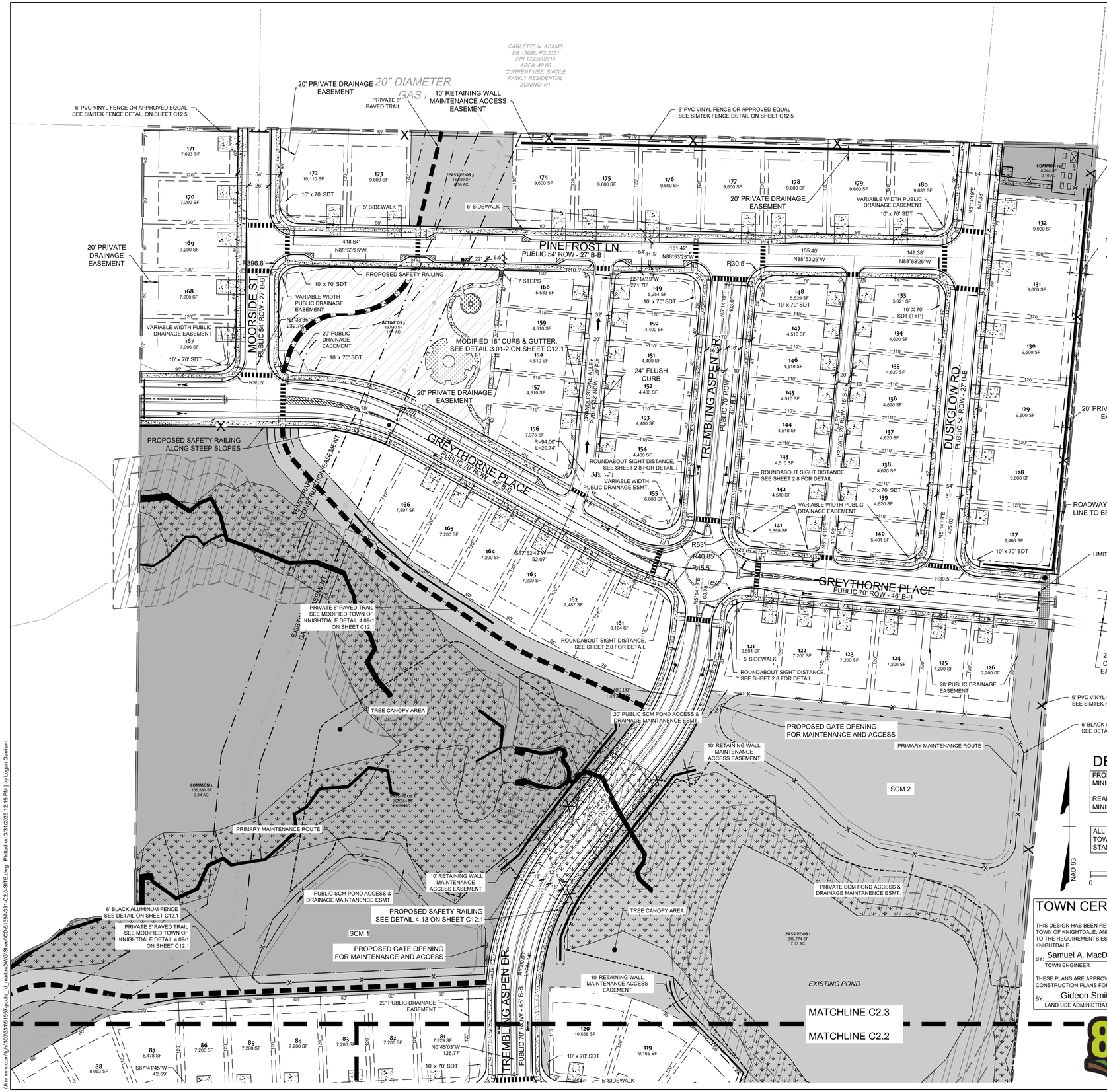

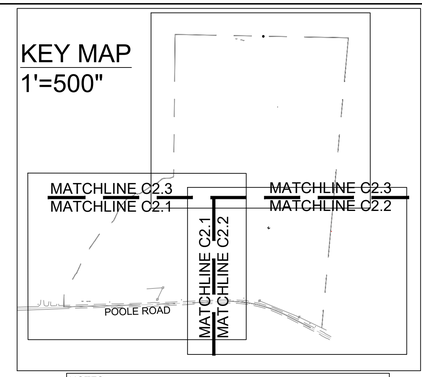

NOTES:
1. FIELD TOPOGRAPHIC SURVEY PERFORMED BY TIMMONS GROUP ON MARCH, 2022.
2. THE CONTRACTOR SHALL CONTACT NC ONE CALL CENTER PRIOR TO ANY DIGGING.
3. ALL PUBLIC WATER IMPROVEMENTS SHALL CONFORM TO ALL CITY OF RALEIGH PUBLIC UTILITIES DEPT. AND NCDENR DEH PWS STANDARDS AND SPECIFICATIONS. ALL SANITARY SEWER IMPROVEMENTS SHALL CONFORM TO ALL CITY OF RALEIGH PUBLIC UTILITIES DEPT. AND NCDENR DWQ STANDARDS AND SPECIFICATIONS
4. **THE CONSTRACTOR SHALL CHECK PLANS AND FIELD CONDITIONS FOR CONFLICTS AND DISCREPANCIES PRIOR TO CONSTRUCTION. THE CONCTRACTOR SHALL NOTIFY THE ENGINEER OF ANY CONFLICT BEFORE PERFORMING WORK IN THE AFFECTED AREA.**
5. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH TOWN OF KNIGHTDALE, CITY OF RALEIGH, AND NCDOT STANDARDS AND SPECIFICATIONS.
6. WETLAND AND RIPARIAN BUFFER DELINEATION BY TIMMONS GROUP DATED JUNE 2, 2022.
7. ALL STREETS SHALL BE PUBLIC. ALLEYS SHALL BE PRIVATE WITH THE EXCEPTION OF PROPOSED PUBLIC ALLEYS A AND E.
8. ALL UTILITIES SHALL BE UNDERGROUND.
9. EACH LOT WILL BE SERVED BY CITY OF RALEIGH PUBLIC WATER SYSTEM.
10. EACH LOT WILL BE SERVED BY CITY OF RALEIGH PUBLIC SEWER SYSTEM.
11. TOWN OF KNIGHTDALE STORMWATER PERMITS WILL BE REQUIRED.
12. TOWN OF KNIGHTDALE EROSION CONTROL REGULATIONS SHALL BE COMPLIED WITH.
13. CONSTRUCTION DRAWINGS MUST BE APPROVED PRIOR TO ANY WORK BEGINNING.
14. SIGNAGE SHALL BE APPROVED THROUGH A SEPARATE PROCESS. APPROVAL OF CDS DOES NOT GRANT APPROVAL OF ANY SIGNAGE
15. NCDOT DRIVEWAY PERMIT WILL BE REQUIRED PRIOR TO FINAL PLAT APPROVAL.
16. STREET NAMES MUST BE APPROVED BY WAKE COUNTY GIS PRIOR TO FINAL PLAT.
17. DEDICATED OPEN SPACE AREAS WILL BE OWNED AND MAINTAINED BY THE HOMEOWNERS ASSOCIATION
18. OPEN SPACE SHALL BE DEDICATED FOR PROVISION OF ACTIVE AND/OR PASSIVE OUTDOOR RECREATION OPPORTUNITIES FOR THE SUBDIVISION'S RESIDENTS AND THEIR GUESTS.
19. VERTICAL CLEARANCE OF 13 FEET 6 INCHES REQUIRED FOR ALL ROADWAYS.
20. AREAS OF DISCONNECTED IMPERVIOUS SHALL BE SHOWN ON THE RECORDED PLAT.
21. A FINANCIAL GUARANTEE FOR INCOMPLETE PUBLIC IMPROVEMENTS REQUIRED PRIOR TO FINAL PLAT.

LEGEND

- PROPERTY LINE
- ADJACENT PROPERTY LINE
- PERIMETER BUFFER
- PROPOSED RIGHT-OF-WAY
- PROPOSED LOT LINE
- BUILDING SETBACK
- PROPOSED ROAD
- CENTER PHASE LINE
- DRAINAGE EASEMENT
- SANITARY SEWER EASEMENT
- POWER LINE EASEMENT
- NATURAL GAS EASEMENT
- EXISTING WETLANDS
- NEUSE RIPARIAN BUFFER
- ACTIVE OPEN SPACE
- PASSIVE OPEN SPACE
- COMMON AREA
- PROPOSED 4' FENCE
- PROPOSED SIDEWALK
- PROPOSED 10' MUP
- PROPOSED ASPHALT
- GREENWAY PROPOSED MULCH
- TRAIL LANDSCAPE BUFFER
- 30" STANDARD CURB & GUTTER

DETAILED LOTS DATA

FRONT LOAD SINGLE FAMILY LOTS = 32 (LOTS 121-132 & 161-180)
MINIMUM LOT SIZE REQUIRED: 7,100 SF

REAR LOAD SINGLE FAMILY LOTS = 28 (LOTS 133-160)
MINIMUM LOT SIZE REQUIRED: 4,100 SF

ALL CONSTRUCTION TO BE IN ACCORDANCE WITH ALL TOWN OF KNIGHTDALE, NCDOT, AND CITY OF RALEIGH STANDARDS, SPECIFICATIONS, AND 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: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

Digitally signed by Samuel A. MacDonald
DN: cn=US, o=knightdalenc.gov, ou=Public Works, email=smacdonald@knightdalenc.gov, cn=A. Weldon Thomas Jr.
Date: 2026.03.31 12:14:47 -04'00'
Reason: I am approving this document
Location: Knightdale, NC

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

Digitally signed by Gideon Smith
DN: cn=Gideon Smith, o=Knightdalenc.gov, O=Town of Knightdale, OU=Development Services
Date: 2026.03.31 12:14:47 -04'00'
Reason: I am approving this document
Location: Knightdale, NC

811 Know what's below. Call before you dig.

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-4142

Public
Sewer Collection / Extension System
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City of Raleigh Public Utilities Department Permit # S-5503

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 ENGINEER TYLER JEFFREY CROSS
3/31/2026

THIS DRAWING PREPARED AT THE
RALEIGH OFFICE
5410 Trinity Road, Suite 102 | Raleigh, NC 27607
TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION	DATE

DATE: 03/31/2026
DRAWN BY: 331
DESIGNED BY: 331
CHECKED BY: T. CROSS
SCALE: 1" = 60'

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA
DETAILED SITE PLAN - SHEET 3 OF 3

JOB NO. 51557
SHEET NO. C2.3

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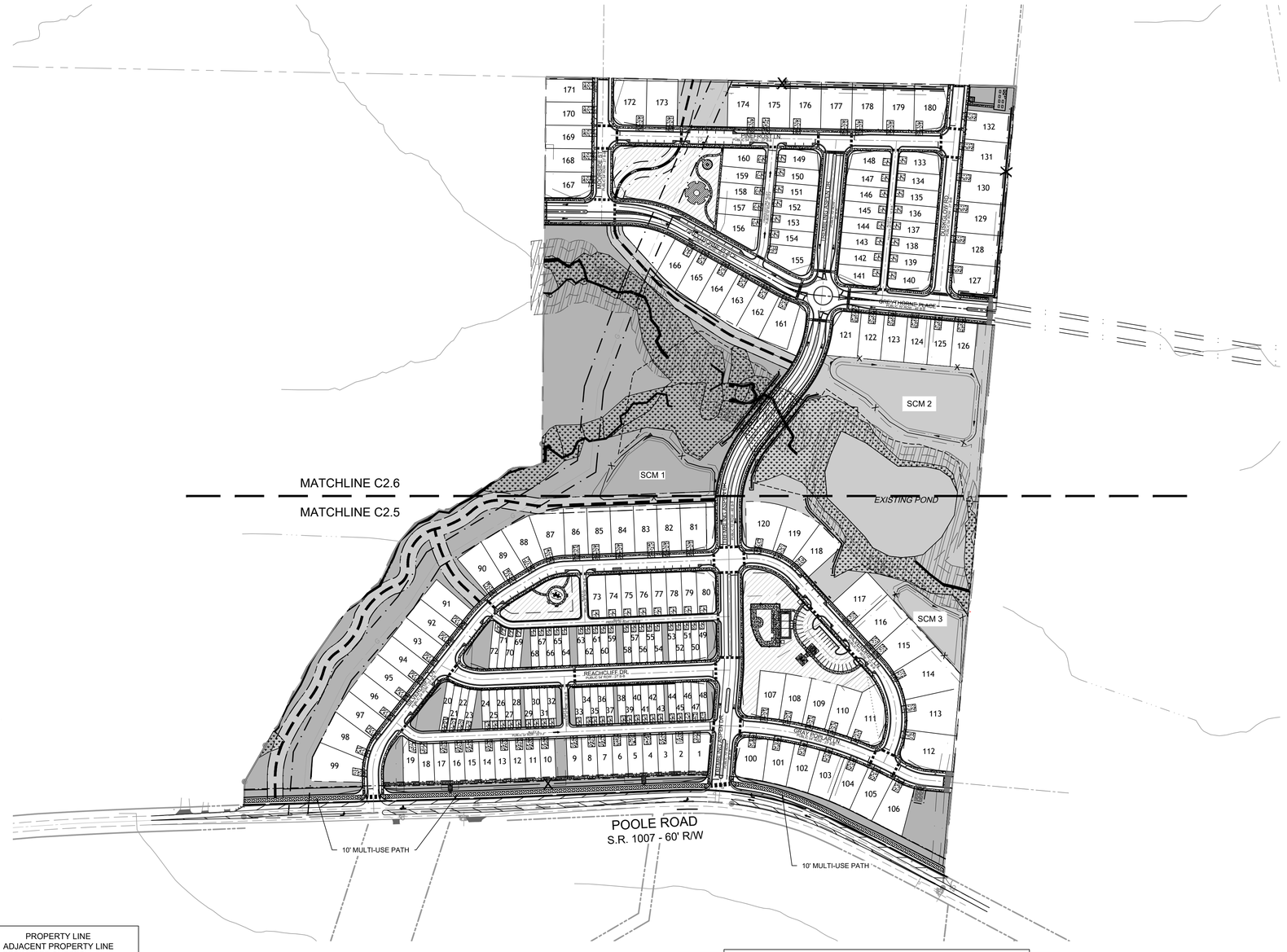

SIGN LEGEND

1. ALL SITE SIGNAGE SHALL BE IN ACCORDANCE WITH THE CURRENT MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AND NCDOT STANDARDS.

SIGN	MUTCD STD.
STOP	R1-1
25 MPH	R2-1
ROAD CLOSED	R11-2
BIKE LANE ENDS	R3-17bP
BIKE LANE AHEAD	R3-17aP
BIKE LANE	R3-17
STREET NAME	D3-1
NO PARKING FIRE LANE	R8-3
YIELD	R1-2
YIELD TO PEDESTRIANS	R1-6
ROUNDABOUT CIRCULATION (PLAQUE)	R6-5P
PEDESTRIAN CROSSING SIGN	W11-2
DOWNWARD DIAGONAL ARROW	W16-7P
DO NOT ENTER	R5-1
NARROW KEEP RIGHT	R4-7C
INTERSECTION WARNING	W2-6
ACCESSIBLE PARKING	R7-8
VAN ACCESSIBLE	R7-8aP
ONE-WAY	R6-1
KEEP RIGHT	R4-7

2. ALL SIGNS SHALL BE MOUNTED WITH 7-FT MIN. VERTICAL CLEARANCE TO THE BOTTOM OF THE SIGN ON 3-LB. GALV. STEEL U-CHANNEL POST SET IN 3-FT
3. DEEP x 12-IN DIA. CONCRETE FOOTING.
4. ALL SIGNAGE SHALL BE FIELD STAKED AND THE LOCATIONS APPROVED BY THE TOWN OF KNIGHTDALE AND/OR NCDOT PRIOR TO SIGN INSTALLATION.
5. CONTRACTOR SHALL PROVIDE TRAFFIC CONTROL AS REQUIRED BY THE TOWN OF KNIGHTDALE, THE CURRENT MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AND ALL NCDOT STANDARDS AND SPECIFICATIONS.
6. THE TOWN OF KNIGHTDALE REQUIRES ALL REGULATORY PAVEMENT MARKINGS TO BE HI-VIS THERMOPLASTIC, EXCEPT FOR PARKING SPACE STRIPING WHICH MAY BE WHITE PAINT. PEDESTRAIN CROSSINGS AT MID-BLOCK OR UNSIGNALIZED LOCATIONS SHALL BE ACCOMPANIED BY RECTANGULAR RAPID FLASHING BEACON (RRFB) SIGNALS.

T60	WHITE LINE, RR X (16", 90 MIL)	Thermo	4891000000-E	1
T61	WHITE STOPBAR (24", 90 MIL)	Thermo	4891000000-E	1
T62	WHITE CROSSWALK LINE (24", 90 MIL)	Thermo	4891000000-E	1
T70	LEFT TURN ARROW (90 MIL)	Thermo	4725000000-E	1
T71	RIGHT TURN ARROW (90 MIL)	Thermo	4725000000-E	1
T72	STRAIGHT ARROW (90 MIL)	Thermo	4725000000-E	1
T91	BICYCLE STRAIGHT ARROW, HEATED-IN-PLACE (90 MIL)	Thermo	4726110000-E	1
T92	BICYCLE LEFT ARROW, HEATED-IN-PLACE (90 MIL)	Thermo	4726110000-E	1
T101	HANDICAP PARKING (90 MIL)	Thermo	4725000000-E	1

LEGEND

- PROPERTY LINE
- ADJACENT PROPERTY LINE
- PERIMETER BUFFER
- PROPOSED RIGHT-OF-WAY
- PROPOSED LOT LINE
- BUILDING SETBACK
- PROPOSED ROAD
- CENTER PHASE LINE
- DRAINAGE EASEMENT
- SANITARY SEWER EASEMENT
- POWER LINE EASEMENT
- NATURAL GAS EASEMENT
- EXISTING WETLANDS
- NEUSE RIPARIAN BUFFER
- ACTIVE OPEN SPACE
- PASSIVE OPEN SPACE
- COMMON AREA
- PROPOSED 4' FENCE
- PROPOSED SIDEWALK
- PROPOSED 10' MUP
- PROPOSED ASPHALT
- GREENWAY PROPOSED MULCH
- TRAIL LANDSCAPE BUFFER
- 30" STANDARD CURB & GUTTER

SIGNS & MARKINGS NOTES

1. ALL CROSS-WALKS AND PAVEMENT MARKINGS ARE REQUIRED TO BE HIGH-VISIBILITY THERMOPLASTIC STRIPING (STANDARD SPECIFICATIONS & CONSTRUCTION DETAILS MANUAL, SECTION 3.05.A).

GENERAL SITE NOTES

1. ALL CONSTRUCTION SHALL CONFORM TO TOWN OF KNIGHTDALE AND CITY OF RALEIGH STANDARDS AND SPECIFICATIONS.
2. ROADS AND DRIVEWAYS SHALL COMPLY WITH NCDOT AND TOWN OF KNIGHTDALE STANDARDS.
3. SIGN PERMITS SHALL BE REQUIRED FOR ANY ENTRANCE SIGNAGE. PERMITS SHALL BE REQUIRED PRIOR TO FABRICATION OR INSTALLATION OF SIGNS. SIGNAGE SHALL BE RESTRICTED TO AN ON-SITE LOCATION.
4. THE WATER AND SEWER SYSTEMS SHALL COMPLY WITH CITY OF RALEIGH STANDARDS.
5. ALL DESIGN AND CONSTRUCTION METHODS SHALL COMPLY WITH THE TOWN OF KNIGHTDALE'S SEDIMENTATION AND EROSION CONTROL REGULATIONS. AN EROSION CONTROL PLAN SHALL BE APPROVED BY THE TOWN OF KNIGHTDALE PRIOR TO ANY GRADING.
6. CONSTRUCTION DRAWINGS SHALL BE SUBMITTED AND APPROVED BY THE TOWN OF KNIGHTDALE AND CITY OF RALEIGH PRIOR TO CONSTRUCTION.
7. ALL STREETS WITHIN THE SUBDIVISION WILL HAVE A POSTED SPEED LIMIT OF 25 MPH.
8. RESTRICTIVE COVENANTS SHALL BE APPROVED AND RECORDED PRIOR TO RECORDING OF FINAL PLAT.
9. STORMWATER CONTROL MEASURES SHALL BE CONTAINED IN AND ACCESSED VIA OPEN SPACE MAINTAINED AND OWNED BY THE HOMEOWNER'S ASSOCIATION. A MAINTENANCE PLAN MUST BE DEVELOPED TO ADDRESS THE STORMWATER CONTROL MEASURES.
10. PRIVATE STORM DRAINAGE EASEMENTS SHALL BE MAINTAINED BY THE HOA.
11. SUBDIVISION LOTS MUST BE LOTS OF RECORD PRIOR TO RECEIVING A BUILDING PERMIT.
12. PER UDO SEC 6.4.H, ALL UTILITES SHALL BE PLACED UNDERGROUND.

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: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

811 Know what's below. Call before you dig.

Public
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City of Raleigh
Public Utilities Department Permit # W-4142

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City of Raleigh
Public Utilities Department Permit # S-5503

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 ENGINEER TYLER JEFFREY CROSS
3/31/2026

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TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION	DATE

TIMMONS GROUP

NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS

KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

OVERALL SIGNS & MARKINGS PLAN

DATE	03/31/2026
DRAWN BY	331
DESIGNED BY	331
CHECKED BY	T. CROSS
SCALE	1" = 150'
JOB NO.	51557
SHEET NO.	C2.4

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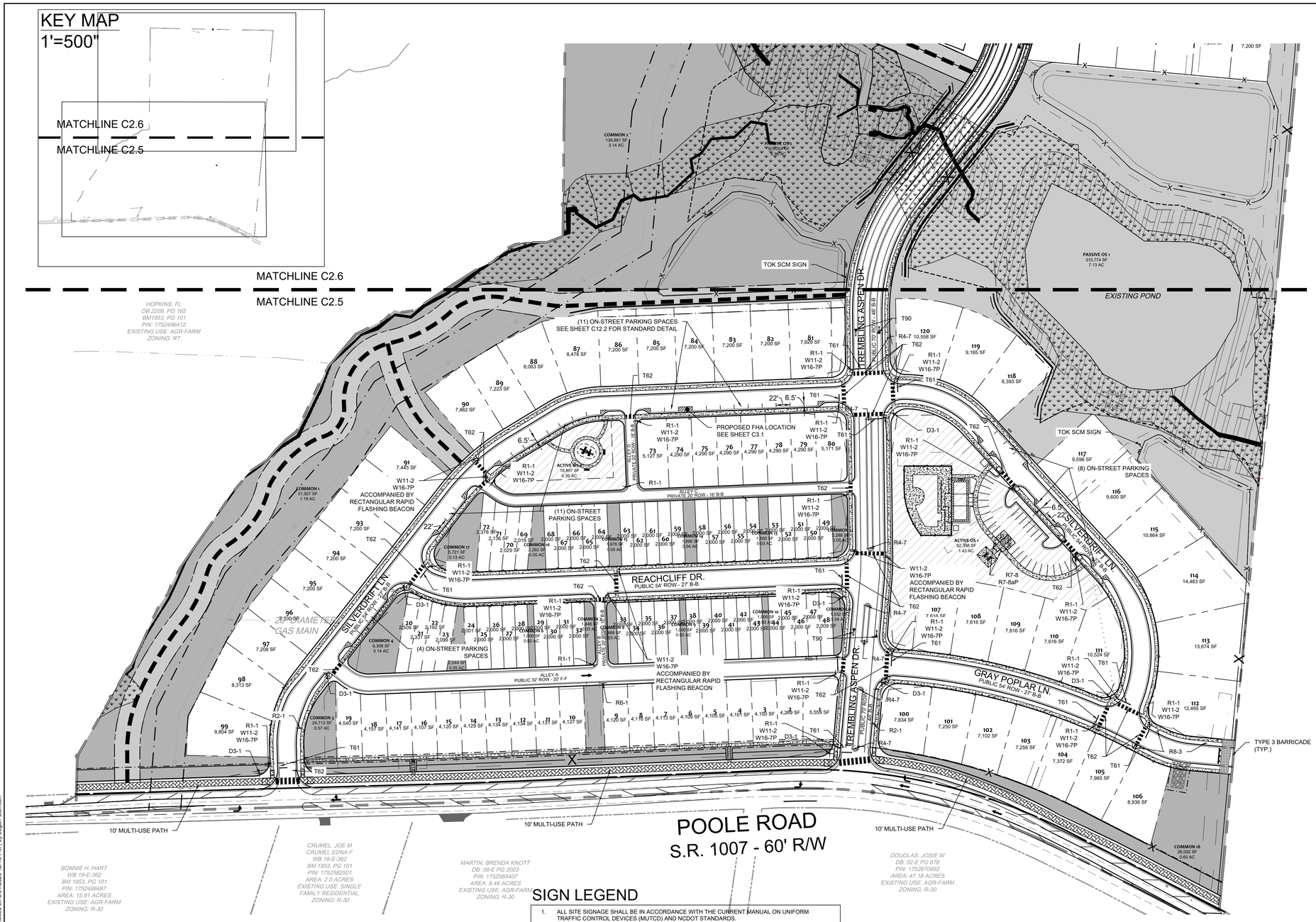

NOTES:

1. FIELD TOPOGRAPHIC SURVEY PERFORMED BY TIMMONS GROUP ON MARCH, 2022.
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14. SIGNAGE SHALL BE APPROVED THROUGH A SEPARATE PROCESS. APPROVAL OF CDS DOES NOT GRANT APPROVAL OF ANY SIGNAGE
15. NCDOT DRIVEWAY PERMIT WILL BE REQUIRED PRIOR TO FINAL PLAT APPROVAL.
16. STREET NAMES MUST BE APPROVED BY WAKE COUNTY GIS PRIOR TO FINAL PLAT.
17. DEDICATED OPEN SPACE AREAS WILL BE OWNED AND MAINTAINED BY THE HOMEOWNERS ASSOCIATION
18. OPEN SPACE SHALL BE DEDICATED FOR PROVISION OF ACTIVE AND/OR PASSIVE OUTDOOR RECREATION OPPORTUNITIES FOR THE SUBDIVISION'S RESIDENTS AND THEIR GUESTS.
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LEGEND

- PROPERTY LINE
- ADJACENT PROPERTY LINE
- PERIMETER BUFFER
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SIGN LEGEND

1. ALL SITE SIGNAGE SHALL BE IN ACCORDANCE WITH THE CURRENT MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AND NCDOT STANDARDS.

SIGN	MUTCD STD.
STOP	R1-1
25 MPH	R2-1
ROAD CLOSED	R11-2
BIKE LANE ENDS	R3-17bP
BIKE LANE AHEAD	R3-17aP
BIKE LANE	R3-17
STREET NAME	D3-1
NO PARKING FIRE LANE	R8-3
YIELD	R1-2
YIELD TO PEDESTRIANS	R1-6
ROUNDABOUT CIRCULATION (PLAQUE)	R6-5P
PEDESTRIAN CROSSING SIGN	W11-2
DOWNWARD DIAGONAL ARROW	W16-7P
DO NOT ENTER	R5-1
NARROW KEEP RIGHT	R4-7C
INTERSECTION WARNING	W2-6
ACCESSIBLE PARKING	R7-8
VAN ACCESSIBLE	R7-8aP
ONE-WAY	R6-1
KEEP RIGHT	R4-7

2. ALL SIGNS SHALL BE MOUNTED WITH 7-FT MIN. VERTICAL CLEARANCE TO THE BOTTOM OF THE SIGN ON 3-LB. GALV. STEEL U-CHANNEL POST SET IN 3-FT
3. DEEP x 12-IN DIA. CONCRETE FOOTING.
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SIGNS & MARKINGS NOTES

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BY: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

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

BY: Gideon Smith DATE: _____
LAND USE 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-4142

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-5503

811 Know what's below. Call before you dig.

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 TYLER JEFFREY CROSS
3/31/2026

THIS DRAWING PREPARED AT THE
RALEIGH OFFICE
5410 Trinity Road, Suite 102 | Raleigh, NC 27607
TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION	DATE

DATE: 03/31/2026
DRAWN BY: 331
DESIGNED BY: 331
CHECKED BY: T. CROSS
SCALE: 1" = 80'

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA
DETAILED SIGNS & MARKINGS PLAN SHEET 1 OF 2

JOB NO. 51557
SHEET NO. C2.5

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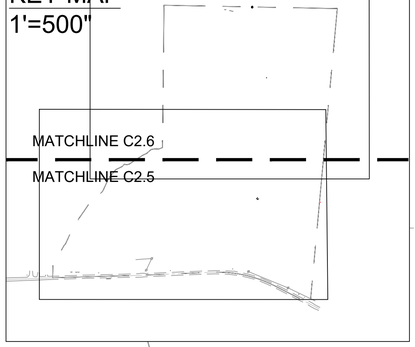
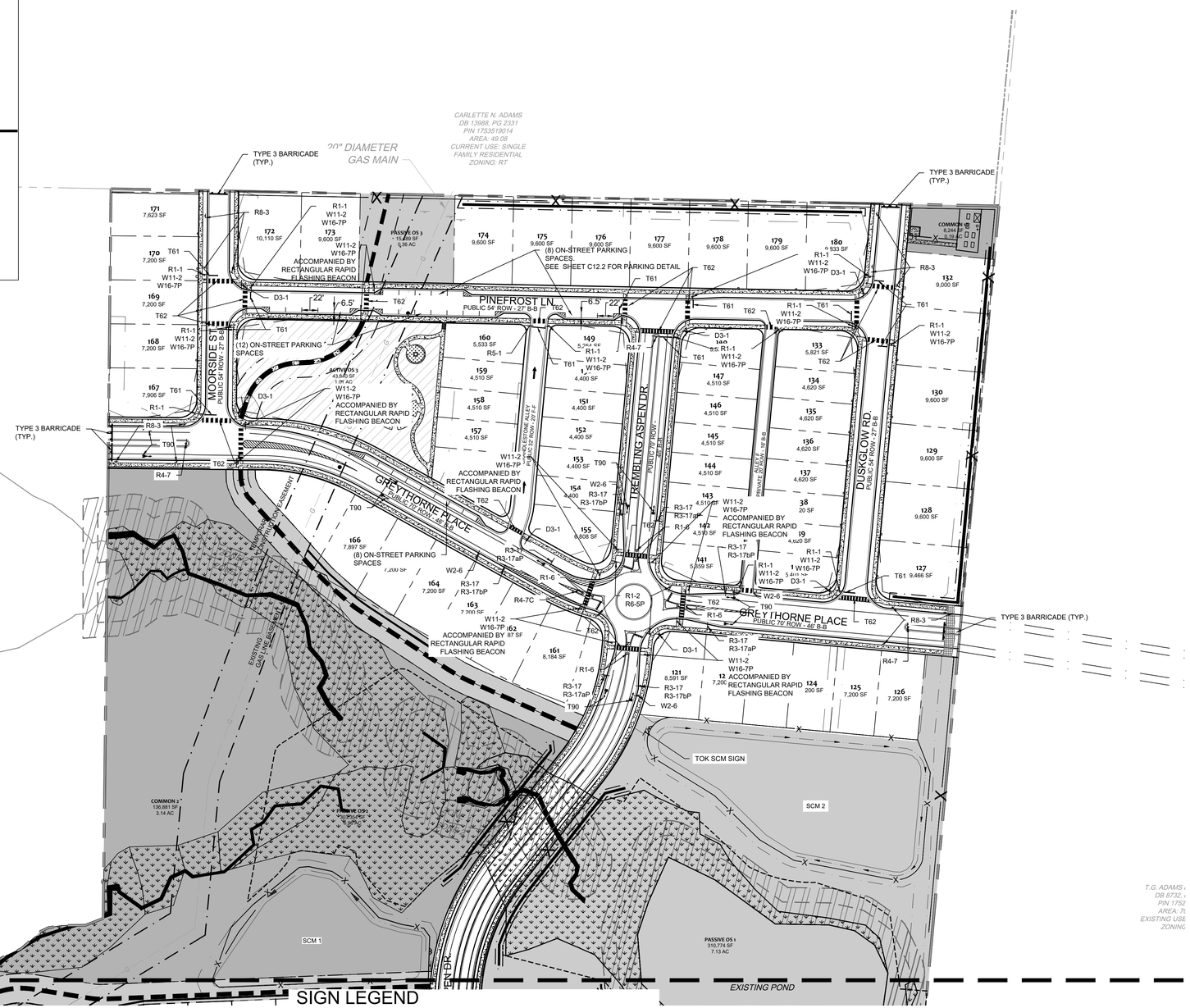
Docusign Envelope ID: A70618E2-0863-423C-B52C-85C38B959696

KEY MAP
1'=500"

MATCHLINE C2.6
MATCHLINE C2.5





MATCHLINE C2.6
MATCHLINE C2.5

NOTES:
1. FIELD TOPOGRAPHIC SURVEY PERFORMED BY TIMMONS GROUP ON MARCH, 2022.
2. THE CONTRACTOR SHALL CONTACT NC ONE CALL CENTER PRIOR TO ANY DIGGING.
3. ALL PUBLIC WATER IMPROVEMENTS SHALL CONFORM TO ALL CITY OF RALEIGH PUBLIC UTILITIES DEPT. AND NCDENR DEH PWS STANDARDS AND SPECIFICATIONS. ALL SANITARY SEWER IMPROVEMENTS SHALL CONFORM TO ALL CITY OF RALEIGH PUBLIC UTILITIES DEPT. AND NCDENR DWQ STANDARDS AND SPECIFICATIONS
4. **THE CONTRACTOR SHALL CHECK PLANS AND FIELD CONDITIONS FOR CONFLICTS AND DISCREPANCIES PRIOR TO CONSTRUCTION. THE CONCTRACTOR SHALL NOTIFY THE ENGINEER OF ANY CONFLICT BEFORE PERFORMING WORK IN THE AFFECTED AREA.**
5. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH TOWN OF KNIGHTDALE, CITY OF RALEIGH, AND NCDOT STANDARDS AND SPECIFICATIONS.
6. WETLAND AND RIPARIAN BUFFER DELINEATION BY TIMMONS GROUP DATED JUNE 2, 2022.
7. ALL STREETS SHALL BE PUBLIC. ALLEYS SHALL BE PRIVATE WITH THE EXCEPTION OF PROPOSED PUBLIC ALLEYS A AND E.
8. ALL UTILITIES SHALL BE UNDERGROUND.
9. EACH LOT WILL BE SERVED BY CITY OF RALEIGH PUBLIC WATER SYSTEM.
10. EACH LOT WILL BE SERVED BY CITY OF RALEIGH PUBLIC SEWER SYSTEM.
11. TOWN OF KNIGHTDALE STORMWATER PERMITS WILL BE REQUIRED.
12. TOWN OF KNIGHTDALE EROSION CONTROL REGULATIONS SHALL BE COMPLIED WITH.
13. CONSTRUCTION DRAWINGS MUST BE APPROVED PRIOR TO ANY WORK BEGINNING.
14. SIGNAGE SHALL BE APPROVED THROUGH A SEPARATE PROCESS. APPROVAL OF CDS DOES NOT GRANT APPROVAL OF ANY SIGNAGE
15. NCDOT DRIVEWAY PERMIT WILL BE REQUIRED PRIOR TO FINAL PLAT APPROVAL.
16. STREET NAMES MUST BE APPROVED BY WAKE COUNTY GIS PRIOR TO FINAL PLAT.
17. DEDICATED OPEN SPACE AREAS WILL BE OWNED AND MAINTAINED BY THE HOMEOWNERS ASSOCIATION
18. OPEN SPACE SHALL BE DEDICATED FOR PROVISION OF ACTIVE AND/OR PASSIVE OUTDOOR RECREATION OPPORTUNITIES FOR THE SUBDIVISION'S RESIDENTS AND THEIR GUESTS.
19. VERTICAL CLEARANCE OF 13 FEET 6 INCHES REQUIRED FOR ALL ROADWAYS.
20. AREAS OF DISCONNECTED IMPERVIOUS SHALL BE SHOWN ON THE RECORDED PLAT.
21. A FINANCIAL GUARANTEE FOR INCOMPLETE PUBLIC IMPROVEMENTS REQUIRED PRIOR TO FINAL PLAT.

LEGEND

- PROPERTY LINE
- ADJACENT PROPERTY LINE
- PERIMETER BUFFER
- PROPOSED RIGHT-OF-WAY
- PROPOSED LOT LINE
- BUILDING SETBACK
- PROPOSED ROAD
- CENTER PHASE LINE
- DRAINAGE EASEMENT
- SANITARY SEWER EASEMENT
- POWER LINE EASEMENT
- NATURAL GAS EASEMENT
- EXISTING WETLANDS
- NEUSE RIPARIAN BUFFER
- ACTIVE OPEN SPACE
- PASSIVE OPEN SPACE
- COMMON AREA
- PROPOSED 4' FENCE
- PROPOSED SIDEWALK
- PROPOSED 10' MUP
- PROPOSED ASPHALT
- GREENWAY PROPOSED MULCH
- TRAIL LANDSCAPE BUFFER
- 30" STANDARD CURB & GUTTER

811 Know what's below. Call before you dig.

SIGN LEGEND

1. ALL SITE SIGNAGE SHALL BE IN ACCORDANCE WITH THE CURRENT MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AND NCDOT STANDARDS.

SIGN	MUTCD STD.
STOP	R1-1
25 MPH	R2-1
ROAD CLOSED	R11-2
BIKE LANE ENDS	R3-17bP
BIKE LANE AHEAD	R3-17aP
BIKE LANE	R3-17
STREET NAME	D3-1
NO PARKING FIRE LANE	R8-3
YIELD	R1-2
YIELD TO PEDESTRIANS	R1-6
ROUNDABOUT CIRCULATION (PLAQUE)	R6-5P
PEDESTRIAN CROSSING SIGN	W11-2
DOWNWARD DIAGONAL ARROW	W16-7P
DO NOT ENTER	R5-1
NARROW KEEP RIGHT	R4-7C
INTERSECTION WARNING	W2-6
ACCESSIBLE PARKING	R7-8
VAN ACCESSIBLE	R7-8aP
ONE-WAY	R6-1
KEEP RIGHT	R4-7

2. ALL SIGNS SHALL BE MOUNTED WITH 7-FT MIN. VERTICAL CLEARANCE TO THE BOTTOM OF THE SIGN ON 3-LB. GALV. STEEL U-CHANNEL POST SET IN 3-FT
3. DEEP x 12-IN DIA. CONCRETE FOOTING.
4. ALL SIGNAGE SHALL BE FIELD STAKED AND THE LOCATIONS APPROVED BY THE TOWN OF KNIGHTDALE AND/OR NCDOT PRIOR TO SIGN INSTALLATION.
5. CONTRACTOR SHALL PROVIDE TRAFFIC CONTROL AS REQUIRED BY THE TOWN OF KNIGHTDALE, THE CURRENT MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AND ALL NCDOT STANDARDS AND SPECIFCATIONS.
6. THE TOWN OF KNIGHTDALE REQUIRES ALL REGULATORY PAVEMENT MARKINGS TO BE HI-VIS THERMOPLASTIC, EXCEPT FOR PARKING SPACE STRIPING WHICH MAY BE WHITE PAINT.

PEDESTRAIN CROSSINGS AT MID-BLOCK OR UNSIGNALIZED LOCATIONS SHALL BE ACCOMPANIED BY RECTANGULAR RAPID FLASHING BEACON (RRFB) SIGNALS.

SIGNS & MARKINGS NOTES

1. ALL CROSS-WALKS AND PAVEMENT MARKINGS ARE REQUIRED TO BE HIGH-VISIBILITY THERMOPLASTIC STRIPING [STANDARD SPECIFICATIONS & CONSTRUCTION DETAILS MANUAL, SECTION 3.05.A].

ALL CONSTRUCTION TO BE IN ACCORDANCE WITH ALL TOWN OF KNIGHTDALE, NCDOT, AND CITY OF RALEIGH STANDARDS, SPECIFICATIONS, AND 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: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

Digitally signed by Samuel A. MacDonald
DN: cn=Samuel A. MacDonald, o=Timmons Group, ou=Transportation, email=Sam.MacDonald@timmons.com, c=US, st=North Carolina, l=Raleigh
Reason: I am the author of this document
Date: 2022.04.19 08:13:24 -04'00'

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

Digitally signed by Gideon Smith
DN: cn=Gideon Smith, o=Town of Knightdale, ou=Development Services, email=gsmith@knightdalenc.gov, c=US
Reason: I am approving this document
Location: Knightdale, NC
Date: 2022.04.20 07:57:13 -04'00'

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-4142

Public
Sewer Collection / Extension System
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City of Raleigh
Public Utilities Department Permit # S-5503

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 TYLER JEFFREY CROSS
3/31/2026

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RALEIGH OFFICE
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YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION

DATE

DATE 03/31/2026
DRAWN BY 331
DESIGNED BY 331
CHECKED BY T. CROSS
SCALE 1" = 80'
JOB NO. 51557
SHEET NO. C2.6

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA
DETAILED SIGNS & MARKINGS PLAN SHEET 2 OF 2

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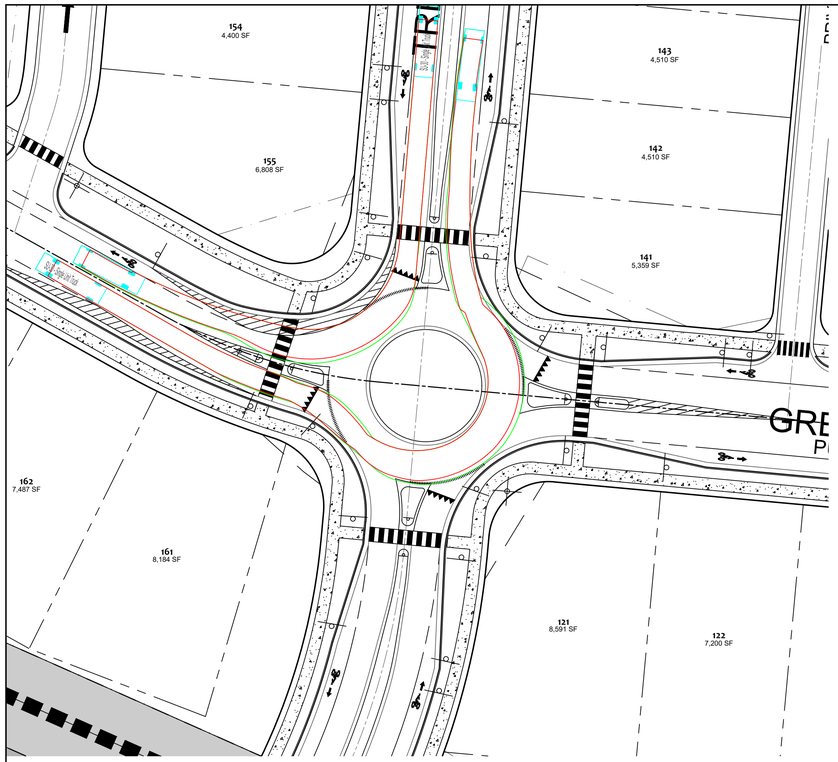
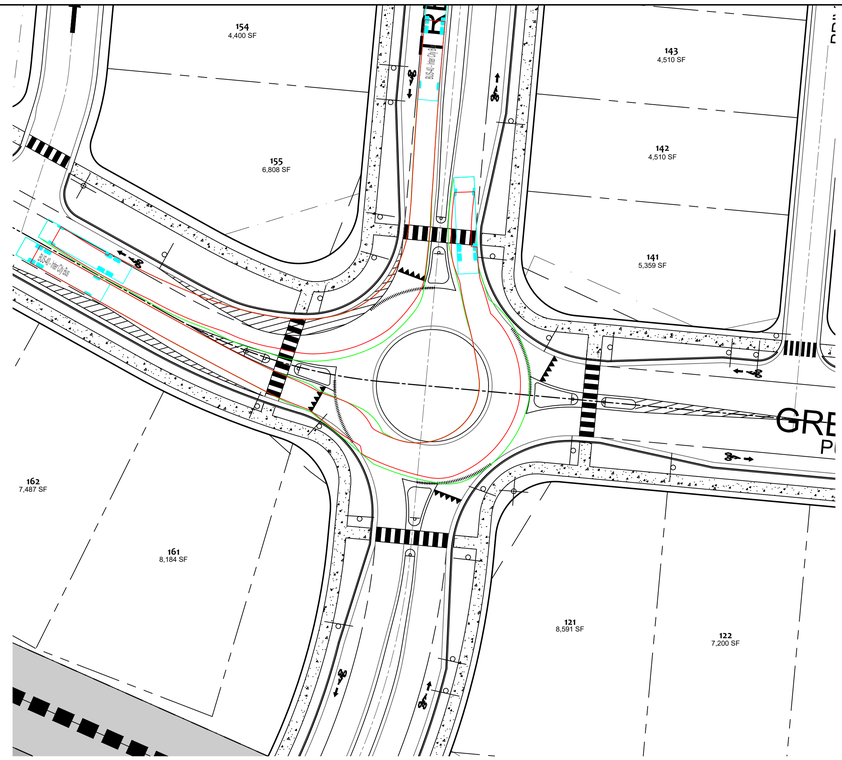
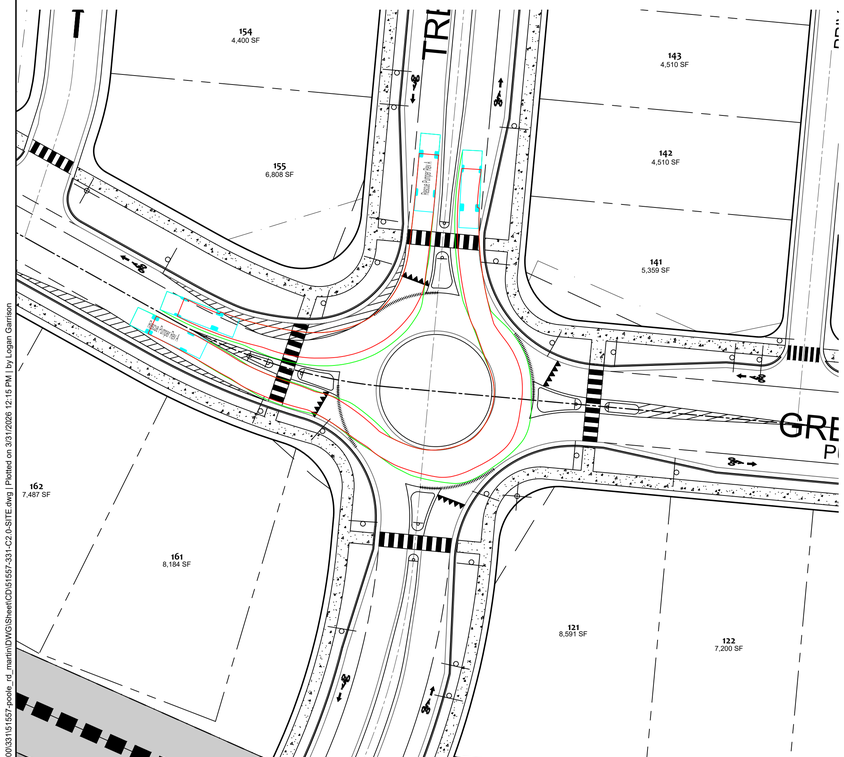


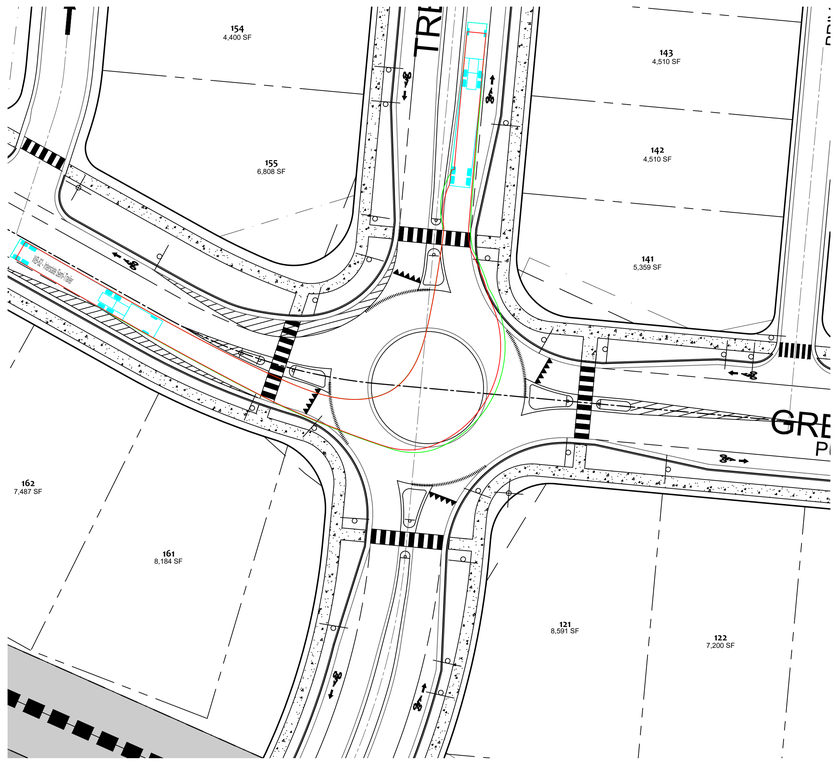
SU-30



BUS-40



FIRE TRUCK - RESCUE PUMPER REV A



WB-62

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NAD 83

SCALE 1"=30'
0 30' 60'

LEGEND

- PROPERTY LINE
- ADJACENT PROPERTY LINE
- PERIMETER BUFFER
- PROPOSED RIGHT-OF-WAY
- PROPOSED LOT LINE
- BUILDING SETBACK
- PROPOSED ROAD
- CENTER PHASE LINE
- DRAINAGE EASEMENT
- SANITARY SEWER EASEMENT
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- PROPOSED ASPHALT
- GREENWAY PROPOSED MULCH
- TRAIL LANDSCAPE BUFFER
- 30" STANDARD CURB & GUTTER

811 Know what's **below.** **Call** before you dig.

TOWN CERTIFICATION

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BY: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

Digitally signed by Samuel A. MacDonald
DN: cn=Samuel A. MacDonald, o=Timmons Group, ou=N. Walton Thomas & Associates, Inc., l="Chi=Samuel A. MacDonald
Reason: I am approving this document
Date: 2026.03.30 09:52:34 -04'00'

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

Digitally signed by Gideon Smith
DN: cn=Gideon Smith, o=Knightdale, ou=Planning&Zoning, c=US
Reason: I am approving this document
Date: 2026.03.30 09:54:29 -04'00'

ALL CONSTRUCTION TO BE IN ACCORDANCE WITH ALL TOWN OF KNIGHTDALE, NCDOT, AND CITY OF RALEIGH STANDARDS, SPECIFICATIONS, AND DETAILS.

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-4142

Public
Sewer Collection / Extension System
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City of Raleigh
Public Utilities Department Permit # S-5503

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 ENGINEER TYLER JEFFREY CROSS

3/31/2026

THIS DRAWING PREPARED AT THE
RALEIGH OFFICE
5410 Trinity Road, Suite 102 | Raleigh, NC 27607
TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION	DATE

DATE: 03/31/2026
DRAWN BY: 331
DESIGNED BY: 331
CHECKED BY: T. CROSS
SCALE: 1" = 80'

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA
DETAILED ROUNDABOUT VEHICLE TRACKING SHEET

JOB NO. 51557
SHEET NO. C2.7

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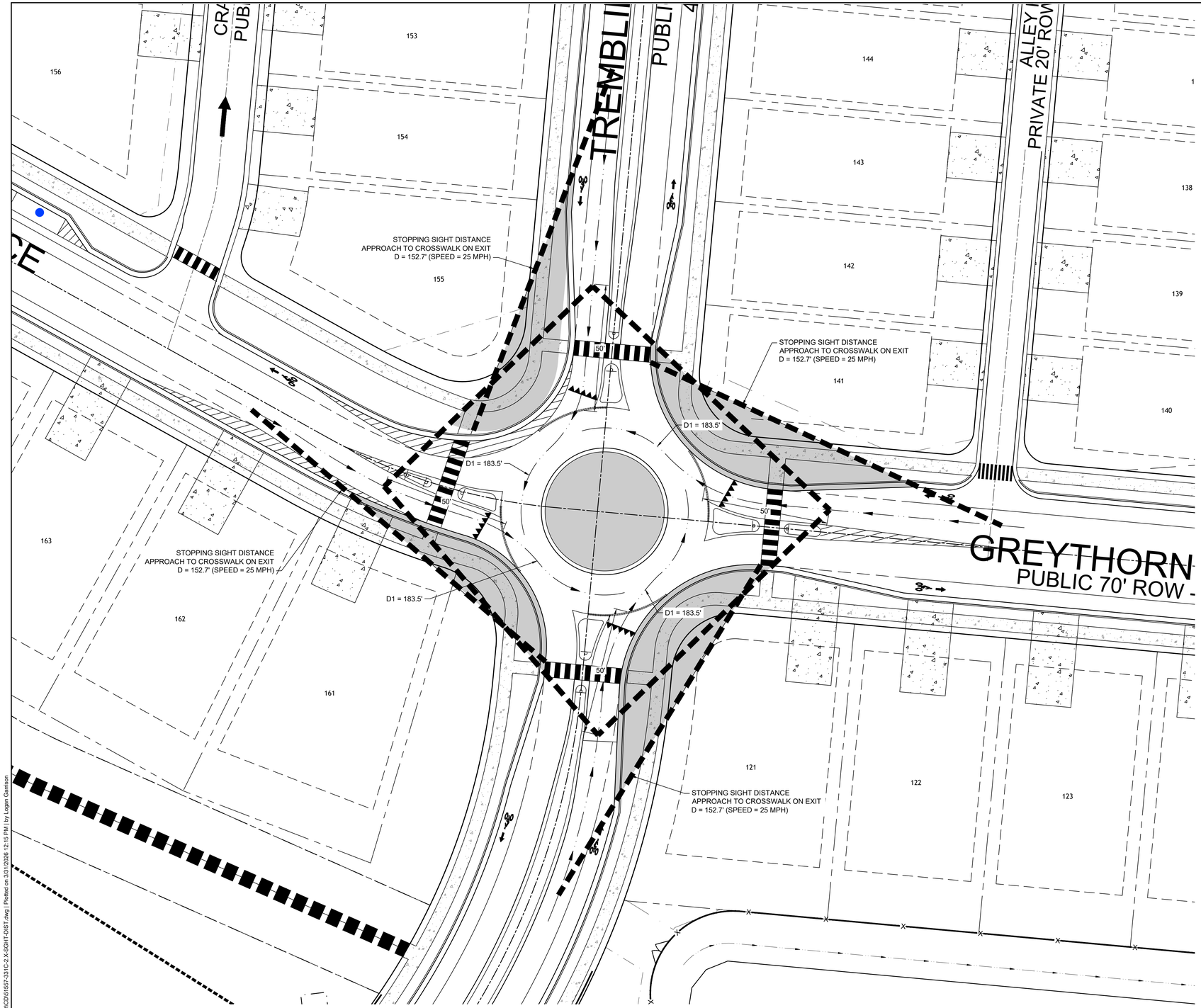


REFERENCE MATERIAL

SECTION 6.7.3 OF NCHRP REPORT 672 (REFERRED TO BY NCDOT ROAD DESIGN MANUAL) AND TOWN OF KNIGHTDALE STD NO. 3.33

STOPPING SIGHT DISTANCE

SPEED = 25 MPH
COMPUTED DISTANCE = 152.7' (EXHIBIT 6-54)
TO BE CHECKED AT:

APPROACH TO CROSSWALK ON ENTRY
NOT APPLICABLE BECAUSE ALL APPROACHES ARE STRAIGHT

CIRCULATORY ROADWAY
RESULTS IN ENTIRE ISLAND AFFECTED BY SIGHT DISTANCE RESTRICTIONS

APPROACH TO CROSSWALK ON EXIT
APPLIES TO ALL APPROACHES

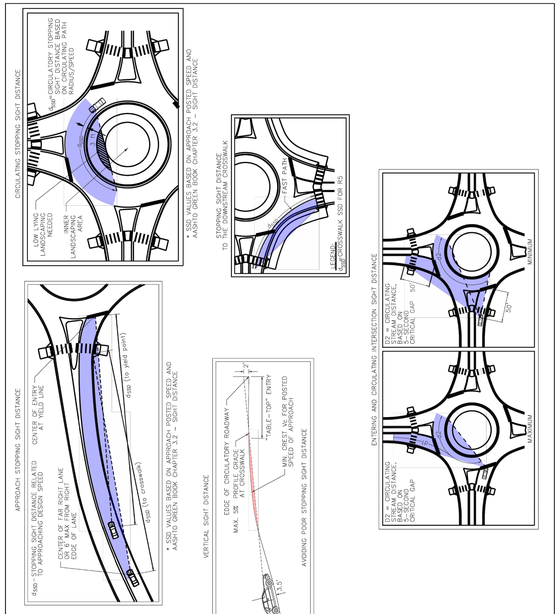
INTERSECTION SIGHT DISTANCE

TOWN OF KNIGHTDALE STD. NO 3.33 PG 7 (MINIMUM INTERSECTION DISTANCE)
MEASURED AT 50' BACK FROM YIELD LINE TO 50' BACK FROM ADJACENT YIELD LINE
TO BE CHECKED AT:

ENTERING STREAM
APPLIES TO ALL APPROACHES

CIRCULATING STREAM
NOT APPLICABLE ON ANY ENTRIES - CIRCULATORY SIGHT DISTANCE GOVERNS MORE STRICTLY WITHIN ISLAND THAN INTERSECTION SIGHT DISTANCE

SIGHT DISTANCE CALCULATIONS WERE BASED ON THE NCHRP REPORT, WHICH IS BASED ON GUIDANCE FROM THE AASHTO GREENBOOK. CALCULATIONS ASSUME AN OBJECT HEIGHT OF 24" FOR STOPPING SIGHT DISTANCE, AND 42" FOR INTERSECTION SIGHT DISTANCE.



REVISIONS	
DATE	DESCRIPTION

7 of 8

TOWN OF KNIGHTDALE STANDARD DETAILS	SIGHT DISTANCE CHECKS SINGLE LANE ROUNDABOUT	STD. NO. 3.33

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.

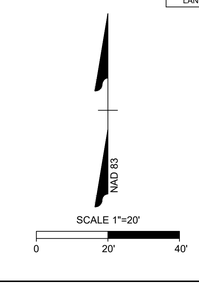
BY: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

Digitally signed by Samuel A. MacDonald
DN: c=US, o=Town of Knightdale, ou=Engineering.com, cn=A. Morton Thomas & Associates, Inc., cn=Samuel A. MacDonald
Reason: I am approving this document
Date: 2026.04.10 09:51:53 -04'00'

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

Digitally signed by Gideon Smith
DN: c=US, o=Town of Knightdale, ou=Development Services, cn=Gideon Smith
Reason: I am approving this document
Date: 2026.04.10 08:41:14 -04'00'



Public
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City of Raleigh
Public Utilities Department Permit # W-4142

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City of Raleigh
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REVISION DESCRIPTION	DATE

DATE	03/31/2026
DRAWN BY	331
DESIGNED BY	331
CHECKED BY	T. CROSS
SCALE	1" = 20'

TIMMONS GROUP

NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS

KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

ROUNDABOUT SIGHT DISTANCE

JOB NO.	51557
SHEET NO.	C2.8

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Docusign Envelope ID: A70618E2-0863-423C-B52C-85C38B959696



PHASING NOTES:

AREA WITHIN HATCHED REGION OF PHASE 1 LIMITS FOR CONSTRUCTION RELATED TO INSTALLATION OF PUBLIC SEWER OUTFALL ONLY. WATER, PAVEMENT, CURB/GUTTER, SIDEWALK, AND OTHER PUBLIC IMPROVEMENTS WITHIN HATCHED AREA TO BE INSTALLED AS PART OF PHASE 2. A TEMPORARY 30' CORSSE SHALL BE DEDICATED AT TIME OF PHASE 1 PLAT, CENTERED OVER SEWER OUTFALL. TO BE ABANDONED WITH DEDICATION OF PUBLIC ROW AT TIME OF PHASE 2 PLAT.

LEGEND

- PROPERTY LINE
- ADJACENT PROPERTY LINE
- PERIMETER BUFFER
- PROPOSED RIGHT-OF-WAY
- PROPOSED LOT LINE
- BUILDING SETBACK
- PROPOSED ROAD
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- DRAINAGE EASEMENT
- SANITARY SEWER EASEMENT
- POWER LINE EASEMENT
- NATURAL GAS EASEMENT
- EXISTING WETLANDS
- NEUSE RIPARIAN BUFFER
- ACTIVE OPEN SPACE
- PASSIVE OPEN SPACE
- COMMON AREA
- PROPOSED 4' FENCE
- PROPOSED SIDEWALK
- PROPOSED 10' MUP
- PROPOSED ASPHALT
- GREENWAY PROPOSED MULCH
- TRAIL LANDSCAPE BUFFER
- 30" STANDARD CURB & GUTTER

GENERAL SITE NOTES

1. ALL CONSTRUCTION SHALL CONFORM TO TOWN OF KNIGHTDALE AND CITY OF RALEIGH STANDARDS AND SPECIFICATIONS.
2. ROADS AND DRIVEWAYS SHALL COMPLY WITH NCDOT AND TOWN OF KNIGHTDALE STANDARDS.
3. SIGN PERMITS SHALL BE REQUIRED FOR ANY ENTRANCE SIGNAGE. PERMITS SHALL BE REQUIRED PRIOR TO FABRICATION OR INSTALLATION OF SIGNS. SIGNAGE SHALL BE RESTRICTED TO AN ON-SITE LOCATION.
4. THE WATER AND SEWER SYSTEMS SHALL COMPLY WITH CITY OF RALEIGH STANDARDS.
5. ALL DESIGN AND CONSTRUCTION METHODS SHALL COMPLY WITH THE TOWN OF KNIGHTDALE'S SEDIMENTATION AND EROSION CONTROL REGULATIONS. AN EROSION CONTROL PLAN SHALL BE APPROVED BY THE TOWN OF KNIGHTDALE PRIOR TO CONSTRUCTION DRAWINGS APPROVAL AND ANY GRADING.
6. CONSTRUCTION DRAWINGS SHALL BE SUBMITTED AND APPROVED BY THE TOWN OF KNIGHTDALE AND CITY OF RALEIGH PRIOR TO CONSTRUCTION.
7. RESTRICTIVE COVENANTS SHALL BE APPROVED AND RECORDED PRIOR TO RECORDING OF FINAL PLAT.
8. STORMWATER CONTROL MEASURES SHALL BE CONTAINED IN AND ACCESSED VIA OPEN SPACE MAINTAINED AND OWNED BY THE HOMEOWNER'S ASSOCIATION. A MAINTENANCE PLAN MUST BE DEVELOPED TO ADDRESS THE STORMWATER CONTROL MEASURES.
9. PRIVATE STORM DRAINAGE EASEMENTS SHALL BE MAINTAINED BY THE HOA.
10. SUBDIVISION LOTS MUST BE LOTS OF RECORD PRIOR TO RECEIVING A BUILDING PERMIT.
11. PER UDO SEC 6.4.H, ALL UTILITES SHALL BE PLACED UNDERGROUND.

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: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

811 Know what's below. Call before you dig.

RALEIGH WATER - PLANS AUTHORIZED FOR CONSTRUCTION
Any work authorized by this approval must proceed in accordance with the plans. This electronic approval may not be edited once issued. Any modification to this approval once issued will invalidate this approval.

Cydney Terry
2026.05.18 20:48:22-04'00'

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-4142

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-5503

TYLER JEFFREY CROSS
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879
3/31/2026

THIS DRAWING PREPARED AT THE
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TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

TIMMONS GROUP

NORTH CAROLINA LICENSE NO. C-1652

REVISION DESCRIPTION

DATE

DATE 03/31/2026
DRAWN BY 331
DESIGNED BY 331
CHECKED BY T. CROSS
SCALE 1" = 150'

HAVEN AT GRIFFITH MEADOWS

KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

PHASING PLAN

JOB NO. 51557
SHEET NO. C2.9

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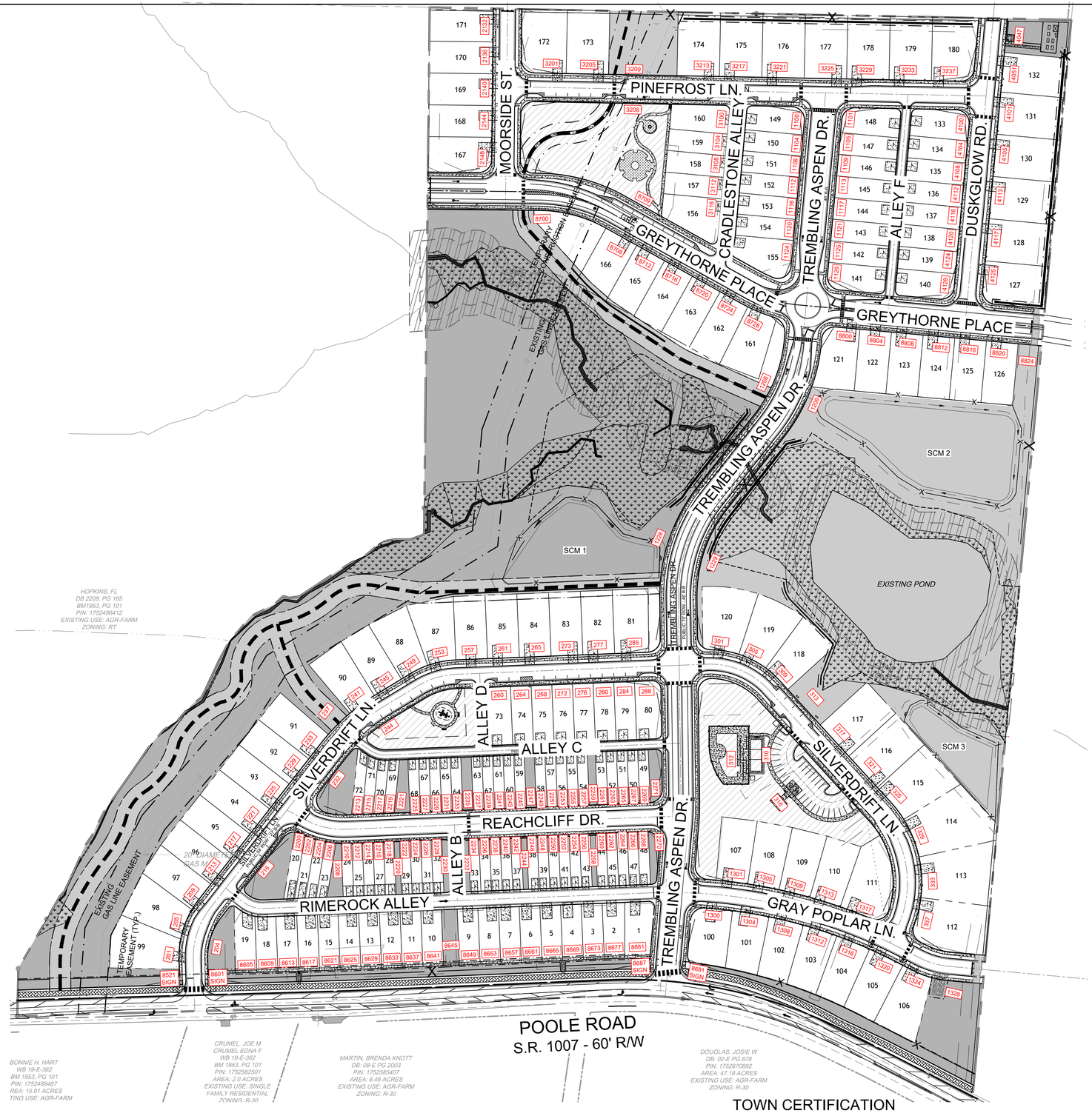

TOWN CERTIFICATION

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: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

Digitally signed by Samuel A. MacDonald
DN: cn=Samuel A. MacDonald, o=Timmons Group, ou=Civil, c=US
Reason: I am approving this document
Date: 2026.03.31 12:16:47 -04'00'

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

Digitally signed by Gideon Smith
DN: cn=Gideon Smith, o=Knightdale, ou=Development Services, email=gsmith@knightdale-nc.gov, c=US
Date: 2026.03.31 12:16:47 -04'00'

811 Know what's below. Call before you dig.

ALL CONSTRUCTION TO BE IN ACCORDANCE WITH ALL TOWN OF KNIGHTDALE, NCDOT, AND CITY OF RALEIGH STANDARDS, SPECIFICATIONS, AND DETAILS.

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-4142

Public
Sewer Collection / Extension System
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City of Raleigh
Public Utilities Department Permit # S-5503

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 TYLER JEFFREY CROSS
3/31/2026

THIS DRAWING PREPARED AT THE
RALEIGH OFFICE
5410 Trinity Road, Suite 102 | Raleigh, NC 27607
TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION	DATE

DATE: 03/31/2026
DRAWN BY: 331
DESIGNED BY: 331
CHECKED BY: T. CROSS
SCALE: 1" = 100'

TIMMONS GROUP

NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS

KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

SITE ADDRESSING PLAN

JOB NO. 51557
SHEET NO. C2.10

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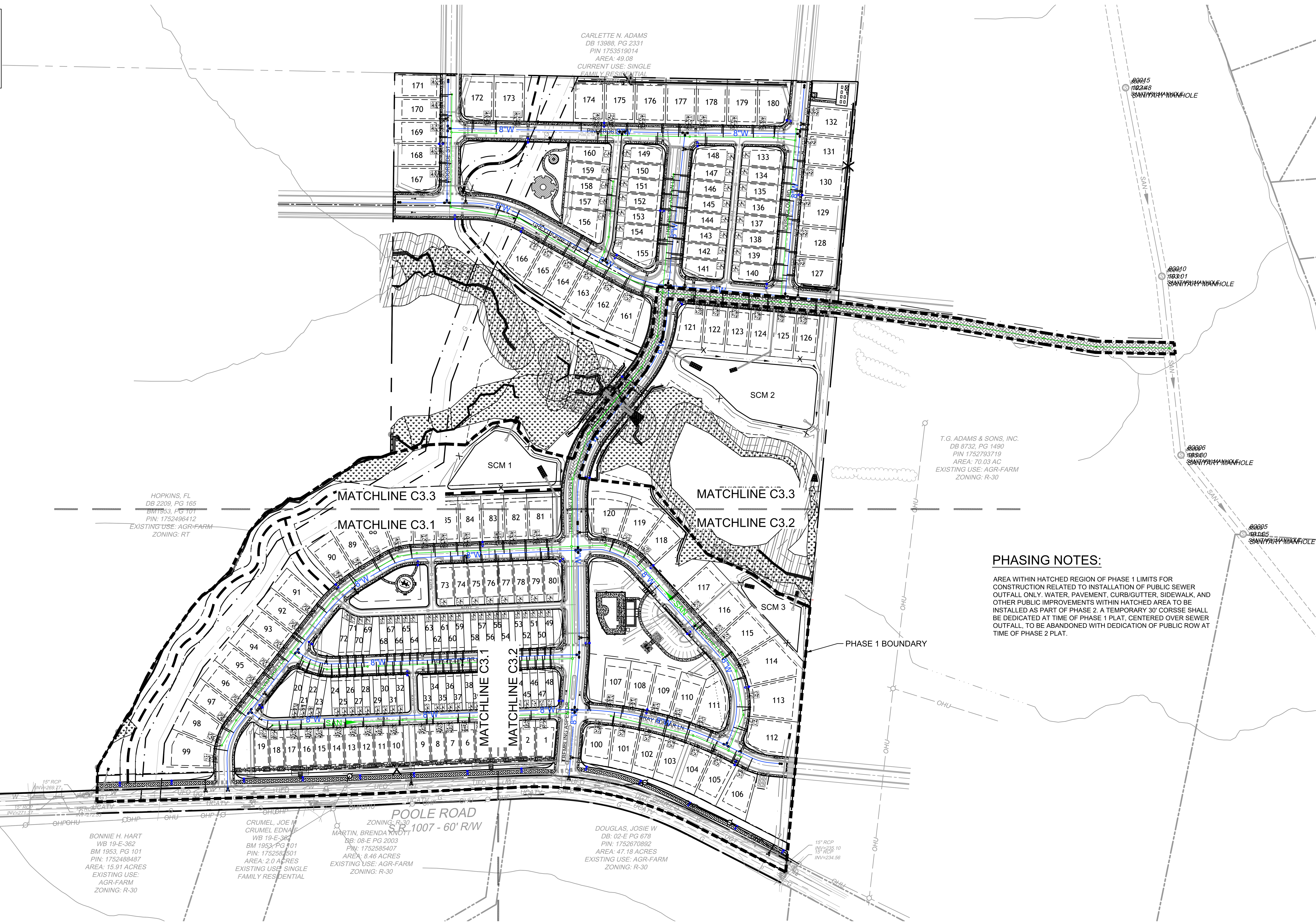
NOTE:

1. CONTRACTOR IS SOLELY RESPONSIBLE FOR ALL MATERIAL ORDERED PRIOR TO FINAL, APPROVED PLANS THAT ARE RELEASED FOR CONSTRUCTION AND IS RESPONSIBLE FOR MAKING ALL ADJUSTMENTS TO THOSE MATERIALS TO MEET THE FINAL, APPROVED DESIGN, SUCH AS STRUCTURE HEIGHTS, ANGLES, PIPE MATERIALS, TOC. , WITHOUT ADDITIONAL COST TO THE DEVELOPER OR ENGINEER.



PHASING NOTES:

AREA WITHIN HATCHED REGION OF PHASE 1 LIMITS FOR CONSTRUCTION RELATED TO INSTALLATION OF PUBLIC SEWER OUTFALL ONLY. WATER, PAVEMENT, CURB/GUTTER, SIDEWALK, AND OTHER PUBLIC IMPROVEMENTS WITHIN HATCHED AREA TO BE INSTALLED AS PART OF PHASE 2. A TEMPORARY 30' CORSSE SHALL BE DEDICATED AT TIME OF PHASE 1 PLAT, CENTERED OVER SEWER OUTFALL, TO BE ABANDONED WITH DEDICATION OF PUBLIC ROW AT TIME OF PHASE 2 PLAT.

LEGEND

- PROPERTY LINE
- POWER LINE EASEMENT
- NATURAL GAS EASEMENT
- PROPOSED FENCE
- EXISTING WETLANDS
- NEUSE RIPARIAN BUFFER
- PRIMARY OPEN SPACE
- SECONDARY OPEN SPACE
- COMMON GREEN

UTILITY NOTES:

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CITY OF RALEIGH STANDARDS AND SPECIFICATIONS.
2. MINIMUM UTILITY HORIZONTAL SEPARATION DISTANCES:
   WATER AND SANITARY SEWER MAINS - 10 FT.
   WATER AND STORM SEWER MAINS - 5 FT.
   SANITARY SEWER AND STORM SEWER MAINS - 5 FT.
   GRAVITY SANITARY SEWER AND FORCE MAINS - 5 FT.
3. MINIMUM UTILITY VERTICAL SEPARATION DISTANCES:
   WATER AND SANITARY SEWER MAINS - 18 IN.
   WATER AND STORM SEWER MAINS - 18 IN.
   SANITARY SEWER AND STORM SEWER MAINS - 24 IN.

LEGEND

SEWER

- SAN → SANITARY SEWER
- (S) SANITARY MANHOLE

WATER

- W EXISTING WATER LINE
- W PROPOSED WATER LINE
- WATER VALVE
- FIRE HYDRANT
- BLOWOFF ASSEMBLY

CORPUD STANDARD UTILITY NOTES:

STANDARD UTILITY NOTES:

1. All materials & construction methods shall be in accordance with City of Raleigh design standards, details & specifications (reference: CORPUD Handbook, current edition)
2. Utility separation requirements:
   a) A distance of 100' shall be maintained between sanitary sewer & any private or public water supply source such as an impounded reservoir used as a source of drinking water. If adequate lateral separation cannot be achieved, ferrous sanitary sewer pipe shall be specified & installed to waterline specifications. However, the minimum separation shall not be less than 25' from a private well or 50' from a public well.
   b) When installing water &/or sewer mains, the horizontal separation between utilities shall be 10'. If this separation cannot be maintained due to existing conditions, the variation allowed is the water main in a separate trench with the elevation of the water main at least 18" above the top of the sewer & must be approved by the Public Utilities Director. All distances are measured from outside diameter to outside diameter.
   c) Where it is impossible to obtain proper separation, or anytime a sanitary sewer passes over a watermain, DIP materials or steel encasement extended 10' on each side of crossing must be specified & installed to waterline specifications.
   d) 5.0' minimum horizontal separation is required between all sanitary sewer & storm sewer facilities, unless DIP material is specified for sanitary sewer
   e) Maintain 18" min. vertical separation at all watermain & RCP storm drain crossings; maintain 18" min. vertical separation at all sanitary sewer & RCP stormdrain crossings. Where adequate separations cannot be achieved, specify DIP materials & a concrete cradle having 6" min. clearance (per CORPUD details W- 41 & S-49).
   f) All other underground utilities shall cross water & sewer facilities with 18" min. vertical separation required.
3. 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.
4. Developer shall provide 30 days advance written notice to owner for any work required within an existing City of Raleigh Utility Easement traversing private property.
5. 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.
6. SEWER BYPASS PUMPING – A bypass plan sealed by an NC Professional Engineer shall be provided to Raleigh Water prior to pumping operations for approval. The operations and equipment shall comply with the Public Utilities Handbook.
7. 3.0' minimum cover is required on all water mains & sewer force mains. 4.0' minimum cover is required on all reuse mains.
8. 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.
9. Install 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.
10. Inspections of 4" and larger water mains of the private distribution system will be inspected as part of the infrastructure permit.
11. Private sewer mains as part of a collection system are permitted and inspected under the private Infrastructure permit for sewer.
12. Any water or sewer services on private property that will be installed under Construction Drawings may require a Plumbing Utility Permit in the City of Raleigh. Consult with the Engineering Inspection Coordinator during the pre-construction meeting on the necessary permits.
13. Install sewer services with cleanouts located at ROW or easement line & spaced per the current NC Plumbing code.
14. 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 upstreammanhole.
15. 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.
16. NCDOT / Railroad Encroachment Agreements are required for any utility work (including main extensions & service taps) within state or railroad ROW prior to construction.
17. Grease Interceptor / Oil Water Separator sizing calculations & installation specifications shall be approved by the RW FOG Program Coordinator prior to issuance of a UC and/or Building Permit. Contact (919) 996-4516 or fog@raleighnc.gov for more information.
18. Cross-connection control protection devices are required based on the degree of health hazard involved as listed in Appendix B of the Rules Governing Public Water Systems in North Carolina.
19. The devices shall meet the American Society of Sanitary Engineering (ASSE) standards and be on the University of Southern California approval list.
20. The device and installation shall meet the guidelines of Appendix A – Guidelines and Requirements for the Cross Connection Program in Raleigh's Service Area.
21. 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 Cross.connection@raleighnc.gov for more information.
22. NOTICE for projects that involve an oversized main or urban main replacement. Any City reimbursement greater than $250,000.00 must undergo the public bidding process.
23. Private sub-metering - No resale of water shall occur without approval of the North Carolina Utility Commission. Sub-metering shall be in accordance with Section 1400 of the "SAFE DRINKING WATER ACT".

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: Samuel A. MacDonald (Digitally signed by Samuel A. MacDonald; Date: 2026.04.16 09:52:06-04'00') DATE: ____________

TOWN ENGINEER

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

BY: Gideon Smith (Digitally signed by Gideon Smith; Date: 2026.05.19 08:49:15-04'00') DATE: ____________

LAND USE ADMINISTRATOR

NAD 83

SCALE 1"=150'

0 150' 300'

811 Know what's below. Call before you dig.

RALEIGH WATER - PLANS AUTHORIZED FOR CONSTRUCTION
Any work authorized by this approval must proceed in accordance with the plans. This electronic approval may not be edited once issued. Any modification to this approval once issued will invalidate this approval.

Cydney Terry
2026.05.18 20:49:56-04'00'

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-4142

Public
Sewer Collection / Extension System

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City of Raleigh
Public Utilities Department Permit # S-5503

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 TYLER JEFFREY CROSS
3/31/2026

THIS DRAWING PREPARED AT THE
RALEIGH OFFICE
5410 Trinity Road, Suite 102 | Raleigh, NC 27607
TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

DATE	REVISION DESCRIPTION

DATE	03/31/2026
DRAWN BY	331
DESIGNED BY	331
CHECKED BY	T. CROSS
SCALE	1" = 150'

TIMMONS GROUP

NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS

KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

OVERALL UTILITY PLAN

JOB NO.	51557
SHEET NO.	C3.0

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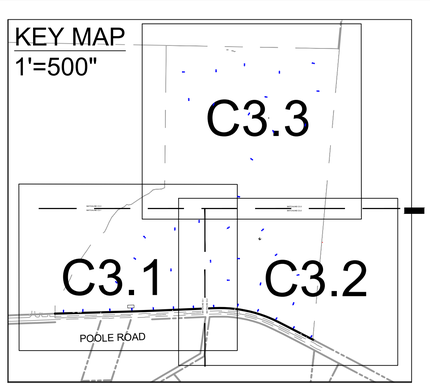

UTILITY NOTES:

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CITY OF RALEIGH STANDARDS AND SPECIFICATIONS.
2. MINIMUM UTILITY HORIZONTAL SEPARATION DISTANCES:
   WATER AND SANITARY SEWER MAINS - 10 FT.
   WATER AND STORM SEWER MAINS - 5 FT.
   SANITARY SEWER AND STORM SEWER MAINS - 5 FT.
   GRAVITY SANITARY SEWER AND FORCE MAINS - 5 FT.
3. MINIMUM UTILITY VERTICAL SEPARATION DISTANCES:
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   WATER AND STORM SEWER MAINS - 18 IN.
   SANITARY SEWER AND STORM SEWER MAINS - 24 IN.



NAD 83

SCALE 1"=60'
0 60' 120'

811 Know what's below. Call before you dig.

TOWN CERTIFICATION

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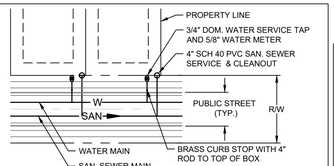
BY: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

Digitally signed by Samuel A. MacDonald
DN: C=US, O=knightdalenc.gov, OU=Town of Knightdale, CN=Samuel A. MacDonald, E=smacdonald@knightdalenc.gov
Reason: I am approving this document
Date: 2026.04.30 09:39:34-04'00'

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

Gideon Smith
Digitally signed by Gideon Smith
DN: C=US, O=knightdalenc.gov, OU=Town of Knightdale, CN=Gideon Smith, E=gsmith@knightdalenc.gov
Reason: I am approving this document
Date: 2026.04.30 09:39:34-04'00'



NOTE:
1. DOMESTIC WATER AND SAN. SEWER SERVICES SHALL BE INSTALLED PER CITY OF RALEIGH DESIGN STANDARDS, DETAILS & SPECIFICATIONS.
2. DOMESTIC WATER AND SAN. SEWER SERVICES SHALL BE INSTALLED ON THE LOW SIDE OF THE LOT.

TYPICAL UTILITY SERVICE LOCATION
N.T.S.

LEGEND

SEWER
- SAN — SANITARY SEWER
- (S) — SANITARY MANHOLE

WATER
- W — EXISTING WATER LINE
- W — PROPOSED WATER LINE
- ⊗ — WATER VALVE
- FIRE HYDRANT
- BLOWOFF ASSEMBLY

LEGEND
- PROPERTY LINE
- POWER LINE EASEMENT
- NATURAL GAS EASEMENT
- PROPOSED FENCE
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RALEIGH WATER - PLANS AUTHORIZED FOR CONSTRUCTION
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Cydney Terry
2026.05.18 20:51:33-04'00'

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City of Raleigh
Public Utilities Department Permit # W-4142

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City of Raleigh
Public Utilities Department Permit # S-5503

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 ENGINEER TYLER JEFFREY CROSS
3/31/2026

THIS DRAWING PREPARED AT THE
RALEIGH OFFICE
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TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION	DATE

DATE: 03/31/2026
DRAWN BY: 331
DESIGNED BY: 331
CHECKED BY: T. CROSS
SCALE: 1" = 60'

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

DETAILED UTILITY PLAN - SHEET 1 OF 3

JOB NO. 51557
SHEET NO. C3.1

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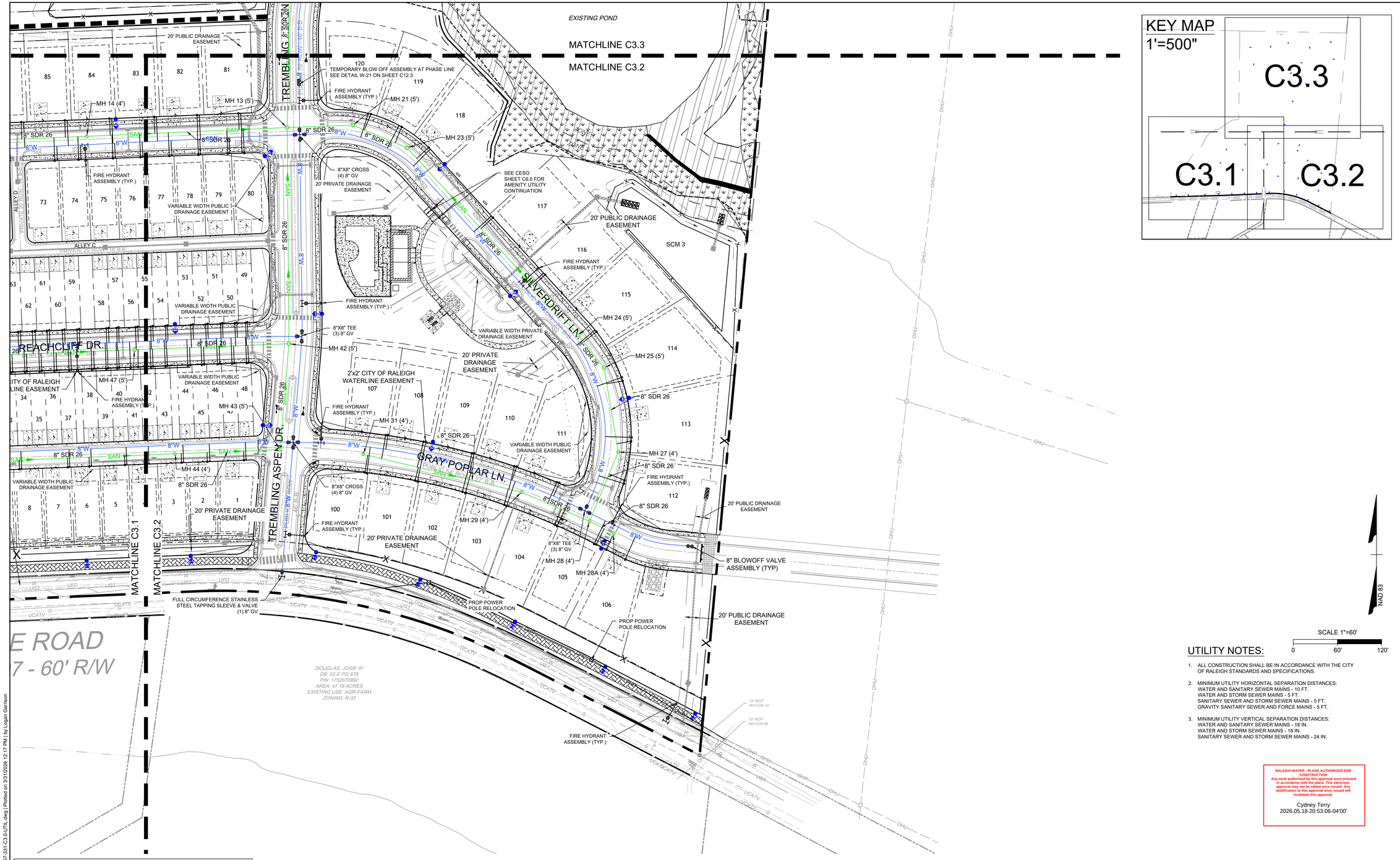

NAD 83

SCALE 1"=60'
0 60' 120'

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RALEIGH WATER - PLANS AUTHORIZED FOR CONSTRUCTION
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Cydney Terry
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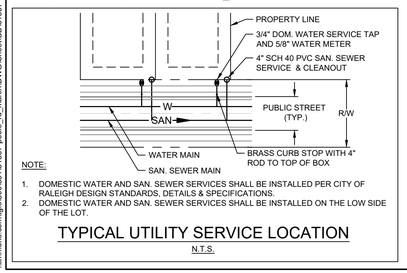

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2. DOMESTIC WATER AND SAN. SEWER SERVICES SHALL BE INSTALLED ON THE LOW SIDE OF THE LOT.

TYPICAL UTILITY SERVICE LOCATION
N.T.S.

811 Know what's below. Call before you dig.

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: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

Digitally signed by Samuel A. MacDonald
DN: cn=US, o=transcendentengineering.com, ou=A. Marion Thomas & Associates, P.A., email=sam@transcendentengineering.com
Reason: I am approving this document
Date: 2026.03.18 08:53:53 -04'00'

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

Digitally signed by Gideon Smith
DN: cn=US, o=gideon.smith@knightdalenc.gov, ou=Town of Knightdale, email=gideon.smith@knightdalenc.gov
Reason: I am approving this document
Date: 2026.03.18 08:53:53 -04'00'

LEGEND

SEWER
- SAN — SANITARY SEWER
- (S) — SANITARY MANHOLE

WATER
- W — EXISTING WATER LINE
- W — PROPOSED WATER LINE
- ⊗ — WATER VALVE
- FIRE HYDRANT
- ⊗⊗ — BLOWOFF ASSEMBLY

LEGEND

- PROPERTY LINE
- POWER LINE EASEMENT
- NATURAL GAS EASEMENT
- PROPOSED FENCE
- EXISTING WETLANDS
- NEUSE RIPARIAN BUFFER
- PRIMARY OPEN SPACE
- SECONDARY OPEN SPACE
- COMMON GREEN

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-4142

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-5503

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 ENGINEER TYLER JEFFREY CROSS
3/31/2026

THIS DRAWING PREPARED AT THE
RALEIGH OFFICE
5410 Trinity Road, Suite 102 | Raleigh, NC 27607
TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

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REVISION DESCRIPTION

DATE
03/31/2026

DRAWN BY	DESIGNED BY	CHECKED BY	SCALE
331	331	T. CROSS	1" = 60'

JOB NO.	SHEET NO.
51557	C3.2

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

DETAILED UTILITY PLAN - SHEET 2 OF 3

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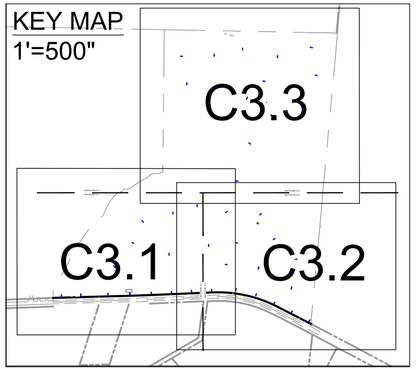
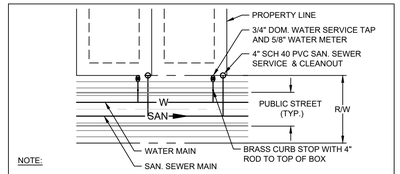
KEY MAP
1'=500"





NOTE:
1. DOMESTIC WATER AND SAN. SEWER SERVICES SHALL BE INSTALLED PER CITY OF RALEIGH DESIGN STANDARDS, DETAILS & SPECIFICATIONS.
2. DOMESTIC WATER AND SAN. SEWER SERVICES SHALL BE INSTALLED ON THE LOW SIDE OF THE LOT.

TYPICAL UTILITY SERVICE LOCATION
N.T.S.

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: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

SCALE 1"=60'
0 60' 120'
NAD 83

LEGEND

- PROPERTY LINE
- POWER LINE EASEMENT
- NATURAL GAS EASEMENT
- PROPOSED FENCE
- EXISTING WETLANDS
- NEUSE RIPARIAN BUFFER
- PRIMARY OPEN SPACE
- SECONDARY OPEN SPACE
- COMMON GREEN

LEGEND

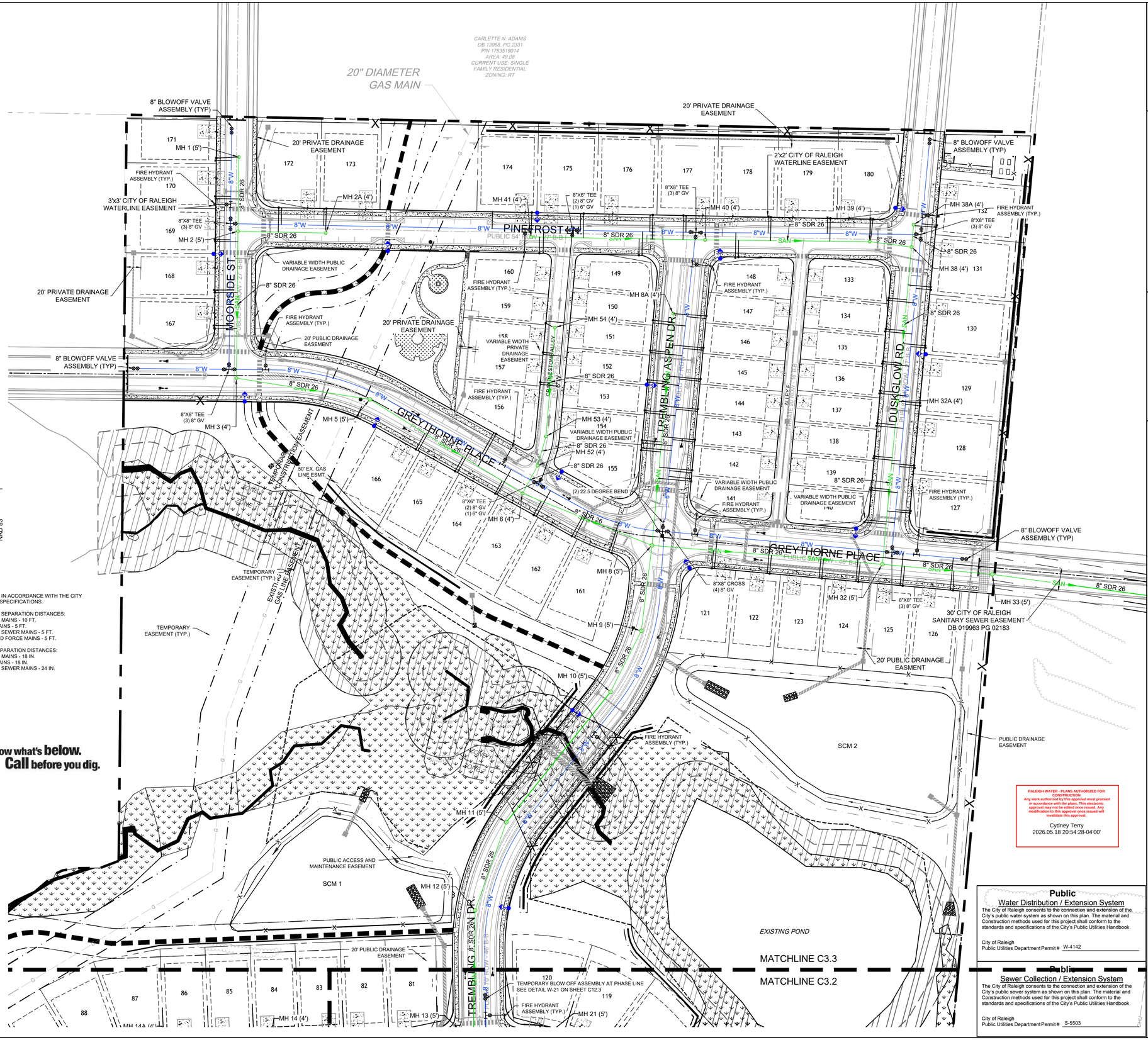
SEWER
- SAN — SANITARY SEWER
- (S) SANITARY MANHOLE

WATER
- W — EXISTING WATER LINE
- W — PROPOSED WATER LINE
- WATER VALVE
- FIRE HYDRANT
- BLOWOFF ASSEMBLY

811 Know what's **below.** **Call** before you dig.

UTILITY NOTES:

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CITY OF RALEIGH STANDARDS AND SPECIFICATIONS.
2. MINIMUM UTILITY HORIZONTAL SEPARATION DISTANCES:
   WATER AND SANITARY SEWER MAINS - 10 FT.
   WATER AND STORM SEWER MAINS - 5 FT.
   SANITARY SEWER AND STORM SEWER MAINS - 5 FT.
   GRAVITY SANITARY SEWER AND FORCE MAINS - 5 FT.
3. MINIMUM UTILITY VERTICAL SEPARATION DISTANCES:
   WATER AND SANITARY SEWER MAINS - 18 IN.
   WATER AND STORM SEWER MAINS - 18 IN.
   SANITARY SEWER AND STORM SEWER MAINS - 24 IN.



RALEIGH WATER - PLANS AUTHORIZED FOR CONSTRUCTION
Any work authorized by this approval must proceed in accordance with the plans. This electronic approval may not be edited once issued. Any modification to this approval once issued will invalidate this approval.
Cydney Terry
2026.05.18 20:54:28-04'00'

Public
Water Distribution / Extension System
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City of Raleigh
Public Utilities Department Permit # W-4142

Public
Sewer Collection / Extension System
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City of Raleigh
Public Utilities Department Permit # S-5503

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 ENGINEER TYLER JEFFREY CROSS
3/31/2026

THIS DRAWING PREPARED AT THE
RALEIGH OFFICE
5410 Trinity Road, Suite 102 | Raleigh, NC 27607
TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION

DATE

DATE 03/31/2026
DRAWN BY 331
DESIGNED BY 331
CHECKED BY T. CROSS
SCALE 1" = 60'
JOB NO. 51557
SHEET NO. C3.3

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

DETAILED UTILITY PLAN - SHEET 3 OF 3

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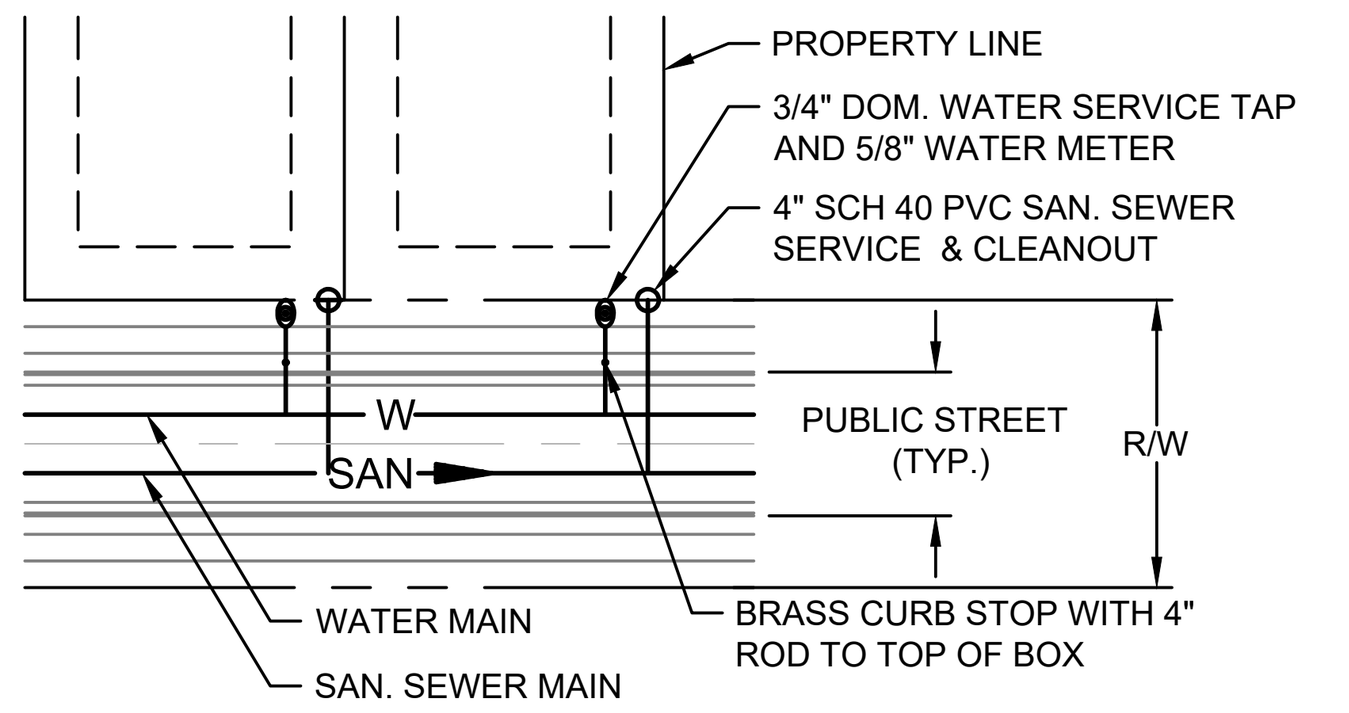

NOTE:

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2. DOMESTIC WATER AND SAN. SEWER SERVICES SHALL BE INSTALLED ON THE LOW SIDE OF THE LOT.

TYPICAL UTILITY SERVICE LOCATION

N.T.S.

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: Samuel A. MacDonald (Digitally signed by Samuel A. MacDonald, DN: C=US, E=smacdonald@amtengineering.com, O="A. Morton Thomas & Associates, Inc.", CN=Samuel A. MacDonald, Reason: I am approving this document, Date: 2026.04.16 09:53:52-04'00') DATE: ____________

TOWN ENGINEER

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

BY: Gideon Smith (Digitally signed by Gideon Smith, DN: C=US, E=gideon.smith@knightdalenc.gov, O=Town of Knightdale, OU=Development Services, CN=Gideon Smith, Reason: I am approving this document, Date: 2026.05.19 08:50:00-04'00') DATE: ____________

LAND USE ADMINISTRATOR

Know what's **below.** **Call** before you dig.

NOTE:
FOR MANHOLES WITH DEPTHS 0'-12' = 4' DIAMETER
FOR MANHOLES WITH DEPTHS 12'-20' = 5' DIAMETER
FOR MANHOLES WITH DEPTHS >20' = 6' DIAMETER

UTILITY NOTES:

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   WATER AND SANITARY SEWER MAINS - 18 IN.
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   SANITARY SEWER AND STORM SEWER MAINS - 24 IN.

LEGEND

PROPERTY LINE
POWER LINE EASEMENT
NATURAL GAS EASEMENT
PROPOSED FENCE
EXISTING WETLANDS
NEUSE RIPARIAN BUFFER
PRIMARY OPEN SPACE
SECONDARY OPEN SPACE
COMMON GREEN

SCALE 1"=60'
0 60' 120'

NAD 83

LEGEND

SEWER
SAN— SANITARY SEWER
(S) SANITARY MANHOLE

WATER
—W— EXISTING WATER LINE
—W— PROPOSED WATER LINE
WATER VALVE
FIRE HYDRANT
BLOWOFF ASSEMBLY

SANITARY SEWER SCHEDULE

STRUCTURE	HEIGHT	TOP	INV IN	INLET PIPE	INV OUT	OUTLET PIPE
MH 1 (5')	11.71'	251.74			240.05'	99 LF 8" SDR 26 @ 6.33% (MH 2 (5'))
MH 2 (5')	14.35'	245.64	233.79' 233.79'	99 LF 8" SDR 26 @ 6.33% (MH 1 (5')) 117 LF 8" SDR 26 @ 4.36% (MH 2A (4'))	231.29'	196 LF 8" SDR 26 @ 0.55% (MH 3 (4'))
MH 2A (4')	7.61'	246.49			238.89'	117 LF 8" SDR 26 @ 4.36% (MH 2 (5'))
MH 3 (4')	10.15'	239.48	230.21'	196 LF 8" SDR 26 @ 0.55% (MH 2 (5'))	229.33'	180 LF 8" SDR 26 @ 2.84% (MH 5 (5'))
MH 5 (5')	14.19'	238.21	224.21'	180 LF 8" SDR 26 @ 2.84% (MH 3 (4'))	224.01'	239 LF 8" SDR 26 @ 0.56% (MH 6 (4'))
MH 6 (4')	11.29'	233.77	222.68' 224.08'	239 LF 8" SDR 26 @ 0.56% (MH 5 (5')) 42 LF 8" SDR 26 @ 0.55% (MH 52 (4'))	222.48'	186 LF 8" SDR 26 @ 2.60% (MH 8 (5'))
MH 8 (5')	18.46'	233.60	217.64' 217.64' 215.34'	186 LF 8" SDR 26 @ 2.60% (MH 6 (4')) 311 LF 8" SDR 26 @ 4.31% (MH 8A (4')) 115 LF 8" SDR 26 @ 0.55% (MH 9 (5'))	215.14'	308 LF 8" SDR 26 @ 0.55% (MH 32 (5'))
MH 8A (4')	9.67'	240.67			231.00'	310 LF 8" SDR 26 @ 4.31% (MH 8 (5'))
MH 9 (5')	16.45'	232.42	216.17'	91 LF 8" SDR 26 @ 0.55% (MH 10 (5'))	215.97'	115 LF 8" SDR 26 @ 0.55% (MH 8 (5'))
MH 10 (5')	14.84'	231.51	216.87'	222 LF 8" DUCTILE IRON @ 0.55% (MH 11 (5'))	216.67'	91 LF 8" SDR 26 @ 0.55% (MH 9 (5'))
MH 11 (5')	15.60'	233.70	220.59'	125 LF 8" SDR 26 @ 0.55% (MH 12 (5'))	218.09'	222 LF 8" DUCTILE IRON @ 0.55% (MH 10 (5'))
MH 12 (5')	13.97'	235.24	222.27'	177 LF 8" SDR 26 @ 0.55% (MH 13 (5'))	221.28'	125 LF 8" SDR 26 @ 0.55% (MH 11 (5'))
MH 13 (5')	16.31'	239.55	225.74' 223.44' 225.74'	293 LF 8" SDR 26 @ 2.60% (MH 42 (5')) 89 LF 8" SDR 26 @ 0.55% (MH 21 (5')) 272 LF 8" SDR 26 @ 2.53% (MH 14 (4'))	223.24'	177 LF 8" SDR 26 @ 0.55% (MH 12 (5'))
MH 14 (4')	11.99'	244.60	234.33'	132 LF 8" SDR 26 @ 3.52% (MH 14A (4'))	232.63'	272 LF 8" SDR 26 @ 2.53% (MH 13 (5'))
MH 14A (4')	11.46'	250.45	240.18'	51 LF 8" SDR 26 @ 1.96% (MH 15 (4'))	238.99'	132 LF 8" SDR 26 @ 3.52% (MH 14 (4'))
MH 15 (4')	10.84'	252.00	241.97'	127 LF 8" SDR 26 @ 2.36% (MH 16 (4'))	241.18'	51 LF 8" SDR 26 @ 1.96% (MH 14A (4'))
MH 16 (4')	10.43'	255.39	245.16'	76 LF 8" SDR 26 @ 0.58% (MH 17 (4'))	244.96'	127 LF 8" SDR 26 @ 2.36% (MH 15 (4'))
MH 17 (4')	9.79'	255.39	245.80'	177 LF 8" SDR 26 @ 0.54% (MH 18 (4'))	245.60'	76 LF 8" SDR 26 @ 0.58% (MH 16 (4'))
MH 18 (4')	9.06'	255.81	246.95' 246.95'	228 LF 8" SDR 26 @ 1.87% (MH 19 (4')) 41 LF 8" SDR 26 @ 0.55% (MH 49 (4'))	246.75'	177 LF 8" SDR 26 @ 0.54% (MH 17 (4'))
MH 19 (4')	11.09'	262.30	253.71'	75 LF 8" SDR 26 @ 2.79% (MH 20 (4'))	251.21'	228 LF 8" SDR 26 @ 1.87% (MH 18 (4'))
MH 20 (4')	8.86'	264.65			255.81'	75 LF 8" SDR 26 @ 2.79% (MH 19 (4'))
MH 21 (5')	15.15'	239.08	224.13'	79 LF 8" SDR 26 @ 0.55% (MH 23 (5'))	223.93'	89 LF 8" SDR 26 @ 0.55% (MH 13 (5'))
MH 23 (5')	13.96'	238.53	224.77'	345 LF 8" SDR 26 @ 0.55% (MH 24 (5'))	224.57'	79 LF 8" SDR 26 @ 0.55% (MH 21 (5'))
MH 24 (5')	10.73'	237.37	226.96'	56 LF 8" SDR 26 @ 0.55% (MH 25 (5'))	226.66'	345 LF 8" SDR 26 @ 0.55% (MH 23 (5'))
MH 25 (5')	10.12'	237.39	227.47'	116 LF 8" SDR 26 @ 0.55% (MH 27 (4'))	227.27'	56 LF 8" SDR 26 @ 0.55% (MH 24 (5'))
MH 27 (4')	8.16'	236.27	228.31'	102 LF 8" SDR 26 @ 0.55% (MH 28 (4'))	228.11'	116 LF 8" SDR 26 @ 0.55% (MH 25 (5'))
MH 28 (4')	6.89'	235.74	229.71' 229.07'	100 LF 8" SDR 26 @ 0.73% (MH 29 (4')) 37 LF 8" SDR 26 @ 0.55% (MH 28A (4'))	228.87'	102 LF 8" SDR 26 @ 0.55% (MH 27 (4'))
MH 28A (4')	5.44'	234.69			229.27'	37 LF 8" SDR 26 @ 0.55% (MH 28 (4'))
MH 29 (4')	8.19'	238.62	232.94'	221 LF 8" SDR 26 @ 3.18% (MH 31 (4'))	230.44'	100 LF 8" SDR 26 @ 0.73% (MH 28 (4'))
MH 31 (4')	7.86'	247.81			239.97'	221 LF 8" SDR 26 @ 3.18% (MH 29 (4'))
MH 32 (5')	17.46'	230.71	213.45' 215.72'	308 LF 8" SDR 26 @ 0.55% (MH 8 (5')) 218 LF 8" SDR 26 @ 3.58% (MH 32A (4'))	213.25'	147 LF 8" SDR 26 @ 0.55% (MH 33 (5'))

SEWER TO BE INSTALLED IN PHASE 1

SANITARY SEWER SCHEDULE

STRUCTURE	HEIGHT	TOP	INV IN	INLET PIPE	INV OUT	OUTLET PIPE
MH 32A (4')	11.55'	235.09	223.74'	207 LF 8" SDR 26 @ 3.25% (MH 38 (4'))	223.54'	218 LF 8" SDR 26 @ 3.58% (MH 32 (5'))
MH 33 (5')	10.35'	222.79	212.44'	147 LF 8" SDR 26 @ 0.55% (MH 32 (5'))	212.24'	318 LF 8" SDR 26 @ 2.79% (MH 34 (4'))
MH 34 (4')	7.03'	210.01	203.37'	318 LF 8" SDR 26 @ 2.79% (MH 33 (5'))	202.97'	230 LF 8" SDR 35 @ 4.44% (MH 35 (4'))
MH 35 (4')	7.04'	199.48	192.78'	230 LF 8" SDR 35 @ 4.44% (MH 34 (4'))	192.44'	139 LF 8" SDR 35 @ 3.03% (MH 36 (4'))
MH 36 (4')	7.04'	194.91	188.23'	139 LF 8" SDR 35 @ 3.03% (MH 35 (4'))	187.89'	192 LF 8" SDR 35 @ 3.83% (MH 37 (6' DOGHOUSE))
MH 37 (6' DOGHOUSE)	10.66'	189.93	180.54' 179.29'	192 LF 8" SDR 35 @ 3.83% (MH 36 (4')) 189 LF 36" Ductile Iron @ 0.20% ()	179.29'	281 LF 36" Ductile Iron @ 0.19% ()
MH 38 (4')	11.70'	242.15	232.95' 232.95'	30 LF 8" SDR 26 @ 2.00% (MH 38A (4')) 56 LF 8" SDR 26 @ 1.11% (MH 39 (4'))	230.45'	206 LF 8" SDR 26 @ 3.25% (MH 32A (4'))
MH 38A (4')	9.68'	243.21			233.55'	30 LF 8" SDR 26 @ 2.00% (MH 38 (4'))
MH 39 (4')	9.10'	242.67	233.77'	219 LF 8" SDR 26 @ 0.71% (MH 40 (4'))	233.57'	56 LF 8" SDR 26 @ 1.11% (MH 38 (4'))
MH 40 (4')	8.59'	243.91	235.52'	232 LF 8" SDR 26 @ 2.24% (MH 41 (4'))	235.32'	219 LF 8" SDR 26 @ 0.71% (MH 39 (4'))
MH 41 (4')	6.90'	247.59			240.71'	232 LF 8" SDR 26 @ 2.24% (MH 40 (4'))
MH 42 (5')	13.16'	246.52	235.51' 233.56'	144 LF 8" SDR 26 @ 2.47% (MH 43 (5')) 209 LF 8" SDR 26 @ 0.80% (MH 47 (5'))	233.36'	293 LF 8" SDR 26 @ 2.60% (MH 13 (5'))
MH 43 (5')	12.09'	251.13	240.76'	143 LF 8" SDR 26 @ 0.79% (MH 44 (4'))	239.06'	144 LF 8" SDR 26 @ 2.47% (MH 42 (5'))
MH 44 (4')	10.79'	252.65	243.43'	289 LF 8" SDR 26 @ 0.87% (MH 45 (4'))	241.89'	143 LF 8" SDR 26 @ 0.79% (MH 43 (5'))
MH 45 (4')	9.49'	255.43	248.44'	340 LF 8" SDR 26 @ 1.77% (MH 46 (4'))	245.94'	289 LF 8" SDR 26 @ 0.87% (MH 44 (4'))
MH 46 (4')	6.46'	260.89			254.45'	340 LF 8" SDR 26 @ 1.77% (MH 45 (4'))
MH 47 (5')	14.39'	249.64	237.75'	297 LF 8" SDR 26 @ 2.43% (MH 48 (4'))	235.25'	209 LF 8" SDR 26 @ 0.80% (MH 42 (5'))
MH 48 (4')	10.78'	255.75			244.99'	297 LF 8" SDR 26 @ 2.43% (MH 47 (5'))
MH 49 (4')	7.93'	255.11	247.38'	65 LF 8" SDR 26 @ 0.83% (MH 50 (4'))	247.18'	41 LF 8" SDR 26 @ 0.55% (MH 18 (4'))
MH 50 (4')	7.14'	255.04	250.42'	107 LF 8" SDR 26 @ 0.93% (MH 51 (4'))	247.92'	65 LF 8" SDR 26 @ 0.83% (MH 49 (4'))
MH 51 (4')	4.40'	255.79			251.41'	107 LF 8" SDR 26 @ 0.93% (MH 50 (4'))
MH 52 (4')	9.41'	233.73	224.52'	41 LF 8" SDR 26 @ 0.55% (MH 53 (4'))	224.32'	42 LF 8" SDR 26 @ 0.55% (MH 6 (4'))
MH 53 (4')	9.18'	233.92	226.79'	146 LF 8" SDR 26 @ 4.39% (MH 54 (4'))	224.74'	41 LF 8" SDR 26 @ 0.55% (MH 52 (4'))
MH 54 (4')	7.66'	240.81			233.18'	145 LF 8" SDR 26 @ 4.39% (MH 53 (4'))

RALEIGH WATER - PLANS AUTHORIZED FOR CONSTRUCTION
Any work authorized by this approval must proceed in accordance with the plans. This electronic approval may not be edited once issued. Any modification to this approval once issued will invalidate this approval.

Cydney Terry
2026.05.18 20:55:53-04'00'

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-4142

Public
Sewer Collection / Extension System
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City of Raleigh
Public Utilities Department Permit # S-5503

NORTH CAROLINA PROFESSIONAL SEAL 051879 ENGINEER TYLER JEFFREY CROSS
3/31/2026

THIS DRAWING PREPARED AT THE **RALEIGH OFFICE**
5410 Trinity Road, Suite 102 | Raleigh, NC 27607
TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

DATE	REVISION DESCRIPTION

DATE 03/31/2026
DRAWN BY 331
DESIGNED BY 331
CHECKED BY T. CROSS
SCALE NTS

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS

KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

SANITARY SEWER SCHEDULE

JOB NO. 51557
SHEET NO. C3.4

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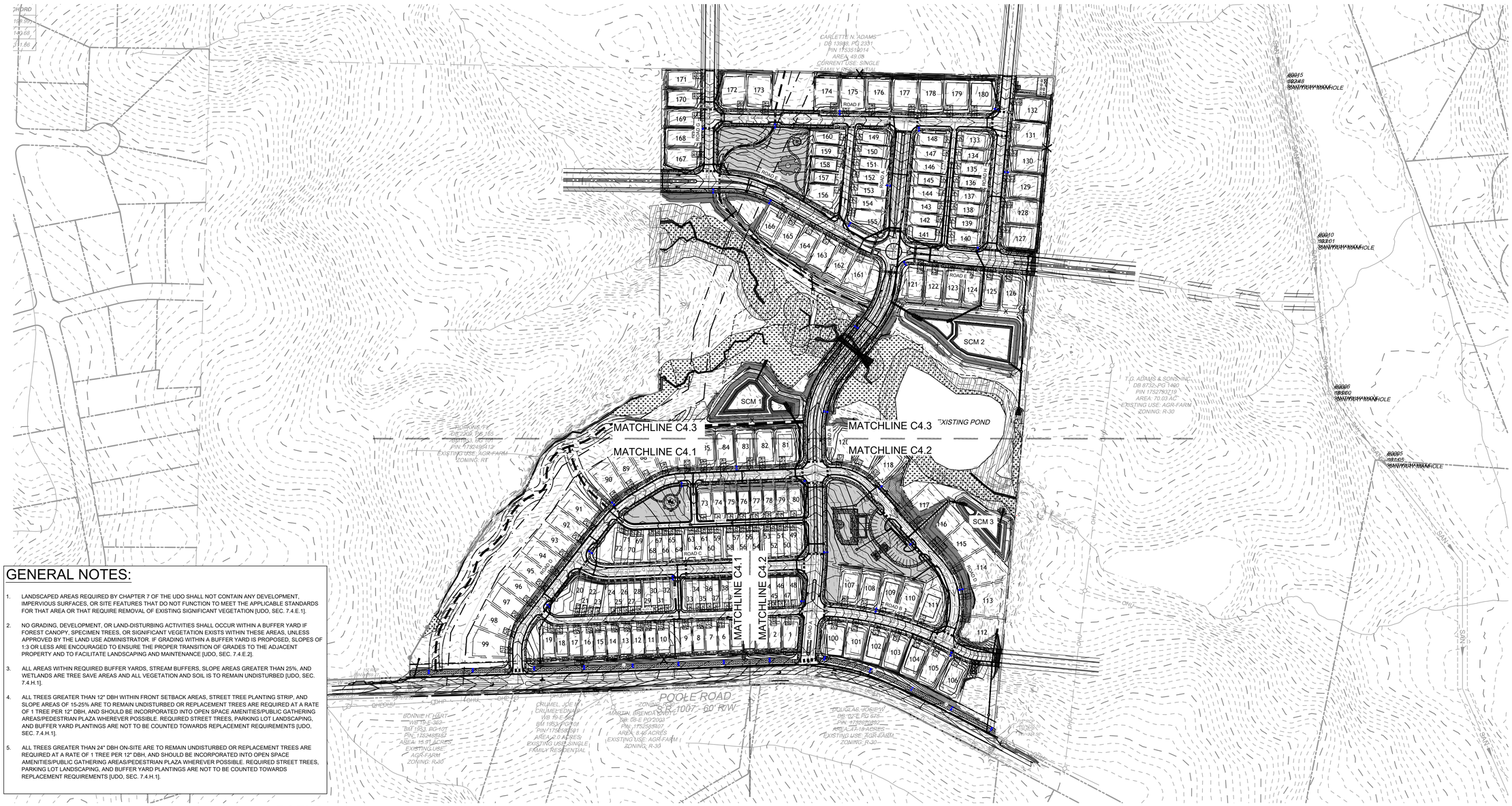

GENERAL NOTES:

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3. ALL AREAS WITHIN REQUIRED BUFFER YARDS, STREAM BUFFERS, SLOPE AREAS GREATER THAN 25%, AND WETLANDS ARE TREE SAVE AREAS AND ALL VEGETATION AND SOIL IS TO REMAIN UNDISTURBED [UDO, SEC. 7.4.H.1].
4. ALL TREES GREATER THAN 12" DBH WITHIN FRONT SETBACK AREAS, STREET TREE PLANTING STRIP, AND SLOPE AREAS OF 15-25% ARE TO REMAIN UNDISTURBED OR REPLACEMENT TREES ARE REQUIRED AT A RATE OF 1 TREE PER 12" DBH, AND SHOULD BE INCORPORATED INTO OPEN SPACE AMENITIES/PUBLIC GATHERING AREAS/PEDESTRIAN PLAZA WHEREVER POSSIBLE. REQUIRED STREET TREES, PARKING LOT LANDSCAPING, AND BUFFER YARD PLANTINGS ARE NOT TO BE COUNTED TOWARDS REPLACEMENT REQUIREMENTS [UDO, SEC. 7.4.H.1].
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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: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

Digitally signed by Samuel A. MacDonald
DN: cn=Samuel A. MacDonald, o=Timmons Group, ou=Transportation, l=Charlotte, st=North Carolina, c=US
Reason: I am approving this document
Date: 2026.03.31 09:23:12 -04'00'

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

Digitally signed by Gideon Smith
DN: cn=Gideon Smith, o=Knightdale, ou=Development Services, email=gsmith@knightdalenc.gov, c=US
Date: 2026.04.01 08:08:23 -04'00'

ALL CONSTRUCTION TO BE IN ACCORDANCE WITH ALL TOWN OF KNIGHTDALE, NCDOT, AND CITY OF RALEIGH STANDARDS, SPECIFICATIONS, AND DETAILS.

NAD 83

SCALE 1"=150'
0 200' 400'

LEGEND

- PROPERTY LINE
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- ADJACENT PROPERTY LINE
- PHASE LINE
- PROPOSED CONTOUR
- EXISTING CONTOUR
- FENCE
- PROPOSED DRAIN EASEMENT
- PROPOSED PERIMETER BUFFER
- TREE PROTECTION FENCE
- 100-YR FLOODPLAIN
- WETLANDS
- NUESE RIPARIAN BUFFER
- LANDSCAPE BUFFER

811 Know what's below. Call before you dig.

GRADING AND STORMWATER PLAN NOTES:

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3. SCMS SHALL BE DESIGNED TO CONTROL AND TREAT THE DIFFERENCE IN STORMWATER RUNOFF VOLUME LEAVING THE PROJECT SITE BETWEEN THE PRE- AND POST- DEVELOPMENT CONDITIONS FOR, AT A MINIMUM, THE 1-YEAR, 24-HOUR STORM.
4. SCMS SHALL BE DESIGNED TO HAVE A MINIMUM OF 85% AVERAGE ANNUAL REMOVAL FOR TOTAL SUSPENDED SOLIDS.
5. ALL SCMS ASSOCIATED WITH THIS PROJECT WILL REQUIRE MAINTENANCE EASEMENTS AND AN OPERATION AND MAINTENANCE AGREEMENT TO BE NOTED ON THE FINAL PLAT. ALL OF THESE ITEMS WILL NEED TO BE RECORDED WITH THE COUNTY REGISTER OF DEEDS.
6. ALL PUBLIC SANITARY SEWER EASEMENTS SHALL HAVE MAX. FINISHED GRADE SLOPE OF 3:1 TO ASSURE SAFE ACCESS FOR MAINTENANCE VEHICLES AND MOWERS.
7. ANY FILL PLACED WITHIN AN HRW EASEMENT SHALL BE FIELD TESTED/APPROVED BY THE OWNERS GEOTECHNICAL ENGINEER.
8. BUILDING PADS SHALL BE A MIN OF 18" ABOVE THE TOP OF CURB. DRIVEWAY SLOPE SHALL NOT EXCEED 8%
9. PAD GRADE DENOTES FINISHED SUBGRADE.
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13. ALL SCM'S WILL PROVIDE A MINIMUM 20' VEHICULAR ACCESSIBLE ACCESS EASEMENT FOR FUTURE MAINTENANCE AND INSPECTIONS. ACCESS EASEMENTS SHALL PROVIDE DIRECT ACCESS TO THE PRIMARY OUTFALL/BERM AND EASEMENT SLOPE SHALL NOT EXCEED 33.33% MAXIMUM LONGITUDINAL SLOPE.
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18. **IF CONTRACTOR NOTICES ANY DISCREPANCIES IN ANY OF THESE SLOPE REQUIREMENTS, IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT THE OWNER PRIOR TO POURING ANY CONCRETE SO THAT A SOLUTION CAN BE FOUND.**
19. RETAINING WALL AND ASSOCIATED DRAINAGE TO BE DESIGNED BY OTHERS. CONTRACTOR SHALL COORDINATE DESIGN AND SUBMIT SEALED PLAN FOR REVIEW AND APPROVAL BY THE TOWN INSPECTIONS DEPARTMENT.

RETAINING WALL NOTES:

1. ALL RETAINING WALLS TO BE DESIGNED AND PERMITTED BY OTHERS.
2. ALL RETAINING WALLS GREATER THAN 30" IN HEIGHT SHALL INCLUDE A MINIMUM 4' HIGH BLACK ALUMINUM FENCE.
3. CONTRACTOR SHALL COORDINATE DESIGN AND SUBMIT SEALED PLAN(S) FOR REVIEW AND APPROVAL FROM CITY OF SANFORD INSPECTIONS DEPARTMENT.
4. PRIOR TO CONSTRUCTION CONTRACTOR TO FIELD VERIFY BOTTOM OF WALL AND ALL OTHER ASSOCIATED ELEVATIONS.
5. CONTRACTOR TO PROVIDE SHOP DRAWINGS TO THE ENGINEER OF RECORD FOR COORDINATION PURPOSED WITH FIELD CONDITIONS. UNSEEN CONFLICTS AND ASSOCIATED DRAINAGE AS NEEDED.
6. ALL RETAINING WALLS WILL REQUIRE A BUILDING PERMIT FROM THE JURISDICTIONS INSPECTIONS DEPARTMENT.
7. TOP OF WALL SPOT GRADES PROVIDE 6" ELEVATION DIFFERENCE ABOVE GRADE SHOWN.
8. CONTRACTOR WILL BE REQUIRED TO MITIGATE ANY LOCALIZED LOW POINTS THAT MAY LEAD TO PONDING ALONG THE TOP OF WALL.
9. DRAINAGE SWALES TO BE LINED WITH RIP RAP AT END OF WALLS TO PREVENT EROSION.

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 ENGINEER TYLER JEFFREY CROSS
3/31/2026

THIS DRAWING PREPARED AT THE RALEIGH OFFICE
5410 Trinity Road, Suite 102 | Raleigh, NC 27607
TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION

DATE

DATE: 03/31/2026
DRAWN BY: 331
DESIGNED BY: 331
CHECKED BY: T. CROSS
SCALE: 1" = 150'

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA
OVERALL GRADING & DRAINAGE PLAN

JOB NO. 51557
SHEET NO. C4.0

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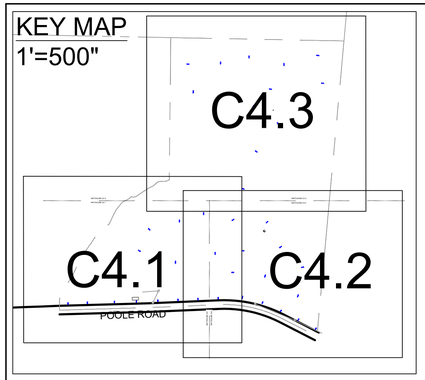
KEY MAP
1'=500"



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BY: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

Digitally signed by Samuel A. MacDonald
DN: cn=Samuel A. MacDonald, o=Knightdale, ou=Engineering, email=samuel.macdonald@knightdalenc.gov, c=US, Mediion Thomas A. Contreras, Inc. / Orchestrated S. Machinelli
Reason: I am approving this document
Date: 2026.04.16 09:54:48 -04'00'

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

Digitally signed by Gideon Smith
DN: cn=Gideon Smith, o=Knightdale, ou=Planning, email=gideon.smith@knightdalenc.gov, c=US
Date: 2026.04.16 10:00:51 -04'00'
Reason: I am approving this document

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811 Know what's below. Call before you dig.

NAD 83

SCALE 1"=60'
0 60' 120'

LEGEND

- PROPERTY LINE
- PROPOSED RIGHT-OF-WAY
- ADJACENT PROPERTY LINE
- PHASE LINE
- PROPOSED CONTOUR
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- FENCE
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- WETLANDS
- NUESE RIPARIAN BUFFER
- LANDSCAPE BUFFER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 TYLER JEFFREY CROSS
3/31/2026

THIS DRAWING PREPARED AT THE
RALEIGH OFFICE
5410 Trinity Road, Suite 102 | Raleigh, NC 27607
TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION	DATE

DATE: 03/31/2026
DRAWN BY: 331
DESIGNED BY: 331
CHECKED BY: T. CROSS
SCALE: 1" = 60'

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA
DETAILED GRADING & DRAINAGE PLAN - SHEET 1 OF 3

JOB NO. 51557
SHEET NO. C4.1

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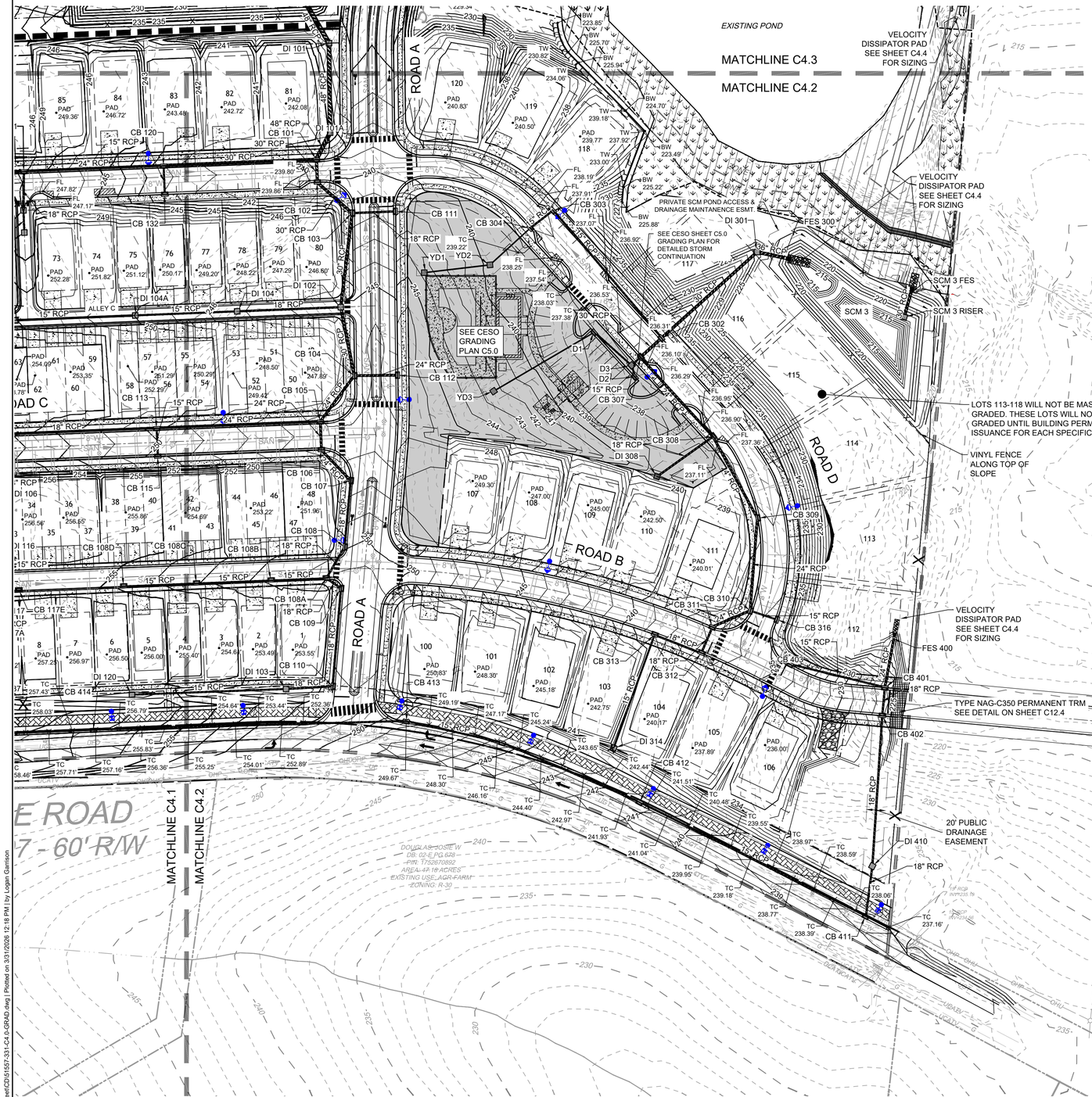
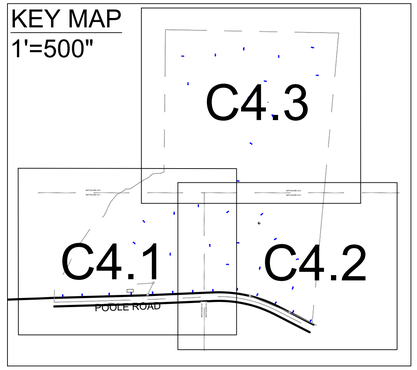


KEY MAP

1'=500"



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- 100-YR FLOODPLAIN
- WETLANDS
- NUESE RIPARIAN BUFFER
- LANDSCAPE BUFFER

NAD 83

SCALE 1"=60'

0 60' 120'

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: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

ALL CONSTRUCTION TO BE IN ACCORDANCE WITH ALL TOWN OF KNIGHTDALE, NCDOT, AND CITY OF RALEIGH STANDARDS, SPECIFICATIONS, AND DETAILS.

811 Know what's below. Call before you dig.

NOTE:
RETAINING WALL TO BE DESIGNED BY OTHERS. CONTRACTOR SHALL COORDINATE DESIGN AND SUBMIT SEALED PLAN FOR REVIEW AND APPROVAL BY THE TOWN INSPECTIONS DEPARTMENT.

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 TYLER JEFFREY CROSS

3/31/2026

THIS DRAWING PREPARED AT THE
RALEIGH OFFICE
5410 Trinity Road, Suite 102 | Raleigh, NC 27607
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REVISION DESCRIPTION	DATE

DATE: 03/31/2026
DRAWN BY: 331
DESIGNED BY: 331
CHECKED BY: T. CROSS
SCALE: 1" = 60'

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA
DETAILED GRADING & DRAINAGE PLAN - SHEET 2 OF 3

JOB NO. 51557
SHEET NO. C4.2

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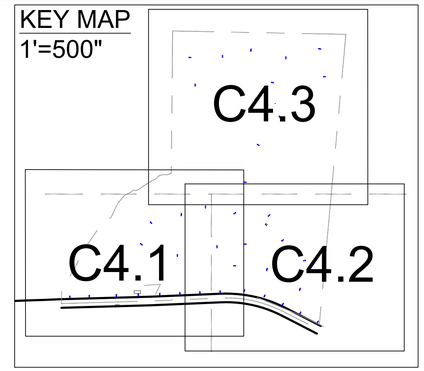
GENERAL NOTES:

1. LANDSCAPED AREAS REQUIRED BY CHAPTER 7 OF THE UDO SHALL NOT CONTAIN ANY DEVELOPMENT, IMPERVIOUS SURFACES, OR SITE FEATURES THAT DO NOT FUNCTION TO MEET THE APPLICABLE STANDARDS FOR THAT AREA OR THAT REQUIRE REMOVAL OF EXISTING SIGNIFICANT VEGETATION [UDO, SEC. 7.4.E.1].
2. NO GRADING, DEVELOPMENT, OR LAND-DISTURBING ACTIVITIES SHALL OCCUR WITHIN A BUFFER YARD IF FOREST CANOPY, SPECIMEN TREES, OR SIGNIFICANT VEGETATION EXISTS WITHIN THESE AREAS, UNLESS APPROVED BY THE LAND USE ADMINISTRATOR. IF GRADING WITHIN A BUFFER YARD IS PROPOSED, SLOPES OF 1:3 OR LESS ARE ENCOURAGED TO ENSURE THE PROPER TRANSITION OF GRADES TO THE ADJACENT PROPERTY AND TO FACILITATE LANDSCAPING AND MAINTENANCE [UDO, SEC. 7.4.E.2].
3. ALL AREAS WITHIN REQUIRED BUFFER YARDS, STREAM BUFFERS, SLOPE AREAS GREATER THAN 25%, AND WETLANDS ARE TREE SAVE AREAS AND ALL VEGETATION AND SOIL IS TO REMAIN UNDISTURBED [UDO, SEC. 7.4.H.1].
4. ALL TREES GREATER THAN 12" DBH WITHIN FRONT SETBACK AREAS, STREET TREE PLANTING STRIP, AND SLOPE AREAS OF 15-25% ARE TO REMAIN UNDISTURBED OR REPLACEMENT TREES ARE REQUIRED AT A RATE OF 1 TREE PER 12" DBH, AND SHOULD BE INCORPORATED INTO OPEN SPACE AMENITIES/PUBLIC GATHERING AREAS/PEDESTRIAN PLAZA WHEREVER POSSIBLE. REQUIRED STREET TREES, PARKING LOT LANDSCAPING, AND BUFFER YARD PLANTINGS ARE NOT TO BE COUNTED TOWARDS REPLACEMENT REQUIREMENTS [UDO, SEC. 7.4.H.1].
5. ALL TREES GREATER THAN 24" DBH ON-SITE ARE TO REMAIN UNDISTURBED OR REPLACEMENT TREES ARE REQUIRED AT A RATE OF 1 TREE PER 12" DBH, AND SHOULD BE INCORPORATED INTO OPEN SPACE AMENITIES/PUBLIC GATHERING AREAS/PEDESTRIAN PLAZA WHEREVER POSSIBLE. REQUIRED STREET TREES, PARKING LOT LANDSCAPING, AND BUFFER YARD PLANTINGS ARE NOT TO BE COUNTED TOWARDS REPLACEMENT REQUIREMENTS [UDO, SEC. 7.4.H.1].

KEY MAP
1'=500"



GRADING AND STORMWATER PLAN NOTES:

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE TOWN OF KNIGHTDALE STANDARDS AND SPECIFICATIONS.
2. ALL PERMITS SHALL BE OBTAINED FROM THE TOWN OF KNIGHTDALE, WAKE COUNTY, NCDOT, NCDEQ-DWR, AND USACE AS APPLICABLE PRIOR TO BEGINNING CONSTRUCTION. A COPY OF ALL PERMITS SHALL BE SUBMITTED TO THE TOWN OF KNIGHTDALE FOR THEIR RECORDS.
3. SCMS SHALL BE DESIGNED TO CONTROL AND TREAT THE DIFFERENCE IN STORMWATER RUNOFF VOLUME LEAVING THE PROJECT SITE BETWEEN THE PRE- AND POST- DEVELOPMENT CONDITIONS FOR, AT A MINIMUM, THE 1-YEAR, 24-HOUR STORM.
4. SCMS SHALL BE DESIGNED TO HAVE A MINIMUM OF 85% AVERAGE ANNUAL REMOVAL FOR TOTAL SUSPENDED SOLIDS.
5. ALL SCMS ASSOCIATED WITH THIS PROJECT WILL REQUIRE MAINTENANCE EASEMENTS AND AN OPERATION AND MAINTENANCE AGREEMENT TO BE NOTED ON THE FINAL PLAT. ALL OF THESE ITEMS WILL NEED TO BE RECORDED WITH THE COUNTY REGISTER OF DEEDS.
6. ALL PUBLIC SANITARY SEWER EASEMENTS SHALL HAVE MAX. FINISHED GRADE SLOPE OF 3:1 TO ASSURE SAFE ACCESS FOR MAINTENANCE VEHICLES AND MOWERS.
7. ANY FILL PLACED WITHIN AN HRW EASEMENT SHALL BE FIELD TESTED/APPROVED BY THE OWNERS GEOTECHNICAL ENGINEER.
8. BUILDING PADS SHALL BE A MIN OF 18" ABOVE THE TOP OF CURB. DRIVEWAY SLOPE SHALL NOT EXCEED 8%
9. PAD GRADE DENOTES FINISHED SUBGRADE.
10. SWALES SHALL HAVE A MIN SLOPE OF 2% BUT NO LESS THAN 1% IF MIN CANNOT BE MET. ALL SWALES BETWEEN HOUSES TO BE MORE THAN 1% SLOPE. SWALE HIGH POINTS TO BE 6" BELOW BUILDING PAD. REAR YARD SWALES TO BE MIN. 2% SLOPE.
11. HIGH POINT WITHIN SWALE AS NOTED TO BE 6 IN BELOW FINISHED SUBGRADE.
12. HOUSE SIDE SLOPES TO BE 3:1 FROM PAD TO SIDE SWALE. PAD TO BE .5' (6") HIGHER THAN GRADE AND SWALE TO BE LOCATED 1.5' LENGTH FROM PAD.
13. ALL SCM'S WILL PROVIDE A MINIMUM 20' VEHICULAR ACCESSIBLE ACCESS EASEMENT FOR FUTURE MAINTENANCE AND INSPECTIONS. ACCESS EASEMENTS SHALL PROVIDE DIRECT ACCESS TO THE PRIMARY OUTFALL/BERM AND EASEMENT SLOPE SHALL NOT EXCEED 33.33% MAXIMUM LONGITUDINAL SLOPE.
14. ALL ROOF DRAINS SHALL BE DIRECTED TO THE STORM DRAIN SYSTEM.
15. ALL SEWER ACCESS EASEMENTS WILL NOT EXCEED A 33.33% SLOPE
16. ALL HANDICAP PARKING SPACES AND STRIPED ACCESSIBILITY AISLES ARE TO HAVE NO MORE THAN A 1:50 SLOPE IN ALL DIRECTIONS.
17. ALL SIDEWALKS ARE TO HAVE NO MORE THAN A 1:20 SLOPE FOR THE LENGTH OF THE SIDEWALK AND NO MORE THAN A 1:50 SLOPE FOR THE WIDTH OF THE SIDEWALK.
18. **IF CONTRACTOR NOTICES ANY DISCREPANCIES IN ANY OF THESE SLOPE REQUIREMENTS, IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT THE OWNER PRIOR TO POURING ANY CONCRETE SO THAT A SOLUTION CAN BE FOUND.**
19. RETAINING WALL AND ASSOCIATED DRAINAGE TO BE DESIGNED BY OTHERS. CONTRACTOR SHALL COORDINATE DESIGN AND SUBMIT SEALED PLAN FOR REVIEW AND APPROVAL BY THE TOWN INSPECTIONS DEPARTMENT.

NOTE:
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BY: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

LEGEND

- PROPERTY LINE
- PROPOSED RIGHT-OF-WAY
- ADJACENT PROPERTY LINE
- PHASE LINE
- PROPOSED CONTOUR
- EXISTING CONTOUR
- FENCE
- PROPOSED DRAIN EASEMENT
- PROPOSED PERIMETER BUFFER
- TREE PROTECTION FENCE
- 100-YR FLOODPLAIN
- WETLANDS
- NUESE RIPARIAN BUFFER
- LANDSCAPE BUFFER

ALL CONSTRUCTION TO BE IN ACCORDANCE WITH ALL TOWN OF KNIGHTDALE, NCDOT, AND CITY OF RALEIGH STANDARDS, SPECIFICATIONS, AND DETAILS.

Know what's below. Call before you dig.

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SCALE 1"=60'
0 60' 120'

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 TYLER JEFFREY CROSS
3/31/2026

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NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA
DETAILED GRADING & DRAINAGE PLAN - SHEET 3 OF 3

JOB NO. 51557
SHEET NO. C4.3

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STORM DRAINAGE SCHEDULE						
STRUCTURE	HEIGHT	TOP	INV IN	INLET PIPE	INV OUT	OUTLET PIPE
CB 101	9.65'	240.14'	231.99' 231.99'	164 LF 30" RCP @ 1.45% (CB 120) 25 LF 30" RCP @ 0.96% (CB 102)	230.49'	32 LF 48" RCP @ 3.08% (DI 101A)
CB 102	7.91'	240.14'	232.23'	50 LF 30" RCP @ 0.97% (CB 103)	232.23'	25 LF 30" RCP @ 0.96% (CB 101)
CB 103	9.15'	241.86'	232.71' 233.71'	102 LF 30" RCP @ 0.68% (DI 102) 47 LF 18" RCP @ 0.51% (CB 111)	232.71'	50 LF 30" RCP @ 0.97% (CB 102)
CB 104	10.70'	246.10'	235.90' 235.90'	61 LF 24" RCP @ 1.11% (CB 105) 47 LF 24" RCP @ 1.28% (CB 112)	235.40'	75 LF 30" RCP @ 2.00% (DI 102)
CB 105	10.18'	246.76'	236.58' 236.58'	176 LF 24" RCP @ 3.20% (CB 113) 31 LF 24" RCP @ 1.55% (CB 106)	236.58'	61 LF 24" RCP @ 1.11% (CB 104)
CB 106	9.72'	246.78'	237.90'	45 LF 24" RCP @ 2.31% (CB 107)	237.06'	31 LF 24" RCP @ 1.55% (CB 105)
CB 107	8.91'	247.85'	239.44'	72 LF 18" RCP @ 5.36% (CB 108)	238.94'	45 LF 24" RCP @ 2.31% (CB 106)
CB 108	7.09'	250.36'	243.27'	39 LF 18" RCP @ 1.54% (CB 108A)	243.27'	72 LF 18" RCP @ 5.36% (CB 107)
CB 108A	6.78'	250.65'	244.12' 243.87'	59 LF 15" RCP @ 3.50% (CB 108B) 19 LF 18" RCP @ 1.58% (CB 109)	243.87'	39 LF 18" RCP @ 1.54% (CB 108)
CB 108B	5.37'	251.55'	246.19'	80 LF 15" RCP @ 1.88% (CB 108C)	246.19'	59 LF 15" RCP @ 3.50% (CB 108A)
CB 108C	5.37'	253.06'	247.69'	78 LF 15" RCP @ 1.88% (CB 108D)	247.69'	80 LF 15" RCP @ 1.88% (CB 108B)
CB 108D	5.37'	254.53'			249.16'	78 LF 15" RCP @ 1.88% (CB 108C)
CB 109	7.71'	251.88'	244.17'	106 LF 18" RCP @ 0.66% (CB 110)	244.17'	19 LF 18" RCP @ 1.58% (CB 108A)
CB 110	7.19'	252.06'	244.94'	50 LF 18" RCP @ 4.42% (DI 103)	244.87'	106 LF 18" RCP @ 0.66% (CB 109)
CB 111	7.86'	241.81'			233.95'	47 LF 18" RCP @ 0.51% (CB 103)
CB 112	9.60'	246.10'			236.50'	47 LF 24" RCP @ 1.28% (CB 104)
CB 113	8.01'	250.21'	242.70' 242.95'	192 LF 18" RCP @ 1.45% (CB 114) 31 LF 15" RCP @ 0.45% (CB 115)	242.20'	176 LF 24" RCP @ 3.20% (CB 105)
CB 114	8.74'	254.22'	245.48'	52 LF 18" RCP @ 1.61% (DI 106)	245.48'	192 LF 18" RCP @ 1.45% (CB 113)
CB 115	7.12'	250.21'			243.09'	31 LF 15" RCP @ 0.45% (CB 113)
CB 117	6.54'	255.29'	248.84' 252.43'	17 LF 15" RCP @ 1.99% (CB 117A) 37 LF 15" RCP @ 1.71% (CB 117E)	248.75'	27 LF 15" RCP @ 1.68% (DI 116)
CB 117A	5.95'	255.12'	249.17' 249.17'	117 LF 15" RCP @ 2.68% (DI 137) 58 LF 15" RCP @ 3.10% (CB 117B)	249.17'	17 LF 15" RCP @ 1.99% (CB 117)
CB 117B	5.79'	256.59'	250.98'	69 LF 15" RCP @ 2.29% (CB 117C)	250.98'	58 LF 15" RCP @ 3.10% (CB 117A)
CB 117C	5.29'	257.86'	252.57'	82 LF 15" RCP @ 2.29% (CB 117D)	252.57'	69 LF 15" RCP @ 2.29% (CB 117B)
CB 117D	5.29'	259.74'			254.44'	82 LF 15" RCP @ 2.29% (CB 117C)
CB 117E	2.94'	256.01'			253.07'	37 LF 15" RCP @ 1.71% (CB 117)
CB 120	8.17'	242.53'	234.86' 235.61'	150 LF 24" RCP @ 3.58% (CB 121) 32 LF 15" RCP @ -0.51% (CB 132)	234.36'	164 LF 30" RCP @ 1.45% (CB 101)
CB 121	8.91'	249.14'	240.53' 240.73'	47 LF 24" RCP @ 3.76% (CB 122) 42 LF 18" RCP @ 0.52% (DI 121)	240.23'	150 LF 24" RCP @ 3.58% (CB 120)
CB 122	8.94'	251.03'	242.62'	53 LF 24" RCP @ 2.68% (CB 123)	242.28'	47 LF 24" RCP @ 3.76% (CB 121)
CB 123	8.45'	252.49'	244.04'	115 LF 24" RCP @ 2.55% (CB 124)	244.04'	53 LF 24" RCP @ 2.68% (CB 122)
CB 124	8.71'	255.57'	246.86'	77 LF 24" RCP @ 1.73% (CB 125)	246.96'	115 LF 24" RCP @ 2.55% (CB 123)

STORM DRAINAGE SCHEDULE						
STRUCTURE	HEIGHT	TOP	INV IN	INLET PIPE	INV OUT	OUTLET PIPE
CB 125	7.60'	255.79'	248.19' 249.08'	98 LF 24" RCP @ 0.84% (CB 126) 52 LF 15" RCP @ 0.35% (DI 122)	248.19'	77 LF 24" RCP @ 1.73% (CB 124)
CB 126	5.64'	254.65'	249.51' 249.76'	226 LF 18" RCP @ 1.37% (CB 127) 31 LF 15" RCP @ 1.19% (CB 133)	249.01'	98 LF 24" RCP @ 0.84% (CB 125)
CB 127	7.43'	260.03'	252.60'	32 LF 18" RCP @ 0.50% (CB 128)	252.60'	226 LF 18" RCP @ 1.37% (CB 126)
CB 128	7.14'	259.90'	252.76'	43 LF 18" RCP @ 2.13% (CB 129)	252.76'	32 LF 18" RCP @ 0.50% (CB 127)
CB 129	7.29'	260.97'	253.78'	24 LF 18" RCP @ 0.55% (CB 130)	253.68'	43 LF 18" RCP @ 2.13% (CB 128)
CB 130	6.94'	260.85'	256.06'	32 LF 15" RCP @ 0.69% (DI 131)	253.91'	23 LF 18" RCP @ 0.55% (CB 129)
CB 132	7.95'	243.40'			235.45'	32 LF 15" RCP @ -0.51% (CB 120)
CB 133	3.89'	254.02'	250.13'	74 LF 15" RCP @ 0.50% (CB 134)	250.13'	31 LF 15" RCP @ 1.19% (CB 126)
CB 134	4.70'	255.20'	250.50'	31 LF 15" RCP @ 0.71% (CB 135)	250.50'	74 LF 15" RCP @ 0.50% (CB 133)
CB 135	4.48'	255.20'			250.72'	31 LF 15" RCP @ 0.71% (CB 134)
DI 101	8.55'	236.57'	228.02'	96 LF 48" RCP @ 1.54% (DI 101A)	228.02'	51 LF 48" RCP @ 2.00% (FES 100)
DI 101A	10.29'	239.79'	229.50'	32 LF 48" RCP @ 3.08% (CB 101)	229.50'	96 LF 48" RCP @ 1.54% (DI 101)
DI 102	11.96'	245.36'	233.90' 237.60'	75 LF 30" RCP @ 2.00% (CB 104) 111 LF 18" RCP @ 3.27% (DI 104)	233.40'	102 LF 30" RCP @ 0.68% (CB 103)
DI 103	3.95'	251.10'	247.40'	165 LF 15" RCP @ 1.72% (DI 120)	247.15'	50 LF 18" RCP @ 4.42% (CB 110)
DI 104	6.00'	247.23'	241.48'	109 LF 15" RCP @ 1.94% (DI 104A)	241.23'	111 LF 18" RCP @ 3.27% (DI 102)
DI 104A	6.37'	249.97'	243.60'	129 LF 15" RCP @ 2.04% (DI 105)	243.60'	109 LF 15" RCP @ 1.94% (DI 104)
DI 105	5.81'	252.04'			246.23'	129 LF 15" RCP @ 2.04% (DI 104A)
DI 106	7.68'	253.99'	246.31'	90 LF 18" RCP @ 1.65% (DI 116)	246.31'	52 LF 18" RCP @ 1.61% (CB 114)
DI 116	7.28'	254.88'	248.29'	27 LF 15" RCP @ 1.68% (CB 117)	247.79'	90 LF 18" RCP @ 1.65% (DI 106)
DI 120	4.23'	254.47'			250.24'	165 LF 15" RCP @ 1.72% (DI 103)
DI 121	8.03'	248.98'	240.95'	24 LF 15" RCP @ 0.71% (DI 121A)	240.95'	42 LF 18" RCP @ 0.52% (CB 121)
DI 121A	8.16'	249.28'			241.12'	24 LF 15" RCP @ 0.71% (DI 121)
DI 122	5.80'	255.06'			249.26'	52 LF 15" RCP @ 0.35% (CB 125)
DI 131	6.33'	262.61'	256.28'	105 LF 15" RCP @ 0.62% (DI 136)	256.28'	32 LF 15" RCP @ 0.69% (CB 130)
DI 136	4.76'	261.69'			256.93'	105 LF 15" RCP @ 0.62% (DI 131)
DI 137	4.39'	256.69'	252.90'	210 LF 15" RCP @ 1.50% (DI 138)	252.30'	117 LF 15" RCP @ 2.68% (CB 117A)
DI 138	N/A	259.77'			256.05'	210 LF 15" RCP @ 1.50% (DI 137)
FES 100	228.00'	231.42'	227.00'	51 LF 48" RCP @ 2.00% (DI 101)		

STORM DRAINAGE SCHEDULE						
STRUCTURE	HEIGHT	TOP	INV IN	INLET PIPE	INV OUT	OUTLET PIPE
CB 201	9.66'	232.33'	223.67' 224.60'	81 LF 36" RCP @ 0.74% (CB 202) 90 LF 24" RCP @ 0.51% (CB 233)	222.67'	69 LF 48" RCP @ 0.72% (FES 200)
CB 202	8.96'	233.23'	224.27'	148 LF 36" RCP @ 0.74% (CB 205)	224.27'	81 LF 36" RCP @ 0.74% (CB 201)
CB 203	7.90'	232.66'	224.76'	45 LF 36" RCP @ 0.53% (CB 204)	224.77'	170 LF 36" RCP @ 0.87% (CB 241)
CB 204	7.66'	232.66'	225.00' 226.75'	41 LF 36" RCP @ 0.72% (DI 201) 72 LF 15" RCP @ 0.55% (DI 204A)	225.00'	45 LF 36" RCP @ 0.53% (CB 203)
CB 205	9.68'	235.04'	225.36'	36 LF 36" RCP @ 0.86% (CB 206)	225.36'	148 LF 36" RCP @ 0.74% (CB 202)
CB 206	9.37'	235.04'	225.67' 228.46'	84 LF 36" RCP @ 0.63% (CB 207) 166 LF 24" RCP @ 1.29% (CB 220)	225.67'	36 LF 36" RCP @ 0.86% (CB 205)
CB 207	6.80'	232.99'	226.70' 227.96'	53 LF 30" RCP @ 2.31% (CB 208) 35 LF 15" RCP @ 0.55% (CB 222)	226.20'	84 LF 36" RCP @ 0.63% (CB 206)
CB 208	5.46'	233.38'	227.92'	59 LF 30" RCP @ 1.42% (CB 209)	227.92'	53 LF 30" RCP @ 2.31% (CB 207)
CB 209	5.17'	233.92'	228.75' 229.84'	30 LF 30" RCP @ 2.02% (CB 210) 96 LF 15" RCP @ 4.05% (CB 223)	228.75'	59 LF 30" RCP @ 1.42% (CB 208)
CB 210	5.81'	235.17'	229.35'	101 LF 30" RCP @ 0.90% (CB 211)	229.35'	30 LF 30" RCP @ 2.02% (CB 209)
CB 211	6.95'	237.21'	230.76' 231.82'	68 LF 24" RCP @ 0.50% (CB 212) 38 LF 15" RCP @ 0.55% (DI 203)	230.26'	101 LF 30" RCP @ 0.90% (CB 210)
CB 212	7.38'	238.30'	231.10'	111 LF 24" RCP @ 0.64% (CB 213)	231.10'	68 LF 24" RCP @ 0.50% (CB 211)
CB 213	5.98'	237.79'	231.81' 232.97'	65 LF 24" RCP @ 0.71% (CB 214) 41 LF 15" RCP @ 0.56% (CB 225)	231.81'	111 LF 24" RCP @ 0.64% (CB 212)
CB 214	5.98'	238.25'	232.27'	36 LF 24" RCP @ 0.84% (DI 205)	232.27'	65 LF 24" RCP @ 0.71% (CB 213)
CB 215	7.01'	239.84'	233.43' 233.43'	100 LF 18" RCP @ 4.16% (CB 216) 31 LF 18" RCP @ 0.55% (CB 226)	232.83'	29 LF 24" RCP @ 0.55% (DI 205)
CB 216	6.06'	243.65'	237.84'	44 LF 15" RCP @ 3.02% (CB 217)	237.59'	100 LF 18" RCP @ 4.16% (CB 215)
CB 217	6.59'	245.76'	239.17'	25 LF 15" RCP @ 3.02% (CB 218)	239.17'	44 LF 15" RCP @ 3.02% (CB 216)
CB 218	6.03'	245.77'	239.92'	47 LF 15" RCP @ 3.18% (CB 219)	239.92'	25 LF 15" RCP @ 3.02% (CB 217)
CB 219	8.02'	249.43'	241.97' 241.41'	31 LF 15" RCP @ 0.71% (CB 229) 90 LF 15" RCP @ 1.84% (DI 208)	241.41'	47 LF 15" RCP @ 3.18% (CB 218)
CB 220	7.98'	238.59'	231.36' 231.36'	114 LF 15" RCP @ 6.02% (CB 230) 47 LF 15" RCP @ 1.07% (CB 221)	230.61'	166 LF 24" RCP @ 1.29% (CB 206)
CB 221	6.73'	238.59'			231.86'	47 LF 15" RCP @ 1.07% (CB 220)
CB 222	4.84'	233.00'			228.15'	35 LF 15" RCP @ 0.55% (CB 207)
CB 223	3.80'	237.54'	233.74'	83 LF 15" RCP @ 4.39% (CB 224)	233.74'	96 LF 15" RCP @ 4.05% (CB 209)
CB 224	7.43'	241.73'			237.38'	83 LF 15" RCP @ 4.39% (CB 223)
CB 225	4.78'	237.79'			233.20'	41 LF 15" RCP @ 0.56% (CB 213)
CB 226	6.23'	239.83'	233.70'	63 LF 18" RCP @ 0.55% (CB 227)	233.60'	31 LF 18" RCP @ 0.55% (CB 215)
CB 227	7.29'	241.14'	234.77'	71 LF 18" RCP @ 0.52% (DI 206)	234.04'	63 LF 18" RCP @ 0.55% (CB 226)
CB 229	7.24'	249.43'			242.19'	31 LF 15" RCP @ 0.71% (CB 219)
CB 230	4.69'	242.89'	238.66'	62 LF 15" RCP @ 2.52% (CB 231)	238.20'	113 LF 15" RCP @ 6.02% (CB 220)
CB 231	3.76'	243.99'	240.33'	96 LF 15" RCP @ 1.97% (CB 232)	240.23'	62 LF 15" RCP @ 2.52% (CB 230)

STORM DRAINAGE SCHEDULE						
STRUCTURE	HEIGHT	TOP	INV IN	INLET PIPE	INV OUT	OUTLET PIPE
CB 232	3.40'	245.63'			242.23'	96 LF 15" RCP @ 1.97% (CB 231)
CB 233	6.10'	231.16'	225.56' 225.81'	87 LF 18" RCP @ 0.50% (CB 234) 46 LF 15" RCP @ 0.54% (CB 236)	225.06'	90 LF 24" RCP @ 0.51% (CB 201)
CB 234	6.45'	232.45'	226.25'	48 LF 15" RCP @ 0.53% (CB 235)	226.00'	87 LF 18" RCP @ 0.50% (CB 233)
CB 235	5.82'	232.32'			226.50'	48 LF 15" RCP @ 0.53% (CB 234)
CB 236	5.79'	231.67'			226.06'	46 LF 15" RCP @ 0.54% (CB 233)
CB 241	8.25'	231.55'	223.80' 223.30'	55 LF 30" RCP @ 0.53% (CB 242) 170 LF 36" RCP @ 0.87% (CB 203)	223.30'	117 LF 36" RCP @ 1.58% (DI 241)
CB 242	8.49'	232.58'	224.59'	43 LF 24" RCP @ 0.76% (CB 243)	224.09'	55 LF 30" RCP @ 0.53% (CB 241)
CB 243	6.20'	231.12'	224.92'	31 LF 24" RCP @ 0.79% (CB 244)	224.92'	43 LF 24" RCP @ 0.76% (CB 242)
CB 244	6.21'	231.12'	225.16'	144 LF 24" RCP @ 0.76% (CB 245)	225.16'	31 LF 24" RCP @ 0.79% (CB 243)
CB 245	8.83'	234.91'	228.60' 227.01'	201 LF 18" RCP @ 2.44% (CB 246) 31 LF 15" RCP @ 0.63% (CB 250)	226.26'	144 LF 24" RCP @ 0.76% (CB 244)
CB 246	8.47'	241.76'	233.75'	64 LF 15" RCP @ 5.34% (CB 247)	233.50'	201 LF 18" RCP @ 2.44% (CB 245)
CB 247	5.82'	242.79'	237.15'	31 LF 15" RCP @ 1.68% (CB 248)	237.15'	64 LF 15" RCP @ 5.34% (CB 246)
CB 248	5.31'	242.79'	237.67'	48 LF 15" RCP @ 1.91% (CB 249)	237.67'	31 LF 15" RCP @ 1.68% (CB 247)
CB 249	5.83'	244.22'	238.78'	88 LF 15" RCP @ 0.55% (DI 242)	238.58'	48 LF 15" RCP @ 1.91% (CB 248)
CB 250	7.89'	234.91'			227.20'	31 LF 15" RCP @ 0.63% (CB 245)
DI 201	7.28'	232.58'	227.05'	135 LF 15" RCP @ 4.70% (DI 202)	225.30'	41 LF 36" RCP @ 0.72% (CB 204)
DI 202	3.26'	236.44'	233.37'	118 LF 15" RCP @ 2.02% (DI 202A)	233.37'	135 LF 15" RCP @ 4.70% (DI 201)
DI 202A	4.68'	240.44'			235.76'	118 LF 15" RCP @ 2.02% (DI 202)
DI 203	4.44'	236.47'	232.31'	103 LF 15" RCP @ 1.92% (DI 204)	232.03'	38 LF 15" RCP @ 0.55% (CB 211)
DI 204	6.59'	240.88'			234.28'	103 LF 15" RCP @ 1.92% (DI 203)
DI 204A	7.06'	234.21'			227.15'	72 LF 15" RCP @ 0.55% (CB 204)
DI 205	6.86'	239.43'	232.67'	29 LF 24" RCP @ 0.55% (CB 215)	232.57'	36 LF 24" RCP @ 0.84% (CB 214)
DI 206	3.26'	238.19'	235.39'	111 LF 15" RCP @ 2.27% (DI 207)	235.14'	71 LF 18" RCP @ 0.52% (CB 227)
DI 207	5.05'	242.97'			237.92'	111 LF 15" RCP @ 2.27% (DI 206)
DI 208	4.23'	247.11'			243.07'	90 LF 15" RCP @ 1.84% (CB 219)
DI 241	9.41'	230.87'	221.46'	117 LF 36" RCP @ 1.58% (CB 241)	221.47'	95 LF 36" RCP @ 0.49% (FES 240)
DI 242	4.60'	243.67'	239.47'	305 LF 15" RCP @ 0.55% (DI 243)	239.27'	88 LF 15" RCP @ 0.55% (CB 249)
DI 243	3.61'	244.76'			241.15'	305 LF 15" RCP @ 0.55% (DI 242)
FES 200	N/A	226.59'	222.17'	69 LF 48" RCP @ 0.72% (CB 201)		
FES 240	N/A	224.33'	221.00'	95 LF 36" RCP @ 0.49% (DI 241)		

STORM DRAINAGE SCHEDULE						
STRUCTURE	HEIGHT	TOP	INV IN	INLET PIPE	INV OUT	OUTLET PIPE
CB 302	9.38'	236.67'	228.37' 228.92'	31 LF 30" RCP @ 0.65% (CB 307) 180 LF 15" RCP @ 0.75% (CB 303)	227.29'	138 LF 30" RCP @ 5.54% (DI 301)
CB 303	8.31'	238.32'	230.01'	32 LF 15" RCP @ 0.76% (CB 304)	230.26'	180 LF 15" RCP @ 0.75% (CB 302)
CB 304	8.23'	238.48'	234.51'	58 LF 8" PVC @ 2.08% (YD2)	230.25'	32 LF 15" RCP @ 0.76% (CB 303)
CB 307	7.47'	236.04'	229.07' 229.82'	115 LF 24" RCP @ 0.68% (CB 308) 13 LF 15" RCP @ 3.68% (D3)	228.57'	31 LF 30" RCP @ 0.65% (CB 302)
CB 308	7.15'	237.00'	229.85' 230.05'	100 LF 24" RCP @ 0.56% (CB 309) 74 LF 18" RCP @ 4.68% (DI 308)	229.85'	115 LF 24" RCP @ 0.68% (CB 307)
CB 309	6.86'	237.27'	230.86'	100 LF 24" RCP @ 0.54% (CB 310)	230.41'	100 LF 24" RCP @ 0.56% (CB 308)
CB 310	4.78'	236.18'	232.14' 231.40'	44 LF 24" RCP @ 0.50% (CB 311) 31 LF 15" RCP @ 0.55% (CB 316)	231.40'	100 LF 24" RCP @ 0.54% (CB 309)
CB 311	4.81'	237.17'	232.86'	31 LF 18" RCP @ 0.52% (CB 312)	232.36'	44 LF 24" RCP @ 0.50% (CB 310)
CB 312	4.33'	237.17'	233.27'	54 LF 18" RCP @ 0.52% (CB 313)	233.02'	31 LF 18" RCP @ 0.52% (CB 311)
CB 313	5.60'	238.96'	233.78'	129 LF 15" RCP @ 0.50% (DI 314)	233.55'	54 LF 18" RCP @ 0.52% (CB 312)
CB 316	4.62'	236.19'			231.57'	31 LF 15" RCP @ 0.55% (CB 310)
** D1						
** D2						
** D3						
DI 301	5.27'	224.44'	219.67'	138 LF 30" RCP @ 5.54% (CB 302)	219.17'	29 LF 36" RCP @ 1.17% (FES 300)
DI 308	4.05'	237.34'			233.50'	74 LF 18" RCP @ 4.68% (DI 308)
DI 314	3.68'	238.11'			234.43'	129 LF 15" RCP @ 0.50% (CB 313)
FES 300	219.94'	222.16'	218.83'	29 LF 36" RCP @ 1.17% (DI 301)		
** YD1						
** YD2						
** YD3						

**STRUCTURE SHOWN PER CESO PLAN. SEE CESO PLAN SHEET C5.0 FOR DESIGN DETAILS

STORM DRAINAGE SCHEDULE						
STRUCTURE	HEIGHT	TOP	INV IN	INLET PIPE	INV OUT	OUTLET PIPE
CB 401	5.45'	226.58'	221.63' 221.88'	31 LF 18" RCP @ 0.55% (CB 402) 105 LF 15" RCP @ 4.93% (CB 403)	221.13'	53 LF 24" RCP @ 2.80% (FES 400)
CB 402	4.78'	226.58'	221.80'	161 LF 18" RCP @ 4.06% (DI 410)	221.80'	31 LF 18" RCP @ 0.55% (CB 401)
CB 403	7.67'	234.70'			227.03'	104 LF 15" RCP @ 4.93% (CB 401)
CB 411	7.46'	237.89'	230.89'	272 LF 15" RCP @ 2.03% (CB 412)	230.43'	54 LF 18" RCP @ 3.86% (DI 410)
CB 412	5.25'	241.65'	236.45'	161 LF 15" RCP @ 2.55% (CB 412A)	236.40'	272 LF 15" RCP @ 2.03% (CB 411)
CB 412A	6.07'	246.62'	240.55'	106 LF 15" RCP @ 2.52% (CB 413)	240.55'	161 LF 15" RCP @ 2.55% (CB 412)
CB 413	6.46'	249.67'	243.89'	335 LF 15" RCP @ 2.00% (CB 414)	243.21'	106 LF 15" RCP @ 2.52% (CB 412A)
CB 414	6.60'	257.19'	250.69'	336 LF 15" RCP @ 1.87% (CB 415)	250.59'	335 LF 15" RCP @ 2.00% (CB 413)
CB 415	6.00'	262.97'	256.97'	212 LF 15" RCP @ 0.92% (CB 416)	256.97'	336 LF 15" RCP @ 1.87% (CB 414)
CB 416	7.61'	266.53'	258.92'	129 LF 15" RCP @ 1.72% (CB 417)	258.92'	212 LF 15" RCP @ 0.92% (CB 415)
CB 417	7.18'	268.31'			261.13'	129 LF 15" RCP @ 1.72% (CB 416)
CB 421	3.24'	272.77'	269.53'	42 LF 18" RCP @ 1.41% (DI 422)	269.55'	49 LF 18" RCP @ 1.13% (FES 420)
DI 410	7.49'	235.65'	228.35'	54 LF 18" RCP @ 3.86% (CB 411)	228.35'	161 LF 18" RCP @ 4.06% (CB 402)
DI 422	3.37'	273.49'	270.75'	29 LF 18" RCP @ 0.85% ()	270.12'	42 LF 18" RCP @ 1.41% (CB 421)
FES 400	N/A	221.90'	219.65'	53 LF 24" RCP @ 2.80% (CB 401)		
FES 420	N/A	270.97'	269.00'	49 LF 18" RCP @ 1.13% (CB 421)		

STORM DRAINAGE SCHEDULE						
STRUCTURE	HEIGHT	TOP	INV IN	INLET PIPE	INV OUT	OUTLET PIPE
CB 262	5.20'	225.21'	220.19'	47 LF 18" RCP @ 0.49% (CB 263)	220.19'	115 LF 18" RCP @ 0.50% (DI 261)
CB 263	4.95'	225.19'	220.67'	31 LF 15" RCP @ 3.09% (DI 264)	220.42'	47 LF 18" RCP @ 0.49% (CB 262)
DI 261	7.40'	226.83'	219.62'	115 LF 18" RCP @ 0.50% (CB 262)	219.62'	195 LF 18" RCP @ 0.50% (SCM 2 JB)
DI 264	10.73'	232.35'	224.12'	227 LF 15" RCP @ 3.90% (DI 265)	221.62'	31 LF 15" RCP @ 3.09% (CB 263)
DI 265	5.26'	238.23'			232.97'	227 LF 15" RCP @ 3.90% (DI 264)
SCM 1 - RISER	13.00'	233.50'			227.50'	41 LF 36" RCP @ 0.60% (SCM 1 FES)
SCM 1 FES	N/A	230.58'	227.25'	41 LF 36" RCP @ 0.60% (SCM 1 - RISER)		
SCM 2 - RISER	10.50'	226.00'			220.00'	42 LF 36" RCP @ 1.41% (SCM 2 JB)
SCM 2 FES	N/A	219.99'	216.66'	109 LF 36" RCP @ 0.45% (SCM 2 JB)		
SCM 2 JB	12.23'	229.37'	218.64' 219.40'	195 LF 18" RCP @ 0.50% (DI 261) 42 LF 36" RCP @ 1.41% (SCM 2 - RISER)	217.14'	109 LF 36" RCP @ 0.45% (SCM 2 FES)
SCM 3 FES	N/A	219.54'	216.75'	27 LF 30" RCP @ 0.91% (SCM 3 RISER)		
SCM 3 RISER	10.25'	220.75'			217.00'	27 LF 30" RCP @ 0.91% (SCM 3 FES)

VELOCITY DISSIPATION PAD (VDP) DESIGN											
OUTLET NAME	PIPE DIA.	PIPE SLOPE	Q10	V10	ZONE	PAD DIMENSIONS			STONE SIZING		
						LENGTH	WIDTH	DEPTH	D50	Dmax	CLASS
	(in)	(ft/ft)	(cfs)	(fps)		(ft)	(ft)	(in)	(in)	(in)	(NCDOT)
FES 100	48	0.01	35.18	9.24	3	32	12	26	10	17	1
FES 200	48	0.072	35.38	18.06	6	40	12	36	14	23	2
FES 240	36	0.005	14.84	5.84	2	18	9	18	8	12	B
FES 300	36	0.017	22.14	10.24	3	24	9	26	10	17	1
FES 400	24	0.028	6.37	8.68	2	12	6	18	8	12	B
FES 420	18	0.011	11.00	7.12	2	9	5	18	8	12	B
SCM 1 FES	36	0.006	52.96	8.34	2	18	9	18	8	12	B
SCM 2 FES	36	0.0053	47.2	7.83	2	18	9	18	8	12	B
SCM 3 FES	30	0.0058	29.94	7.26	2	15	8	18	8	12	B
Culvert 100	48	0.0025	101.31	8.06	2	24	12	18	8	12	B
Culvert 200	72	0.0025	228.16	8.34	5	60	18	36	14	23	2

GRADING AND STORMWATER PLAN NOTES:

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE TOWN OF KNIGHTDALE STANDARDS AND SPECIFICATIONS.
2. ALL PERMITS SHALL BE OBTAINED FROM THE TOWN OF KNIGHTDALE, WAKE COUNTY, NCDOT, NCDEQ-DWR, AND USACE AS APPLICABLE PRIOR TO BEGINNING CONSTRUCTION. A COPY OF ALL PERMITS SHALL BE SUBMITTED TO THE TOWN OF KNIGHTDALE FOR THEIR RECORDS.
3. SCMS SHALL BE DESIGNED TO CONTROL AND TREAT THE DIFFERENCE IN STORMWATER RUNOFF VOLUME LEAVING THE PROJECT SITE BETWEEN THE PRE- AND POST- DEVELOPMENT CONDITIONS FOR, AT A MINIMUM, THE 1-YEAR, 24-HOUR STORM.
4. SCMS SHALL BE DESIGNED TO HAVE A MINIMUM OF 85% AVERAGE ANNUAL REMOVAL FOR TOTAL SUSPENDED SOLIDS.
5. ALL SCMS ASSOCIATED WITH THIS PROJECT WILL REQUIRE MAINTENANCE EASEMENTS AND AN OPERATION AND MAINTENANCE AGREEMENT TO BE NOTED ON THE FINAL PLAT. ALL OF THESE ITEMS WILL NEED TO BE RECORDED WITH THE COUNTY REGISTER OF DEEDS.
6. ALL PUBLIC SANITARY SEWER EASEMENTS SHALL HAVE MAX. FINISHED GRADE SLOPE OF 3:1 TO ASSURE SAFE ACCESS FOR MAINTENANCE VEHICLES AND MOWERS.
7. ANY FILL PLACED WITHIN AN HRW EASEMENT SHALL BE FIELD TESTED/APPROVED BY THE OWNERS GEOTECHNICAL ENGINEER.
8. BUILDING PADS SHALL BE A MIN OF 18" ABOVE THE TOP OF CURB. DRIVEWAY SLOPE SHALL NOT EXCEED 8%
9. PAD GRADE DENOTES FINISHED SUBGRADE.
10. SWALES SHALL HAVE A MIN SLOPE OF 2% BUT NO LESS THAN 1% IF MIN CANNOT BE MET. ALL SWALES BETWEEN HOUSES TO BE MORE THAN 1% SLOPE. SWALE HIGH POINTS TO BE 6" BELOW BUILDING PAD. REAR YARD SWALES TO BE MIN. 2% SLOPE.
11. HIGH POINT WITHIN SWALE AS NOTED TO BE 6 IN BELOW FINISHED SUBGRADE.
12. HOUSE SIDE SLOPES TO BE 3:1 FROM PAD TO SIDE SWALE. PAD TO BE .5' (6") HIGHER THAN GRADE AND SWALE TO BE LOCATED 1.5' LENGTH FROM PAD.
13. ALL SCM'S WILL PROVIDE A MINIMUM 20' VEHICULAR ACCESSIBLE ACCESS EASEMENT FOR FUTURE MAINTENANCE AND INSPECTIONS. ACCESS EASEMENTS SHALL PROVIDE DIR

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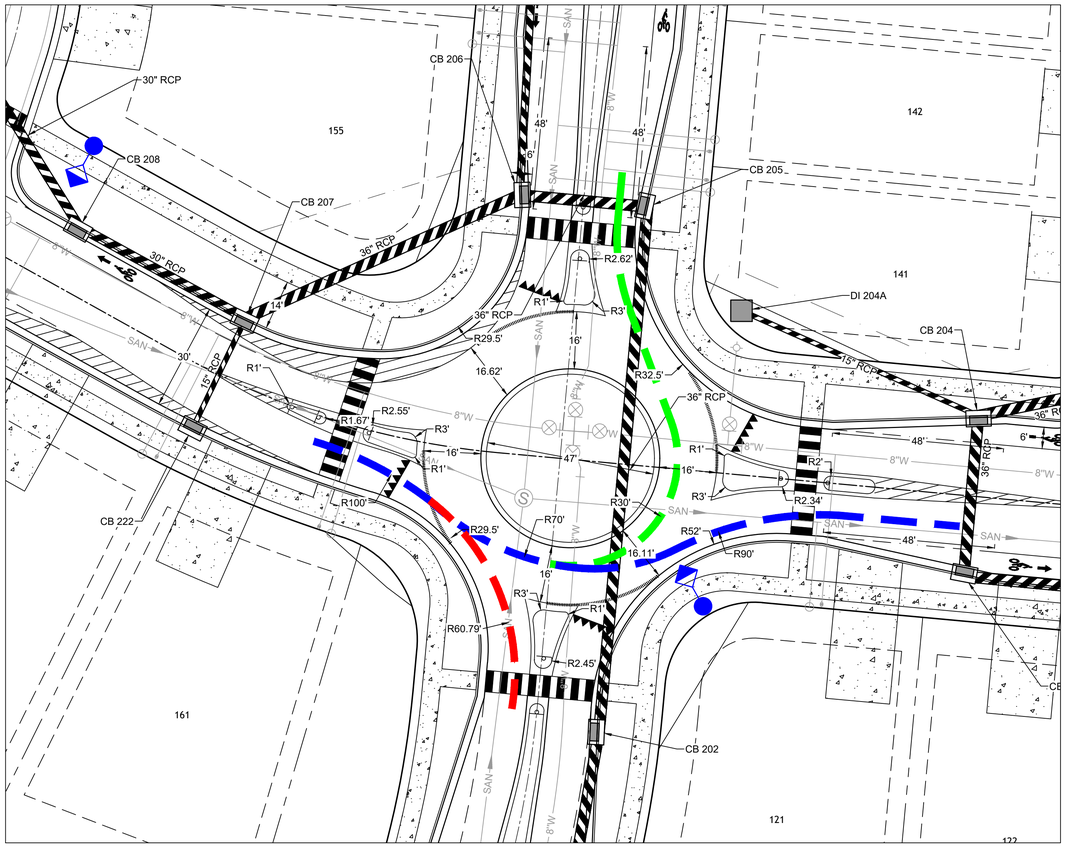
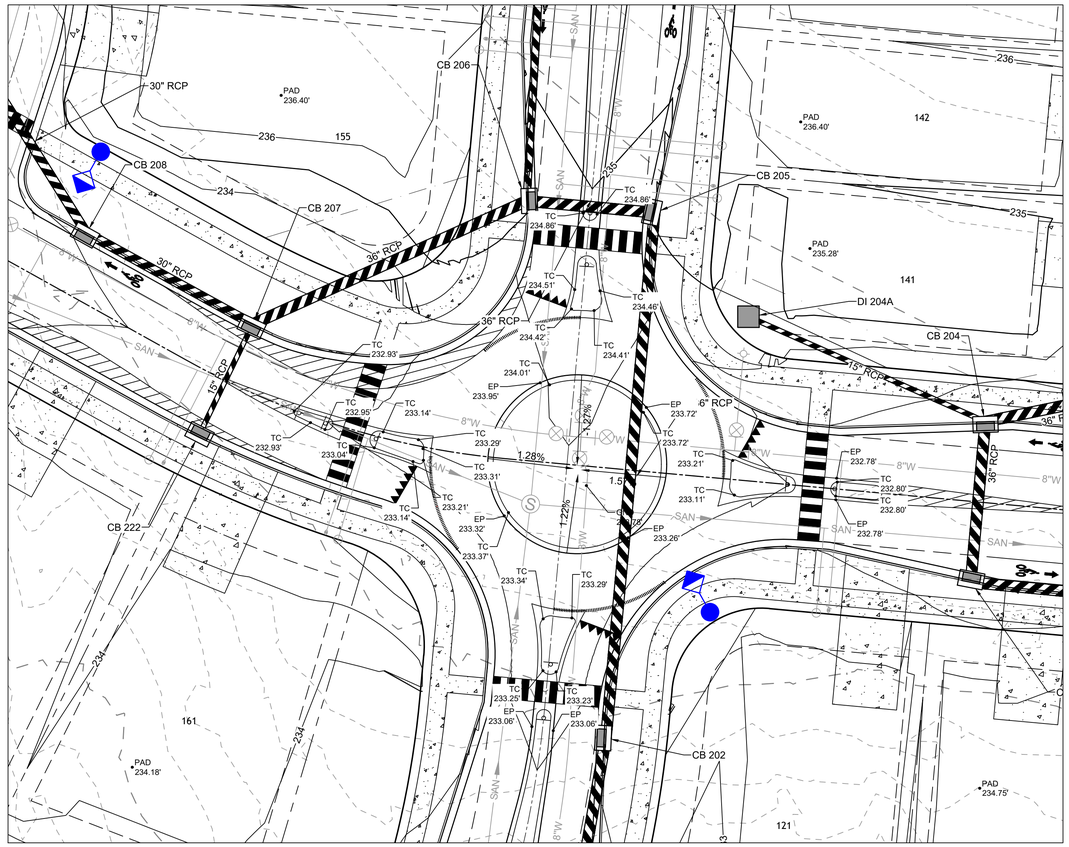


ROUNDABOUT PLAN



ROUNDABOUT GRADING PLAN

GRADING AND STORMWATER PLAN NOTES:

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE TOWN OF KNIGHTDALE STANDARDS AND SPECIFICATIONS.
2. ALL PERMITS SHALL BE OBTAINED FROM THE TOWN OF KNIGHTDALE, WAKE COUNTY, NCDOT, NCDEQ-DWR, AND USACE AS APPLICABLE PRIOR TO BEGINNING CONSTRUCTION. A COPY OF ALL PERMITS SHALL BE SUBMITTED TO THE TOWN OF KNIGHTDALE FOR THEIR RECORDS.
3. SCMS SHALL BE DESIGNED TO CONTROL AND TREAT THE DIFFERENCE IN STORMWATER RUNOFF VOLUME LEAVING THE PROJECT SITE BETWEEN THE PRE- AND POST- DEVELOPMENT CONDITIONS FOR, AT A MINIMUM, THE 1-YEAR, 24-HOUR STORM.
4. SCMS SHALL BE DESIGNED TO HAVE A MINIMUM OF 85% AVERAGE ANNUAL REMOVAL FOR TOTAL SUSPENDED SOLIDS.
5. ALL SCMS ASSOCIATED WITH THIS PROJECT WILL REQUIRE MAINTENANCE EASEMENTS AND AN OPERATION AND MAINTENANCE AGREEMENT TO BE NOTED ON THE FINAL PLAT. ALL OF THESE ITEMS WILL NEED TO BE RECORDED WITH THE COUNTY REGISTER OF DEEDS.
6. ALL PUBLIC SANITARY SEWER EASEMENTS SHALL HAVE MAX. FINISHED GRADE SLOPE OF 3:1 TO ASSURE SAFE ACCESS FOR MAINTENANCE VEHICLES AND MOWERS.
7. ANY FILL PLACED WITHIN AN HRW EASEMENT SHALL BE FIELD TESTED/APPROVED BY THE OWNERS GEOTECHNICAL ENGINEER.
8. BUILDING PADS SHALL BE A MIN OF 18" ABOVE THE TOP OF CURB. DRIVEWAY SLOPE SHALL NOT EXCEED 8%
9. PAD GRADE DENOTES FINISHED SUBGRADE.
10. SWALES SHALL HAVE A MIN SLOPE OF 2% BUT NO LESS THAN 1% IF MIN CANNOT BE MET. ALL SWALES BETWEEN HOUSES TO BE MORE THAN 1% SLOPE. SWALE HIGH POINTS TO BE 6" BELOW BUILDING PAD. REAR YARD SWALES TO BE MIN. 2% SLOPE.
11. HIGH POINT WITHIN SWALE AS NOTED TO BE 6 IN BELOW FINISHED SUBGRADE.
12. HOUSE SIDE SLOPES TO BE 3:1 FROM PAD TO SIDE SWALE. PAD TO BE .5' (6") HIGHER THAN GRADE AND SWALE TO BE LOCATED 1.5' LENGTH FROM PAD.
13. ALL SCM'S WILL PROVIDE A MINIMUM 20' VEHICULAR ACCESSIBLE ACCESS EASEMENT FOR FUTURE MAINTENANCE AND INSPECTIONS. ACCESS EASEMENTS SHALL PROVIDE DIRECT ACCESS TO THE PRIMARY OUTFALL/BERM AND EASEMENT SLOPE SHALL NOT EXCEED 33.33% MAXIMUM LONGITUDINAL SLOPE.
14. ALL ROOF DRAINS SHALL BE DIRECTED TO THE STORM DRAIN SYSTEM.
15. ALL SEWER ACCESS EASEMENTS WILL NOT EXCEED A 33.33% SLOPE
16. ALL HANDICAP PARKING SPACES AND STRIPED ACCESSIBILTY AISLES ARE TO HAVE NO MORE THAN A 1:50 SLOPE IN ALL DIRECTIONS.
17. ALL SIDEWALKS ARE TO HAVE NO MORE THAN A 1:20 SLOPE FOR THE LENGTH OF THE SIDEWALK AND NO MORE THAN A 1:50 SLOPE FOR THE WIDTH OF THE SIDEWALK.
18. **IF CONTRACTOR NOTICES ANY DISCREPANCIES IN ANY OF THESE SLOPE REQUIREMENTS, IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT THE OWNER PRIOR TO POURING ANY CONCRETE SO THAT A SOLUTION CAN BE FOUND.**
19. RETAINING WALL AND ASSOCIATED DRAINAGE TO BE DESIGNED BY OTHERS. CONTRACTOR SHALL COORDINATE DESIGN AND SUBMIT SEALED PLAN FOR REVIEW AND APPROVAL BY THE TOWN INSPECTIONS DEPARTMENT.

GENERAL NOTES:

1. LANDSCAPED AREAS REQUIRED BY CHAPTER 7 OF THE UDO SHALL NOT CONTAIN ANY DEVELOPMENT, IMPERVIOUS SURFACES, OR SITE FEATURES THAT DO NOT FUNCTION TO MEET THE APPLICABLE STANDARDS FOR THAT AREA OR THAT REQUIRE REMOVAL OF EXISTING SIGNIFICANT VEGETATION [UDO, SEC. 7.4.E.1].
2. NO GRADING, DEVELOPMENT, OR LAND-DISTURBING ACTIVITIES SHALL OCCUR WITHIN A BUFFER YARD IF FOREST CANOPY, SPECIMEN TREES, OR SIGNIFICANT VEGETATION EXISTS WITHIN THESE AREAS, UNLESS APPROVED BY THE LAND USE ADMINISTRATOR. IF GRADING WITHIN A BUFFER YARD IS PROPOSED, SLOPES OF 1:3 OR LESS ARE ENCOURAGED TO ENSURE THE PROPER TRANSITION OF GRADES TO THE ADJACENT PROPERTY AND TO FACILITATE LANDSCAPING AND MAINTENANCE [UDO, SEC. 7.4.E.2].
3. ALL AREAS WITHIN REQUIRED BUFFER YARDS, STREAM BUFFERS, SLOPE AREAS GREATER THAN 25%, AND WETLANDS ARE TREE SAVE AREAS AND ALL VEGETATION AND SOIL IS TO REMAIN UNDISTURBED [UDO, SEC. 7.4.H.1].
4. ALL TREES GREATER THAN 12" DBH WITHIN FRONT SETBACK AREAS, STREET TREE PLANTING STRIP, AND SLOPE AREAS OF 15-25% ARE TO REMAIN UNDISTURBED OR REPLACEMENT TREES ARE REQUIRED AT A RATE OF 1 TREE PER 12" DBH, AND SHOULD BE INCORPORATED INTO OPEN SPACE AMENITIES/PUBLIC GATHERING AREAS/PEDESTRIAN PLAZA WHEREVER POSSIBLE. REQUIRED STREET TREES, PARKING LOT LANDSCAPING, AND BUFFER YARD PLANTINGS ARE NOT TO BE COUNTED TOWARDS REPLACEMENT REQUIREMENTS [UDO, SEC. 7.4.H.1].
5. ALL TREES GREATER THAN 24" DBH ON-SITE ARE TO REMAIN UNDISTURBED OR REPLACEMENT TREES ARE REQUIRED AT A RATE OF 1 TREE PER 12" DBH, AND SHOULD BE INCORPORATED INTO OPEN SPACE AMENITIES/PUBLIC GATHERING AREAS/PEDESTRIAN PLAZA WHEREVER POSSIBLE. REQUIRED STREET TREES, PARKING LOT LANDSCAPING, AND BUFFER YARD PLANTINGS ARE NOT TO BE COUNTED TOWARDS REPLACEMENT REQUIREMENTS [UDO, SEC. 7.4.H.1].

TOWN CERTIFICATION

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

BY: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

SCALE 1"=20'
0 20' 40'
NAD 83

NOTE:
RETAINING WALL TO BE DESIGNED BY OTHERS. CONTRACTOR SHALL COORDINATE DESIGN AND SUBMIT SEALED PLAN FOR REVIEW AND APPROVAL BY THE TOWN INSPECTIONS DEPARTMENT.

ALL CONSTRUCTION TO BE IN ACCORDANCE WITH ALL TOWN OF KNIGHTDALE, NCDOT, AND CITY OF RALEIGH STANDARDS, SPECIFICATIONS, AND DETAILS.

