STONERIVER - PHASES 3-4

CONSTRUCTION DOCUMENTS

PROJECT #: S-6-16

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

Sheet List Table

Sheet Number	Sheet Title
C0.0	COVER SHEET
C1.0	EXISTING CONDITIONS
C1.1	ENVIRONMENTAL SURVEY
C2.0	OVERALL SITE PLAN
C2.1	DETAILED SITE PLAN - SHEET 1 OF 2
C2.2	DETAILED SITE PLAN - SHEET 2 OF 2
C2.3	DETAILED SITE PLAN - SHEET 3 OF 4
C2.4	DETAILED SITE PLAN - SHEET 4 OF 4
C2.5	SIGNAGE AND MARKING PLAN - SHEET 1 OF 4
C2.6	SIGNAGE AND MARKING PLAN - SHEET 2 OF 4
C2.7	SIGNAGE AND MARKING PLAN - SHEET 3 OF 4
C2.8	SIGNAGE AND MARKING PLAN - SHEET 4 OF 4
C3.0	OVERALL UTILITY PLAN
C3.1	DETAILED UTILITY PLAN - SHEET 1 OF 4
C3.2	DETAILED UTILITY PLAN - SHEET 2 OF 4
C3.3	DETAILED UTILITY PLAN - SHEET 3 OF 4
C3.4	DETAILED UTILITY PLAN - SHEET 4 OF 4
C3.5	SANITARY SEWER SCHEDULE
C4.0	OVERALL GRADING PLAN
C4.1	GRADING AND DRAINAGE PLAN - SHEET 1 OF 2
C4.2	GRADING AND DRAINAGE PLAN - SHEET 2 OF 2
C4.3	GRADING AND DRAINAGE PLAN - SHEET 3 OF 4
C4.4	GRADING AND DRAINAGE PLAN - SHEET 4 OF 4
C4.5	STORM SEWER SCHEDULE
C5.1	NIGHTHAWK RIDGE ROAD PLAN & PROFILE
C5.2	NIGHTHAWK RIDGE ROAD PLAN & PROFILE
C5.3	NIGHTHAWK RIDGE ROAD PLAN & PROFILE
C5.4	GOLDFINCH PERCH LANE PLAN & PROFILE
C5.5	GOLDFINCH PERCH LANE PLAN & PROFILE
C5.6	GOLDFINCH PERCH LANE PLAN & PROFILE
C5.7	GOLDFINCH PERCH LANE PLAN & PROFILE
C5.8	GOLDFINCH PERCH LANE PLAN & PROFILE
C5.9	JAY ROAD PLAN & PROFILE
C5.10	SISKIN ROAD PLAN & PROFILE
C5.11	BUNTING HOUSE & CROSSBILL DRIVE PLAN & PROFILE
C5.12	KINGLET HOUSE ROAD & WADER CIRCLE PLAN & PROFILE
C5.13	HAUSER LAKE ROAD PLAN & PROFILE
C5.14	ALLEY A PLAN & PROFILE
C5.15	ALLEY B PLAN & PROFILE
C5.16	ALLEY C PLAN & PROFILE
C5.17	SANITARY SEWER OUTFALL
C5.18	STORM DRAINAGE OUTFALL PROFILES
C5.19	STORM DRAINAGE OUTFALL PROFILES
C6.1	SCM 1 PLAN & PROFILE
C6.2	SCM 2 PLAN & PROFILE
C6.3	SCM 3 PLAN & PROFILE
C6.4	SCM DETAILS
C6.5	SCM PLANTING PLAN
C7.1	SITE DETAILS
C7.2	SITE DETAILS
C7.3	WATER AND SEWER DETAILS
C7.4	WATER AND SEWER DETAILS
C7.5	STORM DETAILS
C8.0	OVERALL EROSION AND SEDIMENT CONTROL PLAN STAGE 1
C8.1	EROSION AND SEDIMENT CONTROL PLAN STAGE 1 SHEET 1 OF 4
C8.2	EROSION AND SEDIMENT CONTROL PLAN STAGE 1 SHEET 2 OF 4
C8.3	EROSION AND SEDIMENT CONTROL PLAN STAGE 1 SHEET 3 OF 4
C8.4	EROSION AND SEDIMENT CONTROL PLAN STAGE 1 SHEET 4 OF 4
C8.5	OVERALL EROSION AND SEDIMENT CONTROL PLAN STAGE 2
C8.6	EROSION AND SEDIMENT CONTROL PLAN STAGE 2 SHEET 1 OF 4
C8.7	EROSION AND SEDIMENT CONTROL PLAN STAGE 2 SHEET 2 OF 4
C8.8	EROSION AND SEDIMENT CONTROL PLAN STAGE 2 SHEET 3 OF 4
C8.9	EROSION AND SEDIMENT CONTROL PLAN STAGE 2 SHEET 4 OF 4
C8.10	EROSION AND SEDIMENT CONTROL DETAILS
C8.11	EROSION AND SEDIMENT CONTROL DETAILS
C8.12	EROSION AND SEDIMENT CONTROL NOTES
C9.0	OVERALL LANDSPACE & LIGHTING PLAN
C9.1	DETAILED LANDSCAPE & LIGHTING PLAN - SHEET 1 OF 4
C9.2	DETAILED LANDSCAPE & LIGHTING PLAN - SHEET 2 OF 4
C9.3	DETAILED LANDSCAPE & LIGHTING PLAN - SHEET 3 OF 4
C9.4	DETAILED LANDSCAPE & LIGHTING PLAN - SHEET 4 OF 4
C9.5	LANDSCAPE DETAILS

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

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

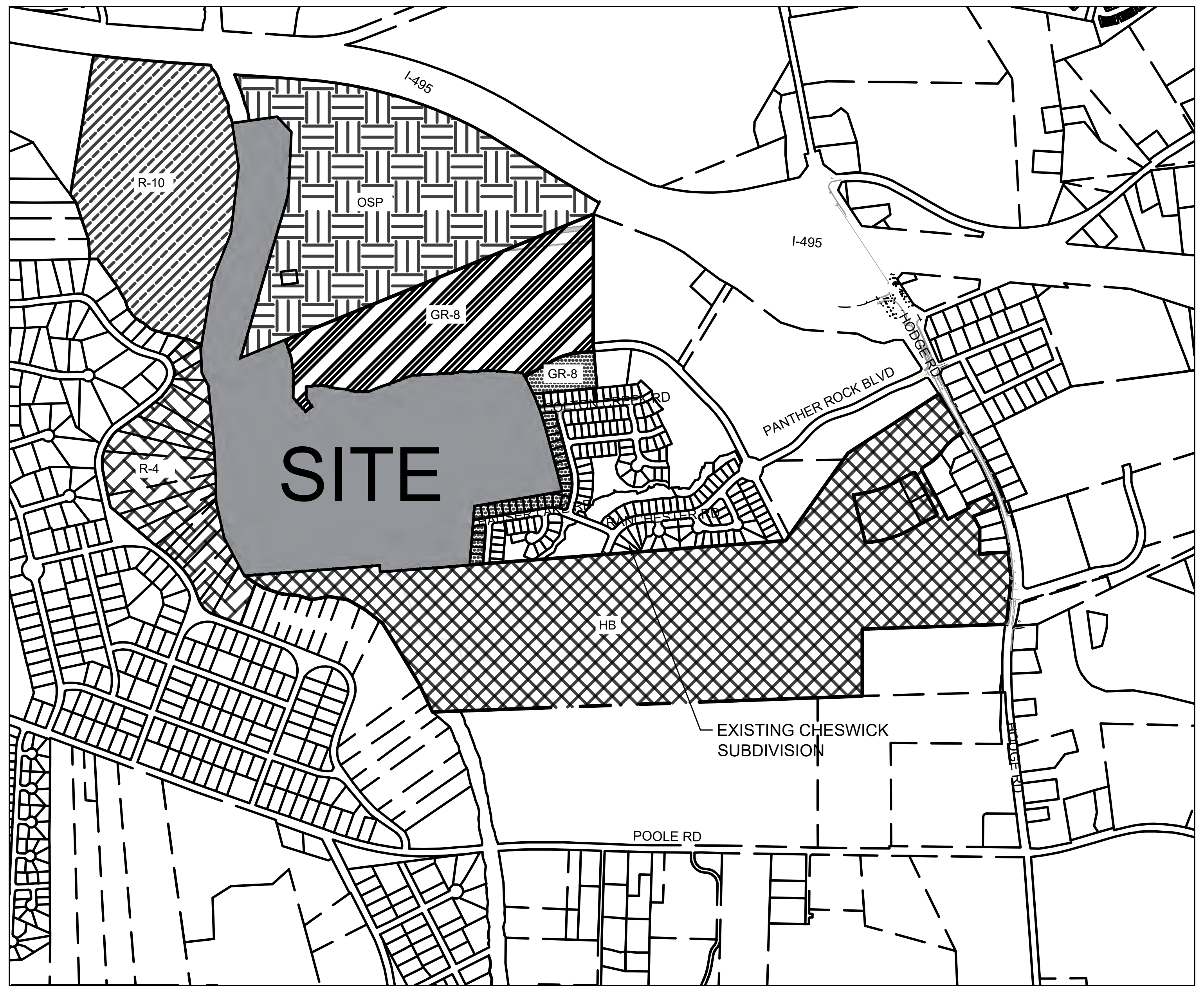
City of Raleigh Development Approval ____________________

Raleigh Water Review Officer

GLOBAL CITY
DEVELOPMENT

ZONING LEGEND

R-4	▨
R-10	▨
OSP	▦
GR-8	▨
UR-12	▒
HB	▦



VICINITY MAP

ZONING CONDITIONS:

Voluntary Applicant Conditions:

1. The development will consist of residential lots not to exceed 4 units per acre or 656 lots.
2. Design Guidelines:

It is the intention of Acraterra Land, LLC to continue the architectural character of the successful Cheswick subdivision. As such, the residential development would adhere to the following design guidelines:

Single Family Detached

- Single-family 2 story homes will have a minimum heated square footage of 2200 sq. ft.
- Single-family 1 or 1.5 story homes will have a minimum heated square footage of 1800 sq. ft.
- All single-family homes with crawl spaces will be wrapped in brick or natural or cultured stone on all sides
- All single-family homes with raised stem wall or raised slab foundations will have a minimum exposure of 18” with brick or stone.
- All single-family homes will have a combination of 2 or more of the following materials on the front facade (not counting foundation): stone, brick, lap siding, cedar shakes or board and batten unless the home is only stone or brick. When 2 materials are used, the materials shall be different, but complementary colors.
- Lap siding, shakes or board and batten on single family homes shall be fiber cement.
- All single-family homes built on 60' lots or wider would have a minimum width of 40' at the front elevation (including porches).
- All single-family homes would have a front porch with a minimum depth of 5'. Front porch posts will be at least 6”x6”.
- Main roof pitches (excluding porches) fronting the street for 2 story homes will be at least 8: 12
- Main roof pitches (excluding porches) fronting the street for 1 and 1.5 story homes will be at least 6:12
- There will be a 12” overhang on every gable end
- All garage doors will have decorative lights
- Garages will not protrude more than 6' from the front porch or stoop
- At least 50% of the homes shall have a rear porch or deck at least I 0'x 10'. The remaining homes shall have a patio at least l0'xl0'.
- Side Facade articulations: For every 20' (or fraction) of continuous side elevations (calculated on a per floor basis), there shall be 1 window or door added to the side elevation. For example, a 55 first floor depth shall have 3 windows on the first floor. If the second floor is 35', there shall be 2 windows on the second floor. Any siding break on the side of the home such as a fireplace, side porch, wall offsets could be used as an alternate to windows.

Townhomes

A. Description: The Townhouse Building is at least a 1,250-square foot building with at least 50% greater than 1,500 square feet, with 2 or more units (up to a max. of 6 units) on individual lots that are located side-by-side and preferably accessed from a rear lane or alley. As a result, the Townhouse typically only has 1 yard in the rear, although variations may include a small front setback to provide for landscaping, while the bulk, scale, and architectural design of the building(s) reflects that of the surrounding neighborhood or planned development, as may apply.

B. Specific Requirements:

1.Residential Vehicular Access

a. Alley/Rear Lane Access: A townhouse should be access by a rear lane or alley to minimize pedestrian and vehicle conflicts, maximize on-street short term guest parking, and provide more landscaping along the street scape

2.Unit Differentiation

A single townhouse unit shall be differentiated from adjacent units along the common wall from foundation to roof ridge to be architecturally distinguishable from each other. Specifically, the following standards must be met:

a. Roof line breaks must be provided where each unit's roof appears to stand alone;

b. Gables may not span between two units;

c. Each unit shall have at least two materials (brick, stone, stucco, clapboard, scales, shingles, board, and batten, etc.) on the primary facade, with each material being of different but complimentary color than the material on the adjacent unit.

d. Rear yards shall provide at least one of the following:

i. Architectural wall/fencing matching the structure.

ii. Storage room that divides the units creating a courtyard like setting.

iii. Shrubs extending out delineating each rear yard.

3.Unit Design Details: All Townhouse Buildings shall provide detailed design along all unit facades visible from a public right-of-way. Detailed design shall be provided by using at least one (1) of the architectural features from each of the following three (3) feature categories on all facades as appropriate for the proposed architectural style (may vary features on rear/side/front elevations):

a. Entrance (primary facade only):

i. Porch Pillars (6” min width)

ii. Sidelights)

iii. Decorative Door Surround (6” min width) with Pediment or Crown

b. Window Treatment:

i. Decorative Window Surround (4” min width) with Crown

ii. Shutters with Fasteners

iii. Window Box Planters

c. Roof Line:

i. Dormer/Gable

ii. Bracketed Eaves

iii. Decorative cornice or roof line (flat roofs only)

4.Foundations

a. Material: The crawlspace of buildings shall be enclosed with brick, stone, or stucco. Slabs' shall be covered with brick or stone. Areas under porches may be enclosed with lattice.

b. Landscaping: At least 60% of the length of any foundation wall visible from the right-of-way must be landscaped with foundation plantings.

5.Wall Materials: Townhouse Building walls shall be wood clapboard, cementious fiber board, wood shingle, wood drop siding, wood board and batten, brick, stone, or stucco. If not entirely masonry, Townhouse Building front facades shall have at least two (2) siding textures with the heavier material (i.e. stone, brick) placed below the lighter material (i.e. siding, shakes) to give the sense of support and grounding, (brick, stone, stucco, clapboard, scales, shingles, board, and batten, etc.) must change between units (applicable to each floor); and

6.Roofs

a. Materials: Townhouse Building roofs shall be clad in wood shingles, standing seam metal, slate, copper, or asphalt shingles.

b. Pitch: Main roofs on residential buildings shall be symmetrical gables or hips with a pitch between 6: 12 and 12:12. Monopitch (shed) roofs are allowed only if they are attached to the wall of the main building. No monopitch roof shall be less than 3: 12.

7.Administrative Approval of Minor Variances, The Staff may approve minor variances to the Specific Requirements listed above provided that such minor variance meets the overall intent of these Townhouse Standards and conforms to the Comprehensive Plan and other adopted plans of the Town.

3.Ability to grade the site outside of the proposed right-of-way (mass grading). A single phase of the development shall not encompass more than 50 acres of grading unless approved by the Town's Development Services Department.

4.Provide a 10' Type A buffer adjacent to the existing homes in Cheswick that would about the StoneRiver development.

5.The StoneRiver entrance monument will be placed near the leg of the roundabout of Hardin Hill Ln. & Panther Rock Blvd. (PINs 1743-03-7192, 1743-03-4436, 174303-9361) and outside of the public right-of-way.

6.The Cheswick entrance monument will be relocated from Panther Rock Blvd. and Hodge Rd. to a parcel on the corner of Ranchester Rd. & Panther Rock Blvd. (PIN 1743-02-9924). The Cheswick entrance monument shall be relocated before the HOA is turned over to the residents.

7.Ability to locate street graphics on light poles on Panther Rock Blvd., Hardin Hill Ln. and new 4th leg of the roundabout

SITE DATA

OWNERS/SUBDIVIDER/DEVELOPER:
GLOBAL CITY DEVELOPMENT
ATTN: ADAM ADLER
CASSA KNIGHTDALE II, LLC
801 BRICKELL AVE, STE 2360
MIAMI, FL 33131-4943
PHONE: 786-577-4113

ENGINEER:
TIMMONS GROUP
MIKE ZACCARDO, PE
5410 TRINITY ROAD, STE. 102
RALEIGH, NC 27607
PHONE: 919-532-3281

PIN = 1733-73-7297
DB = 17614 PG = 1463

FIRM MAP# = 3720173300J, 3720174300J

TOTAL EXISTING TRACT ACREAGE = 112.93 acres
PROPOSED RIGHT OF WAY DEDICATION = 572,224 SF (13.13 AC)

ZONING = GR-8 PRD (GENERAL RESIDENTIAL)

EXISTING USE:	AGRICULTURE & WOODED
PROPOSED USE:	SINGLE-FAMILY RESIDENTIAL
NON-RESIDENTIAL USE ACREAGE BY PHASE:	PHASE 3 0 AC PHASE 4 1.21 AC
MIXED-USE AND NON-RESIDENTIAL BUILDING AREA BY PHASE:	PHASE 3 0 AC PHASE 4 0 AC
PARCEL ACREAGE BY PHASE AND NUMBER OF PARCELS:	PHASE 3 17.45 AC (119 PARCELS) PHASE 4 19.23 AC (96 PARCELS)

TOTAL LENGTH OF PUBLIC STREET = 9,883 LF
TOTAL LENGTH OF PRIVATE ALLEY = 1,812 LF
TOTAL LENGTH OF CURB AND GUTTER = 22,463 LF
TOTAL LENGTH OF SIDEWALK = 17,980 LF
TOTAL LENGTH OF PUBLIC WATER LINE
6" = 285 LF
8" = 9,182 LF
TOTAL LENGTH OF 8" PVC PUBLIC SEWER LINE = 4,900 LF
TOTAL LENGTH OF 8" SDR26 PUBLIC SEWER LINE = 3,481 LF
TOTAL LENGTH OF PUBLIC STORMWATER LINE
15" RCP = 3,902 LF
18" RCP = 3,255 LF
24" RCP = 2,934 LF
30" RCP = 500 LF
36" RCP = 1,001 LF
42" RCP = 324 LF
15" HDPE = 109 LF
WATER SERVICE STUBS = 215
SEWER SERVICE STUBS = 215
TOTAL WASTEWATER FLOW = 51,600 GPD

TAKEOFFS BY PHASE	PHASE 3
LINEAR FOOTAGE OF PUBLIC STREET:	3,296 LF
LINEAR FOOTAGE OF PUBLIC SIDEWALK:	8,363 LF
LINEAR FOOTAGE OF PUBLIC WATER LINE:	4,201 LF
LINEAR FOOTAGE OF PUBLIC SEWER LINE:	3,184 LF
LINEAR FOOTAGE OF PUBLIC STORMWATER LINE:	5,467 LF
TOTAL WASTEWATER FLOW GENERATED:	28,560GPD
	PHASE 4
LINEAR FOOTAGE OF PUBLIC STREET:	6,587 LF
LINEAR FOOTAGE OF PUBLIC SIDEWALK:	9,617 LF
LINEAR FOOTAGE OF PUBLIC WATER LINE:	5,266 LF
LINEAR FOOTAGE OF PUBLIC SEWER LINE:	5,197 LF
LINEAR FOOTAGE OF PUBLIC STORMWATER LINE:	6,558 LF
TOTAL WASTEWATER FLOW GENERATED:	23,040 GPD

NUMBER OF HOUSING UNITS:	PHASE 3 119 UNITS PHASE 4 96 UNITS

GROSS PROJECT DENSITY (PHASE 3-4): 0.53 AC/LOT

SURVEY NOTE

SURVEY PROVIDED BY TIMMONS GROUP
CERTIFIED BY THOMAS E. TEABO, PLS

VARIANCE CONDITIONS:

1. 9.5(E): Allowing the applicant to exceed the maximum cul-de-sac length for "Street A" on the StoneRiver Master Plan.

   Conditions:

   i. "Street F" must extend southward and connect to "Street A".

   ii. Public access must be provided from "Street A" to the common open space.

2. 9.5(G): Allowing the StoneRiver Master Plan to have a Connectivity Index less than the 1.40 minimum standard.

OVERALL CONNECTIVITY INDEX CALCULATIONS
LINKS: 26
NODES: 16
CONNECTIVITY INDEX: 1.63

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

EROSION AND SEDIMENT CONTROL

APPROVED PLAN
DATE_______________
PERMIT NO. S-_______________
Wake County Environmental Services
Sedimentation & Erosion Control
919-856-7400

WAKE COUNTY NORTH CAROLINA
EFFECTIVE: 08/23/17
ENVIRONMENTAL CONSULTANT SIGNATURE

ATTENTION CONTRACTORS

The ***Construction Contractor*** responsible for the extension of water, sewer, and/or reuse, as approved in these plans, is responsible for ***contacting*** the ***Public Works Department*** at ***(919) 996-2409***, and the ***Public Utilities Department*** at ***(919) 996-4540*** at least ***twenty four hours*** prior to beginning any of their construction.

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

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

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.

I, __________________, PE, certify that the Standard Specifications of the Town of Knightdale have been thoroughly checked and found to be applicable to this project. All exceptions to the applicable Town standards have been previously approved by the Town of Knightdale and said exceptions are shown on Sheet(s) __________ of these drawings.

Seal By: ______________________, PE
Date: ___________________

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-5745__

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-3737__

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: ____ DATE: ____________
DEVELOPMENT SERVICES ENGINEER

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

BY: ____ DATE: ____________
ADMINISTRATOR

MICHAEL V. ZACCARDO
6/22/21

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	06/22/2021
DRAWN BY	JD. MACMILLAN
DESIGNED BY	JD. MACMILLAN
CHECKED BY	M. ZACCARDO
SCALE	AS SHOWN

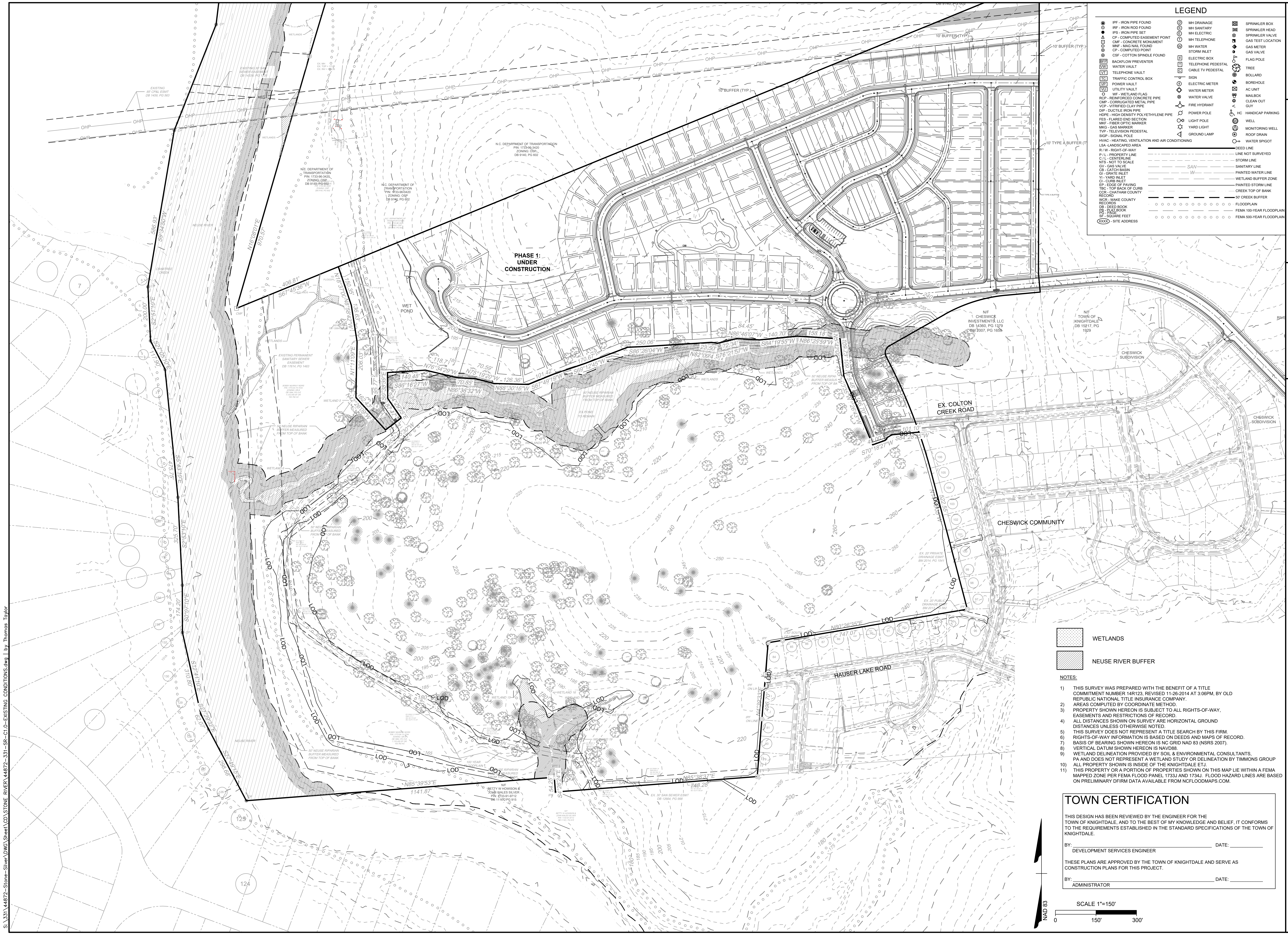
TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION
KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA
COVER SHEET

JOB NO. 44872
SHEET NO. C0.0

FOR REVIEW ONLY: NOT FOR CONSTRUCTION

S:\331\44872-Stone-Silver\DWG\Sheet\CD\STONE RIVER\44872-331-SR-C0.0-COVER.dwg | by Thomas Taylor


PHASE 1:
UNDER
CONSTRUCTION
WET
POND
N.C. DEPARTMENT OF TRANSPORTATION
PIN: 1733-96-3420
ZONING: OSP
DB 9140, PG 602
EXISTING PERMANENT SANITARY SEWER EASEMENT DB 17614, PG 1463
50' NEUSE RIPARIAN BUFFER MEASURED FROM TOP OF BANK
WETLANDS
WETLAND 5
WETLAND 6
EX. POND TO REMAIN
N/F CHESWICK INVESTMENTS, LLC DB 14360, PG 1379 BM 2007, PG 1659
N/F TOWN OF KNIGHTDALE
CHESWICK SUBDIVISION
EX. COLTON CREEK ROAD
CHESWICK COMMUNITY
HAUSER LAKE ROAD
EX. 20' PRIVATE DRAINAGE ESMT BM 2014, PG 1541
EX. 20' PUBLIC DRAINAGE ESMT BM 2013, PG 562
EX. 30' SAN SEWER ESMT DB 12664, PG 998
N/F BETTY W HOWISON & JOHN WALES SILVER
LOD
OHP
10' BUFFER (TYP.)
10' TYPE A BUFFER
N16°08'01"E 970.57'
S67°45'36"W 406.81'
N85°39'53"E 1141.87'
N80°26'35"E 747.07'
N85°38'37"E 748.28'
NAD 83

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
VW WATER VAULT
VT TELEPHONE VAULT
TC TRAFFIC CONTROL BOX
VP POWER VAULT
VU 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
PG - PAGE
SF - SQUARE FEET
(XXXX) - SITE ADDRESS

Ⓓ MH DRAINAGE
Ⓢ MH SANITARY
Ⓔ MH ELECTRIC
Ⓣ MH TELEPHONE
Ⓦ MH WATER
STORM INLET
ELECTRIC BOX
T TELEPHONE PEDESTAL
C 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
SAN SANITARY LINE
W PAINTED WATER LINE
WETLAND BUFFER ZONE
PAINTED STORM LINE
CREEK TOP OF BANK
50' CREEK BUFFER
FLOODPLAIN
FEMA 100-YEAR FLOODPLAIN
FEMA 500-YEAR FLOODPLAIN

⬚ WETLANDS

▨ NEUSE RIVER BUFFER

NOTES:

1) THIS SURVEY WAS PREPARED WITH THE BENEFIT OF A TITLE COMMITMENT NUMBER 14R123, REVISED 11-26-2014 AT 3:06PM, BY OLD REPUBLIC NATIONAL TITLE INSURANCE COMPANY.
2) AREAS COMPUTED BY COORDINATE METHOD.
3) PROPERTY SHOWN HEREON IS SUBJECT TO ALL RIGHTS-OF-WAY, EASEMENTS AND RESTRICTIONS OF RECORD.
4) ALL DISTANCES SHOWN ON SURVEY ARE HORIZONTAL GROUND DISTANCES UNLESS OTHERWISE NOTED.
5) THIS SURVEY DOES NOT REPRESENT A TITLE SEARCH BY THIS FIRM.
6) RIGHTS-OF-WAY INFORMATION IS BASED ON DEEDS AND MAPS OF RECORD.
7) BASIS OF BEARING SHOWN HEREON IS NC GRID NAD 83 (NSRS 2007).
8) VERTICAL DATUM SHOWN HEREON IS NAVD88.
9) WETLAND DELINEATION PROVIDED BY SOIL & ENVIRONMENTAL CONSULTANTS, PA AND DOES NOT REPRESENT A WETLAND STUDY OR DELINEATION BY TIMMONS GROUP
10) ALL PROPERTY SHOWN IS INSIDE OF THE KNIGHTDALE ETJ.
11) THIS PROPERTY OR A PORTION OF PROPERTIES SHOWN ON THIS MAP LIE WITHIN A FEMA MAPPED ZONE PER FEMA FLOOD PANEL 1733J AND 1734J. FLOOD HAZARD LINES ARE BASED ON PRELIMINARY DFIRM DATA AVAILABLE FROM NCFLOODMAPS.COM.

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

SCALE 1"=150'
0 150' 300'

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022321 MICHAEL V. ZACCARDO
6/22/21

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	06/22/2021
DRAWN BY	JD. MACMILLAN
DESIGNED BY	JD. MACMILLAN
CHECKED BY	M. ZACCARDO
SCALE	1" = 150'

TIMMONS GROUP

NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION

KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA

EXISTING CONDITIONS

JOB NO.
44872

SHEET NO.
C1.0

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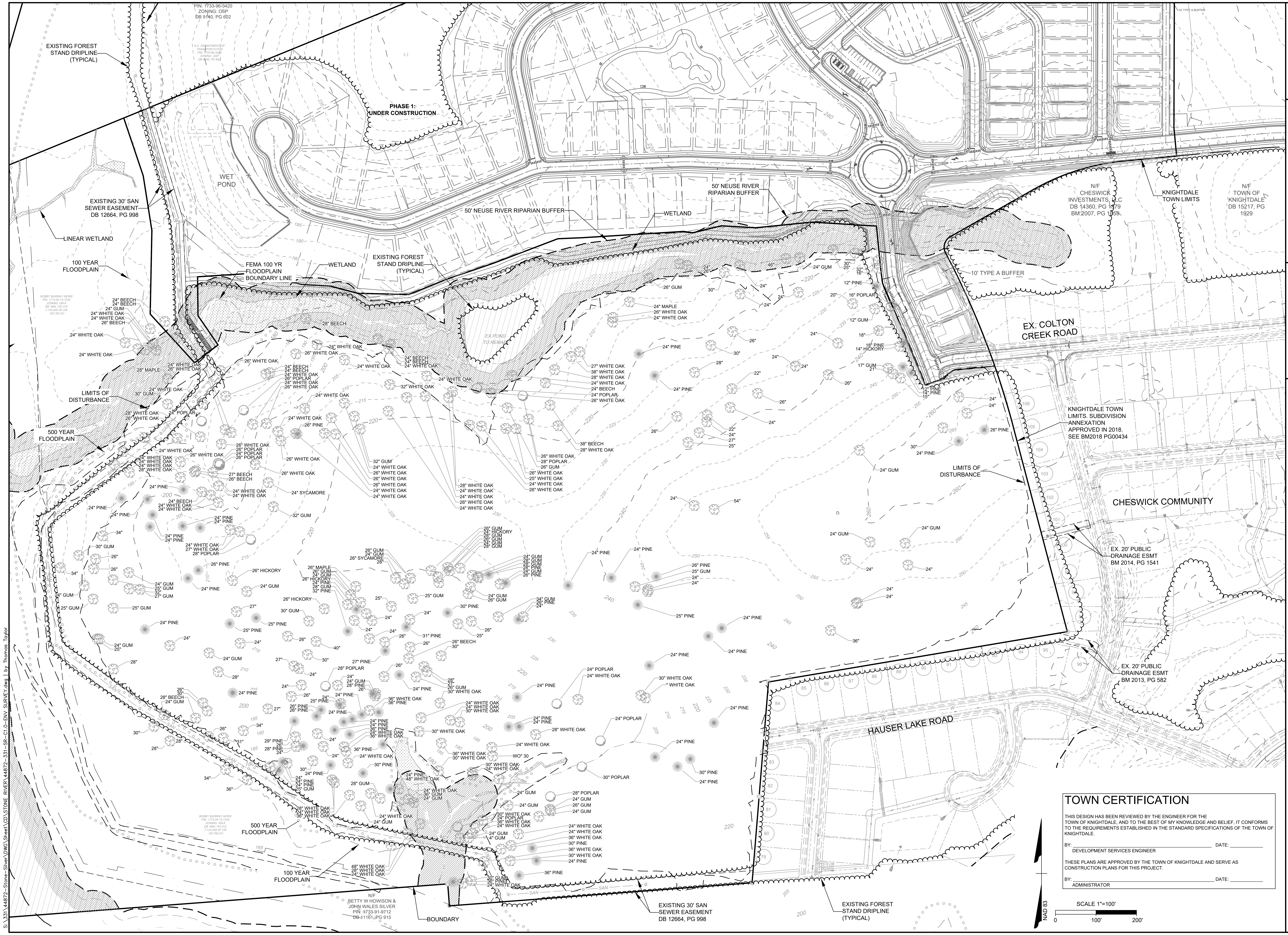
S:\331\44872-Stone-Silver\DWG\Sheet\CD\STONE RIVER\44872-331-SR-C1.0-EXISTING CONDITIONS.dwg | by: Thomas Taylor


PIN: 1733-96-3420
ZONING: OSP
DB 9140, PG 602
EXISTING FOREST STAND DRIPLINE (TYPICAL)
PHASE 1: UNDER CONSTRUCTION
WET POND
EXISTING 30' SAN SEWER EASEMENT DB 12664, PG 998
LINEAR WETLAND
100 YEAR FLOODPLAIN
FEMA 100 YR FLOODPLAIN BOUNDARY LINE
WETLAND
EXISTING FOREST STAND DRIPLINE (TYPICAL)
50' NEUSE RIVER RIPARIAN BUFFER
WETLAND
50' NEUSE RIVER RIPARIAN BUFFER
N/F CHESWICK INVESTMENTS, LLC DB 14360, PG 1379 BM 2007, PG 1959
KNIGHTDALE TOWN LIMITS
N/F TOWN OF KNIGHTDALE DB 15217, PG 1929
10' TYPE A BUFFER
EX. POND TO REMAIN
EX. COLTON CREEK ROAD
LIMITS OF DISTURBANCE
500 YEAR FLOODPLAIN
KNIGHTDALE TOWN LIMITS. SUBDIVISION ANNEXATION APPROVED IN 2018. SEE BM2018 PG00434
LIMITS OF DISTURBANCE
CHESWICK COMMUNITY
EX. 20' PUBLIC DRAINAGE ESMT BM 2014, PG 1541
EX. 20' PUBLIC DRAINAGE ESMT BM 2013, PG 582
HAUSER LAKE ROAD
BOBBY MURRAY HEIRS
500 YEAR FLOODPLAIN
100 YEAR FLOODPLAIN
N/F BETTY W HOWISON & JOHN WALES SILVER PIN: 1733-91-9712 DB 11161, PG 915
BOUNDARY
EXISTING 30' SAN SEWER EASEMENT DB 12664, PG 998
EXISTING FOREST STAND DRIPLINE (TYPICAL)
24" WHITE OAK
26" BEECH
28" BEECH
24" PINE
24" GUM
30" POPLAR
38" BEECH
28" WHITE OAK
54"
NAD 83
SCALE 1"=100'
0
100'
200'

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

S:\331\44872–Stone–Silver\DWG\Sheet\CD\STONE RIVER\44872–331–SR–C1.0–ENV SURVEY.dwg | by Thomas Taylor

6/22/21

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.

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

DATE	REVISION DESCRIPTION

DATE	06/22/2021
DRAWN BY	JD. MACMILLAN
DESIGNED BY	JD. MACMILLAN
CHECKED BY	M. ZACCARDO
SCALE	1" = 100'

FOR REVIEW ONLY: NOT FOR CONSTRUCTION

STONERIVER SUBDIVISION

KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA

ENVIRONMENTAL SURVEY

JOB NO. 44872

SHEET NO. C1.1

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SITE DATA

OWNERS/SUBDIVIDER/DEVELOPER:
GLOBAL CITY DEVELOPMENT
ATTN: ADAM ADLER
CASSA KNIGHTDALE II, LLC
801 BRICKELL AVE, STE 2360
MIAMI, FL 33131-4943
PHONE: 786-577-4113
ENGINEER:
TIMMONS GROUP
MIKE ZACCARDO, PE
5410 TRINITY ROAD, STE. 102
RALEIGH, NC 27607
PHONE: 919-532-3281

PIN = 1733-73-7297
DB = 17614 PG = 1463

FIRM MAP# = 3720173300J, 3720174300J

TOTAL EXISTING TRACT ACREAGE = 112.93 acres
PROPOSED RIGHT OF WAY DEDICATION = 572,224 SF (13.13 AC)

ZONING = GR-8 PRD
(GENERAL RESIDENTIAL)

EXISTING USE:
PROPOSED USE: SINGLE-FAMILY RESIDENTIAL

NON-RESIDENTIAL USE ACREAGE BY PHASE:	PHASE 3	0 AC
	PHASE 4	1.21 AC
MIXED-USE AND NON-RESIDENTIAL BUILDING AREA BY PHASE:	PHASE 3	0 AC
	PHASE 4	0 AC
PARCEL ACREAGE BY PHASE AND NUMBER OF PARCELS:	PHASE 3	17.45 AC (119 PARCELS)
	PHASE 4	19.23 AC (96 PARCELS)

TOTAL LENGTH OF PUBLIC STREET = 9,883 LF
TOTAL LENGTH OF PRIVATE ALLEY = 1,812 LF
TOTAL LENGTH OF CURB AND GUTTER = 22,463 LF
TOTAL LENGTH OF SIDEWALK = 17,980 LF
TOTAL LENGTH OF PUBLIC WATER LINE
6" = 285 LF
8" = 9,182 LF
TOTAL LENGTH OF 8" PVC PUBLIC SEWER LINE = 4,900 LF
TOTAL LENGTH OF 8" SDR26 PUBLIC SEWER LINE = 3,481 LF
TOTAL LENGTH OF PUBLIC STORMWATER LINE
15" RCP = 3,902 LF
18" RCP = 3,255 LF
24" RCP = 2,934 LF
30" RCP = 500 LF
36" RCP = 1,001 LF
42" RCP = 324 LF
15" HDPE = 109 LF
WATER SERVICE STUBS = 215
SEWER SERVICE STUBS = 215
TOTAL WASTEWATER FLOW = 51,600 GPD

TAKEOFFS BY PHASE	PHASE 3
LINEAR FOOTAGE OF PUBLIC STREET:	3,296 LF
LINEAR FOOTAGE OF PUBLIC SIDEWALK:	8,363 LF
LINEAR FOOTAGE OF PUBLIC WATER LINE:	4,201 LF
LINEAR FOOTAGE OF PUBLIC SEWER LINE:	3,184 LF
LINEAR FOOTAGE OF PUBLIC STORMWATER LINE:	5,467 LF
TOTAL WASTEWATER FLOW GENERATED:	28,560GPD
	PHASE 4
LINEAR FOOTAGE OF PUBLIC STREET:	6,587 LF
LINEAR FOOTAGE OF PUBLIC SIDEWALK:	9,617 LF
LINEAR FOOTAGE OF PUBLIC WATER LINE:	5,266 LF
LINEAR FOOTAGE OF PUBLIC SEWER LINE:	5,197 LF
LINEAR FOOTAGE OF PUBLIC STORMWATER LINE:	6,558 LF
TOTAL WASTEWATER FLOW GENERATED:	23,040 GPD

NUMBER OF HOUSING UNITS:	PHASE 3	119 UNITS
	PHASE 4	96 UNITS

GROSS PROJECT DENSITY (PHASE 3-4): 0.53 AC/LOT

PASSIVE OPEN SPACE NOTE:

PASSIVE OPEN SPACE TO INCLUDE A TRAIL/WALKWAY LEADING TO AN OPEN, OUTDOOR GATHERING AREA. GATHERING AREA TO INCLUDE AMENITIES SUCH AS, BUT NOT LIMITED TO, A PERGOLA, HARDSCAPING, LANDSCAPING, OPEN LAWN AREAS, BENCHES, AND ONE OF THE FOLLOWING RECREATIONAL GAMES (HORSESHOE PIT, BOCCE BALL, CORN HOLE, OR SIMILAR APPLICATION.) A FORMAL PLAN WILL BE SUBMITTED TO TOWN STAFF FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION OF THIS OPEN SPACE AREA.