811 Know what's below. Call before you dig.

LEGEND

- PROPERTY LINE
- PROPOSED RIGHT-OF-WAY
- ADJACENT PROPERTY LINE
- PHASE LINE
- PROPOSED CONTOUR
- EXISTING CONTOUR
- FENCE
- PROPOSED DRAIN EASEMENT
- PROPOSED PERIMETER BUFFER
- TREE PROTECTION FENCE
- 100-YR FLOODPLAIN
- WETLANDS
- NUESE RIPARIAN BUFFER
- LANDSCAPE BUFFER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 TYLER JEFFREY CROSS
3/31/2026

THIS DRAWING PREPARED AT THE
RALEIGH OFFICE
5410 Trinity Road, Suite 102 | Raleigh, NC 27607
TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION	DATE

DATE: 03/31/2026
DRAWN BY: 331
DESIGNED BY: 331
CHECKED BY: T. CROSS
SCALE: 1" = 20'

TIMMONS GROUP

NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

DETAILED ROUNDABOUT GRADING

JOB NO. 51557
SHEET NO. C4.5

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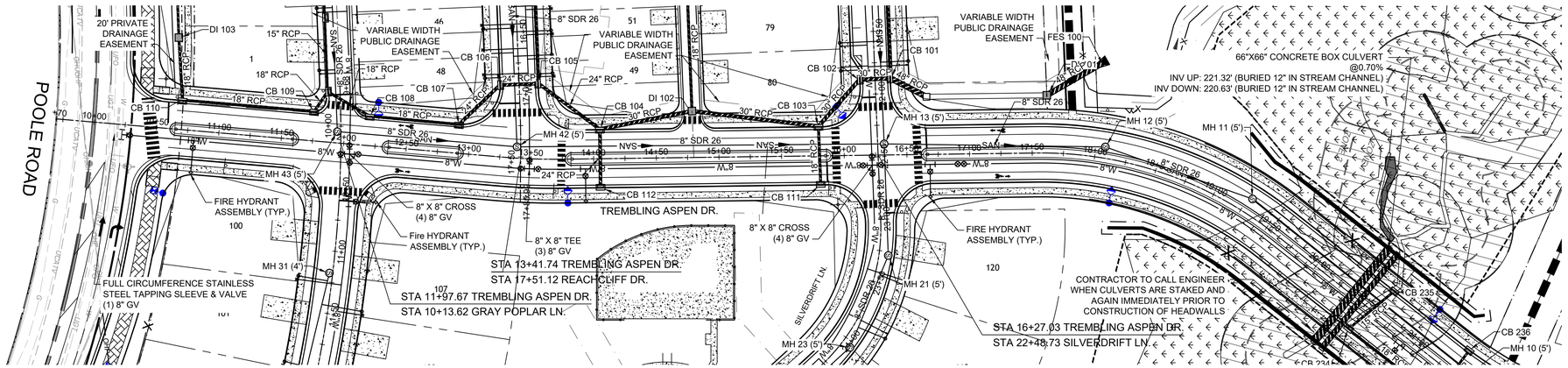

TREMBLING ASPEN DR. PROFILE (STA 9+00 - 21+00)

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

ROAD A PLAN VIEW (STA 9+00 TO 21+00)

1" = 50'

RALEIGH WATER - PLANS AUTHORIZED FOR CONSTRUCTION
Any work authorized by this approval must proceed in accordance with the plans. This electronic approval may not be edited once issued. Any modification to this approval once issued will invalidate this approval.
Cydney Terry
2026.05.18 20:57:27-04'00'

UTILITY NOTES:

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY OF RALEIGH STANDARDS AND SPECIFICATIONS.
2. MINIMUM UTILITY HORIZONTAL SEPARATION DISTANCES:
   WATER AND SANITARY SEWER MAINS - 10 FT.
   WATER AND STORM SEWER MAINS - 5 FT.
   SANITARY SEWER AND STORM SEWER MAINS - 5 FT.
   GRAVITY SANITARY SEWER AND FORCE MAINS - 5 FT.
3. MINIMUM UTILITY VERTICAL SEPARATION DISTANCES:
   WATER AND SANITARY SEWER MAINS - 18 IN.
   WATER AND STORM SEWER MAINS - 18 IN.
   SANITARY SEWER AND STORM SEWER MAINS - 24 IN.
4. CLASS 1 STRUCTURAL MATERIAL REQUIRED FROM EXISTING GROUND TO SPRING LINE OF PROPOSED PIPE IN FILL CONDITIONS (TYP).

ALL SEWER SERVICES GREATER THAN 12' IN DEPTH TO USE DEEP SEWER SERVICE DETAIL

811 Know what's below. Call before you dig.

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: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

Digitally signed by Samuel A. MacDonald
DN: cn=Samuel A. MacDonald, o=Timmons Group, ou=N. Manor Thomas & Engineers, Inc. CN=Samuel A. MacDonald
Reason: I am approving this document
Date: 2026.05.20 09:53:53-04'00'

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

Digitally signed by Gideon Smith
DN: cn=Gideon Smith, o=Town of Knightdale, ou=Planning, email=gsmith@knightdale-nc.gov, c=US
Reason: I am approving this document
Date: 2026.05.20 10:07:12-04'00'

NAD 83

SCALE 1"=50'
0 50' 100'

5
0 0 50
PROFILE SCALE

UTILITY LEGEND

- SAN — PROPOSED SEWER LINE
- 8"W — PROPOSED WATER LINE
- WATER LINE TEE
- FIRE HYDRANT
- WATER METER
- REDUCER
- GATE VALVE
- BLOWOFF ASSEMBLY

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-4142

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-5503

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 TYLER JEFFREY CROSS 3/31/2026

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YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION

DATE

DATE 03/31/2026
DRAWN BY 331
DESIGNED BY 331
CHECKED BY T. CROSS
SCALE H: 1" = 50' V: 1" = 5'

TIMMONS GROUP

NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS

KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

ROAD A PROFILE - SHEET 1 OF 2

JOB NO. 51557
SHEET NO. C5.0

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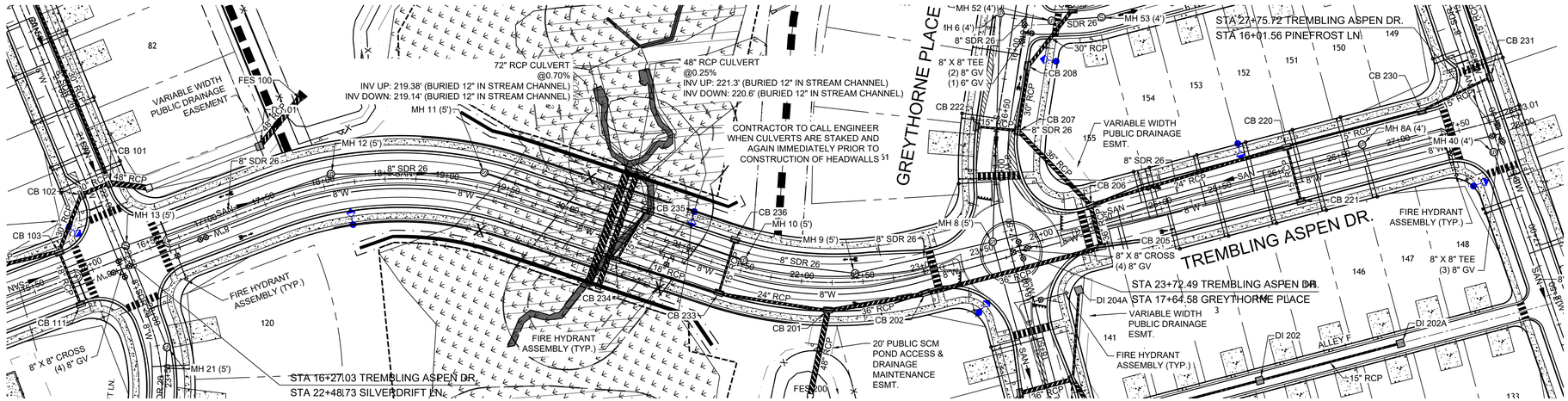
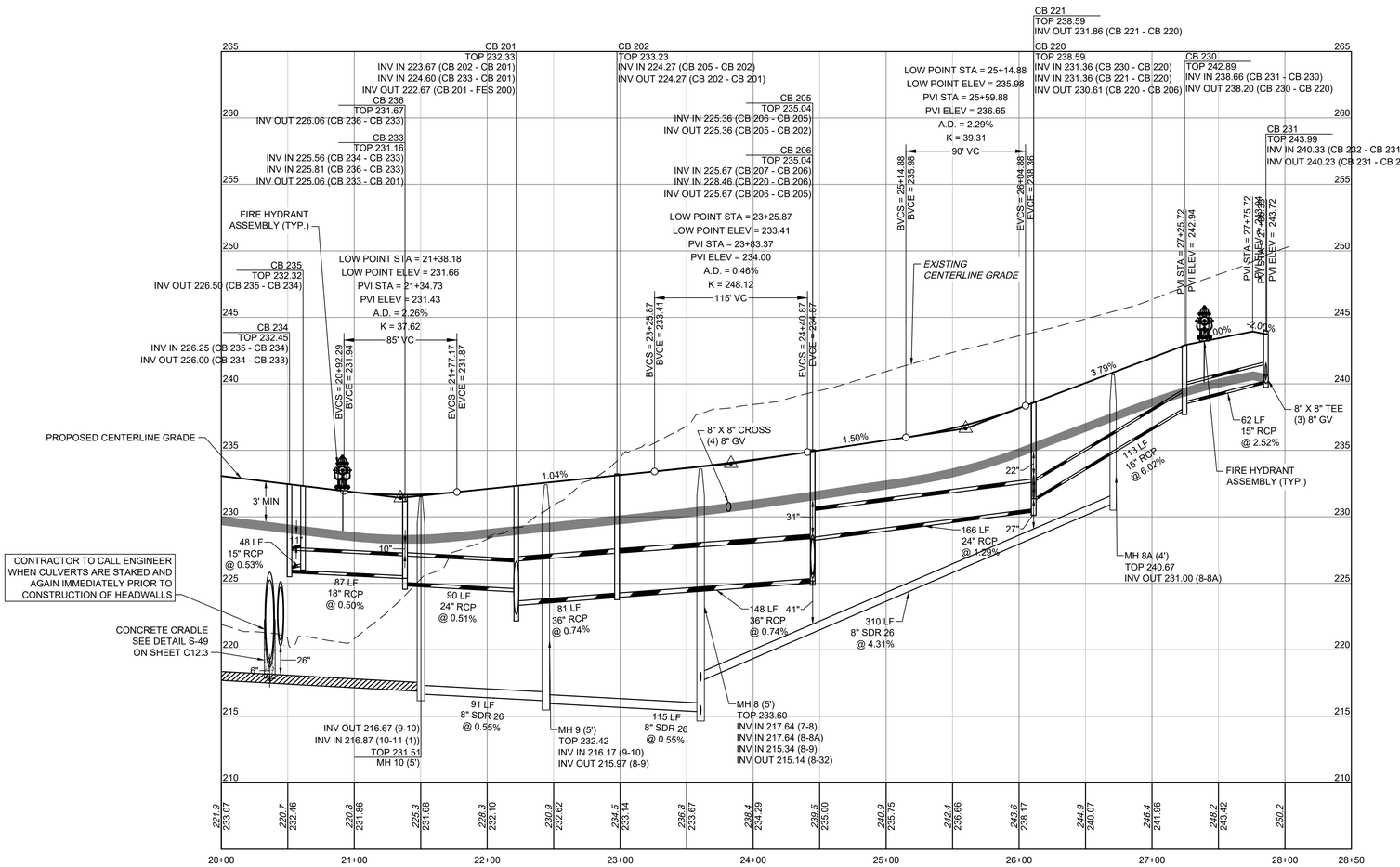


TREMBLING ASPEN DR. PLAN VIEW (STA 20+00 TO 27+86.72)

1" = 50'



TREMBLING ASPEN DR. PROFILE (STA 20+00 - 28+50)

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

UTILITY LEGEND

- PROPOSED SEWER LINE
- PROPOSED WATER LINE
- WATER LINE TEE
- FIRE HYDRANT
- WATER METER
- REDUCER
- GATE VALVE
- BLOWOFF ASSEMBLY

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: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

Digitally signed by Samuel A. MacDonald
DN: cn=US, O=knightdalenc.legistamp.com, OU=A. Morton Thomas & Associates, Inc., E=samuel@amorton.com
Reason: I am approving this document
Date: 2026.05.18 08:53:19 -04'00'

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

Digitally signed by Gideon Smith
DN: cn=US, O=knightdalenc.legistamp.com, OU=Town of Knightdale, E=gideon@knightdalenc.gov
Reason: I am approving this document
Date: 2026.05.19 08:53:16 -04'00'

UTILITY NOTES:

1. **ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY OF RALEIGH STANDARDS AND SPECIFICATIONS.**
2. **MINIMUM UTILITY HORIZONTAL SEPARATION DISTANCES:**
   WATER AND SANITARY SEWER MAINS - 10 FT.
   WATER AND STORM SEWER MAINS - 5 FT.
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   GRAVITY SANITARY SEWER AND FORCE MAINS - 5 FT.
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   WATER AND SANITARY SEWER MAINS - 18 IN.
   WATER AND STORM SEWER MAINS - 18 IN.
   SANITARY SEWER AND STORM SEWER MAINS - 24 IN.
4. **CLASS 1 STRUCTURAL MATERIAL REQUIRED FROM EXISTING GROUND TO SPRING LINE OF PROPOSED PIPE IN FILL CONDITIONS (TYP).**

ALL SEWER SERVICES GREATER THAN 12' IN DEPTH TO USE DEEP SEWER SERVICE DETAIL

811 Know what's below. Call before you dig.

NAD 83

SCALE 1"=50'
0 50' 100'

3' MI

5
0
0 50
PROFILE SCALE

RALEIGH WATER - PLANS AUTHORIZED FOR CONSTRUCTION
Any work authorized by this approval must proceed in accordance with the plans. This electronic approval may not be edited once issued. Any modification to this approval once issued will invalidate this approval.

Cydney Terry
2026.05.18 20:58:52-04'00'

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-4142

Public
Sewer Collection / Extension System
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City of Raleigh
Public Utilities Department Permit # S-5503

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 ENGINEER TYLER JEFFREY CROSS
3/31/2026

THIS DRAWING PREPARED AT THE
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YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION	DATE

DATE: 03/31/2026
DRAWN BY: 331
DESIGNED BY: 331
CHECKED BY: T. CROSS
SCALE: H: 1" = 50' V: 1" = 5'

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA
ROAD A PROFILE - SHEET 2 OF 2

JOB NO. 51557
SHEET NO. C5.1

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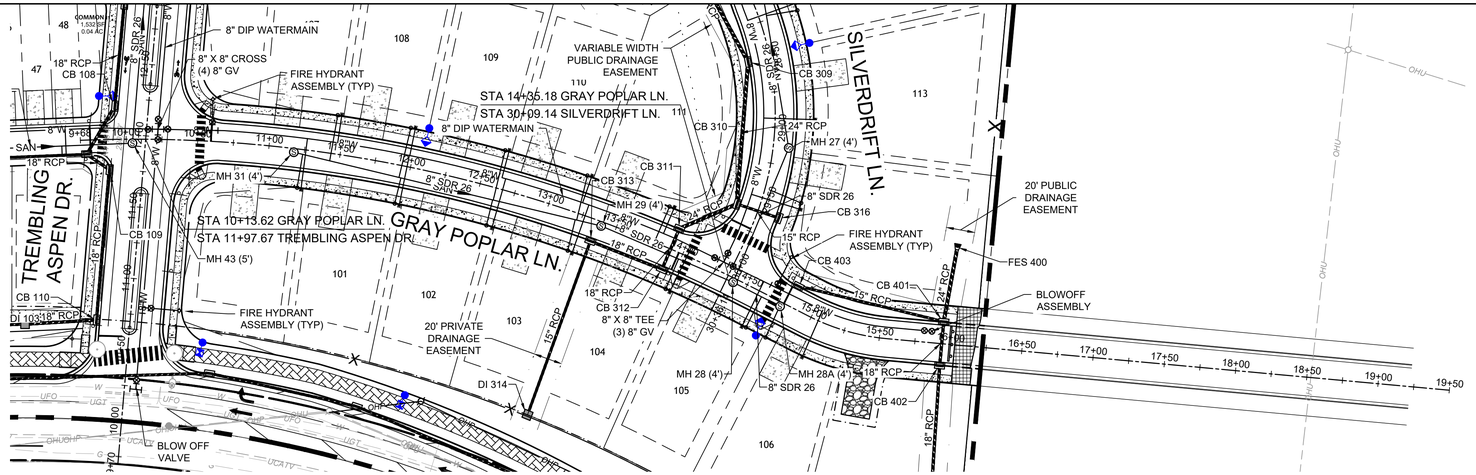

GRAY POPLAR LN. PLAN VIEW (STA 8+50 TO 19+50)

1" = 50'

SCALE 1"=50'
0 50' 100'

5
0
0 50
PROFILE SCALE

UTILITY NOTES:

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY OF RALEIGH STANDARDS AND SPECIFICATIONS.
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   WATER AND SANITARY SEWER MAINS - 10 FT.
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   GRAVITY SANITARY SEWER AND FORCE MAINS - 5 FT.
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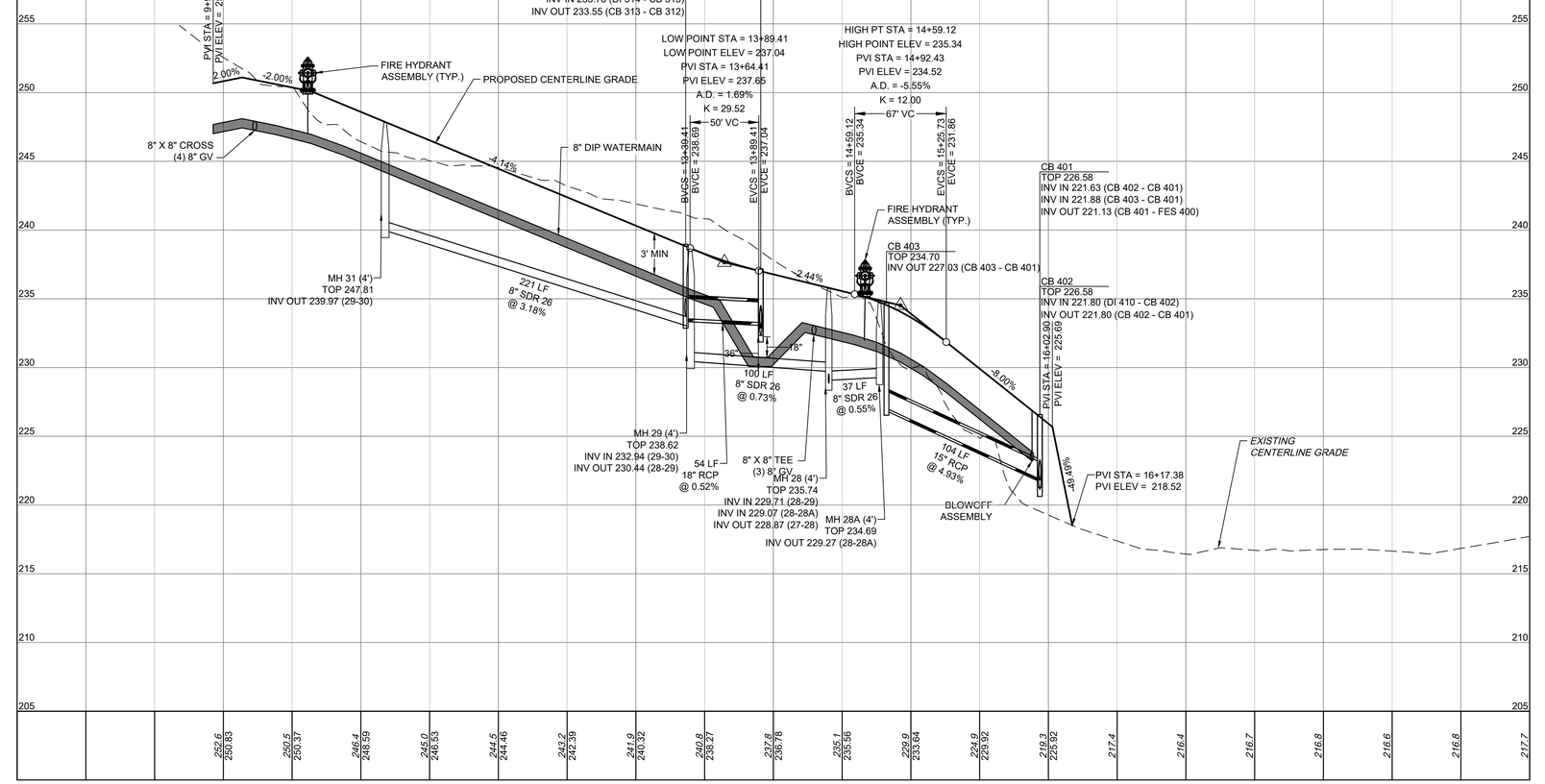
   SANITARY SEWER AND STORM SEWER MAINS - 24 IN.
4. CLASS 1 STRUCTURAL MATERIAL REQUIRED FROM EXISTING GROUND TO SPRING LINE OF PROPOSED PIPE IN FILL CONDITIONS (TYP).



GREY POPLAR LN. PROFILE

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

ALL SEWER SERVICES GREATER THAN 12' IN DEPTH TO USE DEEP SEWER SERVICE DETAIL

811 Know what's below. Call before you dig.

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: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

UTILITY LEGEND

SAN	PROPOSED SEWER LINE
8"W	PROPOSED WATER LINE
	WATER LINE TEE
	FIRE HYDRANT
	WATER METER
	REDUCER
	GATE VALVE
	BLOWOFF ASSEMBLY

RALEIGH WATER - PLANS AUTHORIZED FOR CONSTRUCTION
Any work authorized by this approval must proceed in accordance with the plans. This electronic approval may not be edited once issued. Any modification to this approval once issued will invalidate this approval.

Cydney Terry
2026.05.18 21:00:28-04'00'

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-4142

Public
Sewer Collection / Extension System
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City of Raleigh
Public Utilities Department Permit # S-5503

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 TYLER JEFFREY CROSS
3/31/2026

THIS DRAWING PREPARED AT THE
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5410 Trinity Road, Suite 102 | Raleigh, NC 27607
TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION	DATE

DATE: 03/31/2026
DRAWN BY: 331
DESIGNED BY: 331
CHECKED BY: T. CROSS
SCALE: H: 1" = 50' V: 1" = 5'

TIMMONS GROUP

HAVEN AT GRIFFITH MEADOWS

KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

NORTH CAROLINA LICENSE NO. C-1652

ROAD B PROFILE

JOB NO. 51557
SHEET NO. C5.2

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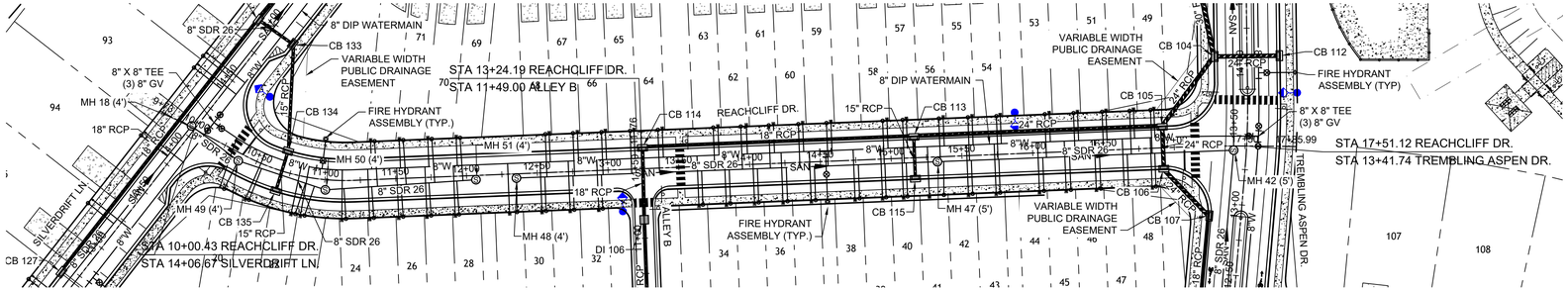
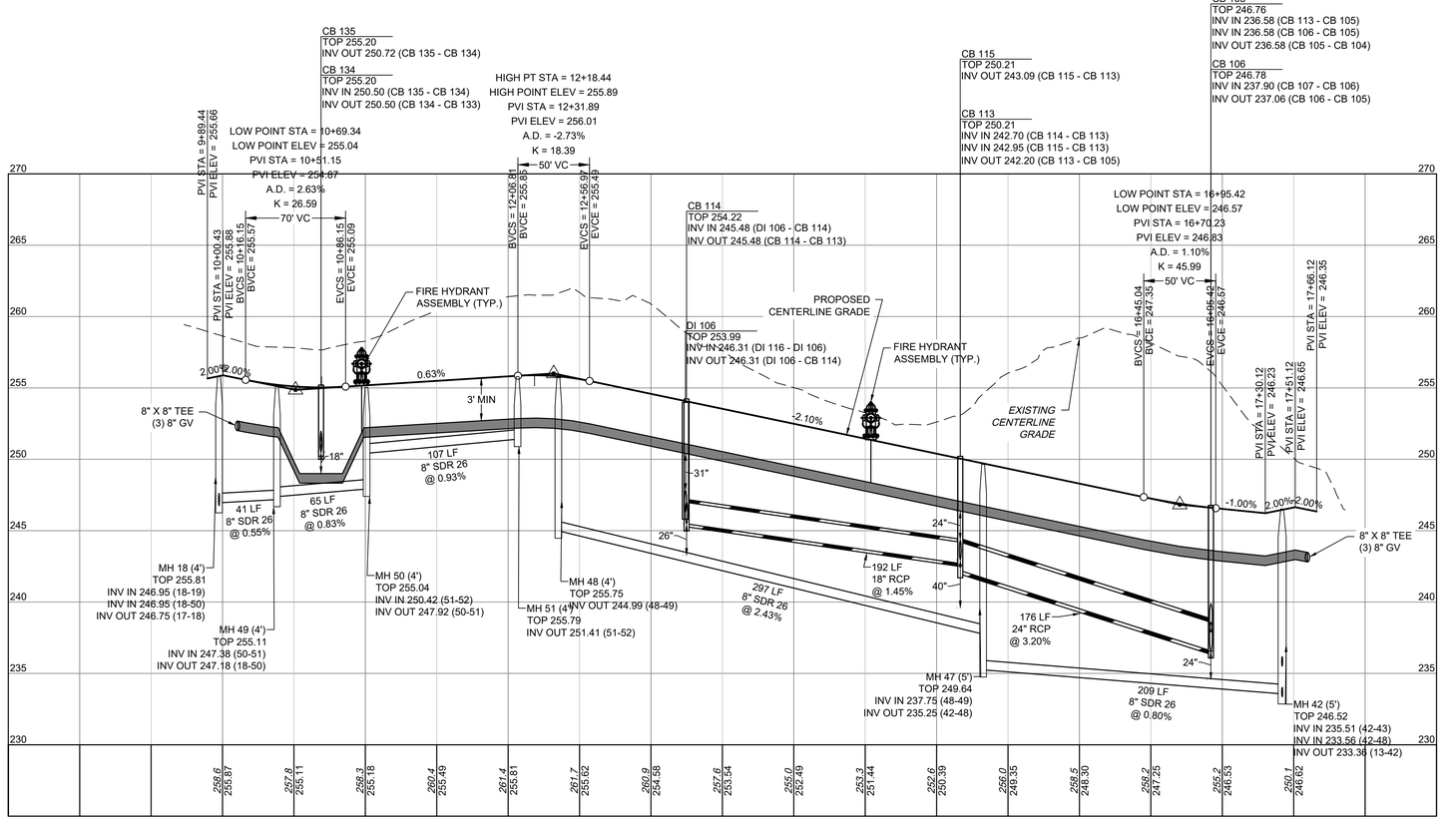


REACHCLIFF DR. PLAN VIEW (STA 8+50 TO 18+50)

1" = 50'



REACHCLIFF DR. PROFILE

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

5
0
0 50
PROFILE SCALE

UTILITY NOTES:

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY OF RALEIGH STANDARDS AND SPECIFICATIONS.
2. MINIMUM UTILITY HORIZONTAL SEPARATION DISTANCES:
   WATER AND SANITARY SEWER MAINS - 10 FT.
   WATER AND STORM SEWER MAINS - 5 FT.
   SANITARY SEWER AND STORM SEWER MAINS - 5 FT.
   GRAVITY SANITARY SEWER AND FORCE MAINS - 5 FT.
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4. CLASS 1 STRUCTURAL MATERIAL REQUIRED FROM EXISTING GROUND TO SPRING LINE OF PROPOSED PIPE IN FILL CONDITIONS (TYP).

ALL SEWER SERVICES GREATER THAN 12' IN DEPTH TO USE DEEP SEWER SERVICE DETAIL

Know what's below. Call before you dig.

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: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

UTILITY LEGEND

- PROPOSED SEWER LINE
- PROPOSED WATER LINE
- WATER LINE TEE
- FIRE HYDRANT
- WATER METER
- REDUCER
- GATE VALVE
- BLOWOFF ASSEMBLY

RALEIGH WATER - PLANS AUTHORIZED FOR CONSTRUCTION
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Cydney Terry
2026.05.18 21:02:05-04'00'

Public
Water Distribution / Extension System
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City of Raleigh Public Utilities Department Permit # W-4142

Public
Sewer Collection / Extension System
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City of Raleigh Public Utilities Department Permit # S-5503

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 TYLER JEFFREY CROSS
3/31/2026

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REVISION DESCRIPTION

DATE

DATE: 03/31/2026
DRAWN BY: 331
DESIGNED BY: 331
CHECKED BY: T. CROSS
SCALE: H: 1" = 50' V: 1" = 5'
JOB NO.: 51557
SHEET NO.: C5.3

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA
ROAD C PROFILE

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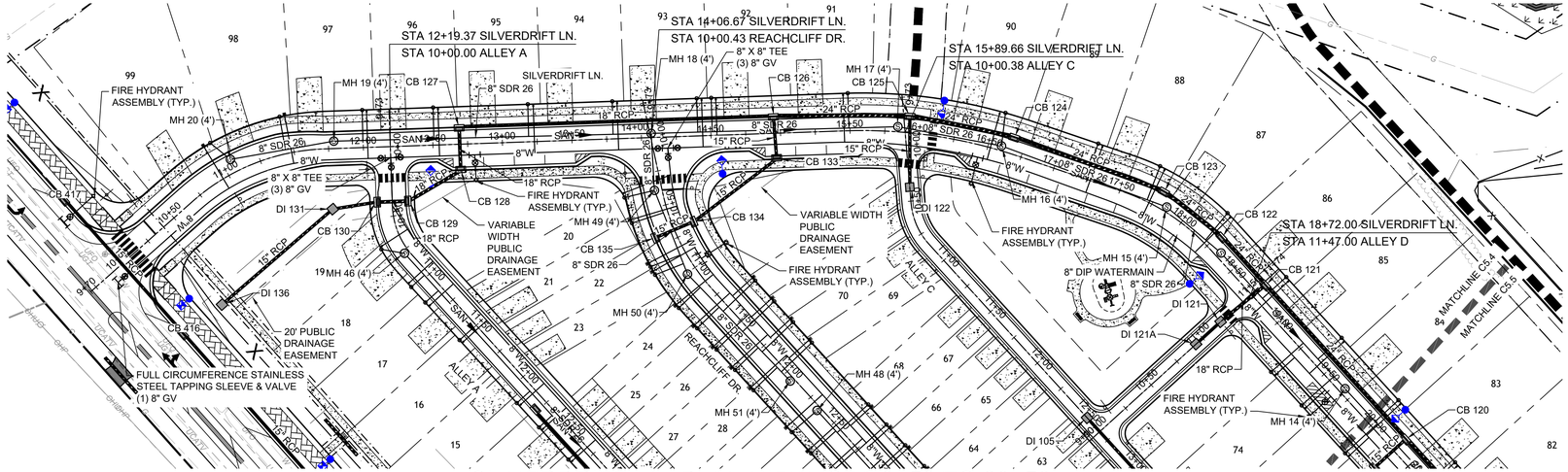
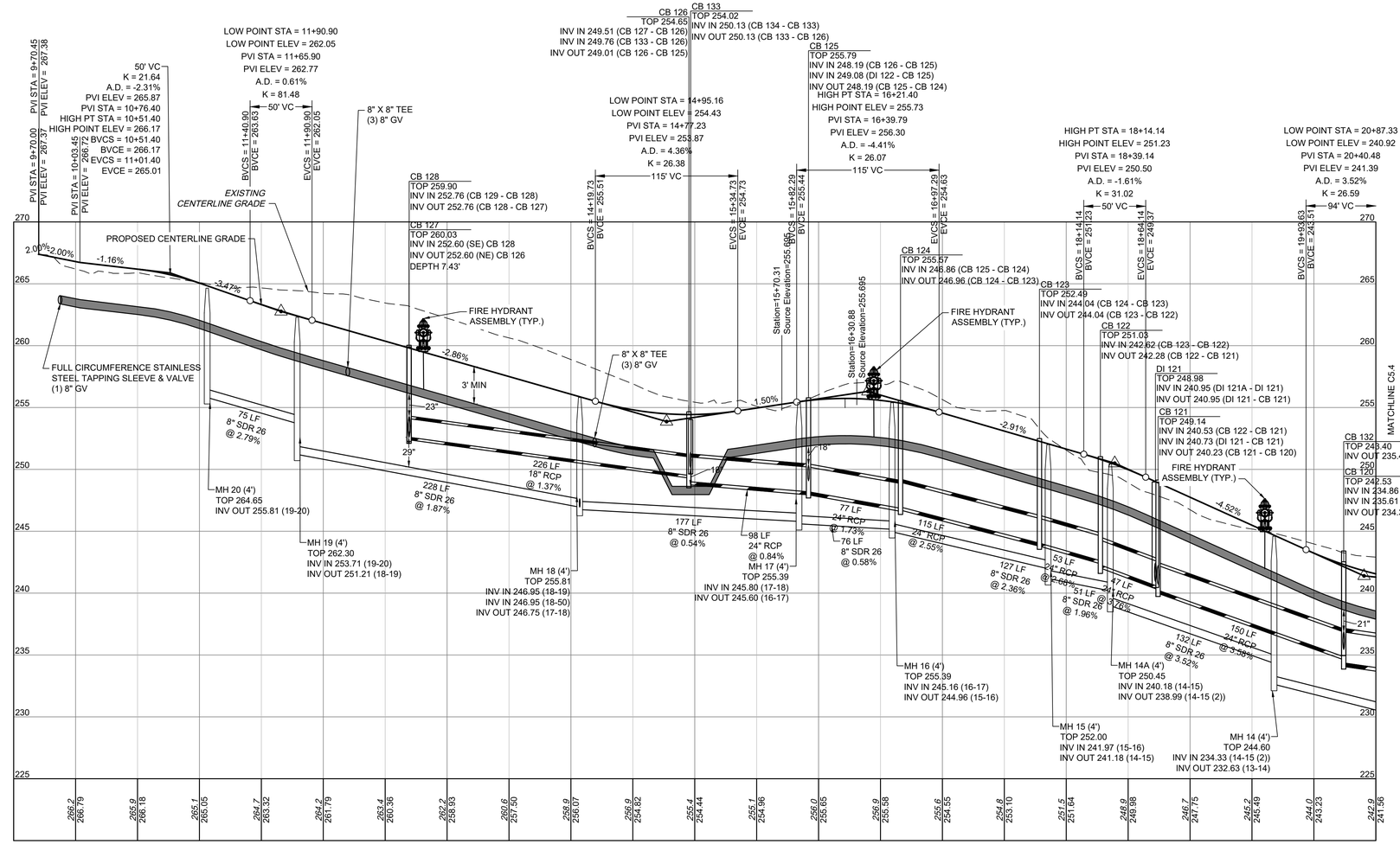


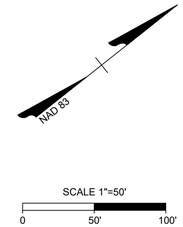
SILVERDRIFT LN. PLAN VIEW (STA 9+50 TO 20+50)

1" = 50'



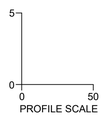
SILVERDRIFT LN. PROFILE

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



UTILITY LEGEND

- SAN — PROPOSED SEWER LINE
- 8"W — PROPOSED WATER LINE
- WATER LINE TEE
- FIRE HYDRANT
- WATER METER
- REDUCER
- GATE VALVE
- BLOWOFF ASSEMBLY



UTILITY NOTES:

1. **ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY OF RALEIGH STANDARDS AND SPECIFICATIONS.**
2. **MINIMUM UTILITY HORIZONTAL SEPARATION DISTANCES:**
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4. **CLASS 1 STRUCTURAL MATERIAL REQUIRED FROM EXISTING GROUND TO SPRING LINE OF PROPOSED PIPE IN FILL CONDITIONS (TYP).**

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811 Know what's below. Call before you dig.

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BY: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

Digitally signed by Samuel A. MacDonald
DN: cn=Samuel A. MacDonald, o=Knightdale Engineering, ou=, t=A. Morton Thomas & Associates, Inc., email=smacdonald@amorton.com, c=US
Reason: I am approving this document
Date: 2026.04.20 08:58:29-04'00'

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

Digitally signed by Gideon Smith
DN: cn=Gideon Smith, o=Knightdale, ou=Development Services, email=gsmith@knightdalenc.gov, c=US
Reason: I am approving this document
Date: 2026.04.22 08:51:24-04'00'

RALEIGH WATER - PLANS AUTHORIZED FOR CONSTRUCTION
Any work authorized by this approval must proceed in accordance with the plans. This electronic approval may not be edited once issued. Any modification to this approval once issued will invalidate this approval.

Cydney Terry
2026.05.18 21:03:36-04'00'

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-4142

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-5503

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 TYLER JEFFREY CROSS
3/31/2026

THIS DRAWING PREPARED AT THE
RALEIGH OFFICE
5410 Trinity Road, Suite 102 | Raleigh, NC 27607
TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION

DATE

DATE: 03/31/2026
DRAWN BY: 331
DESIGNED BY: 331
CHECKED BY: T. CROSS
SCALE: 1" = 50'

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

ROAD D PROFILE - SHEET 1 OF 2

JOB NO. 51557
SHEET NO. C5.4

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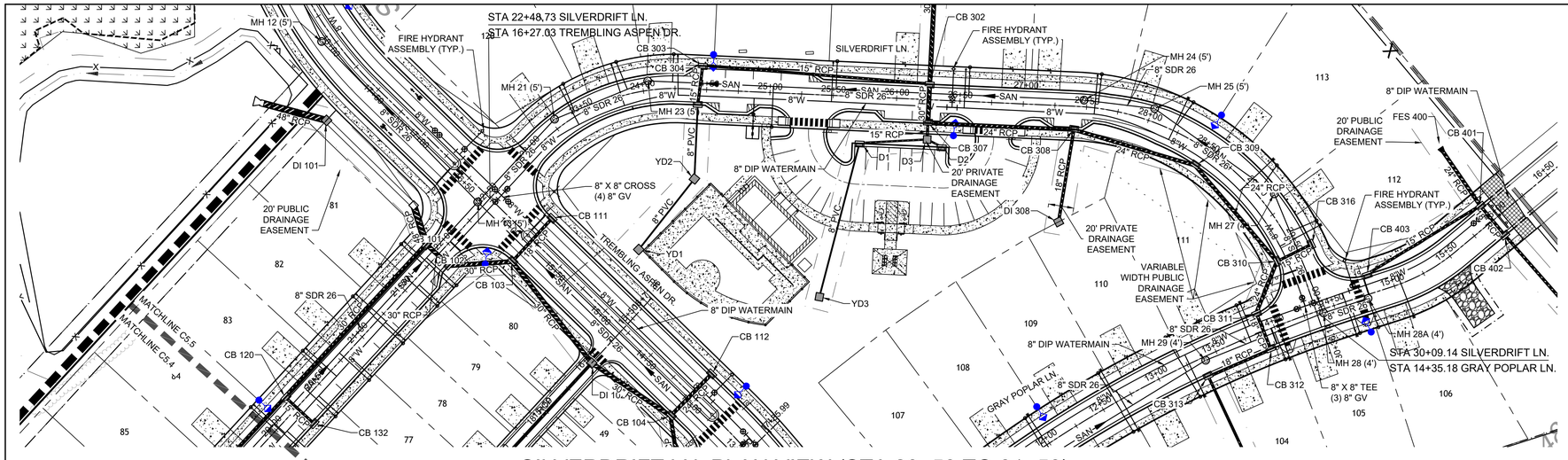
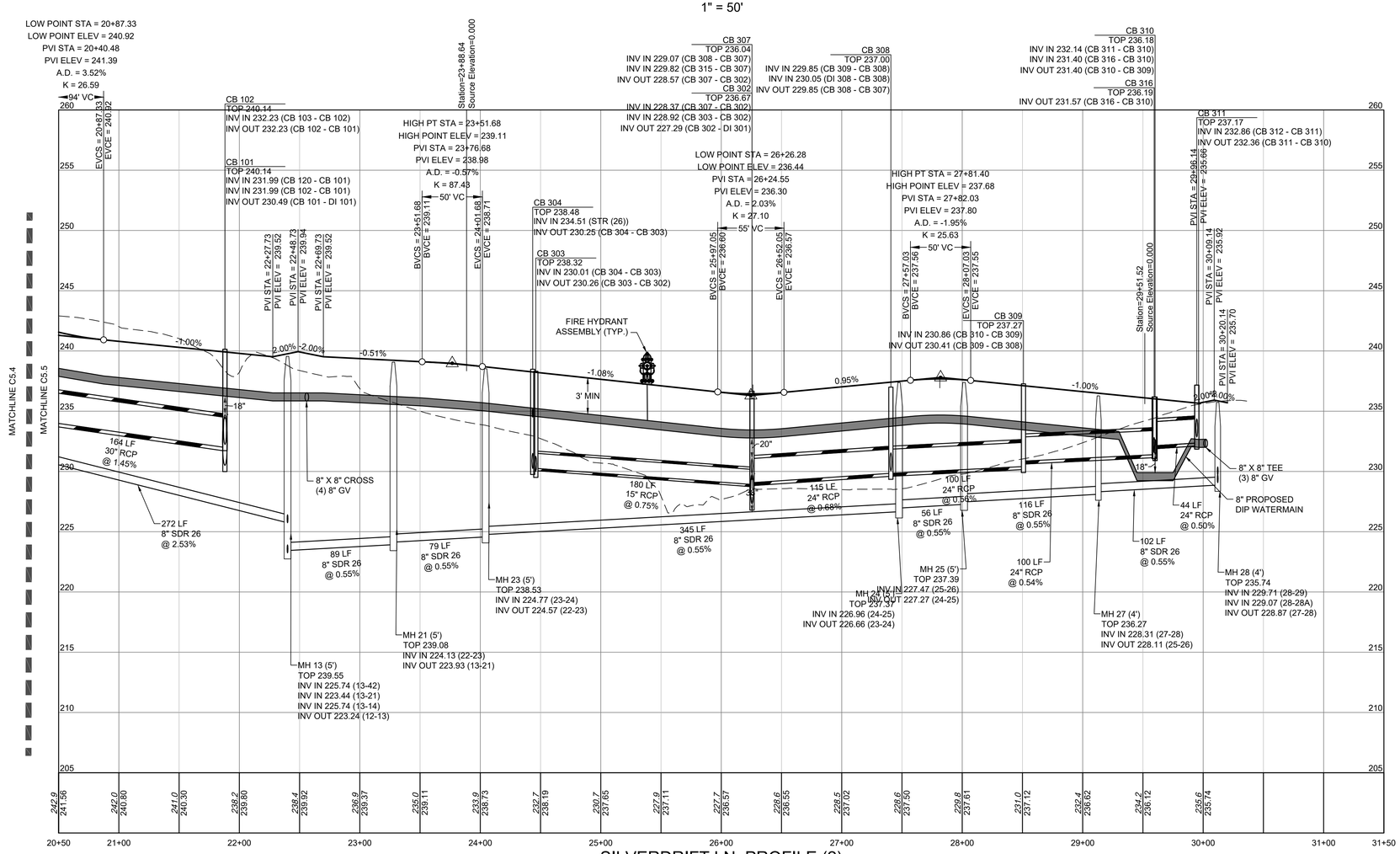


SILVERDRIFT LN. PLAN VIEW (STA 20+50 TO 31+50)

1" = 50'



SILVERDRIFT LN. PROFILE (2)

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

5
0
0
50
PROFILE SCALE

UTILITY NOTES:

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY OF RALEIGH STANDARDS AND SPECIFICATIONS.
2. MINIMUM UTILITY HORIZONTAL SEPARATION DISTANCES:
   WATER AND SANITARY SEWER MAINS - 10 FT.
   WATER AND STORM SEWER MAINS - 5 FT.
   SANITARY SEWER AND STORM SEWER MAINS - 5 FT.
   GRAVITY SANITARY SEWER AND FORCE MAINS - 5 FT.
3. MINIMUM UTILITY VERTICAL SEPARATION DISTANCES:
   WATER AND SANITARY SEWER MAINS - 18 IN.
   WATER AND STORM SEWER MAINS - 18 IN.
   SANITARY SEWER AND STORM SEWER MAINS - 24 IN.
4. CLASS 1 STRUCTURAL MATERIAL REQUIRED FROM EXISTING GROUND TO SPRING LINE OF PROPOSED PIPE IN FILL CONDITIONS (TYP.).

ALL SEWER SERVICES GREATER THAN 12' IN DEPTH TO USE DEEP SEWER SERVICE DETAIL

811 Know what's below. Call before you dig.

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: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

Digitally signed by Samuel A. MacDonald
DN: cn=Samuel A. MacDonald, o=Timmons Group, ou=Town of Knightdale, email=sam.macdonald@timmons.com, C=N, Michael Thomas & Associates, Inc. / Tim Raymond A. MacDonald
Reason: I am approving this document
Date: 2026.04.22 08:52:42 -04'00'

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

Digitally signed by Gideon Smith
DN: cn=Gideon Smith, o=Town of Knightdale, ou=Planning Department, email=gsmith@knightdalenc.gov, C=Town of Knightdale
Reason: I am approving this document
Date: 2026.04.22 10:05:24 -04'00'

UTILITY LEGEND

- SAN — PROPOSED SEWER LINE
- 8"W — PROPOSED WATER LINE
- WATER LINE TEE
- FIRE HYDRANT
- WATER METER
- REDUCER
- GATE VALVE
- BLOWOFF ASSEMBLY

RALEIGH WATER - PLANS AUTHORIZED FOR CONSTRUCTION
Any work authorized by this approval must proceed in accordance with the plans. This electronic approval may not be edited once issued. Any modification to this approval once issued will invalidate this approval.

Cydney Terry
2026.05.18 21:05:08-04'00'

Public
Water Distribution / Extension System
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City of Raleigh
Public Utilities Department Permit # W-4142

Public
Sewer Collection / Extension System
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City of Raleigh
Public Utilities Department Permit # S-5503

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 TYLER JEFFREY CROSS
3/31/2026

THIS DRAWING PREPARED AT THE
RALEIGH OFFICE
5410 Trinity Road, Suite 102 | Raleigh, NC 27607
TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION	DATE

DATE: 03/31/2026
DRAWN BY: 331
DESIGNED BY: 331
CHECKED BY: T. CROSS
SCALE: 1" = 50'
JOB NO.: 51557
SHEET NO.: C5.5

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA
ROAD D PROFILE - SHEET 2 OF 2

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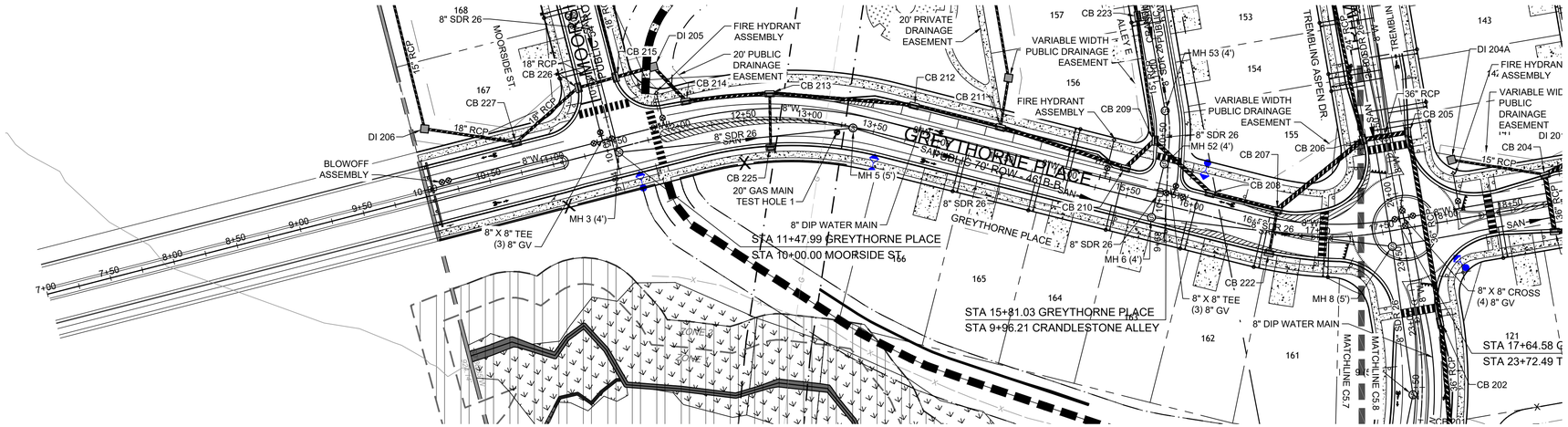
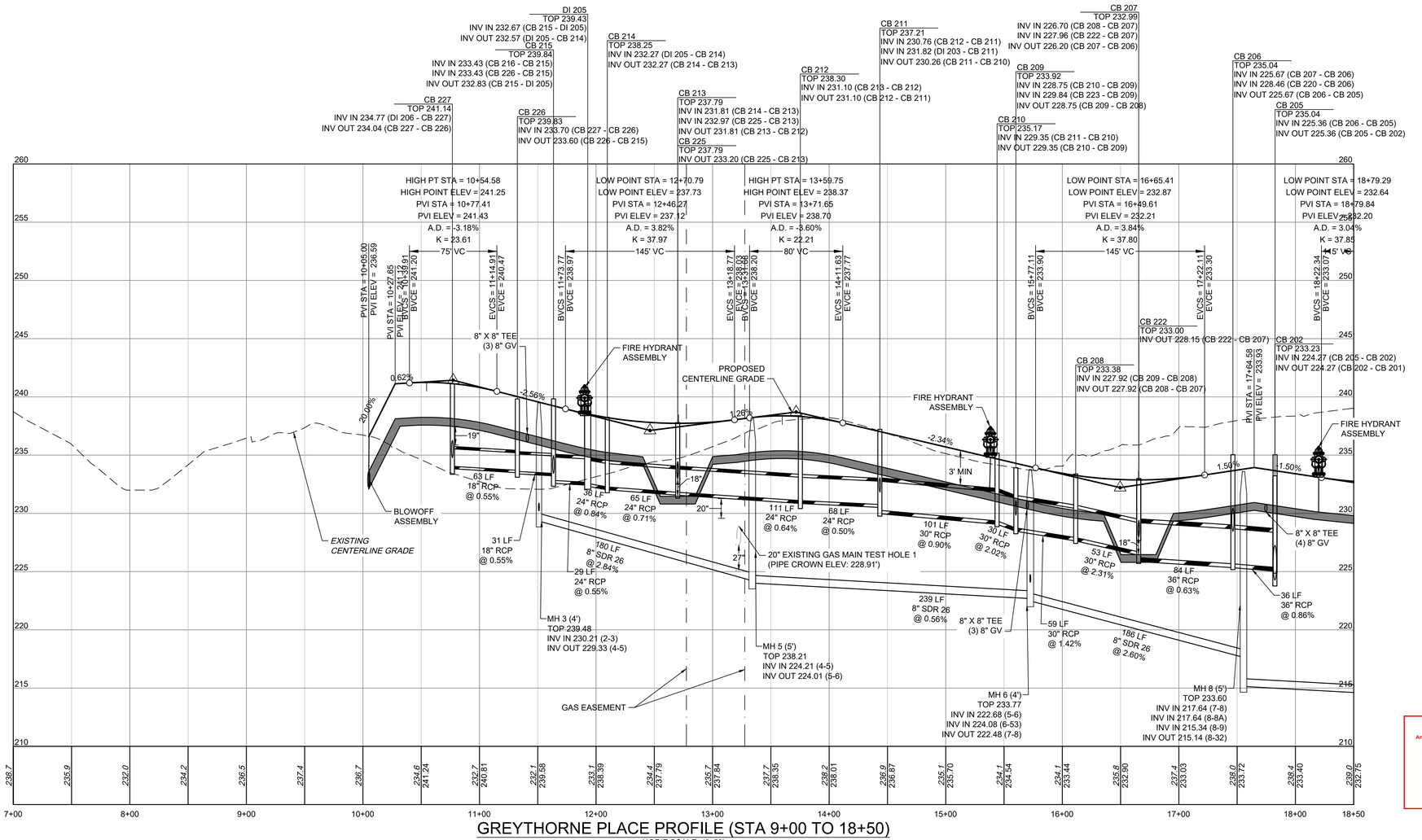


GREYTHORNE PLACE PLAN VIEW (STA 9+00 TO 18+50)

1" = 50'



GREYTHORNE PLACE PROFILE (STA 9+00 TO 18+50)

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

UTILITY LEGEND

SAN	PROPOSED SEWER LINE
8"W	PROPOSED WATER LINE
	WATER LINE TEE
	FIRE HYDRANT
	WATER METER
	REDUCER
	GATE VALVE
	BLOWOFF ASSEMBLY

UTILITY NOTES:

1. **ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY OF RALEIGH STANDARDS AND SPECIFICATIONS.**
2. **MINIMUM UTILITY HORIZONTAL SEPARATION DISTANCES: WATER AND SANITARY SEWER MAINS - 10 FT. WATER AND STORM SEWER MAINS - 5 FT. SANITARY SEWER AND STORM SEWER MAINS - 5 FT. GRAVITY SANITARY SEWER AND FORCE MAINS - 5 FT.**
3. **MINIMUM UTILITY VERTICAL SEPARATION DISTANCES: WATER AND SANITARY SEWER MAINS - 18 IN. WATER AND STORM SEWER MAINS - 18 IN. SANITARY SEWER AND STORM SEWER MAINS - 24 IN.**
4. **CLASS 1 STRUCTURAL MATERIAL REQUIRED FROM EXISTING GROUND TO SPRING LINE OF PROPOSED PIPE IN FILL CONDITIONS (TYP).**

ALL SEWER SERVICES GREATER THAN 12' IN DEPTH TO USE DEEP SEWER SERVICE DETAIL

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TOWN CERTIFICATION

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BY: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

Digitally signed by Samuel A. MacDonald
DN: C=US, E=sam.macdonald@knightdalenc.gov, O=Town of Knightdale, OU=Public Works, CN=Samuel A. MacDonald
Reason: I am approving this document
Date: 2026.04.20 08:08:39 -04'00'

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

Digitally signed by Gideon Smith
DN: C=US, E=gideon.smith@knightdalenc.gov, O=Town of Knightdale, OU=Public Works, CN=Gideon Smith
Reason: I am approving this document
Date: 2026.04.21 07:55:39 -04'00'

SCALE 1"=50'
0 50' 100'
5 0 0 50
PROFILE SCALE
NAD 83

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-4142

Public
Sewer Collection / Extension System
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City of Raleigh
Public Utilities Department Permit # S-5503

RALEIGH WATER - PLANS AUTHORIZED FOR CONSTRUCTION
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Cydney Terry
2026.05.18 21:06:39-04'00'

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 TYLER JEFFREY CROSS
3/31/2026

THIS DRAWING PREPARED AT THE
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5410 Trinity Road, Suite 102 | Raleigh, NC 27607
TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION	DATE

DATE 03/31/2026
DRAWN BY 331
DESIGNED BY 331
CHECKED BY T. CROSS
SCALE 1" = 50'

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA
ROAD E PROFILE - SHEET 1 OF 2

JOB NO. 51557
SHEET NO. C5.6

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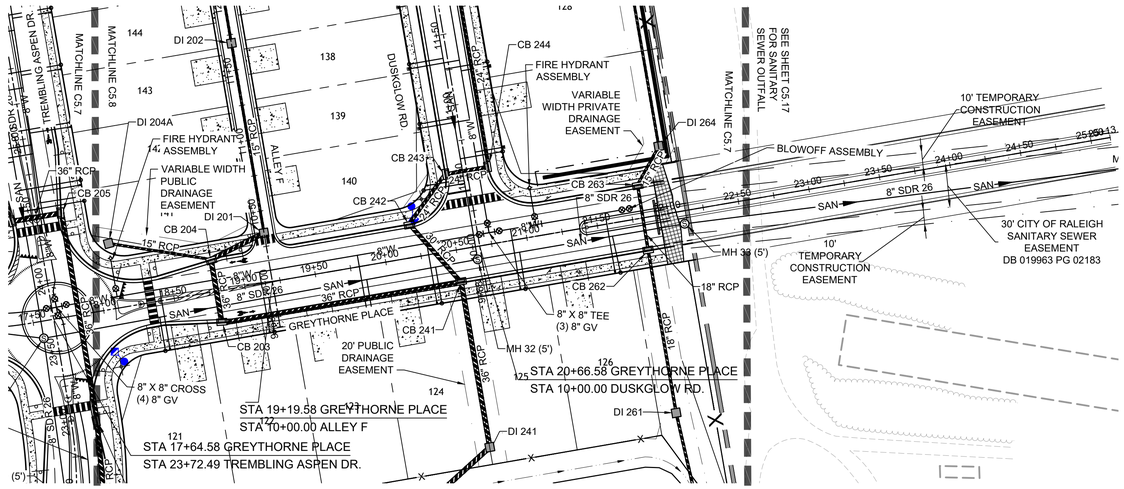
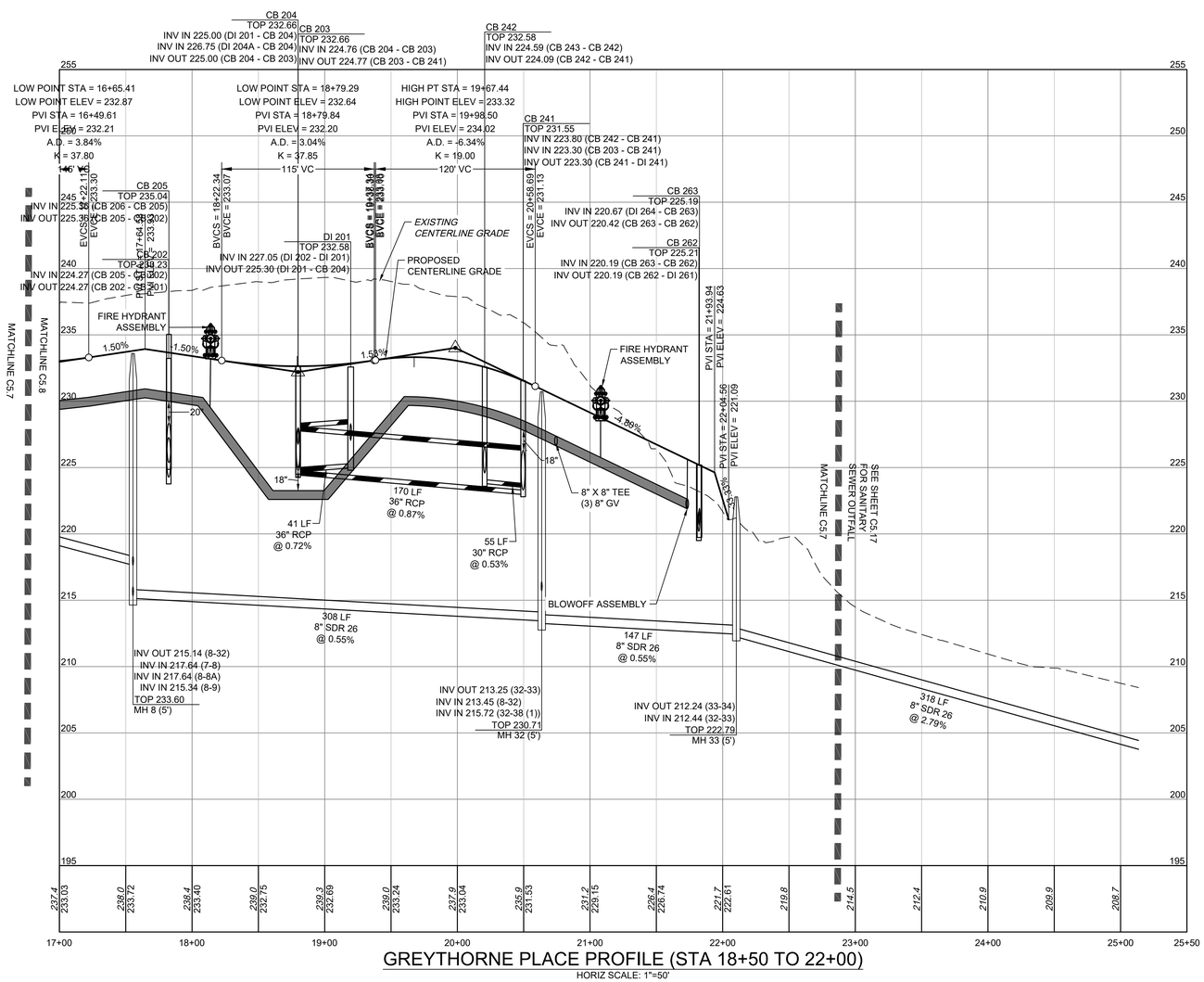


GREYTHORNE PLACE PLAN VIEW (STA 17+00 TO 22+50) 1" = 50'



GREYTHORNE PLACE PROFILE (STA 18+50 TO 22+00)

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

UTILITY NOTES:

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY OF RALEIGH STANDARDS AND SPECIFICATIONS.
2. MINIMUM UTILITY HORIZONTAL SEPARATION DISTANCES:
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   GRAVITY SANITARY SEWER AND FORCE MAINS - 5 FT.
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811 Know what's below. Call before you dig.

TOWN CERTIFICATION

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BY: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

SCALE 1"=50'
0 50' 100'

5
0
0 50
PROFILE SCALE

NAD 83

UTILITY LEGEND

- SAN — PROPOSED SEWER LINE
- 8"W — PROPOSED WATER LINE
- WATER LINE TEE
- FIRE HYDRANT
- WATER METER
- REDUCER
- GATE VALVE
- BLOWOFF ASSEMBLY

RALEIGH WATER - PLANS AUTHORIZED FOR CONSTRUCTION
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Cydney Terry
2026.05.18 21:08:13-04'00'

Public
Water Distribution / Extension System
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City of Raleigh
Public Utilities Department Permit # W-4142

Public
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City of Raleigh
Public Utilities Department Permit # S-5503

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 TYLER JEFFREY CROSS
3/31/2026

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REVISION DESCRIPTION	DATE

DATE: 03/31/2026
DRAWN BY: 331
DESIGNED BY: 331
CHECKED BY: T. CROSS
SCALE: H: 1" = 50' V: 1" = 5'

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA
ROAD E PROFILE - SHEET 1 OF 2

JOB NO. 51557
SHEET NO. C5.6

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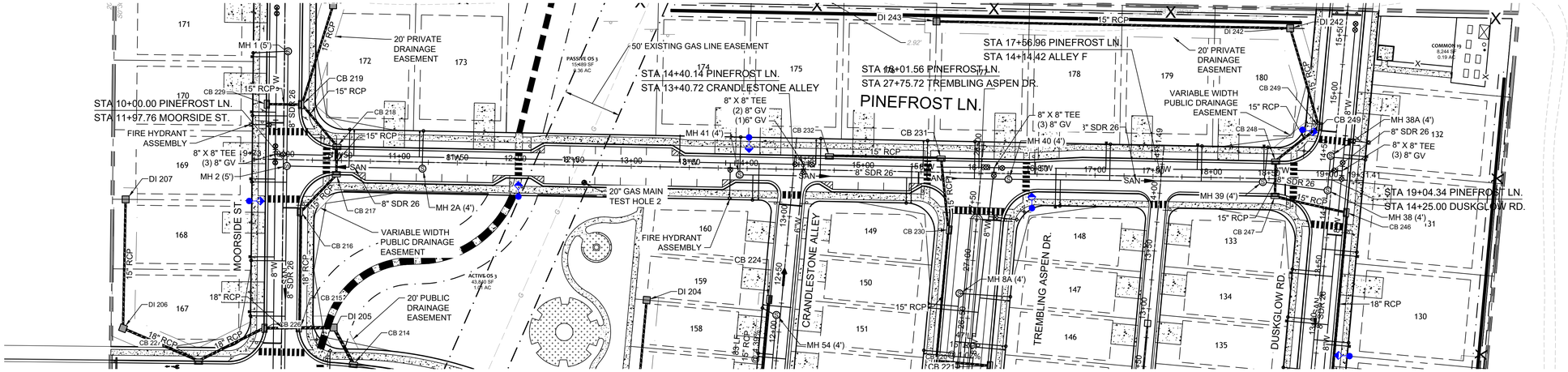
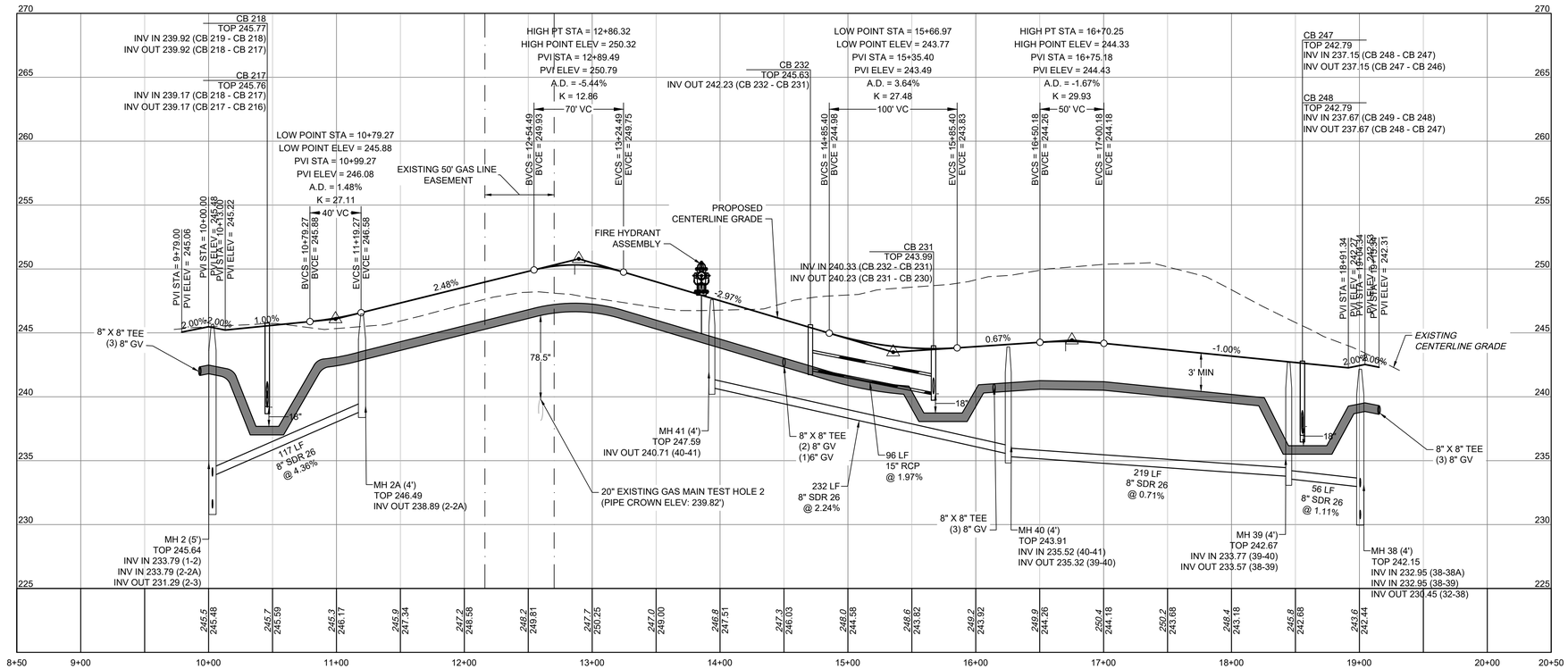


PINEFROST LN. PLAN VIEW (STA 8+50 TO 20+50)

1" = 50'



PINEFROST LN. PROFILE

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

5
0
0
50
PROFILE SCALE

UTILITY NOTES:

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY OF RALEIGH STANDARDS AND SPECIFICATIONS.
2. MINIMUM UTILITY HORIZONTAL SEPARATION DISTANCES:
   WATER AND SANITARY SEWER MAINS - 10 FT.
   WATER AND STORM SEWER MAINS - 5 FT.
   SANITARY SEWER AND STORM SEWER MAINS - 5 FT.
   GRAVITY SANITARY SEWER AND FORCE MAINS - 5 FT.
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   WATER AND SANITARY SEWER MAINS - 18 IN.
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4. CLASS 1 STRUCTURAL MATERIAL REQUIRED FROM EXISTING GROUND TO SPRING LINE OF PROPOSED PIPE IN FILL CONDITIONS (TYP).

ALL SEWER SERVICES GREATER THAN 12' IN DEPTH TO USE DEEP SEWER SERVICE DETAIL

811 Know what's below. Call before you dig.

UTILITY LEGEND

- SAN — PROPOSED SEWER LINE
- 8"W — PROPOSED WATER LINE
- WATER LINE TEE
- FIRE HYDRANT
- WATER METER
- REDUCER
- GATE VALVE
- BLOWOFF ASSEMBLY

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City of Raleigh
Public Utilities Department Permit # W-4142

Public
Sewer Collection / Extension System
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City of Raleigh
Public Utilities Department Permit # S-5503

RALEIGH WATER - PLANS AUTHORIZED FOR CONSTRUCTION
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Cydney Terry
2026.05.18 21:09:48-04'00'

TOWN CERTIFICATION

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BY: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 TYLER JEFFREY CROSS
3/31/2026

THIS DRAWING PREPARED AT THE
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REVISION DESCRIPTION	DATE

DATE: 03/31/2026
DRAWN BY: 331
DESIGNED BY: 331
CHECKED BY: T. CROSS
SCALE: H: 1" = 50' V: 1" = 5'

TIMMONS GROUP

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA
NORTH CAROLINA LICENSE NO. C-1652
ROAD F PROFILE

JOB NO. 51557
SHEET NO. C5.8

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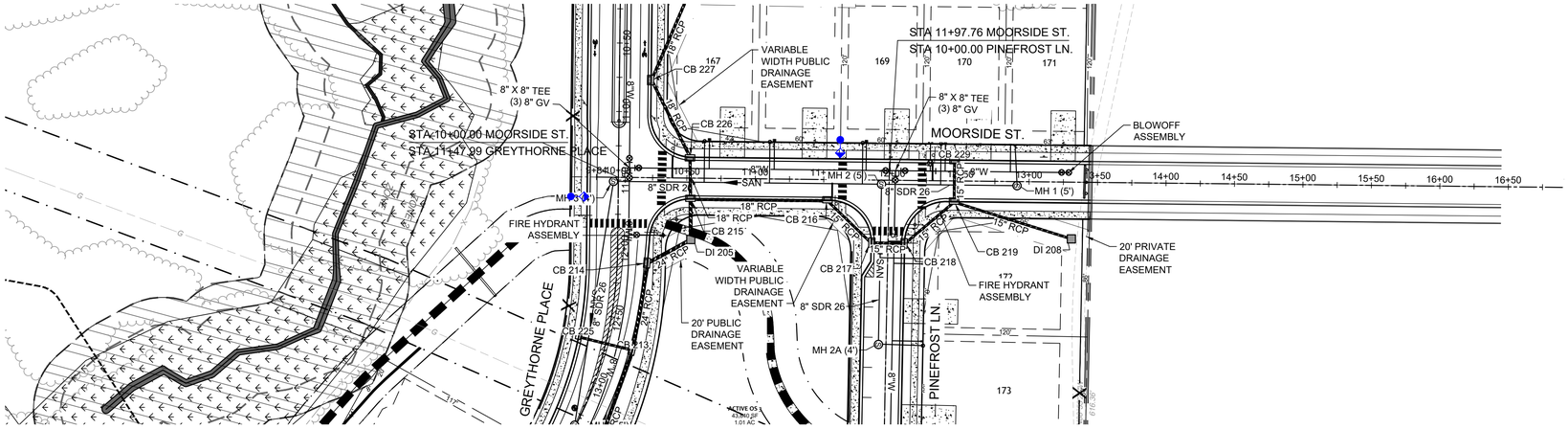
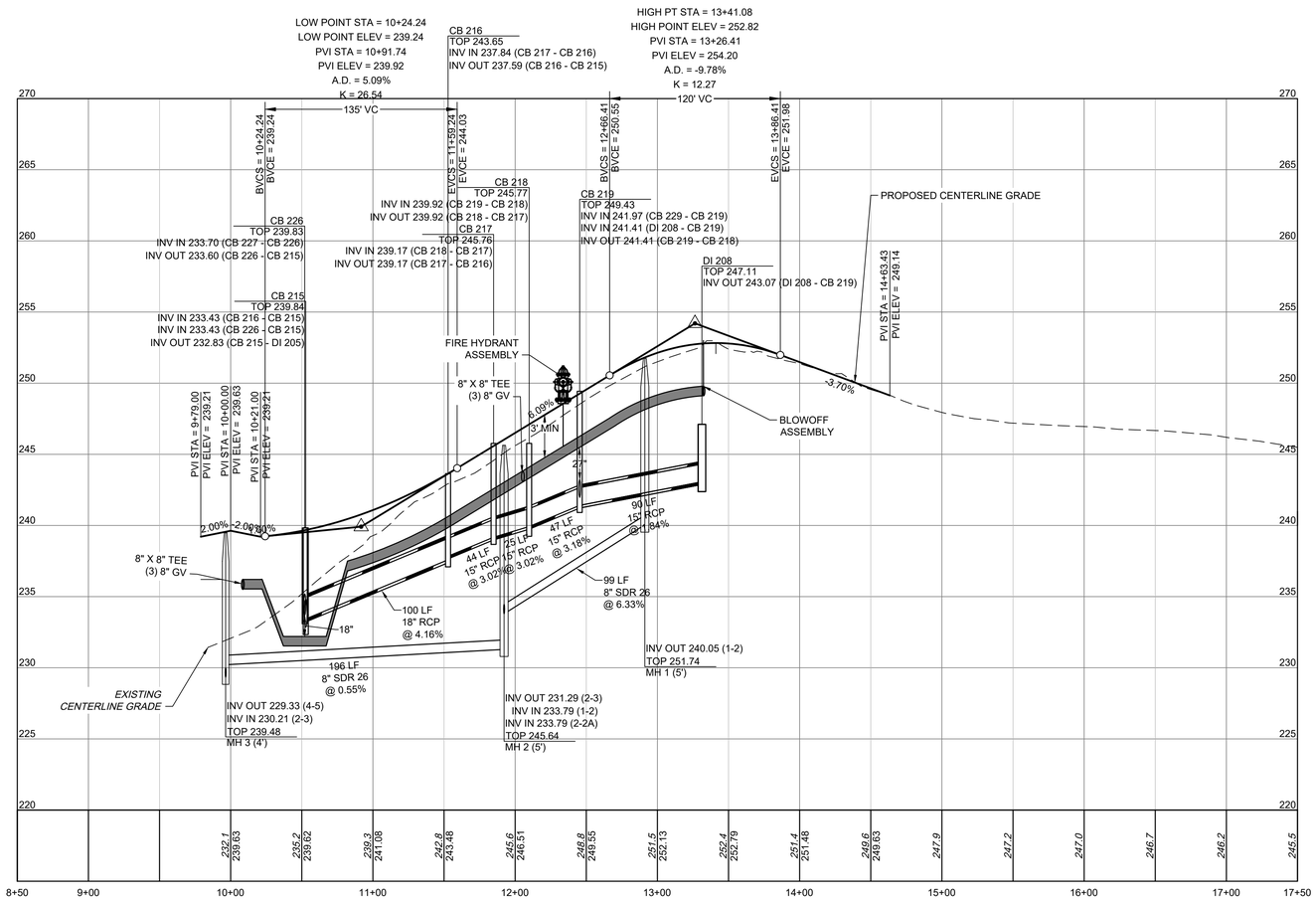


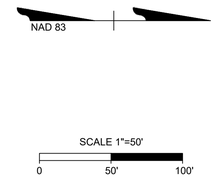
MOORSIDE ST. PLAN VIEW (STA 8+50 TO 15+50)

1" = 50'



MOORSIDE ST. PROFILE

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



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811 Know what's below. Call before you dig.

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: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

UTILITY LEGEND

SAN	PROPOSED SEWER LINE
8"W	PROPOSED WATER LINE
	WATER LINE TEE
	FIRE HYDRANT
	WATER METER
	REDUCER
	GATE VALVE
	BLOWOFF ASSEMBLY

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-4142

Public
Sewer Collection / Extension System
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City of Raleigh
Public Utilities Department Permit # S-5503

RALEIGH WATER - PLANS AUTHORIZED FOR CONSTRUCTION
Any work authorized by this approval must proceed in accordance with the plans. This electronic approval may not be edited once issued. Any modification to this approval once issued will invalidate this approval.

Cydney Terry
2026.05.18 21:11:37-04'00'

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 ENGINEER TYLER JEFFREY CROSS
3/31/2026

THIS DRAWING PREPARED AT THE
RALEIGH OFFICE
5410 Trinity Road, Suite 102 | Raleigh, NC 27607
TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION

DATE

DATE: 03/31/2026
DRAWN BY: 331
DESIGNED BY: 331
CHECKED BY: T. CROSS
SCALE: H: 1" = 50' V: 1" = 5'

TIMMONS GROUP

NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS

KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

ROAD G PROFILE

JOB NO. 51557
SHEET NO. C5.9

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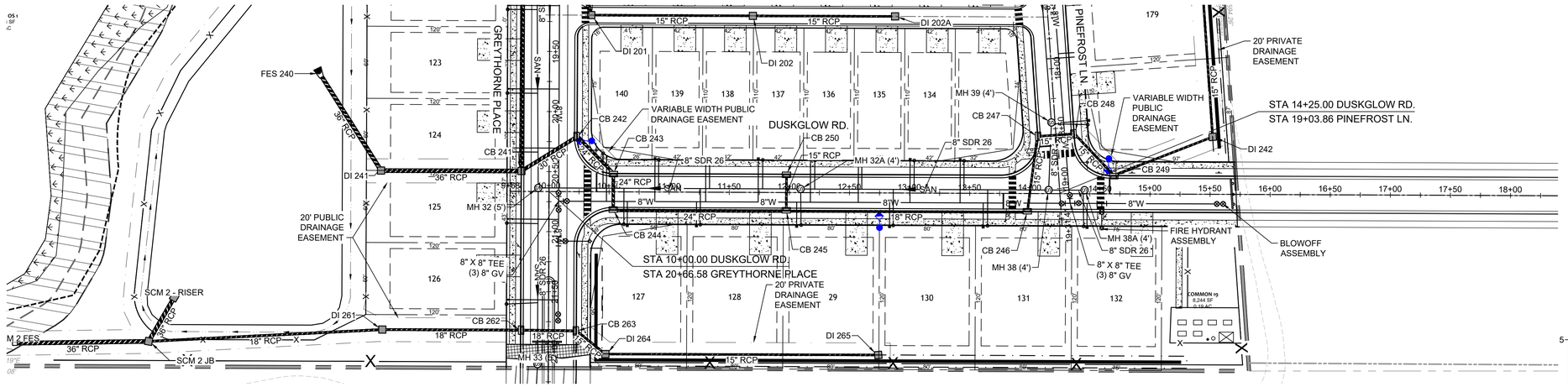
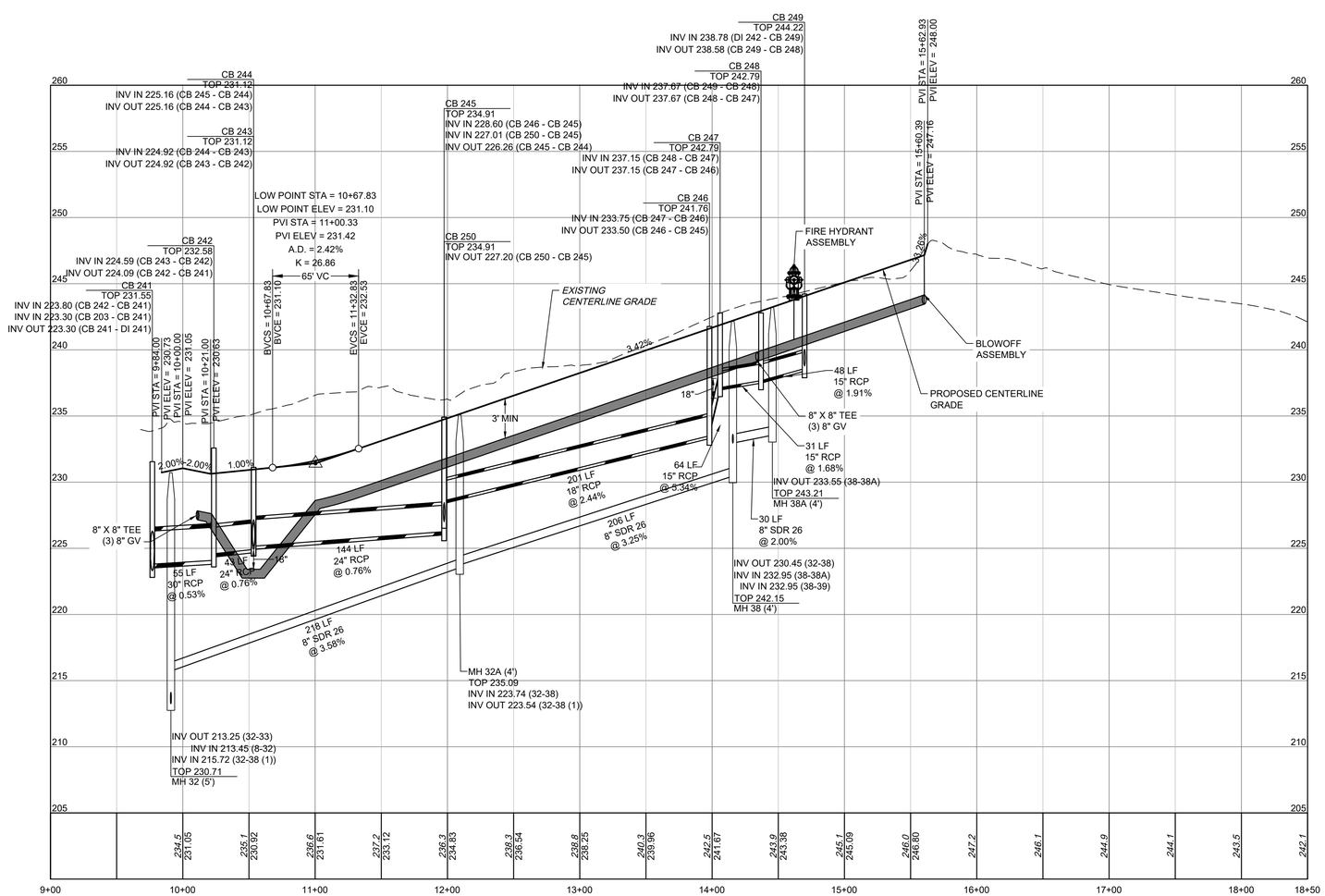


DUSKGLOW RD. PLAN VIEW (STA 9+00 TO 17+00)

1" = 50'



DUSKGLOW RD. PROFILE

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

UTILITY NOTES:

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY OF RALEIGH STANDARDS AND SPECIFICATIONS.
2. MINIMUM UTILITY HORIZONTAL SEPARATION DISTANCES:
   WATER AND SANITARY SEWER MAINS - 10 FT.
   WATER AND STORM SEWER MAINS - 5 FT.
   SANITARY SEWER AND STORM SEWER MAINS - 5 FT.
   GRAVITY SANITARY SEWER AND FORCE MAINS - 5 FT.
3. MINIMUM UTILITY VERTICAL SEPARATION DISTANCES:
   WATER AND SANITARY SEWER MAINS - 18 IN.
   WATER AND STORM SEWER MAINS - 18 IN.
   SANITARY SEWER AND STORM SEWER MAINS - 24 IN.
4. CLASS 1 STRUCTURAL MATERIAL REQUIRED FROM EXISTING GROUND TO SPRING LINE OF PROPOSED PIPE IN FILL CONDITIONS (TYP).

ALL SEWER SERVICES GREATER THAN 12' IN DEPTH TO USE DEEP SEWER SERVICE DETAIL

811 Know what's below. Call before you dig.

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: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

Digitally signed by Samuel A. MacDonald
DN: cn=Samuel A. MacDonald, o=Timmons Group, ou=Engineering, email=Sam.MacDonald@timmons.com, c=US
Date: 2026.05.18 13:13:10 -04'00'

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

Digitally signed by Gideon Smith
DN: cn=Gideon Smith, o=Town of Knightdale, ou=Development Services, email=gsmith@knightdale-nc.gov, c=US
Date: 2026.05.19 10:05:53 -04'00'

UTILITY LEGEND

SAN	PROPOSED SEWER LINE
8"W	PROPOSED WATER LINE
	WATER LINE TEE
	FIRE HYDRANT
	WATER METER
	REDUCER
	GATE VALVE
	BLOWOFF ASSEMBLY

RALEIGH WATER - PLANS AUTHORIZED FOR CONSTRUCTION
Any work authorized by this approval must proceed in accordance with the plans. This electronic approval may not be edited once issued. Any modification to this approval once issued will invalidate this approval.

Cydney Terry
2026.05.18 21:13:10-04'00'

Public
Water Distribution / Extension System
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City of Raleigh
Public Utilities Department Permit # W-4142

Public
Sewer Collection / Extension System
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City of Raleigh
Public Utilities Department Permit # S-5503

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 TYLER JEFFREY CROSS
3/31/2026

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TIMMONS GROUP

NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS

KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

ROAD H PROFILE

REVISION DESCRIPTION	DATE

DATE: 03/31/2026
DRAWN BY: 331
DESIGNED BY: 331
CHECKED BY: T. CROSS
SCALE: H: 1" = 50' V: 1" = 5'
JOB NO.: 51557
SHEET NO.: C5.10

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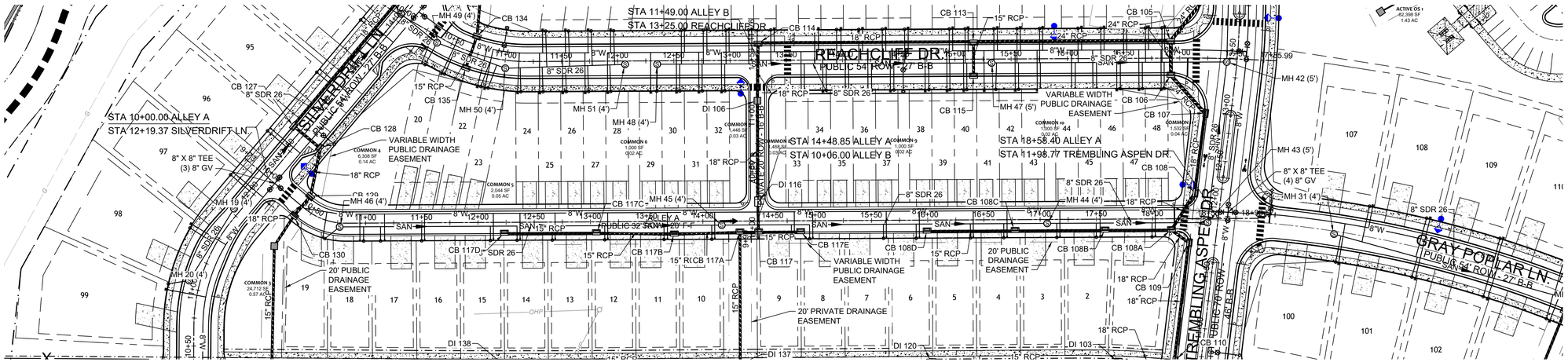
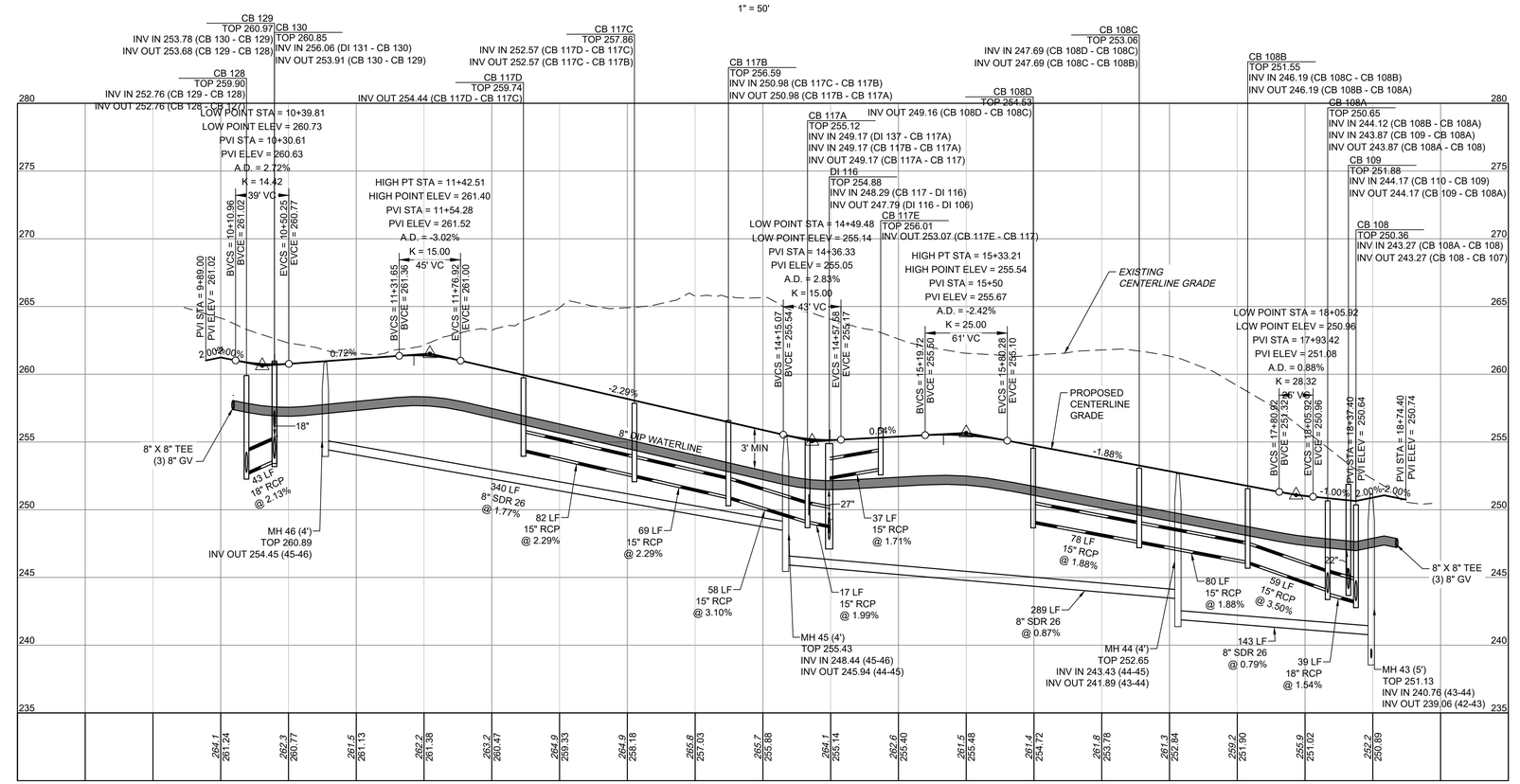


ALLEY A PLAN VIEW (STA 8+00 TO 19+50)



ALLEY A PROFILE

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

UTILITY NOTES:

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY OF RALEIGH STANDARDS AND SPECIFICATIONS.
2. MINIMUM UTILITY HORIZONTAL SEPARATION DISTANCES:
   WATER AND SANITARY SEWER MAINS - 10 FT.
   WATER AND STORM SEWER MAINS - 5 FT.
   SANITARY SEWER AND STORM SEWER MAINS - 5 FT.
   GRAVITY SANITARY SEWER AND FORCE MAINS - 5 FT.
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   WATER AND SANITARY SEWER MAINS - 18 IN.
   WATER AND STORM SEWER MAINS - 18 IN.
   SANITARY SEWER AND STORM SEWER MAINS - 24 IN.
4. CLASS 1 STRUCTURAL MATERIAL REQUIRED FROM EXISTING GROUND TO SPRING LINE OF PROPOSED PIPE IN FILL CONDITIONS (TYP).

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: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

Digitally signed by Samuel A. MacDonald
DN: C=US, E=smacdonald@wakegov.com, O=TX, Wake County, OU=Engineering, Inc., CN=Samuel A. MacDonald
Reason: I am approving this document
Date: 2026.03.18 10:05:41-04'00'

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

Digitally signed by Gideon Smith
DN: C=US, E=gsmith@knightdalenc.gov, O=Town of Knightdale, CN=Gideon Smith
Reason: I am approving this document
Date: 2026.03.19 10:09:04-04'00'

UTILITY LEGEND

- SAN — PROPOSED SEWER LINE
- 8"W — PROPOSED WATER LINE
- WATER LINE TEE
- FIRE HYDRANT
- WATER METER
- REDUCER
- GATE VALVE
- BLOWOFF ASSEMBLY

ALL SEWER SERVICES GREATER THAN 12' IN DEPTH TO USE DEEP SEWER SERVICE DETAIL

811 Know what's below. Call before you dig.

Public
Water Distribution / Extension System
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City of Raleigh
Public Utilities Department Permit # W-4142

Public
Sewer Collection / Extension System
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City of Raleigh
Public Utilities Department Permit # S-5503

RALEIGH WATER - PLANS AUTHORIZED FOR CONSTRUCTION
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Cydney Terry
2026.05.18 21:14:48-04'00'

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 TYLER JEFFREY CROSS
3/31/2026

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TIMMONS GROUP

REVISION DESCRIPTION

DATE

DATE 03/31/2026
DRAWN BY 331
DESIGNED BY 331
CHECKED BY T. CROSS
SCALE H: 1" = 50' V: 1" = 5'

NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS

KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

ALLEY A PROFILE

JOB NO. 51557
SHEET NO. C5.11

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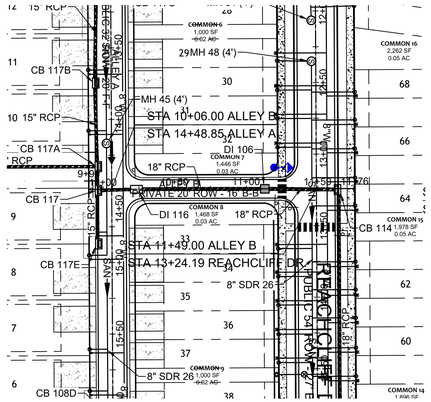


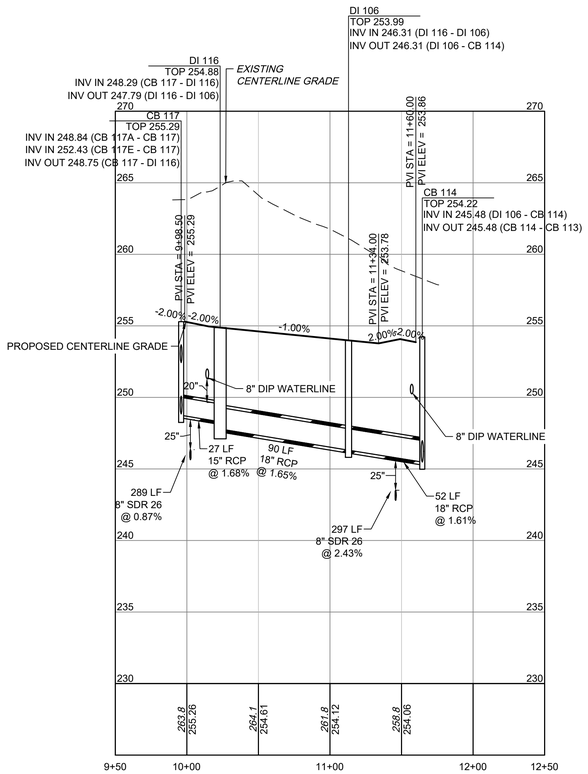
ALLEY B PLAN VIEW (STA 9+50 TO 12+50)

1" = 50'

NAD 83

SCALE 1"=50'

0 50' 100'



ALLEY B PROFILE

HORIZ SCALE: 1"=50'

VERT SCALE: 1"=5

UTILITY NOTES:

1. **ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY OF RALEIGH STANDARDS AND SPECIFICATIONS.**
2. **MINIMUM UTILITY HORIZONTAL SEPARATION DISTANCES:**
   WATER AND SANITARY SEWER MAINS - 10 FT.
   WATER AND STORM SEWER MAINS - 5 FT.
   SANITARY SEWER AND STORM SEWER MAINS - 5 FT.
   GRAVITY SANITARY SEWER AND FORCE MAINS - 5 FT.
3. **MINIMUM UTILITY VERTICAL SEPARATION DISTANCES:**
   WATER AND SANITARY SEWER MAINS - 18 IN.
   WATER AND STORM SEWER MAINS - 18 IN.
   SANITARY SEWER AND STORM SEWER MAINS - 24 IN.
4. **CLASS 1 STRUCTURAL MATERIAL REQUIRED FROM EXISTING GROUND TO SPRING LINE OF PROPOSED PIPE IN FILL CONDITIONS (TYP).**

ALL SEWER SERVICES GREATER THAN 12' IN DEPTH TO USE DEEP SEWER SERVICE DETAIL

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TOWN CERTIFICATION

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BY: Samuel A. MacDonald DATE: _____

TOWN ENGINEER

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

BY: Gideon Smith DATE: _____

LAND USE ADMINISTRATOR

5
0
0 50
PROFILE SCALE

UTILITY LEGEND

SAN	PROPOSED SEWER LINE
8"W	PROPOSED WATER LINE
	WATER LINE TEE
	FIRE HYDRANT
	WATER METER
	REDUCER
	GATE VALVE
	BLOWOFF ASSEMBLY

RALEIGH WATER - PLANS AUTHORIZED FOR CONSTRUCTION
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Cydney Terry
2026.05.18 21:16:13-04'00'

Public
Water Distribution / Extension System
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City of Raleigh
Public Utilities Department Permit # W-4142

Public
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City of Raleigh
Public Utilities Department Permit # S-5503

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 ENGINEER TYLER JEFFREY CROSS

3/31/2026

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TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

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REVISION DESCRIPTION	DATE

DATE: 03/31/2026
DRAWN BY: 331
DESIGNED BY: 331
CHECKED BY: T. CROSS
SCALE: H: 1" = 50' V: 1" = 5'

TIMMONS GROUP

NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS

KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

ALLEY B PROFILE

JOB NO. 51557

SHEET NO. C5.12

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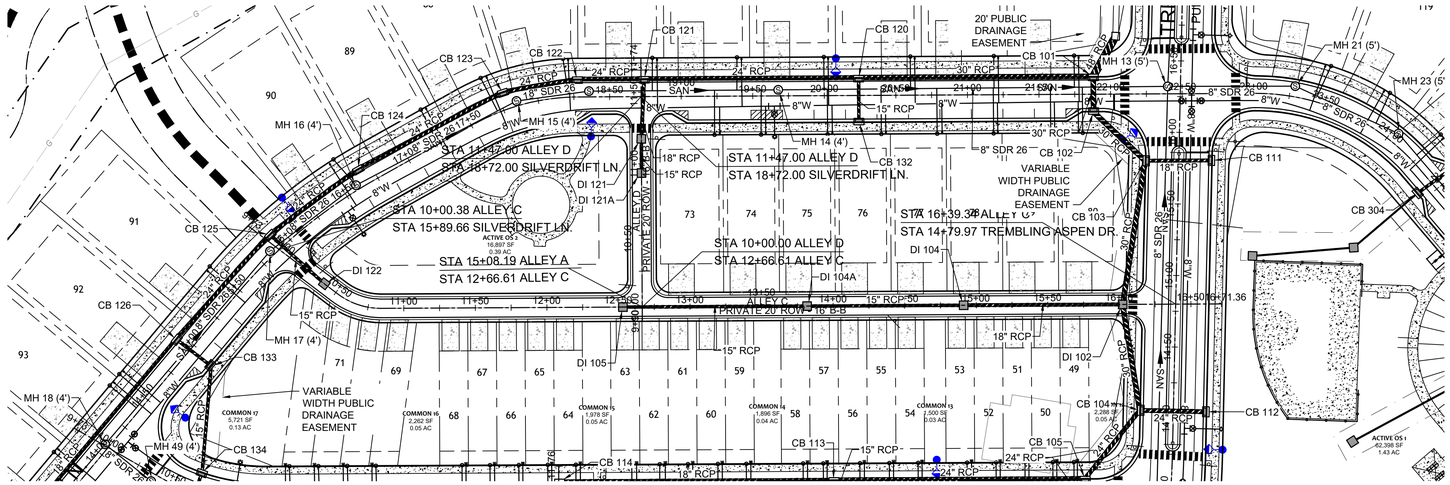
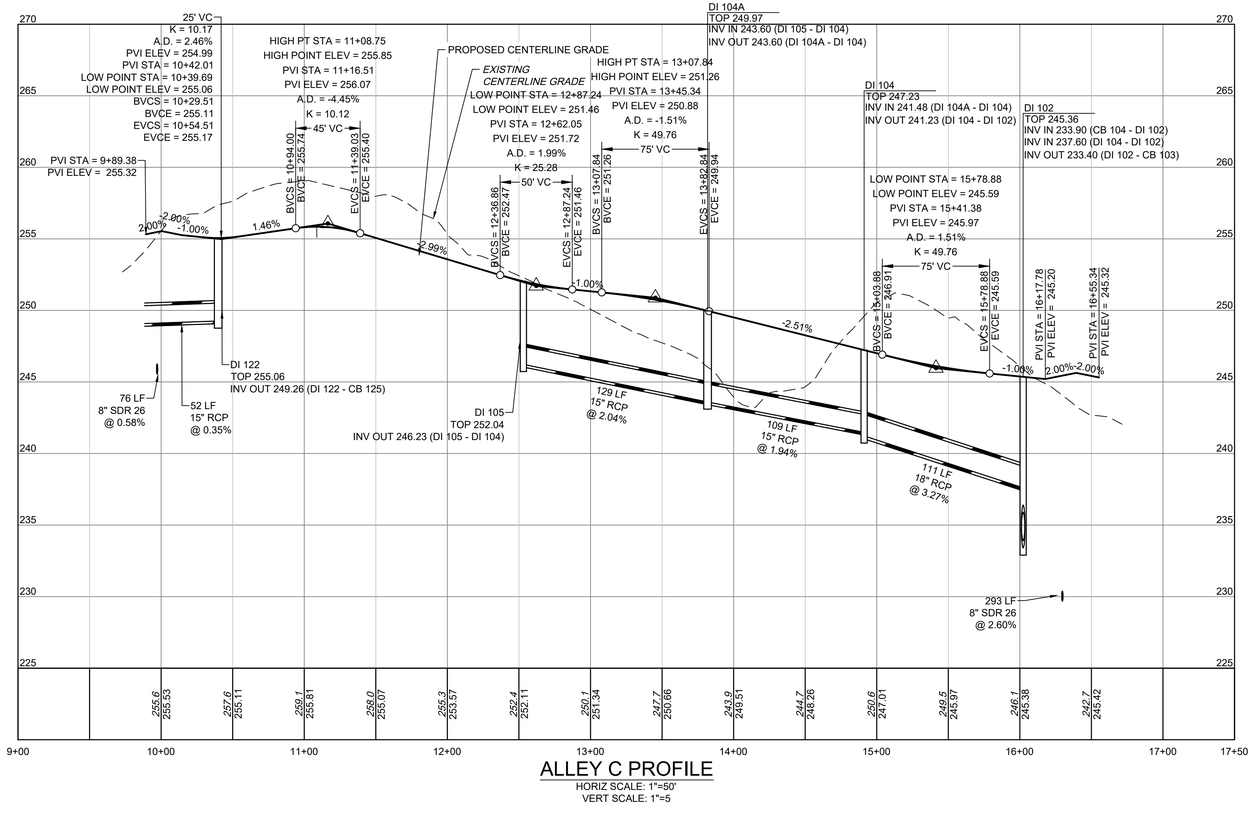


ALLEY C PLAN VIEW (STA 9+00 TO 17+50)

1" = 50'



ALLEY C PROFILE

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



SCALE 1"=50'

0 50' 100'

RALEIGH WATER - PLANS AUTHORIZED FOR CONSTRUCTION
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Cydney Terry
2026.05.18 21:17:39-04'00'

TOWN CERTIFICATION

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BY: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

Digitally signed by Samuel A. MacDonald
DN: cn=Samuel A. MacDonald, o=Timmons Group, ou=Civil, st=North Carolina, c=US
Reason: I am approving this document
Location: Raleigh, NC
Date: 2026.05.18 10:52:39-04'00'

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

Digitally signed by Gideon Smith
DN: cn=Gideon Smith, o=Town of Knightdale, ou=Development Services, c=US
Reason: I am approving this document
Location: 305 West Main Street
Date: 2026.05.19 10:02:39-04'00'

UTILITY LEGEND

SAN	PROPOSED SEWER LINE
8"W	PROPOSED WATER LINE
	WATER LINE TEE
	FIRE HYDRANT
	WATER METER
	REDUCER
	GATE VALVE
	BLOWOFF ASSEMBLY

UTILITY NOTES:

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2. MINIMUM UTILITY HORIZONTAL SEPARATION DISTANCES:
   WATER AND SANITARY SEWER MAINS - 10 FT.
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City of Raleigh
Public Utilities Department Permit # W-4142

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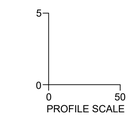
City of Raleigh
Public Utilities Department Permit # S-5503



NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 ENGINEER TYLER JEFFREY CROSS
3/31/2026

THIS DRAWING PREPARED AT THE
RALEIGH OFFICE
5410 Trinity Road, Suite 102 | Raleigh, NC 27607
TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION	DATE

DATE: 03/31/2026
DRAWN BY: 331
DESIGNED BY: 331
CHECKED BY: T. CROSS
SCALE: H: 1" = 50' V: 1" = 5'

TIMMONS GROUP

HAVEN AT GRIFFITH MEADOWS

NORTH CAROLINA LICENSE NO. C-1652

KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

ALLEY C PROFILE

JOB NO. 51557
SHEET NO. C5.13

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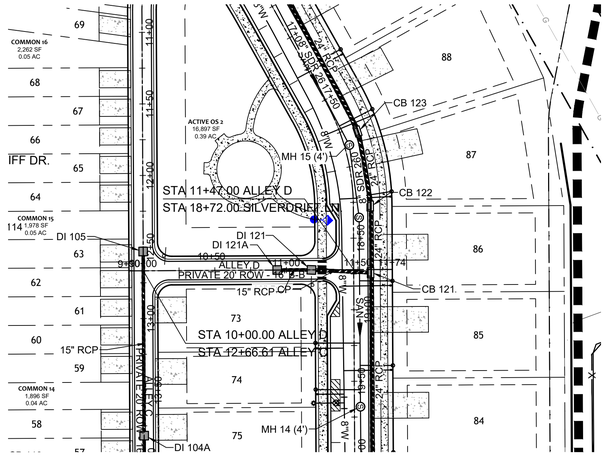
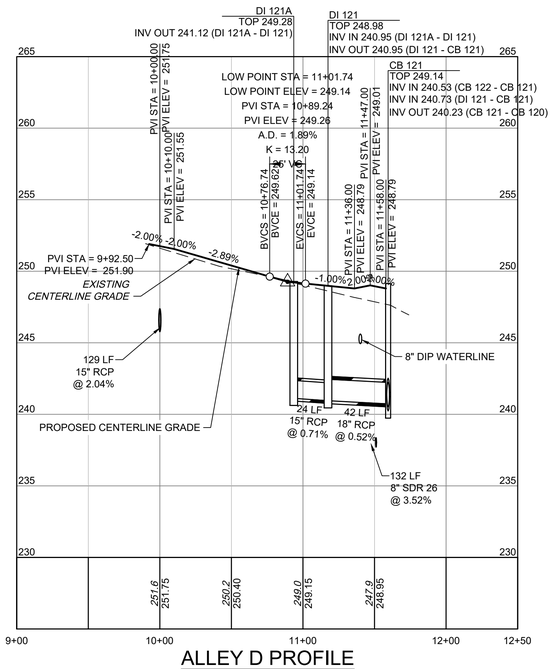
Docusign Envelope ID: A70618E2-0863-423C-B52C-85C38B959696



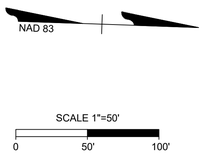
ALLEY D PLAN VIEW (STA 9+00 TO 12+50)

1" = 50'



ALLEY D PROFILE

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



UTILITY NOTES:

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY OF RALEIGH STANDARDS AND SPECIFICATIONS.
2. MINIMUM UTILITY HORIZONTAL SEPARATION DISTANCES:
   WATER AND SANITARY SEWER MAINS - 10 FT.
   WATER AND STORM SEWER MAINS - 5 FT.
   SANITARY SEWER AND STORM SEWER MAINS - 5 FT.
   GRAVITY SANITARY SEWER AND FORCE MAINS - 5 FT.
3. MINIMUM UTILITY VERTICAL SEPARATION DISTANCES:
   WATER AND SANITARY SEWER MAINS - 18 IN.
   WATER AND STORM SEWER MAINS - 18 IN.
   SANITARY SEWER AND STORM SEWER MAINS - 24 IN.
4. CLASS 1 STRUCTURAL MATERIAL REQUIRED FROM EXISTING GROUND TO SPRING LINE OF PROPOSED PIPE IN FILL CONDITIONS (TYP).

ALL SEWER SERVICES GREATER THAN 12' IN DEPTH TO USE DEEP SEWER SERVICE DETAIL

811 Know what's below. Call before you dig.

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.

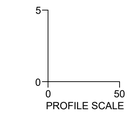
BY: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

Digitally signed by Samuel A. MacDonald
DN: cn=Samuel A. MacDonald, email=samuel.macdonald@timmons.com, O=A. Morton Thomas & Associates, Inc., C=North Carolina, S=MacDonald, G=Samuel A.
Reason: I am approving this document
Date: 2026.04.20 10:05:34-04'00'

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

Digitally signed by Gideon Smith
DN: cn=Gideon Smith, email=gsmith@knightdale.gov, O=Town of Knightdale, OU=Development Services, L=City Council Seat
Reason: I am approving this document
Date: 2026.04.20 10:05:34-04'00'



UTILITY LEGEND

SAN	PROPOSED SEWER LINE
8"W	PROPOSED WATER LINE
	WATER LINE TEE
	FIRE HYDRANT
	WATER METER
	REDUCER
	GATE VALVE
	BLOWOFF ASSEMBLY

RALEIGH WATER - PLANS AUTHORIZED FOR CONSTRUCTION
Any work authorized by this approval must proceed in accordance with the plans. This electronic approval may not be edited once issued. Any modification to this approval once issued will invalidate this approval.

Cydney Terry
2026.05.18 21:19:16-04'00'

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-4142

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-5503

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 ENGINEER TYLER JEFFREY CROSS
3/31/2026

THIS DRAWING PREPARED AT THE
RALEIGH OFFICE
5410 Trinity Road, Suite 102 | Raleigh, NC 27607
TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION

DATE

DATE 03/31/2026
DRAWN BY 331
DESIGNED BY 331
CHECKED BY T. CROSS
SCALE H: 1" = 50' V: 1" = 5'

TIMMONS GROUP

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA
NORTH CAROLINA LICENSE NO. C-1652
ALLEY D PROFILE

JOB NO. 51557
SHEET NO. C5.14

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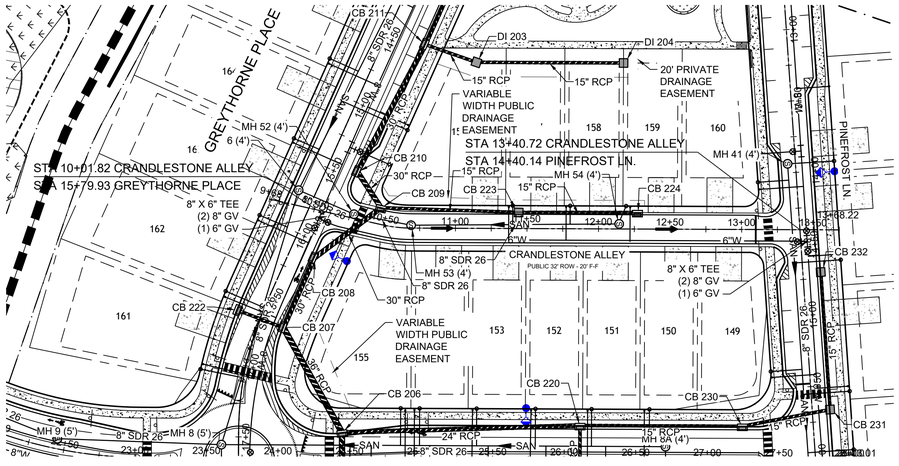


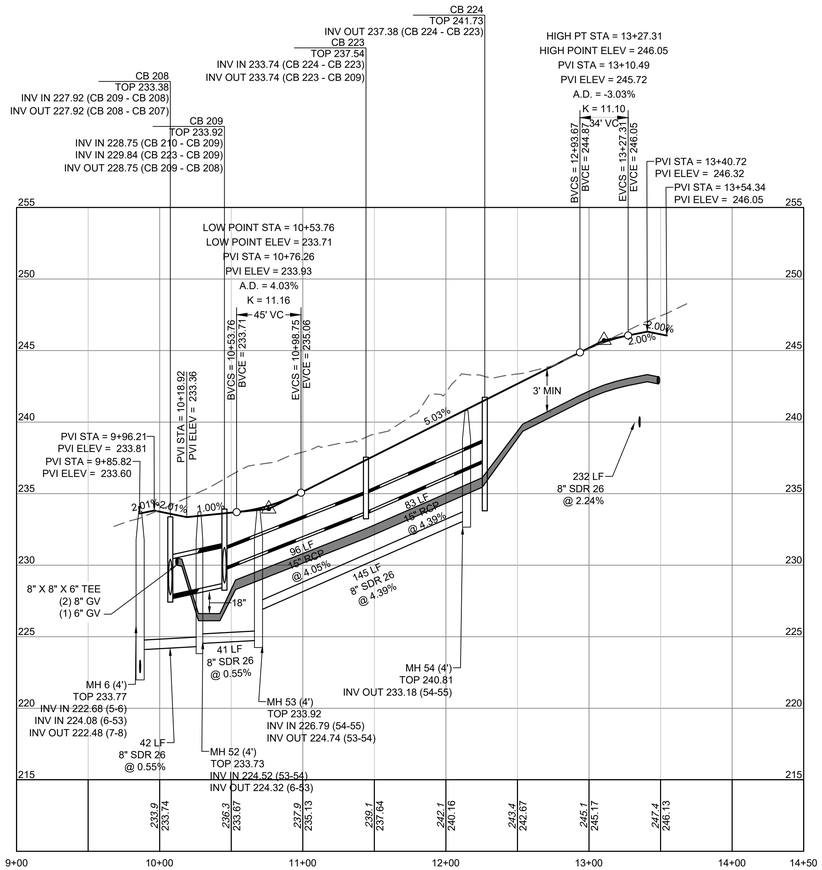
CRANDLESTONE ALLEY PLAN VIEW (STA 9+00 TO 14+50)

1" = 50'

NAD 83

SCALE 1"=50'

0 50' 100'



CRANDLESTONE ALLEY PROFILE

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

5
0
0 50
PROFILE SCALE

UTILITY NOTES:

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY OF RALEIGH STANDARDS AND SPECIFICATIONS.
2. MINIMUM UTILITY HORIZONTAL SEPARATION DISTANCES:
   WATER AND SANITARY SEWER MAINS - 10 FT.
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   SANITARY SEWER AND STORM SEWER MAINS - 24 IN.
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ALL SEWER SERVICES GREATER THAN 12' IN DEPTH TO USE DEEP SEWER SERVICE DETAIL

811 Know what's below. Call before you dig.

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: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

Digitally signed by Samuel A. MacDonald
DN: C=US, E=samuel.macdonald@knightdalenc.gov, O=N, Morton Thomas & Associates, Inc., CN=Samuel A. MacDonald
Reason: I am approving this document
Date: 2026.05.18 10:03:24-04'00'

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

Digitally signed by Gideon Smith
DN: C=US, E=gideon.smith@knightdalenc.gov, O=Town of Knightdale, OU=Development Services, CN=Gideon Smith
Reason: I am approving this document
Date: 2026.05.18 10:04:24-04'00'

UTILITY LEGEND

SAN	PROPOSED SEWER LINE
8"W	PROPOSED WATER LINE
	WATER LINE TEE
	FIRE HYDRANT
@	WATER METER
	REDUCER
	GATE VALVE
	BLOWOFF ASSEMBLY

RALEIGH WATER - PLANS AUTHORIZED FOR CONSTRUCTION
Any work authorized by this approval must proceed in accordance with the plans. This electronic approval may not be edited once issued. Any modification to this approval once issued will invalidate this approval.

Cydney Terry
2026.05.18 21:20:49-04'00'

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-4142

Public
Sewer Collection / Extension System
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City of Raleigh
Public Utilities Department Permit # S-5503

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 TYLER JEFFREY CROSS
3/31/2026

THIS DRAWING PREPARED AT THE
RALEIGH OFFICE
5410 Trinity Road, Suite 102 | Raleigh, NC 27607
TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION	DATE

DATE: 03/31/2026
DRAWN BY: 331
DESIGNED BY: 331
CHECKED BY: T. CROSS
SCALE: H: 1" = 50' V: 1" = 5'

TIMMONS GROUP

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA
NORTH CAROLINA LICENSE NO. C-1652
ALLEY E PROFILE

JOB NO. 51557
SHEET NO. C5.15

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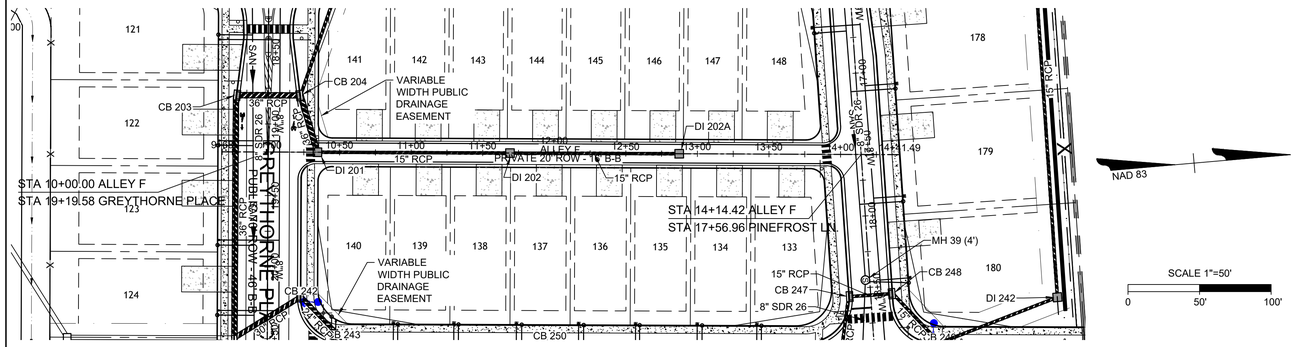
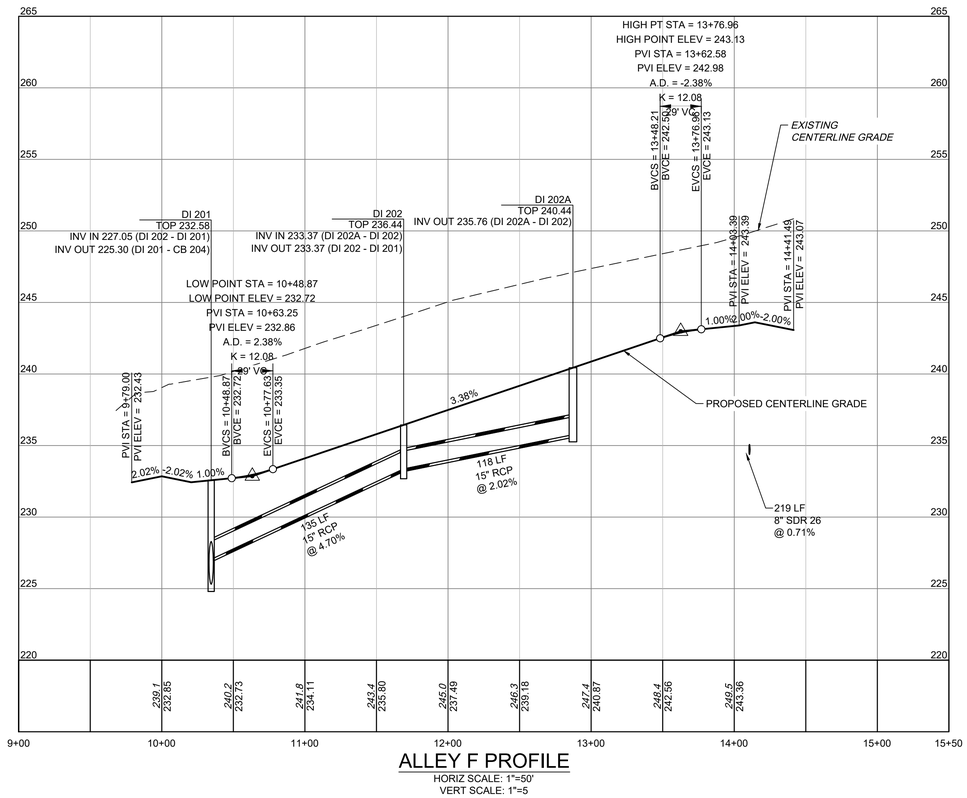


ALLEY F PLAN VIEW (STA 9+00 TO 15+50)

1" = 50'



ALLEY F PROFILE

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

UTILITY NOTES:

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY OF RALEIGH STANDARDS AND SPECIFICATIONS.
2. MINIMUM UTILITY HORIZONTAL SEPARATION DISTANCES:
   WATER AND SANITARY SEWER MAINS - 10 FT.
   WATER AND STORM SEWER MAINS - 5 FT.
   SANITARY SEWER AND STORM SEWER MAINS - 5 FT.
   GRAVITY SANITARY SEWER AND FORCE MAINS - 5 FT.
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TOWN CERTIFICATION

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BY: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

5
0
0
50
PROFILE SCALE

UTILITY LEGEND

- SAN — PROPOSED SEWER LINE
- 8"W — PROPOSED WATER LINE
- WATER LINE TEE
- FIRE HYDRANT
- WATER METER
- REDUCER
- GATE VALVE
- BLOWOFF ASSEMBLY

RALEIGH WATER - PLANS AUTHORIZED FOR CONSTRUCTION
Any work authorized by this approval must proceed in accordance with the plans. This electronic approval may not be edited once issued. Any modification to this approval once issued will invalidate this approval.
Cydney Terry
2026.05.18 21:22:33-04'00'

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-4142

Public
Sewer Collection / Extension System
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City of Raleigh
Public Utilities Department Permit # S-5503

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 TYLER JEFFREY CROSS
3/31/2026

THIS DRAWING PREPARED AT THE
RALEIGH OFFICE
5410 Trinity Road, Suite 102 | Raleigh, NC 27607
TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION	DATE

DATE: 03/31/2026
DRAWN BY: 331
DESIGNED BY: 331
CHECKED BY: T. CROSS
SCALE: H: 1" = 50' V: 1" = 5'
JOB NO.: 51557
SHEET NO.: C5.16

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA
ALLEY F PROFILE

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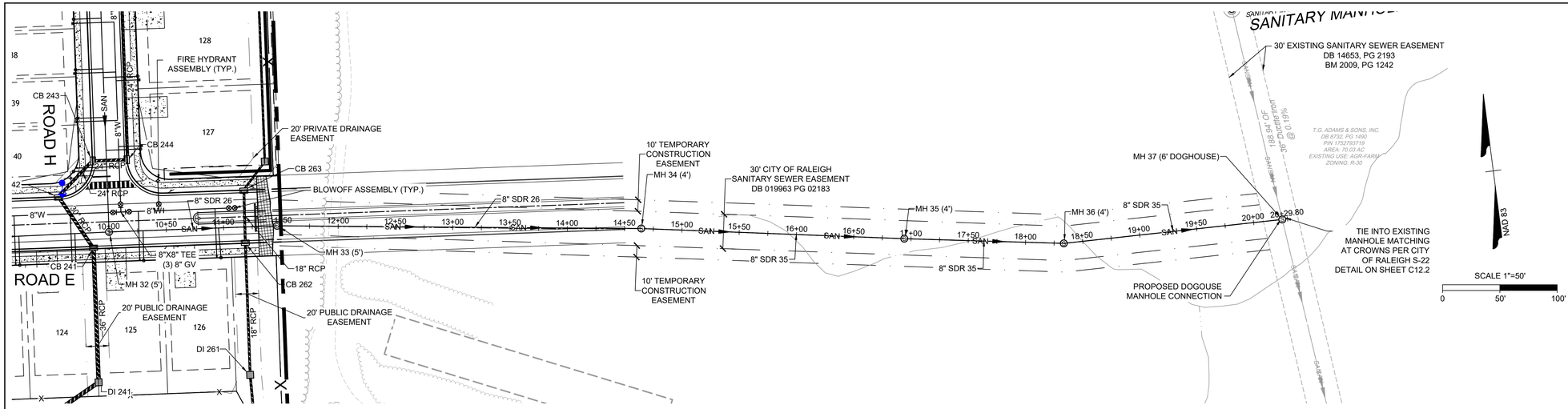

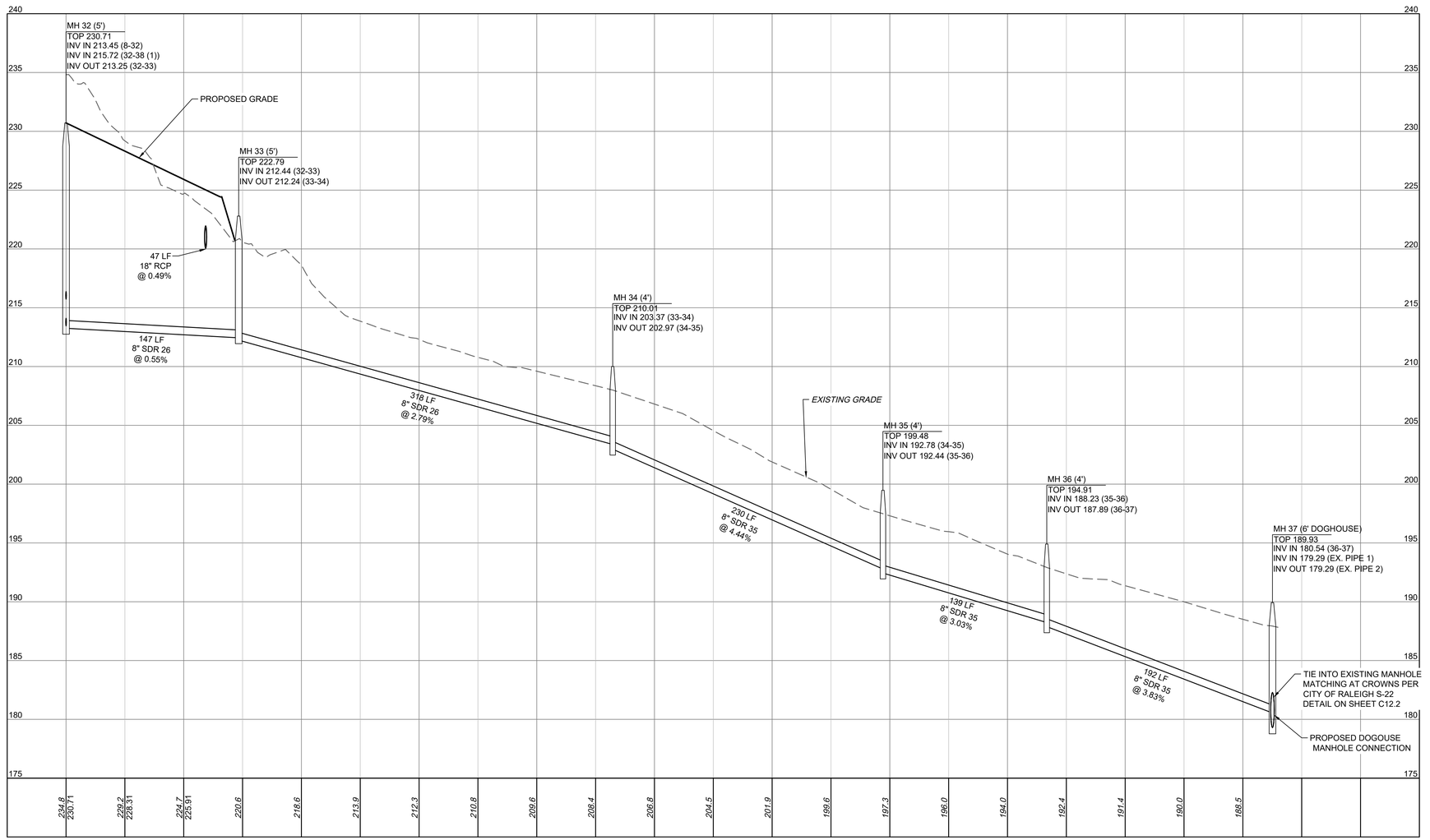

SANITARY SEWER OUTFALL PROFILE

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

UTILITY NOTES:

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY OF RALEIGH STANDARDS AND SPECIFICATIONS.
2. MINIMUM UTILITY HORIZONTAL SEPARATION DISTANCES:
   WATER AND SANITARY SEWER MAINS - 10 FT.
   WATER AND STORM SEWER MAINS - 5 FT.
   SANITARY SEWER AND STORM SEWER MAINS - 5 FT.
   GRAVITY SANITARY SEWER AND FORCE MAINS - 5 FT.
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   WATER AND STORM SEWER MAINS - 18 IN.
   SANITARY SEWER AND STORM SEWER MAINS - 24 IN.
4. CLASS 1 STRUCTURAL MATERIAL REQUIRED FROM EXISTING GROUND TO SPRING LINE OF PROPOSED PIPE IN FILL CONDITIONS (TYP).

ALL SEWER SERVICES GREATER THAN 12' IN DEPTH TO USE DEEP SEWER SERVICE DETAIL

811 Know what's below. Call before you dig.

TOWN CERTIFICATION

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BY: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

NOTE: FILL SECTION AT ALL MANHOLES SHOWN ON PROFILE SHALL BE TESTED BY A GEOTECHNICAL FIRM AND TEST RESULTS PROVIDED TO WAKE COUNTY.

5
0
0
50
PROFILE SCALE

UTILITY LEGEND

SAN	PROPOSED SEWER LINE
8"W	PROPOSED WATER LINE
	WATER LINE TEE
	FIRE HYDRANT
	WATER METER
	REDUCER
	GATE VALVE
	BLOWOFF ASSEMBLY

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-4142

Public
Sewer Collection / Extension System
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City of Raleigh
Public Utilities Department Permit # S-5503

RALEIGH WATER - PLANS AUTHORIZED FOR CONSTRUCTION
Any work authorized by this approval must proceed in accordance with the plans. This electronic approval may not be edited once issued. Any modification to this approval once issued will invalidate this approval.

Cydney Terry
2026.05.18 21:23:56-04'00'

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 TYLER JEFFREY CROSS

3/31/2026

THIS DRAWING PREPARED AT THE
RALEIGH OFFICE
5410 Trinity Road, Suite 102 | Raleigh, NC 27607
TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION

DATE

DATE: 03/31/2026
DRAWN BY: 331
DESIGNED BY: 331
CHECKED BY: T. CROSS
SCALE: H: 1" = 50' V: 1" = 5'

JOB NO. 51557
SHEET NO. C5.17

TIMMONS GROUP

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA
NORTH CAROLINA LICENSE NO. C-1652
SEWER OUTFALL PLAN & PROFILE

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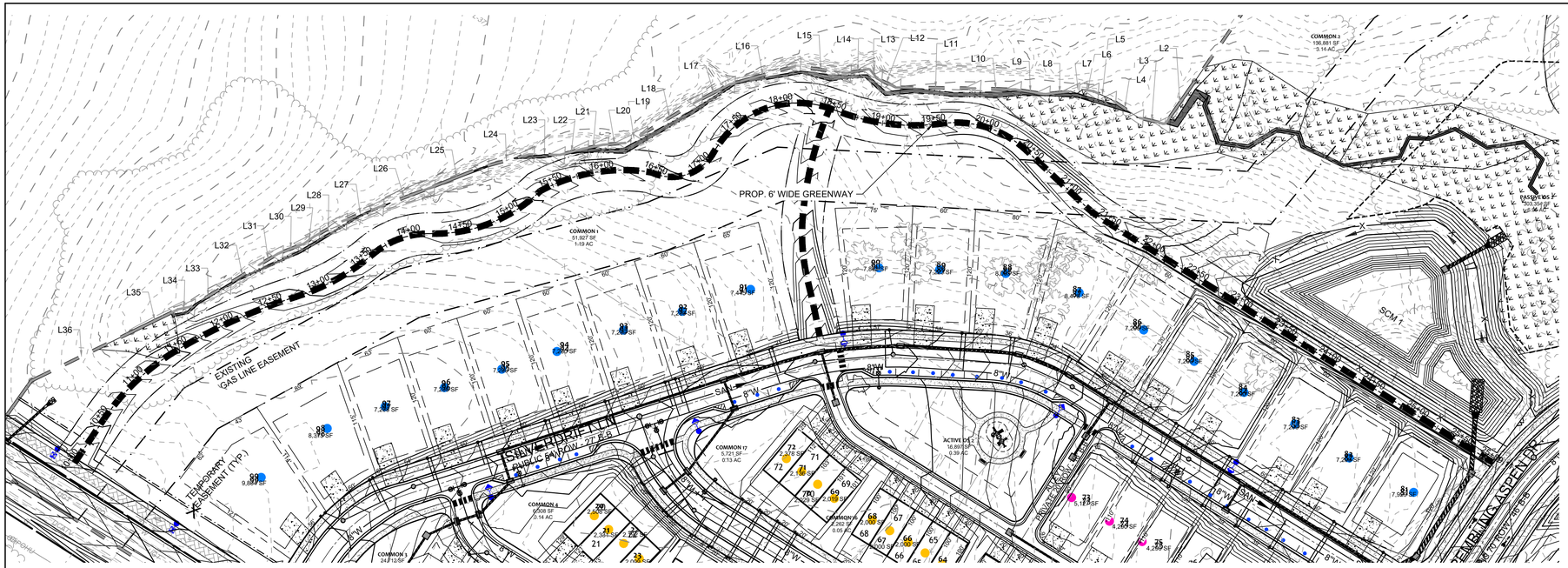
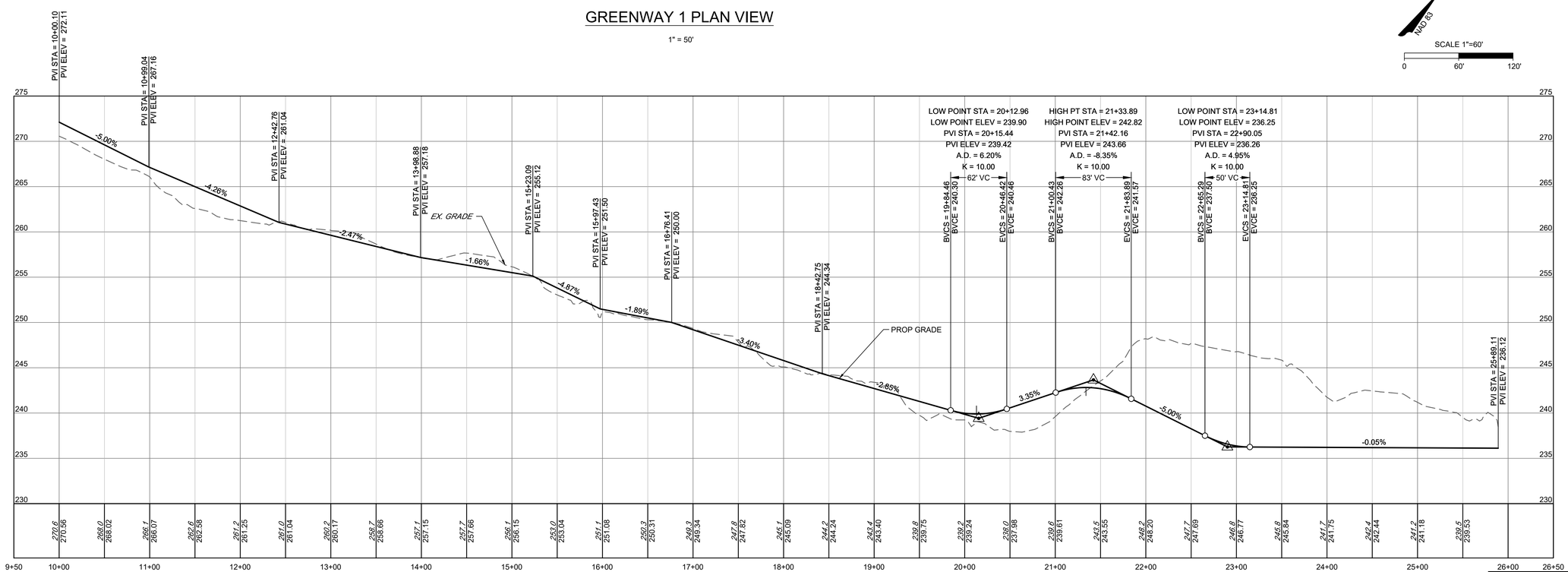


GREENWAY 1 PLAN VIEW

1" = 50'



GREENWAY 1 PROFILE

HORIZ SCALE: 1"=60'
VERT SCALE: 1"=6

6
0
0
60
PROFILE SCALE

UTILITY NOTES:

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY OF RALEIGH STANDARDS AND SPECIFICATIONS.
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BY: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

Digitally signed by Samuel A. MacDonald
DN: cn=Samuel A. MacDonald, o=Knightdale Engineering, ou=Engineering, email=smacdonald@knightdalenc.gov, c=US
Reason: I am approving this document
Date: 2026.03.30 14:03:37-04'00'

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

Digitally signed by Gideon Smith
DN: cn=Gideon Smith, o=Knightdale Development Services, ou=Town of Knightdale, email=gsmith@knightdalenc.gov, c=US
Reason: I am approving this document
Date: 2026.03.31 10:43:22-04'00'

UTILITY LEGEND

SAN	PROPOSED SEWER LINE
8"W	PROPOSED WATER LINE
	WATER LINE TEE
	FIRE HYDRANT
	WATER METER
	REDUCER
	GATE VALVE
	BLOWOFF ASSEMBLY

Public
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City of Raleigh
Public Utilities Department Permit # W-4142

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City of Raleigh
Public Utilities Department Permit # S-5503

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 ENGINEER TYLER JEFFREY CROSS
3/31/2026

THIS DRAWING PREPARED AT THE
RALEIGH OFFICE
5410 Trinity Road, Suite 102 | Raleigh, NC 27607
TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION	DATE

DATE: 03/31/2026
DRAWN BY: 331
DESIGNED BY: 331
CHECKED BY: T. CROSS
SCALE: H: 1" = 60' V: 1" = 6'
JOB NO.: 51557
SHEET NO.: C5.18

TIMMONS GROUP

NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS

KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

GREENWAY PROFILE - SHEET 1 OF 2

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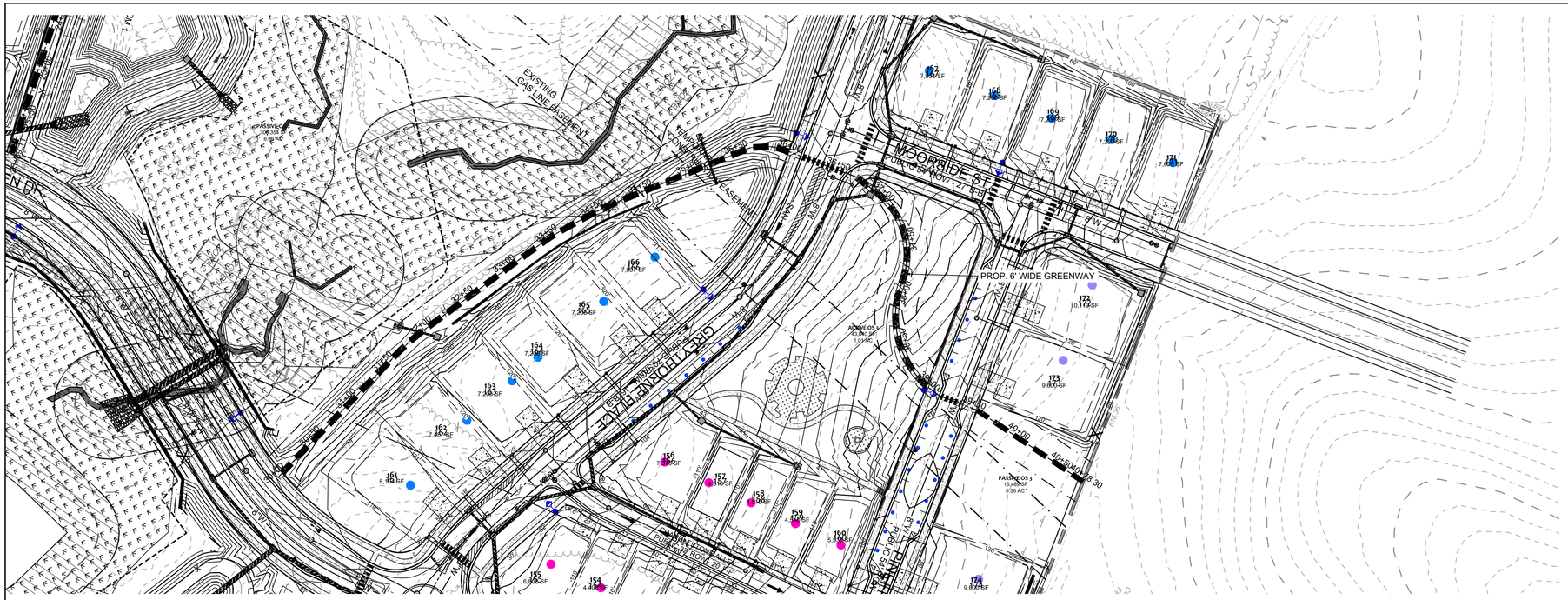
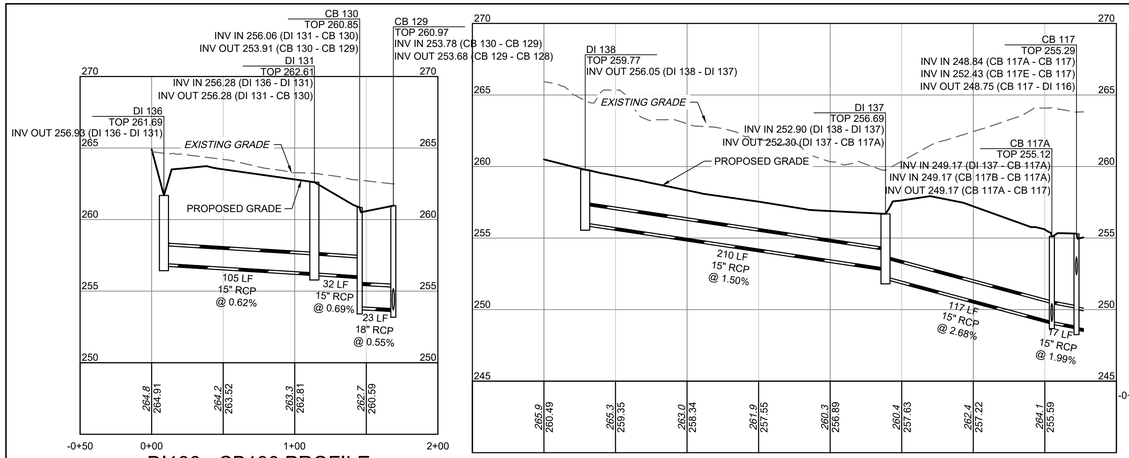

EXISTING GAS LINE EASEMENT
EXISTING 30' SANITARY SEWER EASEMENT
EXISTING 30' SANITARY SEWER EASEMENT
EXISTING 30' SANITARY SEWER EASEMENT
MOORRIDE ST
PROP. 8' WIDE GREENWAY
OAK VISTA DR
OAK VISTA DR
PROP. 6' WIDE GREENWAY
PROP. 8' WIDE GREENWAY

Docusign Envelope ID: A70618E2-0863-423C-B52C-85C38B959696

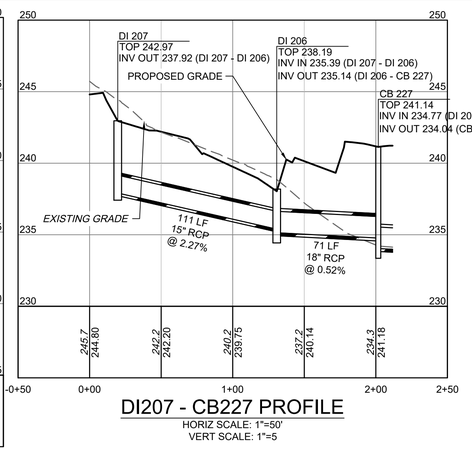


DI136 - CB130 PROFILE

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

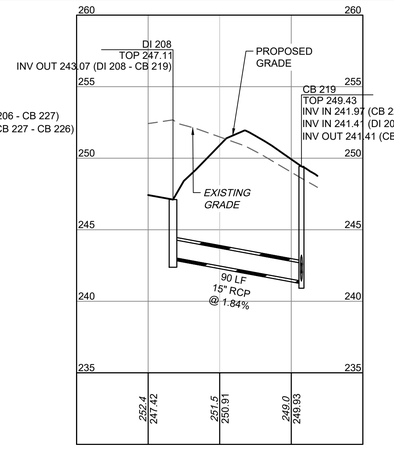
DI138 - CB117 PROFILE

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



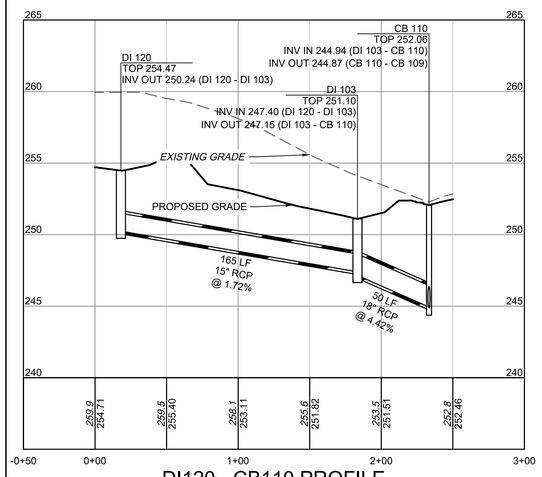
DI207 - CB227 PROFILE

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



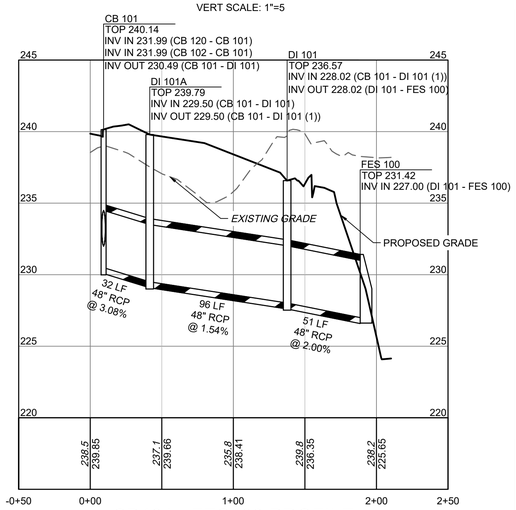
DI208 - CB219 PROFILE

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



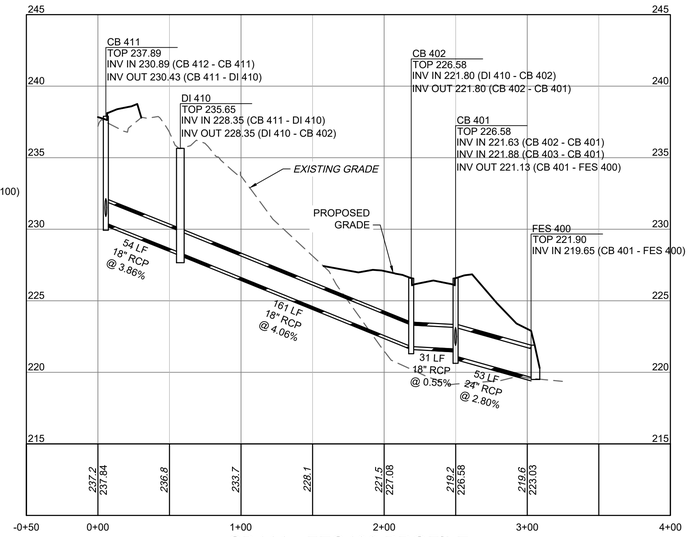
DI120 - CB110 PROFILE

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



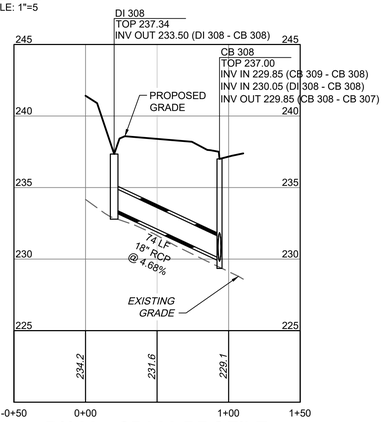
CB101 - FES100 PROFILE

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



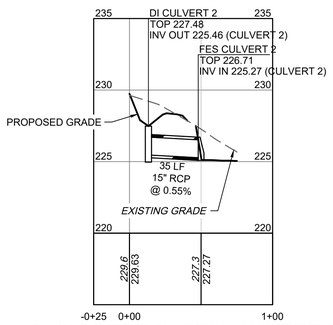
CB411 - FES400 PROFILE

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



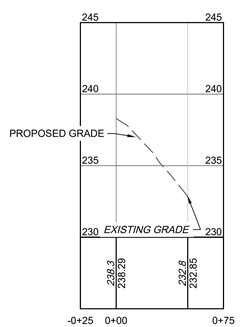
DI308 - CB308 PROFILE

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



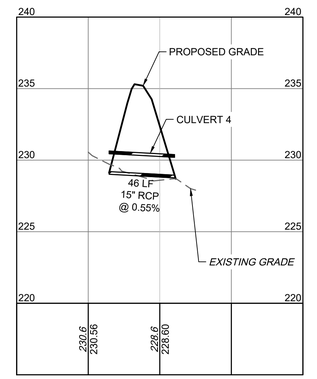
DI CULVERT 2 - FES CULVERT 2

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



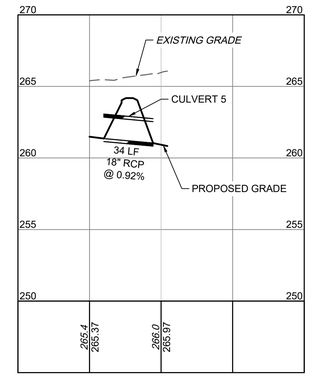
DI CULVERT 3 - FES CULVERT 3

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



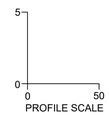
CULVERT 4 PROFILE

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



CULVERT 5 PROFILE

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



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: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

Digitally signed by Samuel A. MacDonald
DN: C=US, O=timmonsgroup.com, OU=A, Motion Thomas & Engineers, Inc., CN=Samuel A. MacDonald
Reason: I am approving this document
Date: 2026.03.31 10:03:54 -04'00'

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

Digitally signed by Gideon Smith
DN: C=US, O=admin.smithg@knightdalenc.gov, OU=Town of Knightdale, CN=Gideon Smith, E=admin.smithg@knightdalenc.gov
Reason: I am approving this document
Date: 2026.04.02 07:58:36 -04'00'

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-4142

Public
Sewer Collection / Extension System

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City of Raleigh
Public Utilities Department Permit # S-5503

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 TYLER JEFFREY CROSS
3/31/2026

THIS DRAWING PREPARED AT THE
RALEIGH OFFICE
5410 Trinity Road, Suite 102 | Raleigh, NC 27607
TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION	DATE

DATE: 03/31/2026
DRAWN BY: 331
DESIGNED BY: 331
CHECKED BY: T. CROSS
SCALE: H: 1" = 50' V: 1" = 5

TIMMONS GROUP

NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS

KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

STORM OUTFALL PROFILES

JOB NO. 51557
SHEET NO. C6.1

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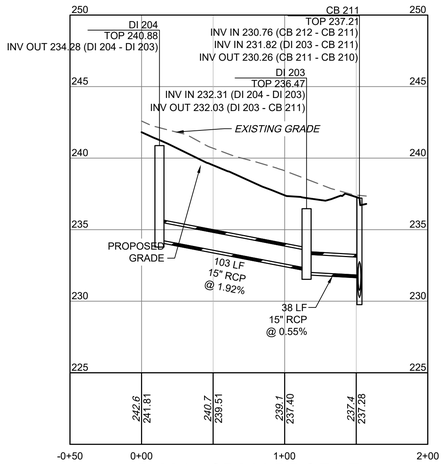
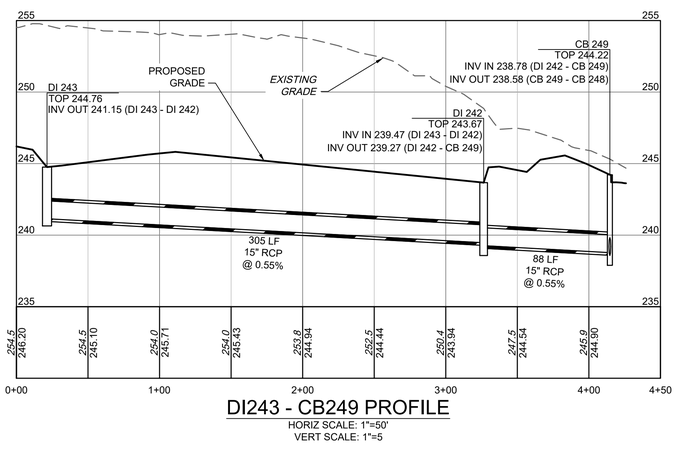


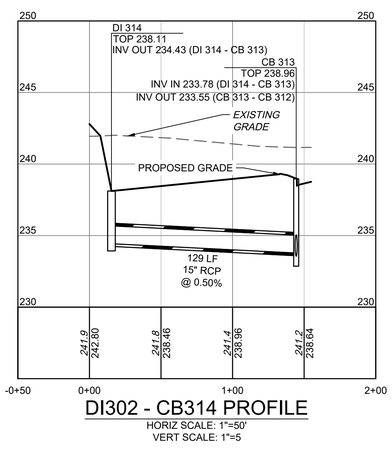
DI204 - CB211 PROFILE

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



DI243 - CB249 PROFILE

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



DI302 - CB314 PROFILE

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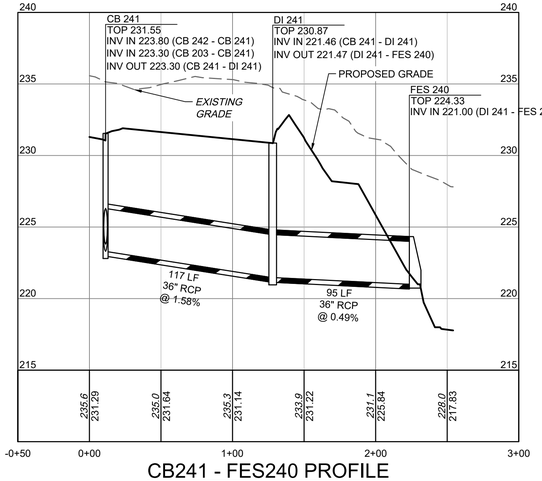
VERT SCALE: 1"=5



CB241 - FES240 PROFILE

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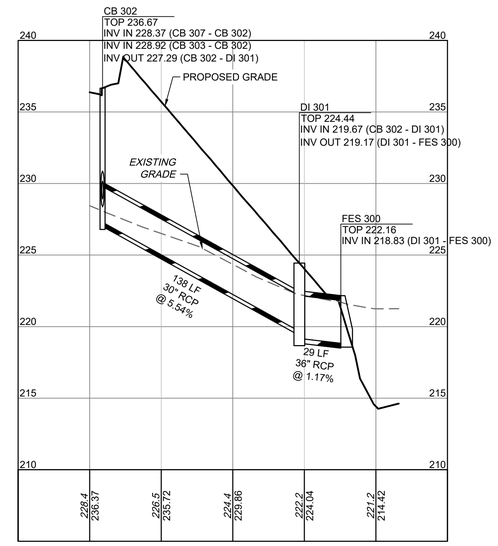
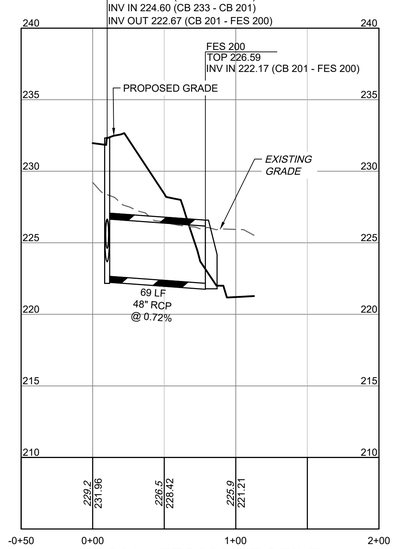
VERT SCALE: 1"=5



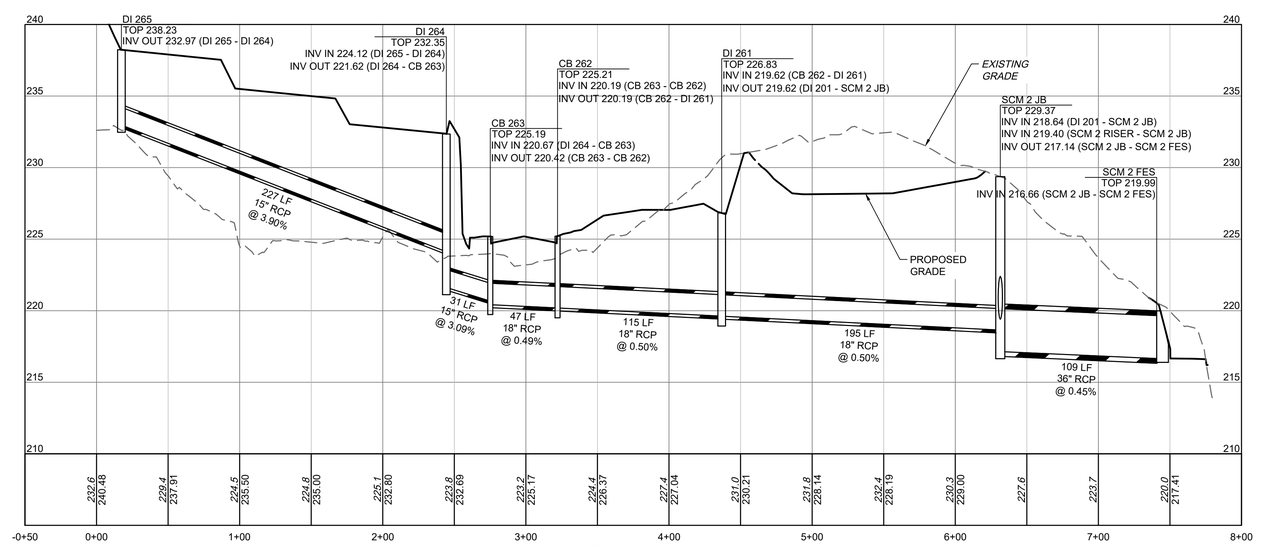
CB301 - FES300 PROFILE

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



CB201 - FES220 PROFILE

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



DI265 - SCM2FES PROFILE

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

5
0
0 50
PROFILE SCALE

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: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

Digitally signed by Samuel A. MacDonald
DN: C=US, E=samacdonald@knightdalenc.gov, O=N, Mailstop Thomas & Hutton, L=Raleigh, S=North Carolina, CN=Samuel A. MacDonald
Reason: I am approving this document
Date: 2026.04.10 10:58:17-04'00'

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

Digitally signed by Gideon Smith
DN: C=US, E=gsmith@knightdalenc.gov, O=Town of Knightdale, OU=Development Services, CN=Gideon Smith
Reason: I am approving this document
Date: 2026.04.10 10:58:34-04'00'

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-4142

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-5503

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 ENGINEER TYLER JEFFREY CROSS

3/31/2026

THIS DRAWING PREPARED AT THE
RALEIGH OFFICE
5410 Trinity Road, Suite 102 | Raleigh, NC 27607
TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION

DATE

DATE: 03/31/2026
DRAWN BY: 331
DESIGNED BY: 331
CHECKED BY: T. CROSS
SCALE: H: 1" = 50' V: 1" = 5

TIMMONS GROUP

NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS

KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

STORM OUTFALL PROFILES

JOB NO. 51557
SHEET NO. C6.2

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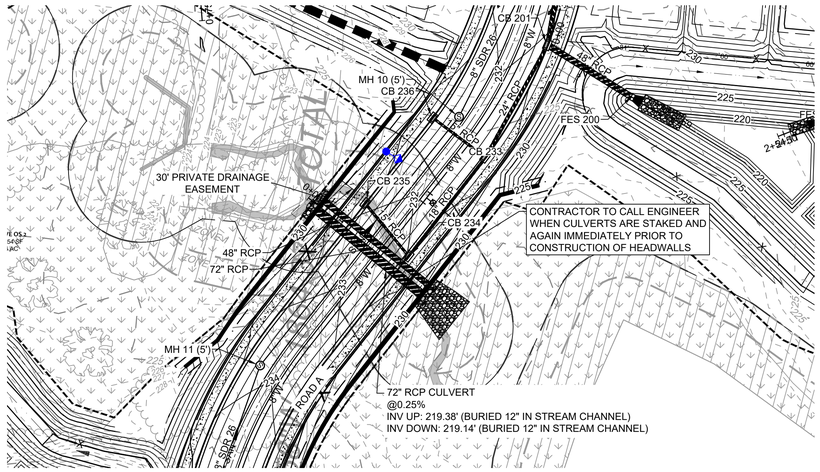
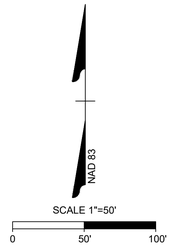
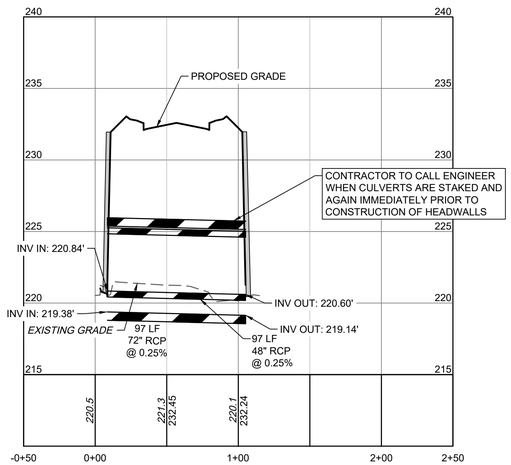




SCALE 1"=50'

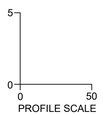
0 50' 100'

ALL CONSTRUCTION TO BE IN ACCORDANCE WITH ALL TOWN OF KNIGHTDALE AND NCDOT STANDARDS, SPECIFICATIONS, AND DETAILS.



CULVERT PROFILE

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



PROFILE SCALE

Know what's **below.** **Call** before you dig.

LEGEND

- PROPERTY LINE
- PROPOSED RIGHT-OF-WAY
- ADJACENT PROPERTY LINE
- PHASE LINE
- PROPOSED CONTOUR
- EXISTING CONTOUR
- FENCE
- PROPOSED DRAIN EASEMENT
- PROPOSED PERIMETER BUFFER
- TREE PROTECTION FENCE
- 100-YR FLOODPLAIN
- WETLANDS
- NUESE RIPARIAN BUFFER
- LANDSCAPE BUFFER

NOTE:
RETAINING WALL AND ASSOCIATED DRAINAGE TO BE DESIGNED BY OTHERS. CONTRACTOR SHALL COORDINATE DESIGN AND SUBMIT SEALED PLAN FOR REVIEW AND APPROVAL BY THE TOWN INSPECTIONS DEPARTMENT.

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: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

Digitally signed by Samuel A. MacDonald
DN: cn=Samuel A. MacDonald, E=SamuelMacDonald@timmonsgroup.com, O=TA, Mortion Thomas & Associates, Inc., OU=Engineering, C=US
Reason: I am approving this document
Date: 2026.04.08 10:54:29 -04'00'

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

Digitally signed by Gideon Smith
DN: cn=Gideon Smith, E=gsmith@knightdale-nc.gov, O=Town of Knightdale, OU=Development Services, Title=Director, C=US
Reason: I am approving this document
Date: 2026.04.10 10:07:24 -04'00'

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-4142

Public
Sewer Collection / Extension System
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City of Raleigh
Public Utilities Department Permit # S-5503

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 ENGINEER TYLER JEFFREY CROSS

3/31/2026

THIS DRAWING PREPARED AT THE
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5410 Trinity Road, Suite 102 | Raleigh, NC 27607
TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

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REVISION DESCRIPTION	DATE

DATE: 03/31/2026
DRAWN BY: 331
DESIGNED BY: 331
CHECKED BY: T. CROSS
SCALE: H: 1" = 50' V: 1" = 5'
JOB NO.: 51557
SHEET NO.: C6.3

TIMMONS GROUP

HAVEN AT GRIFFITH MEADOWS

KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

NORTH CAROLINA LICENSE NO. C-1652

CULVERT PLAN & PROFILE

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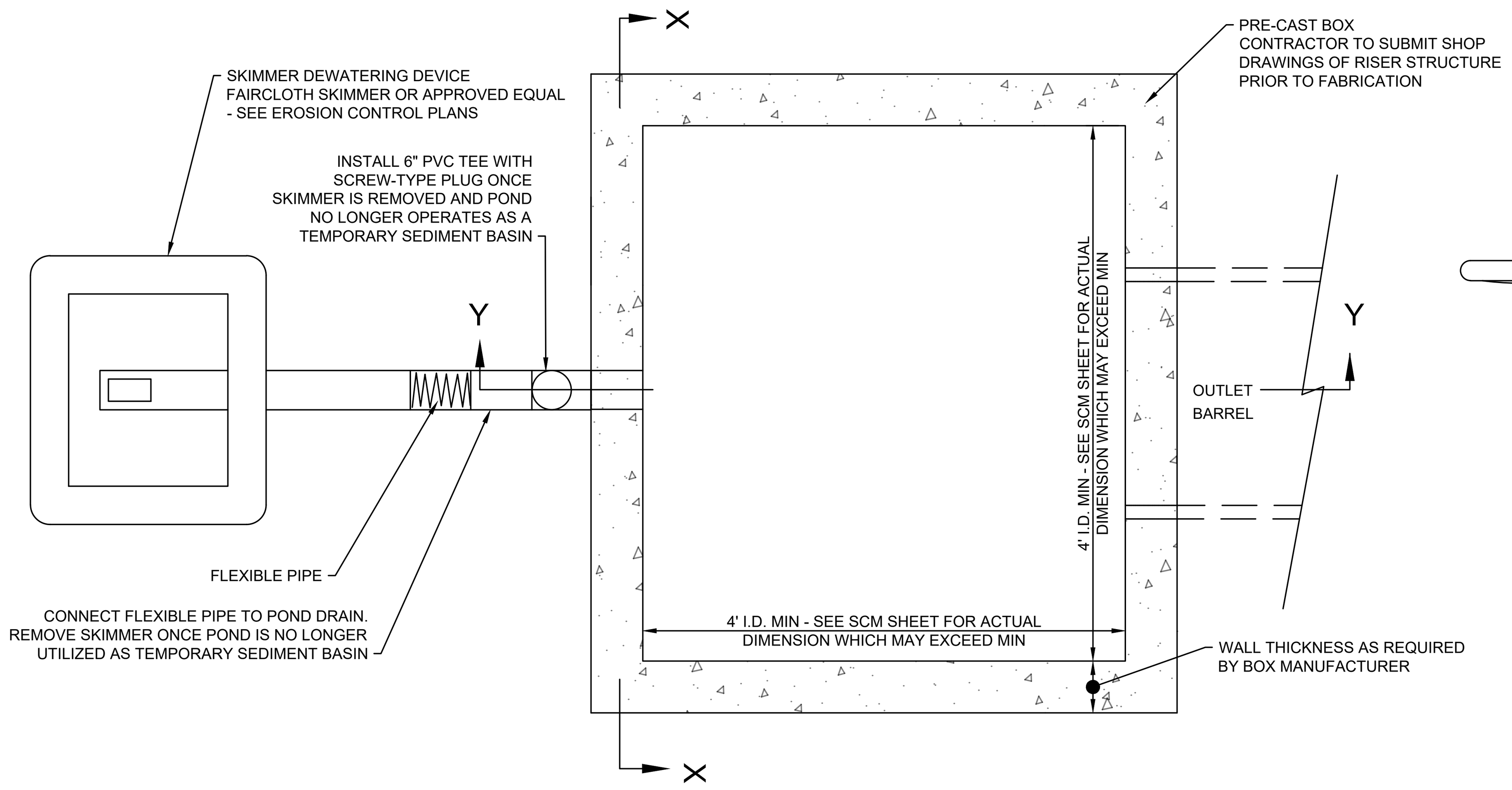
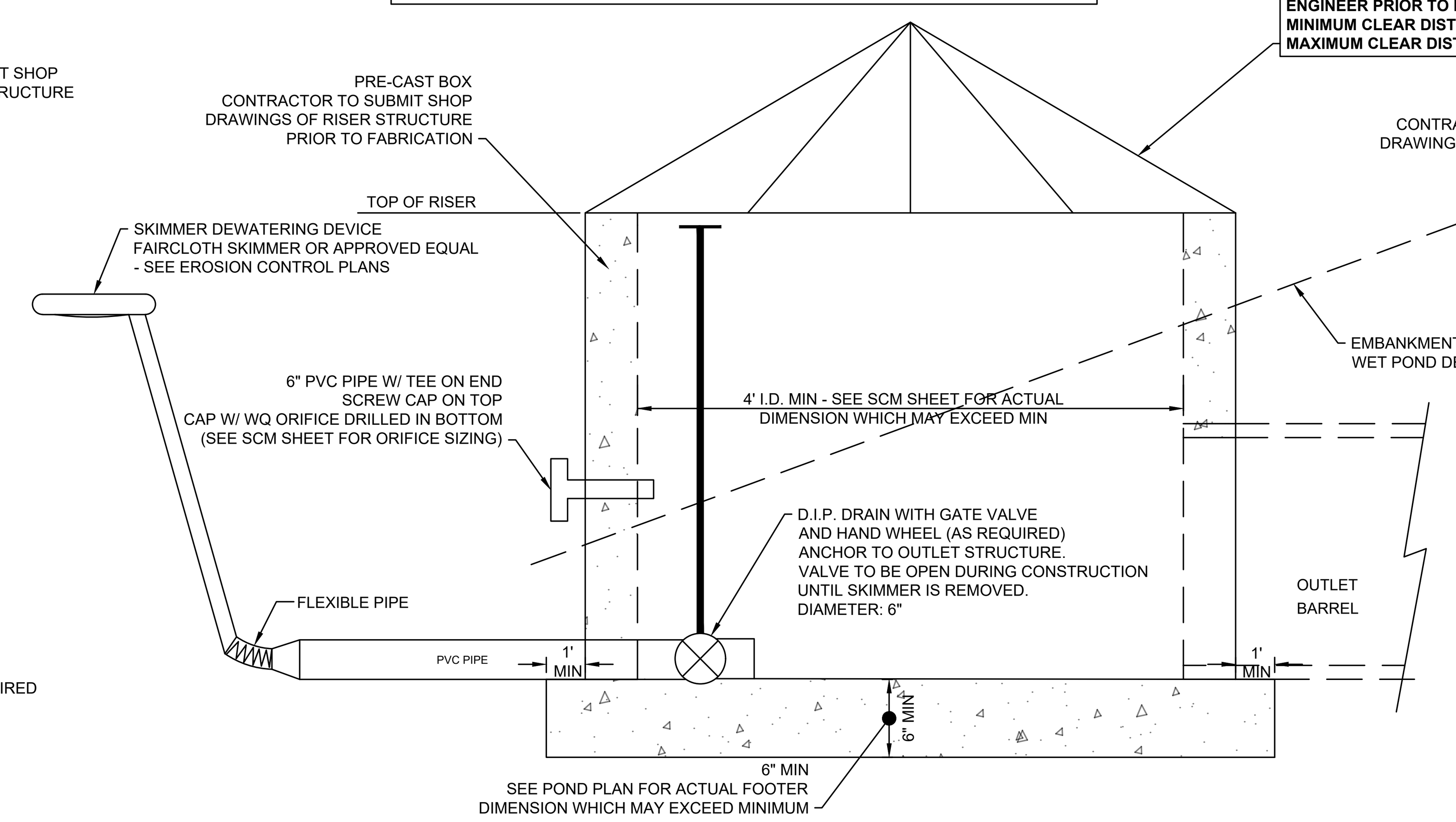
PERMANENT OUTLET "RISER" STRUCTURE NOTES & DETAILS

NOT TO SCALE



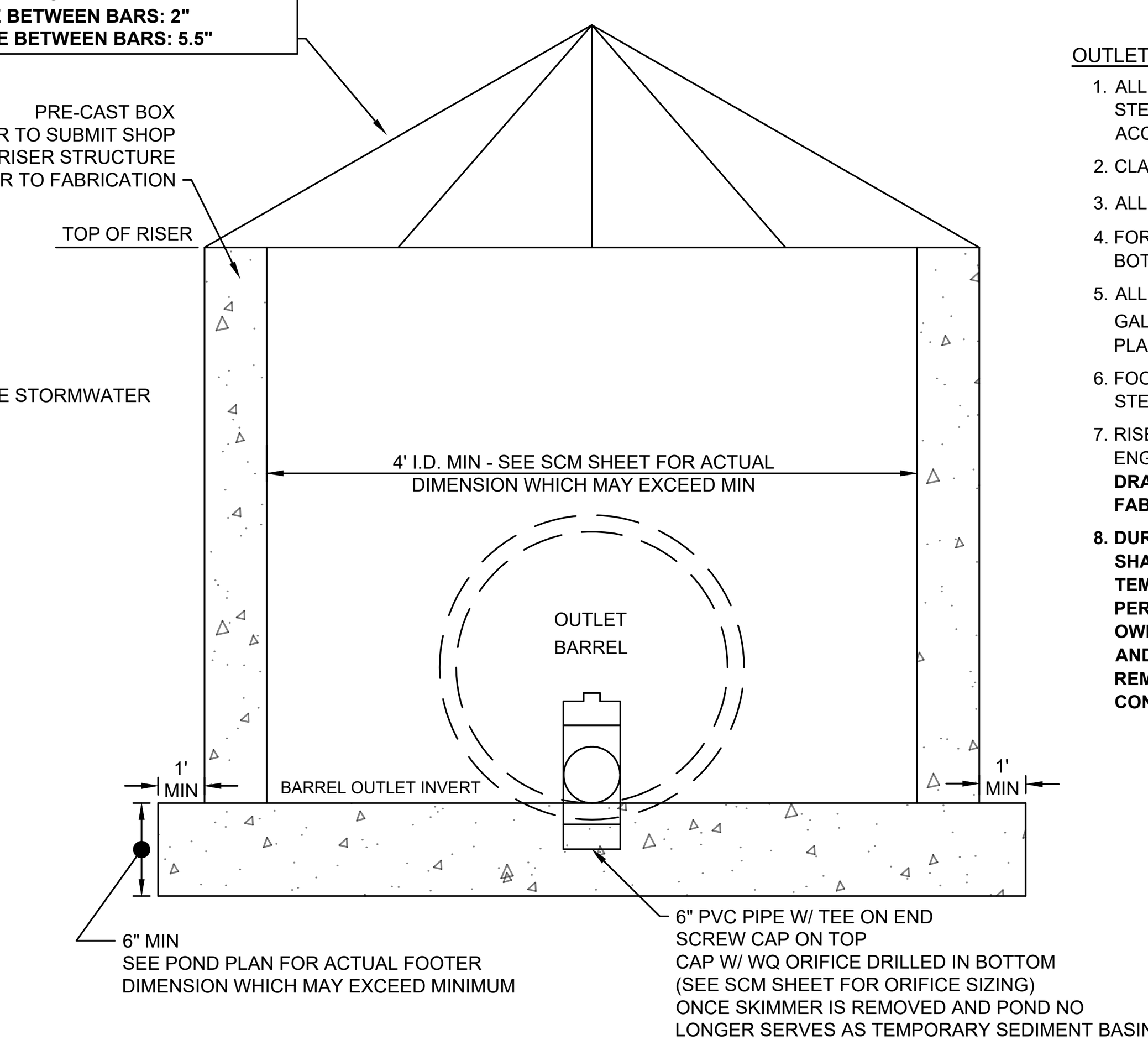
PLAN VIEW

NOT TO SCALE



SECTION Y-Y

NOT TO SCALE



SECTION X-X

NOT TO SCALE

OUTLET STRUCTURE / RISER NOTES:

1. ALL STRUCTURES OVER 3'-6" IN DEPTH TO BE PROVIDED WITH STEPS 12" ON-CENTERS VERTICALLY. STEPS SHALL BE IN ACCORDANCE WITH NCDOT RSD 840.66 OR APPROVED EQUAL.
2. CLASS "B" CONCRETE TO BE USED THROUGHOUT.
3. ALL MORTAR JOINTS (IF APPLICABLE) ARE $\frac{1}{2}$" +/- $\frac{1}{8}$".
4. FORMS ARE TO BE USED FOR THE CONSTRUCTION OF THE BOTTOM SLAB.
5. ALL RISER JOINTS SHALL BE WATER-TIGHT AND HAVE (4) GALVANIZED STEEL PLATES 10"x10"x$\frac{1}{4}$" TH WITH (4) $\frac{1}{2}$" BOLTS PER PLATE.
6. FOOTER SHALL BE SECURED TO RISER WITH STRUCTURAL STEEL.
7. RISER SHALL BE ENGINEERED BY PRECASTER'S STRUCTURAL ENGINEER TO RESIST BUOYANCY FORCES. **SUBMIT SHOP DRAWINGS OF RISER STRUCTURE TO ENGINEER PRIOR TO FABRICATION.**
8. **DURING EROSION CONTROL STAGES, ALL RISER ORIFICES SHALL BE TEMPORARILY PLUGGED, EXCEPT FOR THE TEMPORARY SKIMMER. AT TIME OF SKIMMER REMOVAL, WITH PERMISSION FROM EROSION CONTROL PERMITTING AGENCY, OWNER, AND ENGINEER, THE DRAIN VALVE SHALL BE CLOSED AND ALL RISER ORIFICES SHALL BE UNPLUGGED. SEE BASIN REMOVAL/CONVERSION SEQUENCE ON APPROVED EROSION CONTROL PLANS.**

STORMWATER WET POND NOTES & DETAILS

NOT TO SCALE

GENERAL NOTES:

1. MINIMUM DENSITY SHALL NOT BE LESS THAN 95% OF MAXIMUM DRY DENSITY WITH MOISTURE CONTENT WITHIN +/- 2% OF THE OPTIMUM. EACH LIFT OF FILL SHALL BE COMPACTED AS NECESSARY TO OBTAIN THAT DENSITY. ALL COMPACTION IS DETERMINED PER AASHTO METHOD T-99 (STANDARD PROCTOR).
2. DAM EMBANKMENT IS TO BE SEEDED IMMEDIATELY AFTER DAM CONSTRUCTION IS COMPLETE.
3. **STORMWATER MANAGEMENT STRUCTURE IS TO BE UTILIZED AS A TEMPORARY EROSION CONTROL DEVICE INITIALLY. ONCE CONSTRUCTION IS COMPLETED, UPSTREAM SURFACES HAVE BEEN PERMANENTLY STABILIZED, AND APPROVAL HAS BEEN ISSUED BY EROSION CONTROL AUTHORITY, OWNER, AND ENGINEER, CONTRACTOR IS TO REMOVE ALL SEDIMENT FROM BASIN AND CONVERT TO PERMANENT WATER QUALITY STRUCTURE. THIS INCLUDES INSTALLING THE PROPOSED PLANTINGS ALONG THE LITTORAL SHELF, IF APPLICABLE.**
4. **DO NOT REMOVE ANY EROSION AND SEDIMENT CONTROL MEASURES UNTIL ALL CONTRIBUTING AREAS HAVE BEEN PERMANENTLY STABILIZED AND APPROVAL HAS BEEN RECEIVED FROM THE EROSION CONTROL AUTHORITY, OWNER, AND ENGINEER.**

DAM EMBANKMENT CONSTRUCTION NOTES:

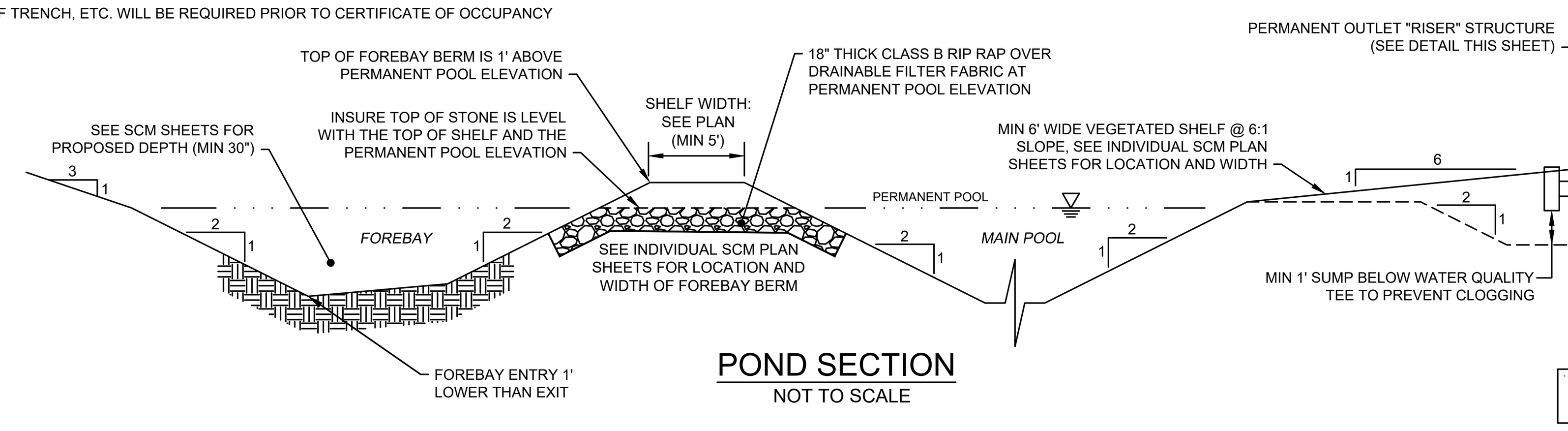
1. CONSTRUCTION OF THIS DAM SHALL BE DONE UNDER THE OBSERVATION OF A QUALIFIED GEOTECHNICAL ENGINEER, WHO IS A REGISTERED PROFESSIONAL ENIGINEER IN THE STATE OF NORTH CAROLINA. CONTROLLED FILL, AS SPECIFIED BY THE GEOTECHNICAL ENGINEER, IN THE DAM EMBANKMENT SHALL BE PLACED IN 6-INCH LOOSE LAYERS (3-INCH LOOSE LAYERS WITHIN 3-FEET OF EITHER SIDE OF THE PRINCIPAL SPILLWAY PIPE TO A DEPTH OF 2-FEET OVER THE PIPE) AND SHALL BE COMPACTED TO A DENSITY OF NO LESS THAN 95% OF THE STANDARD PROCTOR MAXIMUM DENSITY AT A MOISTURE CONTENT OF + OR - TWO PERCENTAGE POINTS OF THE OPTIMUM MOISTURE CONTENT IN ACCORDANCE WITH ASTM D698.
2. ALL VISIBLE ORGANIC DEBRIS SUCH AS ROOTS AND LIMBS SHALL BE REMOVED FROM THE FILL MATERIAL PRIOR TO COMPACTION TO THE REQUIRED DENSITY. SOILS WITH ORGANIC MATTER CONTENT EXCEEDING 5% BY WEIGHT SHALL NOT BE USED. STONES GREATER THAN 3-INCH (IN ANY DIRECTION) SHALL BE REMOVED FROM THE FILL PRIOR TO COMPACTION.
3. FILL MATERIAL PLACED AT DENSITIES LOWER THAN SPECIFIED MINIMUM DENSITIES OR AT MOISTURE CONTENTS OUTSIDE THE SPECIFIED RANGES OR OTHERWISE NOT CONFORMING TO SPECIFIED REQUIREMENTS SHALL BE REMOVED AND REPLACED WITH ACCEPTABLE MATERIALS.
4. ANY FILL LAYER THAT IS SMOOTH DRUM ROLLED TO REDUCE MOISTURE PENETRATION DURING A STORM EVENT SHALL BE PROPERLY SCARIFIED PRIOR TO THE PLACEMENT OF THE NEXT SOIL LIFT.
5. SURFACE WATER AND STREAM FLOW SHALL BE CONTINUOUSLY CONTROLLED THROUGHOUT CONSTRUCTION AND THE PLACEMENT OF CONTROLLED FILL.
6. FOUNDATION AREAS MAY REQUIRE UNDERCUTTING OF COMPRESSIBLE AND/OR UNSUITABLE SOILS IN ADDITION TO THAT INDICATED ON THE PLANS. ALL SUCH UNDERCUTTING SHALL BE PERFORMED AT THE DISCRETION OF THE GEOTECHNICAL ENGINEER AND SHALL BE MONITORED AND DOCUMENTED. IN NO CASE SHALL THERE BE AN ATTEMPT TO STABILIZE ANY PORTIONS OF THE FOUNDATION SOILS WITH CRUSHED STONE.
7. TREATMENT OF SEEPAGE AREAS, SUBGRADE PREPARATION, FOUNDATION DEWATERING AND ROCK FOUNDATION PREPARATION (I.E., TREATMENT WITH SLUSH GROUTING, DENTAL CONCRETE, ETC.) MAY BE REQUIRED AT THE DISCRETION OF THE GEOTECHNICAL ENGINEER. ALL SUCH ACTIVITIES SHALL BE CLOSELY MONITORED AND DOCUMENTED BY THE GEOTECHNICAL ENGINEER.
8. FILL ADJACENT TO THE RISER AND PRINCIPAL SPILLWAY PIPE SHALL BE PLACED SO THAT LIFTS ARE AT THE SAME LEVEL ON BOTH SIDES OF THE STRUCTURES.
9. EARTHWORK COMPACTION WITHIN 3-FEET OF ANY STRUCTURES SHALL BE ACCOMPLISHED BY MEANS OF HAND TAMPERS, MANUALLY DIRECTED POWER TAMPERS OR PLATE COMPACTORS OR MINIATURE SELF-PROPELLED ROLLERS.
10. COMPACTION BY MEANS OF DROP WEIGHTS FROM A CRANE OR HOIST SHALL NOT BE PERMITTED.
11. HEAVY EQUIPMENT SHALL NOT BE ALLOWED TO PASS OVER CAST-IN-PLACE STRUCTURES (INCLUDING THE CRADLE) UNTIL ADEQUATE CURING TIME HAS ELAPSED.
12. TO RE-ESTABLISH VEGETATION AFTER CONSTRUCTION, A 2- TO 3-INCH LAYER OF TOPSOIL SHALL BE PLACED ON THE DISTURBED EMBANKMENT SURFACE AND THE AREA SEEDED AND MULCHED OR HYDROSEEDED.
13. THE EMBANKMENT MATERIAL SHALL BE COMPRISED OF CLAYEY SAND OR SANDY CLAY WITH A MINIMUM OF 30% PASSING THE #200 SIEVE, A LIQUID LIMIT OF AT LEAST 25 AND A PLASTICITY INDEX OF AT LEAST 10%, AND LESS THAN 5% ORGANICS. THIS MATERIAL SHALL ALSO HAVE A UNIFIED SOIL CLASSIFICATION OF SC OR CL.

STORMWATER WET POND NOTES:

1. EMBANKMENT SHALL BE CONSTRUCTED OF CLEAN STRUCTURAL SOIL, FREE OF ROOTS, VEGETATION, ROCKS & OTHER OBJECTIONABLE MATERIAL. SCARIFY SURFACES BEFORE PLACING FILL. PLACE FILL IN 6-8 INCH LOOSE LIFTS. COMPACTS TO AT LEAST 95% OF THE STANDARD PROCTOR DENSITY. SEE DAM EMBANKMENT CONSTRUCTION NOTES - THIS SHEET.
2. CONTRACTOR TO SUPPLY SHOP DRAWINGS OF RISER STRUCTURES PRIOR TO FABRICATION.
3. ALL RISERS SHALL BE PRECAST CONCRETE SOLID 6" MIN WALL STRUCTURES.
4. 4-6 INCH LAYER OF AMENDED SOIL IS RECOMMENDED IN ANY AREA WHERE PLANTINGS ARE REQUIRED (SEE NCDENR BMP DESIGN MANUAL).

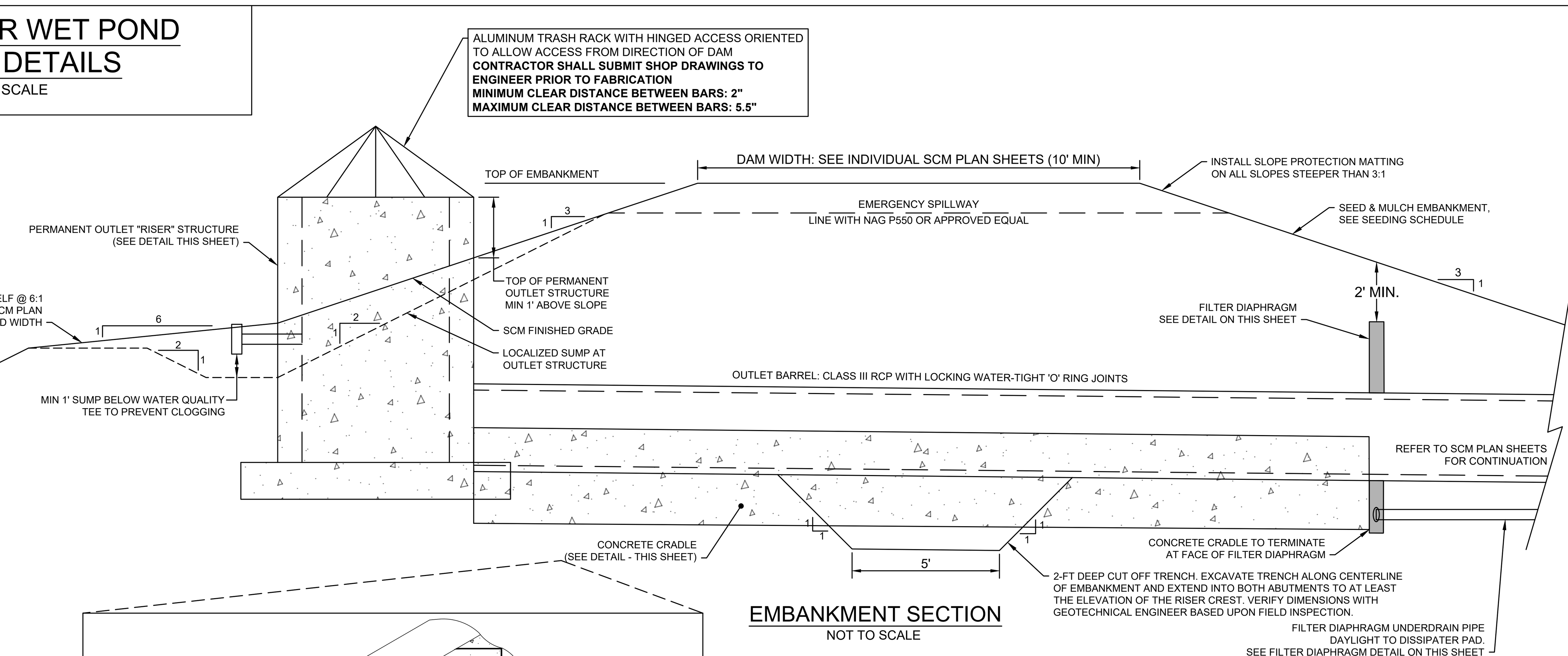
GEOTECHNICAL CERTIFICATION NOTE:

ASBUILT CERTIFICATION OF THE EMBANKMENT COMPACTION, ANTI-SEEP COLLARS AND/OR FILTER DIAPHRAGM, CUT OFF TRENCH, ETC. WILL BE REQUIRED PRIOR TO CERTIFICATE OF OCCUPANCY



POND SECTION

NOT TO SCALE



EMBANKMENT SECTION

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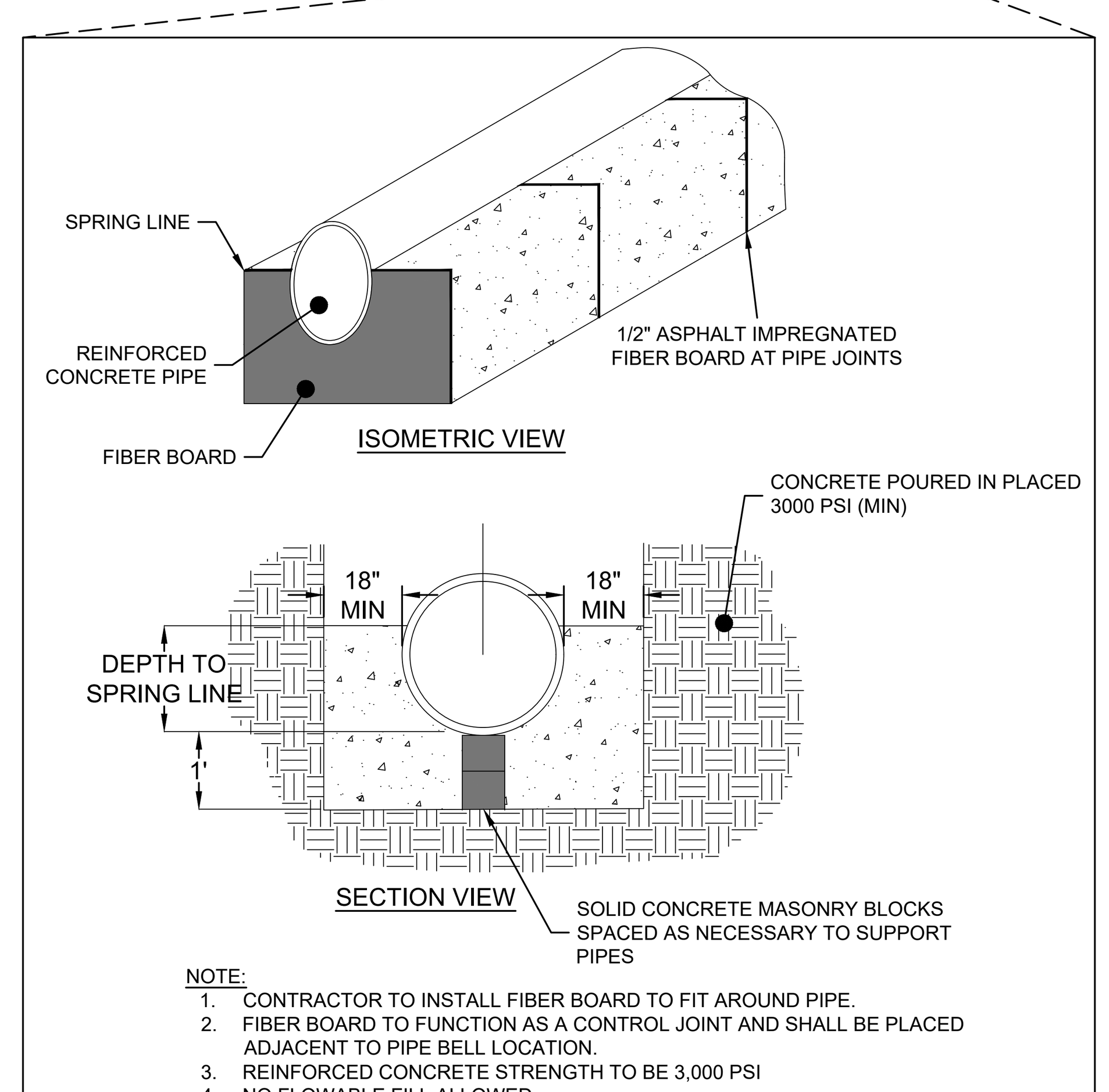
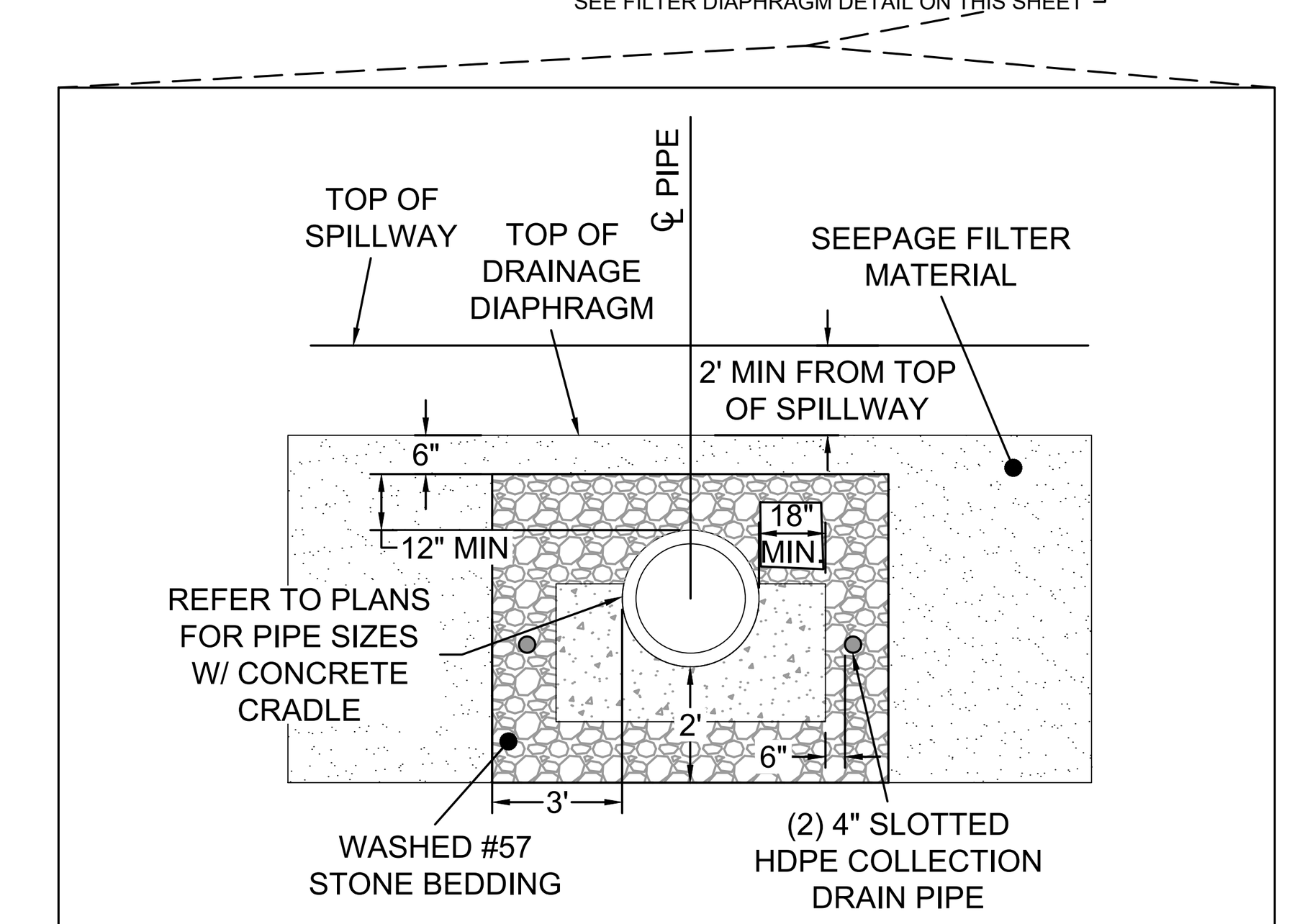


NOTE:
1. CONTRACTOR TO INSTALL FIBER BOARD TO FIT AROUND PIPE.
2. FIBER BOARD TO FUNCTION AS A CONTROL JOINT AND SHALL BE PLACED ADJACENT TO PIPE BELL LOCATION.
3. REINFORCED CONCRETE STRENGTH TO BE 3,000 PSI
4. NO FLOWABLE FILL ALLOWED.

CONCRETE CRADLE ENLARGEMENT

NOT TO SCALE



FILTER DIAPHRAGM SECTION ENLARGEMENT

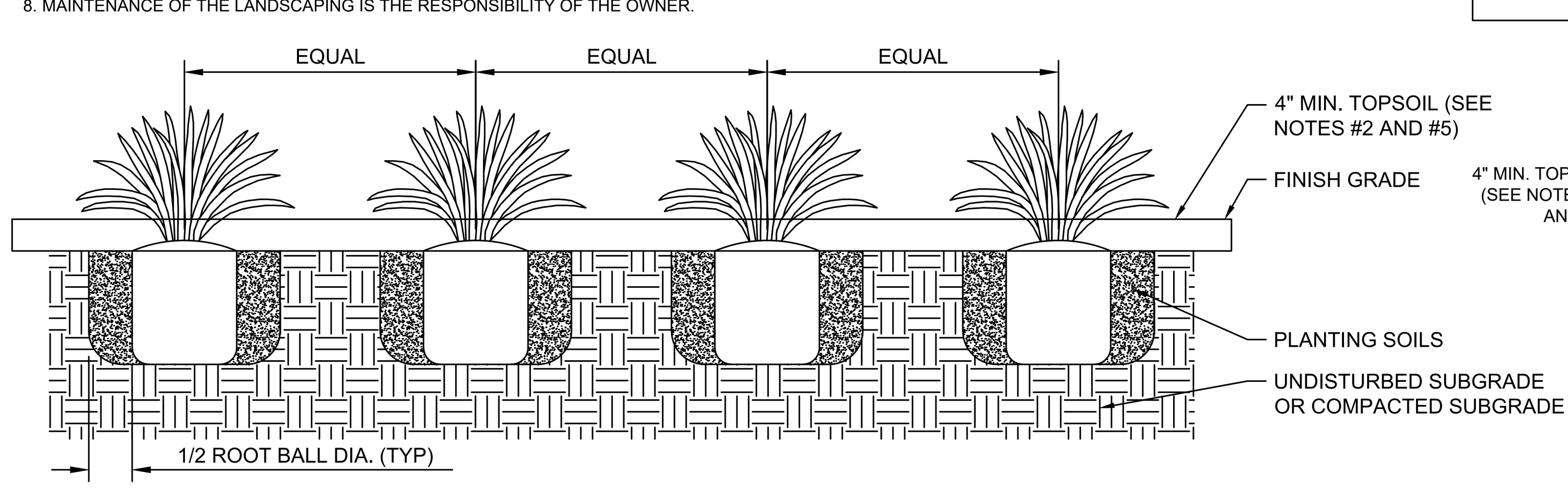
NOT TO SCALE

INSTALLATION AND MAINTENANCE OF LANDSCAPING:

1. ALL LANDSCAPING SHALL BE OF NURSERY-STOCK QUALITY AND SHALL BE INSTALLED IN A SOUND, WORKMANLIKE MANNER AND ACCORDING TO ACCEPTED GOOD PLANTING PROCEDURES. ALL LANDSCAPING SHALL BE ADAPTABLE TO CLIMATIC CONDITIONS OF THE AREA, AND CONSIDERATION SHALL BE GIVEN TO NOT PLANTING LARGE TREES NEAR UTILITIES. ALL LANDSCAPING SHALL BE MAINTAINED IN GOOD CONDITION.
2. ALL PLANTS SHALL MEET OR EXCEED THE MINIMUM STANDARDS SET BY THE U.S.D.A. STANDARD FOR NURSERY STOCK SPONSORED BY THE AMERICAN ASSOCIATION OF NURSERYMEN, INC.
3. ALL LANDSCAPING SHALL AT ALL TIMES SHALL PRESENT A HEALTHY, NEAT, CLEAN, ORDERLY, DISEASE-FREE AND PEST-FREE APPEARANCE.
4. ALL LANDSCAPING SOIL AND FILL SHALL BE FREE FROM WEEDS, REFUSE, AND DEBRIS AT ALL TIMES.
5. ANY DEAD PLANT MATERIAL OR MATERIAL THAT FAILS TO SHOW HEALTHY GROWTH MUST BE REMOVED WITHIN 30 DAYS.
6. REPLACEMENT OF REMOVED PLANT MATERIAL MUST TAKE PLACE WITHIN 90 DAYS OF REMOVAL OR NOTIFICATION BY THE CITY, WHICHEVER OCCURS FIRST.
7. ANY REPLACEMENT PLANT MATERIAL MUST MEET THE SIZE AND OTHER CHARACTERISTICS OF NEWLY PLANTED MATERIAL.
8. MAINTENANCE OF THE LANDSCAPING IS THE RESPONSIBILITY OF THE OWNER.

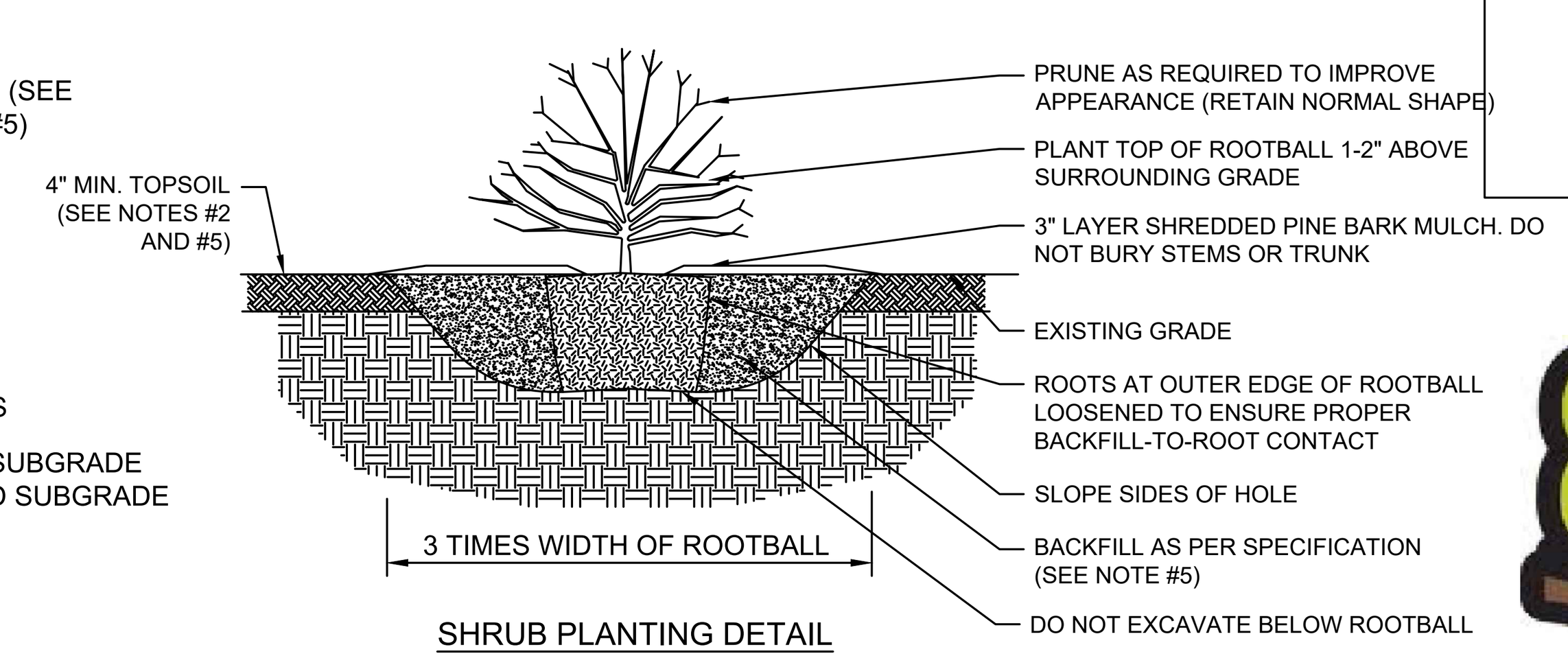
WET POND PLANTINGS NOTES & DETAILS

NOT TO SCALE



HERBACEOUS PLANTING DETAIL

NOT TO SCALE



SHRUB PLANTING DETAIL

NOT TO SCALE

Know what's **below.** **Call** before you dig.

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: Samuel A. MacDonald (Digitally signed by Samuel A. MacDonald, DN: C=US, E=smacdonald@amtengineering.com, O="A. Morton Thomas & Associates, Inc.", CN=Samuel A. MacDonald, Reason: I am approving this document, Date: 2026.04.16 10:04:53-04'00') DATE: ____________

TOWN ENGINEER

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

BY: Gideon Smith (Digitally signed by Gideon Smith, DN: C=US, E=gideon.smith@knightdalenc.gov, O=Town of Knightdale, OU=Development Services, CN=Gideon Smith, Reason: I am approving this document, Date: 2026.05.19 10:07:28-04'00') DATE: ____________

LAND USE 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-4142

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-5503

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 TYLER JEFFREY CROSS (DocuSigned by: FB5F...5449...)

3/31/2026

THIS DRAWING PREPARED AT THE **RALEIGH OFFICE**
5410 Trinity Road, Suite 102 | Raleigh, NC 27607
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YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION	DATE

DATE	03/31/2026
DRAWN BY	331
DESIGNED BY	331
CHECKED BY	T. CROSS
SCALE	NTS
JOB NO.	51557
SHEET NO.	C7.0

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS

KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

SCM NOTES AND DETAILS

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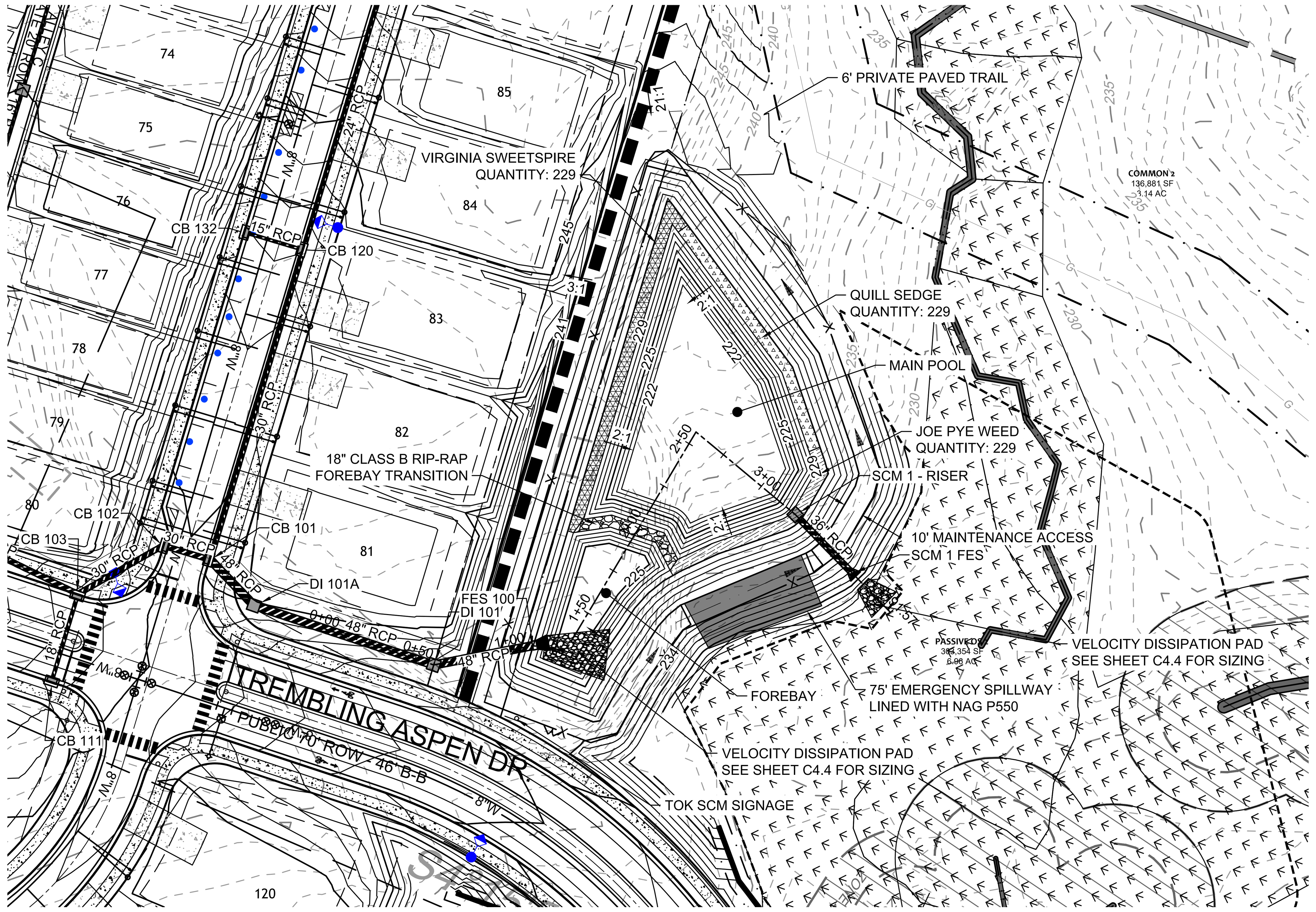


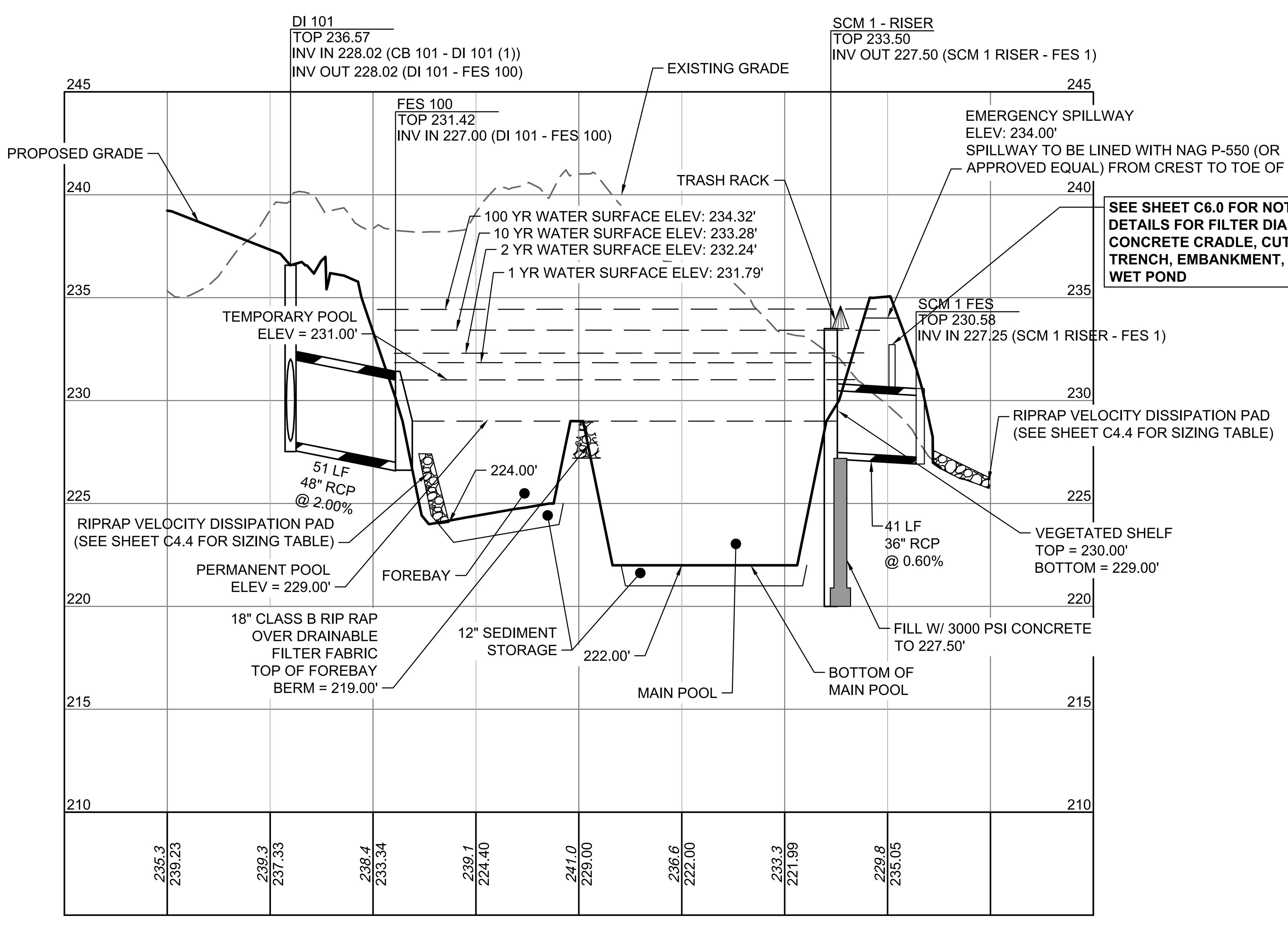
SCALE 1"=50'
0 50' 100'

SCM 1 WET POND PLAN VIEW

SCALE: 1" = 50'

PLANTING LEGEND

	VIRGINIA SWEETSPIRE (VS)
	QUILL SEDGE (QS)
	JOE PYE WEED (JP)



SCM 1 WET POND PROFILE

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

PROFILE SCALE
0 50 / 0 5

Know what's below. Call before you dig.

SCM INSPECTIONS SEQUENCE - SCM INSTALLATION

WHEN SCHEDULING INSPECTIONS, PLEASE CALL THE PUBLIC WORKS ADMINISTRATION ASSISTANT AT (919) 217-2250.

PLEASE NOTE THE FOLLOWING PERSONNEL MUST BE PRESENT AT ALL INSPECTIONS:
1) SITE SUPERVISOR
2) GEOTECH
3) AS-BUILT CERTIFYING ENGINEER OR SOMEONE UNDER THEIR SUPERVISION

THE FOLLOWING ITEMS MUST BE INSPECTED BY TOK STAFF DURING THE INSTALLATION OF ANY SCM WITH DAM
- KEY TRENCH EXCAVATION
- PRINCIPAL SPILLWAY PIPE AND ASSOCIATED COMPONENTS:
  -- CONCRETE CRADLE
  -- ANTI-SEEP COLLAR
  -- SEEPAGE DIAPHRAGM
  -- OUTLET STRUCTURE
  -- ANTI-FLOTATION BALLAST
  -- ANY SITE-CONSTRUCTED REINFORCED CONCRETE STRUCTURES

THE FOLLOWING ITEMS MUST BE INSPECTED BY TOK STAFF DURING THE INSTALLATION OF ANY SAND FILTERS OR BIORETENTION DEVICES:
- SUBGRADE OR CONSTRUCTED FOUNDATION
- OUTLET OR RISER IN COMBINATION WITH CONNECTING UNDERDRAINS
- FILTER MEDIA
- DATE ITEMS ON PREVIOUS LIST IF APPLICABLE

GEOTECHNICAL TESTING AND CERTIFICATION
ALL REPORTS ARE TO BE SUBMITTED WITHIN 30-DAYS OF DAM COMPLETION
REQUIRED GEOTECHNICAL RECORDS INCLUDE:
- DAM EMBANKMENT MATERIAL COMPOSITION AND DENSITY TESTING WITH A PASSING COMPACTION OF 95% OR GREATER
- MAP THAT LABELS ALL POINTS WHERE THE DAM AND DAM FOUNDATION AREAS WERE TESTED
- DIGITAL PHOTOS SHOWING THE DAM AREAS, THE RISER, THE PRINCIPLE SPILLWAY PIPE THE CONCRETE CRADLE, THE SEEPAGE DIAPHRAGM RELIEF, DRAINS, ETC., BEING INSTALLED.

SCM INSPECTION NOTE:

THE TOWN OF KNIGHTDALE REQUIRES THAT ALL INFRASTRUCTURE INSTILLATION BE OBSERVED BY SOMEONE OPERATING UNDER THE DESIGN ENGINEERS AUTHORITY, A LICENSED GEOTECH, AND A REPRESENTATIVE FROM THE TOWN OF KNIGHTDALE. REFERENCE THE DETAILED SCM INSPECTIONS SEQUENCE.

WHEN PREPARING FOR THESE INSTALLATIONS, SCHEDULE AN INSPECTION BY CALLING THE PUBLIC WORKS OFFICE AT (919) 217-2250.

SCM SEQUENCE - PLANTING NOTES:

THE DAM STRUCTURE, INCLUDING FRONT AND BACK EMBANKMENT SLOPES, OF THE POND SHALL BE VEGETATED WITH NON-CLUMPING TURF GRASS OR SOD. (CENTIPEDE/HYBRID-BERMUDA) 90% GERMINATION OF NON-CLUMPING TURF WILL BE REQUIRED PRIOR TO FINAL CERTIFICATION FORM THE TOWN.

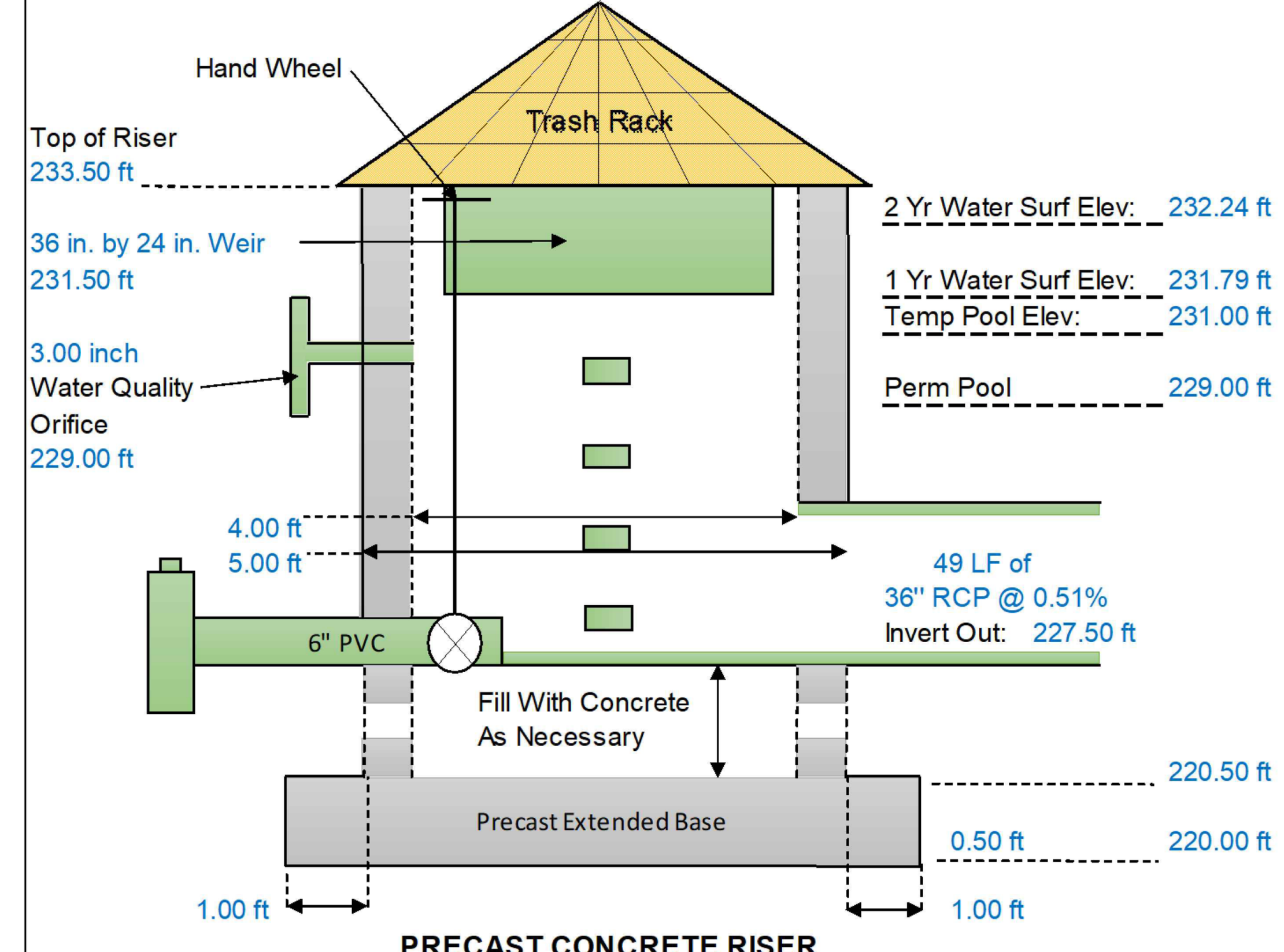
THE VEGETATED SHELF SHALL BE PLANTED WITH A MINIMUM OF THREE DIVERSE SPECIES OF HERBACEOUS, NATIVE VEGETATION AT A MINIMUM DENSITY OF 50 PLANTS PER 200 FEET OF SHELF AREA.

CONTRACTOR TO WORK WITH SOILS SCIENTIST TO ENSURE SOILS ARE ADEQUATE TO SUPPORT PROPER ESTABLISHMENT AND GROWTH OF THE AQUATIC PLANTINGS. CONTRACTOR TO AMEND SOILS AND INSTALL SOILS IN PLANT, SHRUB, AND TREE AREAS PER DETAILS, SOIL SPECIFICATIONS. NCDENR SPECIFICATION, AND SOIL SCIENTIST RECOMMENDATIONS.

ALL DISTURBED AREAS AROUND THE OUTSIDE OF THE DEVICE SHALL BE SEEDED WITH A LAWN AREA SEED MIX (PER SEEDING SPECIFICATIONS) NATIVE GRASSES, LEGUMES, CLOVERS, AND WILDFLOWERS.

IF THE DEVICE WAS USED DURING CONSTRUCTION AS A SEDIMENT BASIN OR TRAP, THE BASIN MUST BE CLEANED OUT, GRADED, APPROPRIATE AREAS COVERED WITH 4" OF TOPSOIL AS SPECIFIED IN NOTE #2 ABOVE, AND VEGETATED WITHIN 14 DAYS OF THE COMPLETION OF CONSTRUCTION.

CONTRACTOR SHALL WATER ALL VEGETATION AND GRASS ON A WEEKLY BASIS AS NEEDED TO ENSURE GRASS AND PLANT SURVIVAL UNTIL AFTER THE SCM IS CERTIFIED AND ACCEPTED BY THE TOWN.



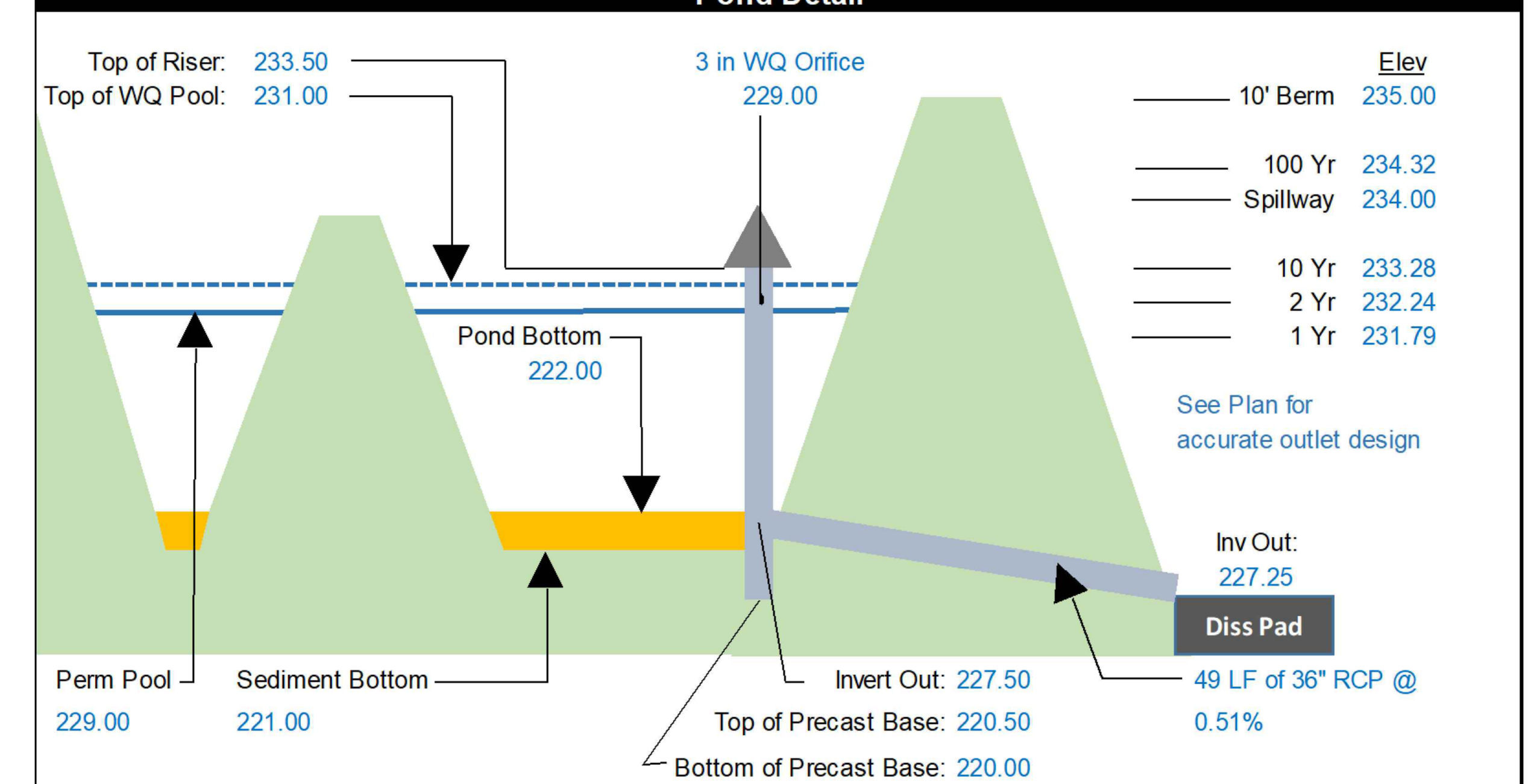
PRECAST CONCRETE RISER

4 ft x 4 ft x 13 ft Tall, With a 0.5 ft Thick Precast Extended Base

Pond / Riser Data & Elevations

Pond Type	Wet Pond		
TSS Removal	85%		
Top of Pond / Berm	235.00 ft		
Secondary Spillway Width	75.00 ft		
Bottom of Secondary Spillway	234.00 ft		
Top of Riser	233.50 ft	(at least 1' Above TPE)	
Riser Type / Size	4x4 ft		
Top of Water Quality / Temp Pool Elev	231.00 ft	(1" Runoff)	
Top of Veg. Shelf	230.00 ft		
Permanent Pool Elevation (Normal Pool)	229.00 ft		
Water Quality Orifice Elevation & Size	229.00 ft		3.00 in
Secondary Orifice Elevation & Size (Rise & Span)	NA ft	0.00 inch	0.00 inch
		^ Rise	^ Span
Weir Elevation, Width, & Number of Sides	231.50 ft	36.00 inch	2
Bottom of Veg. Shelf	229.00 ft	^ Width	^ # of Sides
Top of Sediment Storage / Pond Bottom	222.00 ft		
Bottom of Sediment Storage	221.00 ft	(Min 1 ft)	
Invert Out of Riser	227.50 ft		
Outlet Pipe Size	36.00 in	Diameter RCP	
Outlet Pipe Length & Slope	49.00 ft		0.51 %
Downstream Outlet Elevation	227.25 ft		
1 Yr Water Surface Elev / Peak Flow (CFS)	231.79 ft		3.60 CFS
2 Yr Water Surface Elev Peak Flow (CFS)	232.24 ft		13.08 CFS
10 Yr Water Surface Elev Peak Flow (CFS)	233.28 ft		47.94 CFS
100 Yr Water Surface Elev Peak Flow (CFS)	234.32 ft		111.80 CFS

Pond Detail



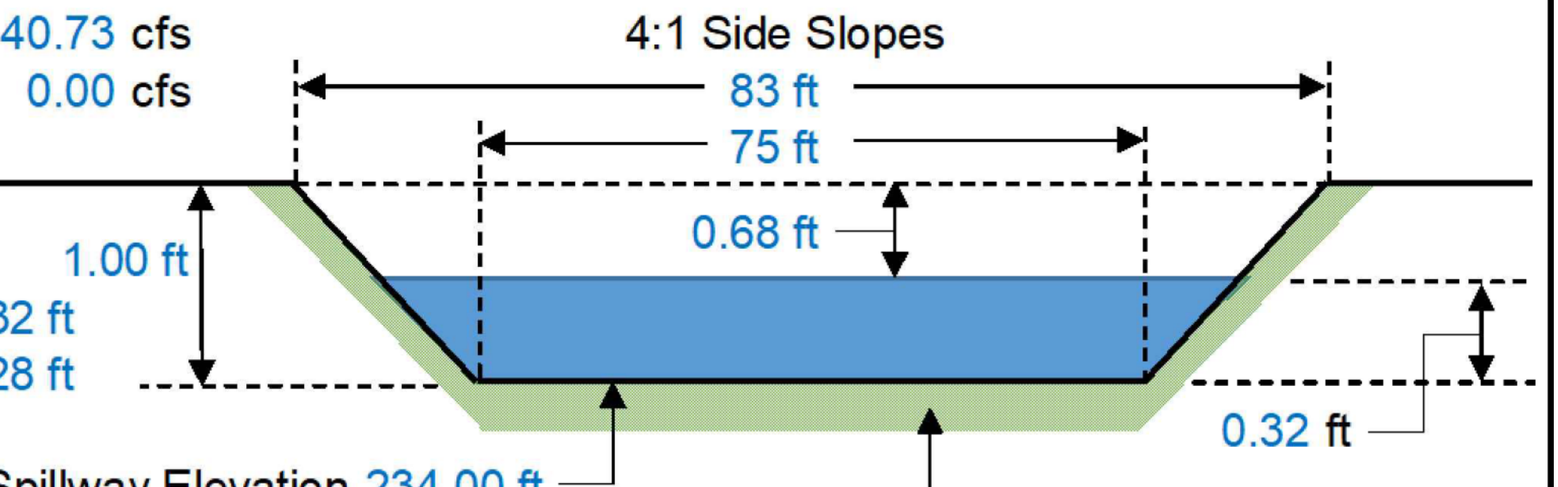
Anti-Buoyancy Calculations for the Riser Structure

Riser Dimensions		Weight of Structure		Displaced Volume	
Outside Width	5.00 ft	Walls =	17,550 LBS	V = LxWx(HT) = C.F.	
Inside Width	4.00 ft	Base =	3,675 LBS		
Outside Length	5.00 ft	FILL =	16,800 lbs	Displaced Water =	
Inside Length	4.00 ft			C.F. * 62.4 PCF = LBS	
Height	13.00 ft	Outlet Pipe =	530 LBS		
Base Thick' (ft)	0.50 ft	WQ Orifice =	4 LBS	Add 15% Factor of Safety	
Wall Thick' (ft)	0.50 ft				
Ext Base (ft)	1.00 ft	Weir #1 =	0 LBS	V =	325 C.F.
Areas removed from Riser		Weir #2 =	900 LBS	Disp. Water =	20,280 LBS
Outlet Pipe	7.07 ft	Weir #3 =	0 LBS	15% F.S. =	3,042 LBS
WQ Orifice	0.05 ft	Weir #4 =	0 LBS		
Orifice #1	0.00 ft	Other #1 =	0 LBS	Safety Factor	1.57
Orifice #2	12.00 ft				
Orifice #3	0.00 ft	Weight =	36,591 LBS	Weight =	23,322 LBS
Orifice #4	0.00 ft	Precast Concrete Riser Structure to be 4 ft x 4 ft x 13 ft Tall, With a 0.5 ft Thick Precast Extended Base			
Other	0.00 ft				

Planting Summary Requirements

Quantity	Type	Root	Common Name	Scientific Name	Planting Size	Notes
Dam / Berm				Non-Clumping Turf Grass		
6' Shelf Length 457		Area of Shelf = 2742 SF		(50 Plants per 200 SF of Area)		
229	Herbaceous	Container	Quill Sedge	Cerex Tenera	4" Pot	24"-36" OC
229	Herbaceous	Container	Virginia Sweetspire	Itea Virginica	4" Pot	24"-36" OC
229	Herbaceous	Container	Joe Pye Weed	Eupat' Fistulosus	4" Pot	24"-36" OC

100 Yr Flow in Spillway	40.73 cfs
10 Yr Flow in Spillway	0.00 cfs
Top of Pond	235.00



Spillway Liner to be North American Green (NAG) P550 or approved equal.

SPILLWAY DETAIL

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: Samuel A. MacDonald (Digitally signed by Samuel A. MacDonald, Date: 2026.04.16 10:05:14-04'00') DATE: ______
TOWN ENGINEER

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

BY: Gideon Smith (Digitally signed by Gideon Smith, Date: 2026.05.19 10:07:41-04'00') DATE: ______
LAND USE ADMINISTRATOR

Public
Water Distribution / Extension System
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City of Raleigh
Public Utilities Department Permit # W-4142

Public
Sewer Collection / Extension System
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City of Raleigh
Public Utilities Department Permit # S-5503

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 TYLER JEFFREY CROSS
3/31/2026

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TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION | DATE

DATE 03/31/2026
DRAWN BY 331
DESIGNED BY 331
CHECKED BY T. CROSS
SCALE H: 1" = 50' V: 1" = 5'

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA
SCM 1 PLAN & PROFILE

JOB NO. 51557
SHEET NO. C7.1

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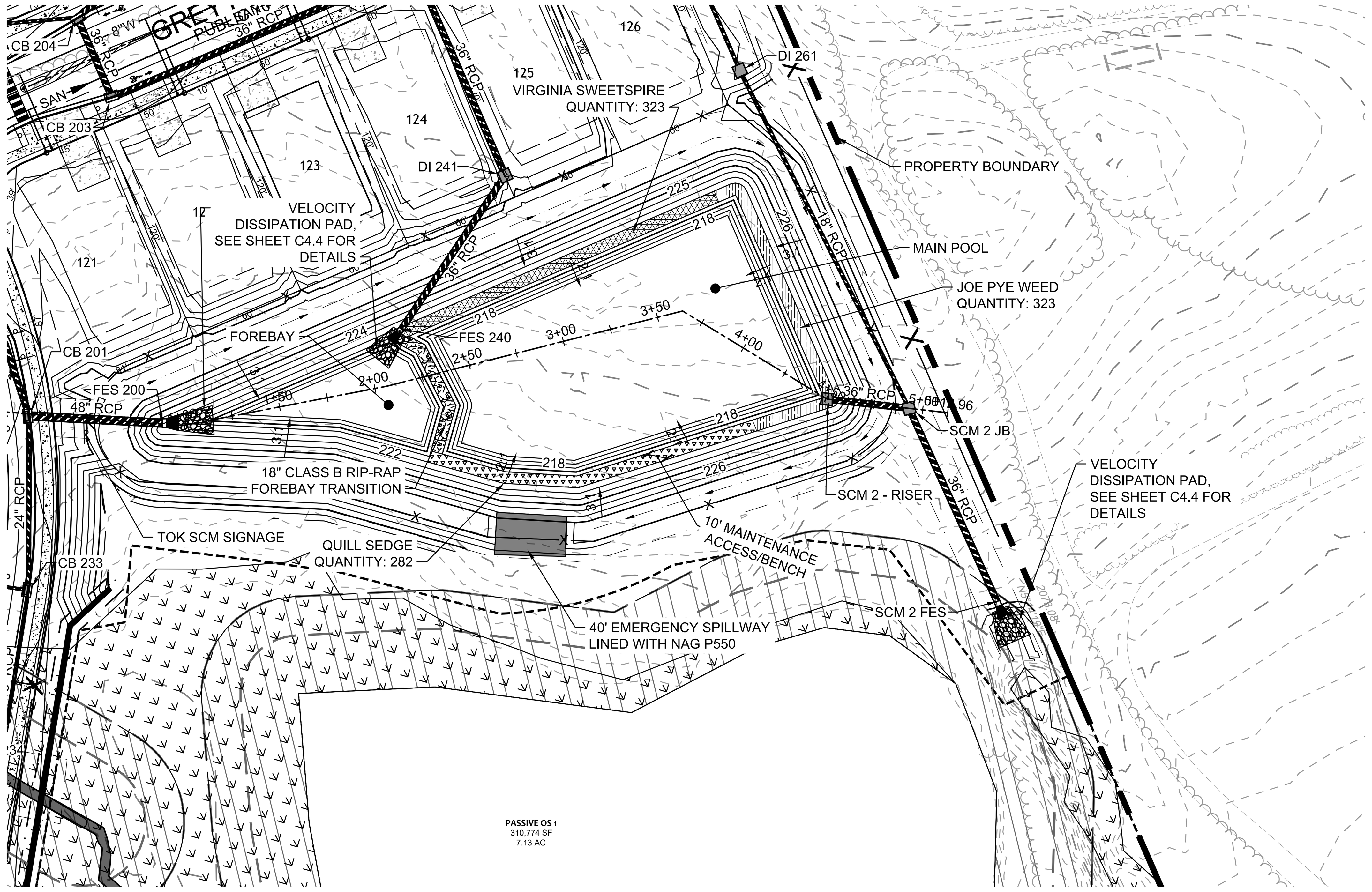
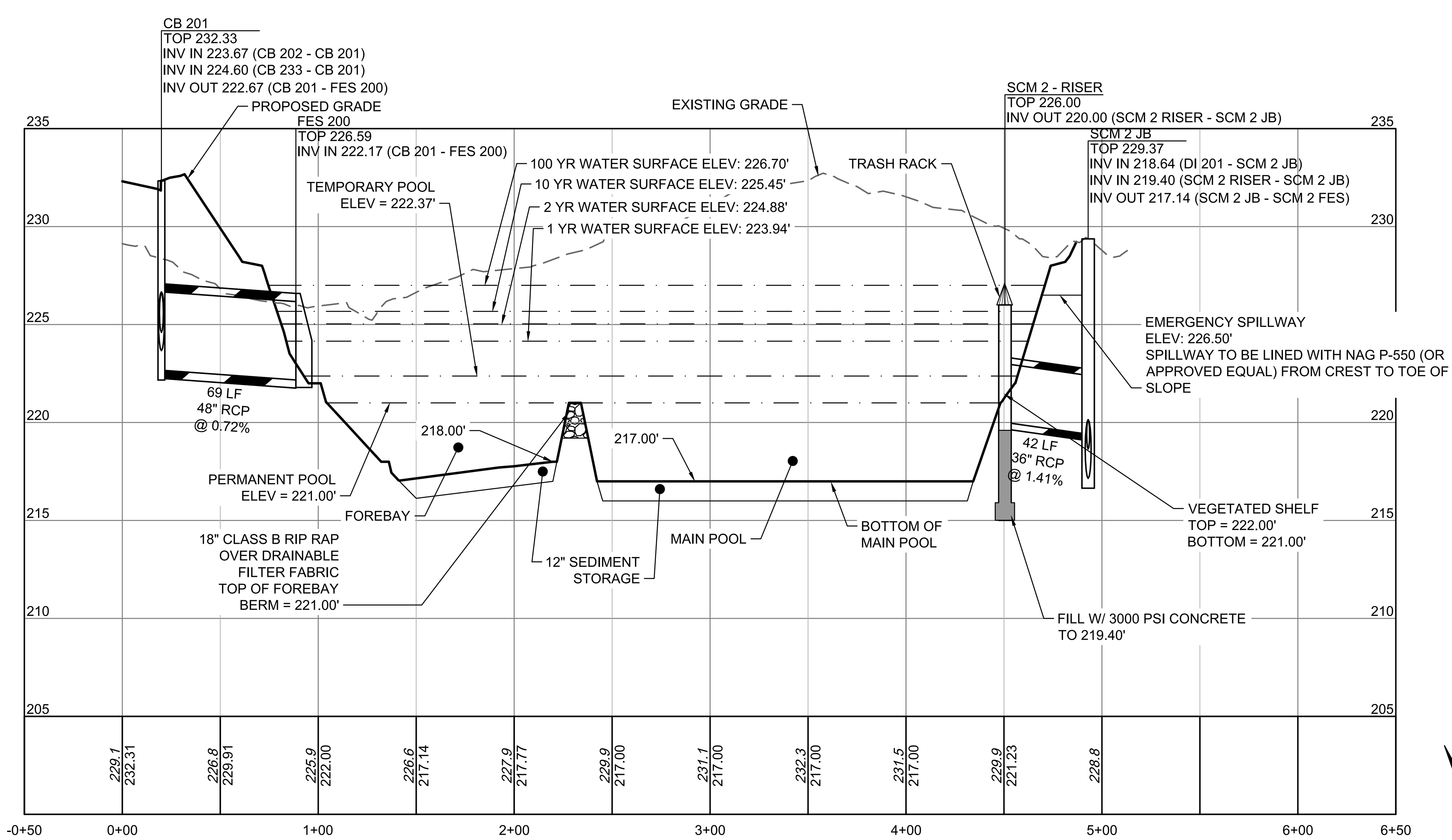


SCM 2 WET POND PLAN VIEW

SCALE: 1" = 50'



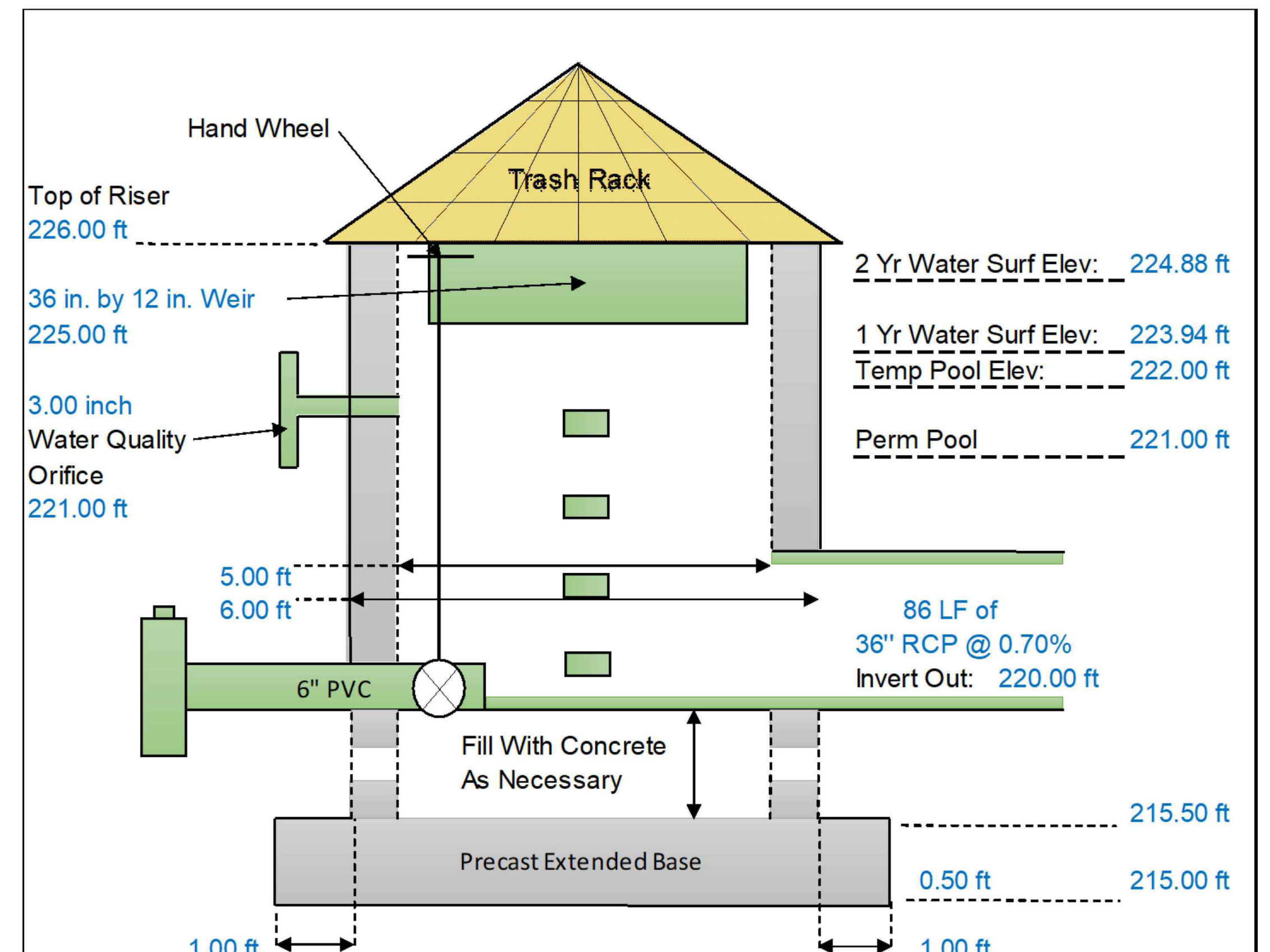
SCM 2 WET POND PROFILE

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

PROFILE SCALE 0 50 (5)

NAD 83

SCALE 1"=50' 0 50' 100'



PRECAST CONCRETE RISER

5 ft x 5 ft x 10.5 ft Tall, With a 0.5 ft Thick Precast Extended Base

SCM INSPECTIONS SEQUENCE - SCM INSTALLATION

WHEN SCHEDULING INSPECTIONS, PLEASE CALL THE PUBLIC WORKS ADMINISTRATION ASSISTANT AT (919) 217-2250.

PLEASE NOTE THE FOLLOWING PERSONNEL MUST BE PRESENT AT ALL INSPECTIONS:
1) SITE SUPERVISOR
2) GEOTECH
3) AS-BUILT CERTIFYING ENGINEER OR SOMEONE UNDER THEIR SUPERVISION

THE FOLLOWING ITEMS MUST BE INSPECTED BY TOK STAFF DURING THE INSTALLATION OF ANY SCM WITH DAM
- KEY TRENCH EXCAVATION
- PRINCIPAL SPILLWAY PIPE AND ASSOCIATED COMPONENTS:
  -- CONCRETE CRADLE
  -- ANTI-SEEP COLLAR
  -- SEEPAGE DIAPHRAGM
  -- OUTLET STRUCTURE
  -- ANTI-FLOTATION BALLAST
  -- ANY SITE-CONSTRUCTED REINFORCED CONCRETE STRUCTURES

THE FOLLOWING ITEMS MUST BE INSPECTED BY TOK STAFF DURING THE INSTALLATION OF ANY SAND FILTERS OR BIORETENTION DEVICES:
- SUBGRADE OR CONSTRUCTED FOUNDATION
- OUTLET OR RISER IN COMBINATION WITH CONNECTING UNDERDRAINS
- FILTER MEDIA
- DATE ITEMS ON PREVIOUS LIST IF APPLICABLE

GEOTECHNICAL TESTING AND CERTIFICATION
ALL REPORTS ARE TO BE SUBMITTED WITHIN 30-DAYS OF DAM COMPLETION
REQUIRED GEOTECHNICAL RECORDS INCLUDE:
- DAM EMBANKMENT MATERIAL COMPOSITION AND DENSITY TESTING WITH A PASSING COMPACTION OF 95% OR GREATER
- MAP THAT LABELS ALL POINTS WHERE THE DAM AND DAM FOUNDATION AREAS WERE TESTED
- DIGITAL PHOTOS SHOWING THE DAM AREAS, THE RISER, THE PRINCIPLE SPILLWAY PIPE THE CONCRETE CRADLE, THE SEEPAGE DIAPHRAGM RELIEF, DRAINS, ETC., BEING INSTALLED.

SCM INSPECTION NOTE:

THE TOWN OF KNIGHTDALE REQUIRES THAT ALL INFRASTRUCTURE INSTILLATION BE OBSERVED BY SOMEONE OPERATING UNDER THE DESIGN ENGINEERS AUTHORITY, A LICENSED GEOTECH, AND A REPRESENTATIVE FROM THE TOWN OF KNIGHTDALE. REFERENCE THE DETAILED SCM INSPECTIONS SEQUENCE.

WHEN PREPARING FOR THESE INSTALLATIONS, SCHEDULE AN INSPECTION BY CALLING THE PUBLIC WORKS OFFICE AT (919) 217-2250.

SCM SEQUENCE - PLANTING NOTES:

THE DAM STRUCTURE, INCLUDING FRONT AND BACK EMBANKMENT SLOPES, OF THE POND SHALL BE VEGETATED WITH NON-CLUMPING TURF GRASS OR SOD. (CENTIPEDE/HYBRID-BERMUDA) 90% GERMINATION OF NON-CLUMPING TURF WILL BE REQUIRED PRIOR TO FINAL CERTIFICATION FORM THE TOWN.

THE VEGETATED SHELF SHALL BE PLANTED WITH A MINIMUM OF THREE DIVERSE SPECIES OF HERBACEOUS, NATIVE VEGETATION AT A MINIMUM DENSITY OF 50 PLANTS PER 200 FEET OF SHELF AREA.

CONTRACTOR TO WORK WITH SOILS SCIENTIST TO ENSURE SOILS ARE ADEQUATE TO SUPPORT PROPER ESTABLISHMENT AND GROWTH OF THE AQUATIC PLANTINGS. CONTRACTOR TO AMEND SOILS AND INSTALL SOILS IN PLANT, SHRUB, AND TREE AREAS PER DETAILS, SOIL SPECIFICATIONS. NCDENR SPECIFICATION, AND SOIL SCIENTIST RECOMMENDATIONS.

ALL DISTURBED AREAS AROUND THE OUTSIDE OF THE DEVICE SHALL BE SEEDED WITH A LAWN AREA SEED MIX (PER SEEDING SPECIFICATIONS) NATIVE GRASSES, LEGUMES, CLOVERS, AND WILDFLOWERS.

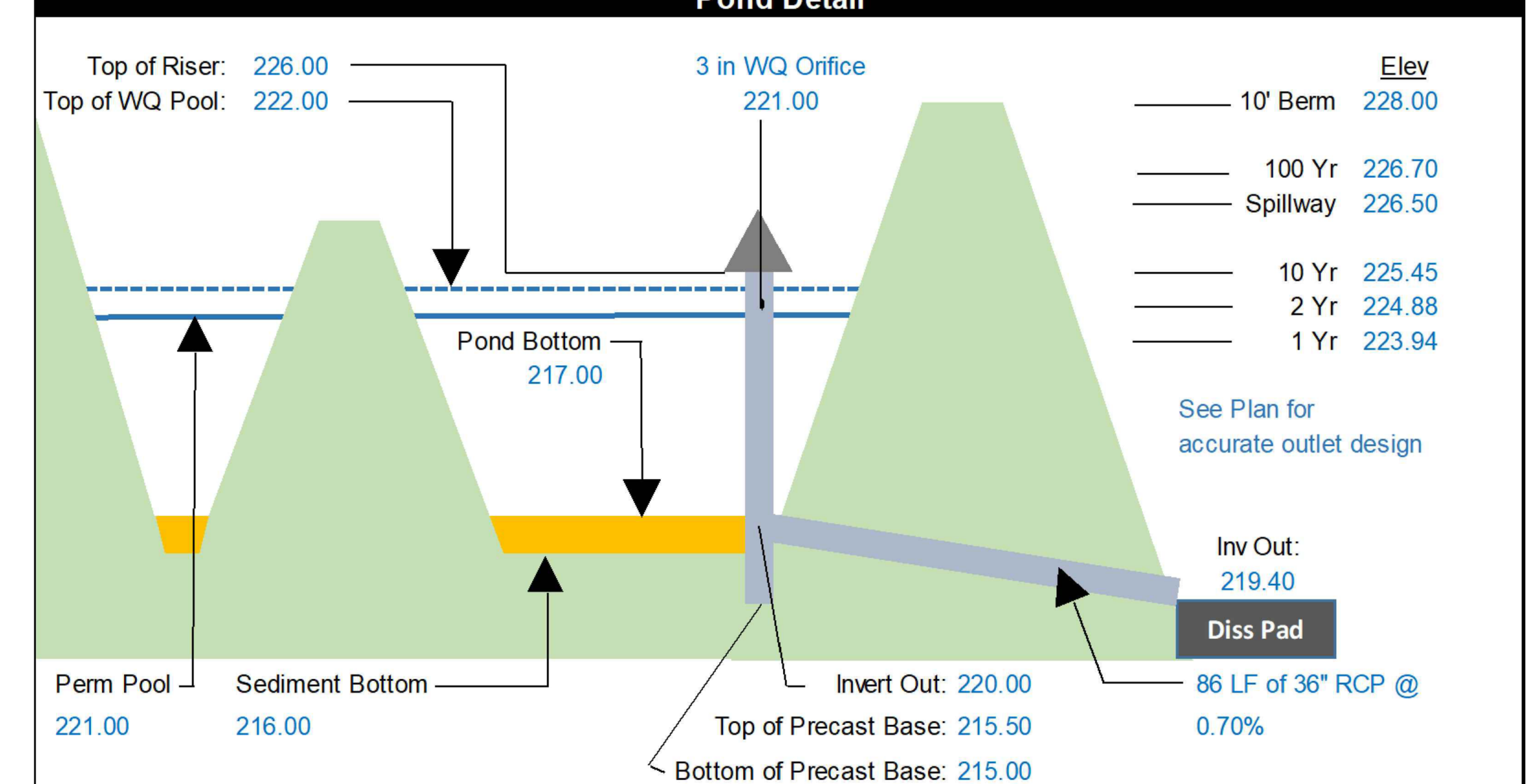
IF THE DEVICE WAS USED DURING CONSTRUCTION AS A SEDIMENT BASIN OR TRAP, THE BASIN MUST BE CLEANED OUT, GRADED, APPROPRIATE AREAS COVERED WITH 4" OF TOPSOIL AS SPECIFIED IN NOTE #2 ABOVE, AND VEGETATED WITHIN 14 DAYS OF THE COMPLETION OF CONSTRUCTION.

CONTRACTOR SHALL WATER ALL VEGETATION AND GRASS ON A WEEKLY BASIS AS NEEDED TO ENSURE GRASS AND PLANT SURVIVAL UNTIL AFTER THE SCM IS CERTIFIED AND ACCEPTED BY THE TOWN.

Pond / Riser Data & Elevations

Pond Type	Wet Pond			
TSS Removal	85%			
Top of Pond / Berm	228.00 ft			
Secondary Spillway Width	40.00 ft			
Bottom of Secondary Spillway	226.50 ft			
Top of Riser	226.00 ft	(at least 1' Above TPE)		
Riser Type / Size	5x5 ft			
Top of Water Quality / Temp Pool Elev	222.00 ft	(1" Runoff)		
Top of Veg. Shelf	222.00 ft			
Permanent Pool Elevation (Normal Pool)	221.00 ft			
Water Quality Orifice Elevation & Size	221.00 ft		3.00 in	
Secondary Orifice Elevation & Size (Rise & Span)	NA ft		0.00 inch	0.00 inch
			^ Rise	^ Span
Weir Elevation, Width, & Number of Sides	225.00 ft		36.00 inch	3
Bottom of Veg. Shelf	221.00 ft		^ Width	^ # of Sides
Top of Sediment Storage / Pond Bottom	217.00 ft			
Bottom of Sediment Storage	216.00 ft	(Min 1 ft)		
Invert Out of Riser	220.00 ft			
Outlet Pipe Size	36.00 in	Diameter RCP		
Outlet Pipe Length & Slope	86.00 ft		0.70 %	
Downstream Outlet Elevation	219.40 ft			
1 Yr Water Surface Elev / Peak Flow (CFS)	223.94 ft		0.40 CFS	
2 Yr Water Surface Elev Peak Flow (CFS)	224.88 ft		0.46 CFS	
10 Yr Water Surface Elev Peak Flow (CFS)	225.45 ft		9.72 CFS	
100 Yr Water Surface Elev Peak Flow (CFS)	226.70 ft		84.10 CFS	

Pond Detail

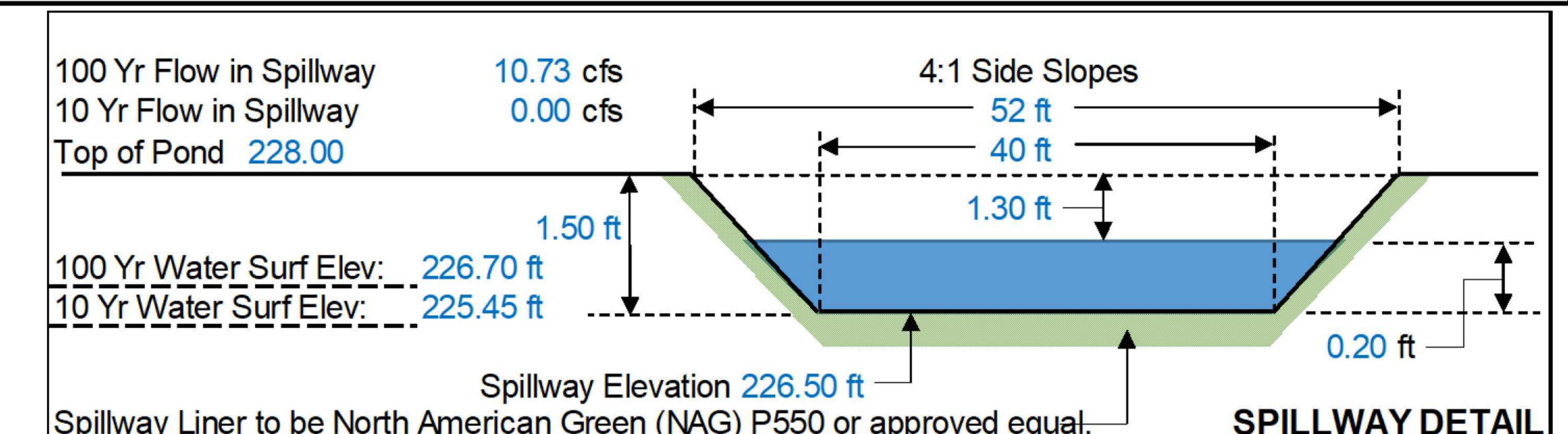


Anti-Buoyancy Calculations for the Riser Structure

Riser Dimensions		Weight of Structure		Displaced Volume	
Outside Width	6.00 ft	Walls =	17,325 LBS	V = LxWx(HT) = C.F.	
Inside Width	5.00 ft	Base =	4,800 LBS		
Outside Length	6.00 ft	FILL =	16,875 lbs	Displaced Water =	
Inside Length	5.00 ft			C.F. * 62.4 PCF = LBS	
Height	10.50 ft	Outlet Pipe =	530 LBS		
Base Thick' (ft)	0.50 ft	WQ Orifice =	4 LBS	Add 15% Factor of Safety	
Wall Thick' (ft)	0.50 ft				
Ext Base (ft)	1.00 ft	Weir #1 =	0 LBS	V =	378 C.F.
Areas removed from Riser		Weir #2 =	675 LBS	Disp. Water =	23,587 LBS
Outlet Pipe	7.07 ft	Weir #3 =	0 LBS	15% F.S. =	3,538 LBS
WQ Orifice	0.05 ft	Weir #4 =	0 LBS		
Orifice #1	0.00 ft	Other #1 =	0 LBS	Safety Factor	1.39
Orifice #2	9.00 ft				
Orifice #3	0.00 ft	Weight =	37,791 LBS	Weight =	27,125 LBS
Orifice #4	0.00 ft	Precast Concrete Riser Structure to be 5 ft x 5 ft x 10.5 ft Tall, With a 0.5 ft Thick Precast Extended Base			
Other	0.00 ft				

Planting Summary Requirements

Dam / Berm				Non-Clumping Turf Grass		
6' Shelf Length 646		Area of Shelf = 3876 SF		(50 Plants per 200 SF of Area)		
Quantity	Type	Root	Common Name	Scientific Name	Planting Size	Notes
323	Herbaceous	Container	Quill Sedge	Cerex Tenera	4" Pot	24"-36" OC
323	Herbaceous	Container	Virginia Sweetspire	Itea Virginica	4" Pot	24"-36" OC
323	Herbaceous	Container	Joe Pye Weed	Eupat' Fistulosus	4" Pot	24"-36" OC



SPILLWAY DETAIL

PLANTING LEGEND

- VIRGINIA SWEETSPIRE (VS)
- QUILL SEDGE (QS)
- JOE PYE WEED (JP)

811 Know what's below. Call before you dig.

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: Samuel A. MacDonald (Digitally signed by Samuel A. MacDonald; Reason: I am approving this document; Date: 2026.04.16 10:05:34-04'00') DATE: ____
TOWN ENGINEER

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

BY: Gideon Smith (Digitally signed by Gideon Smith; Reason: I am approving this document; Date: 2026.05.19 10:08:08-04'00') DATE: ____
LAND USE 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-4142

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-5503

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 TYLER JEFFREY CROSS
3/31/2026

THIS DRAWING PREPARED AT THE **RALEIGH OFFICE**
5410 Trinity Road, Suite 102 | Raleigh, NC 27607
TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION | DATE

DATE 03/31/2026
DRAWN BY 331
DESIGNED BY 331
CHECKED BY T. CROSS
SCALE H: 1" = 50' V: 1" = 5'

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS

KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

SCM 2 PLAN & PROFILE

JOB NO. 51557
SHEET NO. C7.2

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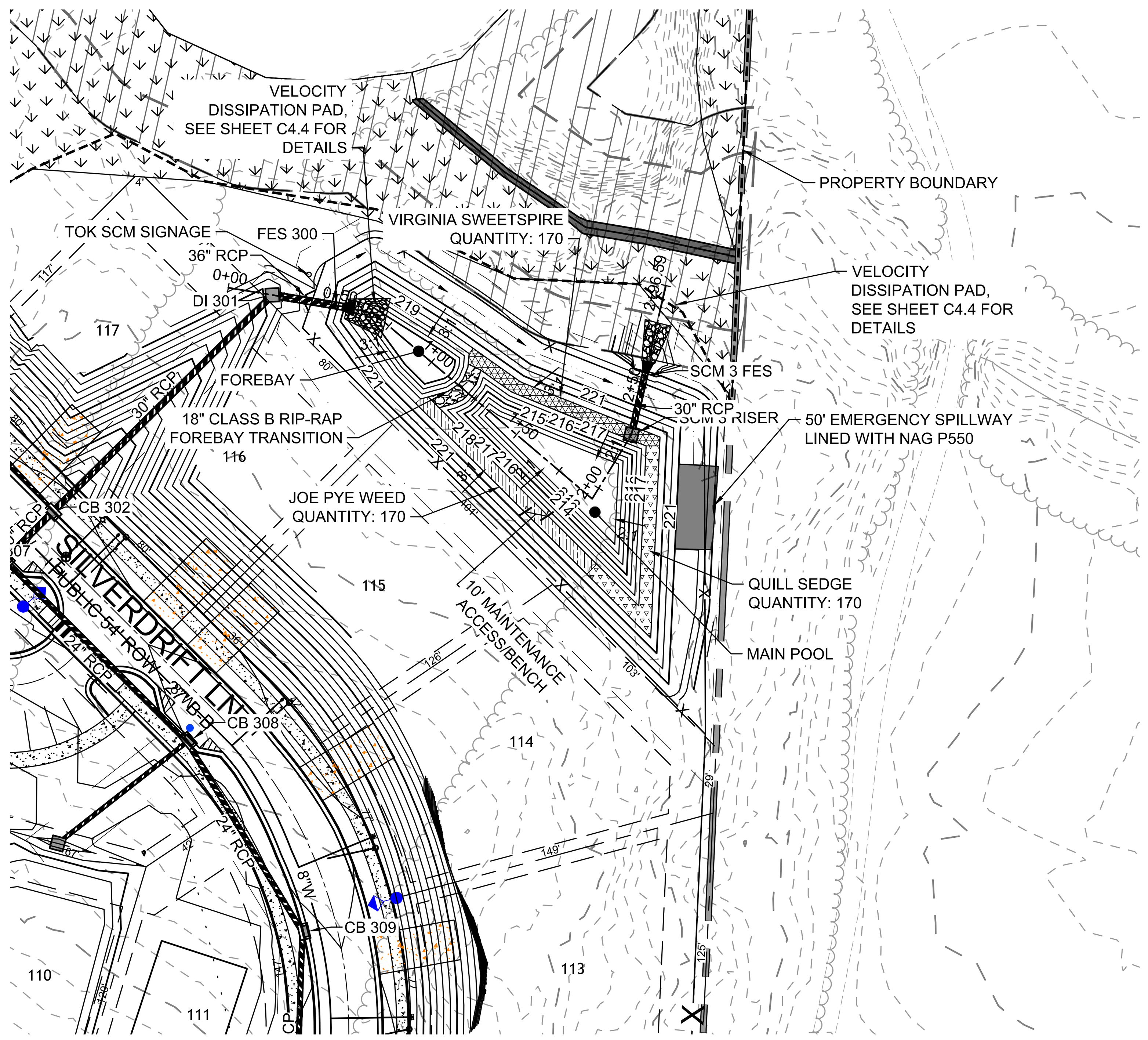
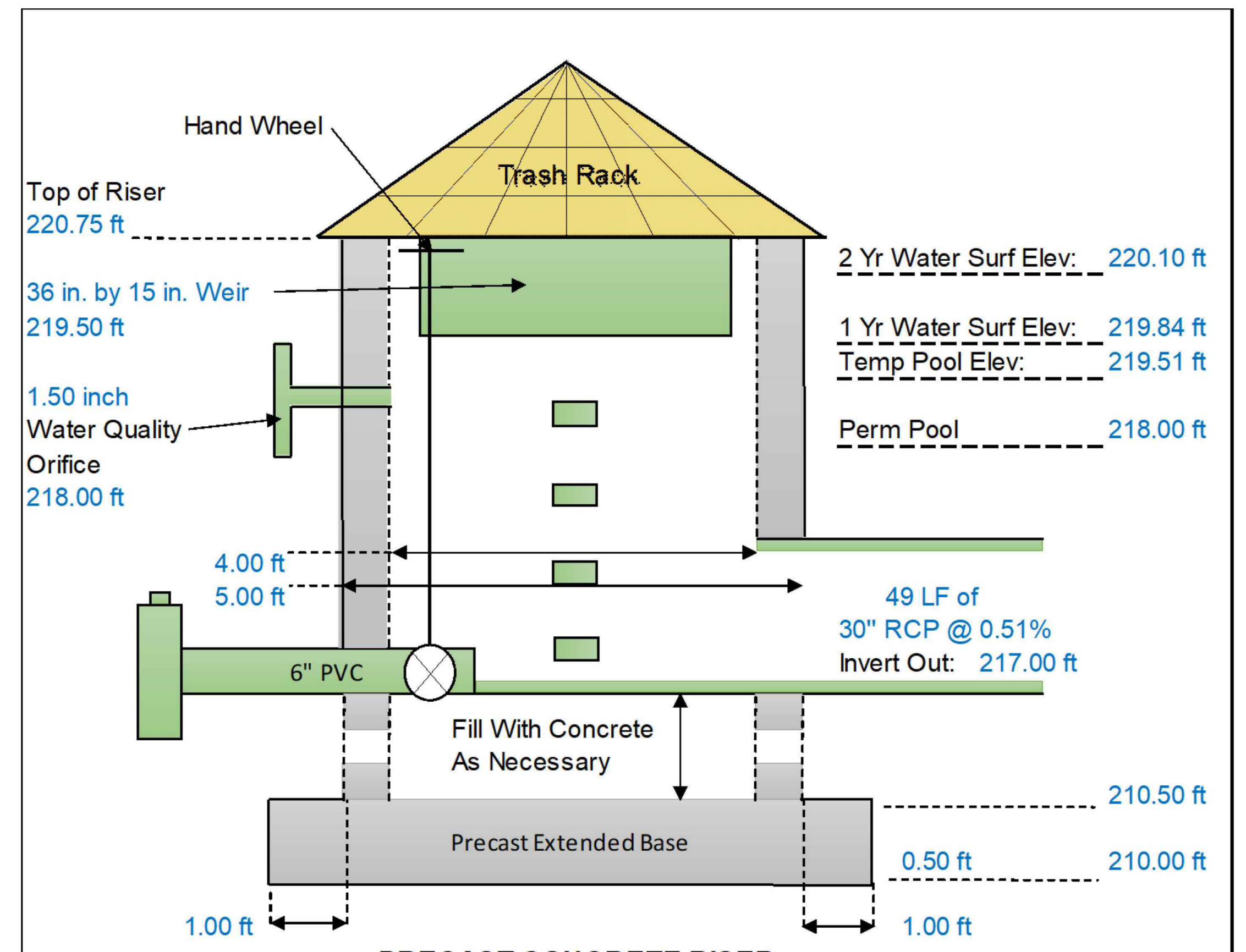


SCM 3 WET POND PLAN VIEW

SCALE: 1" = 50'

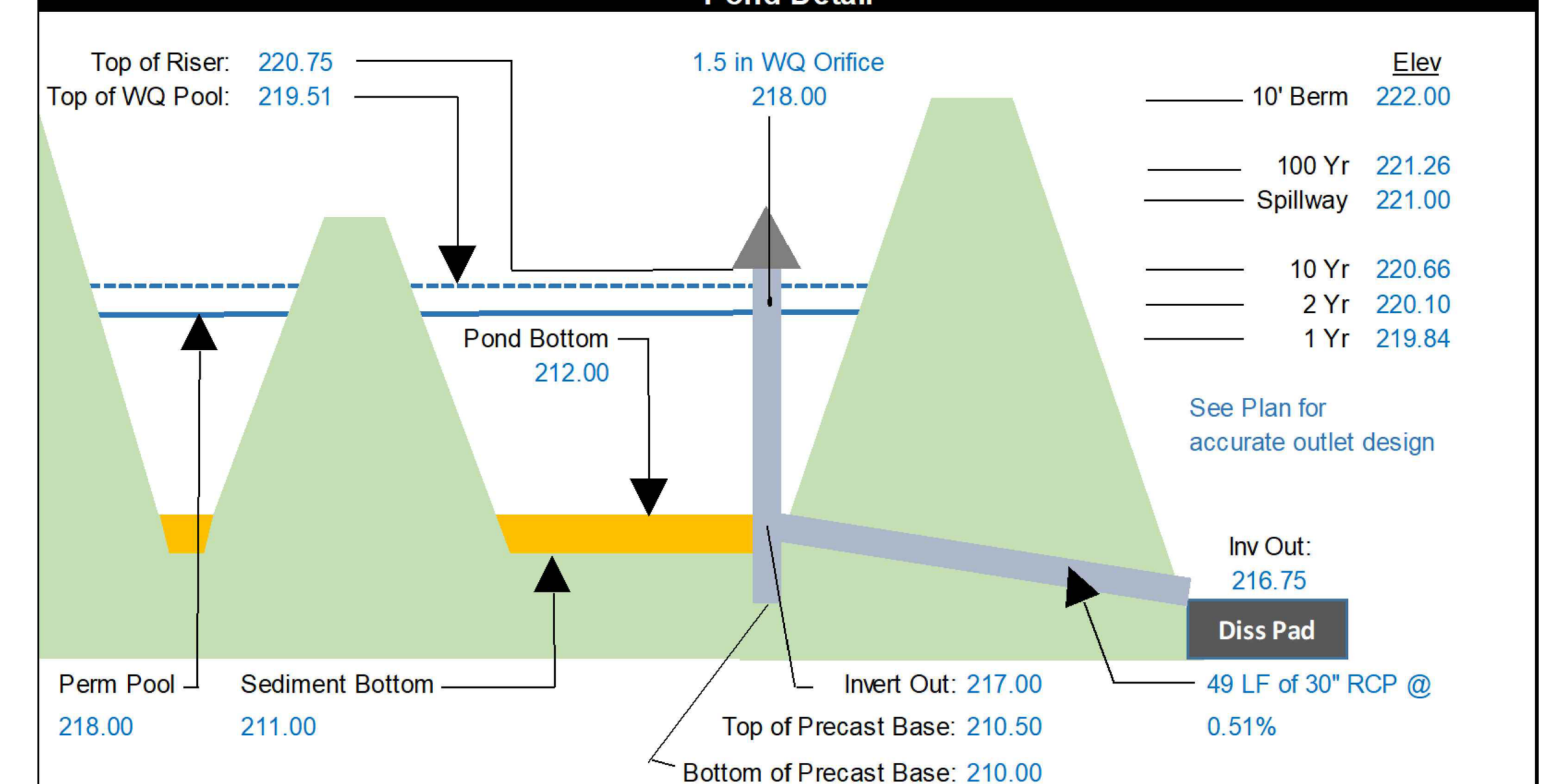


PRECAST CONCRETE RISER

4 ft x 4 ft x 10.25 ft Tall, With a 0.5 ft Thick Precast Extended Base

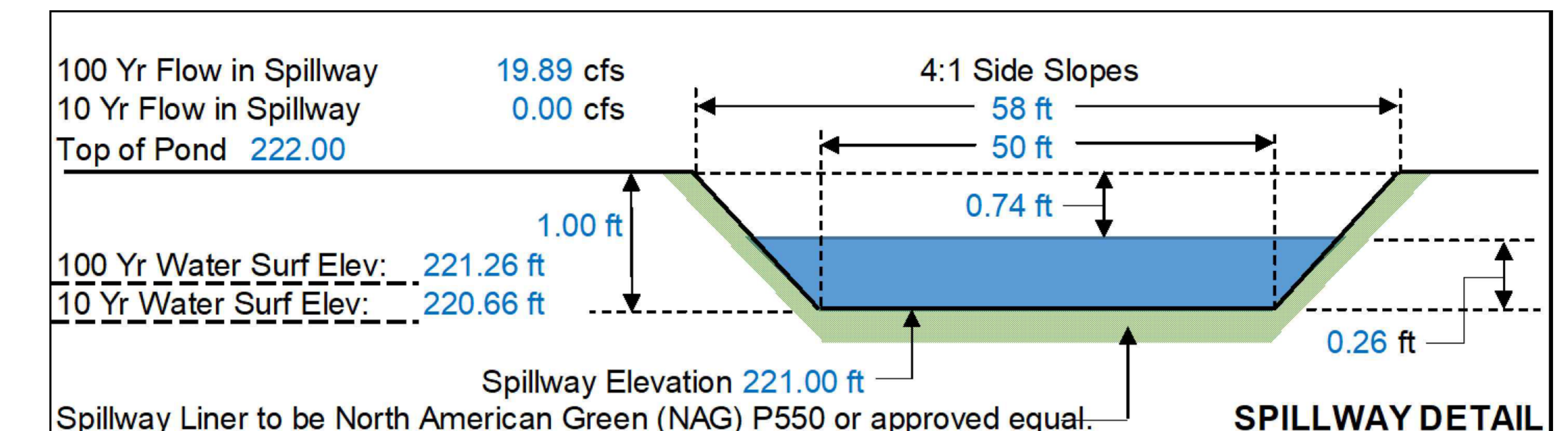
Pond / Riser Data & Elevations				
Pond Type	Wet Pond			
TSS Removal	85%			
Top of Pond / Berm	222.00 ft			
Secondary Spillway Width	50.00 ft			
Bottom of Secondary Spillway	221.00 ft			
Top of Riser	220.75 ft	(at least 1' Above TPE)		
Riser Type / Size	4x4 ft			
Top of Water Quality / Temp Pool Elev	219.51 ft	(1" Runoff)		
Top of Veg. Shelf	219.00 ft			
Permanent Pool Elevation (Normal Pool)	218.00 ft			
Water Quality Orifice Elevation & Size	218.00 ft		1.50 in	
Secondary Orifice Elevation & Size (Rise & Span)	NA ft		0.00 inch	0.00 inch
			^ Rise	^ Span
Weir Elevation, Width, & Number of Sides	219.50 ft		36.00 inch	3
Bottom of Veg. Shelf	218.00 ft		^ Width	^ # of Sides
Top of Sediment Storage / Pond Bottom	212.00 ft			
Bottom of Sediment Storage	211.00 ft	(Min 1 ft)		
Invert Out of Riser	217.00 ft			
Outlet Pipe Size	30.00 in	Diameter RCP		
Outlet Pipe Length & Slope	49.00 ft		0.51 %	
Downstream Outlet Elevation	216.75 ft			
1 Yr Water Surface Elev / Peak Flow (CFS)	219.84 ft		6.07 CFS	
2 Yr Water Surface Elev Peak Flow (CFS)	220.10 ft		14.07 CFS	
10 Yr Water Surface Elev Peak Flow (CFS)	220.66 ft		28.19 CFS	
100 Yr Water Surface Elev Peak Flow (CFS)	221.26 ft		56.23 CFS	

Pond Detail

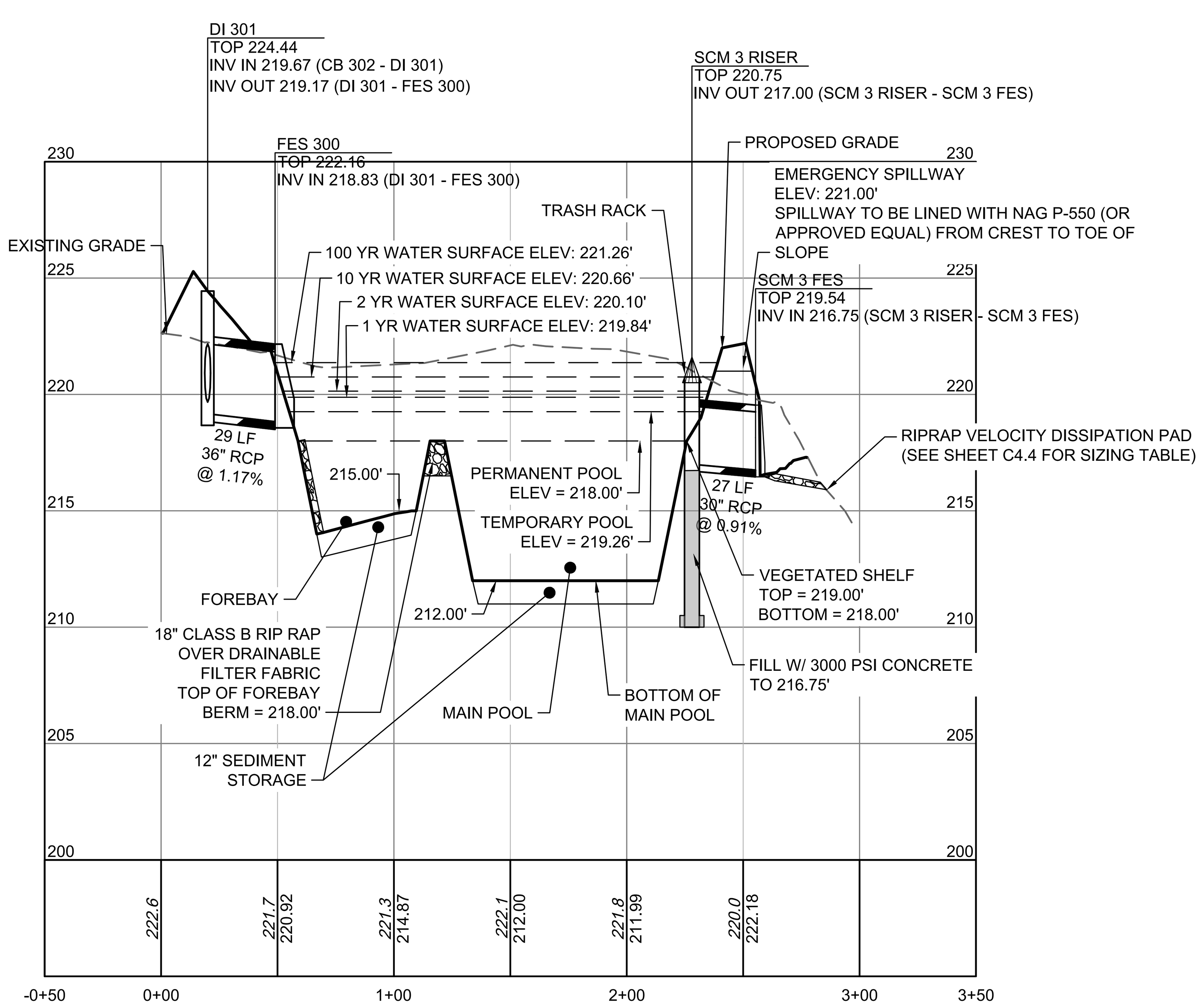


Anti-Buoyancy Calculations for the Riser Structure					
Riser Dimensions		**Weight of Structure**		**Displaced Volume**	
Outside Width	5.00 ft	Walls =	13,838 LBS	V = LxWx(HT) = C.F.	
Inside Width	4.00 ft	Base =	3,675 LBS		
Outside Length	5.00 ft	FILL =	15,600 lbs	Displaced Water =	
Inside Length	4.00 ft			C.F. * 62.4 PCF = LBS	
Height	10.25 ft	Outlet Pipe =	368 LBS		
Base Thick' (ft)	0.50 ft	WQ Orifice =	1 LBS	Add 15% Factor of Safety	
Wall Thick' (ft)	0.50 ft				
Ext Base (ft)	1.00 ft	Weir #1 =	0 LBS	V =	256 C.F.
Areas removed from Riser		Weir #2 =	843.75 LBS	Disp. Water =	15,990 LBS
Outlet Pipe	4.91 ft	Weir #3 =	0 LBS	15% F.S. =	2,399 LBS
WQ Orifice	0.01 ft	Weir #4 =	0 LBS		
Orifice #1	0.00 ft	Other #1 =	0 LBS	Safety Factor	1.73
Orifice #2	11.25 ft				
Orifice #3	0.00 ft	**Weight =**	**31,900 LBS**	**Weight =**	**18,389 LBS**
Orifice #4	0.00 ft	**Precast Concrete Riser Structure to be 4 ft x 4 ft x 10.25 ft Tall, With a 0.5 ft Thick Precast Extended Base**			
Other	0.00 ft				

Planting Summary Requirements						
Dam / Berm				Non-Clumping Turf Grass		
6' Shelf Length 339		Area of Shelf = 2034 SF		(50 Plants per 200 SF of Area)		
Quantity	Type	Root	Common Name	Scientific Name	Planting Size	Notes
170	Herbaceous	Container	Quill Sedge	Cerex Tenera	4" Pot	24"-36" OC
170	Herbaceous	Container	Virginia Sweetspire	Itea Virginica	4" Pot	24"-36" OC
170	Herbaceous	Container	Joe Pye Weed	Eupat' Fistulosus	4" Pot	24"-36" OC



SPILLWAY DETAIL

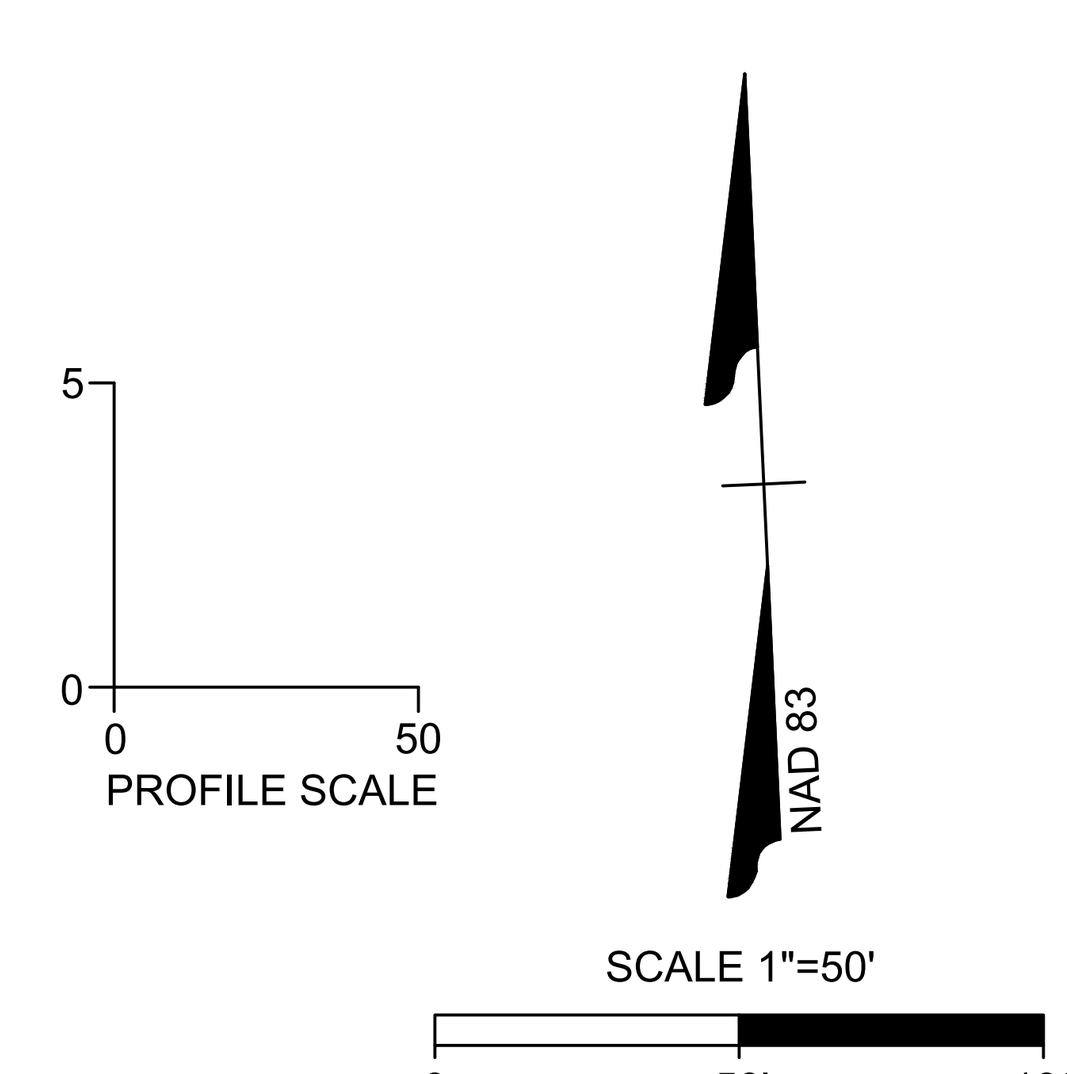


SCM 3 WET POND PROFILE

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

PLANTING LEGEND

- VIRGINIA SWEETSPIRE (VS)
- QUILL SEDGE (QS)
- JOE PYE WEED (JP)



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  - -- CONCRETE CRADLE
  - -- ANTI-SEEP COLLAR
  - -- SEEPAGE DIAPHRAGM
  - -- OUTLET STRUCTURE
  - -- ANTI-FLOTATION BALLAST
  - -- ANY SITE-CONSTRUCTED REINFORCED CONCRETE STRUCTURES

THE FOLLOWING ITEMS MUST BE INSPECTED BY TOK STAFF DURING THE INSTALLATION OF ANY SAND FILTERS OR BIORETENTION DEVICES:
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- OUTLET OR RISER IN COMBINATION WITH CONNECTING UNDERDRAINS
- FILTER MEDIA
- DATE ITEMS ON PREVIOUS LIST IF APPLICABLE

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ALL REPORTS ARE TO BE SUBMITTED WITHIN 30-DAYS OF DAM COMPLETION
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- MAP THAT LABELS ALL POINTS WHERE THE DAM AND DAM FOUNDATION AREAS WERE TESTED
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CONTRACTOR TO WORK WITH SOILS SCIENTIST TO ENSURE SOILS ARE ADEQUATE TO SUPPORT PROPER ESTABLISHMENT AND GROWTH OF THE AQUATIC PLANTINGS. CONTRACTOR TO AMEND SOILS AND INSTALL SOILS IN PLANT, SHRUB, AND TREE AREAS PER DETAILS, SOIL SPECIFICATIONS. NCDENR SPECIFICATION, AND SOIL SCIENTIST RECOMMENDATIONS.

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CONTRACTOR SHALL WATER ALL VEGETATION AND GRASS ON A WEEKLY BASIS AS NEEDED TO ENSURE GRASS AND PLANT SURVIVAL UNTIL AFTER THE SCM IS CERTIFIED AND ACCEPTED BY THE TOWN.

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: Samuel A. MacDonald DATE: ____________
TOWN ENGINEER

Digitally signed by Samuel A. MacDonald
DN: C=US, E=smacdonald@amtengineering.com, O="A. Morton Thomas & Associates, Inc.", CN=Samuel A. MacDonald
Reason: I am approving this document
Date: 2026.04.16 10:05:56-04'00'

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

BY: Gideon Smith DATE: ____________
LAND USE ADMINISTRATOR

Digitally signed by Gideon Smith
DN: C=US, E=gideon.smith@knightdalenc.gov, O=Town of Knightdale, OU=Development Services, CN=Gideon Smith
Reason: I am approving this document
Date: 2026.05.19 10:08:18-04'00'

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-4142

Public
Sewer Collection / Extension System
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City of Raleigh
Public Utilities Department Permit # S-5503

811 Know what's below. Call before you dig.

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 TYLER JEFFREY CROSS
3/31/2026

THIS DRAWING PREPARED AT THE
RALEIGH OFFICE
5410 Trinity Road, Suite 102 | Raleigh, NC 27607
TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

DATE	REVISION DESCRIPTION

DATE	03/31/2026
DRAWN BY	331
DESIGNED BY	331
CHECKED BY	T. CROSS
SCALE	H: 1" = 50' V: 1" = 5'
JOB NO.	51557
SHEET NO.	C7.3

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

SCM 3 PLAN & PROFILE

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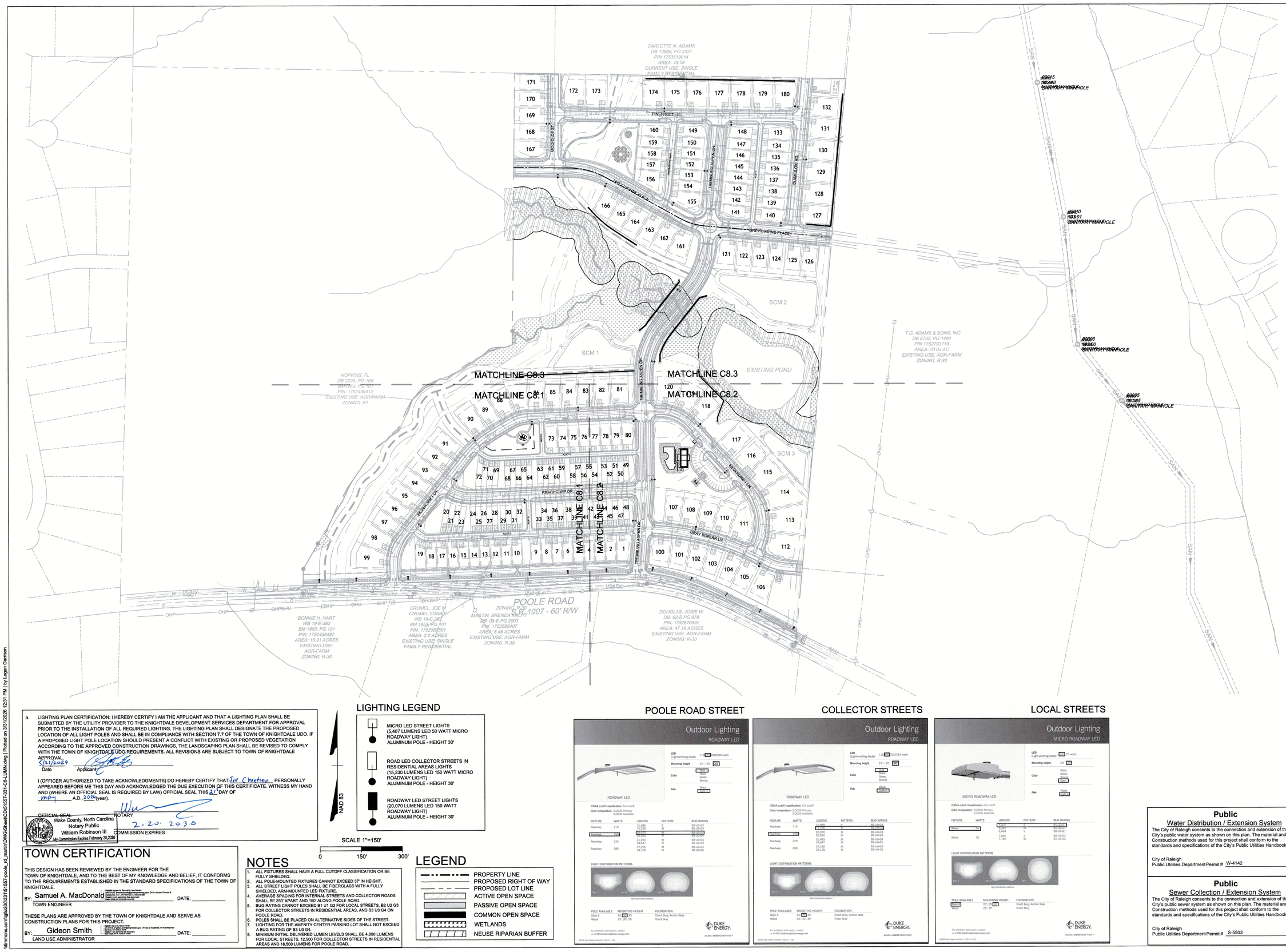

LIGHTING LEGEND

- MICRO LED STREET LIGHTS (5,407 LUMENS LED 50 WATT MICRO ROADWAY LIGHT) ALUMINUM POLE - HEIGHT 30'
- ROAD LED COLLECTOR STREETS IN RESIDENTIAL AREAS LIGHTS (15,230 LUMENS LED 150 WATT MICRO ROADWAY LIGHT) ALUMINUM POLE - HEIGHT 30'
- ROADWAY LED STREET LIGHTS (20,070 LUMENS LED 150 WATT ROADWAY LIGHT) ALUMINUM POLE - HEIGHT 30'

NAD 83

SCALE 1"=150'

0 150' 300'

a. LIGHTING PLAN CERTIFICATION: I HEREBY CERTIFY I AM THE APPLICANT AND THAT A LIGHTING PLAN SHALL BE SUBMITTED BY THE UTILITY PROVIDER TO THE KNIGHTDALE DEVELOPMENT SERVICES DEPARTMENT FOR APPROVAL PRIOR TO THE INSTALLATION OF ALL REQUIRED LIGHTING. THE LIGHTING PLAN SHALL DESIGNATE THE PROPOSED LOCATION OF ALL LIGHT POLES AND SHALL BE IN COMPLIANCE WITH SECTION 7.7 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.

5/21/2026
Date

Applicant

I (OFFICER AUTHORIZED TO TAKE ACKNOWLEDGMENTS) DO HEREBY CERTIFY THAT Jill C Mathieu PERSONALLY APPEARED BEFORE ME THIS DAY AND ACKNOWLEDGED THE DUE EXECUTION OF THIS CERTIFICATE. WITNESS MY HAND AND (WHERE AN OFFICIAL SEAL IS REQUIRED BY LAW) OFFICIAL SEAL THIS 21 DAY OF May A.D., 2026(year).

OFFICIAL SEAL
Wake County, North Carolina
Notary Public
William Robinson III
My Commision Expires February 20,2030

NOTARY
2.20.2030
COMMISSION EXPIRES

TOWN CERTIFICATION

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

BY: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

NOTES

1. ALL FIXTURES SHALL HAVE A FULL CUTOFF CLASSIFICATION OR BE FULLY SHIELDED.
2. ALL POLE-MOUNTED FIXTURES CANNOT EXCEED 37' IN HEIGHT.
3. ALL STREET LIGHT POLES SHALL BE FIBERGLASS WITH A FULLY SHIELDED, ARM-MOUNTED LED FIXTURE.
4. AVERAGE SPACING FOR INTERNAL STREETS AND COLLECTOR ROADS SHALL BE 250' APART AND 150' ALONG POOLE ROAD.
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8. MINIMUM INITIAL DELIVERED LUMEN LEVELS SHALL BE 4,800 LUMENS FOR LOCAL STREETS, 12,500 FOR COLLECTOR STREETS IN RESIDENTIAL AREAS AND 18,500 LUMENS FOR POOLE ROAD.

LEGEND

- PROPERTY LINE
- PROPOSED RIGHT OF WAY
- PROPOSED LOT LINE
- ACTIVE OPEN SPACE
- PASSIVE OPEN SPACE
- COMMON OPEN SPACE
- WETLANDS
- NEUSE RIPARIAN BUFFER

POOLE ROAD STREET

COLLECTOR STREETS

LOCAL STREETS

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-4142

Public
Sewer Collection / Extension System
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City of Raleigh
Public Utilities Department Permit # S-5503

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 ENGINEER TYLER JEFFREY CROSS
3/31/2026

THIS DRAWING PREPARED AT THE
RALEIGH OFFICE
5410 Trinity Road, Suite 102 | Raleigh, NC 27607
TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

DATE	REVISION DESCRIPTION

DATE 03/31/2026
DRAWN BY 331
DESIGNED BY 331
CHECKED BY T. CROSS
SCALE 1" = 150'

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA
OVERALL LIGHTING PLAN

JOB NO. 51557
SHEET NO. C8.0

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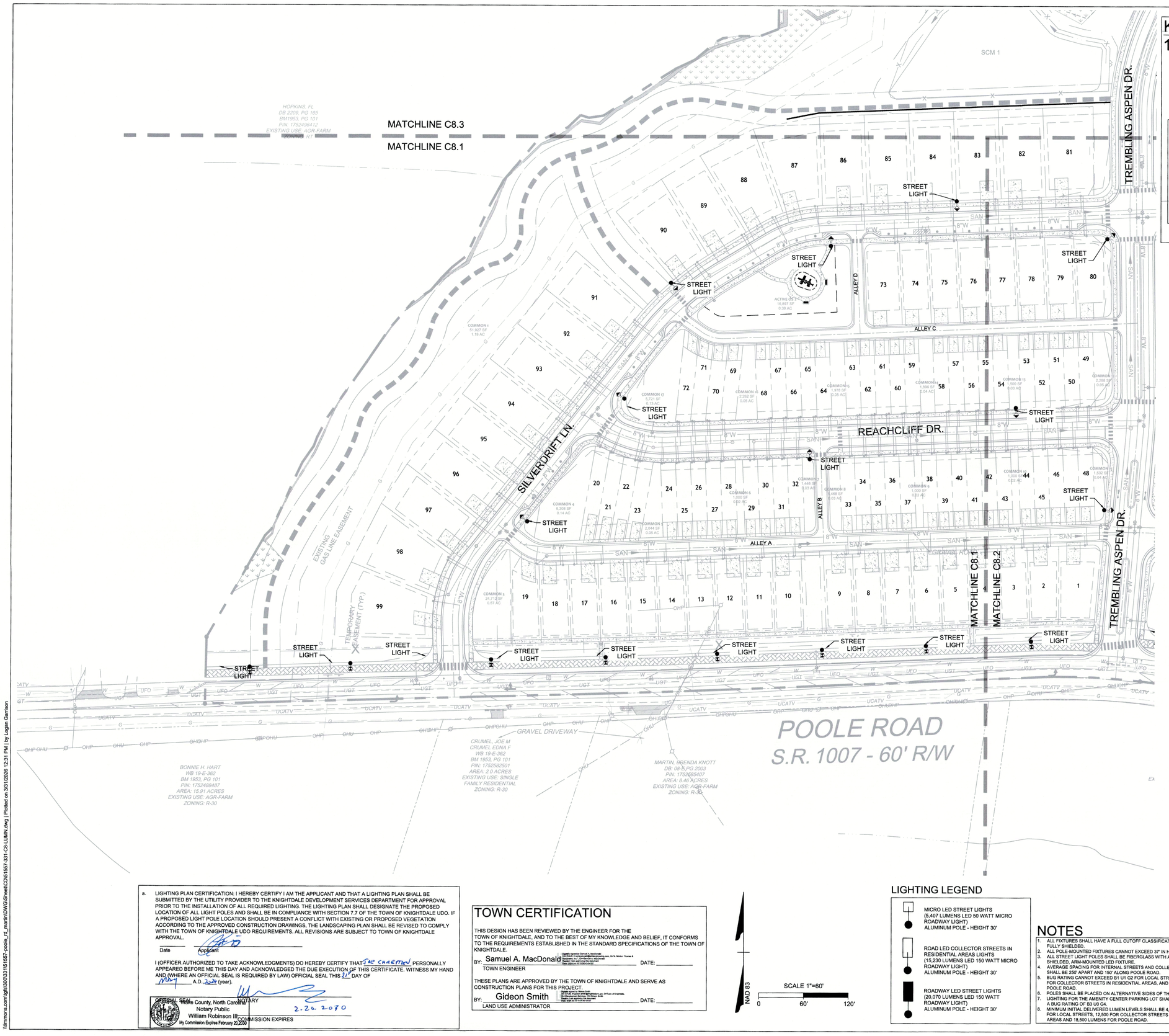
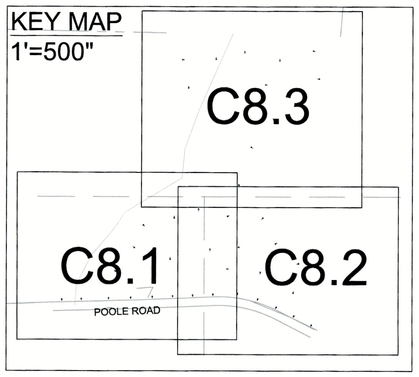


KEY MAP

1'=500"



LEGEND

- PROPERTY LINE
- PROPOSED RIGHT OF WAY
- PROPOSED LOT LINE
- ACTIVE OPEN SPACE
- PASSIVE OPEN SPACE
- COMMON OPEN SPACE
- WETLANDS
- NEUSE RIPARIAN BUFFER

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Date _____ Applicant _____

I (OFFICER AUTHORIZED TO TAKE ACKNOWLEDGMENTS) DO HEREBY CERTIFY THAT THE CREATION PERSONALLY APPEARED BEFORE ME THIS DAY AND ACKNOWLEDGED THE DUE EXECUTION OF THIS CERTIFICATE. WITNESS MY HAND AND (WHERE AN OFFICIAL SEAL IS REQUIRED BY LAW) OFFICIAL SEAL THIS 21 DAY OF MAY, A.D., 2026 (year).

OFFICIAL SEAL — Wake County, North Carolina — NOTARY Notary Public William Robinson III — COMMISSION EXPIRES My Commission Expires February 20, 2030 — 2.20.2030

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: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

NAD 83

SCALE 1"=60'
0 60' 120'

LIGHTING LEGEND

- MICRO LED STREET LIGHTS (5,407 LUMENS LED 50 WATT MICRO ROADWAY LIGHT) ALUMINUM POLE - HEIGHT 30'
- ROAD LED COLLECTOR STREETS IN RESIDENTIAL AREAS LIGHTS (15,230 LUMENS LED 150 WATT MICRO ROADWAY LIGHT) ALUMINUM POLE - HEIGHT 30'
- ROADWAY LED STREET LIGHTS (20,070 LUMENS LED 150 WATT ROADWAY LIGHT) ALUMINUM POLE - HEIGHT 30'

NOTES

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Public
Water Distribution / Extension System

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City of Raleigh Public Utilities Department Permit # W-4142

Public
Sewer Collection / Extension System

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City of Raleigh Public Utilities Department Permit # S-5503

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 ENGINEER TYLER JEFFREY CROSS

3/31/2026

THIS DRAWING PREPARED AT THE RALEIGH OFFICE
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TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

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REVISION DESCRIPTION	DATE

DATE 03/31/2026
DRAWN BY 331
DESIGNED BY 331
CHECKED BY T. CROSS
SCALE 1" = 60'

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS

KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

DETAILED LIGHTING PLAN

JOB NO. 51557
SHEET NO. C8.1

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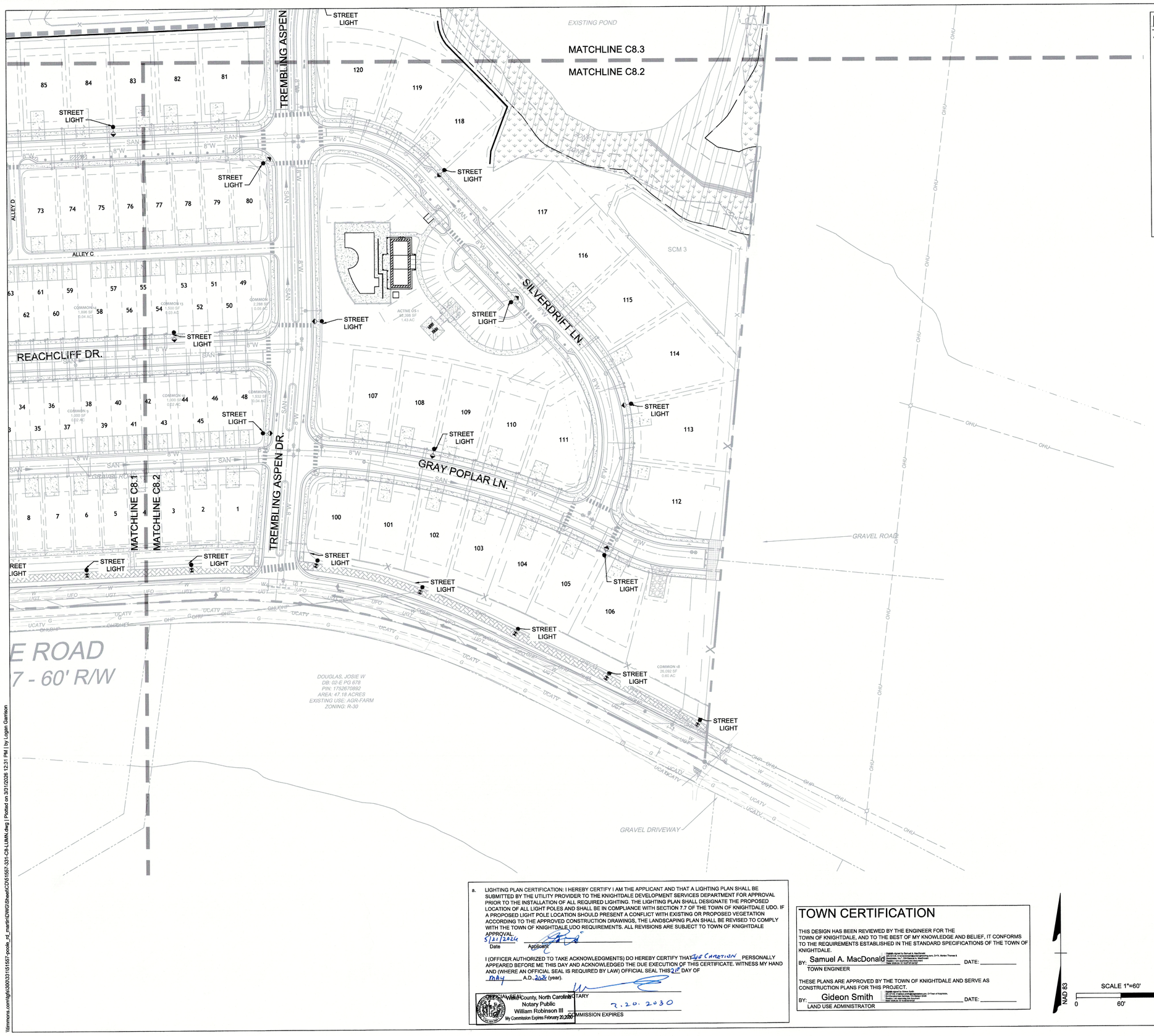
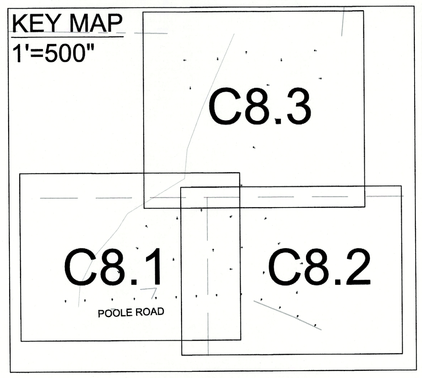


KEY MAP
1'=500"



LIGHTING LEGEND

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LEGEND

- PROPERTY LINE
- PROPOSED RIGHT OF WAY
- PROPOSED LOT LINE
- ACTIVE OPEN SPACE
- PASSIVE OPEN SPACE
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- WETLANDS
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5/21/2026 — Date — Applicant

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OFFICIAL SEAL — Wake County, North Carolina — NOTARY Notary Public — William Robinson III — My Commission Expires February 20,2030

7.20.2030 — COMMISSION EXPIRES

TOWN CERTIFICATION

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

BY: Samuel A. MacDonald — DATE: _____
TOWN ENGINEER

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

BY: Gideon Smith — DATE: _____
LAND USE ADMINISTRATOR

NAD 83

SCALE 1"=60'
0 60' 120'

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-4142

Public
Sewer Collection / Extension System
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City of Raleigh
Public Utilities Department Permit # S-5503

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 TYLER JEFFREY CROSS
3/31/2026

THIS DRAWING PREPARED AT THE ADDRESS LISTED BELOW
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TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION	DATE

DATE: 03/31/2026
DRAWN BY: 331
DESIGNED BY: 331
CHECKED BY: T. CROSS
SCALE: 1" = 60'

TIMMONS GROUP

NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS

KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

DETAILED LIGHTING PLAN

JOB NO. 51557
SHEET NO. C8.2

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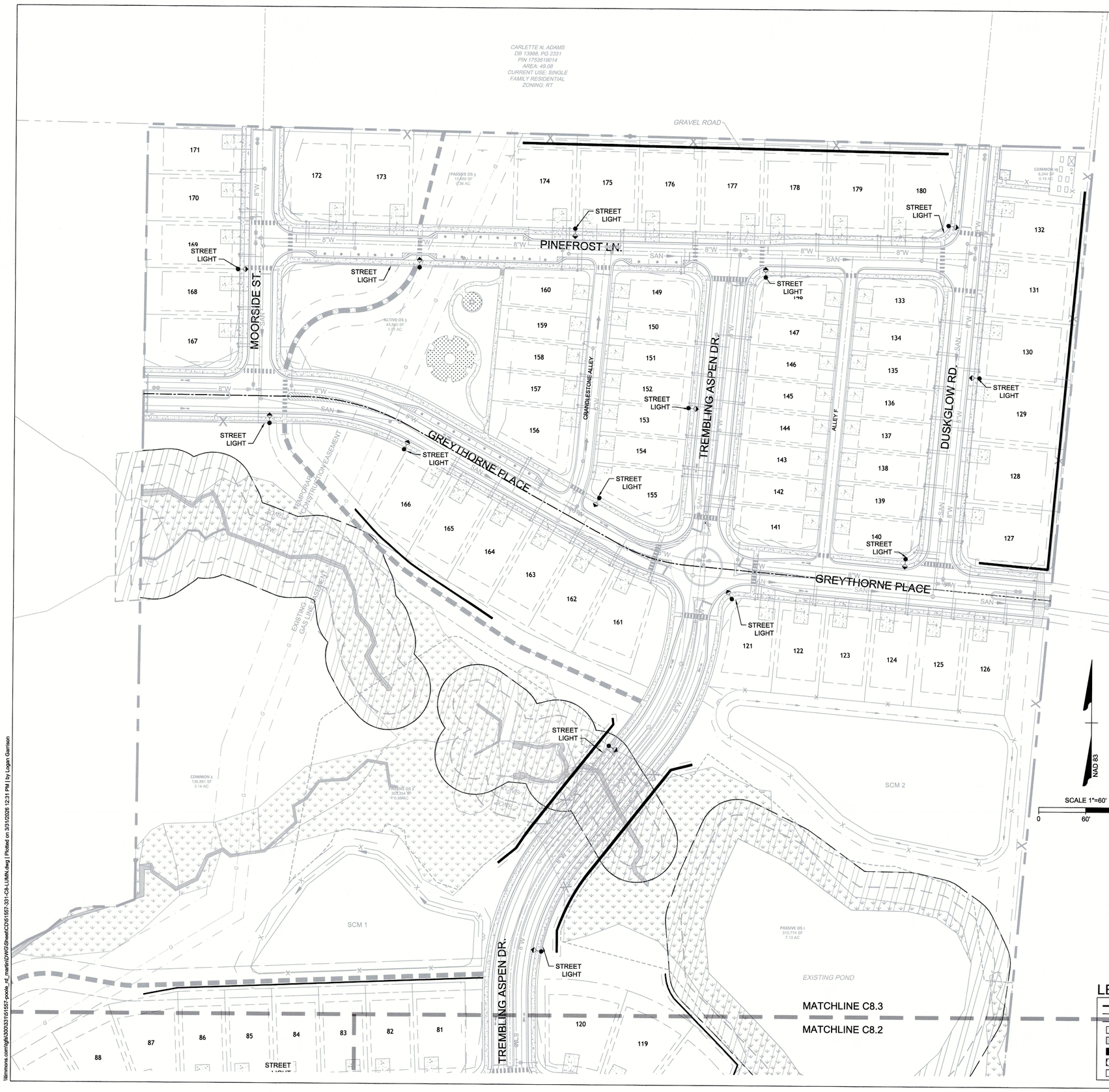

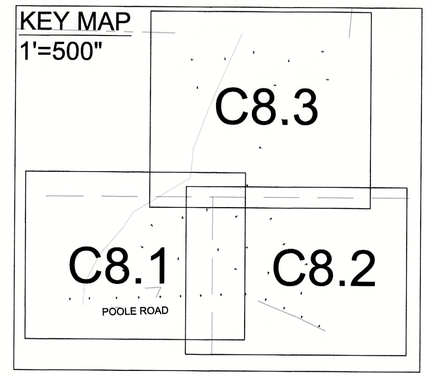

NOTES

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BY: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

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3/31/2026
Date

Applicant

I (OFFICER AUTHORIZED TO TAKE ACKNOWLEDGMENTS) DO HEREBY CERTIFY THAT Joe Carstarphen PERSONALLY APPEARED BEFORE ME THIS DAY AND ACKNOWLEDGED THE DUE EXECUTION OF THIS CERTIFICATE. WITNESS MY HAND AND (WHERE AN OFFICIAL SEAL IS REQUIRED BY LAW) OFFICIAL SEAL THIS 31st DAY OF March A.D., 2026 (year).

NOTARY

OFFICIAL SEAL
Wake County, North Carolina
Notary Public
William Robinson III
My Commission Expires February 20,2030

2.20.2030
COMMISSION EXPIRES

NAD 83

SCALE 1"=60'
0 60' 120'

LIGHTING LEGEND

- MICRO LED STREET LIGHTS (5,407 LUMENS LED 50 WATT MICRO ROADWAY LIGHT) ALUMINUM POLE - HEIGHT 30'
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- PROPOSED RIGHT OF WAY
- PROPOSED LOT LINE
- ACTIVE OPEN SPACE
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- WETLANDS
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City of Raleigh
Public Utilities Department Permit # W-4142

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City of Raleigh
Public Utilities Department Permit # S-5503

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 TYLER JEFFREY CROSS
3/31/2026

THIS DRAWING PREPARED AT THE
RALEIGH OFFICE
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YOUR VISION ACHIEVED THROUGH OURS.

DATE	REVISION DESCRIPTION

DATE 03/31/2026
DRAWN BY 331
DESIGNED BY 331
CHECKED BY T. CROSS
SCALE 1" = 60'

TIMMONS GROUP

NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS

KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

DETAILED LIGHTING PLAN

JOB NO. 51557
SHEET NO. C8.3

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NAD 83

SCALE 1"=150'

0 150' 300'

TOWN CERTIFICATION

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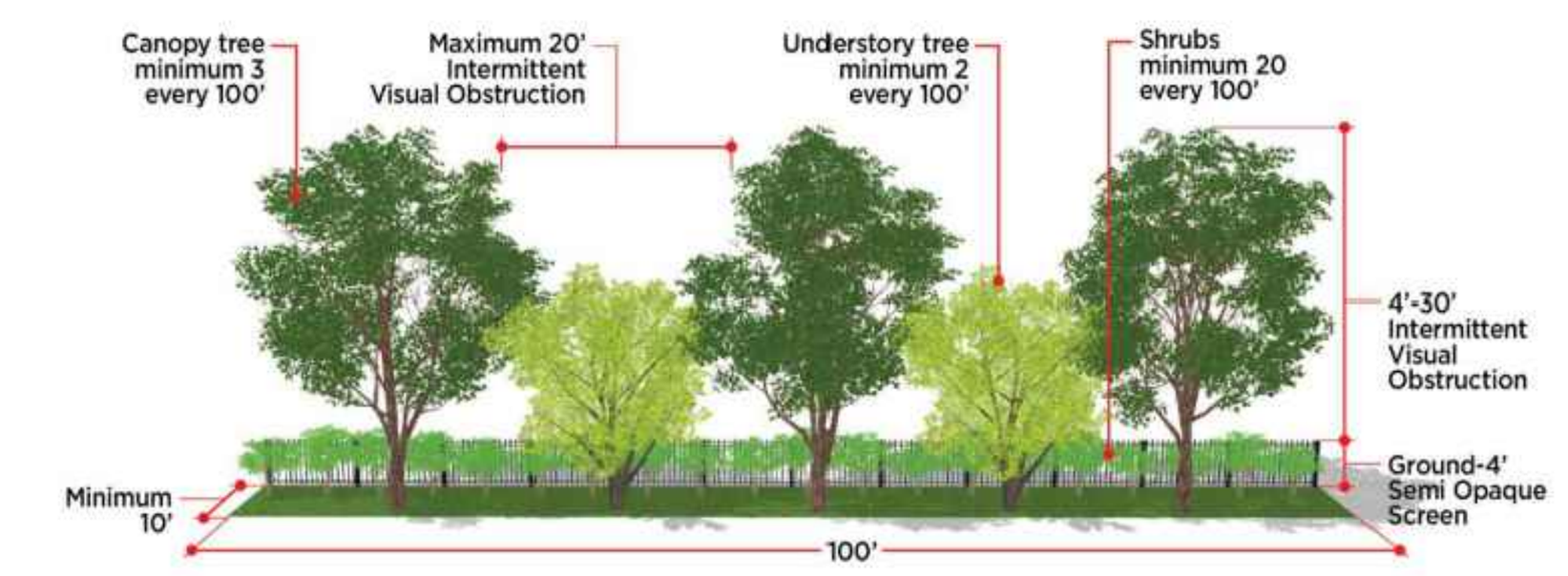
BY: Samuel A. MacDonald (Digitally signed by Samuel A. MacDonald; DN: C=US, E=smacdonald@amtengineering.com, O="A. Morton Thomas & Associates, Inc.", CN=Samuel A. MacDonald; Reason: I am approving this document; Date: 2026.04.16 10:08:02-04'00') DATE: ____________

TOWN ENGINEER

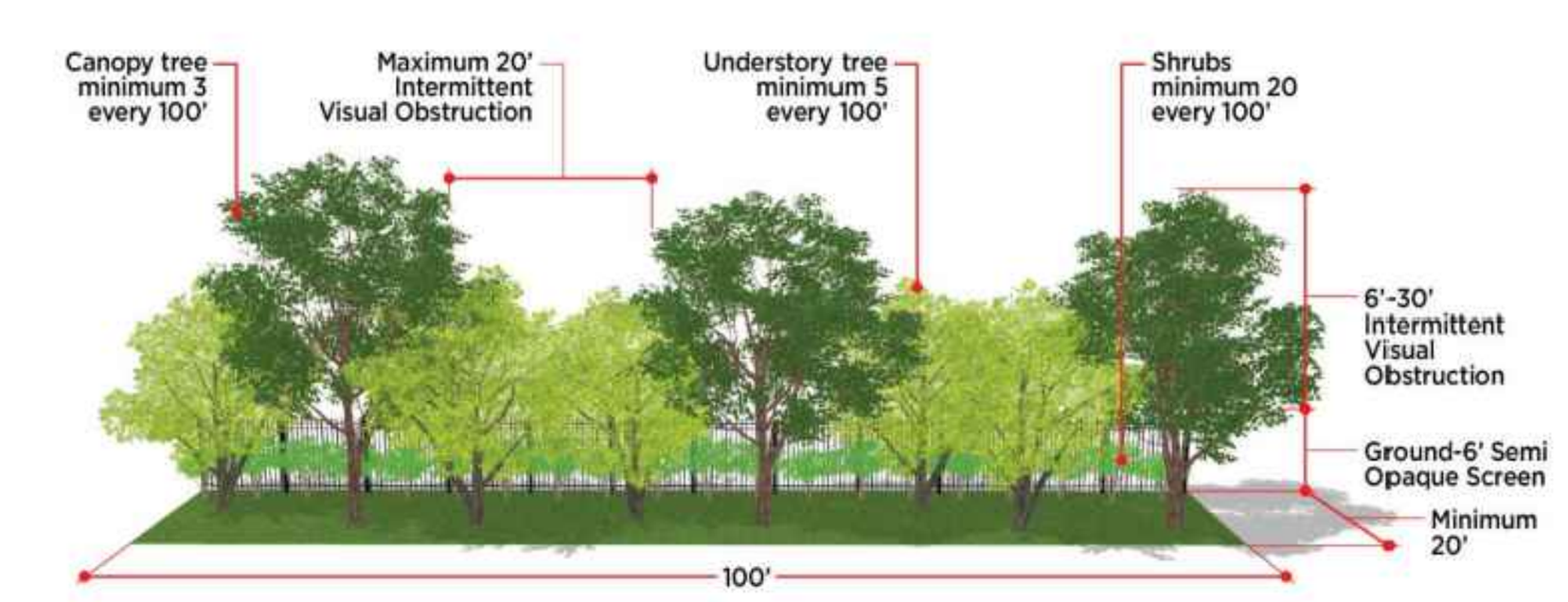
THESE PLANS ARE APPROVED BY THE TOWN OF KNIGHTDALE AND SERVE AS CONSTRUCTION PLANS FOR THIS PROJECT.

BY: Gideon Smith (Digitally signed by Gideon Smith; DN: C=US, E=gideon.smith@knightdalenc.gov, O=Town of Knightdale, OU=Development Services, CN=Gideon Smith; Reason: I am approving this document; Date: 2026.05.19 10:09:54-04'00') DATE: ____________

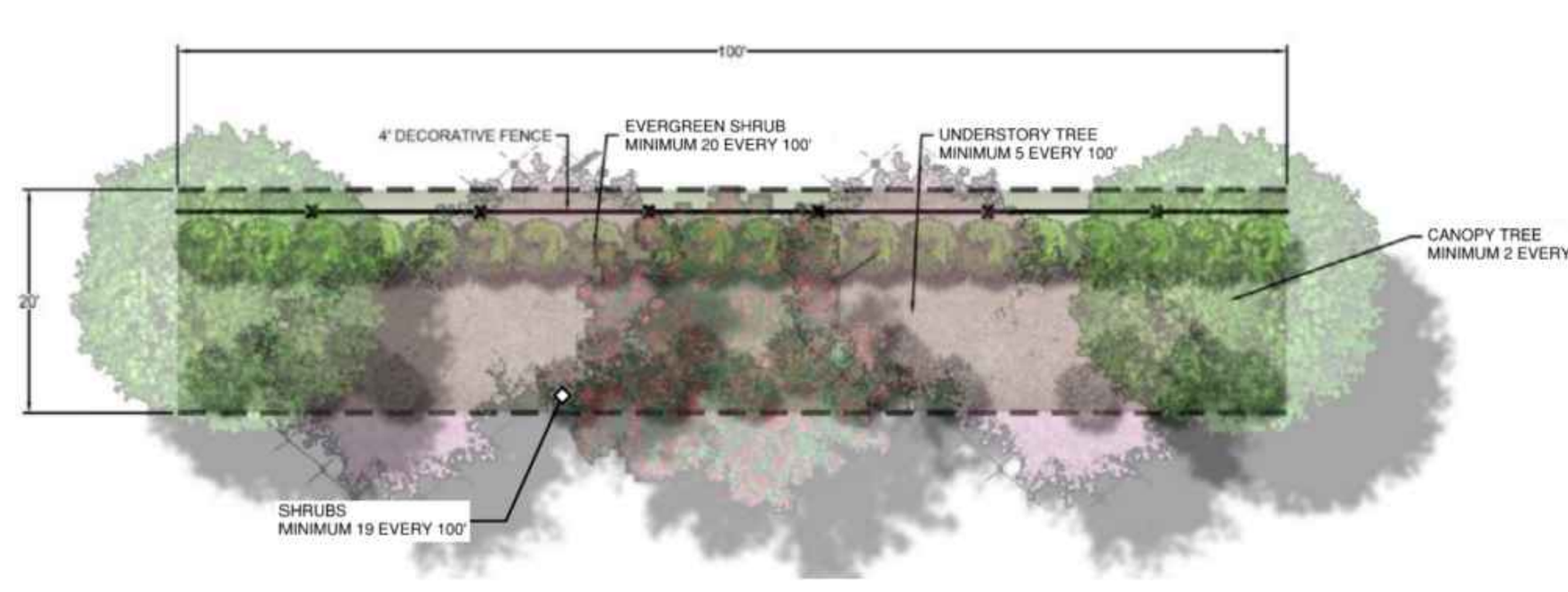
LAND USE ADMINISTRATOR



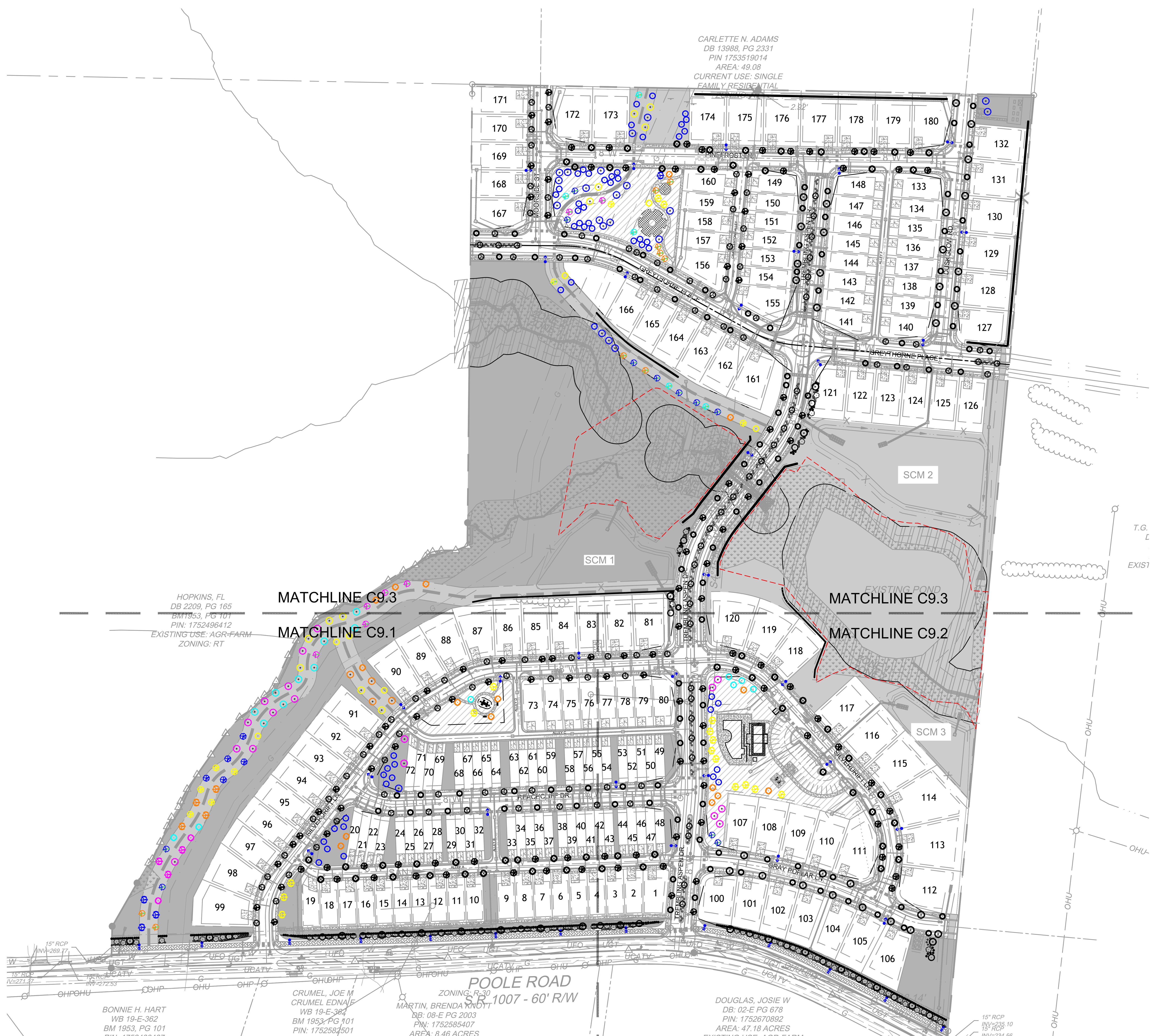
TYPE A BUFFER YARD
NOT TO SCALE



TYPE B BUFFER YARD
NOT TO SCALE



ENHANCED ROADSIDE LANDSCAPING - POOLE RD
NOT TO SCALE



OVERALL REPLACEMENT SCHEDULE

REPLACEMENT PLANTING SCHEDULE - PHASE 1

KEY	DBH (IN) REMOVED (TIER 2)	QTY REPLACE (TIER 2)	DBH (IN) REMOVED (TIER 3)	QTY REPLACE (TIER 3)	BOTANICAL NAME	COMMON NAME	MIN. INSTALLED SIZE	HEIGHT	ROOT	TYPE	LOCATION
ACRU	167	14	0	0	ACER RUBRUM	RED MAPLE	2.5" CAL.	8'-12'	B&B	CANOPY	OPEN SPACE AND GREENWAY
CAIL	19	2	34	3	CARYA ILLINOINENSIS	PECAN	2.5" CAL.	8'-12'	B&B	CANOPY	OPEN SPACE AND GREENWAY
CEOC	54	5	0	0	CELTIS OCCIDENTALIS	COMMON HACKBERRY	2.5" CAL.	8'-12'	B&B	CANOPY	OPEN SPACE AND GREENWAY
DIVI	16	2	0	0	DIOSPYROS VIRGINIANA	COMMON PERSIMMON	2.5" CAL.	8'-12'	B&B	CANOPY	OPEN SPACE AND GREENWAY
LIST	13	1	0	0	LIQUIDAMBAR STYRACIFLUA	SWEETGUM	2.5" CAL.	8'-12'	B&B	CANOPY	OPEN SPACE AND GREENWAY
LITU	37	3	35	3	LIRIODENDRON TULIPIFERA	TULIP-POPLAR	2.5" CAL.	8'-12'	B&B	CANOPY	OPEN SPACE AND GREENWAY
MAGR	0	0	24	2	MAGNOLIA GRANDIFLORA	SOUTHERN MAGNOLIA	2.5" CAL.	8'-12'	B&B	CANOPY	OPEN SPACE AND GREENWAY
PITA	206	17	28	2	PINUS TAEDA	LOBLOLLY PINE	2.5" CAL.	8'-12'	B&B	CANOPY	OPEN SPACE AND GREENWAY
PRSE	44	4	0	0	PRUNUS SEROTINA	BLACK CHERRY	2.5" CAL.	8'-12'	B&B	CANOPY	OPEN SPACE AND GREENWAY
PYCA	54	5	0	0	PYRUS CALLERYANA	CALLERY PEAR	2.5" CAL.	8'-12'	B&B	CANOPY	OPEN SPACE AND GREENWAY
QUAL	52	5	0	0	QUERCUS ALBA	WHITE OAK	2.5" CAL.	8'-12'	B&B	CANOPY	OPEN SPACE AND GREENWAY
QUFA	27	2	0	0	QUERCUS FALCATA	SOUTHERN RED OAK	2.5" CAL.	8'-12'	B&B	CANOPY	OPEN SPACE AND GREENWAY
QULA	0	0	42	4	QUERCUS LAURIFOLIA	LAUREL OAK	2.5" CAL.	8'-12'	B&B	CANOPY	OPEN SPACE AND GREENWAY
QUMA	0	0	37	3	QUERCUS MARILANDICA	BLACKJACK OAK	2.5" CAL.	8'-12'	B&B	CANOPY	OPEN SPACE AND GREENWAY
QUPA	50	4	0	0	QUERCUS PAGODA	CHERRYBARK OAK	2.5" CAL.	8'-12'	B&B	CANOPY	OPEN SPACE AND GREENWAY
QUPH	113	9	54	5	QUERCUS PHELLOS	WILLOW OAK	2.5" CAL.	8'-12'	B&B	CANOPY	OPEN SPACE AND GREENWAY
QUVE	35	3	0	0	QUERCUS VELUTINA	BLACK OAK	2.5" CAL.	8'-12'	B&B	CANOPY	OPEN SPACE AND GREENWAY
ULAL	46	4	0	0	ULMUS ALATA	WINGED ELM	2.5" CAL.	8'-12'	B&B	CANOPY	OPEN SPACE AND GREENWAY
ULAM	103	9	0	0	ULMUS AMERICANA	AMERICAN ELM	2.5" CAL.	8'-12'	B&B	CANOPY	OPEN SPACE AND GREENWAY
ULRU	58	5	146	12	ULMUS RUBRA	SLIPPERY ELM	2.5" CAL.	8'-12'	B&B	CANOPY	OPEN SPACE AND GREENWAY
TOTAL PHASE 1 REPLACEMENT:			128 TREES								

REPLACEMENT PLANTING SCHEDULE - PHASE 2

KEY	DBH (IN) REMOVED (TIER 2)	QTY REPLACE (TIER 2)	DBH (IN) REMOVED (TIER 3)	QTY REPLACE (TIER 3)	BOTANICAL NAME	COMMON NAME	MIN. INSTALLED SIZE	HEIGHT	ROOT	TYPE	LOCATION
ACRU	16	2	0	0	ACER RUBRUM	RED MAPLE	2.5" CAL.	8'-12'	B&B	CANOPY	OPEN SPACE AND GREENWAY
CEOC	16	2	0	0	CELTIS OCCIDENTALIS	COMMON HACKBERRY	2.5" CAL.	8'-12'	B&B	CANOPY	OPEN SPACE AND GREENWAY
ILOP	16	2	0	0	ILEX OPACA	AMERICAN HOLLY	2.5" CAL.	8'-12'	B&B	CANOPY	OPEN SPACE AND GREENWAY
LIST	153	13	82	7	LIQUIDAMBAR STYRACIFLUA	SWEETGUM	2.5" CAL.	8'-12'	B&B	CANOPY	OPEN SPACE AND GREENWAY
LITU	59	5	0	0	LIRIODENDRON TULIPIFERA	TULIP-POPLAR	2.5" CAL.	8'-12'	B&B	CANOPY	OPEN SPACE AND GREENWAY
PITA	267	22	157	13	PINUS TAEDA	LOBLOLLY PINE	2.5" CAL.	8'-12'	B&B	CANOPY	OPEN SPACE AND GREENWAY
PRSE	15	1	0	0	PRUNUS SEROTINA	BLACK CHERRY	2.5" CAL.	8'-12'	B&B	CANOPY	OPEN SPACE AND GREENWAY
QUAL	0	0	24	2	QUERCUS ALBA	WHITE OAK	2.5" CAL.	8'-12'	B&B	CANOPY	OPEN SPACE AND GREENWAY
QUFA	60	5	26	2	QUERCUS FALCATA	SOUTHERN RED OAK	2.5" CAL.	8'-12'	B&B	CANOPY	OPEN SPACE AND GREENWAY
QUNI	26	2	41	3	QUERCUS NIGRA	WATER OAK	2.5" CAL.	8'-12'	B&B	CANOPY	OPEN SPACE AND GREENWAY
QUPA	87	7	0	0	QUERCUS PAGODA	CHERRYBARK OAK	2.5" CAL.	8'-12'	B&B	CANOPY	OPEN SPACE AND GREENWAY
QUPH	21	2	0	0	QUERCUS PHELLOS	WILLOW OAK	2.5" CAL.	8'-12'	B&B	CANOPY	OPEN SPACE AND GREENWAY
QURU	12	1	0	0	QUERCUS RUBRA	NORTHERN RED OAK	2.5" CAL.	8'-12'	B&B	CANOPY	OPEN SPACE AND GREENWAY
QUVE	15	1	0	0	QUERCUS VELUTINA	BLACK OAK	2.5" CAL.	8'-12'	B&B	CANOPY	OPEN SPACE AND GREENWAY
TOTAL PHASE 2 REPLACEMENT:			92 TREES								

TREE REPLACEMENT NOTE

ALL REPLACEMENT TREE PLANTINGS SHALL BE MINIMUM 2.5" DBH AT THE TIME OF INSTALLATION

OVERALL PLANTING SCHEDULE

SEE CESO SHEET L1.0 & L1.1 FOR SEPERATE TOTAL AMENITY LANDSCAPE CALCULATIONS

PLANTING SCHEDULE - CANOPY TREES

KEY	QTY (STREET)	QTY (BUFFER)	BOTANICAL NAME	COMMON NAME	MIN. INSTALLED SIZE	HEIGHT	ROOT	TYPE	LOCATION
SM	56	0	ACER SACCHARUM	SUGAR MAPLE	2" CAL.	8' MIN.	B&B	CANOPY	STREET TREE
CP	52	0	PISTACIA CHINENSIS	CHINESE PISTACHIA	2" CAL.	8' MIN.	B&B	CANOPY	STREET TREE
SO	66	0	QUERCUS ACUTISSIMA	SAWTOOTH OAK	2" CAL.	8' MIN.	B&B	CANOPY	STREET TREE
AE	12	12	ULMUS PARVIFOLIA	LACEBARK ELM (CHINESE)	2" CAL.	8' MIN.	B&B	CANOPY	STREET TREE, OPAQUE SCREEN, LANDSCAPE BUFFER
JZ	117	0	ZELKOA SERRATA	JAPANESE ZELKOVA	2" CAL.	8' MIN.	B&B	CANOPY	STREET TREE, ROADWAY MEDIAN
SZ	102	0	ZELKOVA SCHNEIDERIANA	SCHNEIDER ZELKOVA	2" CAL.	6' MIN.	B&B	CANOPY	STREET TREE

PLANTING SCHEDULE - UNDERSTORY TREES

KEY	QTY (STREET)	QTY (BUFFER)	BOTANICAL NAME	COMMON NAME	MIN. INSTALLED SIZE	HEIGHT	ROOT	TYPE	LOCATION
JC	0	21	PRUNUS SERRULATA	JAPANESE CHERRY FLOWERING	1.25" CAL.	6' MIN.	B&B	UNDERSTORY	LANDSCAPE BUFFER
DC	0	73	CORNUS FLORIDA	DOGWOOD	1.25" CAL.	6' MIN	B&B	UNDERSTORY	OPAQUE SCREEN

PLANTING SCHEDULE - SHRUBS

KEY	QTY (STREET)	QTY (BUFFER)	BOTANICAL NAME	COMMON NAME	MIN. INSTALLED SIZE	HEIGHT	ROOT	LOCATION
IC	184	405	ILEX CRENATA	JAPANESE HOLLY	18" HT/SPRD	18" HT/SPRD	CON	LANDSCAPE BUFFER,SEMI OPAQUE SCREEN, ROADWAY MEDIAN
IH	0	269	ILEX CRENATA 'HETZI'	HETZI HOLLY	18" HT/SPRD	18" HT/SPRD	CON	OPAQUE SCREEN

NOTES

1. STREET TREES SHALL BE LOCATED WITHIN THE RIGHT OF WAY.
2. STREET TREES SHALL BE PLANTED IN ACCORDANCE WITH STD. 3.26 AND SECTION 7.4.L OF THE UDO AND THE APPLICABLE ROADWAY CROSS-SECTION DETAILED IN SECTION 10.4.A OF THE UDO
3. ALL LANDSCAPING SHOULD BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH STD. 3.25 AND THE TOWN OF KNIGHTDALE'S UDO.
4. ALL PLANT MATERIALS TO COMPLY WITH AMERICAN STANDARD FOR NURSERY STOCK ANSI.Z60.1
5. CONTRACTOR ENGAGED IN LANDSCAPE IMPLEMENTATION SHALL BE A LANDSCAPE CONTRACTOR REGISTERED IN THE STATE OF NORTH CAROLINA.
6. SUBSTITUTIONS OF PLANT MATERIALS SPECIFIED CAN ONLY OCCUR WITH PRIOR APPROVAL BY LANDSCAPE ARCHITECT.
7. ALL NEW TREES TO HAVE A 5' DIAMETER SHREDDED HARDWOOD MULCH RING AT 4" DEEP UNLESS OTHERWISE NOTED OR LOCATED IN A PLANT BED PER SITE PLAN.
8. LANDSCAPE CONTRACTOR TO GUARANTEE PLANT MATERIALS FOR A ONE YEAR PERIOD FOLLOWING SUBSTANTIAL COMPLETION.
9. AREAS DAMAGED BY LANDSCAPE CONTRACTOR TO BE REPAIRED TO PRE-CONSTRUCTION CONDITION AT NO ADDITIONAL COST TO THE OWNER.
10. ALL LANDSCAPE ISLANDS SHALL BE GRADED FOR POSITIVE DRAINAGE WITH NO LOW SPOTS ALLOWING WATER TO BE TRAPPED.
11. ALL ABOVE GROUND UTILITIES MUST BE SCREENED.
12. WITHIN THE AREA OF A DEFINED SIGHT TRIANGLE, THERE SHALL BE NO SIGHT OBSTRUCTING OR PARTLY OBSTRUCTING WALL, FENCE, SIGN, FOLIAGE, BERM, OR PARKED VEHICLES BETWEEN 24 INCHES AND EIGHT FEET ABOVE THE CURB LINE ELEVATION, OBJECTS, WHICH MAY BE LOCATED IN THE SIGHT DISTANCE TRIANGLE, ARE ITEMS SUCH AS HYDRANTS, UTILITY POLES, UTILITY JUNCTION BOXES, AND TRAFFIC CONTROL DEVICES PROVIDED THESE OBJECTS ARE LOCATED TO MINIMIZE VISUAL OBSTRUCTION [UDO, SEC. 10.5.D.3.b].
13. ANY REQUIRED STREET TREES PLANTED ON PRIVATE PROPERTY MUST REMAIN AND CANNOT BE REMOVED BY PROPERTY OWNER

NOTE

CANOPY TREES EIGHT (8) INCH CALIPER OR GREATER SHALL BE REPLACED WITH LIKE TREES WITH MINIMUM INDIVIDUAL CALIPER OF 2.5" WHO'S CUMULATIVE CALIPER IS EQUAL TO OR GREATER THAN THE ORIGINAL TREE.

TREE COVER AREA

SITE PERIMETER:	7,391 LF
TREE COVER REQUIRED (20 X PERIMETER):	147,820 SF
TREE SAVE AREA PROVIDED:	245,476 SF
LANDSCAPE BUFFER AREA PROVIDED:	39,697 SF
TOTAL TREE COVER AREA PROVIDED:	285,173 SF

LEGEND

- PROPERTY LINE
- PROPOSED RIGHT OF WAY
- PROPOSED LOT LINE
- TREE SAVE
- ACTIVE OPEN SPACE
- PASSIVE OPEN SPACE
- COMMON OPEN SPACE
- WETLANDS
- NEUSE RIPARIAN BUFFER

SPECIES LIST

Species Acronym	Scientific Name	Common Name
ACRU	*Acer rubrum*	red maple
CAIL	*Carya illinoinensis*	pecan
CELA	*Celtis laevigata*	sugarberry
CEOC	*Celtis occidentalis*	common hackberry
DIVI	*Diospyros virginiana*	common persimmon
ILOP	*Ilex opaca*	American holly
JUVI	*Juniperus virginiana*	eastern red-cedar
LIST	*Liquidambar styraciflua*	sweetgum
LITU	*Liriodendron tulipifera*	tulip-poplar
MAGR	*Magnolia grandiflora*	southern magnolia
MEAZ	*Melia azedarach*	chinaberrytree
MORU	*Morus rubra*	red mulberry
NYSY	*Nyssa sylvatica*	black tupelo
PATO	*Paulownia tomentosa*	princesstree
PITA	*Pinus taeda*	loblolly pine
PRSE	*Prunus serotina*	black cherry
PYCA	*Pyrus calleryana*	callery pear
QUAL	*Quercus alba*	white oak
QUFA	*Quercus falcata*	southern red oak
QULA	*Quercus laurifolia*	laurel oak
QUMA	*Quercus marilandica*	blackjack oak
QUNI	*Quercus nigra*	water oak
QUPA	*Quercus pagoda*	cherrybark oak
QUPH	*Quercus phellos*	willow oak
QURU	*Quercus rubra*	northern red oak
QUVE	*Quercus velutina*	black oak
ULAL	*Ulmus alata*	winged elm
ULAM	*Ulmus americana*	American elm
ULRU	*Ulmus rubra*	slippery elm

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-4142

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-5503

NORTH CAROLINA PROFESSIONAL SEAL 051879 ENGINEER TYLER JEFFREY CROSS
3/31/2026

THIS DRAWING PREPARED AT THE **RALEIGH OFFICE**
5410 Trinity Road, Suite 102 | Raleigh, NC 27607
TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

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REVISION DESCRIPTION | DATE

DATE 03/31/2026
DRAWN BY 331
DESIGNED BY 331
CHECKED BY T. CROSS
SCALE 1" = 150'

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

OVERALL LANDSCAPE PLAN

JOB NO. 51557
SHEET NO. C9.0

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PLANTING SCHEDULE - CANOPY TREES

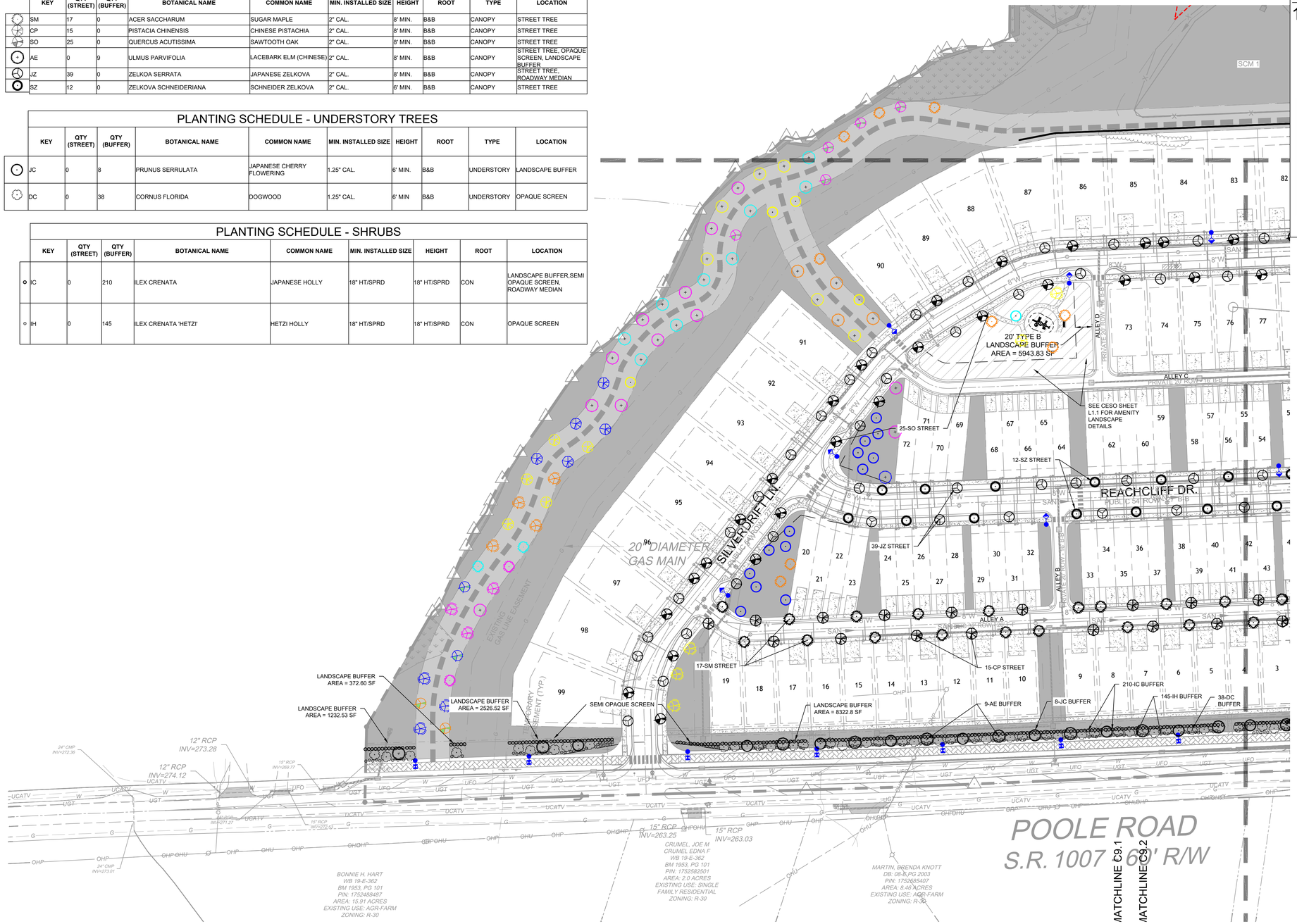
KEY	QTY (STREET)	QTY (BUFFER)	BOTANICAL NAME	COMMON NAME	MIN. INSTALLED SIZE	HEIGHT	ROOT	TYPE	LOCATION
SM	17	0	ACER SACCHARUM	SUGAR MAPLE	2" CAL.	8' MIN.	B&B	CANOPY	STREET TREE
CP	15	0	PISTACIA CHINENSIS	CHINESE PISTACHIA	2" CAL.	8' MIN.	B&B	CANOPY	STREET TREE
SO	25	0	QUERCUS ACUTISSIMA	SAWTOOTH OAK	2" CAL.	8' MIN.	B&B	CANOPY	STREET TREE
AE	0	9	ULMUS PARVIFOLIA	LACEBARK ELM (CHINESE)	2" CAL.	8' MIN.	B&B	CANOPY	STREET TREE, OPAQUE SCREEN, LANDSCAPE BUFFER
JZ	39	0	ZELKOA SERRATA	JAPANESE ZELKOVA	2" CAL.	8' MIN.	B&B	CANOPY	STREET TREE, ROADWAY MEDIAN
SZ	12	0	ZELKOVA SCHNEIDERIANA	SCHNEIDER ZELKOVA	2" CAL.	6' MIN.	B&B	CANOPY	STREET TREE

PLANTING SCHEDULE - UNDERSTORY TREES

KEY	QTY (STREET)	QTY (BUFFER)	BOTANICAL NAME	COMMON NAME	MIN. INSTALLED SIZE	HEIGHT	ROOT	TYPE	LOCATION
JC	0	8	PRUNUS SERRULATA	JAPANESE CHERRY FLOWERING	1.25" CAL.	6' MIN.	B&B	UNDERSTORY	LANDSCAPE BUFFER
DC	0	38	CORNUS FLORIDA	DOGWOOD	1.25" CAL.	6' MIN	B&B	UNDERSTORY	OPAQUE SCREEN

PLANTING SCHEDULE - SHRUBS

KEY	QTY (STREET)	QTY (BUFFER)	BOTANICAL NAME	COMMON NAME	MIN. INSTALLED SIZE	HEIGHT	ROOT	LOCATION
IC	0	210	ILEX CRENATA	JAPANESE HOLLY	18" HT/SPRD	18" HT/SPRD	CON	LANDSCAPE BUFFER,SEMI OPAQUE SCREEN, ROADWAY MEDIAN
IH	0	145	ILEX CRENATA 'HETZI'	HETZI HOLLY	18" HT/SPRD	18" HT/SPRD	CON	OPAQUE SCREEN



KEY MAP
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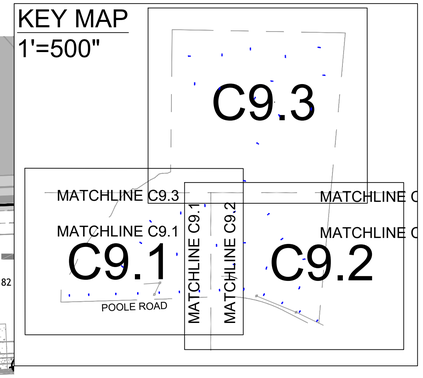

TOWN CERTIFICATION

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: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

LEGEND

- PROPERTY LINE
- PROPOSED RIGHT OF WAY
- PROPOSED LOT LINE
- TREE SAVE
- ACTIVE OPEN SPACE
- PASSIVE OPEN SPACE
- COMMON OPEN SPACE
- WETLANDS
- NEUSE RIPARIAN BUFFER

NAD 83

SCALE 1"=60'
0 60' 120'

NOTES

1. STREET TREES SHALL BE LOCATED WITHIN THE RIGHT OF WAY.
2. STREET TREES SHALL BE PLANTED IN ACCORDANCE WITH STD. 3.26 AND SECTION 7.4.L OF THE UDO AND THE APPLICABLE ROADWAY CROSS-SECTION DETAILED IN SECTION 10.4.A OF THE UDO
3. ALL LANDSCAPING SHOULD BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH STD. 3.25 AND THE TOWN OF KNIGHTDALE'S UDO.
4. ALL PLANT MATERIALS TO COMPLY WITH AMERICAN STANDARD FOR NURSERY STOCK ANSI.Z60.1
5. CONTRACTOR ENGAGED IN LANDSCAPE IMPLEMENTATION SHALL BE A LANDSCAPE CONTRACTOR REGISTERED IN THE STATE OF NORTH CAROLINA.
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13. ANY REQUIRED STREET TREES PLANTED ON PRIVATE PROPERTY MUST REMAIN AND CANNOT BE REMOVED BY PROPERTY OWNER

Public
Water Distribution / Extension System
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City of Raleigh
Public Utilities Department Permit # W-4142

Public
Sewer Collection / Extension System
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City of Raleigh
Public Utilities Department Permit # S-5503

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 TYLER JEFFREY CROSS ENGINEER
3/31/2026

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REVISION DESCRIPTION

DATE

DATE 03/31/2026
DRAWN BY 331
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CHECKED BY T. CROSS
SCALE 1" = 60'

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

DETAIL LANDSCAPE PLAN - SHEET 1 OF 3

JOB NO. 51557
SHEET NO. C9.1

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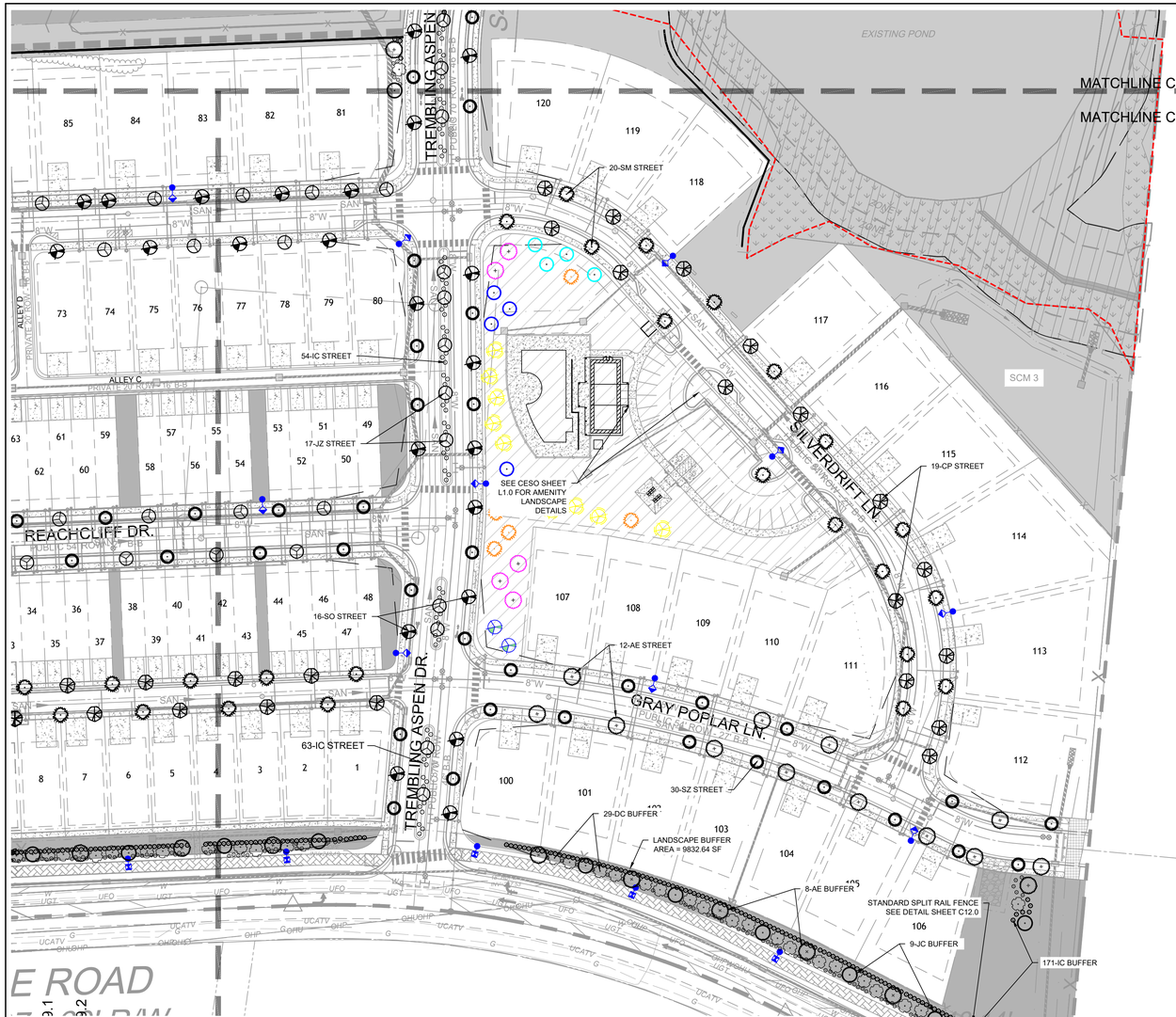

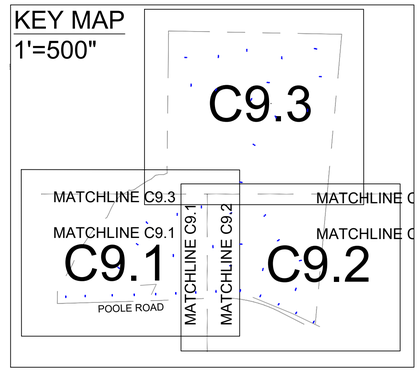

NAD 83

SCALE 1"=60'
0 60' 120'

LEGEND

- PROPERTY LINE
- PROPOSED RIGHT OF WAY
- PROPOSED LOT LINE
- TREE SAVE
- ACTIVE OPEN SPACE
- PASSIVE OPEN SPACE
- COMMON OPEN SPACE
- WETLANDS
- NEUSE RIPARIAN BUFFER

PLANTING SCHEDULE - CANOPY TREES

KEY	QTY (STREET)	QTY (BUFFER)	BOTANICAL NAME	COMMON NAME	MIN. INSTALLED SIZE	HEIGHT	ROOT	TYPE	LOCATION
SM	20	0	ACER SACCHARUM	SUGAR MAPLE	2" CAL.	8' MIN.	B&B	CANOPY	STREET TREE
CP	19	0	PISTACIA CHINENSIS	CHINESE PISTACHIA	2" CAL.	8' MIN.	B&B	CANOPY	STREET TREE
SO	16	0	QUERCUS ACUTISSIMA	SAWTOOTH OAK	2" CAL.	8' MIN.	B&B	CANOPY	STREET TREE
AE	12	8	ULMUS PARVIFOLIA	LACEBARK ELM (CHINESE)	2" CAL.	8' MIN.	B&B	CANOPY	STREET TREE, OPAQUE SCREEN, LANDSCAPE BUFFER
JZ	17	0	ZELKOA SERRATA	JAPANESE ZELKOVA	2" CAL.	8' MIN.	B&B	CANOPY	STREET TREE, ROADWAY MEDIAN
SZ	30	0	ZELKOVA SCHNEIDERIANA	SCHNEIDER ZELKOVA	2" CAL.	6' MIN.	B&B	CANOPY	STREET TREE

PLANTING SCHEDULE - UNDERSTORY TREES

KEY	QTY (STREET)	QTY (BUFFER)	BOTANICAL NAME	COMMON NAME	MIN. INSTALLED SIZE	HEIGHT	ROOT	TYPE	LOCATION
JC	0	9	PRUNUS SERRULATA	JAPANESE CHERRY FLOWERING	1.25" CAL.	6' MIN.	B&B	UNDERSTORY	LANDSCAPE BUFFER
DC	0	29	CORNUS FLORIDA	DOGWOOD	1.25" CAL.	6' MIN	B&B	UNDERSTORY	OPAQUE SCREEN

PLANTING SCHEDULE - SHRUBS

KEY	QTY (STREET)	QTY (BUFFER)	BOTANICAL NAME	COMMON NAME	MIN. INSTALLED SIZE	HEIGHT	ROOT	LOCATION
IC	63	171	ILEX CRENATA	JAPANESE HOLLY	18" HT/SPRD	18" HT/SPRD	CON	LANDSCAPE BUFFER,SEMI OPAQUE SCREEN, ROADWAY MEDIAN
IH	0	96	ILEX CRENATA 'HETZI'	HETZI HOLLY	18" HT/SPRD	18" HT/SPRD	CON	OPAQUE SCREEN

NOTES

1. STREET TREES SHALL BE LOCATED WITHIN THE RIGHT OF WAY.
2. STREET TREES SHALL BE PLANTED IN ACCORDANCE WITH STD. 3.26 AND SECTION 7.4.L OF THE UDO AND THE APPLICABLE ROADWAY CROSS-SECTION DETAILED IN SECTION 10.4.A OF THE UDO
3. ALL LANDSCAPING SHOULD BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH STD. 3.25 AND THE TOWN OF KNIGHTDALE'S UDO.
4. ALL PLANT MATERIALS TO COMPLY WITH AMERICAN STANDARD FOR NURSERY STOCK ANSI.Z60.1
5. CONTRACTOR ENGAGED IN LANDSCAPE IMPLEMENTATION SHALL BE A LANDSCAPE CONTRACTOR REGISTERED IN THE STATE OF NORTH CAROLINA.
6. SUBSTITUTIONS OF PLANT MATERIALS SPECIFIED CAN ONLY OCCUR WITH PRIOR APPROVAL BY LANDSCAPE ARCHITECT.
7. ALL NEW TREES TO HAVE A 5' DIAMETER SHREDDED HARDWOOD MULCH RING AT 4" DEEP UNLESS OTHERWISE NOTED OR LOCATED IN A PLANT BED PER SITE PLAN.
8. LANDSCAPE CONTRACTOR TO GUARANTEE PLANT MATERIALS FOR A ONE YEAR PERIOD FOLLOWING SUBSTANTIAL COMPLETION.
9. AREAS DAMAGED BY LANDSCAPE CONTRACTOR TO BE REPAIRED TO PRE-CONSTRUCTION CONDITION AT NO ADDITIONAL COST TO THE OWNER.
10. ALL LANDSCAPE ISLANDS SHALL BE GRADED FOR POSITIVE DRAINAGE WITH NO LOW SPOTS ALLOWING WATER TO BE TRAPPED.
11. ALL ABOVE GROUND UTILITIES MUST BE SCREENED.
12. WITHIN THE AREA OF A DEFINED SIGHT TRIANGLE, THERE SHALL BE NO SIGHT OBSTRUCTING OR PARTLY OBSTRUCTING WALL, FENCE, SIGN, FOLIAGE, BERM, OR PARKED VEHICLES BETWEEN 24 INCHES AND EIGHT FEET ABOVE THE CURB LINE ELEVATION. OBJECTS, WHICH MAY BE LOCATED IN THE SIGHT DISTANCE TRIANGLE, ARE ITEMS SUCH AS HYDRANTS, UTILITY POLES, UTILITY JUNCTION BOXES, AND TRAFFIC CONTROL DEVICES PROVIDED THESE OBJECTS ARE LOCATED TO MINIMIZE VISUAL OBSTRUCTION [UDO, SEC. 10.5.D.3.b].
13. ANY REQUIRED STREET TREES PLANTED ON PRIVATE PROPERTY MUST REMAIN AND CANNOT BE REMOVED BY PROPERTY OWNER

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: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

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

BY: Gideon Smith DATE: _____
LAND USE 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-4142

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-5503

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 ENGINEER TYLER JEFFREY CROSS
3/31/2026

THIS DRAWING PREPARED AT THE
RALEIGH OFFICE
5410 Trinity Road, Suite 102 | Raleigh, NC 27607
TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

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REVISION DESCRIPTION

DATE

DATE 03/31/2026
DRAWN BY 331
DESIGNED BY 331
CHECKED BY T. CROSS
SCALE 1" = 60'

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA
DETAIL LANDSCAPE PLAN - SHEET 2 OF 3

JOB NO. 51557
SHEET NO. C9.2

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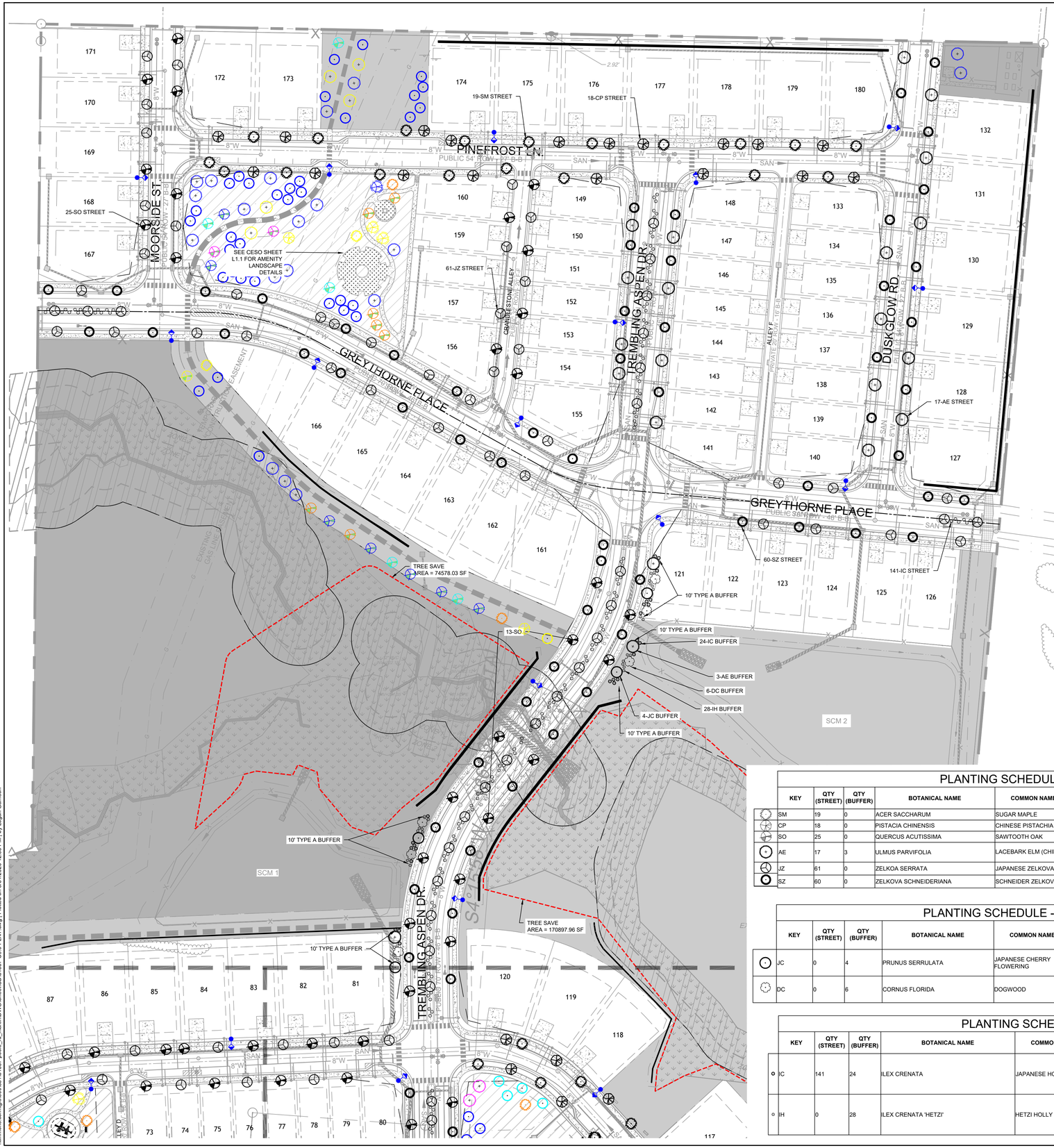
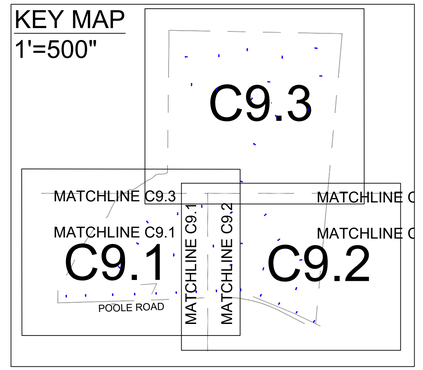


KEY MAP
1'=500"



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: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

Digitally signed by Samuel A. MacDonald
DN: cn=Samuel A. MacDonald, o=Knightdale Engineering, ou=N/A, Motion Thomas & Associates, email=samuel.macdonald@knightdalenc.gov, c=N/A
Reason: I am approving this document
Date: 2026.04.08 10:08:24-04'00'

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

Digitally signed by Gideon Smith
DN: cn=Gideon Smith, email=gsmith@knightdalenc.gov, o=Town of Knightdale, ou=Development Services, c=US
Reason: I am approving this document
Date: 2026.04.08 10:11:18-04'00'

NOTES

1. STREET TREES SHALL BE LOCATED WITHIN THE RIGHT OF WAY.
2. STREET TREES SHALL BE PLANTED IN ACCORDANCE WITH STD. 3.26 AND SECTION 7.4.L OF THE UDO AND THE APPLICABLE ROADWAY CROSS-SECTION DETAILED IN SECTION 10.4.A OF THE UDO
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6. SUBSTITUTIONS OF PLANT MATERIALS SPECIFIED CAN ONLY OCCUR WITH PRIOR APPROVAL BY LANDSCAPE ARCHITECT.
7. ALL NEW TREES TO HAVE A 5' DIAMETER SHREDDED HARDWOOD MULCH RING AT 4" DEEP UNLESS OTHERWISE NOTED OR LOCATED IN A PLANT BED PER SITE PLAN.
8. LANDSCAPE CONTRACTOR TO GUARANTEE PLANT MATERIALS FOR A ONE YEAR PERIOD FOLLOWING SUBSTANTIAL COMPLETION.
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13. ANY REQUIRED STREET TREES PLANTED ON PRIVATE PROPERTY MUST REMAIN AND CANNOT BE REMOVED BY PROPERTY OWNER

NAD 83

SCALE 1"=60'
0 60' 120'

PLANTING SCHEDULE - CANOPY TREES

KEY	QTY (STREET)	QTY (BUFFER)	BOTANICAL NAME	COMMON NAME	MIN. INSTALLED SIZE	HEIGHT	ROOT	TYPE	LOCATION
SM	19	0	ACER SACCHARUM	SUGAR MAPLE	2" CAL.	8' MIN.	B&B	CANOPY	STREET TREE
CP	18	0	PISTACIA CHINENSIS	CHINESE PISTACHIA	2" CAL.	8' MIN.	B&B	CANOPY	STREET TREE
SO	25	0	QUERCUS ACUTISSIMA	SAWTOOTH OAK	2" CAL.	8' MIN.	B&B	CANOPY	STREET TREE
AE	17	3	ULMUS PARVIFOLIA	LACEBARK ELM (CHINESE)	2" CAL.	8' MIN.	B&B	CANOPY	STREET TREE, OPAQUE SCREEN, LANDSCAPE BUFFER
JZ	61	0	ZELKOA SERRATA	JAPANESE ZELKOVA	2" CAL.	8' MIN.	B&B	CANOPY	STREET TREE, ROADWAY MEDIAN
SZ	60	0	ZELKOVA SCHNEIDERIANA	SCHNEIDER ZELKOVA	2" CAL.	6' MIN.	B&B	CANOPY	STREET TREE

PLANTING SCHEDULE - UNDERSTORY TREES

KEY	QTY (STREET)	QTY (BUFFER)	BOTANICAL NAME	COMMON NAME	MIN. INSTALLED SIZE	HEIGHT	ROOT	TYPE	LOCATION
JC	0	4	PRUNUS SERRULATA	JAPANESE CHERRY FLOWERING	1.25" CAL.	6' MIN.	B&B	UNDERSTORY	LANDSCAPE BUFFER
DC	0	6	CORNUS FLORIDA	DOGWOOD	1.25" CAL.	6' MIN	B&B	UNDERSTORY	OPAQUE SCREEN

PLANTING SCHEDULE - SHRUBS

KEY	QTY (STREET)	QTY (BUFFER)	BOTANICAL NAME	COMMON NAME	MIN. INSTALLED SIZE	HEIGHT	ROOT	LOCATION
IC	141	24	ILEX CRENATA	JAPANESE HOLLY	18" HT/SPRD	18" HT/SPRD	CON	LANDSCAPE BUFFER,SEMI OPAQUE SCREEN, ROADWAY MEDIAN
IH	0	28	ILEX CRENATA 'HETZI'	HETZI HOLLY	18" HT/SPRD	18" HT/SPRD	CON	OPAQUE SCREEN

LEGEND

- PROPERTY LINE
- PROPOSED RIGHT OF WAY
- PROPOSED LOT LINE
- TREE SAVE
- ACTIVE OPEN SPACE
- PASSIVE OPEN SPACE
- COMMON OPEN SPACE
- WETLANDS
- NEUSE RIPARIAN BUFFER

Public
Water Distribution / Extension System
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City of Raleigh
Public Utilities Department Permit # W-4142

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-5503

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 TYLER JEFFREY CROSS
3/31/2026

THIS DRAWING PREPARED AT THE
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5410 Trinity Road, Suite 102 | Raleigh, NC 27607
TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION	DATE

DATE: 03/31/2026
DRAWN BY: 331
DESIGNED BY: 331
CHECKED BY: T. CROSS
SCALE: 1" = 60'
JOB NO.: 51557
SHEET NO.: C9.3

TIMMONS GROUP

NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS

KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

DETAIL LANDSCAPE PLAN - SHEET 3 OF 3

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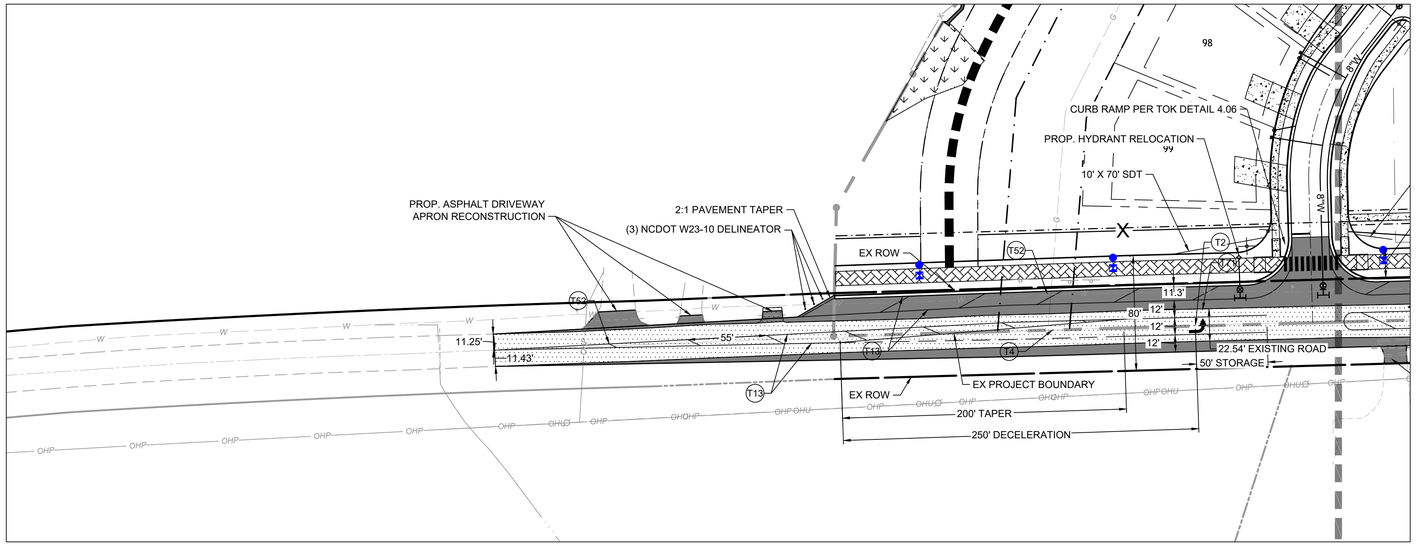
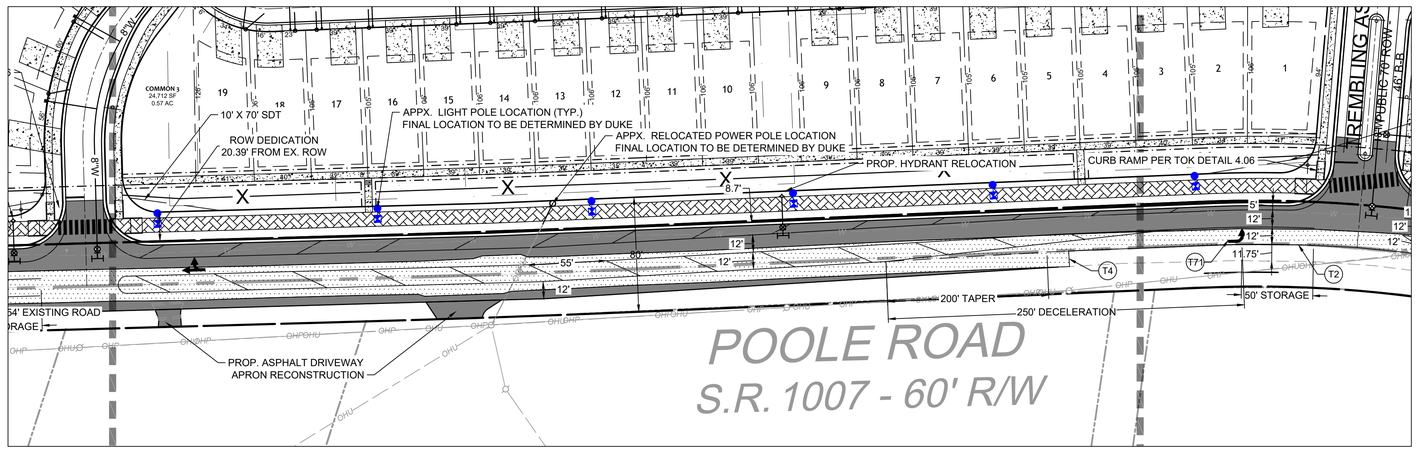
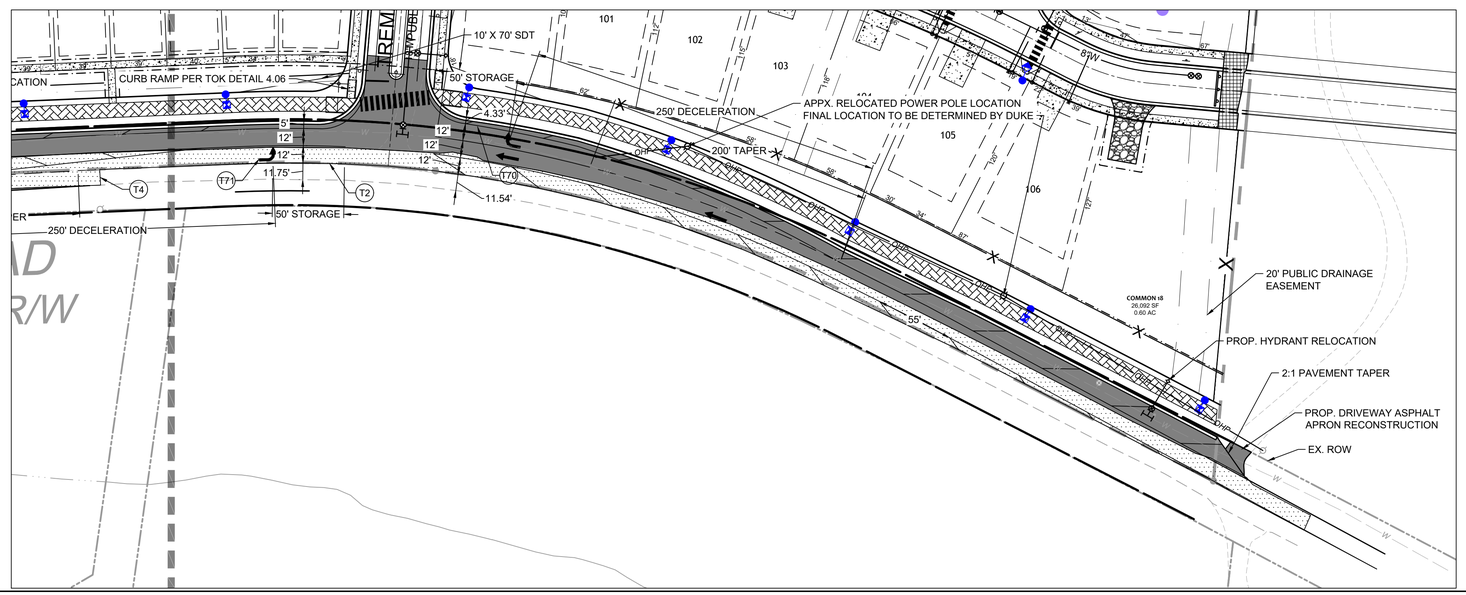
POOLE ROAD WIDENING
PROPOSED STRIPING



POOLE ROAD WIDENING
PROPOSED STRIPING



POOLE ROAD WIDENING
PROPOSED STRIPING



PAVEMENT MARKING NOTES

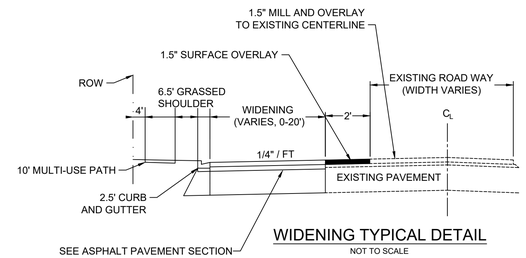
1. LOCATION OF PAVEMENT MARKINGS SHALL CONFORM TO NCDOT PAVEMENT MARKING STANDARDS . APPLICATION OF PAVEMENT MARKINGS SHALL BE DONE IN ACCORDANCE WITH SECTION 1205 OF THE N.C. DIVISION OF HIGHWAYS STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES HANDBOOK (2012 EDITION) WITH REVISION(S) THERETO.
2. ALL EXISTING PAVEMENT MARKINGS SHALL BE ERADICATED PER NCDOT SPECIFICATIONS PRIOR TO PLACEMENT OF MARKING SHOWN HEREIN.
3. THE CONTRACTOR SHALL BE REQUIRED TO PRE-MARK THE PAVEMENT PRIOR TO ACTUAL APPLICATION OF MARKINGS WITHIN THE NCDOT RIGHT OF WAY. THE CONTRACTOR SHALL SCHEDULE A PRE-MARKING INSPECTION REVIEW WITH THE NCDOT DISTRICT ENGINEER AT LEAST ONE WEEK PRIOR TO MARKING. PAVEMENT MARKINGS SHALL NOT BE INSTALLED UNTIL AFTER FIELD REVIEW AND APPROVAL BY THE NCDOT DISTRICT ENGINEER.
4. PAVEMENT MARKINGS SHALL MATCH TO AND ALIGN WITH EXISTING CONDITIONS AND MARKINGS. THE CONTRACTOR SHALL PROVIDE THERMOPLASTIC MARKINGS ON ROADWAYS .
5. INSTALLATION OF PAVEMENT MARKINGS AND RAISED REFLECTIVE PAVEMENT MARKERS FOR NEWLY CONSTRUCTED TURN LANES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR .
6. ALL PAVEMENT MARKINGS WITHIN NCDOT RIGHT-OF-WAY SHALL BE LONG LIFE THERMOPLASTIC.
7. CONTACT NCDOT TRAFFIC SERVICES FOR PAVEMENT MARKING LAYOUT.