S:\331\44872-Stone-Silver\DWG\Sheet\CD\STONE RIVER\44872-331-SR-C2.0-SITE.dwg | by Thomas Taylor

Building Type *(CH 5)*:	House	Townhouse	Civic & Institutional
Lot Width *(a) (Min)*	30 ft	n/a	100 ft
Front Setback *(g) (Min)*	10 ft	0 ft	10 ft
Front Setback *(g) (Max)*	n/a	25 ft	n/a
Front Yard Encroachment *(b)*	8 ft	*(e)*	10 ft
Minimum Driveway Length	35 ft	*n/a*	n/a
Side Setback *(g) (Min)*	20% of lot width *(d)*	10 ft between buildings	15 ft
Rear Setback *(g) (Min)*	25 ft	n/a	30 ft
Rear Setback from Rear Lane/Alley *(c) (Min)*	20 ft from centerline	15 ft from centerline	n/a
Accessory Structure Side/Rear Setback *(Min)*	5 ft	5 ft	5 ft
Maximum Height *(f)*	3 stories	3 stories	3 stories

Notes:

(a) For lots less than 80 feet wide, alley/rear lane access to all off-street parking areas is required, except when such lots front onto an approved cul-de-sac, in which case shared driveways shall be required. For in-fill lots less than 80 feet wide where no alley/rear lane access exists, shared driveways shall be required. For lots 80feet wide or greater, access to off-street parking is permitted from the fronting street or rear lane/alley.

(b) Balconies, stoops, stairs, chimneys, open porches, bay windows, and raised doorways are permitted to encroach into the front setback (Section 4.4).

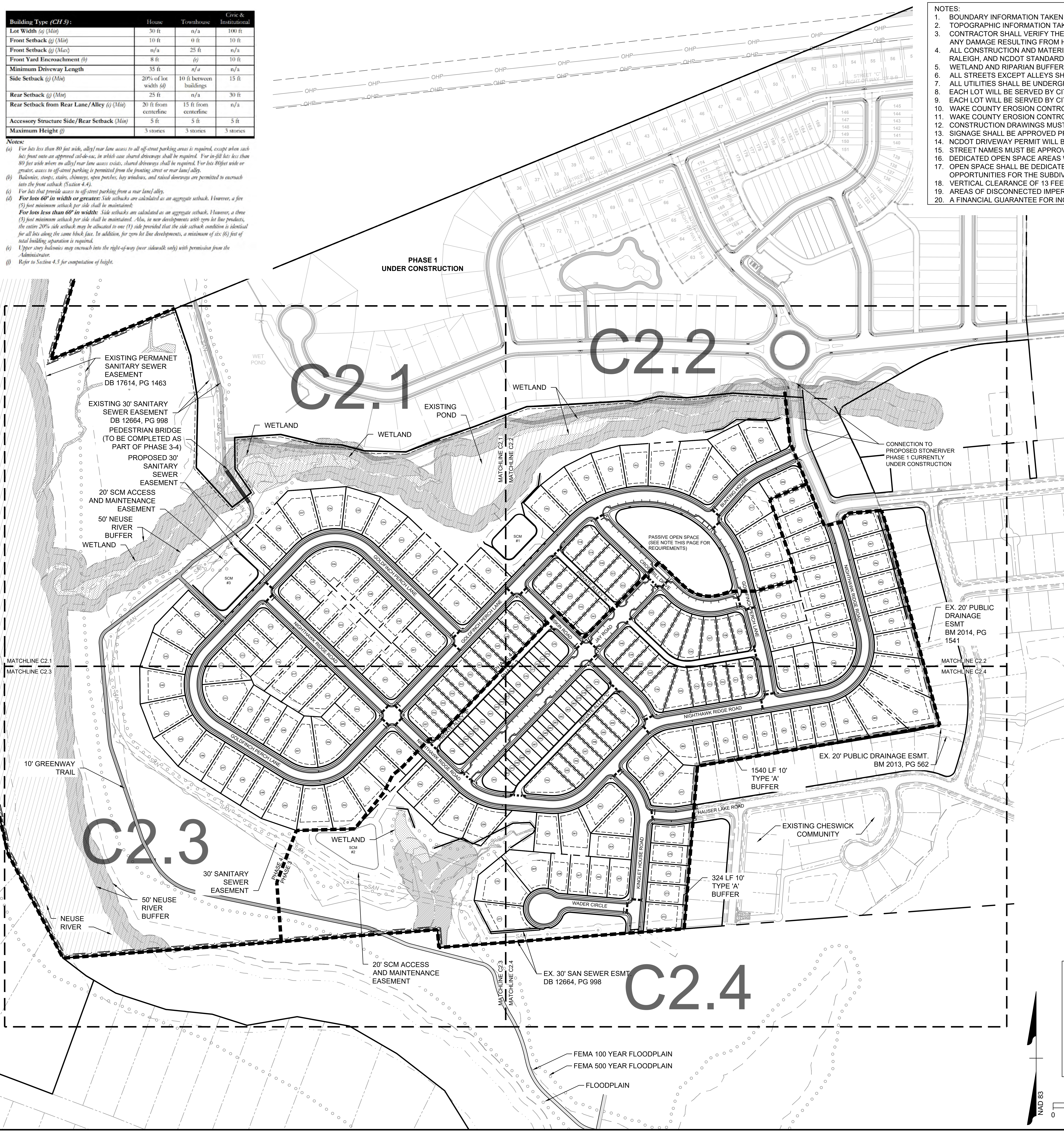
(c) For lots that provide access to off-street parking from a rear lane/alley.

(d) ***For lots 60' in width or greater:*** *Side setbacks are calculated as an aggregate setback. However, a five (5) foot minimum setback per side shall be maintained;*
For lots less than 60' in width: *Side setbacks are calculated as an aggregate setback. However, a three (3) foot minimum setback per side shall be maintained. Also, in new developments with zero lot line products, the entire 20% side setback may be allocated to one (1) side provided that the side setback condition is identical for all lots along the same block face. In addition, for zero lot line developments, a minimum of six (6) feet of total building separation is required.*

(e) Upper story balconies may encroach into the right-of-way (over sidewalk only) with permission from the Administrator.

(f) Refer to Section 4.5 for computation of height.

NOTES:
1. BOUNDARY INFORMATION TAKEN FROM SURVEY BY TIMMONS GROUP.
2. TOPOGRAPHIC INFORMATION TAKEN FROM SURVEY BY TIMMONS GROUP.
3. CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING UTILITIES AND SHALL BE RESPONSIBLE FOR ANY DAMAGE RESULTING FROM HIS ACTIVITIES. CALL UTILITY LOCATOR SERVICE BEFORE DIGGING.
4. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH TOWN OF KNIGHTDALE, CITY OF RALEIGH, AND NCDOT STANDARDS AND SPECIFICATIONS.
5. WETLAND AND RIPARIAN BUFFER DELINEATION BY S&EC DATED SEPTEMBER 24, 2014.
6. ALL STREETS EXCEPT ALLEYS SHALL BE PUBLIC.
7. ALL UTILITIES SHALL BE UNDERGROUND.
8. EACH LOT WILL BE SERVED BY CITY OF RALEIGH PUBLIC WATER SYSTEM.
9. EACH LOT WILL BE SERVED BY CITY OF RALEIGH PUBLIC SEWER SYSTEM.
10. WAKE COUNTY EROSION CONTROL AND TOWN OF KNIGHTDALE STORMWATER PERMITS WILL BE REQUIRED.
11. WAKE COUNTY EROSION CONTROL REGULATIONS SHALL BE COMPLIED WITH.
12. CONSTRUCTION DRAWINGS MUST BE APPROVED PRIOR TO ANY WORK BEGINNING.
13. SIGNAGE SHALL BE APPROVED PRIOR TO ANY INSTALLATION WORK.
14. NCDOT DRIVEWAY PERMIT WILL BE REQUIRED PRIOR TO FINAL PLAT APPROVAL.
15. STREET NAMES MUST BE APPROVED BY WAKE COUNTY GIS PRIOR TO FINAL PLAT.
16. DEDICATED OPEN SPACE AREAS WILL BE OWNED AND MAINTAINED BY THE HOMEOWNERS ASSOCIATION
17. OPEN SPACE SHALL BE DEDICATED FOR PROVISION OF ACTIVE AND/OR PASSIVE OUTDOOR RECREATION OPPORTUNITIES FOR THE SUBDIVISION'S RESIDENTS AND THEIR GUESTS.
18. VERTICAL CLEARANCE OF 13 FEET 6 INCHES REQUIRED FOR ALL ROADWAYS.
19. AREAS OF DISCONNECTED IMPERVIOUS SHALL BE SHOWN ON THE RECORDED PLAT.
20. A FINANCIAL GUARANTEE FOR INCOMPLETE PUBLIC IMPROVEMENTS REQUIRED PRIOR TO FINAL PLAT.


PHASE 1
UNDER CONSTRUCTION
C2.1
C2.2
C2.3
C2.4
EXISTING PERMANENT SANITARY SEWER EASEMENT DB 17614, PG 1463
EXISTING 30' SANITARY SEWER EASEMENT DB 12664, PG 998
PEDESTRIAN BRIDGE (TO BE COMPLETED AS PART OF PHASE 3-4)
PROPOSED 30' SANITARY SEWER EASEMENT
20' SCM ACCESS AND MAINTENANCE EASEMENT
50' NEUSE RIVER BUFFER
WETLAND
WET POND
EXISTING POND
MATCHLINE C2.1
MATCHLINE C2.2
MATCHLINE C2.3
MATCHLINE C2.4
CONNECTION TO PROPOSED STONERIVER PHASE 1 CURRENTLY UNDER CONSTRUCTION
PASSIVE OPEN SPACE (SEE NOTE THIS PAGE FOR REQUIREMENTS)
SCM #1
SCM #2
SCM #3
GOLDFINCH PERCH LANE
NIGHTHAWK RIDGE ROAD
JAY ROAD
HAUSER LAKE ROAD
KINGLET HOUSE ROAD
WADER CIRCLE
EX. 20' PUBLIC DRAINAGE ESMT BM 2014, PG 1541
EX. 20' PUBLIC DRAINAGE ESMT. BM 2013, PG 562
1540 LF 10' TYPE 'A' BUFFER
324 LF 10' TYPE 'A' BUFFER
EXISTING CHESWICK COMMUNITY
10' GREENWAY TRAIL
30' SANITARY SEWER EASEMENT
PHASE 3
NEUSE RIVER
EX. 30' SAN SEWER ESMT DB 12664, PG 998
FEMA 100 YEAR FLOODPLAIN
FEMA 500 YEAR FLOODPLAIN
FLOODPLAIN
OHP

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
▢	PRIMARY OPEN SPACE
▩	SECONDARY OPEN SPACE
▤	COMMON GREEN
═	30" STANDARD CURB & GUTTER

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

NAD 83

SCALE 1"=150'
0 150' 300'

MICHAEL V. ZACCARDO
6/22/21

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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DATE	REVISION DESCRIPTION

DATE	06/22/2021
DRAWN BY	JD. MACMILLAN
DESIGNED BY	JD. MACMILLAN
CHECKED BY	M. ZACCARDO
SCALE	1" = 150'

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION
KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA
OVERALL SITE PLAN

JOB NO.	44872
SHEET NO.	C2.0

FOR REVIEW ONLY: NOT FOR CONSTRUCTION

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BY: ______________________ DATE: __________
DEVELOPMENT SERVICES ENGINEER

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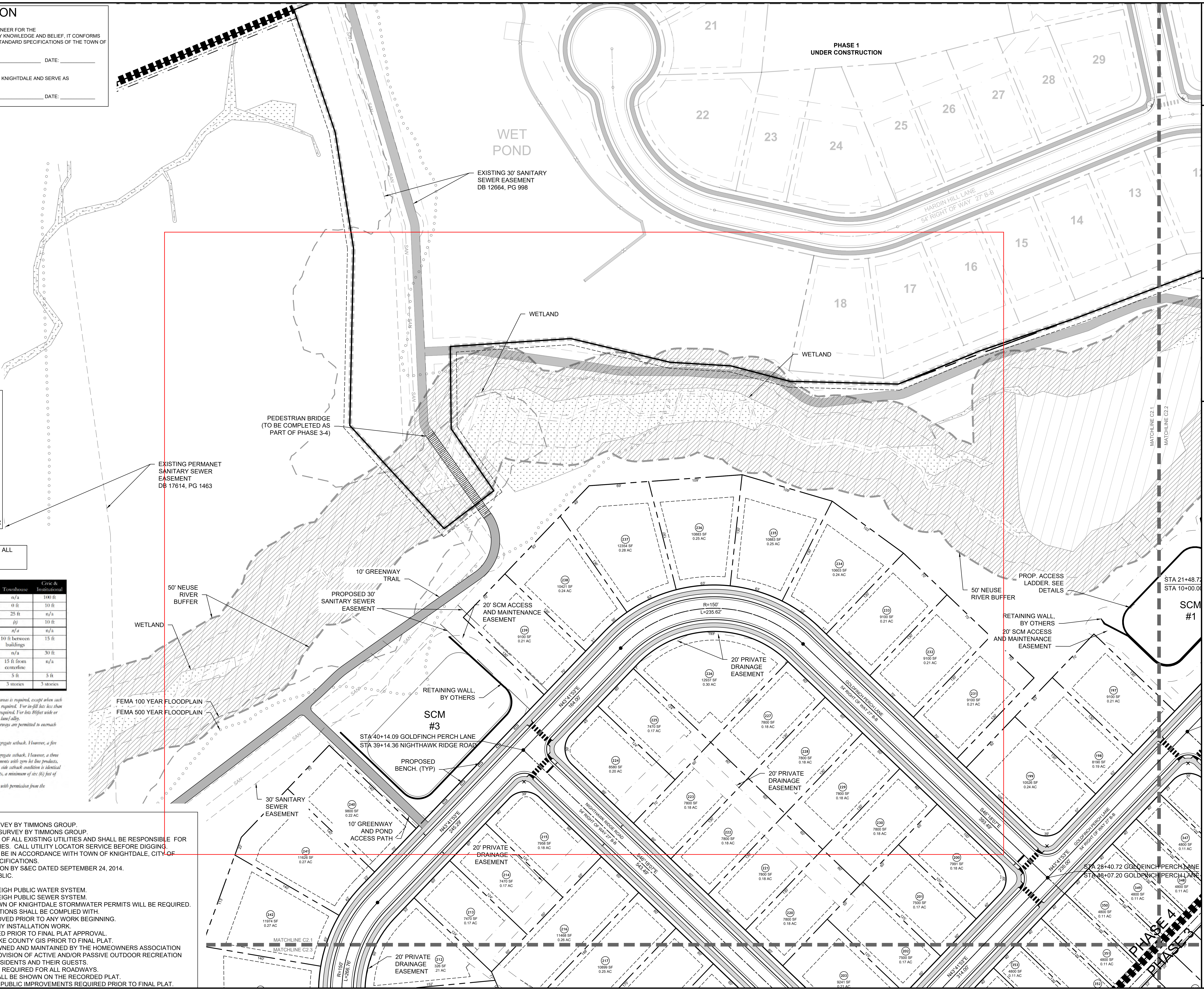
BY: ______________________ DATE: __________
ADMINISTRATOR

NAD 83

SCALE 1"=50'
0 50' 100'



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
- PRIMARY OPEN SPACE
- SECONDARY OPEN SPACE
- COMMON GREEN
- 30" STANDARD CURB & GUTTER

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

Building Type *(CH 5)*:	House	Townhouse	Civic & Institutional
Lot Width *(a) (Min)*	30 ft	n/a	100 ft
Front Setback *(g) (Min)*	10 ft	0 ft	10 ft
Front Setback *(g) (Max)*	n/a	25 ft	n/a
Front Yard Encroachment *(b)*	8 ft	*(e)*	10 ft
Minimum Driveway Length	35 ft	*n/a*	n/a
Side Setback *(g) (Min)*	20% of lot width *(d)*	10 ft between buildings	15 ft
Rear Setback *(g) (Min)*	25 ft	n/a	30 ft
Rear Setback from Rear Lane/Alley *(c) (Min)*	20 ft from centerline	15 ft from centerline	n/a
Accessory Structure Side/Rear Setback *(Min)*	5 ft	5 ft	5 ft
Maximum Height *(f)*	3 stories	3 stories	3 stories

Notes:

(a) *For lots less than 80 feet wide, alley/rear lane access to all off-street parking areas is required, except when such lots front onto an approved cul-de-sac, in which case shared driveways shall be required. For in-fill lots less than 80 feet wide where no alley/rear lane access exists, shared driveways shall be required. For lots 80feet wide or greater, access to off-street parking is permitted from the fronting street or rear lane/alley.*

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(e) *Upper story balconies may encroach into the right-of-way (over sidewalk only) with permission from the Administrator.*

(f) *Refer to Section 4.5 for computation of height.*

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20. A FINANCIAL GUARANTEE FOR INCOMPLETE PUBLIC IMPROVEMENTS REQUIRED PRIOR TO FINAL PLAT.

S:\331\44872-Stone-Silver\DWG\Sheet\CD\STONE RIVER\44872-331-SR-C2.0-SITE.dwg | by Thomas Taylor

MICHAEL V. ZACCARDO
6/22/21

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DATE	REVISION DESCRIPTION

DATE	06/22/2021
DRAWN BY	JD. MACMILLAN
DESIGNED BY	JD. MACMILLAN
CHECKED BY	M. ZACCARDO
SCALE	1" = 50'

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION
KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA

DETAILED SITE PLAN - SHEET 1 OF 4

JOB NO.	44872
SHEET NO.	C2.1

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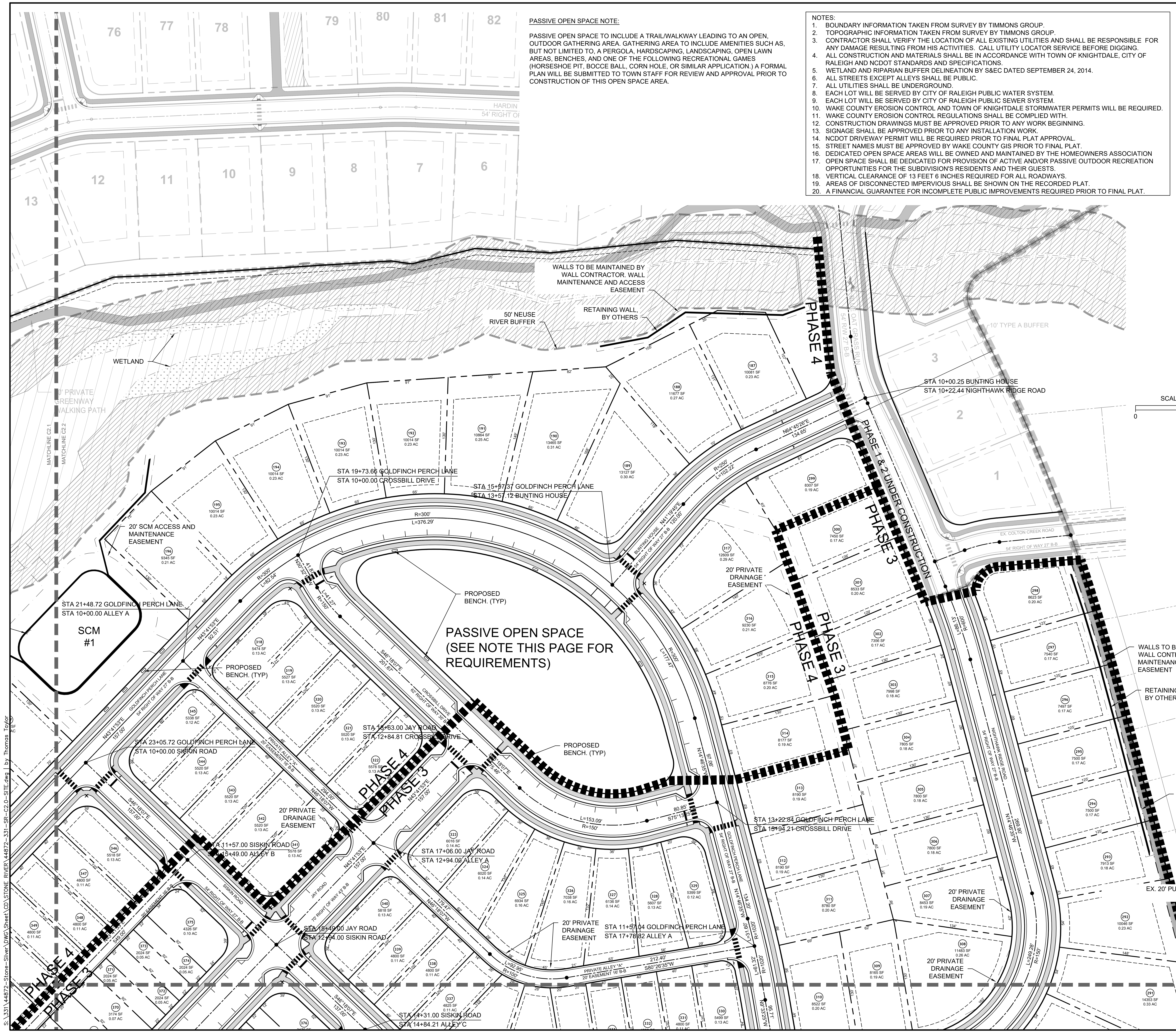