PAVEMENT MARKING LEGEND
T1 - WHITE EDGELINE (4", 90 MIL)
T2 - WHITE SOLID (4", 90 MIL)
T4 - 3FT - 9 FT SP WHITE MINI SKIP (4", 90 MIL)
T13 - YELLOW DOUBLE CENTER (4", 90 MIL)
T40 - WHITE GORELINE (8", 90 MIL)
T41 - WHITE DIAGONAL (8", 90 MIL)
T52 - YELLOW DIAGONAL (12", 90 MIL)
T61 - WHITE STOPBAR (24", 90 MIL)
T70 - RIGHT TURN ARROW (90 MIL)
T71 - LEFT TURN ARROW (90 MIL)

DESIGN SPEED: 60 MPH

POSTED SPEED: 55 MPH

LEGEND
1.5" MILL AND OVERLAY
PROPOSED PAVEMENT



WIDENING TYPICAL DETAIL
NOT TO SCALE

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: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

Digitally signed by Samuel A. MacDonald
DN: cn=Samuel A. MacDonald, o=Timmons Group, ou=Civil, l=Raleigh, st=North Carolina, c=US
Reason: I am approving this document
Date: 2026.03.31 12:55:23 -04'00'

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

Digitally signed by Gideon Smith
DN: cn=Gideon Smith, o=Knightdale, ou=Development Services, email=gsmith@knightdale-nc.gov, c=US
Date: 2026.04.01 07:27:13 -04'00'

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-4142

Public
Sewer Collection / Extension System
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City of Raleigh
Public Utilities Department Permit # S-5503

NAD 83

SCALE 1"=50'
0 50' 100'

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 TYLER JEFFREY CROSS
3/31/2026

THIS DRAWING PREPARED AT THE
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TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION

DATE
03/31/2026
DRAWN BY
331
DESIGNED BY
331
CHECKED BY
T. CROSS
SCALE

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA
DETAILED ROADWAY WIDENING PLAN

JOB NO.
51557
SHEET NO.
C10.0

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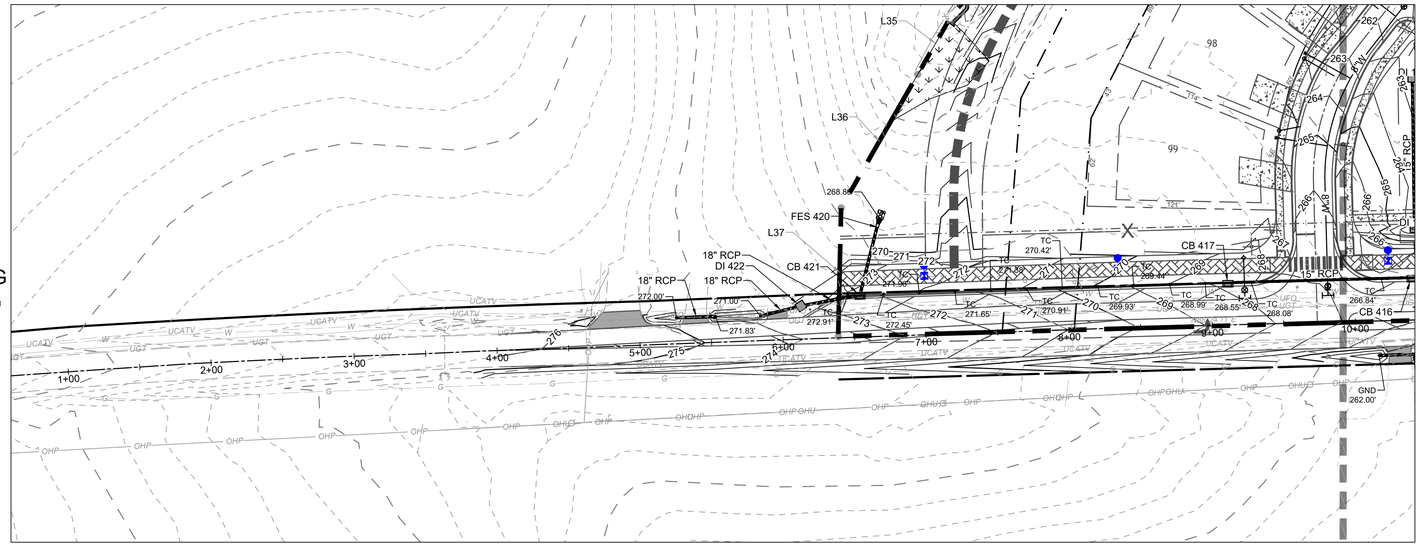
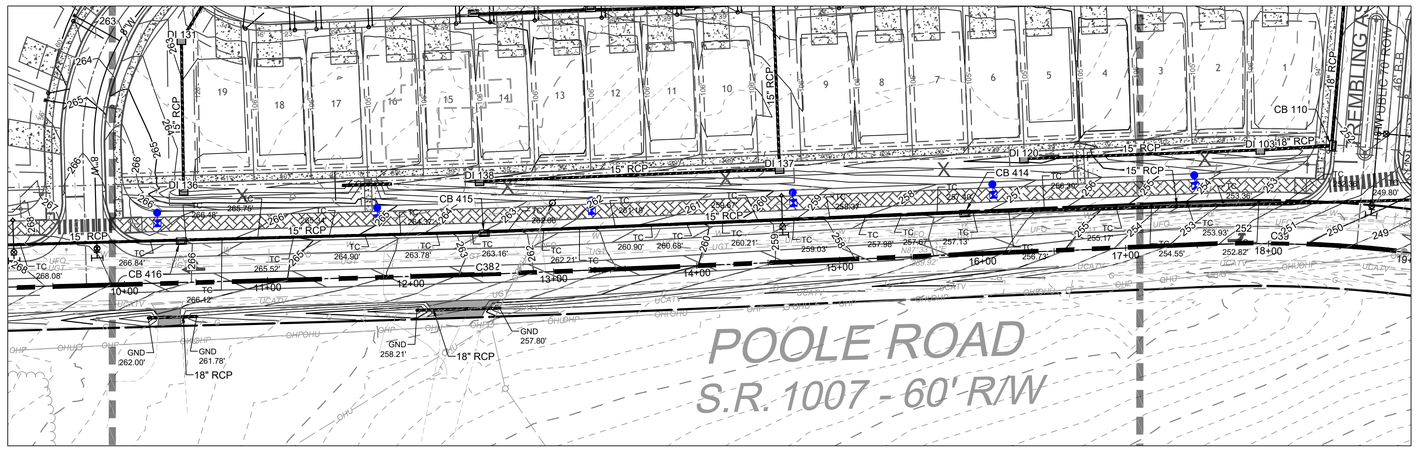
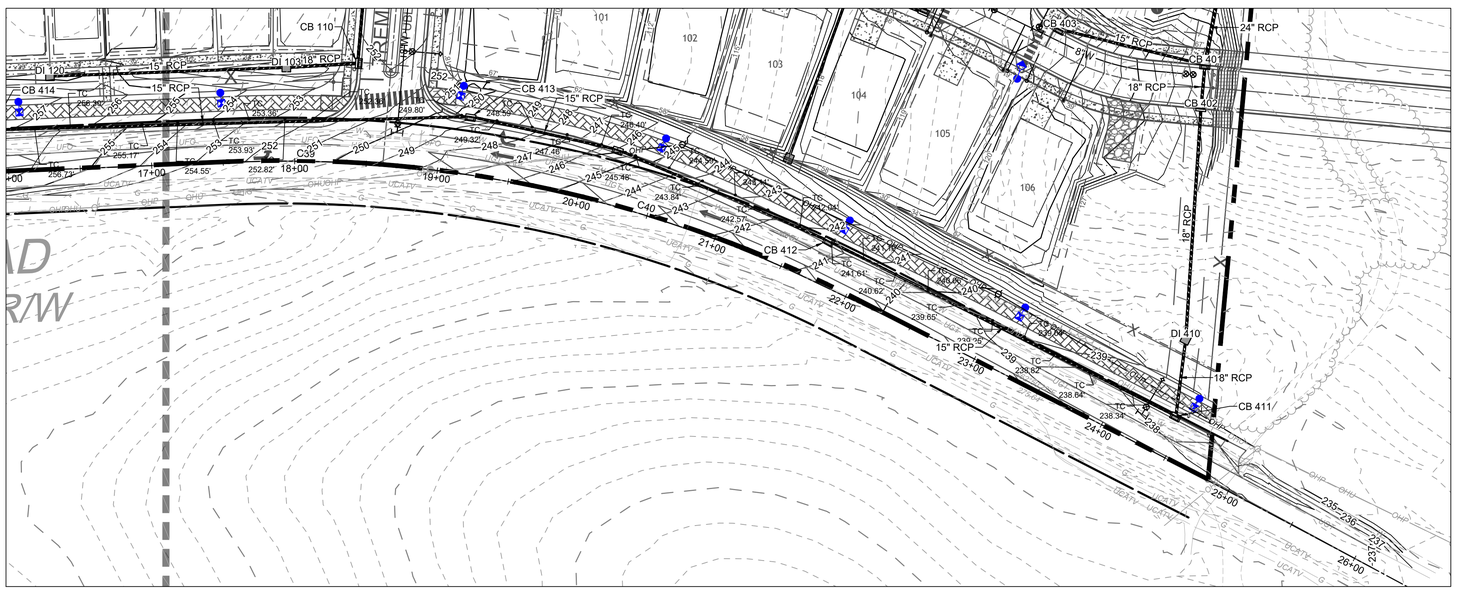
POOLE ROAD WIDENING
PROPOSED GRADING



POOLE ROAD WIDENING
PROPOSED GRADING



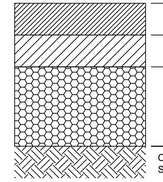
POOLE ROAD WIDENING
PROPOSED GRADING



ASPHALT PAVEMENT SECTION

NOT TO SCALE

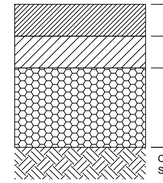
PAVEMENT SECTION-WIDENING GREATER THAN 6' WIDTH



TYPE S-9.5C SURFACE COURSE	3-IN
TYPE I19.0C BINDER COURSE	4-IN
AGGREGATE BASE COURSE	10-IN

COMPACTED SUBGRADE

PAVEMENT SECTION-WIDENING LESS THAN OR EQUAL TO 6' WIDTH



TYPE S-9.5C SURFACE COURSE	3-IN
TYPE I19.0C BINDER COURSE	4-IN
TYPE B-25.0C BASE COURSE	5-IN

COMPACTED SUBGRADE

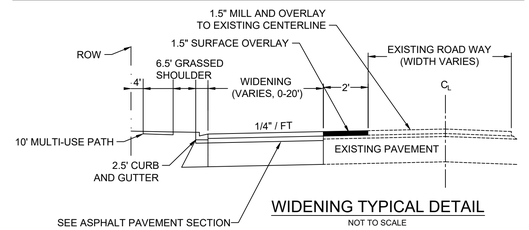
* OVERLAY AREAS - 1.5" SF9.5C

NOTES:

1. PREPARING, GRADING, SHAPING, AND COMPACTION OF SUBGRADE SOILS SHOULD BE PERFORMED IN ACCORDANCE WITH DIVISION 5, SECTION 501 OF THE NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES (2006). PREPARING, GRADING, SHAPING, AND COMPACTION OF AGGREGATE BASE COURSE (ABC) STONE SHOULD BE PERFORMED IN ACCORDANCE WITH DIVISION 5, SECTION 520 OF THE NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES (2006). PLACEMENT AND COMPACTION OF THE BITUMINOUS CONCRETE SHOULD BE PERFORMED IN ACCORDANCE WITH DIVISION 6, SECTION 600 OF THE NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES (2006). PROPER SUBGRADE COMPACTION, ADHERENCE TO THE NCDOT SPECIFICATIONS, AND COMPLIANCE WITH PROJECT PLANS AND SPECIFICATIONS ARE CRITICAL TO THE PERFORMANCE OF THE CONSTRUCTED PAVEMENT.
2. THE CONTRACTOR MAY CHOOSE TO INSTALL INTERMEDIATE COURSES OF PAVEMENT TO STABILIZE THE SITE DURING CONSTRUCTION AT NO ADDITIONAL COST. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE ADEQUATE THICKNESS REQUIRED FOR INTERMEDIATE PAVING. INCREASES IN THE DESIGN PAVEMENT SECTION TO FACILITATE INTERMEDIATE PAVING SHALL BE PROVIDED AT NO ADDITIONAL COST.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ANY DAMAGES TO SUBGRADE, INSTALLED BASE COURSE AND/OR INTERMEDIATE PAVING PRIOR TO PLACING SUBSEQUENT PAVEMENT LIFTS AT NO ADDITIONAL COST.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING PAVEMENT DURING ALL PHASES OF WORK. THE FINAL SURFACE OF PAVEMENT SHALL BE FREE OF ALL DEFECTS OR DAMAGE.
5. MILL 1.5" AND OVERLAY WITH 1.5" S9.5C TO REMOVE CONFLICTING PAVEMENT MARKING.

ROAD WIDENING NOTES

1. CONTRACTOR SHALL COORDINATE ALL UTILITY RELOCATIONS WITH APPROPRIATE PROVIDERS.
2. CONTRACTOR SHALL OBTAIN AND READ ALL NCDOT DRIVEWAY PERMITS AND ENCROACHMENTS. THEY SHALL BE A PART OF THESE PLANS.
3. ALL FINISHED SURFACES SHALL SLOPE TOWARDS DRAINAGE STRUCTURES AT POSITIVE SLOPE AND TO AVOID STANDING WATER.
4. CONTRACTOR TO PERFORM TRAFFIC AND PEDESTRIAN CONTROL PER NCDOT AND TOWN OF KNIGHTDALE STANDARDS.
5. CONTRACTOR SHALL COORDINATE ALL WORK IN R/W WITH NCDOT AND TOWN OF KNIGHTDALE INSPECTORS.



WIDENING TYPICAL DETAIL

NOT TO SCALE

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: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

Digitally signed by Samuel A. MacDonald
DN: cn=US, o=macdonaldgroupengineering.com, ou=A. Malone Thomas & Associates, P.A., email=sam@macdonaldgroupengineering.com
Reason: I am approving this document
Date: 2026.04.02 07:25:23-04'00'

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

Digitally signed by Gideon Smith
DN: cn=Gideon Smith, email=gsmith@knightdale-gov, O=Town of Knightdale, ou=Development Services, C=Gideon Smith
Reason: I am approving this document
Date: 2026.04.07 11:14:41-04'00'

LEGEND

1.5" MILL AND OVERLAY

PROPOSED PAVEMENT

811 Know what's below. Call before you dig.

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-4142

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-5503

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 TYLER JEFFREY CROSS ENGINEER

3/31/2026

THIS DRAWING PREPARED AT THE
RALEIGH OFFICE
5410 Trinity Road, Suite 102 | Raleigh, NC 27607
TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION	DATE

DATE	03/31/2026
DRAWN BY	331
DESIGNED BY	331
CHECKED BY	T. CROSS
SCALE	1" = 50'

TIMMONS GROUP

NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA
DETAILED ROADWAY WIDENING GRADING PLAN

JOB NO.	SHEET NO.
51557	C10.1

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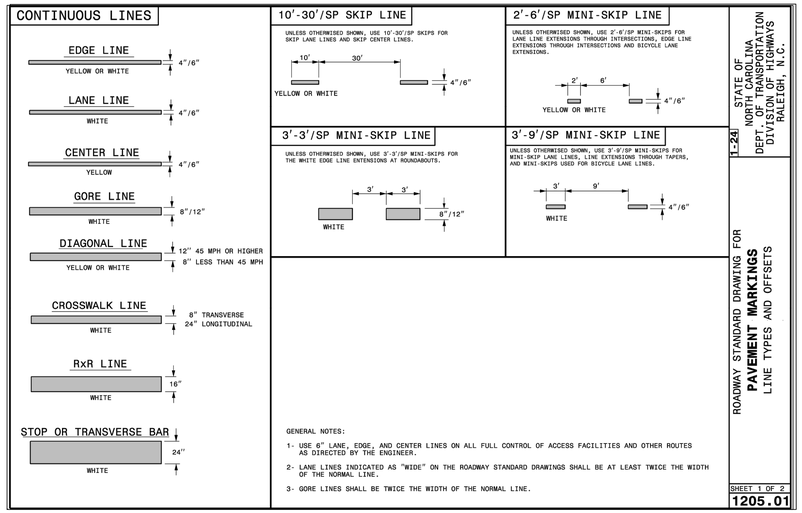
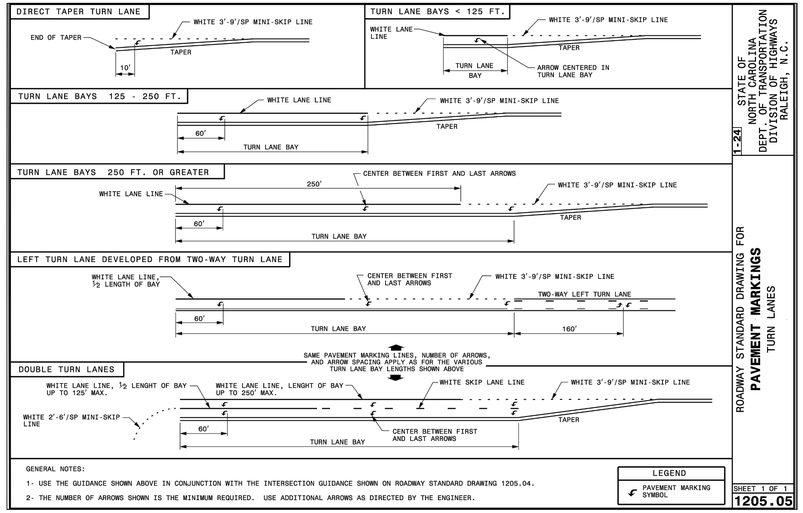


1 PAVEMENT MARKINGS
PLAN NTS



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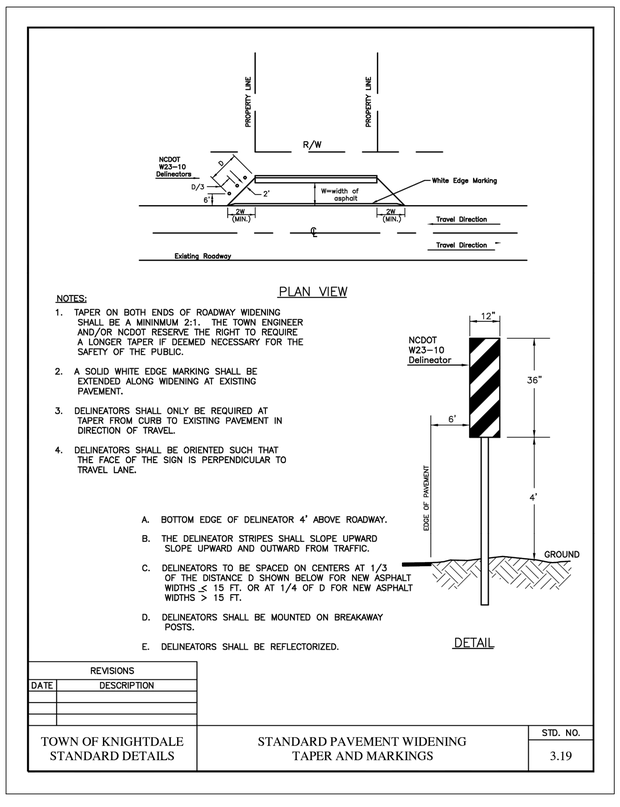

TOWN CERTIFICATION

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: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

Public
Water Distribution / Extension System
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City of Raleigh
Public Utilities Department Permit # W-4142

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Sewer Collection / Extension System
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City of Raleigh
Public Utilities Department Permit # S-5503

811 Know what's below. Call before you dig.

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 ENGINEER TYLER JEFFREY CROSS
3/31/2026

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REVISION DESCRIPTION

DATE

DATE
03/31/2026
DRAWN BY
331
DESIGNED BY
331
CHECKED BY
T. CROSS
SCALE
1" = 50'

TIMMONS GROUP

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA
ROADWAY WIDENING DETAILS

JOB NO.
51557
SHEET NO.
C10.2

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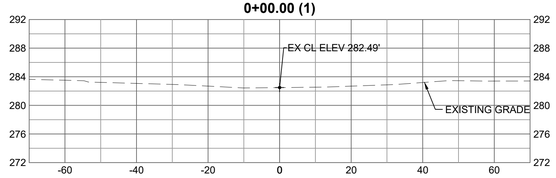

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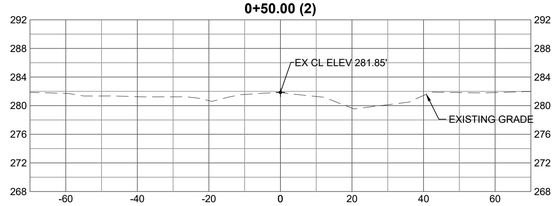

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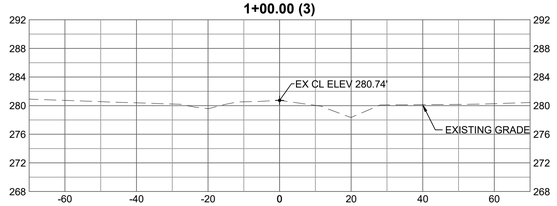

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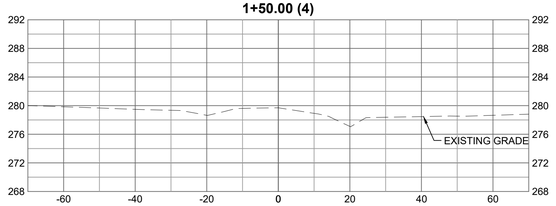

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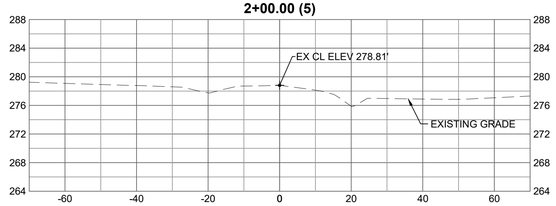

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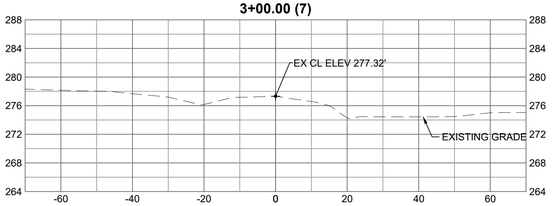

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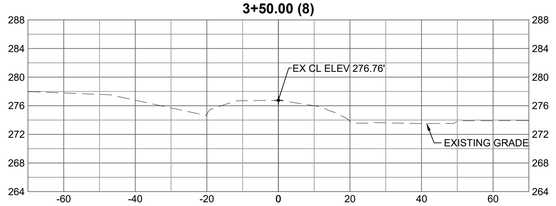

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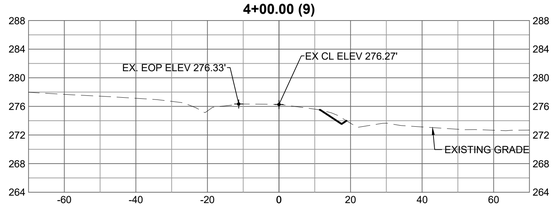

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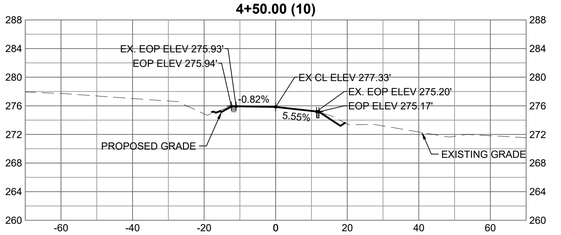

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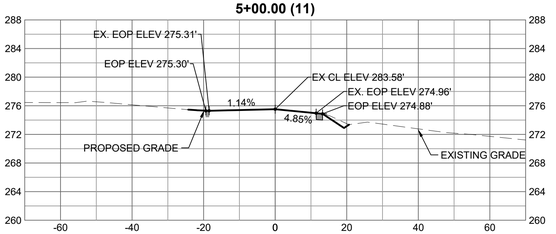

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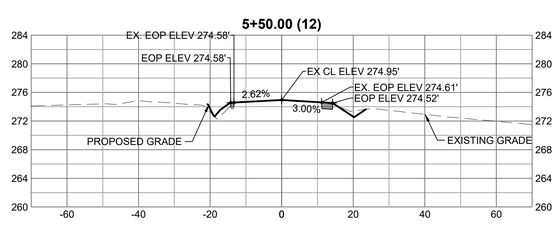

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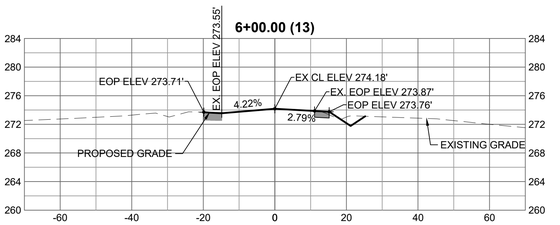

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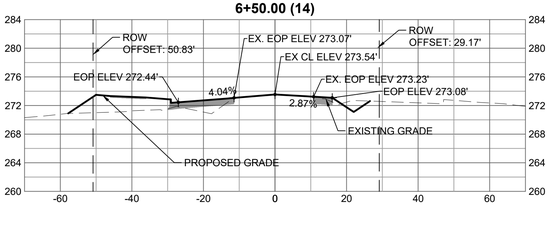

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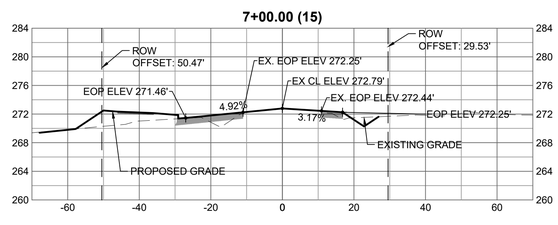

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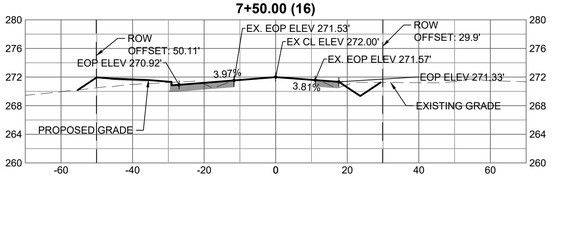

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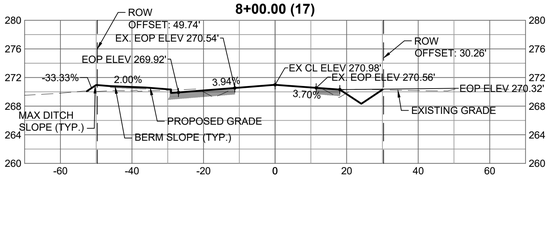

TOWN CERTIFICATION

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: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

Digitally signed by Samuel A. MacDonald
DN: C=US, E=smacdonald@timmonsgroup.com, O=N, Monton Thomas A
Reason: I am approving this document
Date: 2026.04.28 07:54:48-04'00'

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

Digitally signed by Gideon Smith
DN: C=US, E=gsmith@knightdalenc.gov, O=Town of Knightdale, OU=Development Services, CN=Gideon Smith
Reason: I am approving this document
Date: 2026.04.28 10:23:53-04'00'

811 Know what's below. Call before you dig.

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-4142

Public
Sewer Collection / Extension System
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City of Raleigh
Public Utilities Department Permit # S-5503

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 ENGINEER TYLER JEFFREY CROSS
3/31/2026

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RALEIGH OFFICE
5410 Trinity Road, Suite 102 | Raleigh, NC 27607
TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

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TIMMONS GROUP

REVISION DESCRIPTION

DATE

DATE 03/31/2026
DRAWN BY 331
DESIGNED BY 331
CHECKED BY T. CROSS
SCALE 1" = 50'

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA
ROAD WIDENING CROSS SECTIONS - SHEET 1 OF 4
NORTH CAROLINA LICENSE NO. C-1652

JOB NO. 51557
SHEET NO. C10.3

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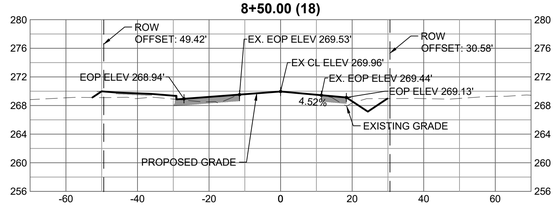

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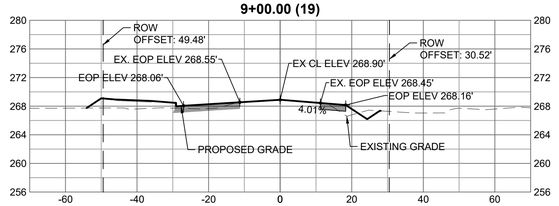

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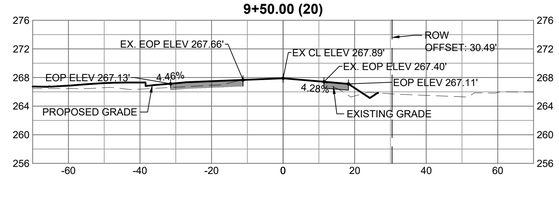

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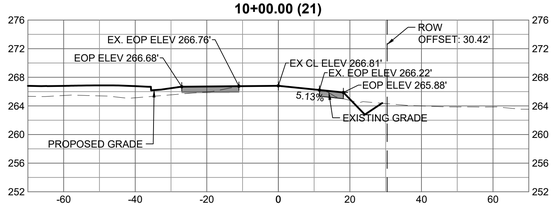

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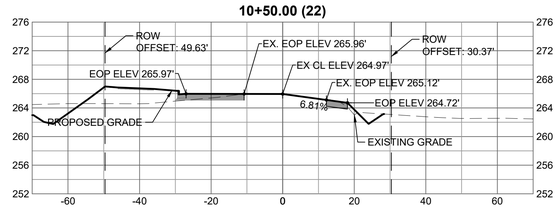

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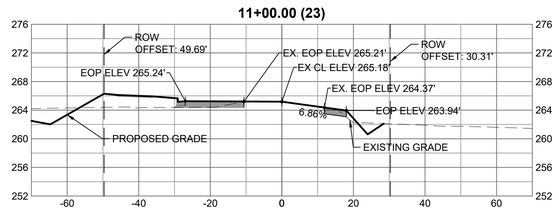

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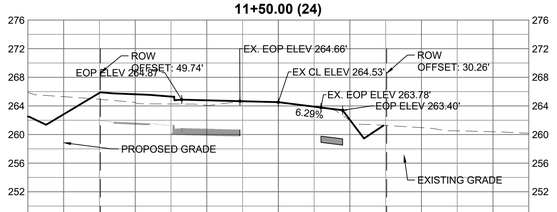

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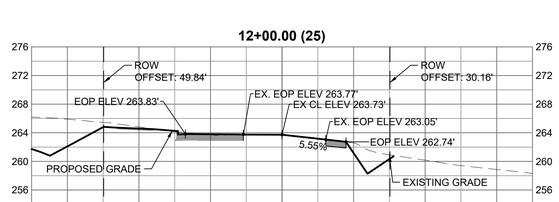

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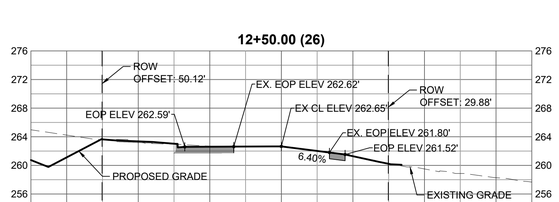

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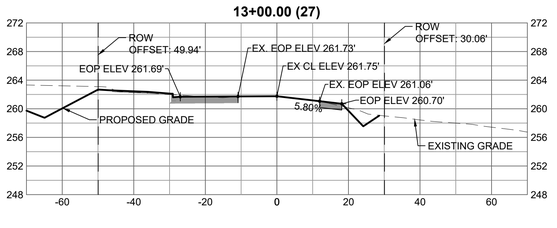

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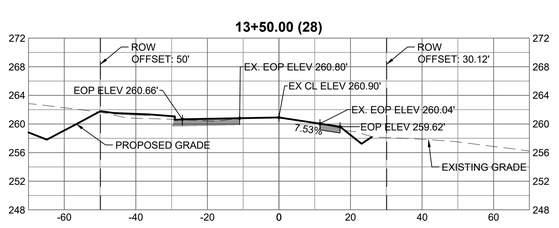

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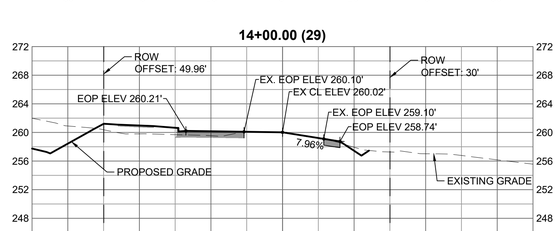

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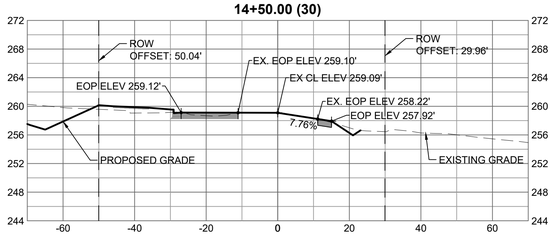

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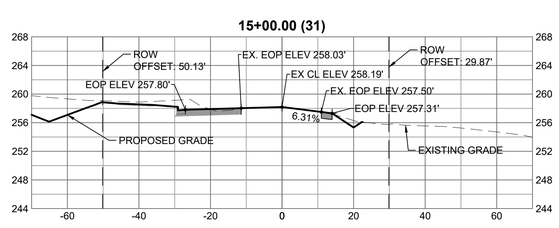

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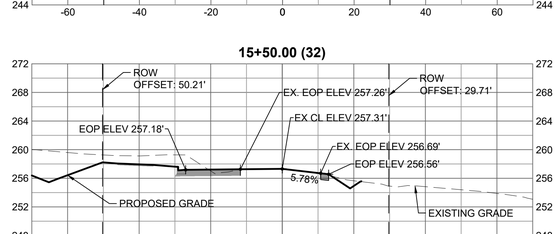

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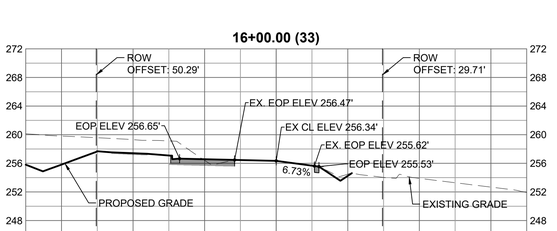

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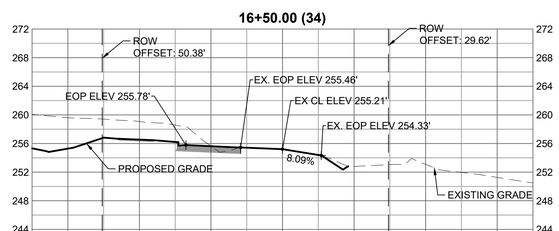

TOWN CERTIFICATION

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: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

811 Know what's below. Call before you dig.

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-4142

Public
Sewer Collection / Extension System
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City of Raleigh
Public Utilities Department Permit # S-5503

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 TYLER JEFFREY CROSS

3/31/2026

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TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

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REVISION DESCRIPTION

DATE

DATE: 03/31/2026
DRAWN BY: 331
DESIGNED BY: 331
CHECKED BY: T. CROSS
SCALE: 1" = 50'
JOB NO.: 51557
SHEET NO.: C10.4

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA
ROAD WIDENING CROSS SECTIONS - SHEET 2 OF 4

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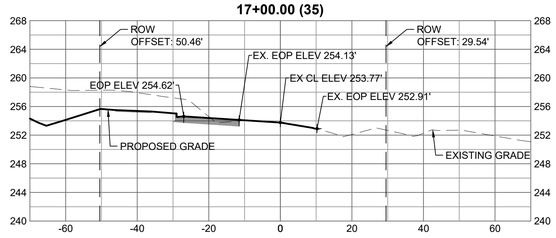

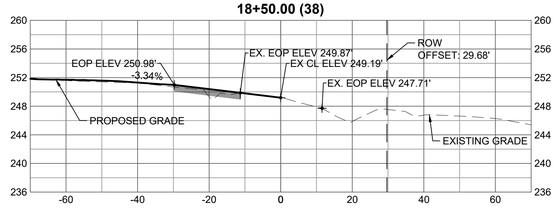

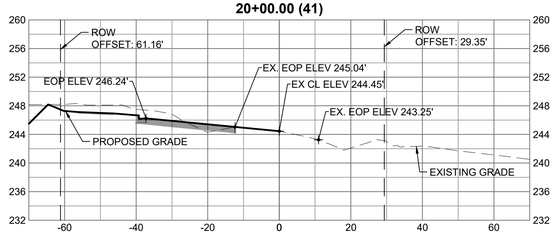

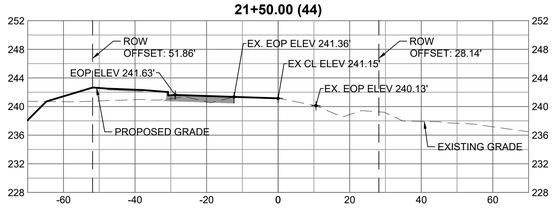

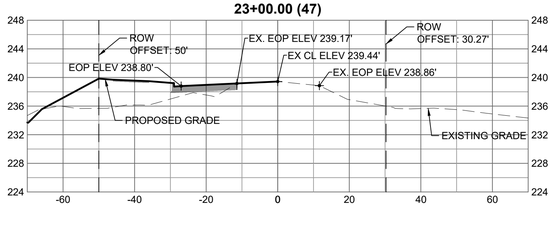

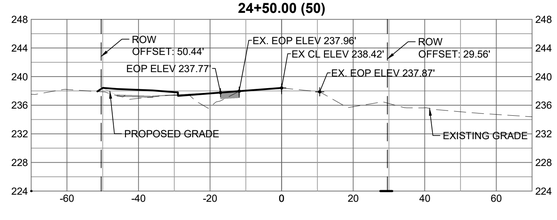

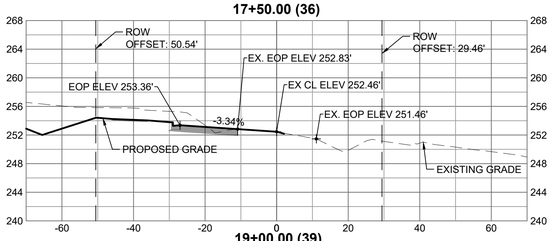

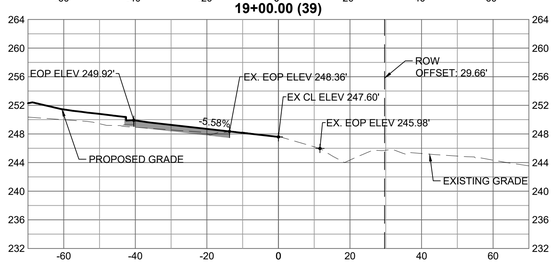

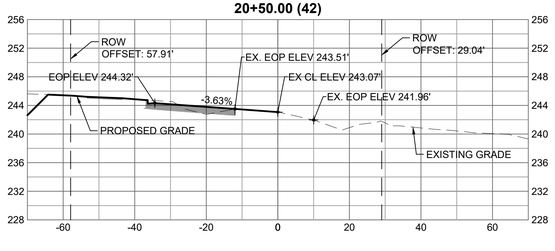

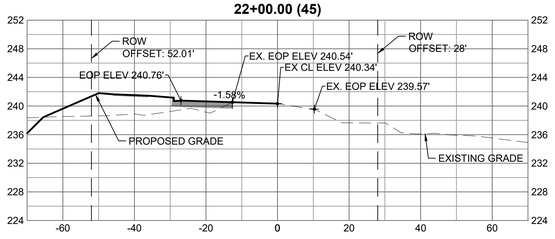

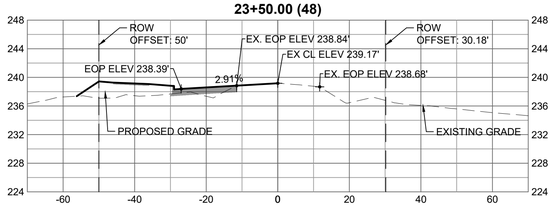

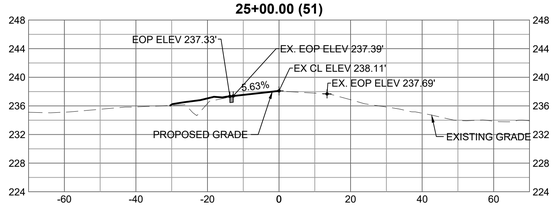

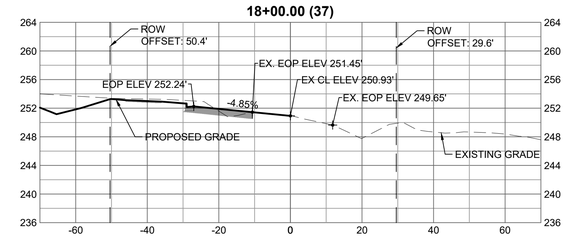

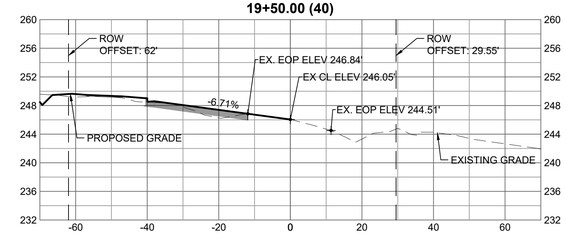

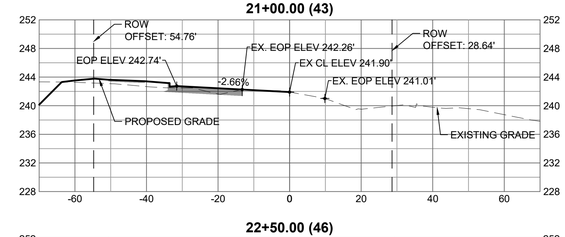

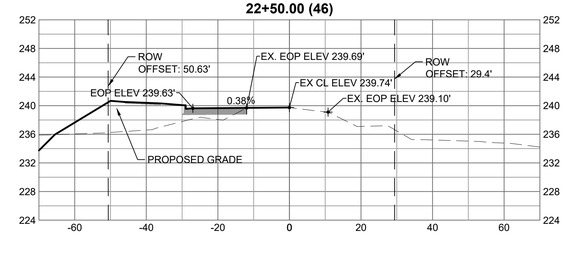

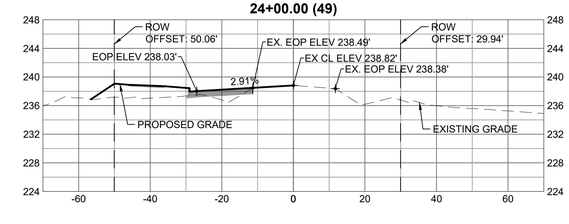

Know what's below. Call before you dig.

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: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

Digitally signed by Samuel A. MacDonald
DN: cn=Samuel A. MacDonald, o=Knightdale, ou=Engineering, ou=Town Of N. Morrison Thomas &, email=smacdonald@knightdalenc.gov, c=Town of Knightdale, Ou=Development
Reason: I am approving this document
Date: 2026.03.31 14:08:38 -04'00'

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

Digitally signed by Gideon Smith
DN: cn=Gideon Smith, o=Knightdale, ou=Development, email=gsmith@knightdalenc.gov, c=US
Date: 2026.03.31 13:51:24 -04'00'

Public
Water Distribution / Extension System
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City of Raleigh
Public Utilities Department Permit # W-4142

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City of Raleigh
Public Utilities Department Permit # S-5503

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 TYLER JEFFREY CROSS ENGINEER
3/31/2026

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DATE: 03/31/2026
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DESIGNED BY: 331
CHECKED BY: T. CROSS
SCALE: 1" = 50'

TIMMONS GROUP

NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA
ROAD WIDENING CROSS SECTIONS - SHEET 3 OF 4

JOB NO. 51557
SHEET NO. C10.5

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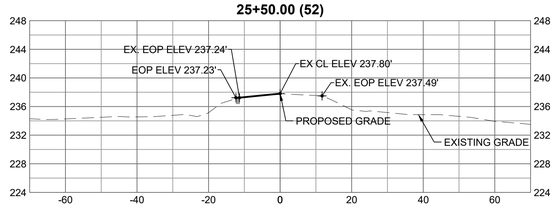

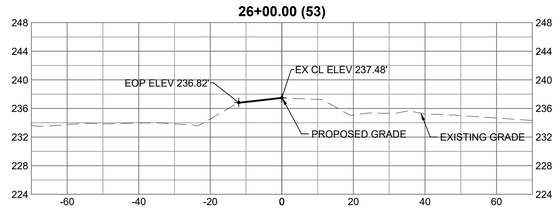

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BY: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

Digitally signed by Samuel A. MacDonald
DN: E=sam@timmonsgroup.com, CN=S. MacDonald, O=Timmons Group, OU=Engineering
Reason: I am the author of this document
Date: 2026.04.02 12:21:24 -04'00'

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

Digitally signed by Gideon Smith
DN: C=US, E=gsmith@knightdale-nc.gov, O=Town of Knightdale, OU=Development Services, CN=Gideon Smith
Reason: I am the author of this document
Date: 2026.04.06 07:52:23 -04'00'

Public
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City of Raleigh
Public Utilities Department Permit # W-4142

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City of Raleigh
Public Utilities Department Permit # S-5503

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3/31/2026

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DESIGNED BY: 331
CHECKED BY: T. CROSS
SCALE: 1" = 50'

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS

KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

ROAD WIDENING CROSS SECTIONS - SHEET 4 OF 4

JOB NO. 51557
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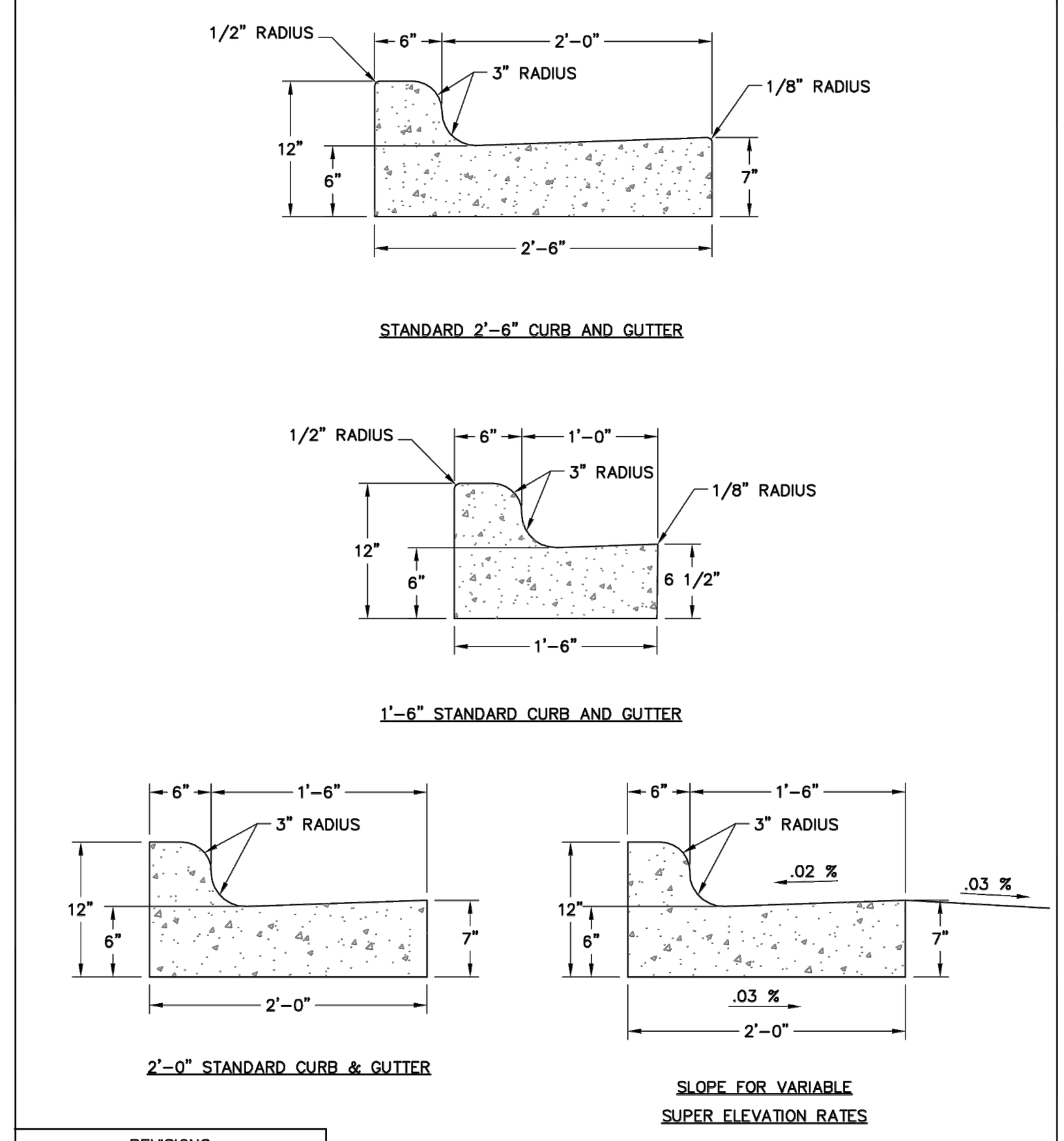
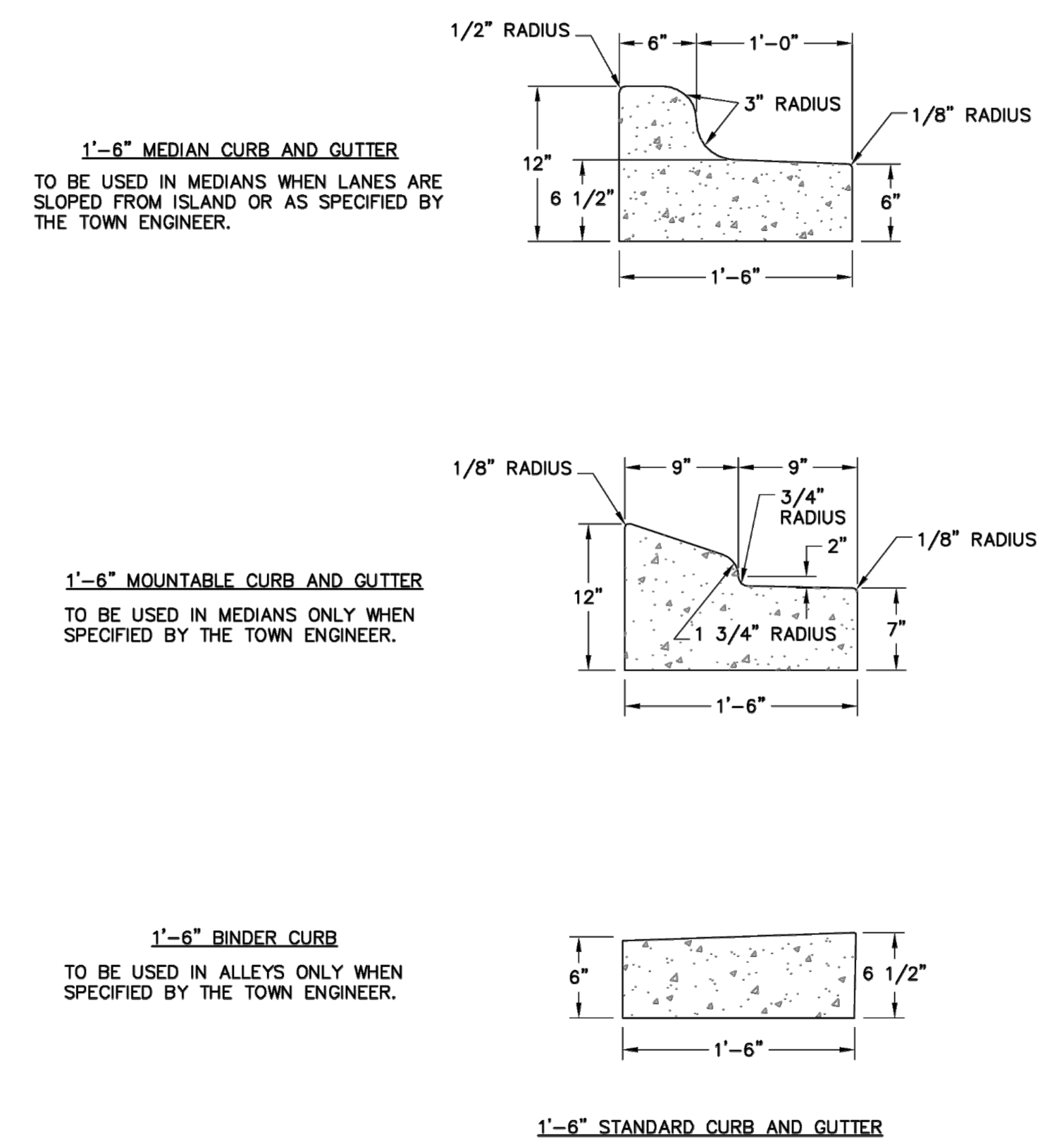


REVISIONS	
DATE	DESCRIPTION

1 of 3

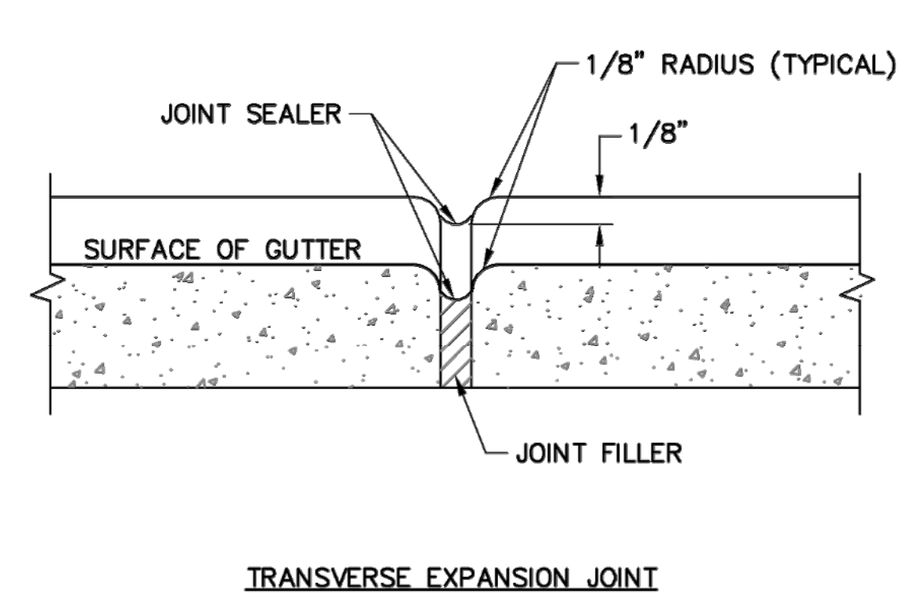
TOWN OF KNIGHTDALE STANDARD DETAILS | CURB AND GUTTER | STD. NO. 4.01



REVISIONS	
DATE	DESCRIPTION

2 of 3

TOWN OF KNIGHTDALE STANDARD DETAILS | CURB AND GUTTER | STD. NO. 4.01



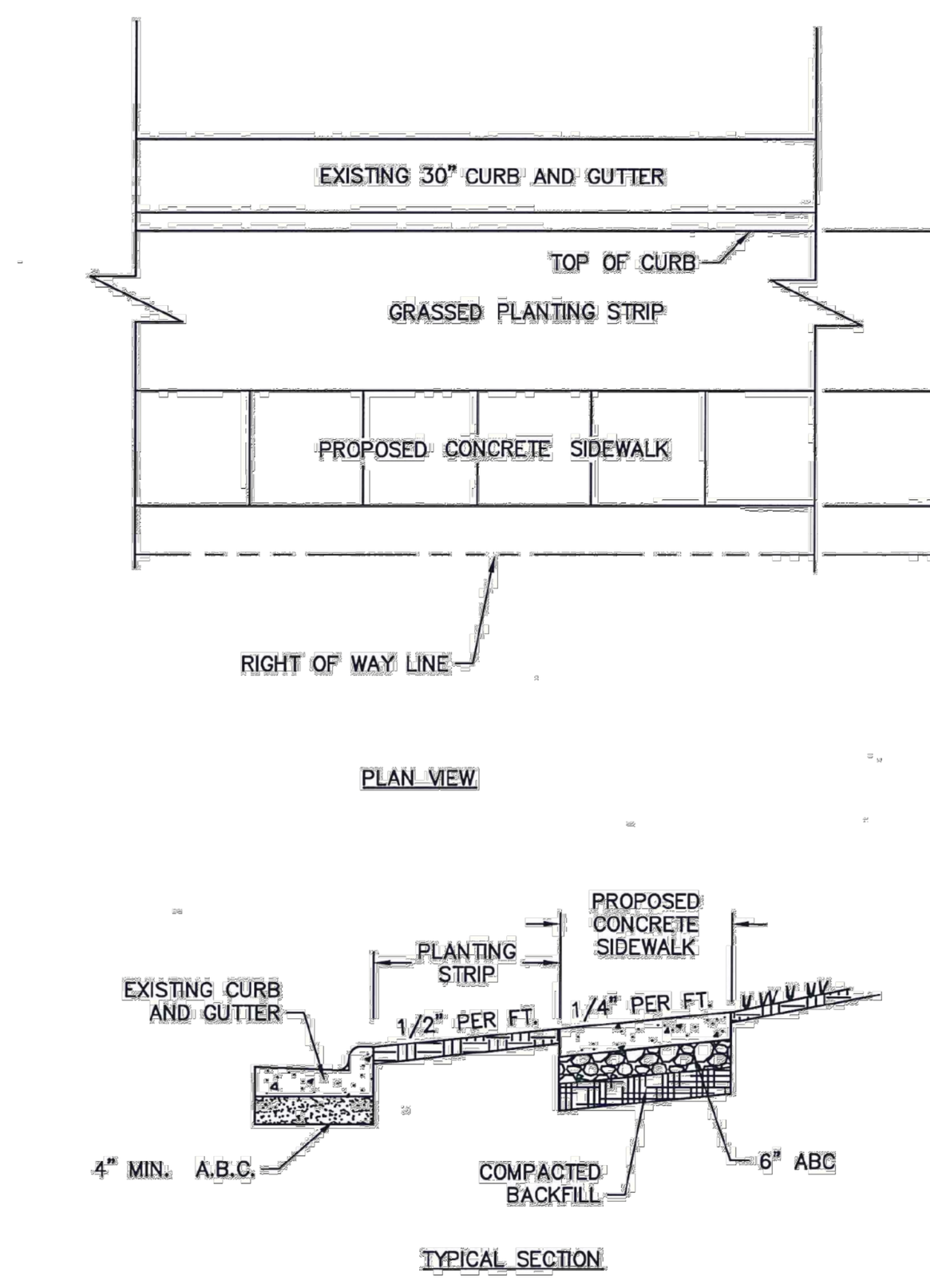
NOTES:

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 OBTAINED.
3. ALL EXPANSION JOINTS SHALL BE SPACED AT 90-FOOT INTERVALS, AND ADJACENT TO ALL RIGID OBJECTS. JOINTS SHALL MATCH LOCATIONS WITH JOINTS IN ABUTTING SIDEWALK.
4. CONCRETE COMPRESSIVE STRENGTH SHALL BE 3600 PSI IN 28 DAYS.
5. CURB SHALL BE DEPRESSED AT INTERSECTIONS TO PROVIDE FOR FUTURE ACCESSIBLE RAMPS.
6. TOP 6" OF SUBGRADE BENEATH THE CURB AND GUTTER SHALL BE COMPACTED TO 100% STANDARD PROCTOR DENSITY.

REVISIONS	
DATE	DESCRIPTION

3 of 3

TOWN OF KNIGHTDALE STANDARD DETAILS | CURB AND GUTTER | STD. NO. 4.01



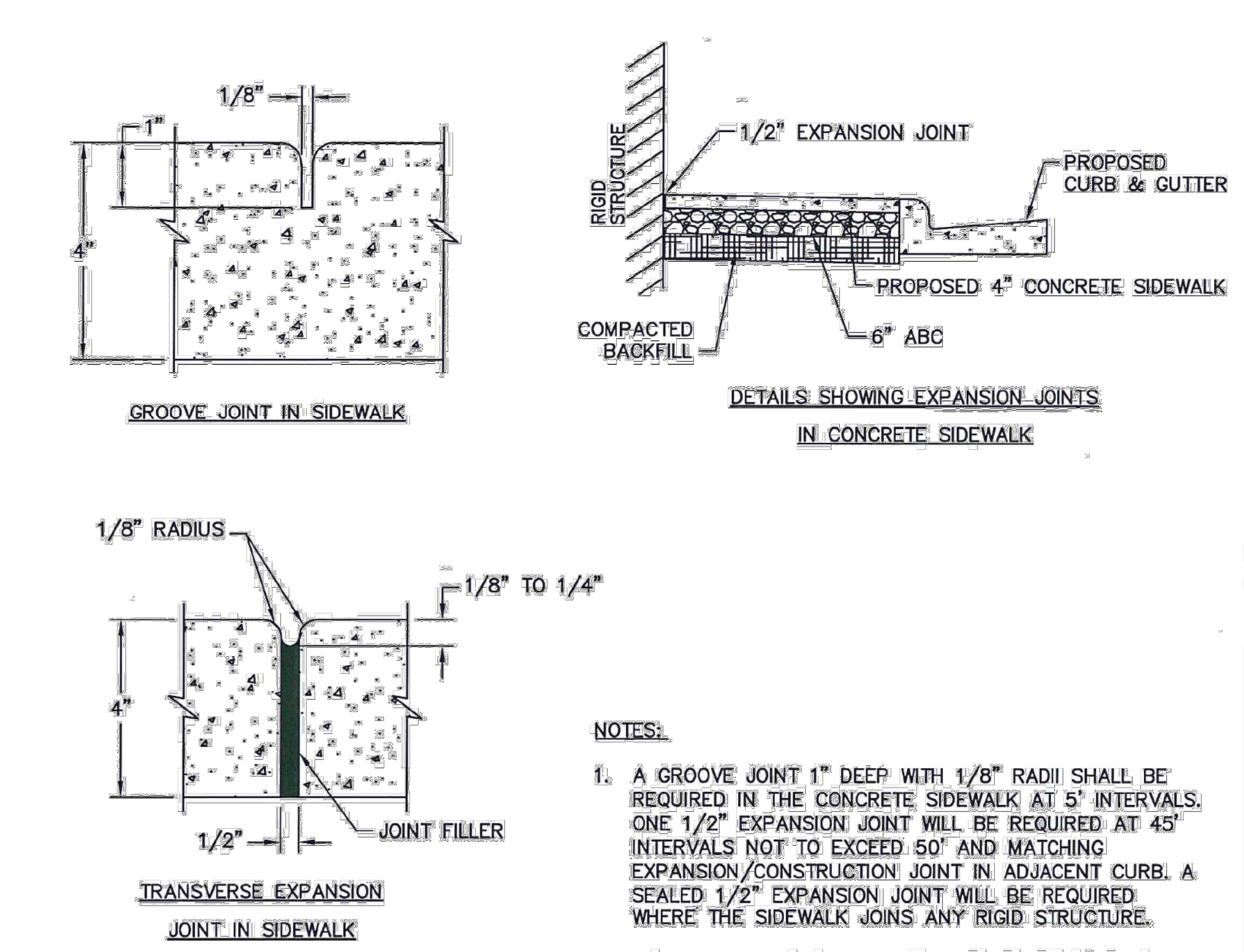
NOTES:

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.

REVISIONS	
DATE	DESCRIPTION

1 of 2

TOWN OF KNIGHTDALE STANDARD DETAILS | CONCRETE SIDEWALKS | STD. NO. 4.04-1



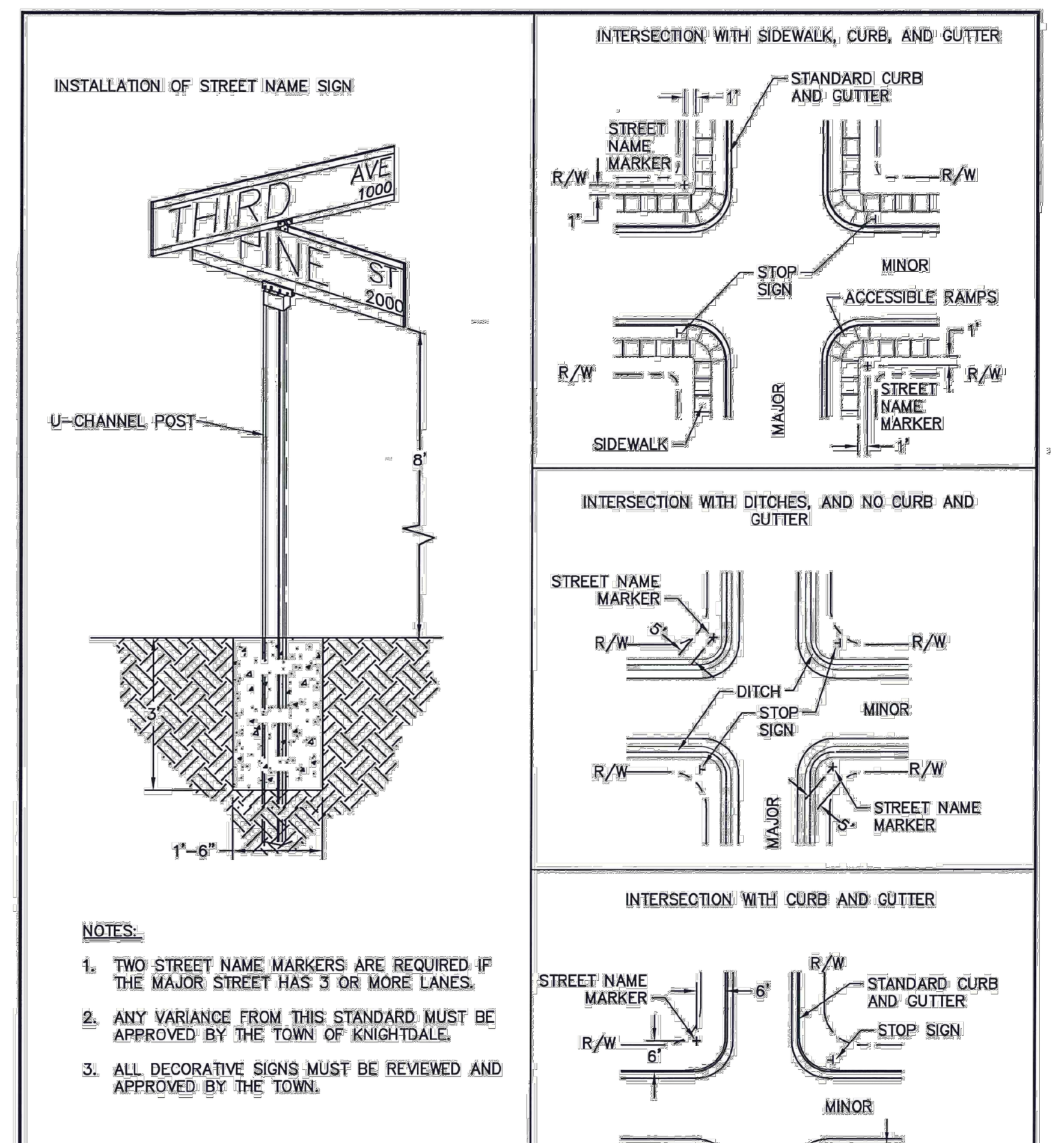
NOTES:

1. A GROOVE JOINT 1" DEEP WITH 1/8" RADII 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 WHERE THE SIDEWALK JOINS ANY RIGID STRUCTURE.
2. SIDEWALK AT DRIVEWAY ENTRANCES TO BE 6" THICK.
3. WIDTH OF SIDEWALK SHALL CORRESPOND TO STREET CROSS SECTION BUT SHALL BE 5' AT A MINIMUM.
4. SIDEWALK ADJACENT TO CURB AND GUTTER IN PARKING LOT OR ALONG STREET SHALL BE 6' WIDE AT A MINIMUM.
5. SIDEWALK TO BE POURED TO END OF RADIUS AT INTERSECTING STREETS.
6. CONCRETE COMPRESSIVE STRENGTH SHALL BE 3600 PSI IN 28 DAYS.

REVISIONS	
DATE	DESCRIPTION

2 of 2

TOWN OF KNIGHTDALE STANDARD DETAILS | CONCRETE SIDEWALKS | STD. NO. 4.04-2

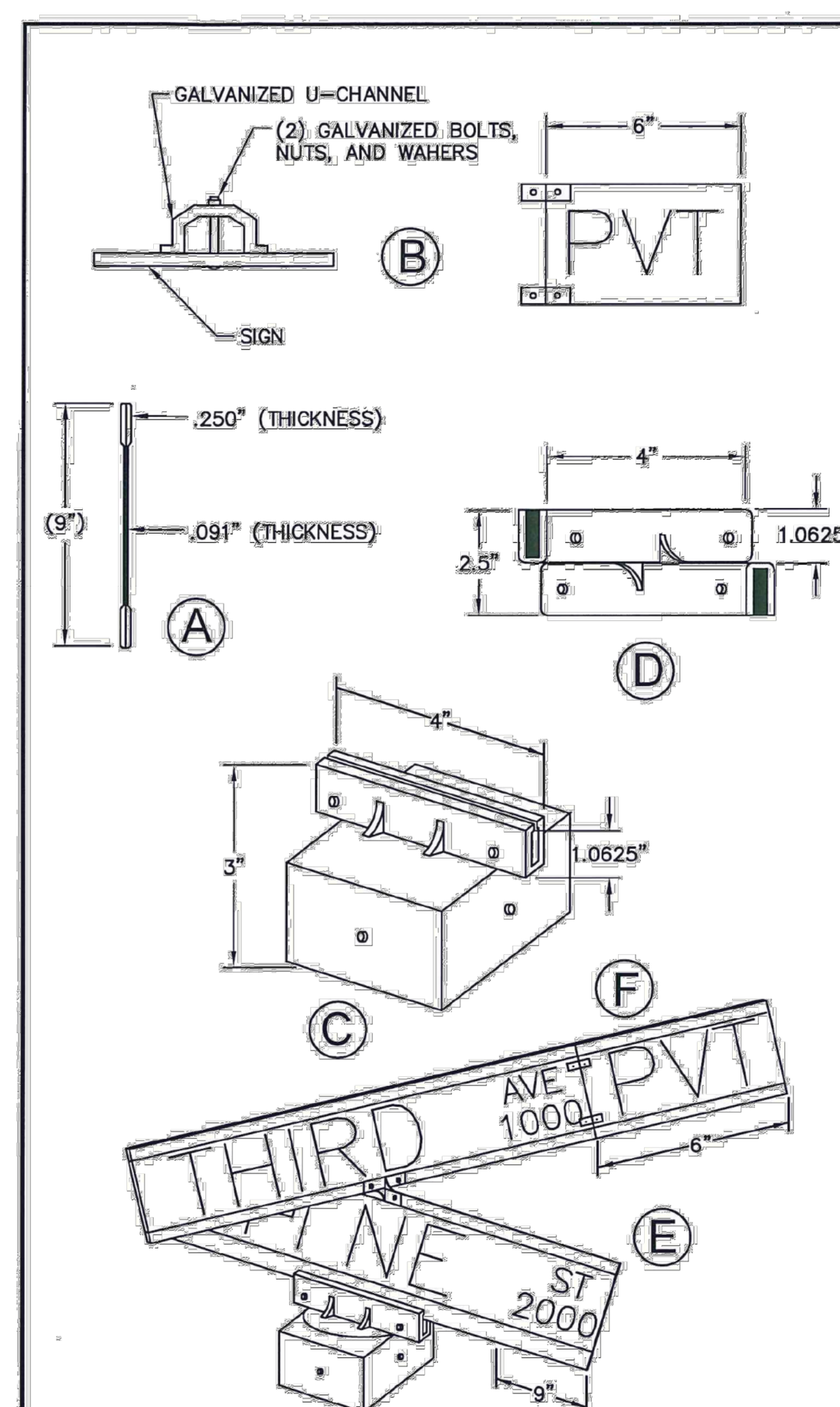


NOTES:

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.
3. ALL DECORATIVE SIGNS MUST BE REVIEWED AND APPROVED BY THE TOWN.

REVISIONS	
DATE	DESCRIPTION

TOWN OF KNIGHTDALE STANDARD DETAILS | STREET NAME SIGN INSTALLATION LOCATIONS | STD. NO. 3.16

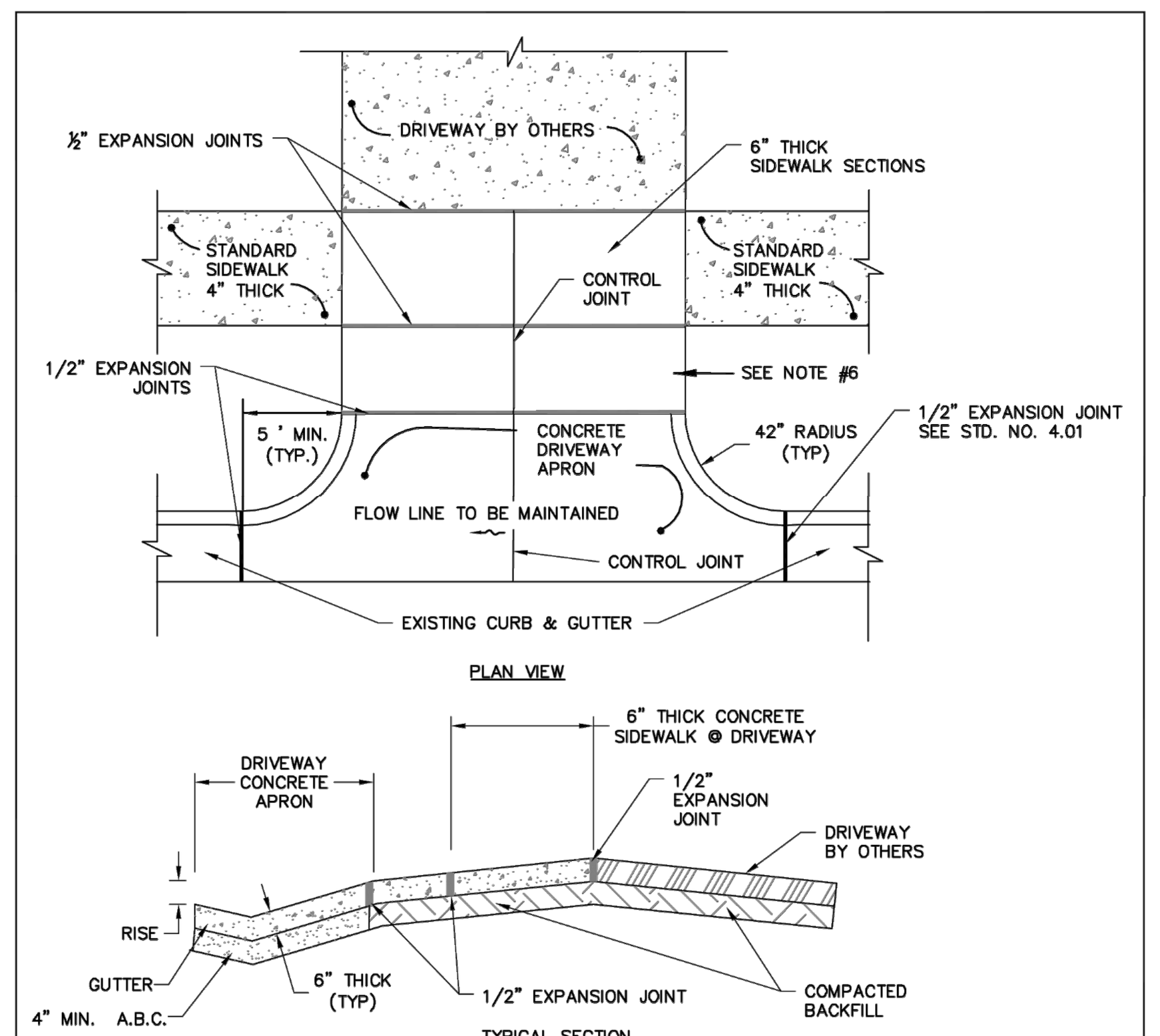


NOTES:

1. BLADES SHALL BE EXTRUDED ALUMINUM 6063T5 OR 6063T6 ALLOY .080" THICK. POST SHALL BE 10'-0" IN LENGTH, 3 LB. STEEL U-CHANNEL SUPPORTS PER NCDOT STD. 1094-1(B).
2. CAP TO BE ALUMINUM #380 ALLOY OR EQUAL SLOTTED FOR .25" EXTRUDED BLADE; 2.375" I.D. BASE, DIE CAST AND POLISHED. CAP SHALL BE TAPPED TO RECEIVE AND INCLUDE 3 STAINLESS STEEL SET SCREWS FOR POST MOUNTING AND 2 STAINLESS STEEL SET SCREWS FOR BLADE MOUNTING. SET SCREWS TO HAVE ALLEN HEADS (SEE DETAIL C).
3. BLADE SPACER BRACKET SHALL MEET SAME SPECIFICATIONS AS THE CAP WITH 2 SCREWS TO EACH BLADE MOUNTING (SEE DETAIL D).
4. THE FACE OF ALL BLADES SHALL MEET COVERED WITH ENGINEERING GRADE SHEETING WITH #2290 WHITE DIE CUT LETTERS WITH REVERSED SCREENED #708 TRANSPARENT GREEN. THE PRIMARY LETTERS SHALL BE 5" HIGH UPPER CASE, FHWA SERIES B AND PREFIX/SUFFIX LETTERS SHALL BE 2-1/2" HIGH, UPPER CASE, FHWA SERIES C. BLOCK NUMBERS SHALL BE PLACED IN THE LOWER RIGHT CORNER AND SHALL BE 2-1/2" HIGH, FHWA SERIES C. ALL MATERIALS TO BE VACUUM AND HEAT APPLIED TO A PREPARED ALUMINUM BLADE, WHICH HAS BEEN CLEANED AND ALL FOREIGN MATERIAL REMOVED (SEE DETAIL E).
5. LETTERS, NUMBERS AND SPACING SHALL CONFORM TO THE STANDARD ALPHABETS FOR HIGHWAY SIGNS, 1966 EDITION, REPRINT MAY, 1972 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 IS REQUIRED. THE SUPPLEMENTAL PLATE MAY BE ATTACHED TO THE SIGN OR AN EXTENDED BLADE WITH BLACK ON YELLOW SHEETING MAY BE USED. THE SIGN SHALL HAVE BLACK LETTERS THAT SHOW PVT TO STAND FOR PRIVATE. THE LETTERS SHALL BE 2-1\2" HIGH, UPPER CASE, FHWA SERIES C, ON A BACKGROUND OF YELLOW ENGINEERING GRADE SHEETING. (SEE DETAIL F).
8. ON ALL ROADWAYS EXCEPT STREETS WITH STANDARD CURB AND GUTTER AND SPEED LIMITS EQUAL TO OR LESS THAN 25 MPH, ALL SIGNS WITHIN CLEAR ZONE SHALL BE OF A BREAKAWAY DESIGN THAT COMPLIES WITH THE LATEST EDITION OF AASHTO MANUAL FOR ASSESSING SAFETY HARDWARE (MASH)AND NCHRP REPORT 350.

REVISIONS	
DATE	DESCRIPTION

TOWN OF KNIGHTDALE STANDARD DETAILS | STREET NAME SIGN | STD. NO. 3.17

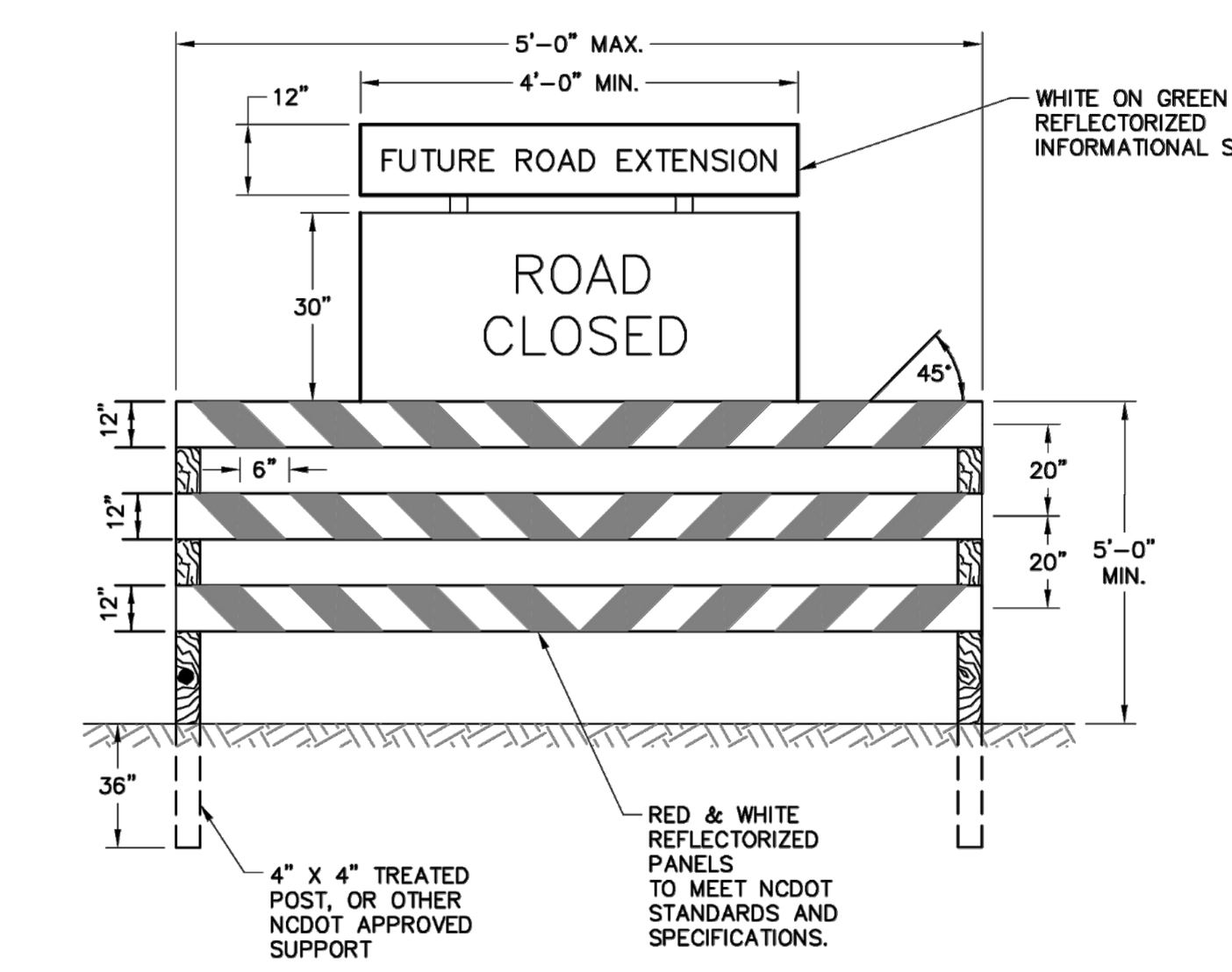


NOTES:

1. RESIDENTIAL DRIVEWAYS TO BE 12' TO 18'.
2. COMMERCIAL DRIVEWAYS TO BE A MAXIMUM OF 36' WIDE.
3. CONCRETE SHALL BE 3000 P.S.I.
4. CONTROL JOINTS NOT TO EXCEED 10' 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 18" 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.

REVISIONS	
DATE	DESCRIPTION

TOWN OF KNIGHTDALE STANDARD DETAILS | STANDARD DRIVEWAY APRON | STD. NO. 4.03



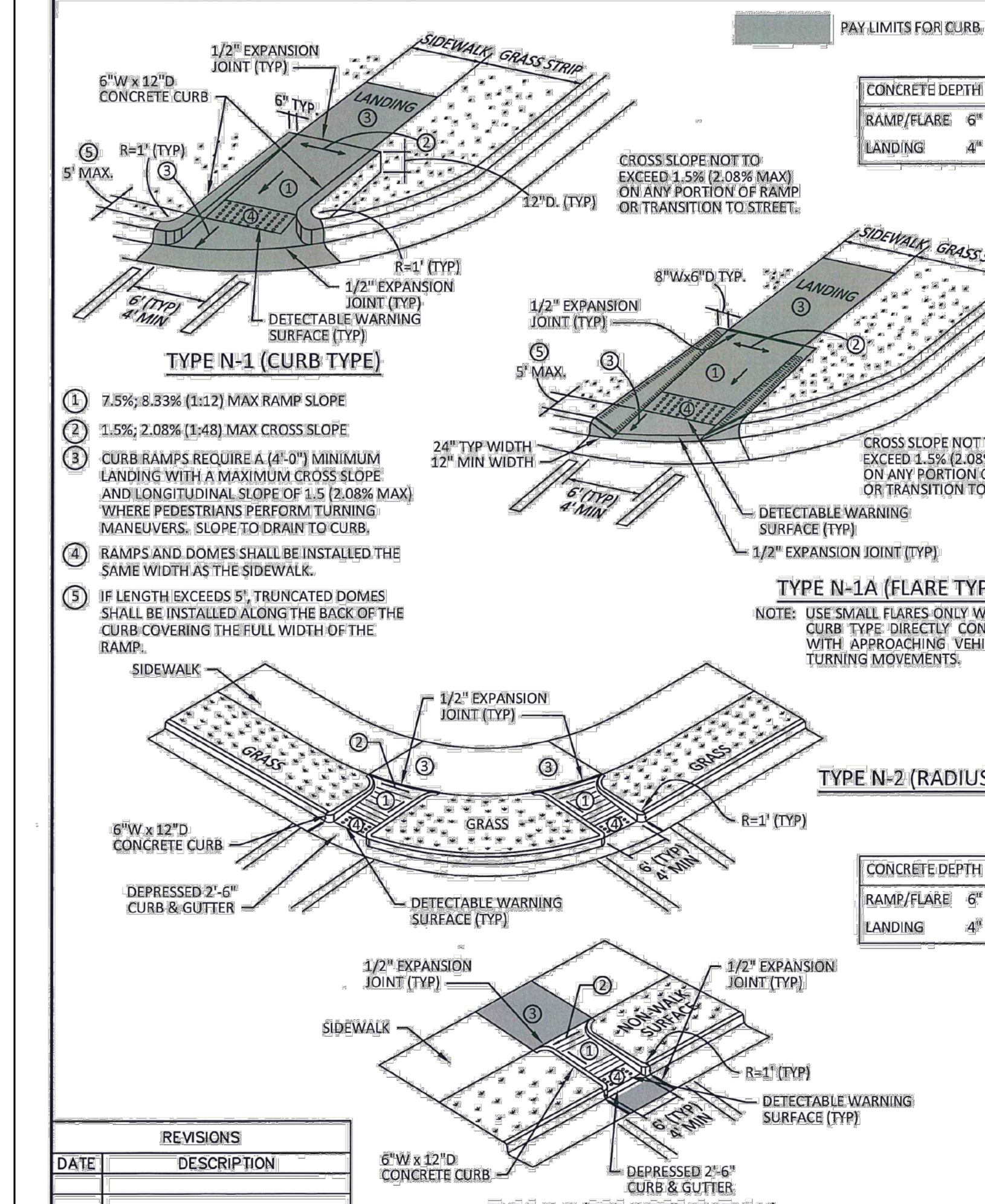
NOTES:

1. BARRICADE(S) 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. MARKINGS FOR BARRICADE RAILS SHALL BE REFLECTIVE AND ALTERNATE RED AND WHITE STRIPS.
4. "ROAD CLOSED" SIGN SHALL MEET SPECIFICATIONS OF M.U.T.C.D R11-2 AND BE REQUIRED ATOP EACH BARRICADE USED.

REVISIONS	
DATE	DESCRIPTION

TOWN OF KNIGHTDALE STANDARD DETAILS | TEMPORARY BARRICADE FOR DEAD END ROADS | STD. NO. 3.18

PAY LIMITS FOR CURB RAMP



CONCRETE DEPTH	
RAMP/FLARE	6"
LANDING	4"

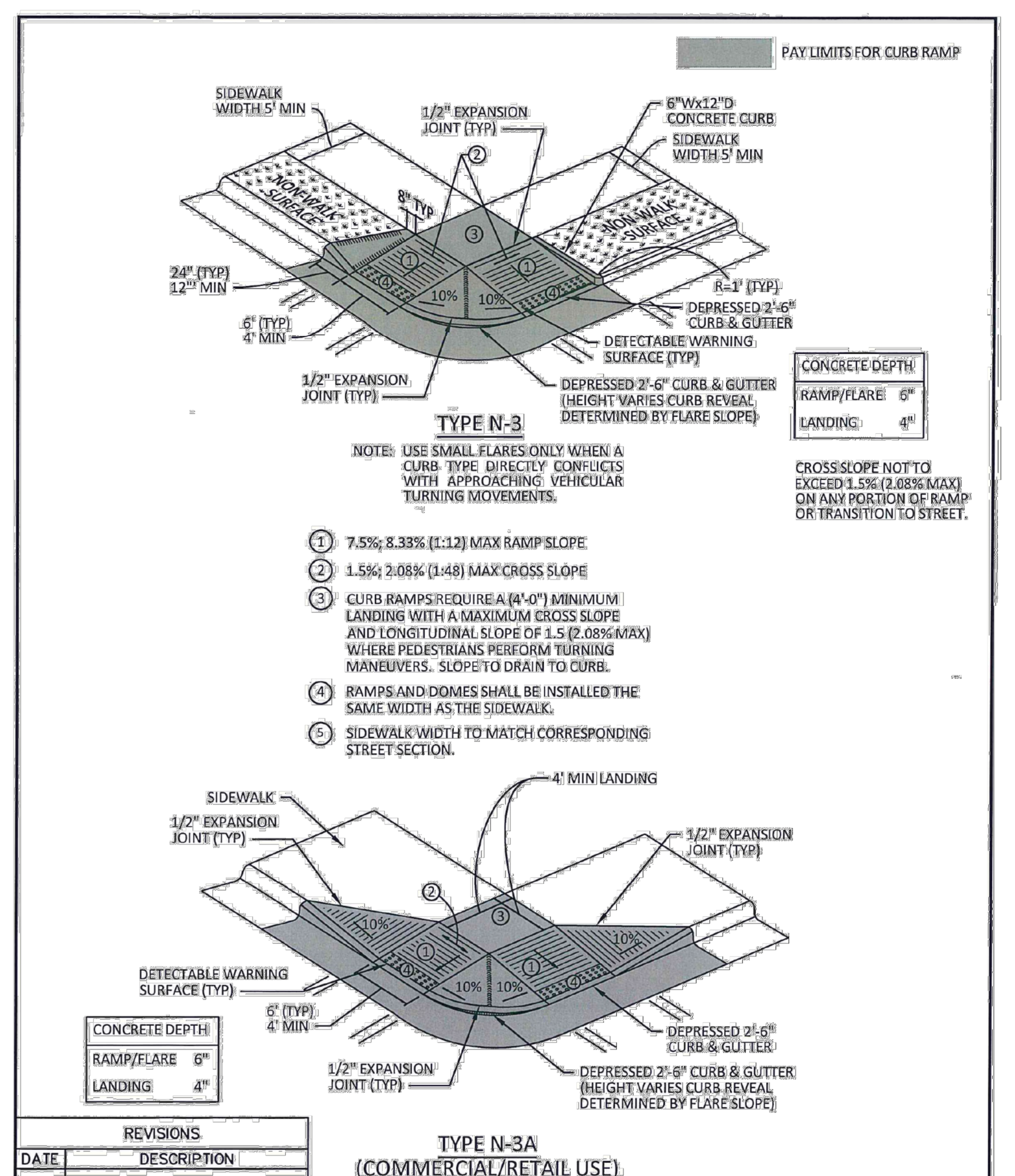
1. 7.5%; 8.33% (1:12) MAX RAMP SLOPE
2. 1.5%; 2.08% (1:48) MAX CROSS SLOPE
3. CURB RAMPS REQUIRE A (4'-0") MINIMUM LANDING WITH A MAXIMUM CROSS SLOPE AND LONGITUDINAL SLOPE OF 1.5 (2.08% MAX) WHERE PEDESTRIANS PERFORM TURNING MANEUVERS. SLOPE TO DRAIN TO CURB.
4. RAMPS AND DOMES SHALL BE INSTALLED THE SAME WIDTH AS THE SIDEWALK.
5. IF LENGTH EXCEEDS 5', TRUNCATED DOMES SHALL BE INSTALLED ALONG THE BACK OF THE CURB COVERING THE FULL WIDTH OF THE RAMP.

REVISIONS	
DATE	DESCRIPTION

1 of 8

TOWN OF KNIGHTDALE STANDARD DETAILS | WHEELCHAIR CURB RAMPS (NEW DEVELOPMENT) | STD. NO. 4.06-1

PAY LIMITS FOR CURB RAMP



CONCRETE DEPTH	
RAMP/FLARE	6"
LANDING	4"

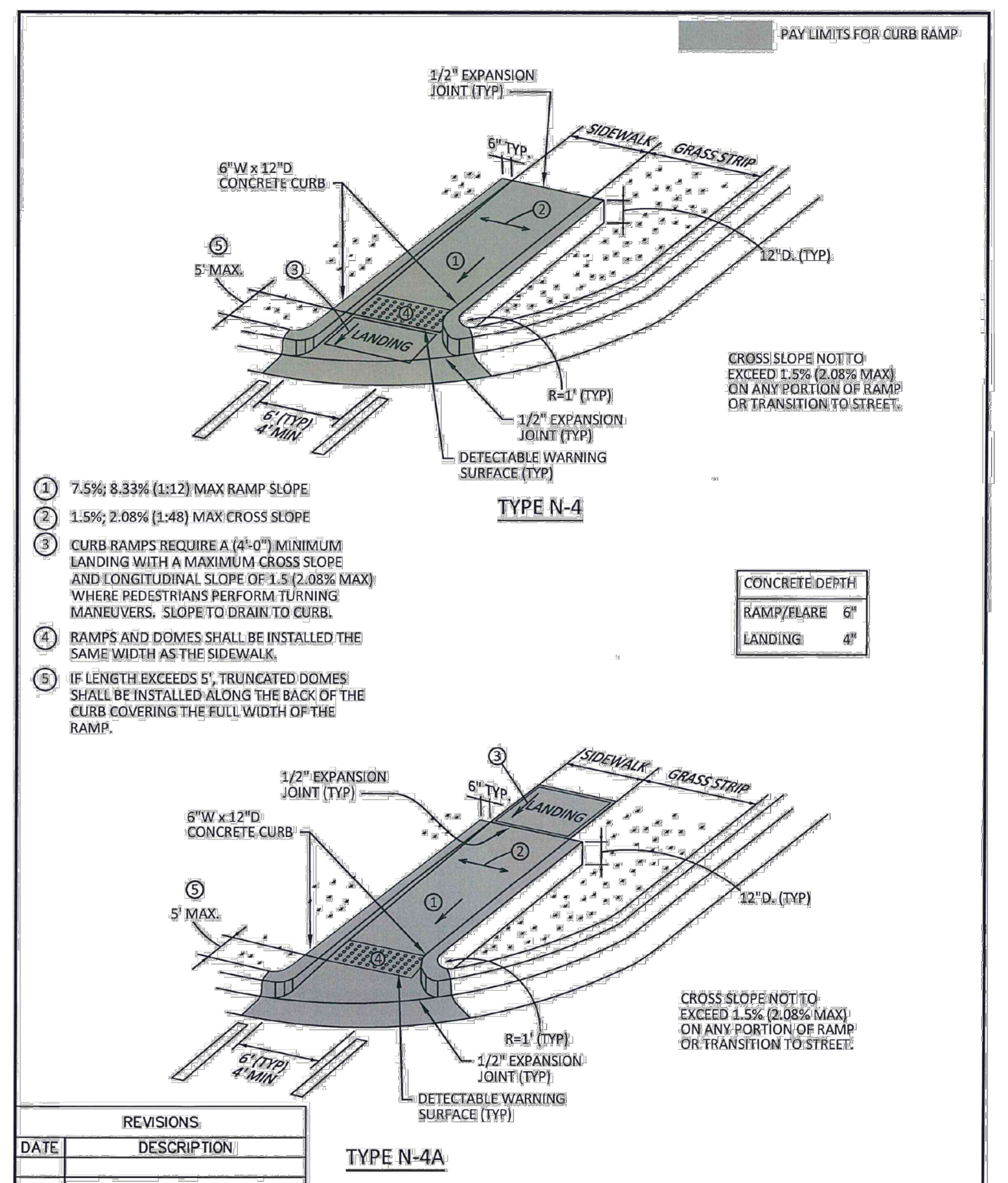
1. 7.5%; 8.33% (1:12) MAX RAMP SLOPE
2. 1.5%; 2.08% (1:48) MAX CROSS SLOPE
3. CURB RAMPS REQUIRE A (4'-0") MINIMUM LANDING WITH A MAXIMUM CROSS SLOPE AND LONGITUDINAL SLOPE OF 1.5 (2.08% MAX) WHERE PEDESTRIANS PERFORM TURNING MANEUVERS. SLOPE TO DRAIN TO CURB.
4. RAMPS AND DOMES SHALL BE INSTALLED THE SAME WIDTH AS THE SIDEWALK.
5. SIDEWALK WIDTH TO MATCH CORRESPONDING STREET SECTION.

REVISIONS	
DATE	DESCRIPTION

2 of 8

TOWN OF KNIGHTDALE STANDARD DETAILS | WHEELCHAIR CURB RAMPS (NEW DEVELOPMENT) | STD. NO. 4.06-2

PAY LIMITS FOR CURB RAMP



1. 7.5%; 8.33% (1:12) MAX RAMP SLOPE
2. 1.5%; 2.08% (1:48) MAX CROSS SLOPE
3. CURB RAMPS REQUIRE A (4'-0") MINIMUM LANDING WITH A MAXIMUM CROSS SLOPE AND LONGITUDINAL SLOPE OF 1.5 (2.08% MAX) WHERE PEDESTRIANS PERFORM TURNING MANEUVERS. SLOPE TO DRAIN TO CURB.
4. RAMPS AND DOMES SHALL BE INSTALLED THE SAME WIDTH AS THE SIDEWALK.
5. IF LENGTH EXCEEDS 5', TRUNCATED DOMES SHALL BE INSTALLED ALONG THE BACK OF THE CURB COVERING THE FULL WIDTH OF THE RAMP.

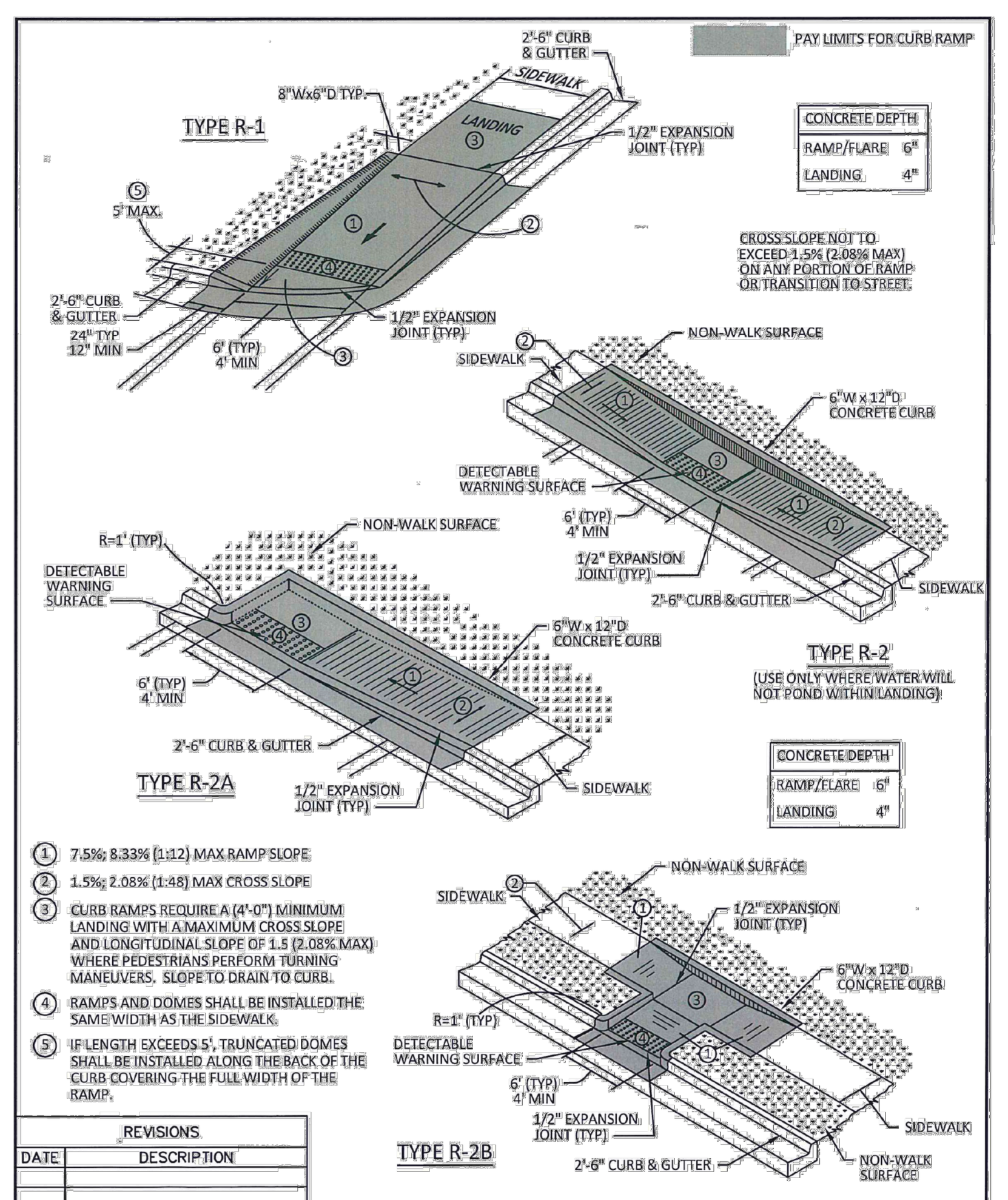
CONCRETE DEPTH	
RAMP/FLARE	6"
LANDING	4"

REVISIONS	
DATE	DESCRIPTION

3 of 8

TOWN OF KNIGHTDALE STANDARD DETAILS | WHEELCHAIR CURB RAMPS (NEW DEVELOPMENT) | STD. NO. 4.06-3

PAY LIMITS FOR CURB RAMP



CONCRETE DEPTH	
RAMP/FLARE	6"
LANDING	4"

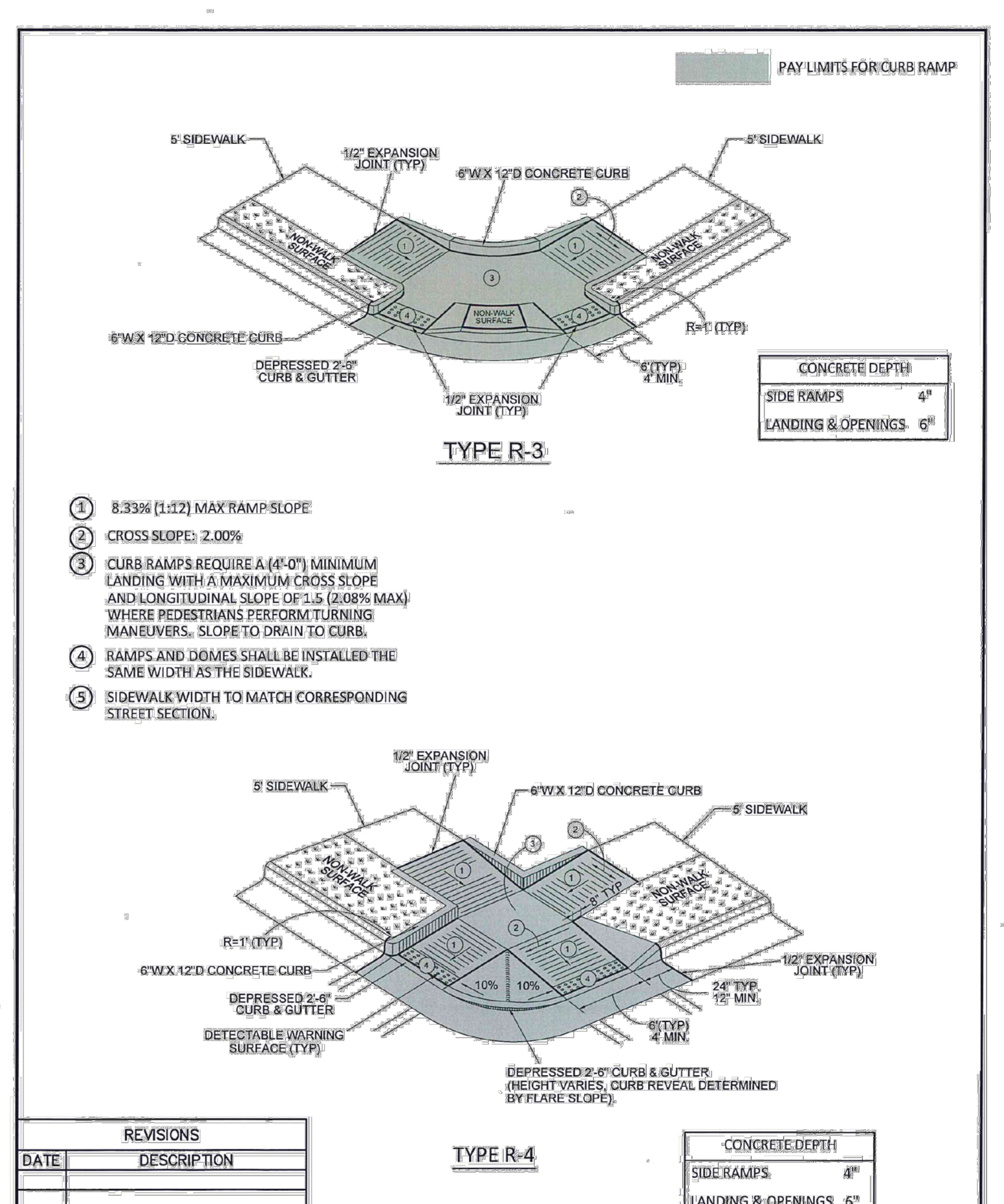
1. 7.5%; 8.33% (1:12) MAX RAMP SLOPE
2. 1.5%; 2.08% (1:48) MAX CROSS SLOPE
3. CURB RAMPS REQUIRE A (4'-0") MINIMUM LANDING WITH A MAXIMUM CROSS SLOPE AND LONGITUDINAL SLOPE OF 1.5 (2.08% MAX) WHERE PEDESTRIANS PERFORM TURNING MANEUVERS. SLOPE TO DRAIN TO CURB.
4. RAMPS AND DOMES SHALL BE INSTALLED THE SAME WIDTH AS THE SIDEWALK.
5. IF LENGTH EXCEEDS 5', TRUNCATED DOMES SHALL BE INSTALLED ALONG THE BACK OF THE CURB COVERING THE FULL WIDTH OF THE RAMP.

REVISIONS	
DATE	DESCRIPTION

4 of 8

TOWN OF KNIGHTDALE STANDARD DETAILS | WHEELCHAIR CURB RAMPS (NEW DEVELOPMENT) | STD. NO. 4.06-4

PAY LIMITS FOR CURB RAMP



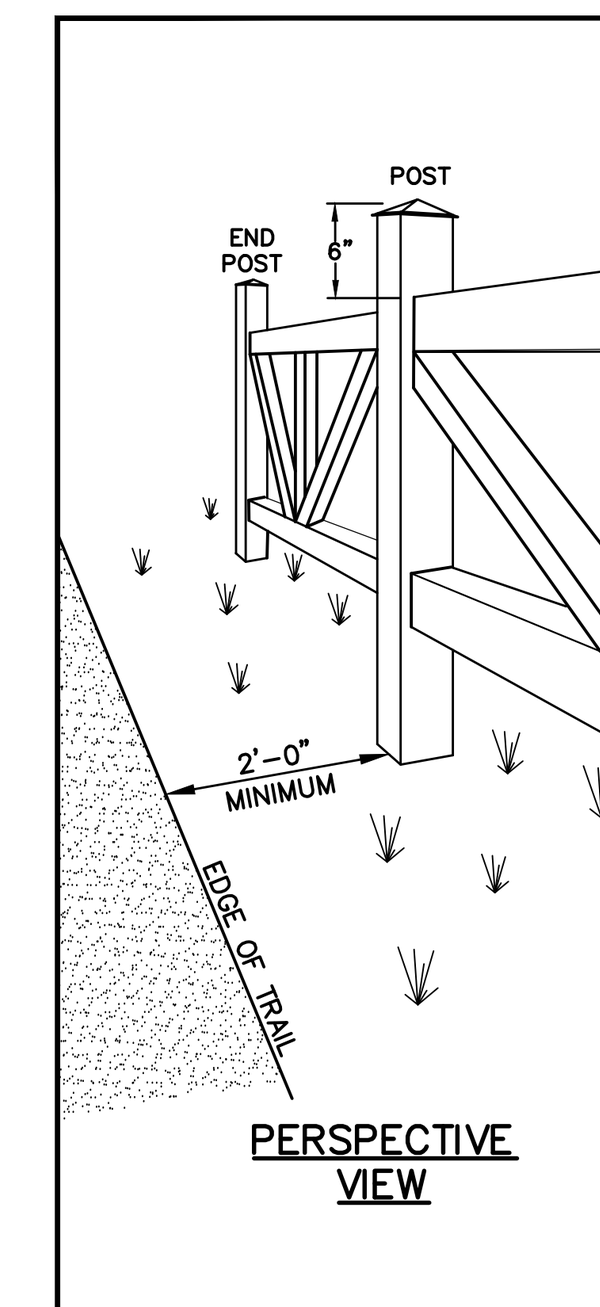
CONCRETE DEPTH	
SIDE RAMPS	4"
LANDING & OPENINGS	6"

1. 8.33% (1:12) MAX RAMP SLOPE
2. CROSS SLOPE: 2.00%
3. CURB RAMPS REQUIRE A (4'-0") MINIMUM LANDING WITH A MAXIMUM CROSS SLOPE AND LONGITUDINAL SLOPE OF 1.5 (2.08% MAX) WHERE PEDESTRIANS PERFORM TURNING MANEUVERS. SLOPE TO DRAIN TO CURB.
4. RAMPS AND DOMES SHALL BE INSTALLED THE SAME WIDTH AS THE SIDEWALK.
5. SIDEWALK WIDTH TO MATCH CORRESPONDING STREET SECTION.

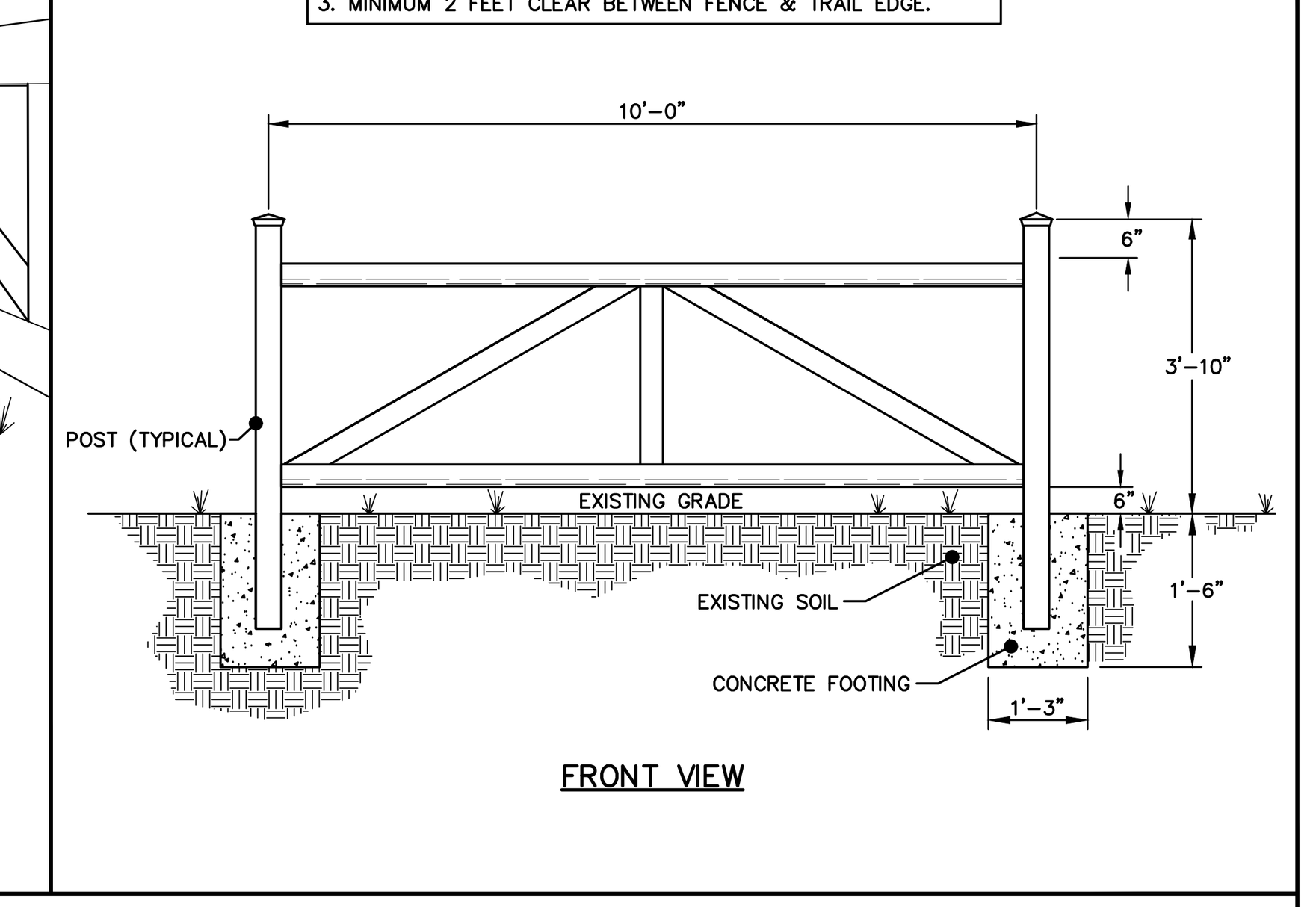
REVISIONS	
DATE	DESCRIPTION

5 of 8

TOWN OF KNIGHTDALE STANDARD DETAILS | WHEELCHAIR CURB RAMPS (NEW DEVELOPMENT) | STD. NO. 4.06-5



NOTES:
1. ALL WOOD FOR SPLIT RAIL FENCE TO BE PRESSURE TREATED.
2. END POST SHALL BE TERMINAL POST.
3. MINIMUM 2 FEET CLEAR BETWEEN FENCE & TRAIL EDGE.



STANDARD SPLIT-RAIL FENCE

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: Samuel A. MacDonald (Digitally signed by Samuel A. MacDonald; Date: 2026.04.16 10:12:15-04'00') DATE: ____________
TOWN ENGINEER

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

BY: Gideon Smith (Digitally signed by Gideon Smith; Date: 2026.05.19 10:13:46-04'00') DATE: ____________
LAND USE ADMINISTRATOR

NORTH CAROLINA PROFESSIONAL SEAL 051879 ENGINEER TYLER JEFFREY CROSS — 3/31/2026

THIS DRAWING PREPARED AT THE **RALEIGH OFFICE**
5410 Trinity Road, Suite 102 | Raleigh, NC 27607
TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION	DATE

DATE: 03/31/2026
DRAWN BY: 331
DESIGNED BY: 331
CHECKED BY: T. CROSS
SCALE

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

SITE DETAILS - SHEET 1 OF 3

JOB NO. 51557
SHEET NO. C12.0

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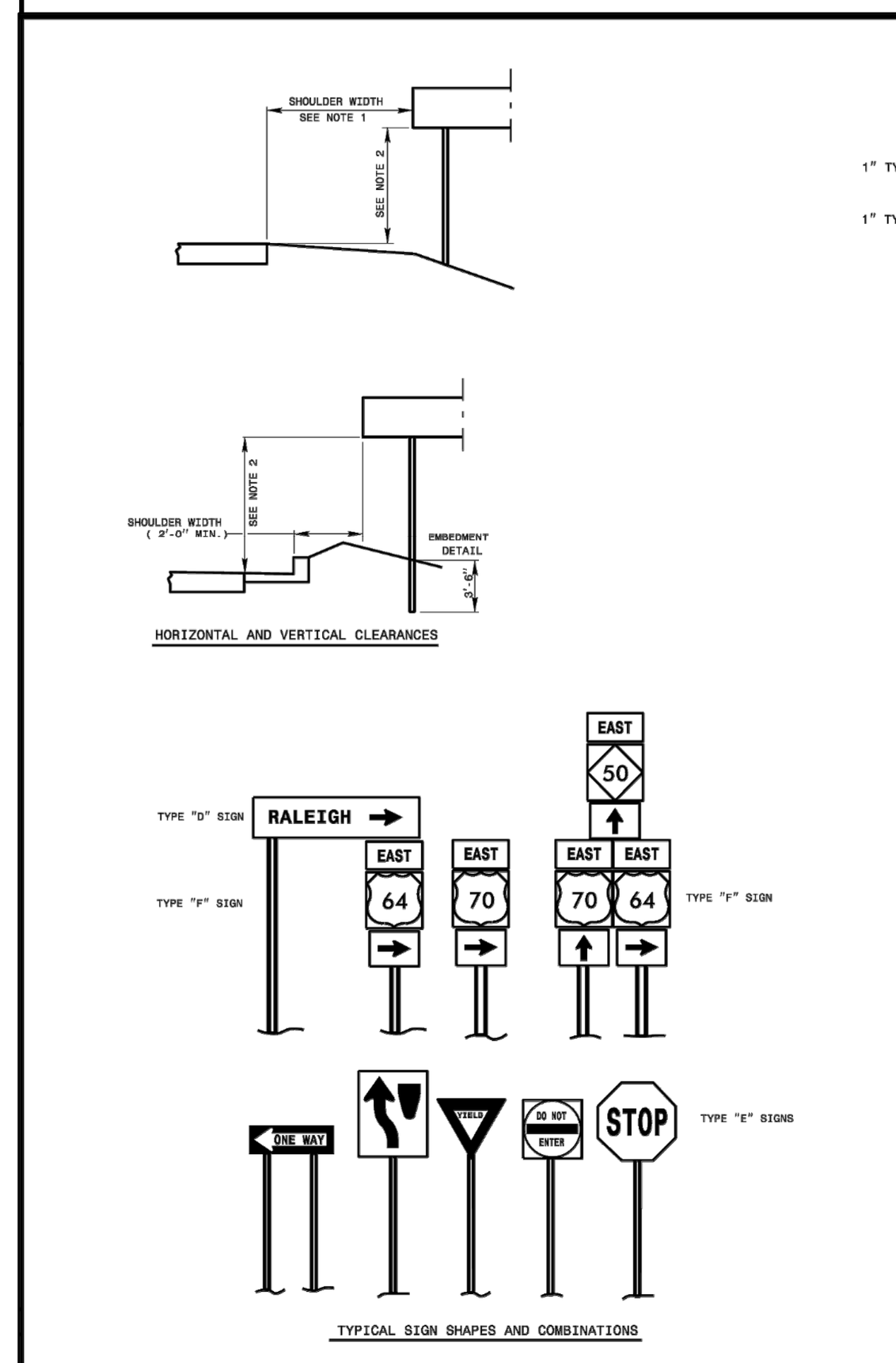
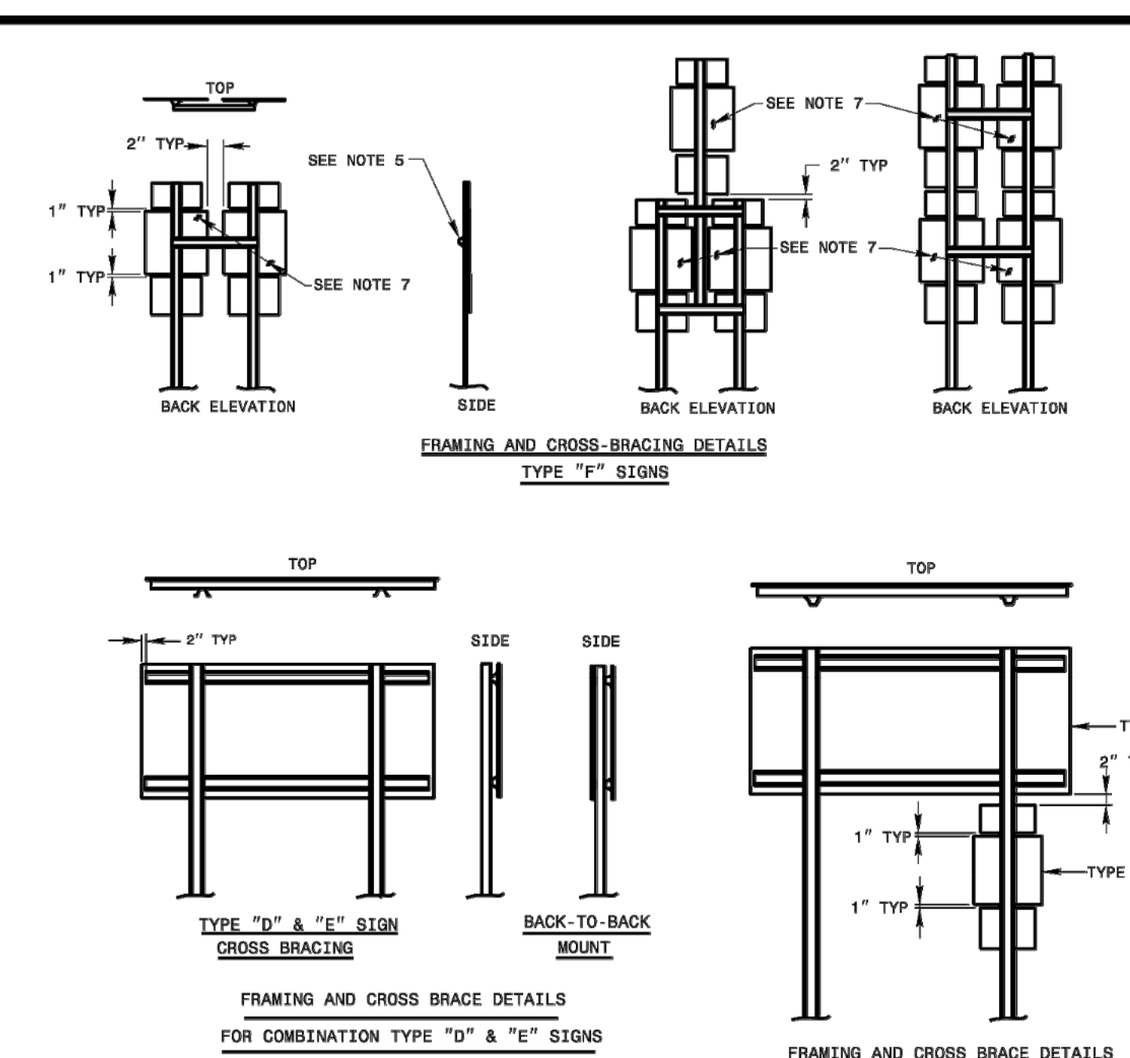




NOTES:

1. ERECT TYPE "D", "E", AND "F" SIGNS ON FREEWAYS WITH THE NEAR EDGE OF THE SIGN 20 FT. FROM THE TRAVEL LANE. ERECT ALL OTHER "D", "E", AND "F" SIGNS WITH THE NEAR EDGE OF THE SIGN AT THE EDGE OF THE SHOULDER BREAK (6 FT. MINIMUM CLEARANCE, 12 FT. DESIRABLE, FROM THE EDGE OF TRAVEL LANE), OR AS DIMENSIONED ON PLAN SHEETS.
2. ERECT TYPE "D", "E", AND "F" SIGNS WITH THE BOTTOM OF SIGN ASSEMBLY AT LEAST 7 FT. ABOVE THE EDGE OF THE TRAVEL LANE ON ROADS WITH 2 OR MORE LANES AND AT LEAST 5 FT. ON OTHER ROUTES. THE VERTICAL CLEARANCE IS 7 FT. WHERE REQUIRED FOR PEDESTRIAN TRAFFIC AND/OR PARKED VEHICLES.
3. THE VERTICAL DIMENSION BETWEEN MOUNTING HOLE CENTERS ON ALL TYPES "D", "E", AND "F" SIGNS IS 30" MAXIMUM. THE VERTICAL AND HORIZONTAL DIMENSIONS BETWEEN MOUNTING HOLES IS TO THE WHOLE INCH. EACH SIGN PANEL HAS A MINIMUM OF 2 BOLTS PER SUPPORT.
4. ATTACH SIGN W/ 5/16" HEX HEAD BOLT, NYLON WASHER, SHIM, FLAT WASHER, LOCK WASHER, HEX NUT NO BUCKLING OF THE SIGN WILL BE PERMITTED. SEE ASSEMBLY DETAIL SHEET# 2 OF 904.50.
5. FURNISH AND INSTALL CROSS-BRACING AS SHOWN IN DETAIL. PAINT ENDS OF CROSS BRACES W/ APPROVED. ZINC PAINT
6. INSTALL POST AND CROSS-BRACING WITH THE WIDE SIDE OF THE FLANGE TOWARD THE BACK OF SIGN(S) FOR COMBINATION TYPE "D" AND "F" SIGNS.
7. THE SHIELD HEIGHTS IN THESE ASSEMBLIES CAN NOT BE LARGER THAN 24".
8. IF SIGN ASSEMBLIES REQUIRE MORE THAN TWO U-CHANNEL SUPPORTS, THE SUPPORTS SHALL BE PLACED A MINIMUM OF 4 FT. BETWEEN POSTS. NO MORE THAN TWO POSTS SHALL FALL WITHIN 7 FT. PATH, OR THE SIGN ASSEMBLY MUST BE PLACED BEHIND BARRIER PROTECTION.

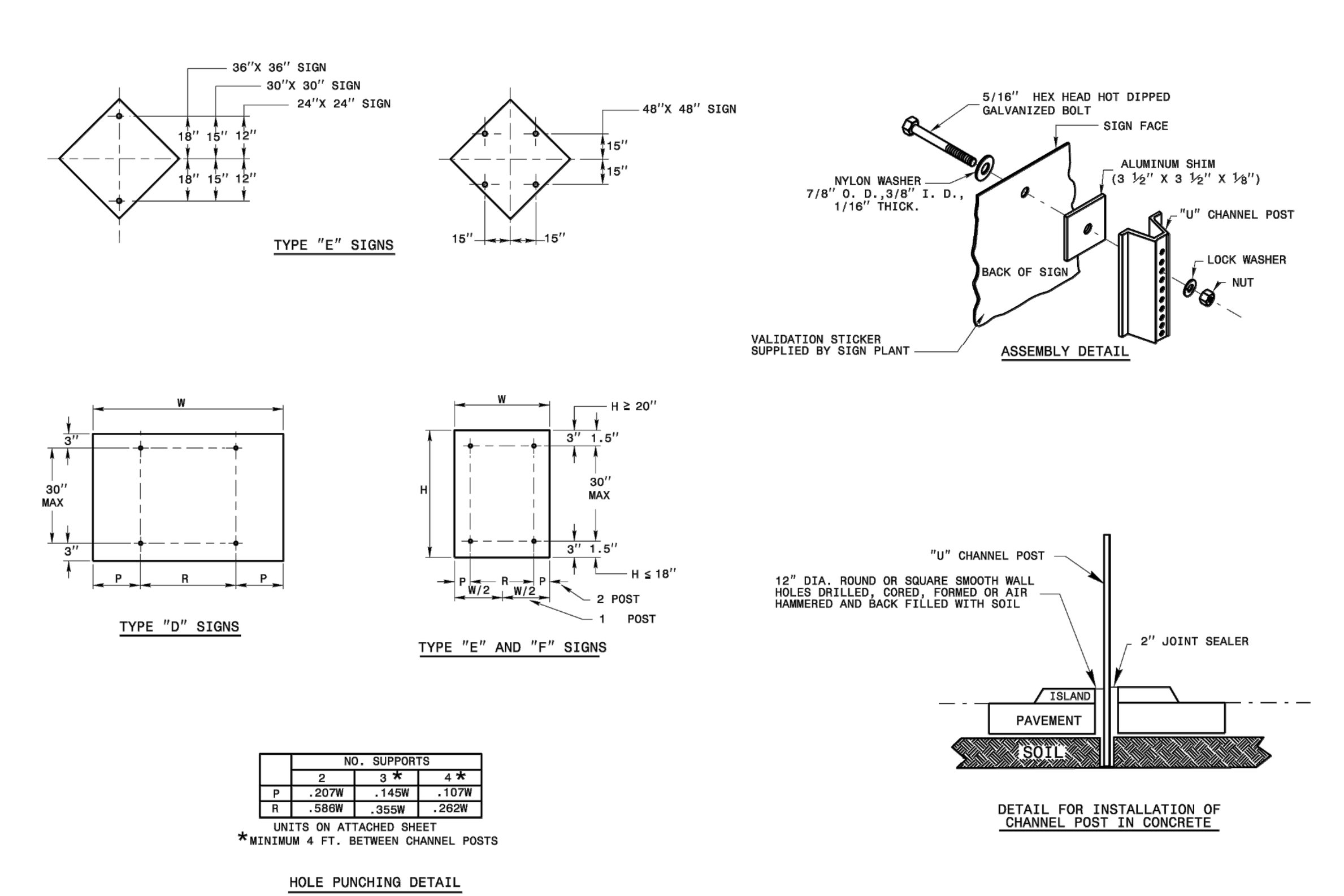
STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

1-18

ENGLISH STANDARD DRAWING FOR **MOUNTING OF TYPE 'D','E' AND 'F' SIGNS ON 'U' CHANNEL POSTS**

SHEET 1 OF 2

904.50



	NO. SUPPORTS		
	2	3 *	4 *
P	.207W	.145W	.107W
R	.586W	.355W	.262W

UNITS ON ATTACHED SHEET
*MINIMUM 4 FT. BETWEEN CHANNEL POSTS

HOLE PUNCHING DETAIL

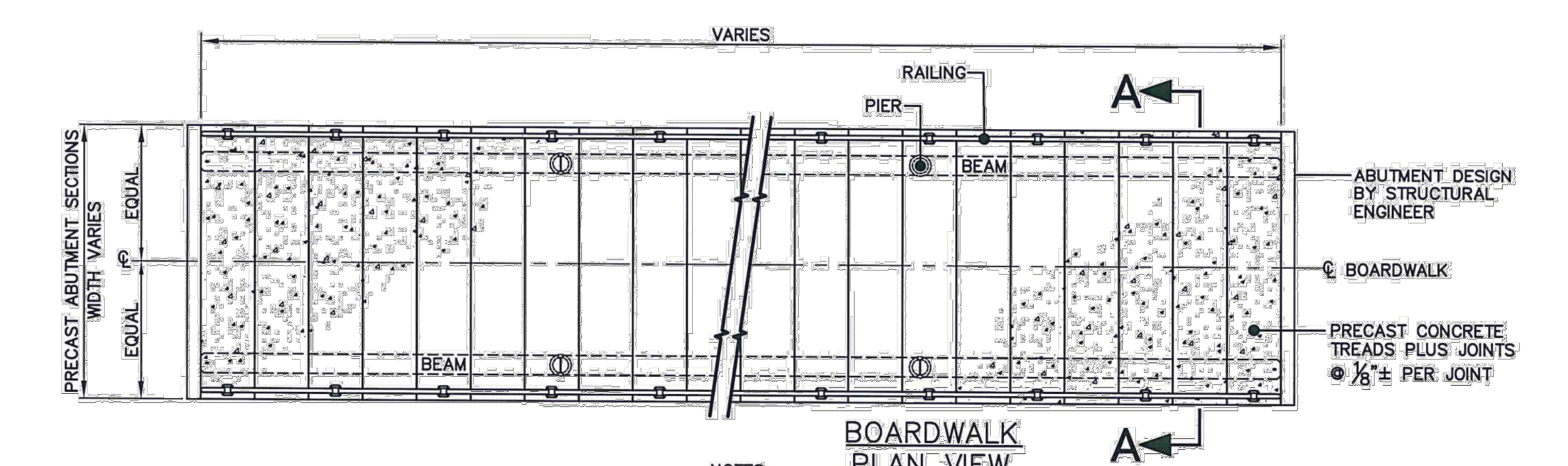
STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

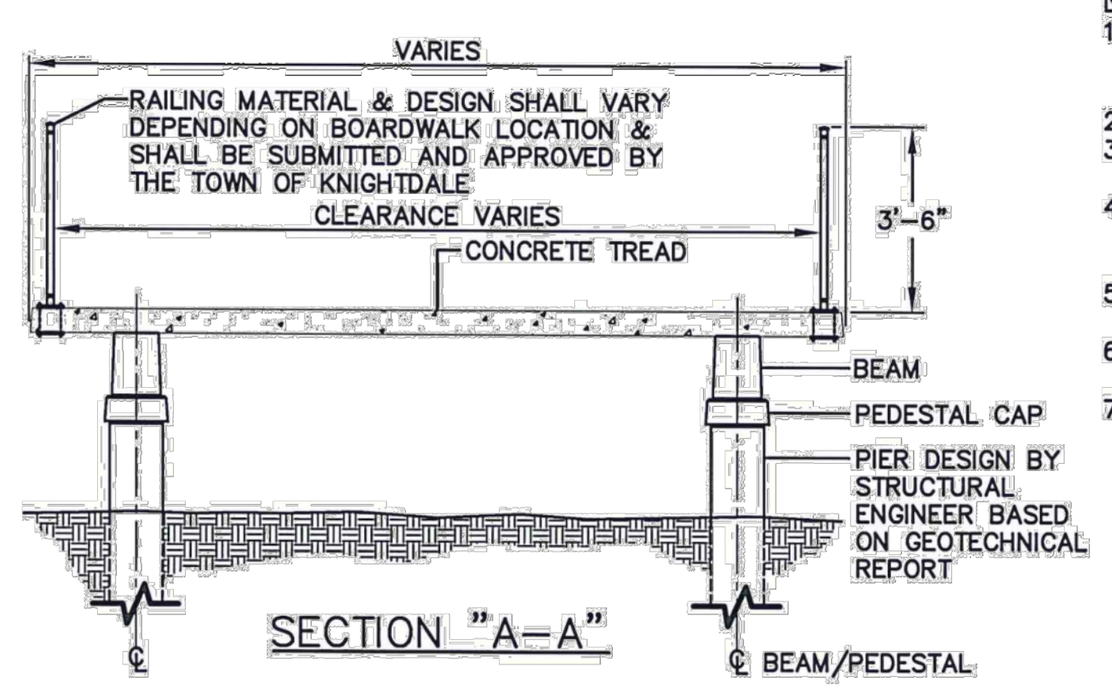
1-18

ENGLISH STANDARD DRAWING FOR **MOUNTING OF TYPE 'D','E' AND 'F' SIGNS ON 'U' CHANNEL POSTS**

SHEET 2 OF 2

904.50



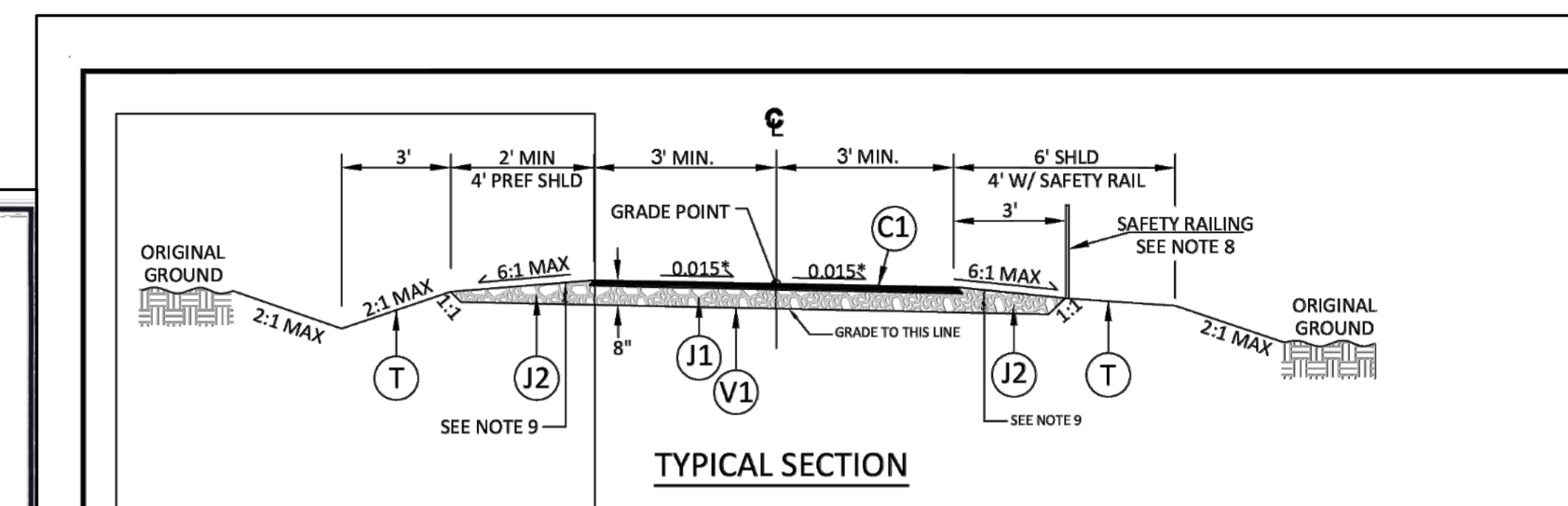


NOTES:

1. BOARDWALK SYSTEM (BEAMS, TREADS, AND CURBS IF APPLICABLE) MUST BE PRECAST CONCRETE. WALKING SURFACE (TREADS) SHALL BE MADE OF PRECAST CONCRETE, AND SUPPORTED BY PRECAST CONCRETE BEAMS.
2. COLOR AND FINISH TEXTURE SHALL BE INTEGRAL AND MUST BE SUBMITTED FOR APPROVAL.
3. PRECAST CONCRETE TREADS SHALL BE STRUCTURAL LOAD BEARING ELEMENTS AND SHALL INTERLOCK WITH ONE ANOTHER VIA A "TONGUE AND GROOVE" CONNECTION.
4. TREADS SHALL MAINTAIN A "BOARDWALK APPEARANCE", SPECIFICALLY MEANING EACH TREAD SHALL HAVE A WIDTH: LENGTH RATIO RANGING FROM A MINIMUM OF 3:1 TO A MAXIMUM OF 14:1.
5. ALL BOARDWALK CONNECTORS SHALL BE NON-CORROSIVE, AND HIDDEN FROM VIEW. METALLIC CONNECTORS ARE NOT ACCEPTABLE FOR THIS PROJECT.
6. THE DESIGNER OF THE BOARDWALK, FOUNDATION AND RAILING SYSTEM SHALL BE A QUALIFIED REGISTERED PROFESSIONAL ENGINEER LICENSED IN THE STATE OF NORTH CAROLINA.
7. BOARDWALK DESIGN CRITERIA:
   - AASHTO LRFD GUIDE SPECIFICATIONS FOR THE DESIGN OF PEDESTRIAN BRIDGES, 2ND EDITION
   - AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR HIGHWAY BRIDGES, 5TH EDITION.
   - AMERICAN CONCRETE INSTITUTE 2005 — BUILDING CODE AND COMMENTARY.
   - RAILINGS (WHEN REQUIRED BY CODE) SHALL BE SUITABLE FOR PEDESTRIAN TRAFFIC AND SHALL BE A MINIMUM OF 42 INCHES ABOVE THE TREAD / DECK SURFACE.
   - RAILING TO BE ATTACHED BY POST TO DECK TOP WITH A BASE PLATE OR MOUNTED TO SIDEWALK OR SUPPORTING BEAM SIDES.
   - A 4-INCH SPHERE CANNOT PASS THROUGH THE LOWER 34 INCHES OF THE RAIL SYSTEM AND AN 8-INCH SPHERE MUST NOT PASS THROUGH THE THE UPPER AREA OF THE RAIL SYSTEM FROM 34" TO 42" HEIGHT.
   - RAILINGS MUST RESIST A UNIFORM LOAD OF 50 POUNDS APPLIED PER LINEAR FOOT OR A SINGLE CONCENTRATED LOAD OF 200 POUNDS APPLIED IN ANY DIRECTION AT THE TOP OF EACH RAIL.
   - RAILINGS SHOULD PROVIDE SAFETY TOE RAIL OR CURB.
   - RAILINGS NEED TO BE SUBMITTED AND APPROVED BY THE TOWN OF KNIGHTDALE.
8. OTHER DESIGNS/MATERIALS MAY BE ALLOWED PER TOWN OF KNIGHTDALE REVIEW AND APPROVAL

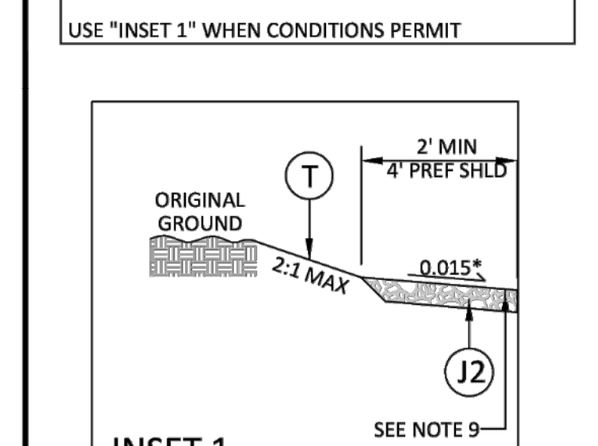
REVISIONS	
DATE	DESCRIPTION

TOWN OF KNIGHTDALE STANDARD DETAILS	STANDARD PRECAST CONCRETE BOARDWALK (PLAN & SECTION VIEW)	STD. NO. 4.09-2



TYPICAL SECTION

*0.02 MAX



PAVEMENT SCHEDULE	
C1	2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B AT AN AVERAGE RATE OF 220 LBS. PER SQ. YD. OR 110 LBS. PER SQ. YD. IN EACH OF TWO LAYERS
J1	6" AGGREGATE BASE COURSE
J2	VARIABLE DEPTH AGGREGATE BASE COURSE
T	EARTH MATERIAL
V1	GEOTEXTILE FOR PAVEMENT STABILIZATION

TABLE 1 - MAXIMUM RUNNING SLOPE AND TRAIL SEGMENT LENGTH

RUNNING SLOPE	MAX LENGTH OF SEGMENT
1:20 (5%)	200 FT
1:12(8.33%)	30 FT

NOTES:

1. TRAIL WIDTH TO BE DETERMINED BY THE TOWN OF KNIGHTDALE
2. WHEN CONDITIONS PERMIT, USE 6' SHOULDER IN FILL SECTIONS AND 4' SHOULDER IN CUT SECTIONS. USE MINIMUM 2' SHOULDER IN CUT AND FILL SECTIONS. FOR CUT SECTION CONDITION SHOWN IN "INSET 1" , APPLY ENGINEERING JUDGEMENT TO DETERMINE IF UPHILL SIDE REQUIRES A SWALE.
3. PROVIDE MINIMUM 2' SHOULDER OF UNPLANTED AGGREGATE BASE COURSE.
4. TRAILS OR TRAIL SEGMENTS OF ANY LENGTH MAY BE CONSTRUCTED WITH RUNNING SLOPES/VERTICAL GRADES UP TO 1:20 (5%). TO ACCOMMODATE STEEP TERRAIN, TRAILS MAY BE DESIGNED WITH STEEPER SECTIONS OF CONSTRAINED LENGTH AS SHOWN IN TABLE 1. RESTING INTERVALS WITH FLATTER GRADES ARE REQUIRED BETWEEN TRAIL SEGMENTS ANY TIME RUNNING SLOPE EXCEEDS 1:20 (5%). RESTING INTERVALS SHALL BE LOCATED ON UPHILL SIDE OF TRAIL IF ONLY PROVIDED ON ONE SIDE.
5. TO ENSURE THAT A TRAIL IS NOT DESIGNED AS A SERIES OF STEEP SEGMENTS, NO MORE THAN 30% OF THE TOTAL LENGTH OF TRAIL MAY HAVE A RUNNING SLOPE/VERTICAL GRADE OF 7.5% (8.33% OR 1:12 MAX). RESTING INTERVALS MUST BE PROVIDED FREQUENTLY AS THE RUNNING SLOPE INCREASES.
6. RUNNING SLOPE/VERTICAL GRADE RECOMMENDATIONS MAY NOT BE ABLE TO BE ACHIEVED FOR TRAIL REPLACEMENT PROJECTS. FOR THESE TYPE OF PROJECTS, REPLACEMENT OF EXISTING CONDITION IN KIND IS SUFFICIENT.
7. TYPICAL CROSS SLOPE SHALL BE 1.5% (2.08% OR 1:48 MAX). CROSS SLOPE DIRECTION VARIES. SLOPE SHOULDERS FOR POSITIVE DRAINAGE WHICH MAY REQUIRE CONTINUING PAVEMENT OR SHOULDER SLOPE UNTIL TIE-IN WITH NATURAL GROUND. SEE PLAN SHEETS AND CROSS SECTIONS.
8. WHEN CONDITIONS PERMIT, SHOULDERS TO MATCH CROSS SLOPE OF TRAIL AND SIDE SLOPES TO BE 3:1 OR FLATTER.
9. PROVIDE A SAFETY RAIL FOR THE FOLLOWING CIRCUMSTANCES WITHIN 6' OF THE EDGE OF PAVEMENT: 1) SLOPE > 3:1 AND DROP OF 6'; 2) SLOPE > 2:1 AND DROP OF 4'; 3) SLOPE > 1:1 AND DROP OF 1'.
10. CONTRACTOR IS RESPONSIBLE FOR RE-ESTABLISHING ALL SLOPES DISTURBED DURING CONSTRUCTION.
11. PROOF ROLLING SHALL OCCUR IN PRESENCE OF THE OWNER OR THE OWNER'S TESTING AGENCY AT THE FOLLOWING STAGES: 1)PRIOR TO PLACING FILL IN LOW AREAS; 2) AFTER THE PREPARATION OF SUBGRADE PRIOR TO PLACING ABC; 3) AFTER THE PLACEMENT OF ABC PRIOR TO PAVING.
12. PAVEMENT EDGE SLOPES ARE 1:1 UNLESS OTHERWISE NOTED.
13. NO ABOVE-GROUND UTILITIES OR UTILITY SURFACE COVERS/PLATES/MANHOLES SHALL BE LOCATED WITHIN THE TRAIL AND SHALL BE A MINIMUM OF 2' FROM THE EDGE OF TRAIL. RAISED MANHOLES SHALL BE A MINIMUM OF 4' FROM THE EDGE OF TRAIL.

REVISIONS	
DATE	DESCRIPTION

MODIFIED TOWN OF KNIGHTDALE STANDARD DETAILS	MODIFIED ASPHALT TYPICAL GREENWAY SECTION VARIABLE WIDTH (6' MIN)	STD. NO. MODIFIED 4.09-1

MINIMUM PAVEMENT DESIGN:

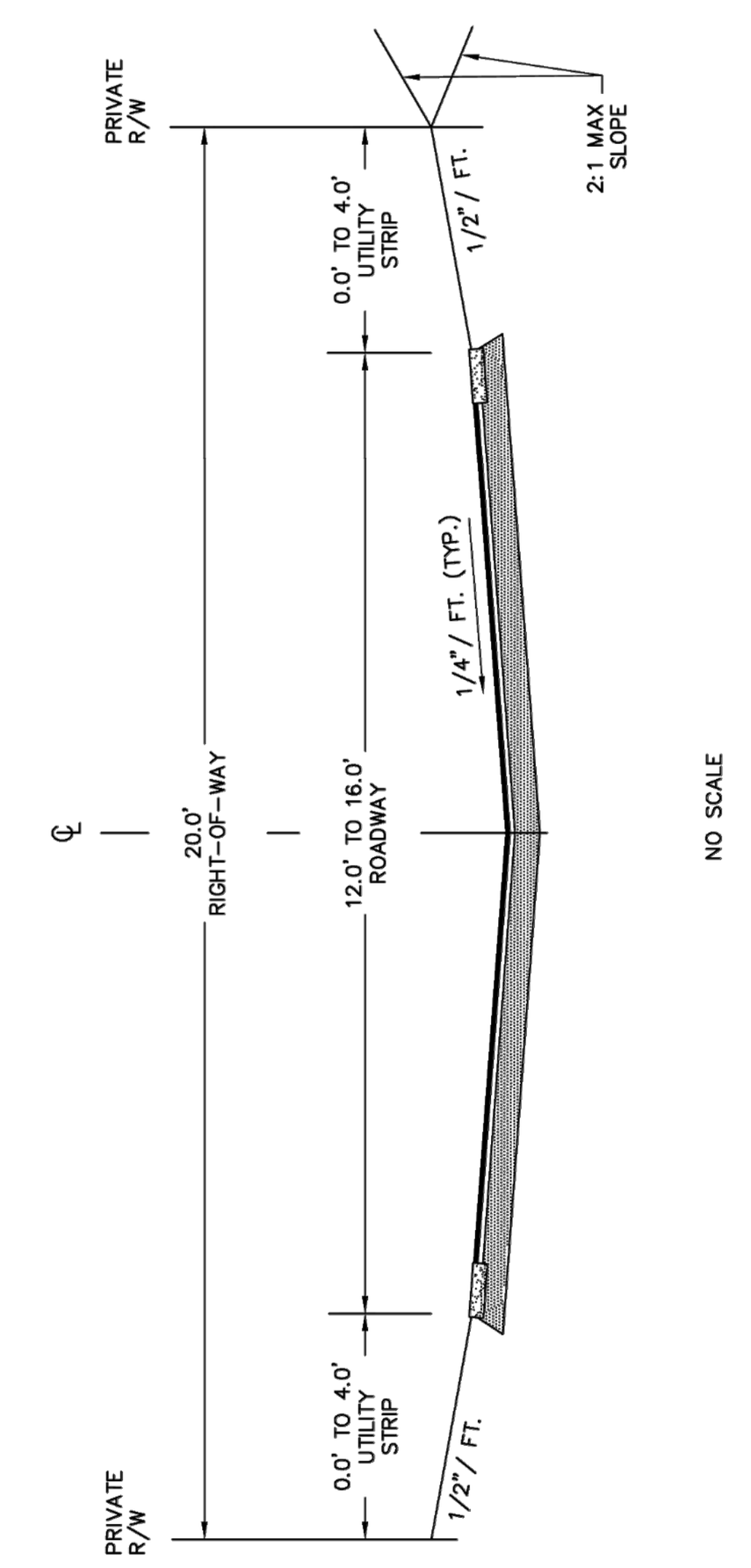
BITUMINOUS SURFACE COURSE: 2-½" S 9.5A
BASE COURSE: 8" ABC

STREET FEATURES:

STREET WIDTH OF 12 FT. MINIMUM, 16 FT. DESIRABLE
REQUIRES 20 FT. OF RIGHT-OF-WAY
UTILITY LOCATION UNDERGROUND
TWO TO SIX BLOCKS LONG
AVERAGE SPEED OF 10 MPH

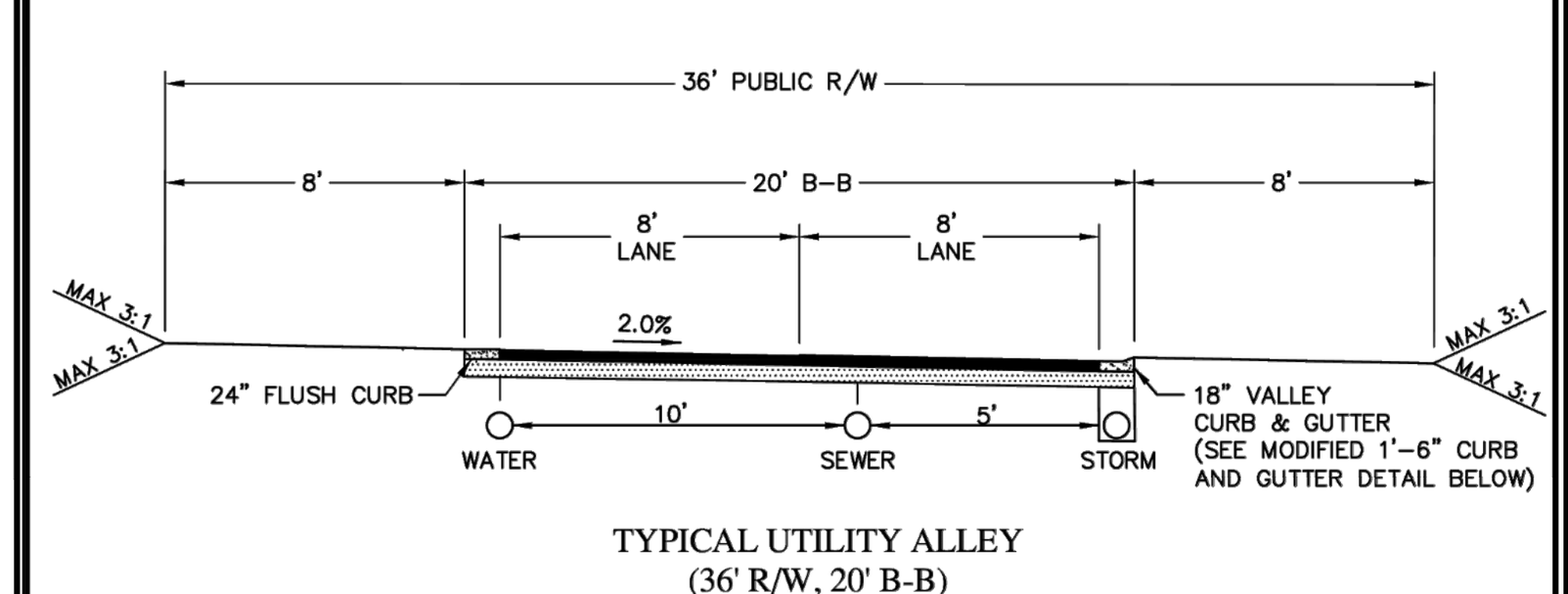
BUILDINGS & LAND USE:

RESIDENTIAL - PRIMARILY SINGLE FAMILY
COMMERCIAL

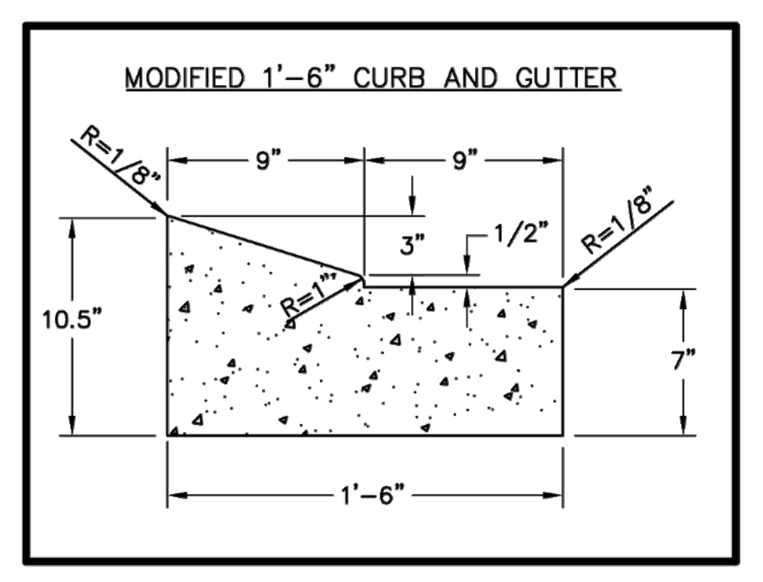


REVISIONS	
DATE	DESCRIPTION

TOWN OF KNIGHTDALE STANDARD DETAILS	ALLEY SECTION	STD. NO. 3.01-1



TYPICAL UTILITY ALLEY
(36' R/W, 20' B-B)



MINIMUM PAVEMENT DESIGN:

BITUMINOUS SURFACE COURSE: 1 1/2" S9.5B
INTERMEDIATE COURSE: 2 1/2" I 19.0B
BASE COURSE: 8" ABC

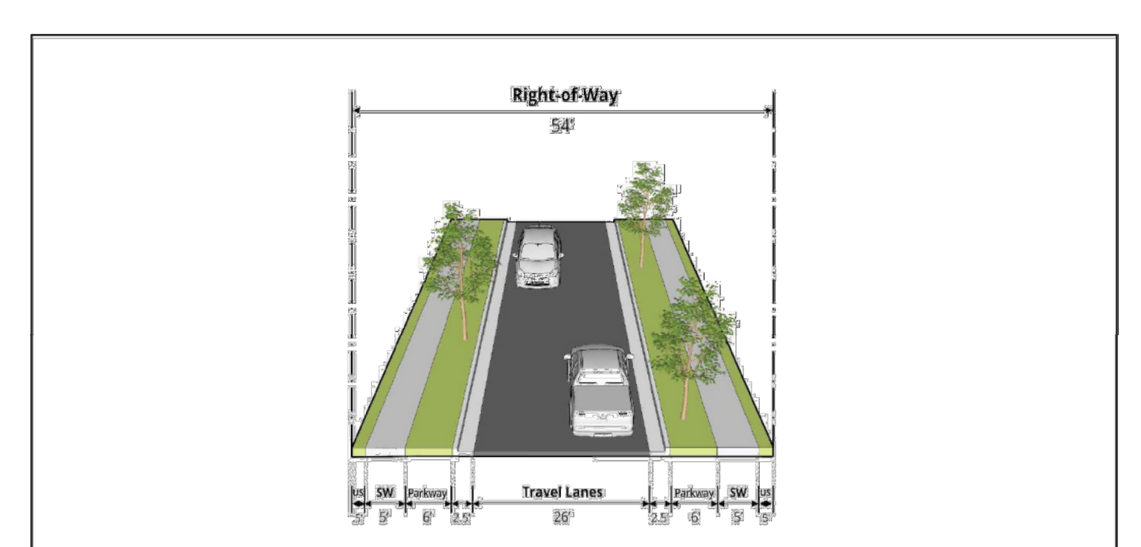
STREET FEATURES:

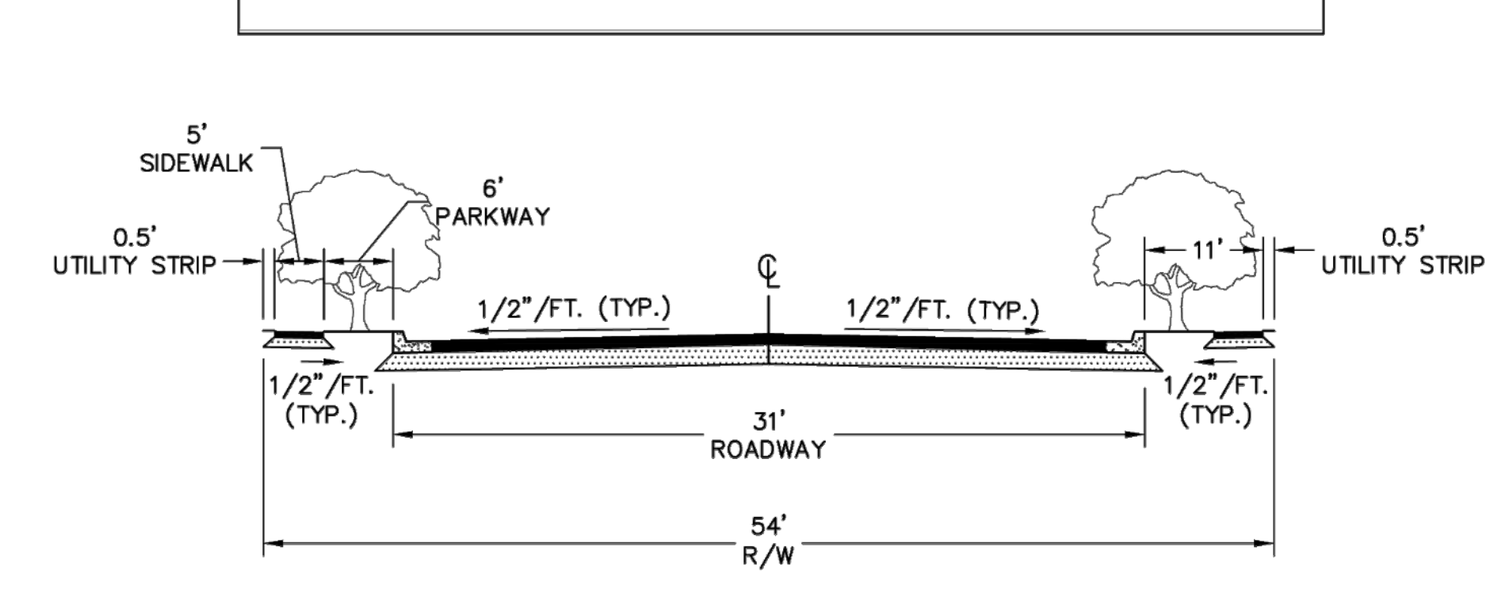
STREET WIDTH 16 FT. MINIMUM
REQUIRES 36 FT. OF RIGHT-OF-WAY
AVERAGE SPEED 10 MPH

REVISIONS	
DATE	DESCRIPTION

1 of 1

TOWN OF KNIGHTDALE STANDARD DETAILS	PUBLIC ALLEY SECTION	STD. NO. 3.01-2





MINIMUM PAVEMENT DESIGN:

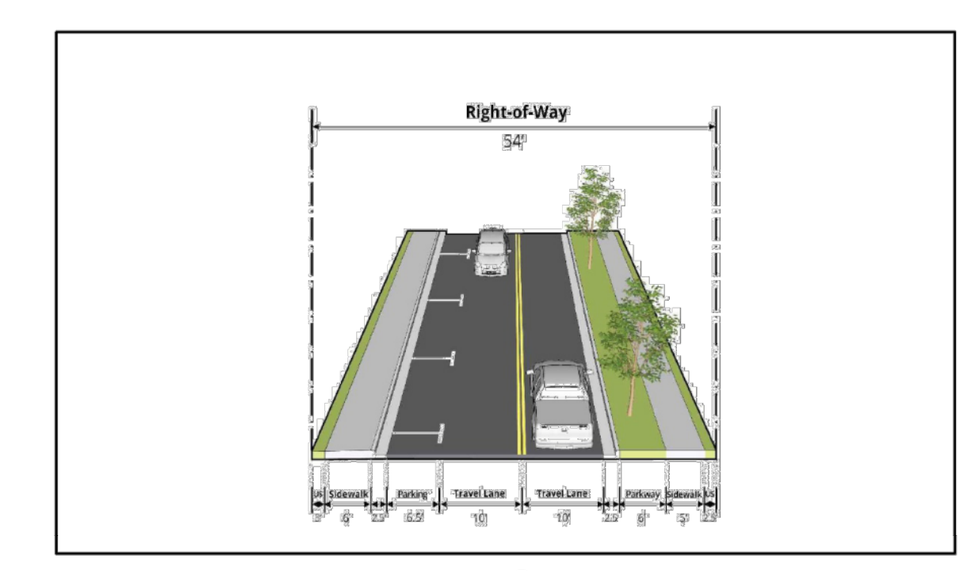
BITUMINOUS SURFACE COURSE: 1 1/2" S 9.5B
INTERMEDIATE COURSE: 2 1/2" I 19.0B
BASE COURSE: 8" ABC

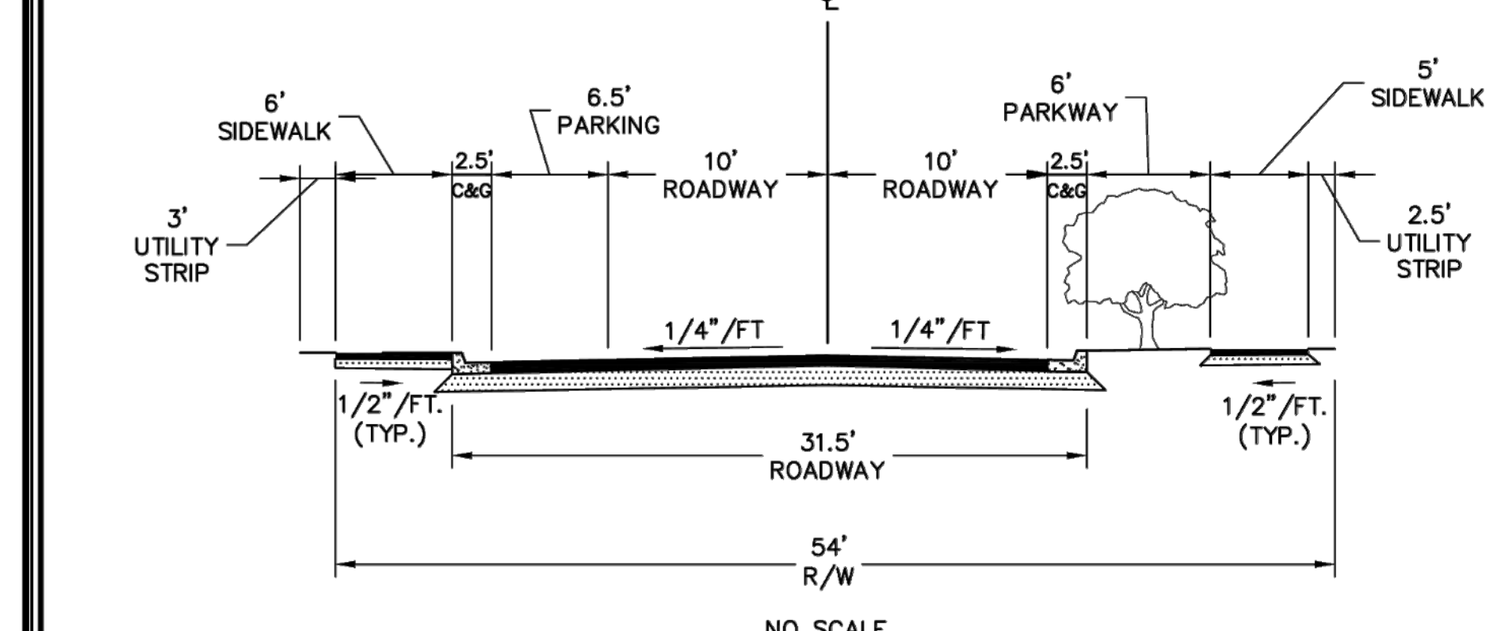
STREET FEATURES:

FLEXIBLE STREET DESIGN
COORDINATE STREET DESIGN ELEMENTS WITH TOWN STAFF
STREET WIDTH OF 20 FT. FOR ONE-WAY
STREET WIDTH OF 31 FT. FOR TWO-WAY
CURB & GUTTER
INFORMAL PARKING - ONE SIDE ONLY
PARKWAY - 6 FT. ON EACH SIDE
SIDEWALK - 5 FT. ON EACH SIDE
UTILITY STRIP - 0.5 FT. ON EACH SIDE
REQUIRES 47 FT. OF RIGHT-OF-WAY FOR ONE-WAY
REQUIRES 54 FT. OF RIGHT-OF-WAY FOR TWO-WAY
UTILITY LOCATION UNDERGROUND
AVERAGE SPEED 20 MPH
STREET TREES LOCATED IN PARKWAY

REVISIONS	
DATE	DESCRIPTION

TOWN OF KNIGHTDALE STANDARD DETAILS	LOCAL STREET - 2 LANES SIDEWALKS	STD. NO. 3.02-1





MINIMUM PAVEMENT DESIGN:

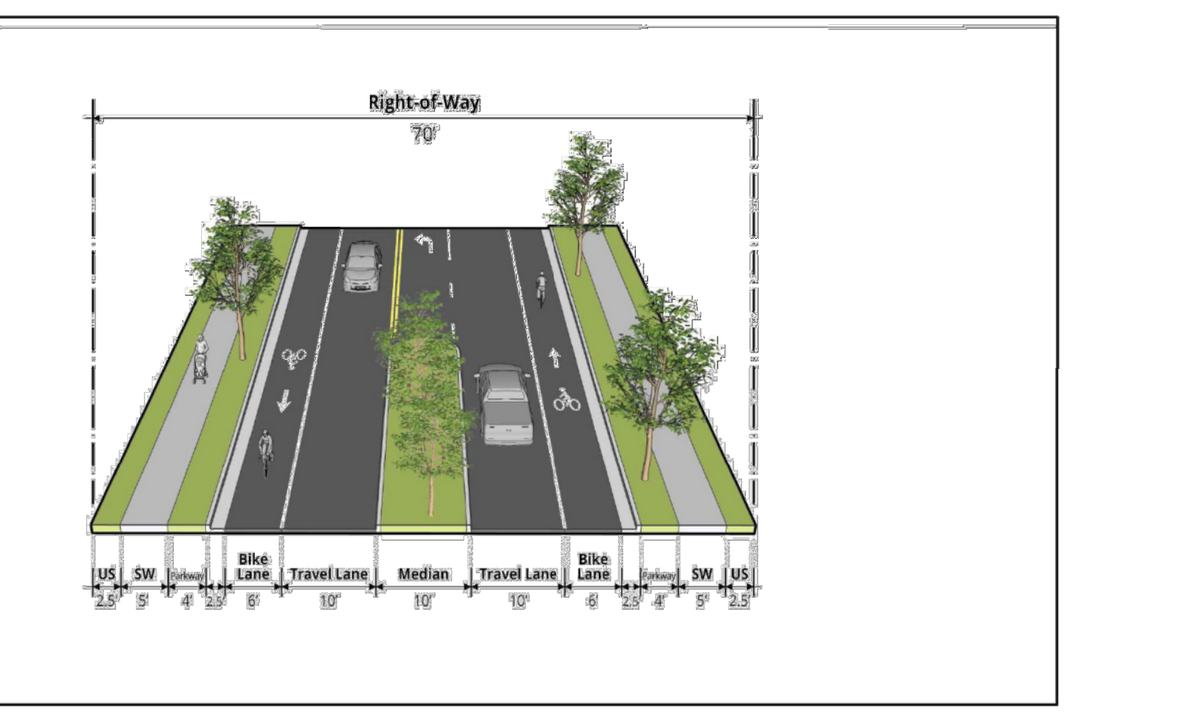
BITUMINOUS SURFACE COURSE: 1 1/2" S 9.5B
INTERMEDIATE COURSE: 2 1/2" I 19.0B
BASE COURSE: 8" ABC

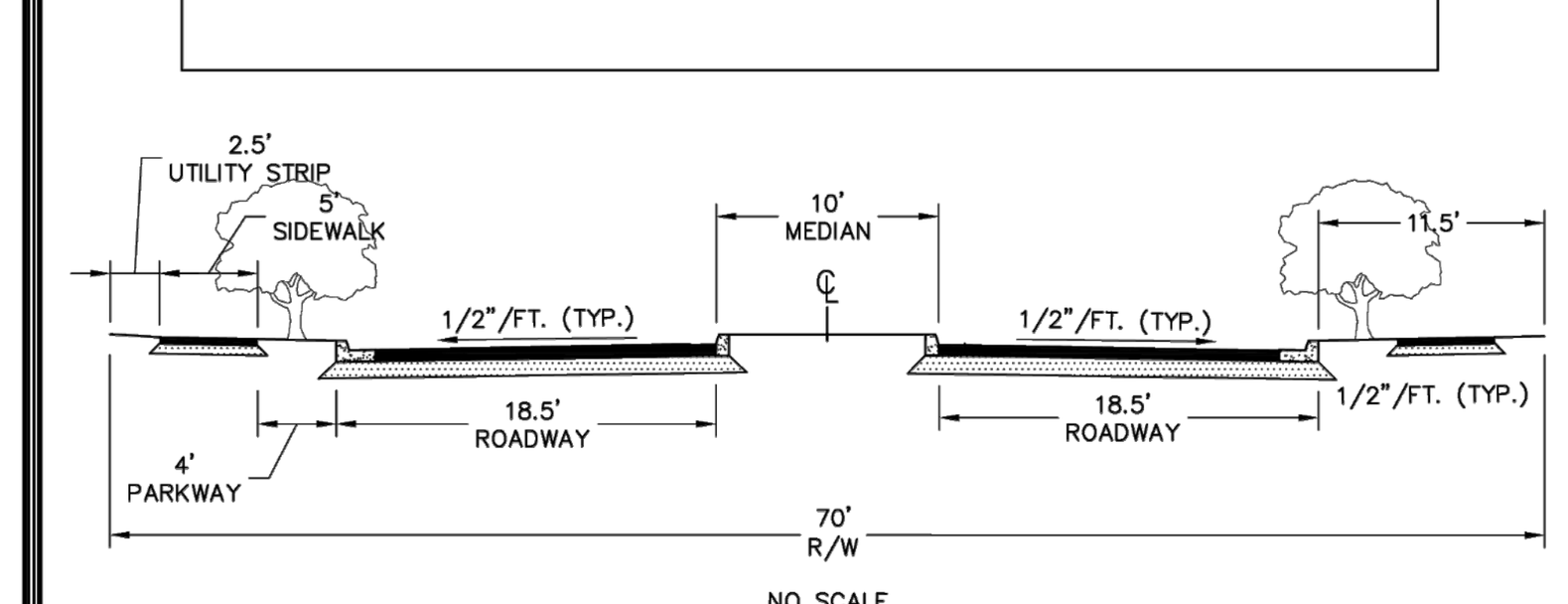
STREET FEATURES:

FLEXIBLE STREET DESIGN
COORDINATE STREET DESIGN ELEMENTS WITH TOWN STAFF
TRAVEL LANES OF 10 FT.
CURB & GUTTER
STRIPED PARALLEL PARKING - ONE SIDE ONLY
PARKWAY - 6 FT. ON ONE SIDE
SIDEWALK - 6 FT. ON PARKING SIDE; 5 FT. ON OPPOSING SIDE
REQUIRES 54 FT. OF RIGHT-OF-WAY
UTILITY LOCATION UNDERGROUND
AVERAGE SPEED 20 MPH
STREET TREES LOCATED IN PARKWAY
STREET TREES LOCATED ON PARKING SIDE OF STREET WILL BE PLACED IN CURB BULB OUT OR BACK OF SIDEWALK

REVISIONS	
DATE	DESCRIPTION

TOWN OF KNIGHTDALE STANDARD DETAILS	LOCAL STREET - ON STREET PARKING ONE SIDE ONLY	STD. NO. 3.02-2





MINIMUM PAVEMENT DESIGN:

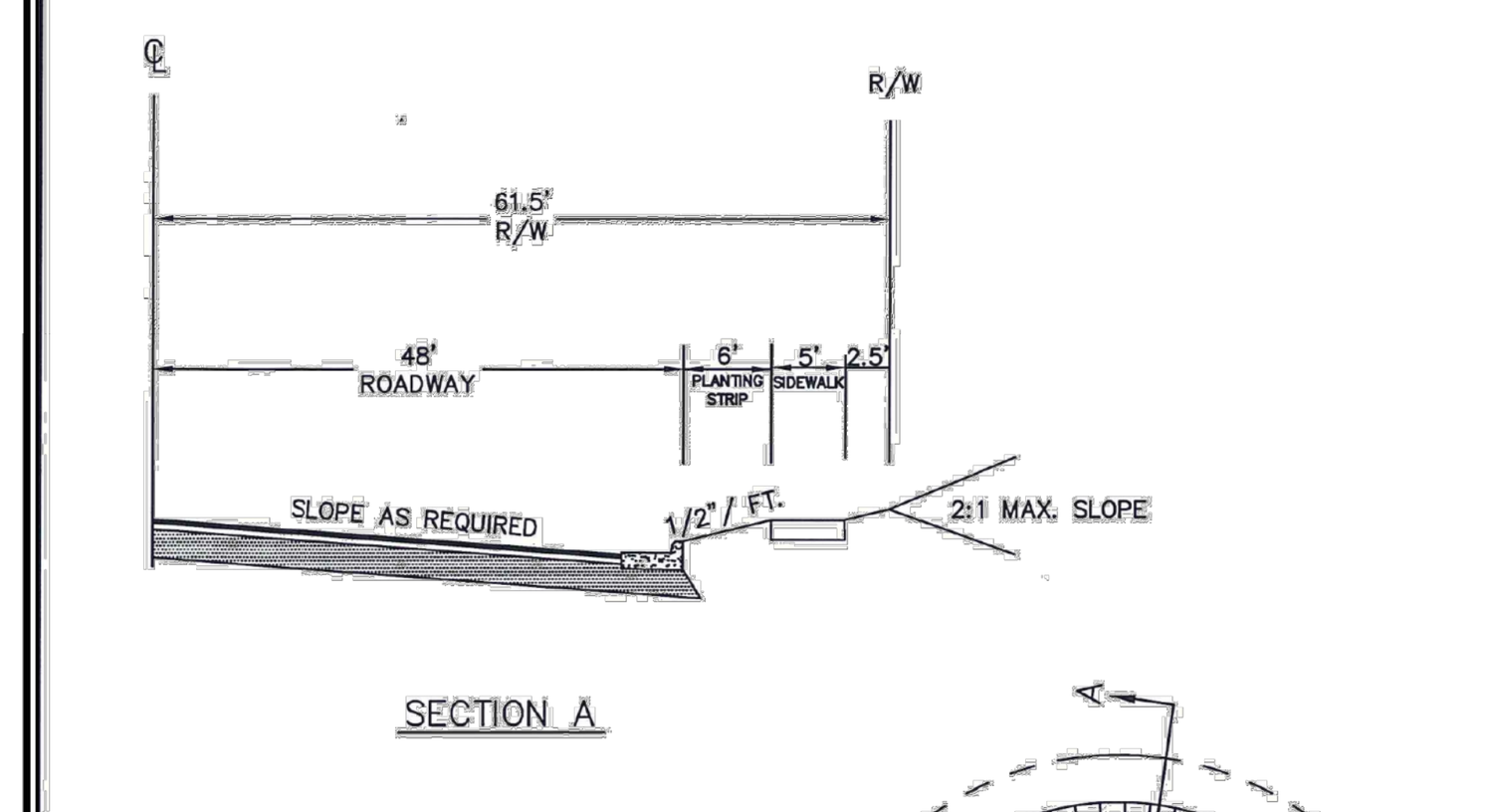
BITUMINOUS SURFACE COURSE: 1 1/2" S 9.5B
INTERMEDIATE COURSE: 2 1/2" I 19.0B
BASE COURSE: 8" ABC

STREET FEATURES:

MEDIAN OF 10 FT.
TRAVEL LANES OF 10 FT.
CURB & GUTTER
BIKE LANE - 6 FT. ON EACH SIDE
PARKWAY - 4 FT. ON EACH SIDE
SIDEWALKS - 5 FT. ON EACH SIDE
REQUIRES 70 FT. OF RIGHT-OF-WAY
UTILITY LOCATION UNDERGROUND OR ALLEY
AVERAGE SPEED 20-25 MPH
STREET TREES LOCATED IN PARKWAY
UTILITY LOCATION BEHIND CURB ON NCDOT FACILITIES
BICYCLE FACILITY PAVEMENT MARKINGS SHALL ADHERE TO MUTCD STANDARDS

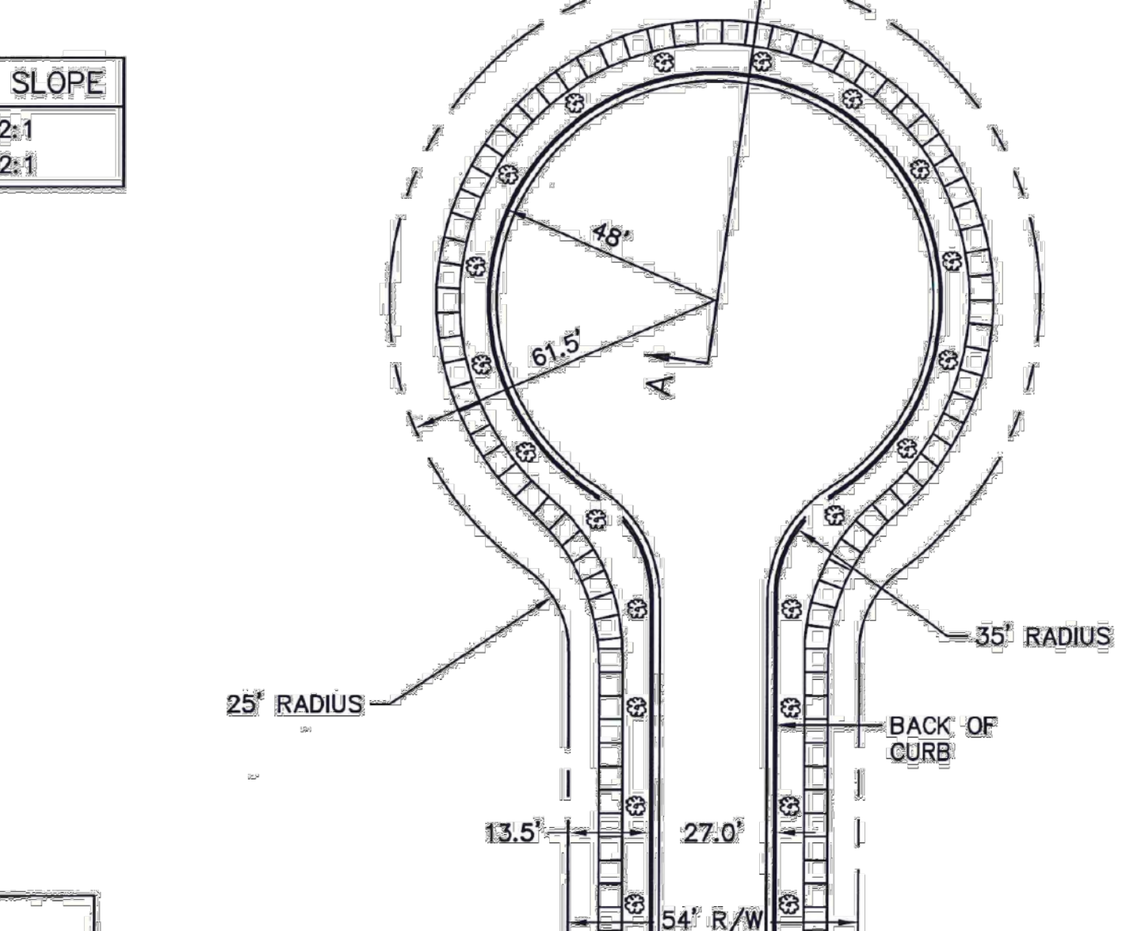
REVISIONS	
DATE	DESCRIPTION

TOWN OF KNIGHTDALE STANDARD DETAILS	MAIN STREET - 3 LANES BIKE LANES	STD. NO. 3.03



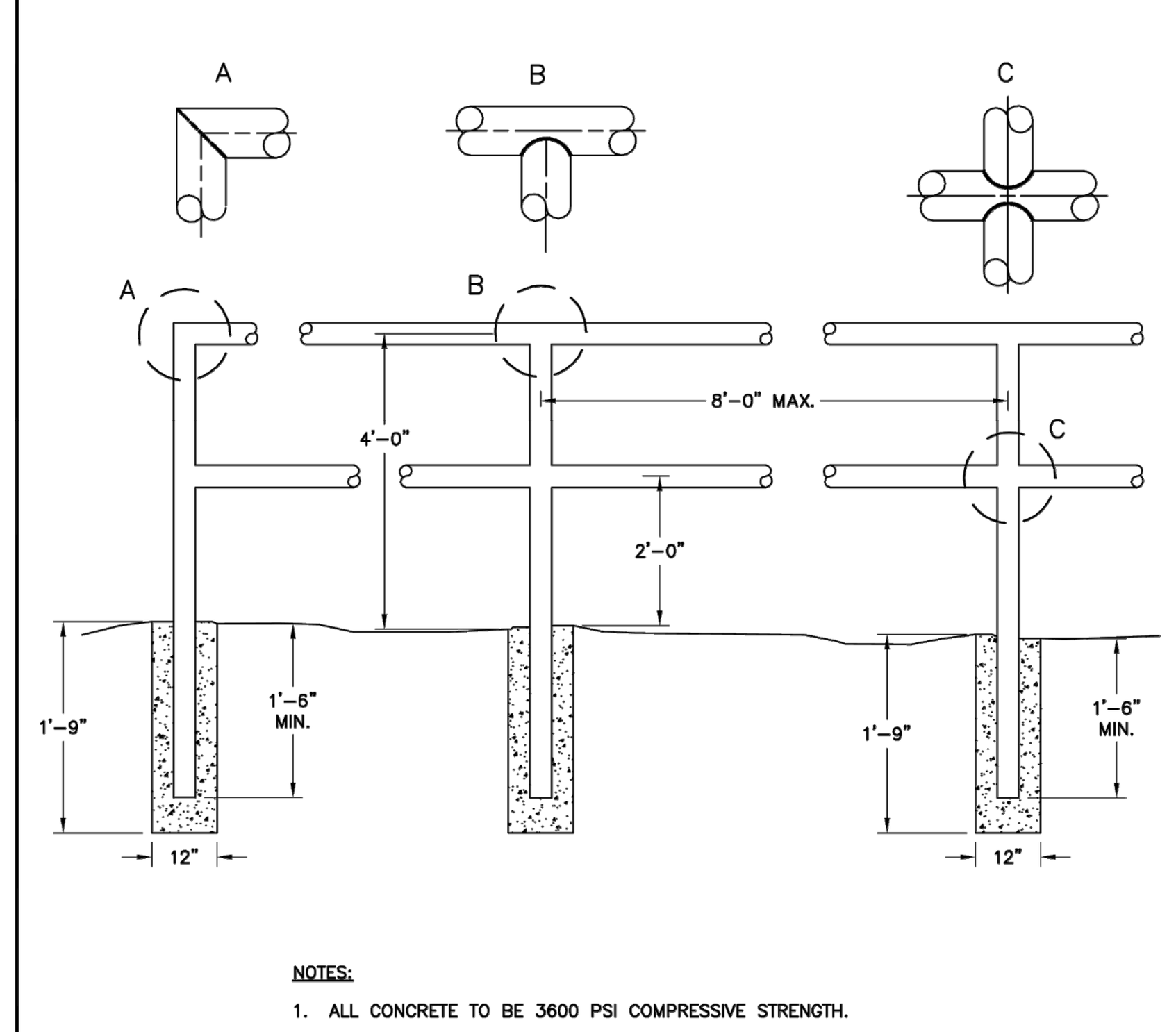
SECTION A

TERRAIN	MAX. SLOPE
LEVEL	2:1
ROLLING	2:1



REVISIONS	
DATE	DESCRIPTION

TOWN OF KNIGHTDALE STANDARD DETAILS	CUL DE SAC SECTION	STD. NO. 3.08



NOTES:

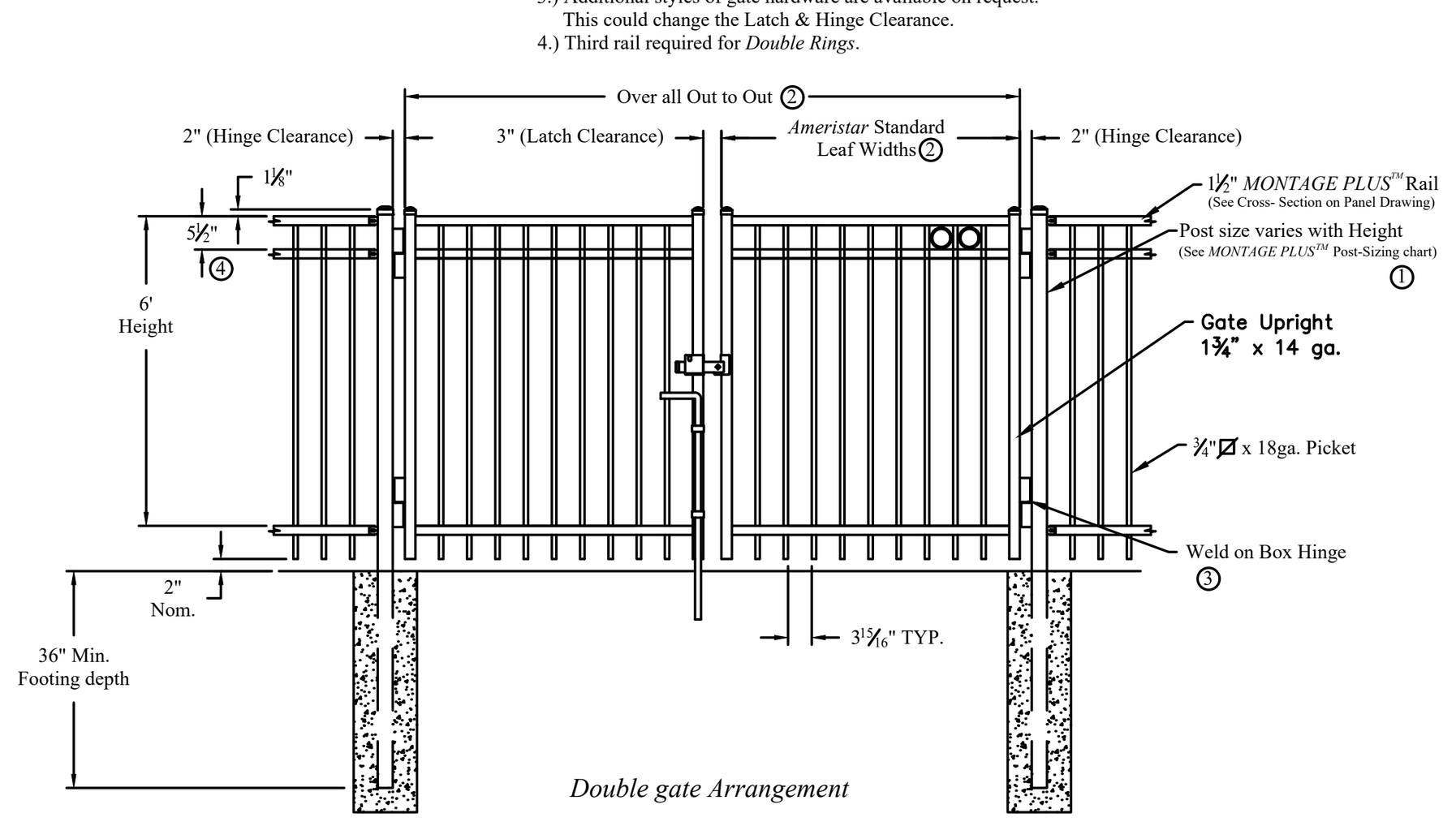
1. ALL CONCRETE TO BE 3600 PSI COMPRESSIVE STRENGTH.
2. TYPE OF PIPE TO BE USED IS 1-5/8" MAX. O.D. BLACK IRON, LOW CARBON PIPE.
3. ALL JOINTS TO HAVE A 1/2" FILLET WELD.
4. AFTER INSTALLATION, PAINT ASSEMBLY WITH BLACK ALL WEATHER ENAMEL.
5. TO BE USED AS REQUIRED BY THE TOWN ENGINEER.

REVISIONS	
DATE	DESCRIPTION

TOWN OF KNIGHTDALE STANDARD DETAILS	TYPICAL HANDRAIL	STD. NO. 4.13

Single gate Arrangement

NOTES:
1.) Post size depends on fence height, weight and wind loads. See *MONTAGE PLUS™* specifications for post sizing chart.
2.) See *Ameristar* gate table for standard out to outs. Custom gate openings available for special out to out/leaf widths.
3.) Additional styles of gate hardware are available on request. This could change the Latch & Hinge Clearance.
4.) Third rail required for *Double Rings*.

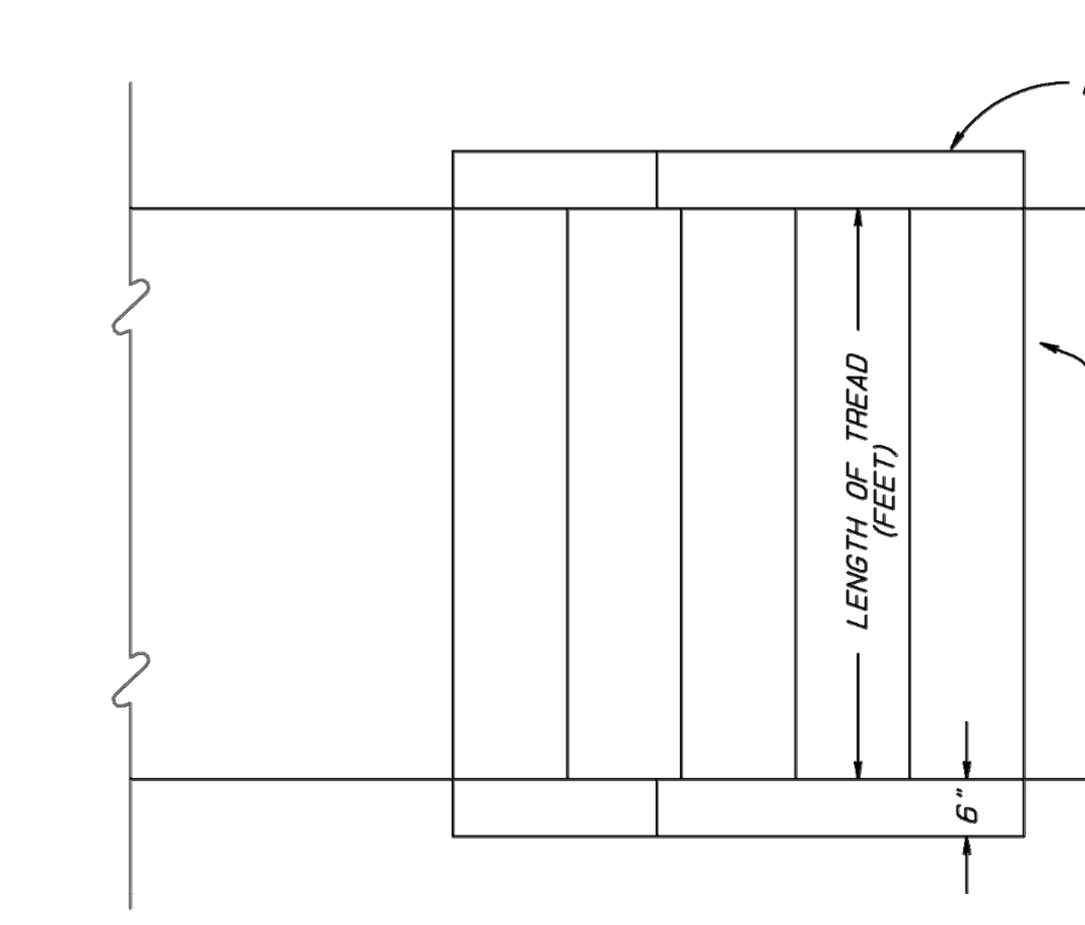


Double gate Arrangement

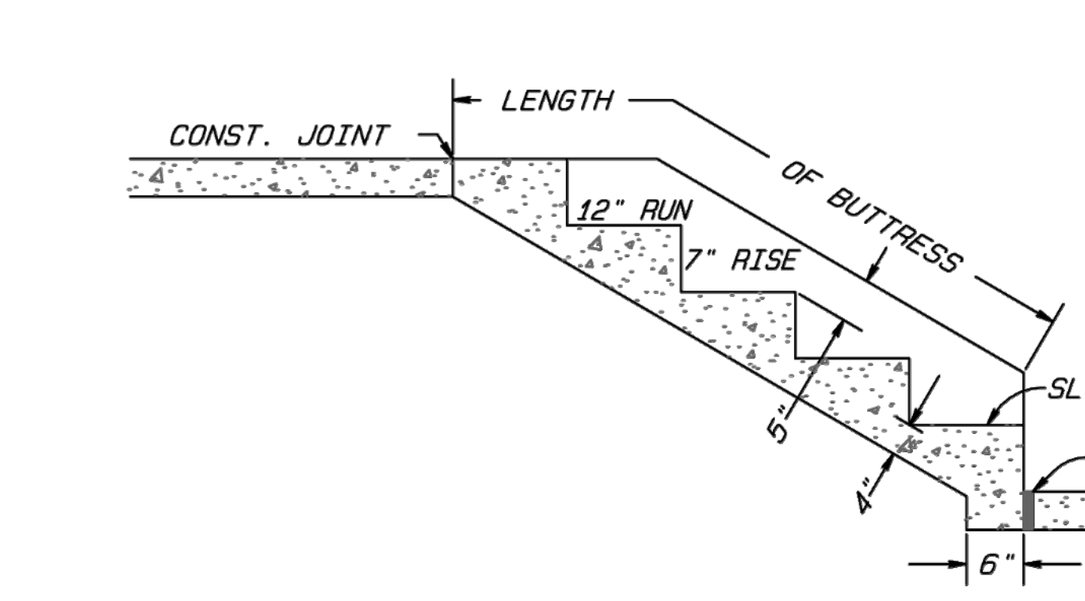
Values shown are nominal and not to be used for installation purposes. See product specification for installation requirements.

ALUMIUM FENCE DETAIL (BLACK)

NTS



PLAN



SECTION

NOTES:

ONE & TWO RISER STEPS WILL NOT HAVE A BUTTRESS WALL UNLESS DIRECTED BY ENGINEER.

TREAD & RISER DIMENSIONS MAY VARY SLIGHTLY TO ACCOMODATE FIELD CONDITIONS.

CONCRETE SHALL BE CLASS A, 3000 PSI AIR ENTRAINED.

STEPS AND BUTTRESS WALLS WILL BE MEASURED FOR PAYMENT AS FOLLOWS:

1) LENGTH OF TREAD MULTIPLIED BY NUMBER OF RISERS EQUALS LINEAR FEET OF CONCRETE STEP TREADS.

2) LENGTH OF EACH BUTTRESS WALL MEASURED AS SHOWN ABOVE EQUALS LINEAR FEET OF CONCRETE BUTRESS WALL.

STANDARD CONCRETE STEPS AND BUTTRESS WALLS	STD. NO.	REV.
	417	

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: Samuel A. MacDonald DATE: ____________
TOWN ENGINEER

Digitally signed by Samuel A. MacDonald
DN: C=US, E=smacdonald@amtengineering.com, O="A. Morton Thomas & Associates, Inc.", CN=Samuel A. MacDonald
Reason: I am approving this document
Date: 2026.04.16 10:12:43-04'00'

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

BY: Gideon Smith DATE: ____________
LAND USE ADMINISTRATOR

Digitally signed by Gideon Smith
DN: C=US, E=gideon.smith@knightdalenc.gov, O=Town of Knightdale, OU=Development Services, CN=Gideon Smith
Reason: I am approving this document
Date: 2026.05.19 10:13:55-04'00'

NORTH CAROLINA PROFESSIONAL SEAL 051879 ENGINEER TYLER JEFFREY CROSS

3/31/2026

THIS DRAWING PREPARED AT THE **RALEIGH OFFICE**
5410 Trinity Road, Suite 102 | Raleigh, NC 27607
TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION

DATE

DATE	03/31/2026
DRAWN BY	331
DESIGNED BY	331
CHECKED BY	T. CROSS
SCALE	

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS

KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

SITE DETAILS - SHEET 2 OF 3

JOB NO.	51557
SHEET NO.	C12.1

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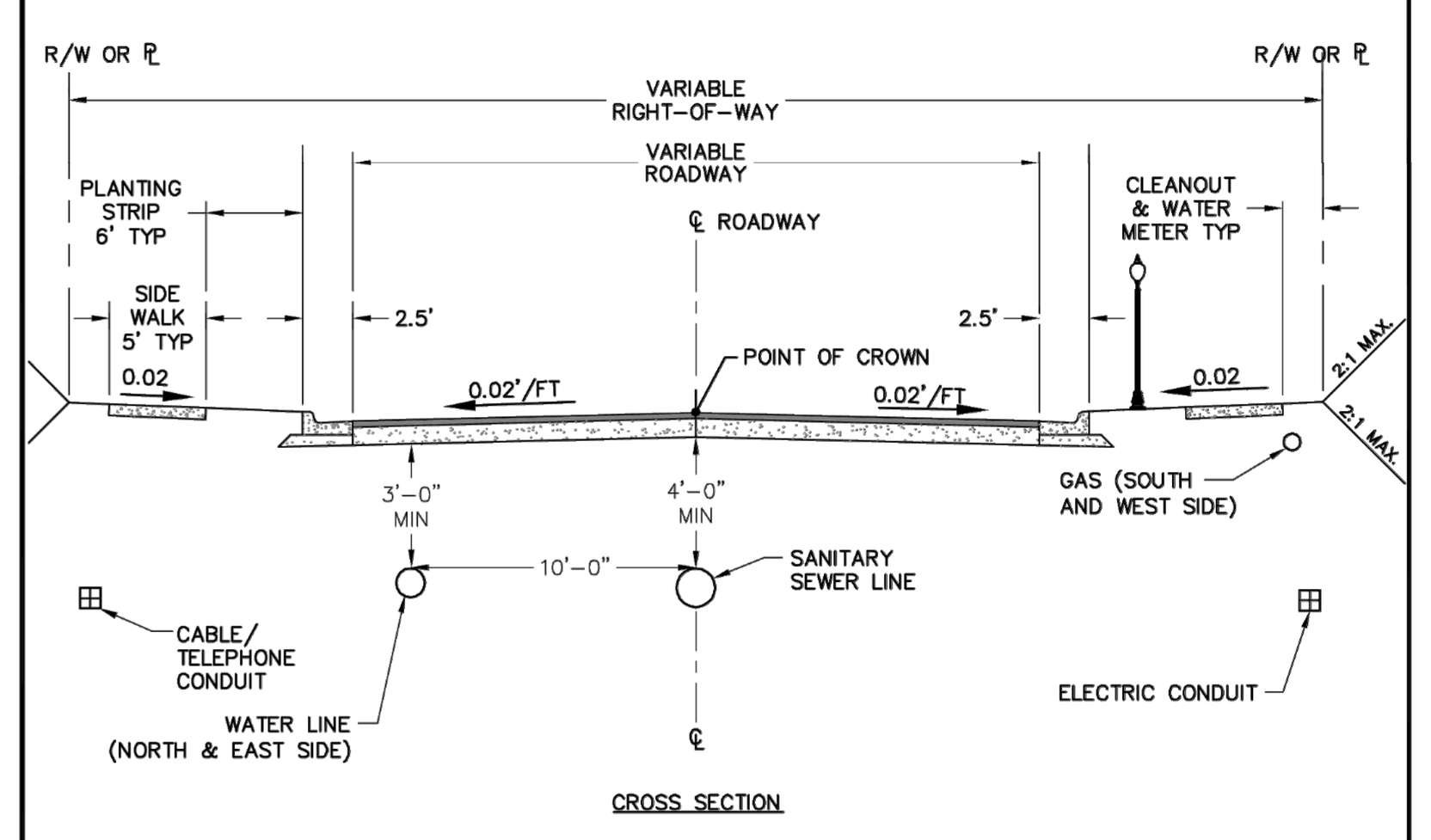
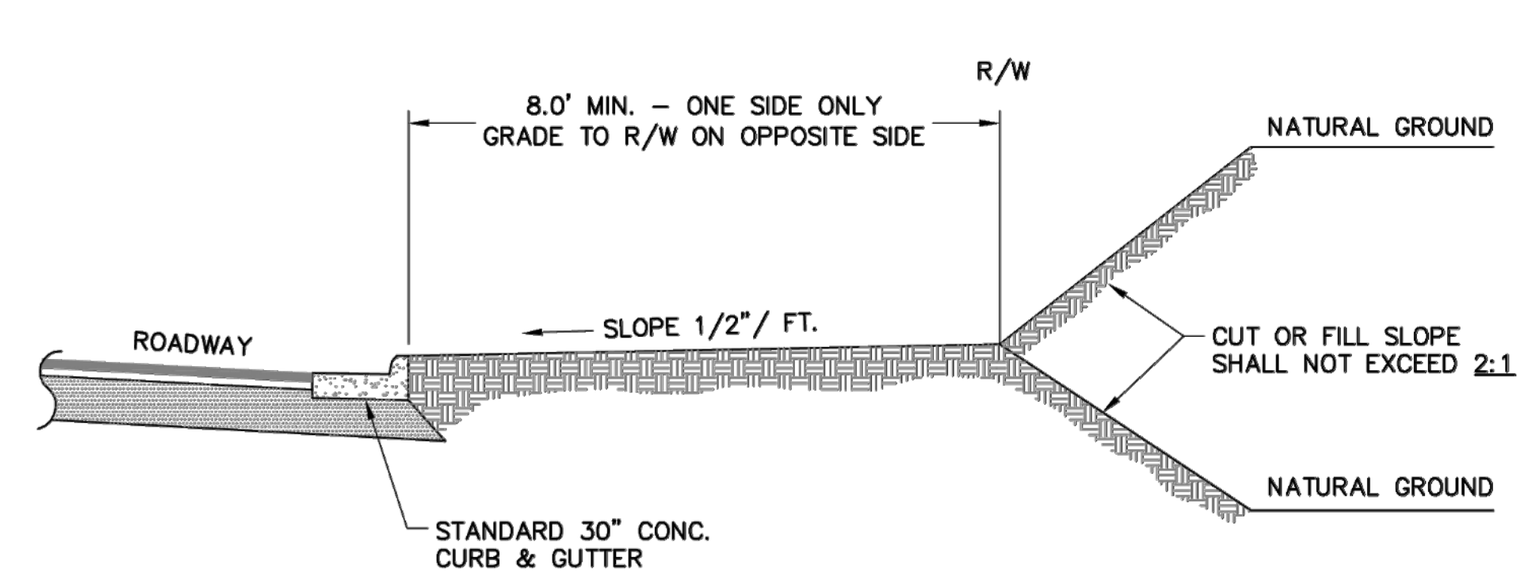


NOTES:

1. THERE SHALL BE AN 18-INCH VERTICAL SEPARATION BETWEEN WATER AND SEWER LINES.
2. WATER AND/OR SANITARY SEWER LINES SHALL BE A MINIMUM OF TWO (2) FEET FROM THE EDGE OF THE CURB AND GUTTER.
3. ENCROACHMENT ONTO TOWN MAINTAINED RIGHT OF WAY SHALL FOLLOW CONDITIONS OF THE APPLICABLE ENCROACHMENT AGREEMENT OR FRANCHISE AGREEMENT.
4. STREET LAMPS SHALL BE PLACED SUCH THAT THERE ARE NO CONFLICTS WITH STREET TREES.

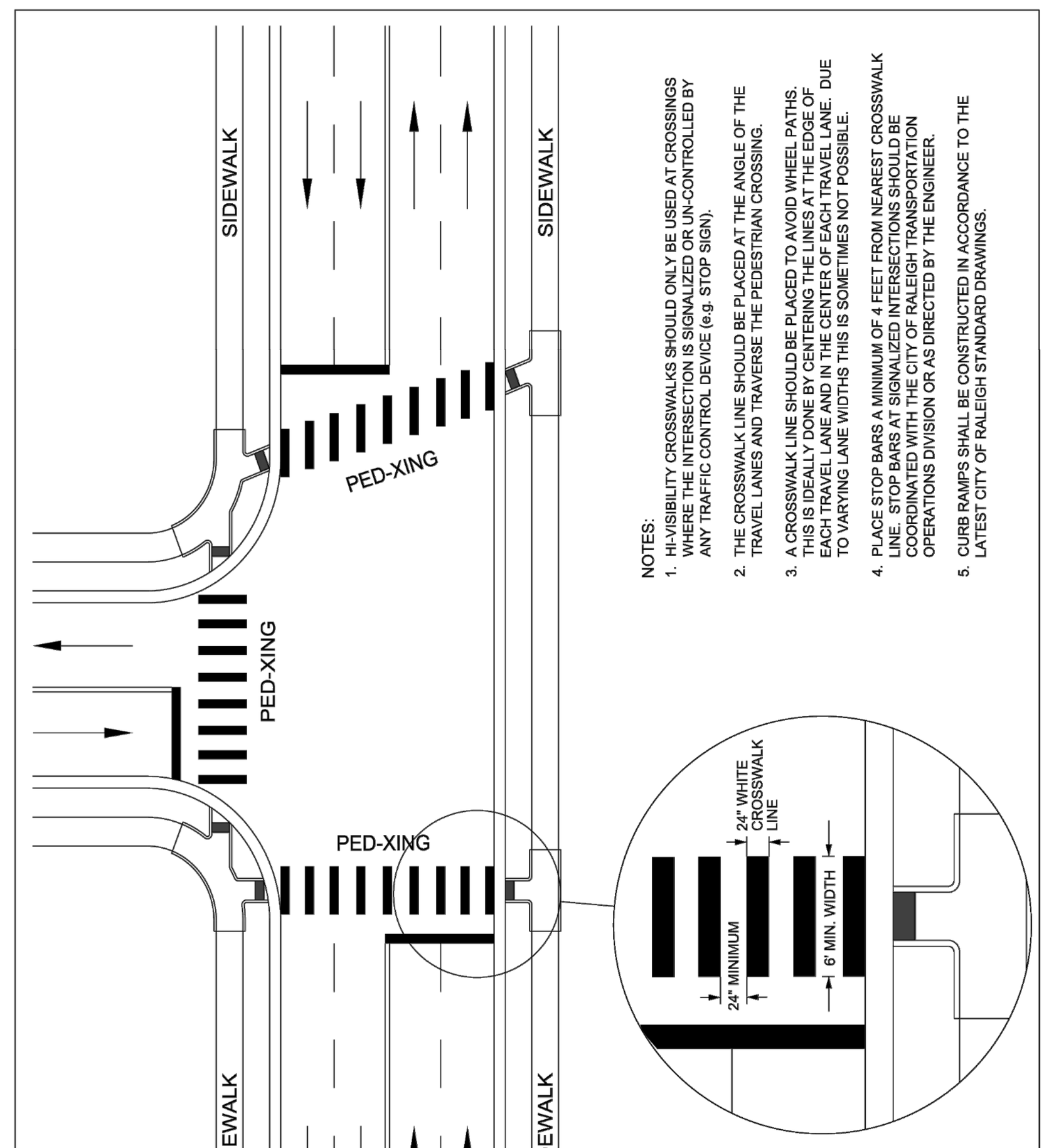
REVISIONS	
DATE	DESCRIPTION

TOWN OF KNIGHTDALE STANDARD DETAILS	STANDARD UTILITY LOCATION IN STREET	STD. NO. 3.13



REVISIONS	
DATE	DESCRIPTION

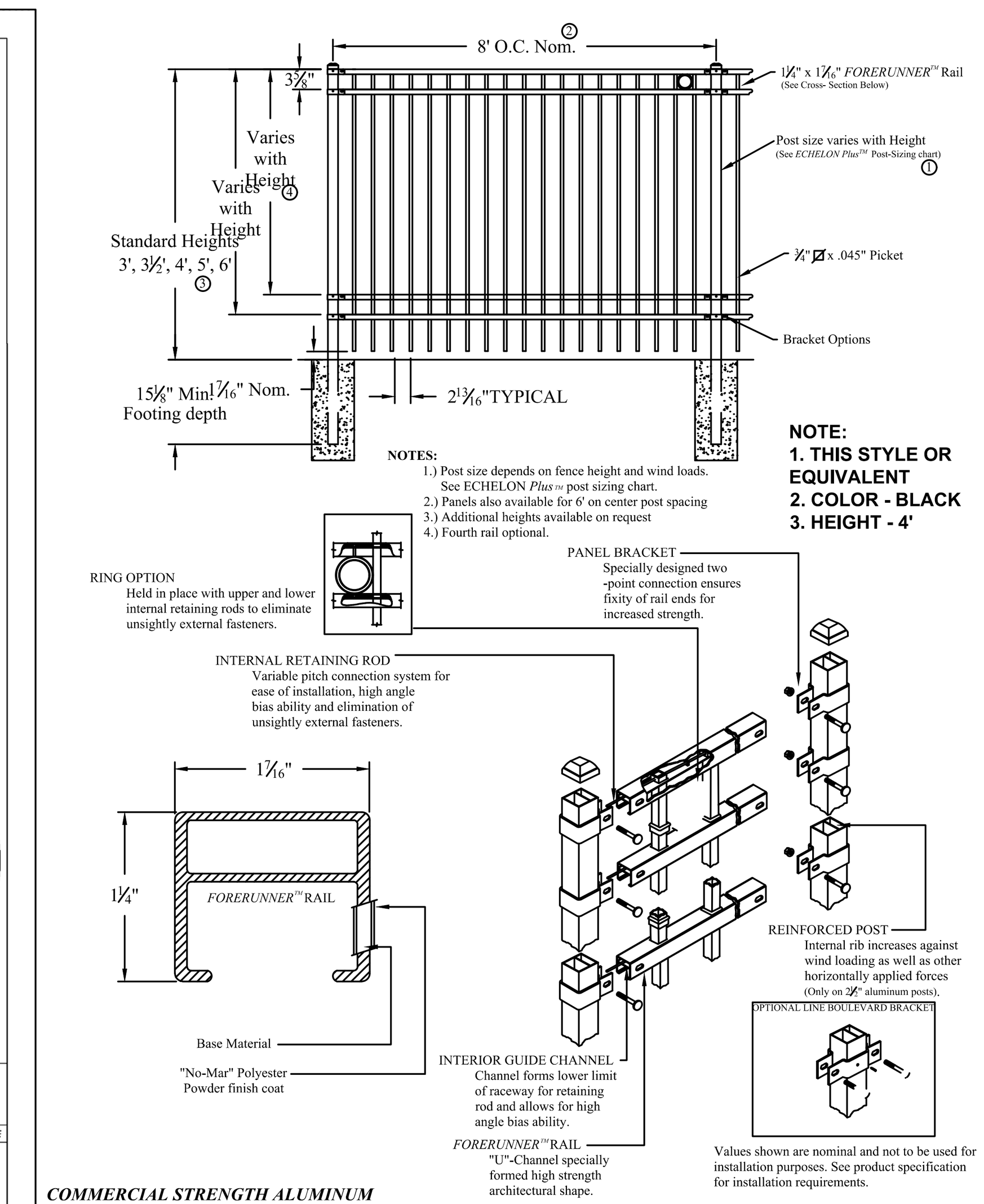
TOWN OF KNIGHTDALE STANDARD DETAILS	STANDARD SHOULDER SECTION WITHOUT SIDEWALK	STD. NO. 3.09



NOTES:

1. HI-VISIBILITY CROSSWALKS SHOULD ONLY BE USED AT CROSSINGS WHERE THE INTERSECTION IS SIGNALIZED OR UN-CONTROLLED BY ANY TRAFFIC CONTROL DEVICE (e.g. STOP SIGN).
2. THE CROSSWALK LINE SHOULD BE PLACED AT THE ANGLE OF THE TRAVEL LANES AND TRAVERSE THE PEDESTRIAN CROSSING.
3. A CROSSWALK LINE SHOULD BE PLACED TO AVOID WHEEL PATHS. THIS IS IDEALLY DONE BY CENTERING THE LINES AT THE EDGE OF EACH TRAVEL LANE AND IN THE CENTER OF EACH TRAVEL LANE. DUE TO VARYING LANE WIDTHS THIS IS SOMETIMES NOT POSSIBLE.
4. PLACE STOP BARS A MINIMUM OF 4 FEET FROM NEAREST CROSSWALK LINE. STOP BARS AT SIGNALIZED INTERSECTIONS SHOULD BE COORDINATED WITH THE CITY OF RALEIGH TRANSPORTATION OPERATIONS DIVISION OR AS DIRECTED BY THE ENGINEER.
5. CURB RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE TO THE LATEST CITY OF RALEIGH STANDARD DRAWINGS.

CITY OF RALEIGH
STANDARD DETAIL
REVISIONS | DATE: 8/2020 | NOT TO SCALE
PAVEMENT MARKINGS
HI-VISIBILITY
PEDESTRIAN CROSSWALK
T-20.05

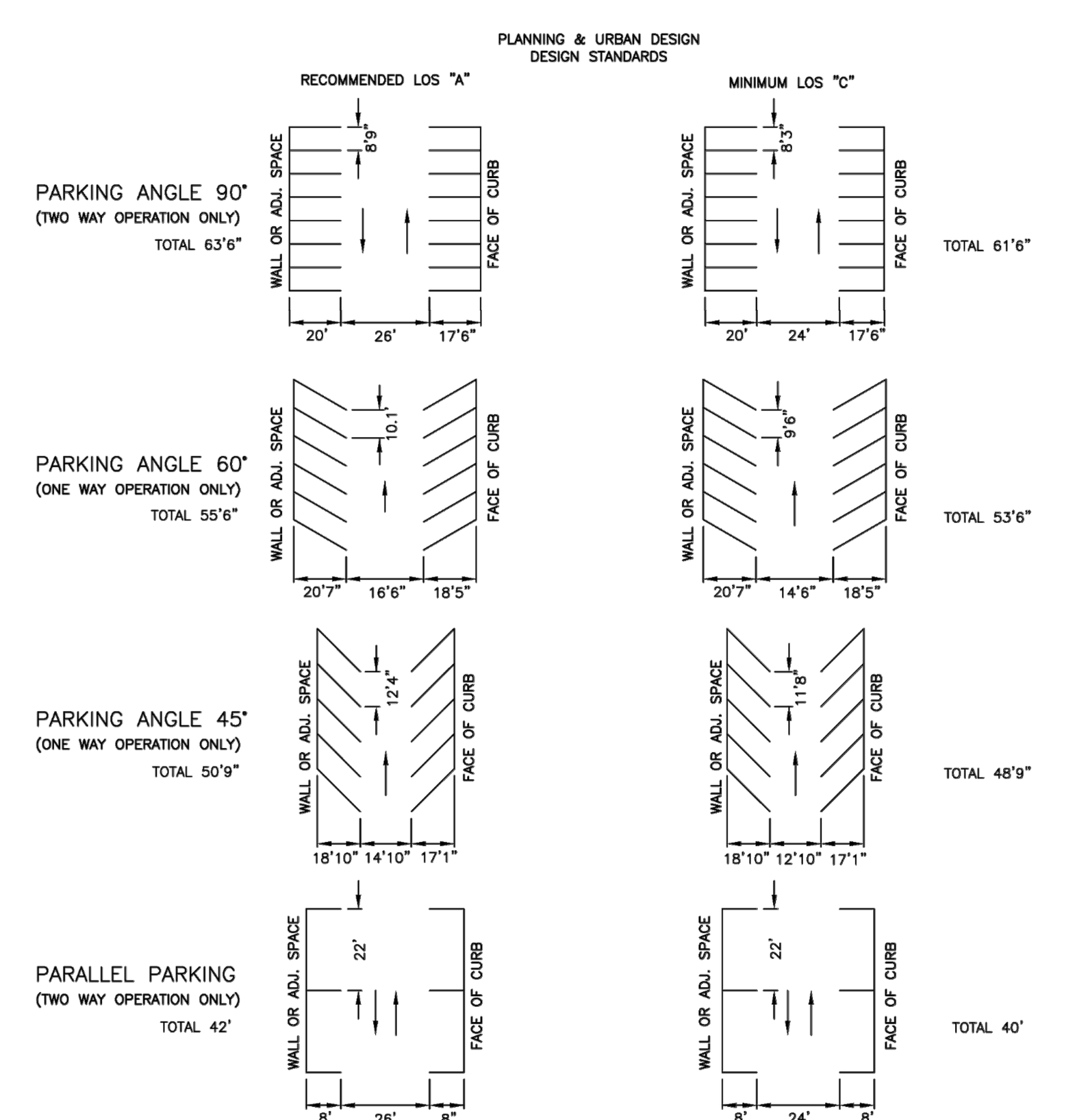


NOTES:
1.) Post size depends on fence height and wind loads. See ECHELON Plus™ post sizing chart.
2.) Panels also available for 6' on center post spacing
3.) Additional heights available on request
4.) Fourth rail optional.

NOTE:
1. THIS STYLE OR EQUIVALENT
2. COLOR - BLACK
3. HEIGHT - 4'

COMMERCIAL STRENGTH ALUMINUM

Title: ECHELON PLUS MAJESTIC 3/4-RAIL W/RING OPTION		
DR:	SH. 1of 1	SCALE: DO NOT SCALE
CK:	Date	REV: e



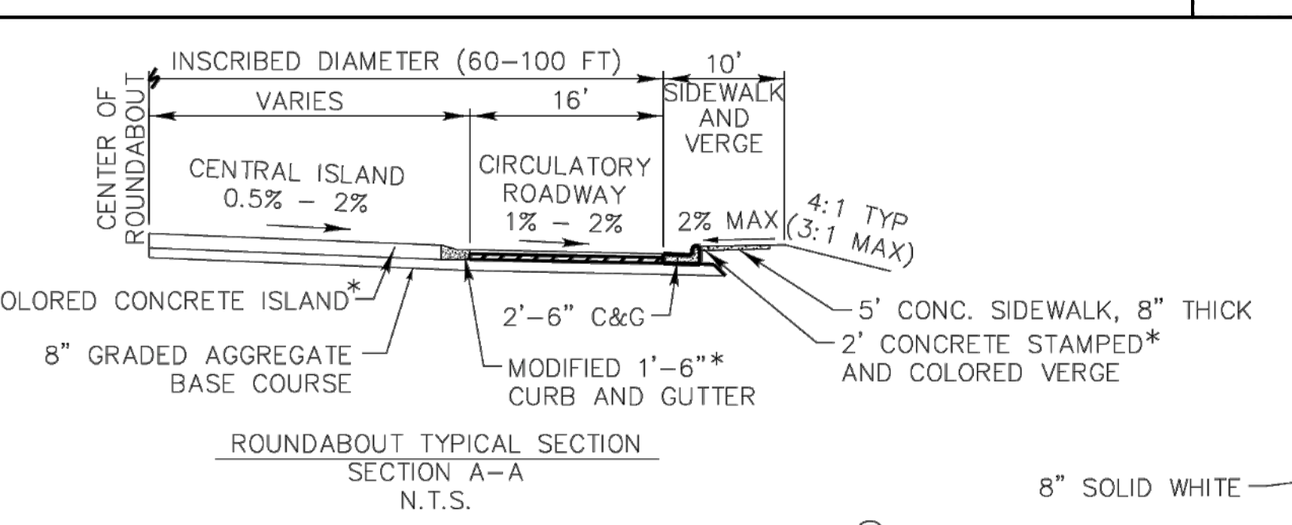
NOTE:

1. FOR ACCESSIBLE PARKING STANDARDS SEE TOWN UNIFIED DEVELOPMENT ORDINANCE.
2. PAVEMENT MARKINGS SHALL BE 4" WHITE PAINT TO TOWN STANDARDS.

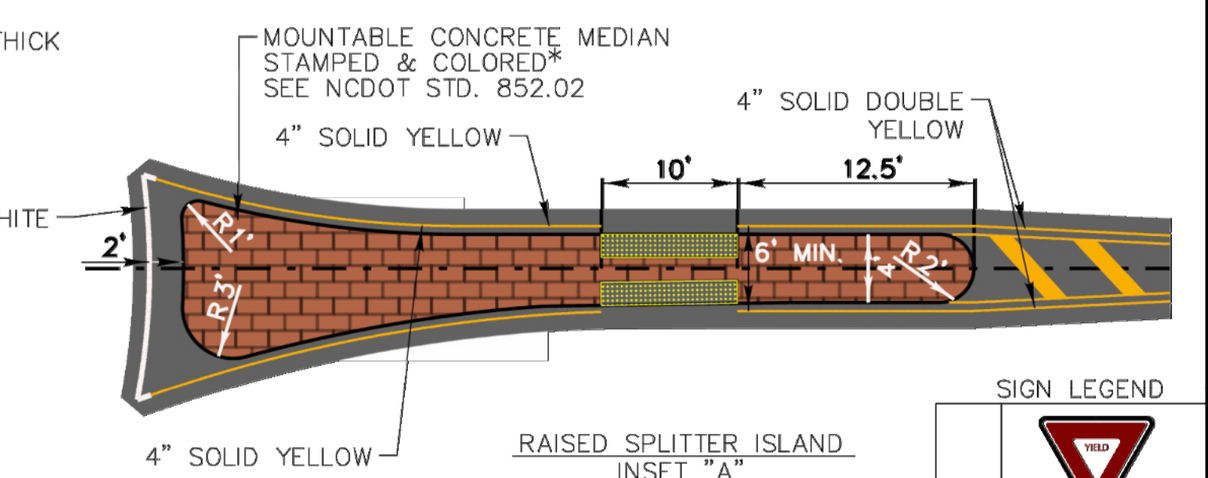
REVISIONS	
DATE	DESCRIPTION

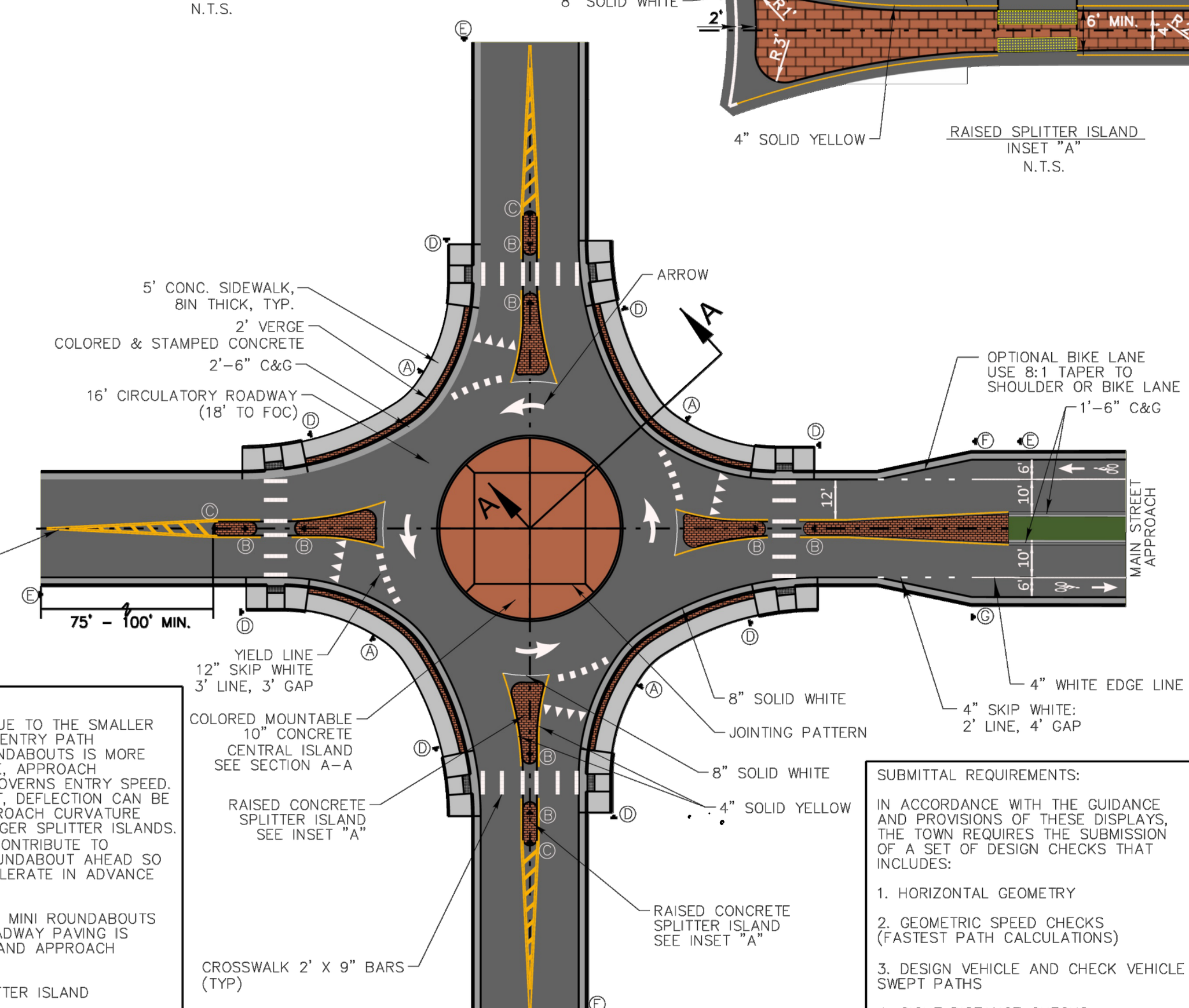
TOWN OF KNIGHTDALE STANDARD DETAILS	PARKING STANDARDS	STD. NO. 3.20

TOWN OF KNIGHTDALE STANDARD DETAILS | REVISIONS: DATE / DESCRIPTION
PHYSICAL CHARACTERISTICS MINI-ROUNDABOUT
STD. NO. 3.33 | 4 of 8



* NOTE: SEE STANDARD DETAIL 3.33, SHEET 8 OF 8 FOR COLORED AND STAMPED CONCRETE SPECIFICATIONS AND MODIFIED 1'-6" CURB AND GUTTER DETAILS





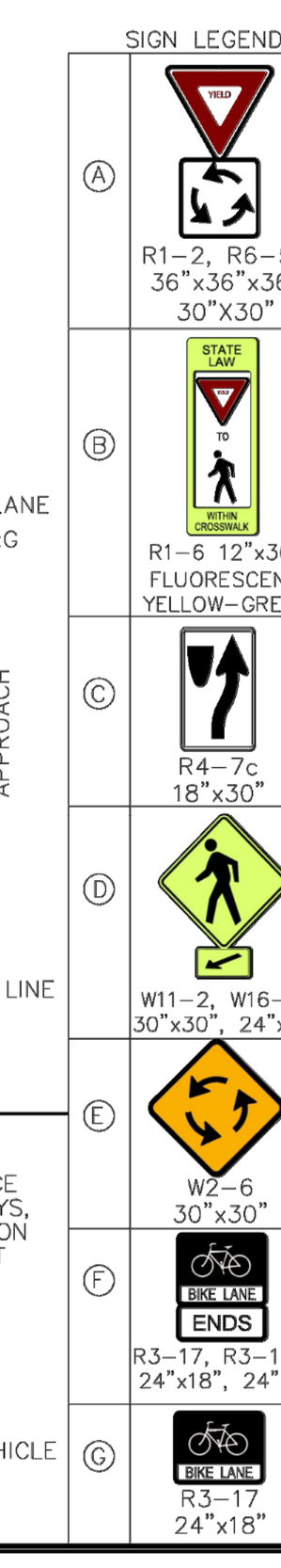
GENERAL NOTES

1. MINI-ROUNDABOUTS – DUE TO THE SMALLER CIRCLE SIZE, GEOMETRIC ENTRY PATH DEFLECTION AT MINI-ROUNDABOUTS IS MORE CHALLENGING, THEREFORE, APPROACH CURVATURE TYPICALLY GOVERNS ENTRY SPEED. ALONG WITH LEFT OFFSET, DEFLECTION CAN BE ACHIEVED THROUGH APPROACH CURVATURE (CHICANES) AND/OR LONGER SPLITTER ISLANDS. THESE FEATURES ALSO CONTRIBUTE TO RECOGNITION OF THE ROUNDABOUT AHEAD SO THAT DRIVERS MAY DECELERATE IN ADVANCE OF THE ENTRY POINT.
2. USE THIS STANDARD FOR MINI ROUNDABOUTS WHERE CIRCULATORY ROADWAY PAVING IS ASPHALT OR CONCRETE AND APPROACH SPEEDS ARE <35 MPH.
3. SEE INSET "A" FOR SPLITTER ISLAND DIMENSIONS

SUBMITTAL REQUIREMENTS:

IN ACCORDANCE WITH THE GUIDANCE AND PROVISIONS OF THESE DISPLAYS, THE TOWN REQUIRES THE SUBMISSION OF A SET OF DESIGN CHECKS THAT INCLUDES:

1. HORIZONTAL GEOMETRY
2. GEOMETRIC SPEED CHECKS (FASTEST PATH CALCULATIONS)
3. DESIGN VEHICLE AND CHECK VEHICLE SWEPT PATHS
4. SIGHT DISTANCE CHECKS



TOWN OF KNIGHTDALE STANDARD DETAILS | REVISIONS: DATE / DESCRIPTION
TRUCK MOVEMENTS SINGLE-LANE ROUNDABOUT AND MINI-ROUNDABOUT
STD. NO. 3.33 | 5 of 8

TURNING WIDTH REQUIRED FOR SINGLE-LANE ROUNDABOUTS ('D' IN FT)

INSCRIBED CIRCLE DIAMETER	DESIGN VEHICLES				
	D1 (EOP)			D2 (FOC)	
	SU-30	BUS-40	FIRE TRUCK	WB-62	WB-62FL
110	14*	15	14	32	39
120	14*	15	14	30	36
130	14*	14	14*	27	33
140	14*	14	14*	26	30

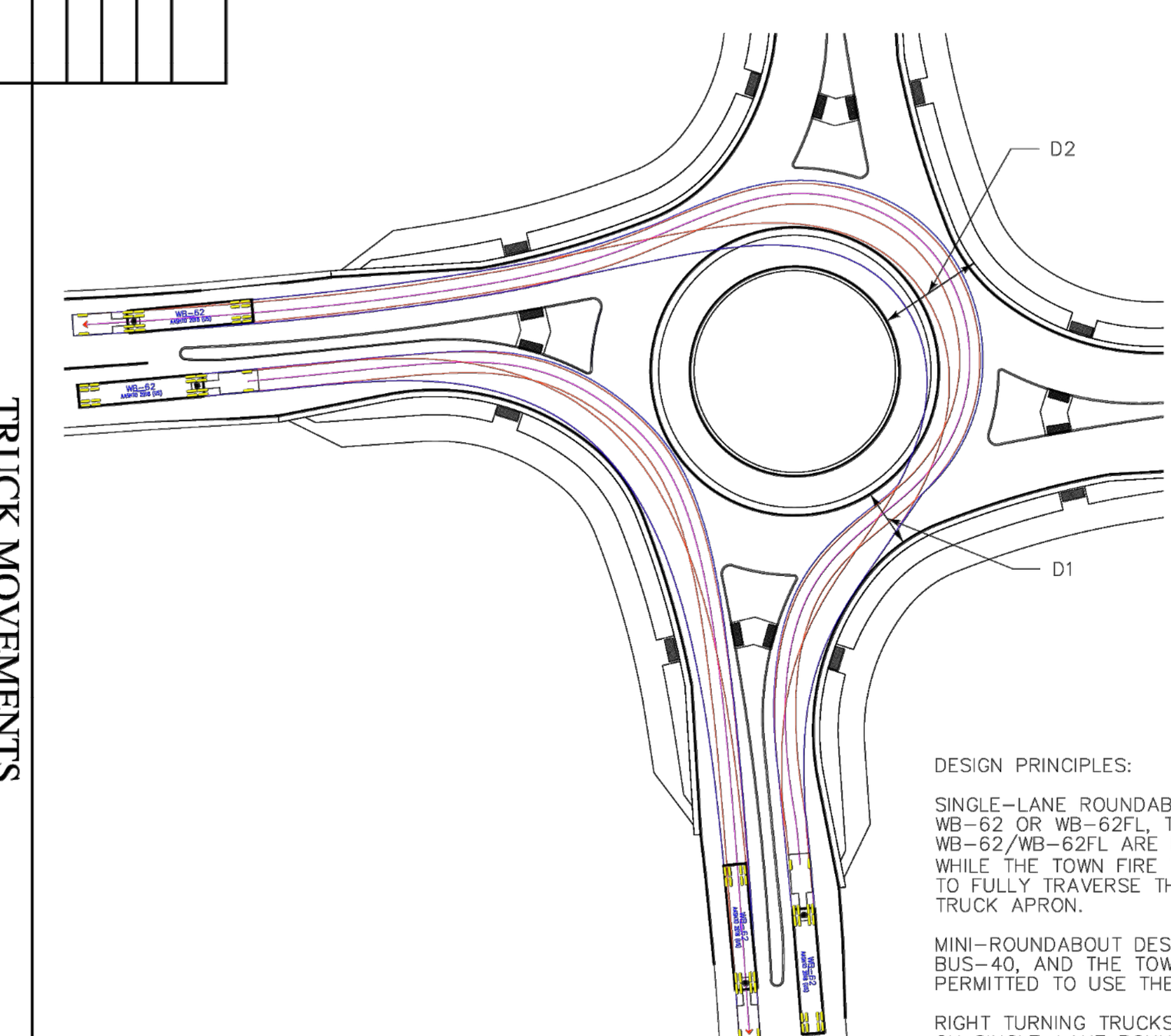
NOTE: THE VALUES PROVIDED ABOVE ARE FOR GENERAL GUIDANCE.
*14 FT MINIMUM EOP/18 FT FOC

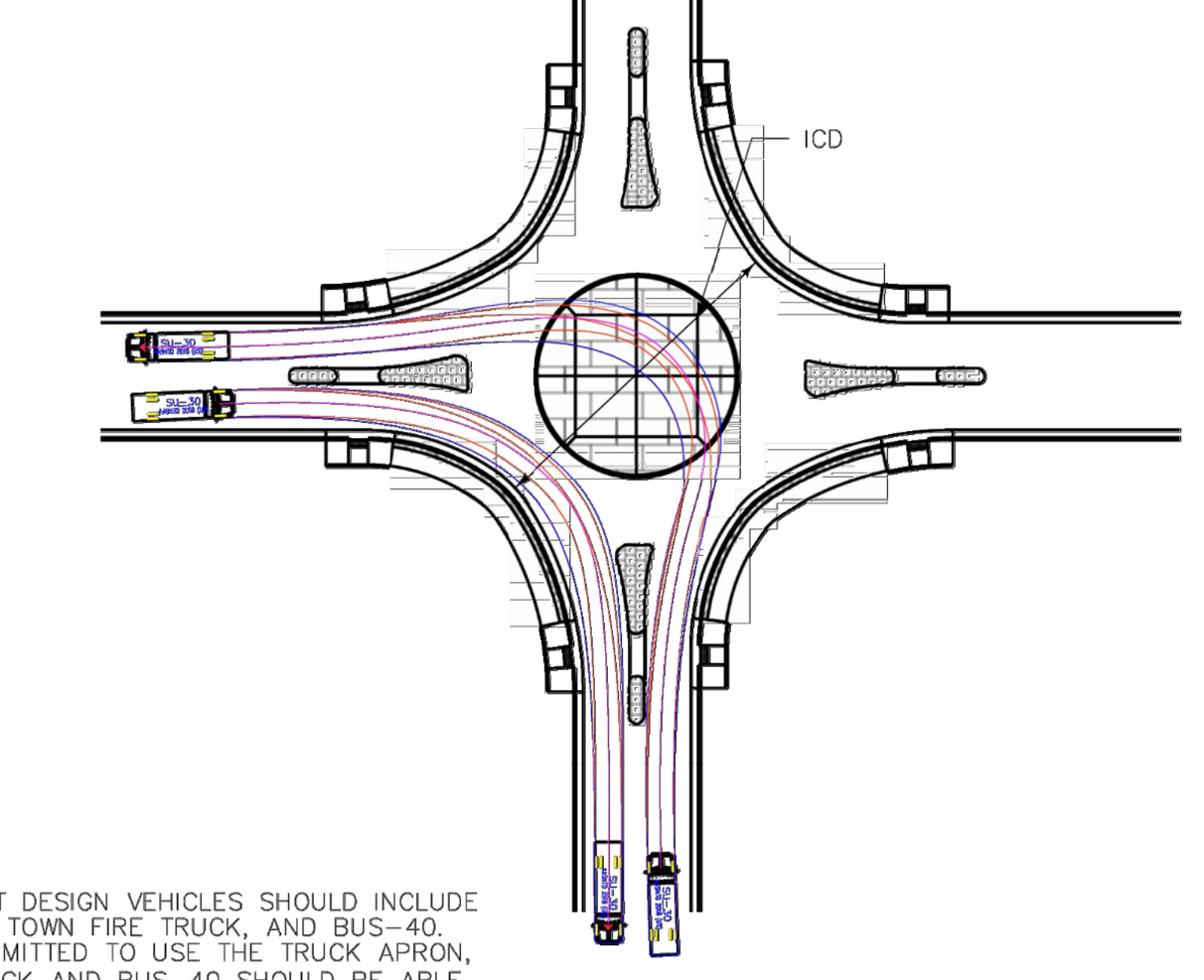
MIN. RIGHT TURN RADIUS	
SU-30	30 FT
BUS-40	25 FT
FIRE TRUCK	16 FT
WB-62	DETERMINED BY AUTOTURN
WB-62FL	DETERMINED BY AUTOTURN

MINI-ROUNDABOUT ICD REQUIREMENTS FOR VEHICLE U-TURNS AND LEFT TURNS (LT)

INSCRIBED CIRCLE DIAMETER	DESIGN VEHICLES			
	SU-30	BUS-40	FIRE TRUCK	WB-62
60	LT-ONLY	NO	LT-ONLY	NO
65	LT-ONLY	LT-ONLY	LT-ONLY	NO
70	LT-ONLY	LT-ONLY	YES	NO
80	LT-ONLY	LT-ONLY	YES	LT-ONLY
90	YES	YES	YES	YES
100	YES	YES	YES	YES

TABLE NOTE: SPLITTER ISLANDS SHOULD BE MOUNTABLE OR TRIMMED AS NEEDED BASED ON SWEPT PATHS





DESIGN PRINCIPLES:

SINGLE-LANE ROUNDABOUT DESIGN VEHICLES SHOULD INCLUDE WB-62 OR WB-62FL, THE TOWN FIRE TRUCK, AND BUS-40. WB-62/WB-62FL ARE PERMITTED TO USE THE TRUCK APRON, WHILE THE TOWN FIRE TRUCK AND BUS-40 SHOULD BE ABLE TO FULLY TRAVERSE THE ROUNDABOUT WITHOUT USING THE TRUCK APRON.

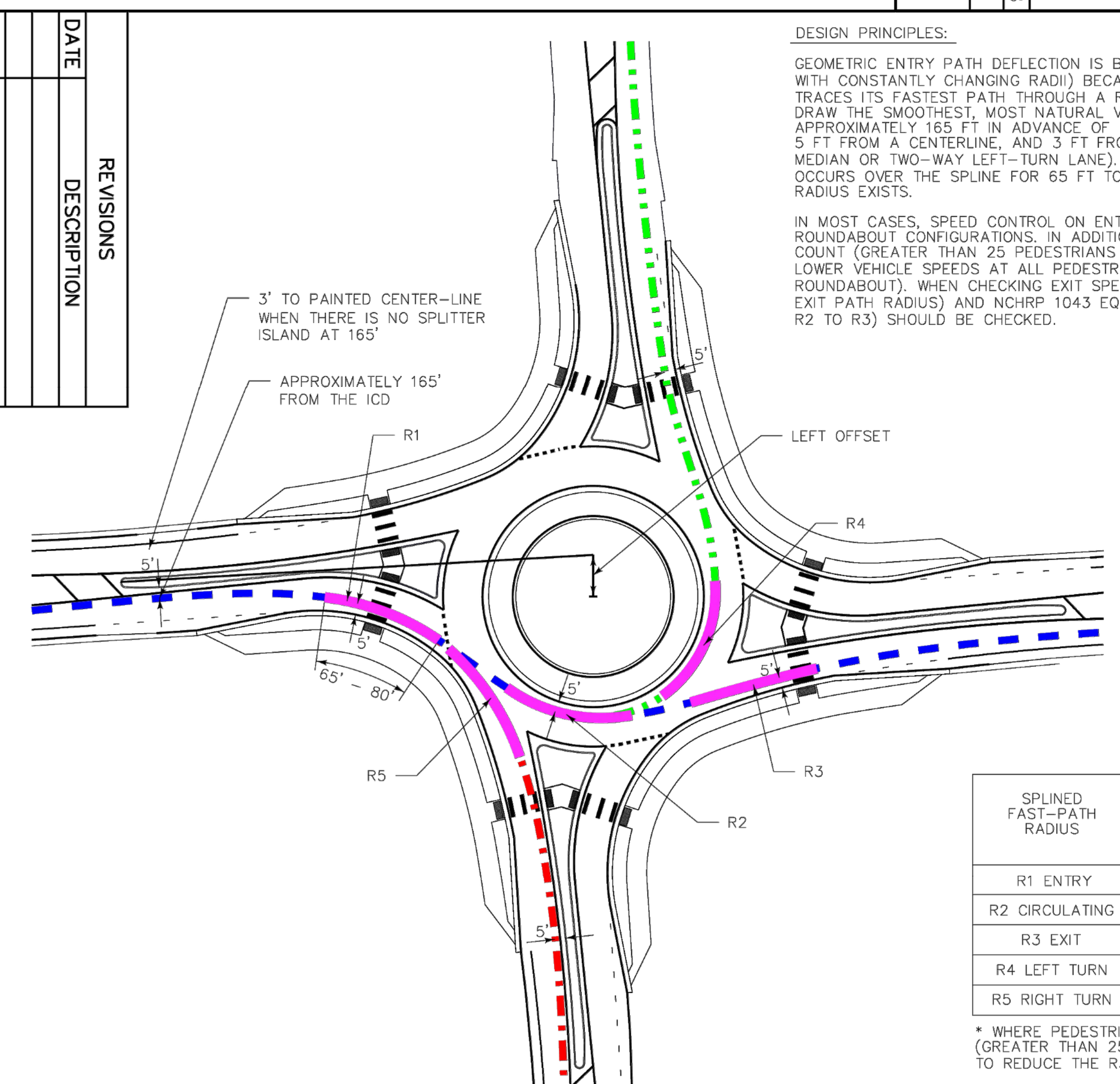
MINI-ROUNDABOUT DESIGN VEHICLES SHOULD INCLUDE SU-30, BUS-40, AND THE TOWN FIRE TRUCK, ALL OF WHICH ARE PERMITTED TO USE THE TRUCK APRON.

RIGHT TURNING TRUCKS ARE NOT TO USE THE TRUCK APRON ON SINGLE-LANE ROUNDABOUTS. WHERE ENTRY, EXIT, OR CIRCULATING WIDTHS BECOME EXCESSIVE FOR RIGHT TURNS, CONSIDER USING AN EXTERNAL TRUCK APRON. EXTERNAL TRUCK APRONS SHOULD NOT PASS THROUGH CROSSWALKS.

GENERAL NOTES:

1. CHECK LEFT, THROUGH, AND RIGHT TURN MOVEMENTS FOR EACH RELEVANT DESIGN VEHICLE.
2. D1: CIRCULATORY ROADWAY SHOULD BE 18FT TO 20FT MEASURED FROM THE FACE OF CURB

TOWN OF KNIGHTDALE STANDARD DETAILS | REVISIONS: DATE / DESCRIPTION
GEOMETRIC SPEED CHECKS SINGLE LANE ROUNDABOUT
STD. NO. 3.33 | 6 of 8



DESIGN PRINCIPLES:

GEOMETRIC ENTRY PATH DEFLECTION IS BEST REPRESENTED BY A CONTINUOUS SPLINE (A CURVE WITH CONSTANTLY CHANGING RADII) BECAUSE THIS MOST CLOSELY APPROXIMATES HOW A VEHICLE TRACES ITS FASTEST PATH THROUGH A ROUNDABOUT. A SPLINE ALSO ALLOWS ANALYSTS TO DRAW THE SMOOTHEST, MOST NATURAL VEHICULAR PATH. IT IS DRAWN FROM A STARTING POINT APPROXIMATELY 165 FT IN ADVANCE OF THE ENTRY LINE, WITH AN OFFSET OF 5 FT FROM CURBS, 5 FT FROM A CENTERLINE, AND 3 FT FROM OTHER PAVEMENT MARKINGS (SUCH AS A PAINTED MEDIAN OR TWO-WAY LEFT-TURN LANE). THE CRITICAL ENTRY PATH RADIUS, REFERRED TO AS R1, OCCURS OVER THE SPLINE FOR 65 FT TO 80 FT, NEAR THE YIELD POINT, WHERE THE TIGHTEST RADIUS EXISTS.

IN MOST CASES, SPEED CONTROL ON ENTRY IS THE MOST IMPORTANT FASTEST PATH CRITERIA FOR ROUNDABOUT CONFIGURATIONS. IN ADDITION, IF A LOCATION HAS A SIGNIFICANT PEDESTRIAN COUNT (GREATER THAN 25 PEDESTRIANS PER HOUR), STEPS SHOULD BE TAKEN TO FACLITATE LOWER VEHICLE SPEEDS AT ALL PEDESTRIAN CONFLICT AREAS (INCLUDING EXIT SPEEDS FROM THE ROUNDABOUT). WHEN CHECKING EXIT SPEEDS, BOTH THE PREDICTIVE METHOD (BASED ON THE R3 EXIT PATH RADIUS) AND NCHRP 1043 EQUATION 9.7 (WHICH ACCOUNTS FOR ACCELERATION FROM R2 TO R3) SHOULD BE CHECKED.

SPLINED FAST-PATH RADIUS	RECOMMENDED RADIUS FOR SINGLE-LANE ROUNDABOUT (FT)	RECOMMENDED RADIUS FOR MINI-ROUNDABOUT (FT)
R1 ENTRY	120FT TO 165FT	100FT TO 165FT
R2 CIRCULATING	70FT TO 120FT	70FT TO 100FT
R3 EXIT	120FT TO 300FT*	90FT TO 150FT
R4 LEFT TURN	TRUCK APRON R.+5FT	CENTER ISLAND R.+5FT
R5 RIGHT TURN	70FT TO 100FT	50FT TO 90FT

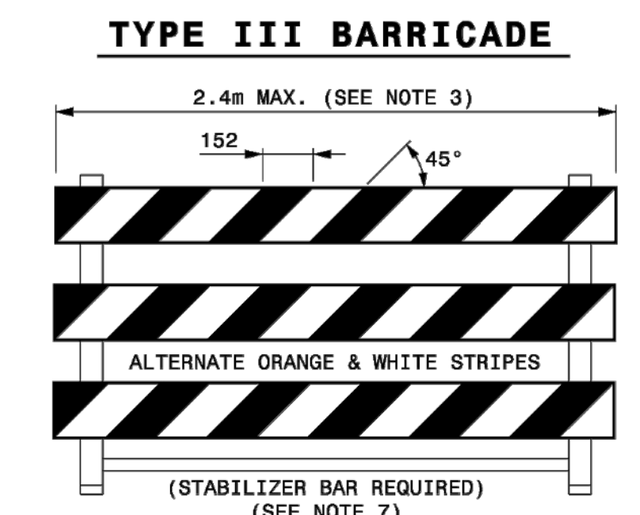
* WHERE PEDESTRIAN USE OF AN EXIT CROSSWALK IS FREQUENT (GREATER THAN 25 PEDESTRIANS PER HOUR), ADJUST EXIT RADII TO REDUCE THE R3 TO <200FT.

GENERAL NOTES:

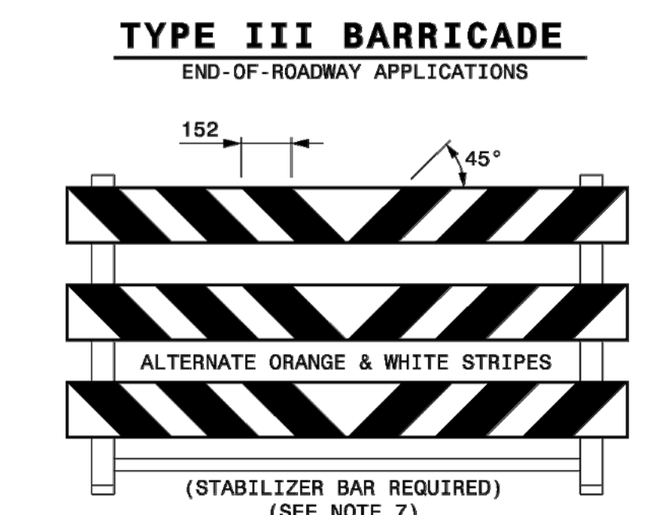
1. R1, R2, R3 PATH TO FOLLOW NATURAL SPLINE.
2. GEOMETRIC ENTRY SPEED USUALLY GOVERNED BY R1 RADIUS, BUT MAY BE GOVERNED BY R5 RADIUS.
3. ON DESIGNS THAT CANNOT ACHIEVE DEFLECTION USING CENTRAL ISLAND AND APPROACH ALIGNMENT OFFSET TO THE LEFT OF CENTER-LINE, ADD REVERSE CURVES ON THE APPROACH SPLITTER ISLAND, SEPARATED BY A SHORT TANGENT 50FT TO 100FT. APPROACH CURVE RADII TO BE SIZED USING AASHTO GREEN BOOK TABLE 3-13, MINIMUM RADII AND SUPERELEVATION FOR LOW-SPEED STREETS IN URBAN AREAS TO MAINTAIN NORMAL CROWN.

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C. | 7-06
METRIC STANDARD DRAWING FOR **BARRICADES** TYPE-III
SHEET 1 OF 1 | **1145.01**

TYPE III BARRICADE



TYPE III BARRICADE
END-OF-ROADWAY APPLICATIONS



GENERAL NOTES

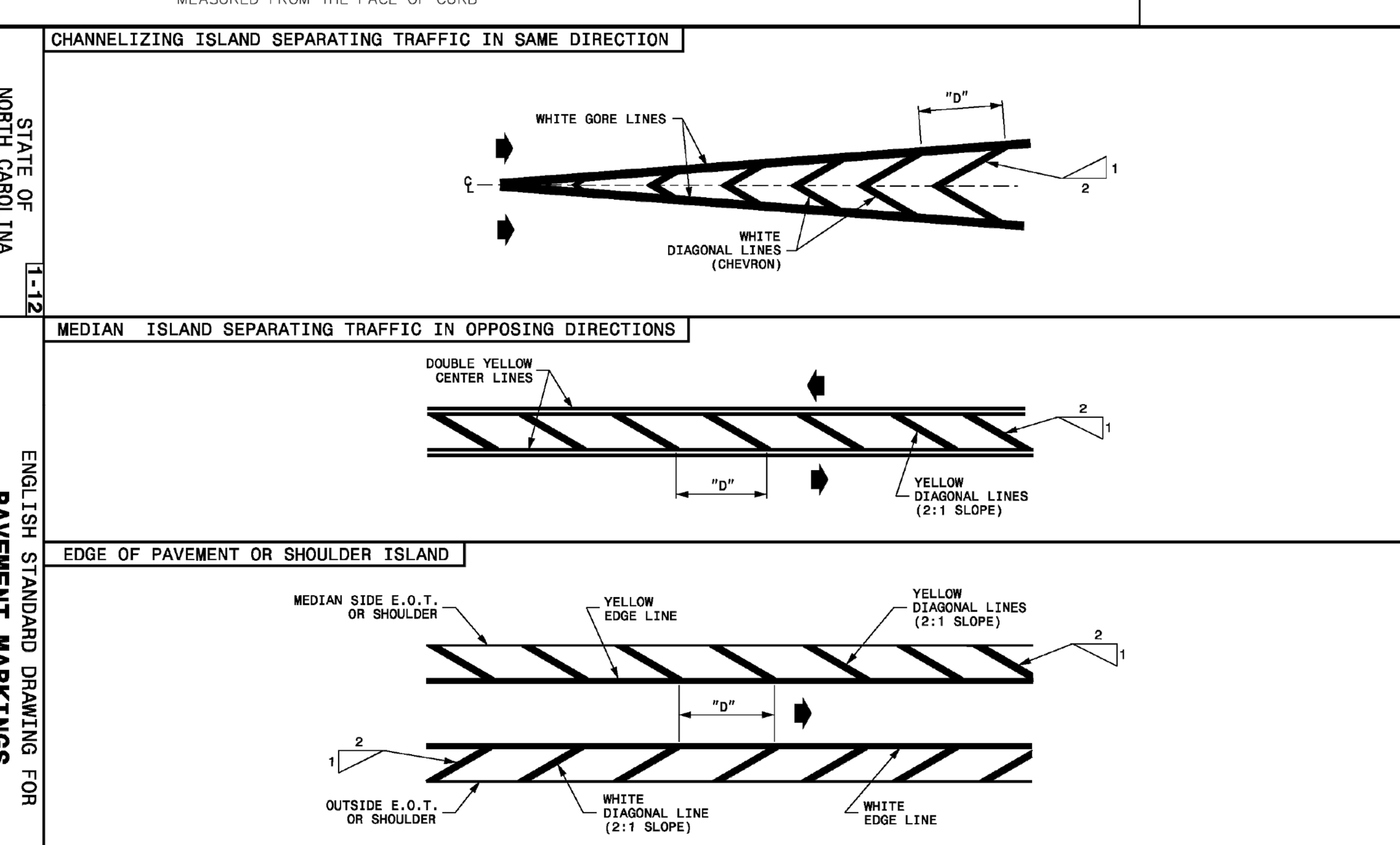
1-HORIZONTAL RAILS FOR TYPE-III BARRICADES MAY BE HOLLOW/CORRUGATED EXTRUDED RIGID POLYOLEFIN, HIGH DENSITY POLYETHYLENE, OR OTHER NCDOT APPROVED RAILS. PLASTIC TYPE RAILS MUST BE FLAME TREATED BY THE MANUFACTURER SO THAT REFLECTIVE SHEETING MAY ADHERE PROPERLY.
2-BARRICADE SHALL BE LIMITED TO A MAXIMUM LENGTH OF 2.4m UNLESS NCHRP 350 CRASH TESTED AND NCDOT APPROVED.
3-ONLY NCDOT APPROVED COMPOSITE AND ROLL-UP SIGNS MAY BE MOUNTED ON THE BARRICADE RAILS. MOUNT SIGNS TO BARRICADED RAILS USING MINIMUM SIZES BOLT TO ENSURE SIGN WILL NOT BECOME DETACHED UNDER NORMAL WIND AND TRAFFIC CONDITIONS.
4-SIGNS MOUNTED ON BARRICADES SHOULD NOT COVER MORE THAN 50 PERCENT OF THE TOP TWO RAILS OR 33 PERCENT OF THE TOTAL AREA OF THE THREE RAILS.
5-USE TYPE VII, VIII OR IX RETROREFLECTIVE SHEETING ON BOTH SIDES OF THE BARRICADE RAILS.
6-BARRICADE MUST BE NCHRP 350 AND NCDOT APPROVED WITH STABILIZER BAR OR ADEQUATE LATERAL BRACING.
7-ASSEMBLY OF THE GENERIC BARRICADES MUST BE SELF CERTIFIED BY THE ASSEMBLER.
8-BARRICADES USED TO CLOSE A ROADWAY SHALL EXTEND ACROSS THE ENTIRE ROADWAY. WHERE LOCAL TRAFFIC MUST BE MAINTAINED, THEY MAY BE PLACED IN A STAGGERED PATTERN.
9-STRIPES ON WORK ZONE BARRICADE RAILS SHALL BE ALTERNATE ORANGE AND WHITE RETROREFLECTIVE STRIPES, SLOPED DOWNWARD TOWARDS THE SIDE WHICH TRAFFIC IS TO PASS OR TURN IN DETOURING. WHERE NO TURNS ARE INTENDED, THE STRIPES SHOULD SLOPE DOWNWARD TOWARD THE CENTER OF THE BARRICADE OR BARRICADES. USE RED AND WHITE STRIPES FOR PERMANENT BARRICADES.
10-SEE NCDOT APPROVED PRODUCTS LIST FOR MANUFACTURERS OF APPROVED BARRICADES.
11-PLACE MANUFACTURER'S NAME AND FEDERAL HIGHWAY ADMINISTRATION'S NCHRP 350 APPROVAL LETTER NUMBER ON BARRICADE FRAME.
12-PLACE SANDBAGS ON FEET OF THE FRAME FOR BALLASTING. DO NOT PLACE SANDBAGS ON TOP OF A STRIPED RAIL OR STABILIZER BAR. DO NOT BALLAST BARRICADES BY HEAVY OBJECTS SUCH AS ROCKS, CHUNKS OF CONCRETE OR OTHER ITEMS THAT WOULD CAUSE DAMAGE IF THE BARRICADE IS STRUCK BY A VEHICLE.

NOTE:
THIS DRAWING IS DIMENSIONED IN MILLIMETERS UNLESS OTHERWISE DEPICTED WITHIN THE DRAWING.

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C. | 7-06
METRIC STANDARD DRAWING FOR **BARRICADES** TYPE-III
SHEET 1 OF 1 | **1145.01**

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C. | 1-12
ENGLISH STANDARD DRAWING FOR **PAVEMENT MARKINGS** PAINTED ISLANDS
SHEET 1 OF 1 | **1205.09**

CHANNELIZING ISLAND SEPARATING TRAFFIC IN SAME DIRECTION



GENERAL NOTES:

1- "D" = SPACING OF DIAGONAL LINES (TYPICALLY EQUAL IN FEET TO THE POSTED SPEED LIMIT).
2- INCREASE SPACING OF DIAGONALS TO 200' OR MORE ON INTERSTATE ROADWAYS.
3- ADJUST SPACING OF DIAGONALS DEPENDING ON THE LENGTH OF THE ISLAND. SPACING MAY BE ADJUSTED AS DETERMINED BY THE ENGINEER.

LEGEND
E.O.T.= EDGE OF TRAVEL
DIRECTION OF TRAFFIC FLOW

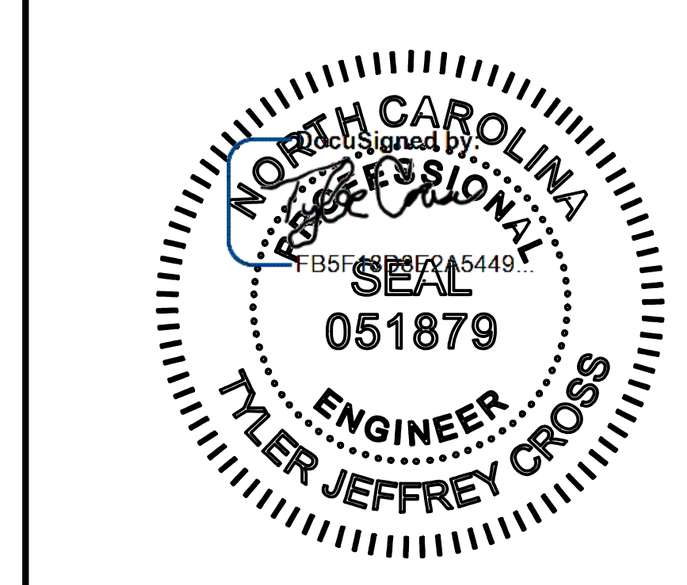
TOWN CERTIFICATION

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: Samuel A. MacDonald (Digitally signed by Samuel A. MacDonald. Reason: I am approving this document. Date: 2026.04.16 10:13:14-04'00') DATE: ____________
TOWN ENGINEER

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

BY: Gideon Smith (Digitally signed by Gideon Smith. Reason: I am approving this document. Date: 2026.05.19 10:14:06-04'00') DATE: ____________
LAND USE ADMINISTRATOR



3/31/2026

THIS DRAWING PREPARED AT THE **RALEIGH OFFICE**
5410 Trinity Road, Suite 102 | Raleigh, NC 27607
TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

DATE	REVISION DESCRIPTION

DATE	03/31/2026
DRAWN BY	331
DESIGNED BY	331
CHECKED BY	T. CROSS
SCALE	

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

SITE DETAILS - SHEET 3 OF 3

JOB NO.	51557
SHEET NO.	C12.2

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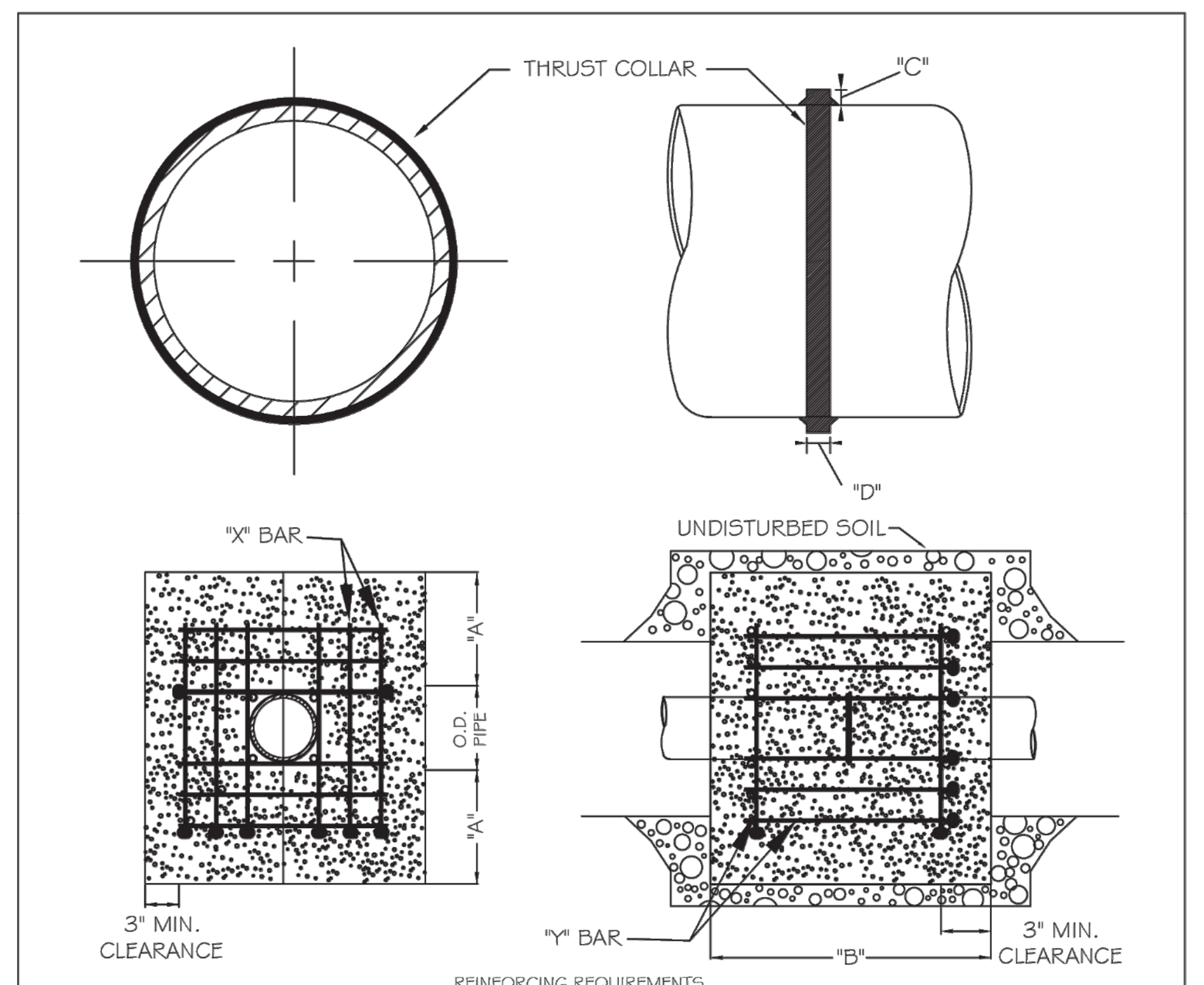


REINFORCING REQUIREMENTS

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

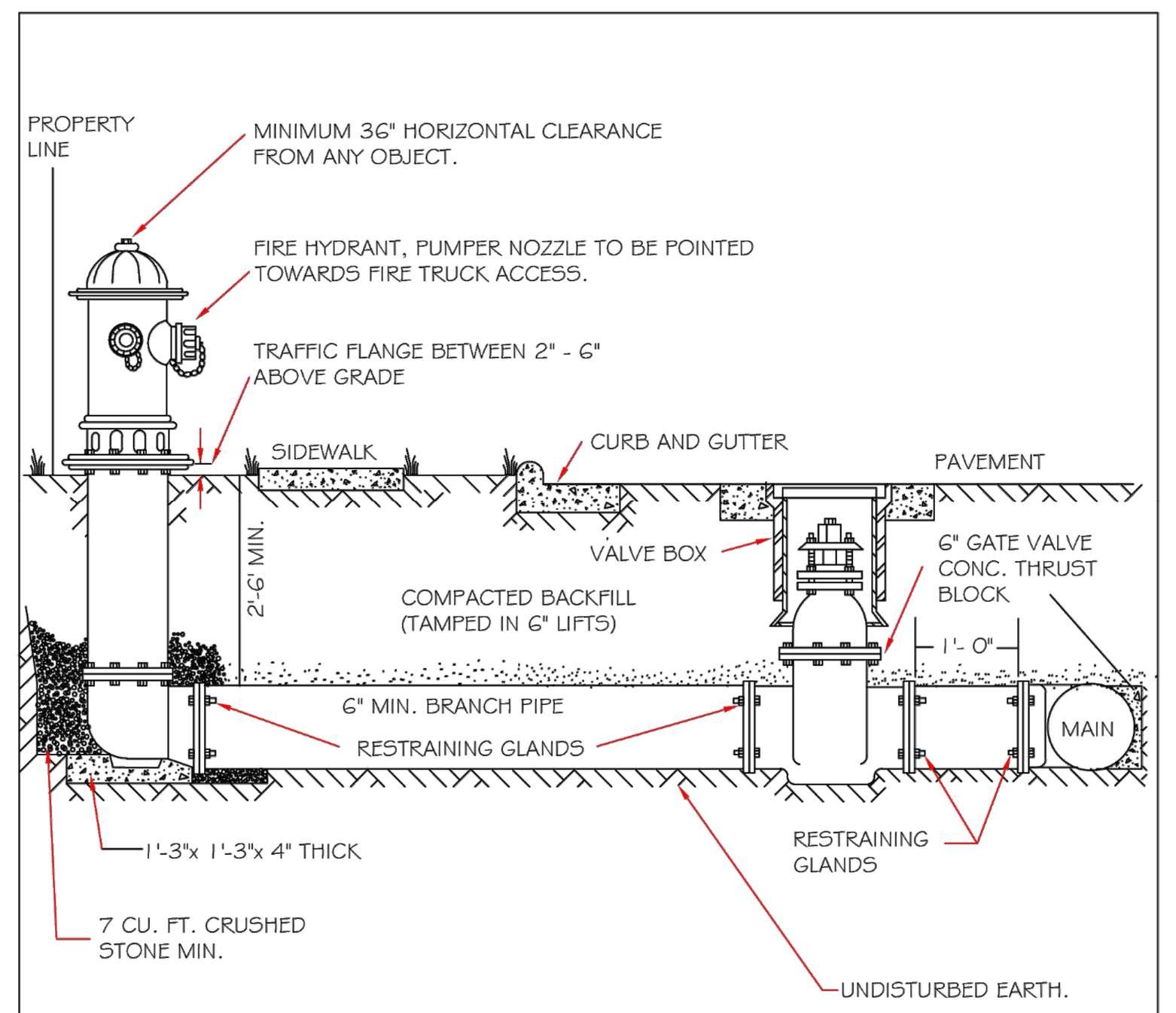
THRUST COLLAR, AND THRUST SCHEDULE

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

NOTES:
1. SEE STANDARD DETAIL W-9 FOR THRUST BLOCK LOCATIONS.
2. CONCRETE SHALL BE 3000 PSI AND TRANSIT 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.
5. BACKFILL TAMPED IN 6" LIFTS PER STANDARD DETAIL W-3.
6. THRUST COLLAR MUST BE FACTORY WELDED ON BOTH SIDES ALONG BOTH EDGES OF COLLAR AROUND CIRCUMFERENCE.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
THRUST BLOCKING DESIGN DATA FOR WATER MAINS

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-7	RRH	1-21-00	J.P.S.	11-1-10
	D.H.L.	6-18-08		

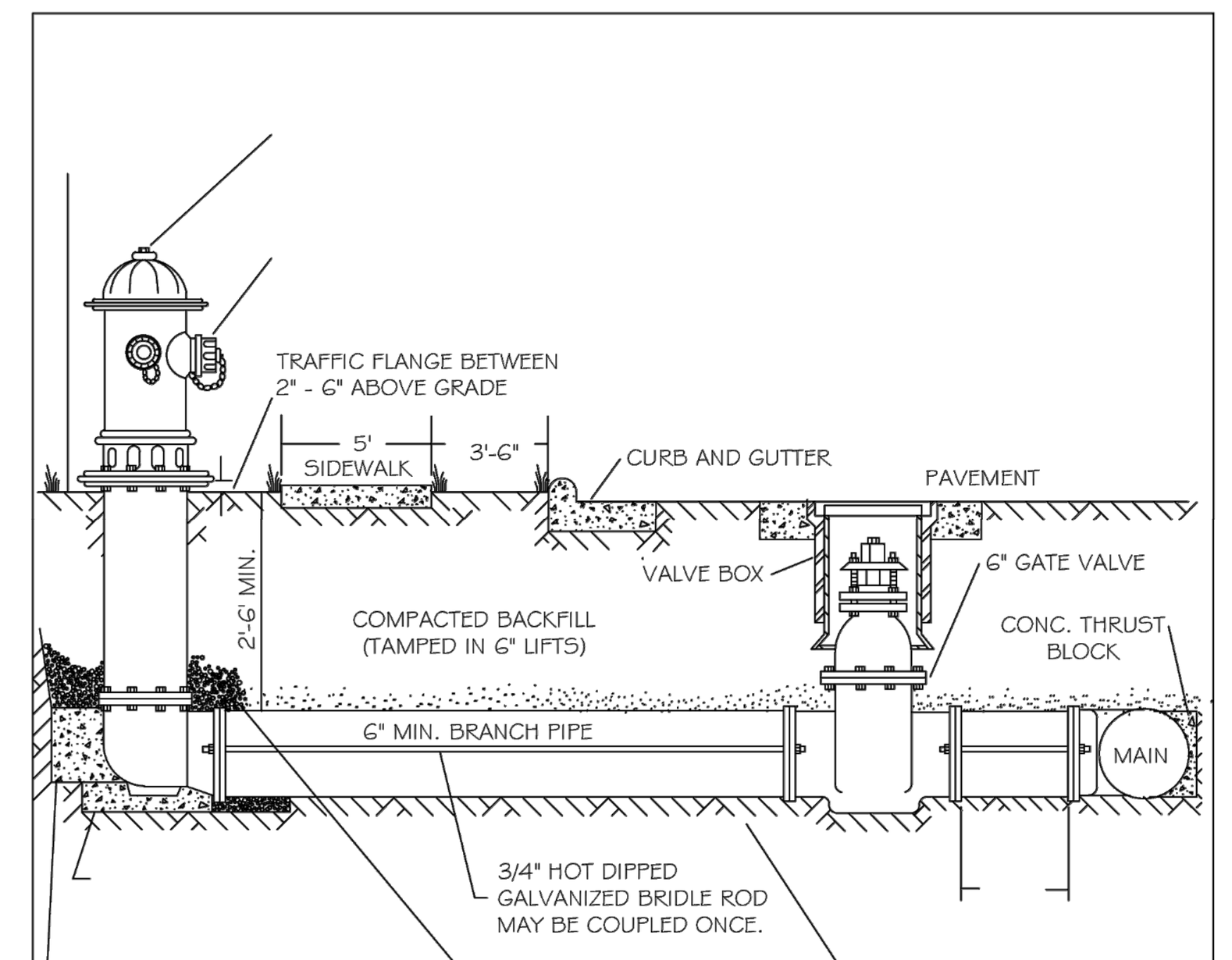


NOTES:
1. FIRE HYDRANT SHALL BE AS MANUFACTURED: MUELLER, AMERICAN DARLING, KENNEDY, M&H, WATEROUS, CLOW, EAST JORDAN IRON WORKS, OR US PIPE.
2. BRANCH PIPE SHALL BE DUCTILE IRON AWWA C150-96
3. 6" GATE VALVE SHALL BE AWWA C500-86 OPEN LEFT
4. STEEL RODS AND BOLTS SHALL BE ¾" HOT DIPPED GALVANIZED
5. FIRE HYDRANTS WILL BE INSTALLED IN TRUE VERTICAL POSITION
RODS SHALL NOT BE COUPLED MORE THAN ONCE. IF THE LENGTH FROM THE VALVE TO THE HYDRANT EXCEEDS 20' THEN A MECHANICAL RESTRAINING GLAND WITH A REBAR CAGE SHALL BE INSTALLED NO MORE THAN 10' FROM HYDRANT AND POURED IN CONCRETE.
FIRE HYDRANTS TO BE LOCATED IN ROW OR 2 FOOT EASEMENT ADJACENT TO ROW

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

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
STANDARD FIRE HYDRANT INSTALLATION DETAIL

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-4	ABB	4-6-04	PAP	2/17/09
	DHL	2/14/08		



NOTES:
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5. FIRE HYDRANTS WILL BE INSTALLED IN TRUE VERTICAL POSITION
RODS SHALL NOT BE COUPLED MORE THAN ONCE. IF THE LENGTH FROM THE VALVE TO THE HYDRANT EXCEEDS 20' THEN A MECHANICAL RESTRAINING GLAND WITH A REBAR CAGE SHALL BE INSTALLED NO MORE THAN 10' FROM HYDRANT AND POURED IN CONCRETE.
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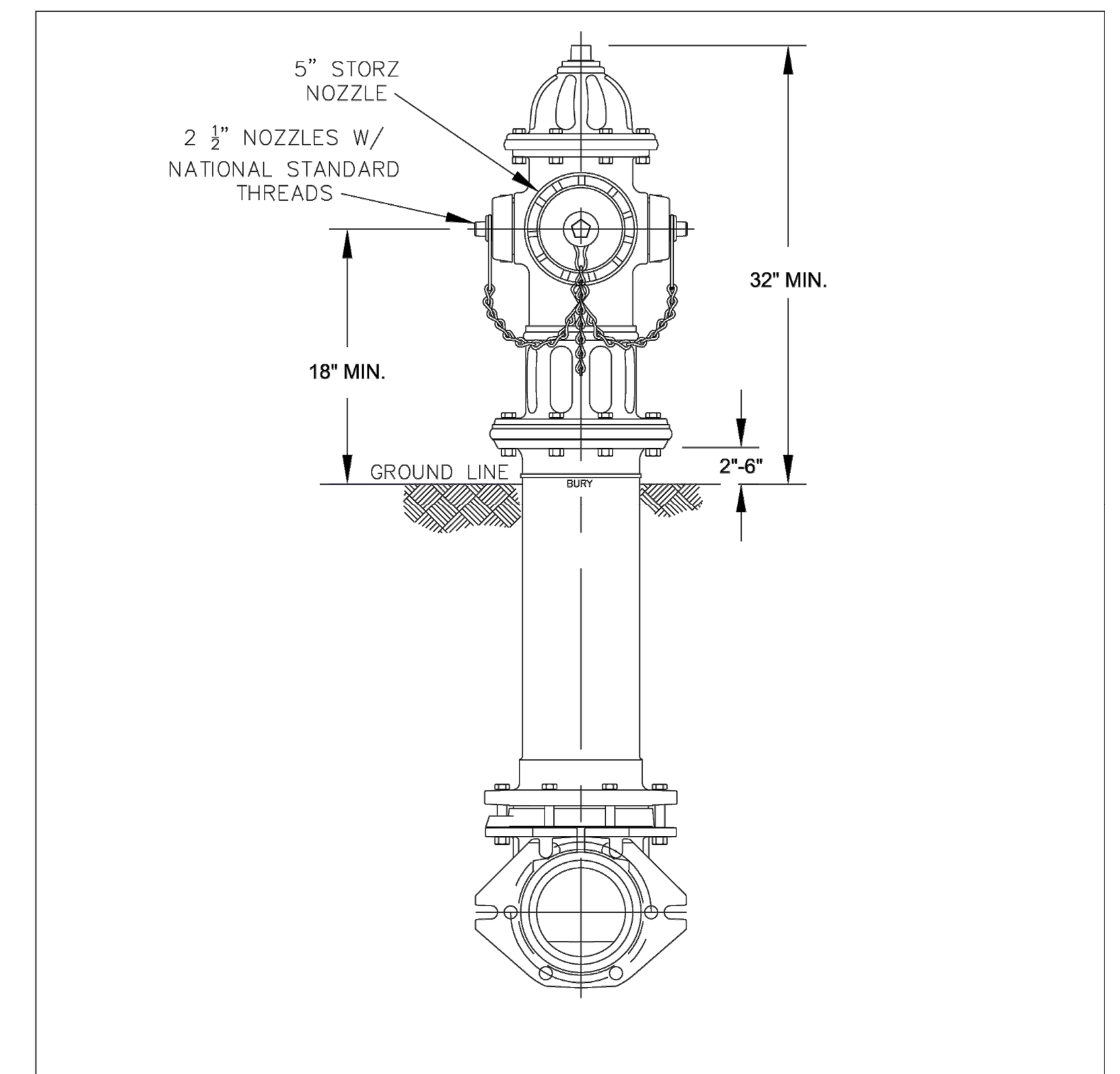
ANYTIME SITE WORK, CONSTRUCTION, ROAD WORK, OR ANY OTHER WORK CHANGES THE GRADE OF THE FIRE HYDRANT, THE PERSON RESPONSIBLE FOR THE WORK IS RESPONSIBLE FOR ADJUSTING THE FIRE HYDRANT TO STAY WITHIN COMPLIANCE.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
STANDARD FIRE HYDRANT INSTALLATION DETAIL

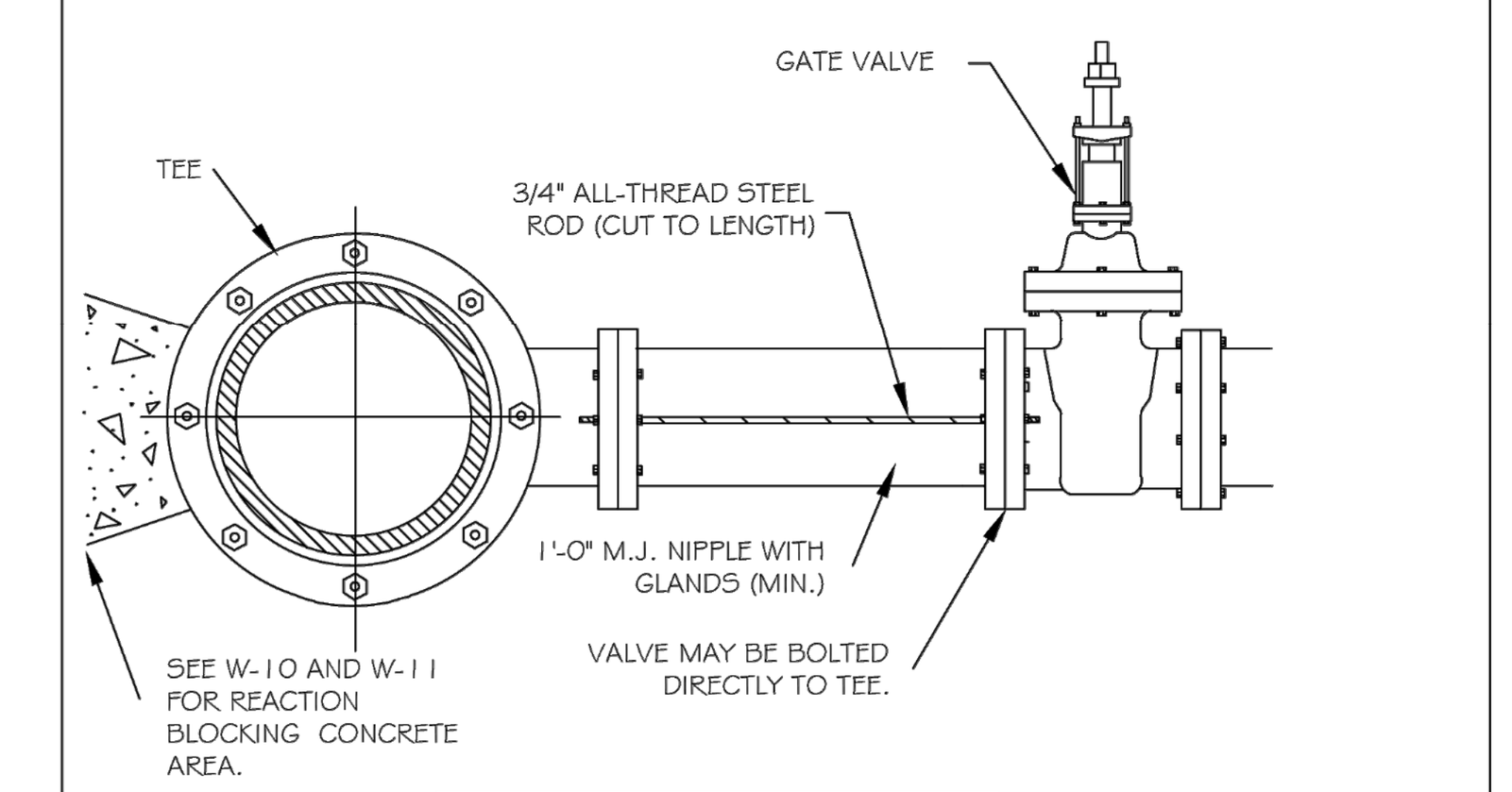
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-4a	ABB	4-6-04		



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

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
RALEIGH, GARNER, KNIGHTDALE, ROLESVILLE, WAKE FOREST, WENDELL & ZEBULON
STANDARD FIRE HYDRANT WITH 5" STORZ PUMPER NOZZLE

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-5	MAB	6-30-16		
	KAT	9-15-17		



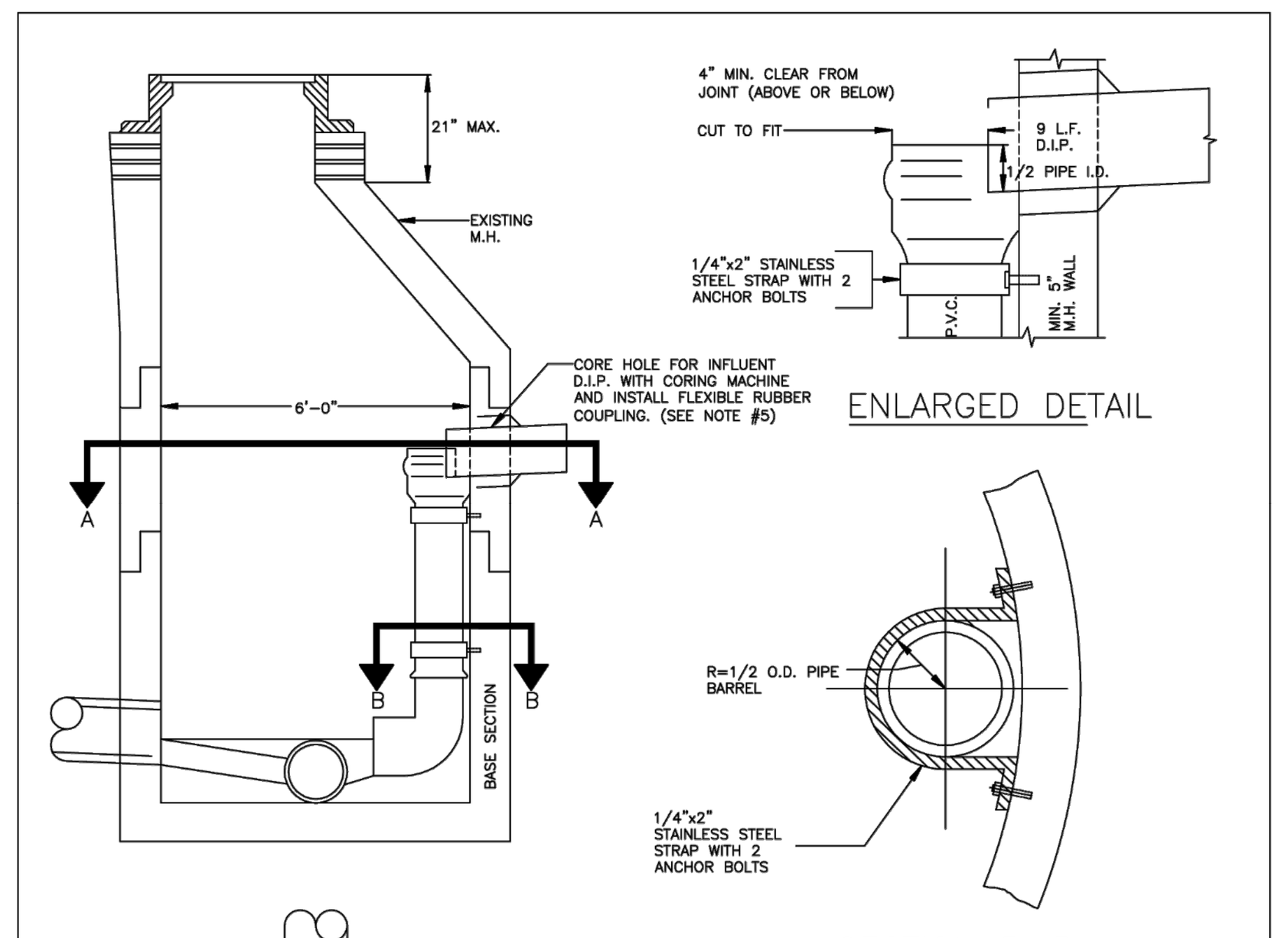
ROD REQUIREMENTS

NO. OF RODS	BRANCH SIZE
4"	2
6"	2
8"	4
12"	4
16"	6
24"	6
30"	8
36"	8

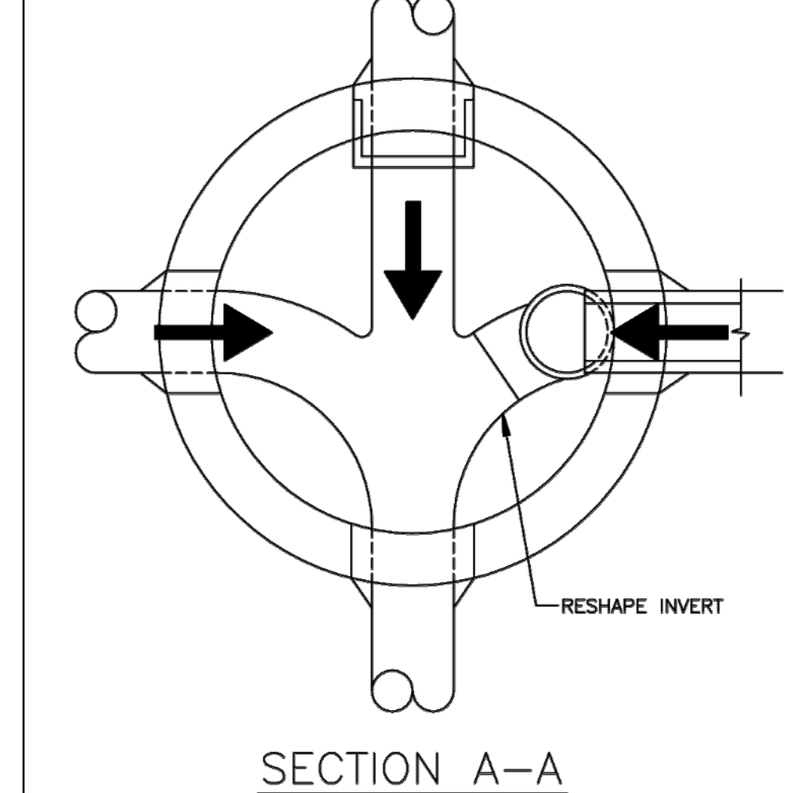
NOTES:
1. STEEL RODS AND BOLTS SHALL BE 3/4" HOT DIPPED GALVANIZED.
2. SEE STANDARD THRUST BLOCK. TABLES W-10 AND W-11 FOR CONCRETE.
3. CONCRETE SHALL NOT CONTACT BOLTS OR ENDS OF MECHANICAL FITTINGS.
4. THIS RODDING REQUIREMENT DOES NOT APPLY TO FIRE HYDRANTS.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
VALVE RESTRAINT AT TEES AND CROSSES FOR LINES (4"-24")

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-15	RRH	3-31-00	D.H.L.	6-16-08
	A.B.B.	4-19-04	J.P.S.	11-1-10

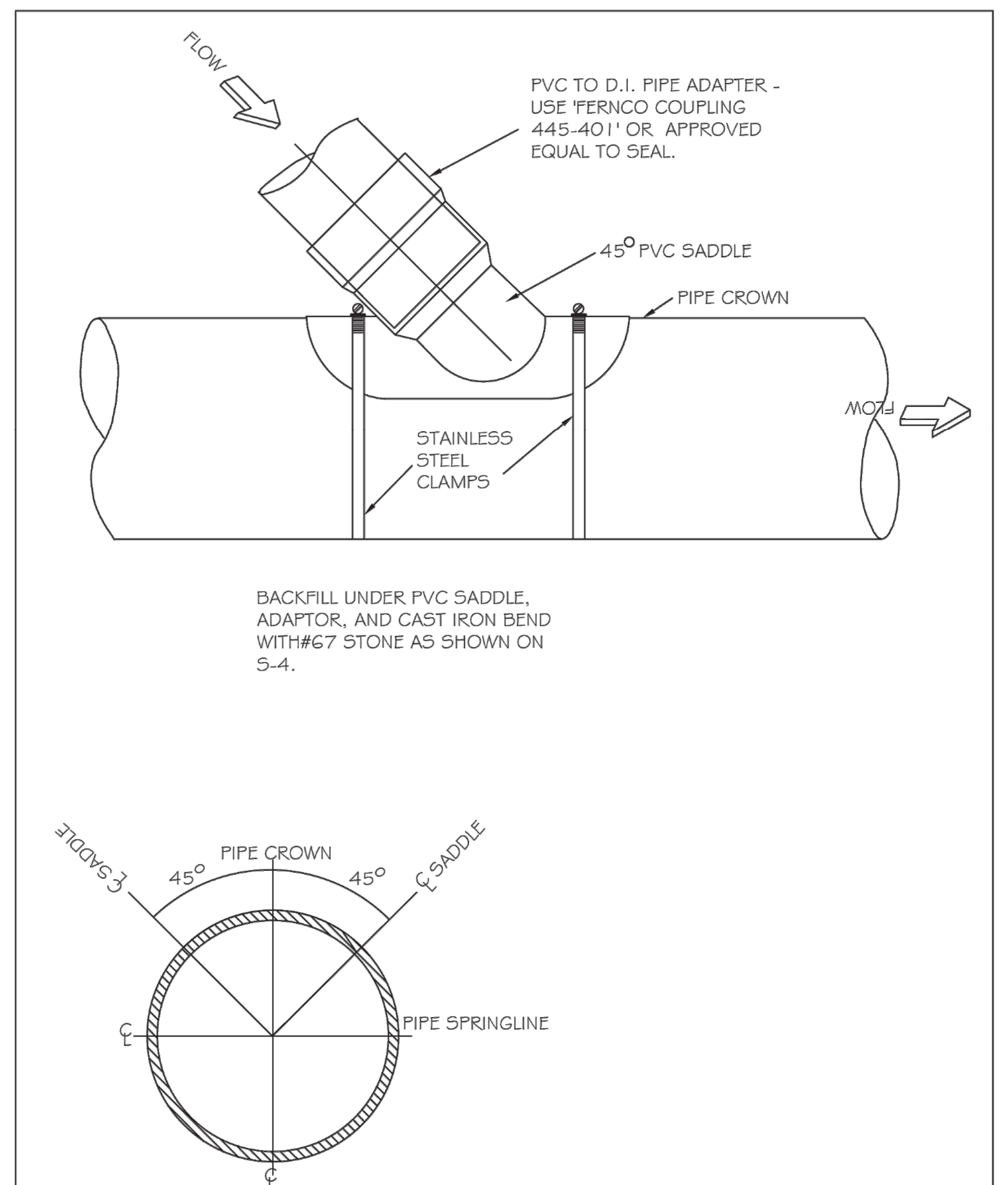


NOTES:
1. PIPE FOR INSIDE DROP SHALL BE SDR 35 PVC CONFORMING TO ASTM SPECIFICATION 03034.
2. BOTTOM BEND TO BE 90° SHORT BEND, BELL SPIGOT, OF SDR 35 PVC. SPIGOT OF BEND TO REST DIRECTLY ON EXISTING SHELF. CONSTRUCT MASONRY TROUGH FROM DROP EFFLUENT TO MAIN CHANNEL.
3. NOTCH BELL OF PVC DROP TO ACCEPT D.I.P. SPIGOT AS SHOWN.
4. LOCATE STRAPS AT PIPE BELL AND ABOVE BELL OF 90° BEND AS SHOWN. ADD EXTRA STRAPS AS NECESSARY TO MAINTAIN MAXIMUM SPACING OF TEN FEET.
5. HOLE IN MANHOLE WALL TO BE MADE WITH A CORING MACHINE. INSTALL FLEXIBLE RUBBER COUPLING.
6. CORE HOLE SHALL NOT ENTER CONE SECTION.
7. STEPS SHALL BE RELOCATED IF THEY CONFLICT WITH INSIDE DROP.



CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
INSIDE DROP MANHOLE

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-53	MAB	11-6-13		

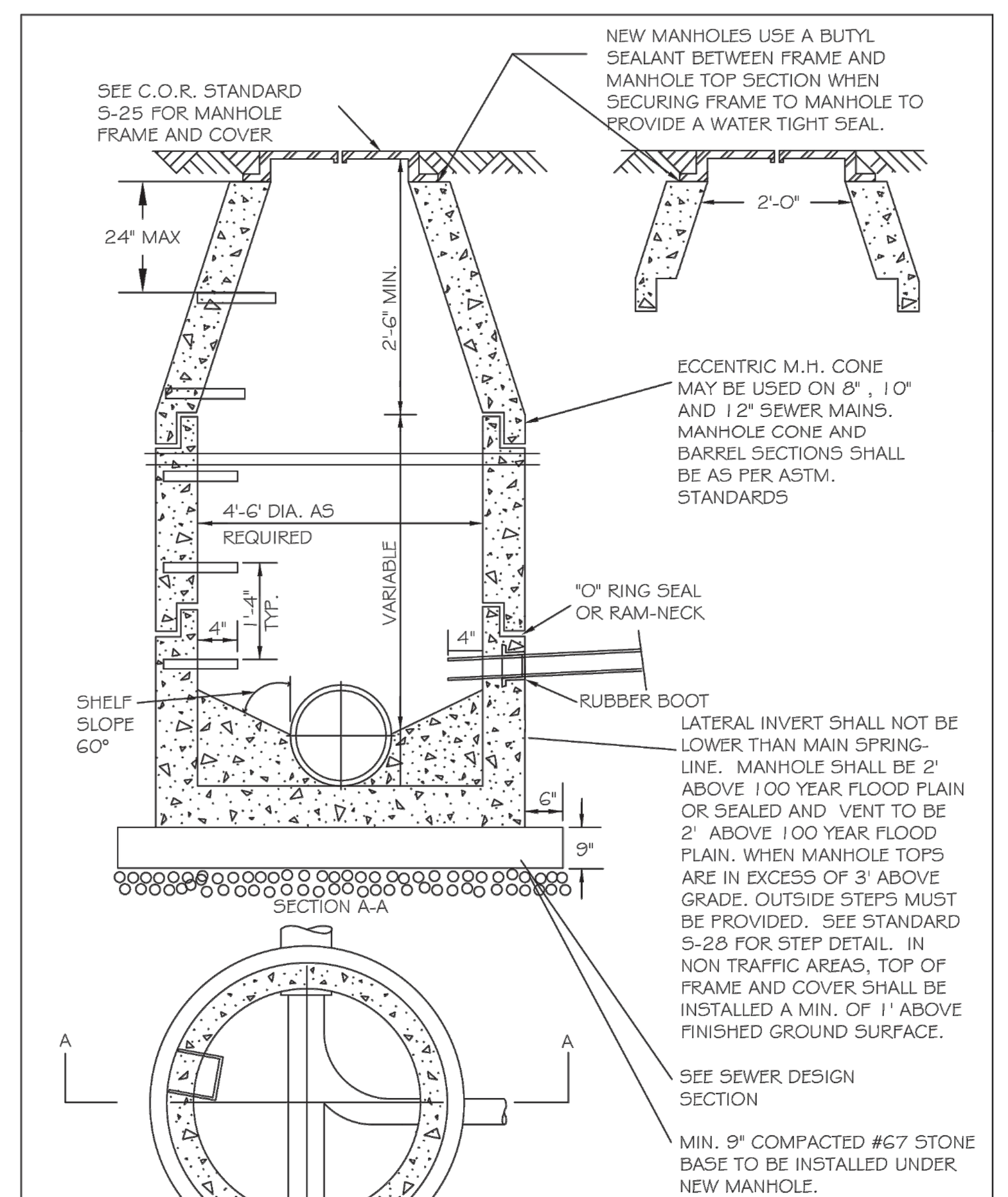


BACKFILL UNDER PVC SADDLE, ADAPTOR, AND CAST IRON BEND WITH#67 STONE AS SHOWN ON S-4.

SADDLE INSTALLATION LIMITS

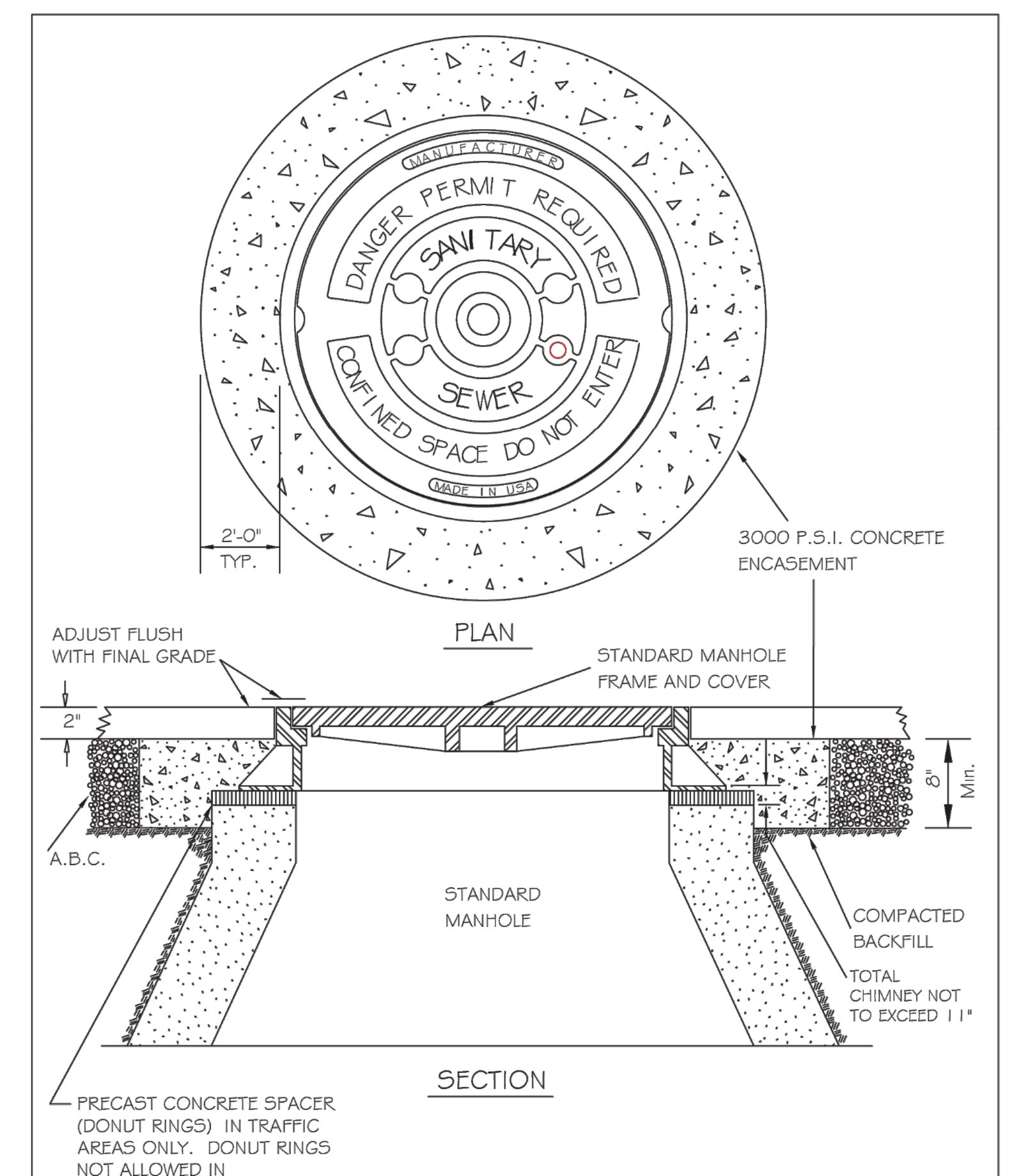
CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
LATERAL SADDLE INSTALLATION DETAIL FOR PVC PIPE

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-31		3-1-87		
	RRH	3-30-00		



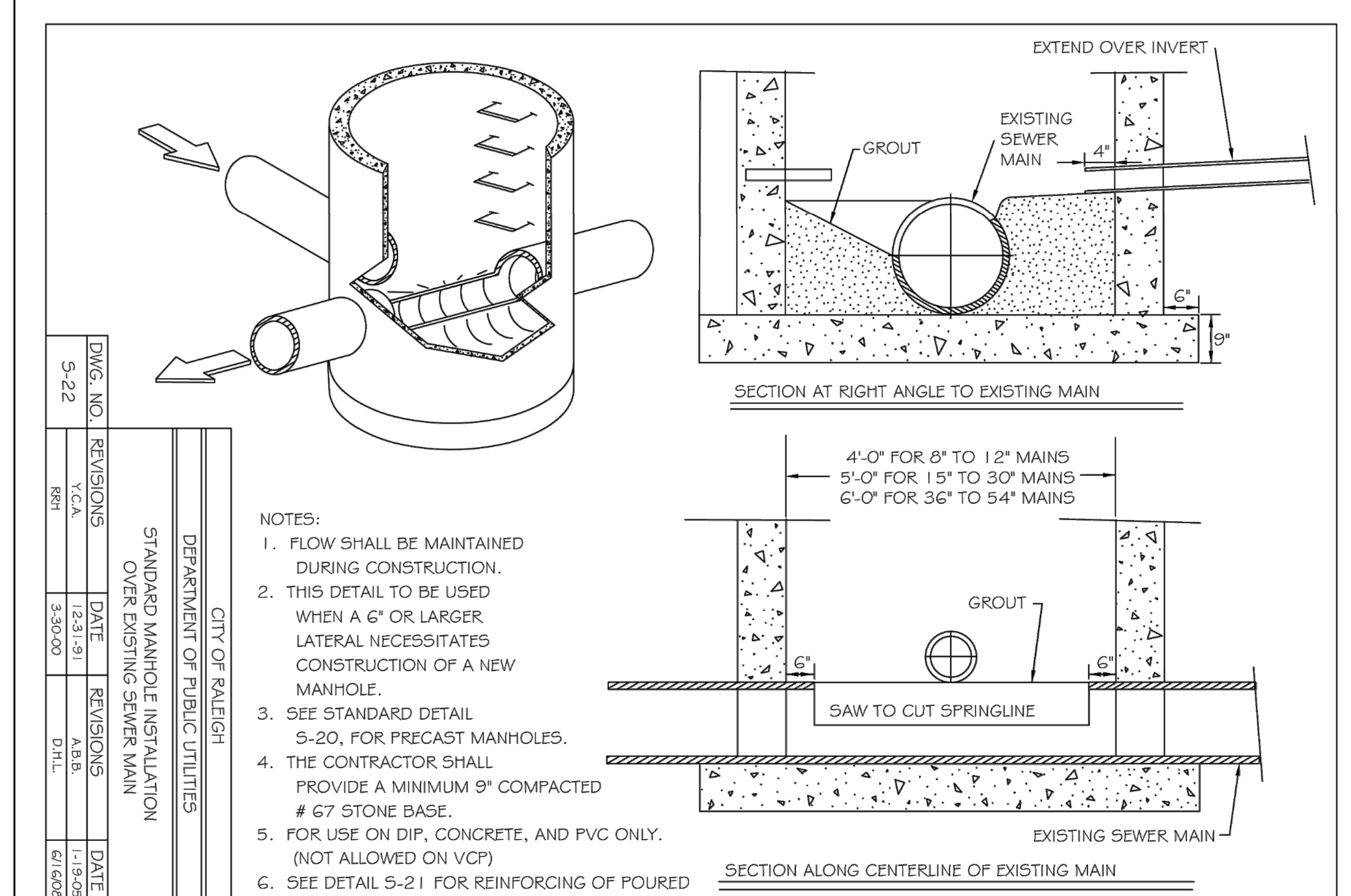
CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
STANDARD PRECAST SANITARY SEWER MANHOLE

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-20	Y.C.A.	12-31-92	ABB	2-21-05
	RRH	3-30-00	D.H.L.	6-16-08



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

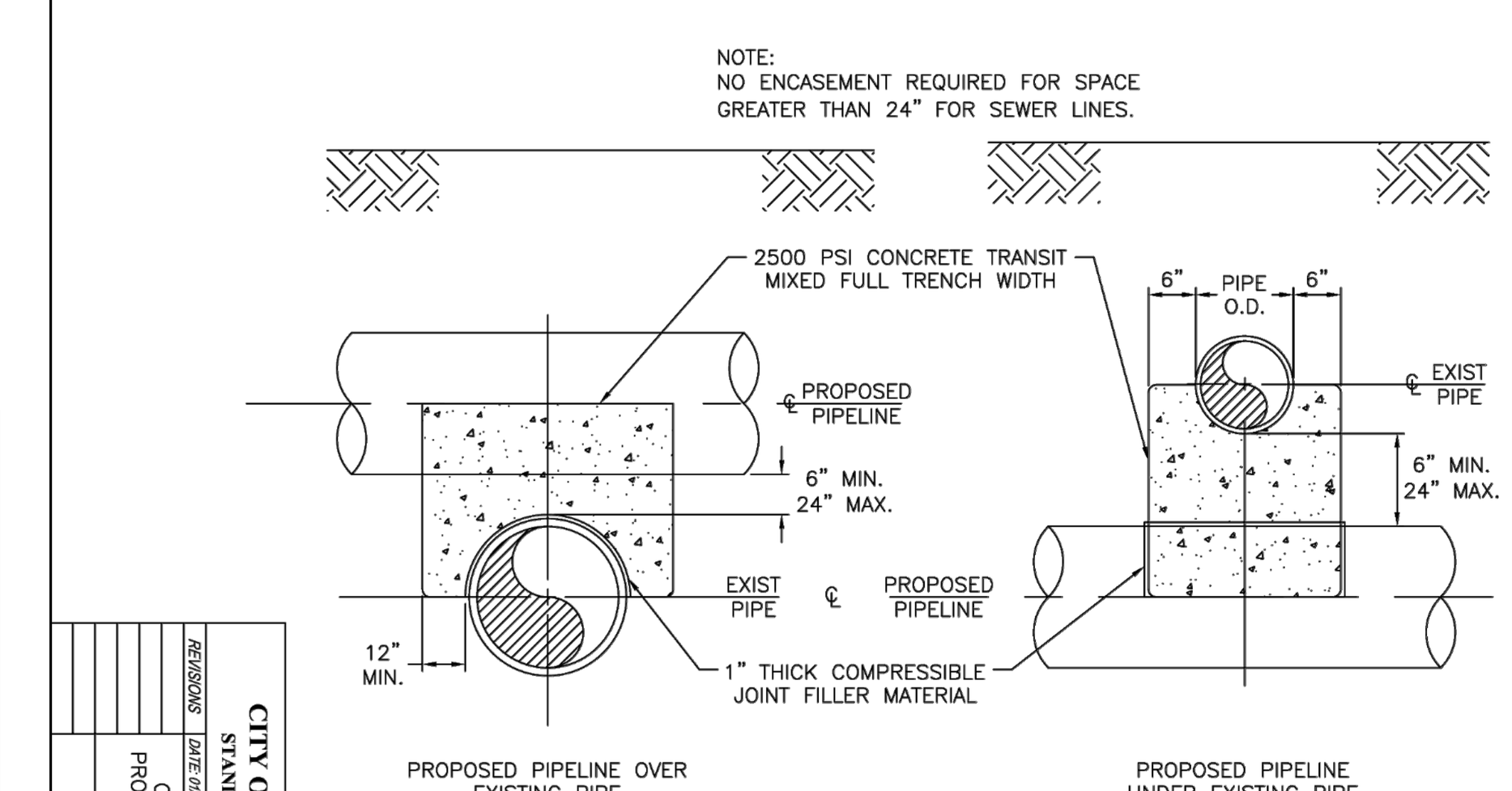
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-29	Y.C.A.	12-31-91	ABB	9-20-04
	RRH	3-30-00	DHL	11-29-07



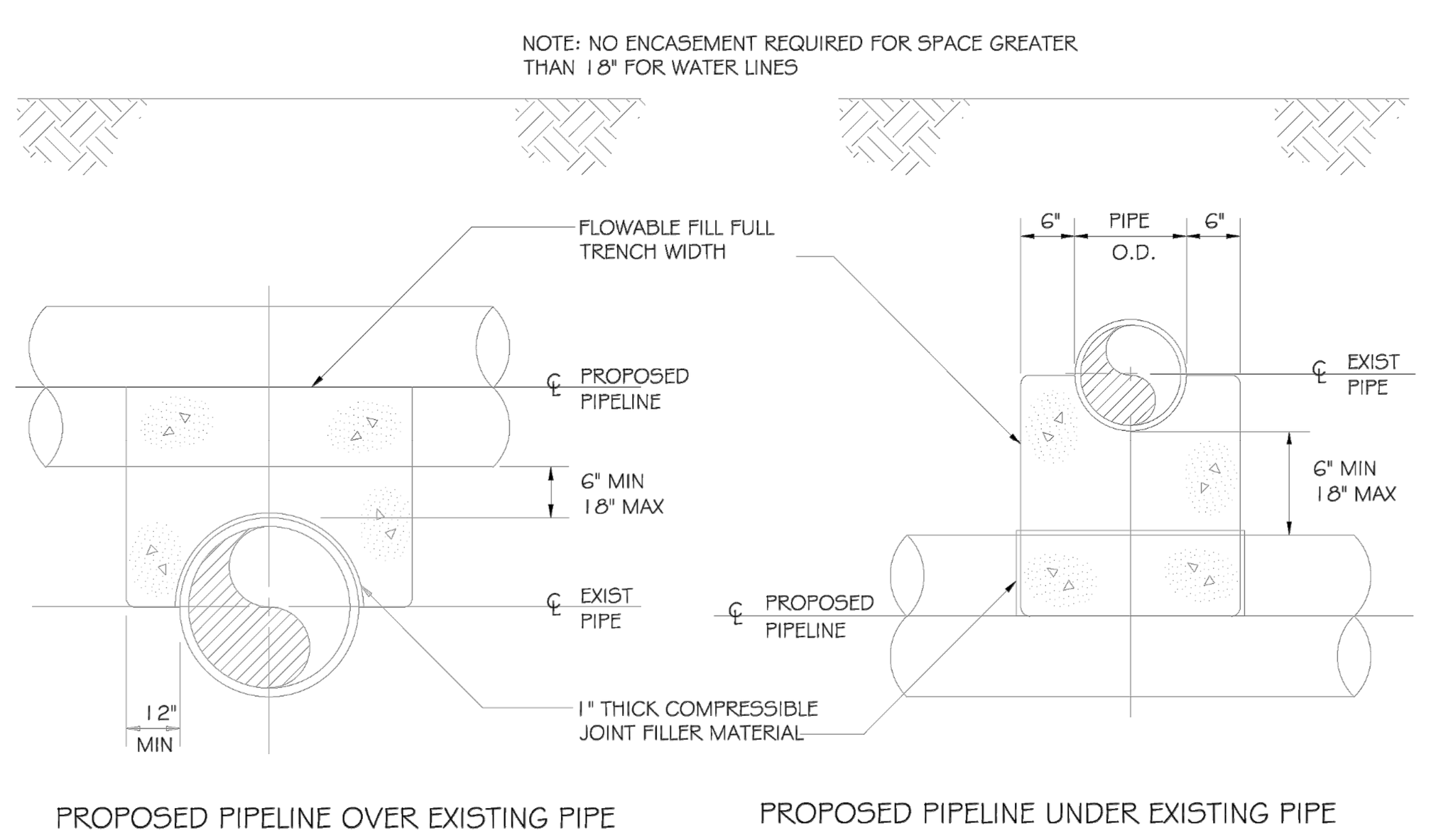
NOTES:
1. FLOW SHALL BE MAINTAINED DURING CONSTRUCTION.
2. THIS DETAIL TO BE USED WHEN A 6" OR LARGER LATERAL NECESSITATES CONSTRUCTION OF A NEW MANHOLE.
3. SEE STANDARD DETAIL S-20, FOR PRECAST MANHOLES.
4. THE CONTRACTOR SHALL PROVIDE A MINIMUM 9" COMPACTED # 67 STONE BASE.
5. FOR USE ON DIP, CONCRETE, AND PVC ONLY. (NOT ALLOWED ON VCP)
6. SEE DETAIL S-21 FOR REINFORCING OF POURED IN-PLACE BASE

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
STANDARD MANHOLE INSTALLATION OVER EXISTING SEWER MAIN

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-22	Y.C.A.	12-31-91	A.B.B.	1-19-05
	RRH	3-30-00	D.H.L.	6/16/08

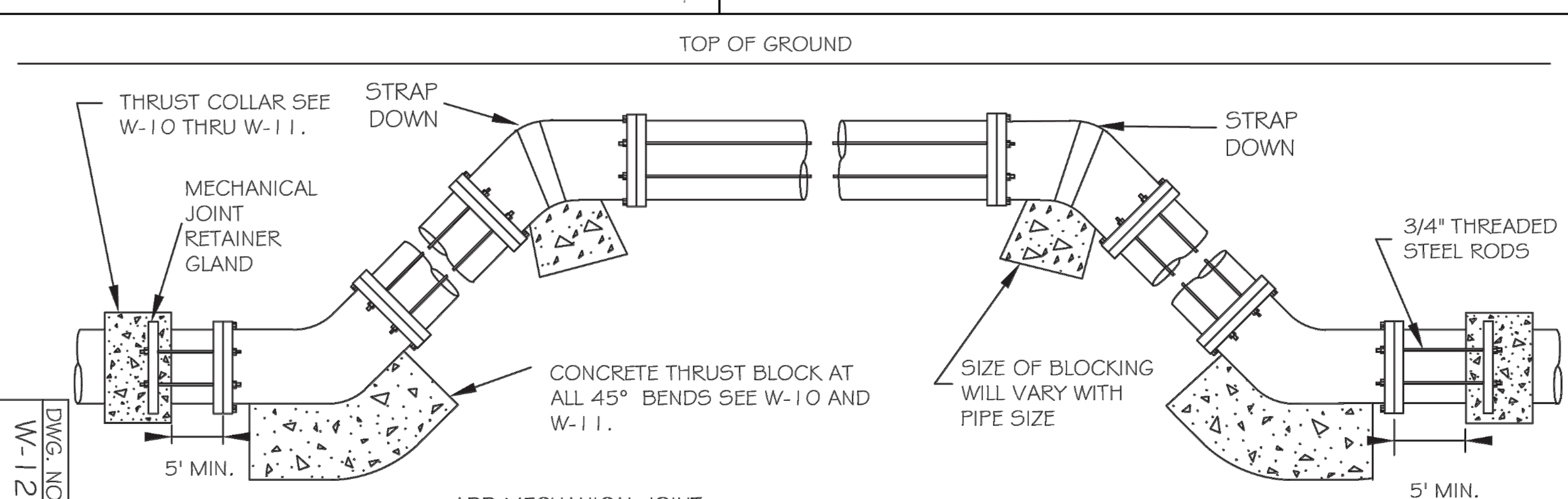


CITY OF RALEIGH
STANDARD DETAIL
CONCRETE CRADLE PROTECTION FOR SEWER LINE CROSSINGS
REVISIONS DATE: 01/18/2025 NOT TO SCALE
S-49



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

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-41	DHL	2-20-08		



ADD MECHANICAL JOINT RETAINER GLANDS THROUGHOUT ASSEMBLY.

ROD REQUIREMENTS

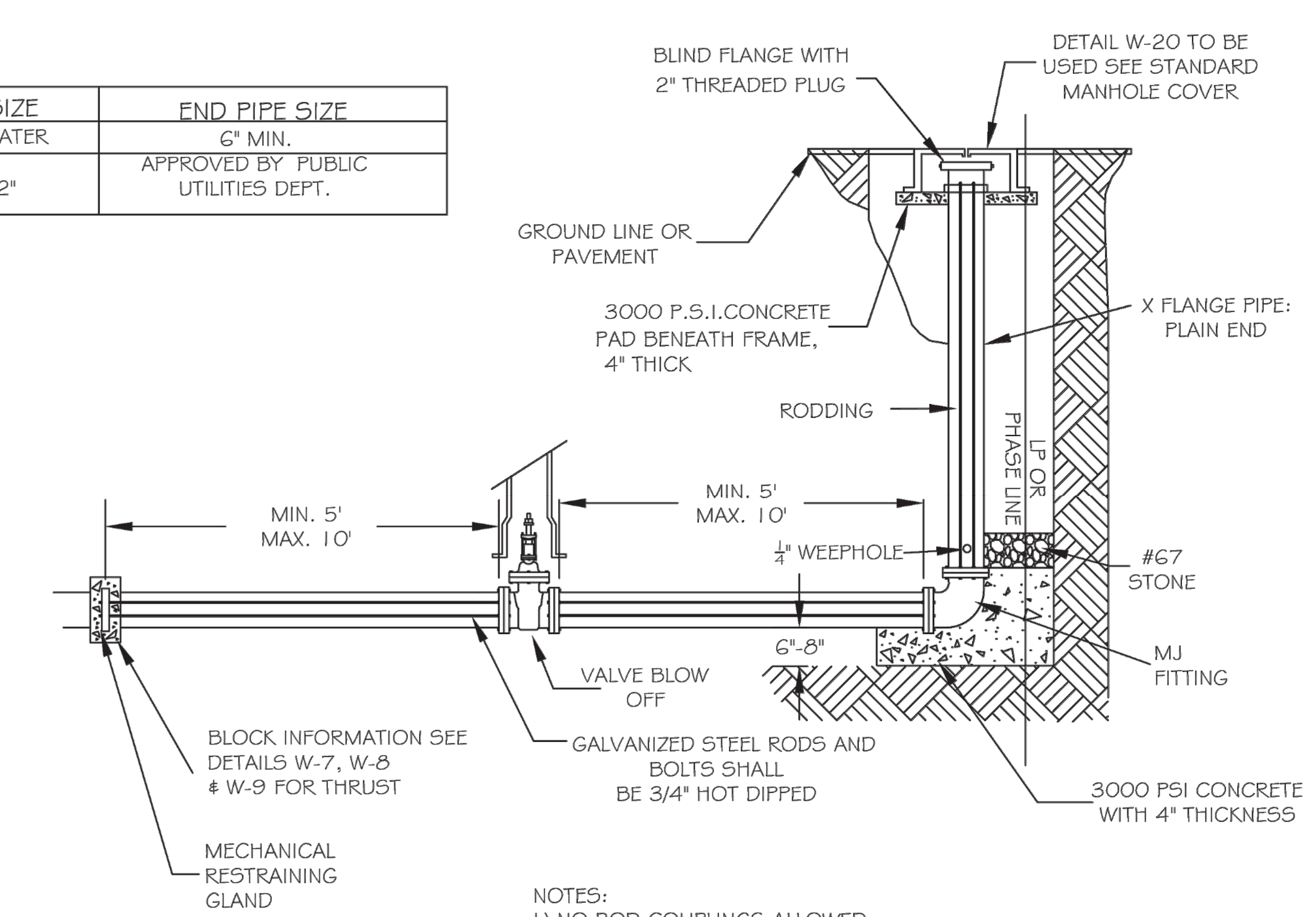
SIZE OF 45 BEND	STATIC THRUST IN POUNDS	NO. OF RODS REQUIRED
6"	4,328	2
8"	7,694	4
12"	17,312	4
16"	30,779	8
24"	69,252	8

GENERAL NOTES:
1. STEEL RODS AND BOLTS SHALL BE 3/4" HOT DIPPED GALVANIZED.
2. CONCRETE SHALL NOT CONTACT BOLTS OR ENDS OF MECHANICAL JOINT BENDS.
3. RESTRAINED MECHANICAL GLANDS TO BE USED AT ALL FITTINGS.
4. MUST USE DUCTILE IRON EYE BOLTS WHERE NECESSARY.
5. 3' MINIMUM COVER MUST BE MAINTAINED ON ALL WATER MAINS

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
STANDARD VERTICAL BEND

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-12	ABB	4-6-04	J.P.S.	11-1-10
	D.H.L.	6-18-08		

MAIN SIZE	END PIPE SIZE
16" & GREATER	6" MIN.
6" - 12"	APPROVED BY PUBLIC UTILITIES DEPT.



NOTES:
1) NO ROD COUPLINGS ALLOWED

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
TEMPORARY WATER MAIN BLOW OFF ASSEMBLY

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-21	D.W.C.	12-28-99	A.B.B.	4-12-04
	RRH	3-31-00	DHL	8-16-07

RALEIGH WATER - PLANS AUTHORIZED FOR CONSTRUCTION
Any work authorized by this approval must proceed in accordance with the plans. This electronic approval may not be edited once issued. Any modification to this approval once issued will invalidate this approval.
Cydney Terry
2026.05.18 21:25:27-04'00'

SITE PERMITTING APPROVAL

Water and Sewer Permits (if applicable)

The City of Raleigh consents to the connection and extension of the City's **Public Sewer System** as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. **City of Raleigh Public Utilities Department Permit #** S-5503

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-4142

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

City of Raleigh Public Utilities Department Permit # ______________

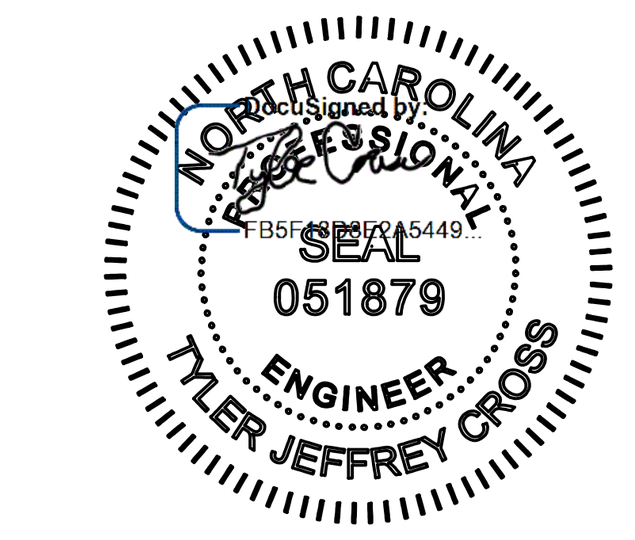
TOWN CERTIFICATION

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

BY: Samuel A. MacDonald (Digitally signed by Samuel A. MacDonald, Date: 2026.04.16 10:13:34-04'00') DATE: ____________
TOWN ENGINEER

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

BY: Gideon Smith (Digitally signed by Gideon Smith, Date: 2026.05.19 10:14:17-04'00') DATE: ____________
LAND USE ADMINISTRATOR



3/31/2026

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5410 Trinity Road, Suite 102 | Raleigh, NC 27607
TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

DATE	REVISION DESCRIPTION

DATE	03/31/2026
DRAWN BY	331
DESIGNED BY	331
CHECKED BY	T. CROSS
SCALE	

TIMMONS GROUP

NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS

KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

WATER AND SEWER DETAILS

JOB NO. 51557

SHEET NO. C12.3

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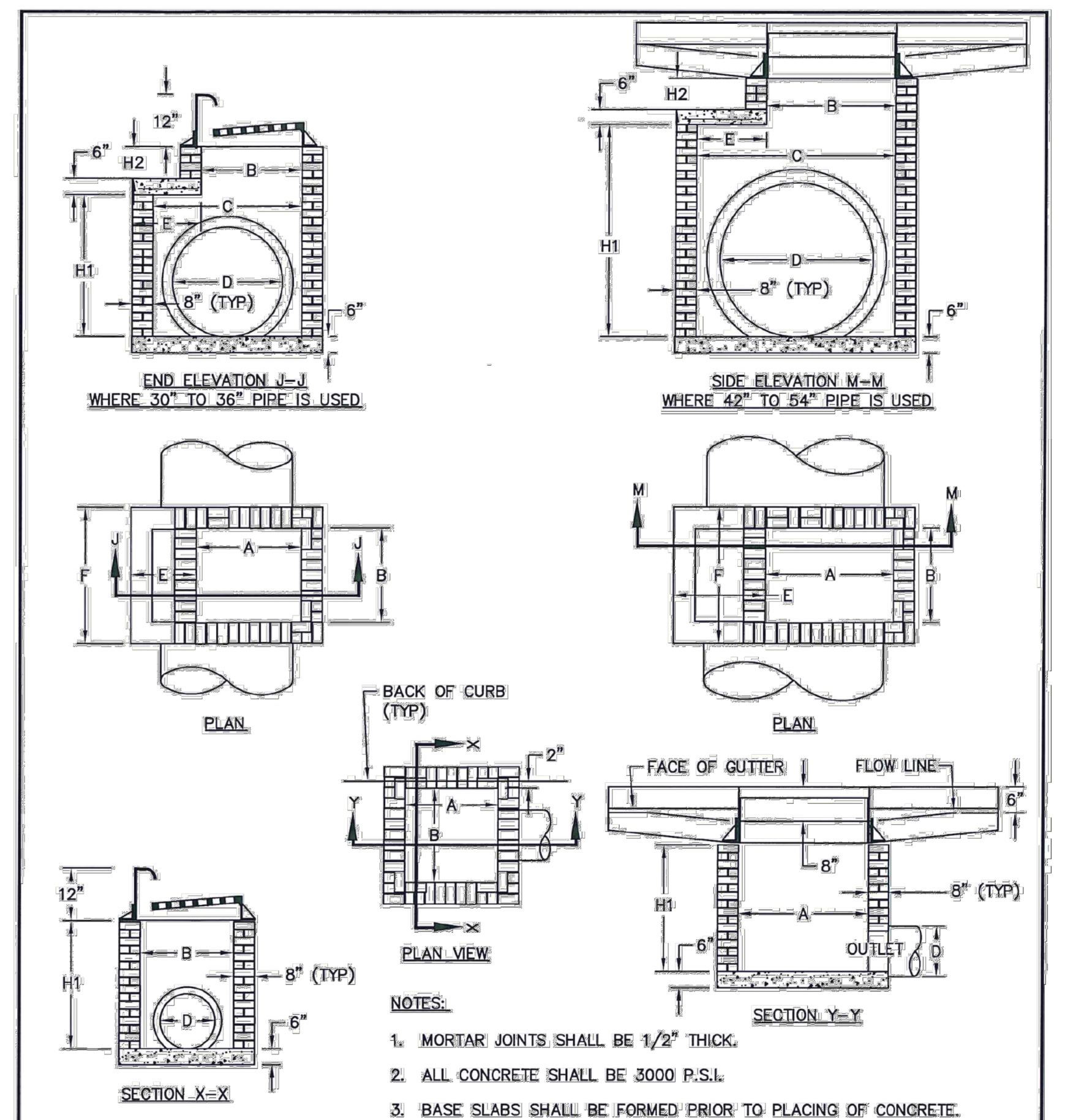


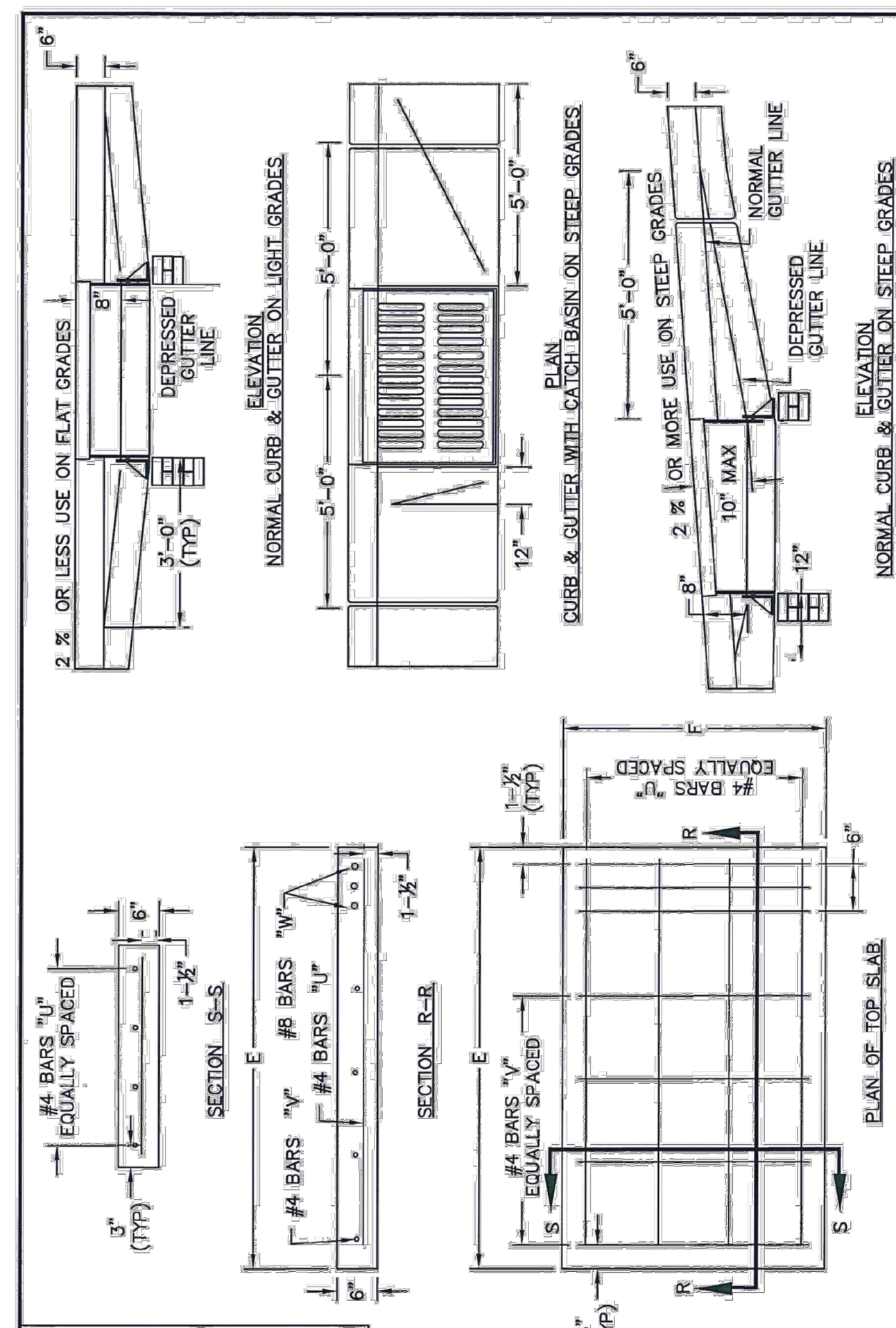
NOTES:

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

REVISIONS	
DATE	DESCRIPTION

1 of 4

TOWN OF KNIGHTDALE STANDARD DETAILS	STANDARD CURB INLET BRICK BOX	STD. NO. 5.05-1



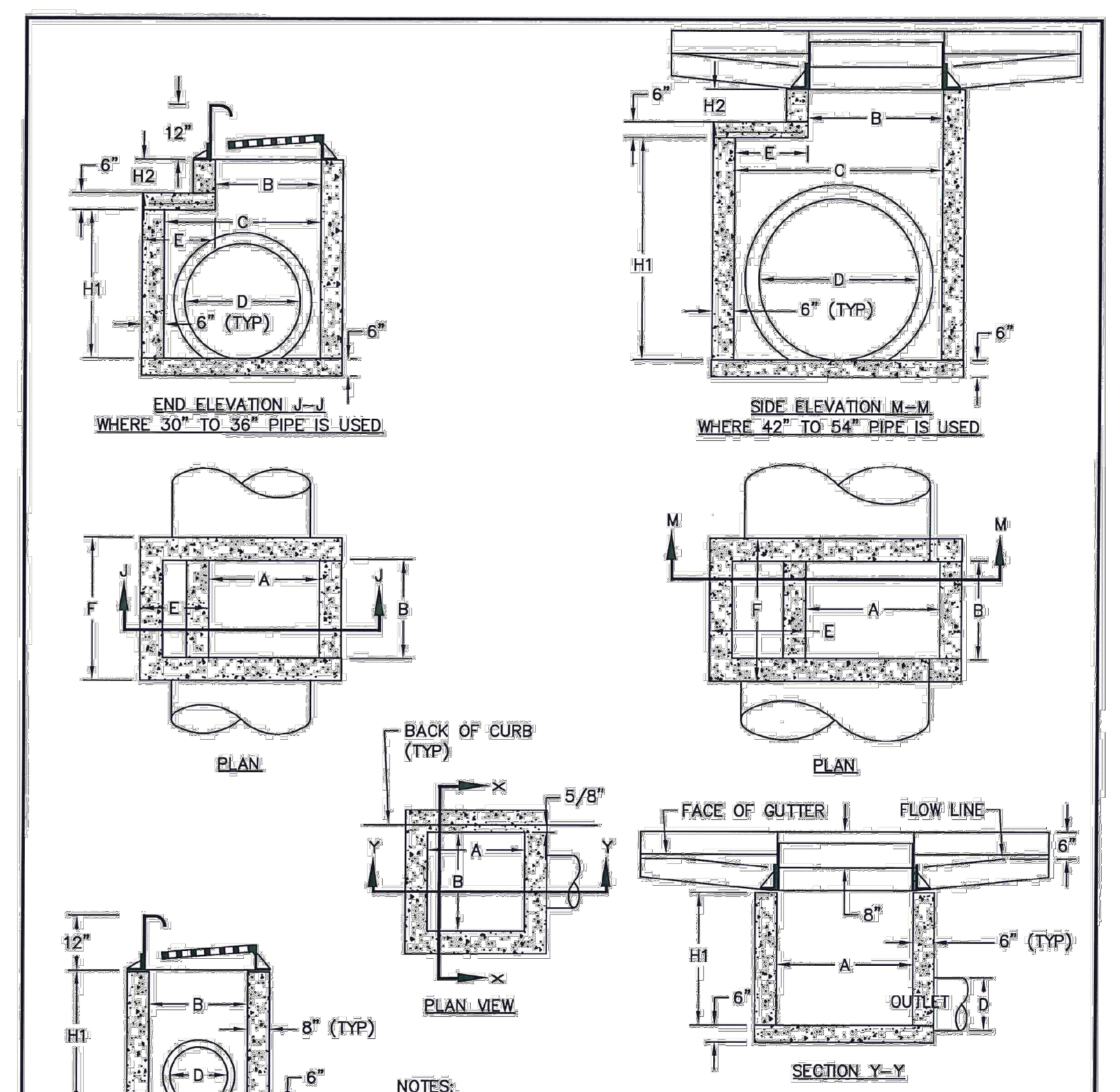
DIMENSIONS AND QUANTITIES FOR BRICK CATCH BASINS

PIPE D	SPAN A	WIDTH B	WIDTH C	SPAN G	HEIGHT MIN H1	HEIGHT H2	COVER DIMENSIONS E	COVER DIMENSIONS F	BARS "U" NO	BARS "U" LENGTH	BARS "V" NO	BARS "V" LENGTH	BARS "W" NO	BARS "W" LENGTH	TOTAL LBS	CONCRETE TOP SLAB	CONCRETE FLOOR	CONCRETE TOTAL	BRICK MASONRY H1 CU YDS	BRICK MASONRY PER FT Ht	DEDUCTIONS CM	DEDUCTIONS RC
15"	3'-0"	2'-2"			2'-6"	VARIABLE														0.321 ABOVE MIN H1	0.0308	0.047
18"					2'-10"																0.0442	0.065
24"					3'-4"																0.0794	0.113
30"			3'-4"		3'-2"		1'-10"	4'-4"	4	1'-6"	3	4'-1"	3	4'-1"	4'-1"	45				0.3231 H2	0.1224	0.170
36"			3'-10"		3'-8"		2'-4"	4'-4"	4	2'-0"	4	4'-1"	3	4'-1"	4'-1"	49					0.1760	0.230
42"				4'-5"	4'-4"		2'-1"	3'-6"	4	1'-9"	3	3'-3"	3	3'-3"	3'-3"	38					0.2400	0.323
48"				5'-0"	4'-10"		2'-6"	3'-6"	4	2'-6"	4	3'-3"	3	3'-3"	3'-3"	40					0.3131	0.460
54"	3'-0"	2'-2"		5'-7"	5'-4"		3'-3"	3'-9"	4	3'-0"	6	3'-3"	3	3'-3"	3'-3"	48					0.3958	0.580

REVISIONS	
DATE	DESCRIPTION

2 of 4

TOWN OF KNIGHTDALE STANDARD DETAILS	STANDARD CURB INLET BRICK BOX	STD. NO. 5.05-2



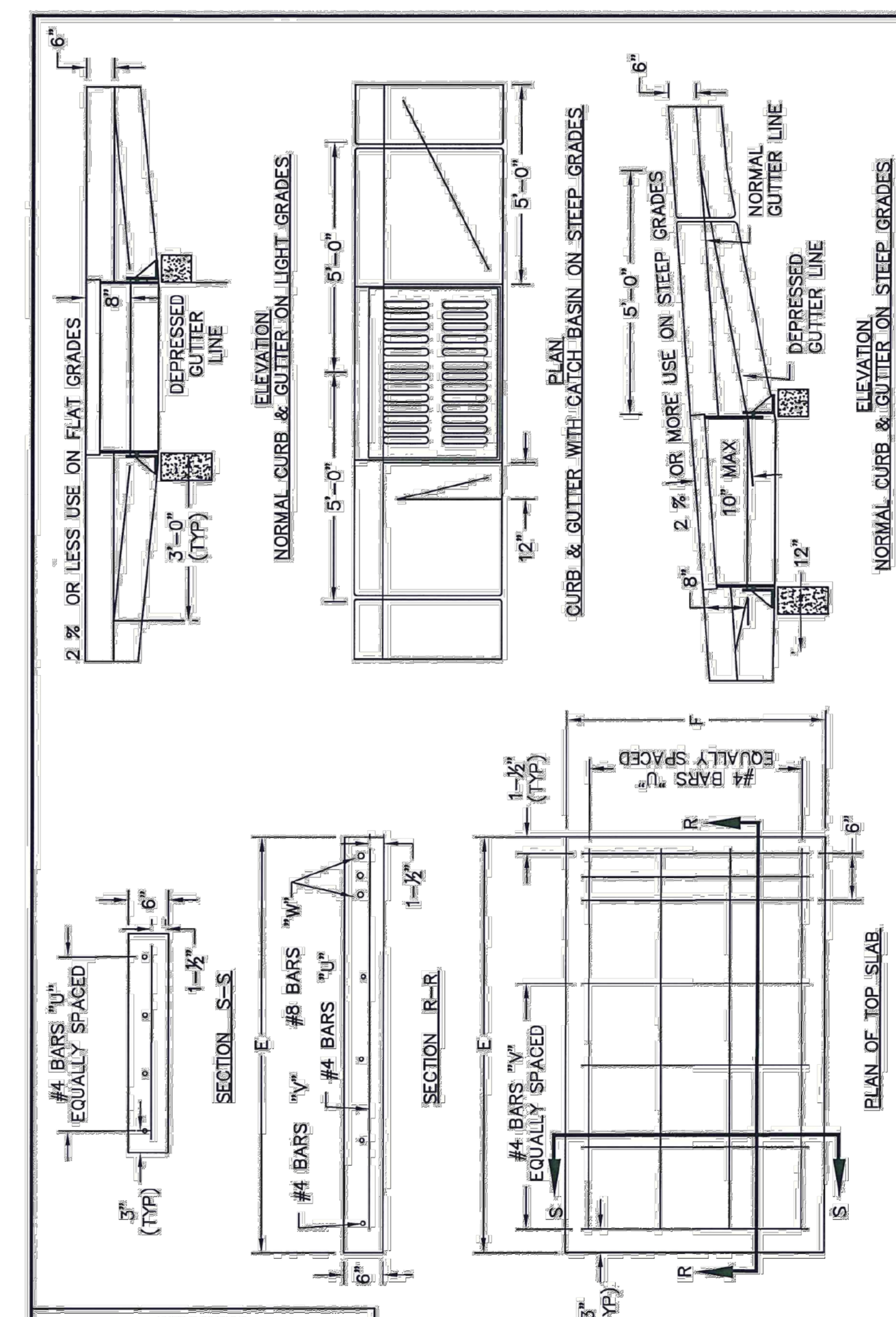
NOTES:

1. ALL CONCRETE SHALL BE 3000 P.S.I.
2. BASE SLABS SHALL BE FORMED PRIOR TO PLACING OF CONCRETE.
3. USE TYPE "A" GRATE AT SAG POINTS, OTHERWISE USE TYPE "B" OR "C" FOR THE APPROPRIATE FLOW DIRECTION.
4. ALL WALLS GREATER THAN 6" IN DEPTH SHALL BE CONSTRUCTED 12" THICK.
5. WAFFLE BOXES ARE NOT ALLOWED WITHOUT PRIOR APPROVAL FROM THE TOWN OF KNIGHTDALE

REVISIONS	
DATE	DESCRIPTION

3 of 4

TOWN OF KNIGHTDALE STANDARD DETAILS	STANDARD CURB INLET PRECAST CONCRETE BOX	STD. NO. 5.05-3



DIMENSIONS AND QUANTITIES FOR BRICK CATCH BASINS

PIPE D	SPAN A	WIDTH B	WIDTH C	SPAN G	HEIGHT MIN H1	HEIGHT H2	COVER DIMENSIONS E	COVER DIMENSIONS F	BARS "U" NO	BARS "U" LENGTH	BARS "V" NO	BARS "V" LENGTH	BARS "W" NO	BARS "W" LENGTH	TOTAL LBS	CONCRETE TOP SLAB	CONCRETE FLOOR	CONCRETE TOTAL	BRICK MASONRY H1 CU YDS	BRICK MASONRY PER FT Ht	DEDUCTIONS CM	DEDUCTIONS RC
15"	3'-0"	2'-2"			2'-6"	VARIABLE														0.321 ABOVE MIN H1	0.0308	0.047
18"					2'-10"																0.0442	0.065
24"					3'-4"																0.0794	0.113
30"			3'-4"		3'-2"		1'-10"	4'-4"	4	1'-6"	3	4'-1"	3	4'-1"	4'-1"	45				0.3231 H2	0.1224	0.170
36"			3'-10"		3'-8"		2'-4"	4'-4"	4	2'-0"	4	4'-1"	3	4'-1"	4'-1"	49					0.1760	0.230
42"				4'-5"	4'-4"		2'-1"	3'-6"	4	1'-9"	3	3'-3"	3	3'-3"	3'-3"	38					0.2400	0.323
48"				5'-0"	4'-10"		2'-6"	3'-6"	4	2'-6"	4	3'-3"	3	3'-3"	3'-3"	40					0.3131	0.460
54"	3'-0"	2'-2"		5'-7"	5'-4"		3'-3"	3'-9"	4	3'-0"	6	3'-3"	3	3'-3"	3'-3"	48					0.3958	0.580

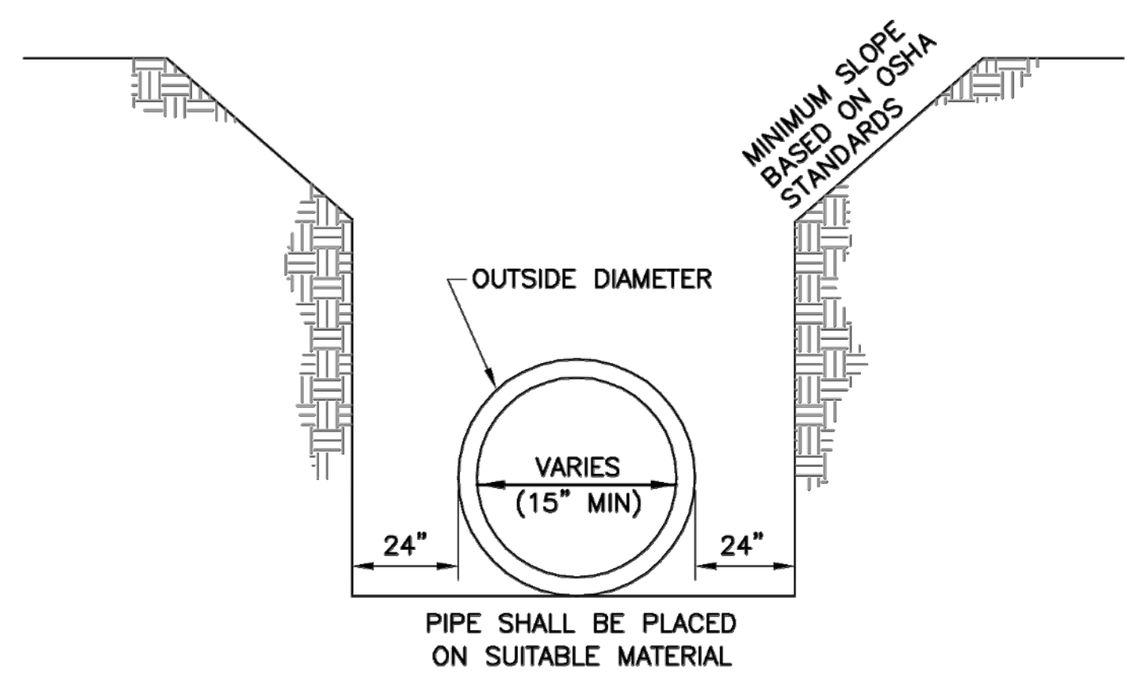
REVISIONS	
DATE	DESCRIPTION

4 of 4

TOWN OF KNIGHTDALE STANDARD DETAILS	STANDARD CURB INLET PRECAST CONCRETE BOX	STD. NO. 5.05-4

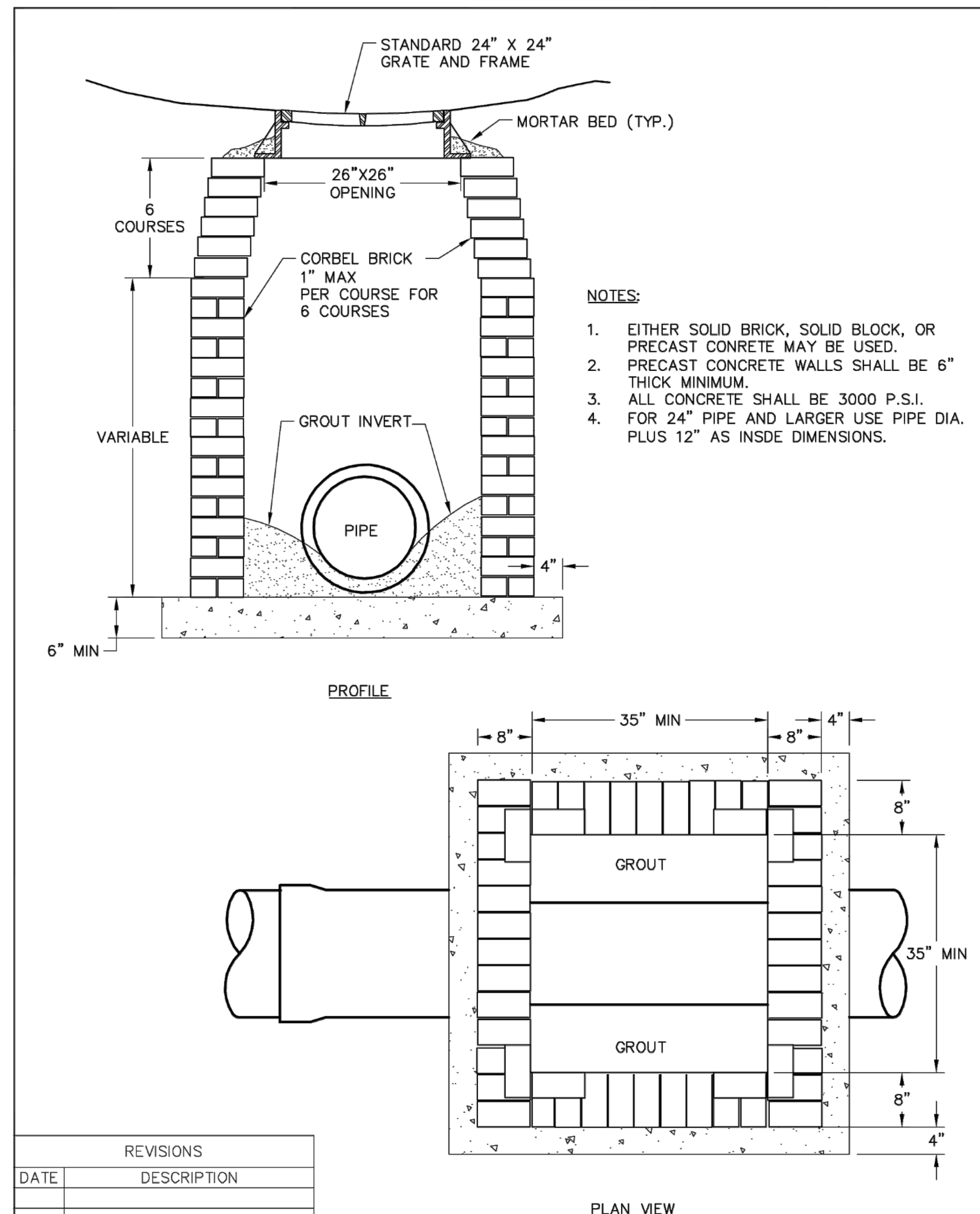
NOTES:

1. 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. THE FILL AROUND THE PIPE SHALL BE PLACED IN LAYERS NOT TO EXCEED 6". UNDER NO CIRCUMSTANCES SHALL WATER BE PERMITTED TO RISE IN UNBACKFILLED TRENCHES AFTER THE PIPE HAS BEEN PLACED. COMPACTION REQUIREMENTS SHALL BE ATTAINED BY THE USE OF MECHANICAL TAMPS ONLY. EACH AND EVERY LAYER OF BACKFILL SHALL BE PLACED LOOSE AND THOROUGHLY COMPACTED INTO PLACE.
2. ALL BACKFILL MATERIAL SHALL HAVE AN IN PLACE COMPACTED DENSITY OF AT LEAST 95% OF THE STANDARD PROCTOR MAXIMUM DENSITY.
3. THE FINAL 24" OF BACKFILL MATERIAL SHALL BE COMPACTED TO 100% OF THE STANDARD PROCTOR MAXIMUM DENSITY.
4. ALL TRENCHING OPERATIONS SHALL MEET OSHA STANDARDS.
5. BACKFILL MATERIAL BENEATH ROADWAY SHALL BE SELECT BACKFILL MATERIAL.



REVISIONS	
DATE	DESCRIPTION

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

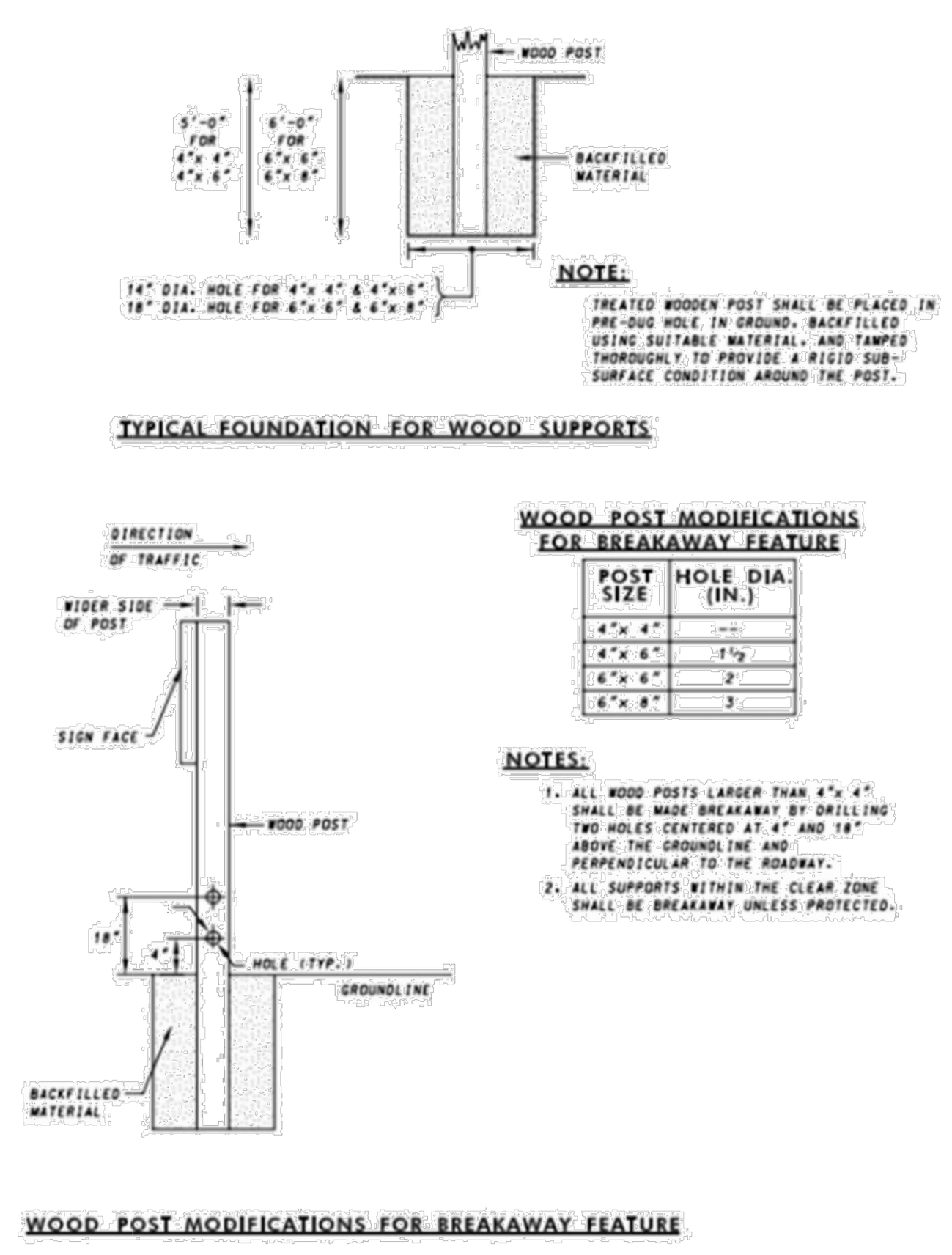


NOTES:

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

REVISIONS	
DATE	DESCRIPTION

TOWN OF KNIGHTDALE STANDARD DETAILS	STANDARD DROP INLET WITH GRATE AND FRAME	STD. NO. 5.04



NOTE:

TREATED WOODEN POST SHALL BE PLACED IN PRE-DUG HOLE IN GROUND. BACKFILLED USING SUITABLE MATERIAL, AND TAMPED THOROUGHLY TO PROVIDE A RIGID SUB-SURFACE CONDITION AROUND THE POST.

WOOD POST MODIFICATIONS FOR BREAKAWAY FEATURE

POST SIZE	HOLE DIA. (IN.)
4"x 4"	--
4"x 6"	1½
6"x 6"	2
6"x 8"	3

NOTES:

1. ALL WOOD POSTS LARGER THAN 4"x 4" SHALL BE MADE BREAKAWAY BY DRILLING TWO HOLES CENTERED AT 4" AND 18" ABOVE THE GROUNDLINE AND PERPENDICULAR TO THE ROADWAY.
2. ALL SUPPORTS WITHIN THE CLEAR ZONE SHALL BE BREAKAWAY UNLESS PROTECTED.

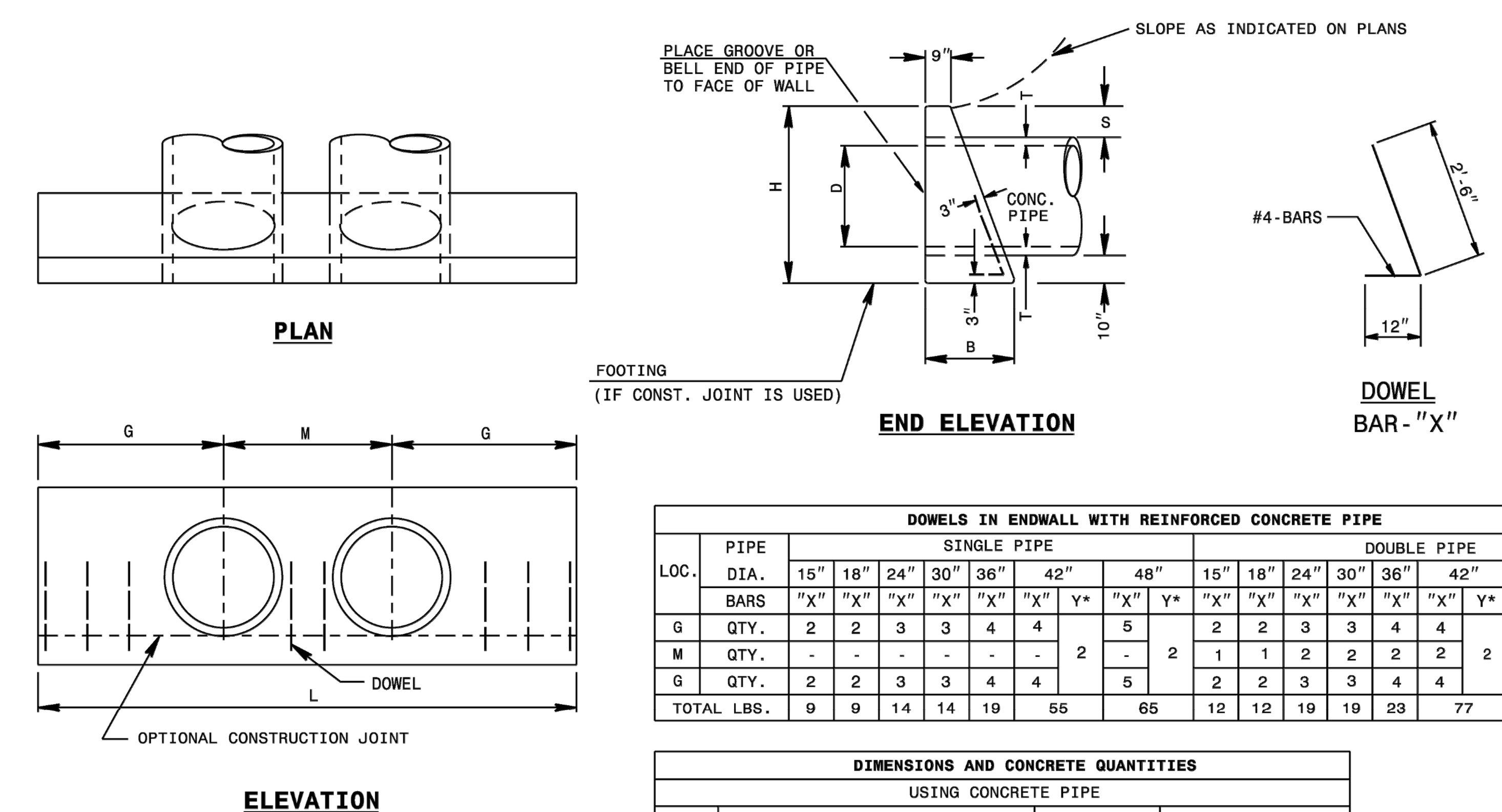


Signs should be installed on 4" x4" (min.) treated wooden post in a conspicuous location.
Signs should have an aluminum backing material
Signs should contain the above symbols as applicable
Signs should always include the following additional information:

- Name of Owner/Party responsible for maintenance
- Owner/Responsible party contact telephone
- Knightdale Stormwater Hotline Telephone: 919-217-2255

Owner/Responsible Party may submit custom signage for approval.
Signs must be properly maintained to ensure all graphics stay legible.

SPEC: 1.02 SCM Identification Sign	Drawing Type: Detail		Drawn: PB	TOWN OF KNIGHTDALE STANDARD DETAILS
Title: Stormwater Control Measure Signage Detail	Scale: N/A	Date: 11-03-2020	Rev: 1.1	



DOWELS IN ENDWALL WITH REINFORCED CONCRETE PIPE

LOC.	PIPE DIA.	SINGLE 15"	SINGLE 18"	SINGLE 24"	SINGLE 30"	SINGLE 36"	SINGLE 42"	SINGLE 42"	SINGLE 48"	SINGLE 48"	DOUBLE 15"	DOUBLE 18"	DOUBLE 24"	DOUBLE 30"	DOUBLE 36"	DOUBLE 42"	DOUBLE 42"	DOUBLE 48"	DOUBLE 48"
	BARS	"X"	"X"	"X"	"X"	"X"	"X"	Y*	"X"	Y*	"X"	"X"	"X"	"X"	"X"	"X"	Y*	"X"	Y*
G	QTY.	2	2	3	3	4	4	2	5	2	2	2	3	3	4	4	2	5	2
M	QTY.	-	-	-	-	-	-		-		1	1	2	2	2	2		3	
G	QTY.	2	2	3	3	4	4		5		2	2	3	3	4	4		5	
TOTAL LBS.		9	9	14	14	19	55		65		12	12	19	19	23	77		92	

DIMENSIONS AND CONCRETE QUANTITIES
USING CONCRETE PIPE

D	H	B	G	T	S	SINGLE PIPE L	SINGLE PIPE YD³	DOUBLE PIPE M	DOUBLE PIPE L	DOUBLE PIPE YD³
15"	3'-3"	1'-8"	2'-9"	2¼"	9½"	5'-6"	0.7	2'-2"	7'-8"	1.0
18"	3'-7"	1'-10"	3'-2"	2½"	10"	6'-4"	1.0	2'-7"	8'-11"	1.3
24"	4'-2"	2'-1"	4'-0"	3"	10"	8'-0"	1.5	3'-5"	11'-5"	2.0
30"	5'-0"	2'-6"	4'-7"	4¼"	11½"	9'-2"	2.3	4'-3"	13'-5"	3.1
36"	5'-8"	2'-8"	5'-6"	4¾"	11½"	11'-0"	3.4	5'-0"	16'-0"	4.5
42"	6'-2"	3'-1"	6'-4"	5¼"	11½"	12'-8"	4.5	5'-10"	18'-6"	6.0
48"	6'-9"	3'-5"	7'-2"	5¾"	11½"	14'-4"	6.0	6'-8"	21'-0"	8.0

*SEE SHEET 3

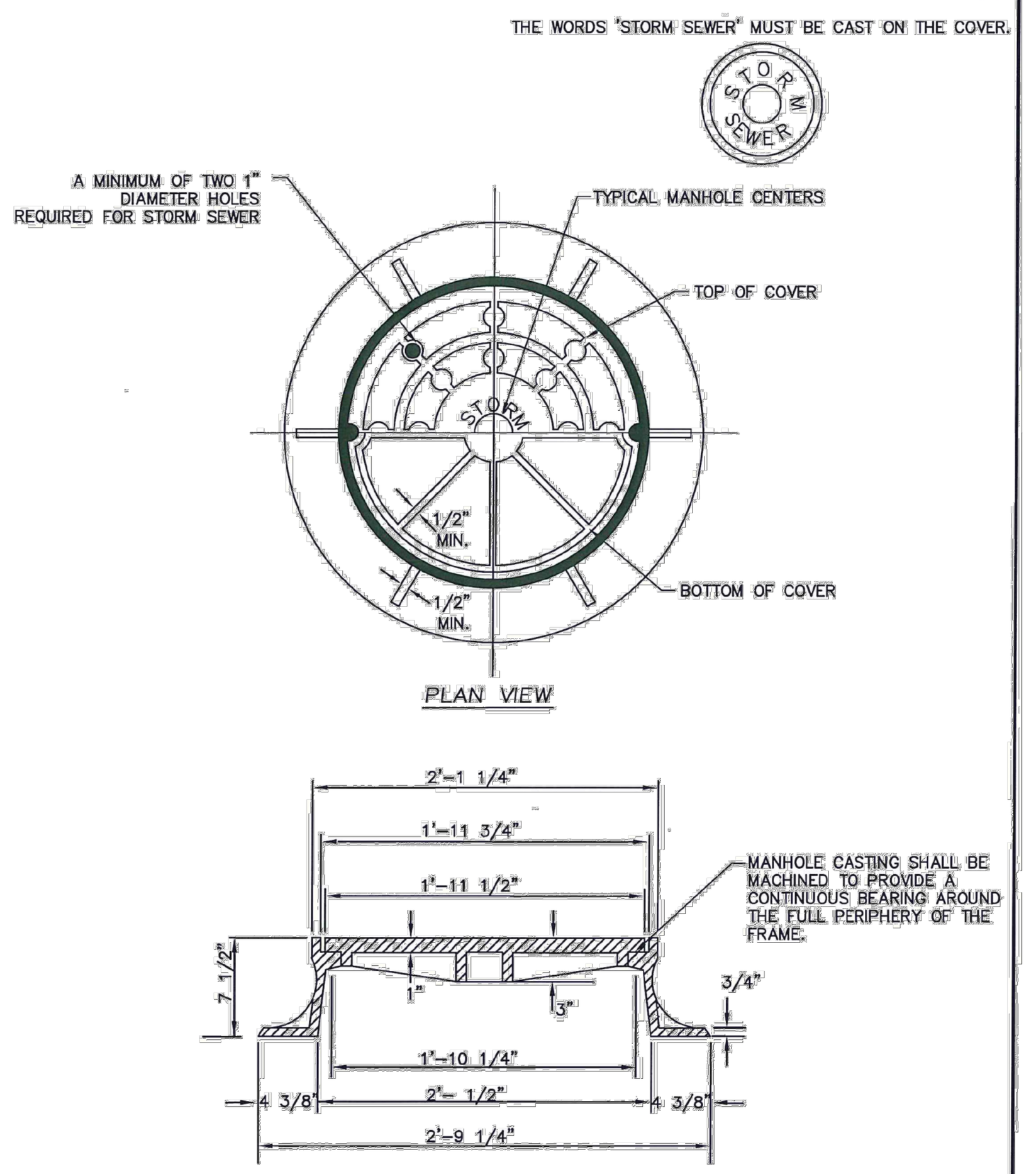
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

1-18

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

SHEET 1 OF 3
838.01

THE WORDS "STORM SEWER" MUST BE CAST ON THE COVER.



MINIMUM AVERAGE WEIGHT	
RING	190
COVER	120
TOTAL	310

REVISIONS	
DATE	DESCRIPTION

TOWN OF KNIGHTDALE STANDARD DETAILS	STANDARD MANHOLE RING & COVER	STD. NO. 5.10

SITE PERMITTING APPROVAL

Water and Sewer Permits (If applicable)

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City of Raleigh Public Utilities Department Permit # ______________

TOWN CERTIFICATION

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

BY: Samuel A. MacDonald (Digitally signed by Samuel A. MacDonald, DN: C=US, E=smacdonald@amtengineering.com, O="A. Morton Thomas & Associates, Inc.", CN=Samuel A. MacDonald, Reason: I am approving this document, Date: 2026.04.16 10:13:55-04'00') DATE: ____________
TOWN ENGINEER

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

BY: Gideon Smith (Digitally signed by Gideon Smith, DN: C=US, E=gideon.smith@knightdalenc.gov, O=Town of Knightdale, OU=Development Services, CN=Gideon Smith, Reason: I am approving this document, Date: 2026.05.19 10:14:27-04'00') DATE: ____________
LAND USE ADMINISTRATOR

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 TYLER JEFFREY CROSS (DocuSigned by: FB5F4... 5449...)
3/31/2026

THIS DRAWING PREPARED AT THE
RALEIGH OFFICE
5410 Trinity Road, Suite 102 | Raleigh, NC 27607
TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION	DATE

DATE	03/31/2026
DRAWN BY	331
DESIGNED BY	331
CHECKED BY	T. CROSS
SCALE	

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

STORM DETAILS

JOB NO.	51557
SHEET NO.	C12.4

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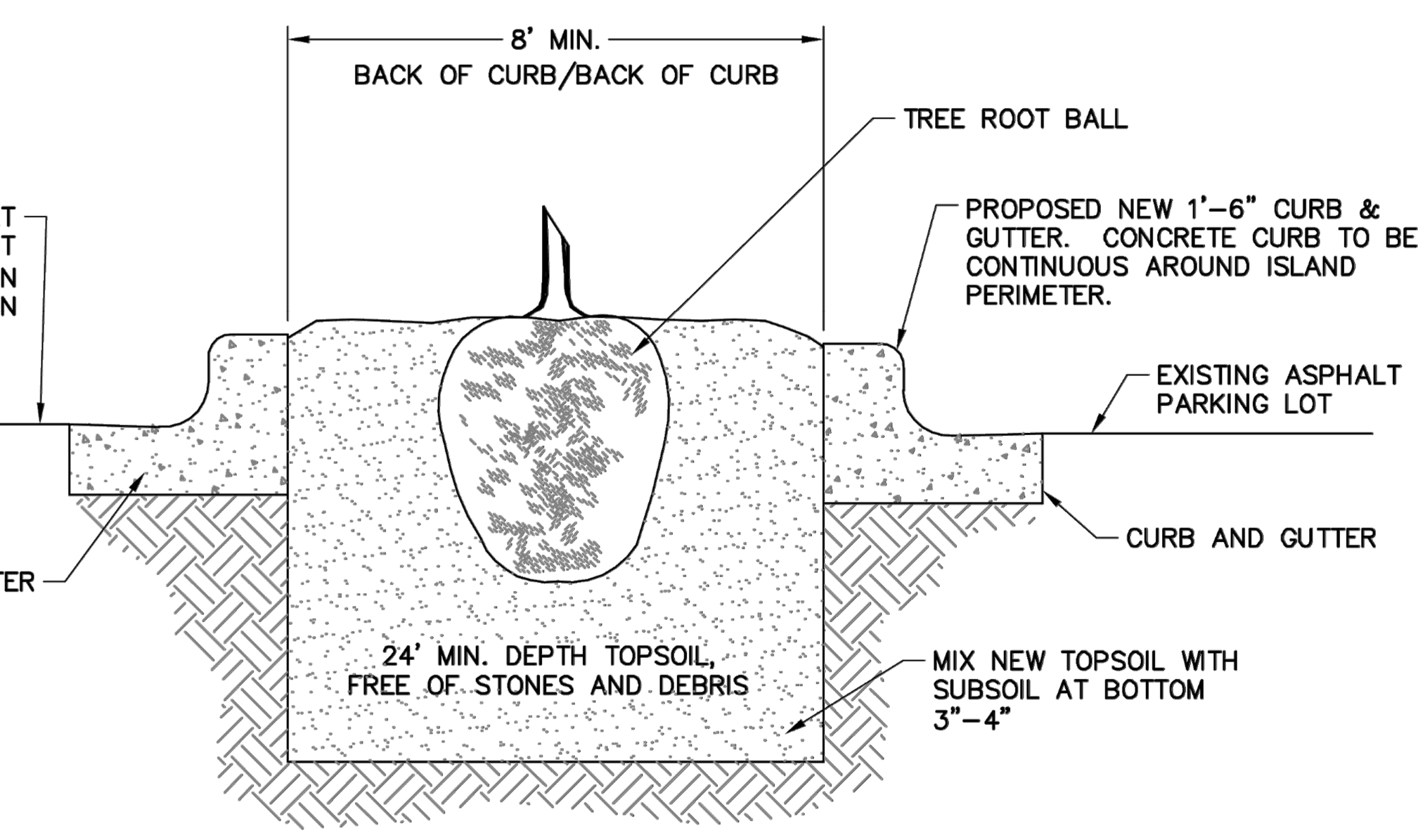


NOTES:

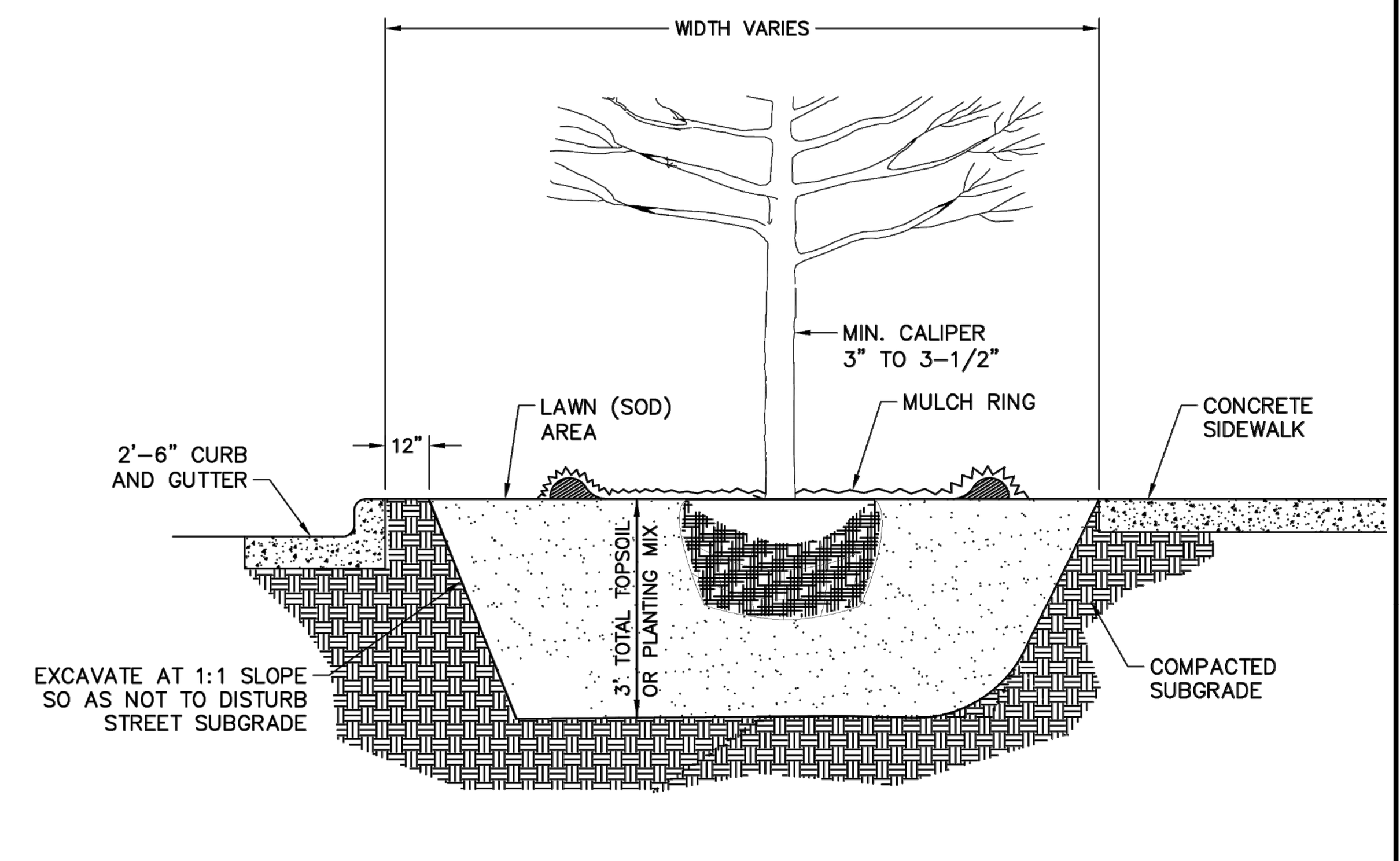
1. 300 SF MIN. TOTAL REQUIRED AREA PER TREE.
2. FOR NEW PLANTING AREAS, REMOVE ALL PAVEMENT, GRAVEL SUB–BASE AND CONSTRUCTION DEBRIS BEFORE PREPARING SOIL AND PLANTING TREES.
3. REMOVE COMPACTED SOIL AND ADD 24" NEW OR TOPSOIL/PLANTING MIX OR UNCOMPACT AND AMEND TOP 24" OF EXISTING SOIL TO MEET TOPSOIL/PLANTING MIX STANDARDS FOR TREES.

REVISIONS	
DATE	DESCRIPTION

TOWN OF KNIGHTDALE STANDARD DETAILS	TREE PLANTING ISLAND IN PARKING LOTS	STD. NO. 3.23

NOTES:

1. MEANT TO PROVIDE GUIDANCE ON STREET TREE PLANTING. REFERENCE SPECIFIC CROSS SECTION FOR PLANTING LOCATION AND WIDTH.
2. 6 FT. PLANTING WIDTH PREFERRED, WHERE POSSIBLE.
3. FOR NEW PLANTING AREAS, REMOVE ALL PAVEMENT, GRAVEL, SUB–BASE, AND CONSTRUCTION DEBRIS BEFORE PREPARING SOIL AND PLANTING TREES.
4. REMOVE COMPACTED SOIL AND ADD 24" NEW TOPSOIL WITH PLANT MIX OR UNCOMPACT AND AMEND TO 24" OF EXISTING SOIL TO MEET TOPSOIL WITH PLANTING MIX STANDARDS FOR TREES.
5. MULCH SHALL NOT BE STACKED AGAINST BASE OF PLANTING.