76
77
78
79
80
81
82
HARDIN
54' RIGHT OF
13
12
11
10
9
8
7
6
WALLS TO BE MAINTAINED BY WALL CONTRACTOR. WALL MAINTENANCE AND ACCESS EASEMENT
RETAINING WALL, BY OTHERS
50' NEUSE RIVER BUFFER
WETLAND
PHASE 4
10' PRIVATE GREENWAY WALKING PATH
MATCHLINE C2.1
MATCHLINE C2.2
STA 10+00.25 BUNTING HOUSE
STA 10+22.44 NIGHTHAWK RIDGE ROAD
10' TYPE A BUFFER
3
2
1
PHASE 1 & 2 UNDER CONSTRUCTION
PHASE 3
STA 19+73.66 GOLDFINCH PERCH LANE
STA 10+00.00 CROSSBILL DRIVE
STA 15+57.37 GOLDFINCH PERCH LANE
STA 13+57.12 BUNTING HOUSE
20' SCM ACCESS AND MAINTENANCE EASEMENT
STA 21+48.72 GOLDFINCH PERCH LANE
STA 10+00.00 ALLEY A
SCM #1
PROPOSED BENCH. (TYP)
PASSIVE OPEN SPACE (SEE NOTE THIS PAGE FOR REQUIREMENTS)
20' PRIVATE DRAINAGE EASEMENT
EX. COLTON CREEK ROAD
54' RIGHT OF WAY 27' B-B
STA 15+63.00 JAY ROAD
STA 12+84.81 CROSSBILL DRIVE
STA 23+05.72 GOLDFINCH PERCH LANE
STA 10+00.00 SISKIN ROAD
PHASE 4
PHASE 3
STA 13+22.84 GOLDFINCH PERCH LANE
STA 15+94.21 CROSSBILL DRIVE
STA 11+57.00 SISKIN ROAD
STA 15+49.00 ALLEY B
STA 17+06.00 JAY ROAD
STA 12+94.00 ALLEY A
STA 18+49.00 JAY ROAD
STA 12+94.00 SISKIN ROAD
STA 11+57.04 GOLDFINCH PERCH LANE
STA 17+78.82 ALLEY A
PRIVATE ALLEY "A"
20' EASEMENT 16' B-B
STA 14+31.00 SISKIN ROAD
STA 14+84.21 ALLEY C
WALLS TO BE MAINTAINED BY WALL CONTRACTOR. WALL MAINTENANCE AND ACCESS EASEMENT
RETAINING WALL, BY OTHERS
1540 LF 10' TYPE 'A' BUFFER
EX. 20' PUBLIC DRAINAGE ESMT BM 2014, PG 1541
LENA LANE
MATCHLINE C2.2
MATCHLINE C2.4
NIGHTHAWK RIDGE ROAD
BUNTING HOUSE
CROSSBILL DRIVE
GOLDFINCH PERCH LANE
SISKIN ROAD
JAY ROAD

PASSIVE OPEN SPACE NOTE:

PASSIVE OPEN SPACE TO INCLUDE A TRAIL/WALKWAY LEADING TO AN OPEN, OUTDOOR GATHERING AREA. GATHERING AREA TO INCLUDE AMENITIES SUCH AS, BUT NOT LIMITED TO, A PERGOLA, HARDSCAPING, LANDSCAPING, OPEN LAWN AREAS, BENCHES, AND ONE OF THE FOLLOWING RECREATIONAL GAMES (HORSESHOE PIT, BOCCE BALL, CORN HOLE, OR SIMILAR APPLICATION.) A FORMAL PLAN WILL BE SUBMITTED TO TOWN STAFF FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION OF THIS OPEN SPACE AREA.

NOTES:
1. BOUNDARY INFORMATION TAKEN FROM SURVEY BY TIMMONS GROUP.
2. TOPOGRAPHIC INFORMATION TAKEN FROM SURVEY BY TIMMONS GROUP.
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4. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH TOWN OF KNIGHTDALE, CITY OF RALEIGH AND NCDOT STANDARDS AND SPECIFICATIONS.
5. WETLAND AND RIPARIAN BUFFER DELINEATION BY S&EC DATED SEPTEMBER 24, 2014.
6. ALL STREETS EXCEPT ALLEYS SHALL BE PUBLIC.
7. ALL UTILITIES SHALL BE UNDERGROUND.
8. EACH LOT WILL BE SERVED BY CITY OF RALEIGH PUBLIC WATER SYSTEM.
9. EACH LOT WILL BE SERVED BY CITY OF RALEIGH PUBLIC SEWER SYSTEM.
10. WAKE COUNTY EROSION CONTROL AND TOWN OF KNIGHTDALE STORMWATER PERMITS WILL BE REQUIRED.
11. WAKE COUNTY EROSION CONTROL REGULATIONS SHALL BE COMPLIED WITH.
12. CONSTRUCTION DRAWINGS MUST BE APPROVED PRIOR TO ANY WORK BEGINNING.
13. SIGNAGE SHALL BE APPROVED PRIOR TO ANY INSTALLATION WORK.
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15. STREET NAMES MUST BE APPROVED BY WAKE COUNTY GIS PRIOR TO FINAL PLAT.
16. DEDICATED OPEN SPACE AREAS WILL BE OWNED AND MAINTAINED BY THE HOMEOWNERS ASSOCIATION
17. OPEN SPACE SHALL BE DEDICATED FOR PROVISION OF ACTIVE AND/OR PASSIVE OUTDOOR RECREATION OPPORTUNITIES FOR THE SUBDIVISION'S RESIDENTS AND THEIR GUESTS.
18. VERTICAL CLEARANCE OF 13 FEET 6 INCHES REQUIRED FOR ALL ROADWAYS.
19. AREAS OF DISCONNECTED IMPERVIOUS SHALL BE SHOWN ON THE RECORDED PLAT.
20. A FINANCIAL GUARANTEE FOR INCOMPLETE PUBLIC IMPROVEMENTS REQUIRED PRIOR TO FINAL PLAT.

Building Type *(CH 5)*:	House	Townhouse	Civic & Institutional
Lot Width *(a) (Min)*	30 ft	n/a	100 ft
Front Setback *(g) (Min)*	10 ft	0 ft	10 ft
Front Setback *(g) (Max)*	n/a	25 ft	n/a
Front Yard Encroachment *(b)*	8 ft	*(e)*	10 ft
Minimum Driveway Length	35 ft	*n/a*	n/a
Side Setback *(g) (Min)*	20% of lot width *(d)*	10 ft between buildings	15 ft
Rear Setback *(g) (Min)*	25 ft	n/a	30 ft
Rear Setback from Rear Lane/Alley *(c) (Min)*	20 ft from centerline	15 ft from centerline	n/a
Accessory Structure Side/Rear Setback *(Min)*	5 ft	5 ft	5 ft
Maximum Height *(f)*	3 stories	3 stories	3 stories

Notes:

(a) For lots less than 80 feet wide, alley/rear lane access to all off-street parking areas is required, except when such lots front onto an approved cul-de-sac, in which case shared driveways shall be required. For in-fill lots less than 80 feet wide where no alley/rear lane access exists, shared driveways shall be required. For lots 80feet wide or greater, access to off-street parking is permitted from the fronting street or rear lane/alley.

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(e) Upper story balconies may encroach into the right-of-way (over sidewalk only) with permission from the Administrator.

(f) Refer to Section 4.5 for computation of height.

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
▨	PRIMARY OPEN SPACE
■	SECONDARY OPEN SPACE
▭	COMMON GREEN
═══	30" STANDARD CURB & GUTTER

NAD 83

SCALE 1"=50'
0 50' 100'

ALL CONSTRUCTION TO BE IN ACCORDANCE WITH ALL TOWN OF KNIGHTDALE AND NCDOT 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: ______________________________ 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 022321 MICHAEL V. ZACCARDO
6/22/21

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	06/22/2021
DRAWN BY	JD. MACMILLAN
DESIGNED BY	JD. MACMILLAN
CHECKED BY	M. ZACCARDO
SCALE	1" = 50'

FOR REVIEW ONLY: NOT FOR CONSTRUCTION

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION
KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA
DETAILED SITE PLAN - SHEET 2 OF 4

JOB NO.
44872

SHEET NO.
C2.2

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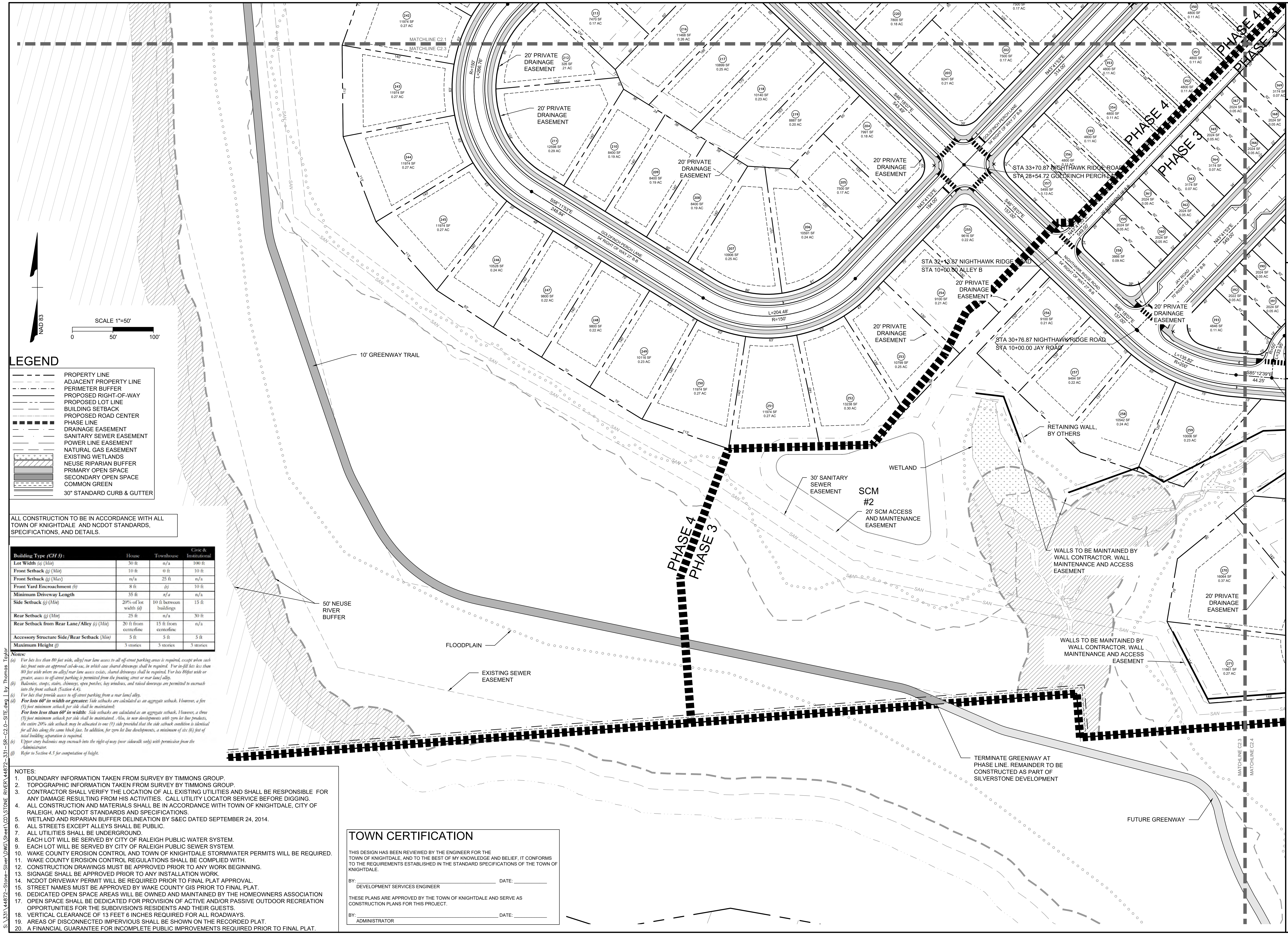
S:\331\44872-Stone-River\DWG\Sheet\CD\STONE RIVER\44872-331-SR-C2.0-SITE.dwg | by: Thomas Taylor



LEGEND

- PROPERTY LINE
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- PERIMETER BUFFER
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- PROPOSED LOT LINE
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- PROPOSED ROAD CENTER
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- ▨ EXISTING WETLANDS
- ▨ NEUSE RIPARIAN BUFFER
- ▨ PRIMARY OPEN SPACE
- ▨ SECONDARY OPEN SPACE
- ▨ COMMON GREEN
- 30" STANDARD CURB & GUTTER

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S:\331\44872-Stone-Silver\DWG\Sheet\CD\STONE RIVER\44872-331-SR-C2.0-SITE.dwg | by Thomas Taylor

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TOWN CERTIFICATION

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

BY: ______________________ DATE: __________
DEVELOPMENT SERVICES ENGINEER

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

BY: ______________________ DATE: __________
ADMINISTRATOR

MICHAEL V. ZACCARDO
6/22/21

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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

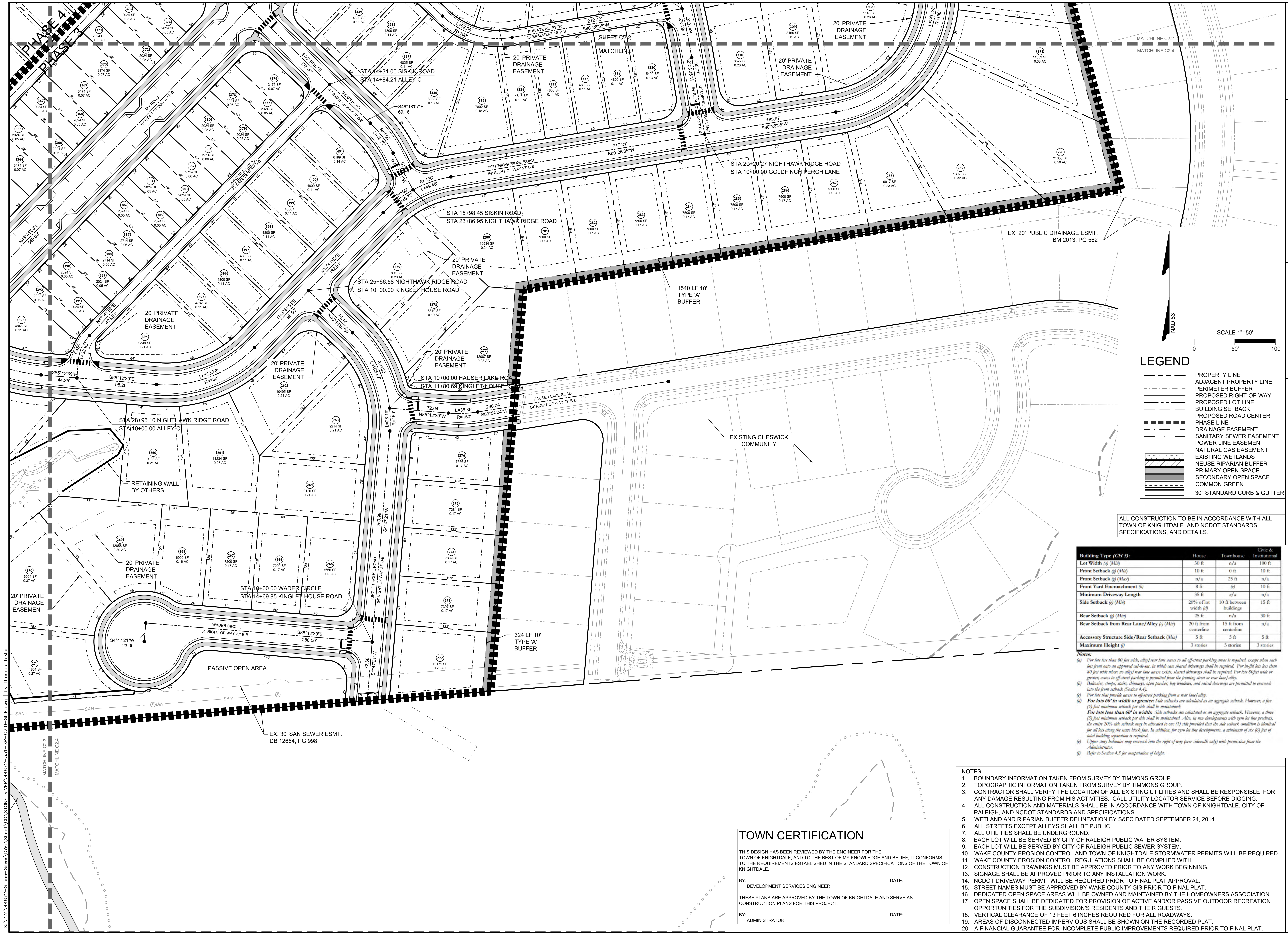
DATE
06/22/2021
DRAWN BY
JD. MACMILLAN
DESIGNED BY
JD. MACMILLAN
CHECKED BY
M. ZACCARDO
SCALE
1" = 50'

FOR REVIEW ONLY: NOT FOR CONSTRUCTION

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION
KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA
DETAILED SITE PLAN - SHEET 3 OF 4

JOB NO.
44872
SHEET NO.
C2.3


PHASE 4
PHASE 3
MATCHLINE C2.2
MATCHLINE C2.4
SHEET C2.2
MATCHLINE
20' PRIVATE DRAINAGE EASEMENT
PRIVATE ALLEY "A" 20' EASEMENT 16' B-B
STA 14+31.00 SISKIN ROAD
STA 14+84.21 ALLEY C
SISKIN ROAD 54' RIGHT OF WAY 27' B-B
NIGHTHAWK RIDGE ROAD 54' RIGHT OF WAY 27' B-B
GOLDFINCH PERCH LANE
STA 20+20.27 NIGHTHAWK RIDGE ROAD
STA 10+00.00 GOLDFINCH PERCH LANE
STA 15+98.45 SISKIN ROAD
STA 23+86.95 NIGHTHAWK RIDGE ROAD
EX. 20' PUBLIC DRAINAGE ESMT. BM 2013, PG 562
STA 25+66.58 NIGHTHAWK RIDGE ROAD
STA 10+00.00 KINGLET HOUSE ROAD
1540 LF 10' TYPE 'A' BUFFER
JAY ROAD 70' RIGHT OF WAY 43' B-B
PRIVATE ALLEY "C" 20' EASEMENT 16' B-B
STA 10+00.00 HAUSER LAKE ROAD
STA 11+80.69 KINGLET HOUSE ROAD
HAUSER LAKE ROAD 54' RIGHT OF WAY 27' B-B
STA 28+95.10 NIGHTHAWK RIDGE ROAD
STA 10+00.00 ALLEY C
EXISTING CHESWICK COMMUNITY
RETAINING WALL, BY OTHERS
KINGLET HOUSE ROAD 54' RIGHT OF WAY 27' B-B
STA 10+00.00 WADER CIRCLE
STA 14+69.85 KINGLET HOUSE ROAD
WADER CIRCLE 54' RIGHT OF WAY 27' B-B
324 LF 10' TYPE 'A' BUFFER
PASSIVE OPEN AREA
EX. 30' SAN SEWER ESMT. DB 12664, PG 998
SAN
NAD 83
SCALE 1"=50'
0
50'
100'

LEGEND

- PROPERTY LINE
- ADJACENT PROPERTY LINE
- PERIMETER BUFFER
- PROPOSED RIGHT-OF-WAY
- PROPOSED LOT LINE
- BUILDING SETBACK
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Notes:

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BY: ______________________________ DATE: ____________
DEVELOPMENT SERVICES ENGINEER

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TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION

KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA

DETAILED SITE PLAN - SHEET 4 OF 4

JOB NO.
44872

SHEET NO.
C2.4

FOR REVIEW ONLY: NOT FOR CONSTRUCTION

S:\331\44872-Stone-Silver\DWG\Sheet\CD\STONE RIVER\44872-331-SR-C2.0-STE.dwg | by: Thomas Taylor