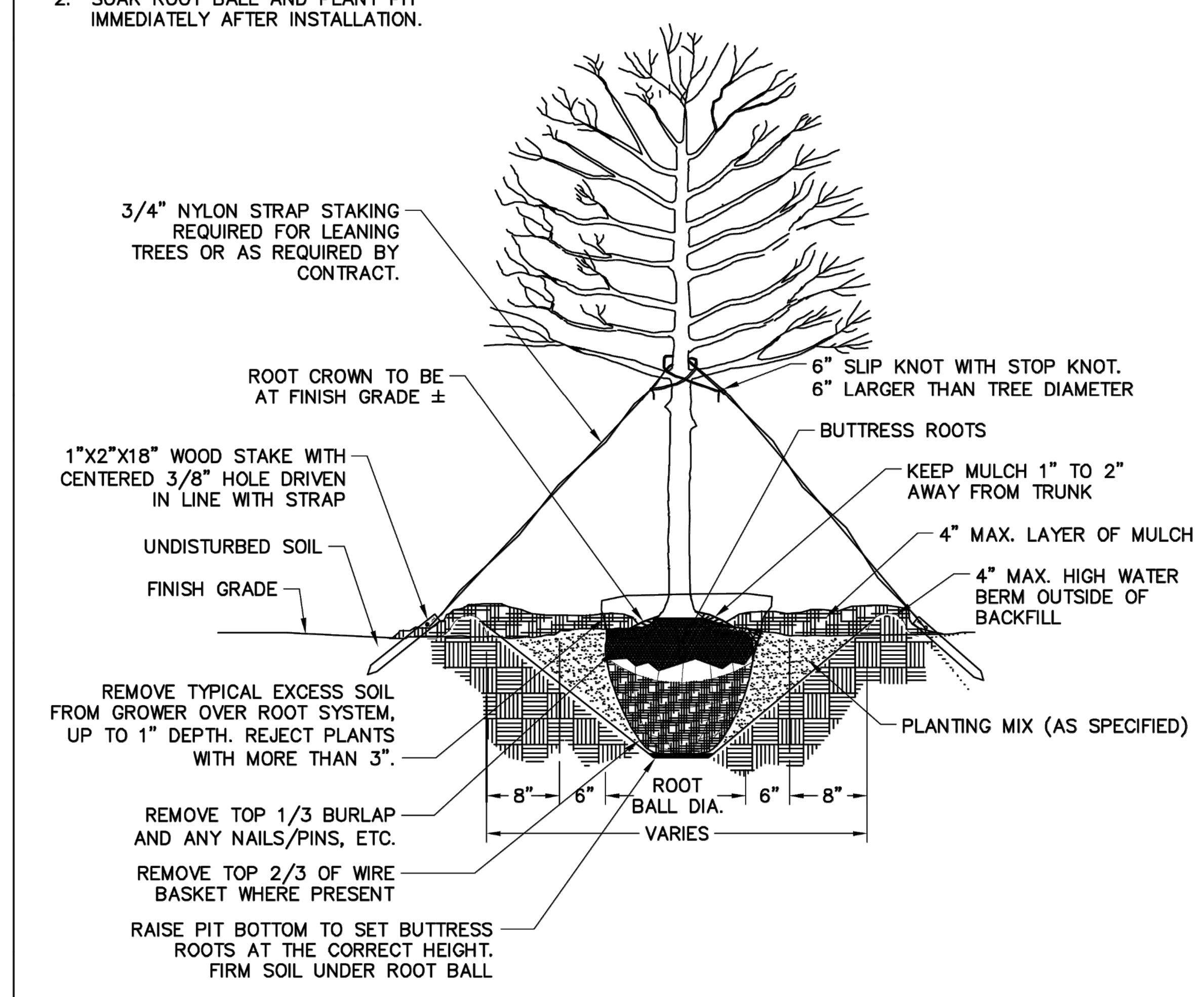


REVISIONS	
DATE	DESCRIPTION
	07.01.2024

TOWN OF KNIGHTDALE STANDARD DETAILS	STREET TREE PLANTING	STD. NO. 3.26

NOTES:

1. REMOVE WIRE OR NYLON TWINE FROM BALL.
2. SOAK ROOT BALL AND PLANT PIT IMMEDIATELY AFTER INSTALLATION.



ALL TREES SHALL MEET AMERICAN STANDARD FOR NURSERY STOCK (AMSI, 1990, PART 1, "SHADE AND FLOWERING TREES")

FOR EXAMPLE:	CALIPER	HEIGHT (RANGE)	MAX. HEIGHT	MIN. ROOT BALL DIA.	MIN. ROOT BALL DEPTH
	2"	12–14'	16'	24"	16"
	3"	14–16'	18'	32"	21"

REVISIONS	
DATE	DESCRIPTION

TOWN OF KNIGHTDALE STANDARD DETAILS	TREE PLANTING (FOR SINGLE AND MULTI-STEM TREES)	STD. NO. 3.25

MATERIAL PROPERTY DATA SHEET

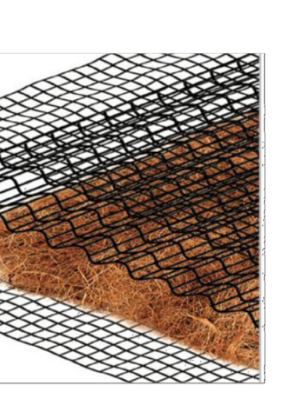
WESTERN GREEN

VMax® C350™

Permanent • Triple Net • Organic Fiber Matrix • Turf Reinforcement Mat

DESCRIPTION

C350 Turf Reinforcement Mat (TRM) is composed of 100% coconut fibers mechanically (stitch) bound between a three-dimensional UV stabilized, heavy duty synthetic net structure. Stitching is secured on two-inch centers using UV stabilized, synthetic thread. C350 is a permanent, three-dimensional TRM that provides immediate erosion protection and long-term turf reinforcement and is intended for applications requiring erosion protection for greater than thirty-six months.



Each roll of C350 is made in the USA and manufactured under Western Green's Quality Assurance Program to ensure a continuous distribution of fibers and consistent thickness.

Material Content	
Matrix	Coconut
Netting	Top Net: Heavyweight, UV stable Middle Net: Corrugated Ultra-Heavyweight, UV stable Bottom Net: Heavyweight, UV stable
Thread	Synthetic, UV Stable

Standard Roll Sizes				
Width	8 ft	(2.4 m)	6.5 ft	(2.0 m)
Length	90 ft	(27.4 m)	55.5 ft	(17.0 m)
Weight ± 10%	74 lb	(34.0 kg)	37 lb	(17.0 kg)
Area	80 sy	(66.9 m²)	40 sy	(33.4 m²)

Material available in custom roll sizes

Approvals & Classification	
Classification	FHWA: Type 5.C / ECTC: 5.D
TTI Approvals	Class 2 Type H
NTPEP Number	ECP-2020-01-14

Index Property	Test Method	Typical	
Thickness	ASTM D6525	0.58 in.	(15 mm)
Mass/Unit Area	ASTM D6566	15.0 oz/sy	(500 g/sm)
Tensile Strength – MD	ASTM D6818	750 lbs/ft	(10.9 kN/m)
Tensile Strength – TD	ASTM D6818	750 lbs/ft	(10.9 kN/m)
Elongation - MD	ASTM D6818	30%	
Elongation – TD	ASTM D6818	20%	
UV Stability	ASTM D4355	80% @1000 hr	
Light Penetration	ASTM D6567	10%	
Biomass Improvement	ASTM D7322	350%	
Specific Gravity	ASTM D792	57.4 lb/ft³	(0.92 g/cm³)
Porosity	ECTC	N/A	

Design Parameters		
Property	Unvegetated	Vegetated[3]
RUSLE C Factor[2]	0.05	N/A
Slope Maximum Gradient[1]	0.5H:1V	0.5H:1V
Permissible Shear Stress[2]	3.2 psf (155 Pa)	12.0 psf (575 Pa)
Permissible Velocity[2]	10.5 fps (3.2 m/s)	18.0 fps (5.5 m/s)
τ_{veg} / τ_{TRM} (HEC-15)	N/A	0.44

Manning's n Roughness (HEC-15)		
τ_{lower}	τ_{mid}	τ_{upper}
0.035	0.032	0.027

1 Maximum Gradient a recomendation for typical installations.
2 Hydraulic thresholds compliant with ASTM D6459/D6460 but generalized for typical applications.
3 Vegetated values dependent on established stand of vegetation

Disclaimer: The information contained herein may represent product index data, performance ratings, bench scale testing or other material utility quantifications. Each representation may have unique utility and limitations. Every effort has been made to ensure accuracy, however, no warranty is claimed and no liability shall be assumed by Western Green or its affiliates regarding the completeness, accuracy or fitness of these values for any particular application or interpretation. While testing methods are provided for reference, values shown may be derived from interpolation or adjustment to be representative of intended use. For further information, please feel free to contact Western Green.

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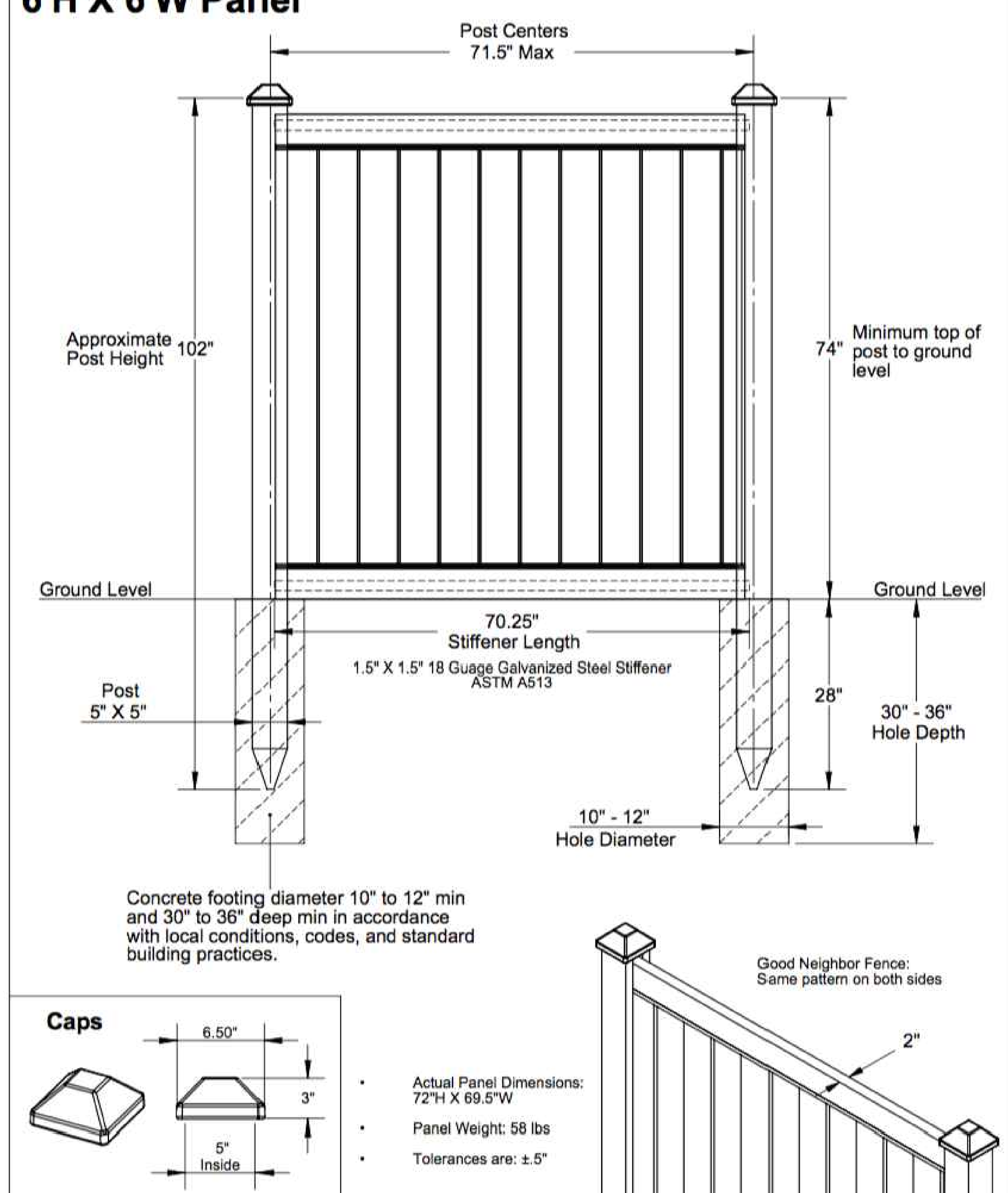
6'H X 6'W Panel



Model #:WP72X72	This drawing may not be altered or reproduced without the permission of SimTek Fence		SimTek FENCE
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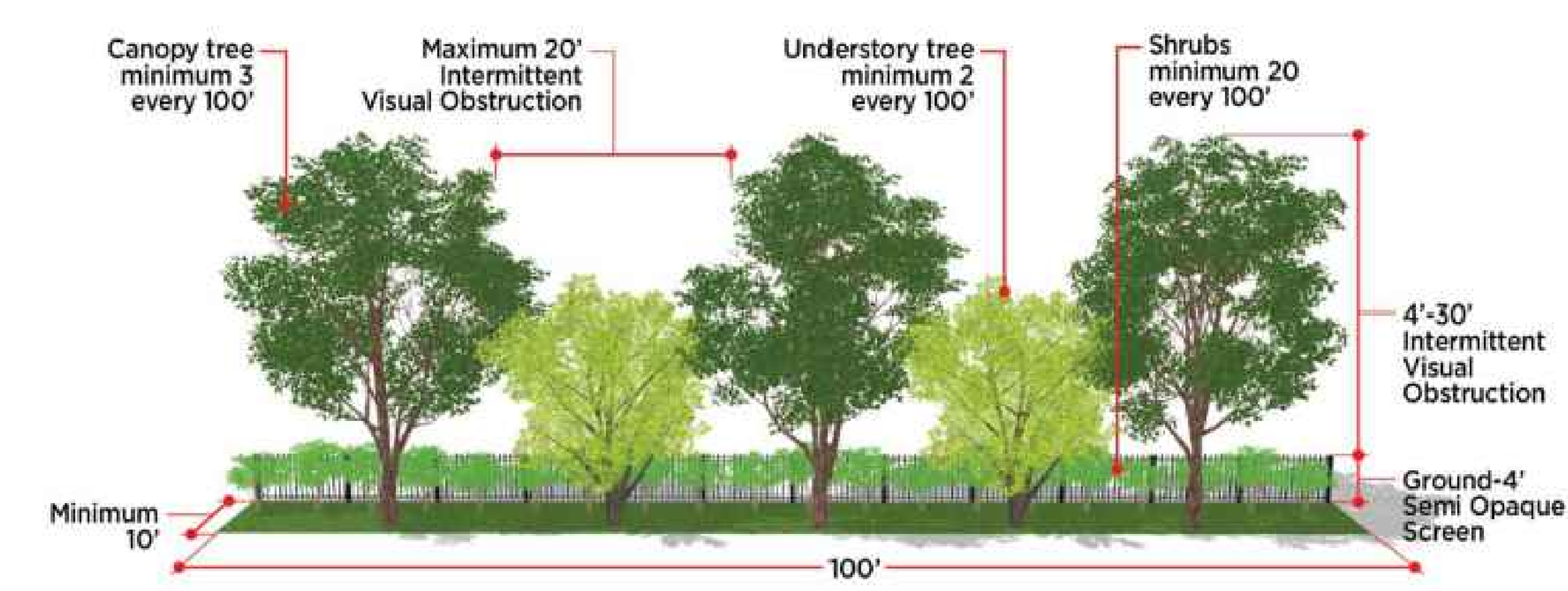
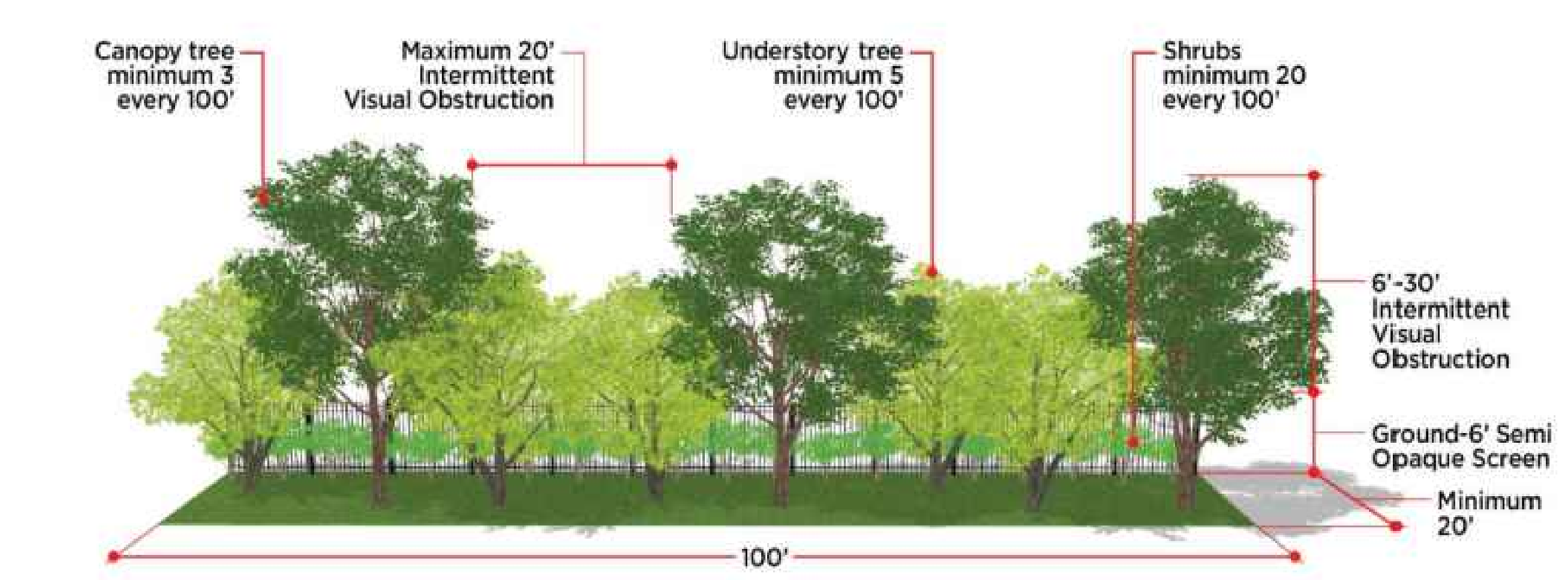
Sheet 1 of 1	U.S. Patents: 7,478,797 / 7,635,114 Foreign Patents Pending		www.simtekfence.com



TYPE A BUFFER YARD
NOT TO SCALE



TYPE B BUFFER YARD
NOT TO SCALE

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: Samuel A. MacDonald DATE: ____________
TOWN ENGINEER

Digitally signed by Samuel A. MacDonald
DN: C=US, E=smacdonald@amtengineering.com, O="A. Morton Thomas & Associates, Inc.", CN=Samuel A. MacDonald
Reason: I am approving this document
Date: 2026.04.16 10:14:25-04'00'

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

BY: Gideon Smith DATE: ____________
LAND USE ADMINISTRATOR

Digitally signed by Gideon Smith
DN: C=US, E=gideon.smith@knightdalenc.gov, O=Town of Knightdale, OU=Development Services, CN=Gideon Smith
Reason: I am approving this document
Date: 2026.05.19 10:14:38-04'00'

NORTH CAROLINA PROFESSIONAL SEAL 051879 ENGINEER TYLER JEFFREY CROSS
3/31/2026

THIS DRAWING PREPARED AT THE **RALEIGH OFFICE**
5410 Trinity Road, Suite 102 | Raleigh, NC 27607
TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

DATE	REVISION DESCRIPTION

DATE	03/31/2026
DRAWN BY	331
DESIGNED BY	331
CHECKED BY	T. CROSS
SCALE	

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS

KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

LANDSCAPE DETAILS

JOB NO.	51557
SHEET NO.	C12.5

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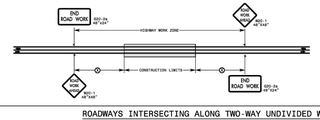
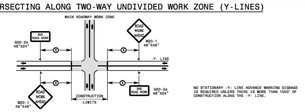
Docusign Envelope ID: 0BE430A7-A22A-42DC-A151-320BB5CC0A15

TWO-WAY UNDIVIDED (L-LINES)



POSTED SPEED LIMIT (MPH)	RECOMMENDED MAXIMUM SIGN SPACING "D"
≤ 30	350'
35	1000'

ROADWAYS INTERSECTING ALONG TWO-WAY UNDIVIDED WORK ZONE (Y-LINES)



NO STATIONARY Y- LINE ADVANCE WARNING SIGNAGE IS REQUIRED WHEN WORK ZONE IS LESS THAN 1000' OF CONSTRUCTION ALONG THE Y- LINE.

GENERAL NOTES

1- DO NOT INSTALL ADVANCE WARNING SIGNS MORE THAN 3 DAYS PRIOR TO BEGINNING OF WORK UNLESS COVERED.

2- SIGNS SHOWN ARE REQUIRED FOR WORK ZONES THAT WILL REMAIN IN EFFECT LONGER THAN 3 CONSECUTIVE DAYS.

3- ALL SIGN SPACING DIMENSIONS ARE APPROXIMATE, FIELD ADJUST AS NECESSARY OR AS DIRECTED.

4- ERECT SIGNS PER RSD 1110.01. PAYMENT FOR WOOD POSTS, SUB STEEL U-CHANNEL AND SQUARE STEEL TUBING POSTS WITH SIGNS WILL BE MADE ACCORDING TO STANDARD SPECIFICATIONS FOR WORK ZONE SIGNS.

5- WHEN NECESSARY, USE SPLICING IN ACCORDANCE WITH RSD. 1110.01.

6- DO NOT BACK BRACE SIGN SUPPORTS.

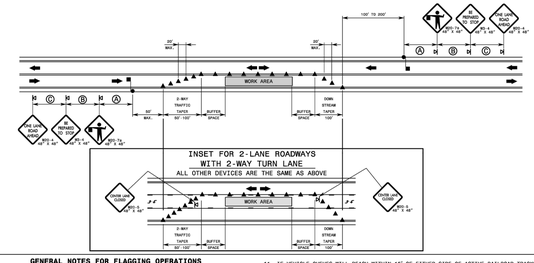
LEGEND
- STATIONARY SIGN
- DIRECTION OF TRAFFIC FLOW

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

1-1B

ROADWAY STANDARD DRAWING FOR
WORK ZONE ADVANCE WARNING SIGNS FOR TWO-WAY UNDIVIDED FACILITIES

SHEET 3 OF 3
1101.01



GENERAL NOTES FOR FLAGGING OPERATIONS

1- REFER TO RSD. 1101.11, SHEETS 1 & 4, FOR "L" DISTANCE AND SIGN SPACING.

2- INSTALL LANE CLOSURES WITH THE TRAFFIC FLOW, BEGINNING WITH DEVICES ON THE CONSTRUCTION SIDE OF TRAFFIC.

3- REMOVE LANE CLOSURES AGAINST THE TRAFFIC FLOW, BEGINNING WITH DEVICES ON THE CONSTRUCTION SIDE OF TRAFFIC.

4- PLACE CONES THRU THE WORK AREA AT THE MAXIMUM SPACING EQUAL IN FEET TO 2 TIMES THE POSTED SPEED LIMIT.

5- EXTEND LANE CLOSURES AT THE BUFFER SPACE SUCH THAT STOPPING SIGHT DISTANCE IS PROVIDED TO THE FLAGGER (REFER TO RSD. 1101.11, SHEET 2).

6- DO NOT STOP TRAFFIC IN ANY ONE DIRECTION FOR MORE THAN 5 MINUTES AT A TIME.

7- DRUMS OR SKINNY DRUMS MAY BE USED IN LIEU OF CONES. REFER TO RSD. 1180.01 FOR SKINNY DRUM REQUIREMENTS.

8- USE FLAGGERS TO CONTROL TRAFFIC AT INTERSECTIONS AFFECTED BY THE LANE CLOSURE. SUPPLEMENT FLAGGERS LOCATED AT INTERSECTIONS WITH FLAGGER AHEAD SIGNS (W20-7A) PLACED APPROXIMATELY 1000 FT. IN ADVANCE OF THE FLAGGER. FOR SIGNALIZED INTERSECTIONS PLACE SIGNALS IN THE FLASH MODE AND USE LAW ENFORCEMENT.

9- REFER TO THE CURRENT MUTCD FOR FLAGGER CONTROL, REQUIREMENTS, AND PROCEDURES.

10- DO NOT EXCEED A 1 MILE LANE CLOSURE LENGTH UNLESS OTHERWISE SHOWN IN THE TMP OR AS DIRECTED BY THE ENGINEER.

11- IF VEHICLE QUEUES WILL REACH WITHIN 15' OF EITHER SIDE OF ACTIVE RAILROAD TRACKS, PLACE FLAGGERS AT THE RAILROAD CROSSING TO ADVISE MOTORISTS TO STOP. FLAGGERS STOPPING WITHIN THE GRADE CROSSING PROVIDE DIVISION OR FLAGGER EVEN IF AUTOMATIC WARNING MEASURES ALREADY EXIST.

GENERAL NOTES FOR PILOT CAR OPERATIONS

1- USE PILOT CARS WHEN DIRECTED BY THE ENGINEER.

2- IF ROADWAY WIDTH IS LESS THAN 22 FEET (EDP TO EDP), CONFIG.WAY NOT BE REQUIRED. PLACE "PILOT CAR FOLLOW ME" SIGN AT THE BEGINNING POSITION OF THE ENGINEER, CONES MAY BE OMITTED ALONG THE WORK AREA IF USING A PILOT CAR.

3- CONES ARE ALWAYS REQUIRED IN THE UPSTREAM AND DOWNSTREAM TAPERS.

4- MOUNT SIGN G20-4 "PILOT CAR FOLLOW ME" AT A CONSPICUOUS POSITION ON THE REAR OF THE PILOT VEHICLE.

5- DO NOT INSTALL MORE THAN ONE (1) MILE OF LANE CLOSURE AHEAD OF THE PILOT CAR. REMOVE CONES AT THE MERGE TAPER TO THE END OF THE LANE CLOSURE.

6- ADVISE RESIDENTS AND BUSINESSES WITHIN THE LANE CLOSURE LIMITS ABOUT METHODS OF SAFE EGRESS AND INGRESS FROM DRIVEWAYS DURING FLAGGING AND PILOT CAR OPERATIONS.

LEGEND
- FLAGGER
- CONE
- PORTABLE SIGN
- DIRECTION OF TRAFFIC FLOW

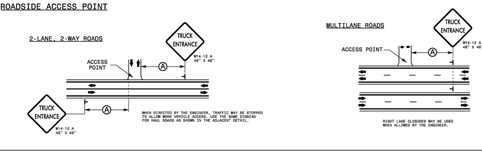
STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

1-1B

ROADWAY STANDARD DRAWING FOR
TEMPORARY LANE CLOSURES
2-LANE, 2-WAY ROADWAY, 1 LANE CLOSED

SHEET 1 OF 14
1101.02

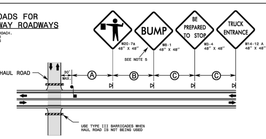
ROADSIDE ACCESS POINT



WHEN DIRECTED BY THE ENGINEER, TRAFFIC MAY BE STOPPED TO ALLOW WORK VEHICLE ACCESS, USE THE LANE CLOSING FOR HAUL ROADS AS SHOWN IN THE ROADWAY DETAIL.

RIGHT LANE CLOSURES MAY BE USED WHEN ALLOWED BY THE ENGINEER.

HAUL ROADS FOR 2-LANE, 2-WAY ROADWAYS



GENERAL NOTES

1- MOUNT SIGNS ON BOTH LEFT AND RIGHT SIDES ON DIVIDED ROADWAYS. SIGNS ARE REQUIRED ONLY ON THE RIGHT SIDE OF THE ROADWAY FOR UNDIVIDED ROADWAYS.

2- PROVIDE MINIMUM STOPPING SIGHT DISTANCE FOR EACH FLAGGER LOCATION.

3- REFER TO RSD. 1101.11, SHEETS 2 & 4, FOR STOPPING SIGHT DISTANCE AND SIGN SPACING.

4- UPON COMPLETION OF EACH HAULING OPERATION, REPAIR, SWEEP, AND RESTORE THE ROADWAY TO BE SAFELY TRAVERSABLE AT NORMAL OPERATING SPEEDS.

5- "BUMP" SIGNS (W9-1) ARE REQUIRED ONLY IF A BUMP OVER THE ROADWAY EXISTS AS A RESULT OF IMPLEMENTING THE HAUL ROAD. USE FLAGGERS AT ALL TIMES TO STOP TRAFFIC WHEN BUMPS ARE LOCATED ACROSS THE ROADWAY. CONSTRUCT BUMPS TO PROVIDE A SMOOTH TRANSITION FOR TRAFFIC CROSSING THEM. REMOVE BUMPS PRIOR TO ALLOWING TRAFFIC TO RESUME NORMAL OPERATING SPEEDS.

6- WHEN NOT SPECIFIED IN THE PLANS OR BY THE ENGINEER, PAYMENT FOR CONVENIENCE WILL NOT BE MADE FOR FLAGGERS.

LEGEND
- STATIONARY SIGN
- PORTABLE SIGN
- FLAGGER
- DIRECTION OF TRAFFIC FLOW

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

1-1B

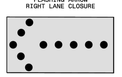
ROADWAY STANDARD DRAWING FOR
WORK ZONE VEHICLE ACCESSES
HAUL ROAD ACCESS

SHEET 1 OF 2
1101.05

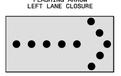
FLASHING ARROW BOARD MODES

FLASHING ARROW BOARD TYPE			
PANEL TYPE	MINIMUM SIZE (W x H IMCHES)	MINIMUM LEGIBILITY DISTANCE (MILES)	MINIMUM NUMBER OF ELEMENTS
C	96 X 48	1	15

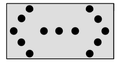
FLASHING ARROW RIGHT LANE CLOSURE



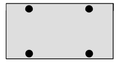
FLASHING ARROW LEFT LANE CLOSURE



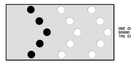
FLASHING DOUBLE ARROW CENTER LANE CLOSURE



FLASHING CAUTION MODE

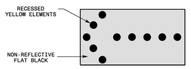


MOVING CHEVRON



ONE CHEVRON WILL BE LIT ON THE ARROW BOARD TO INDICATE THE DIRECTION OF OPEN TRAFFIC

TYPICAL FLASHING ARROW BOARD



GENERAL NOTES

1- DO NOT USE STRAIGHT-LINE CAUTION OR STATIC CHEVRON DISPLAYS.

2- USE A MINIMUM MOUNTING HEIGHT OF 7 FEET FROM GROUND LEVEL TO THE BOTTOM OF THE PANEL FOR TRAILER-MOUNTED ARROW BOARDS, EXCEPT ON VEHICLE-MOUNTED PANELS WHICH SHOULD BE AS HIGH AS PRACTICAL.

3- USE ARROW BOARD ELEMENTS CAPABLE OF A MINIMUM 50 PERCENT DIMMING FROM THEIR FULL RATED LAMP VOLTAGE. USE FULL LAMP VOLTAGE DURING THE DAY, AND USE THE DIMMED MODE AT NIGHT.

4- DO NOT USE ARROW BOARDS IN FLASHING ARROW MODE ON A 2-LANE, 2-WAY ROADWAY DURING A ONE LANE OPERATION, NOR ON MULTILANE ROADWAYS WHEN SHIFTING ALL TRAFFIC LANES LATERALLY.

5- ALL FLASHING ARROW BOARDS MUST BE LISTED ON THE THE DEPARTMENT'S APPROVED PRODUCTS LIST.

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

1-1B

ROADWAY STANDARD DRAWING FOR
FLASHING ARROW BOARDS

SHEET 1 OF 1
1115.01

TIRE BALLAST

ALL RUBBER COLLARS MUST BE BLACK IN COLOR AND FREE OF ANY COLORED PILOT

BALLAST COLLAR SHALL HAVE GOOD CONTACT WITH THE BARREL, FILLING AND BALLAST WITH SAND OR WATER IS NOT ACCEPTABLE

DRUMS THAT USE TIRE BALLASTS ARE MANUFACTURED SPECIFICALLY FOR THAT PURPOSE. DO NOT USE TIRE BALLASTS WITH OTHER DRUM VERSIONS.

GENERAL NOTES

1- BALLASTING SHALL BE ACHIEVED BY THE SAND BAG, TIRE-SIDEWALL, OR PREFORMED WEIGHTED BASE METHODS. USE THE TIRE BALLAST AS SPECIFIED BY THE MANUFACTURER. DO NOT PLACE BALLAST ON TOP OF THE DRUM.

2- IF NECESSARY PLACE THE NAME OF THE AGENCY, CONTRACTOR, OR SUPPLIER ON NON-RETROREFLECTIVE DRUM SURFACES. SHOW THE LETTERS AND NUMBERS USING A NON-RETROREFLECTIVE COLOR AND NOT OVER 2" IN HEIGHT.

3- ALL DRUMS MUST BE LISTED ON THE DEPARTMENT'S APPROVED PRODUCT LIST.

4- REFER TO THE STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES FOR ADDITIONAL INFORMATION.

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

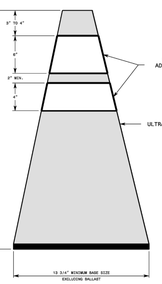
1-1B

ROADWAY STANDARD DRAWING FOR
DRUMS

SHEET 1 OF 1
1130.01

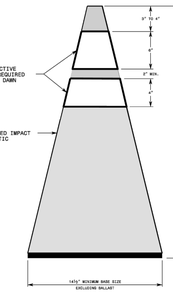
28 INCH CONE

(MINIMUM SIZE CONE FOR ALL CLASSES OF ROADS SUBJECT FREEWAYS AND EXPRESSWAYS)



36 INCH CONE

(REQUIRED FOR FREEWAYS AND EXPRESSWAYS)



GENERAL NOTES

1- ACHIEVE BALLASTING BY USING SPECIAL WEIGHTED BASES SUCH AS SAND BAG RINGS, DOUBLING CONES, OR BASES THAT CAN BE FILLED WITH BALLAST. SEVENTY PERCENT OF THE WEIGHT OF THE CONE MUST BE IN THE BASE. USE BALLAST'S THAT DO NOT PRESENT A HAZARD WHEN STRUCK.

2- ALL CONES MUST BE LISTED ON THE DEPARTMENT'S APPROVED PRODUCTS LIST.

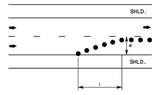
STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

1-1B

ROADWAY STANDARD DRAWING FOR
CONES

SHEET 1 OF 1
1135.01

EXAMPLE OF "L" & "W" DESIGNATIONS



TAPER LENGTH CRITERIA FOR CHANNELIZING DEVICES IN WORK ZONES

TYPES OF TAPERS	TAPER LENGTH
MERGING TAPER	L MINIMUM
SHIFTING TAPER	½ L MINIMUM
SHOULDER TAPER	⅓ L MINIMUM
TWO-WAY TRAFFIC TAPER	50' - 100 FEET MAXIMUM
DOWNSTREAM TAPER	100 FEET MAXIMUM

DO NOT INTRODUCE A MERGING OR SHIFTING TAPER WITHIN A CURVE OF THE ROADWAY

QUICK REFERENCE - "L" DISTANCE TABLE MINIMUM LONGITUDINAL DISTANCE "L" (FEET) (ROUNDED VALUES)											
POSTED SPEED (MPH)	LATERAL WIDTH "W" (FEET)										
	1	2	3	4	5	6	7	8	9	10	11	12
20	10	15	20	30	35	40	50	55	60	70	75	80
25	15	25	35	45	55	65	75	85	95	105	115	125
30	15	30	45	60	75	90	105	120	135	150	165	180
35	25	45	65	85	105	125	145	165	185	205	225	245
40	30	55	80	110	135	160	190	215	240	270	295	320
45	45	90	135	180	225	270	315	360	405	450	495	540
50	50	100	150	200	250	300	350	400	450	500	550	600
55	55	110	165	220	275	330	385	440	495	550	605	660
60	60	120	180	240	300	360	420	480	540	600	660	720
65	65	130	195	260	325	390	455	520	585	650	715	780
70	70	140	210	280	350	420	490	560	630	700	770	840

GENERAL NOTES

1- TABLE FOR "L" DISTANCE IS BASED ON CHANNELIZATION TAPER FORMULA FROM THE MUTCD. WHERE:

SPEED LIMIT	FORMULA
40 MPH OR LESS	$L_{MIN} = \frac{W \times S^2}{60}$
45 MPH OR GREATER	$L_{MIN} = W \times S$

L = MINIMUM TAPER LENGTH IN FEET (LONGITUDINAL DISTANCE)
W = WIDTH OF OFFSET IN FEET (LATERAL DISTANCE)
S = POSTED SPEED LIMIT, OR OFF-PEAK 85 PERCENTILE SPEED IN MPH PRIOR TO WORK STARTING, OR THE ANTICIPATED OPERATING SPEED IN MPH

2- "L" DISTANCE IS FOR APPLICATION WITH CHANNELIZING DEVICE AND PAVEMENT MARKING TAPERS AND TRANSITIONS. CHANNELIZING DEVICES INCLUDE DRUMS, CONES, TUBULAR MARKERS, BARRICADES, RAISED ASPHALT ISLANDS, AND VERTICAL PANELS.

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

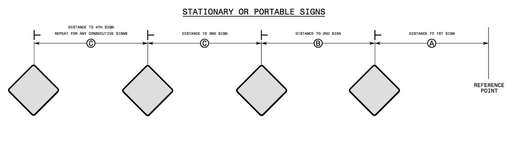
1-1B

ROADWAY STANDARD DRAWING FOR
TRAFFIC CONTROL DESIGN TABLES
"L" DISTANCE AND CHANNELIZING DEVICE TAPER CRITERIA

SHEET 1 OF 4
1101.11

ADVANCE WARNING SIGN SPACING CHART			
POSTED SPEED LIMIT (MPH)	RECOMMENDED DISTANCE BETWEEN SIGNS (FEET)+		
	A	B	C
≤ 35	200	200	200
40-50	350	350	350
55	500	500	500
CONTROLLED ACCESS ROADS (≥ 55)	1000	1500	2700

STATIONARY OR PORTABLE SIGNS



GENERAL NOTES

1- REFER TO 2009 MUTCD OR THE LATEST EDITION.

2- USE THIS STANDARD DRAWING IN CONJUNCTION WITH OTHER TRAFFIC CONTROL ROADWAY STANDARD DRAWINGS WHERE SIGN SPACING DISTANCES A, B, C, ARE SPECIFIED.

3- APPLY THE ADVANCE WARNING SIGN SPACING CHART WHERE A SERIES OF 2 OR MORE SIGNS ARE USED. ALL SIGN SPACING DIMENSIONS ARE APPROXIMATE. FIELD ADJUST AS VARIOUS CONDITIONS OCCUR, SUCH AS LIMITED SIGHT DISTANCE, OBSTRUCTION INTERFERENCE, ETC.

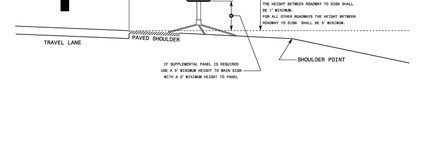
STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

1-1B

ROADWAY STANDARD DRAWING FOR
TRAFFIC CONTROL SIGNS IN SERIES
SPACING OF TEMPORARY SIGNS IN SERIES

SHEET 4 OF 4
1101.11

LATERAL CLEARANCE:



GENERAL NOTES

1- DIMENSIONS SHOWN ARE MINIMUM VALUES. MOUNT SIGNS SO THEY WILL BE CLEARLY VISIBLE TO APPROACHING TRAFFIC EVEN WHEN SIGNS ARE MOUNTED BEHIND TRAFFIC CONTROL DEVICES SUCH AS DRUMS, BARRIER, OR OTHER OBJECTS.

2- ALL PORTABLE SIGNS AND STANDS MUST MEET OR EXCEED THE REQUIREMENTS OF NCHRP 350 FOR CATEGORY II DEVICES. USE PORTABLE WORK ZONE SIGNS AND STANDS SPECIFICALLY DESIGNED FOR ONE ANOTHER.

3- ALL PORTABLE WORK ZONE SIGNS AND STANDS MUST BE LISTED ON THE DEPARTMENT'S APPROVED PRODUCTS LIST.

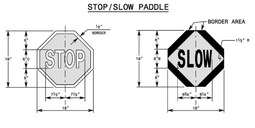
STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

1-1B

ROADWAY STANDARD DRAWING FOR
PORTABLE WORK ZONE SIGNS
MOUNTING HEIGHT & LATERAL CLEARANCE

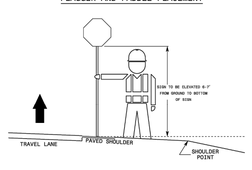
SHEET 1 OF 1
1110.02

STOP/SLOW PADDLE



NOTE: FOR OPERATIONS THAT ARE RESTRICTED FROM SIGN TO DAWN ONLY, USE REFLECTORIZED LEGENDS, BORDERS AND BACKGROUNDS.

FLAGGER AND PADDLE PLACEMENT



GENERAL NOTES

1- USE HAND SIGNALING DEVICES SUCH AS STOP-SLOW PADDLES, FLASHLIGHTS TO CONTROL TRAFFIC. USE STOP-SLOW PADDLES AS THE PRIMARY DEVICE.

2- FABRICATE STOP-SLOW PADDLES FROM SHEET METAL OR OTHER LIGHT SEMI RIGID MATERIAL. PROVIDE A RIGID HANDLE OF SUFFICIENT LENGTH SO THE PADDLE IS HELD AT 6'-7' ABOVE GROUND LEVEL.

3- PROVIDE STOPPING SIGHT DISTANCE TO EACH FLAGGER STATION. REFER TO RSD. 1101.11, SHEET 2.

4- ILLUMINATE FLAGGER STATIONS DURING NIGHT OPERATIONS.

5- FOLLOW FLAGGER QUALIFICATIONS AND METHODS OF HAND-SIGNALING PROCEDURES IN ACCORDANCE WITH PART VI OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

6- ALL FLAGGERS MUST BE CERTIFIED BY AN NCDOT APPROVED TRAINING RESOURCE.

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

1-1B

ROADWAY STANDARD DRAWING FOR
FLAGGERS

SHEET 1 OF 1
1150.01

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: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

Digitally signed by Samuel A. MacDonald
DN: cn=S. A. MacDonald, o=Knightdale Engineering.com, ou=A, Walter Thomas II, email=samuel.macdonald@knightdalenc.gov
Reason: I am approving this document
Date: 2024.04.18 10:13:45-04'00'

Digitally signed by Gideon Smith
DN: cn=Gideon Smith, o=Knightdale Engineering.com, ou=Town of Knightdale, email=gideon.smith@knightdalenc.gov
Reason: I am approving this document
Date: 2024.04.18 10:21:13-04'00'

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652
5410 Trinity Road, Suite 102 | Raleigh, NC 27607
TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION

DATE

DATE
03/31/2026

DRAWN BY
331

DESIGNED BY
331

CHECKED BY
T. CROSS

SCALE

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA
LANDSCAPE DETAILS

JOB NO.
51557

SHEET NO.
C12.6

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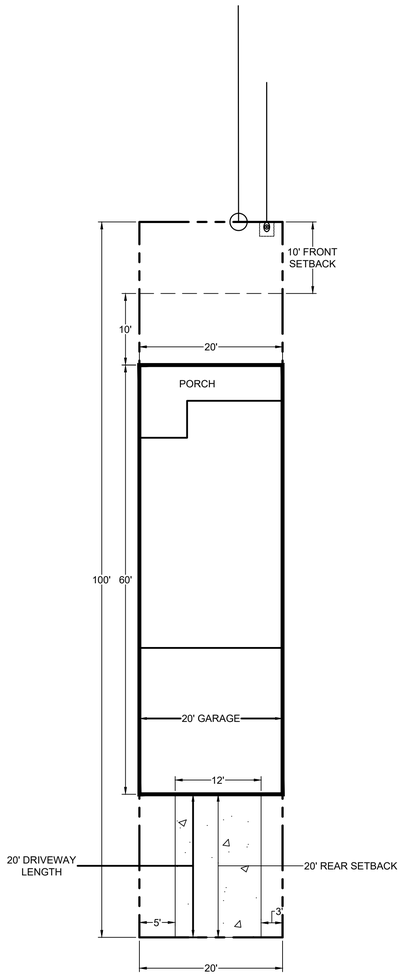
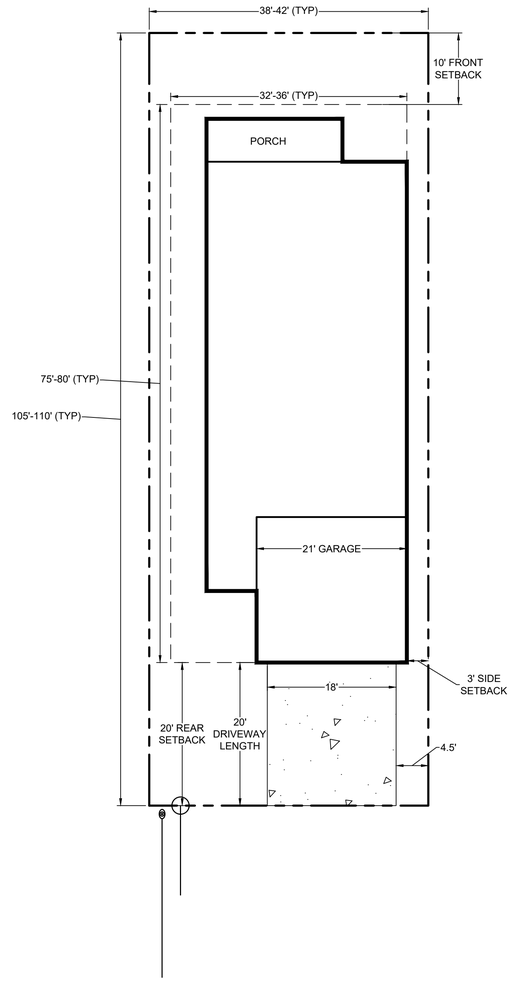
TOWNHOUSE LOT (TYP)



REAR LOAD TOWNHOME LOTS = 53
MINIMUM LOT SIZE REQUIRED: 2,000 SF

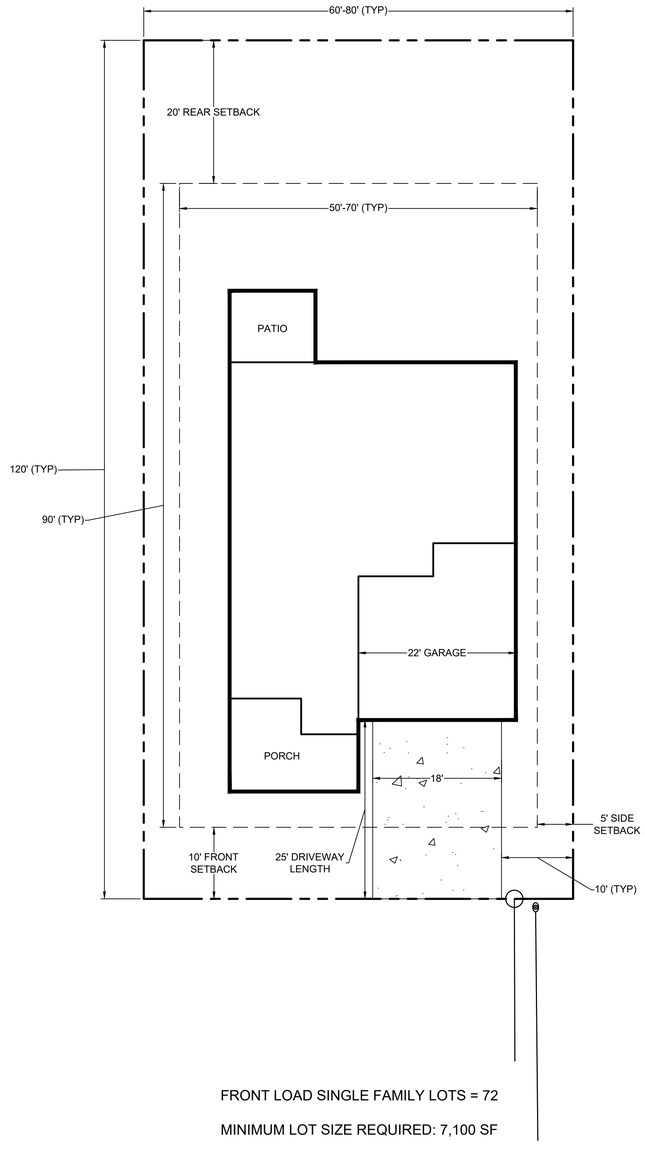
SINGLE FAMILY HOUSE (4,100 SF MIN) (TYP)



REAR LOAD SINGLE FAMILY LOTS = 55

MINIMUM LOT SIZE REQUIRED: 4,100 SF

SINGLE FAMILY HOUSE (7,100 SF MIN) (TYP)



FRONT LOAD SINGLE FAMILY LOTS = 72

MINIMUM LOT SIZE REQUIRED: 7,100 SF

FINAL PLAT REQUIRED NOTES

1. EACH SINGLE-FAMILY OR DUPLEX LOT SHALL CONTAIN A MINIMUM OF ONE (1) CANOPY TREE FOR EVERY TWO THOUSAND (2,000) SQUARE FEET OF LOT AREA OR FRACTION THEREOF UP TO TWENTY-THOUSAND (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 LAND USE ADMINISTRATOR.
2. THE USE OF EXISTING TREES MEETING THE FOLLOWING STANDARDS TO SATISFY THIS REQUIREMENT IS ENCOURAGED. EXISTING LARGE SHADE TREES MEASURING MORE THAN SIX (6) INCHES IN DBH MAY BE COUNTED TOWARDS FULFILLING THIS REQUIREMENT.
3. REQUIRED STREET TREES (SECTION 7.4 (L)) MAY NOT BE COUNTED TOWARDS THE FULFILLMENT OF THE RESIDENTIAL LANDSCAPING REQUIREMENT. APART FROM REQUIRED STREET TREES, ALL OTHER TREES REQUIRED UNDER THIS CHAPTER SHALL BE PLANTED WITHIN THE PRIVATE LOT.
4. FOUNDATION PLANTINGS CONSISTING OF EVERGREEN SHRUBS SHALL BE INSTALLED ALONG THE ENTIRE FOUNDATION WALL OF THE BUILDING. PLANT INSTALLATION SHALL BE A MINIMUM OF TWO (2) FEET IN HEIGHT PLANTED AT FOUR (4) FOOT INTERVALS.

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: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

Digitally signed by Samuel A. MacDonald
DN: c=US, o=Town of Knightdale, ou=Engineering, cn=Samuel A. MacDonald, email=Samuel.MacDonald@knightdale.org
Reason: I am approving this document
Date: 2026.04.01 10:13:54 -04'00'

Digitally signed by Gideon Smith
DN: c=US, o=Town of Knightdale, ou=Development Services, cn=Gideon Smith, email=Gideon.Smith@knightdale.org
Reason: I am approving this document
Date: 2026.04.01 10:13:54 -04'00'

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 TYLER JEFFREY CROSS
3/31/2026

THIS DRAWING PREPARED AT THE **RALEIGH OFFICE**
5410 Trinity Road, Suite 102 | Raleigh, NC 27607
TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION

DATE

DATE: 03/31/2026
DRAWN BY: 331
DESIGNED BY: 331
CHECKED BY: T. CROSS
SCALE:

JOB NO. 51557
SHEET NO. C12.7

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA
LOT FIT TYPICALS

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TOWN OF KNIGHTDALE, WAKE COUNTY, NC
MERITAGE HOMES RALEIGH
THE HAVEN AT GRIFFITH MEADOWS (ZMA-12-22)
AMENITY, TOT LOT, AND PUBLIC PLAZA
8613 POOLE ROAD
KNIGHTDALE, NC

OWNER/DEVELOPER:
MERITAGE HOMES
WILLIAM ROBINSON
3300 PARAMOUNT PARKWAY, SUIT 120
MORRISVILLE, NC 27560
PHONE: (919)-322-2289
EMAIL: BILL.ROBINSON@MERITAGEHOMES.COM

LANDSCAPE ARCHITECT:
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1000 LEGION PL SUITE 800
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CONTACT: RYAN TURY

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PHONE: (813)-220-7881
CONTACT: MARK STENSON

ENGINEER:
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1000 LEGION PL SUITE 800
ORLANDO, FL 32801
EMAIL: GARRETT.GEORGE@CESOINC.COM
CONTACT: GARRETT GEORGE
ENGINEER OF RECORD: JEFFREY A. TIBBITTS

SURVEYOR:
TIMMONS GROUP
5410 TRINITY ROAD, SUITE 102
RALEIGH, NC 27607
PHONE: (919)-866-4951

GOVERNING AGENCIES AND UTILITY COMPANIES:

SEWER:
CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT
ADDRESS: 222 W. HARGETT STREET
RALEIGH, NC 27601
PHONE: (919)-996-3245

GAS SERVICE:
DOMINION ENERGY
PHONE: (877) 776-2427

WATER:
CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT
ADDRESS: 222 W. HARGETT STREET
RALEIGH, NC 27601
PHONE:(919)-996-3245

ZONING:
KNIGHTDALE PLANNING DEPARTMENT
950 STEEPLE SQUARE CT, KNIGHTDALE, NC 27545
PHONE: (919)-217-2241

STORMWATER:
TOWN OF KNIGHTDALE STORMWATER DEPARTMENT
ADDRESS: 950 STEEPLE SQUARE RD,
KNIGHTDALE, NC 27545
PHONE: (919)-217-2257

ELECTRIC:
DUKE ENERGY
PHONE: 800-452-2777

WAKE ELECTRIC
PHONE: 800-474-6300

PROPERTY DATA:

PARCEL OWNER:	TPG AG EHC III (MTH) MULTI STATE 4 LLC 8585 E HARTFORD DR, STE 118 SCOTTSDALE, AZ 85255 PIN #: 1752-59-7507 & 1752-59-9261 DB: 19824 PG: 1748
PARCEL ID:	1752-59-7507, 1752-59-9261, & 1752-69-3494
ADDRESS:	8613 POOLE ROAD KNIGHTDALE, NC 27545
PROPERTY AREA:	AMENITY: 1.43 AC TOT LOT: 0.39 AC PUBLIC PLAZA: 1.01 AC
ZONING:	GR-3 PUD GENERAL RESIDENTIAL 3
PROPOSED USE:	AMENITY CENTER, TOT LOT, AND PUBLIC PLAZA

	REQUIRED	PROPOSED
BUILDING SETBACKS		
FRONTAGE ALONG STREET:	10-FT MIN	VARIES (SEE SITE PLAN)
SIDE:	6-FT	VARIES (SEE SITE PLAN)
REAR:	0-FT	VARIES (SEE SITE PLAN)

PARKING
OUTDOOR RECREATIONAL FACILITY PARKING:
4,470± SF POOL DECK
MAXIMUM OCCUPANTS 135(4,470 SF/ 33 SF)

OUTDOOR RECREATIONAL FACILITY PARKING:	
MAXIMUM PARKING (1.0 PER 3 PERSONS)	45
MINIMUM PARKING (1/2 MAXIMUM)	23
PARKING PROVIDED	31

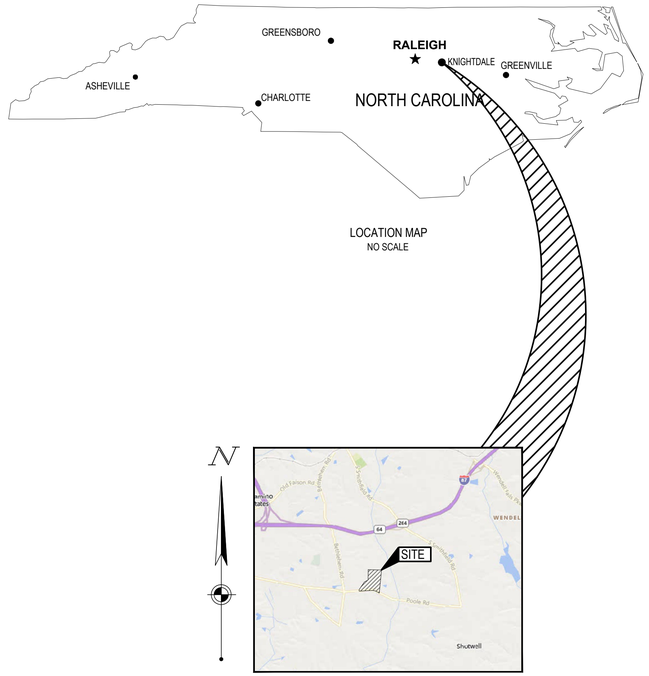
CBU PARKING:	
MINIMUM	8
PARKING PROVIDED	8

TOTAL PARKING PROVIDED:	39
MAXIMUM BUILDING HEIGHT:	42-FT
BUILDING AREA:	2,566 SF
FLOODPLAIN DESIGNATION:	3720175200K & 3720175300K EFFECTIVE 07/19/2022



INDEX MAP
SCALE 1"=200'

SHEET LIST TABLE	
SHEET NUMBER	SHEET TITLE
C(A)1.0	COVER SHEET
C(A)1.1	GENERAL NOTES
C(A)2.0	EXISTING CONDITIONS AMENITY CENTER
C(A)2.1	EXISTING CONDITIONS TOT LOT & PLAZA
C(A)3.0	EROSION CONTROL PH1 AMENITY CENTER
C(A)3.1	EROSION CONTROL PH1 TOT LOT & PLAZA
C(A)3.2	EROSION CONTROL PH2 AMENITY CENTER
C(A)3.3	EROSION CONTROL PH2 TOT LOT & PLAZA
C(A)3.4	EROSION CONTROL DETAILS
C(A)3.5	EROSION CONTROL NOTES
C(A)4.0	SITE PLAN AMENITY CENTER
C(A)4.1	SITE PLAN TOT LOT & PLAZA
C(A)5.0	GRADING PLAN AMENITY CENTER
C(A)5.1	GRADING PLAN TOT LOT & PLAZA
C(A)6.0	UTILITY PLAN
C(A)8.0	DETAILS PLAN
C(A)8.1	DETAILS PLAN
L1.0	PLANTING PLAN
L1.1	PLANTING PLAN
L1.2	PLANTING PLAN
L1.3	HARDSCAPE DETAILS
L1.4	HARDSCAPE DETAILS
L1.5	PLANTING DETAILS AND NOTES



LOCATION MAP
NO SCALE

VICINITY MAP
NO SCALE

TIMMONS GROUP:
5410 TRINITY ROAD SUITE 102
RALEIGH, NC 27607
PHONE: (919)-833-8124
TYLER CROSS, PE
EMAIL: TYLER.CROSS@TIMMONS.COM

CESO PROVIDES NO GUARANTEE TO THE ACCURACY OF THE SURVEY PROVIDED BY TIMMONS GROUP. CONTRACTOR TO VERIFY EXISTING CONDITIONS PRIOR TO BID AND CONSTRUCTION.

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: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

SEVENTY-TWO (72) HOURS BEFORE DIGGING IS TO COMMENCE, THE CONTRACTORS SHALL NOTIFY THE FOLLOWING AGENCIES: NORTH CAROLINA UTILITIES PROTECTION SERVICE AT 811 OR 800-632-4949 AND ALL OTHER AGENCIES WHICH MIGHT HAVE UNDERGROUND UTILITIES INVOLVING THIS PROJECT AND ARE NONMEMBERS OF STATE UTILITIES PROTECTION SERVICE

CESO
WWW.CESOINC.COM

NO.	DATE	REVISION DESCRIPTION

CESO NC, Co.
4601 Park Road Suite 650
Charlotte, NC 28209
Phone: 704-521-7979 License No.: C-4740

NORTH CAROLINA PROFESSIONAL SEAL 029683 ENGINEER JEFFREY A TIBBITTS
03/27/2026

THE HAVEN AT GRIFFITH MEADOWS AMENITY AND OPEN SPACES
POOLE ROAD
TOWN OF KNIGHTDALE, NC

COVER SHEET

ISSUE:	FOR PERMIT - NOT CONSTRUCTION
DATE:	10/17/2025
JOB NO.:	766644-01
DESIGN:	RAM
DRAWN:	SCR
CHECKED:	CSG
SHEET NO.	C(A)1.0

GENERAL NOTES

DEMOLITION NOTES

1. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS REQUIRED FOR DEMOLITION AND DISPOSAL. THE DEMOLITION, REMOVAL, AND DISPOSAL IS TO BE APPROVED BY ALL GOVERNING AUTHORITIES, OF ALL FACILITIES SUCH AS: STRUCTURES, PADS, WALLS, FLUMES, FOUNDATIONS, PARKING, DRIVES, DRAINAGE, STRUCTURES, UTILITIES, WELLS, ETC., SUCH THAT THE IMPROVEMENTS SHOWN ON THE REMAINING PLANS CAN BE CONSTRUCTED. ALL FACILITIES TO BE REMOVED SHALL BE UNDERCUT TO SUITABLE MATERIAL AND BROUGHT TO GRADE WITH SUITABLE COMPACTED FILL MATERIAL AS SPECIFIED BY A QUALIFIED PROFESSIONAL GEOTECHNICAL ENGINEER. IF UNDOCUMENTED FACILITIES ARE FOUND ON SITE, CONTRACTOR SHALL CONTACT THE OWNER AND UTILITY COMPANY PRIOR TO REMOVAL. ALL FACILITIES SHALL BE PLUGGED, ABANDONED, OR REMOVED PER STATE AND LOCAL REQUIREMENTS.
2. FEDERAL, STATE AND LOCAL CODE REQUIREMENTS SHALL GOVERN THE DISPOSAL OF DEBRIS INCLUDING ANY POTENTIALLY HAZARDOUS AND TOXIC MATERIALS. ALL MATERIALS AND STRUCTURES DESIGNATED AS "TO BE REMOVED" SHALL BE DISPOSED OF OFF SITE AND AT THE COST OF THE CONTRACTOR.
3. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING JOB SITE SAFETY PER OSHA REQUIREMENTS AT ALL TIMES.
4. PRIOR TO DEMOLITION, IT IS THE CONTRACTOR'S RESPONSIBILITY TO CALL THE STATE 811 AND NOTIFY ALL UTILITY COMPANIES TO SCHEDULE UTILITY SERVICE REMOVAL AND/OR ABANDONMENT. ALL UTILITIES SHALL BE REMOVED/RELOCATED PER THE SPECIFICATIONS OF THE UTILITY COMPANIES. THE CONTRACTOR IS RESPONSIBLE TO PAY ALL FEES AND CHARGES ASSOCIATED WITH THIS WORK
5. CONTRACTOR SHALL MAINTAIN ALL UTILITY SERVICES TO INHABITED BUILDINGS ON SITE AND ADJACENT PROPERTIES AT ALL TIMES. INTERRUPTIONS SHALL BE APPROVED BY THE OWNERS OF THE BUILDINGS/PROPERTIES.
6. THE LOCATIONS OF ALL EXISTING UTILITIES SHOWN ON THIS PLAN HAVE BEEN DETERMINED FROM THE BEST INFORMATION AVAILABLE AND ARE GIVEN FOR THE CONVENIENCE OF THE CONTRACTOR. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR THEIR ACCURACY. PRIOR TO THE START OF ANY DEMOLITION ACTIVITY, THE CONTRACTOR SHALL NOTIFY THE UTILITY COMPANIES FOR ONSITE LOCATIONS OF EXISTING UTILITIES. IF THE LOCATION OR ELEVATION OF THE EXISTING UTILITIES ARE FOUND TO BE DIFFERENT FROM THE PLANS, CONTRACTOR SHALL CONTACT THE ENGINEER IMMEDIATELY.
7. CONTRACTOR SHALL PROTECT EXISTING SITE FEATURES TO REMAIN INSIDE AND OUTSIDE CONSTRUCTION LIMITS. CONTRACTOR IS RESPONSIBLE TO DOCUMENT ALL EXISTING DAMAGES AND NOTIFY THE CITY/COUNTY PRIOR TO CONSTRUCTION START. ANY EXISTING SITE FEATURE TO REMAIN THAT IS DAMAGED DURING CONSTRUCTION, SUCH AS, BUT NOT LIMITED TO, DRAINAGE, UTILITIES, PAVEMENT, CURB, ETC. SHALL BE REPAIRED TO A CONDITION THAT IS EQUAL TO, OR BETTER THAN, THE EXISTING CONDITIONS. PRIOR TO BEING DAMAGED, THE CONTRACTOR IS RESPONSIBLE FOR REPAIRING ANY DAMAGE TO THE SATISFACTION OF THE OWNER AT NO ADDITIONAL COST.
8. CONTINUOUS ACCESS SHALL BE MAINTAINED TO THE SURROUNDING PROPERTIES AT ALL TIMES DURING DEMOLITION OF THE EXISTING FACILITIES.
9. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING TRAFFIC CONTROL. ALL TRAFFIC CONTROL MEASURES SHALL BE IN ACCORDANCE WITH STATE DEPARTMENT OF TRANSPORTATION REGULATIONS AND LOCAL REGULATIONS.
10. THE CONTRACTOR IS RESPONSIBLE FOR PLACING AND MAINTAINING CONSTRUCTION FENCE, SIGNS, ETC. TO WARN AND KEEP UNAUTHORIZED PEOPLE OFF SITE FOR THE DURATION OF THE PROJECT.
11. PRIOR TO DEMOLITION, ALL EROSION CONTROL DEVICES ARE TO BE INSTALLED PER THE GOVERNING AGENCIES GUIDELINES AND STANDARDS. DUST CONTROL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
12. SAWCUT LINE PROVIDED IS FOR REFERENCE ONLY. CONTRACTOR WILL BE RESPONSIBLE FOR DETERMINING THE EXTENT OF THE SAWCUT THAT WILL BE REQUIRED AS WELL AS PAVEMENT REPAIRS TO INSTALL UTILITY TRENCHING. IF ANY DAMAGE OCCURS ON ANY OF THE SURROUNDING PAVEMENT, ETC. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ITS REMOVAL AND REPAIR. THE CONTRACTOR IS RESPONSIBLE FOR REMOVING THAT WHICH IS NECESSARY TO COMPLETE THE INTENT OF THE PROPOSED IMPROVEMENTS. SAWCUT EXISTING PAVEMENT TO FULL DEPTH, USING CARE TO CUT NEAT, STRAIGHT LINES. CUT AT EXISTING JOINTS WHERE POSSIBLE.
13. THE CONTRACTOR SHALL MAINTAIN A WELL-DRAINED SITE, FREE OF STANDING WATER DURING CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR TEMPORARY DRAINAGE MEASURES DURING CONSTRUCTION.
14. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO STUDY THE PLANS AND VISIT THE SITE TO DETERMINE THE ITEMS THAT MUST BE REMOVED TO COMPLY WITH THE SITE DEVELOPMENT PLANS. NO EXTRA FEE WILL BE PAID FOR THE REMOVAL OF ANY ITEM NOT LISTED THAT IS VISIBLE UPON A SITE VISIT. THE DEMOLITION PLAN IS INTENDED TO PRESENT THE SCOPE OF THE DEMOLITION, AND DOES NOT GUARANTEE THAT ALL ITEMS ARE ADDRESSED.
15. THE CONTRACTOR SHALL OBTAIN ALL PERMITS FOR ALL SITE DEVELOPMENT WORK, PAY ALL FEES FOR PERMITS AND CHECK ALL GOVERNING AUTHORITIES' SPECIFICATIONS FOR BUT NOT LIMITED TO, GUTTERS, SIDEWALKS, POLES, AND OTHER STRUCTURES, INCLUDING THE REMOVAL OR RELOCATION OF EXISTING UTILITIES OR OTHER PHYSICAL OBJECTS SHOWN ON PLANS OR NOTED OTHERWISE.
16. THE CONTRACTOR SHALL CREATE AND IMPLEMENT AN EROSION AND SEDIMENTATION CONTROL PLAN FOR ALL SITE CONSTRUCTION ACTIVITIES ASSOCIATED WITH THE PROJECT. THE PLAN MUST CONFORM TO THE EROSION AND SEDIMENTATION REQUIREMENTS OF THE CONSTRUCTION GENERAL PERMIT OR LOCAL STANDARDS AND CODES, WHICHEVER IS MORE STRINGENT.
17. ALL COSTS FOR INSPECTIONS AND/OR TESTS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR UNLESS NOTED OTHERWISE.

SITE NOTES

1. ALL MATERIAL NOTED ON DRAWINGS WILL BE SUPPLIED BY THE CONTRACTOR UNLESS OTHERWISE NOTED.
2. CONTRACTOR SHALL REFER TO THE ARCHITECTURAL PLANS TO COORDINATE ACCESS POINTS AND ELEVATIONS. REFER TO ARCHITECTURAL PLANS. FOR EXACT LOCATIONS AND DIMENSIONS OF DOORS, ENTRY RAMP, AND CANOPY.
3. ALL COSTS FOR INSPECTIONS AND/OR TESTS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR UNLESS NOTED OTHERWISE.
4. ACCESSIBILITY STANDARDS SHALL BE IN ACCORDANCE WITH FEDERAL AND LOCAL REQUIREMENTS FOR HANDICAP ACCESSIBILITY, INCLUDING BUT NOT LIMITED TO THE AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES. ADA PARKING STALLS SHALL MEET ADA GRADE GUIDELINES. CONTRACTOR SHALL FIELD VERIFY EXISTING GRADES AT ACCESS POINTS, ACCESSIBLE ROUTES, AND EXISTING PARKING TO REMAIN TO DETERMINE COMPLIANCE WITH STANDARDS.
5. ALL ADA ACCESSIBLE ROUTES, WITHIN THE PUBLIC RIGHT-OF-WAY, SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT EDITION OF THE "PUBLIC RIGHTS-OF-WAY ACCESSIBILITY GUIDELINES" AND ANY APPLICABLE LOCAL OR STATE REQUIREMENTS. THE MORE STRINGENT REQUIREMENT SHALL GOVERN.
6. ALL ADA ACCESSIBLE ROUTES, INCLUDING SIGNAGE AND STRIPPING WITHIN THE PROJECT LIMITS, SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT EDITION OF THE "ADA STANDARDS FOR ACCESSIBLE DESIGN" AND ANY LOCAL OR STATE REQUIREMENTS. THE MORE STRINGENT REQUIREMENT SHALL GOVERN.
7. ALL DIMENSIONS AND RADII ARE TO THE FACE OF THE CURB OR EDGE OF PAVEMENT, AS APPLICABLE, UNLESS OTHERWISE NOTED.
8. ALL CURB RADII ARE 5 FEET UNLESS OTHERWISE NOTED.
9. PROVIDE SIGNAGE AND STRIPING AS SHOWN. ALL SIGNAGE AND PAVEMENT MARKINGS SHALL COMPLY WITH THE GOVERNING MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (M.U.T.C.D.). PAVEMENT MARKINGS ON ASPHALT SHALL BE WHITE. PAVEMENT MARKINGS ON CONCRETE SHALL BE YELLOW.
10. REFER TO ARCHITECTURAL PLANS BY FOR PROPOSED BUILDING SIGNAGE.
11. REFER TO MECHANICAL PLANS FOR EQUIPMENT LAYOUT.
12. REFER TO ELECTRICAL PLANS FOR ELECTRICAL WORK.
13. REFER TO GEOTECHNICAL ENGINEERING REPORT REFERENCED IN THE PLANS FOR THE RESIDENTIAL DEVELOPMENT - HAVEN AT GRIFFITH MEADOWS.
14. REFER TO ORIGINAL SURVEY PROVIDED BY TIMMONS GROUP.
15. ALL LIGHT POLES TO BE LOCATED 3' FROM THE BACK OF CURB, AS MEASURED FROM THE FACE OF POLE FOUNDATION, UNLESS OTHERWISE DENOTED ON PLANS.

GRADING NOTES

1. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES, AND WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANIES AT LEAST 72 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES.
2. THE TOPOGRAPHIC SURVEY WAS PERFORMED BY A REGISTERED LAND SURVEYOR. IF CONTRACTOR DOES NOT ACCEPT EXISTING TOPOGRAPHY AS SHOWN ON THE PLANS, WITHOUT EXCEPTION, HE SHALL HAVE MADE, AT HIS EXPENSE, A TOPOGRAPHIC SURVEY BY A REGISTERED LAND SURVEYOR AND SUBMIT IT TO THE OWNER FOR REVIEW. **GRADING AND TOPOGRAPHY IN THESE PLANS BASED ON FILES RECIVED FROM AMERICAN ENGINEERING ON 11/18/2025.**
3. CONSTRUCTION SHALL COMPLY WITH ALL APPLICABLE GOVERNING CODES AND BE CONSTRUCTED TO SAME.
4. THE CONTRACTOR SHALL ADHERE TO ALL TERMS & CONDITIONS AS OUTLINED IN THE EPA OR APPLICABLE STATE GENERAL N.P.D.E.S. PERMIT FOR STORM WATER DISCHARGE ASSOCIATED WITH CONSTRUCTION ACTIVITIES.
5. EXISTING AND PROPOSED GRADE CONTOUR INTERVALS ARE SHOWN AT 1 FOOT INTERVALS.
6. ALL SPOT ELEVATIONS REFER TO FINISHED PAVEMENT ELEVATIONS UNLESS OTHERWISE NOTED.
7. ALL ADA ACCESSIBLE PARKING SPACES AND LOADING AREAS SHALL BE GRADED WITH A 2.0% MAXIMUM SLOPE IN ALL DIRECTIONS. ALL ADA ACCESSIBLE ROUTES SHALL BE GRADED WITH A 2.0% MAXIMUM CROSS SLOPE AND 5.0% MAXIMUM RUNNING SLOPE.
8. MAINTAIN EXISTING DRAINAGE PATTERN THROUGHOUT THE SITE, EXCEPT WITHIN THE LIMITS OF DISTURBANCE (LOD).
9. COORDINATE GRADES AT BUILDING ENTRIES WITH ARCHITECTURAL PLANS.
10. EXISTING DRAINAGE STRUCTURES SHALL BE INSPECTED AND REPAIRED AS NEEDED, AND EXISTING PIPES ARE TO BE CLEANED TO REMOVE ALL SILT AND DEBRIS AFTER CONSTRUCTION IS COMPLETE.
11. IF ANY EXISTING STRUCTURES TO REMAIN ARE DAMAGED DURING CONSTRUCTION IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REPAIR AND/OR REPLACE THE EXISTING STRUCTURE AS NECESSARY TO RETURN IT TO A CONDITION EQUAL TO OR BETTER THAN IT'S CONDITION PRIOR TO DAMAGE.
12. CONTRACTOR SHALL ASSURE POSITIVE DRAINAGE AWAY FROM BUILDING AND WITHIN PAVED AREAS.
13. ALL TOPSOIL MUST BE REMOVED BEFORE FILL MATERIAL IS PLACED.
14. ALL WET, OR OTHERWISE UNSUITABLE SOILS MUST BE STABILIZED. THIS MAY BE ACCOMPLISHED BY DRYING, REMOVAL & REPLACEMENT, REMOVAL & DRYING & RECOMPACTION, OR SOIL TREATMENT (LIME/CEMENT) UNDER THE SUPERVISION OF A QUALIFIED PROFESSIONAL GEOTECHNICAL ENGINEER.
15. ALL UNSURFACED AREAS, DISTURBED BY GRADING, OPERATION SHALL RECEIVE 6" OF TOPSOIL. CONTRACTOR SHALL APPLY STABILIZATION FABRIC TO ALL SLOPES GREATER THAN 3H:1V AND SEED WITH LOW MAINTENANCE GRASS SEED MIX. CONTRACTOR SHALL SEED DISTURBED AREAS IN ACCORDANCE WITH SPECIFICATIONS UNTIL A HEALTHY STAND OF GRASS IS OBTAINED. ALL EXPOSED SURFACE AREAS SHALL BE STABILIZED PER THE SWPPP AND LANDSCAPE REQUIREMENTS AS PART OF THIS PLAN SET.
16. ALL STORM PIPE ENTERING STRUCTURES SHALL BE GROUTED TO ASSURE CONNECTION AT STRUCTURE IS SOIL TIGHT.
17. ALL STORM STRUCTURES SHALL HAVE A SMOOTH UNIFORM POURED MORTAR INVERT FROM INVERT IN TO INVERT OUT.
18. STORM PIPE SHALL BE AS FOLLOWS UNLESS OTHERWISE NOTED:

MATERIAL	TYPE	PIPE SPEC	JOINT SPEC	INSTALLATION	ACCEPTABLE AREAS OF USE
HIGH DENSITY POLY-ETHYLENE (HDPE)	SMOOTH-WALLED CORRUGATED ADS-N12 OR EQUAL	AASHTO M294 (TYPE S)	ASTM F477	ASTM D2321	ON SITE, 12" TO 60" DIA.
POLY VINYL CHLORIDE (PVC)	SDR 35	ASTM D3034	ASTM D3212	ASTM D2321	ON SITE, 4" TO 10"

19. ALL STORM SEWER STRUCTURE GRATES AND FRAMES WITHIN PAVEMENT SHALL BE HEAVY DUTY.
20. ALL STORM DRAINAGE SHALL BE PERFORMED IN ACCORDANCE WITH ALL LOCAL COUNTY AND DOT STANDARDS.
21. ALL DOWNSPOUT DRAIN LINES OR ROOF LEADERS SHALL HAVE A 1.0% MINIMUM SLOPE, UNLESS OTHERWISE NOTED. CONNECT ALL DOWNSPOUTS AND ROOF LEADERS TO THE STORM SEWER SYSTEM. REFER TO ARCHITECTURAL PLANS FOR DOWNSPOUT AND ROOF LEADER LOCATIONS. PROVIDE POSITIVE DRAINAGE AND PAVEMENT REPAIR AS NEEDED.
22. ROOF DRAINS, FOUNDATION DRAINS, AND OTHER CLEAN WATER CONNECTIONS TO THE SANITARY SEWER SYSTEM ARE PROHIBITED.
23. THE STORM SEWER GRADE WILL BE SUCH THAT A MINIMUM COVER IS MAINTAINED TO WITHSTAND AASHTO HS-25 LOADING ON THE PIPE. PROVIDE MINIMUM 2.0 FEET OF COVER FOR ALL STORM SEWERS UNLESS OTHERWISE NOTED.
24. WHEN A SANITARY SEWER MAIN LIES ABOVE A STORM SEWER, OR WITHIN 18 INCHES BELOW, THE SANITARY SEWER WILL HAVE AN IMPERVIOUS ENCASEMENT OR BE CONSTRUCTED OF STRUCTURAL SEWER PIPE FOR A MINIMUM OF 10 FEET ON EACH SIDE OF WHERE THE STORM SEWER CROSSES.
25. IF EXISTING FIELD TILES ARE ENCOUNTERED DURING CONSTRUCTION THEY SHALL BE REPAIRED AND/OR TIED INTO A STORM SEWER SYSTEM AS NEEDED TO MAINTAIN POSITIVE DRAINAGE.

UTILITY NOTES

1. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANIES AT LEAST 72 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.
2. CONTRACTOR SHALL COMPLY TO THE FULLEST EXTENT WITH THE LATEST STANDARDS OF O.S.H.A. DIRECTIVES OR ANY OTHER AGENCY HAVING JURISDICTION FOR EXCAVATION AND TRENCHING PROCEDURES. THE CONTRACTOR SHALL USE SUPPORT SYSTEMS, SLOPING, BENCHING, AND OTHER MEANS OF PROTECTION. THIS TO INCLUDE BUT NOT LIMITED FOR ACCESS AND EGRESS FROM ALL EXCAVATION AND TRENCHING. CONTRACTOR IS RESPONSIBLE TO COMPLY WITH PERFORMANCE CRITERIA FOR O.S.H.A.
3. CONTRACTOR IS RESPONSIBLE FOR REPAIRS OF DAMAGE TO ANY EXISTING UTILITY DURING CONSTRUCTION AT NO COST TO THE OWNER.
4. ALL FILL MATERIAL IS TO BE IN PLACE AND COMPACTED BEFORE INSTALLATION OF PROPOSED UTILITIES.
5. CONTRACTOR SHALL COORDINATE WITH ALL UTILITY COMPANIES FOR INSTALLATION REQUIREMENTS AND SPECIFICATIONS. THE CONTRACTOR SHALL CONDUCT ALL REQUIRED TESTS TO THE SATISFACTION OF THE RESPECTIVE UTILITY REGULATIONS AND THE OWNER'S INSPECTION AUTHORITIES.
6. CONTRACTOR SHALL NOTIFY THE UTILITY AUTHORITY'S INSPECTORS 72 HOURS BEFORE CONNECTING TO ANY EXISTING LINE.
7. WATER AND SANITARY UTILITIES SHALL HAVE TEN (10') FEET OF HORIZONTAL CLEARANCE WHEN PARALLEL OR 18" VERTICAL CLEARANCE WHEN CROSSING. ALL CLEARANCE DISTANCES SHALL BE MEASURE FROM OUTSIDE EDGE OF PIPE TO OUTSIDE EDGE OF PIPE. THE CROSSING SHALL BE ARRANGED SO THAT THE SANITARY SEWER JOINTS WILL BE EQUIDISTANT AND AS FAR AS POSSIBLE FROM THE WATER LINE JOINTS.
8. IF A WATER LINE PASSES UNDER THE SANITARY SEWER LINE, THE SEWER LINE SHOULD BE CONSTRUCTED OF A WATERTIGHT MATERIAL APPROVED BY THE REGULATORY AGENCY FOR USE IN WATER MAIN CONSTRUCTION AND SHALL EXTEND TEN (10') FEET ON BOTH SIDES OF THE CROSSING, AS MEASURED PERPENDICULAR TO THE WATER LINES. ADEQUATE STRUCTURAL SUPPORT SHALL BE PROVIDED FOR THE SEWER TO MAINTAIN LINE AND GRADE.
9. UNDERGROUND LINES SHALL BE INSTALLED, INSPECTED AND APPROVED BEFORE BACKFILLING.
10. CONTRACTOR SHALL COORDINATE WITH ALL UTILITY COMPANIES FOR INSTALLATION REQUIREMENTS AND SPECIFICATIONS. THE CONTRACTOR SHALL CONDUCT ALL REQUIRED TESTS TO THE SATISFACTION OF THE RESPECTIVE UTILITY REGULATIONS AND THE OWNER'S INSPECTION AUTHORITIES.
11. UTILITY TRENCHES WITHIN PAVED AREAS TO BE BACKFILLED PER UTILITY TRENCH DETAIL PROVIDED WITHIN THE CONSTRUCTION DETAILS SHEET.
12. ALL WATER LINE WORK SHALL BE PERFORMED IN ACCORDANCE WITH TOWN OF KNIGHTDALE NC CONSTRUCTION STANDARDS AND STATE REGULATIONS.
13. INSTALL ALL WATER LINES WITH A MINIMUM COVER OF 3-FT.
14. ON-SITE WATER LINE MATERIAL SHALL BE AS FOLLOWS:

MATERIAL	PRESSURE RATING	PIPE SPEC	FITTINGS	INSTALLATION	ACCEPTABLE AREAS OF USE
HIGH-DENSITY POLY-ETHYLENE (HPDE TUBING)	SDR 9 P.C. = 250 PSI	ASTM D2239 AWWA C901 ASTM F714	ASTM D3350 ASTM D3261	ASTM D2774	ON SITE, < 3" DIA.

15. ON-SITE SANITARY SEWER LINE MATERIAL SHALL BE AS FOLLOWS:

MATERIAL	PRESSURE RATING	PIPE SPEC	FITTINGS	INSTALLATION	ACCEPTABLE AREAS OF USE
POLY VINYL CHLORIDE (PVC)	SDR 26	ASTM 3034	ASTM D3212	ASTM 2321 WITH TYPE 1 BEDDING	ON SITE, 6" TO 8" DIA., GREATER THAN OR EQUAL TO 8.5' OF COVER

16. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT BUILDING UTILITY CONNECTION LOCATIONS, SERVICE SIZES TO BE DETERMINED BY ARCHITECT.
17. CLEAN OUTS AND CURB BOXES WITHIN THE PAVED AREAS MUST HAVE TRAFFIC LOADING FRAMES AND COVERS.

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: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

CESO
WWW.CESOINC.COM

NO.	DATE	REVISION DESCRIPTION

CESO NC, Co.
4601 Park Road Suite 650
Charlotte, NC 28209
Phone: 704-521-7979 License No.: C-4740

NORTH CAROLINA PROFESSIONAL SEAL 029683 ENGINEER JEFFREY A. TIBBITTS
10/17/2025

THE HAVEN AT GRIFFITH MEADOWS AMENITY AND OPEN SPACES

POOLE ROAD
TOWN OF KNIGHTDALE, NC

GENERAL NOTES

ISSUE:	FOR PERMIT - NOT CONSTRUCTION
DATE:	10/17/2025
JOB NO.:	766644-01
DESIGN:	RAM
DRAWN:	SCR
CHECKED:	CSG

SHEET NO.
C(A)1.1

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AMENITY AREA

N

30 0 30 60

GRAPHIC SCALE (IN FEET)
1 in. = 30 ft.

EXISTING FEATURES LEGEND

APPLIES TO ALL CIVIL SHEETS

R/W	RIGHT OF WAY
	PARCEL LINE
	PROPERTY BOUNDARY
	EASEMENT
	CURB
	EDGE OF PAVEMENT
	EDGE OF WALK
	PAVEMENT MARKINGS
G	GAS LINE
W	WATER LINE
STM	STORM SEWER
SAN	SANITARY SEWER
100	MAJOR CONTOURS
102	MINOR CONTOURS

	WATER METER		STORM CATCH BASIN
	WATER VALVE		STORM INLET BASIN
	GAS VALVE		STORM MANHOLE
	SANITARY MANHOLE		SANITARY CLEANOUT
	SIGN		

DEMOLITION LEGEND

PROPOSED

LOD	LIMITS OF DISTURBANCE
XXXXXXXXXXXXXXXXXXXX	STORM PIPE TO BE REMOVED

NOTE:

1. LIMITS OF DISTURBANCE FOR THE SCOPE OF WORK INCLUDED IN THIS PLAN SET. FULL PROJECT LOD IS SHOWN WITH THE HAVENS AT GRIFFITH MEADOWS PLAN SET PREPARED BY TIMMONS GROUP.
2. RIGHT-OF-WAY IMPROVEMENTS ARE PART OF SEPARATE PLAN SET/CONTRACT. REFER TO TIMMONS GROUP PLANS FOR RIGHT-OF-WAY IMPROVEMENTS FOR HAVEN AT GRIFFITH MEADOWS.

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: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

Digitally signed by Samuel A. MacDonald
DN: cn=Samuel A. MacDonald, o=Timmons Group, ou=Civil, st=North Carolina & Virginia, c=US
Reason: I am approving this document
Date: 2026.02.18 07:57:13 -05'00'

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

Digitally signed by Gideon Smith
DN: cn=Gideon Smith, o=Town of Knightdale, ou=Development Services, email=gsmith@knightdale-nc.gov
Reason: I am approving this document
Date: 2026.02.18 08:14:54 -05'00'

North Carolina 811 www.nc811.org

SEVENTY-TWO (72) HOURS BEFORE DIGGING IS TO COMMENCE. THE CONTRACTORS SHALL NOTIFY THE FOLLOWING AGENCIES: NORTH CAROLINA UTILITIES PROTECTION SERVICE AT 811 OR 800-632-4949 AND ALL OTHER AGENCIES WHICH MIGHT HAVE UNDERGROUND UTILITIES INVOLVING THIS PROJECT AND ARE NONMEMBERS OF STATE UTILITIES PROTECTION SERVICE

CESO
WWW.CESOINC.COM

NO.	DATE	REVISION DESCRIPTION

CESO NC, Co.
4601 Park Road Suite 650
Charlotte, NC 28209
Phone: 704-521-7979 License No.: C-4740

NORTH CAROLINA PROFESSIONAL SEAL 029683 ENGINEER JEFFREY A. TIBBITTS
03/27/2026

THE HAVEN AT GRIFFITH MEADOWS AMENITY AND OPEN SPACES

POOLE ROAD
TOWN OF KNIGHTDALE, NC

EXISTING CONDITIONS AMENITY CENTER

ISSUE:	FOR PERMIT - NOT CONSTRUCTION
DATE:	10/17/2025
JOB NO.:	766644-01
DESIGN:	RAM
DRAWN:	SCR
CHECKED:	CSG

SHEET NO.
C(A)2.0

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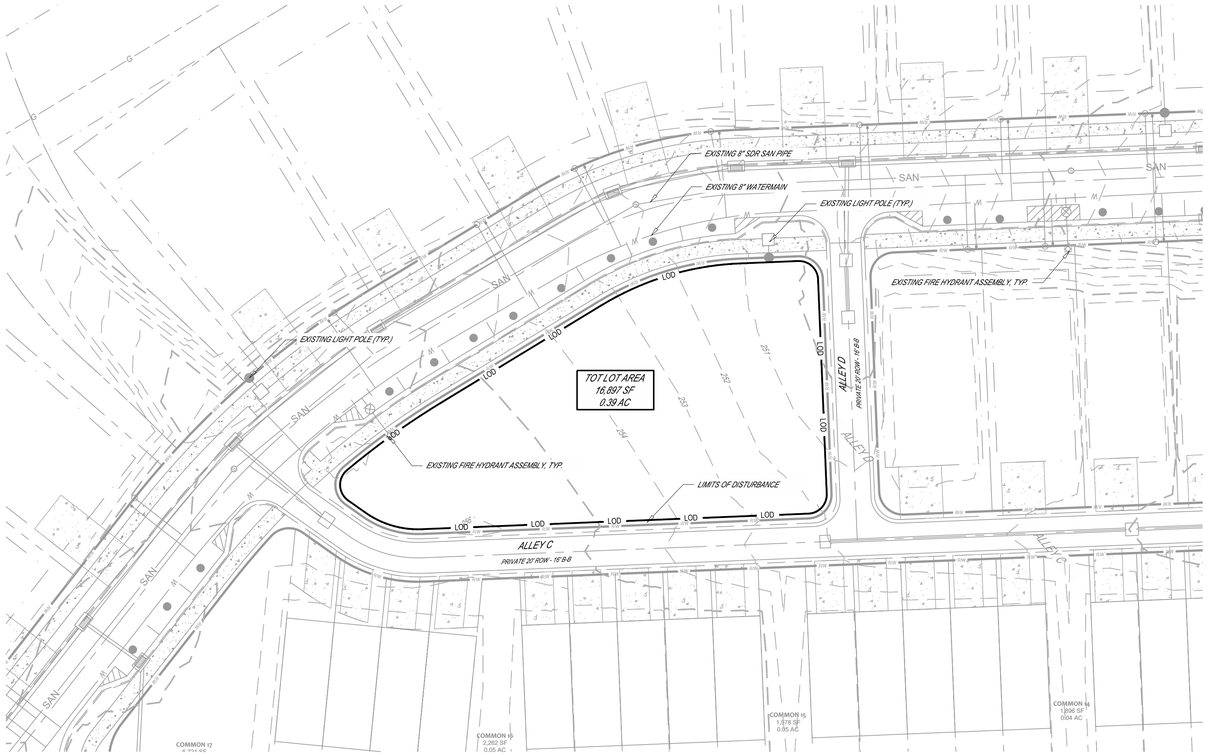
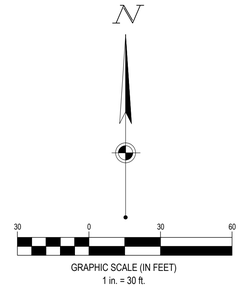


TOT LOT



EXISTING FEATURES LEGEND

APPLIES TO ALL CIVIL SHEETS

R/W	RIGHT OF WAY
	PARCEL LINE
	PROPERTY BOUNDARY
	EASEMENT
	CURB
	EDGE OF PAVEMENT
	EDGE OF WALK
	PAVEMENT MARKINGS
G	GAS LINE
W	WATER LINE
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	SANITARY MANHOLE		SANITARY CLEANOUT
	SIGN		

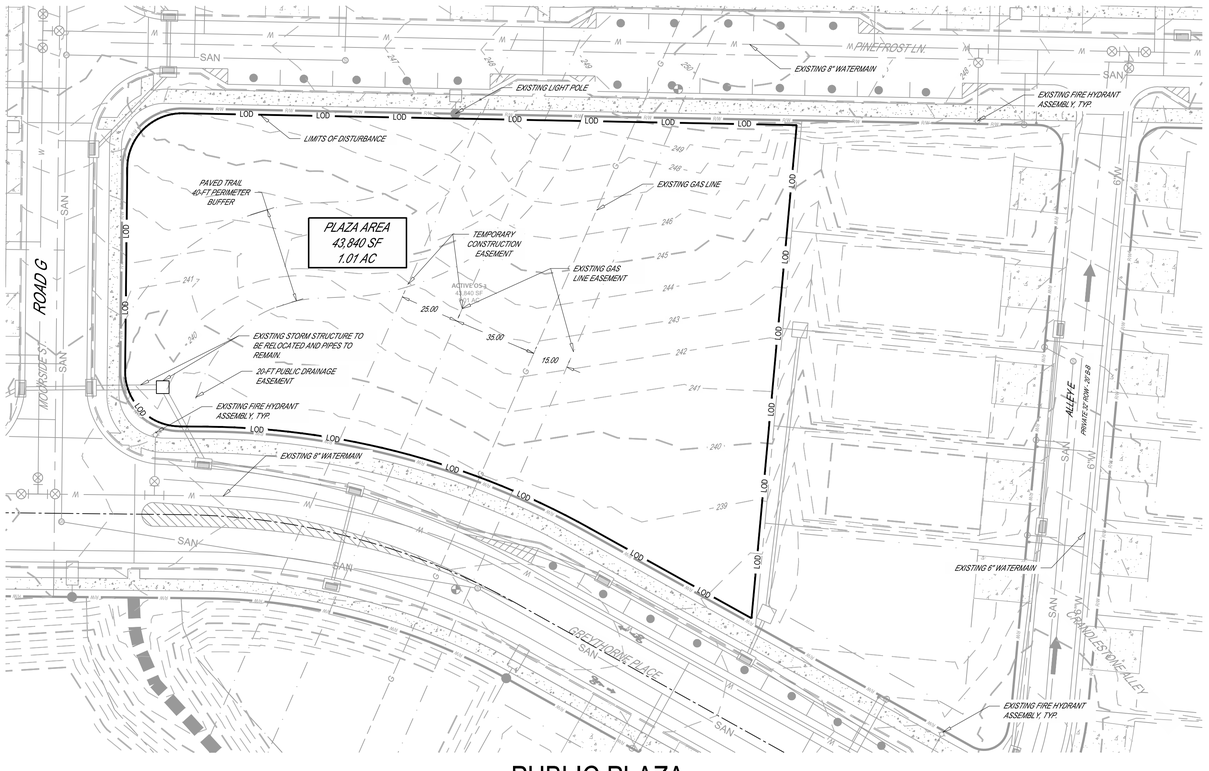
DEMOLITION LEGEND

PROPOSED

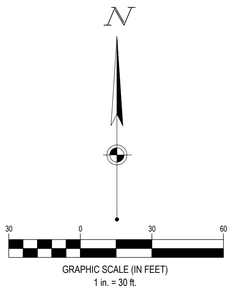
LOD	LIMITS OF DISTURBANCE

NOTE:

1. LIMITS OF DISTURBANCE FOR THE SCOPE OF WORK INCLUDED IN THIS PLAN SET. FULL PROJECT LOD IS SHOWN WITH THE HAVENS AT GRIFFITH MEADOWS PLAN SET PREPARED BY TIMMONS GROUP.
2. RIGHT-OF-WAY IMPROVEMENTS ARE PART OF SEPARATE PLAN SET/CONTRACT. REFER TO TIMMONS GROUP PLANS FOR RIGHT-OF-WAY IMPROVEMENTS FOR HAVEN AT GRIFFITH MEADOWS.



PUBLIC PLAZA



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: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

SEVENTY-TWO (72) HOURS BEFORE DIGGING IS TO COMMENCE, THE CONTRACTORS SHALL NOTIFY THE FOLLOWING AGENCIES: NORTH CAROLINA UTILITIES PROTECTION SERVICE AT 811 OR 800-632-4949 AND ALL OTHER AGENCIES WHICH MIGHT HAVE UNDERGROUND UTILITIES INVOLVING THIS PROJECT AND ARE NONMEMBERS OF STATE UTILITIES PROTECTION SERVICE

CESO
WWW.CESOINC.COM

NO.	DATE	REVISION DESCRIPTION

CESO NC, Co.
4601 Park Road Suite 650
Charlotte, NC 28209
Phone: 704-521-7979 License No.: C-4740

NORTH CAROLINA PROFESSIONAL SEAL 029683 ENGINEER JEFFREY A. TIBBITTS
DATE: 10/17/2025

THE HAVEN AT GRIFFITH MEADOWS AMENITY AND OPEN SPACES

POOLE ROAD
TOWN OF KNIGHTDALE, NC

EXISTING CONDITIONS TOT LOT & PLAZA

ISSUE:	FOR PERMIT - NOT CONSTRUCTION
DATE:	10/17/2025
JOB NO.:	766644-01
DESIGN:	RAM
DRAWN:	SCR
CHECKED:	CSG
SHEET NO.	C(A)2.1

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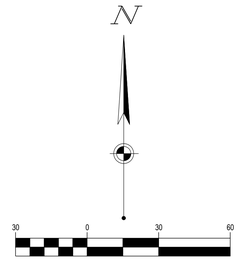
AMENITY AREA



GRAPHIC SCALE (IN FEET)
1 in. = 30 ft.

SWPPP LEGEND

EXISTING

REFER TO C2.0 AND C2.1 FOR EXISTING FEATURES LEGEND

PROPOSED

- 980 — MAJOR CONTOUR
- 982 — MINOR CONTOUR
- PAVEMENT/WALK
- SF — SILT FENCE
- LOD — LIMIT OF DISTURBANCE
- STABILIZED CONSTRUCTION ENTRANCE
- STORAGE AREA
- CE — STABILIZED CONSTRUCTION ENTRANCE
- HW — HAZARDOUS WASTE STORAGE AREA
- CW — CONCRETE WASHOUT AREA
- IP — INLET PROTECTION
- TR — TRASH AREA

STORMWATER POLLUTION PREVENTION PLAN (SWPPP) PROJECT NARRATIVE:

PLAN ENGINEERS:	CESO, INC. 1000 LEGION PLACE SUITE 800 ORLANDO, FL 32801 EMAIL: GARRETT.GEORGE@CESOINC.COM CONTACT: GARRETT GEORGE ENGINEER OF RECORD: JEFFREY A. TIBBITTS	DEVELOPER:	MERITAGE HOMES 3300 PARAMOUNT PARKWAY SUITE 120 MORRISVILLE, NC 27560 PHONE: (919) 322-2289 EMAIL: BILL.ROBINSON@MERITAGEHOMES.COM CONTACT: WILLIAM ROBINSON

THE PROPOSED PROJECT IS THE CONSTRUCTION OF AN AMENITY CENTER FOR THE HAVEN AT GRIFFITH MEADOWS SUBDIVISION. THE SUBJECT PARCEL IS ±1.43 ACRES.

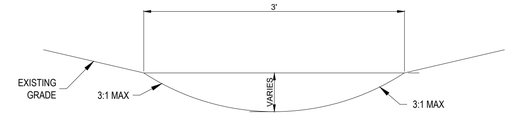
SEQUENCE OF CONSTRUCTION

1. NOTIFY WAKE COUNTY ENGINEER BEFORE WORK IS TO BEGIN.
2. INSTALL ALL TEMPORARY EROSION CONTROL MEASURES INCLUDING SILT FENCE, CONSTRUCTION EXIT, FILTER SACKS, CONCRETE WASHOUT, ETC.
3. SITE DEMOLITION AND CLEARING.
4. ROUGH GRADING. PROVIDE TEMPORARY SEEDING OF DISTURBED AREAS WHICH ARE INACTIVE.
5. STORM SEWER AND UNDERGROUND UTILITY CONSTRUCTION.
6. BUILDING PAD.
7. CURB CONSTRUCTION.
8. FINE GRADING AND PAVEMENT SUBGRADE PREPARATION
9. ASPHALT PAVING AND REMAINING CONCRETE FLATWORK.
10. FINAL SEEDING.

* CONTRACTOR SHALL MODIFY THE SEQUENCE OF CONSTRUCTION BASED ON SITE CONDITIONS. CONTRACTOR TO NOTIFY PROJECT MANAGER PRIOR TO CHANGING SEQUENCE OF CONSTRUCTION.

NOTES

1. CONTRACTOR TO FOLLOW THE PROPOSED GRADING BY TIMMONS GROUP WITHIN THE GAS EASEMENT.



DIVERSION SWALE

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: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

Digitally signed by Samuel A. MacDonald
DN: C=US, E=smacdonald@timmonsgroup.com, CN="A. Morton Thomas & Associates, Inc.", OU=Samuel A. MacDonald
Reason: I am the author of this document
Date: 2026.03.18 10:07:54-04'00'

Digitally signed by Gideon Smith
DN: C=US, E=gsmith@knightdale.gov, O=Town of Knightdale, OU=Development Services, CN=Gideon Smith
Reason: I am the author of this document
Date: 2026.03.18 12:19:23-04'00'

SEVENTY-TWO (72) HOURS BEFORE DIGGING IS TO COMMENCE, THE CONTRACTORS SHALL NOTIFY THE FOLLOWING AGENCIES: NORTH CAROLINA UTILITIES PROTECTION SERVICE AT 811 OR 800-632-4949 AND ALL OTHER AGENCIES WHICH MIGHT HAVE UNDERGROUND UTILITIES INVOLVING THIS PROJECT AND ARE NONMEMBERS OF STATE UTILITIES PROTECTION SERVICE

CESO
WWW.CESOINC.COM

CESO NC, Co.
4601 Park Road Suite 650
Charlotte, NC 28209
Phone: 704-521-7979 License No.: C-4740

NORTH CAROLINA PROFESSIONAL SEAL 029683 ENGINEER JEFFREY A TIBBITTS
03/27/2026

NO.	DATE	REVISION DESCRIPTION

THE HAVEN AT GRIFFITH MEADOWS AMENITY AND OPEN SPACES

POOLE ROAD
TOWN OF KNIGHTDALE, NC

EROSION CONTROL PH1 AMENITY CENTER

ISSUE:	FOR PERMIT - NOT CONSTRUCTION
DATE:	10/17/2025
JOB NO.:	766644-01
DESIGN:	RAM
DRAWN:	SCR
CHECKED:	CSG

SHEET NO.
C(A)3.0

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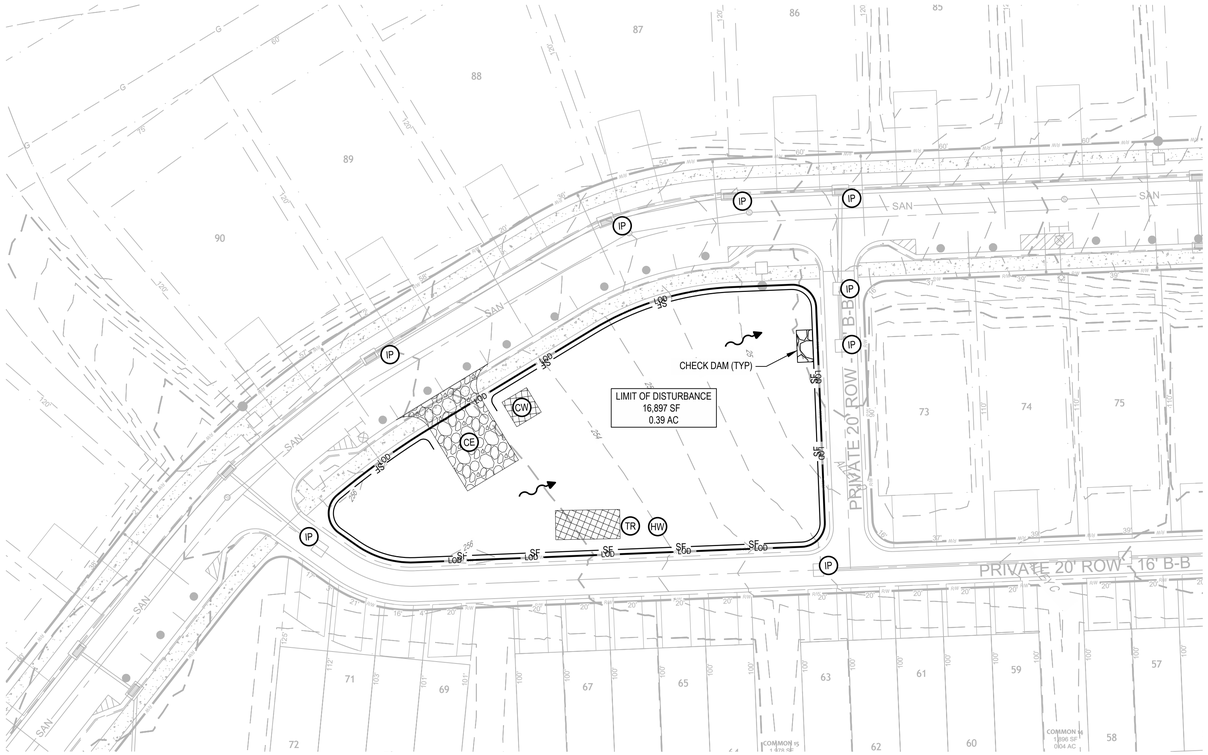
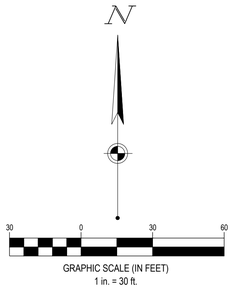
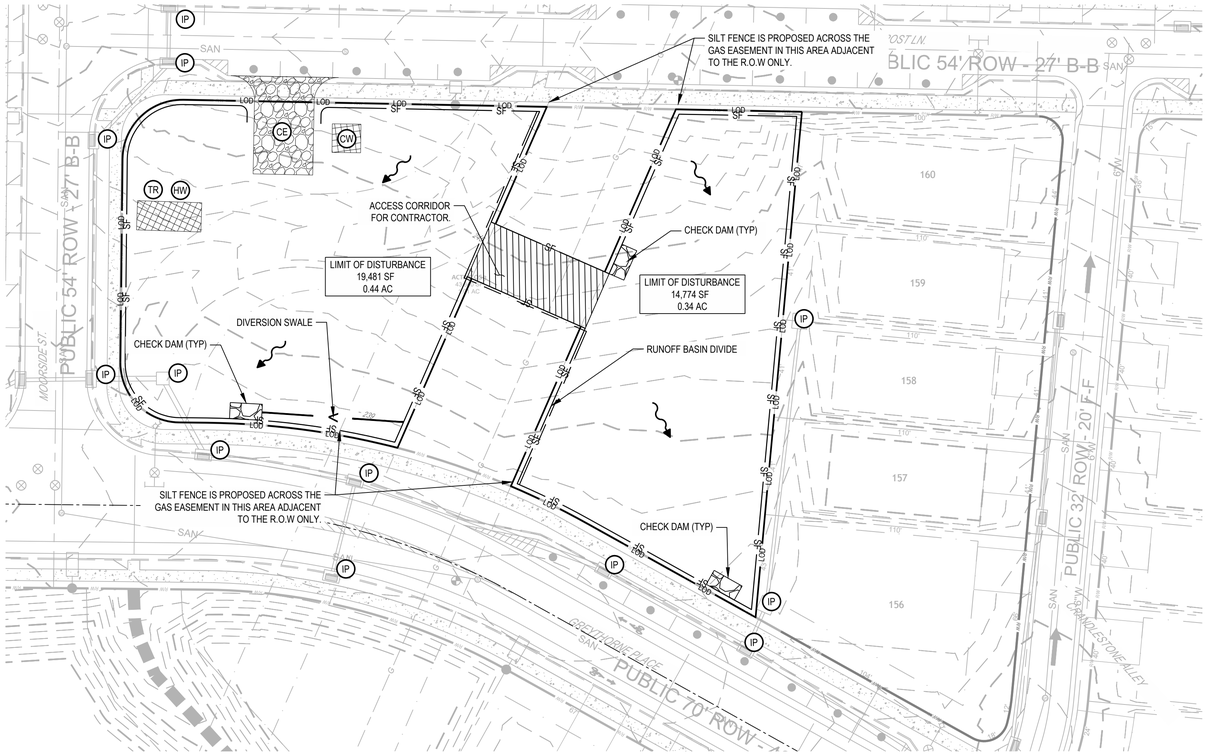
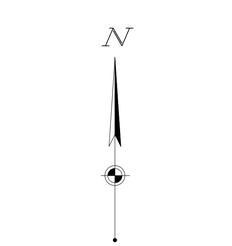


TOT LOT





PUBLIC PLAZA



SWPPP LEGEND

EXISTING

REFER TO C2.0 AND C2.1 FOR EXISTING FEATURES LEGEND

PROPOSED

- S60 — MAJOR CONTOUR
- S62 — MINOR CONTOUR
- PAVEMENT/WALK
- SF — SILT FENCE
- LOD — LIMIT OF DISTURBANCE
- STABILIZED CONSTRUCTION ENTRANCE
- STORAGE AREA
- CE — STABILIZED CONSTRUCTION ENTRANCE
- HW — HAZARDOUS WASTE STORAGE AREA
- CW — CONCRETE WASHOUT AREA
- IP — INLET PROTECTION
- TR — TRASH AREA

STORMWATER POLLUTION PREVENTION PLAN (SWPPP) PROJECT NARRATIVE:

PLAN ENGINEERS: CESO, INC.
1000 LEGION PLACE SUITE 800
ORLANDO, FL 32801
EMAIL: GARRETT.GEORGE@CESOINC.COM
CONTACT: GARRETT GEORGE
ENGINEER OF RECORD: JEFFREY A. TIBBITTS

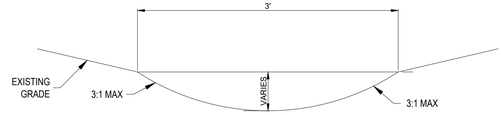
DEVELOPER: MERITAGE HOMES
3300 PARAMOUNT PARKWAY SUITE 120
MORRISVILLE, NC 27560
PHONE: (919) 322-2289
EMAIL: BILL.ROBINSON@MERITAGEHOMES.COM
CONTACT: WILLIAM ROBINSON

THE PROPOSED PROJECT IS THE CONSTRUCTION OF AN AMENITY CENTER FOR THE HAVEN AT GRIFFITH MEADOWS SUBDIVISION. THE DISTURBED AREA FOR THE TOT LOT IS 0.39 AC AND FOR THE PUBLIC PLAZA IS 1.09 AC

SEQUENCE OF CONSTRUCTION

1. NOTIFY WAKE COUNTY ENGINEER BEFORE WORK IS TO BEGIN.
2. INSTALL ALL TEMPORARY EROSION CONTROL MEASURES INCLUDING SILT FENCE, CONSTRUCTION EXIT, FILTER SACKS, CONCRETE WASHOUT, ETC.
3. SITE DEMOLITION AND CLEARING.
4. ROUGH GRADING. PROVIDE TEMPORARY SEEDING OF DISTURBED AREAS WHICH ARE INACTIVE.
5. STORM SEWER AND UNDERGROUND UTILITY CONSTRUCTION.
6. BUILDING PAD.
7. CURB CONSTRUCTION.
8. FINE GRADING AND PAVEMENT SUBGRADE PREPARATION
9. ASPHALT PAVING AND REMAINING CONCRETE FLATWORK.
10. FINAL SEEDING.

* CONTRACTOR SHALL MODIFY THE SEQUENCE OF CONSTRUCTION BASED ON SITE CONDITIONS. CONTRACTOR TO NOTIFY PROJECT MANAGER PRIOR TO CHANGING SEQUENCE OF CONSTRUCTION.



DIVERSION SWALE

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: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

Digitally signed by Samuel A. MacDonald
DN: cn=Samuel A. MacDonald, o=mcdonaldengineering.com, ou=N. Morton Thomas & Associates, email=sam@mcdonaldengineering.com, c=US
Reason: I am approving this document
Date: 2026.04.08 10:17:14-04'00'

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

Digitally signed by Gideon Smith
DN: cn=Gideon Smith, o=Development Services, ou=Town of Knightdale, email=gsmith@knightdalenc.gov, c=US
Reason: I am approving this document
Date: 2026.04.08 10:21:14-04'00'

SEVENTY-TWO (72) HOURS BEFORE DIGGING IS TO COMMENCE, THE CONTRACTORS SHALL NOTIFY THE FOLLOWING AGENCIES: NORTH CAROLINA UTILITIES PROTECTION SERVICE AT 811 OR 800-632-4949 AND ALL OTHER AGENCIES WHICH MIGHT HAVE UNDERGROUND UTILITIES INVOLVING THIS PROJECT AND ARE NONMEMBERS OF STATE UTILITIES PROTECTION SERVICE

CESO
WWW.CESOINC.COM

NO.	DATE	REVISION DESCRIPTION

CESO NC, Co.
4601 Park Road Suite 650
Charlotte, NC 28209
Phone: 704-521-7979 License No.: C-4740

NORTH CAROLINA PROFESSIONAL SEAL 029683 ENGINEER JEFFREY A TIBBITTS
04/17/2026

THE HAVEN AT GRIFFITH MEADOWS AMENITY AND OPEN SPACES

POOLE ROAD
TOWN OF KNIGHTDALE, NC

EROSION CONTROL PH1 TOT LOT & PLAZA

ISSUE:	FOR PERMIT - NOT CONSTRUCTION
DATE:	10/17/2025
JOB NO.:	766644-01
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DRAWN:	SCR
CHECKED:	CSG

SHEET NO.
C(A)3.1



AMENITY AREA

N

30 0 30 60

GRAPHIC SCALE (IN FEET)
1 in. = 30 ft.

SWPPP LEGEND

EXISTING	
REFER TO C2.0 AND C2.1 FOR EXISTING FEATURES LEGEND	
PROPOSED	
960	MAJOR CONTOUR
962	MINOR CONTOUR
	BASIN DELINEATION LINE
STM	STORM SEWER
SF	SILT FENCE
LOD	LIMIT OF DISTURBANCE
	STABILIZED CONSTRUCTION ENTRANCE
	STORAGE AREA
D	STORM MANHOLE
CE	STABILIZED CONSTRUCTION ENTRANCE
HW	HAZARDOUS WASTE STORAGE AREA
CW	CONCRETE WASHOUT AREA
IP	INLET PROTECTION
TR	TRASH AREA

STORMWATER POLLUTION PREVENTION PLAN (SWPPP) PROJECT NARRATIVE:

PLAN ENGINEERS: CESO, INC.
1000 LEGION PL SUITE 800
ORLANDO, FL 32801
EMAIL: GARRETT.GEORGE@CESOINC.COM
CONTACT: GARRETT GEORGE, PE
ENGINEER OF RECORD: JEFFREY A. TIBBITTS

DEVELOPER: MERITAGE HOMES
3300 PARAMOUNT PARKWAY SUITE 120
MORRISVILLE, NC 27560
PHONE: (919) 322-2289
EMAIL: BILL.ROBINSON@MERITAGEHOMES.COM
CONTACT: WILLIAM ROBINSON

THE PROPOSED PROJECT IS THE CONSTRUCTION OF AN AMENITY CENTER FOR THE HAVEN AT GRIFFITH MEADOWS SUBDIVISION. THE SUBJECT PARCEL IS ±1.43 ACRES.

SEQUENCE OF CONSTRUCTION

1. NOTIFY WAKE COUNTY ENGINEER BEFORE WORK IS TO BEGIN.
2. INSTALL ALL TEMPORARY EROSION CONTROL MEASURES INCLUDING SILT FENCE, CONSTRUCTION EXIT, FILTER SACKS, CONCRETE WASHOUT, ETC.
3. SITE DEMOLITION AND CLEARING.
4. ROUGH GRADING. PROVIDE TEMPORARY SEEDING OF DISTURBED AREAS WHICH ARE INACTIVE.
5. STORM SEWER AND UNDERGROUND UTILITY CONSTRUCTION.
6. BUILDING PAD.
7. CURB CONSTRUCTION.
8. FINE GRADING AND PAVEMENT SUBGRADE PREPARATION
9. ASPHALT PAVING AND REMAINING CONCRETE FLATWORK.
10. FINAL SEEDING.

* CONTRACTOR SHALL MODIFY THE SEQUENCE OF CONSTRUCTION BASED ON SITE CONDITIONS. CONTRACTOR TO NOTIFY PROJECT MANAGER PRIOR TO CHANGING SEQUENCE OF CONSTRUCTION.

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: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

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CESO
WWW.CESOINC.COM

NO.	DATE	REVISION DESCRIPTION

CESO NC, Co.
4601 Park Road Suite 650
Charlotte, NC 28209
Phone: 704-521-7979 License No.: C-4740

NORTH CAROLINA PROFESSIONAL SEAL 029683 ENGINEER JEFFREY A TIBBITTS
03/27/2026

THE HAVEN AT GRIFFITH MEADOWS AMENITY AND OPEN SPACES

POOLE ROAD
TOWN OF KNIGHTDALE, NC

EROSION CONTROL PH2 AMENITY CENTER

ISSUE:	FOR PERMIT - NOT CONSTRUCTION
DATE:	10/17/2025
JOB NO.:	766644-01
DESIGN:	RAM
DRAWN:	SCR
CHECKED:	CSG

SHEET NO.
C(A)3.2

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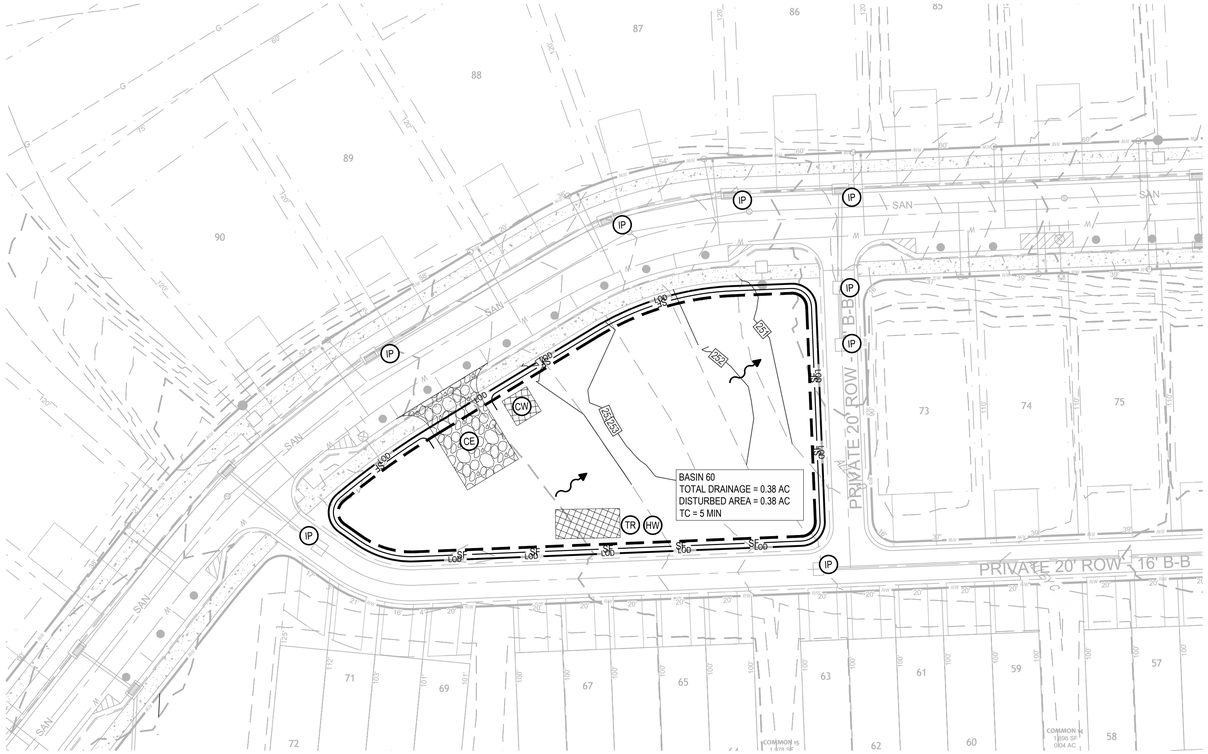
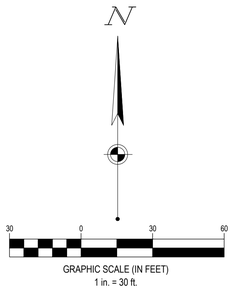


TOT LOT



SWPPP LEGEND	
EXISTING	
REFER TO C2.0 AND C2.1 FOR EXISTING FEATURES LEGEND	
PROPOSED	
960	MAJOR CONTOUR
962	MINOR CONTOUR
	BASIN DELINEATION LINE
SF	SILT FENCE
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	STABILIZED CONSTRUCTION ENTRANCE
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PHONE: (919) 322-2289
EMAIL: BILL.ROBINSON@MERITAGEHOMES.COM
CONTACT: WILLIAM ROBINSON

THE PROPOSED PROJECT IS THE CONSTRUCTION OF AN AMENITY CENTER FOR THE HAVEN AT GRIFFITH MEADOWS SUBDIVISION. THE DISTURBED AREA FOR THE TOT LOT IS 0.39 AC AND FOR THE PUBLIC PLAZA IS 1.09 AC

SEQUENCE OF CONSTRUCTION

1. NOTIFY WAKE COUNTY ENGINEER BEFORE WORK IS TO BEGIN.
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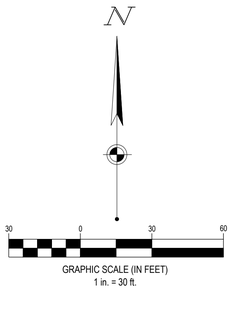
PUBLIC PLAZA



TOWN CERTIFICATION

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BY: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

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BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

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CESO
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4601 Park Road Suite 650
Charlotte, NC 28209
Phone: 704-521-7979 License No.: C-4740

NORTH CAROLINA PROFESSIONAL SEAL 029683 ENGINEER JEFFREY A. TIBBITTS
10/17/2025

THE HAVEN AT GRIFFITH MEADOWS AMENITY AND OPEN SPACES

POOLE ROAD
TOWN OF KNIGHTDALE, NC

EROSION CONTROL PH2 TOT LOT & PLAZA

ISSUE:	FOR PERMIT - NOT CONSTRUCTION
DATE:	10/17/2025
JOB NO.:	766644-01
DESIGN:	RAM
DRAWN:	SCR
CHECKED:	CSG

SHEET NO.
C(A)3.3

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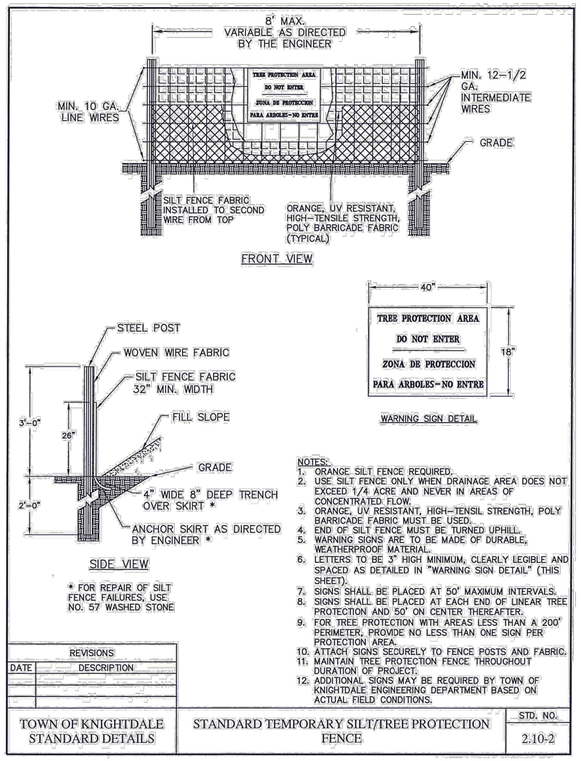
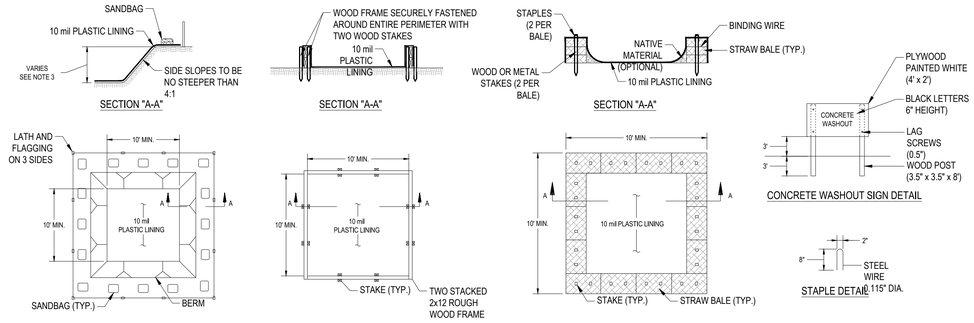


NOTES:

1. ORANGE SILT FENCE REQUIRED.
2. USE SILT FENCE ONLY WHEN DRAINAGE AREA DOES NOT EXCEED 1/4 ACRE AND NEVER IN AREAS OF CONCENTRATED FLOW.
3. ORANGE, UV RESISTANT, HIGH-TENSIL STRENGTH, POLY BARRICADE FABRIC MUST BE USED.
4. END OF SILT FENCE MUST BE TURNED UPHILL.
5. WARNING SIGNS ARE TO BE MADE OF DURABLE, WEATHERPROOF MATERIAL.
6. LETTERS TO BE 3" HIGH MINIMUM, CLEARLY LEGIBLE AND SPACED AS DETAILED IN "WARNING SIGN DETAIL" (THIS SHEET).
7. SIGNS SHALL BE PLACED AT 50' MAXIMUM INTERVALS.
8. SIGNS SHALL BE PLACED AT EACH END OF LINEAR TREE PROTECTION AND 50' ON CENTER THEREAFTER.
9. FOR TREE PROTECTION WITH AREAS LESS THAN A 200' PERIMETER, PROVIDE NO LESS THAN ONE SIGN PER PROTECTION AREA.
10. ATTACH SIGNS SECURELY TO FENCE POSTS AND FABRIC.
11. MAINTAIN TREE PROTECTION FENCE THROUGHOUT DURATION OF PROJECT.
12. ADDITIONAL SIGNS MAY BE REQUIRED BY TOWN OF KNIGHTDALE ENGINEERING DEPARTMENT BASED ON ACTUAL FIELD CONDITIONS.

REVISIONS	
DATE	DESCRIPTION

TOWN OF KNIGHTDALE STANDARD DETAILS	STANDARD TEMPORARY SILT/TREE PROTECTION FENCE	STD. NO. 2.10-2

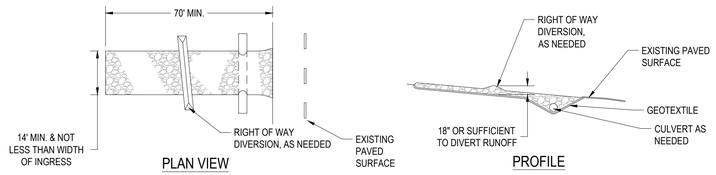


NOTES:

1. ACTUAL LAYOUT DETERMINED IN THE FIELD.
2. THE CONCRETE WASHOUT SIGN SHALL BE INSTALLED WITHIN 30' OF THE TEMPORARY CONCRETE WASHOUT FACILITY.
3. THE WASHOUT MUST HAVE SUFFICIENT VOLUME TO CONTAIN ALL LIQUID AND CONCRETE WASTE GENERATED BY WASHOUT OPERATIONS INCLUDING BUT NOT LIMITED TO OPERATIONS ASSOCIATED WITH GROUT AND MORTAR.

CONCRETE WASHOUT

NTS



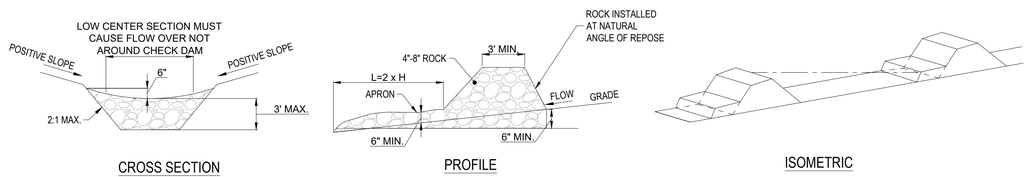
NOTES:

1. STONE SIZE - (1.5-2.5 INCH) STONE SHALL BE USED, OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH - THE CONSTRUCTION ENTRANCE SHALL BE AS LONG AS REQUIRED TO STABILIZE HIGH TRAFFIC AREAS BUT NOT LESS THAN 70 FT. (EXCEPTION: APPLY 30 FT. MINIMUM TO SINGLE RESIDENCE LOTS.
3. THICKNESS - THE STONE LAYER SHALL BE AT LEAST 6 INCHES THICK FOR LIGHT DUTY ENTRANCES OR AT LEAST 10 INCHES FOR HEAVY DUTY USE.
4. WIDTH - THE ENTRANCE SHALL E AT LEAST 14 FEET WIDE, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS.
5. GEOTEXTILE - A GEOTEXTILE SHALL BE LAID OVER THE ENTIRE AREA PRIOR TO PLACING STONE, IT SHALL BE COMPOSED OF STRONG ROT-PROOF POLYMERIC FIBERS AND MEET THE FOLLOWING SPECIFICATIONS:
6. TIMING - THE CONSTRUCTION ENTRANCE SHALL BE INSTALLED AS SOON AS IS PRACTICAL BEFORE MAJOR GRADING ACTIVITIES.
7. CULVERT - A PIPE OR CULVERT SHALL BE CONSTRUCTED UNDER THE ENTRANCE IF NEEDED TO PREVENT SURFACE WATER FROM FLOWING ACROSS THE ENTRANCE OR TO PREVENT RUNOFF FROM BEING DIRECTED OUT ONTO PAVED SURFACES.
8. WATER BAR - A WATER BAR SHALL BE CONSTRUCTED AS PART OF THE CONSTRUCTION ENTRANCE IF NEEDED TO PREVENT SURFACE RUNOFF FROM FLOWING THE LENGTH OF THE CONSTRUCTION ENTRANCE AND OUT ONTO PAVED SURFACES.
9. MAINTENANCE - TOP DRESSING OF ADDITIONAL STONE SHALL BE APPLIED AS CONDITIONS DEMAND. MUD SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC ROADS, ORA ANY SURFACE WHERE RUNOFF IS NOT CHECKED BY SEDIMENT CONTROLS, SHALL BE REMOVED IMMEDIATELY, REMOVAL SHALL BE ACCOMPLISHED BY SCRAPING OR SWEEPING. CONSTRUCTION ENTRANCES SHALL NOT BE RELIED UPON TO REMOVE MUD FROM VEHICLES AND PREVENT OFF-SITE TRACKING. VEHICLES THAT ENTER AND LEAVE THE CONSTRUCTION-SITE SHALL BE RESTRICTED FROM MUDDY AREAS.
10. REMOVAL - THE ENTRANCE SHALL REMAIN IN PLACE UNTIL THE DISTURBED AREA IS STABILIZED OR REPLACED WITH A PERMANENT ROADWAY OR ENTRANCE.

GEOTEXTILE SPECIFICATION FOR CONSTRUCTION ENTRANCE	
MINIMUM TENSILE STRENGTH	200 lbs.
MINIMUM PUNCTURE STRENGTH	80 psi.
MINIMUM TEAR STRENGTH	50 lbs.
MINIMUM BURST STRENGTH	320 psi.
MINIMUM ELONGATION	20%
EQUIVALENT OPENING SIZE	EOS < 0.6 mm.
PERMITTIVITY	1x10-3 cm/sec.

STABILIZED CONSTRUCTION ENTRANCE

NTS

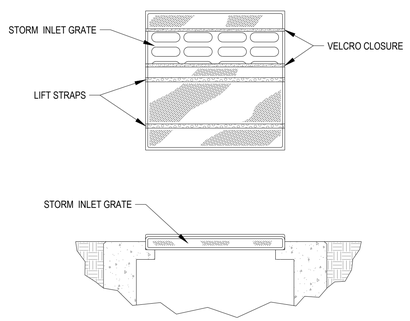


NOTES:

1. THE CHECK DAM SHALL BE CONSTRUCTED OF 4-8 INCH DIAMETER STONE, PLACED SO THAT IT COMPLETELY COVERS THE WIDTH OF THE CHANNEL. FILTER FABRIC SHALL BE NON-WOVEN MEETING AASHTO M-288-06 FOR CLASS 1 APPLICATIONS.
2. MAXIMUM HEIGHT OF CHECK DAM SHALL NOT EXCEED 3.0 FEET.
3. THE MIDPOINT OF THE ROCK CHECK DAM SHALL BE A MINIMUM OF 6 INCHES LOWER THAN THE SIDES IN ORDER TO DIRECT ACROSS THE CENTER AND AWAY FROM THE CHANNEL SIDES.
4. THE BASE OF THE CHECK DAM SHALL BE ENTRENCHED APPROXIMATELY 6 INCHES.
5. SPACING OF CHECK DAMS SHALL BE IN A MANNER SUCH THAT THE TOE OF THE UPSTREAM DAM IS AT THE SAME ELEVATION AS THE TOP OF THE DOWNSTREAM DAM.
6. A SPLASH APRON SHALL BE CONSTRUCTED WHERE CHECK DAMS ARE EXPECTED TO BE IN USE FOR AN EXTENDED PERIOD OF TIME, A STONE APRON SHALL BE CONSTRUCTED IMMEDIATELY DOWNSTREAM OF THE CHECK DAM TO PREVENT FLOWS FROM UNDERCUTTING THE STRUCTURE. THE APRON SHOULD BE 6 IN. THICK AND ITS LENGTH TWO TIMES THE HEIGHT OF THE DAM.
7. STONE PLACEMENT SHALL BE PERFORMED EITHER BY HAND OR MECHANICALLY AS LONG AS THE CENTER OF CHECK DAM IS LOWER THAN THE SIDES AND EXTENDS ACROSS ENTIRE CHANNEL.
8. SIDE SLOPES SHALL BE A MINIMUM OF 2:1.

ROCK CHECK DAM

NTS



NOTE:

INLET PROTECTION SHALL BE DANDY BAG OR APPROVED OTHER.

INLET PROTECTION

NTS

TOWN CERTIFICATION

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

BY: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

CESO
WWW.CESOINC.COM

NO.	DATE	REVISION DESCRIPTION

CESO NC, Co.
4601 Park Road Suite 650
Charlotte, NC 28209
Phone: 704-521-7979 License No.: C-4740

NORTH CAROLINA PROFESSIONAL SEAL 029683 ENGINEER JEFFREY A TIBBITTS
3/25/2026

THE HAVEN AT GRIFFITH MEADOWS AMENITY AND OPEN SPACES

POOLE ROAD
TOWN OF KNIGHTDALE, NC

EROSION CONTROL DETAILS

ISSUE: FOR PERMIT - NOT CONSTRUCTION	
DATE: 10/17/2025	
JOB NO.:	766644-01
DESIGN:	RAM
DRAWN:	SCR
CHECKED:	CSG

SHEET NO.
C(A)3.4

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NCDEQ GENERAL NOTES

1. ALL EROSION AND SEDIMENTATION CONTROL SHALL BE PERFORMED ACCORDING TO: NCDEQ AND DETAIL PLANS; ACCORDING TO THE LATEST EPA AUTHORIZATION FOR CONSTRUCTION ACTIVITY UNDER THE "NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM" (NPDES); ANY AND ALL REQUIRED PERMITS, REPORTS, AND RELATED DOCUMENTS. ALL CONTRACTORS AND SUBCONTRACTORS MUST BECOME FAMILIAR WITH ALL OF THE ABOVE.

2. CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES (BMPS) AS REQUIRED BY THE SWPPP. ADDITIONAL BEST MANAGEMENT PRACTICES SHALL BE IMPLEMENTED AS DICTATED BY CONDITIONS AND GRADE CHANGES TO THE SITE AT NO ADDITIONAL COST TO OWNER THROUGHOUT ALL PHASES OF CONSTRUCTION.

3. CONTRACTOR SHALL MINIMIZE CLEARING AND DISTURBANCE TO THE ENVIRONMENT TO THE MAXIMUM EXTENT POSSIBLE OR AS REQUIRED BY THE GENERAL PERMIT.

4. SEDIMENT STRUCTURES AND PERIMETER SEDIMENT BARRIERS SHALL BE IMPLEMENTED AS THE FIRST STEP OF GRADING WITHIN SEVEN (7) DAYS FROM THE START OF CLEARING AND GRUBBING, AND SHALL CONTINUE TO FUNCTION UNTIL THE DEVELOPMENT AREA IS STABILIZED.

5. PERMANENT SOIL STABILIZATION OF DISTURBED AREAS BY MEANS OF VEGETATION, LANDSCAPE TYPE MULCHING, MATTING, SOD, RIP RAP, AND OTHER APPROVED LANDSCAPING TECHNIQUES TO BE APPLIED AS FOLLOWS:
   - WITHIN SEVEN (7) DAYS OF ANY AREA THAT WILL BE DORMANT FOR ONE (1) YEAR OR MORE.
   - WITHIN TWO (2) DAYS OF ANY AREA WITHIN 50 FEET OF A STREAM AT FINAL GRADE.
   - WITHIN SEVEN (7) DAYS FOR ANY OTHER AREA AT FINAL GRADE.

6. TEMPORARY SOIL STABILIZATION OF DISTURBED AREAS BY MEANS OF TEMPORARY VEGETATION, MULCHING, GEOTEXTILES, SOD, PRESERVATION OF EXISTING VEGETATION, AND OTHER APPROVED TECHNIQUES TO BE APPLIED AS FOLLOWS:
   - WITHIN TWO (2) DAYS OF ANY AREA WITHIN 50 FEET OF A STREAM NOT AT FINAL GRADE.
   - WITHIN SEVEN (7) DAYS OF ANY AREA THAT WILL BE DORMANT FOR MORE THAN TWENTY ONE (21) DAYS, BUT LESS THAN ONE (1) YEAR.
   - PRIOR TO THE ONSET OF WINTER WEATHER FOR AREAS THAT WILL BE IDLE OVER WINTER.

7. TEMPORARY SEEDING, MULCHING, AND FERTILIZER SPECIFICATIONS:

   SEEDING: ANNUAL RYEGRASS AT 2.02 POUNDS PER 1,000 S.F.

   MULCHING: STRAW MATERIAL SHALL BE UNROTTED SMALL GRAIN STRAW APPLIED AT A RATE OF TWO (2) TON/ACRE, OR 80-100 POUNDS PER 1,000 S.F. MULCH MATERIALS SHALL BE RELATIVELY FREE OF ALL KINDS OF WEEDS AND SHALL BE FREE OF PROHIBITIVE NOXIOUS WEEDS. MULCH SHALL BE SPREAD UNIFORMLY BY HAND OR MECHANICAL MEANS. FROM NOVEMBER 01 THRU MARCH 15 INCREASE THE RATE OF STRAW MULCH TO THREE (3) TON/ACRE.

   FERTILIZER: APPLY FERTILIZER AT HALF THE RATE OF PERMANENT APPLICATION AND AS PER SPECIFICATIONS. IF PROJECT CONDITIONS PREVENT FERTILIZING THE SOIL, THEN THIS ITEM MAY BE WAIVED.

8. SLOPES SHALL BE LEFT IN A ROUGHENED CONDITION DURING THE GRADING PHASE TO REDUCE RUNOFF VELOCITIES AND EROSION. ALL SLOPES GREATER THAN 3:1 SHALL BE FERTILIZED, SEEDED, AND CURLEX BLANKETS BY AMERICAN EXCELSIOR COMPANY, NORTH AMERICAN GREEN, INC. OR AN APPROVED EQUAL AS SPECIFIED IN THE PLANS SHALL BE INSTALLED ON THE SLOPES.

9. NO SOLID (OTHER THAN SEDIMENT) OR LIQUID WASTE, INCLUDING BUILDING MATERIALS, SHALL BE DISCHARGED IN STORM WATER RUNOFF. ALL NON-SEDIMENT POLLUTANTS MUST BE DISPOSED OF IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL GUIDELINES. WASH OUT OF CEMENT TRUCKS SHOULD OCCUR IN DESIGNATED PIT OR DIKED AREAS, WHERE WASHINGS CAN BE REMOVED AND PROPERLY DISPOSED OFF-SITE WHEN THEY HARDEN. STORAGE TANKS SHOULD ALSO BE LOCATED IN PIT OR DIKED AREAS. IN ADDITION, SUFFICIENT OIL AND GREASE ABSORBING MATERIALS AND FLOTATION BOOMS TO CLEAN AND CONTAIN FUEL AND CHEMICAL SPILLS MUST BE KEPT ON SITE.

10. IF THE ACTION OF VEHICLES TRAVELING OVER THE STABILIZED CONSTRUCTION EXIT DOES NOT SUFFICIENTLY REMOVE MOST OF THE DIRT AND MUD, THEN THE TIRES MUST BE WASHED BEFORE VEHICLES ENTER A PUBLIC ROAD. PROVISIONS MUST BE MADE TO INTERCEPT THE WATER AND TRAP THE SEDIMENT BEFORE IT IS CARRIED OFF THE SITE.

11. RUBBISH, TRASH, GARBAGE, LITTER, OR OTHER SUCH MATERIALS SHALL BE DISPOSED INTO SEALED CONTAINERS. MATERIALS SHALL BE PREVENTED FROM LEAVING THE SITE THROUGH THE ACTION OF WIND OR STORM WATER DISCHARGE INTO DRAINAGE DITCHES OR WATERS OF THE STATE.

12. DUST CONTROL USING APPROVED MATERIALS MUST BE PERFORMED AT ALL TIMES. THE USE OF MOTOR OILS AND OTHER PETROLEUM BASED OR TOXIC LIQUIDS FOR DUST SUPPRESSION IS PROHIBITED.

13. ON-SITE AND OFF-SITE STOCKPILE AND BORROW AREAS SHALL BE PROTECTED FROM EROSION AND SEDIMENTATION BY THE USE OF BEST MANAGEMENT PRACTICES. THESE AREAS MUST BE SHOWN IN THE SITE MAP AND PERMITTED IN ACCORDANCE WITH GENERAL PERMIT REQUIREMENTS. AT A MINIMUM SILT FENCE TO BE PLACED AT PERIMETER OF STOCKPILE AREA TO PREVENT SOIL FROM LEAVING THE STOCKPILE AREA.

14. ALL MATERIALS SPILLED, DROPPED, WASHED, OR TRACKED ONTO THE ROADWAYS OR INTO THE STORM SEWERS MUST BE REMOVED IMMEDIATELY.

15. ALL CONSTRUCTION SHALL BE STABILIZED AT THE END OF EACH DAY; THIS INCLUDES BACKFILLING OF TRENCHES FOR UTILITY CONSTRUCTION AND PLACEMENT OF GRAVEL OR ASPHALT FOR ROAD CONSTRUCTION.

16. THE LAST LAYER OF SOIL, INCLUDING TOP SOIL SHOULD BE COMPACTED TO 80% - 85% OF THE MAXIMUM STANDARD PROCTOR DENSITY, IN AREAS OUTSIDE THE PARKING LOT THAT WILL RECEIVE VEGETATION. THIS IS PARTICULARLY IMPORTANT IN CUT SLOPE AND EMBANKMENT AREAS. IN PAVEMENT AND ISLAND AREAS, IT IS RECOMMENDED THAT THE SOIL BE COMPACTED TO 98% AND 95% OF THE MAXIMUM STANDARD PROCTOR DENSITY RESPECTIVELY; THE LAST COMPACTED LAYER MAY BE SCARIFIED TO IMPROVE THE SOIL GROWTH CHARACTERISTICS.

17. ALL DEWATERING ACTIVITIES SUCH AS PUMPING DOWN OF FLOODED FOUNDATION AND UTILITY TRENCHES MUST PASS THROUGH THE RETROFITTED DETENTION BASIN OR A SEDIMENT CONTROL PRACTICE PRIOR TO WATER LEAVING THE SITE.

18. SILT FENCE AND OTHER PERIMETER EROSION CONTROL MEASURES SHOWN OFF LIMITS OF DISTURBANCE FOR CLARITY PURPOSES ONLY. CONTRACTOR TO ENSURE PERIMETER EROSION CONTROL MEASURES ARE PLACED AT THE LIMITS OF DISTURBANCE. ANY DISCREPANCIES SHOULD BE BROUGHT TO THE ENGINEER PRIOR TO PLACEMENT OF ANY EROSION CONTROL MEASURES.

NCDEQ MAINTENANCE NOTES

1. ALL CONTROL MEASURES STATED IN NCDEQ REQUIREMENTS SHALL BE MAINTAINED IN FULLY FUNCTIONAL CONDITION UNTIL TEMPORARY OR PERMANENT STABILIZATION OF THE SITE IS ACHIEVED. ALL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE INSPECTED BY A QUALIFIED PERSON IN ACCORDANCE TO THE CONTRACT DOCUMENTS OR THE APPLICABLE PERMIT, WHICHEVER IS MORE STRINGENT, AND REPAIRED ACCORDING TO THE FOLLOWING:

2. INLET PROTECTION DEVICES AND CONTROLS SHALL BE REPAIRED OR REPLACED WHEN THEY SHOW SIGNS OF UNDERMINING AND OR DETERIORATION. INLET PROTECTION DEVICES SHOULD BE ROUTINELY CLEANED AND MAINTAINED.

3. ALL SEEDED AREAS SHALL BE CHECKED REGULARLY TO ENSURE THAT A GOOD STANDING OF GRASS IS MAINTAINED. AREAS SHOULD BE FERTILIZED, WATERED, AND RESEEDED AS NEEDED.

4. MINIMIZE OFF-SITE SEDIMENT TRACKING OF VEHICLES BY THE USE OF STONE MATERIAL IN ALL CONSTRUCTION ENTRANCES, ALONG WITH REGULARLY SCHEDULED SWEEPING/GOOD HOUSEKEEPING. STABILIZED CONSTRUCTION ENTRANCES TO BE PROPERLY MAINTAINED BY GENERAL CONTRACTOR AND IN GOOD WORKING ORDER AT ALL TIMES; THIS MAY REQUIRE PERIODIC TOP DRESSING OF THE STONE AS CONDITIONS DEMAND.

5. THE TEMPORARY PARKING AND STORAGE AREA SHALL BE KEPT IN GOOD CONDITION (SUITABLE FOR PARKING AND STORAGE) BY GENERAL CONTRACTOR. THIS MAY REQUIRE PERIODIC TOP DRESSING OF THE TEMPORARY PARKING AS CONDITIONS DEMAND.

6. CONTRACTORS AND SUBCONTRACTORS WILL BE RESPONSIBLE FOR REMOVING ALL SEDIMENT FROM THE SITE, AND STORM SEWER SYSTEMS. SEDIMENT DEPOSITION DURING SITE STABILIZATION MUST ALSO BE REMOVED.

7. STONE CONSTRUCTION EXIT TO BE MAINTAINED BY GENERAL CONTRACTOR UNTIL SITE HAS BEEN PAVED OR IS NO LONGER REQUIRED.

8. ALL CATCH BASIN GRATES ARE TO BE PROTECTED WITH INLET BAGS AFTER THEY ARE INSTALLED. THEY SHOULD BE ROUTINELY CLEANED AND MAINTAINED.

9. CONTAINERS SHALL BE AVAILABLE FOR DISPOSAL OF DEBRIS, TRASH, HAZARDOUS OR PETROLEUM WASTES. ALL CONTAINERS MUST BE COVERED AND LEAK-PROOF. ALL WASTE MATERIAL SHALL BE DISPOSED OF AT FACILITIES APPROVED FOR THE PERTINENT MATERIAL

10. BRICKS, HARDENING CONCRETE AND SOIL WASTE SHALL BE FREE FROM CONTAMINATION WHICH MAY LEACH CONSTITUENTS TO WATERS OF THE STATE.

11. CLEAN CONSTRUCTION WASTES THAT WILL BE DISPOSED INTO THE PROPERTY SHALL BE SUBJECT TO ANY LOCAL PROHIBITIONS FROM THIS TYPE OF DISPOSAL.

12. ALL CONSTRUCTION AND DEMOLITION DEBRIS (C&DD) WASTE SHALL BE DISPOSED OF IN A STATE APPROVED C&DD LANDFILL. CONSTRUCTION DEBRIS MAY BE DISPOSED OF ON-SITE, BUT DEMOLITION DEBRIS MUST BE DISPOSED IN A STATE APPROVED LANDFILL. ALSO, MATERIALS WHICH CONTAIN ASBESTOS MUST COMPLY WITH ALL LOCAL AND STATE REGULATIONS.

13. AREA SHALL BE DESIGNATED BY CONTRACTOR AND SHOWN ON SWPPP MAP FOR MIXING OR STORAGE OF COMPOUNDS SUCH AS FERTILIZERS, LIME ASPHALT, OR CONCRETE, THESE DESIGNATED AREAS SHALL BE LOCATED AWAY FROM WATERCOURSES, DRAINAGE DITCHES, FIELD DRAINS, OR OTHER STORMWATER DRAINAGE AREA.

14. EQUIPMENT FUELING & MAINTENANCE SHALL BE IN DESIGNATED AREAS ONLY.

15. A SPILL PREVENTION CONTROL AND COUNTERMEASURE (SPCC) PLAN MUST BE DEVELOPED FOR SITES WITH ONE ABOVE-GROUND STORAGE TANK OF 660 GALLONS OR MORE, TOTAL ABOVE-GROUND STORAGE OF 1,330 GALLONS OR BELOW-GROUND STORAGE OF 4,200 GALLONS OF FUEL.

16. ALL DESIGNATED CONCRETE WASHOUT AREAS SHALL BE LOCATED AWAY FROM WATERCOURSES, DRAINAGE DITCHES, FIELD DRAINS OR OTHER STORMWATER DRAINAGE AREAS.

17. ALL CONTAMINATED SOIL MUST BE TREATED AND/OR DISPOSED IN AN EPA APPROVED SOLID WASTE MANAGEMENT FACILITY OR HAZARDOUS WASTE TREATMENT, STORAGE OR DISPOSAL FACILITIES.

18. THE CONTRACTOR SHALL CONTACT THE STATE EPA, THE LOCAL FIRE DEPARTMENT AND THE LOCAL EMERGENCY PLANNING COMMITTEE IN THE EVENT OF A PETROLEUM SPILL (>25 GALLONS) OR THE PRESENCE OF SHEEN.

19. OPEN BURNING IS NOT PERMITTED ON THE SITE.

20. CONTRACTOR TO ENSURE STREETS SHALL BE CLEARED OF DEBRIS FROM SITE AND SWEPT CLEAN ON AN AS NEEDED BASIS.

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: Samuel A. MacDonald DATE: __________
TOWN ENGINEER

Digitally signed by Samuel A. MacDonald
DN: C=US, E=smacdonald@amtengineering.com, O="A. Morton Thomas & Associates, Inc.", CN=Samuel A. MacDonald
Reason: I am approving this document
Date: 2026.04.16 10:18:50-04'00'

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

BY: Gideon Smith DATE: __________
LAND USE ADMINISTRATOR

Digitally signed by Gideon Smith
DN: C=US, E=gideon.smith@knightdalenc.gov, O=Town of Knightdale, OU=Development Services, CN=Gideon Smith
Reason: I am approving this document
Date: 2026.05.19 10:28:36-04'00'

North Carolina 811 www.nc811.org

SEVENTY-TWO (72) HOURS BEFORE DIGGING IS TO COMMENCE, THE CONTRACTORS SHALL NOTIFY THE FOLLOWING AGENCIES: NORTH CAROLINA UTILITIES PROTECTION SERVICE AT 811 OR 800-632-4949 AND ALL OTHER AGENCIES WHICH MIGHT HAVE UNDERGROUND UTILITIES INVOLVING THIS PROJECT AND ARE NONMEMBERS OF STATE UTILITIES PROTECTION SERVICE

CESO
WWW.CESOINC.COM

NO.	DATE	REVISION DESCRIPTION

CESO NC, Co.
4601 Park Road Suite 650
Charlotte, NC 28209
Phone: 704-521-7979 License No.: C-4740

NORTH CAROLINA PROFESSIONAL SEAL 029683 ENGINEER JEFFREY A TIBBITTS
03/27/2026

THE HAVEN AT GRIFFITH MEADOWS AMENITY AND OPEN SPACES

POOLE ROAD
TOWN OF KNIGHTDALE, NC

EROSION CONTROL NOTES

ISSUE:
FOR PERMIT - NOT CONSTRUCTION
DATE:
10/17/2025

JOB NO.:	766644-01
DESIGN:	RAM
DRAWN:	SCR
CHECKED:	CSG

SHEET NO.
C(A)3.5

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AMENITY AREA

N

30 0 30 60

GRAPHIC SCALE (IN FEET)
1 in. = 30 ft.

SITE LEGEND

EXISTING	
REFER TO C2.0 FOR EXISTING FEATURES LEGEND	
PROPOSED	
	PROPOSED STANDARD DUTY ASPHALT PAVEMENT
	PROPOSED CONCRETE SIDEWALK
	PROPOSED CONCRETE PAVEMENT
R/W	RIGHT-OF-WAY
	PROPERTY LINE
	SETBACK
	CENTERLINE
	BUILDING
	CONCRETE CURB
	PAVEMENT/WALK
7	PARKING SPACE COUNT
	SIGN

GENERAL NOTES:

SEE SHEET C(A)1.1

CODED NOTES:

1. PROPOSED ± 2,566 SF AMENITY BUILDING.
2. PROPOSED POOL AND POOL DECK TO BE DESIGNED AND PERMITTED BY OTHERS.
3. PROPOSED STANDARD DUTY ASPHALT. MATCH DEVELOPMENT PAVING SECTION.
4. PROPOSED CONCRETE SIDEWALK. SEE DETAIL ON SHEET C(A)8.0
5. PROPOSED ADA ACCESSIBLE PARKING SPACE. SEE DETAIL ON SHEET C(A)8.0
6. PROPOSED PARKING LOT PAVEMENT MARKINGS.
7. PROPOSED FENCE. POOL FENCE TO BE PROVIDED BY POOL DESIGNER AND MUST MEET POOL CODE REQUIREMENTS.
8. PROPOSED MAIL KIOSK. CONTRACTOR TO COORDINATE DETAILS AND SPECIFICATIONS WITH OWNER.
9. PROPOSED STANDARD CURB AND GUTTER. SEE DETAIL ON SHEET C(A)8.0
10. CONNECT TO EXISTING SIDEWALK.
11. PROPOSED ACCESSIBLE PARKING SIGN "VAN ACCESSIBLE" TO BE INSTALLED PER MUTCD.
12. PROPOSED TRENCH DRAIN. REFERENCE POOL DESIGN PLANS FOR MODEL, SIZE, AND COLOR.
13. PROPOSED ACCESSIBLE PARKING SIGN TO BE INSTALLED PER MUTCD
14. PROPOSED SPILL OUT CURB. SEE DETAIL ON SHEET C(A)8.0
15. PROPOSED 7-FT WIDE INTEGRAL CURB AND SIDEWALK TO BE INSTALLED PER DETAIL ON SHEET C(A)8.0
16. LANDING AREA. SLOPES NOT TO EXCEED 2% IN ANY DIRECTION.
17. ADA RAMP PER STANDARD DETAILS. SEE DETAIL ON SHEET C(A)8.0
18. 6" POST CURB.
19. PROPOSED CONCRETE PAD FOR ELECTRICAL TRANSFORMER.
20. MATCH EXISTING R.O.W ROAD SECTION DETAILS CONTRACTOR TO REFER TO THE SUBDIVISION PLANS BY TIMMONS GROUP FOR THE PAVING DETAILS.
21. MATCH EXISTING R.O.W. CURB CONTRACTOR TO REFER TO THE SUBDIVISION PLANS BY TIMMONS GROUP FOR THE CURB DETAILS.

NOTE:

1. N: & E: VALUES ARE ON ASSUMED COORDINATE PLANE, AND ARE NOT ASSUMED TO BE PRESENT ON STATE PLANE COORDINATE SYSTEM.
2. CONTRACTOR TO REFERENCE THE GEOTECHNICAL RECOMMENDATION FOR THE SUBDIVISION.
3. CONTRACTOR TO MATCH SUBDIVISION DETAIL FOR CROSSWALK.
4. REFER TO LIGHTING PLAN SHEETS BY TIMMONS GROUP (C8.0 - C8.3)

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: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

SEVENTY-TWO (72) HOURS BEFORE DIGGING IS TO COMMENCE, THE CONTRACTORS SHALL NOTIFY THE FOLLOWING AGENCIES: NORTH CAROLINA UTILITIES PROTECTION SERVICE AT 811 OR 800-632-4949 AND ALL OTHER AGENCIES WHICH MIGHT HAVE UNDERGROUND UTILITIES INVOLVING THIS PROJECT AND ARE NONMEMBERS OF STATE UTILITIES PROTECTION SERVICE

CESO
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Phone: 704-521-7979 License No.: C-4740

NORTH CAROLINA PROFESSIONAL SEAL 029683 ENGINEER JEFFREY A. TIBBITTS
3/25/2026

NO.	DATE	REVISION DESCRIPTION

THE HAVEN AT GRIFFITH MEADOWS AMENITY AND OPEN SPACES

POOLE ROAD
TOWN OF KNIGHTDALE, NC

SITE PLAN AMENITY CENTER

ISSUE:	
FOR PERMIT - NOT CONSTRUCTION	
DATE:	10/17/2025
JOB NO.:	766644-01
DESIGN:	RAM
DRAWN:	SCR
CHECKED:	CSG

SHEET NO.
C(A)4.0

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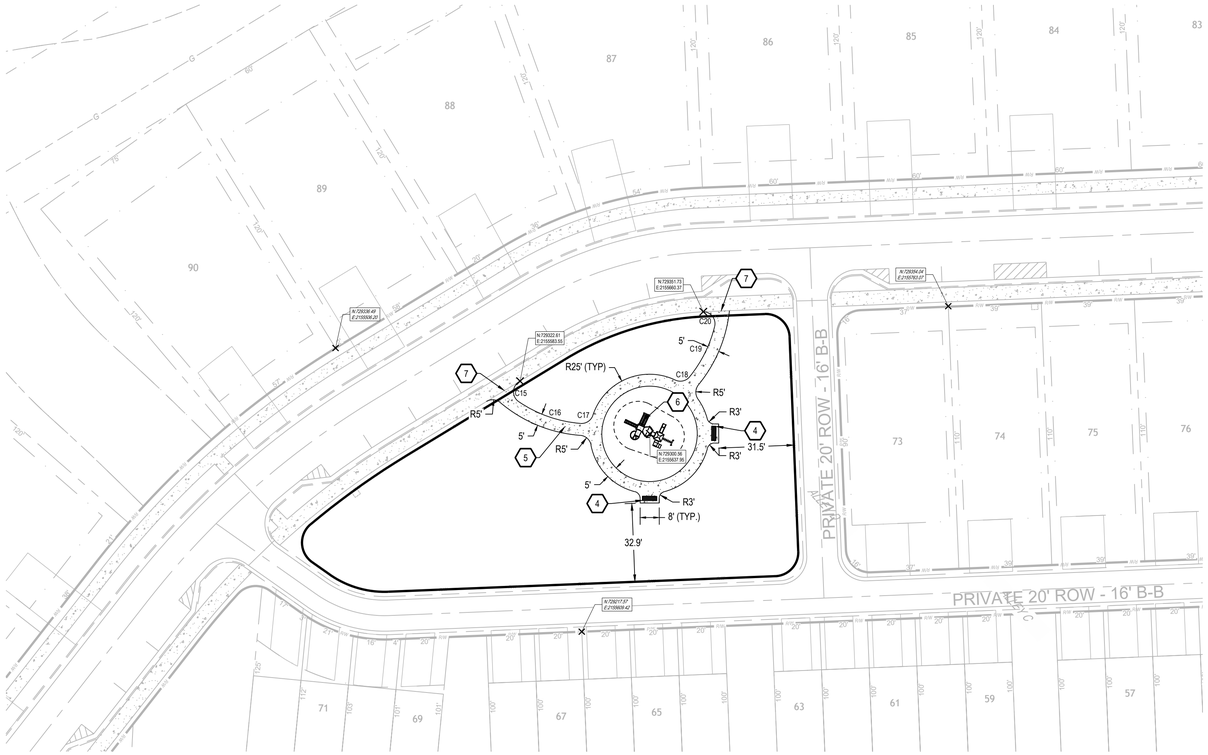
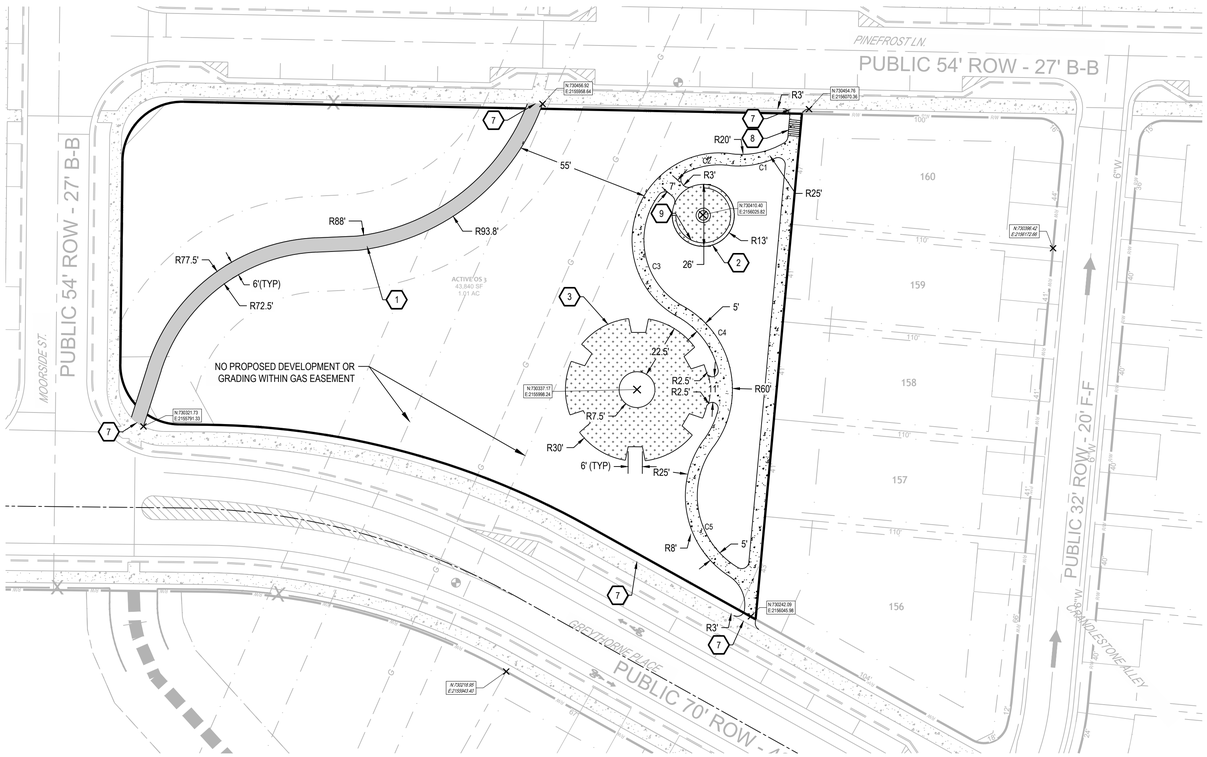
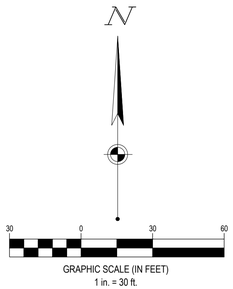
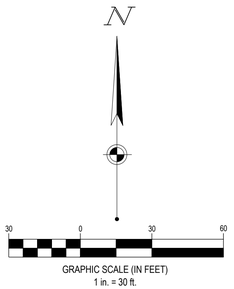


TOT LOT



PUBLIC PLAZA





SITE LEGEND

EXISTING	
REFER TO C2.0 FOR EXISTING FEATURES LEGEND	
PROPOSED	
	PROPOSED STANDARD DUTY ASPHALT PAVEMENT
	PROPOSED CONCRETE SIDEWALK
	PROPOSED STAMPED CONCRETE
R/W	RIGHT-OF-WAY
	PROPERTY LINE
	SETBACK
	CENTERLINE
	BUILDING
	CONCRETE CURB
	PAVEMENT/WALK
	SIGN

GENERAL NOTES:

SEE SHEET C(A)1.1

CODED NOTES:

1. PROPOSED ASPHALT TRAIL. REFER TO DETAIL IN THE PLAN SET FOR HAVEN AT GRIFFITH MEADOWS SUBDIVISION BY TIMMONS GROUP.
2. ROPOSED FIRE PIT TO BE SPECIFIED IN LANDSCAPE FURNISHING PLANS.
3. PROPOSED PUBLIC PLAZA. SEE LANDSCAPE PLANS FOR MORE DETAILS.
4. PROPOSED BENCH TO BE SPECIFIED IN LANDSCAPE FURNISHING PLANS.
5. PROPOSED CONCRETE SIDEWALK. SEE DETAIL ON SHEET C(A)8.0
6. PROPOSED PLAYGROUND TO BE SPECIFIED IN LANDSCAPE FURNISHING PLANS.
7. CONNECT TO EXISTING SIDEWALK
8. PROPOSED STAIRS. SEE DETAIL ON SHEET C(A)8.0
9. PROPOSED SEAT WALL

NOTE:

1. N: & E: VALUES ARE ON ASSUMED COORDINATE PLANE, AND ARE NOT ASSUMED TO BE PRESENT ON STATE PLANE COORDINATE SYSTEM.
2. SEE SHEET L1.2 FOR STAMPED CONCRETE DETAIL.

CURVE TABLE

CURVE	RADIUS	ARC LENGTH	CHORD LENGTH	CHORD BEARING	DELTA ANGLE	TANGENT
C1	37.85'	19.09'	18.89'	S80° 26' 42"W	028° 53' 31"	9.75'
C2	31.57'	19.86'	19.54'	S80° 47' 55"W	036° 02' 51"	10.27'
C3	31.57'	55.11'	48.37'	S12° 55' 36"E	100° 00' 18"	37.63'
C4	40.00'	67.30'	59.64'	S11° 39' 38"E	096° 24' 21"	44.74'
C5	34.93'	58.41'	51.84'	S11° 21' 56"E	095° 48' 57"	38.67'

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: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

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NORTH CAROLINA PROFESSIONAL SEAL 029683 ENGINEER JEFFREY A. TIBBITTS
03/27/2026

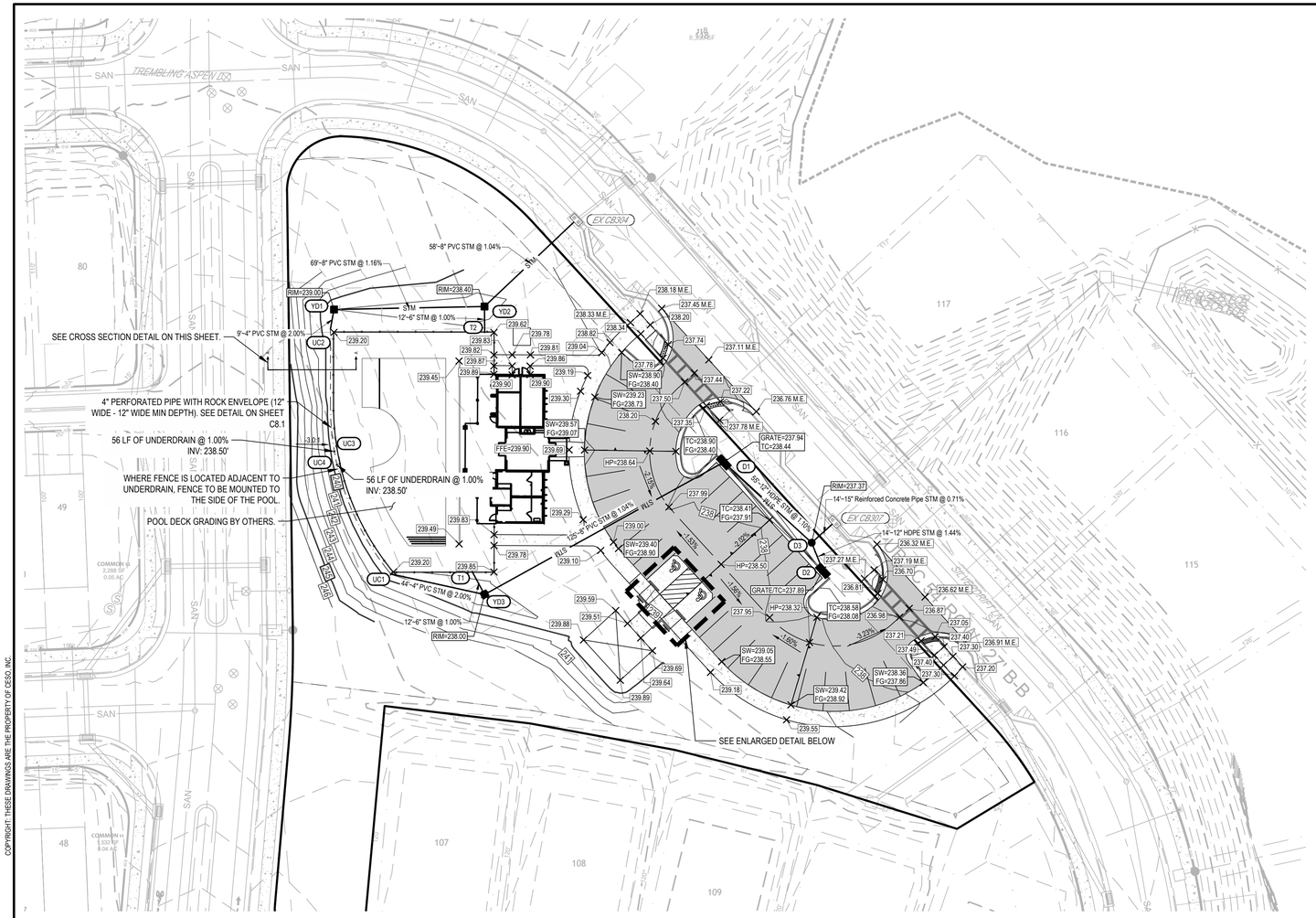
THE HAVEN AT GRIFFITH MEADOWS AMENITY AND OPEN SPACES

POOLE ROAD
TOWN OF KNIGHTDALE, NC

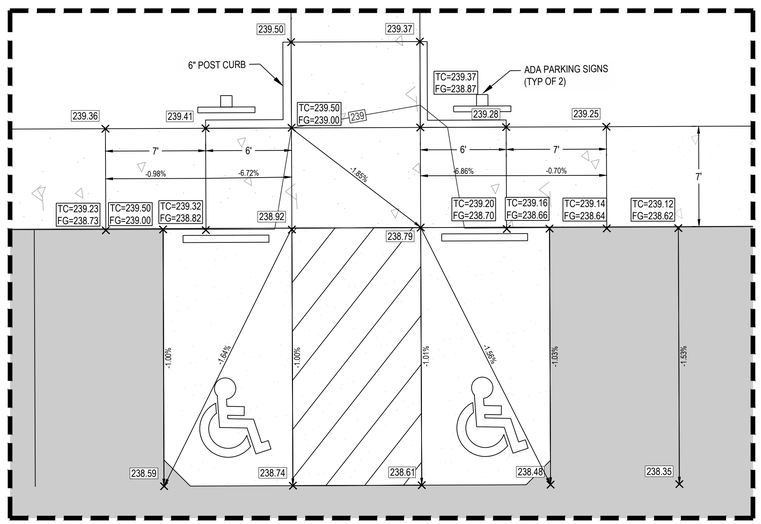
SITE PLAN TOT LOT & PLAZA

ISSUE:	FOR PERMIT - NOT CONSTRUCTION
DATE:	10/17/2025
JOB NO.:	766644-01
DESIGN:	RAM
DRAWN:	SCR
CHECKED:	CSG

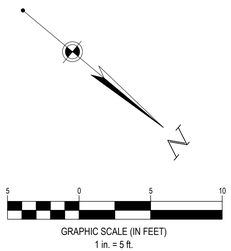
SHEET NO.
C(A)4.1

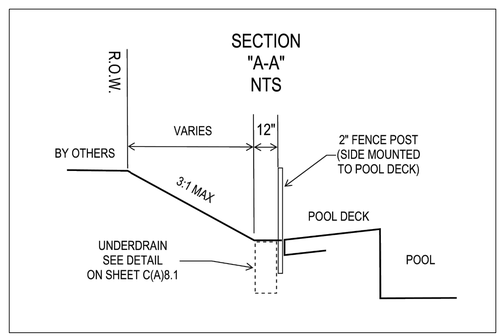


AMENITY AREA

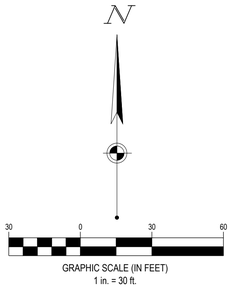


DETAILED GRADING





SECTION A-A



GRADING LEGEND

EXISTING

REFER TO C2.0 & C2.1 FOR EXISTING FEATURES LEGEND

PROPOSED

R/W	RIGHT-OF-WAY
	PROPERTY LINE
	SETBACK
	EASEMENT
	BUILDING
560	MAJOR CONTOUR
562	MINOR CONTOUR
	GRADE BREAK
	FLOW LINE
1	STRUCTURE NUMBER
	CATCH BASIN
D	STORM MANHOLE
	CURB INLET
CO	CLEANOUT
YD	YARD DRAIN
XXX.XX	FINISHED GRADE ELEVATION
RIM=XXX.XX	RIM ELEVATION
TC=XXX.XX FG=XXX.XX	TOP OF CURB ELEVATION FINISHED GRADE ELEVATION
TS=XXX.XX FG=XXX.XX	TOP OF SIDEWALK ELEVATION FINISHED GRADE ELEVATION
M.E.	MATCH EXISTING ELEVATION
X.XX%	SLOPE ARROW

STORM SEWER STRUCTURE SCHEDULE

NO.	STRUCTURE	GRATE	INVERT
D1	CURB INLET (STD NO: 5.05-3)	237.94	231.70 (8") SW 231.30 (12") SE
D2	CURB INLET (STD NO: 5.05-3)	237.91	230.90 (12") N
D3	48" MH	237.37	230.70 (12") S 230.70 (12") NW 230.40 (15") NE
EX CB304	CURB INLET	238.00	232.00 (8") SW 230.25 (15") NE
EX CB307	CURB INLET	241.00	230.30 (15") SW 228.57 (15") NE 229.07 (15") SE
T1	TRENCH DRAIN CONNECTION	233.66	233.12 (6") SE
T2	TRENCH DRAIN CONNECTION	233.26	232.72 (6") N
UC1	UNDERDRAIN CONNECTION	234.25	233.88 (4") NW 233.88 (4") E
UC2	UNDERDRAIN CONNECTION	233.95	233.58 (4") S 233.58 (4") N
UC3	UNDERDRAIN HIGHPOINT	238.87	238.50 (4") N
UC4	UNDERDRAIN HIGHPOINT	238.87	238.50 (4") SE
YD1	NYLOPLAST 18" DRAIN BASIN	239.00	233.40 (4") S 233.40 (8") E
YD2	NYLOPLAST 18" DRAIN BASIN	238.40	232.60 (8") W 232.60 (8") NE 232.60 (6") S
YD3	NYLOPLAST 18" DRAIN BASIN	238.00	233.00 (4") W 233.00 (8") NE 233.00 (6") NW

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: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

TIMMONS GROUP:
5410 TRINITY ROAD SUITE 102
RALEIGH, NC 27607
PHONE: (919)-833-8124
TYLER CROSS, PE
EMAIL: TYLER.CROSS@TIMMONS.COM

CESO PROVIDES NO GUARANTEE TO THE ACCURACY OF THE SURVEY PROVIDED BY TIMMONS GROUP. CONTRACTOR TO VERIFY EXISTING CONDITIONS PRIOR TO BID AND CONSTRUCTION.

SEVENTY-TWO (72) HOURS BEFORE DIGGING IS TO COMMENCE, THE CONTRACTORS SHALL NOTIFY THE FOLLOWING AGENCIES: NORTH CAROLINA UTILITIES PROTECTION SERVICE AT 811 OR 800-632-4949 AND ALL OTHER AGENCIES WHICH MIGHT HAVE UNDERGROUND UTILITIES INVOLVING THIS PROJECT AND ARE NONMEMBERS OF STATE UTILITIES PROTECTION SERVICE

CESO
WWW.CESOINC.COM

CESO NC, Co.
4601 Park Road Suite 650
Charlotte, NC 28209
Phone: 704-521-7979 License No.: C-4740

NO. | DATE | REVISION DESCRIPTION

NORTH CAROLINA PROFESSIONAL SEAL 029683 ENGINEER JEFFREY A. TIBBITTS
10/17/2025

THE HAVEN AT GRIFFITH MEADOWS AMENITY AND OPEN SPACES
POOLE ROAD
TOWN OF KNIGHTDALE, NC

GRADING PLAN AMENITY CENTER

ISSUE: FOR PERMIT - NOT CONSTRUCTION	
DATE:	10/17/2025
JOB NO.:	766644-01
DESIGN:	RAM
DRAWN:	SCR
CHECKED:	CSG

SHEET NO.
C(A)5.0

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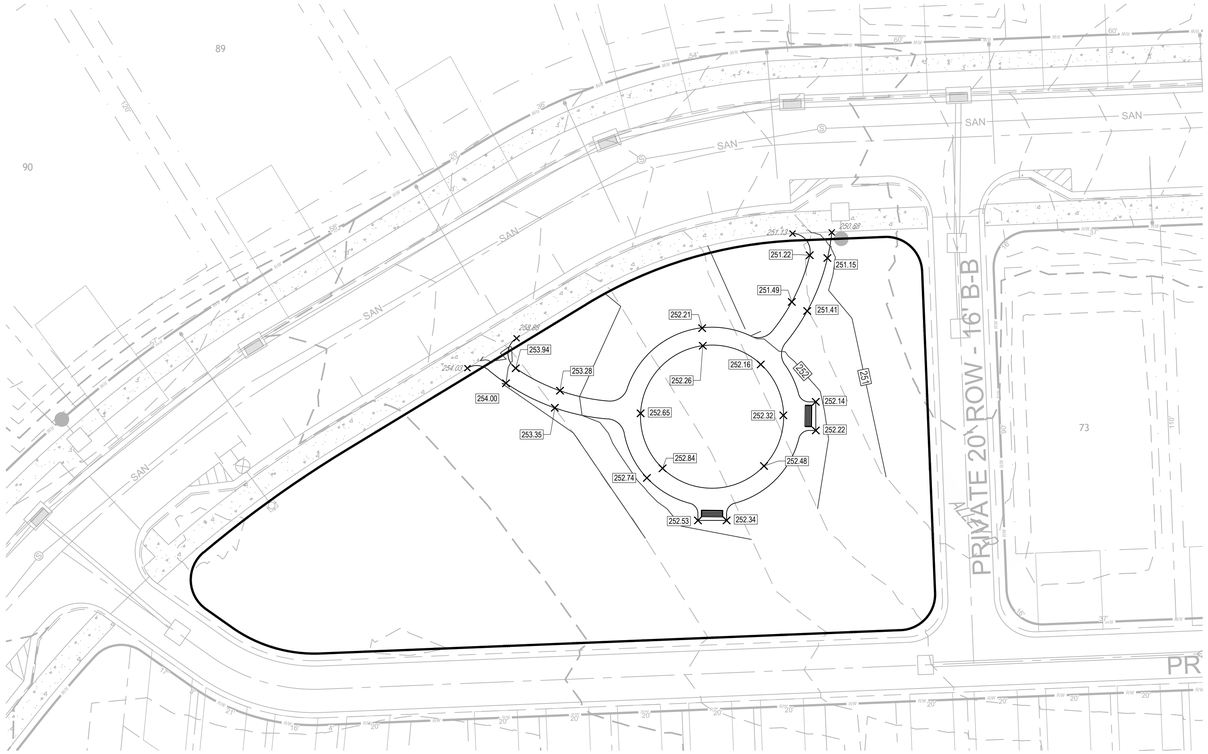
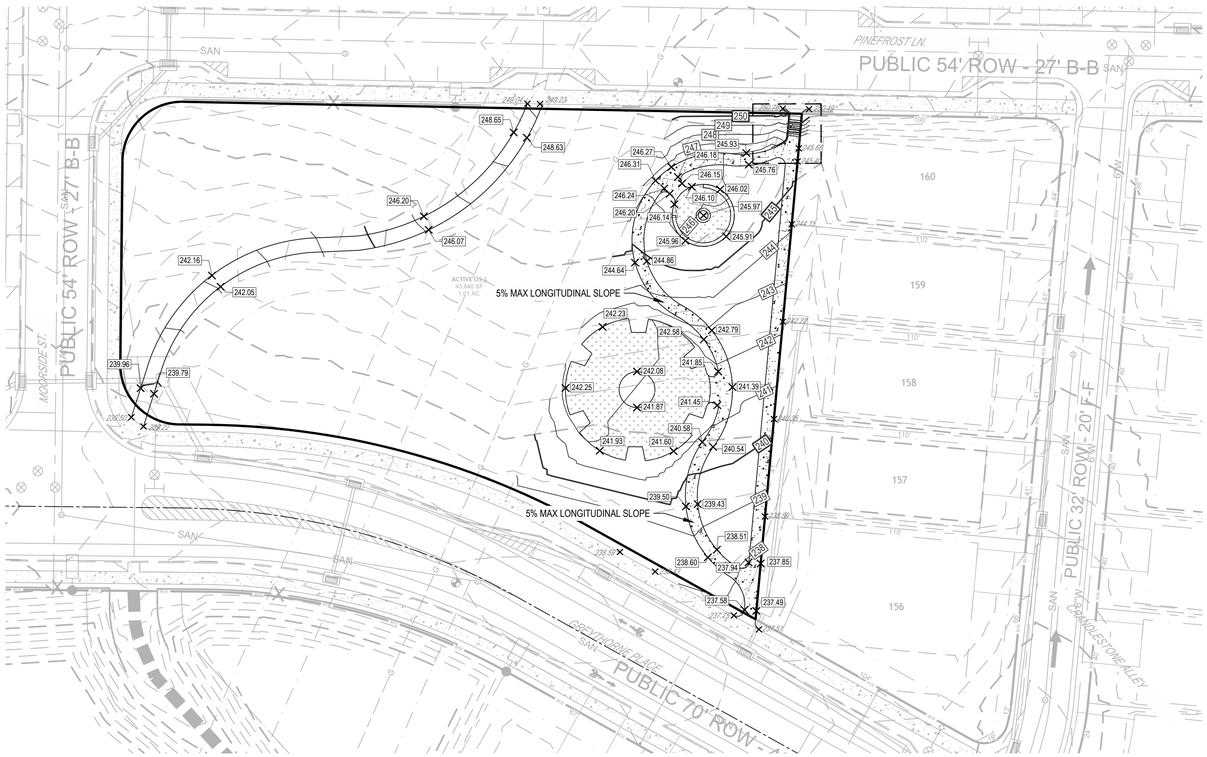
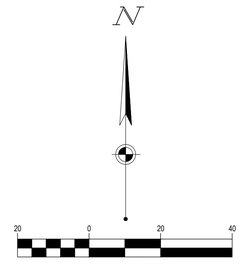


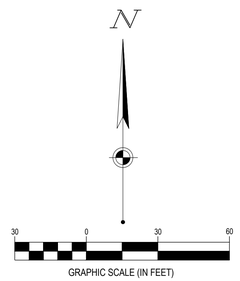
TOT LOT



PUBLIC PLAZA



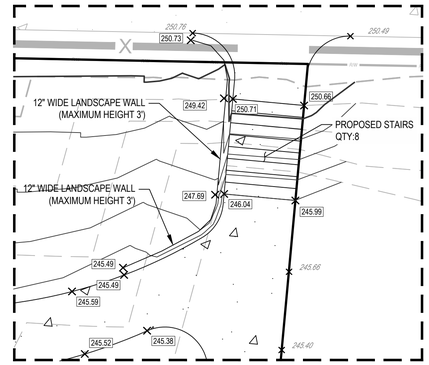
GRAPHIC SCALE (IN FEET)
1 in. = 20 ft.

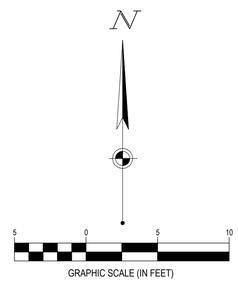


GRAPHIC SCALE (IN FEET)
1 in. = 30 ft.

GRADING LEGEND

EXISTING	
REFER TO C(A)2.0 & C(A)2.1 FOR EXISTING FEATURES LEGEND	
PROPOSED	
R/W	RIGHT-OF-WAY
	PROPERTY LINE
	SETBACK
	EASEMENT
	BUILDING
960	MAJOR CONTOUR
962	MINOR CONTOUR
	GRADE BREAK
	FLOW LINE
1	STRUCTURE NUMBER
	CATCH BASIN
D	STORM MANHOLE
	CURB INLET
CO	CLEANOUT
YD	YARD DRAIN
XXX.XX	FINISHED GRADE ELEVATION
RIM=XXX.XX	RIM ELEVATION
TC=XXX.XX FG=XXX.XX	TOP OF CURB ELEVATION FINISHED GRADE ELEVATION
TS=XXX.XX FG=XXX.XX	TOP OF SIDEWALK ELEVATION FINISHED GRADE ELEVATION
M.E.	MATCH EXISTING ELEVATION
X.XX%	SLOPE ARROW





GRAPHIC SCALE (IN FEET)
1 in. = 5 ft.

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: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

TIMMONS GROUP:
5410 TRINITY ROAD SUITE 102
RALEIGH, NC 27607
PHONE: (919)-833-8124
TYLER CROSS, PE
EMAIL: TYLER.CROSS@TIMMONS.COM

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NO.	DATE	REVISION DESCRIPTION

CESO NC, Co.
4601 Park Road Suite 650
Charlotte, NC 28209
Phone: 704-521-7979 License No.: C-4740

NORTH CAROLINA PROFESSIONAL SEAL 029683 ENGINEER JEFFREY A. TIBBITS
3/25/2026

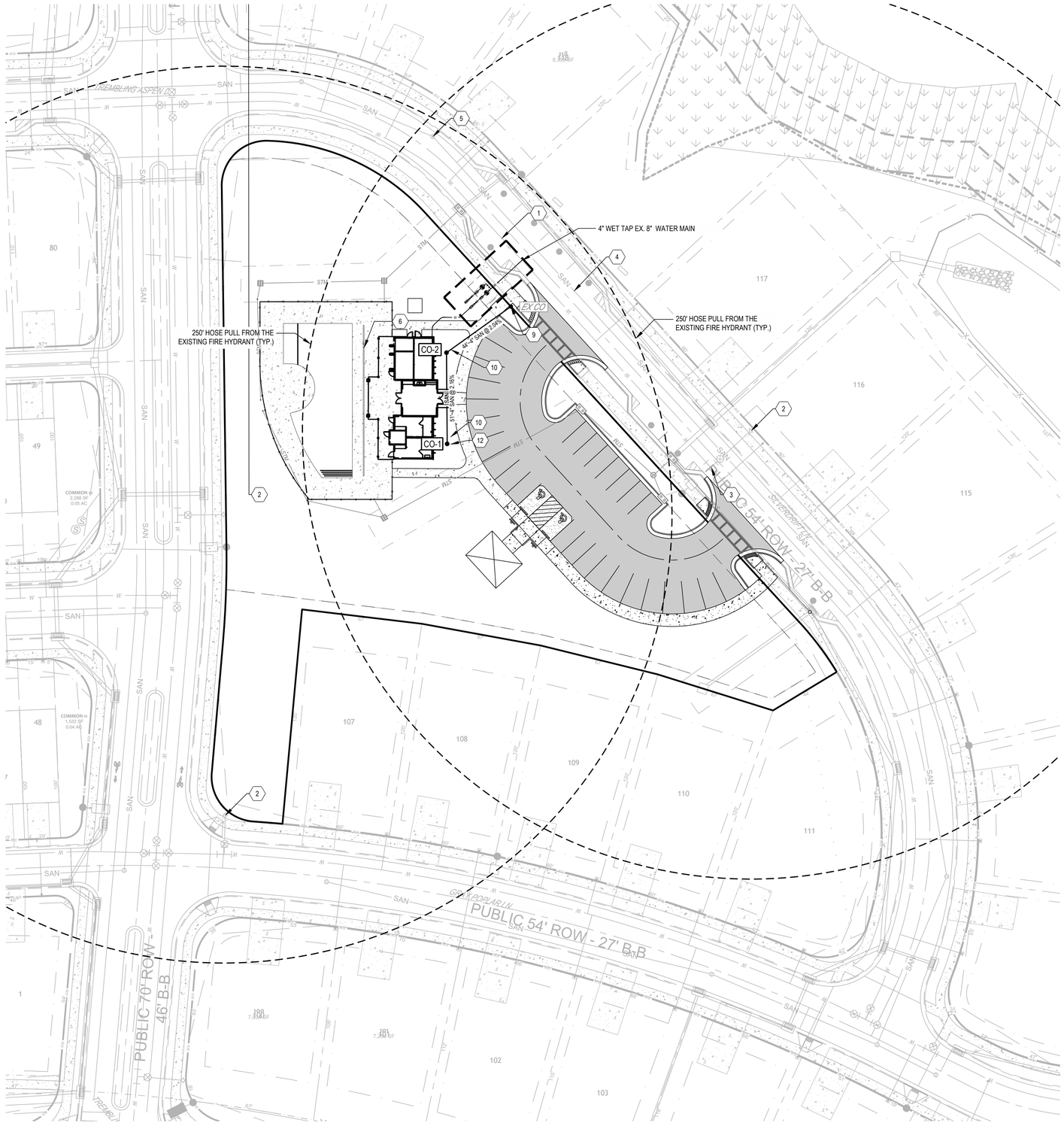
THE HAVEN AT GRIFFITH MEADOWS AMENITY AND OPEN SPACES

POOLE ROAD
TOWN OF KNIGHTDALE, NC

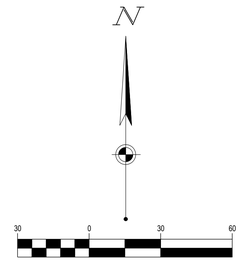
GRADING PLAN TOT LOT & PLAZA

ISSUE: FOR PERMIT - NOT CONSTRUCTION	
DATE: 10/17/2025	
JOB NO.:	766644-01
DESIGN:	RAM
DRAWN:	SCR
CHECKED:	CSG

SHEET NO.
C(A)5.1



AMENITY AREA



UTILITY LEGEND

EXISTING

REFER TO C2.0 & C2.1 FOR EXISTING FEATURES LEGEND

PROPOSED

- BUILDING
- CONCRETE CURB
- PAVEMENT/WALK
- STM — STORM SEWER LINE
- SANITARY SEWER LINE
- W — DOMESTIC WATER SERVICE LINE
- G — GAS SERVICE LINE
- D — STORM SEWER
- S — SANITARY SEWER
- CURB INLET
- CO — CLEANOUT
- YD — YARD DRAIN
- ELECTRICAL TRANSFORMER PAD
- WATER VALVE

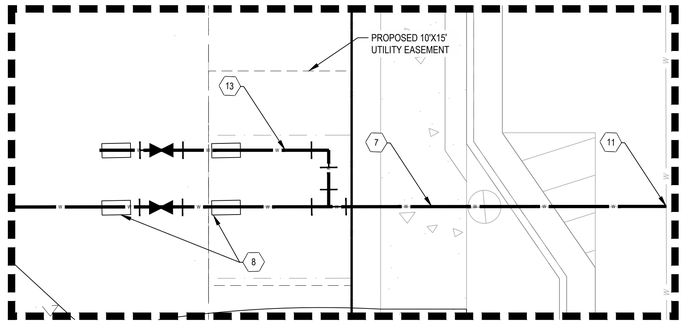
GENERAL NOTES:

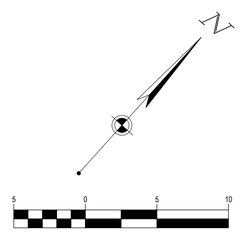
SEE SHEET C(A)1.1

1. EXISTING 8" WATERMAIN LINE.
2. EXISTING FIRE HYDRANT
3. EXISTING 8" x 8" x 8" WATERMAIN TEE.
4. EXISTING 8" SDR 26 PVC SANITARY SEWER PIPE. SEE DETAL ON SHEETS C12.3 & C12.4.
5. EXISTING SANITARY SEWER MANHOLE. SEE DETAIL ON SHEET C12.3.
6. PROPOSED 86 ± LF TRENCH DRAIN.
7. PROPOSED 4" WATER LINE. SEE DETAIL ON SHEET C(A)8.1
8. PROPOSED 1.5" DOMESTIC METER AND 2" RPZ. SEE DETAILS W-36 AND W-38 ON SHEET C(A)8.1
9. PROPOSED SANITARY SEWER CONNECTION TO EXISTING CLEANOUT.
10. PROPOSED 4" SDR 26 PVC SANITARY SEWER PIPE.
11. PROPOSED WATER LINE CONNECTION TO EXISTING 8" WATER LINE.
12. PROPOSED SAN CLEANOUT (TYP.). SEE DETAILS ON SHEET C(A)8.1
13. PROPOSED 2" IRRIGATION LINE. SEE DETAIL ON SHEET C(A)8.1.

RALEIGH WATER - PLANS AUTHORIZED FOR CONSTRUCTION
Any work authorized by this approval must proceed in accordance with the plans. This electronic approval may not be edited once issued. Any modification to this approval once issued will invalidate this approval.