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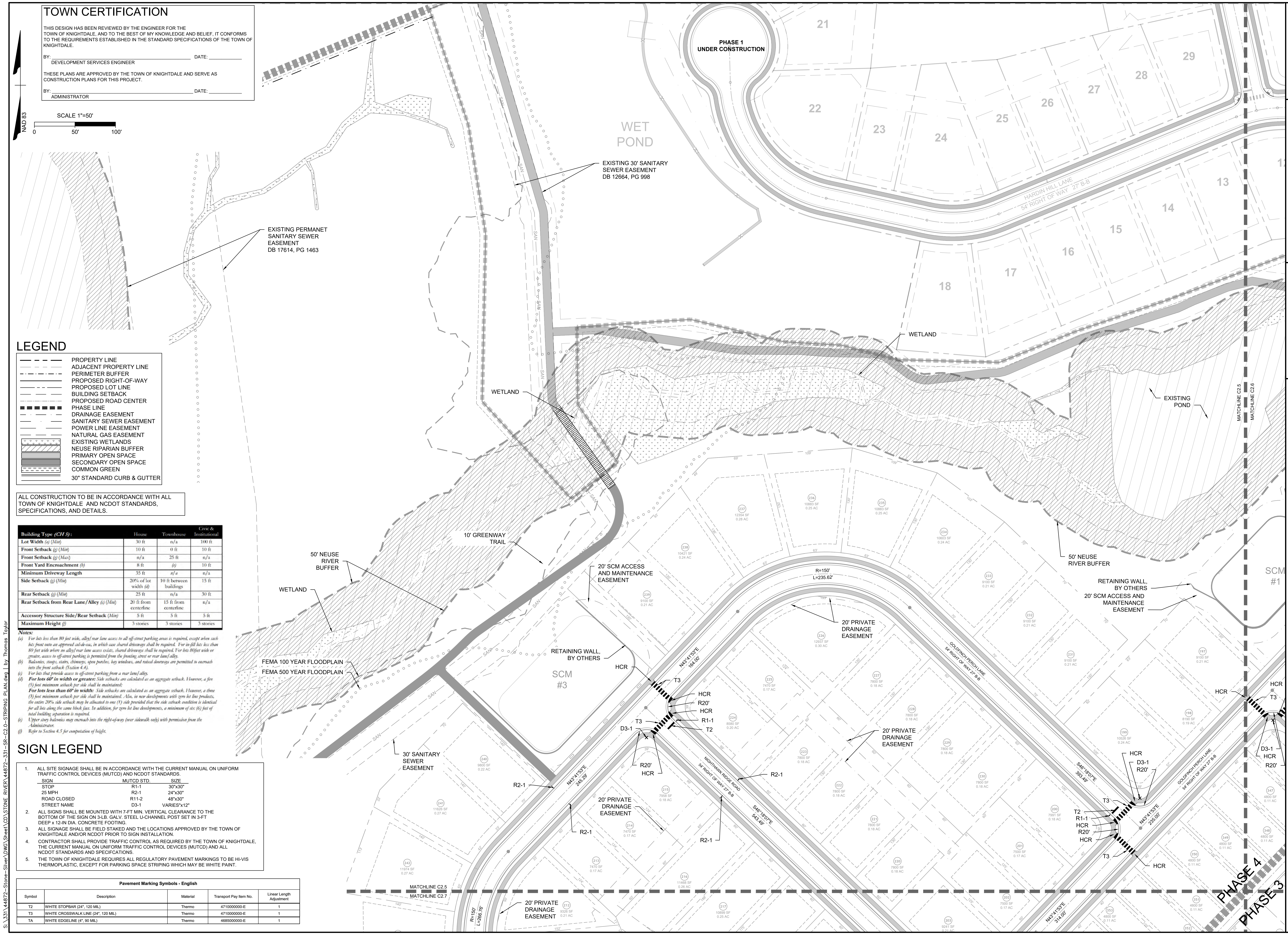

LEGEND

— — — —	PROPERTY LINE
— — — —	ADJACENT PROPERTY LINE
—·—·—·—	PERIMETER BUFFER
————	PROPOSED RIGHT-OF-WAY
— — — —	PROPOSED LOT LINE
— — — —	BUILDING SETBACK
— - — -	PROPOSED ROAD CENTER
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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.	SIZE
STOP	R1-1	30"x30"
25 MPH	R2-1	24"x30"
ROAD CLOSED	R11-2	48"x30"
STREET NAME	D3-1	VARIES"x12"

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 DEEP x 12-IN DIA. CONCRETE FOOTING.
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4. 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.
5. THE TOWN OF KNIGHTDALE REQUIRES ALL REGULATORY PAVEMENT MARKINGS TO BE HI-VIS THERMOPLASTIC, EXCEPT FOR PARKING SPACE STRIPING WHICH MAY BE WHITE PAINT.

Pavement Marking Symbols - English

Symbol	Description	Material	Transport Pay Item No.	Linear Length Adjustment
T2	WHITE STOPBAR (24", 120 MIL)	Thermo	4710000000-E	1
T3	WHITE CROSSWALK LINE (24", 120 MIL)	Thermo	4710000000-E	1
TA	WHITE EDGELINE (4", 90 MIL)	Thermo	4685000000-E	1

S:\331\44872-Stone-Silver\DWG\Sheet\CD\STONE RIVER\44872-331-SR-C2.0-STRIPING PLAN.dwg | by Thomas Taylor

MICHAEL V. ZACCARDO
6/22/21

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.

DATE	REVISION DESCRIPTION

DATE: *06/22/2021*
DRAWN BY: *JD. MACMILLAN*
DESIGNED BY: *JD. MACMILLAN*
CHECKED BY: *M. ZACCARDO*
SCALE: *1" = 50'*

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION
KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA

SIGNAGE AND MARKING PLAN - SHEET 1 OF 4

JOB NO. *44872*
SHEET NO. *C2.5*

FOR REVIEW ONLY: NOT FOR CONSTRUCTION

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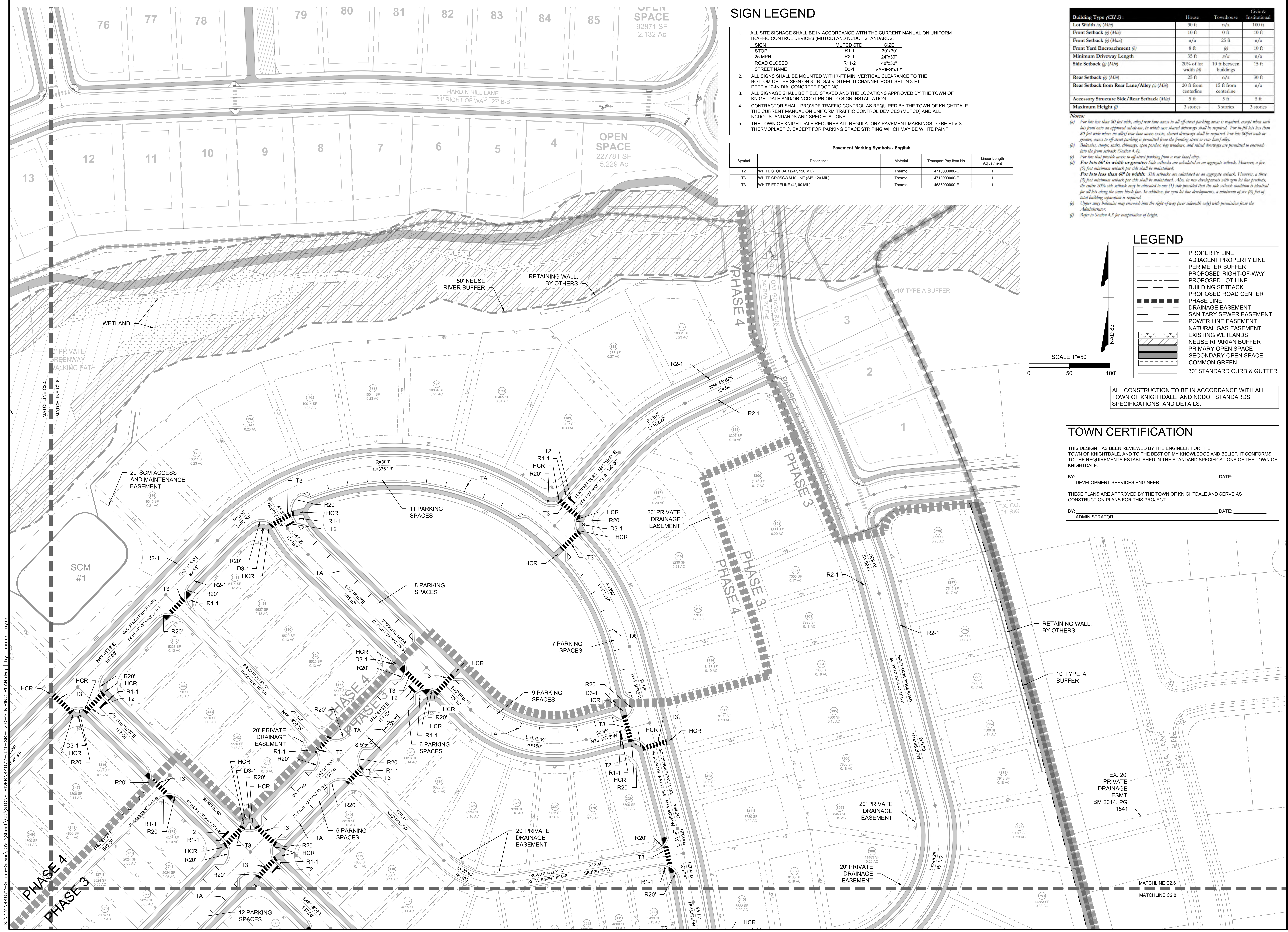

SIGN LEGEND

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SIGN	MUTCD STD.	SIZE
STOP	R1-1	30"x30"
25 MPH	R2-1	24"x30"
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TA	WHITE EDGELINE (4", 90 MIL)	Thermo	4685000000-E	1

Building Type *(CH 5)*:	House	Townhouse	Civic & Institutional
Lot Width *(a) (Min)*	30 ft	n/a	100 ft
Front Setback *(g) (Min)*	10 ft	0 ft	10 ft
Front Setback *(g) (Max)*	n/a	25 ft	n/a
Front Yard Encroachment *(b)*	8 ft	*(e)*	10 ft
Minimum Driveway Length	35 ft	*n/a*	n/a
Side Setback *(g) (Min)*	20% of lot width *(d)*	10 ft between buildings	15 ft
Rear Setback *(g) (Min)*	25 ft	n/a	30 ft
Rear Setback from Rear Lane/Alley *(c) (Min)*	20 ft from centerline	15 ft from centerline	n/a
Accessory Structure Side/Rear Setback *(Min)*	5 ft	5 ft	5 ft
Maximum Height *(f)*	3 stories	3 stories	3 stories

Notes:

(a) For lots less than 80 feet wide, alley/rear lane access to all off-street parking areas is required, except when such lots front onto an approved cul-de-sac, in which case shared driveways shall be required. For in-fill lots less than 80 feet wide where no alley/rear lane access exists, shared driveways shall be required. For lots 80feet wide or greater, access to off-street parking is permitted from the fronting street or rear lane/alley.

(b) Balconies, stoops, stairs, chimneys, open porches, bay windows, and raised doorways are permitted to encroach into the front setback (Section 4.4).

(c) For lots that provide access to off-street parking from a rear lane/alley.

(d) ***For lots 60' in width or greater:*** *Side setbacks are calculated as an aggregate setback. However, a five (5) foot minimum setback per side shall be maintained;*
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(e) Upper story balconies may encroach into the right-of-way (over sidewalk only) with permission from the Administrator.

(f) Refer to Section 4.5 for computation of height.

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
▨	PRIMARY OPEN SPACE
▨	SECONDARY OPEN SPACE
▨	COMMON GREEN
═	30" STANDARD CURB & GUTTER

NAD 83

SCALE 1"=50'

0 50' 100'

ALL CONSTRUCTION TO BE IN ACCORDANCE WITH ALL TOWN OF KNIGHTDALE AND NCDOT 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: ______________________ DATE: __________
DEVELOPMENT SERVICES ENGINEER

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

BY: ______________________ DATE: __________
ADMINISTRATOR

S:\331\44872-Stone-Silver\DWG\Sheet\CD\STONE RIVER\44872-331-SR-C2.0-STRIPING PLAN.dwg | by: Thomas Taylor

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 028391 MICHAEL V. ZACCARDO
6/22/21

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YOUR VISION ACHIEVED THROUGH OURS.

REVISION DESCRIPTION	DATE

DATE	06/22/2021
DRAWN BY	JD. MACMILLAN
DESIGNED BY	JD. MACMILLAN
CHECKED BY	M. ZACCARDO
SCALE	1" = 50'

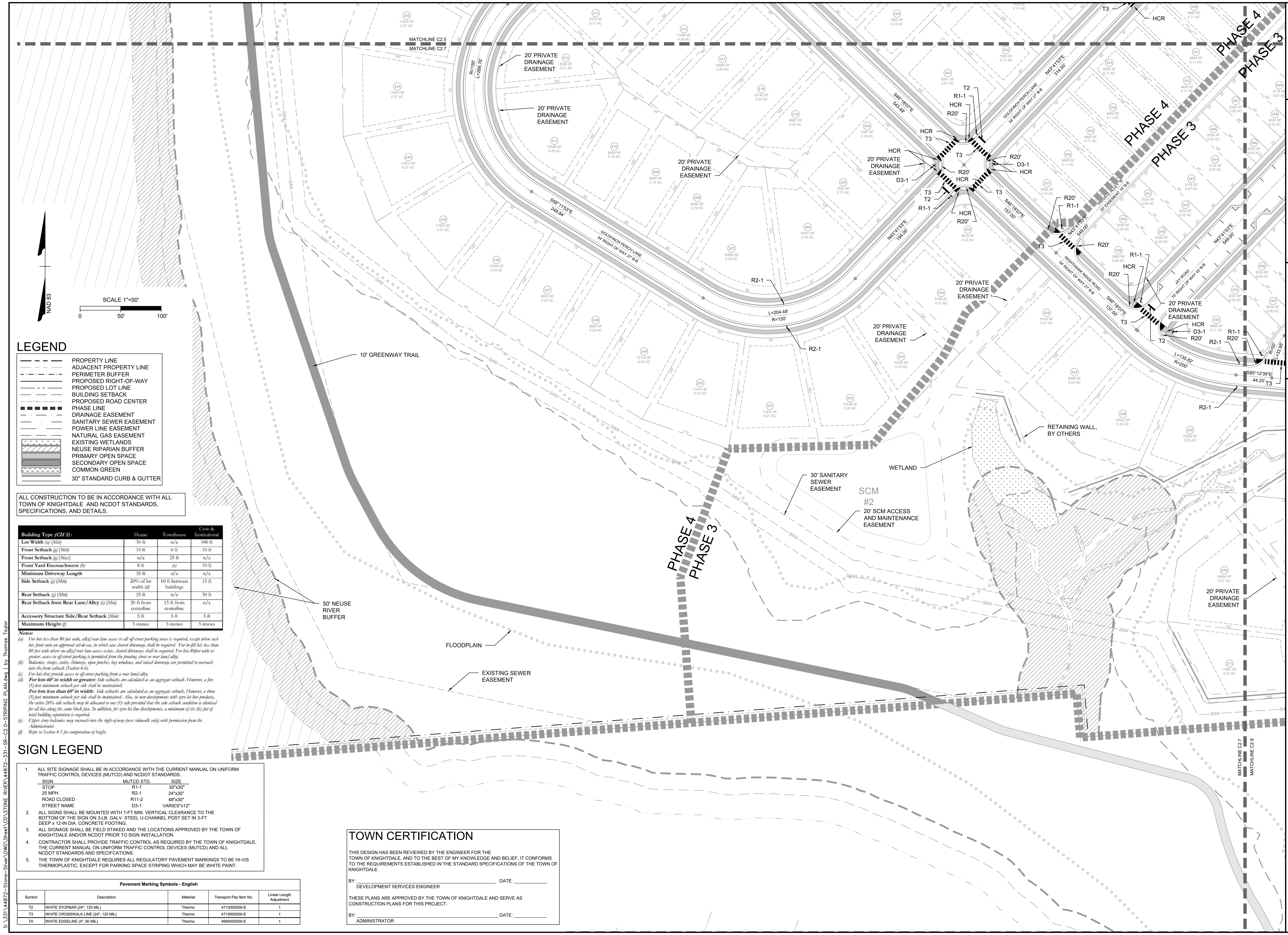
TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION
KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA
SIGNAGE AND MARKING PLAN - SHEET 2 OF 4

FOR REVIEW ONLY: NOT FOR CONSTRUCTION

JOB NO. 44872

SHEET NO. C2.6


MATCHLINE C2.5
MATCHLINE C2.7
20' PRIVATE DRAINAGE EASEMENT
GOLDFINCH PERCH LANE 54' RIGHT OF WAY 27' B-B
NIGHTHAWK RIDGE ROAD 54' RIGHT OF WAY 27' B-B
JAY ROAD 70' RIGHT OF WAY 45' B-B
PRIVATE ALLEY 20' EASEMENT 16' B-B
PHASE 4
PHASE 3
HCR
T2
T3
R1-1
R2-1
R20'
D3-1
10' GREENWAY TRAIL
50' NEUSE RIVER BUFFER
FLOODPLAIN
EXISTING SEWER EASEMENT
30' SANITARY SEWER EASEMENT
SCM #2
20' SCM ACCESS AND MAINTENANCE EASEMENT
WETLAND
RETAINING WALL, BY OTHERS
SCALE 1"=50'
0 50' 100'
NAD 83
MATCHLINE C2.7
MATCHLINE C2.8

LEGEND

- PROPERTY LINE
- ADJACENT PROPERTY LINE
- PERIMETER BUFFER
- PROPOSED RIGHT-OF-WAY
- PROPOSED LOT LINE
- BUILDING SETBACK
- PROPOSED ROAD CENTER
- PHASE LINE
- DRAINAGE EASEMENT
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- NEUSE RIPARIAN BUFFER
- PRIMARY OPEN SPACE
- SECONDARY OPEN SPACE
- COMMON GREEN
- 30" STANDARD CURB & GUTTER

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

Building Type *(CH 5)*:	House	Townhouse	Civic & Institutional
Lot Width *(a) (Min)*	30 ft	n/a	100 ft
Front Setback *(g) (Min)*	10 ft	0 ft	10 ft
Front Setback *(g) (Max)*	n/a	25 ft	n/a
Front Yard Encroachment *(b)*	8 ft	*(e)*	10 ft
Minimum Driveway Length	35 ft	*n/a*	n/a
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Maximum Height *(f)*	3 stories	3 stories	3 stories

Notes:

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BY: ______________________________ DATE: ____________
DEVELOPMENT SERVICES ENGINEER

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BY: ______________________________ DATE: ____________
ADMINISTRATOR

S:\331\44872-Stone-Silver\DWG\Sheet\CD\STONE RIVER\44872-331-SR-C2.0-STRIPING PLAN.dwg | by Thomas Taylor

MICHAEL V. ZACCARDO
6/22/21

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DATE	REVISION DESCRIPTION

DATE	06/22/2021
DRAWN BY	JD. MACMILLAN
DESIGNED BY	JD. MACMILLAN
CHECKED BY	M. ZACCARDO
SCALE	1" = 50'

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION
KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA

SIGNAGE AND MARKING PLAN - SHEET 3 OF 4

JOB NO.	44872
SHEET NO.	C2.7

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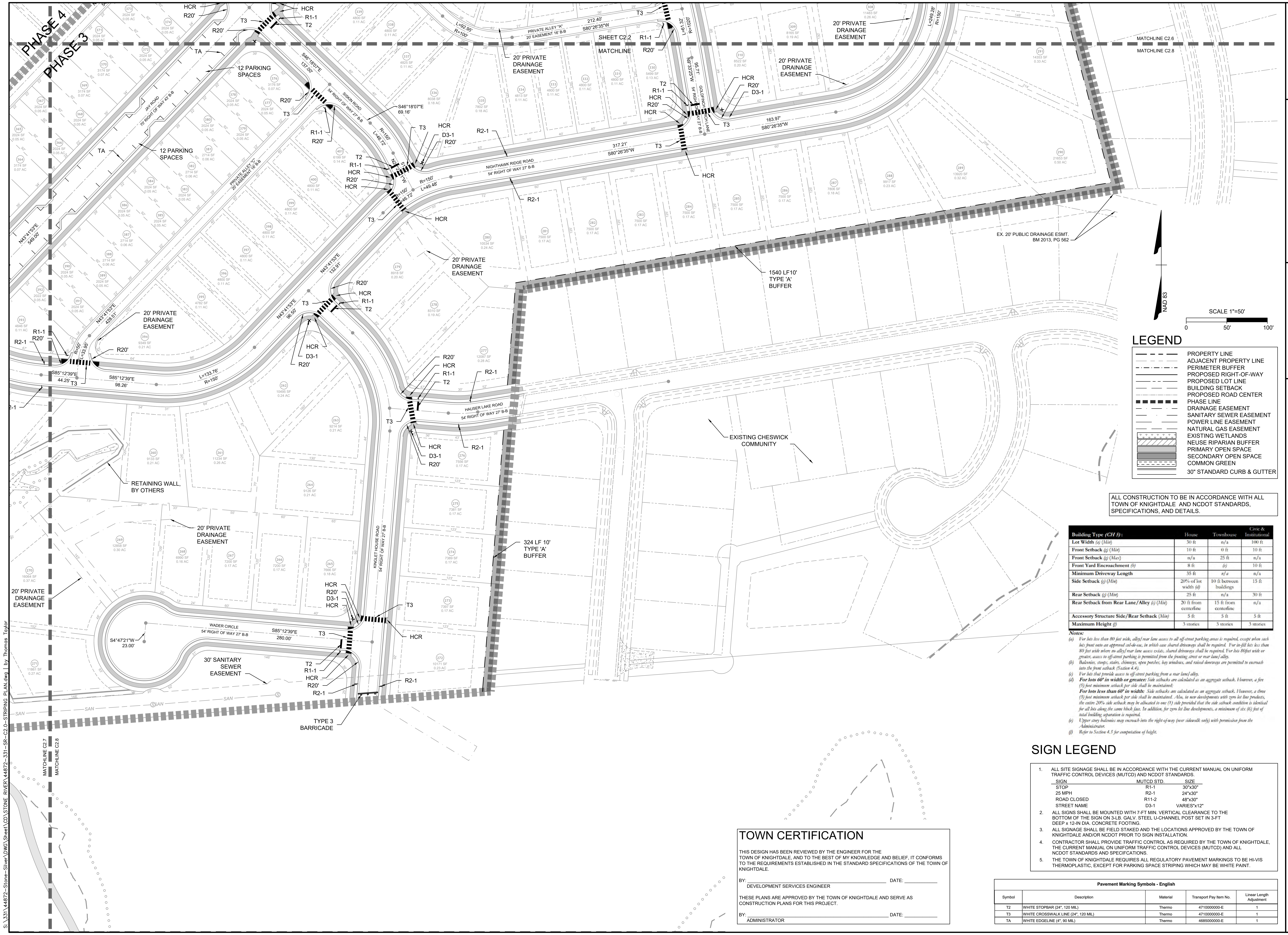

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LEGEND

- PROPERTY LINE
- ADJACENT PROPERTY LINE
- PERIMETER BUFFER
- PROPOSED RIGHT-OF-WAY
- PROPOSED LOT LINE
- BUILDING SETBACK
- PROPOSED ROAD CENTER
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- DRAINAGE EASEMENT
- SANITARY SEWER EASEMENT
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DEVELOPMENT SERVICES ENGINEER

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BY: ______________________ DATE: __________
ADMINISTRATOR

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MICHAEL V. ZACCARDO
6/22/21

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TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION

KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA

SIGNAGE AND MARKING PLAN - SHEET 4 OF 4

JOB NO. 44872

SHEET NO. C2.8

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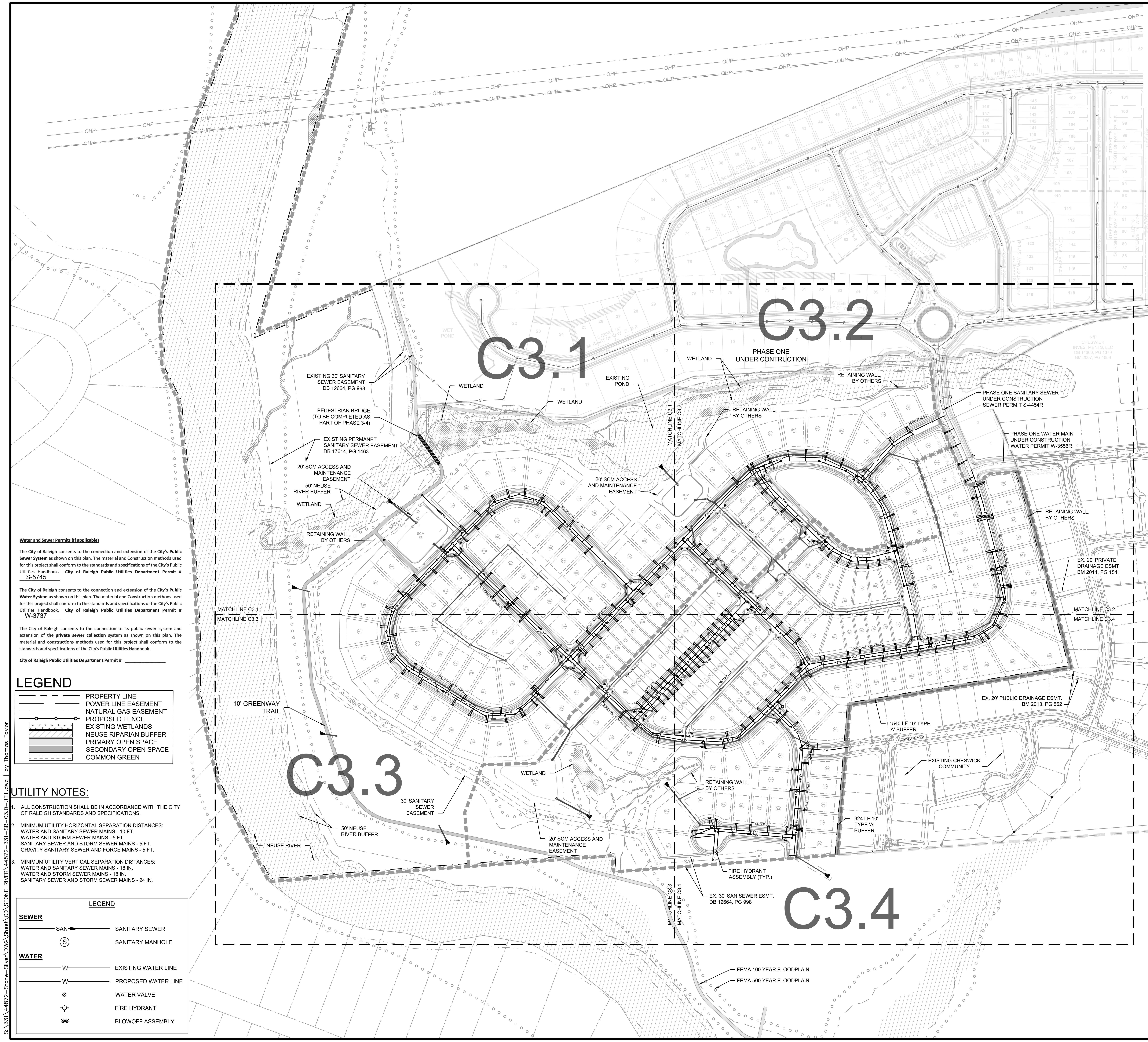
CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

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

City of Raleigh Development Approval ____________________

Raleigh Water Review Officer



C3.1
C3.2
C3.3
C3.4
PHASE ONE UNDER CONTRUCTION
EXISTING 30' SANITARY SEWER EASEMENT DB 12664, PG 998
PEDESTRIAN BRIDGE (TO BE COMPLETED AS PART OF PHASE 3-4)
EXISTING PERMANET SANITARY SEWER EASEMENT DB 17614, PG 1463
20' SCM ACCESS AND MAINTENANCE EASEMENT
50' NEUSE RIVER BUFFER
WETLAND
RETAINING WALL, BY OTHERS
EXISTING POND
20' SCM ACCESS AND MAINTENANCE EASEMENT
MATCHLINE C3.1
MATCHLINE C3.2
MATCHLINE C3.3
MATCHLINE C3.4
PHASE ONE SANITARY SEWER UNDER CONSTRUCTION SEWER PERMIT S-4454R
PHASE ONE WATER MAIN UNDER CONSTRUCTION WATER PERMIT W-3556R
EX. 20' PRIVATE DRAINAGE ESMT BM 2014, PG 1541
EX. 20' PUBLIC DRAINAGE ESMT. BM 2013, PG 562
1540 LF 10' TYPE 'A' BUFFER
EXISTING CHESWICK COMMUNITY
324 LF 10' TYPE 'A' BUFFER
10' GREENWAY TRAIL
30' SANITARY SEWER EASEMENT
50' NEUSE RIVER BUFFER
NEUSE RIVER
20' SCM ACCESS AND MAINTENANCE EASEMENT
FIRE HYDRANT ASSEMBLY (TYP.)
EX. 30' SAN SEWER ESMT. DB 12664, PG 998
FEMA 100 YEAR FLOODPLAIN
FEMA 500 YEAR FLOODPLAIN
SCALE 1"=150'
0
150'
300'
NAD 83

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-5745

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-3737

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 # ______________

LEGEND

— — —	PROPERTY LINE
—— ——	POWER LINE EASEMENT
— — — —	NATURAL GAS EASEMENT
—o—o—o—	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
Ⓢ	SANITARY MANHOLE

WATER

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

S:\331\44872-Stone-Silver\DWG\Sheet\CD\STONE RIVER\44872-331-SR-C3.0-UTIL.dwg | by Thomas Taylor

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

6/22/21

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	06/22/2021
DRAWN BY	JD. MACMILLAN
DESIGNED BY	JD. MACMILLAN
CHECKED BY	M. ZACCARDO
SCALE	1" = 150'

TIMMONS GROUP

NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION

KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA

OVERALL UTILITY PLAN

JOB NO.	44872
SHEET NO.	C3.0

FOR REVIEW ONLY: NOT FOR CONSTRUCTION

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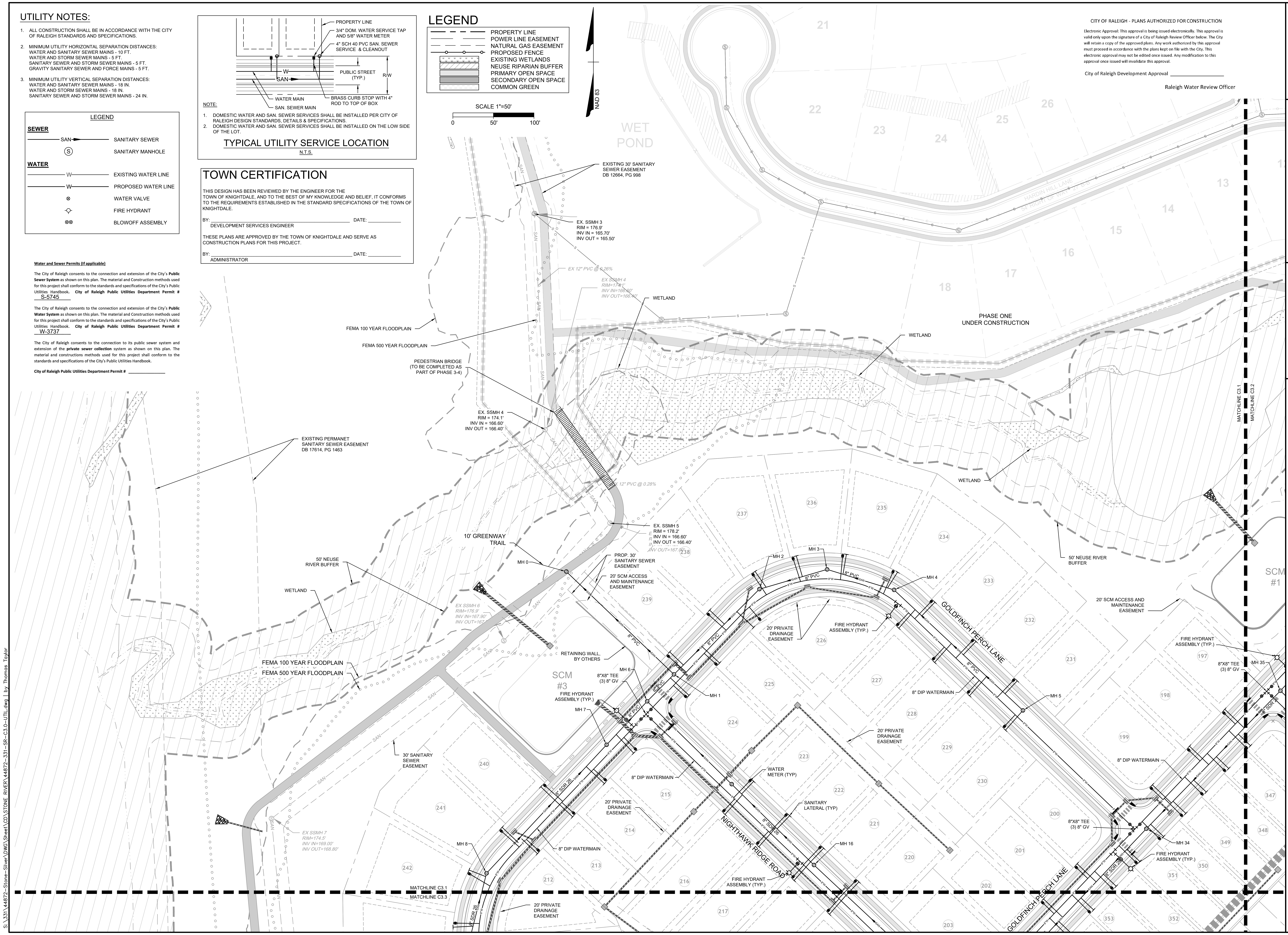

UTILITY NOTES:

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:
   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
Ⓢ	SANITARY MANHOLE

WATER

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

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-5745

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City of Raleigh Public Utilities Department Permit # ______________

PROPERTY LINE
3/4" DOM. WATER SERVICE TAP AND 5/8" WATER METER
4" SCH 40 PVC SAN. SEWER SERVICE & CLEANOUT
W
SAN
PUBLIC STREET (TYP.)
R/W
WATER MAIN
SAN. SEWER MAIN
BRASS CURB STOP WITH 4" ROD TO TOP OF BOX

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

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DEVELOPMENT SERVICES ENGINEER

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BY: ______________________________ DATE: ____________
ADMINISTRATOR

LEGEND

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

SCALE 1"=50'

0
50'
100'
NAD 83
WET POND
EXISTING 30' SANITARY SEWER EASEMENT DB 12664, PG 998
EX. SSMH 3 RIM = 176.9' INV IN = 165.70' INV OUT = 165.50'
EX 12" PVC @ 0.26%
EX SSMH 4 RIM=174.1' INV IN=166.60' INV OUT=166.40'
WETLAND
FEMA 100 YEAR FLOODPLAIN
FEMA 500 YEAR FLOODPLAIN
PEDESTRIAN BRIDGE (TO BE COMPLETED AS PART OF PHASE 3-4)
EX. SSMH 4 RIM = 174.1' INV IN = 166.60' INV OUT = 166.40'
EXISTING PERMANET SANITARY SEWER EASEMENT DB 17614, PG 1463
EX 12" PVC @ 0.28%
EX. SSMH 5 RIM = 178.2' INV IN = 166.60' INV OUT = 166.40'
INV OUT=167.00'
10' GREENWAY TRAIL
MH 0
PROP. 30' SANITARY SEWER EASEMENT
20' SCM ACCESS AND MAINTENANCE EASEMENT
50' NEUSE RIVER BUFFER
WETLAND
EX SSMH 6 RIM=176.9' INV IN=167.90' INV OUT=167.
8" PVC
RETAINING WALL, BY OTHERS
FEMA 100 YEAR FLOODPLAIN
FEMA 500 YEAR FLOODPLAIN
SCM #3
MH 6
8"X8" TEE (3) 8" GV
FIRE HYDRANT ASSEMBLY (TYP.)
MH 7
MH 1
SAN
8"W
30' SANITARY SEWER EASEMENT
EX SSMH 7 RIM=174.5' INV IN=169.00' INV OUT=168.80'
8" DIP WATERMAIN
20' PRIVATE DRAINAGE EASEMENT
WATER METER (TYP)
SANITARY LATERAL (TYP)
NIGHTHAWK RIDGE ROAD
8" SDR 26
MH 8
8" DIP WATERMAIN
MH 16
FIRE HYDRANT ASSEMBLY (TYP.)
MATCHLINE C3.1
MATCHLINE C3.3
20' PRIVATE DRAINAGE EASEMENT
MH 2
MH 3
MH 4
8" PVC
20' PRIVATE DRAINAGE EASEMENT
FIRE HYDRANT ASSEMBLY (TYP.)
GOLDFINCH PERCH LANE
8" DIP WATERMAIN
MH 5
20' PRIVATE DRAINAGE EASEMENT
PHASE ONE UNDER CONSTRUCTION
HARDIN HILL LANE
WETLAND
WETLAND
50' NEUSE RIVER BUFFER
SCM #1
20' SCM ACCESS AND MAINTENANCE EASEMENT
FIRE HYDRANT ASSEMBLY (TYP.)
8"X8" TEE (3) 8" GV
MH 35
8" DIP WATERMAIN
8"X8" TEE (3) 8" GV
MH 34
FIRE HYDRANT ASSEMBLY (TYP.)
GOLDFINCH PERCH LANE
MATCHLINE C3.1
MATCHLINE C3.2
13
14
15
16
17
18
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CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

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

City of Raleigh Development Approval ____________________

Raleigh Water Review Officer

MICHAEL V. ZACCARDO
6/22/21

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YOUR VISION ACHIEVED THROUGH OURS.

DATE	REVISION DESCRIPTION

DATE	06/22/2021
DRAWN BY	JD. MACMILLAN
DESIGNED BY	JD. MACMILLAN
CHECKED BY	M. ZACCARDO
SCALE	1" = 50'

TIMMONS GROUP

NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION

KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA

DETAILED UTILITY PLAN - SHEET 1 OF 4

JOB NO.	44872
SHEET NO.	C3.1

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UTILITY NOTES:

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   SANITARY SEWER AND STORM SEWER MAINS - 24 IN.

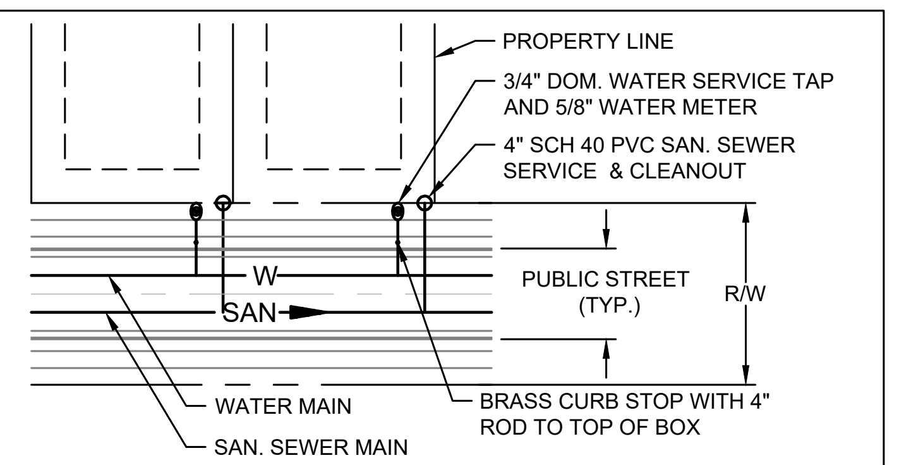
LEGEND

SEWER

——SAN➤——	SANITARY SEWER
Ⓢ	SANITARY MANHOLE

WATER

——W——	EXISTING WATER LINE
——W——	PROPOSED WATER LINE
⊗	WATER VALVE
-ǫ-	FIRE HYDRANT
⊗⊗	BLOWOFF ASSEMBLY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W
SAN
PUBLIC STREET (TYP.)
R/W
WATER MAIN
SAN. SEWER MAIN
BRASS CURB STOP WITH 4" ROD TO TOP OF BOX

NOTE:

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TYPICAL UTILITY SERVICE LOCATION

N.T.S.