Cydney Terry
2026.05.18 21:27:08-04'00'





SANITARY SEWER STRUCTURE SCHEDULE

NO.	STRUCTURE	RIM	INVERT
CO-1	6" CO	239.65	232.00 (4") N
CO-2	6" CO	239.66	230.90 (4") S 228.90 (4") NE
EX CO	6" CO	238.42	228.00 (4") SW 227.65 (8") NE

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: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

SEVENTY-TWO (72) HOURS BEFORE DIGGING IS TO COMMENCE, THE CONTRACTORS SHALL NOTIFY THE FOLLOWING AGENCIES: NORTH CAROLINA UTILITIES PROTECTION SERVICE AT 811 OR 800-632-4949 AND ALL OTHER AGENCIES WHICH MIGHT HAVE UNDERGROUND UTILITIES INVOLVING THIS PROJECT AND ARE NONMEMBERS OF STATE UTILITIES PROTECTION SERVICE

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NO.	DATE	REVISION DESCRIPTION

CESO NC, Co.
4601 Park Road Suite 650
Charlotte, NC 28209
Phone: 704-521-7979 License No.: C-4740

NORTH CAROLINA PROFESSIONAL SEAL 029683 ENGINEER JEFFREY A. TIBBITS
05/21/2026

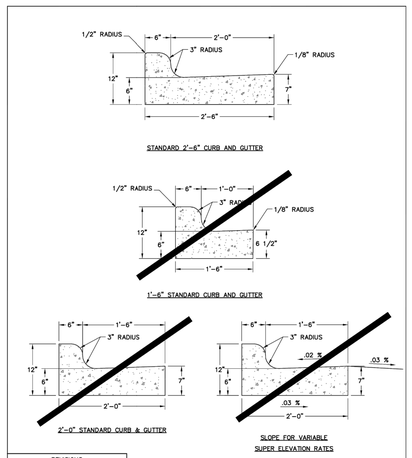
THE HAVEN AT GRIFFITH MEADOWS AMENITY AND OPEN SPACES

POOLE ROAD
TOWN OF KNIGHTDALE, NC

UTILITY PLAN

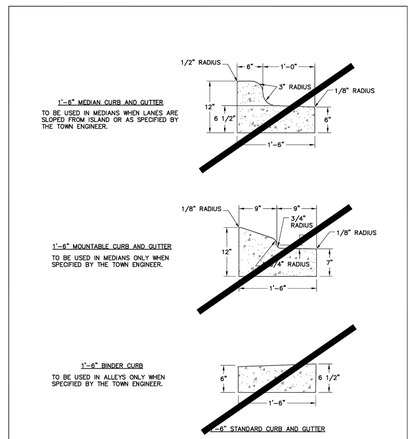
ISSUE:	FOR PERMIT - NOT CONSTRUCTION
DATE:	10/17/2025
JOB NO.:	766644-01
DESIGN:	RAM
DRAWN:	SCR
CHECKED:	CSG

SHEET NO.
C(A)6.0



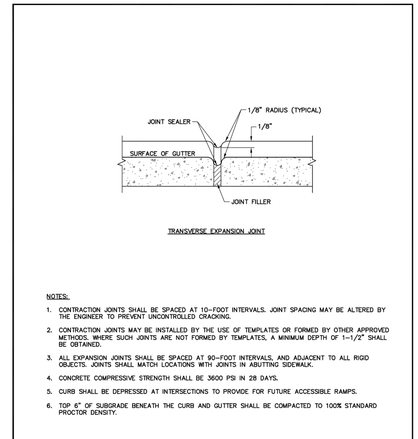
REVISIONS	
DATE	DESCRIPTION

TOWN OF KNIGHTDALE STANDARD DETAILS	CURB AND GUTTER	1 of 3 STD. NO. 4.01



REVISIONS	
DATE	DESCRIPTION

TOWN OF KNIGHTDALE STANDARD DETAILS	CURB AND GUTTER	2 of 3 STD. NO. 4.01

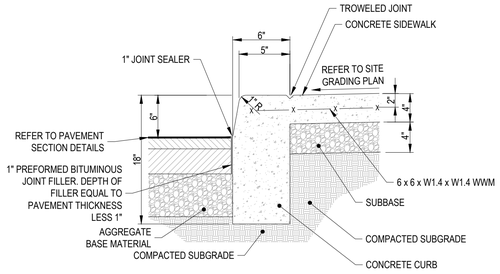


NOTES:

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 OBTAINED.
3. ALL EXPANSION JOINTS SHALL BE SPACED AT 90-FOOT INTERVALS, AND ADJACENT TO ALL RIGID OBJECTS. JOINTS SHALL MATCH LOCATIONS WITH JOINTS IN ABUTTING SIDEWALK.
4. CONCRETE COMPRESSIVE STRENGTH SHALL BE 3600 PSI IN 28 DAYS.
5. CURB SHALL BE DEPRESSED AT INTERSECTIONS TO PROVIDE FOR FUTURE ACCESSIBLE RAMPS.
6. TOP 6" OF SUBGRADE BENEATH THE CURB AND GUTTER SHALL BE COMPACTED TO 100% STANDARD PROCTOR DENSITY.

REVISIONS	
DATE	DESCRIPTION

TOWN OF KNIGHTDALE STANDARD DETAILS	CURB AND GUTTER	3 of 3 STD. NO. 4.01

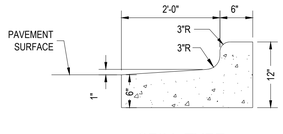


NOTES:

1. ALL CONCRETE CURBS AND SIDEWALK TO BE 4,000 P.S.I. CONCRETE AT 28 DAYS.
2. TRANSVERSE EXPANSION JOINTS, 1/2" WIDE, SHALL BE INSTALLED IN THE CURB 20'-0" APART MAXIMUM. SPACING SHALL MATCH SIDEWALK.
3. EXPANSION JOINTS SHALL BE FILLED WITH 1/2" PREFORMED JOINT FILLER, RECESSED 1/4" FROM TOP AND FACE OF CURB.
4. MAXIMUM HEIGHT OF CURB TO PAVING IS 6".

CONCRETE CURB W/ SIDEWALK

NTS



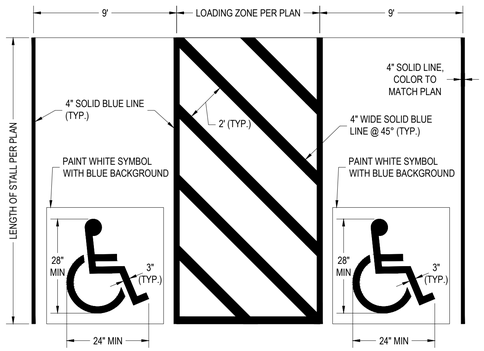
SPILL TYPE

NOTES:

1. ALL CONCRETE CURBS AND SIDEWALKS TO BE 4,000 P.S.I. CONCRETE AT 28 DAYS.
2. TRANSVERSE EXPANSION JOINTS, 1/2" WIDE, SHALL BE INSTALLED IN THE CURB 20'-0" APART MAXIMUM.
3. EXPANSION JOINTS SHALL BE FILLED WITH 1/2" PREFORMED JOINT FILLER, RECESSED 1/4" FROM TOP AND FACE OF CURB.

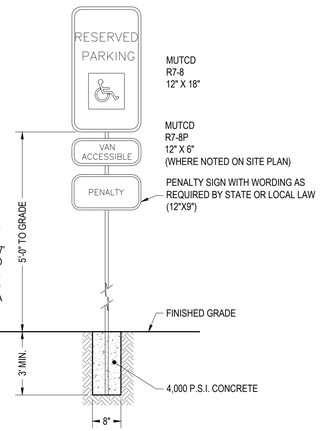
CONCRETE CURB AND GUTTER

NTS



ACCESSIBLE PARKING SPACE STRIPING

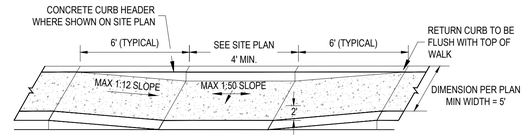
NTS



NOTE:
SIGNS LOCATED WITHIN AN ADA ACCESSIBLE ROUTE, OR OTHER PEDESTRIAN ROUTE, SHALL BE 7' MIN. MEASURED FROM FINISHED GRADE TO THE BOTTOM OF THE LOWEST SIGN. SIGNS MAY ALSO BE PERMANENTLY POSTED ON A WALL AT THE INTERIOR END OF THE PARKING SPACE.

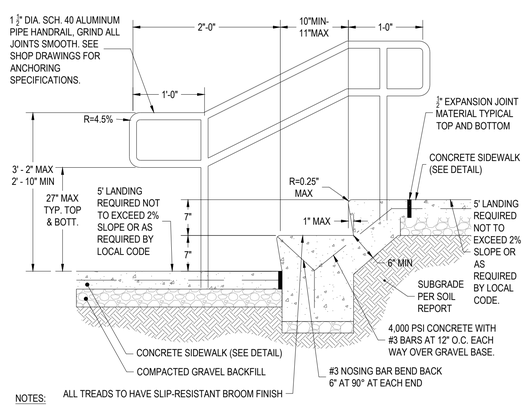
ACCESSIBLE PARKING SIGN

NTS



ACCESSIBLE CURB RAMP (TYPE I)

NTS

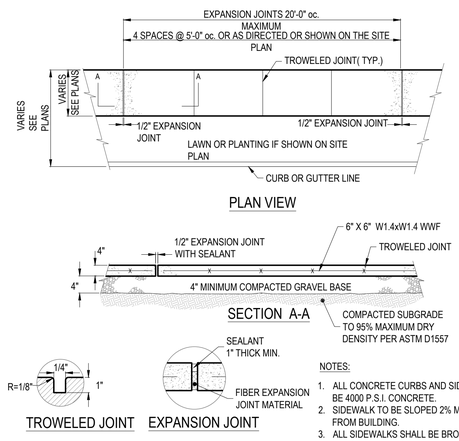


NOTES:

1. ALL ACCESSIBLE STAIRS MUST COMPLY WITH THE LATEST EDITION OF ADA STANDARDS OR STATE BUILDING CODE. CONTACT ENGINEER WITH ANY CONFLICTS.

CONCRETE STAIR AND HANDRAIL

NTS



NOTES:

1. ALL CONCRETE CURBS AND SIDEWALKS TO BE 4000 P.S.I. CONCRETE.
2. SIDEWALK TO BE SLOPED 2% MAX. AWAY FROM BUILDING.
3. ALL SIDEWALKS SHALL BE BROOM FINISHED.

CONCRETE SIDEWALK

NTS

TOWN CERTIFICATION

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

BY: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

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NO.	DATE	REVISION DESCRIPTION

CESO NC, Co.
4601 Park Road Suite 650
Charlotte, NC 28209
Phone: 704-521-7979 License No.: C-4740

NORTH CAROLINA PROFESSIONAL SEAL 029683 ENGINEER JEFFREY A TIBBITTS
3/25/2026

THE HAVEN AT GRIFFITH MEADOWS AMENITY AND OPEN SPACES

POOLE ROAD
TOWN OF KNIGHTDALE, NC

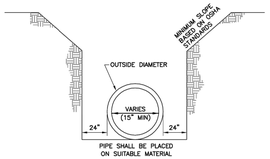
DETAILS

ISSUE: FOR PERMIT - NOT CONSTRUCTION	
DATE:	10/17/2025
JOB NO.:	766644-01
DESIGN:	RAM
DRAWN:	SCR
CHECKED:	CSG

SHEET NO.
C(A)8.0

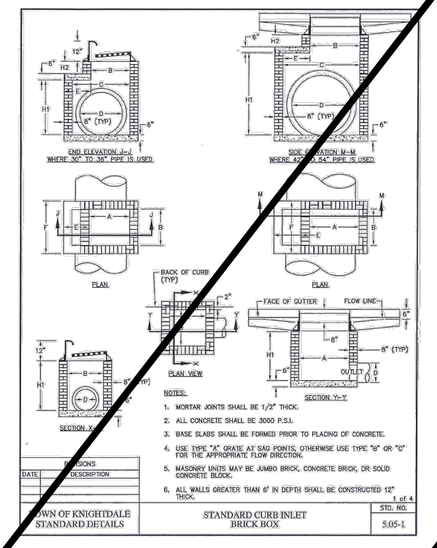
NOTES:

1. 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. THE FILL AROUND THE PIPE SHALL BE PLACED IN LAYERS NOT TO EXCEED 6". UNDER NO CIRCUMSTANCES SHALL WATER BE PERMITTED TO RISE IN UNBACKFILLED TRENCHES AFTER THE PIPE HAS BEEN PLACED. COMPACTION REQUIREMENTS SHALL BE ATTAINED BY THE USE OF MECHANICAL TAMPS ONLY. EACH AND EVERY LAYER OF BACKFILL SHALL BE PLACED LOOSE AND THOROUGHLY COMPACTED INTO PLACE.
2. ALL BACKFILL MATERIAL SHALL HAVE AN IN PLACE COMPACTED DENSITY OF AT LEAST 95% OF THE STANDARD PROCTOR MAXIMUM DENSITY.
3. THE FINAL 24" OF BACKFILL MATERIAL SHALL BE COMPACTED TO 100% OF THE STANDARD PROCTOR MAXIMUM DENSITY.
4. ALL TRENCHING OPERATIONS SHALL MEET OSHA STANDARDS.
5. BACKFILL MATERIAL BENEATH ROADWAY SHALL BE SELECT BACKFILL MATERIAL.



REVISIONS	
DATE	DESCRIPTION

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



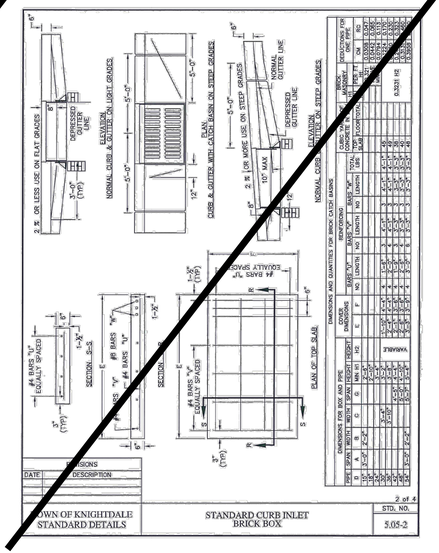
NOTES:

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

REVISIONS	
DATE	DESCRIPTION

TOWN OF KNIGHTDALE STANDARD DETAILS	STANDARD CURB INLET BRICK BOX	STD. NO. 5.05-1

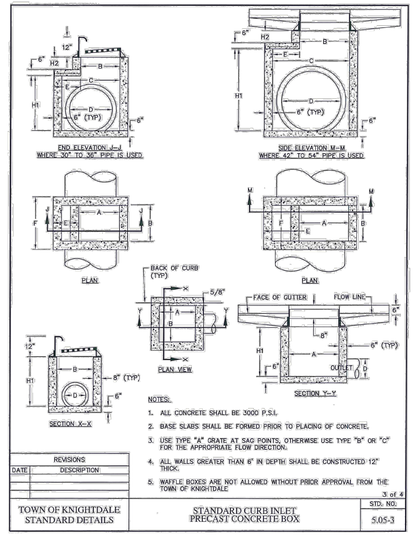
1 of 4



REVISIONS	
DATE	DESCRIPTION

TOWN OF KNIGHTDALE STANDARD DETAILS	STANDARD CURB INLET BRICK BOX	STD. NO. 5.05-2

2 of 4



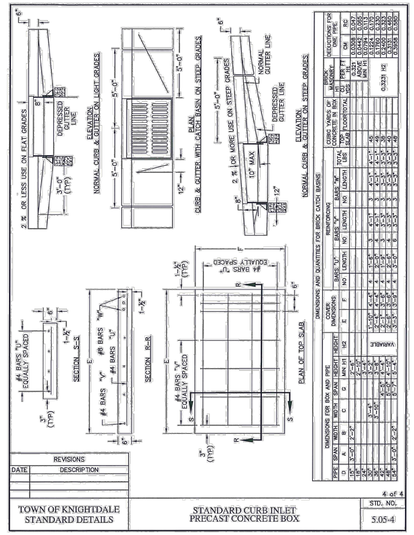
NOTES:

1. ALL CONCRETE SHALL BE 3000 P.S.I.
2. BASE SLABS SHALL BE FORMED PRIOR TO PLACING OF CONCRETE.
3. USE TYPE "A" GRATE AT SAG POINTS, OTHERWISE USE TYPE "B" OR "C" FOR THE APPROPRIATE FLOW DIRECTION.
4. ALL WALLS GREATER THAN 6' IN DEPTH SHALL BE CONSTRUCTED 12" THICK.
5. WAFFLE BOXES ARE NOT ALLOWED WITHOUT PRIOR APPROVAL FROM THE TOWN OF KNIGHTDALE

REVISIONS	
DATE	DESCRIPTION

TOWN OF KNIGHTDALE STANDARD DETAILS	STANDARD CURB INLET PRECAST CONCRETE BOX	STD. NO. 5.05-3

3 of 4


NORMAL CURB & GUTTER ON LIGHT GRADES
DEPRESSED GUTTER LINE
ELEVATION
PLAN
CURB & GUTTER, MITER CATCH BASIN, ON STEEP GRADES
NORMAL GUTTER LINE
2 % OR MORE USE ON STEEP GRADES
10' MAX
NORMAL CURB & GUTTER ON STEEP GRADES
2 % OR LESS USE ON FLAT GRADES
3'-0" (TYP)
5'-0"
12"
6"
#4 BARS "L" EQUALLY SPACED
3" (TYP)
SECTION S–S
#5 BARS "V"
#6 BARS "U"
SECTION R–R
#4 BARS "H" EQUALLY SPACED
PLAN OF TOP SLAB
DIMENSIONS AND QUANTITIES FOR BRICK CATCH BASINS
DIMENSIONS FOR BOX AND PIPE OPENINGS
DIMENSIONS FOR CURB, VANES OR TOP SLAB REINFORCING
CONC. YARDS OF CLASS A CONCRETE
REINFORCING STEEL
PIPE SIZE
A
B
C
D
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F
G
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H2
CM
RC
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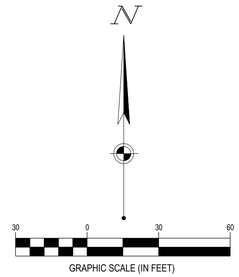
AMENITY



GRAPHIC SCALE (IN FEET)
1 in. = 30 ft.

SITE LEGEND

EXISTING	
REFER TO C2.0 FOR EXISTING FEATURES LEGEND	
PROPOSED	
	PROPOSED STANDARD DUTY ASPHALT PAVEMENT
	PROPOSED CONCRETE SIDEWALK
	PROPOSED STAMPED CONCRETE
R/W	RIGHT-OF-WAY
	PROPERTY LINE
	SETBACK
	CENTERLINE
	BUILDING
	CONCRETE CURB
	PAVEMENT/WALK
	SIGN

CODED NOTES:

1. PROPOSED CONCRETE SIDEWALK.
2. PROPOSED ADA ACCESSIBLE PARKING SPACE.
3. PROPOSED MAIL KIOSK.
4. PROPOSED TRENCH DRAIN
5. PROPOSED POOL FENCE.

LANDSCAPING REQUIREMENTS

PARKING AREA:
NO PARKING SPACE SHALL BE MORE THAN SIXTY (60) FEET FROM THE BASE OF A DECIDUOUS CANOPY TREE. IN ADDITION, LANDSCAPE AREAS SHALL BE PROVIDED AT THE END OF EACH PARKING ROW AND SHALL CONTAIN A DECIDUOUS CANOPY TREE.

ALL SIDES OF PARKING LOTS FRONTING STREET RIGHTS-OF-WAY SHALL BE SCREENED WITH A TYPE 'A' BUFFER.
PARKING LF FRONTING STREET: 329 LF
REQUIRED CANOPY TREES: 9 TREES (3 PER 100 LF)
PROPOSED CANOPY TREES: 9 TREES
REQUIRED UNDERSTORY TREES: 6 TREES (2 PER 100 LF)
PROPOSED UNDERSTORY TREES: 6 TREES
REQUIRED SHRUBS: 60 SHRUBS (20 PER 100 LF)
PROPOSED SHRUBS: 122 SHRUBS

FOUNDATION PLANTING:
FOUNDATION PLANTINGS CONSISTING OF EVERGREEN SHRUBS SHALL BE INSTALLED ALONG THE ENTIRE FOUNDATION WALL OF THE BUILDING.

PLANT SCHEDULE

SYMBOL	QTY	BOTANICAL / COMMON NAME	SIZE	MIN HT / SPR	SPACING
TREES					
	14	ACER SACCHARUM SUGAR MAPLE	2" CAL	8-10` HT	AS SHOWN
	19	QUERCUS LAURIFOLIA LAUREL OAK	2" CAL	8-10` HT	AS SHOWN
FLOWERING TREES					
	22	CORNUS FLORIDA FLOWERING DOGWOOD	2" CAL	6` HT	AS SHOWN
	14	PRUNUS KWANZAN KWANZAN CHERRY	2" CAL	6` HT	AS SHOWN
SHRUBS					
	267	ILEX CRENATA `HELLERI' HELER JAPANESE HOLLY	3 GAL	18" HT	3`-0" OC
	206	LOROPETALUM CHINENSE RUBRUM 'SHANG-HI' TM PURPLE DIAMOND FRINGE FLOWER	3 GAL	24" HT	3`-0" OC
GROUND COVERS					
	135	MUHLENBERGIA CAPILLARIS PINK MUHLY GRASS	24" HT		3`-0" OC

TOWN CERTIFICATION

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BY: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

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NO.	DATE	REVISION DESCRIPTION

CESO NC, Co.
4601 Park Road Suite 650
Charlotte, NC 28209
Phone: 704-521-7979 License No.: C-4740

NORTH CAROLINA REGISTERED LANDSCAPE ARCHITECT ERIC J. ALONE 987
02/11/2026

THE HAVEN AT GRIFFITH MEADOWS AMENITY AND OPEN SPACES

POOLE ROAD
TOWN OF KNIGHTDALE, NC

PLANTING PLAN

ISSUE:	FOR PERMIT - NOT CONSTRUCTION
DATE:	10/17/2025
JOB NO.:	766644-01
DESIGN:	RAM
DRAWN:	SCR
CHECKED:	CSG
SHEET NO.	L1.0

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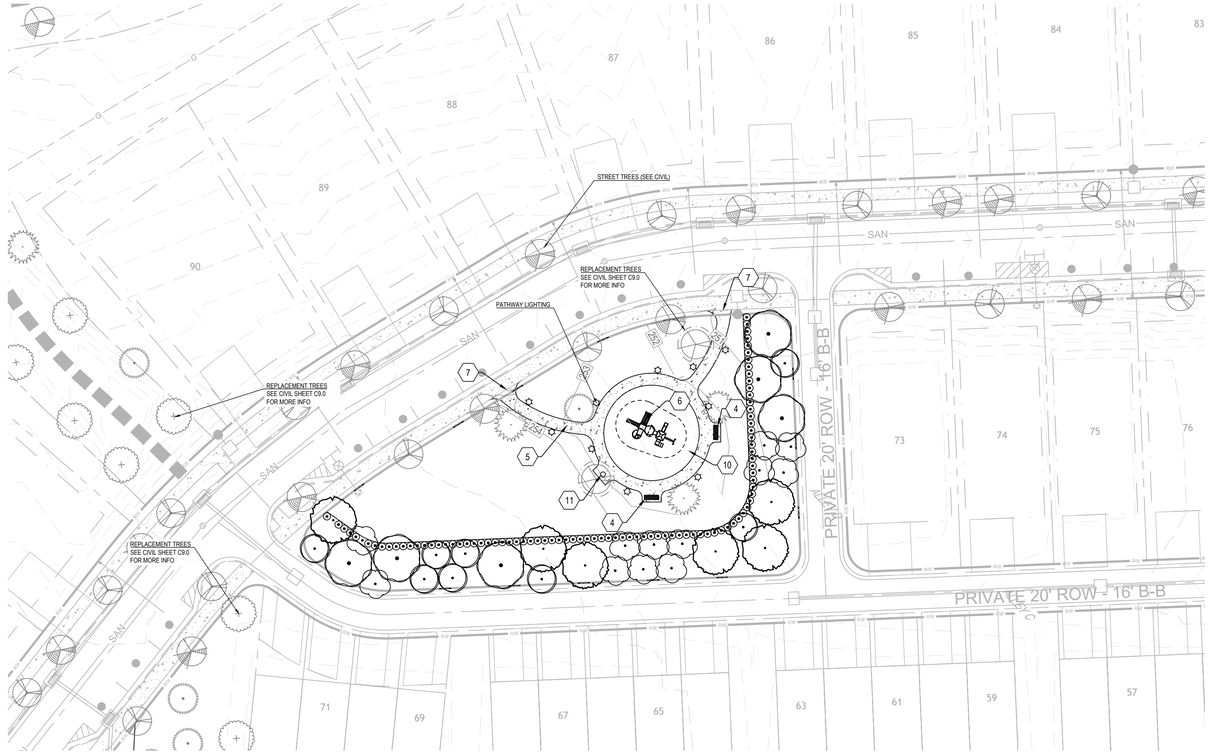
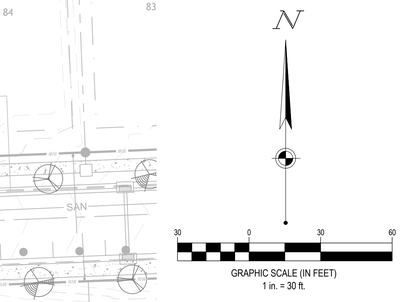
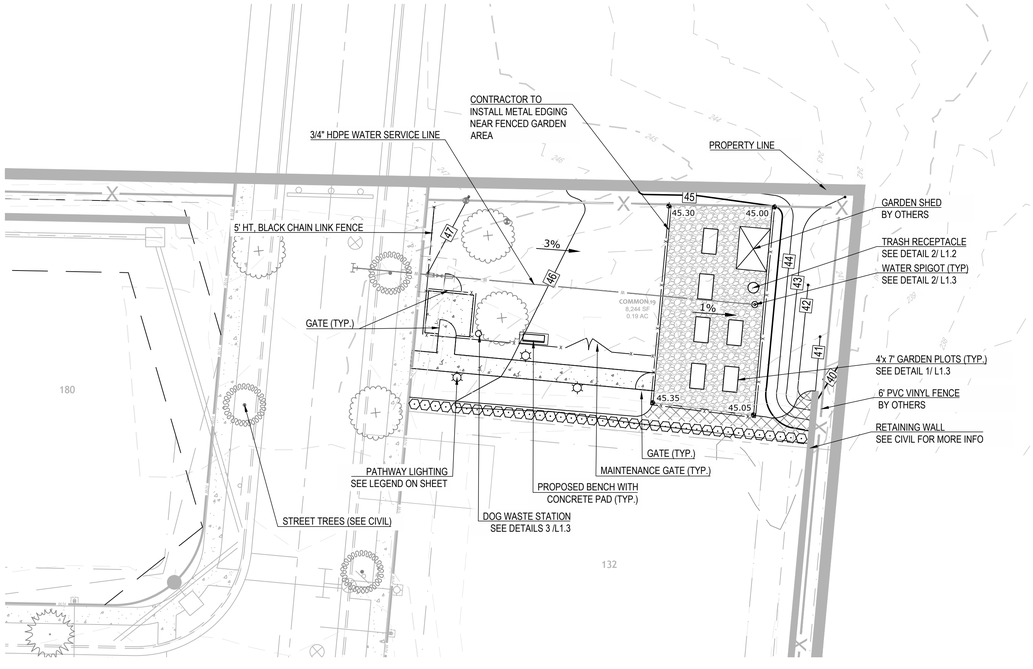
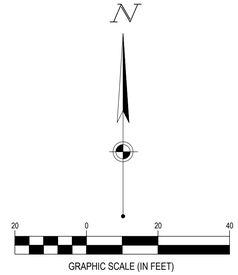


TOT LOT





DOG PARK / COMMUNITY GARDEN



SITE LEGEND

EXISTING	
REFER TO C2.0 FOR EXISTING FEATURES LEGEND	
PROPOSED	
	PROPOSED STANDARD DUTY ASPHALT PAVEMENT
	PROPOSED CONCRETE SIDEWALK
	PROPOSED STAMPED CONCRETE
R/W	RIGHT-OF-WAY
	PROPERTY LINE
	SETBACK
	CENTERLINE
	BUILDING
	CONCRETE CURB
	PAVEMENT/WALK
	SIGN

TOT LOT LANDSCAPING REQUIREMENTS

SCREENING PLANTING:
A TYPE 'B' BUFFER SHALL BE PROPOSED ALONG THE FRONTAGE OF ALLEY 'C' AND ALLEY 'D'
SCREENING LF: 337 LF
REQUIRED CANOPY TREES: 12 TREES (3 PER 100 LF)
PROPOSED CANOPY TREES: 12 TREES
REQUIRED UNDERSTORY TREES: 20 TREES (5 PER 100 LF)
PROPOSED UNDERSTORY TREES: 20 TREES
REQUIRED SHRUBS: 80 SHRUBS (20 PER 100 LF)
PROPOSED SHRUBS: 88 SHRUBS

PATH LIGHT FIXTURES TO LIGHT SIDEWALKS

MFG: WAC LIGHTING
FIXTURE: 2" SURFACE INDICATOR QUAD DIRECTIONAL
MODEL: 25-30-SS

CODED NOTES:

1. PROPOSED ASPHALT TRAIL.
2. PROPOSED FIRE PIT. SEE 3&4/L1.2 FOR DETAILS.
3. PROPOSED PUBLIC PLAZA.
4. PROPOSED BENCH (TYP.) SEE 1/L1.2 FOR DETAILS.
5. PROPOSED CONCRETE SIDEWALK.
6. PROPOSED IPEMA CERTIFIED PLAYGROUND EQUIPTMENT.
7. CONNECT TO EXISTING SIDEWALK.
8. PROPOSED STAIRS.
9. PROPOSED SEAT WALL.
10. ENGINEERED WOOD CHIPS.
11. PROPOSED TRASH RECEPTACLE (TYP.) SEE 2/L1.2 FOR DETAILS.

PLANT SCHEDULE

SYMBOL	QTY	BOTANICAL / COMMON NAME	SIZE	MIN HT / SPR	SPACING
TREES					
	14	ACER SACCHARUM SUGAR MAPLE	2" CAL	8-10` HT	AS SHOWN
	19	QUERCUS LAURIFOLIA LAUREL OAK	2" CAL	8-10` HT	AS SHOWN
FLOWERING TREES					
	22	CORNUS FLORIDA FLOWERING DOGWOOD	2" CAL	6` HT	AS SHOWN
	14	PRUNUS KWANZAN KWANZAN CHERRY	2" CAL	6` HT	AS SHOWN
SHRUBS					
	267	ILEX CRENATA 'HELLERI' HELER JAPANESE HOLLY	3 GAL	18" HT	3`-0" OC
	206	LOROPETALUM CHINENSE RUBRUM 'SHANG-HI' TM PURPLE DIAMOND FRINGE FLOWER	3 GAL	24" HT	3`-0" OC
GROUND COVERS					
	135	MUHLENBERGIA CAPILLARIS PINK MUHLY GRASS	24" HT		3`-0" OC

TOWN CERTIFICATION

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BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

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02/11/2026

THE HAVEN AT GRIFFITH MEADOWS AMENITY AND OPEN SPACES
POOLE ROAD
TOWN OF KNIGHTDALE, NC

PLANTING PLAN

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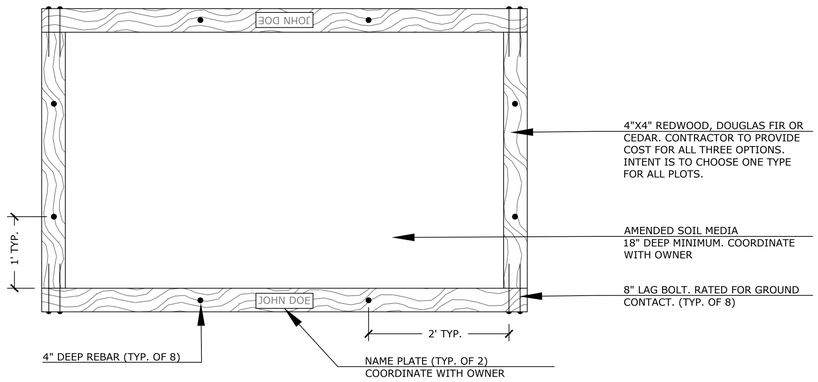
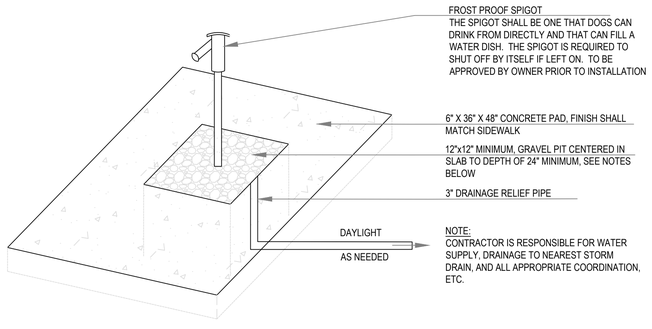
PUBLIC 54' ROW - 27' B-B
PUBLIC 32' ROW - 20' F-F
PUBLIC 70' ROW - 4
PINEFROST LN.
MOONSIDE ST.
GREYSTONE PLACE
GREYSTONE ALLEY
172
173
174
175
160
159
158
157
156
PASSIVE OS 3
16,489 SF
0.36 AC
ACTIVE OS 3
43,840 SF
1.01 AC
31
20
20
39
PROPOSED BENCH WITH
CONCRETE PAD (TYP.)
STREET TREES (SEE CIVIL)
PATHWAY LIGHTING
REPLACEMENT TREES
SEE CIVIL SHEET C9.0
FOR MORE INFO
PATHWAY LIGHTING
SAN
SAN
SAN



1 GARDEN PLOT

SCALE: NTS



2 WATER SPIGOT

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



DOG WASTE STATION
MFG: DOG WASTE DEPOT
MODEL: DOG WASTE STATION
COLOR: BLACK

3 DOG WASTE STATION

SCALE: NTS

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02/11/2026

THE HAVEN AT GRIFFITH MEADOWS AMENITY AND OPEN SPACES

POOLE ROAD
TOWN OF KNIGHTDALE, NC

HARDSCAPE DETAILS

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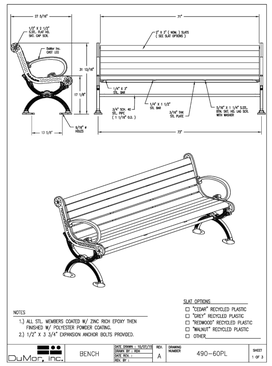
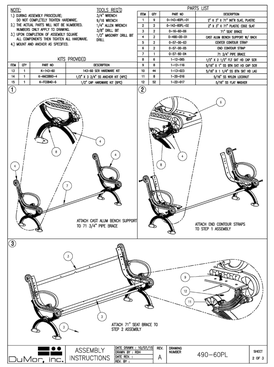
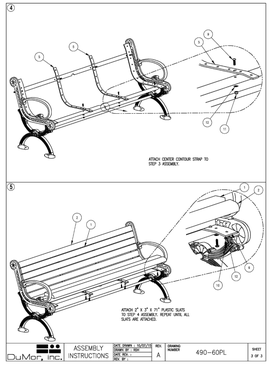
L1.3

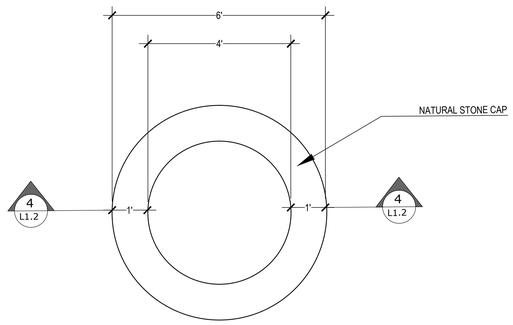






1 BENCH SPECIFICATIONS

SCALE: NTS



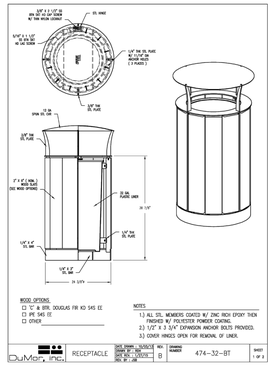
3 FIRE PIT DETAIL

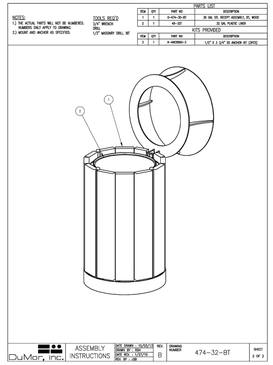
SCALE: 1/2"=1'-0"

HARDSCAPE SCHEDULE LEGEND:

A — MANUFACTURED STONE VENEER
MFG: CENTURION
STYLE: LEDGE
COLOR: KENTUCKY

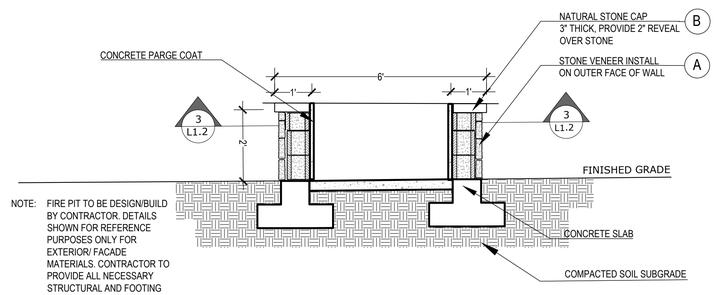
B — NATURAL STONE CAP
COLOR: LIGHT GREY





2 RECEPTACLE SPECIFICATIONS

SCALE: NTS



NOTE: FIRE PIT TO BE DESIGN/BUILD BY CONTRACTOR. DETAILS SHOWN FOR REFERENCE PURPOSES ONLY FOR EXTERIOR/ FACADE MATERIALS. CONTRACTOR TO PROVIDE ALL NECESSARY STRUCTURAL AND FOOTING DESIGN AS WELL AS INTERNAL FIRE APPROPRIATE MATERIALS AND PARGE COAT

4 FIRE PIT PROFILE - SECTION

SCALE: 1/2"=1'-0"

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NORTH CAROLINA REGISTERED LANDSCAPE ARCHITECT 987 JAMES ALONE
02/11/2026

THE HAVEN AT GRIFFITH MEADOWS AMENITY AND OPEN SPACES

POOLE ROAD
TOWN OF KNIGHTDALE, NC

HARDSCAPE DETAILS

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L1.4

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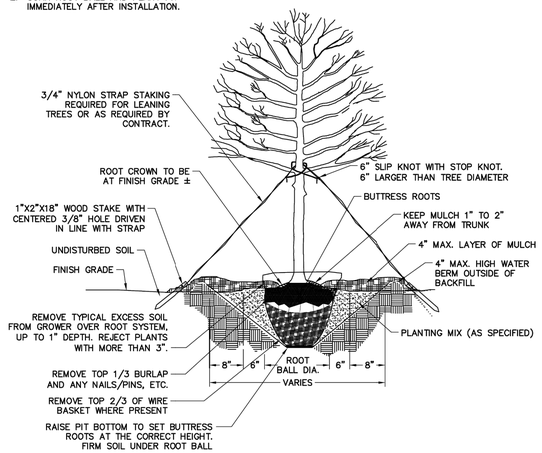
NOTES:

1. REMOVE WIRE OR NYLON TWINE FROM BALL.
2. SOAK ROOT BALL AND PLANT PIT IMMEDIATELY AFTER INSTALLATION.

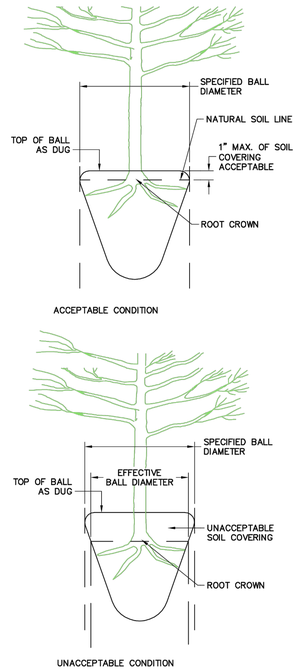


ALL TREES SHALL MEET AMERICAN STANDARD FOR NURSERY STOCK
(AMSI, 1990, PART 1, "SHADE AND FLOWERING TREES")

FOR EXAMPLE: CALIPER	HEIGHT (RANGE)	MAX. HEIGHT	MIN. ROOT BALL DIA.	MIN. ROOT BALL DEPTH
2"	12–14'	16'	24"	16"
3"	14–16'	18'	32"	21"

REVISIONS	
DATE	DESCRIPTION

TOWN OF KNIGHTDALE STANDARD DETAILS	TREE PLANTING (FOR SINGLE AND MULTI-STEM TREES)	STD. NO. 3.25



NOTE:

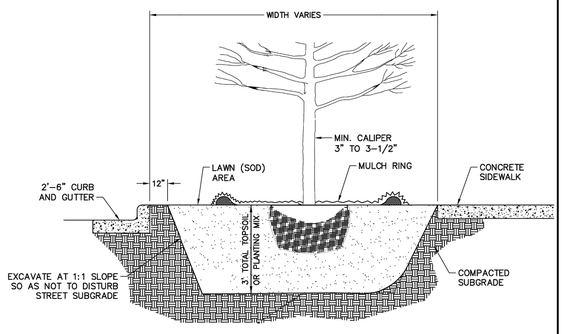
A ROOT COLLAR EXCAVATION FOR ALL TREES SPECIFIED WILL BE DONE BY THE TOWN TO ENSURE THAT TREES WERE NOT PLANTED/GROWN TOO DEEPLY AT SOURCE (NURSERY). LANDSCAPE CONTRACTOR SHALL HAVE SUPPLIER MARK GROUND LEVEL LINE ABOVE ROOT BALL. IF TOWN DETERMINES THAT THERE IS EXCESSIVE SOIL OVER THE ROOT CROWN, THESE TREES WILL BE REJECTED.

REVISIONS	
DATE	DESCRIPTION

TOWN OF KNIGHTDALE STANDARD DETAILS	ROOT CROWN DEPTHS	STD. NO. 3.21

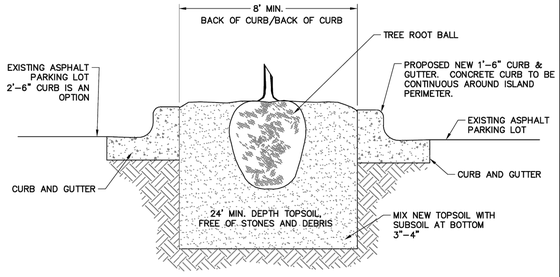
NOTES:

1. MEANT TO PROVIDE GUIDANCE ON STREET TREE PLANTING. REFERENCE SPECIFIC CROSS SECTION FOR PLANTING LOCATION AND WIDTH.
2. 6 FT. PLANTING WIDTH PREFERRED, WHERE POSSIBLE.
3. FOR NEW PLANTING AREAS, REMOVE ALL PAVEMENT, GRAVEL, SUB-BASE, AND CONSTRUCTION DEBRIS BEFORE PREPARING SOIL AND PLANTING TREES.
4. REMOVE COMPACTED SOIL AND ADD 24" NEW TOPSOIL WITH PLANT MIX OR UNCOMPACT AND AMEND TO 24" OF EXISTING SOIL TO MEET TOPSOIL WITH PLANTING MIX STANDARDS FOR TREES.
5. MULCH SHALL NOT BE STACKED AGAINST BASE OF PLANTING.



REVISIONS	
DATE	DESCRIPTION
	07.01.2024

TOWN OF KNIGHTDALE STANDARD DETAILS	STREET TREE PLANTING	STD. NO. 3.26



NOTES:

1. 300 SF MIN. TOTAL REQUIRED AREA PER TREE.
2. FOR NEW PLANTING AREAS, REMOVE ALL PAVEMENT, GRAVEL SUB-BASE AND CONSTRUCTION DEBRIS BEFORE PREPARING SOIL AND PLANTING TREES.
3. REMOVE COMPACTED SOIL AND ADD 24" NEW OR TOPSOIL/PLANTING MIX OR UNCOMPACT AND AMEND TOP 24" OF EXISTING SOIL TO MEET TOPSOIL/PLANTING MIX STANDARDS FOR TREES.

REVISIONS	
DATE	DESCRIPTION

TOWN OF KNIGHTDALE STANDARD DETAILS	TREE PLANTING ISLAND IN PARKING LOTS	STD. NO. 3.23

GENERAL NOTES: LANDSCAPE PLAN

1. CONTRACTOR TO VERIFY WITH OWNER AND UTILITY COMPANIES THE LOCATIONS OF ALL UTILITIES PRIOR TO CONSTRUCTION, TO DETERMINE IN THE FIELD THE ACTUAL LOCATIONS AND ELEVATIONS OF ALL EXISTING UTILITIES, WHETHER SHOWN ON THE PLANS OR NOT. THE CONTRACTOR SHALL CALL UTILITY LOCATE SERVICE 72 HOURS PRIOR TO CONSTRUCTION.
2. SITE CONDITIONS BASED UPON SURVEY PROVIDED BY OWNER. CONTRACTOR TO FIELD VERIFY EXISTING CONDITIONS BY DETAILED INSPECTION PRIOR TO SUBMITTING BID AND BEGINNING CONSTRUCTION.
3. REFER TO SITE CIVIL DRAWINGS FOR ADDITIONAL REQUIREMENTS AND COORDINATE WORK WITH OTHER SITE RELATED DEVELOPMENT DRAWING AS NEEDED.
4. REESTABLISH EXISTING TURF IN AREAS DISTURBED BY GRADING OR UTILITY TRENCHING, INCLUDING AREAS IN RIGHT-OF-WAY, TO MATCH EXISTING SPECIES.
5. CONTRACTOR SHALL EXAMINE FINISH SURFACE, GRADES, TOPSOIL QUALITY AND DEPTH. DO NOT START ANY WORK UNTIL UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED. VERIFY LIMITS OF WORK BEFORE STARTING.
6. CONTRACTOR TO REPORT ALL DAMAGES TO EXISTING CONDITIONS AND INCONSISTENCIES WITH PLANS TO LANDSCAPE ARCHITECT.
7. CONTRACTOR SHALL MAINTAIN POSITIVE DRAINAGE IN ALL LANDSCAPE BEDS AND ALL LAWN AREAS.
8. CONTRACTOR TO FINE GRADE AND ROCK-HOUND ALL TURF AREAS PRIOR TO SEEDING, TO PROVIDE A SMOOTH AND CONTINUAL SURFACE, FREE OF IRREGULARITIES (BUMPS OR DEPRESSIONS) & EXTRANEOUS MATERIAL OR DEBRIS.
9. REMOVE EXISTING WEEDS FROM PROJECT SITE PRIOR TO THE ADDITION OF ORGANIC AMENDMENTS AND FERTILIZER. APPLY AMENDMENTS AND FERTILIZER AS NEEDED.
10. QUANTITIES SHOWN ARE INTENDED TO ASSIST CONTRACTOR IN EVALUATING THEIR OWN TAKE OFFS AND ARE NOT GUARANTEED AS ACCURATE REPRESENTATIONS OF REQUIRED MATERIALS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR HIS BID QUANTITIES AS REQUIRED BY THE PLANS AND SPECIFICATIONS. IF THERE IS A DISCREPANCY BETWEEN THE NUMBER LABELED ON THE PLANT LEGEND AND THE QUANTITY OF GRAPHIC SYMBOLS SHOWN, THE GREATER QUANTITY SHALL GOVERN.
11. COORDINATE LANDSCAPE INSTALLATION WITH INSTALLATION OF UNDERGROUND SPRINKLER AND DRAINAGE SYSTEMS.
12. ALL SIZES AND QUALITY OF PLANT MATERIAL SHALL MEET THE MINIMUM SPECIFICATIONS OF THE AMERICAN STANDARD FOR NURSERY STOCK (ANSI Z60.1-2014). THE LANDSCAPE CONTRACTOR SHALL INSTALL ALL PLANT MATERIAL IN SIZE AS INDICATED IN THE PLANT SCHEDULE UNLESS OTHERWISE SPECIFIED ON THE PLAN SET. ALL PLANTS THAT DO NOT MEET THE SIZE AND SPECIFICATIONS SET FORTH BY THE AMERICAN STANDARD FOR NURSERY STOCK WILL BE REJECTED BY LANDSCAPE ARCHITECT AT NO COST TO OWNER.
13. ONCE PROJECT IS AWARDED, THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE TO SECURE ALL PLANT MATERIAL IN THE SIZE SPECIFIED ON PLAN PRIOR TO INSTALLATION. IN THE EVENT THE PLANT MATERIAL IS NOT AVAILABLE IN THE SIZE SPECIFIED, THE CONTRACTOR SHALL INSTALL LARGER AT NO COST TO OWNER.
14. THE LANDSCAPE CONTRACTOR SHALL OBTAIN WRITTEN APPROVAL FOR ALL PLANT MATERIAL SUBSTITUTIONS FROM THE LANDSCAPE ARCHITECT PRIOR TO INSTALLATION. PLANT SUBSTITUTIONS WITHOUT PRIOR WRITTEN APPROVAL THAT DO NOT COMPLY WITH THE DRAWINGS AND SPECIFICATIONS MAY BE REJECTED BY THE LANDSCAPE ARCHITECT AND REPLACED BY CONTRACTOR AT NO COST TO THE OWNER.
15. PRIOR TO MOBILIZATION THE CONTRACTOR SHALL NOTIFY THE LANDSCAPE ARCHITECT, IN WRITING, IF HE/SHE BELIEVES ANY OF THE PLANT MATERIAL IDENTIFIED ON THE PLAN MAY NOT BE SUITABLE FOR THE SITE OR MAY DIE. SUBSTITUTION REQUESTS WILL BE GRANTED BY THE LANDSCAPE ARCHITECT PRIOR TO THE START OF CONSTRUCTION ACTIVITIES. IF NOTIFICATION IS NOT GIVEN TO THE LANDSCAPE ARCHITECT ALL PLANTING WHICH FAILS TO GROW (EXCEPT FOR DEFECTS RESULTING FROM LACK OF ADEQUATE MAINTENANCE AS DETERMINED BY THE OWNER; NEGLECT, OR VANDALISM) SHALL BE REPLACED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.
16. WHERE PROPOSED TREE LOCATIONS OCCUR UNDER EXISTING OVERHEAD UTILITIES OR CROWD EXISTING TREES, NOTIFY LANDSCAPE ARCHITECT TO ADJUST TREE LOCATIONS.
17. ALL PLANT MASSES TO BE TOP DRESSED WITH MULCH AS SPECIFIED IN PLANT SCHEDULE, SPREAD UNIFORMLY IN DEPTH OVER THE PLANTING BEDS AS DELINEATED ON THE PLANS UNLESS OTHERWISE NOTED.
18. BED EDGE TO BE NO LESS THAN 12" AND NO MORE THAN 18" FROM OUTER EDGE OF PLANT MATERIAL BRANCHING. WHERE GROUND-COVER OCCURS, PLANT TO LIMITS OF AREA AS SHOWN.
19. ALL PLANTS SHALL BE GUARANTEED FOR 1 YEAR AFTER SUBSTANTIAL COMPLETION OCCURS AND FINAL ACCEPTANCE BY OWNER.
20. LANDSCAPE MAINTENANCE PERIOD BEGINS IMMEDIATELY AFTER THE COMPLETION OF ALL PLANTING OPERATIONS AND WRITTEN ACCEPTANCE FROM THE OWNER AND LANDSCAPE ARCHITECT. MAINTAIN TREES, SHRUBS, LAWNS, AND OTHER PLANTS AS PER THE PROJECT MANUAL AND/OR WRITTEN SPECIFICATIONS, IF APPLICABLE. LANDSCAPE MAINTENANCE IS THE LANDSCAPING CONTRACTORS RESPONSIBILITY UNTIL FINAL ACCEPTANCE BY THE OWNER.
21. ALL LANDSCAPE MAINTENANCE SHALL BE IN ACCORDANCE WITH LOCAL GOVERNING STANDARDS.
22. REFER TO PROJECT MANUAL OR WRITTEN SPECIFICATIONS, IF AVAILABLE, FOR ADDITIONAL REQUIREMENTS.

SOIL PLANTING MIXTURE (MIX ONSITE)

1. THE LANDSCAPE CONTRACTOR SHALL FURNISH FROM THEIR SOURCE A GOOD CLEAN, NATIVE SOIL WHICH SHALL MEET THE APPROVAL OF THE OWNER'S REPRESENTATIVE. THIS SOIL SHALL BE USED FOR THE PLANTING MIXTURE AS FOLLOWS:
   A. ONE PART COMPOST/MANURE PLANTING MIX, TOPSOIL OR APPROVED EQUAL
   B. ONE PART NATIVE SOIL
2. SOILS WITHIN PLANTING AREAS MUST BE SUITABLE FOR PROPOSED PLANTED MATERIAL & SOD WITH REGARD TO: pH, SOIL TEXTURE, SOIL STRUCTURE, AND SEASONAL HIGH WATER TABLE. THE CONTRACTOR SHALL ANALYZE EXISTING SOILS LOCATED IN PROXIMITY TO PROPOSED PLANT MATERIAL AND BE RESPONSIBLE TO AMEND THE SOIL TO OBTAIN ESSENTIAL REQUIREMENTS NECESSARY FOR THE ESTABLISHMENT AND GROWTH OF PLANT LIFE. LANDSCAPE CONTRACTOR TO PROVIDE SOILS REPORT AND APPROPRIATE RECOMMENDATIONS PRIOR TO INSTALLATION TO OWNER'S REPRESENTATIVE FOR REVIEW. FAILURE TO PROVIDE REPORT MAY RESULT IN PLANT MATERIAL BEING REJECTED BY OWNER'S REPRESENTATIVE AND REPLACED AT NO COST TO OWNER.
3. THE LANDSCAPE CONTRACTOR SHALL NOTIFY THE OWNER'S REPRESENTATIVE IN WRITING PRIOR TO PLANTING, WHEN CONDITIONS DETRIMENTAL TO PLANT GROWTH ARE ENCOUNTERED, SUCH AS RUBBLE FILL, POOR PLANTING SOIL, ADVERSE DRAINAGE CONDITIONS, OR OBSTRUCTIONS.

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: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

CESO
WWW.CESOINC.COM

NO.	DATE	REVISION DESCRIPTION

CESO NC, Co.
4601 Park Road Suite 650
Charlotte, NC 28209
Phone: 704-521-7979 License No.: C-4740

NORTH CAROLINA REGISTERED LANDSCAPE ARCHITECT ERIC J. LALONE 987
02/11/2026

THE HAVEN AT GRIFFITH MEADOWS AMENITY AND OPEN SPACES

POOLE ROAD
TOWN OF KNIGHTDALE, NC

PLANTING DETAILS AND NOTES

ISSUE: FOR PERMIT - NOT CONSTRUCTION	
DATE:	10/17/2025
JOB NO.:	766644-01
DESIGN:	RAM
DRAWN:	SCR
CHECKED:	CSG

SHEET NO.
L1.5

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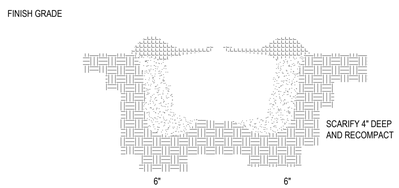
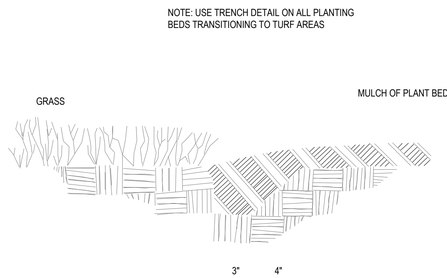
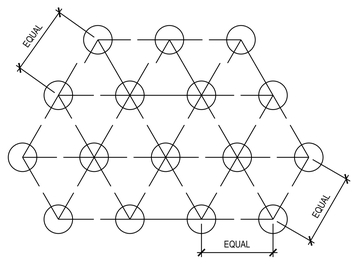


1 EVERGREEN / DECIDUOUS SHRUB N.T.S.



2 TRENCH EDGING N.T.S.



ALL GROUND COVER SHALL BE PLANTED AT EQUAL TRIANGULAR SPACING PER ON CENTER SPACING AS SPECIFIED ON PLANTING PLAN.

LOCATE GROUND COVER ONE HALF OF SPECIFIED SPACING DISTANCE FROM ANY CURB, SIDEWALK, OR OTHER HARD SURFACE, UNLESS OTHERWISE NOTED.

3 GROUND COVER SPACING N.T.S.

FOR SLOPES (3:1 TO 2:1) OR NATURALIZED TREE MIX AREAS

APR 15 - APR 30	COMMON BAHIA	25 #/AC
MAY 1 - JULY 31	WEEPING LOVEGRASS	10 #/AC
JUN 1 - SEP 1	***TALL FESCUE AND	120 #/AC
	***BROWNTOP MULLET	35 #/AC
	***OR SORGHUM-SUDAN HYBRIDS	30 #/AC
SEP 1 - MAR 1	TALL FESCUE	120 #/AC
NOV 1 - MAR 1	ADD ABRUZZI RYE	25 #/AC

NOTE: INTENT IS FOR NO MOW AREA TO BECOME NATURALIZED WITH MINIMAL TO NO MAINTENANCE OVER TIME. IT IS UNDERSTOOD THAT SOME LEVEL OF MAINTENANCE WILL BE NEEDED FOR THE FIRST THREE YEARS TO ACHIEVE PERMANENT VEGETATION.

CONSULT CONSERVATION ENGINEER OR SCS FOR ADDITIONAL INFORMATION CONCERNING OTHER ALTERNATIVES FOR VEGETATION OF DENUDED AREAS. ABOVE VEGETATION RATES ARE THOSE WHICH DO WELL UNDER LOCAL CONDITIONS: OTHER SEEDING RATE COMBINATIONS ARE POSSIBLE.

***TEMPORARY- RESEED ACCORDING TO OPTIMUM SEASON FOR DESIRED PERMANENT VEGETATION. DO NOT ALLOW TEMPORARY COVER TO GROW OVER 12" IN HEIGHT BEFORE MOWING, OTHERWISE FESCUE MAY BE SHADED OUT.

4 NO MOW SEED MIX N.T.S.

GENERAL NOTES: LANDSCAPE PLAN

1. CONTRACTOR TO VERIFY WITH OWNER AND UTILITY COMPANIES THE LOCATIONS OF ALL UTILITIES PRIOR TO CONSTRUCTION, TO DETERMINE IN THE FIELD THE ACTUAL LOCATIONS AND ELEVATIONS OF ALL EXISTING UTILITIES, WHETHER SHOWN ON THE PLANS OR NOT. THE CONTRACTOR SHALL CALL UTILITY LOCATE SERVICE 72 HOURS PRIOR TO CONSTRUCTION.
2. SITE CONDITIONS BASED UPON SURVEY PROVIDED BY OWNER. CONTRACTOR TO FIELD VERIFY EXISTING CONDITIONS BY DETAILED INSPECTION PRIOR TO SUBMITTING BID AND BEGINNING CONSTRUCTION.
3. REFER TO SITE CIVIL DRAWINGS FOR ADDITIONAL REQUIREMENTS AND COORDINATE WORK WITH OTHER SITE RELATED DEVELOPMENT DRAWING AS NEEDED.
4. REESTABLISH EXISTING TURF IN AREAS DISTURBED BY GRADING OR UTILITY TRENCHING, INCLUDING AREAS IN RIGHT-OF-WAY, TO MATCH EXISTING SPECIES.
5. CONTRACTOR SHALL EXAMINE FINISH SURFACE, GRADES, TOPSOIL QUALITY AND DEPTH. DO NOT START ANY WORK UNTIL UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED. VERIFY LIMITS OF WORK BEFORE STARTING.
6. CONTRACTOR TO REPORT ALL DAMAGES TO EXISTING CONDITIONS AND INCONSISTENCIES WITH PLANS TO LANDSCAPE ARCHITECT.
7. CONTRACTOR SHALL MAINTAIN POSITIVE DRAINAGE IN ALL LANDSCAPE BEDS AND ALL LAWN AREAS.
8. CONTRACTOR TO FINE GRADE AND ROCK-HOUND ALL TURF AREAS PRIOR TO SEEDING, TO PROVIDE A SMOOTH AND CONTINUAL SURFACE, FREE OF IRREGULARITIES (BUMPS OR DEPRESSIONS) & EXTRANEOUS MATERIAL OR DEBRIS.
9. REMOVE EXISTING WEEDS FROM PROJECT SITE PRIOR TO THE ADDITION OF ORGANIC AMENDMENTS AND FERTILIZER. APPLY AMENDMENTS AND FERTILIZER AS NEEDED.
10. QUANTITIES SHOWN ARE INTENDED TO ASSIST CONTRACTOR IN EVALUATING THEIR OWN TAKE OFFS AND ARE NOT GUARANTEED AS ACCURATE REPRESENTATIONS OF REQUIRED MATERIALS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR HIS BID QUANTITIES AS REQUIRED BY THE PLANS AND SPECIFICATIONS. IF THERE IS A DISCREPANCY BETWEEN THE NUMBER LABELED ON THE PLANT LEGEND AND THE QUANTITY OF GRAPHIC SYMBOLS SHOWN, THE GREATER QUANTITY SHALL GOVERN.
11. COORDINATE LANDSCAPE INSTALLATION WITH INSTALLATION OF UNDERGROUND SPRINKLER AND DRAINAGE SYSTEMS.
12. ALL SIZES AND QUALITY OF PLANT MATERIAL SHALL MEET THE MINIMUM SPECIFICATIONS OF THE AMERICAN STANDARD FOR NURSERY STOCK (ANSI Z60.1-2014). THE LANDSCAPE CONTRACTOR SHALL INSTALL ALL PLANT MATERIAL IN SIZE AS INDICATED IN THE PLANT SCHEDULE UNLESS OTHERWISE SPECIFIED ON THE PLAN SET. ALL PLANTS THAT DO NOT MEET THE SIZE AND SPECIFICATIONS SET FORTH BY THE AMERICAN STANDARD FOR NURSERY STOCK WILL BE REJECTED BY LANDSCAPE ARCHITECT AT NO COST TO OWNER.
13. ONCE PROJECT IS AWARDED, THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE TO SECURE ALL PLANT MATERIAL IN THE SIZE SPECIFIED ON PLAN PRIOR TO INSTALLATION. IN THE EVENT THE PLANT MATERIAL IS NOT AVAILABLE IN THE SIZE SPECIFIED, THE CONTRACTOR SHALL INSTALL LARGER AT NO COST TO OWNER.
14. THE LANDSCAPE CONTRACTOR SHALL OBTAIN WRITTEN APPROVAL FOR ALL PLANT MATERIAL SUBSTITUTIONS FROM THE LANDSCAPE ARCHITECT PRIOR TO INSTALLATION. PLANT SUBSTITUTIONS WITHOUT PRIOR WRITTEN APPROVAL THAT DO NOT COMPLY WITH THE DRAWINGS AND SPECIFICATIONS MAY BE REJECTED BY THE LANDSCAPE ARCHITECT AND REPLACED BY CONTRACTOR AT NO COST TO THE OWNER.
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BY: Samuel A. MacDonald DATE: _____
TOWN ENGINEER

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

BY: Gideon Smith DATE: _____
LAND USE ADMINISTRATOR

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CESO
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NO.	DATE	REVISION DESCRIPTION

CESO NC, Co.
4601 Park Road Suite 650
Charlotte, NC 28209
Phone: 704-521-7979 License No.: C-4740

NORTH CAROLINA REGISTERED LANDSCAPE ARCHITECT ERIC J. LALONE 987

02/11/2026

THE HAVEN AT GRIFFITH MEADOWS AMENITY AND OPEN SPACES

POOLE ROAD
TOWN OF KNIGHTDALE, NC

PLANTING DETAILS AND NOTES

ISSUE:	FOR PERMIT - NOT CONSTRUCTION
DATE:	10/17/2025
JOB NO.:	766644-01
DESIGN:	RAM
DRAWN:	SCR
CHECKED:	CSG
SHEET NO.	L1.6

Docusign Envelope ID: 8EC3D1A2-7C68-4AE1-9661-67FF6E94546A

SITE DATA

PROJECT:	HAVEN AT GRIFFITH MEADOWS
ENGINEER:	TIMMONS GROUP 5410 TRINITY ROAD, SUITE 102 RALEIGH, NC 27607 PHONE: (919) 532-3271 FAX: 919-833-8124 TYLER CROSS, PE EMAIL: TYLER.CROSS@TIMMONS.COM
DEVELOPER:	MERITAGE HOMES WILLIAM ROBINSON 3300 PARAMOUNT PARKWAY, SUITE 120 MORRISVILLE, NC 27560 PHONE: (919) 322-2289 EMAIL: BILL.ROBINSON@MERITAGEHOMES.COM
OWNERS ON RECORD:	TPG AG EHC III (MTH) MULTI STATE 4 LLC 8585 E HARTFORD DR, STE 118 SCOTTSDALE, AZ 85255 PIN #: 1752-59-7507 DB: 19824 PG: 1748 TPG AG EHC III (MTH) MULTI STATE 4 LLC 8585 E HARTFORD DR, STE 118 SCOTTSDALE, AZ 85255 PIN #: 1752-59-9261 DB: 19824 PG: 1748
PROPERTY LOCATION:	8613 POOLE ROAD KNIGHTDALE, NC 27545
PINS:	1752-59-7507, 1752-59-9261, & 1752-69-3494
ZONING:	GR-3 PUD GENERAL RESIDENTIAL 3
TOWNSHIP:	ST. MATTHEWS
PROPOSED USE:	SINGLE FAMILY RESIDENTIAL
TOTAL SITE AREA:	60.15 ACRES
FIRM MAP#:	3720175200K & 3720175300K EFFECTIVE 07/19/2022
DISTURBANCE AREA:	48 AC

TOWN OF KNIGHTDALE CONTACTS

TOWN OF KNIGHTDALE PUBLIC WORKS
PHONE: (919) 217-2250
EMAIL: SWENGINEER@KNIGHTDALENC.GOV

JOHN STOVER
INSPECTIONS MANAGER,
TOWN OF KNIGHTDALE PUBLIC WORKS
PHONE: (919) 349-2521
EMAIL: JOHN.STOVER@KNIGHTDALENC.GOV

TOWN OF KNIGHTDALE EROSION AND
SEDIMENT CONTROL INSPECTOR
PHONE: (919) 919-2254

IKE ARCHER
STORMWATER MANAGER,
TOWN OF KNIGHTDALE PUBLIC WORKS
PHONE: (919) 217-2255
EMAIL: IKE.ARCHER@KNIGHTDALENC.GOV

TOWN OF KNIGHTDALE STORMWATER
TECHNICIAN, PUBLIC WORKS
PHONE: (919) 217-2256

DONOVAN APPLEWHITE
CODE OF ENFORCEMENT OFFICER, DS
EMAIL:
DONOVAN.APPLEWHITE@KNIGHTDALENC.GOV
PHONE: (919) 217-2248

HAVEN AT GRIFFITH MEADOWS

EROSION & SEDIMENT CONTROL PLAN

TOWN OF KNIGHTDALE, ST. MATTHEWS TOWNSHIP, WAKE COUNTY, NORTH CAROLINA

SEC-000010-2025

KNIGHTDALE PROJECT: #ZMA -12-22
ORDINANCE: #23-11-15-002



VICINITY MAP
1"=500'

KNOW WHAT'S BELOW.
CALL 811 BEFORE YOU DIG.

Sheet List Table

Sheet Number	Sheet Title
EC0.0	COVER SHEET
EC1.0	EXISTING CONDITIONS
EC2.01	EROSION & SEDIMENT CONTROL CALCULATIONS
EC2.0	OVERALL EROSION CONTROL PLAN - STAGE 1
EC2.1	EROSION CONTROL PLAN - STAGE 1 (SHEET 1 OF 3)
EC2.2	EROSION CONTROL PLAN - STAGE 1 (SHEET 2 OF 3)
EC2.3	EROSION CONTROL PLAN - STAGE 1 (SHEET 3 OF 3)
EC2.4	SEWER OUTFALL EROSION CONTROL - STAGE 1
EC2.5	CULVERT STREAM CROSSING
EC2.6	STAGE 1 DRAINAGE AREA
EC3.0	OVERALL EROSION CONTROL PLAN - STAGE 2
EC3.1	EROSION CONTROL PLAN - STAGE 2 (SHEET 1 OF 3)
EC3.2	EROSION CONTROL PLAN - STAGE 2 (SHEET 2 OF 3)
EC3.3	EROSION CONTROL PLAN - STAGE 2 (SHEET 3 OF 3)
EC3.4	SEWER OUTFALL EROSION CONTROL - STAGE 2
EC3.5	STAGE 2 DRAINAGE AREA
EC4.0	NCG01 NOTES & DETAILS
EC4.1	EROSION CONTROL NOTES & DETAILS
EC4.2	EROSION CONTROL NOTES & DETAILS
EC4.3	CULVERT STREAM CROSSING NOTES & DETAILS
C7.0	SCM NOTES AND DETAILS
C7.1	SCM 1 PLAN & PROFILE
C7.2	SCM 2 PLAN & PROFILE
C7.3	SCM 3 PLAN & PROFILE

ESC Approval
04/01/2026 2:34:25 PM

TOWN CERTIFICATION

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

BY: _____ DATE: _____
TOWN ENGINEER

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

BY: _____ DATE: _____
LAND USE ADMINISTRATOR

EROSION AND SEDIMENT CONTROL
APPROVED PLAN
DATE: _____
PERMIT NO. SEC-000010-2025
Town of Knightdale Public Works
Sedimentation & Erosion Control
(919) 217-2250

Town of Knightdale Construction Inspector Signature

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 ENGINEER TYLER JEFFREY CROSS
2/9/2026

THIS DRAWING PREPARED AT THE
RALEIGH OFFICE
5410 Trinity Road, Suite 102 | Raleigh, NC 27607
TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION
GREENWAY ROUTE AND ROAD WIDENING REVISION

DATE	01/30/2026
DATE	10/23/2025
DRAWN BY	331
DESIGNED BY	331
CHECKED BY	T. CROSS
SCALE	1" = 500'
JOB NO.	51557
SHEET NO.	EC0.0

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA
COVER SHEET

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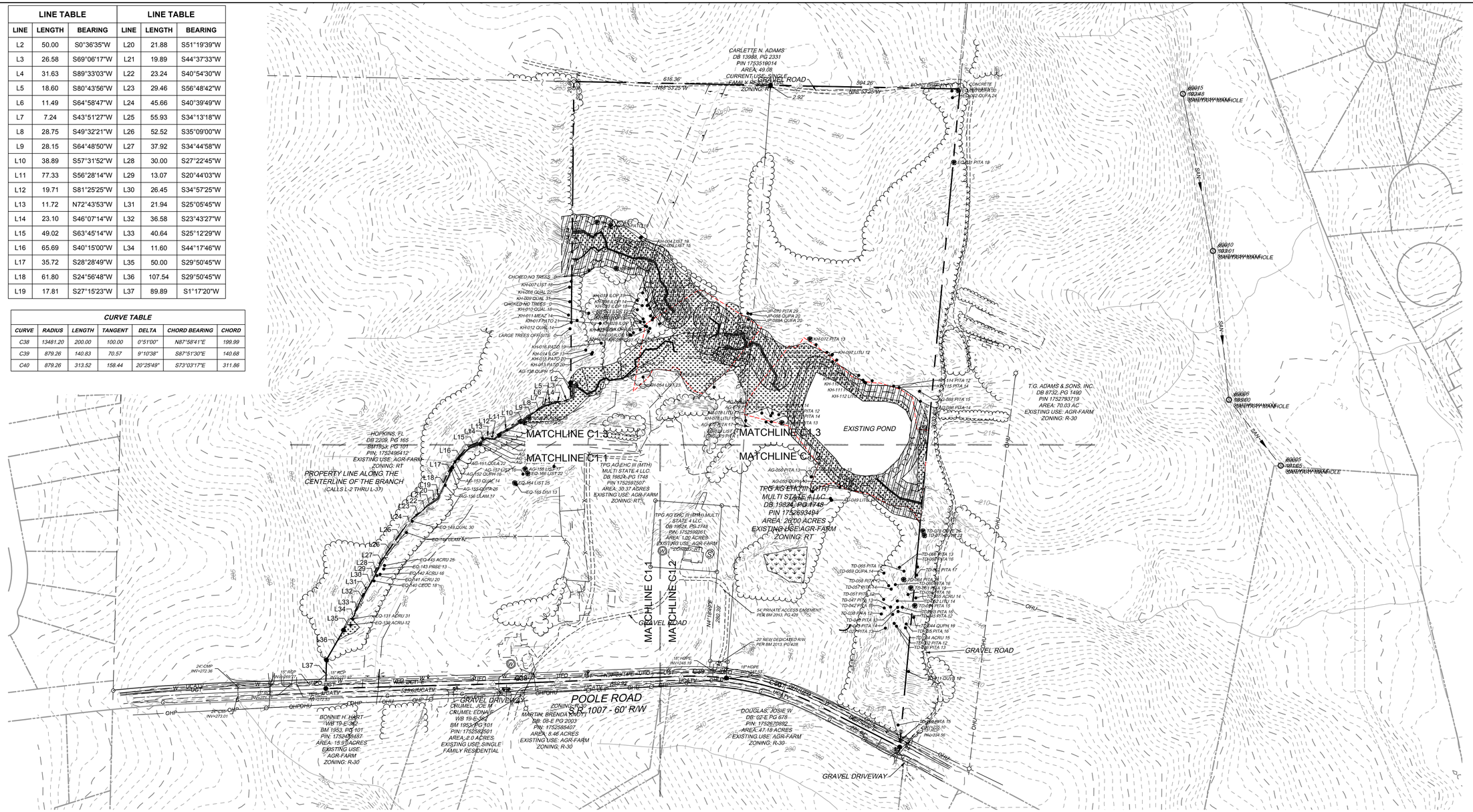
LINE TABLE			LINE TABLE		
LINE	LENGTH	BEARING	LINE	LENGTH	BEARING
L2	50.00	S0°36'35"W	L20	21.88	S51°19'39"W
L3	26.58	S69°06'17"W	L21	19.89	S44°37'33"W
L4	31.63	S89°33'03"W	L22	23.24	S40°54'30"W
L5	18.60	S80°43'56"W	L23	29.46	S56°48'42"W
L6	11.49	S64°58'47"W	L24	45.66	S40°39'49"W
L7	7.24	S43°51'27"W	L25	55.93	S34°13'18"W
L8	28.75	S49°32'21"W	L26	52.52	S35°09'00"W
L9	28.15	S64°48'50"W	L27	37.92	S34°44'58"W
L10	38.89	S57°31'52"W	L28	30.00	S27°22'45"W
L11	77.33	S56°28'14"W	L29	13.07	S20°44'03"W
L12	19.71	S81°25'25"W	L30	26.45	S34°57'25"W
L13	11.72	N72°43'53"W	L31	21.94	S25°05'45"W
L14	23.10	S46°07'14"W	L32	36.58	S23°43'27"W
L15	49.02	S63°45'14"W	L33	40.64	S25°12'29"W
L16	65.69	S40°15'00"W	L34	11.60	S44°17'46"W
L17	35.72	S28°28'49"W	L35	50.00	S29°50'45"W
L18	61.80	S24°56'48"W	L36	107.54	S29°50'45"W
L19	17.81	S27°15'23"W	L37	89.89	S1°17'20"W

CURVE TABLE						
CURVE	RADIUS	LENGTH	TANGENT	DELTA	CHORD BEARING	CHORD
C38	13481.20	200.00	100.00	0°51'00"	N87°55'41"E	199.99
C39	879.26	140.83	70.57	9°10'38"	S87°51'30"E	140.68
C40	879.26	313.52	158.44	20°25'49"	S73°03'17"E	311.86



LEGEND

- IPF - IRON PIPE FOUND
- IRF - IRON ROD FOUND
- IPS - IRON PIPE SET
- CP - COMPUTED EASEMENT POINT
- CMF - CONCRETE MONUMENT
- MNF - MAG NAIL FOUND
- CP - COMPUTED POINT
- CSF - COTTON SPINDLE FOUND
- BFP - BACKFLOW PREVENTER
- WV - WATER VAULT
- TV - TELEPHONE VAULT
- TCI - TRAFFIC CONTROL BOX
- PV - POWER VAULT
- UV - UTILITY VAULT
- WF - WETLAND FLAG
- RCP - REINFORCED CONCRETE PIPE
- CMP - CORRUGATED METAL PIPE
- VCP - VITRIFIED CLAY PIPE
- DIP - DUCTILE IRON PIPE
- HDPE - HIGH DENSITY POLYETHYLENE PIPE
- FES - FLARED END SECTION
- MKF - FIBER OPTIC MARKER
- MKG - GAS MARKER
- TVP - TELEVISION PEDESTAL
- SIGP - SIGNAL POLE
- HVAC - HEATING, VENTILATION AND AIR CONDITIONING
- LSA -LANDSCAPED AREA
- R / W - RIGHT-OF-WAY
- P / L - PROPERTY LINE
- C / L - CENTERLINE
- NTS - NOT TO SCALE
- GV - GAS VALVE
- CB - CATCH BASIN
- GI - GRATE INLET
- YI - YARD INLET
- CI - CURB INLET
- EP - EDGE OF PAVING
- TBC - TOP BACK OF CURB
- CCR - CHATHAM COUNTY RECORD
- WCR - WAKE COUNTY RECORDS
- DB - DEED BOOK
- PB - PLAT BOOK
- SF - SQUARE FEET
- (XXXX) - SITE ADDRESS

- DEED LINE
- LINE NOT SURVEYED
- STORM LINE
- SANITARY LINE
- PAINTED WATER LINE
- WETLAND BUFFER ZONE
- PAINTED STORM LINE
- CREEK TOP OF BANK
- 50' CREEK BUFFER (ZONE 1)
- 50' CREEK BUFFER (ZONE 2)
- FLOODPLAIN
- FEMA 100-YEAR FLOODPLAIN
- FEMA 500-YEAR FLOODPLAIN

ENVIRONMENTAL LEGEND

- NEUSE RIPARIAN BUFFER ZONE 1
- NEUSE RIPARIAN BUFFER ZONE 2
- WETLANDS

NOTES:
1. BOUNDARY TAKEN FROM SURVEY BY TIMMONS GROUP, DATED MARCH 19, 2022.
2. TOPOGRAPHIC INFORMATION TAKEN FROM SURVEY BY TIMMONS GROUP DATED MARCH 19, 2022. WITH SUPPLEMENTAL SURVEY BY TIMMONS GROUP DATED DECEMBER 12, 2024.
3. WETLAND AND STREAM DELINEATION BY TIMMONS GROUP DATED DECEMBER 26, 2024.
4. THE SUBJECT PROPERTY IS LOCATED WITHIN ZONE X, IN ACCORDANCE WITH FIRM MAP #3720175200K & #3720175300K EFFECTIVE 07/19/2022.

TOWN CERTIFICATION

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

BY: _____ DATE: _____
TOWN ENGINEER

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

BY: _____ DATE: _____
LAND USE ADMINISTRATOR

ESC Approval
04/01/2026 2:34:32 PM

811 Know what's below. Call before you dig.

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 ENGINEER TYLER JEFFREY CROSS
2/9/2026

THIS DRAWING PREPARED AT THE
RALEIGH OFFICE
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YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION
GREENWAY ROUTE AND ROAD WIDENING REVISION

DATE
01/30/2026

DATE: 10/23/2025
DRAWN BY: 331
DESIGNED BY: 331
CHECKED BY: T. CROSS
SCALE: 1" = 150'

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS

KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

EXISTING CONDITIONS

JOB NO. 51557
SHEET NO. EC1.0

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TOWN OF KNIGHTDALE EROSION CONTROL CONSTRUCTION SEQUENCE:

STAGE 1

1. EROSION AND SEDIMENT CONTROL (E&SC) PERMIT AND CERTIFICATE OF COVERAGE (COC) MUST BE OBTAINED BEFORE ANY LAND DISTURBING ACTIVITIES OCCUR. A COPY OF THE E&SC PERMIT, THE COC, AND A HARD COPY OF THE PLAN MUST BE KEPT ON SITE, PREFERABLY IN A PERMIT BOX AND ACCESSIBLE DURING INSPECTION. THE COC IS OBTAINED BY FILLING OUT THE ELECTRONIC NOTICE OF INTENT (E-NOI) FORM AND UPLOADING THEM AT DEQ.NC.GOV/NCG01 ONCE THE PLANS HAVE BEEN APPROVED.
2. SCHEDULE AN INITIAL PRE-CONSTRUCTION CONFERENCE WITH THE TOWN OF KNIGHTDALE. OBTAIN A LAND-DISTURBANCE PERMIT. OWNER/CONTRACTOR SHALL NOTIFY ENVIRONMENTAL CONSULTANT - IKE ARCHER AT (919) 217-2255 - A MINIMUM OF 72 HOURS BEFORE START OF CONSTRUCTION ON EACH PHASE.
3. INSTALL THE GRAVEL CONSTRUCTION ENTRANCE, CONCRETE WASHOUT PITS AND PERIMETER SILT FENCE, TREE PROTECTION AND SILT FENCE OUTLETS. CLEAR ONLY AS REQUIRED TO INSTALL THESE DEVICES. ONCE THIS IS COMPLETE, BEGIN INSTALL THE SEDIMENT BASINS, SEDIMENT TRAPS, SKIMMER BASINS & EXCAVATED STORAGE AREAS WITH APPLICABLE DIVERSIONS AND SLOPE DRAINS THAT DIRECT RUNOFF.
4. BEGIN INSTALL OF DIVERSION DITCHES AS NOTED ON THIS SHEET AND UNDER APPLICABLE TABLE. INSTALL CHECK DAMS AS INDICATED AND INSTALL EROSION CONTROL MATTING IN ALL DIVERSIONS PLUS THE BASINS AND SPILLWAY DISCHARGE AREAS. SEED ALL DISTURBED AREAS IMMEDIATELY AFTER MEASURE INSTALLATION. CLEARING SHOULD BE LIMITED TO A MAXIMUM 35' "RIBBON" AROUND PERIMETER TO INSTALL CONTROLS. NO GRADING OR EXCAVATION SHOULD OCCUR
5. NOTIFY IKE ARCHER AT (919) 217-2255 FOR AN INSPECTION AFTER THIS IS COMPLETED. SCHEDULE AN ONSITE PRE-CONSTRUCTION MEETING WITH THE TOWN OF KNIGHTDALE TO INSPECT THE INSTALLED PERIMETER CONTROLS.
6. CONTRACTOR SHALL HAVE ALL MATERIALS AND EQUIPMENT ON-SITE PRIOR TO THE BEGINNING OF ONSITE WORK. FOR UTILITY CROSSINGS WITH CASINGS, THE CARRIER PIPE SHALL BE INSTALLED WITHIN THE CASING PIPE PRIOR TO ANY OPEN CUT ACTIVITIES.
7. CONTRACTOR TO PROVIDE AND FOLLOW STOCKPILE DESIGN CRITERIA NOTED ON THIS SHEET. AN EXISTING STOCKPILE LOCATION HAS BEEN IDENTIFIED ON THIS PLAN. CONTRACTOR IS TO ADJUST STOCKPILE TO AS NOTED ON PLAN & TO MEET REQUIREMENTS OUTLINED.
8. BEGIN CLEARING AND GRUBBING ON THE SOUTHERN HALF OF THE SITE. MAINTAIN DEVICES AS NEEDED AND ROUGH GRADE CROSSING AREA.
9. INSTALL STREAM CROSSING PER SEQUENCE ON SHEET EC2.5. BEGIN CLEARING AND GRUBBING ON THE NORTHERN HALF OF THE SITE. MAINTAIN DEVICES AS NEEDED.
10. BEGIN ROUGH GRADING OF THE SITE. SEED AND STABILIZE SLOPES AS THEY ARE ESTABLISHED AND AS REQUIRED PER THE GENERAL PERMIT STABILIZATION REQUIREMENTS FOUND ON THIS SHEET.
11. INSPECT ALL MEASURES AND DEVICES WEEKLY AND AFTER ALL RAINFALL EVENTS. MAKE PROMPT REPAIRS AS NEEDED. THE CONTRACTOR SHALL CONDUCT SELF-INSPECTIONS OF THE EROSION AND SEDIMENT CONTROL MEASURES AND COMPLETE THE FOLLOWING COMBINED SELF-INSPECTION FORM FOUND ON THE DEMLR WEBSITE: HTTPS://FILES.NC.GOV/NCDEQ/ENERGY%20MINERAL%20AND%20LAND%20RESOURCES/STORMWATER-INCD010000_FINAL_PERMIT_2019_04_01.PDF. TWELVE MONTHS OF COMPLETE INSPECTION FORMS SHALL BE KEPT ON SITE AND AVAILABLE FOR INSPECTION AT ALL TIMES. IT IS RECOMMENDED A COPY BE KEPT IN A PERMIT BOX.
12. SELF INSPECTIONS FOR EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE PERFORMED AT LEAST ONCE EVERY SEVEN CALENDAR DAYS AND WITHIN 24 HOURS OF EVERY RAIN EVENT OF GREATER THAN ONE INCH. ANY NEEDED REPAIRS SHALL BE MADE IMMEDIATELY TO MAINTAIN MEASURES AS DESIGNED. ALL ESC MEASURES SHALL BE MAINTAINED AS SPECIFIED IN THE CONSTRUCTION DETAILS ON THIS PLAN. A RAIN GAUGE SHALL BE INSTALLED AT THE PROJECT SITE FOR MONITORING. SEE ATTACHED DETAIL SHEET FOR SELF-INSPECTION RECORD KEEPING AND REPORTING INFORMATION.

STAGE 2

13. CONTRACTOR TO BEGIN INSTALLATION OF UTILITIES AND ROUGH GRADE PROPOSED ROADWAYS ONSITE. IT IS RECOMMENDED TO PRIORITIZED CONSTRUCTION AND STABILIZATION OF WINTER HAVEN DRIVE AS TO ACCOMMODATE PROPOSED UTILITIES AND TO REMOVE THE PROPOSED EXCAVATED STORAGE AREA. CONTRACTOR CAN HAVE THIS PORTION OF THE PROJECT APPROVED FOR STABILIZATION SEPARATELY FROM THE REMAINING SITE. SEE NOTE 20.
14. CONTRACTOR IS ALSO TO INSTALLED APPLICABLE UTILITY STREAM CROSSINGS AS NOTED IN STREAM CROSSING SEQUENCE DURING DRY CONDITIONS.
15. 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.
16. BEGIN CONSTRUCTION, BUILDING, ETC. ALL SEDIMENT AND SKIMMER BASINS SHALL REMAIN IN PLACE DURING STAGE 2.
17. WHERE DIVERSION DITCHES CROSS UNDERNEATH ONSITE ROADS, CONTRACTOR TO PROVIDE TEMPORARY 15" RCP. THESE ARE TO BE REMOVED ONCE SITE IS STABILIZED.
18. STABILIZE SITE IMMEDIATELY AS AREAS ARE BROUGHT UP TO FINISHED GRADE WITH VEGETATION, PAVING AND TEMPORARY DITCH AND SLOPE LINING AS REQUIRED BY THE GENERAL PERMIT STABILIZATION REQUIREMENTS FOUND ON THIS SHEET. PERMANENT GROUNDCOVER WILL BE PROVIDED FOR ALL DISTURBED AREAS WITHIN 15 WORKING DAYS OR NO MORE THAN 90 CALENDAR DAYS (WHICHEVER IS SHORTER). STABILIZE ALL SLOPES 6:1 OR STEEPER WITH EROSION CONTROL MATTING.
19. ADDITIONAL EROSION MEASURES MAY BE NECESSARY DEPENDING ON THE PERFORMANCE OF THOSE SHOWN ON THE PLAN. THE CONTRACTOR WILL INSTALL ADDITIONAL MEASURES, IF NECESSARY, AS REQUIRED BY TOWN OF KNIGHTDALE, OWNER, ARCHITECT, OR ENGINEER.
20. WHEN CONSTRUCTION IS COMPLETE AND ALL AREAS ARE STABILIZED COMPLETELY, CALL TOWN OF KNIGHTDALE INSPECTOR IKE ARCHER AT (919) 217-2255, A MINIMUM OF 72 HOURS PRIOR, FOR AN INSPECTION.
21. SEDIMENT BASINS, SEDIMENT TRAPS, SKIMMER BASINS OR EXCAVATED STORAGE AREAS, ARE NOT TO BE REMOVED UNTIL SITE HAS BEEN STABILIZED AND APPROVED BY TOWN OF KNIGHTDALE.

SITE STABILIZATION PHASE

22. IF SITE IS APPROVED, CONVERT SEDIMENT BASINS TO PERMANENT PONDS, REMOVE PERIMETER SILT FENCES AND INLET PROTECTION, AND SEED OUT OR STABILIZE ANY RESULTING BARE AREAS. ALL REMAINING PERMANENT EROSION CONTROL DEVICES, SUCH AS VELOCITY DISSIPATERS, SHOULD NOW BE INSTALLED.
23. ONCE SITE IS STABILIZED AND SEDIMENT BASINS HAVE BEEN CONVERTED TO PERMANENT CONDITIONS THE CONTRACTOR IS TO REMOVE ALL REMAINING EROSION CONTROL DEVICES (CONSTRUCTION ENTRANCE, DIVERSION DITCHES, SEDIMENT TRAPS, AND SILT FENCE.
24. WHEN VEGETATION HAS BECOME ESTABLISHED (90% GERMINATION), CALL FOR A FINAL SITE INSPECTION BY THE EROSION CONTROL INSPECTOR TO OBTAIN A CERTIFICATE OF COMPLETION.
25. WHEN THE PROJECT IS COMPLETE, THE PERMITTEES SHALL CONTACT THE TOWN OF KNIGHTDALE TO CLOSE OUT THE E&SC PLAN. AFTER THE TOWN OF KNIGHTDALE INFORMS THE PERMITTEE OF THE PROJECT CLOSE OUT, V/A INSPECTION REPORT, THE PERMITTEE SHALL VISIT DEQ.NC.GOV/NCG01 TO SUBMIT AN ELECTRONIC NOTICE OF TERMINATION (NOT). A $100 ANNUAL GENERAL PERMIT FEE WILL BE CHARGED UNTIL THE E-NOT HAS BEEN FILLED OUT.

NOTES:
1. AREAS WILL BE STABILIZED PER THE GROUND STABILIZATION CHART AFTER ANY GRADING.
2. ALL BASINS SHOULD BE CLEANED AFTER ANY RAIN EVENT THAT EXCEEDS 1" IN 24 HOURS.
3. SEDIMENT BASINS WILL BE INSTALLED WHERE STORM DRAINAGE PIPE IS LOCATED. I.E. PIPES WILL BE LEFT SHORT AND EXTENDED THROUGH BASIN AREAS AFTER SITE HAS BEEN STABILIZED.
4. (LOD) INDICATES THE LIMITS OF ULTIMATE DISTURBANCE

SLOPE STABILIZATION REQUIREMENTS:
3:1 AND FLATTER--GRASS
3:1 TO 2:1 SLOPE--ADAPTIVE PLANTS (SHRUBS AND VINES)
2:1 TO 1.5:1--RIP RAP
STEEPER THAN 1.5 TO 1-RETAINING WALL

SEDIMENT BASIN REMOVAL:
1. SCHEDULE A SITE MEETING WITH THE TOWN OF KNIGHTDALE EROSION CONTROL INSPECTOR 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
2. CONTACT NCDEQ – RALEIGH REGIONAL OFFICE (919) 791-4200 TO DETERMINE THE DIVISION OF ENERGY, MINERAL AND LAND RESOURCES CONTACT PERSON TO RECEIVE DEWATERING NOTIFICATIONS. AT LEAST 10 DAYS PRIOR TO BEGINNING DEWATERING ACTIVITY, SEND EMAIL TO NCDEQ-DEMLR CONTACT PERSON AND COPY ENVIRONMENTAL CONSULTANT THAT MET YOU ONSITE. THE EMAIL SHOULD INCLUDE E&SC JURISDICTION: TOWN OF KNIGHTDALE, TOK PROJECT: NAME, NUMBER, AND LOCATION (CITY/TOWN), ENVIRONMENTAL CONSULTANT NAME, AND ADDRESS THE FOLLOWING: A) REASON FOR CONVERSION, B) BASIN #, C) DEWATERING METHOD, AND D) ALL OTHER NECESSARY INFO FROM PART II, SECTION G, ITEM 4 OF THE NCG01. (KEEP EMAIL FOR YOUR NPDES MONITORING DOCUMENTATION
3. AFTER RECEIVING POSITIVE CONFIRMATION FROM NCDEQ-DEMLR THAT YOU MAY REMOVE THE BASIN OR ON > DAY 11, WHICHEVER IS SOONER. REMOVE BASIN(S) AND ASSOCIATED TEMPORARY DIVERSION DITCHES. IF PIPES NEED TO BE EXTENDED, PERFORM THIS OPERATION AT THIS TIME. FINE GRADE AREA IN PREPARATION FOR SEEDING.
4. PERFORM SEEDBED PREPARATION, SEED, MULCH AND ANCHOR ANY RESULTING BARE AREAS IMMEDIATELY USING NON-CLUMPING TURF GRASS (CENTIPEDE / HYBRID BERMUDA)
5. INSTALL VELOCITY DISSIPATORS AND/OR LEVEL SPREADERS AS REQUIRED ON THE EROSION CONTROL PLAN
6. WHEN SITE IS FULLY STABILIZED, CALL EROSION CONTROL INSPECTOR FOR APPROVAL OF REMOVING REMAINING TEMPORARY EROSION CONTROL MEASURES AND ADVICE ON WHEN SITE CAN BE ISSUED A CERTIFICATE OF COMPLETION. NOTE: A MEETING SHOULD ALSO BE SCHEDULED WITH THE EROSION CONTROL INSPECTOR AND STORMWATER TECHNICIAN TO DETERMINE WHEN A BASIN MAY BE CONVERTED FOR STORMWATER USE.

TOWN OF KNIGHTDALE SCM PLANTING NOTES
1. THE DAM STRUCTURE, INCLUDING FRONT AND BACK EMBANKMENT SLOPES, OF THE POND SHALL BE VEGETATED WITH NON-CLUMPING TURF GRASS OR SOD. (CENTIPEDE/HYBRID-BERMUDA) 90% GERMINATION OF NON-CLUMPING TURF WILL BE REQUIRED PRIOR TO FINAL CERTIFICATION FORM THE TOWN.
2. THE VEGETATED SHELF SHALL BE PLANTED WITH A MINIMUM OF THREE DIVERSE SPECIES OF HERBACEOUS, NATIVE VEGETATION AT A MINIMUM DENSITY OF 50 PLANTS PER 200 FEET OF SHELF AREA.
3. CONTRACTOR TO WORK WITH SOILS SCIENTIST TO ENSURE SOILS ARE ADEQUATE TO SUPPORT PROPER ESTABLISHMENT AND GROWTH OF THE AQUATIC PLANTINGS. CONTRACTOR TO AMEND SOILS AND INSTALL SOILS IN PLANT, SHRUB, AND TREE AREAS PER DETAILS, SOIL SPECIFICATIONS. NCDENR SPECIFICATION, AND SOIL SCIENTIST RECOMMENDATIONS.
4. ALL AQUATIC PLANTINGS ARE TO BE INSTALLED DURING THE APPROPRIATE TIME OF YEAR TO ENSURE SURVIVABILITY. (LAST SPRING FROST AND THE FIRST FALL FROST)
5. ALL DISTURBED AREAS AROUND THE OUTSIDE OF THE DEVICE SHALL BE SEEDED WITH A LAWN AREA SEED MIX (PER SEEDING SPECIFICATIONS) NATIVE GRASSES, LEGUMES, CLOVERS, AND WILDFLOWERS.
6. IF THE DEVICE WAS USED DURING CONSTRUCTION AS A SEDIMENT BASIN OR TRAP, THE BASIN MUST BE CLEANED OUT, GRADED, APPROPRIATE AREAS COVERED WITH 4" OF TOPSOIL AS SPECIFIED IN NOTE #2 ABOVE, AND VEGETATED WITHIN 14 DAYS OF THE COMPLETION OF CONSTRUCTION.
7. CONTRACTOR SHALL WATER ALL VEGETATION AND GRASS ON A WEEKLY BASIS AS NEEDED TO ENSURE GRASS AND PLANT SURVIVAL UNTIL AFTER THE SCM IS CERTIFIED AND ACCEPTED BY THE TOWN.

STOCKPILE AREA NOTES:
1. MAXIMUM SIDE SLOPES: 2:1.
2. MAXIMUM HEIGHT SHALL NOT EXCEED 35 FEET.
3. ENSURE STOCKPILE AREAS ARE SUFFICIENTLY STABILIZED TO MINIMIZE SEDIMENT RUNOFF.
4. STOCKPILE AREAS SHALL BE KEPT WITHIN PROPOSED LIMITS SHOWN ON PLANS

STOCKPILE MAINTENANCE:
1. SEEDING OR COVERING OF PILES WITH TARPS OR MULCH IS REQUIRED AND WILL REDUCE EROSION PROBLEMS. TARPS SHOULD BE KEYED IN AT THE TOP OF THE SLOPE TO KEEP WATER FROM RUNNING UNDERNEATH THE PLASTIC.
2. IF A STOCKPILE IS TO REMAIN FOR FUTURE USE AFTER THE PROJECT IS COMPLETE (BUILDERS, ETC), THE FINANCIAL RESPONSIBLE PARTY MUST NOTIFY THE TOWN OF KNIGHTDALE OF A NEW RESPONSIBLE PARTY FOR THAT STOCKPILE.
3. THE APPROVED PLAN SHALL PROVIDE FOR THE USE OF STAGED SEEDING AND MULCHING ON A CONTINUAL BASIS WHILE THE STOCKPILE IS IN USE.
4. ESTABLISH AND MAINTAIN A VEGETATIVE BUFFER AT THE TOE OF THE SLOPE (WHERE PRACTICAL).

GROUND STABILIZATION

SITE AREA DESCRIPTION	STABILIZATION TIME FRAME	STABILIZATION TIME FRAME EXCEPTIONS
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (HQW) 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 ALLOWED
SLOPES 3:1 OR FLATTER	14 DAYS	7 DAYS FOR SLOPES GREATER THAN 50 FEET IN LENGTH
ANY OTHER AREAS WITH SLOPES FLATTER THAN 4:1	14 DAYS	NONE (EXCEPT FOR PERIMETERS AND HQW ZONES)

* "EXTENSIONS OF TIME MAY BE APPROVED BY THE PERMITTING AUTHORITY BASED ON WEATHER OR OTHER SITE-SPECIFIC CONDITIONS THAT MAKE COMPLIANCE IMPRACTICABLE." (SECTION II.B(2)(B)

NAG STRAW BLANKET MATTING TYPES

SLOPES	NAG MATTING TYPE
>1:1	C125
2:1 - 1:1	SC150
3:1 - 2:1	S150
4:1 - 3:1	S75

TOWN OF KNIGHTDALE REQUIRED ESC PLAN MAINTENANCE NOTES

1. PROVIDE A PLAN DETAIL, CONSTRUCTION SPECIFICATIONS, AND SPECIFIC MAINTENANCE REQUIREMENTS FOR ALL PROPOSED SEDIMENT AND EROSION CONTROL STRUCTURES INCLUDED ON THE PLAN. RECOMMEND PLACING MAINTENANCE REQUIREMENTS WITH THE ASSOCIATED CONSTRUCTION DETAIL.
2. MAINTENANCE AND/OR CLEAN OUT, IS NECESSARY ANYTIME THE DEVICE IS AT 50% CAPACITY. ALL SEDIMENT STORAGE MEASURES WILL REMAIN ON SITE AND FUNCTIONAL UNTIL ALL GRADING AND FINAL LANDSCAPING OF THE PROJECT IS COMPLETE.
3. AS DESIGNATED BY NCDEQ NCG01 PERMITTING, SELF-INSPECTIONS FOR EROSION AND SEDIMENTATION CONTROL MEASURES ARE TO BE PERFORMED AT LEAST ONCE EVERY SEVEN CALENDAR DAYS AND WITHIN 24 HOURS OF EVERY RAIN EVENT OF 1 INCH OR GREATER. ANY NEEDED REPAIRS SHALL BE MADE IMMEDIATELY TO MAINTAIN MEASURES AS DESIGNED.
4. PROVIDE THE MINIMUM MAINTENANCE STANDARDS AS SPECIFIED BELOW:

SURVEYOR FLAGS/TAPE/STAKES:
☐ REPLACE IDENTIFIERS IF DAMAGED OR KNOCKED DOWN DURING DEVELOPMENT.
☐ ENSURE KEY ENVIRONMENTAL AND/OR CULTURAL RESOURCES MAINTAIN IDENTIFIERS.
☐ COLORS SHOULD ADHERE TO THE APWA UNIFORM COLOR CODE. USE ACCEPTED SURVEY SYMBOLS AND ENSURE OPERATORS UNDERSTAND DESIGNATIONS. UTILITY LINE OWNERS/OPERATORS SHALL IDENTIFY THE CULTURAL RESOURCES MAINTAIN IDENTIFIERS.

PERMITS/NCGO1 INSPECTIONS BOX:
☐ CONFIRM BOX IS SECURELY FASHIONS TO A POST OR WALL IN A VISIBLE LOCATION IN PROXIMITY TO THE CONSTRUCTION ENTRANCE.
☐ MAINTAIN RELEVANT IDENTIFICATION ON THE EXTERIOR OF THE BOX.
☐ ENSURE PAPER DOCUMENTS REMAIN DRY / LEGIBLE (LAMINATION, TICKET HOLDERS, BINDERS, ETC.)
☐ REPLACE ANY MISSING DOCUMENTS IMMEDIATELY. CONSIDER PLACING TIES OR FASTENERS IF NECESSARY.

RAIN GUAGE:
☐ CHECK AND REMOVE ANY ITEMS FROM THE RAIN FUNNEL AND THE DEBRIS FILTER (e.g., DUST, BUGS AND OTHER DEBRIS).
☐ OPEN THE RAIN GAUGE AND REMOVE ANY FOREIGN OBJECTS.
☐ PERFORM ROUTINE MAINTENANCE AS SPECIFIED BY THE MANUFACTURER.
☐ CHECK THAT THE GAUGE IS NOT BEING OBSTRUCTED FROM RAIN CAPTURE AND IS LEVEL BEFORE AND AFTER REASSEMBLY.

TREE PROTECTION FENCE:
☐ PRUNE ANY DAMAGED TREES. (IF) DAMAGE TO PROTECTED TREES OCCURS, REPAIR ANY DAMAGE TO THE CROWN, TRUNK, OR ROOT SYSTEM IMMEDIATELY.
☐ REPAIR ROOTS BY CUTTING OFF THE DAMAGED AREAS AND PAINTING THEM WITH TREE PAINT. SPREAD PEAT MOSS OR MOIST TOPSOIL OVER EXPOSED ROOTS.
☐ REPAIR DAMAGE TO BARK BY TRIMMING AROUND THE DAMAGED AREA, TAPER THE CUT TO PROVIDE DRAINAGE AND PAINT WITH TREE PAINT.
☐ CUT OFF ALL DAMAGED TREE LIMBS ABOVE THE TREE COLLAR AT THE TRUNK OR MAIN branch. USE THREE SEPARATE CUTS TO AVOID PEELING BARK FROM HEALTHY AREAS OF THE TREE.

SILT FENCE:
☐ SHOULD THE FABRIC OF A SEDIMENT FENCE COLLAPSE, TEAR, DECOMPOSE, OR BECOME INEFFECTIVE, REPLACE IT PROMPTLY.
☐ REMOVE SEDIMENT DEPOSITS AS NECESSARY TO PROVIDE ADEQUATE STORAGE VOLUME FOR THE NEXT RAIN AND REDUCE PRESSURE ON THE FENCE. TAKE CARE TO AVOID UNDERMINING THE FENCE DURING CLEANOUTS.
☐ REMOVE ALL FENCING MATERIALS AND UNSTABLE SEDIMENT DEPOSITS AND BRING THE AREA TO GRADE AND STABILIZE IT AFTER THE CONTRIBUTING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.

SILT FENCE OUTLET:
☐ FRESHEN STONE WHEN SEDIMENT ACCUMULATION EXCEEDS 6 INCHES.
☐ KEEP MESH FREE OF DEBRIS TO PROVIDE ADEQUATE FLOW AND REPLACE STONE AS NEEDED TO FACILITATE DE-WATERING.

CONSTRUCTION ENTRANCE:
☐ MAINTAIN THE GRAVEL PAD IN A CONDITION TO PREVENT MUD OR SEDIMENT FROM LEAVING THE CONSTRUCTION SITE. THIS MAY REQUIRE PERIODIC TOPDRESSING WITH 2-INCH STONE.
☐ IMMEDIATELY REMOVE ALL OBJECTIONABLE MATERIALS SPILLED, WASHED, OR TRACKED ONTO PUBLIC ROADWAYS.

SKIMMER:
☐ CONFIRM SKIMMER IS FUNCTIONAL. INSTALLED IN THE CORRECT ORIENTATION AND HAS MOBILITY TO FLOAT ON TOP OF THE WATER COLUMN.
☐ ENSURE ROCK PAD STABILIZATION IS PRESENT UNDER THE SKIMMER.
☐ REPAIR ANY STRUCTURAL DEFICIENCIES (E.G., ORIFICE DISK, FLEX HOSE CONNECTION, VENT FUNCTIONING, CRACKED PVC)

SEDIMENT BASIN
☐ BASIN REQUIRES MAINTENANCE WHEN THE INLET ZONE (1ST QUADRANT) HAS BEEN FILLED WITH SEDIMENT.
☐ BAFFLE MATERIAL SHALL BE MAINTAINED IN GOOD CONDITION FOR THE LIFE OF THE POND UNTIL REMOVAL OR CONVERSION.

SEDIMENT BASIN / ROLLED EROSION CONTROL PRODUCT:
☐ INSPECT INITIAL CHANNEL ANCHORING HAS BEEN INSTALLED CORRECTLY, CONFIRM SEGMENTS ARE ROLLED IN CORRECT ORIENTATION.
☐ ANY AREAS THAT ARE DAMAGED OR NOT IN CLOSE CONTACT WITH THE GROUND SHALL BE REPAIRED AND STAPLED.
☐ MONITOR AND REPAIR THE RECP AS NECESSARY UNTIL GROUND COVER IS ESTABLISHED.

BASIN CONVEYANCES / SLOPE DRAIN / RIP-RAP LINED CHANEL
☐ ANY EROSION OF THE SLOPE, BERM OR OUTLET SHOULD BE REPAIRED IMMEDIATELY TO PREVENT HEAD CUTTING BACK INTO THE SLOPE.
☐ CONVEYANCE SHOULD BE REFRESHED IF PORE SPACE HAS BEEN COMPROMISED. CLOGGED DRAINS SHOULD BE FLUSHED OUT OR REPLACED.
☐ ADDITIONAL PERFORMANCE MEASURES MAY BE REQUIRED AT CONVEYANCE ENTRANCE TO SLOW WATER ENTERING THE BASIN.

FILTER BAG / DEWATERING ACTIVITIES
☐ ENSURE THE DEWATERING PAD IS IN A GOOD STABILIZED CONDITION.
☐ PRIOR TO USE INSPECT BAGS FOR ANY DEFECTS. ENSURE PUMP HOE IS SECURE AND A FLOATING INTAKE IS BEING USED (WHEN POSSIBLE!)
☐ FOLLOW ALL MANUFACTURER RECOMMENDATIONS FOR INSPECTION AND MAINTENANCE GUIDELINES. REPLACE WHEN TRAPPED SEDIMENT HAS ACCUMULATED TO 50% OF THE BAG CAPACITY OR IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

TEMPORARY DIVERSION DITCHES / ROLLED EROSION CONTROL PRODUCT:
☐ ANY AREAS THAT ARE DAMAGED OR NOT IN CLOSE CONTACT WITH THE GROUND SHALL BE REPAIRED AND STAPLED.
☐ MONITOR AND REPAIR THE RECP AS NECESSARY UNTIL GROUND COVER IS ESTABLISHED.

WITH WATTLES / SILT SOCKS
O REMOVE SEDIMENT ACCUMULATION BEHIND MEASURE AS NECESSARY
TO PREVENT DAMAGE TO CHANNEL VEGETATION.
O REPLACE WATTLE/SOCK IF CLOGGED OR TORN. REINSTALL PER DETAIL IF DAMAGED OR DISLODGED.
O IF PONDING BECOMES EXCESSIVE, REPLACE WITH A LARGER DIAMETER WATTLE/SOCK OR A DIFFERENT MEASURE.

WITH CHECK DAMS
O REMOVE SEDIMENT ACCUMULATION BEHIND MEASURE AS NECESSARY
TO PREVENT DAMAGE TO CHANNEL VEGETATION.
O CHECK FOR EROSION, PIPING, ROCK DISPLACEMENT, AND CORRECT STONE sizes. REPAIR IMMEDIATELY.
O CONFIRM WEIR PRESENT AND LOCATED AT THE CENTER OF THE DEVICE.

INLET PROTECTIONS (PIPE / YARD / DROP / CURB)
☐ INSPECT INLET PROTECTION AND REMOVE SEDIMENT AFTER EACH RAIN EVENT.
☐ KEEP FREE OF DEBRIS TO PROVIDE ADEQUATE FLOW AND IF PRESENT REPLACE STONE AS NEEDED TO FACILITATE DE-WATERING.

SEDIMENT TRAPS AND BARRIERS

(Chapter 6-VII of the NCDEQ E&SC Planning and Design Manual)

BASIN ID	BASIN TYPE	DRAINAGE AREA (AC)	DISTURBED AREA (AC)	I(10)	C	Q10 (CFS)	REQUIRED VOLUME (CF)	PROVIDED VOLUME (CF)	BASIN LENGTH (FT)	BASIN WIDTH (FT)	BASIN DEPTH (FT)	SURFACE AREA REQ' (SF)	SURFACE AREA PROV'D (SF)	BOTTOM ELEV (FT)	WBR ELEV (FT)	WBR LENGTH (FT)	Q10 TOTAL DA (CFS)	FLOW DEPTH (FT)	DEWATER DEVICE	SKIMMER SIZE (IN)	SKIMMER ORIFICE DIA (IN)	DEWATER TIME (DAYS)
SCM 1	SEDIMENT BASIN	15.58	5.91	7.30	0.50	21.57	10,638	54,383			2.0	9,384	27,192	232.00	234.00	75	56.87	0.40	SKIMMER	4.0	1.5	3.55
SCM 2	SEDIMENT BASIN	17.87	2.77	7.30	0.50	10.11	4,986	104,826			2.5	4,398	41,930	224.00	226.50	40	65.23	0.66	SKIMMER	4.0	1	3.74
SCM 3	SEDIMENT BASIN	4.81	4.81	7.30	0.50	17.56	8,658	24,403			2.0	7,637	12,201	219.00	221.00	50	17.56	0.24	SKIMMER	4.0	1.25	4.16
SKIMMER BASIN 4	SKIMMER BASIN	3.26	3.26	7.30	0.50	11.90	5,868	10,000	100	50	2.0	3,867	5,000	223.00	225.00	10	11.90	0.54	SKIMMER	3.0	1.25	3.25
SKIMMER BASIN 5	SKIMMER BASIN	3.40	3.40	7.30	0.50	12.41	6,120	8,100	90	45	2.0	4,033	4,050	227.00	229.00	10	12.41	0.55	SKIMMER	3.0	1.25	3.39
SKIMMER BASIN 6	SKIMMER BASIN	5.98	5.98	7.30	0.50	21.83	10,764	15,625	125	62.5	2.0	7,094	7,813	226.00	228.00	20	21.83	0.51	SKIMMER	3.0	1.75	3.04
SKIMMER BASIN 7	SKIMMER BASIN	5.47	5.47	7.30	0.50	19.97	9,846	14,400	120	60	2.0	6,489	7,200	224.00	226.00	20	19.97	0.48	SKIMMER	3.0	1.5	3.79
SKIMMER BASIN 8	SKIMMER BASIN	1.30	1.30	7.30	0.50	4.75	2,340	4,225	65	32.5	2.0	1,542	2,113	222.00	224.00	5	4.75	0.46	SKIMMER	2.5	0.75	3.95
SEDIMENT TRAP 9	SEDIMENT TRAP	0.09	0.09	7.30	0.50	0.33	324	625	25	12.5	2.0	143	313	226.00	228.00	5	0.33	0.08	STONE SPILLWAY	N/A	N/A	#VALUE!
SEDIMENT TRAP 10	SEDIMENT TRAP	0.16	0.16	7.30	0.50	0.58	576	900	30	15	2.0	254	450	222.00	224.00	5	0.58	0.11	STONE SPILLWAY	N/A	N/A	#VALUE!
SEDIMENT TRAP 11	SEDIMENT TRAP	0.04	0.04	7.30	0.50	0.15	144	625	25	12.5	2.0	64	313	224.00	226.00	5	0.15	0.04	STONE SPILLWAY	N/A	N/A	#VALUE!

VELOCITY DISSIPATION PAD (VDP) DESIGN

OUTLET NAME	PIPE DIA.	PIPE SLOPE	Q25	V25	ZONE	PAD DIMENSIONS LENGTH	PAD DIMENSIONS WIDTH	PAD DIMENSIONS DEPTH	STONE SIZING D50	STONE SIZING Dmax	STONE SIZING CLASS
	(in)	(ft/ft)	(cfs)	(fps)		(ft)	(ft)	(in)	(in)	(in)	(NCDOT)
Culvert 100	48	0.0025	101.31	8.06	2	24	12	18	8	12	B
Culvert 200	72	0.0025	228.16	8.34	5	60	18	36	14	23	2

VELOCITY DISSIPATION PAD (VDP) DESIGN

OUTLET NAME	PIPE DIA.	PIPE SLOPE	Q10	V10	ZONE	PAD DIMENSIONS LENGTH	PAD DIMENSIONS WIDTH	PAD DIMENSIONS DEPTH	STONE SIZING D50	STONE SIZING Dmax	STONE SIZING CLASS
	(in)	(ft/ft)	(cfs)	(fps)		(ft)	(ft)	(in)	(in)	(in)	(NCDOT)
FES 100	48	0.01	35.18	9.24	3	32	12	26	10	17	1
FES 200	48	0.072	35.38	18.06	6	40	12	36	14	23	2
FES 240	36	0.005	14.84	5.84	2	18	9	18	8	12	B
FES 300	36	0.017	22.14	10.24	3	24	9	26	10	17	1
FES 400	24	0.028	6.37	8.68	2	12	6	18	8	12	B
SCM 1 FES	36	0.006	52.96	8.34	2	18	9	18	8	12	B
SCM 2 FES	36	0.0053	47.2	7.83	2	18	9	18	8	12	B
SCM 3 FES	30	0.0058	29.94	7.26	2	15	8	18	8

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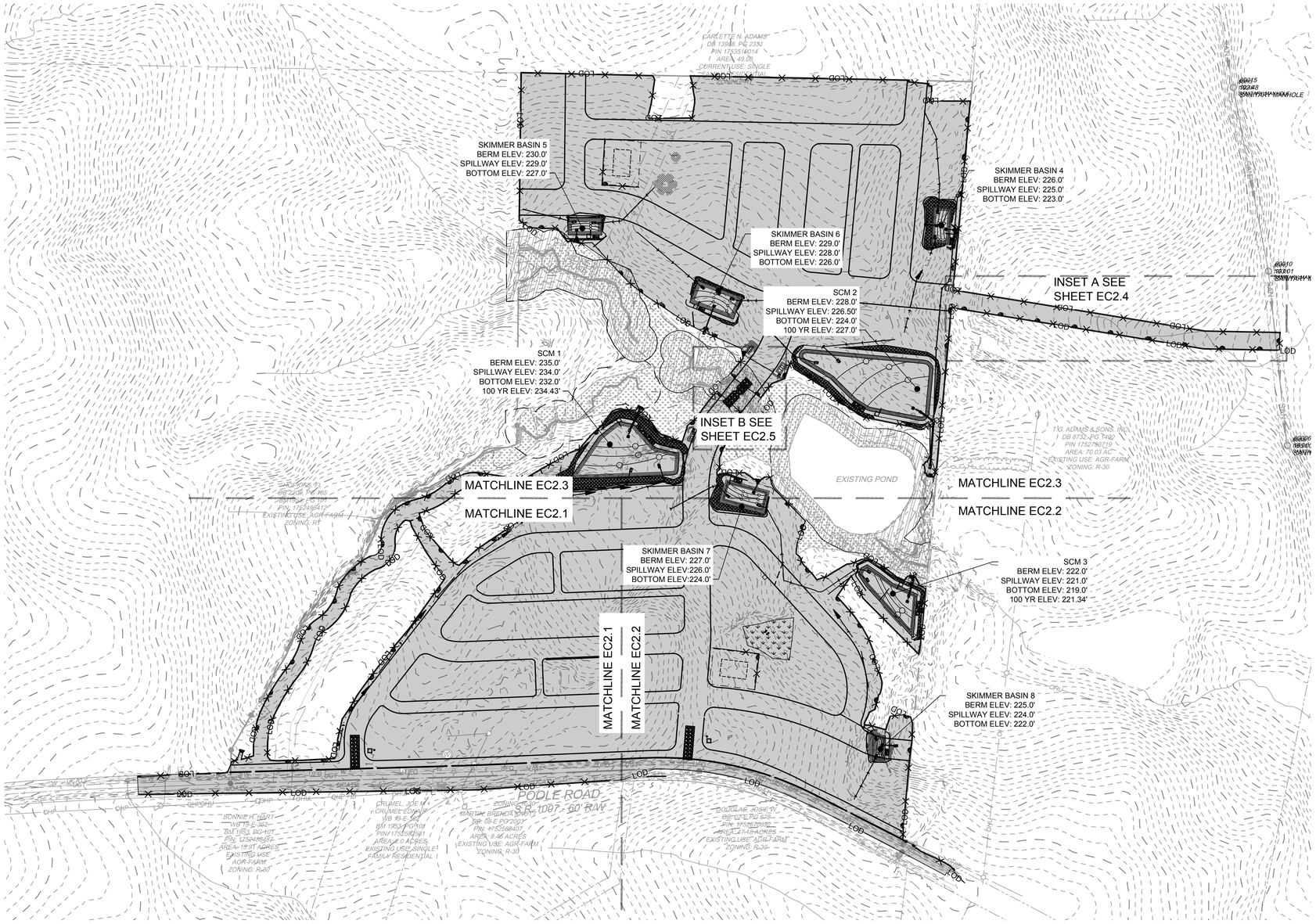
EROSION CONTROL LEGEND

- LOD — LIMITS OF DISTURBANCE
- SF — SILT FENCE
- TP — TREE PROTECTION FENCE
- DD 1-A / DD 1-B — DIVERSION DITCH
- RIP RAP CHECK DAM
- INLET PROTECTION
- SEDIMENT BASIN
- POROUS BAFFLES
- SILT FENCE OUTLET
- SKIMMER
- SLOPE DRAIN
- DEWATERING PUMP WITH FILTER BAG
- ROCK SILT SCREEN
- COIR WATTLE
- SLOPE MATTING

NAD 83

SCALE 1"=150'

0 150' 300'



TOWN CERTIFICATION

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

BY: _____ DATE: _____
DEVELOPMENT SERVICES ENGINEER

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

BY: _____ DATE: _____
ADMINISTRATOR

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04/01/2026 2:34:43 PM

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 TYLER JEFFREY CROSS
2/9/2026

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REVISION DESCRIPTION	DATE
GREENWAY ROUTE AND ROAD WIDENING REVISION	01/30/2026

DATE: 10/23/2025
DRAWN BY: 331
DESIGNED BY: 331
CHECKED BY: T. CROSS
SCALE: 1" = 150'

TIMMONS GROUP

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA
OVERALL EROSION CONTROL PLAN - STAGE 1
NORTH CAROLINA LICENSE NO. C-1652

JOB NO. 51557
SHEET NO. EC2.0

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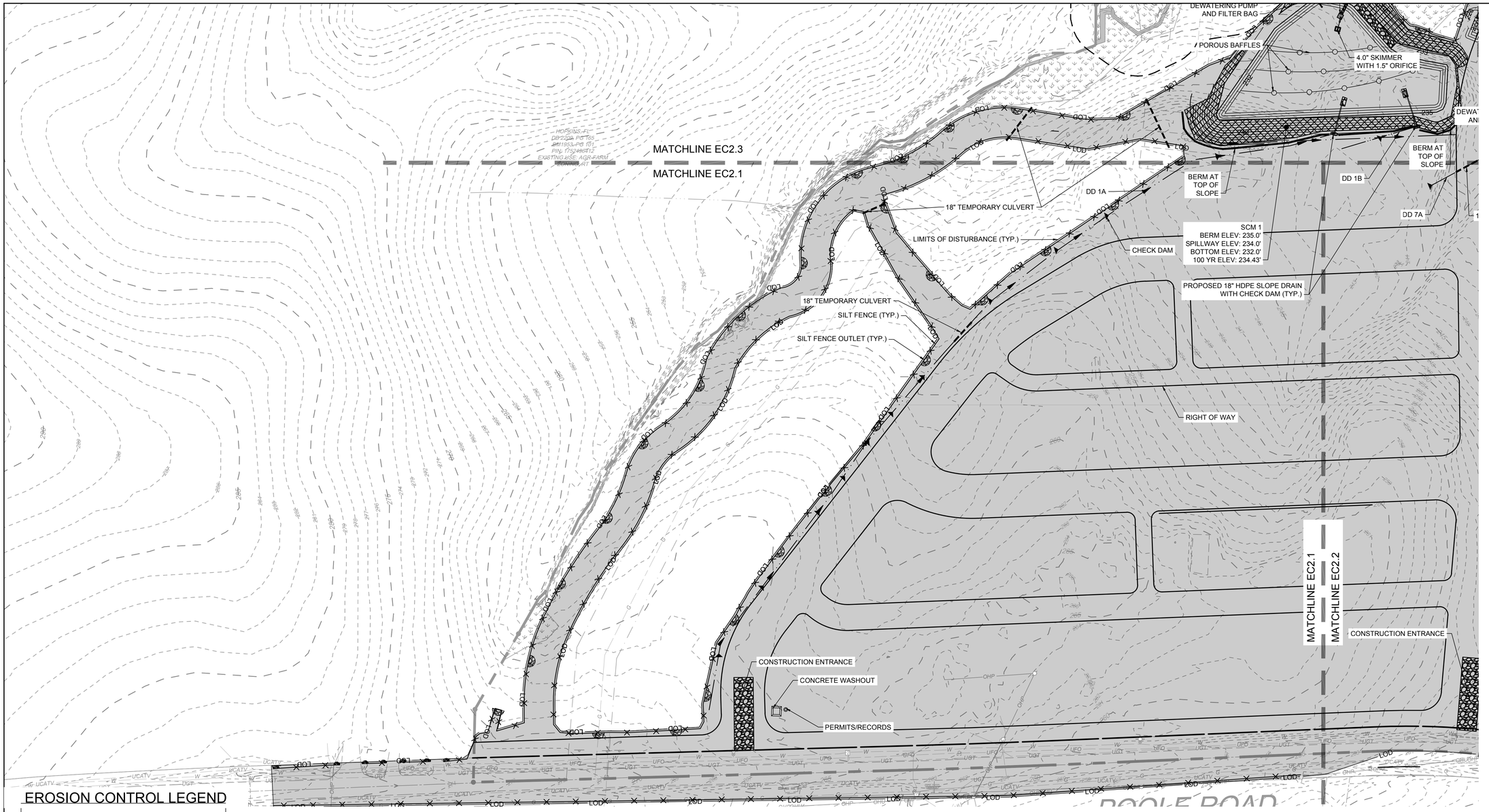

EROSION CONTROL LEGEND

LOD	LIMITS OF DISTURBANCE
	SILT FENCE
TP	TREE PROTECTION FENCE
DD 1-A / DD 1-B	DIVERSION DITCH
	RIP RAP CHECK DAM
	INLET PROTECTION
	SEDIMENT BASIN
	POROUS BAFFLES
	SILT FENCE OUTLET
	SKIMMER
	SLOPE DRAIN
	DEWATERING PUMP WITH FILTER BAG
	ROCK SILT SCREEN
	COIR WATTLE
	SLOPE MATTING

NAD 83

SCALE 1"=60'

0 60' 120'

TOWN CERTIFICATION

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BY: _____ DATE: _____
DEVELOPMENT SERVICES ENGINEER

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

BY: _____ DATE: _____
ADMINISTRATOR

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DATE	10/23/2025
DRAWN BY	331
DESIGNED BY	331
CHECKED BY	T. CROSS
SCALE	1" = 60'

TIMMONS GROUP

NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS

KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

EROSION CONTROL PLAN - STAGE 1 (SHEET 1 OF 3)

JOB NO.	51557
SHEET NO.	EC2.1

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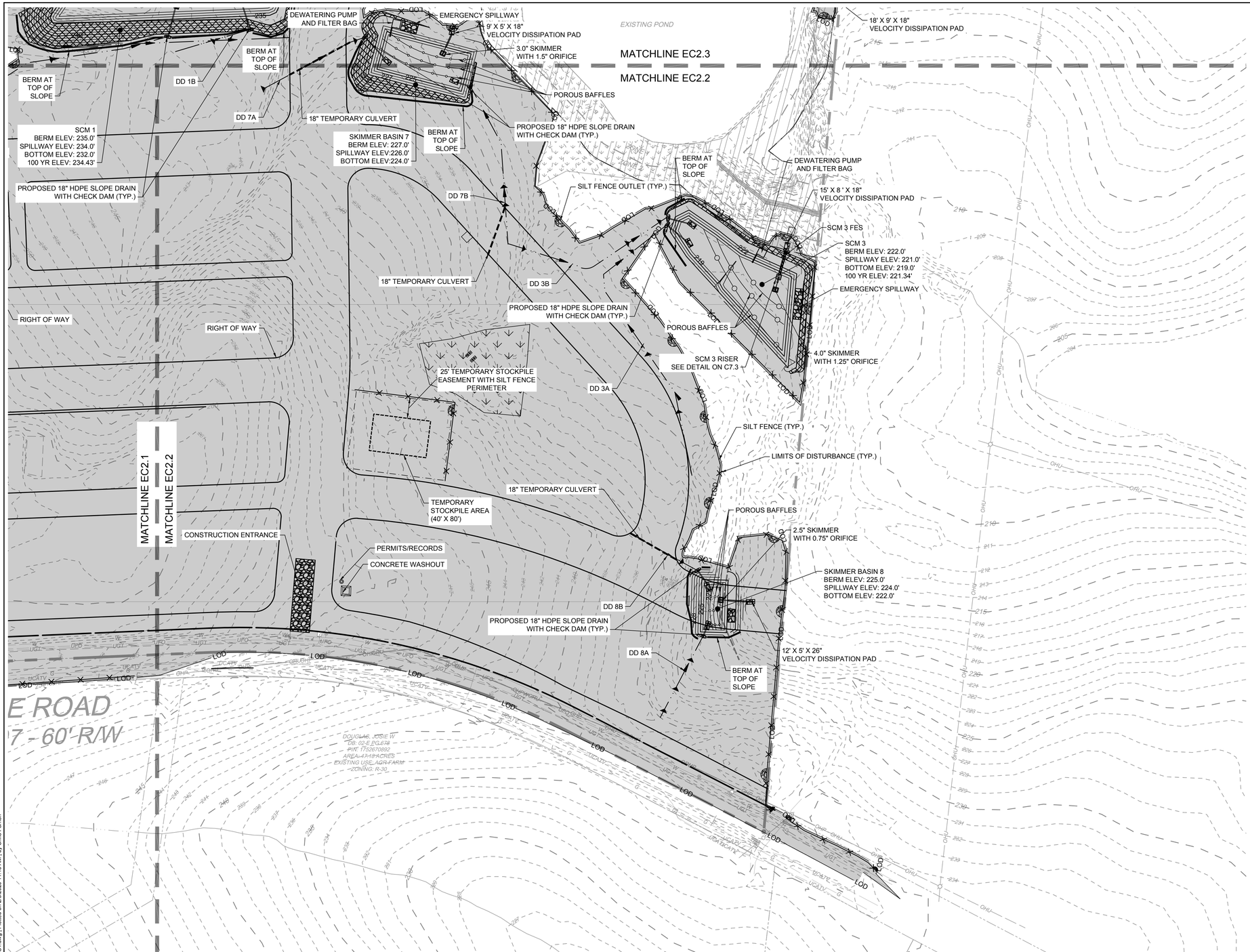

EROSION CONTROL LEGEND

- LOD — LIMITS OF DISTURBANCE
- SILT FENCE
- TP — TREE PROTECTION FENCE
- DD 1-A / DD 1-B — DIVERSION DITCH
- RIP RAP CHECK DAM
- INLET PROTECTION
- SEDIMENT BASIN
- POROUS BAFFLES
- SILT FENCE OUTLET
- SKIMMER
- SLOPE DRAIN
- DEWATERING PUMP WITH FILTER BAG
- ROCK SILT SCREEN
- COIR WATTLE
- SLOPE MATTING

NAD 83

SCALE 1"=60'

0 60' 120'

TOWN CERTIFICATION

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BY: _____ DATE: _____
DEVELOPMENT SERVICES ENGINEER

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

BY: _____ DATE: _____
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DRAWN BY	331
DESIGNED BY	331
CHECKED BY	T. CROSS
SCALE	1" = 60'

TIMMONS GROUP

NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS

KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

EROSION CONTROL PLAN - STAGE 1 (SHEET 2 OF 3)

JOB NO. 51557

SHEET NO. EC2.2

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EROSION CONTROL LEGEND

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- COIR WATTLE
- SLOPE MATTING

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DEVELOPMENT SERVICES ENGINEER

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ADMINISTRATOR

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CHECKED BY: T. CROSS
SCALE: 1" = 60'

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS

KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

EROSION CONTROL PLAN - STAGE 1 (SHEET 3 OF 3)

JOB NO. 51557
SHEET NO. EC2.3

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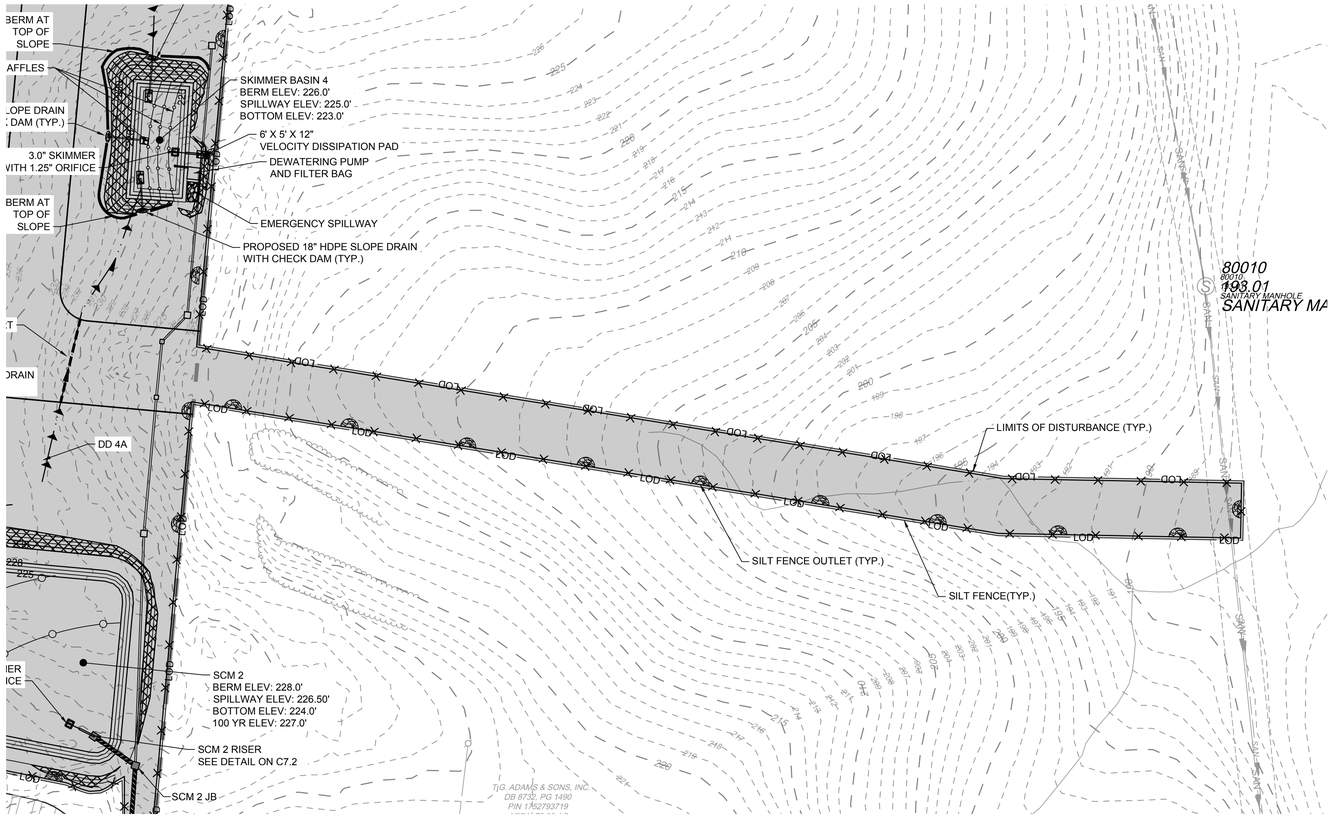

EROSION CONTROL LEGEND

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- SLOPE DRAIN
- DEWATERING PUMP WITH FILTER BAG
- ROCK SILT SCREEN
- COIR WATTLE
- SLOPE MATTING

SCALE 1"=60'
0 60' 120'

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TOWN CERTIFICATION

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BY: _____ DATE: _____
DEVELOPMENT SERVICES ENGINEER

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

BY: _____ DATE: _____
ADMINISTRATOR

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2/9/2026

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DESIGNED BY: 331
CHECKED BY: T. CROSS
SCALE: 1" = 60'

TIMMONS GROUP

NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS

KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

SEWER OUTFALL EROSION CONTROL - STAGE 1

JOB NO. 51557
SHEET NO. EC2.4

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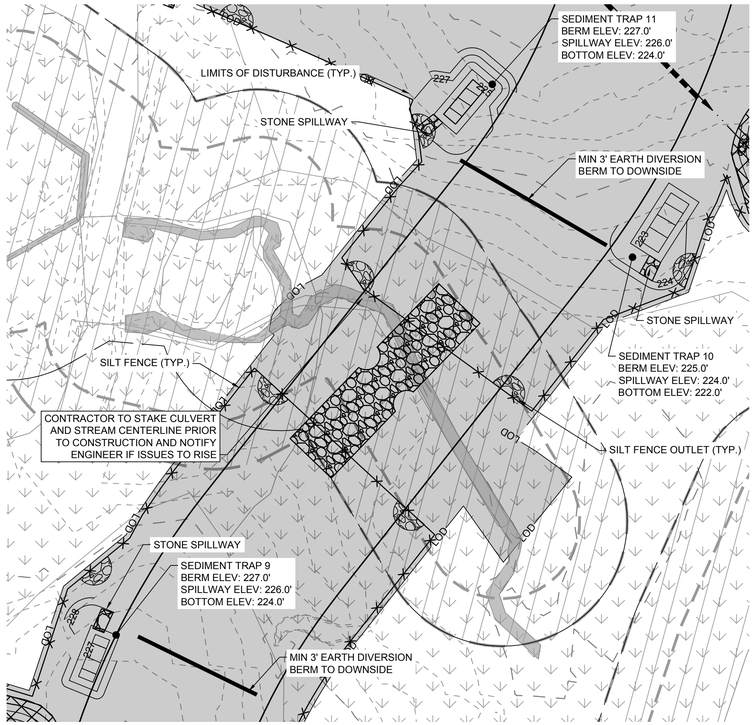
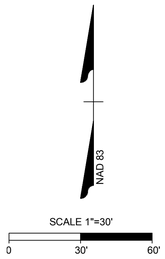
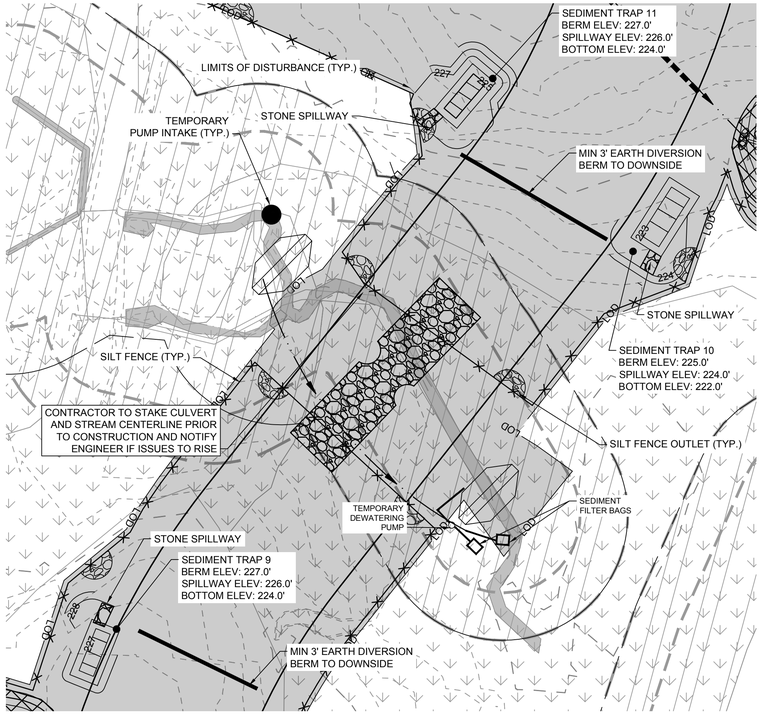


INSET B - EROSION CONTROL DETAIL

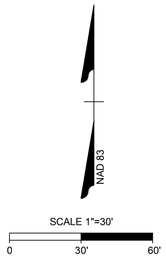
SCALE: 1" = 30'





INSET B - DRY CONDITION INSTALLATION DETAIL

SCALE: 1" = 30'



STREAM CROSSING CONSTRUCTION SEQUENCE

1. SCHEDULE A PRECONSTRUCTION CONFERENCE WITH THE ENVIRONMENTAL CONSULTANT IKE ARCHER (919) 217-2255, PRIOR TO BEGINNING CONSTRUCTION. OBTAIN A LAND-DISTURBING PERMIT.
2. CROSSING WORK SHALL NOT BEGIN UNTIL ALL MATERIAL AND EQUIPMENT ARE ONSITE AND A DRY WEATHER PATTERN FOR THE NEXT 3-5 DAYS. CONTRACTOR WILL ATTEMPT TO COORDINATE CONSTRUCTION DURING A TWO WEEK TIMEFRAME OF DRY WEATHER.
3. INSTALL TEMPORARY 6-FOOT WIDE TRAPEXOIDAL STREAM BYPASS CHANNEL WITH 2:1 SIDE SLOPES, INCLUDING WATTLES/CHECK DAMS, SILT FENCE, TREE PROTECTION FENCE OR OTHER MEASURES AS SHOWN ON THE APPROVED PLAN. CLEAR ONLY AS NECESSARY TO INSTALL THESE DEVICES. SEED TEMPORARY DIVERSIONS AND BERMS IMMEDIATELY AFTER CONSTRUCTION.
4. SANDBAG DIKE WILL BE CONSTRUCTED ON THE UPSTREAM END WITH A PUMP PASS AROUND UTILIZED IF NECESSARY.
   - 4.1. WHEN PUMP AROUND IS IN USE, THE HOSE WILL BE CONTAINED IN THE CULVERT TO AVOID CROSSING ROAD. AT END OF EACH WORKING DAY, THE SITE WILL BE CLEARED OF MEASURES TO ALLOW STREAM WATER TO FLOW NATURALLY.
5. BEGIN CLEARING AND GRUBBING. KEEP CLEARING AND EXCAVATION OF THE STREAM BANKS AND BED, AND APPROACH TO A MINIMUM. MAINTAIN DEVICES AS NEEDED AND ROUGH GRADE CROSSING AREA.
6. INSTALL PIPE CULVERTS / HEADWALL AND BACKFILL PROPERLY.
7. INSTALL DISSIPATOR PADS AT PIPE OUTLETS.
8. INSTALL PROTECTIVE GROUND COVERS TO PROVIDE PERMANENT EROSION PROTECTION AND IMPROVE VISUAL QUALITY, BUT NOT INTERFERE WITH DRIVER LINE OF SIGHT FROM THE ROADWAY.
9. STABILIZE ALL DISTURBED AREAS BEFORE DIVERTING WATER THROUGH STORM CROSSING.
10. WHEN STORM CROSSING CONSTRUCTION IS COMPLETE AND ALL AREAS ARE STABILIZED COMPLETELY, CALL IKE ARCHER (919) 217-2255 FOR AN INSPECTION BY THE ENVIRONMENTAL CONSULTANT.
11. UPON COMPLETION OF CROSSING WITH AREA STABILIZED, THE TEMPORARY STORM BYPASS CHANNEL MAY BE REMOVED, BACKFILLED AS NECESSARY, SEEDED WITH A WETLAND APPROVED SEED MIX AND STABILIZED.
12. ENSURE THAT PERMANENT MEASURES NEEDED TO CONTROL EROSION FROM ROAD WATER RUNOFF (SUCH AS RIPRAP AND PAVED CHANNELS, PAVED FLUMES, OR RIPRAP OUTLET PROTECTION) MEET ALL CONSTRUCTION REQUIREMENTS FOR THOSE PRACTICES.

EROSION CONTROL LEGEND

LOD	LIMITS OF DISTURBANCE
SF	SILT FENCE
TP	TREE PROTECTION FENCE
DD 1-A / DD 1-B	DIVERSION DITCH
	RIP RAP CHECK DAM
	INLET PROTECTION
	SEDIMENT BASIN
	POROUS BAFFLES
	SILT FENCE OUTLET
	SKIMMER
	SLOPE DRAIN
	DEWATERING PUMP WITH FILTER BAG
	ROCK SILT SCREEN
	COIR WATTLE
	SLOPE MATTING

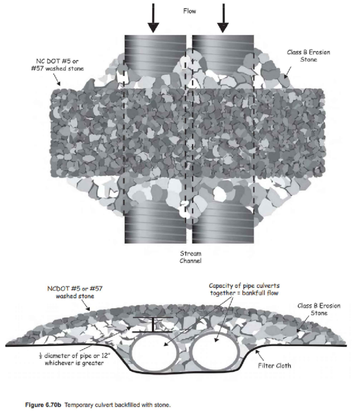


Figure 6.70b Temporary culvert backfilled with stone.

CULVERT CONSTRUCTION DETAIL

NOT TO SCALE

PUMP CAPACITY NOTE:
ESTIMATED MAX FLOW AT CULVERT ENTRANCE (100 YR) = 208,845.63 GPM (465.31 CFS)

CONTRACTOR SHALL SIZE PUMP FOR STREAM CROSSING BASED ON FLOW ESTIMATE, LOCAL TOPOGRAPHY AND FIELD CONDITIONS.

STREAM GRADING NOTE:
AREAS ADJACENT TO STREAM SHALL BE STABILIZED IMMEDIATELY AFTER GRADING

NOTES
1.) NO MORE THAN 75 ACRES SHOULD BE LEFT BARE AT ANYTIME
2.) ALL TEMPORARY DITCHES SHALL BE COVERED WITH GROUNDCOVER AT END OF WORKDAY
3.)SILT FENCE AND TREE PROTECTION ARE SHOWN OFFSET FROM THE LIMITS OF DISTURBANCE FOR PLAN CLARITY.
4.)ALL STREAM CROSSING INSTALLATIONS TO BE DONE DURING DRY WEATHER PATTERNS
5.) ALL AREAS DOWNSTREAM OF BASINS OR DIVERSIONS SHALL BE STABILIZED ONCE CONSTRUCTED.
6.) SEE SHEET EC4.3 FOR STREAM CROSSING NOTES AND DETAILS

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TOWN CERTIFICATION

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BY: _____ DATE: _____
DEVELOPMENT SERVICES ENGINEER

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

BY: _____ DATE: _____
ADMINISTRATOR

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 ENGINEER TYLER JEFFREY CROSS
2/9/2026

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DATE: 10/23/2025
DRAWN BY: 331
DESIGNED BY: 331
CHECKED BY: T. CROSS
SCALE: 1" = 30'

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

CULVERT STREAM CROSSING

JOB NO. 51557
SHEET NO. EC2.5

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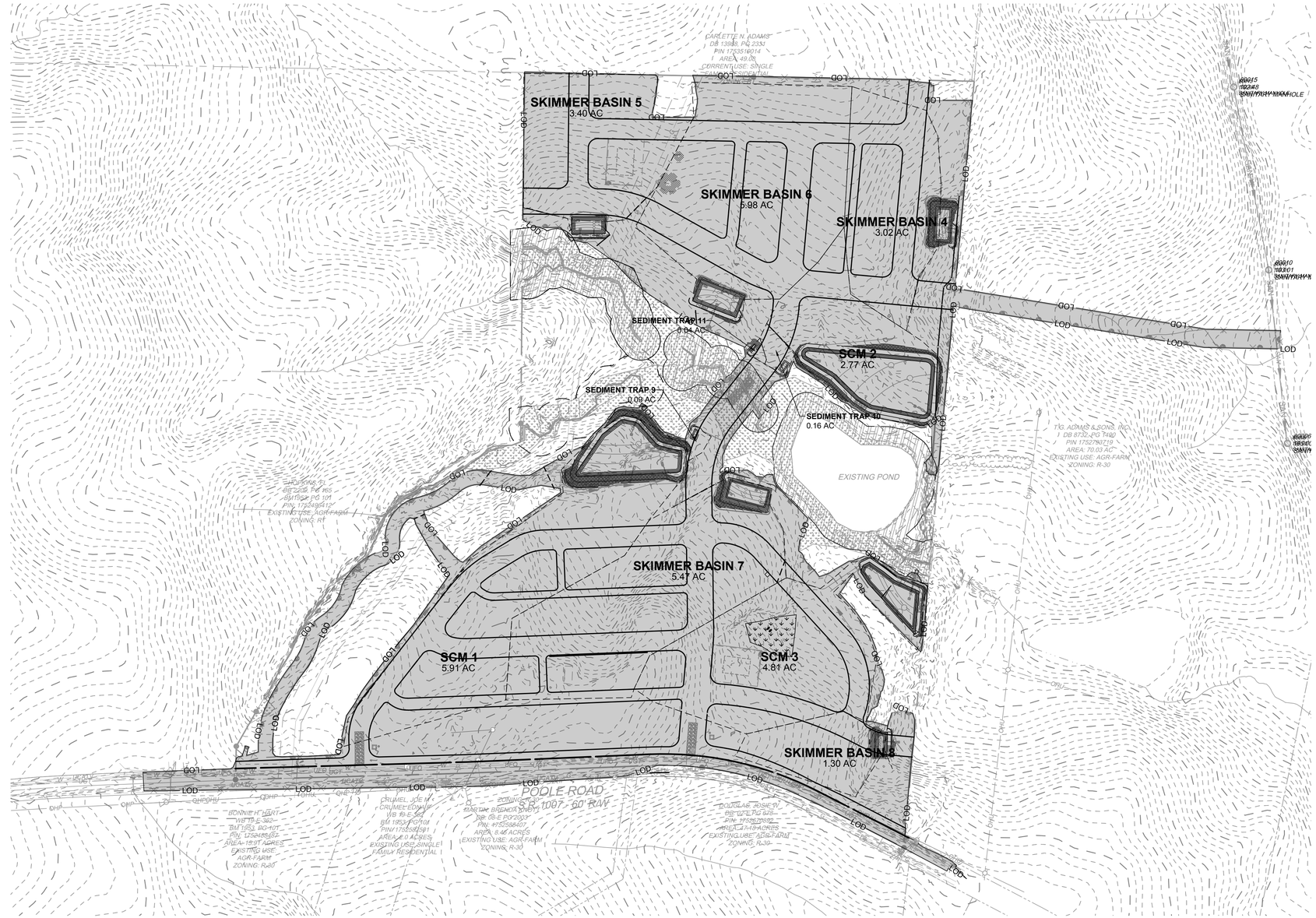
EROSION CONTROL LEGEND

- LOD — LIMITS OF DISTURBANCE
- SILT FENCE
- TP — TREE PROTECTION FENCE
- DD 1-A / DD 1-B — DIVERSION DITCH
- RIP RAP CHECK DAM
- INLET PROTECTION
- SEDIMENT BASIN
- POROUS BAFFLES
- SILT FENCE OUTLET
- SKIMMER
- SLOPE DRAIN
- DEWATERING PUMP WITH FILTER BAG
- ROCK SILT SCREEN
- COIR WATTLE
- SLOPE MATTING



TOWN CERTIFICATION

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BY: _____ DATE: _____
DEVELOPMENT SERVICES ENGINEER

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BY: _____ DATE: _____
ADMINISTRATOR

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DESIGNED BY: 331
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SCALE: 1" = 150'

TIMMONS GROUP

NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS

KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

STAGE 1 DRAINAGE AREA

JOB NO. 51557
SHEET NO. EC2.6

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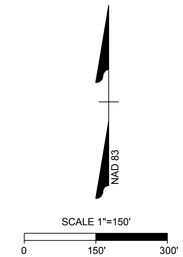
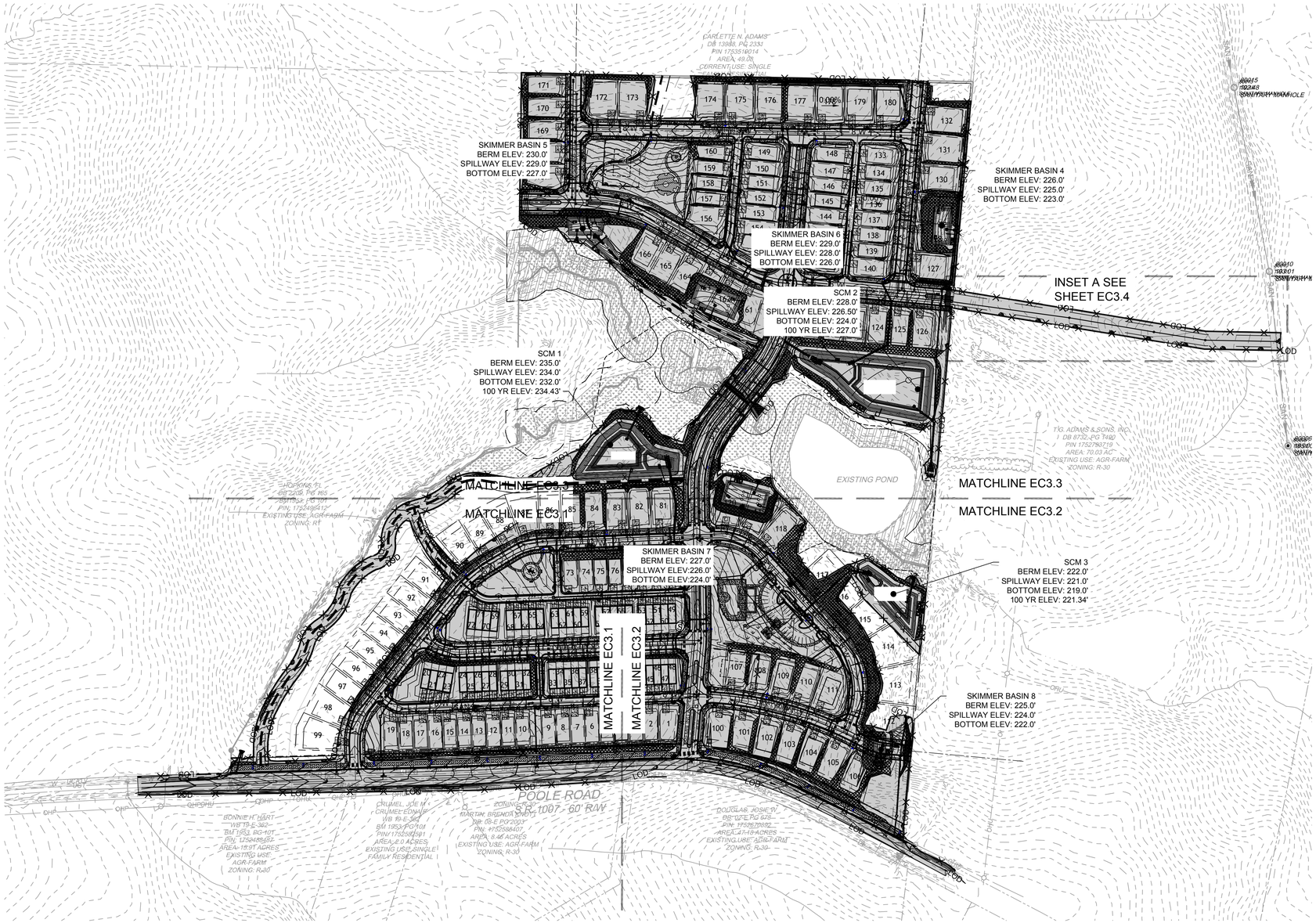
EROSION CONTROL LEGEND

- LOD — LIMITS OF DISTURBANCE
- SILT FENCE
- TP — TREE PROTECTION FENCE
- DD 1-A / DD 1-B — DIVERSION DITCH
- RIP RAP CHECK DAM
- INLET PROTECTION
- SEDIMENT BASIN
- POROUS BAFFLES
- SILT FENCE OUTLET
- SKIMMER
- SLOPE DRAIN
- DEWATERING PUMP WITH FILTER BAG
- ROCK SILT SCREEN
- COIR WATTLE
- SLOPE MATTING





GROUND STABILIZATION

SITE AREA DESCRIPTION	STABILIZATION TIME FRAME	STABILIZATION TIME FRAME EXCEPTIONS
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (HQW) 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 ALLOWED
SLOPES 3:1 OR FLATTER	14 DAYS	7 DAYS FOR SLOPES GREATER THAN 50 FEET IN LENGTH
ANY OTHER AREAS WITH SLOPES FLATTER THAN 4:1	14 DAYS	NONE (EXCEPT FOR PERIMETERS AND HQW ZONES)
* "EXTENSIONS OF TIME MAY BE APPROVED BY THE PERMITTING AUTHORITY BASED ON WEATHER OR OTHER SITE-SPECIFIC CONDITIONS THAT MAKE COMPLIANCE IMPRACTICABLE." (SECTION II.B(2)(B)		

NAG STRAW BLANKET MATTING TYPES

SLOPES	NAG MATTING TYPE
>1:1	C125
2:1 - 1:1	SC150
3:1 - 2:1	S150
4:1 - 3:1	S75

STAGE 2 EROSION CONTROL NOTES

DIVERSION DITCHES ARE TO BE ADJUSTED AS NECESSARY AS SITE IS BROUGHT TO FINAL GRADE.

TOWN CERTIFICATION

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

BY: _____ DATE: _____
TOWN ENGINEER

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

BY: _____ DATE: _____
LAND USE ADMINISTRATOR

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 TYLER JEFFREY CROSS
2/9/2026

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NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA
OVERALL EROSION CONTROL PLAN - STAGE 2

REVISION DESCRIPTION	DATE
GREENWAY ROUTE AND ROAD WIDENING REVISION	01/30/2026

DATE: 10/23/2025
DRAWN BY: 331
DESIGNED BY: 331
CHECKED BY: T. CROSS
SCALE: 1" = 150'
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SHEET NO.: EC3.0

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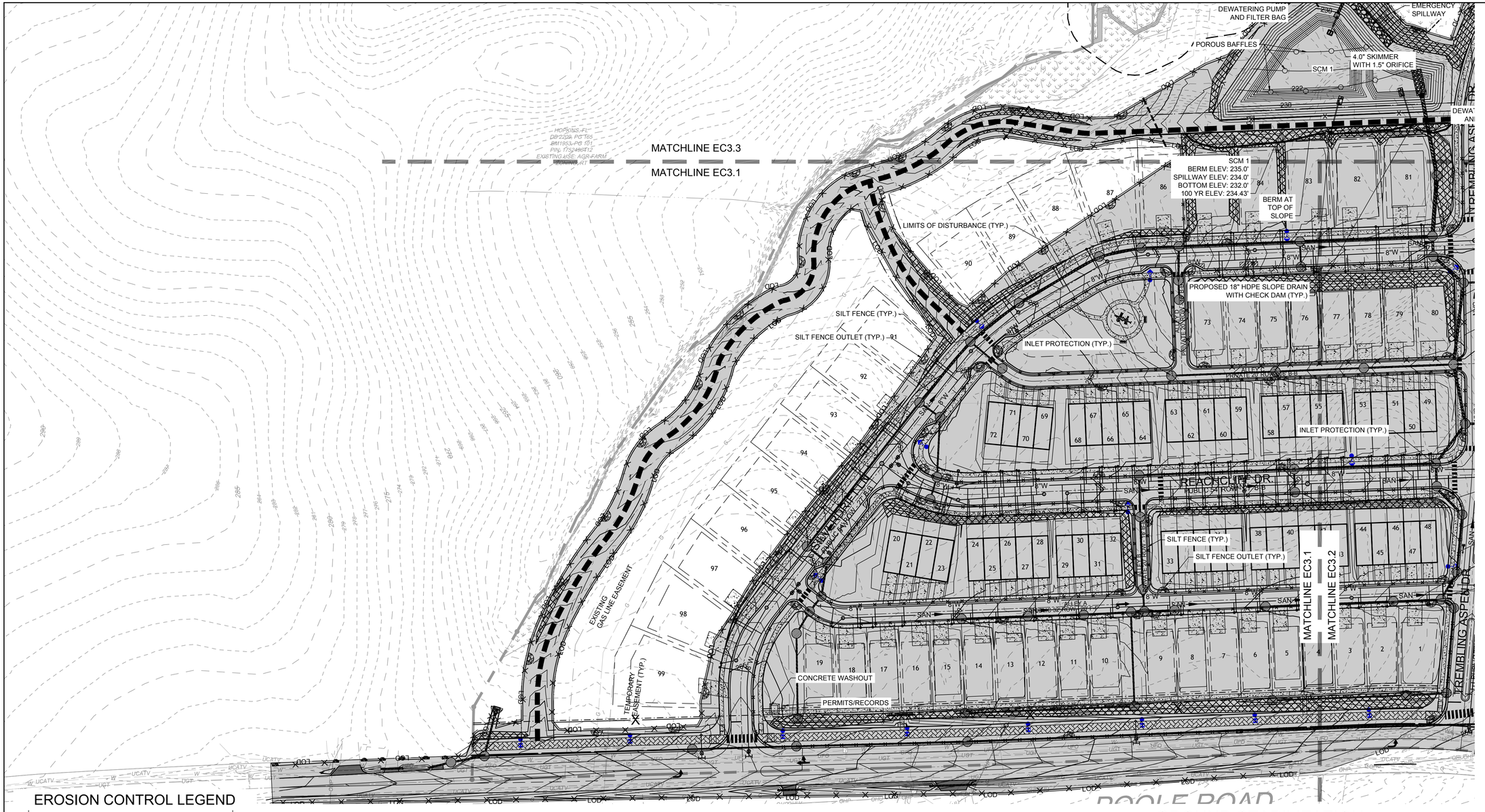

EROSION CONTROL LEGEND

- LOD — LIMITS OF DISTURBANCE
- SILT FENCE
- TP — TREE PROTECTION FENCE
- DD 1-A / DD 1-B — DIVERSION DITCH
- RIP RAP CHECK DAM
- INLET PROTECTION
- SEDIMENT BASIN
- POROUS BAFFLES
- SILT FENCE OUTLET
- SKIMMER
- SLOPE DRAIN
- DEWATERING PUMP WITH FILTER BAG
- ROCK SILT SCREEN
- COIR WATTLE
- SLOPE MATTING

NAD 83

SCALE 1"=60'
0 60' 120'

ESC Approval
04/01/2026 2:35:18 PM

NAG STRAW BLANKET MATTING TYPES

SLOPES	NAG MATTING TYPE
>1:1	C125
2:1 - 1:1	SC150
3:1 - 2:1	S150
4:1 - 3:1	S75

NOTE

TEMP SLOPE DRAIN TO BE RELOCATED TO TOP OF SLOPE AS NECESSARY WHEN SITE IS BROUGHT TO FINISHED GRADE IN STAGE 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: _____ DATE: _____
TOWN ENGINEER

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

BY: _____ DATE: _____
LAND USE ADMINISTRATOR

GROUND STABILIZATION

SITE AREA DESCRIPTION	STABILIZATION TIME FRAME	STABILIZATION TIME FRAME EXCEPTIONS
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (HQW) 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 ALLOWED
SLOPES 3:1 OR FLATTER	14 DAYS	7 DAYS FOR SLOPES GREATER THAN 50 FEET IN LENGTH
ANY OTHER AREAS WITH SLOPES FLATTER THAN 4:1	14 DAYS	NONE (EXCEPT FOR PERIMETERS AND HQW ZONES)

* "EXTENSIONS OF TIME MAY BE APPROVED BY THE PERMITTING AUTHORITY BASED ON WEATHER OR OTHER SITE-SPECIFIC CONDITIONS THAT MAKE COMPLIANCE IMPRACTICABLE." (SECTION II.B(2)(B)

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DATE: 10/23/2025
DRAWN BY: 331
DESIGNED BY: 331
CHECKED BY: T. CROSS
SCALE: 1" = 60'

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA
EROSION CONTROL PLAN - STAGE 2 (SHEET 1 OF 3)

JOB NO. 51557
SHEET NO. EC3.1

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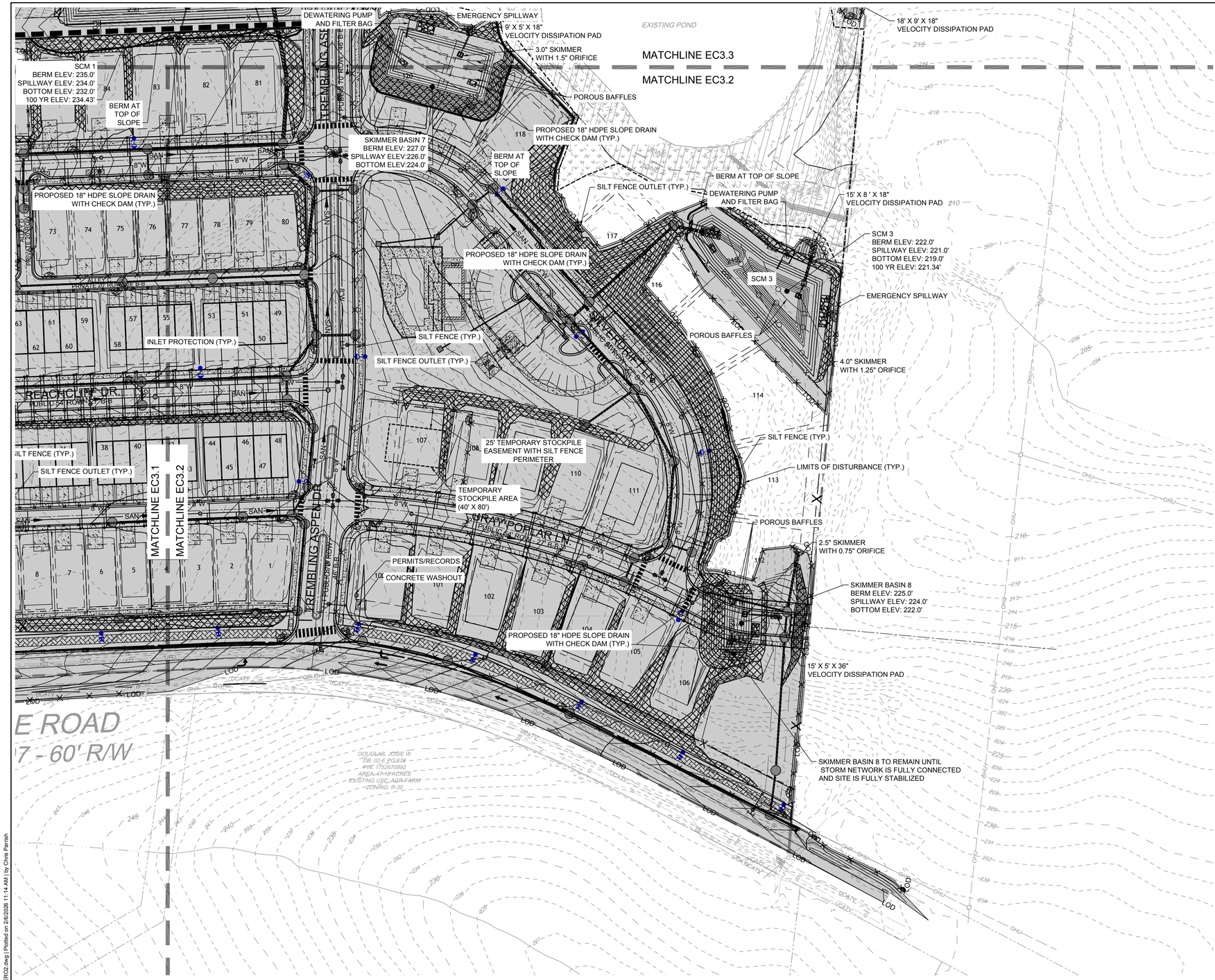

EROSION CONTROL LEGEND

- LOD — LIMITS OF DISTURBANCE
- SILT FENCE
- TREE PROTECTION FENCE
- DD 1-A / DD 1-B — DIVERSION DITCH
- RIP RAP CHECK DAM
- INLET PROTECTION
- SEDIMENT BASIN
- POROUS BAFFLES
- SILT FENCE OUTLET
- SKIMMER
- SLOPE DRAIN
- DEWATERING PUMP WITH FILTER BAG
- ROCK SILT SCREEN
- COIR WATTLE
- SLOPE MATTING

NAD 83

SCALE 1"=60'
0 60' 120'

GROUND STABILIZATION

SITE AREA DESCRIPTION	STABILIZATION TIME FRAME	STABILIZATION TIME FRAME EXCEPTIONS
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (HQW) ZONES	7 DAYS	NONE
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* "EXTENSIONS OF TIME MAY BE APPROVED BY THE PERMITTING AUTHORITY BASED ON WEATHER OR OTHER SITE-SPECIFIC CONDITIONS THAT MAKE COMPLIANCE IMPRACTICABLE." (SECTION II.B(2)(B)

NAG STRAW BLANKET MATTING TYPES

SLOPES	NAG MATTING TYPE
>1:1	C125
2:1 - 1:1	SC150
3:1 - 2:1	S150
4:1 - 3:1	S75

NOTE

TEMP SLOPE DRAIN TO BE RELOCATED TO TOP OF SLOPE AS NECESSARY WHEN SITE IS BROUGHT TO FINISHED GRADE IN STAGE 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: _____ DATE: _____
TOWN ENGINEER

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

BY: _____ DATE: _____
LAND USE ADMINISTRATOR

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DATE 10/23/2025
DRAWN BY 331
DESIGNED BY 331
CHECKED BY T. CROSS
SCALE 1" = 60'

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS

KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

EROSION CONTROL PLAN - STAGE 2 (SHEET 2 OF 3)

JOB NO. 51557
SHEET NO. EC3.2

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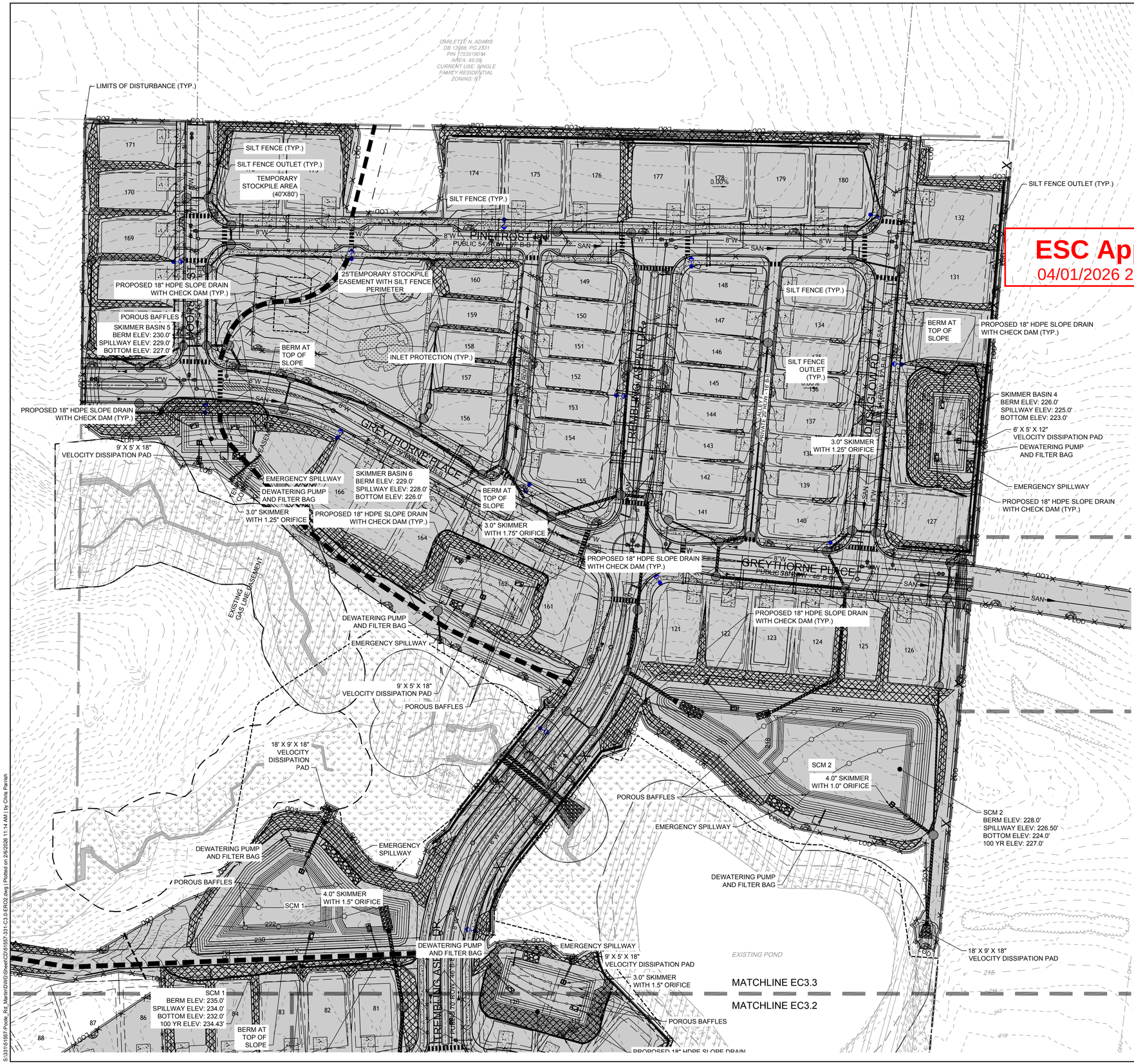

EROSION CONTROL LEGEND

- LOD — LIMITS OF DISTURBANCE
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- SKIMMER
- SLOPE DRAIN
- DEWATERING PUMP WITH FILTER BAG
- ROCK SILT SCREEN
- COIR WATTLE
- SLOPE MATTING

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NAD 83

SCALE 1"=60'
0 60' 120'

GROUND STABILIZATION

SITE AREA DESCRIPTION	STABILIZATION TIME FRAME	STABILIZATION TIME FRAME EXCEPTIONS
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (HQW) ZONES	7 DAYS	NONE
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NAG STRAW BLANKET MATTING TYPES

SLOPES	NAG MATTING TYPE
>1:1	C125
2:1 - 1:1	SC150
3:1 - 2:1	S150
4:1 - 3:1	S75

NOTE

TEMP SLOPE DRAIN TO BE RELOCATED TO TOP OF SLOPE AS NECESSARY WHEN SITE IS BROUGHT TO FINISHED GRADE IN STAGE 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: _____ DATE: _____
TOWN ENGINEER

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

BY: _____ DATE: _____
LAND USE ADMINISTRATOR

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 TYLER JEFFREY CROSS
2/9/2026

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GREENWAY ROUTE AND ROAD WIDENING REVISION	01/30/2026

DATE: 10/23/2025
DRAWN BY: 331
DESIGNED BY: 331
CHECKED BY: T. CROSS
SCALE: 1" = 60'

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS

KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

EROSION CONTROL PLAN - STAGE 2 (SHEET 3 OF 3)

JOB NO. 51557
SHEET NO. EC3.3

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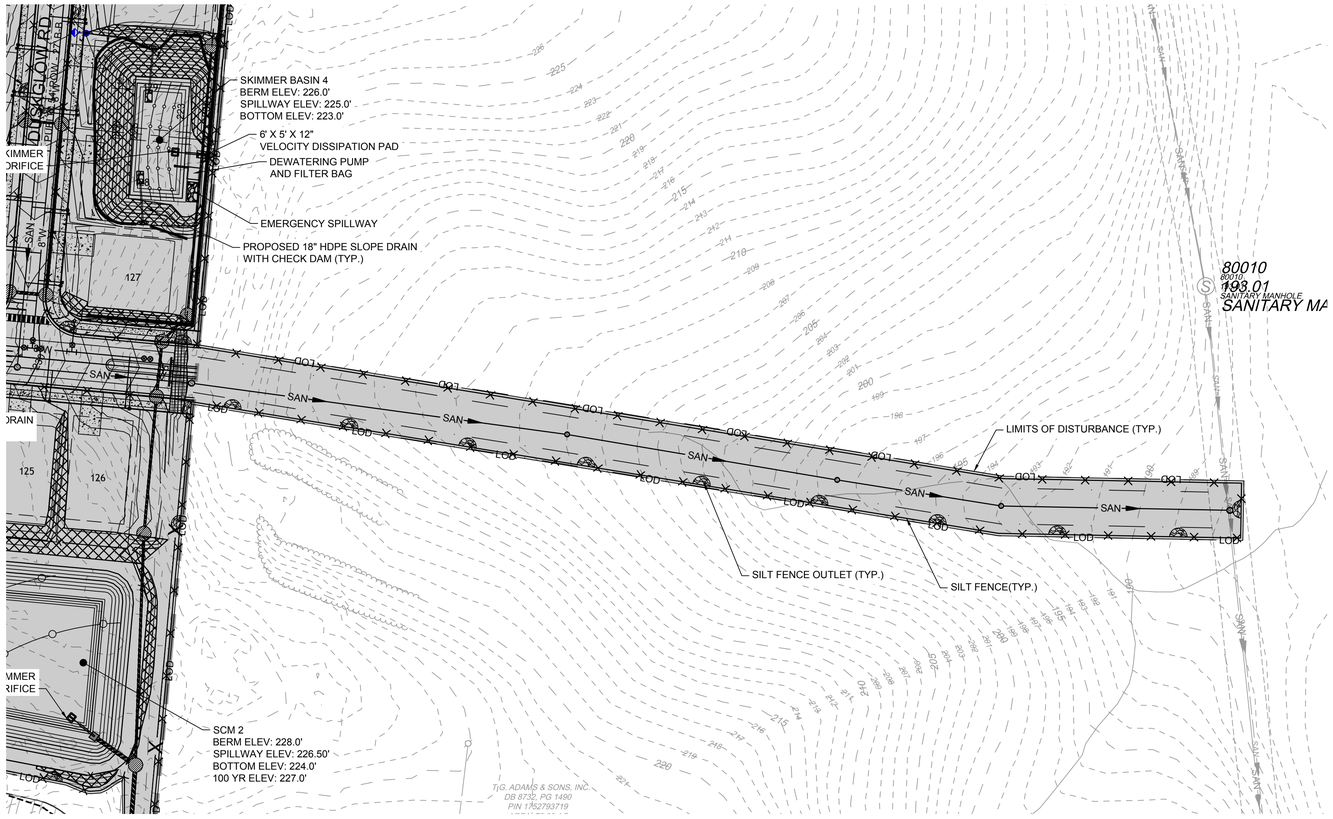

EROSION CONTROL LEGEND

- LOD — LIMITS OF DISTURBANCE
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- SEDIMENT BASIN
- POROUS BAFFLES
- SILT FENCE OUTLET
- SKIMMER
- SLOPE DRAIN
- DEWATERING PUMP WITH FILTER BAG
- ROCK SILT SCREEN
- COIR WATTLE
- SLOPE MATTING

NAD 83

SCALE 1"=60'

0 60' 120'

GROUND STABILIZATION

SITE AREA DESCRIPTION	STABILIZATION TIME FRAME	STABILIZATION TIME FRAME EXCEPTIONS
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (HQW) 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 ALLOWED
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* "EXTENSIONS OF TIME MAY BE APPROVED BY THE PERMITTING AUTHORITY BASED ON WEATHER OR OTHER SITE-SPECIFIC CONDITIONS THAT MAKE COMPLIANCE IMPRACTICABLE." (SECTION II.B(2)(B)		

NAG STRAW BLANKET MATTING TYPES

SLOPES	NAG MATTING TYPE
>1:1	C125
2:1 - 1:1	SC150
3:1 - 2:1	S150
4:1 - 3:1	S75

NOTE

TEMP SLOPE DRAIN TO BE RELOCATED TO TOP OF SLOPE AS NECESSARY WHEN SITE IS BROUGHT TO FINISHED GRADE IN STAGE 2

ESC Approval
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TOWN CERTIFICATION

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

BY: _____ DATE: _____
TOWN ENGINEER

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

BY: _____ DATE: _____
LAND USE ADMINISTRATOR

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 TYLER JEFFREY CROSS 2/9/2026

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REVISION DESCRIPTION	DATE
GREENWAY ROUTE AND ROAD WIDENING REVISION	01/30/2026

DATE: 10/23/2025
DRAWN BY: 331
DESIGNED BY: 331
CHECKED BY: T. CROSS
SCALE: 1" = 60'

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA
SEWER OUTFALL EROSION CONTROL - STAGE 2

JOB NO. 51557
SHEET NO. EC3.4

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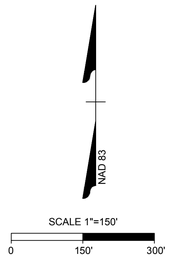
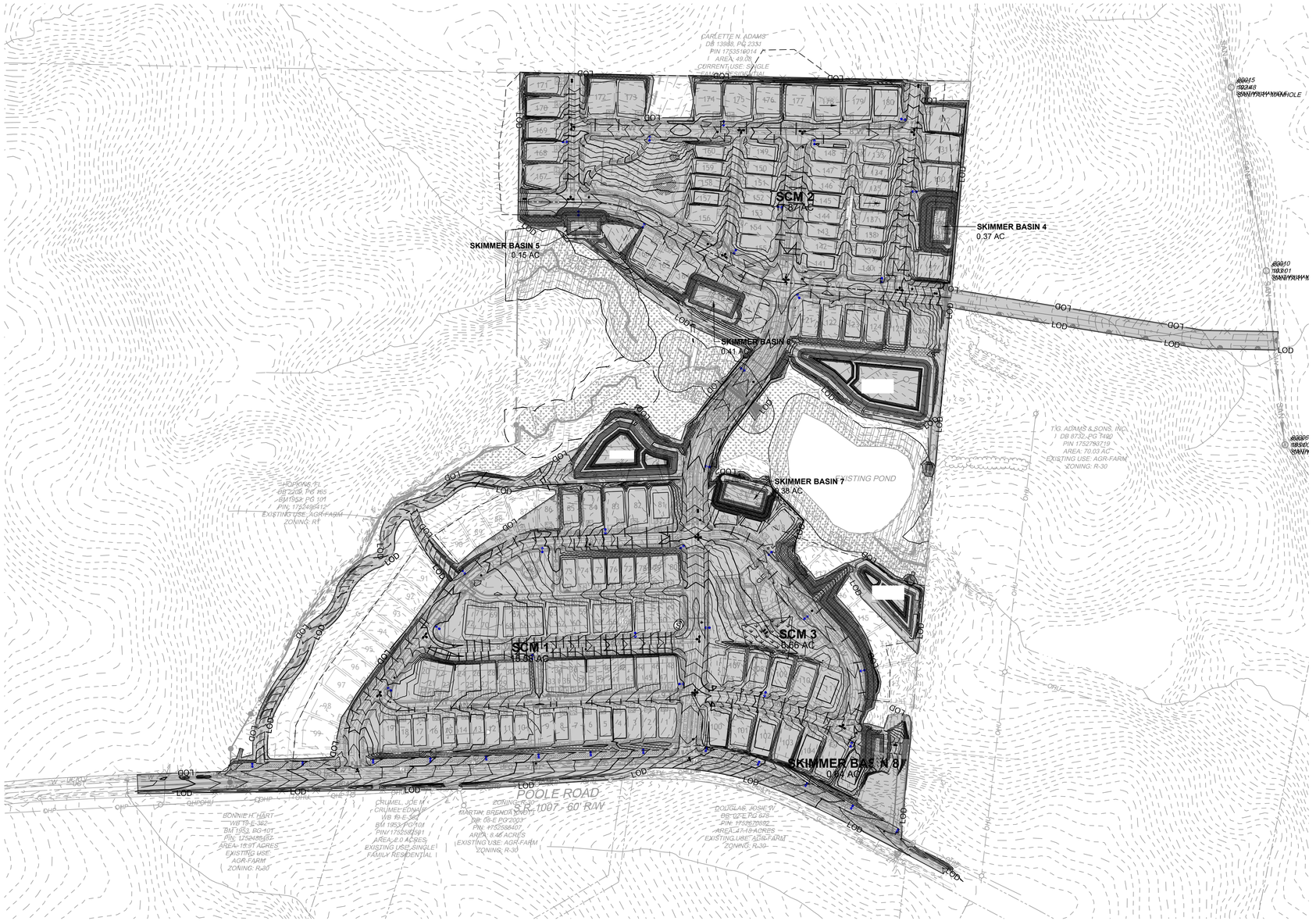
EROSION CONTROL LEGEND

- LOD — LIMITS OF DISTURBANCE
- SILT FENCE
- TP — TREE PROTECTION FENCE
- DD 1-A / DD 1-B — DIVERSION DITCH
- RIP RAP CHECK DAM
- INLET PROTECTION
- SEDIMENT BASIN
- POROUS BAFFLES
- SILT FENCE OUTLET
- SKIMMER
- SLOPE DRAIN
- DEWATERING PUMP WITH FILTER BAG
- ROCK SILT SCREEN
- COIR WATTLE
- SLOPE MATTING





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TOWN ENGINEER

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BY: _____ DATE: _____
LAND USE ADMINISTRATOR

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DESIGNED BY: *331*
CHECKED BY: *T. CROSS*
SCALE: *1" = 150'*

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA
STAGE 2 DRAINAGE AREA

JOB NO. *51557*
SHEET NO. *EC3.5*

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PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION A: SELF-INSPECTION

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

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

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

PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION B: RECORDKEEPING

1. E&SC Plan Documentation

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

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

2. Additional Documentation to be Kept on Site

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

(a) This General Permit as well as the Certificate of Coverage, after it is received.

(b) Records of inspections made during the previous twelve months. The permittee shall record the required observations on the Inspection Record Form provided by the Division or a similar inspection form that includes all the required elements. Use of electronically-available records in lieu of the required paper copies will be allowed if shown to provide equal access and utility as the hard-copy records.

3. Documentation to be Retained for Three Years

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

PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION C: REPORTING

1. Occurrences that Must be Reported

Permittees shall report the following occurrences:

(a) Visible sediment deposition in a stream or wetland.

(b) Oil spills if:
- They are 25 gallons or more,
- They are less than 25 gallons but cannot be cleaned up within 24 hours,
- They cause sheen on surface waters (regardless of volume), or
- They are within 100 feet of surface waters (regardless of volume).

(c) Releases of hazardous substances in excess of reportable quantities under Section 311 of the Clean Water Act (Ref: 40 CFR 110.3 and 40 CFR 117.3) or Section 102 of CERCLA (Ref: 40 CFR 302.4) or G.S. 143-215.85.

(d) Anticipated bypasses and unanticipated bypasses.

(e) Noncompliance with the conditions of this permit that may endanger health or the environment.

2. Reporting Timeframes and Other Requirements

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

Occurrence	Reporting Timeframes (After Discovery) and Other Requirements
(a) Visible sediment deposition in a stream or wetland	• ***Within 24 hours***, an oral or electronic notification. • ***Within 7 calendar days***, a report that contains a description of the sediment and actions taken to address the cause of the deposition. Division staff may waive the requirement for a written report on a case-by-case basis. • If the stream is named on the NC 303(d) list as impaired for sediment-related causes, the permittee may be required to perform additional monitoring, inspections or apply more stringent practices if staff determine that additional requirements are needed to assure compliance with the federal or state impaired-waters conditions.
(b) Oil spills and release of hazardous substances per Item 1(b)-(c) above	• ***Within 24 hours***, an oral or electronic notification. The notification shall include information about the date, time, nature, volume and location of the spill or release.
(c) Anticipated bypasses [40 CFR 122.41(m)(3)]	• ***A report at least ten days before the date of the bypass, if possible.*** The report shall include an evaluation of the anticipated quality and effect of the bypass.
(d) Unanticipated bypasses [40 CFR 122.41(m)(3)]	• ***Within 24 hours***, an oral or electronic notification. • ***Within 7 calendar days,*** a report that includes an evaluation of the quality and effect of the bypass.
(e) Noncompliance with the conditions of this permit that may endanger health or the environment[40 CFR 122.41(l)(7)]	• ***Within 24 hours***, an oral or electronic notification. • ***Within 7 calendar days***, a report that contains a description of the noncompliance, and its causes; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time noncompliance is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6). • Division staff may waive the requirement for a written report on a case-by-case basis.

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

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

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

NORTH CAROLINA Environmental Quality

NCG01 SELF-INSPECTION, RECORDKEEPING AND REPORTING | EFFECTIVE: 04/01/19

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

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

SECTION E: GROUND STABILIZATION

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

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

GROUND STABILIZATION SPECIFICATION

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

Temporary Stabilization	Permanent Stabilization
• Temporary grass seed covered with straw or other mulches and tackifiers • Hydroseeding • Rolled erosion control products with or without temporary grass seed • Appropriately applied straw or other mulch • Plastic sheeting	• Permanent grass seed covered with straw or other mulches and tackifiers • Geotextile fabrics such as permanent soil reinforcement matting • Hydroseeding • Shrubs or other permanent plantings covered with mulch • Uniform and evenly distributed ground cover sufficient to restrain erosion • Structural methods such as concrete, asphalt or retaining walls • Rolled erosion control products with grass seed

POLYACRYLAMIDES (PAMS) AND FLOCCULANTS

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

EQUIPMENT AND VEHICLE MAINTENANCE

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

LITTER, BUILDING MATERIAL AND LAND CLEARING WASTE

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

PAINT AND OTHER LIQUID WASTE

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

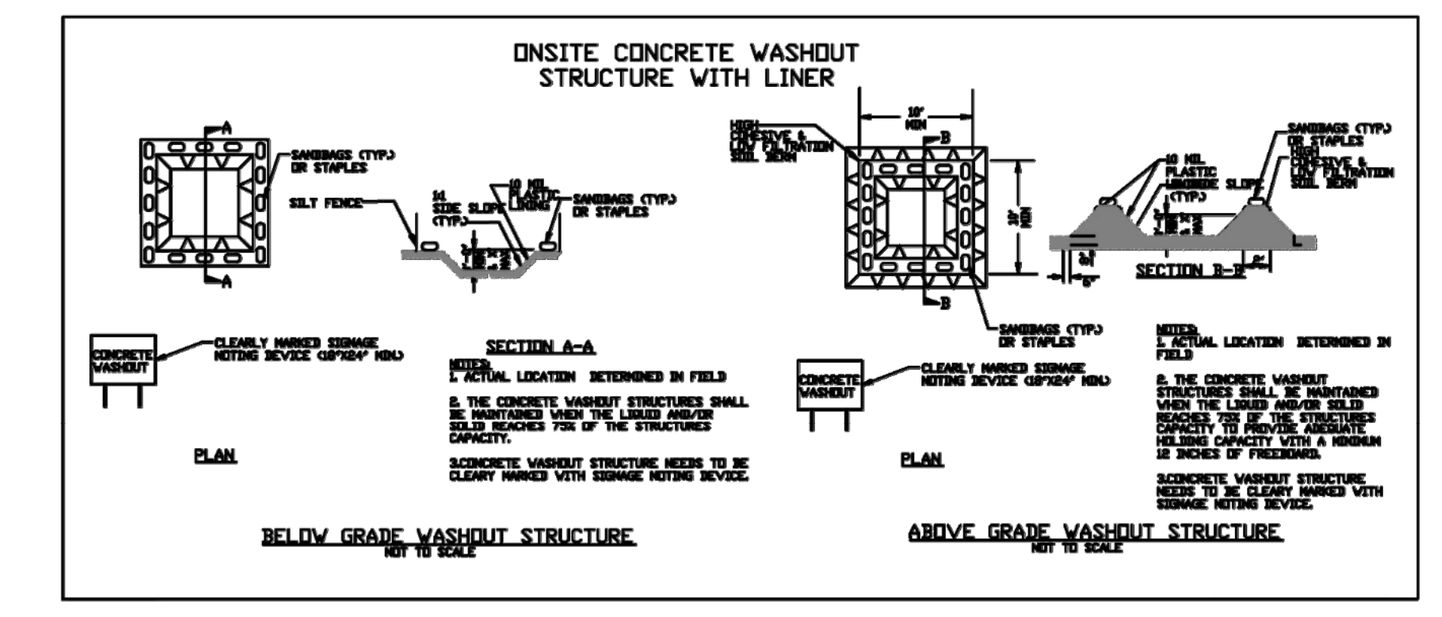
PORTABLE TOILETS

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

EARTHEN STOCKPILE MANAGEMENT

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

NORTH CAROLINA Environmental Quality



CONCRETE WASHOUTS

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

HERBICIDES, PESTICIDES AND RODENTICIDES

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

HAZARDOUS AND TOXIC WASTE

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

NCG01 GROUND STABILIZATION AND MATERIALS HANDLING | EFFECTIVE: 04/01/19

ESC Approval
04/01/2026 2:35:53 PM

NORTH CAROLINA PROFESSIONAL SEAL 051879 ENGINEER TYLER JEFFREY CROSS
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DATE 10/23/2025
DRAWN BY 331
DESIGNED BY 331
CHECKED BY T. CROSS
SCALE NTS

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA
NCG01 NOTES & DETAILS

JOB NO. 51557
SHEET NO. EC4.0

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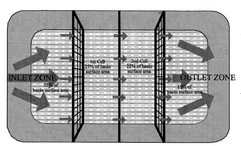
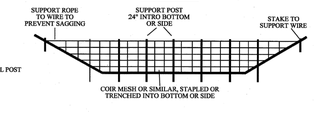
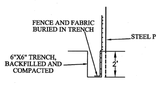


PLAN VIEW

NOTES:
1. BAFFLE MATERIAL SHOULD BE SECURED AT THE BOTTOM AND SIDES USING STAPLES OR BY TRENCHING AS FOR SILT FENCE.
2. MOST OF THE SEDIMENT WILL ACCUMULATE IN THE 1ST BAY, WHICH SHOULD BE READILY ACCESSIBLE FOR MAINTENANCE.
3. PROVIDE 3 BAFFLES (USE TWO IF LESS THAN 20 FEET IN LENGTH). PROVIDE 5 BAFFLES FOR DRAINAGE AREAS GREATER THAN 10 ACRES.
4. BAFFLE SHALL BE 700 G/M2 COIR EROSION BLANKET.
5. TOPS OF BAFFLES SHOULD BE 2 INCHES LOWER THAN THE TOP OF THE BERMS
6. INSPECT BAFFLES FOR REPAIR ONCE A WEEK AND AFTER EACH RAINFALL

CROSS SECTION

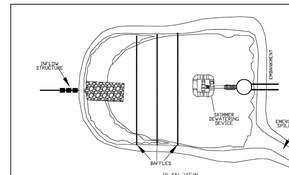




SECTION VIEW AT OPENING

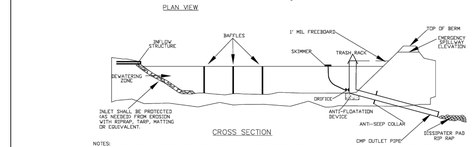
WAKE COUNTY NORTH CAROLINA
EFFECTIVE: 01/31/08

STANDARD BAFFLES DETAIL



PLAN VIEW

SECTION THRU WEIR



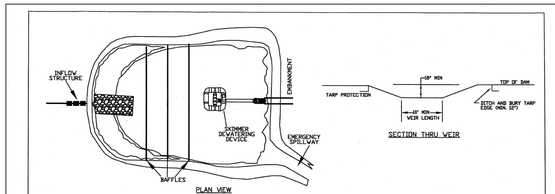
CROSS SECTION

NOTES:
1) THE TARP USED TO PROTECT THE WEIR SHALL BE THE WIDTH SPECIFIED. THE LENGTH OF THE TARP SHALL BE ACCORDING TO AVAILABLE SUPPLY. IF MULTIPLE TARPS ARE TO BE USED, THEN TARPS SHALL BE OVERLAPPED AT LEAST 12". THE UPSTREAM 12" TARP SHALL OVERLAP THE DOWNSTREAM TARP. THE TARP SHALL BE 50 MIL. HEAVY DUTY SILVER TARPAULINS OR EQUIVALENT FOR U.V. RESISTANCE.
2) PROVIDE A MINIMUM OF THREE POROUS BAFFLES TO EVENLY DISTRIBUTE FLOW ACROSS THE BASIN, REDUCING TURBULENCE.
3) BAFFLE MATERIAL MUST BE SECURED AT THE BOTTOM AND SIDES USING STAPLES OR BY TRENCHING AS FOR A SILT FENCE.
4) DURING THE CONSTRUCTION PHASE OF THE PROJECT, PERMANENT STORMWATER RISER SHALL ONLY DEWATER FROM THE TOP OF PIPE.
5) POND SHALL NOT BE CONVERTED FOR STORMWATER USE UNTIL APPROVED BY ENVIRONMENTAL ENGINEER.