TOWN CERTIFICATION

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BY: ______________________________ DATE: __________
DEVELOPMENT SERVICES ENGINEER

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BY: ______________________________ DATE: __________
ADMINISTRATOR

LEGEND

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

SCALE 1"=50'

0 50' 100'

NAD 83

Water and Sewer Permits (If applicable)

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City of Raleigh Public Utilities Department Permit # ________________

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

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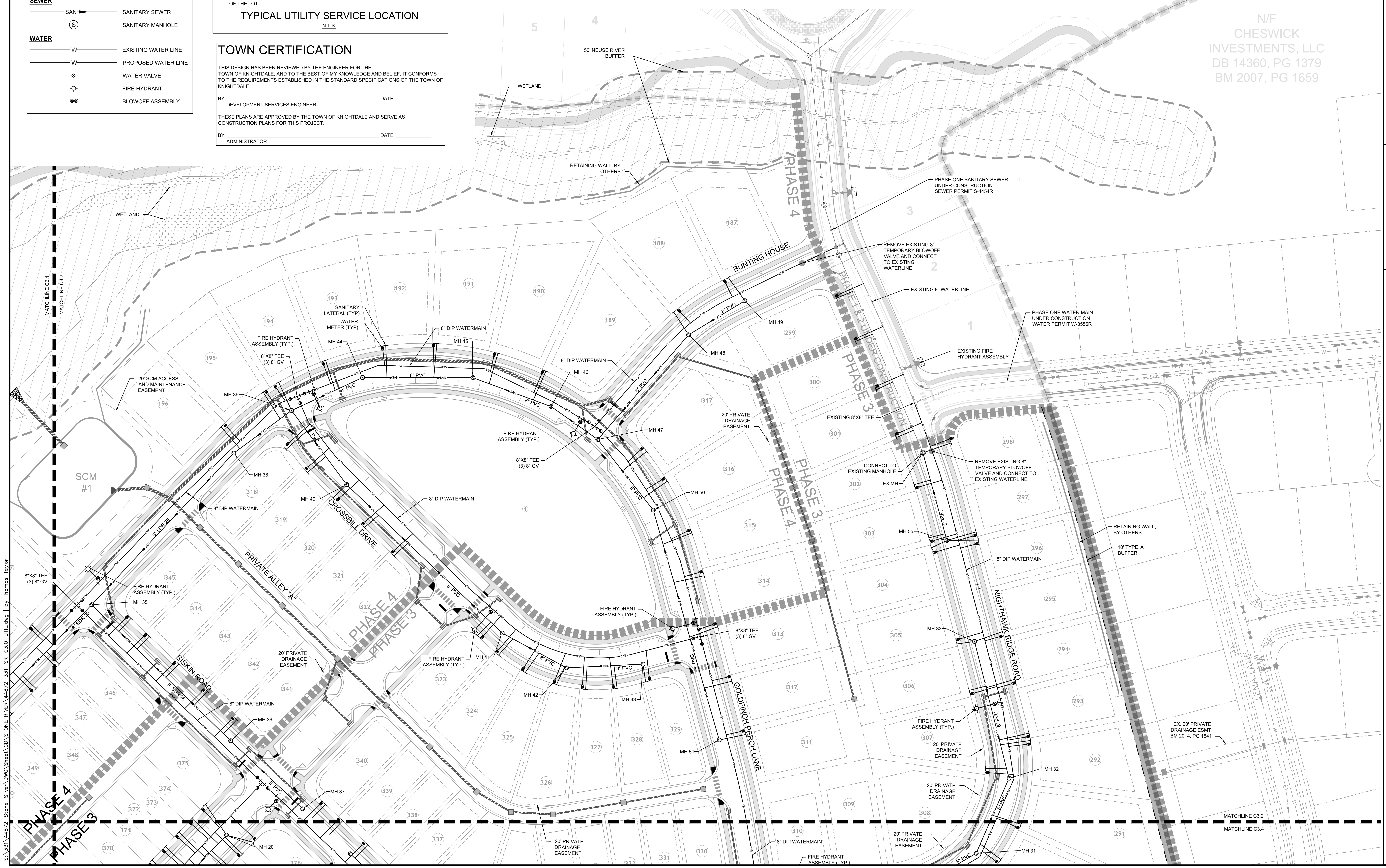
Raleigh Water Review Officer



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TIMMONS GROUP

NORTH CAROLINA LICENSE NO. C-1652

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TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

6/22/21

DATE	REVISION DESCRIPTION

DATE	06/22/2021
DRAWN BY	JD. MACMILLAN
DESIGNED BY	JD. MACMILLAN
CHECKED BY	M. ZACCARDO
SCALE	1" = 50'

STONERIVER SUBDIVISION
KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA
DETAILED UTILITY PLAN - SHEET 2 OF 4

JOB NO.
44872

SHEET NO.
C3.2

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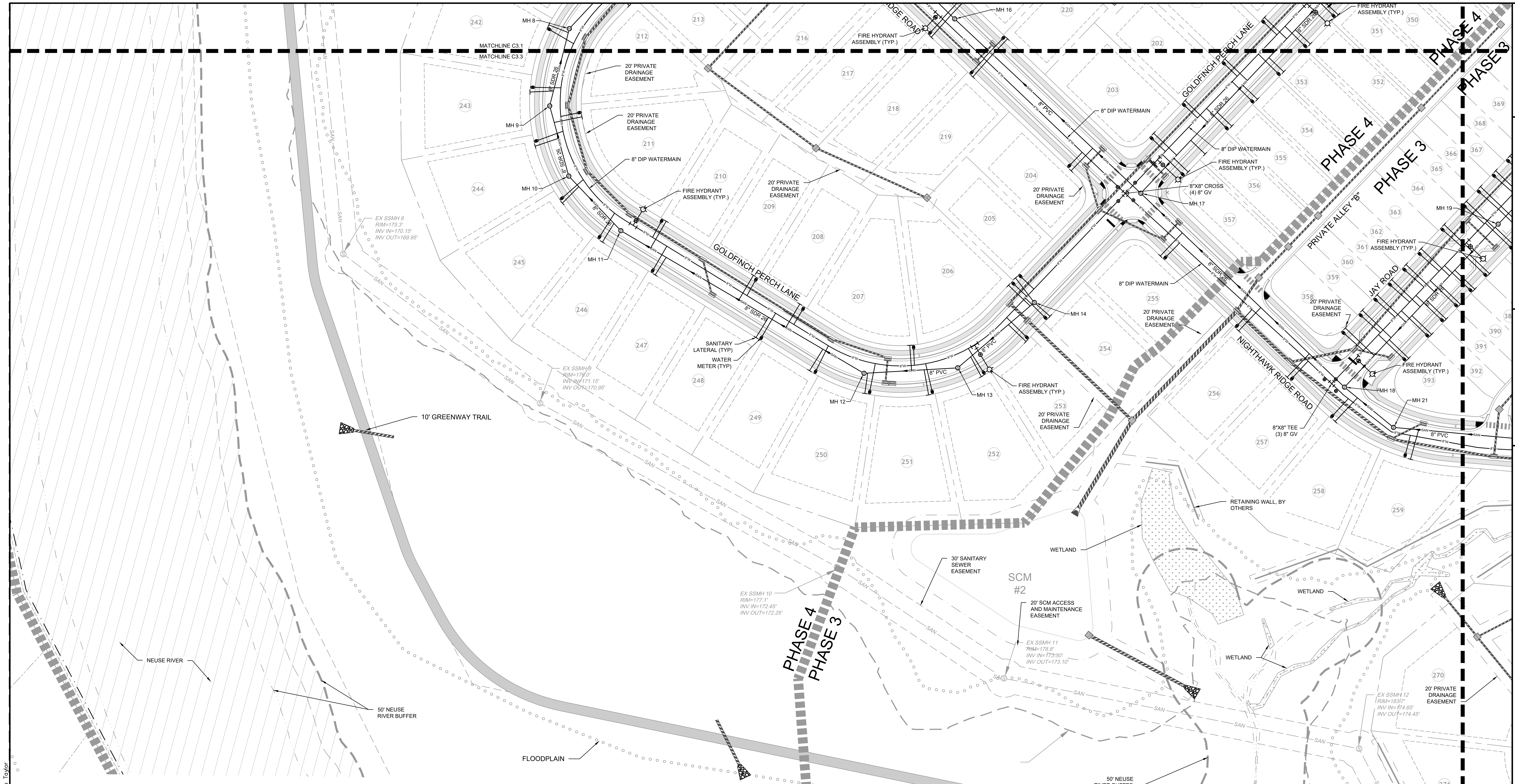

UTILITY NOTES:

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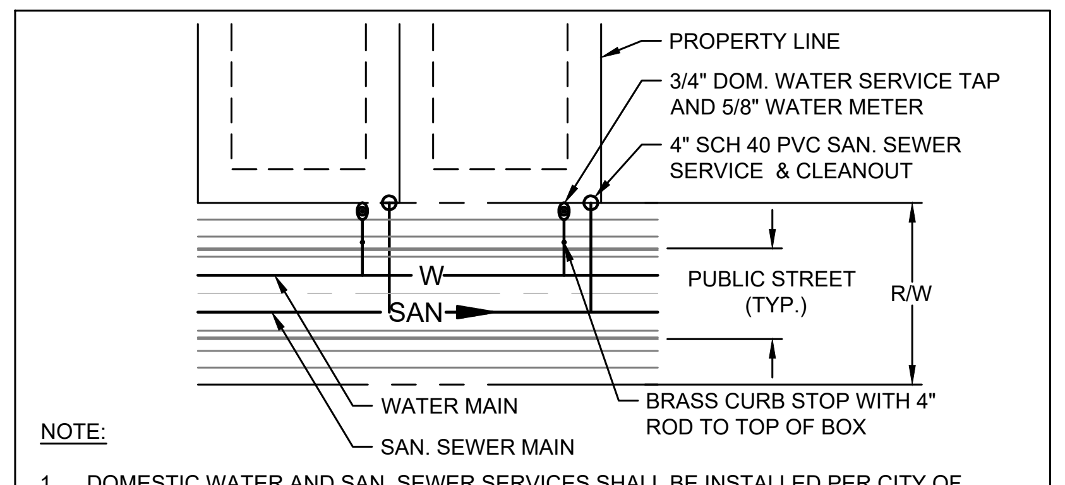
LEGEND

SEWER

——SAN➤——	SANITARY SEWER
Ⓢ	SANITARY MANHOLE

WATER

——W——	EXISTING WATER LINE
——W——	PROPOSED WATER LINE
⊗	WATER VALVE
-○-	FIRE HYDRANT
⊗⊗	BLOWOFF ASSEMBLY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W
SAN
PUBLIC STREET (TYP.)
R/W
WATER MAIN
SAN. SEWER MAIN
BRASS CURB STOP WITH 4" ROD TO TOP OF BOX

NOTE:

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TYPICAL UTILITY SERVICE LOCATION

N.T.S.

TOWN CERTIFICATION

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BY: ______________________________ DATE: ____________
DEVELOPMENT SERVICES ENGINEER

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BY: ______________________________ DATE: ____________
ADMINISTRATOR

LEGEND

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

SCALE 1"=50'

0 50' 100'

NAD 83

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City of Raleigh Public Utilities Department Permit # ____________

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

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City of Raleigh Development Approval ____________

Raleigh Water Review Officer

S:\331\44872-Stone-Silver\DWG\Sheet\CD\STONE RIVER\44872-331-SR-C3.0-UTIL.dwg | by Thomas Taylor

MICHAEL V. ZACCARDO
6/22/21

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REVISION DESCRIPTION	DATE

DATE
06/22/2021

DRAWN BY
JD. MACMILLAN

DESIGNED BY
JD. MACMILLAN

CHECKED BY
M. ZACCARDO

SCALE
1" = 50'

TIMMONS GROUP

NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION

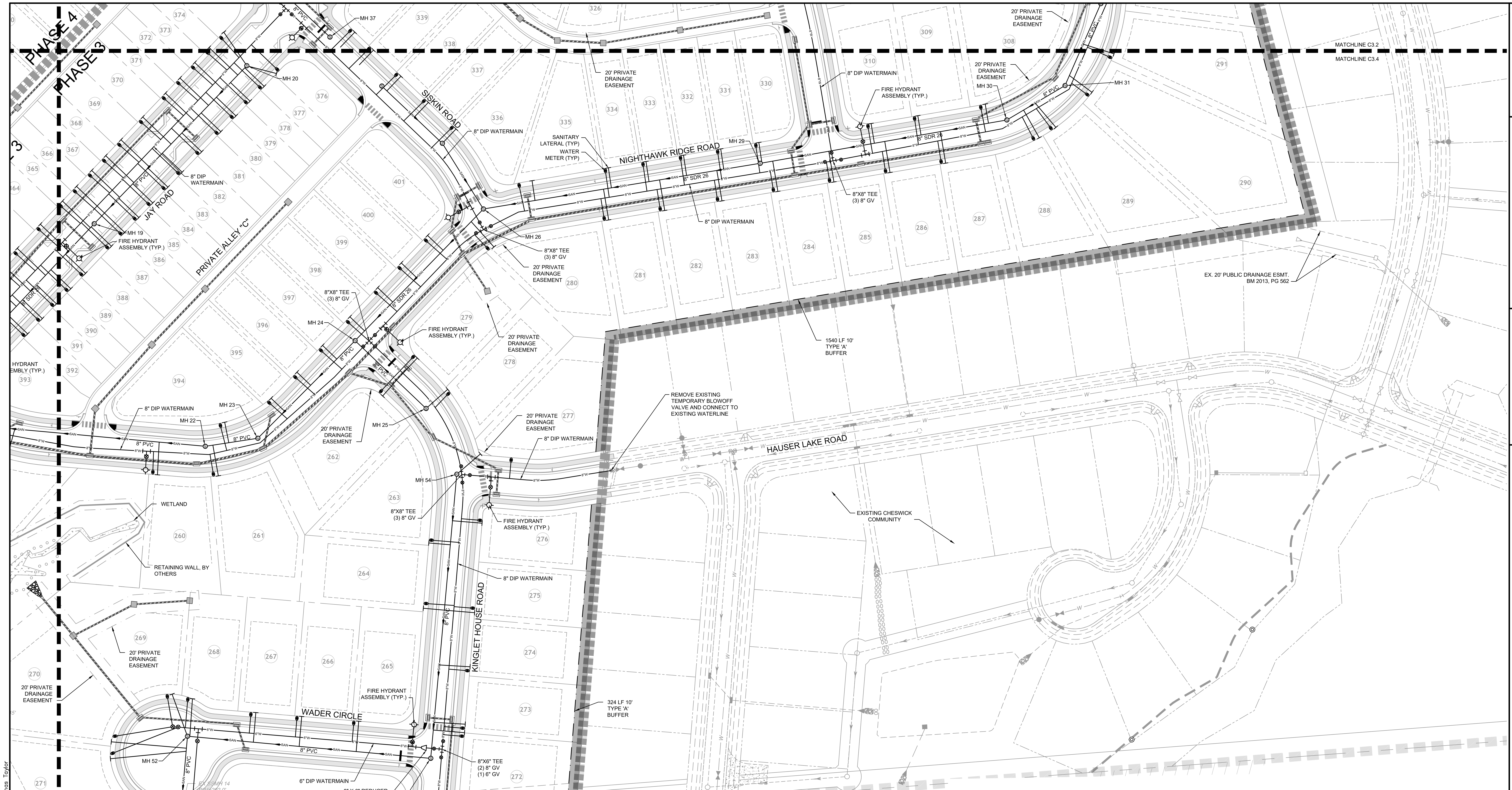
KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA

DETAILED UTILITY PLAN - SHEET 3 OF 4

JOB NO.
44872

SHEET NO.
C3.3

FOR REVIEW ONLY: NOT FOR CONSTRUCTION


PHASE 4
PHASE 3
MATCHLINE C3.2
MATCHLINE C3.4
MH 37
MH 20
MH 19
MH 22
MH 23
MH 24
MH 25
MH 26
MH 29
MH 30
MH 31
MH 52
MH 53
MH 54
SISKIN ROAD
JAY ROAD
PRIVATE ALLEY "C"
NIGHTHAWK RIDGE ROAD
HAUSER LAKE ROAD
KINGLET HOUSE ROAD
WADER CIRCLE
8" DIP WATERMAIN
8" PVC
8" SDR 26
6" DIP WATERMAIN
8" X 6" REDUCER
8"X8" TEE (3) 8" GV
8"X6" TEE (2) 8" GV (1) 6" GV
FIRE HYDRANT ASSEMBLY (TYP.)
SANITARY LATERAL (TYP)
WATER METER (TYP)
20' PRIVATE DRAINAGE EASEMENT
REMOVE EXISTING TEMPORARY BLOWOFF VALVE AND CONNECT TO EXISTING WATERLINE
1540 LF 10' TYPE 'A' BUFFER
324 LF 10' TYPE 'A' BUFFER
EX. 20' PUBLIC DRAINAGE ESMT. BM 2013, PG 562
EXISTING CHESWICK COMMUNITY
WETLAND
RETAINING WALL, BY OTHERS
EX SSMH 14 RIM=202.0' INV IN=196.18' INV OUT=195.98'
EX SSMH 15 RIM=210.5' INV IN=196.85' INV OUT=196.65'
EX SSMH 13
EX. 30' SAN SEWER ESMT. DB 12664, PG 998
FEMA 100 YEAR FLOODPLAIN
FEMA 500 YEAR FLOODPLAIN
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MATCHLINE C3.4
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UTILITY NOTES:

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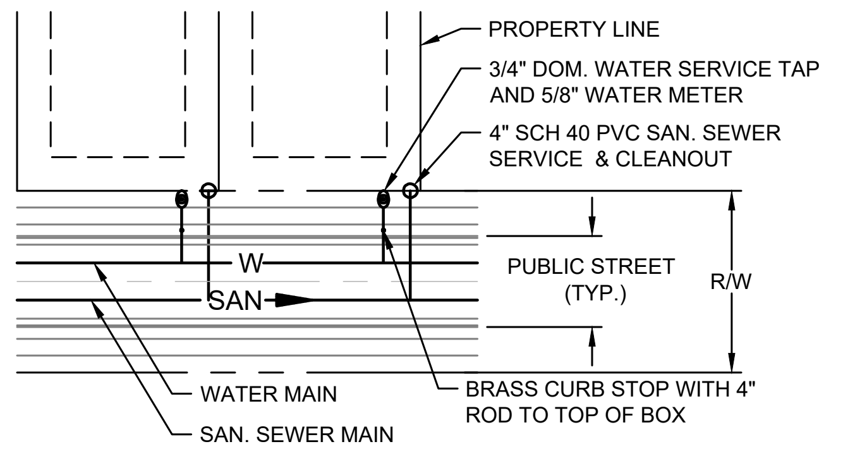
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W
SAN
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R/W
WATER MAIN
SAN. SEWER MAIN
BRASS CURB STOP WITH 4" ROD TO TOP OF BOX

NOTE:

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TYPICAL UTILITY SERVICE LOCATION

N.T.S.

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Water and Sewer Permits (If applicable)

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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-3737

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 # ____________

LEGEND

SEWER

—SAN➤—	SANITARY SEWER
Ⓢ	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
—o—o—o—	PROPOSED FENCE
▨	EXISTING WETLANDS
▨	NEUSE RIPARIAN BUFFER
▨	PRIMARY OPEN SPACE
▨	SECONDARY OPEN SPACE
▨	COMMON GREEN

SCALE 1"=50'

0 50' 100'

NAD 83

MICHAEL V. ZACCARDO
6/22/21

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
06/22/2021

DRAWN BY
JD. MACMILLAN

DESIGNED BY
JD. MACMILLAN

CHECKED BY
M. ZACCARDO

SCALE
1" = 50'

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION
KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA

DETAILED UTILITY PLAN - SHEET 4 OF 4

JOB NO.
44872

SHEET NO.
C3.4

FOR REVIEW ONLY: NOT FOR CONSTRUCTION

S:\331\44872-Stone-Silver\DWG\Sheet\CD\STONE RIVER\44872-331-SR-C3.0-UTIL.dwg | by Thomas Taylor