MAINTENANCE NOTES:
1) INSPECT THE BASIN AND RISER ON A REGULAR BASIS AND AFTER EVERY SIGNIFICANT RAINFALL EVENT (1 INCH OR GREATER).
2) BASIN SHOULD BE CLEANED OUT WHEN CAPACITY REACHES AN ELEVATION REPRESENTING THAT THE BASIN IS HALF-FULL.
3) MOST OF THE SEDIMENT WILL ACCUMULATE IN THE FIRST BAY, SO THIS SHOULD BE READILY AVAILABLE FOR MAINTENANCE.

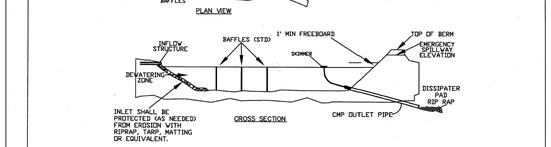
WAKE COUNTY NORTH CAROLINA
EFFECTIVE: 01/31/15

STANDARD SKIMMER ATTACHED TO PERMANENT RISER



PLAN VIEW

SECTION THRU WEIR

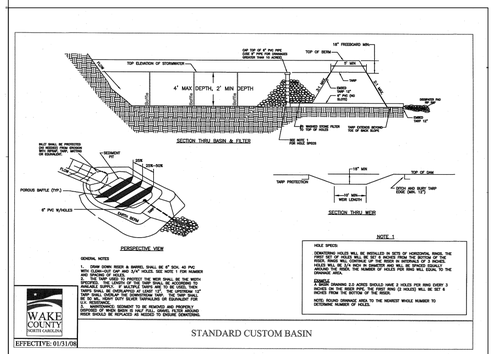


CROSS SECTION

NOTES:
1) BASIN SHOULD BE CLEANED OUT WHEN CAPACITY REACHES AN ELEVATION REPRESENTING THAT THE BASIN IS HALF-FULL.
2) THE TARP USED TO PROTECT THE WEIR SHALL BE THE WIDTH SPECIFIED. THE LENGTH OF THE TARP SHALL BE ACCORDING TO AVAILABLE SUPPLY. IF MULTIPLE TARPS ARE TO BE USED, THEN TARPS SHALL BE OVERLAPPED AT LEAST 12". THE UPSTREAM 12" TARP SHALL OVERLAP THE DOWNSTREAM TARP. THE TARP SHALL BE 50 MIL. HEAVY DUTY SILVER TARPAULINS OR EQUIVALENT FOR U.V. RESISTANCE.
3) PROVIDE A MINIMUM OF THREE POROUS BAFFLES TO EVENLY DISTRIBUTE FLOW ACROSS THE BASIN, REDUCING TURBULENCE.
4) BAFFLE MATERIAL MUST BE SECURED AT THE BOTTOM AND SIDES USING STAPLES OR BY TRENCHING AS FOR A SILT FENCE.
5) MOST OF THE SEDIMENT WILL ACCUMULATE IN THE FIRST BAY, SO THIS SHOULD BE READILY AVAILABLE FOR MAINTENANCE.
6) DURING THE CONSTRUCTION PHASE OF THE PROJECT, PERMANENT STORMWATER RISER SHALL ONLY DEWATER FROM THE TOP OF PIPE.
7) POND SHALL NOT BE CONVERTED FOR STORMWATER USE UNTIL APPROVED BY ENVIRONMENTAL ENGINEER.

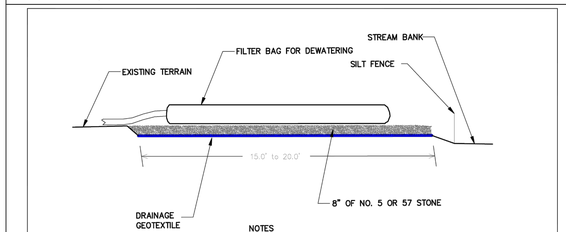
WAKE COUNTY NORTH CAROLINA
EFFECTIVE: 01/31/08

STANDARD SKIMMER BASIN



WAKE COUNTY NORTH CAROLINA
EFFECTIVE: 01/31/08

STANDARD CUSTOM BASIN



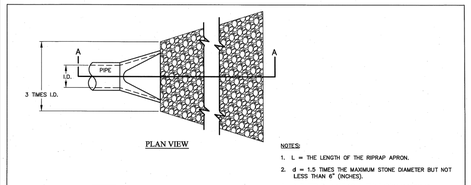
NOTES

PROVIDE STABILIZED OUTLET TO STREAM BANK. WOOD PALLETS MAY BE USED IN LIEU OF STONE AND GEOTEXTILE AS DIRECTED. A SUFFICIENT NUMBER OF PALLETS MUST BE PROVIDED TO ELEVATE THE ENTIRE FILTER BAG FOR DEWATERING ABOVE NATURAL GROUND.

NOT TO SCALE

WAKE COUNTY NORTH CAROLINA
EFFECTIVE: 01/31/08

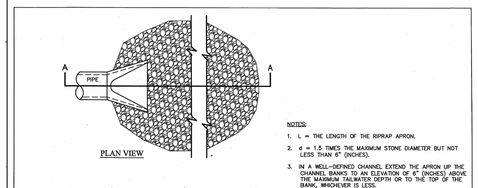
STANDARD FILTER BAG FOR DEWATERING ACTIVITIES



NOTES:
1. L = THE LENGTH OF THE RIPRAP APRON.
2. d = 1.5 TIMES THE MAXIMUM STONE DIAMETER BUT NOT LESS THAN 6" (INCHES).
3. A FILTER BLANKET OR FILTER FABRIC SHOULD BE INSTALLED BETWEEN THE RIPRAP AND SOIL FOUNDATION.

WAKE COUNTY NORTH CAROLINA
EFFECTIVE: 01/31/08

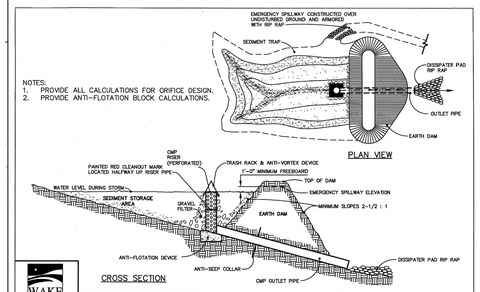
STANDARD PIPE OUTLET TO FLAT AREA NO WELL-DEFINED CHANNEL



NOTES:
1. L = THE LENGTH OF THE RIPRAP APRON.
2. d = 1.5 TIMES THE MAXIMUM STONE DIAMETER BUT NOT LESS THAN 6" (INCHES).
3. IN A WELL-DEFINED CHANNEL EXTEND THE APRON UP THE CHANNEL BANKS TO AN ELEVATION OF 6" (INCHES) ABOVE THE MAXIMUM TAILWATER DEPTH OR TO THE TOP OF THE BANK, WHICHEVER IS LESS.
4. A FILTER BLANKET OR FILTER FABRIC SHOULD BE INSTALLED BETWEEN THE RIPRAP AND SOIL FOUNDATION.

WAKE COUNTY NORTH CAROLINA
EFFECTIVE: 01/31/08

STANDARD PIPE OUTLET TO WELL-DEFINED CHANNEL

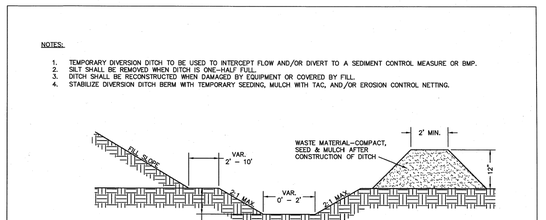


NOTES:
1. PROVIDE ALL CALCULATIONS FOR ORIFICE DESIGN.
2. PROVIDE ANTI-FLOTATION BLOCK CALCULATIONS.

CROSS SECTION

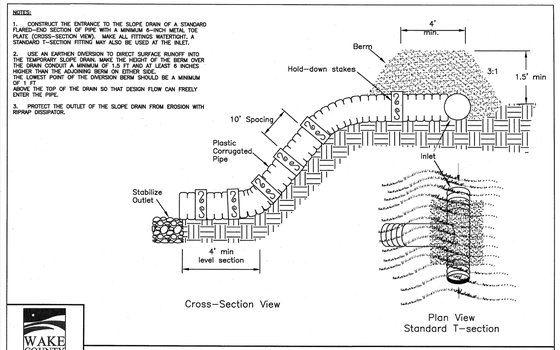
WAKE COUNTY NORTH CAROLINA
EFFECTIVE: 01/31/08

STANDARD RISER-BARREL SEDIMENT BASIN



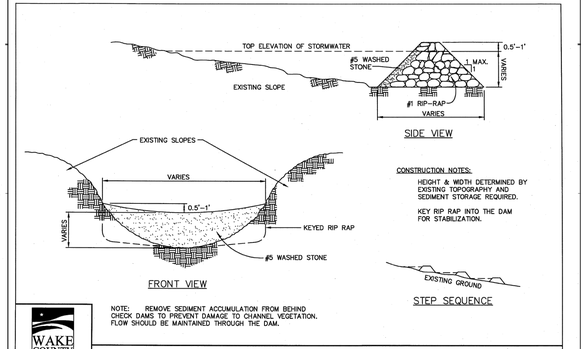
WAKE COUNTY NORTH CAROLINA
EFFECTIVE: 01/31/08

STANDARD TEMPORARY DIVERSION DITCH



WAKE COUNTY NORTH CAROLINA
EFFECTIVE: 01/31/08

STANDARD TEMPORARY SLOPE DRAIN



NOTE: REMOVE SEDIMENT ACCUMULATION FROM BEHIND CHECK DAMS TO PREVENT DAMAGE TO CHANNEL VEGETATION. FLOW SHOULD BE MAINTAINED THROUGH THE DAM.

WAKE COUNTY NORTH CAROLINA
EFFECTIVE: 01/31/08

STANDARD CHECK DAM

ESC Approval
04/01/2026 2:35:59 PM

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 ENGINEER TYLER JEFFREY CROSS
2/9/2026

THIS DRAWING PREPARED AT THE
RALEIGH OFFICE
5410 Trinity Road, Suite 102 | Raleigh, NC 27607
TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION	DATE
GREENWAY ROUTE AND ROAD WIDENING REVISION	01/30/2026

DATE: 10/23/2025
DRAWN BY: 331
DESIGNED BY: 331
CHECKED BY: T. CROSS
SCALE: NTS

TIMMONS GROUP

NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

EROSION CONTROL NOTES & DETAILS

JOB NO. 51557
SHEET NO. EC4.1

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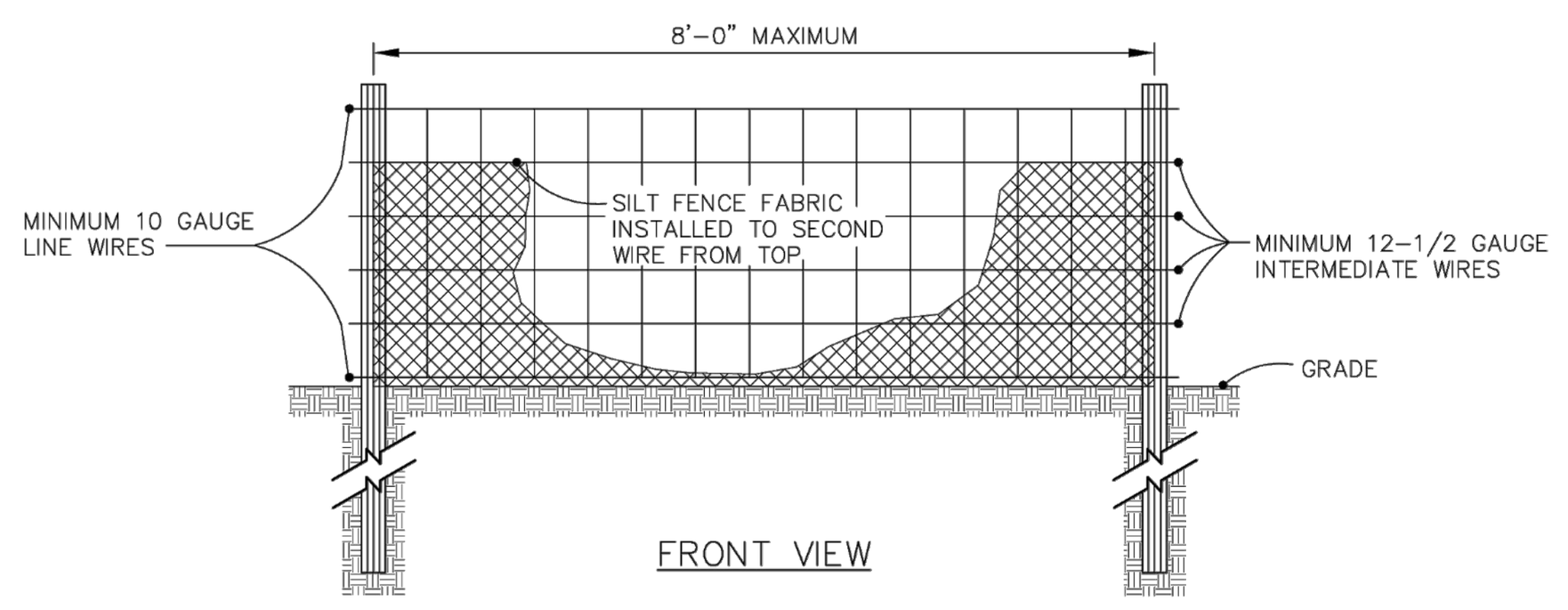
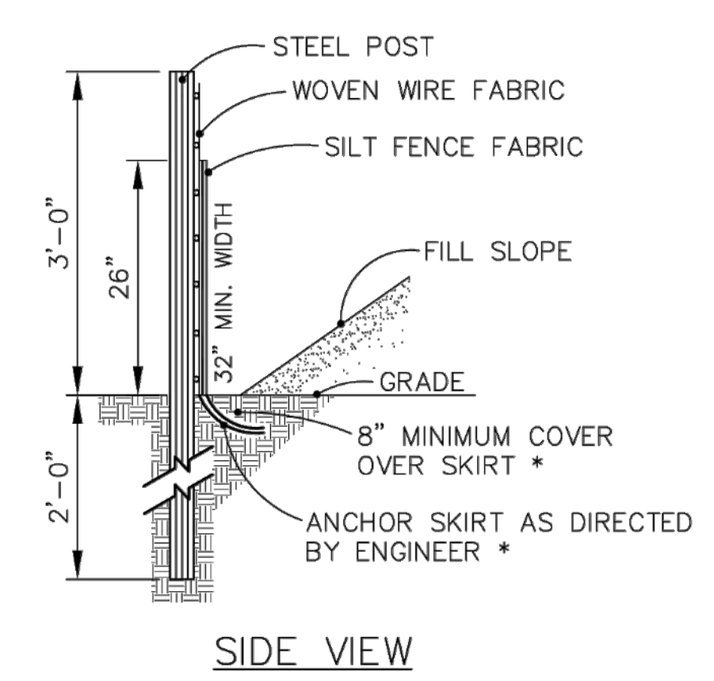


FRONT VIEW

NOTE:

1. USE SILT FENCE ONLY WHEN DRAINAGE AREA DOES NOT EXCEED 1/4 ACRE AND NEVER IN AREAS OF CONCENTRATED FLOW.
2. REMOVE SEDIMENT DEPOSITED AS NEEDED TO PROVIDE STORAGE VOLUME FOR THE NEXT RAIN AND TO REMOVE PRESSURE ON THE SILT FENCE.

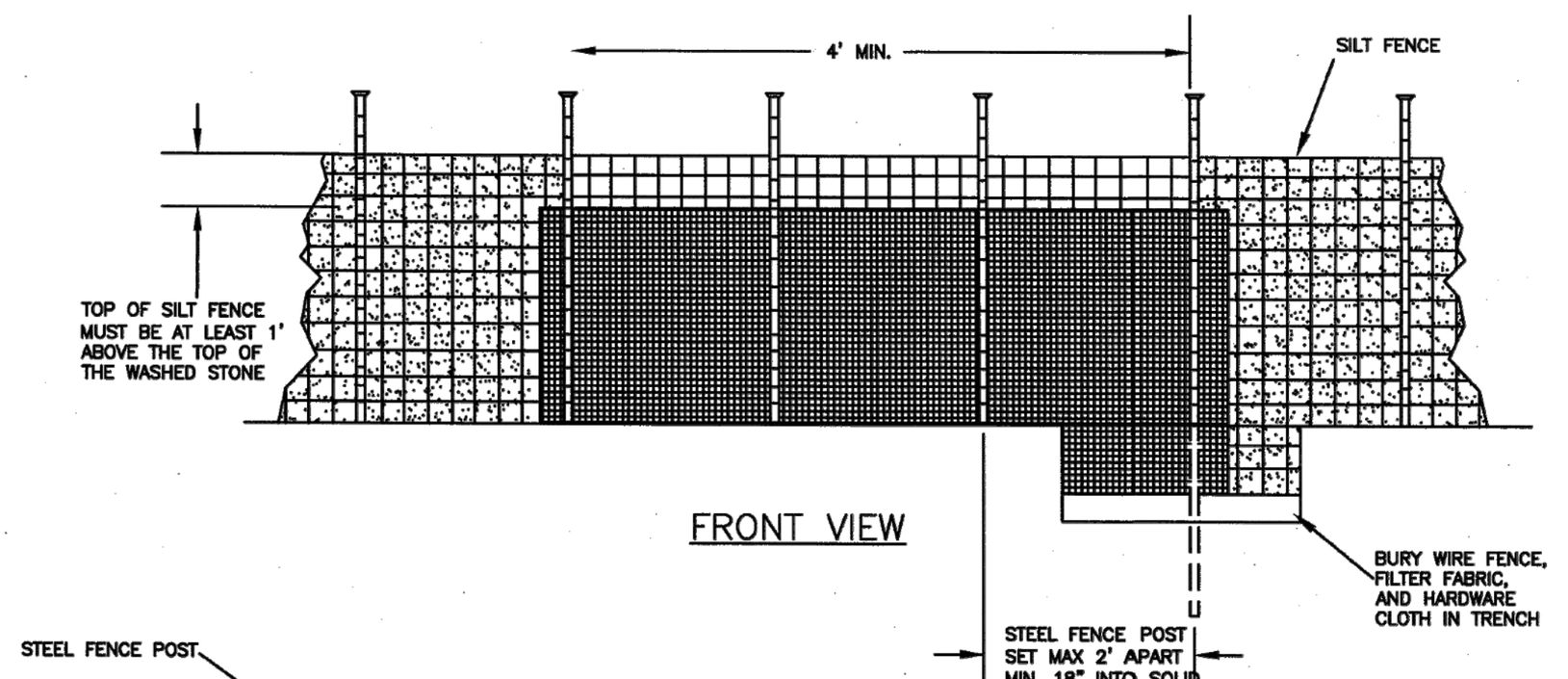


SIDE VIEW

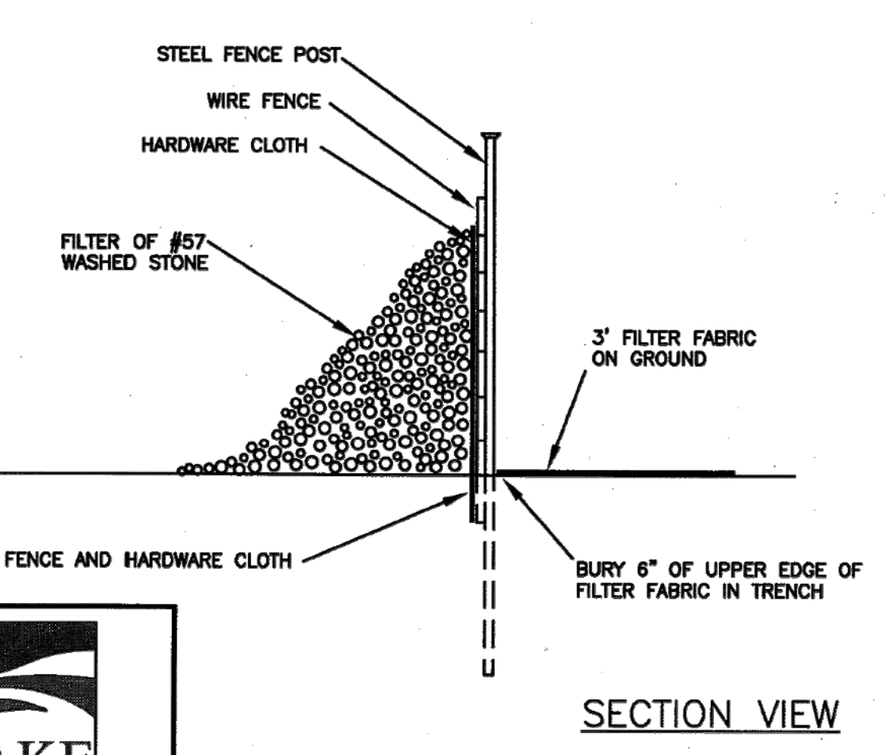
WAKE COUNTY NORTH CAROLINA

STANDARD TEMPORARY SILT FENCE

EFFECTIVE: 01/31/08



FRONT VIEW



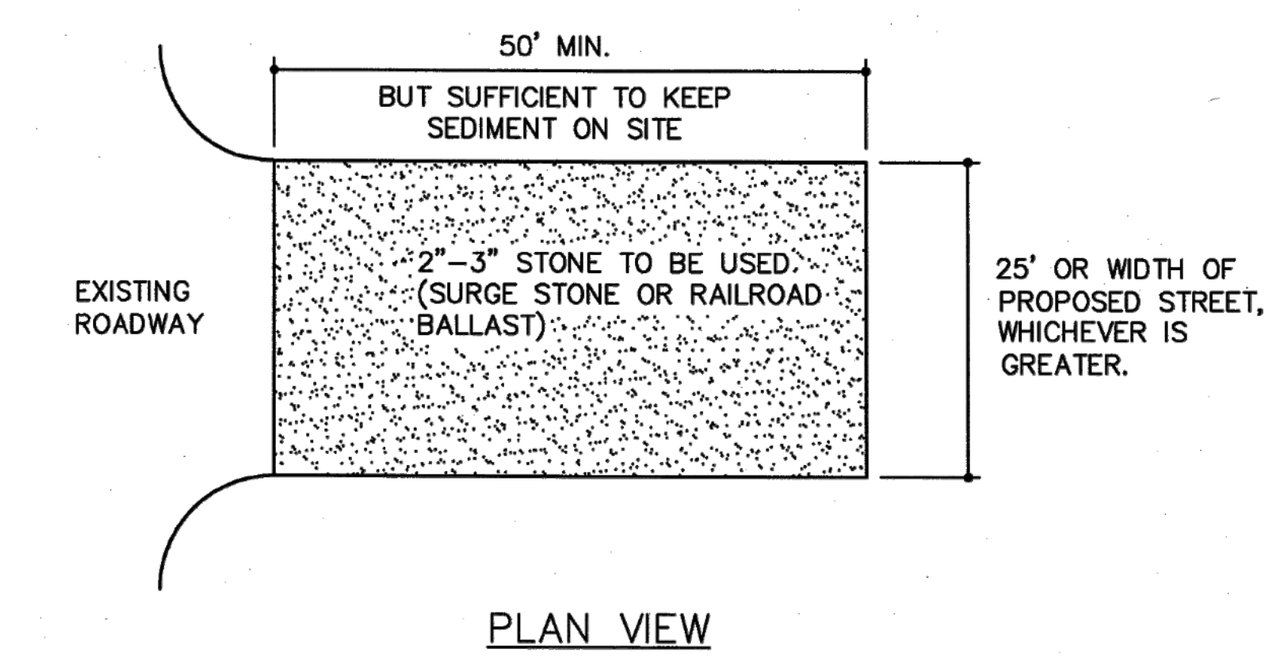
SECTION VIEW

NOTES:
1. REMOVE SEDIMENT WHEN HALF OF STONE OUTLET IS COVERED.
2. REPLACE STONE AS NEEDED TO ENSURE DEWATERING.

WAKE COUNTY NORTH CAROLINA

STANDARD SILT FENCE OUTLET

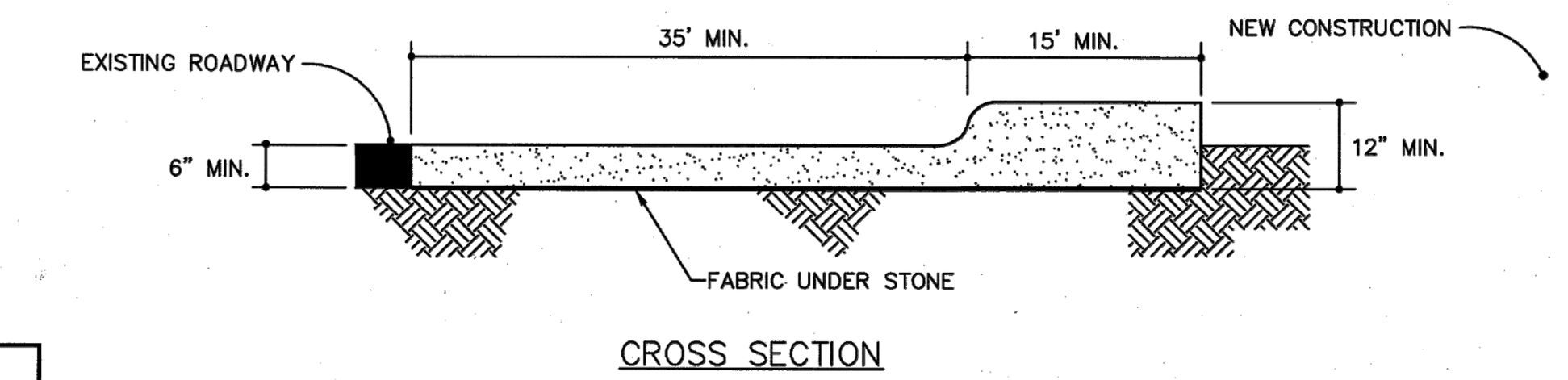
EFFECTIVE: 01/31/08



PLAN VIEW

NOTES:

1. PUT SILT FENCE OR TREE PROTECTION FENCE UP TO ENSURE CONSTRUCTION ENTRANCE IS USED.
2. IF CONSTRUCTION ON THE SITES ARE SUCH THAT THE MUD IS NOT REMOVED BY THE VEHICLE TRAVELING OVER THE STONE, THEN THE TIRES OF THE VEHICLES MUST BE WASHED BEFORE ENTERING THE PUBLIC ROAD.
3. MAINTAIN GRAVEL PAD IN A CONDITION TO PREVENT MUD OR SEDIMENT FROM LEAVING CONSTRUCTION SITE. ENTRANCE WILL REQUIRE PERIODIC REMOVAL OF SEDIMENT-LADEN STONE AND REPLACEMENT WITH FRESH STONE.

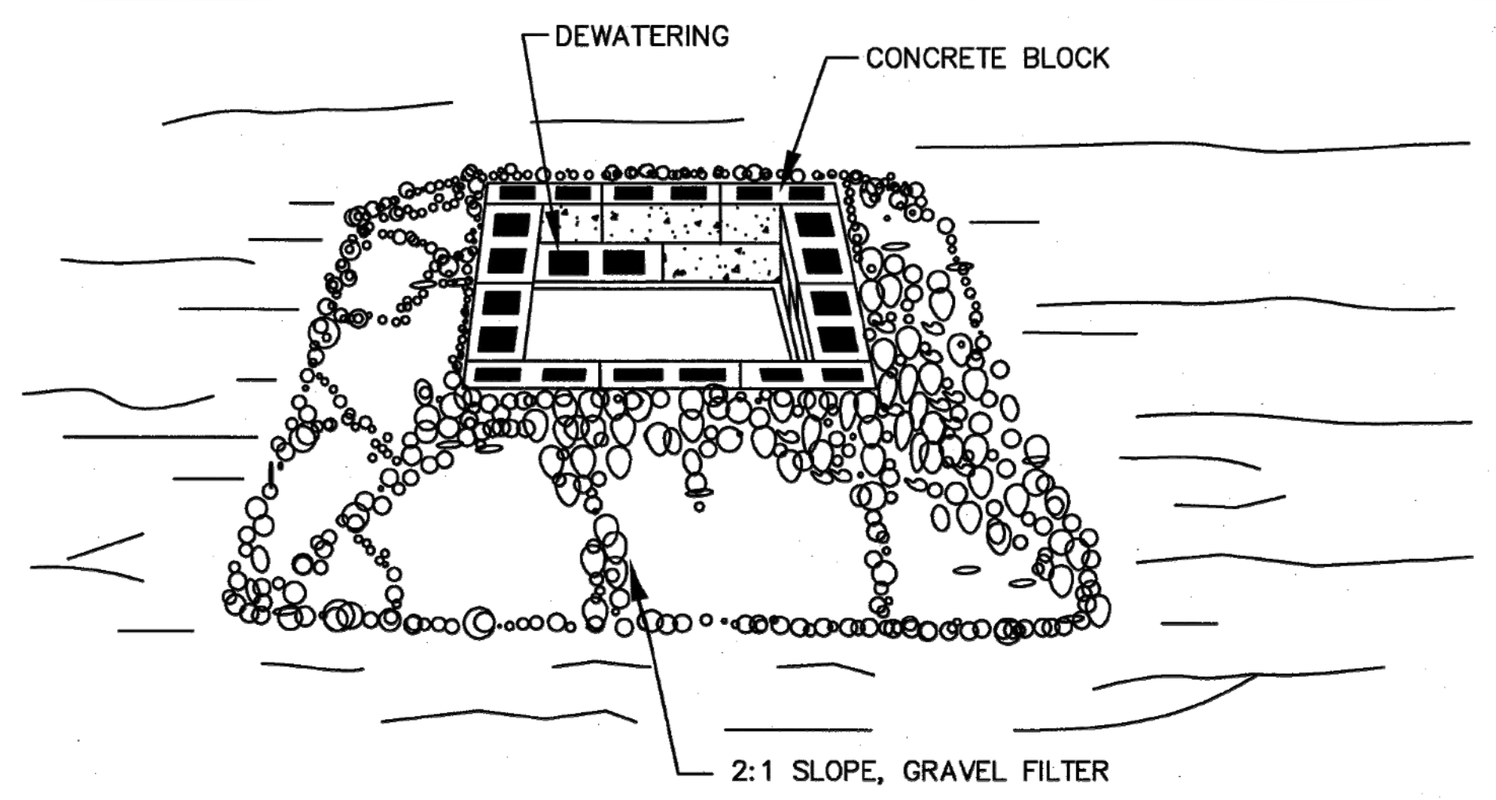


CROSS SECTION

WAKE COUNTY NORTH CAROLINA

STANDARD CONSTRUCTION ENTRANCE

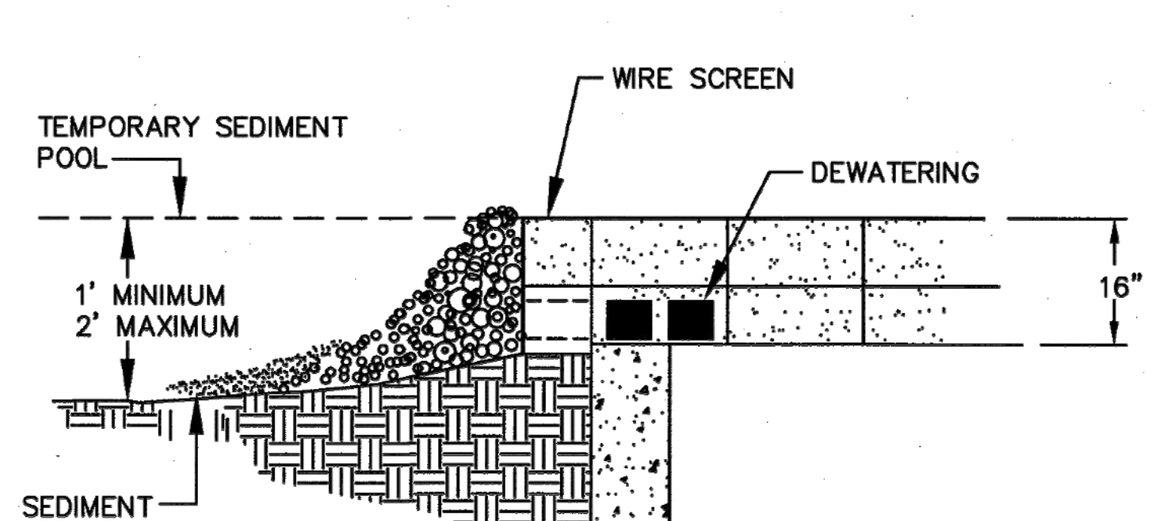
EFFECTIVE: 01/31/08



CONSTRUCTION SPECIFICATIONS

1. LAY ONE BLOCK ON EACH SIDE OF THE STRUCTURE ON ITS SIDE IN THE BOTTOM ROW TO ALLOW POOL DRAINAGE. THE FOUNDATION SHOULD BE EXCAVATED AT LEAST 2 INCHES BELOW THE CREST OF THE STORM DRAIN. PLACE THE BOTTOM ROW OF BLOCKS AGAINST THE EDGE OF THE STORM DRAIN FOR LATERAL SUPPORT AND TO AVOID WASHOUTS WHEN OVERFLOW OCCURS. IF NEEDED, GIVE LATERAL SUPPORT TO SUBSEQUENT ROWS BY PLACING 2x4 WOOD STUDS THROUGH BLOCK OPENINGS.
2. CAREFULLY FIT HARDWARE CLOTH OR COMPARABLE WIRE MESH WITH 1/2 INCH OPENINGS OVER ALL BLOCK OPENINGS TO HOLD GRAVEL IN PLACE.
3. USE CLEAN GRAVEL, 3/4 TO 1/2 INCH IN DIAMETER, PLACED 2 INCHES BELOW THE TOP OF THE BLOCK ON A 2:1 SLOPE OR FLATTER AND SMOOTH IT TO AN EVEN GRADE. DOT #57 WASHED STONE IS RECOMMENDED.

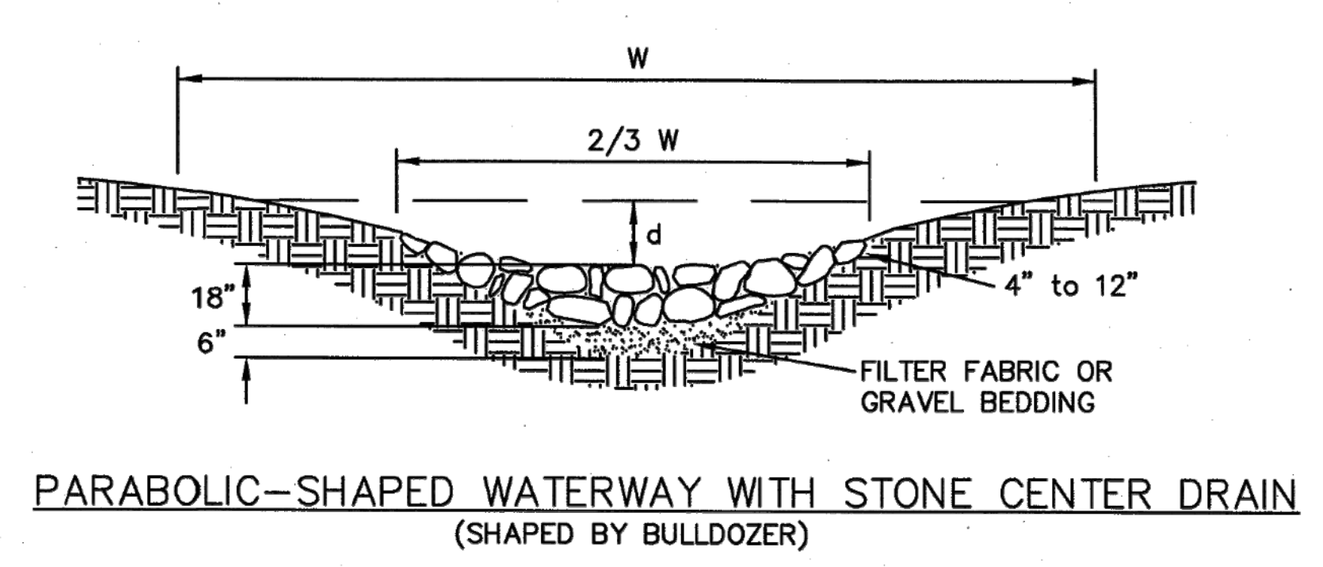
MAINTENANCE: INSPECT INLET PROTECTION AND REMOVE SEDIMENT AFTER EACH RAIN EVENT. GRAVEL SHOULD BE REPLACED AND REPAIRS MADE AS NEEDED.



WAKE COUNTY NORTH CAROLINA

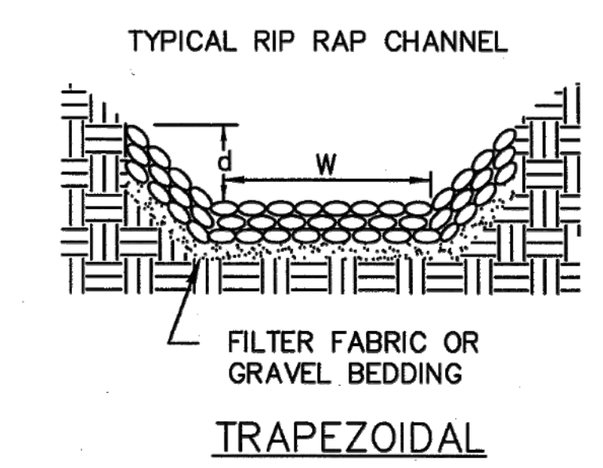
STANDARD BLOCK & GRAVEL DROP INLET PROTECTION

EFFECTIVE: 01/31/08

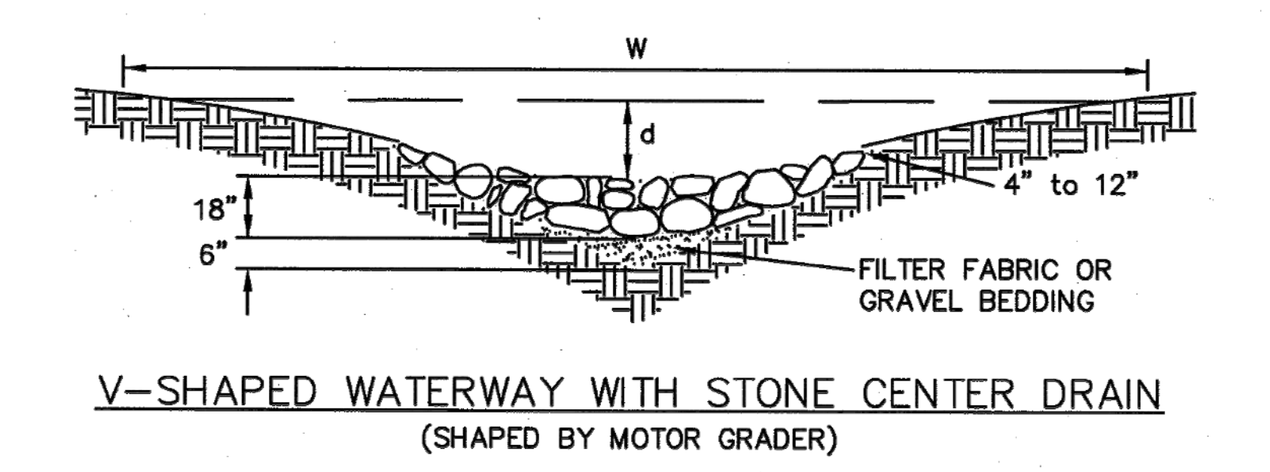


PARABOLIC-SHAPED WATERWAY WITH STONE CENTER DRAIN
(SHAPED BY BULLDOZER)

TYPICAL RIP RAP CHANNEL



TRAPEZOIDAL



V-SHAPED WATERWAY WITH STONE CENTER DRAIN
(SHAPED BY MOTOR GRADER)

NOTES:

- TO BE USED WHERE EXCESSIVE STORMWATER VELOCITIES PROHIBIT VEGETATIVE LININGS.
- SIZE OF STONE MUST BE DETERMINED BY APPROPRIATE DESIGN PROCEDURE.
- DIMENSIONS FOR d & W VARIES ACCORDING TO DESIGN.

WAKE COUNTY NORTH CAROLINA

STANDARD RIP-RAP LINED CHANNELS

EFFECTIVE: 01/31/08

Date:

Page:

NON-INVASIVE PERMANENT SEEDING RECOMMENDATIONS FOR LATE WINTER AND EARLY SPRING

SEEDING MIXTURE

Species	Rate
Centipede	5 lbs/acre
Indian Woodoats	1.5-2.5 lbs/acre*
Virginia Wild Rye	4-6 lbs/acre*

*Depending upon mix with other species. See table 6.11.d from Chapter 6 of the NC Erosion and Sediment Control Planning and Design Manual.

Seeding Dates
Coastal or Eastern Piedmont for Centipede- Sept. 1 - May 1
Coastal and Piedmont for Indian Woodoats and Virginia Wild Rye- Feb 15 - April 1
Mountains for Indian Woodoats and Virginia Wild Rye- March 1 - May 15

Maintenance:
Significant maintenance may be required to obtain desired cover once centipede is planted. Acceptable for sodding.

NON-INVASIVE PERMANENT SEEDING RECOMMENDATIONS FOR SUMMER

SEEDING MIXTURE

Species	Rate
Indian Woodoats	1.5-2.5 lbs/acre*
Virginia Wild Rye	4-6 lbs/acre*

*Depending upon mix with other species. See table 6.11.d from Chapter 6 of the NC Erosion and Sediment Control Planning and Design Manual.

Seeding Dates
Mountains - July 15- Aug 15
Piedmont - Aug 15 - Oct 15

Maintenance:
Indian Woodoats and Virginia Wild Rye are both sun and shade tolerant.

NON-INVASIVE PERMANENT SEEDING RECOMMENDATIONS FOR FALL

SEEDING MIXTURE

Species	Rate
Hard Fescue	15 lbs/acre
Switchgrass	2.5-3.5 lbs/acre*
Indian Grass	5-7 lbs/acre*
Big Bluestem	5-7 lbs/acre*
Indian Woodoats	1.5-2.5 lbs/acre*
Virginia Wild Rye	4-6 lbs/acre*

*Depending upon mix with other species. See table 6.11.d from Chapter 6 of the NC Erosion and Sediment Control Planning and Design Manual.

Seeding Dates
Mountains - Hard Fescue- Aug 1 - June 1
Mountains- Switchgrass, Indian Grass, Big Bluestem- Dec 1 - April 15
Piedmont and Coastal- Switchgrass, Indian Grass, Big Bluestem- Dec 1 - April 1
Coastal- Indian Woodoats and Virginia Wild Rye- Sept 1 - Nov 1

Maintenance:
Hard Fescue is not recommended for slopes > 5%. Prefers shade.

SEED BED PREPARATION:

LIMING- Apply lime according to soil test recommendations. If the pH (acidity) of the soil is not known, an application of ground agricultural limestone at the rate of 1 to 1 $\frac{1}{2}$ tons/acre on coarse-textured soils and 2-3 tons/acre on fine-textured soils is usually sufficient. Apply limestone uniformly and incorporate into the top 4-6 inches of soil. Soils with a pH of 6 or higher need not be limed.
FERTILIZER- Base application rates on soil tests. When these are not possible, apply a 10-10-10 grade fertilizer at 700-1,000 lb/acre. Both fertilizer and lime should be incorporated into the top 4-6 inches of soil. If a hydraulic seeder is used, do not mix seed and fertilizer more than 30 minutes before application.
SURFACE ROUGHENING- If recent tillage operations have resulted in a loose surface additional roughening may not be required, except to break up large clods. If rainfall causes the surface to become sealed or crusted, loosen it just prior to seeding by raking, harrowing, or other suitable methods for fine grading. The finished grade shall be a smooth even soil surface with a loosen uniformly fine texture. All ridges and depressions shall be removed and filled to provide the approved surface drainage. Planting is to be done immediately after finished grades are obtained and seedbed preparation is completed.

NOTES:
1. Permanent seeding, sodding or other means of stabilization are required when all construction work is completed according to the NPDES timeframe's table.
2. A North Carolina Department of Agriculture soils test (or equal) is highly recommended to be obtained for all areas to be seeded, sprigged, sodded or planted.
3. Use a seeding mix that will produce fast growing nurse crops and includes non-invasive species that will eventually provide a permanent groundcover. Soil blankets may be used in lieu of nurse crops. Mat, tack or crimp mulch, as needed to stabilize seeded areas until root establishment. Mulch must be applied uniformly over the soil with a cover density of at least 80%.
4. Ground cover shall be maintained until permanent vegetation is established and stable against accelerated erosion.

NORTH CAROLINA Environmental Quality
EFFECTIVE DATE: 11/12/2020

PERMANENT SEEDING RECOMMENDATIONS

Date:

Page:

TEMPORARY SEEDING RECOMMENDATIONS FOR LATE WINTER AND EARLY SPRING

Seeding Mixture

Species	Rate (lb/acre)
Rye (grain)	120
Annual lespedeza (Kobe in Piedmont and Coastal Plain, Korean in Mountains)	50

Omit annual lespedeza when duration of temporary cover is not to extend beyond June.

Seeding Dates
Mountains—Above 2500 feet: Feb. 15 - May 15
Below 2500 feet: Feb. 1- May 1
Piedmont—Jan. 1 - May 1
Coastal Plain—Dec. 1 - Apr. 15

Mulch
Apply 4,000 lb/acre straw. Anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.

Maintenance
Refertilize if growth is not fully adequate. Reseed, refertilize and mulch immediately following erosion or other damage.

TEMPORARY SEEDING RECOMMENDATIONS FOR SUMMER

Seeding Mixture

Species	Rate (lb/acre)
German millet	40

In the Piedmont and Mountains, a small-stemmed Sudangrass may be substituted at a rate of 50 lb/acre.

Seeding Dates
Mountains—May 15 - Aug. 15
Piedmont—May 1 - Aug. 15
Coastal Plain—Apr. 15 - Aug. 15

Mulch
Apply 4,000 lb/acre straw. Anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.

Maintenance
Refertilize if growth is not fully adequate. Reseed, refertilize and mulch immediately following erosion or other damage.

TEMPORARY SEEDING RECOMMENDATIONS FOR FALL

Seeding Mixture

Species	Rate (lb/acre)
Rye (grain)	120

Seeding Dates
Mountains—Aug. 15 - Dec. 15
Coastal Plain and Piedmont—Aug. 15 - Dec. 31

Mulch
Apply 4,000 lb/acre straw. Anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.

Maintenance
Repair and refertilize damaged areas immediately. Topdress with 50 lb/acre of nitrogen in March. If it is necessary to extend temporary cover beyond June 15, overseed with 50 lb/acre Kobe (Piedmont and Coastal Plain) or Korean (Mountains) lespedeza in late February or early March.

SEED BED PREPARATION:

LIMING- Apply lime according to soil test recommendations. If the pH (acidity) of the soil is not known, an application of ground agricultural limestone at the rate of 1-1 $\frac{1}{2}$ tons/acre on coarse-textured soils and 2-3 tons/acre on fine-textured soils is usually sufficient. Apply limestone uniformly and incorporate into the top 4-6 inches of soil. Soils with a pH of 6 or higher need not be limed.
FERTILIZER- Base application rates on soil tests. When these are not possible, apply a 10-10-10 grade fertilizer at 700-1,000 lb/acre. Both fertilizer and lime should be incorporated into the top 4-6 inches of soil. If a hydraulic seeder is used, do not mix seed and fertilizer more than 30 minutes before application.
SURFACE ROUGHENING- If recent tillage operations have resulted in a loose surface additional roughening may not be required, except to break up large clods. If rainfall causes the surface to become sealed or crusted, loosen it just prior to seeding by raking, harrowing, or other suitable methods for fine grading. The finished grade shall be a smooth even soil surface with a loosen uniformly fine texture. All ridges and depressions shall be removed and filled to provide the approved surface drainage. Planting is to be done immediately after finished grades are obtained and seedbed preparation is completed.

NORTH CAROLINA Environmental Quality
EFFECTIVE DATE: 11/12/2020

TEMPORARY SEEDING RECOMMENDATIONS

Date:

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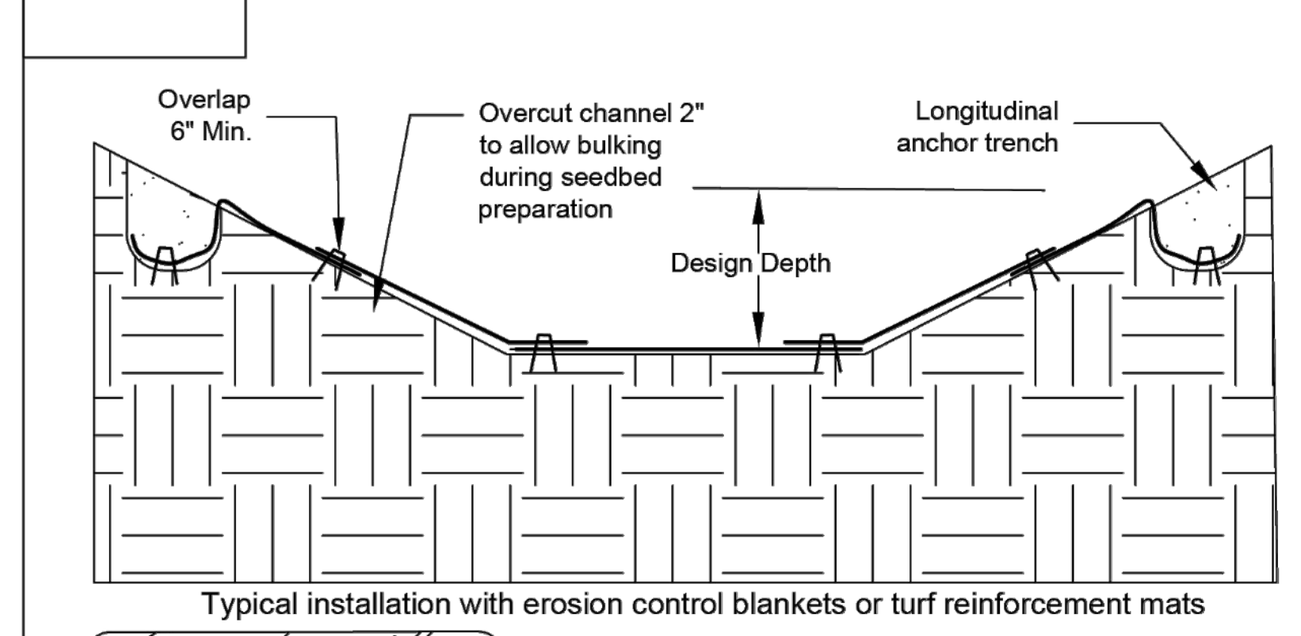
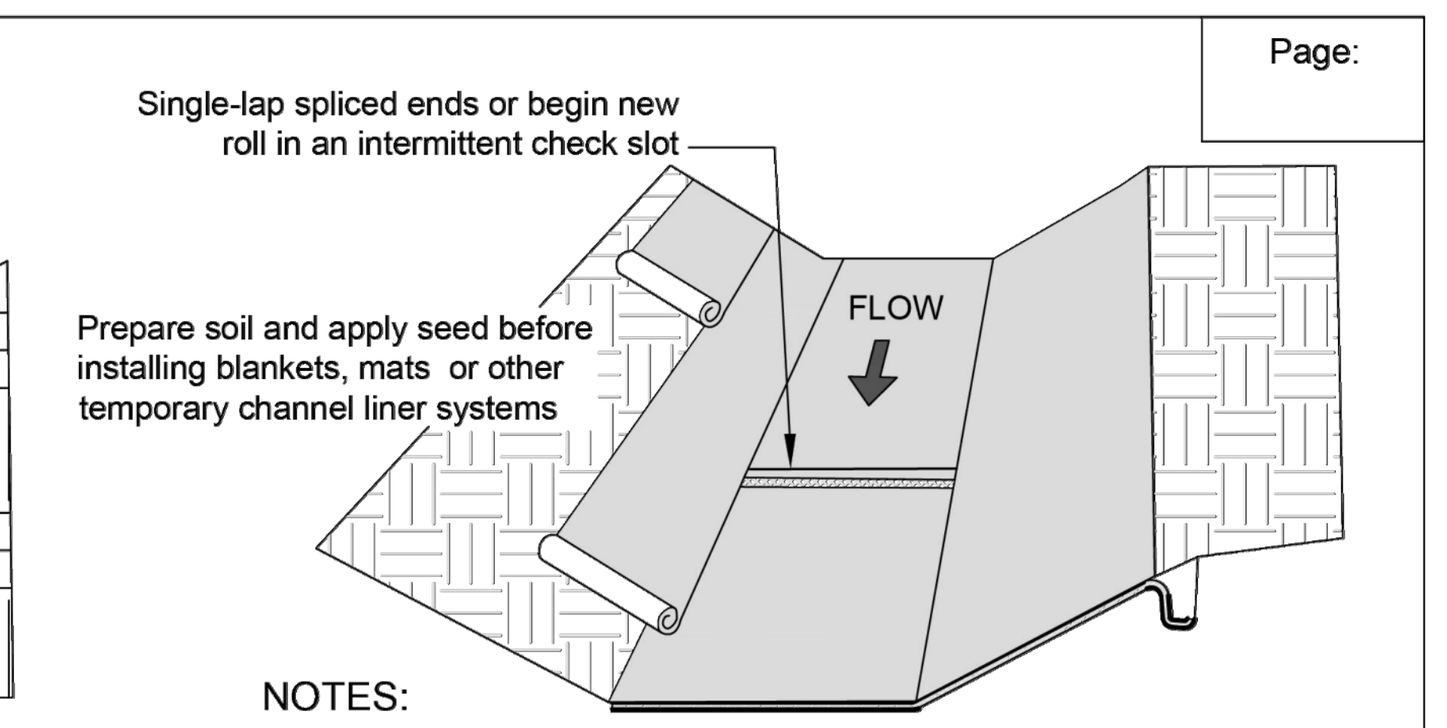
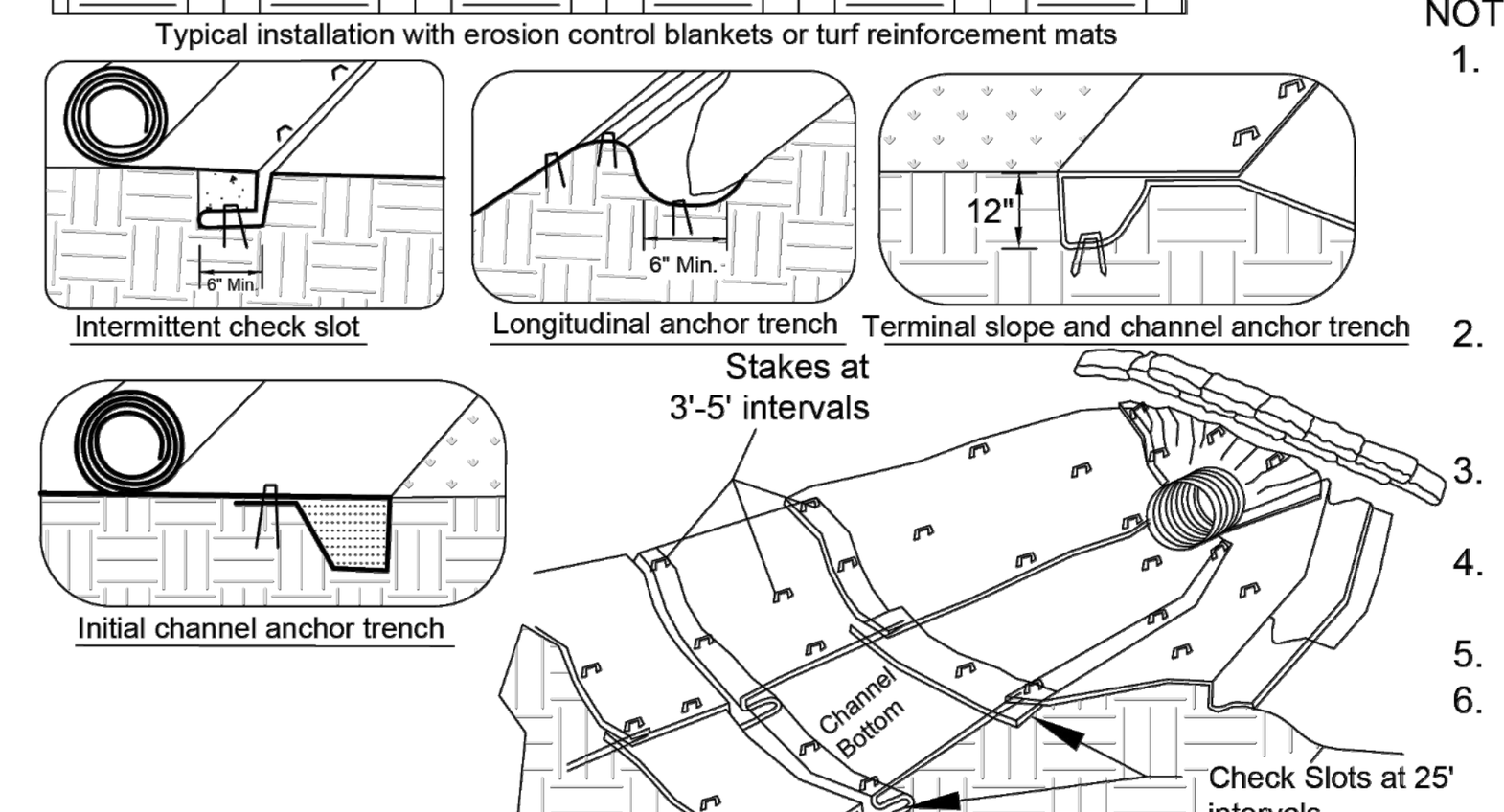


Typical installation with erosion control blankets or turf reinforcement mats





NOTES:
1. Terminal anchor trenches are required at RECP ends and intermittent check slots must be constructed across channels at 25 foot intervals. Terminal anchor trenches should be a minimum of 12 inches in depth and 6 inches in width. Intermittent check slots should be 6 inches deep and 6 inches wide.
2. Design velocities exceeding 2 feet/second require temporary blankets, mats or similar liners to protect seed and soil until vegetation becomes established
3. Grass-lined channels with design velocities exceeding 6 feet/second should include turf reinforcement mats.
4. Check slots to be constructed per manufacturers specifications.
5. Staking or stapling layout per manufacturers specification.
6. 11 gauge, at least 6 inch by 1 inch staples or 12 inch minimum length wooden stakes are recommended for anchoring.
7. Do not stretch blankets/matting tight-allow the rolls to conform to any irregularities.

MAINTENANCE:
1. Inspect Rolled Erosion Control Products at least weekly and after each significant (1 inch or greater) rainfall event; repair immediately.
2. Good contact with the ground must be maintained, and erosion must not occur beneath the RECP.
3. Any areas of the RECP that are damaged or not in close contact with the ground shall be repaired and stapled.
4. If erosion occurs due to poorly controlled drainage, the problem shall be fixed and the eroded area protected.
5. Monitor and repair the RECP as necessary until ground cover is established.

NORTH CAROLINA Environmental Quality
EFFECTIVE DATE: 11/12/2020

ROLLED EROSION CONTROL PRODUCTS (RECP) FOR CHANNELS

Date:

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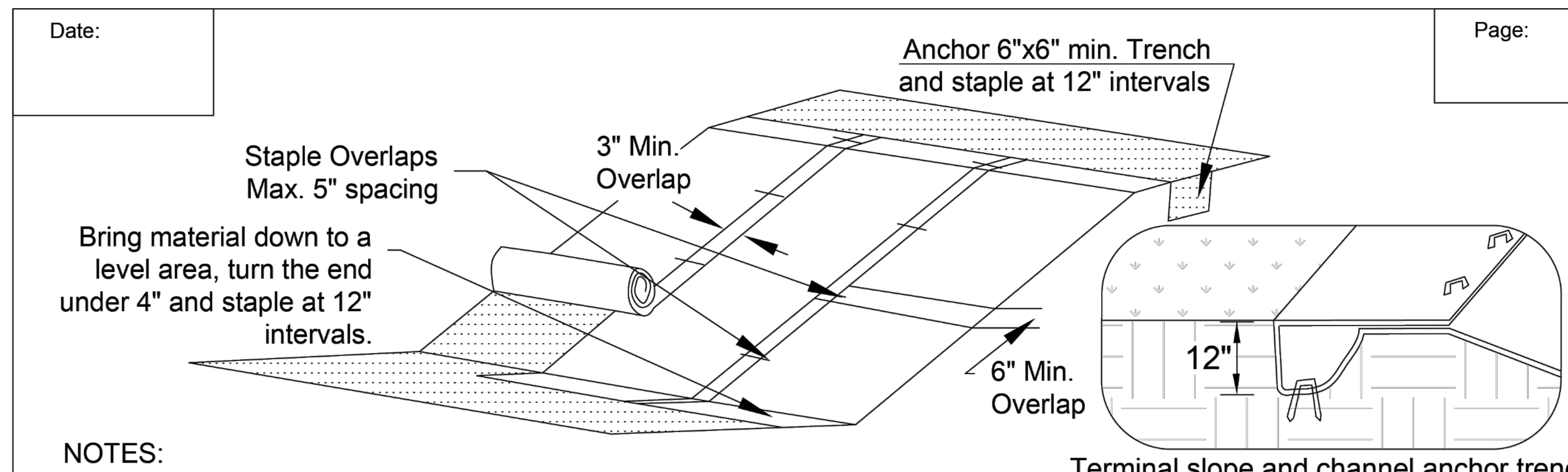

Terminal slope and channel anchor trench

NOTES:
1. Lime, fertilizer and seed before installation. Planting of shrubs,trees, etc. should occur after installation
2. Slope surface shall be smooth before placement for proper soil contact.
3. For installation on a slope, place RECP 2-3 feet over the top of the slope and into an excavated end trench measuring approximately 12 inches deep by 6 inches wide. Pin the RECP at 1 foot intervals along the bottom of the trench, backfill and compact. Unroll the RECP down the slope maintaining direct contact between the soil and RECP.
4. Pin RECP to the ground using staples or pins in a 3 foot center-to-center pattern.
5. Design velocities exceeding 2 feet/second require temporary blankets, mats or similar liners to protect seed and soil until vegetation becomes established.
6. If there is a berm at the top of slope, anchor upslope of the berm.
7. Staking or stapling layout per manufacturers specification.
8. 11 gauge, at least 6 inch by 1 inch staples or 12 inch minimum length wooden stakes are recommended for anchoring.
9. Do not stretch blankets/matting tight, allow the rolls to conform to any irregularities.
10. For slopes less than 3H:1V, rolls may be placed in horizontal strips.

MAINTENANCE:
1. Inspect Rolled Erosion Control Products at least weekly and after each rain 1.0 inch or greater; repair immediately.
2. Good contact with the ground must be maintained, and erosion must not occur beneath the RECP.
3. Any areas of the RECP that are damaged or not in close contact with the ground shall be repaired and stapled.
4. If erosion occurs due to poorly controlled drainage, the problem shall be fixed and eroded area protected.
5. Monitor and repair the RECP as necessary until ground cover is established.

NORTH CAROLINA Environmental Quality
EFFECTIVE DATE:11/12/2020

ROLLED EROSION CONTROL PRODUCTS (RECP) FOR SLOPES

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DATE	REVISION DESCRIPTION
01/30/2026	GREENWAY ROUTE AND ROAD WIDENING REVISION

DATE: 10/23/2025
DRAWN BY: 331
DESIGNED BY: 331
CHECKED BY: T. CROSS
SCALE: NTS

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS

KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

EROSION CONTROL NOTES & DETAILS

JOB NO. 51557
SHEET NO. EC4.2

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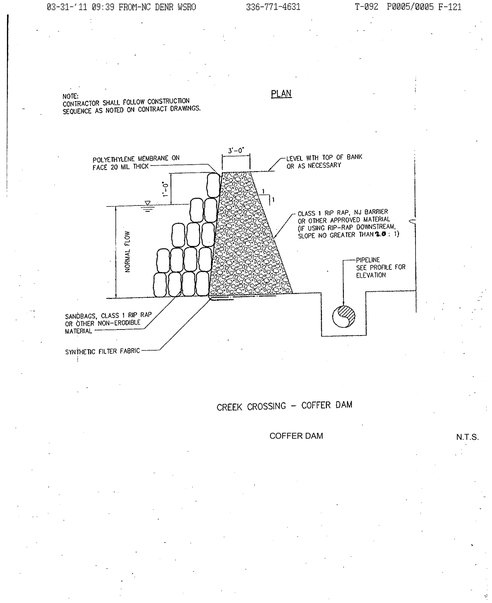
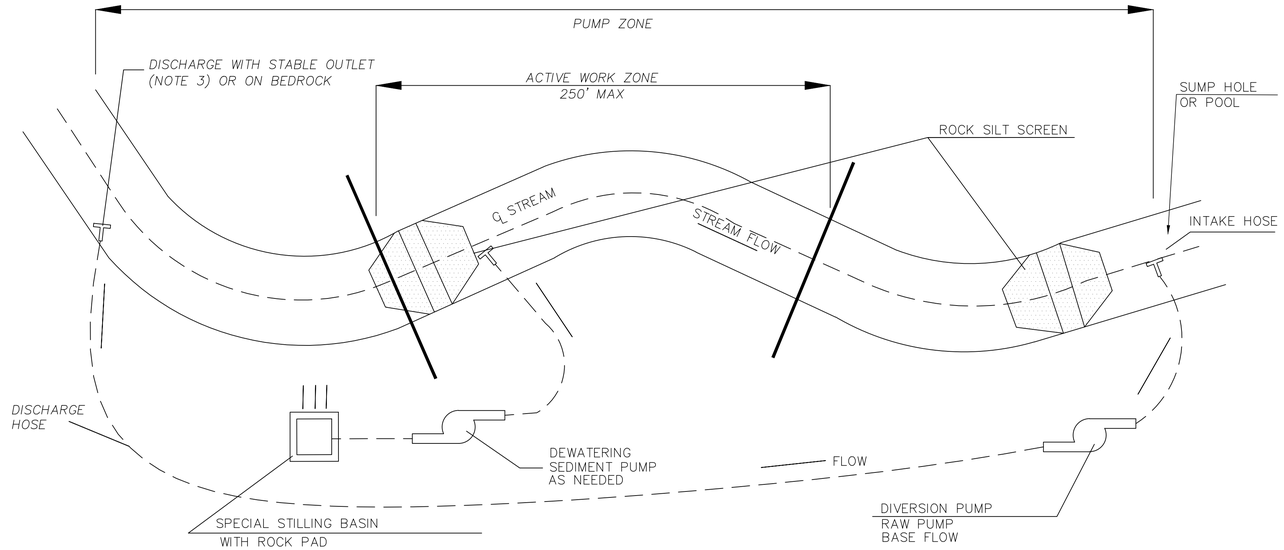


CREEK CROSSING – COFFER DAM

COFFER DAM N.T.S.



NOTES:

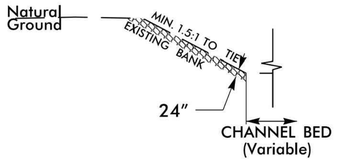
1. *WORK AREA TO BE STABILIZED AT THE END OF EACH WORK DAY.*
2. *ROCK SILT SCREENS REQUIRED FOR PUMP AROUND OPERATIONS ARE CONSIDERED INCIDENTAL TO PUMPING.*
3. *STABLE OUTLET TO CONSIST OF ROCK PLACED IN CHANNEL FOR ENERGY DISSIPATION AND 45° ELBOW INSTALLATION AT THE END OF THE PIPING SO THAT THE WATER DISCHARGES VERTICALLY UP IN THE AIR. THE OUTLET WILL BE APPROVED BY THE DESIGNER PRIOR TO PUMPING.*

TYPICAL PUMP AROUND

DETAIL B16

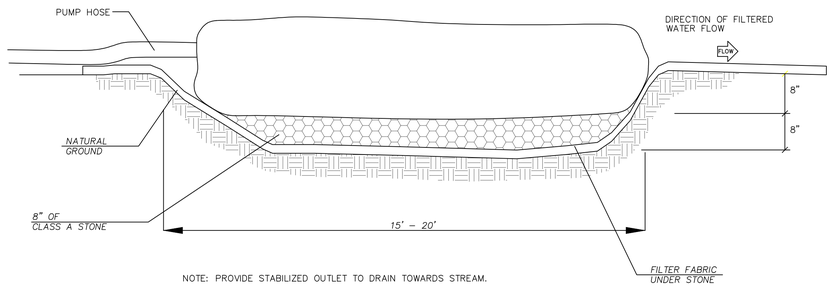
BANK STABILIZATION

(Not to Scale)



Reference plan view for which bank is to be stabilized.

Type of Liner = Class II Riprap (KEYED IN)



NOTE: PROVIDE STABILIZED OUTLET TO DRAIN TOWARDS STREAM.

CONSTRUCTION NOTE:

1. *SPECIAL STILLING BASIN LOCATION TO BE APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.*
2. *PROVIDE STABILIZED OUTLET TO DRAIN TOWARDS STREAM.*
3. *THE SILT BAG SHOULD BE REMOVED TO AN UPLAND AREA AND DISPOSED OF WITH OTHER WASTE MATERIAL IN AN AREA PROTECTED BY SEDIMENT AND EROSION CONTROL MEASURES. THE CONTENTS OF THE SILT BAG SHOULD BE DISPOSED OF IN THIS AREA AND THE BAG ITSELF TAKEN OFF-SITE FOR DISPOSAL.*

MAINTENANCE NOTE:

1. *THE SILT BAG SHOULD BE REPLACED AND DISPOSED OF WHEN IT IS 75% FULL OR WHEN IT IS IMPRACTICABLE TO MOVE OR OTHERWISE NOT FILTERING WATER AT A REASONABLE FLOW RATE.*

SPECIAL STILLING BASIN N.T.S.

CONSTRUCTION SEQUENCE

STEP 1 (PERIMETER CONTROLS)

1. PRIOR TO CLEARING TREES, GRUBBING, OR DISTURBING THE SITE, CLEAR A 15' WIDE STRIP OF TREES AND INSTALL DOUBLE ROW OF SILT FENCE AND A REINFORCED SILT FENCE OUTLET ALONG THE TOP OF NORTHERN STREAM BANK. DO NOT CROSS OR IMPACT THE STREAM.
2. ENTER THE SITE CLEAR A 15' WIDE STRIP OF TREES AND INSTALL DOUBLE ROW OF SILT FENCE AND A REINFORCED SILT FENCE OUTLET ALONG THE TOP OF SOUTHERN STREAM BANK. DO NOT CROSS OR IMPACT THE STREAM.
3. CONTACT THE CIVIL ENGINEER FOR AN INSPECTION OF THE INSTALLED SILT FENCE AND WHEN APPROVED, INSTALL THE REMAINING EROSION CONTROL MEASURES SHOWN IN CONSTRUCTION SEQUENCE STEP 2 AND 3.
4. STABILIZE DISTURBED GROUND WITH TEMPORARY SEEDING AND TEMPORARY SLOPE LININGS DAILY.
5. COORDINATE WITH CIVIL ENGINEER ONCE CENTERLINE OF STREAM AND ALIGNMENT OF CULVERTS ARE CONFIRMED PRIOR TO INSTALLATION.
6. INSTALL COFFER DAM AND PUMP WATER AROUND THE WORK AREA.
7. COORDINATE WITH NCDEQ TO INSPECT PUMP PASS-AROUND DEVICES.

STEP 2

1. APPROACH STREAM AND REPLACE CULVERT BEDDING SOILS WITH STRUCTURAL FILL AND COMPACT SOIL TO 95%. COORDINATE WITH OWNER'S GEOTECHNICAL TESTING AGENCY.
2. INSTALL CULVERT PIPE 1 IN THE DRY. (DURING INSTALLATION OF THE CULVERT, EXPOSED AREAS NOT BEING WORKED SHOULD BE STABILIZED.)
3. FILL OVER PIPE TO ELEVATION AND INSTALL RIPRAP. KEEP STREAM FLOWING.
4. SURVEY THE EXISTING NORMAL STREAMBED ELEVATIONS AT THE UPSTREAM AND DOWNSTREAM ENDS OF THE PERMANENT CULVERT PIPE. RECORD THESE ELEVATIONS FOR FUTURE REFERENCE.
5. STABILIZE DISTURBED GROUND WITH TEMPORARY SEEDING AND TEMPORARY SLOPE LININGS DAILY.

STEP 3

1. GRADE STREAM CHANNEL SUCH THAT STREAM WATER IS DIVERTED INTO PIPE 1.
2. KEEP PORTION OF COFFER DAM IN PLACE FOR ADDITIONAL SUPPORT OF PIPE 1 IF NEEDED.
3. REPLACE CULVERT BEDDING SOILS WITH STRUCTURAL FILL AND COMPACT SOIL TO 95%. COORDINATE WITH OWNER'S GEOTECHNICAL TESTING AGENCY.
4. INSTALL PIPE 2 IN THE DRY. (DURING INSTALLATION OF THE CULVERT, EXPOSED AREAS NOT BEING WORKED SHOULD BE STABILIZED.)
5. DO NOT DISTURB BEYOND SLF OF THE RIPRAP PADS (STREAM BED IMPACTS SHALL ONLY BE WITHIN THE LIMITS AUTHORIZED BY THE NATIONWIDE PERMIT).
6. INSTALL ROAD AND REMAINING INFRASTRUCTURE.
7. INSTALL ADDITIONAL EROSION CONTROL DEVICES AS REQUIRED DURING CONSTRUCTION.
8. STABILIZE DISTURBED GROUND WITH TEMPORARY SEEDING AND TEMPORARY SLOPE LININGS DAILY.

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TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA
CULVERT STREAM CROSSING NOTES & DETAILS

JOB NO. 51557
SHEET NO. EC4.3

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PERMANENT OUTLET "RISER" STRUCTURE NOTES & DETAILS

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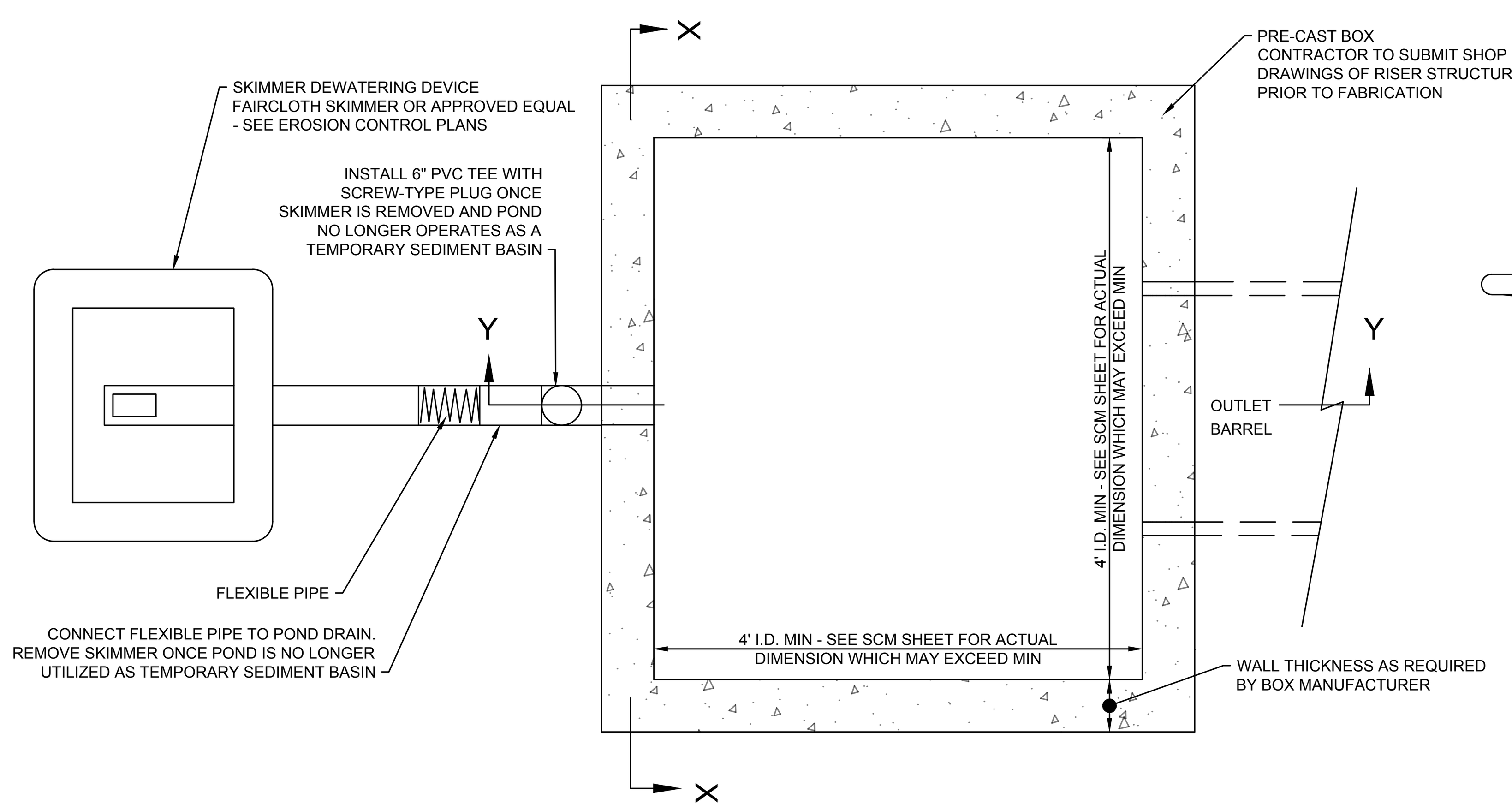

PLAN VIEW

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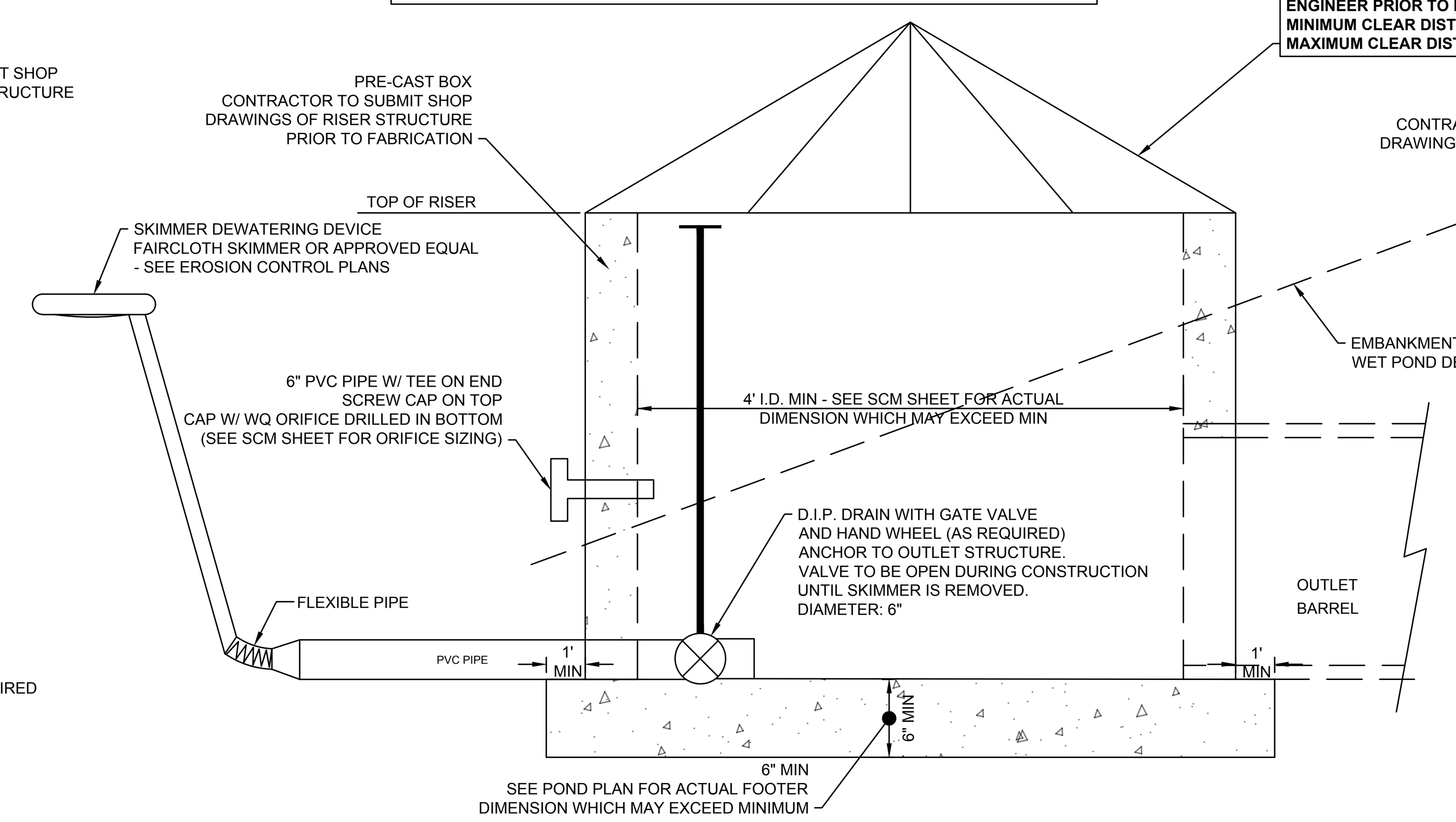

SECTION Y-Y

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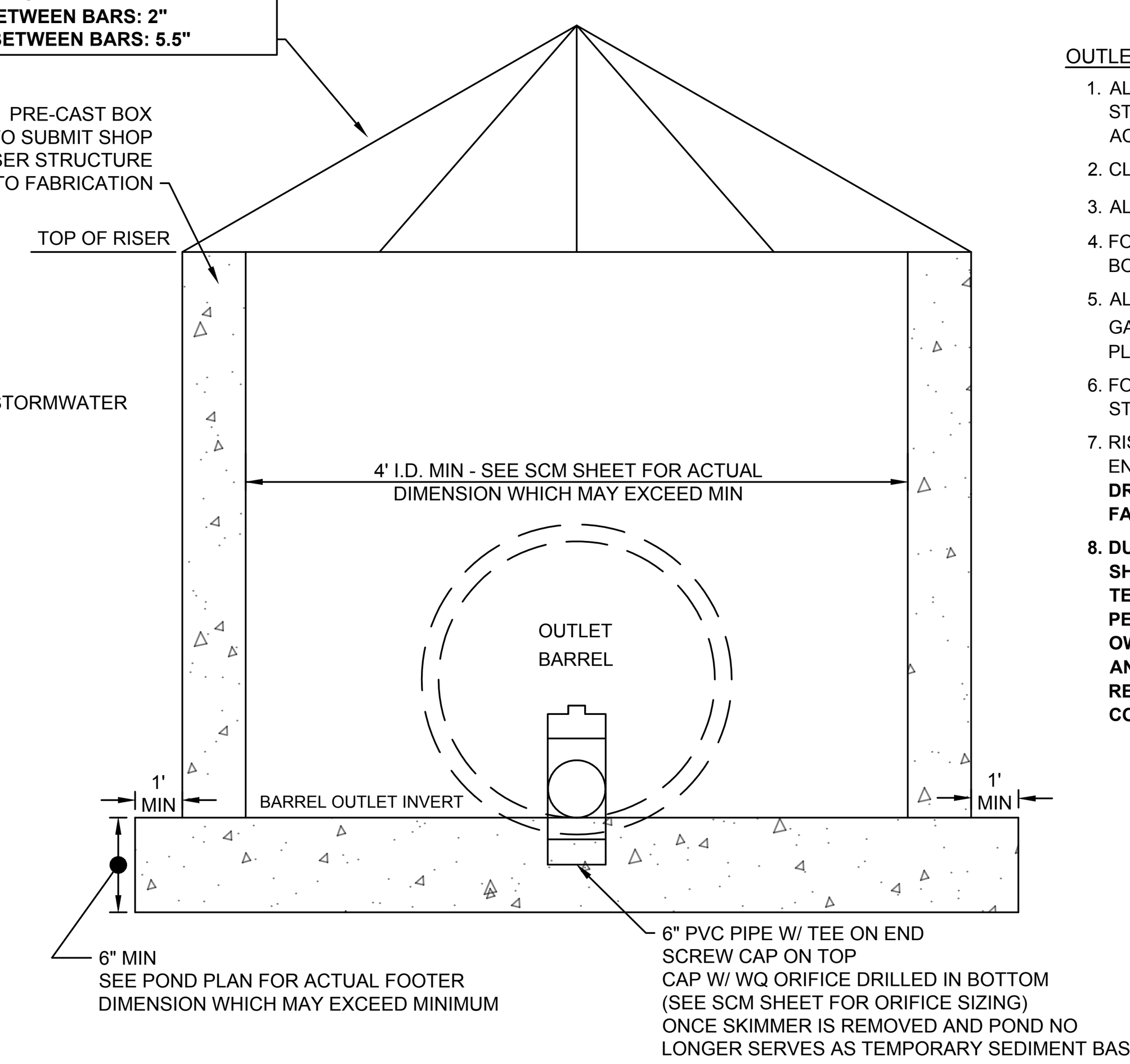

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OUTLET STRUCTURE / RISER NOTES:

1. ALL STRUCTURES OVER 3'-6" IN DEPTH TO BE PROVIDED WITH STEPS 12" ON-CENTERS VERTICALLY. STEPS SHALL BE IN ACCORDANCE WITH NCDOT RSD 840.66 OR APPROVED EQUAL.
2. CLASS "B" CONCRETE TO BE USED THROUGHOUT.
3. ALL MORTAR JOINTS (IF APPLICABLE) ARE $\frac{1}{2}$" +/- $\frac{1}{8}$".
4. FORMS ARE TO BE USED FOR THE CONSTRUCTION OF THE BOTTOM SLAB.
5. ALL RISER JOINTS SHALL BE WATER-TIGHT AND HAVE (4) GALVANIZED STEEL PLATES 10"x10"x$\frac{1}{4}$" TH WITH (4) $\frac{1}{2}$" BOLTS PER PLATE.
6. FOOTER SHALL BE SECURED TO RISER WITH STRUCTURAL STEEL.
7. RISER SHALL BE ENGINEERED BY PRECASTER'S STRUCTURAL ENGINEER TO RESIST BUOYANCY FORCES. **SUBMIT SHOP DRAWINGS OF RISER STRUCTURE TO ENGINEER PRIOR TO FABRICATION.**
8. **DURING EROSION CONTROL STAGES, ALL RISER ORIFICES SHALL BE TEMPORARILY PLUGGED, EXCEPT FOR THE TEMPORARY SKIMMER. AT TIME OF SKIMMER REMOVAL, WITH PERMISSION FROM EROSION CONTROL PERMITTING AGENCY, OWNER, AND ENGINEER, THE DRAIN VALVE SHALL BE CLOSED AND ALL RISER ORIFICES SHALL BE UNPLUGGED. SEE BASIN REMOVAL/CONVERSION SEQUENCE ON APPROVED EROSION CONTROL PLANS.**

GENERAL NOTES:

1. MINIMUM DENSITY SHALL NOT BE LESS THAN 95% OF MAXIMUM DRY DENSITY WITH MOISTURE CONTENT WITHIN +/- 2% OF THE OPTIMUM. EACH LIFT OF FILL SHALL BE COMPACTED AS NECESSARY TO OBTAIN THAT DENSITY. ALL COMPACTION IS DETERMINED PER AASHTO METHOD T-99 (STANDARD PROCTOR).
2. DAM EMBANKMENT IS TO BE SEEDED IMMEDIATELY AFTER DAM CONSTRUCTION IS COMPLETE.
3. **STORMWATER MANAGEMENT STRUCTURE IS TO BE UTILIZED AS A TEMPORARY EROSION CONTROL DEVICE INITIALLY. ONCE CONSTRUCTION IS COMPLETED, UPSTREAM SURFACES HAVE BEEN PERMANENTLY STABILIZED, AND APPROVAL HAS BEEN ISSUED BY EROSION CONTROL AUTHORITY, OWNER, AND ENGINEER, CONTRACTOR IS TO REMOVE ALL SEDIMENT FROM BASIN AND CONVERT TO PERMANENT WATER QUALITY STRUCTURE. THIS INCLUDES INSTALLING THE PROPOSED PLANTINGS ALONG THE LITTORAL SHELF, IF APPLICABLE.**
4. **DO NOT REMOVE ANY EROSION AND SEDIMENT CONTROL MEASURES UNTIL ALL CONTRIBUTING AREAS HAVE BEEN PERMANENTLY STABILIZED AND APPROVAL HAS BEEN RECEIVED FROM THE EROSION CONTROL AUTHORITY, OWNER, AND ENGINEER.**

DAM EMBANKMENT CONSTRUCTION NOTES:

1. CONSTRUCTION OF THIS DAM SHALL BE DONE UNDER THE OBSERVATION OF A QUALIFIED GEOTECHNICAL ENGINEER, WHO IS A REGISTERED PROFESSIONAL ENIGINEER IN THE STATE OF NORTH CAROLINA. CONTROLLED FILL, AS SPECIFIED BY THE GEOTECHNICAL ENGINEER, IN THE DAM EMBANKMENT SHALL BE PLACED IN 6-INCH LOOSE LAYERS (3-INCH LOOSE LAYERS WITHIN 3-FEET OF EITHER SIDE OF THE PRINCIPAL SPILLWAY PIPE TO A DEPTH OF 2-FEET OVER THE PIPE) AND SHALL BE COMPACTED TO A DENSITY OF NO LESS THAN 95% OF THE STANDARD PROCTOR MAXIMUM DENSITY AT A MOISTURE CONTENT OF + OR - TWO PERCENTAGE POINTS OF THE OPTIMUM MOISTURE CONTENT IN ACCORDANCE WITH ASTM D698.
2. ALL VISIBLE ORGANIC DEBRIS SUCH AS ROOTS AND LIMBS SHALL BE REMOVED FROM THE FILL MATERIAL PRIOR TO COMPACTION TO THE REQUIRED DENSITY. SOILS WITH ORGANIC MATTER CONTENT EXCEEDING 5% BY WEIGHT SHALL NOT BE USED. STONES GREATER THAN 3-INCH (IN ANY DIRECTION) SHALL BE REMOVED FROM THE FILL PRIOR TO COMPACTION.
3. FILL MATERIAL PLACED AT DENSITIES LOWER THAN SPECIFIED MINIMUM DENSITIES OR AT MOISTURE CONTENTS OUTSIDE THE SPECIFIED RANGES OR OTHERWISE NOT CONFORMING TO SPECIFIED REQUIREMENTS SHALL BE REMOVED AND REPLACED WITH ACCEPTABLE MATERIALS.
4. ANY FILL LAYER THAT IS SMOOTH DRUM ROLLED TO REDUCE MOISTURE PENETRATION DURING A STORM EVENT SHALL BE PROPERLY SCARIFIED PRIOR TO THE PLACEMENT OF THE NEXT SOIL LIFT.
5. SURFACE WATER AND STREAM FLOW SHALL BE CONTINUOUSLY CONTROLLED THROUGHOUT CONSTRUCTION AND THE PLACEMENT OF CONTROLLED FILL.
6. FOUNDATION AREAS MAY REQUIRE UNDERCUTTING OF COMPRESSIBLE AND/OR UNSUITABLE SOILS IN ADDITION TO THAT INDICATED ON THE PLANS. ALL SUCH UNDERCUTTING SHALL BE PERFORMED AT THE DISCRETION OF THE GEOTECHNICAL ENGINEER AND SHALL BE MONITORED AND DOCUMENTED. IN NO CASE SHALL THERE BE AN ATTEMPT TO STABILIZE ANY PORTIONS OF THE FOUNDATION SOILS WITH CRUSHED STONE.
7. TREATMENT OF SEEPAGE AREAS, SUBGRADE PREPARATION, FOUNDATION DEWATERING AND ROCK FOUNDATION PREPARATION (I.E., TREATMENT WITH SLUSH GROUTING, DENTAL CONCRETE, ETC.) MAY BE REQUIRED AT THE DISCRETION OF THE GEOTECHNICAL ENGINEER. ALL SUCH ACTIVITIES SHALL BE CLOSELY MONITORED AND DOCUMENTED BY THE GEOTECHNICAL ENGINEER.
8. FILL ADJACENT TO THE RISER AND PRINCIPAL SPILLWAY PIPE SHALL BE PLACED SO THAT LIFTS ARE AT THE SAME LEVEL ON BOTH SIDES OF THE STRUCTURES.
9. EARTHWORK COMPACTION WITHIN 3-FEET OF ANY STRUCTURES SHALL BE ACCOMPLISHED BY MEANS OF HAND TAMPERS, MANUALLY DIRECTED POWER TAMPERS OR PLATE COMPACTORS OR MINIATURE SELF-PROPELLED ROLLERS.
10. COMPACTION BY MEANS OF DROP WEIGHTS FROM A CRANE OR HOIST SHALL NOT BE PERMITTED.
11. HEAVY EQUIPMENT SHALL NOT BE ALLOWED TO PASS OVER CAST-IN-PLACE STRUCTURES (INCLUDING THE CRADLE) UNTIL ADEQUATE CURING TIME HAS ELAPSED.
12. TO RE-ESTABLISH VEGETATION AFTER CONSTRUCTION, A 2- TO 3-INCH LAYER OF TOPSOIL SHALL BE PLACED ON THE DISTURBED EMBANKMENT SURFACE AND THE AREA SEEDED AND MULCHED OR HYDROSEEDED.
13. THE EMBANKMENT MATERIAL SHALL BE COMPRISED OF CLAYEY SAND OR SANDY CLAY WITH A MINIMUM OF 30% PASSING THE #200 SIEVE, A LIQUID LIMIT OF AT LEAST 25 AND A PLASTICITY INDEX OF AT LEAST 10%, AND LESS THAN 5% ORGANICS. THIS MATERIAL SHALL ALSO HAVE A UNIFIED SOIL CLASSIFICATION OF SC OR CL.

STORMWATER WET POND NOTES:

1. EMBANKMENT SHALL BE CONSTRUCTED OF CLEAN STRUCTURAL SOIL, FREE OF ROOTS, VEGETATION, ROCKS & OTHER OBJECTIONABLE MATERIAL. SCARIFY SURFACES BEFORE PLACING FILL. PLACE FILL IN 6-8 INCH LOOSE LIFTS. COMPACTS TO AT LEAST 95% OF THE STANDARD PROCTOR DENSITY. SEE DAM EMBANKMENT CONSTRUCTION NOTES - THIS SHEET.
2. CONTRACTOR TO SUPPLY SHOP DRAWINGS OF RISER STRUCTURES PRIOR TO FABRICATION.
3. ALL RISERS SHALL BE PRECAST CONCRETE SOLID 6" MIN WALL STRUCTURES.
4. 4-6 INCH LAYER OF AMENDED SOIL IS RECOMMENDED IN ANY AREA WHERE PLANTINGS ARE REQUIRED (SEE NCDENR BMP DESIGN MANUAL).

GEOTECHNICAL CERTIFICATION NOTE:

ASBUILT CERTIFICATION OF THE EMBANKMENT COMPACTION, ANTI-SEEP COLLARS AND/OR FILTER DIAPHRAGM, CUT OFF TRENCH, ETC. WILL BE REQUIRED PRIOR TO CERTIFICATE OF OCCUPANCY

STORMWATER WET POND NOTES & DETAILS

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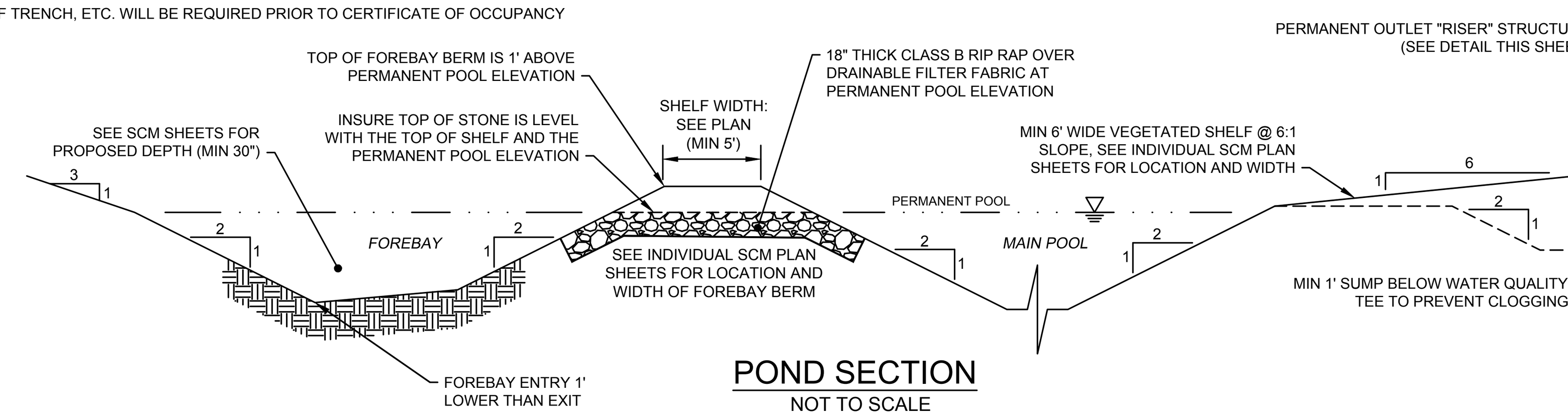

POND SECTION

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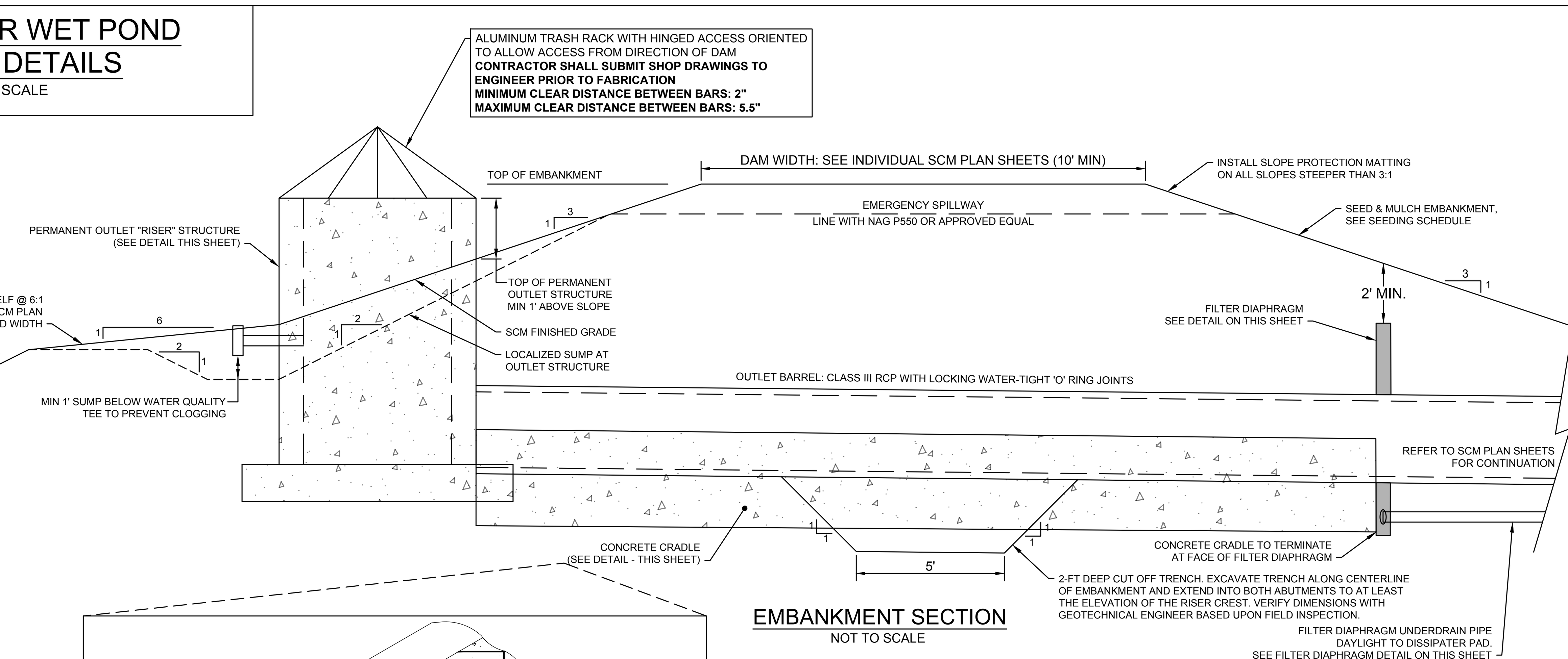

EMBANKMENT SECTION

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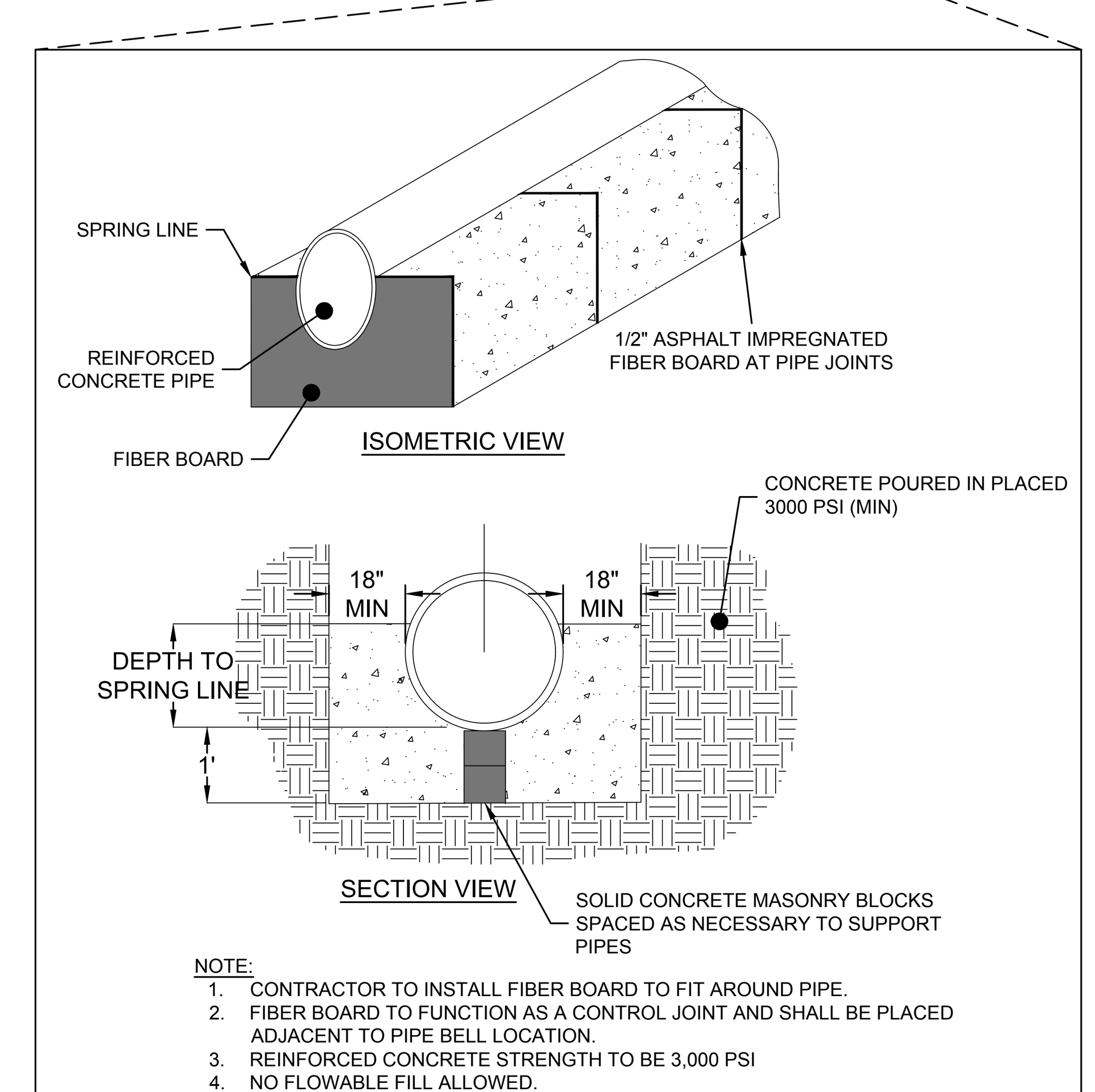

NOTE:
1. CONTRACTOR TO INSTALL FIBER BOARD TO FIT AROUND PIPE.
2. FIBER BOARD TO FUNCTION AS A CONTROL JOINT AND SHALL BE PLACED ADJACENT TO PIPE BELL LOCATION.
3. REINFORCED CONCRETE STRENGTH TO BE 3,000 PSI
4. NO FLOWABLE FILL ALLOWED.

CONCRETE CRADLE ENLARGEMENT

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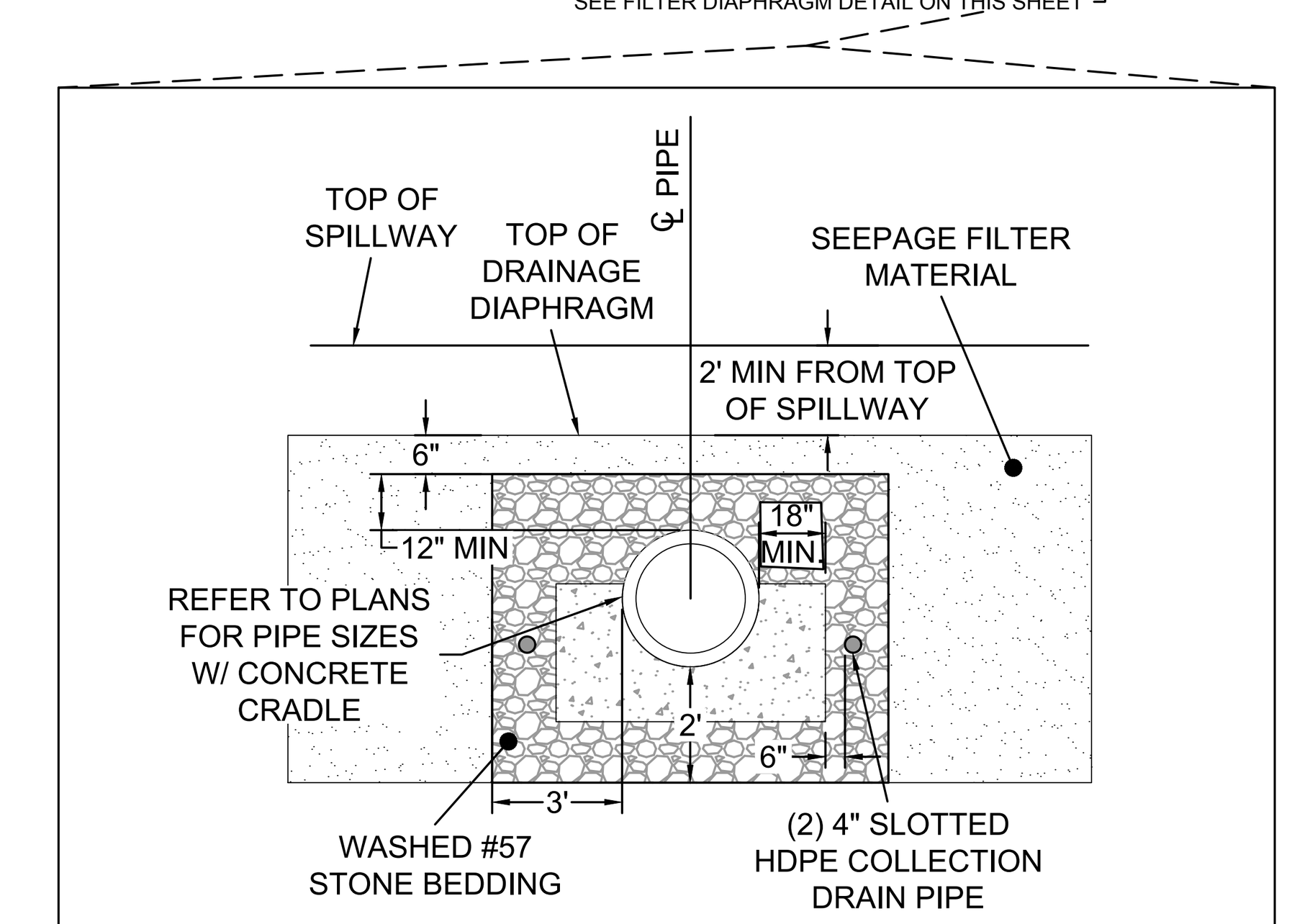

FILTER DIAPHRAGM SECTION ENLARGEMENT

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INSTALLATION AND MAINTENANCE OF LANDSCAPING:

1. ALL LANDSCAPING SHALL BE OF NURSERY-STOCK QUALITY AND SHALL BE INSTALLED IN A SOUND, WORKMANLIKE MANNER AND ACCORDING TO ACCEPTED GOOD PLANTING PROCEDURES. ALL LANDSCAPING SHALL BE ADAPTABLE TO CLIMATIC CONDITIONS OF THE AREA, AND CONSIDERATION SHALL BE GIVEN TO NOT PLANTING LARGE TREES NEAR UTILITIES. ALL LANDSCAPING SHALL BE MAINTAINED IN GOOD CONDITION.
2. ALL PLANTS SHALL MEET OR EXCEED THE MINIMUM STANDARDS SET BY THE U.S.D.A. STANDARD FOR NURSERY STOCK SPONSORED BY THE AMERICAN ASSOCIATION OF NURSERYMEN, INC.
3. ALL LANDSCAPING SHALL AT ALL TIMES SHALL PRESENT A HEALTHY, NEAT, CLEAN, ORDERLY, DISEASE-FREE AND PEST-FREE APPEARANCE.
4. ALL LANDSCAPING SOIL AND FILL SHALL BE FREE FROM WEEDS, REFUSE, AND DEBRIS AT ALL TIMES.
5. ANY DEAD PLANT MATERIAL OR MATERIAL THAT FAILS TO SHOW HEALTHY GROWTH MUST BE REMOVED WITHIN 30 DAYS.
6. REPLACEMENT OF REMOVED PLANT MATERIAL MUST TAKE PLACE WITHIN 90 DAYS OF REMOVAL OR NOTIFICATION BY THE CITY, WHICHEVER OCCURS FIRST.
7. ANY REPLACEMENT PLANT MATERIAL MUST MEET THE SIZE AND OTHER CHARACTERISTICS OF NEWLY PLANTED MATERIAL.
8. MAINTENANCE OF THE LANDSCAPING IS THE RESPONSIBILITY OF THE OWNER.

WET POND PLANTINGS NOTES & DETAILS

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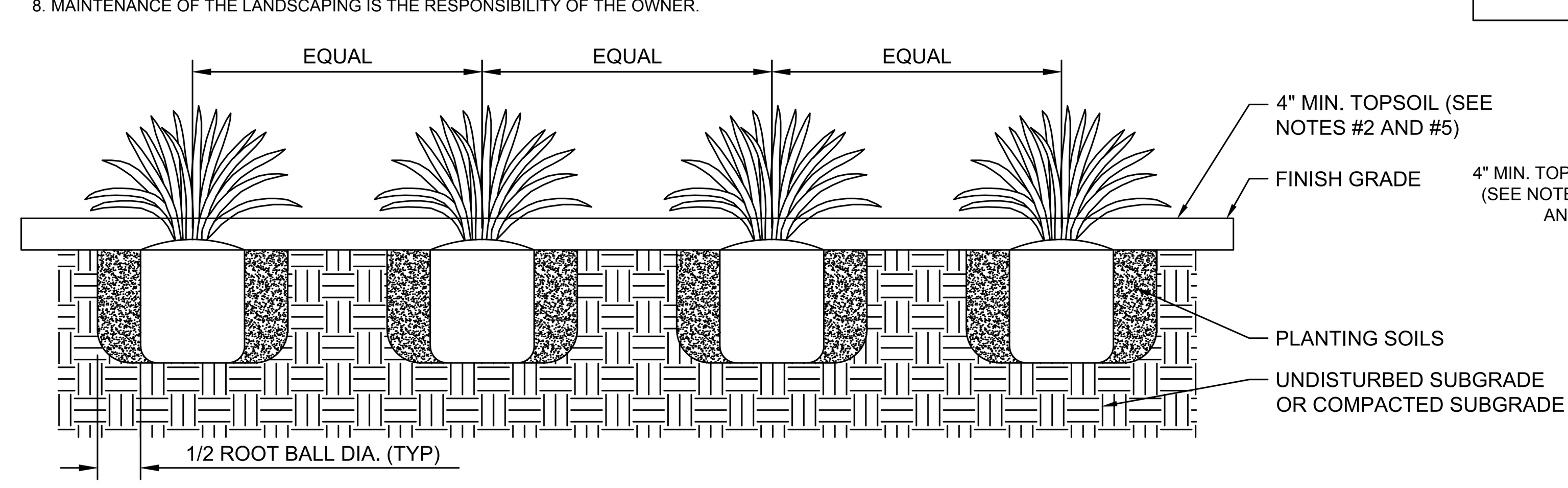
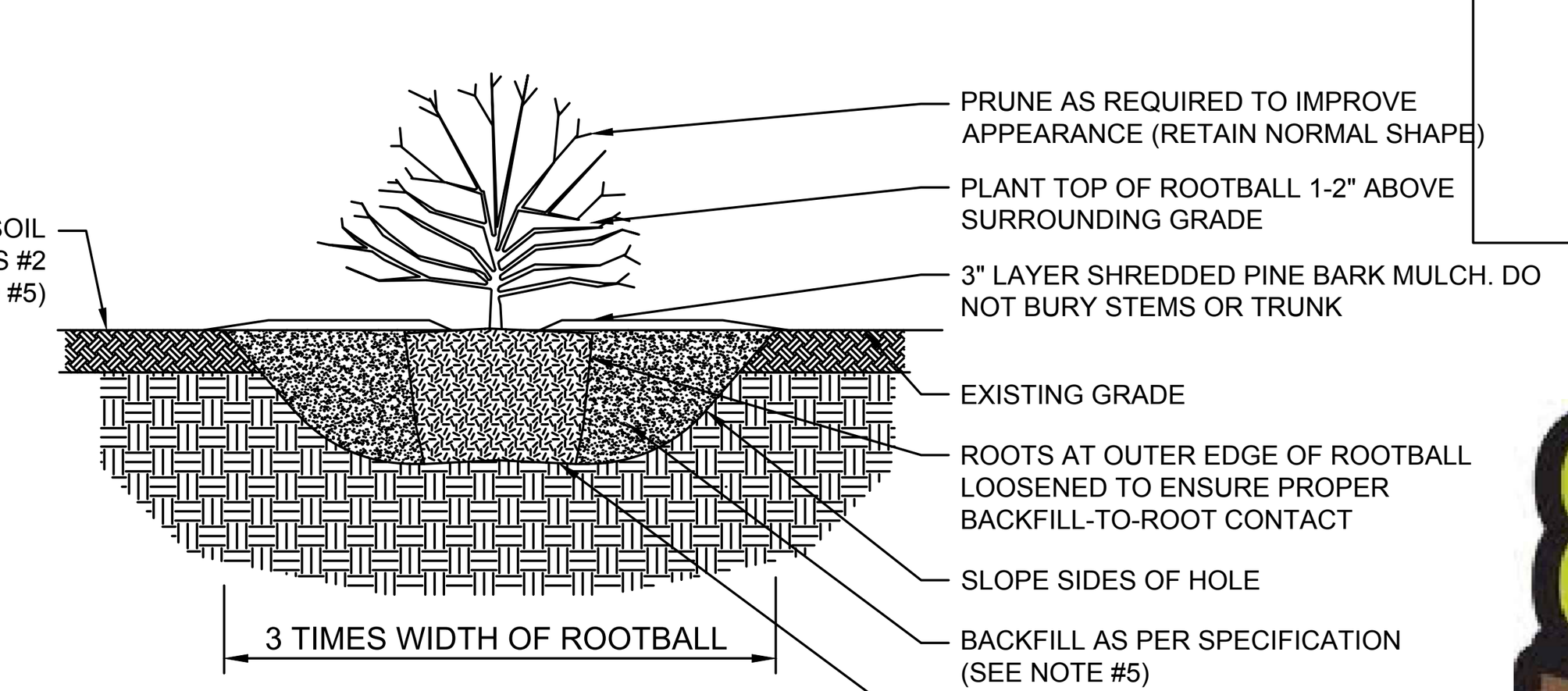


HERBACEOUS PLANTING DETAIL

NOT TO SCALE



SHRUB PLANTING DETAIL

NOT TO SCALE

Know what's **below.** Call before you dig. 811

TOWN CERTIFICATION

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

BY: ______________________ DATE: __________
TOWN ENGINEER

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

BY: ______________________ DATE: __________
LAND USE 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-4142

Public
Sewer Collection / Extension System
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City of Raleigh
Public Utilities Department Permit # S-5503

NORTH CAROLINA PROFESSIONAL SEAL 051879 ENGINEER TYLER JEFFREY CROSS
2/9/2026

THIS DRAWING PREPARED AT THE **RALEIGH OFFICE**
5410 Trinity Road, Suite 102 | Raleigh, NC 27607
TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

DATE	REVISION DESCRIPTION

DATE	10/31/2025
DRAWN BY	331
DESIGNED BY	331
CHECKED BY	T. CROSS
SCALE	NTS

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS

KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

SCM NOTES AND DETAILS

JOB NO.	51557
SHEET NO.	C7.0

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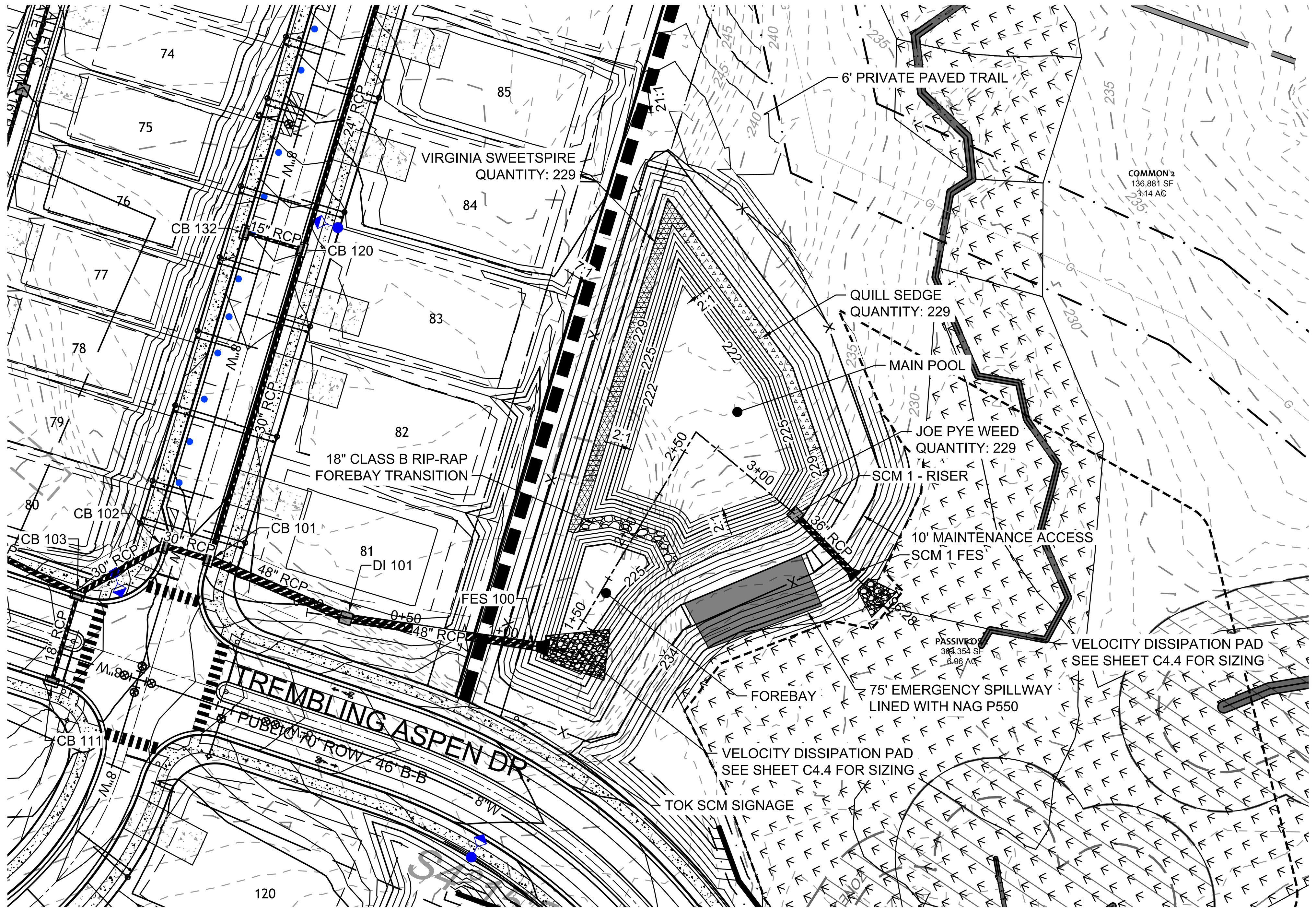


SCM 1 WET POND PLAN VIEW

SCALE: 1" = 50'

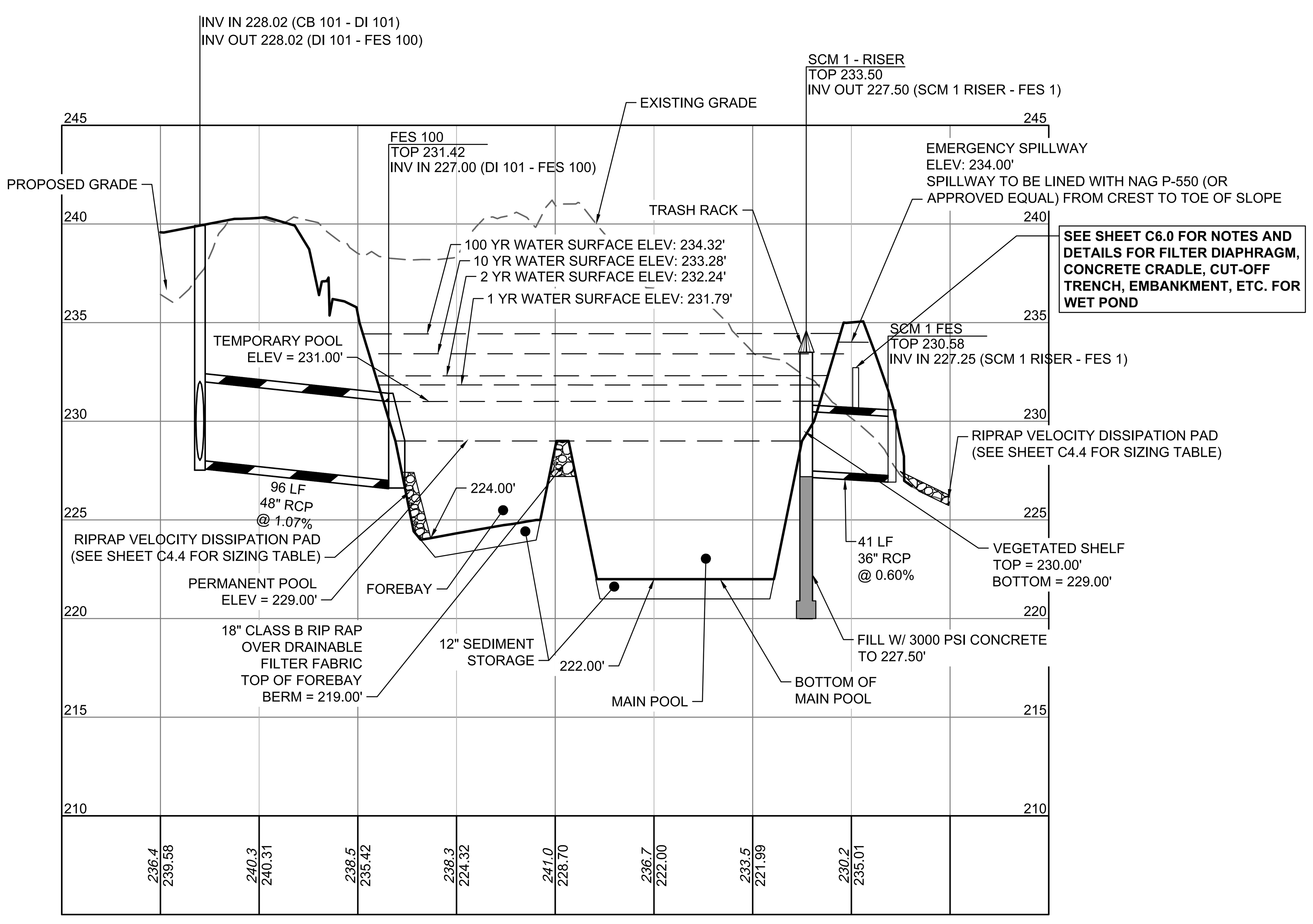
NAD 83

SCALE 1"=50'

0 50' 100'

PLANTING LEGEND

- VIRGINIA SWEETSPIRE (VS)
- QUILL SEDGE (QS)
- JOE PYE WEED (JP)



SCM 1 WET POND PROFILE

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

PROFILE SCALE 0 50 (0 5)

ESC Approval
04/01/2026 2:36:21 PM

811 Know what's below. Call before you dig.

SCM INSPECTIONS SEQUENCE - SCM INSTALLATION

WHEN SCHEDULING INSPECTIONS, PLEASE CALL THE PUBLIC WORKS ADMINISTRATION ASSISTANT AT (919) 217-2250.

PLEASE NOTE THE FOLLOWING PERSONNEL MUST BE PRESENT AT ALL INSPECTIONS:
1) SITE SUPERVISOR
2) GEOTECH
3) AS-BUILT CERTIFYING ENGINEER OR SOMEONE UNDER THEIR SUPERVISION

THE FOLLOWING ITEMS MUST BE INSPECTED BY TOK STAFF DURING THE INSTALLATION OF ANY SCM WITH DAM
- KEY TRENCH EXCAVATION
- PRINCIPAL SPILLWAY PIPE AND ASSOCIATED COMPONENTS:
  -- CONCRETE CRADLE
  -- ANTI-SEEP COLLAR
  -- SEEPAGE DIAPHRAGM
  -- OUTLET STRUCTURE
  -- ANTI-FLOTATION BALLAST
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- SUBGRADE OR CONSTRUCTED FOUNDATION
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- FILTER MEDIA
- DATE ITEMS ON PREVIOUS LIST IF APPLICABLE

GEOTECHNICAL TESTING AND CERTIFICATION
ALL REPORTS ARE TO BE SUBMITTED WITHIN 30-DAYS OF DAM COMPLETION
REQUIRED GEOTECHNICAL RECORDS INCLUDE:
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- DIGITAL PHOTOS SHOWING THE DAM AREAS, THE RISER, THE PRINCIPLE SPILLWAY PIPE THE CONCRETE CRADLE, THE SEEPAGE DIAPHRAGM RELIEF, DRAINS, ETC., BEING INSTALLED.

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THE VEGETATED SHELF SHALL BE PLANTED WITH A MINIMUM OF THREE DIVERSE SPECIES OF HERBACEOUS, NATIVE VEGETATION AT A MINIMUM DENSITY OF 50 PLANTS PER 200 FEET OF SHELF AREA.

CONTRACTOR TO WORK WITH SOILS SCIENTIST TO ENSURE SOILS ARE ADEQUATE TO SUPPORT PROPER ESTABLISHMENT AND GROWTH OF THE AQUATIC PLANTINGS. CONTRACTOR TO AMEND SOILS AND INSTALL SOILS IN PLANT, SHRUB, AND TREE AREAS PER DETAILS, SOIL SPECIFICATIONS. NCDENR SPECIFICATION, AND SOIL SCIENTIST RECOMMENDATIONS.

ALL DISTURBED AREAS AROUND THE OUTSIDE OF THE DEVICE SHALL BE SEEDED WITH A LAWN AREA SEED MIX (PER SEEDING SPECIFICATIONS) NATIVE GRASSES, LEGUMES, CLOVERS, AND WILDFLOWERS.

IF THE DEVICE WAS USED DURING CONSTRUCTION AS A SEDIMENT BASIN OR TRAP, THE BASIN MUST BE CLEANED OUT, GRADED, APPROPRIATE AREAS COVERED WITH 4" OF TOPSOIL AS SPECIFIED IN NOTE #2 ABOVE, AND VEGETATED WITHIN 14 DAYS OF THE COMPLETION OF CONSTRUCTION.

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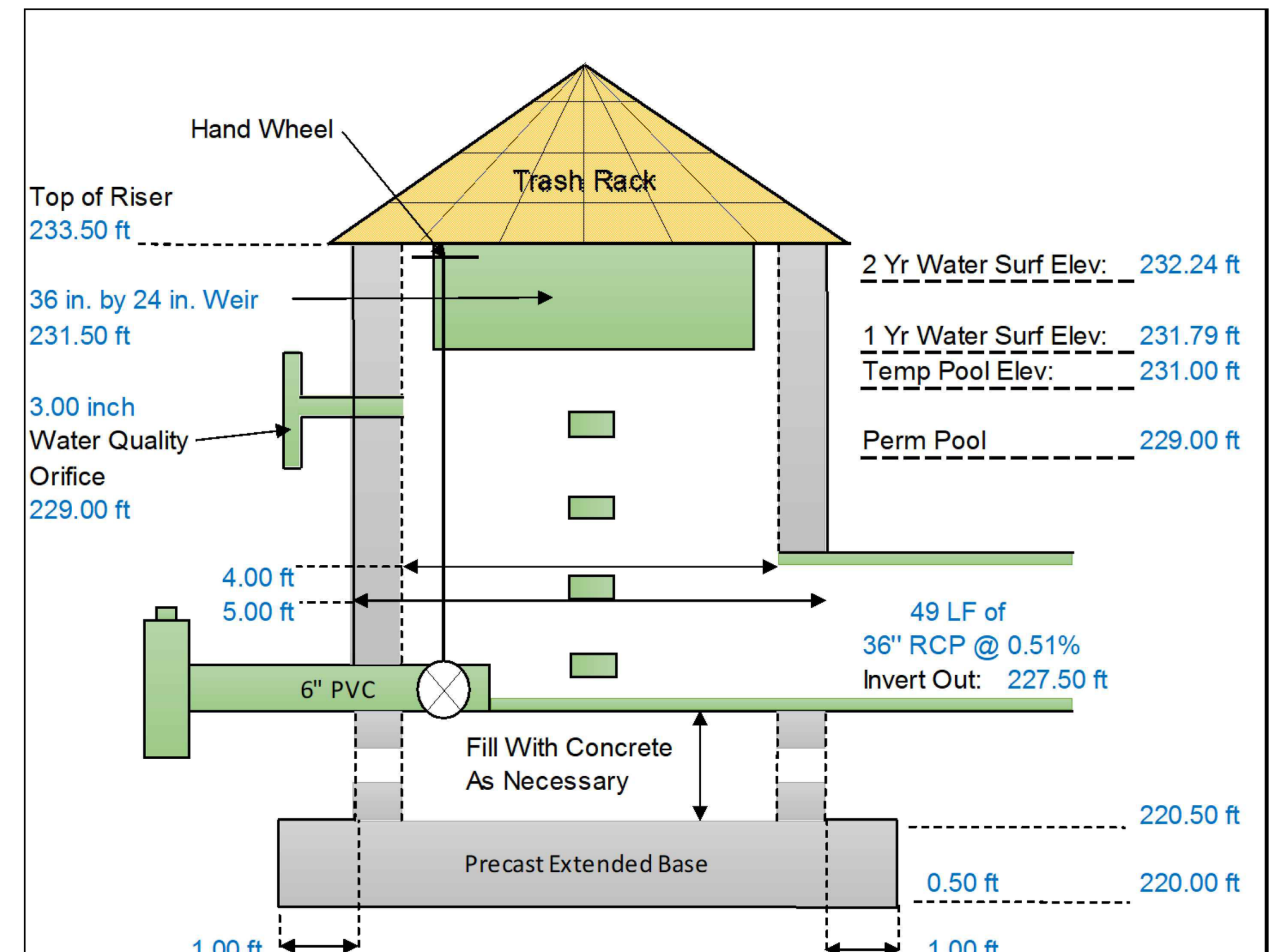


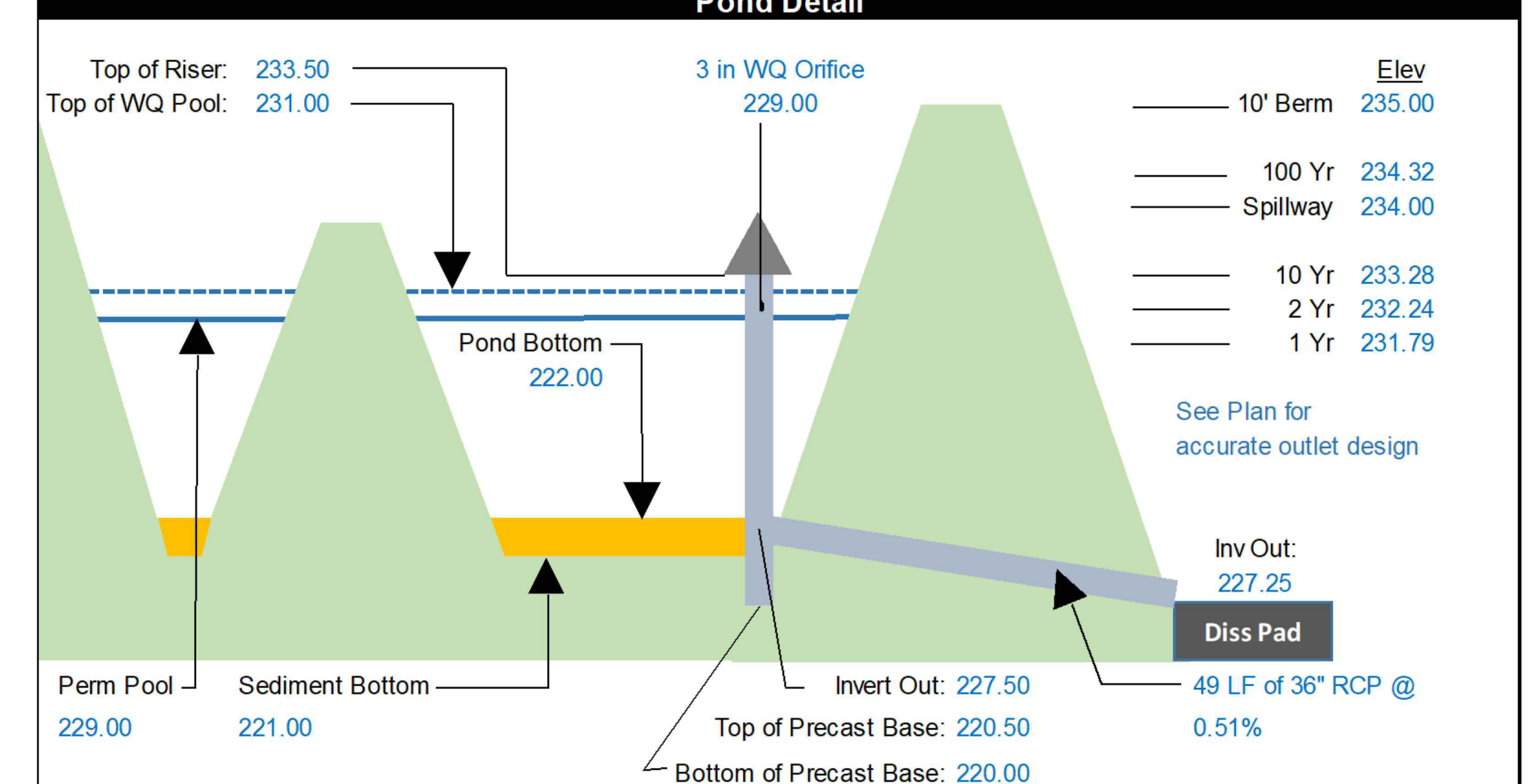
PRECAST CONCRETE RISER

4 ft x 4 ft x 13 ft Tall, With a 0.5 ft Thick Precast Extended Base

Pond / Riser Data & Elevations

Pond Type	Wet Pond		
TSS Removal	85%		
Top of Pond / Berm	235.00 ft		
Secondary Spillway Width	75.00 ft		
Bottom of Secondary Spillway	234.00 ft		
Top of Riser	233.50 ft	(at least 1' Above TPE)	
Riser Type / Size	4x4 ft		
Top of Water Quality / Temp Pool Elev	231.00 ft	(1" Runoff)	
Top of Veg. Shelf	230.00 ft		
Permanent Pool Elevation (Normal Pool)	229.00 ft		
Water Quality Orifice Elevation & Size	229.00 ft	3.00 in	
Secondary Orifice Elevation & Size (Rise & Span)	NA ft	0.00 inch	0.00 inch
		^ Rise	^ Span
Weir Elevation, Width, & Number of Sides	231.50 ft	36.00 inch	2
Bottom of Veg. Shelf	229.00 ft	^ Width	^ # of Sides
Top of Sediment Storage / Pond Bottom	222.00 ft		
Bottom of Sediment Storage	221.00 ft	(Min 1 ft)	
Invert Out of Riser	227.50 ft		
Outlet Pipe Size	36.00 in	Diameter RCP	
Outlet Pipe Length & Slope	49.00 ft	0.51 %	
Downstream Outlet Elevation	227.25 ft		
1 Yr Water Surface Elev / Peak Flow (CFS)	231.79 ft	3.60 CFS	
2 Yr Water Surface Elev Peak Flow (CFS)	232.24 ft	13.08 CFS	
10 Yr Water Surface Elev Peak Flow (CFS)	233.28 ft	47.94 CFS	
100 Yr Water Surface Elev Peak Flow (CFS)	234.32 ft	111.80 CFS	

Pond Detail

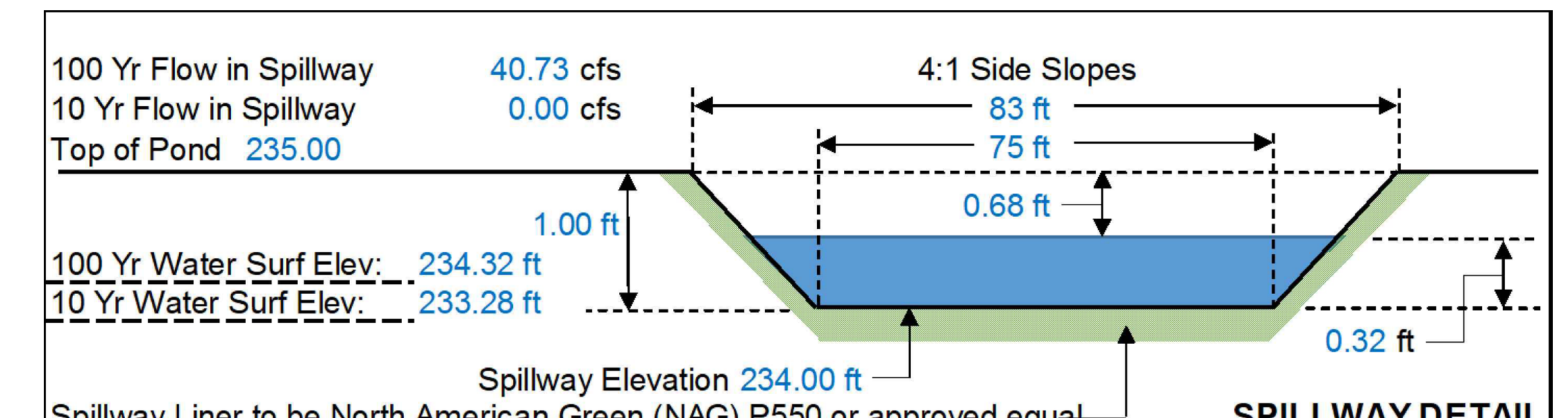


Anti-Buoyancy Calculations for the Riser Structure

Riser Dimensions		Weight of Structure		Displaced Volume	
Outside Width	5.00 ft	Walls =	17,550 LBS	V = LxWx(HT) = C.F.	
Inside Width	4.00 ft	Base =	3,675 LBS		
Outside Length	5.00 ft	FILL =	16,800 lbs	Displaced Water =	
Inside Length	4.00 ft			C.F. * 62.4 PCF = LBS	
Height	13.00 ft	Outlet Pipe =	530 LBS		
Base Thick' (ft)	0.50 ft	WQ Orifice =	4 LBS	Add 15% Factor of Safety	
Wall Thick' (ft)	0.50 ft				
Ext Base (ft)	1.00 ft	Weir #1 =	0 LBS	V =	325 C.F.
Areas removed from Riser		Weir #2 =	900 LBS	Disp. Water =	20,280 LBS
Outlet Pipe	7.07 ft	Weir #3 =	0 LBS	15% F.S. =	3,042 LBS
WQ Orifice	0.05 ft	Weir #4 =	0 LBS		
Orifice #1	0.00 ft	Other #1 =	0 LBS	Safety Factor	1.57
Orifice #2	12.00 ft				
Orifice #3	0.00 ft	Weight =	36,591 LBS	Weight =	23,322 LBS
Orifice #4	0.00 ft	Precast Concrete Riser Structure to be 4 ft x 4 ft x 13 ft Tall, With a 0.5 ft Thick Precast Extended Base			
Other	0.00 ft				

Planting Summary Requirements

Quantity	Type	Root	Common Name	Scientific Name	Planting Size	Notes
Dam / Berm				Non-Clumping Turf Grass		
6' Shelf Length 457		Area of Shelf = 2742 SF		(50 Plants per 200 SF of Area)		
229	Herbaceous	Container	Quill Sedge	Cerex Tenera	4" Pot	24"-36" OC
229	Herbaceous	Container	Virginia Sweetspire	Itea Virginica	4" Pot	24"-36" OC
229	Herbaceous	Container	Joe Pye Weed	Eupat' Fistulosus	4" Pot	24"-36" OC



SPILLWAY DETAIL

TOWN CERTIFICATION

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TOWN ENGINEER

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BY: ______________________ DATE: __________
LAND USE ADMINISTRATOR

Public
Water Distribution / Extension System
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City of Raleigh
Public Utilities Department Permit # W-4142

Public
Sewer Collection / Extension System
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City of Raleigh
Public Utilities Department Permit # S-5503

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 TYLER JEFFREY CROSS
2/9/2026

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TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

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REVISION DESCRIPTION | DATE

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA

SCM 1 PLAN & PROFILE

DATE	10/31/2025
DRAWN BY	331
DESIGNED BY	331
CHECKED BY	T. CROSS
SCALE	H: 1" = 50' V: 1" = 5'
JOB NO.	51557
SHEET NO.	C7.1

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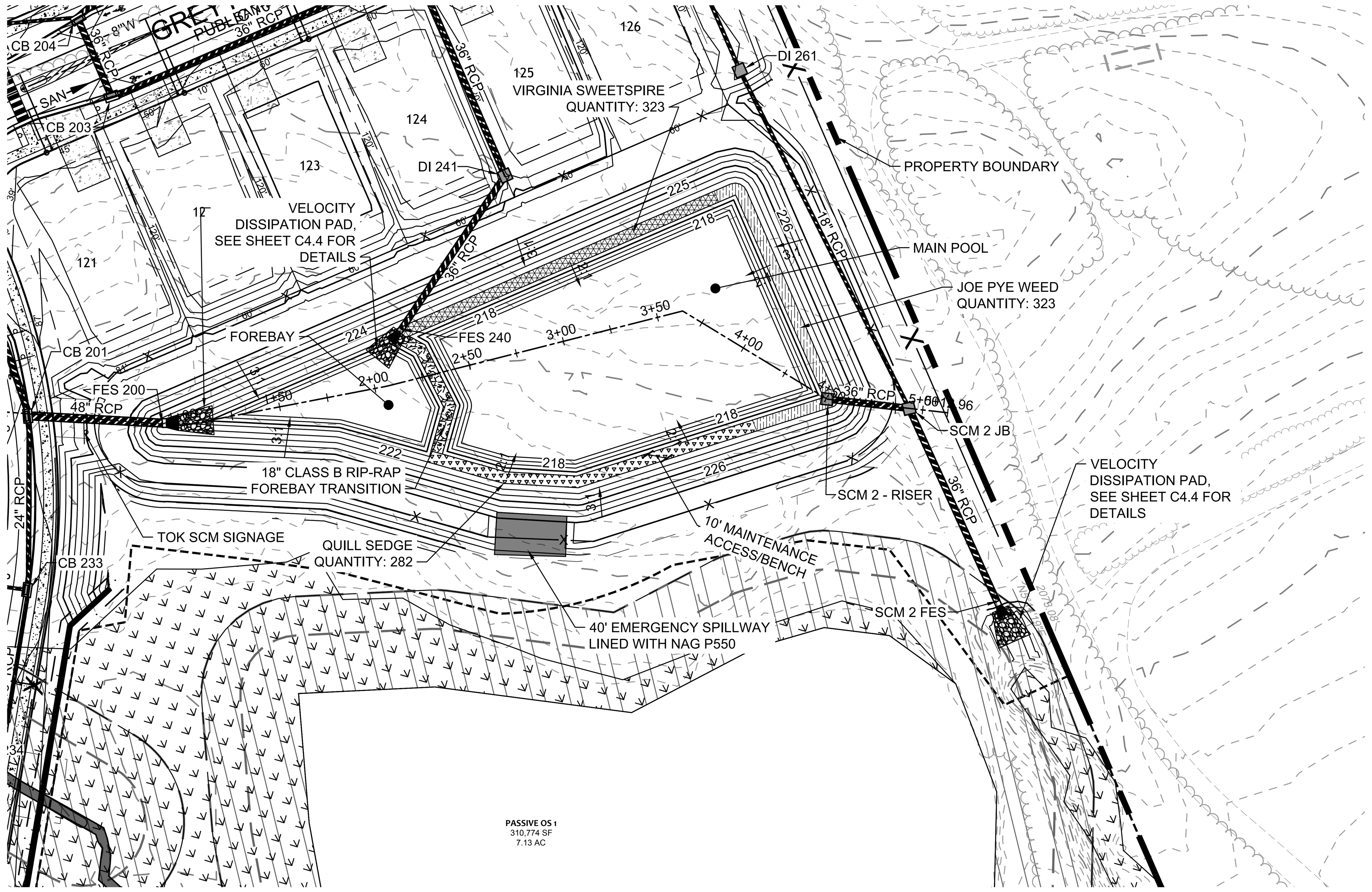
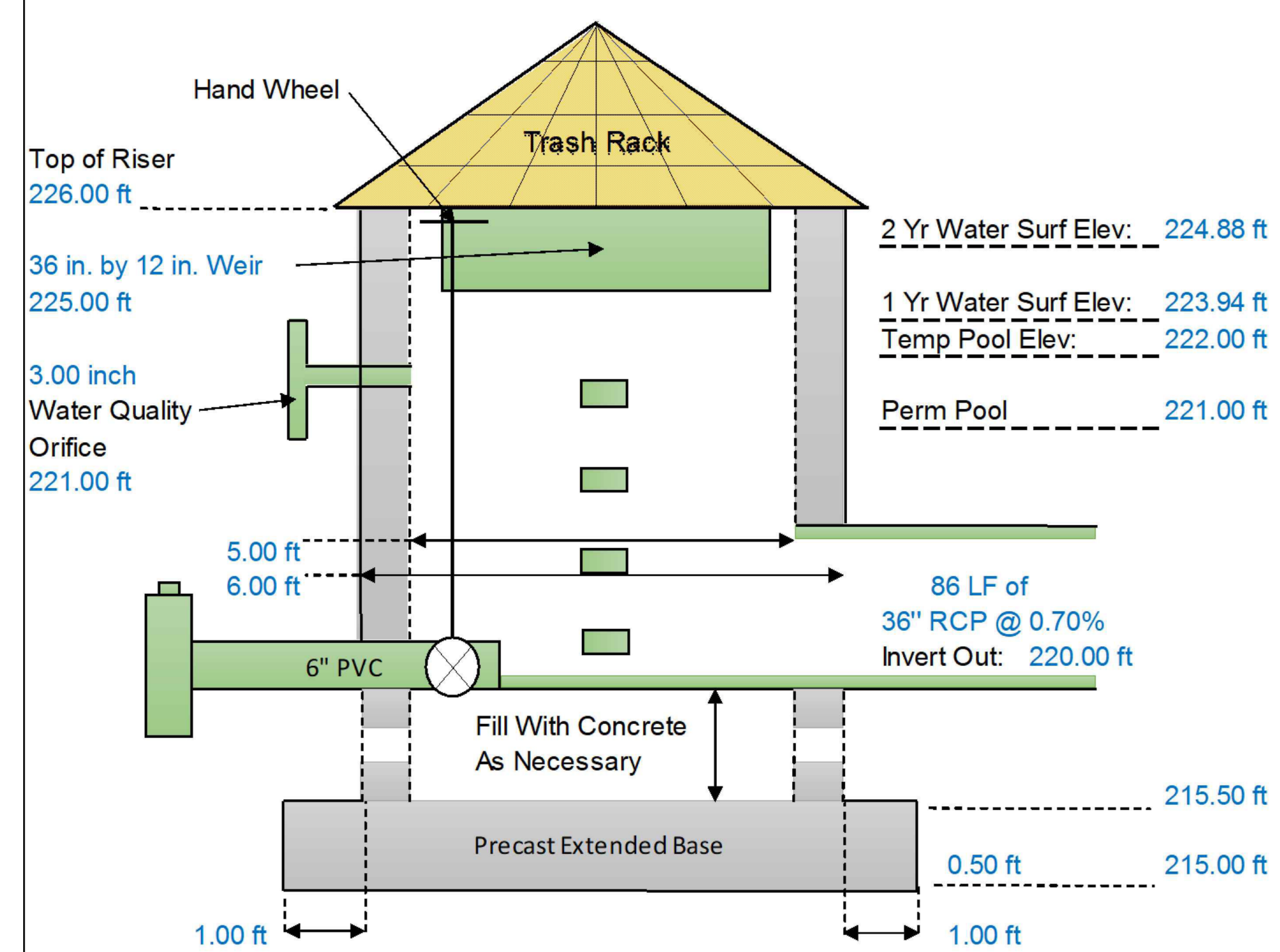


SCM 2 WET POND PLAN VIEW

SCALE: 1" = 50'



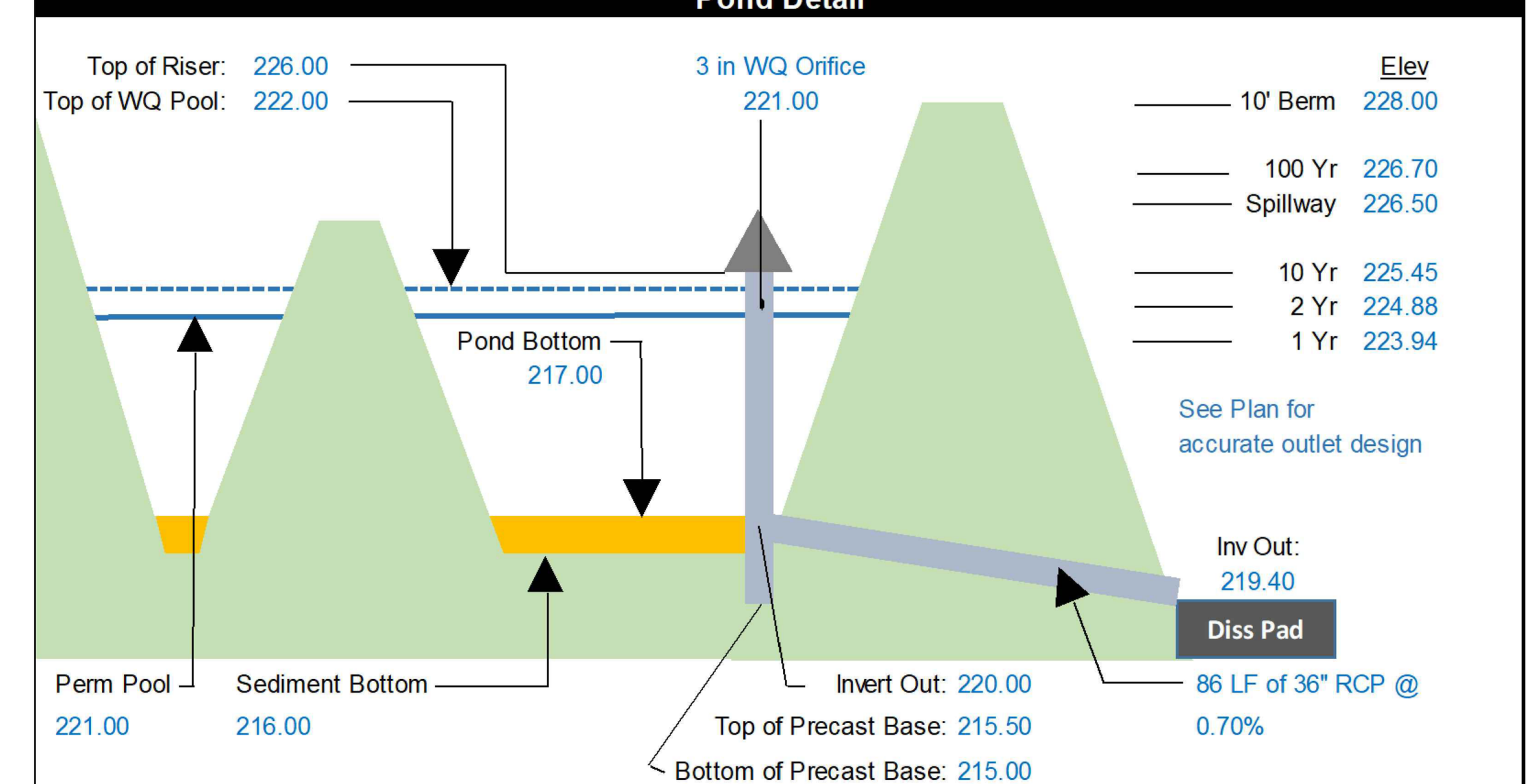
PRECAST CONCRETE RISER

5 ft x 5 ft x 10.5 ft Tall, With a 0.5 ft Thick Precast Extended Base

Pond / Riser Data & Elevations

Pond Type	Wet Pond			
TSS Removal	85%			
Top of Pond / Berm	228.00 ft			
Secondary Spillway Width	40.00 ft			
Bottom of Secondary Spillway	226.50 ft			
Top of Riser	226.00 ft	(at least 1' Above TPE)		
Riser Type / Size	5x5 ft			
Top of Water Quality / Temp Pool Elev	222.00 ft	(1" Runoff)		
Top of Veg. Shelf	222.00 ft			
Permanent Pool Elevation (Normal Pool)	221.00 ft			
Water Quality Orifice Elevation & Size	221.00 ft		3.00 in	
Secondary Orifice Elevation & Size (Rise & Span)	NA ft		0.00 inch	0.00 inch
			^ Rise	^ Span
Weir Elevation, Width, & Number of Sides	225.00 ft		36.00 inch	3
Bottom of Veg. Shelf	221.00 ft		^ Width	^ # of Sides
Top of Sediment Storage / Pond Bottom	217.00 ft			
Bottom of Sediment Storage	216.00 ft	(Min 1 ft)		
Invert Out of Riser	220.00 ft			
Outlet Pipe Size	36.00 in	Diameter RCP		
Outlet Pipe Length & Slope	86.00 ft		0.70 %	
Downstream Outlet Elevation	219.40 ft			
1 Yr Water Surface Elev / Peak Flow (CFS)	223.94 ft		0.40 CFS	
2 Yr Water Surface Elev Peak Flow (CFS)	224.88 ft		0.46 CFS	
10 Yr Water Surface Elev Peak Flow (CFS)	225.45 ft		9.72 CFS	
100 Yr Water Surface Elev Peak Flow (CFS)	226.70 ft		84.10 CFS	

Pond Detail



Anti-Buoyancy Calculations for the Riser Structure

Riser Dimensions		Weight of Structure		Displaced Volume	
Outside Width	6.00 ft	Walls =	17,325 LBS	V = LxWx(HT) = C.F.	
Inside Width	5.00 ft	Base =	4,800 LBS		
Outside Length	6.00 ft	FILL =	16,875 lbs	Displaced Water =	
Inside Length	5.00 ft			C.F. * 62.4 PCF = LBS	
Height	10.50 ft	Outlet Pipe =	530 LBS		
Base Thick' (ft)	0.50 ft	WQ Orifice =	4 LBS	Add 15% Factor of Safety	
Wall Thick' (ft)	0.50 ft				
Ext Base (ft)	1.00 ft	Weir #1 =	0 LBS	V =	378 C.F.
Areas removed from Riser		Weir #2 =	675 LBS	Disp. Water =	23,587 LBS
Outlet Pipe	7.07 ft	Weir #3 =	0 LBS	15% F.S. =	3,538 LBS
WQ Orifice	0.05 ft	Weir #4 =	0 LBS		
Orifice #1	0.00 ft	Other #1 =	0 LBS	Safety Factor	1.39
Orifice #2	9.00 ft				
Orifice #3	0.00 ft	Weight =	37,791 LBS	Weight =	27,125 LBS
Orifice #4	0.00 ft	Precast Concrete Riser Structure to be 5 ft x 5 ft x 10.5 ft Tall, With a 0.5 ft Thick Precast Extended Base			
Other	0.00 ft				

Planting Summary Requirements

Dam / Berm				Non-Clumping Turf Grass		
6' Shelf Length	646	Area of Shelf = 3876 SF		(50 Plants per 200 SF of Area)		
Quantity	Type	Root	Common Name	Scientific Name	Planting Size	Notes
323	Herbaceous	Container	Quill Sedge	Cerex Tenera	4" Pot	24"-36" OC
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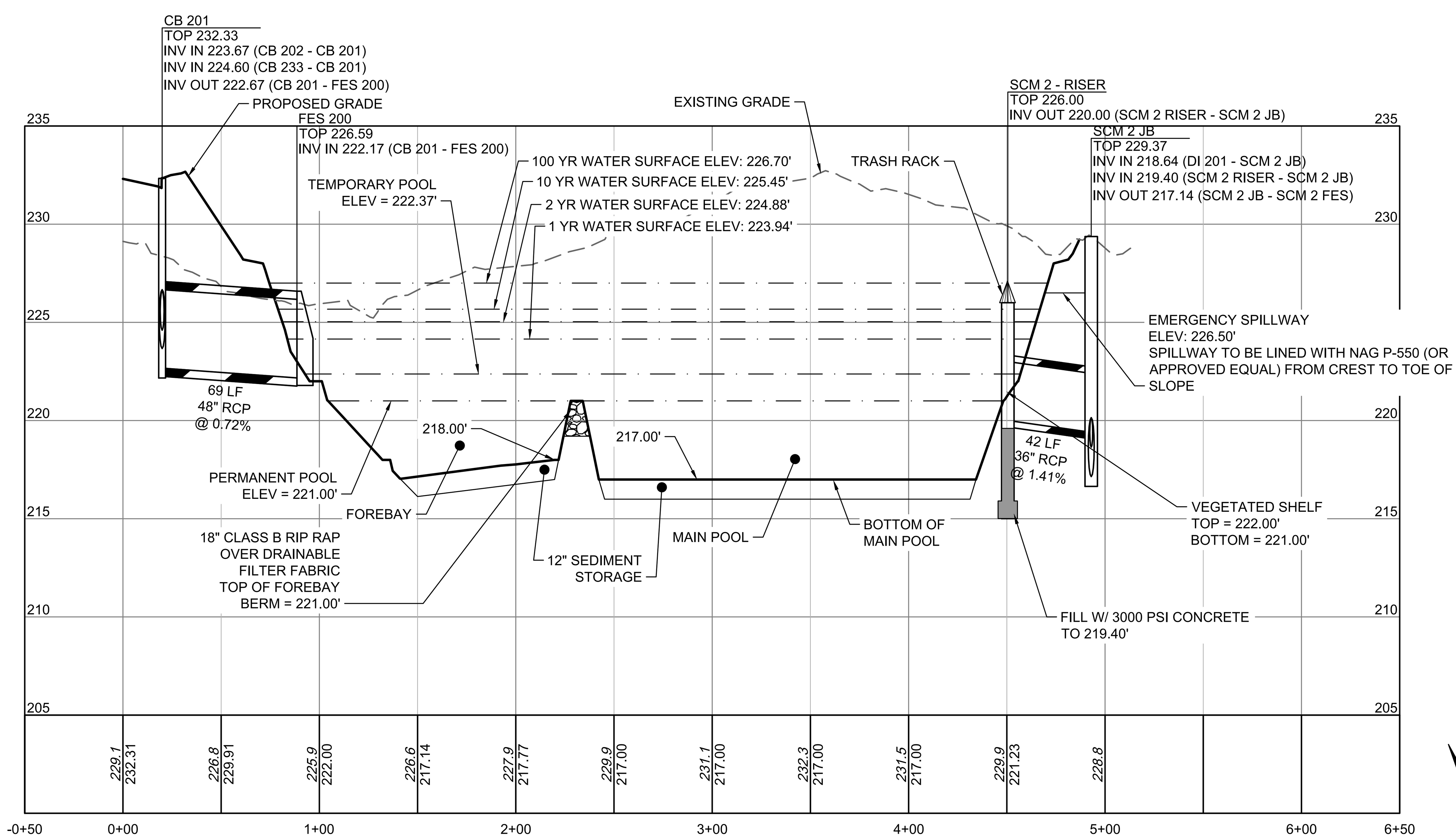

SCM 2 WET POND PROFILE

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

ESC Approval
04/01/2026 2:36:42 PM

PROFILE SCALE 0 – 50 (5)

NAD 83

SCALE 1"=50' 0 50' 100'

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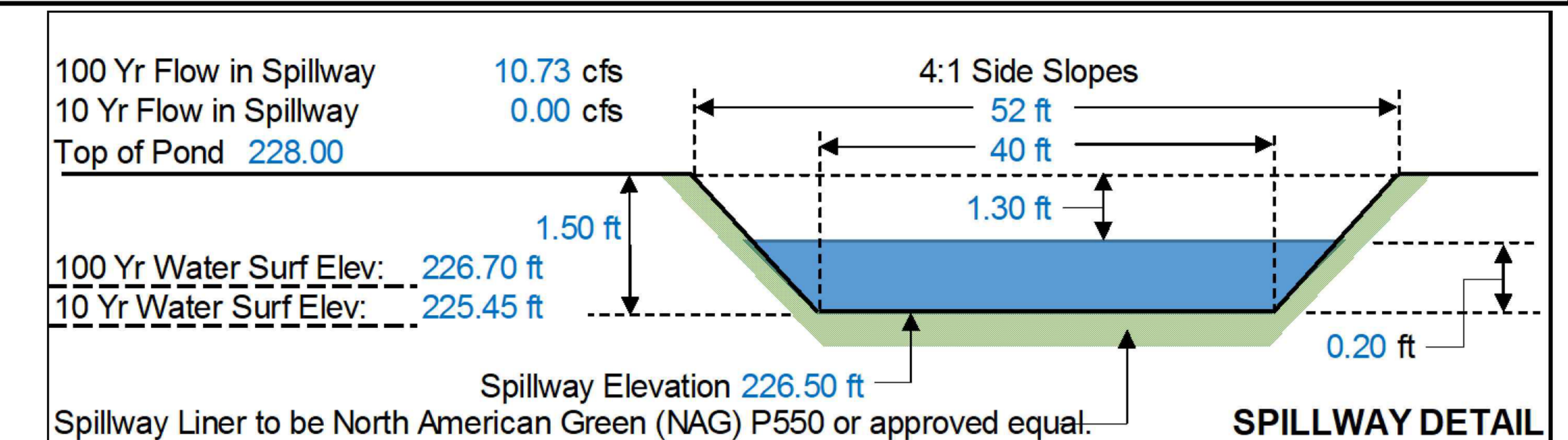

SPILLWAY DETAIL

PLANTING LEGEND

- VIRGINIA SWEETSPIRE (VS)
- QUILL SEDGE (QS)
- JOE PYE WEED (JP)

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Know what's below. Call before you dig. (811)

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City of Raleigh
Public Utilities Department Permit # W-4142

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Sewer Collection / Extension System
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City of Raleigh
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NORTH CAROLINA PROFESSIONAL SEAL 051879 ENGINEER TYLER JEFFREY CROSS 2/9/2026

THIS DRAWING PREPARED AT THE **RALEIGH OFFICE**
5410 Trinity Road, Suite 102 | Raleigh, NC 27607
TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION | DATE

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

HAVEN AT GRIFFITH MEADOWS
KNIGHTDALE - ST. MATTHEWS TOWNSHIP - WAKE COUNTY - NORTH CAROLINA
SCM 2 PLAN & PROFILE

DATE	10/31/2025
DRAWN BY	331
DESIGNED BY	331
CHECKED BY	T. CROSS
SCALE	H: 1" = 50' V: 1" = 5'
JOB NO.	51557
SHEET NO.	C7.2

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\\timmons.com\tgfs\300\331\51557-poole_rd_martin\DWG\Sheet\CD\51557-331-C7.2-POND.dwg | Plotted on 2/6/2026 11:31 AM | by Chris Parrish

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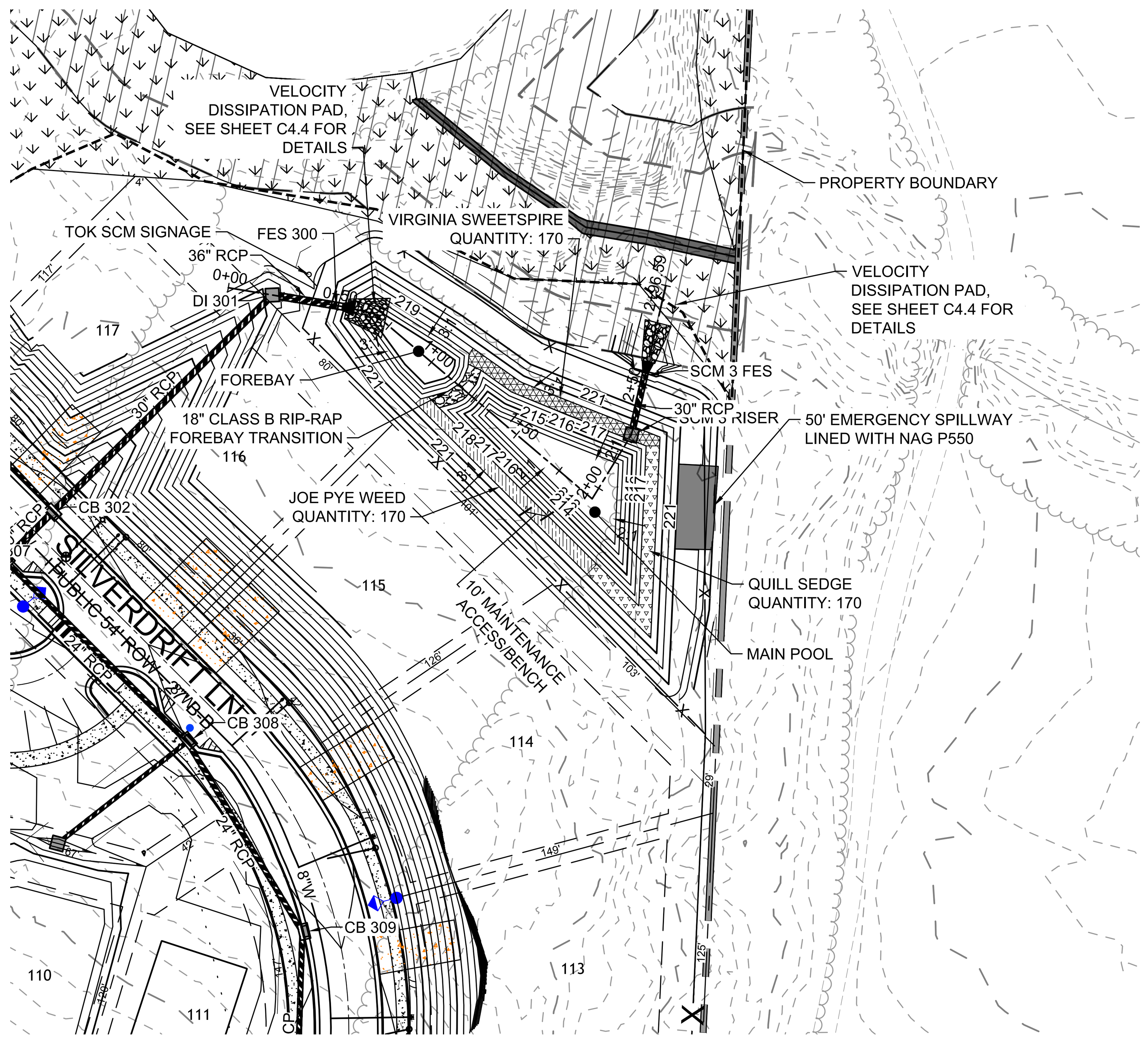
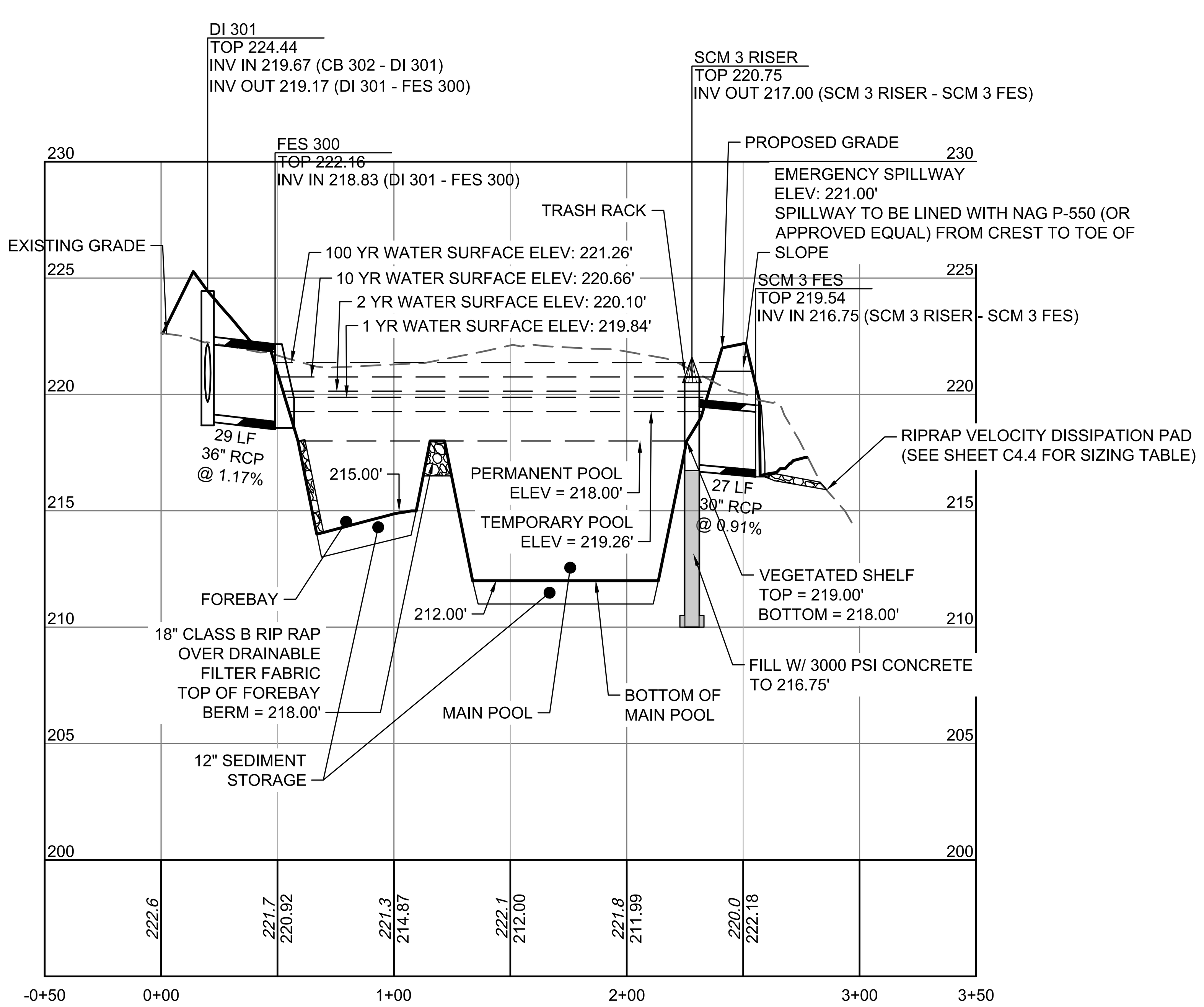


SCM 3 WET POND PLAN VIEW

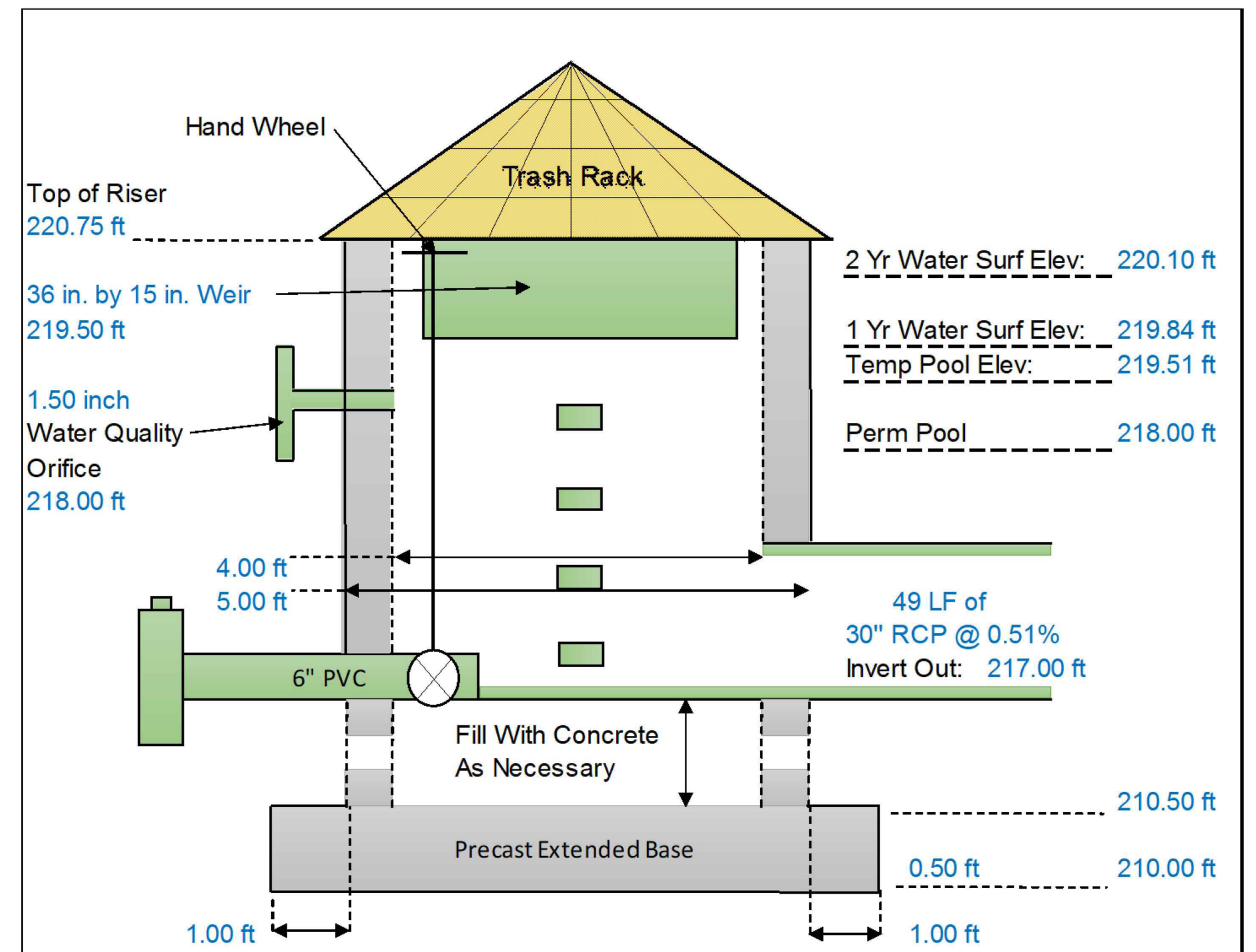
SCALE: 1" = 50'



SCM 3 WET POND PROFILE

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

ESC Approval
04/01/2026 2:36:48 PM



PRECAST CONCRETE RISER

4 ft x 4 ft x 10.25 ft Tall, With a 0.5 ft Thick Precast Extended Base

SCM INSPECTIONS SEQUENCE - SCM INSTALLATION

WHEN SCHEDULING INSPECTIONS, PLEASE CALL THE PUBLIC WORKS ADMINISTRATION ASSISTANT AT (919) 217-2250.

PLEASE NOTE THE FOLLOWING PERSONNEL MUST BE PRESENT AT ALL INSPECTIONS:
1) SITE SUPERVISOR
2) GEOTECH
3) AS-BUILT CERTIFYING ENGINEER OR SOMEONE UNDER THEIR SUPERVISION

THE FOLLOWING ITEMS MUST BE INSPECTED BY TOK STAFF DURING THE INSTALLATION OF ANY SCM WITH DAM
- KEY TRENCH EXCAVATION
- PRINCIPAL SPILLWAY PIPE AND ASSOCIATED COMPONENTS:
  -- CONCRETE CRADLE
  -- ANTI-SEEP COLLAR
  -- SEEPAGE DIAPHRAGM
  -- OUTLET STRUCTURE
  -- ANTI-FLOTATION BALLAST
  -- ANY SITE-CONSTRUCTED REINFORCED CONCRETE STRUCTURES

THE FOLLOWING ITEMS MUST BE INSPECTED BY TOK STAFF DURING THE INSTALLATION OF ANY SAND FILTERS OR BIORETENTION DEVICES:
- SUBGRADE OR CONSTRUCTED FOUNDATION
- OUTLET OR RISER IN COMBINATION WITH CONNECTING UNDERDRAINS
- FILTER MEDIA
- DATE ITEMS ON PREVIOUS LIST IF APPLICABLE

GEOTECHNICAL TESTING AND CERTIFICATION
ALL REPORTS ARE TO BE SUBMITTED WITHIN 30-DAYS OF DAM COMPLETION
REQUIRED GEOTECHNICAL RECORDS INCLUDE:
- DAM EMBANKMENT MATERIAL COMPOSITION AND DENSITY TESTING WITH A PASSING COMPACTION OF 95% OR GREATER
- MAP THAT LABELS ALL POINTS WHERE THE DAM AND DAM FOUNDATION AREAS WERE TESTED
- DIGITAL PHOTOS SHOWING THE DAM AREAS, THE RISER, THE PRINCIPLE SPILLWAY PIPE THE CONCRETE CRADLE, THE SEEPAGE DIAPHRAGM RELIEF, DRAINS, ETC., BEING INSTALLED.

SCM INSPECTION NOTE:

THE TOWN OF KNIGHTDALE REQUIRES THAT ALL INFRASTRUCTURE INSTILLATION BE OBSERVED BY SOMEONE OPERATING UNDER THE DESIGN ENGINEERS AUTHORITY, A LICENSED GEOTECH, AND A REPRESENTATIVE FROM THE TOWN OF KNIGHTDALE. REFERENCE THE DETAILED SCM INSPECTIONS SEQUENCE.

WHEN PREPARING FOR THESE INSTALLATIONS, SCHEDULE AN INSPECTION BY CALLING THE PUBLIC WORKS OFFICE AT (919) 217-2250.

SCM SEQUENCE - PLANTING NOTES:

THE DAM STRUCTURE, INCLUDING FRONT AND BACK EMBANKMENT SLOPES, OF THE POND SHALL BE VEGETATED WITH NON-CLUMPING TURF GRASS OR SOD. (CENTIPEDE/HYBRID-BERMUDA) 90% GERMINATION OF NON-CLUMPING TURF WILL BE REQUIRED PRIOR TO FINAL CERTIFICATION FORM THE TOWN.

THE VEGETATED SHELF SHALL BE PLANTED WITH A MINIMUM OF THREE DIVERSE SPECIES OF HERBACEOUS, NATIVE VEGETATION AT A MINIMUM DENSITY OF 50 PLANTS PER 200 FEET OF SHELF AREA.

CONTRACTOR TO WORK WITH SOILS SCIENTIST TO ENSURE SOILS ARE ADEQUATE TO SUPPORT PROPER ESTABLISHMENT AND GROWTH OF THE AQUATIC PLANTINGS. CONTRACTOR TO AMEND SOILS AND INSTALL SOILS IN PLANT, SHRUB, AND TREE AREAS PER DETAILS, SOIL SPECIFICATIONS. NCDENR SPECIFICATION, AND SOIL SCIENTIST RECOMMENDATIONS.

ALL DISTURBED AREAS AROUND THE OUTSIDE OF THE DEVICE SHALL BE SEEDED WITH A LAWN AREA SEED MIX (PER SEEDING SPECIFICATIONS) NATIVE GRASSES, LEGUMES, CLOVERS, AND WILDFLOWERS.

IF THE DEVICE WAS USED DURING CONSTRUCTION AS A SEDIMENT BASIN OR TRAP, THE BASIN MUST BE CLEANED OUT, GRADED, APPROPRIATE AREAS COVERED WITH 4" OF TOPSOIL AS SPECIFIED IN NOTE #2 ABOVE, AND VEGETATED WITHIN 14 DAYS OF THE COMPLETION OF CONSTRUCTION.

CONTRACTOR SHALL WATER ALL VEGETATION AND GRASS ON A WEEKLY BASIS AS NEEDED TO ENSURE GRASS AND PLANT SURVIVAL UNTIL AFTER THE SCM IS CERTIFIED AND ACCEPTED BY THE TOWN.

PLANTING LEGEND

- VIRGINIA SWEETSPIRE (VS)
- QUILL SEDGE (QS)
- JOE PYE WEED (JP)

PROFILE SCALE (0, 5; 0, 50)

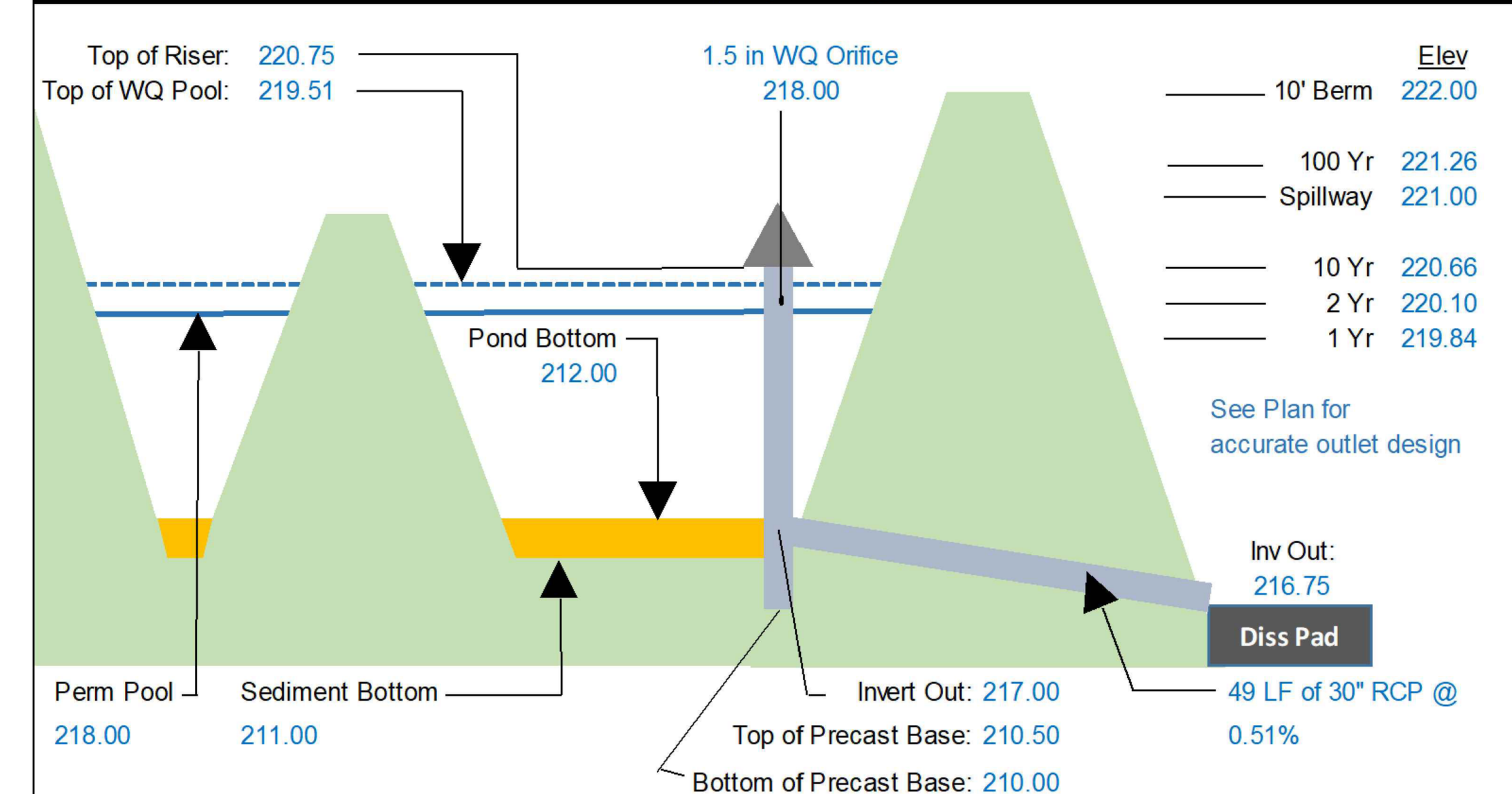
NAD 83

SCALE 1"=50' (0, 50', 100')

Pond / Riser Data & Elevations

Pond Type	Wet Pond			
TSS Removal	85%			
Top of Pond / Berm	222.00 ft			
Secondary Spillway Width	50.00 ft			
Bottom of Secondary Spillway	221.00 ft			
Top of Riser	220.75 ft	(at least 1' Above TPE)		
Riser Type / Size	4x4 ft			
Top of Water Quality / Temp Pool Elev	219.51 ft	(1" Runoff)		
Top of Veg. Shelf	219.00 ft			
Permanent Pool Elevation (Normal Pool)	218.00 ft			
Water Quality Orifice Elevation & Size	218.00 ft			1.50 in
Secondary Orifice Elevation & Size (Rise & Span)	NA ft		0.00 inch	0.00 inch
			^ Rise	^ Span
Weir Elevation, Width, & Number of Sides	219.50 ft		36.00 inch	3
Bottom of Veg. Shelf	218.00 ft		^ Width	^ # of Sides
Top of Sediment Storage / Pond Bottom	212.00 ft			
Bottom of Sediment Storage	211.00 ft	(Min 1 ft)		
Invert Out of Riser	217.00 ft			
Outlet Pipe Size	30.00 in	Diameter RCP		
Outlet Pipe Length & Slope	49.00 ft			0.51 %
Downstream Outlet Elevation	216.75 ft			
1 Yr Water Surface Elev / Peak Flow (CFS)	219.84 ft			6.07 CFS
2 Yr Water Surface Elev Peak Flow (CFS)	220.10 ft			14.07 CFS
10 Yr Water Surface Elev Peak Flow (CFS)	220.66 ft			28.19 CFS
100 Yr Water Surface Elev Peak Flow (CFS)	221.26 ft			56.23 CFS

Pond Detail

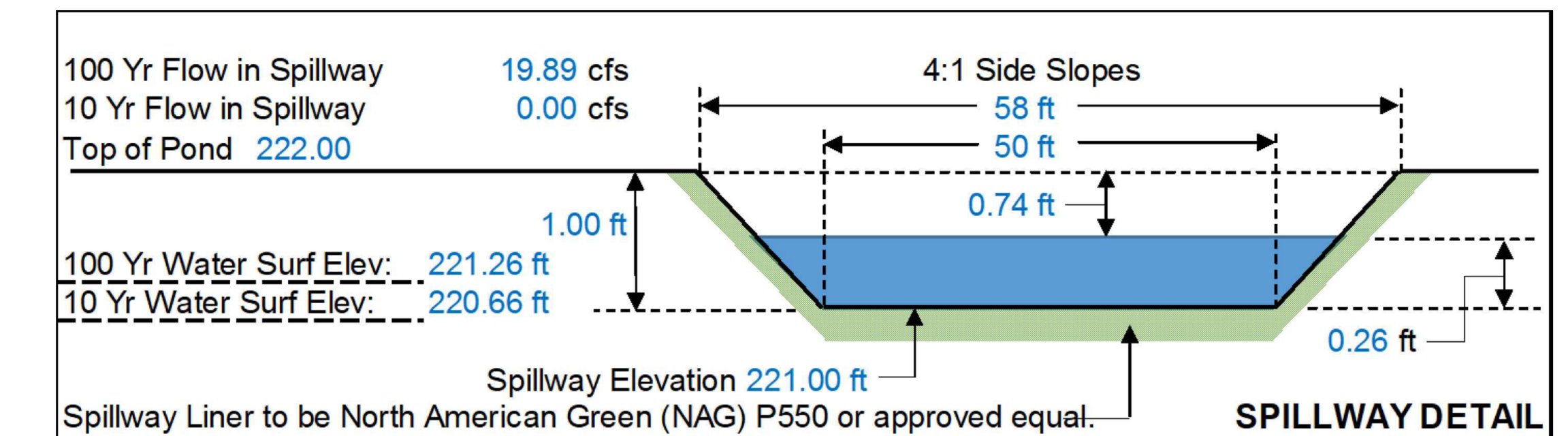


Anti-Buoyancy Calculations for the Riser Structure

Riser Dimensions		Weight of Structure		Displaced Volume	
Outside Width	5.00 ft	Walls =	13,838 LBS	V = LxWx(HT) = C.F.	
Inside Width	4.00 ft	Base =	3,675 LBS		
Outside Length	5.00 ft	FILL =	15,600 lbs	Displaced Water =	
Inside Length	4.00 ft			C.F. * 62.4 PCF = LBS	
Height	10.25 ft	Outlet Pipe =	368 LBS		
Base Thick' (ft)	0.50 ft	WQ Orifice =	1 LBS	Add 15% Factor of Safety	
Wall Thick' (ft)	0.50 ft				
Ext Base (ft)	1.00 ft	Weir #1 =	0 LBS	V =	256 C.F.
Areas removed from Riser		Weir #2 =	843.75 LBS	Disp. Water =	15,990 LBS
Outlet Pipe	4.91 ft	Weir #3 =	0 LBS	15% F.S. =	2,399 LBS
WQ Orifice	0.01 ft	Weir #4 =	0 LBS		
Orifice #1	0.00 ft	Other #1 =	0 LBS	Safety Factor	1.73
Orifice #2	11.25 ft				
Orifice #3	0.00 ft	Weight =	31,900 LBS	Weight =	18,389 LBS
Orifice #4	0.00 ft	Precast Concrete Riser Structure to be 4 ft x 4 ft x 10.25 ft Tall, With a 0.5 ft Thick Precast Extended Base			
Other	0.00 ft				

Planting Summary Requirements

Quantity	Type	Root	Common Name	Scientific Name	Planting Size	Notes
Dam / Berm			Non-Clumping Turf Grass			
6' Shelf Length 339	Area of Shelf = 2034 SF		(50 Plants per 200 SF of Area)			
170	Herbaceous	Container	Quill Sedge	Cerex Tenera	4" Pot	24"-36" OC
170	Herbaceous	Container	Virginia Sweetspire	Itea Virginica	4" Pot	24"-36" OC
170	Herbaceous	Container	Joe Pye Weed	Eupat' Fistulosus	4" Pot	24"-36" OC



SPILLWAY DETAIL

TOWN CERTIFICATION

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

BY: ______________________ DATE: __________
TOWN ENGINEER

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

BY: ______________________ DATE: __________
LAND USE 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-4142

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-5503

811 Know what's below. Call before you dig.

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 051879 TYLER JEFFREY CROSS
2/9/2026

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