SANITARY SEWER SCHEDULE

STRUCTURE UP	HEIGHT	TOP	INV IN	INV OUT	OUTLET PIPE	STRUCTURE DOWN
EX MH	5.68'	252.07	246.39' (8" PVC) MH 55			
EX MH 14	6.49'	202.67	196.18' (8" PVC) MH 52			
MH 0	10.45'	177.85	167.41' (8" PVC) MH 1			
MH 1	11.70'	190.80	179.37' (8" PVC) MH 6 179.37' (8" PVC) MH 2	179.10' (8" PVC)	183' @ 6.37%	MH 0
MH 2	7.25'	194.61	187.57' (8" PVC) MH 3	187.37' (8" PVC)	149' @ 5.38%	MH 1
MH 3	7.09'	198.84	191.94' (8" PVC) MH 4	191.74' (8" PVC)	87' @ 4.81%	MH 2
MH 4	6.70'	203.05	196.55' (8" PVC) MH 5	196.35' (8" PVC)	86' @ 5.11%	MH 3
MH 5	6.00'	213.88		207.88' (8" PVC)	218' @ 5.21%	MH 4
MH 6	11.57'	191.17	179.80' (8" PVC) MH 7 179.80' (8" SDR 26) MH 15	179.60' (8" PVC)	47' @ 0.50%	MH 1
MH 7	12.86'	193.02	180.37' (8" SDR 26) MH 8	180.17' (8" PVC)	73' @ 0.50%	MH 6
MH 8	14.44'	198.92	184.68' (8" SDR 26) MH 9	184.48' (8" SDR 26)	217' @ 1.90%	MH 7
MH 9	15.49'	200.59	185.30' (8" SDR 26) MH 10	185.10' (8" SDR 26)	83' @ 0.50%	MH 8
MH 10	15.21'	200.89	185.88' (8" SDR 26) MH 11	185.68' (8" SDR 26)	76' @ 0.50%	MH 9
MH 11	13.37'	200.03	186.86' (8" SDR 26) MH 12	186.66' (8" SDR 26)	79' @ 0.98%	MH 10
MH 12	7.39'	195.84	188.65' (8" PVC) MH 13	188.45' (8" SDR 26)	295' @ 0.54%	MH 11
MH 13	6.87'	196.37	189.70' (8" PVC) MH 14	189.50' (8" PVC)	98' @ 0.87%	MH 12
MH 14	9.18'	199.40		190.23' (8" PVC)	105' @ 0.50%	MH 13
MH 15	13.96'	196.58	182.82' (8" SDR 26) MH 16	182.62' (8" SDR 26)	146' @ 1.93%	MH 6
MH 16	9.31'	204.69	195.57' (8" PVC) MH 17	195.37' (8" SDR 26)	142' @ 8.83%	MH 15
MH 17	10.29'	207.77	197.68' (8" SDR 26) MH 34 197.68' (8" SDR 26) MH 18	197.48' (8" PVC)	267' @ 0.71%	MH 16
MH 18	12.14'	213.64	201.70' (8" SDR 26) MH 21 201.70' (8" SDR 26) MH 19	201.50' (8" SDR 26)	295' @ 1.30%	MH 17
MH 19	7.31'	224.46	217.35' (8" PVC) MH 20	217.15' (8" SDR 26)	235' @ 6.58%	MH 18
MH 20	7.37'	239.46		232.08' (8" PVC)	231' @ 6.39%	MH 19
MH 21	9.35'	215.43	206.29' (8" PVC) MH 22	206.09' (8" SDR 26)	66' @ 6.61%	MH 18
MH 22	7.79'	220.31	212.72' (8" PVC) MH 23	212.52' (8" PVC)	227' @ 2.74%	MH 21
MH 23	7.65'	221.53	214.08' (8" PVC) MH 24	213.88' (8" PVC)	56' @ 2.08%	MH 22
MH 24	10.09'	225.59	215.90' (8" SDR 26) MH 26 215.70' (8" PVC) MH 25	215.50' (8" PVC)	145' @ 0.98%	MH 23
MH 25	8.14'	225.84		217.70' (8" PVC)	103' @ 1.94%	MH 24
MH 26	14.60'	236.72	222.32' (8" SDR 26) MH 29 224.32' (8" PVC) MH 27	222.12' (8" SDR 26)	193' @ 3.22%	MH 24
MH 29	13.12'	245.61	232.69' (8" SDR 26) MH 30	232.49' (8" SDR 26)	294' @ 3.45%	MH 26
MH 30	7.27'	241.84	234.77' (8" PVC) MH 31	234.57' (8" SDR 26)	263' @ 0.72%	MH 29
MH 31	7.44'	243.47	236.24' (8" PVC) MH 32	236.04' (8" PVC)	71' @ 1.79%	MH 30
MH 32	7.93'	247.93	240.20' (8" PVC) MH 33	240.00' (8" PVC)	94' @ 4.01%	MH 31
MH 33	6.00'	256.43		250.43' (8" PVC)	162' @ 6.33%	MH 32
MH 34	15.35'	224.48	209.32' (8" SDR 26) MH 35	209.12' (8" SDR 26)	313' @ 3.66%	MH 17
MH 35	19.10'	229.61	210.71' (8" SDR 26) MH 38 212.71' (8" SDR 26) MH 36	210.51' (8" SDR 26)	237' @ 0.50%	MH 34
MH 36	8.47'	241.48	233.20' (8" PVC) MH 37	233.00' (8" SDR 26)	223' @ 9.11%	MH 35
MH 37	6.53'	242.73		236.20' (8" PVC)	114' @ 2.64%	MH 36
MH 38	13.06'	224.96	212.10' (8" SDR 26) MH 39	211.90' (8" SDR 26)	238' @ 0.50%	MH 35
MH 39	10.04'	223.19	213.34' (8" PVC) MH 44 213.34' (8" PVC) MH 40	213.14' (8" SDR 26)	82' @ 1.27%	MH 38
MH 40	9.41'	226.15	216.94' (8" PVC) MH 41	216.74' (8" PVC)	106' @ 3.22%	MH 39
MH 41	6.22'	241.15	235.13' (8" PVC) MH 42	234.93' (8" PVC)	246' @ 7.31%	MH 40
MH 42	6.20'	244.98	238.98' (8" PVC) MH 43	238.78' (8" PVC)	84' @ 4.35%	MH 41
MH 43	6.00'	248.83		242.83' (8" PVC)	88' @ 4.38%	MH 42
MH 44	9.02'	222.81	213.99' (8" PVC) MH 45	213.79' (8" PVC)	90' @ 0.50%	MH 39
MH 45	9.05'	226.06	217.21' (8" PVC) MH 46	217.01' (8" PVC)	126' @ 2.38%	MH 44
MH 46	8.74'	229.61	221.06' (8" PVC) MH 47	220.86' (8" PVC)	95' @ 3.84%	MH 45
MH 47	10.09'	233.39	223.50' (8" PVC) MH 50 223.50' (8" PVC) MH 48	223.30' (8" PVC)	66' @ 3.41%	MH 46
MH 48	6.20'	235.65	229.65' (8" PVC) MH 49	229.45' (8" PVC)	159' @ 3.75%	MH 47
MH 49	6.00'	237.74		231.74' (8" PVC)	75' @ 2.77%	MH 48
MH 50	6.20'	240.57	234.57' (8" PVC) MH 51	234.37' (8" PVC)	103' @ 10.56%	MH 47
MH 51	6.00'	252.35		246.35' (8" PVC)	274' @ 4.30%	MH 50
MH 52	6.20'	205.95	199.95' (8" PVC) MH 53	199.75' (8" PVC)	96' @ 3.72%	EX MH 14
MH 53	7.41'	217.92	210.71' (8" PVC) MH 54	210.51' (8" PVC)	256' @ 4.12%	MH 52
MH 54	6.00'	226.81		220.81' (8" PVC)	299' @ 3.38%	MH 53
MH 55	5.92'	256.44		250.52' (8" PVC)	104' @ 3.97%	EX MH

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

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

City of Raleigh Development Approval ____________________

Raleigh Water Review Officer

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-5745

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City of Raleigh Public Utilities Department Permit # ______________

MICHAEL V. ZACCARDO
6/22/21

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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

YOUR VISION ACHIEVED THROUGH OURS.

DATE	REVISION DESCRIPTION

DATE
06/22/2021

DRAWN BY
JD. MACMILLAN

DESIGNED BY
JD. MACMILLAN

CHECKED BY
M. ZACCARDO

SCALE
AS SHOWN

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION
KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA
SANITARY SEWER SCHEDULE

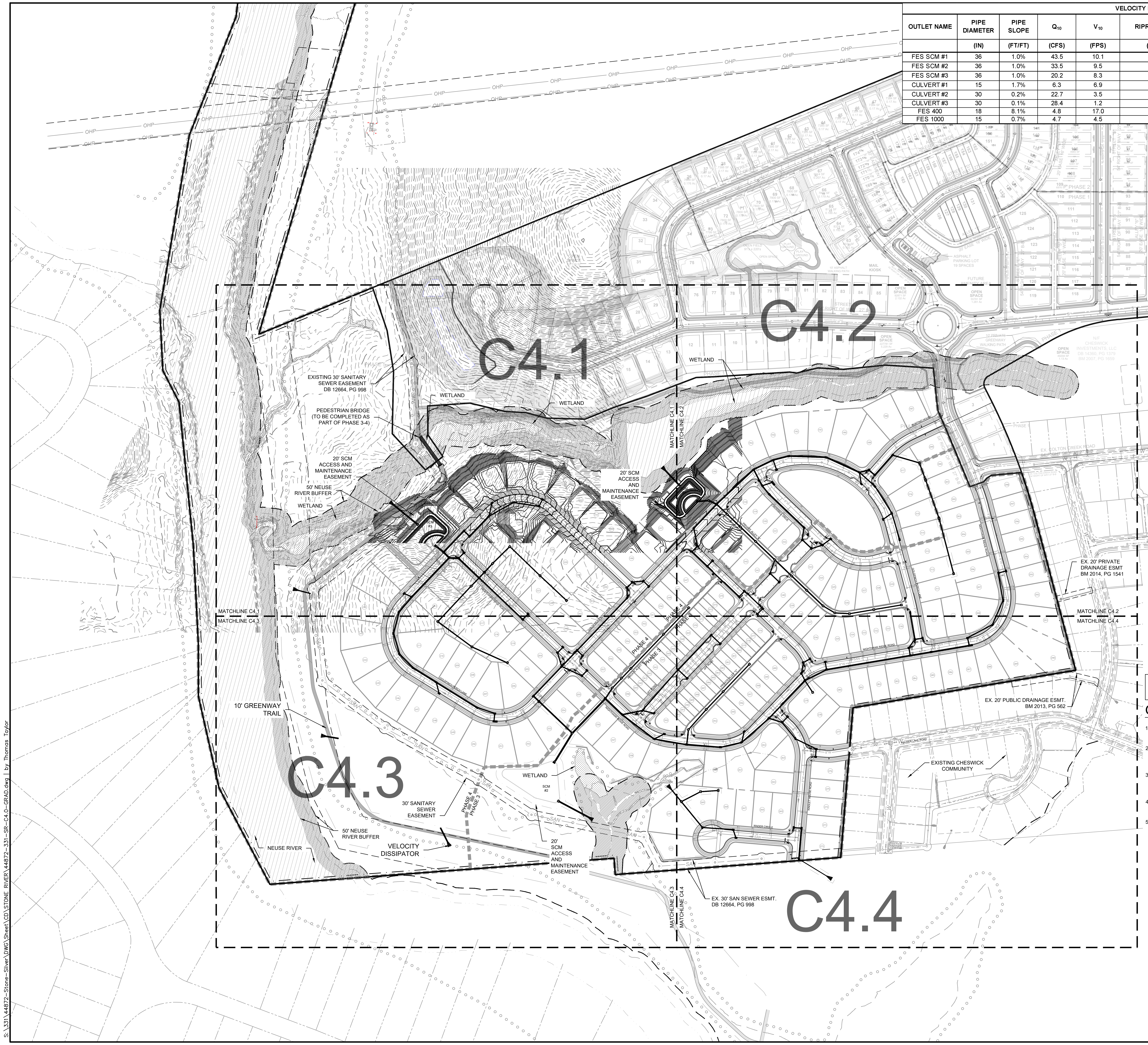
JOB NO.
44872

SHEET NO.
C3.5

FOR REVIEW ONLY: NOT FOR CONSTRUCTION

VELOCITY DISSIPATER PAD DESIGN

OUTLET NAME	PIPE DIAMETER	PIPE SLOPE	Q_{10}	V_{10}	RIPRAP D_{50}	MAXIMUM STONE DIAMETER	APRON LENGTH	APRON WIDTH AT PIPE	APRON WIDTH AT END	APRON THICKNESS
	(IN)	(FT/FT)	(CFS)	(FPS)	(IN)	(IN)	(FT)	(FT)	(FT)	(IN)
FES SCM #1	36	1.0%	43.5	10.1	8	12	18	9.0	9.0	18
FES SCM #2	36	1.0%	33.5	9.5	8	12	18	9.0	9.0	18
FES SCM #3	36	1.0%	20.2	8.3	8	12	18	9.0	9.0	18
CULVERT #1	15	1.7%	6.3	6.9	3	5	5	4.0	6.0	12
CULVERT #2	30	0.2%	22.7	3.5	3	5	10	7.5	12.5	12
CULVERT #3	30	0.1%	28.4	1.2	3	5	10	7.5	12.5	12
FES 400	18	8.1%	4.8	17.0	13	20	12	5.0	14.0	24
FES 1000	15	0.7%	4.7	4.5	3	5	5	4.0	6.0	12


C4.1
C4.2
C4.3
C4.4
MATCHLINE C4.1
MATCHLINE C4.2
MATCHLINE C4.3
MATCHLINE C4.4
EXISTING 30' SANITARY SEWER EASEMENT DB 12664, PG 998
PEDESTRIAN BRIDGE (TO BE COMPLETED AS PART OF PHASE 3-4)
20' SCM ACCESS AND MAINTENANCE EASEMENT
50' NEUSE RIVER BUFFER
WETLAND
EX. 20' PRIVATE DRAINAGE ESMT BM 2014, PG 1541
EX. 20' PUBLIC DRAINAGE ESMT. BM 2013, PG 562
EXISTING CHESWICK COMMUNITY
10' GREENWAY TRAIL
30' SANITARY SEWER EASEMENT
VELOCITY DISSIPATOR
NEUSE RIVER
EX. 30' SAN SEWER ESMT. DB 12664, PG 998
PHASE 4
PHASE 3
SCM #2

LEGEND

───	PROPOSED CONTOUR
- - -	EXISTING CONTOUR
─o──o─	FENCE
— · —	PROPOSED DRAIN EASEMENT
- · - · -	PROPOSED PERIMETER BUFFER
• ● ● ● ● ● •	100-YR FLOODPLAIN
▨	WETLANDS

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

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.

NOTE:
RETAINING WALLS 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: ______________________________ DATE: __________
DEVELOPMENT SERVICES ENGINEER

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

BY: ______________________________ DATE: __________
ADMINISTRATOR

NAD 83

SCALE 1"=150'
0 150' 300'

S:\331\44872-Stone-Silver\DWG\Sheet\CD\STONE RIVER\44872-331-SR-C4.0-GRAD.dwg | by Thomas Taylor

MICHAEL V. ZACCARDO
6/22/21

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DATE	REVISION DESCRIPTION

DATE
06/22/2021
DRAWN BY
JD. MACMILLAN
DESIGNED BY
JD. MACMILLAN
CHECKED BY
M. ZACCARDO
SCALE
1" = 150'

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION
KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA
OVERALL GRADING PLAN

JOB NO.
44872
SHEET NO.
C4.0

FOR REVIEW ONLY: NOT FOR 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.

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BY: ______________________________ DATE: ____________
ADMINISTRATOR

NAD 83

SCALE 1"=50'
0 50' 100'

VELOCITY DISSIPATER PAD DESIGN

OUTLET NAME	PIPE DIAMETER	PIPE SLOPE	Q_{10}	V_{10}	RIPRAP D_{50}	MAXIMUM STONE DIAMETER	APRON LENGTH	APRON WIDTH AT PIPE	APRON WIDTH AT END	APRON THICKNESS
	(IN)	(FT/FT)	(CFS)	(FPS)	(IN)	(IN)	(FT)	(FT)	(FT)	(IN)
FES SCM #1	36	1.0%	43.5	10.1	8	12	18	9.0	9.0	18
FES SCM #2	36	1.0%	33.5	9.5	8	12	18	9.0	9.0	18
FES SCM #3	36	1.0%	20.2	8.3	8	12	18	9.0	9.0	18
CULVERT #1	15	1.7%	6.3	6.9	3	5	5	4.0	6.0	12
CULVERT #2	30	0.2%	22.7	3.5	3	5	10	7.5	12.5	12
CULVERT #3	30	0.1%	28.4	1.2	3	5	10	7.5	12.5	12
FES 400	18	8.1%	4.8	17.0	13	20	12	5.0	14.0	24
FES 1000	15	0.7%	4.7	4.5	3	5	5	4.0	6.0	12

LEGEND

───	PROPOSED CONTOUR
- - -	EXISTING CONTOUR
— · —	PROPOSED DRAIN EASEMENT
── ──	CREEK BUFFER
▨	WETLANDS

NOTE:
RETAINING WALLS 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:
RETAINING WALL DESIGN BY OTHERS. CONTRACTOR SHALL COORDINATE DESIGN AND SUBMIT FOR REVIEW AND APPROVAL.

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

NOTE:
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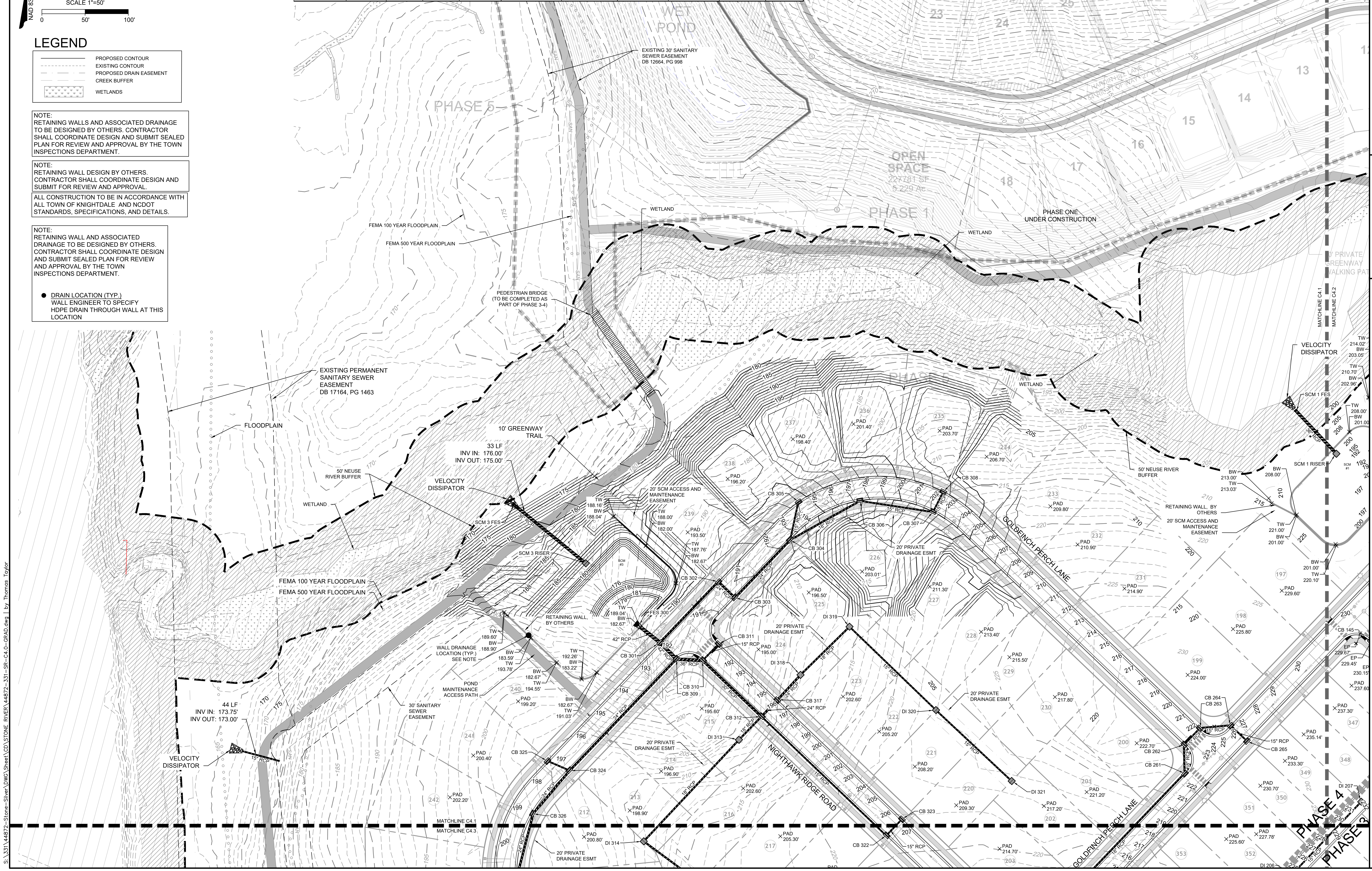
● DRAIN LOCATION (TYP.)
WALL ENGINEER TO SPECIFY HDPE DRAIN THROUGH WALL AT THIS LOCATION


WET POND
EXISTING 30' SANITARY SEWER EASEMENT DB 12664, PG 998
PHASE 5
PHASE 1
PHASE ONE UNDER CONSTRUCTION
OPEN SPACE 227781 SF 5.229 Ac
WETLAND
FEMA 100 YEAR FLOODPLAIN
FEMA 500 YEAR FLOODPLAIN
PEDESTRIAN BRIDGE (TO BE COMPLETED AS PART OF PHASE 3-4)
EXISTING PERMANENT SANITARY SEWER EASEMENT DB 17164, PG 1463
FLOODPLAIN
10' GREENWAY TRAIL
33 LF INV IN: 176.00' INV OUT: 175.00'
VELOCITY DISSIPATOR
50' NEUSE RIVER BUFFER
SCM 3 FES
SCM 3 RISER
20' SCM ACCESS AND MAINTENANCE EASEMENT
RETAINING WALL, BY OTHERS
WALL DRAINAGE LOCATION (TYP.) SEE NOTE
POND MAINTENANCE ACCESS PATH
30' SANITARY SEWER EASEMENT
44 LF INV IN: 173.75' INV OUT: 173.00'
15" RCP
24" RCP
36" RCP
42" RCP
FES 300
20' PRIVATE DRAINAGE ESMT
GOLDFINCH PERCH LANE
NIGHTHAWK RIDGE ROAD
SCM 1 FES
SCM 1 RISER
20' PRIVATE GREENWAY WALKING PATH
MATCHLINE C4.1
MATCHLINE C4.2
MATCHLINE C4.3
PHASE 4
PHASE 3
CB 145
CB 261
CB 262
CB 263
CB 264
CB 265
CB 301
CB 302
CB 303
CB 304
CB 305
CB 306
CB 307
CB 308
CB 309
CB 310
CB 311
CB 312
CB 317
CB 322
CB 323
CB 324
CB 325
CB 326
DI 206
DI 207
DI 313
DI 314
DI 318
DI 319
DI 320
DI 321

NORTH CAROLINA PROFESSIONAL SEAL ENGINEER MICHAEL V. ZACCARDO
6/22/21

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JD. MACMILLAN

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M. ZACCARDO

SCALE
1" = 50'

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION
KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA

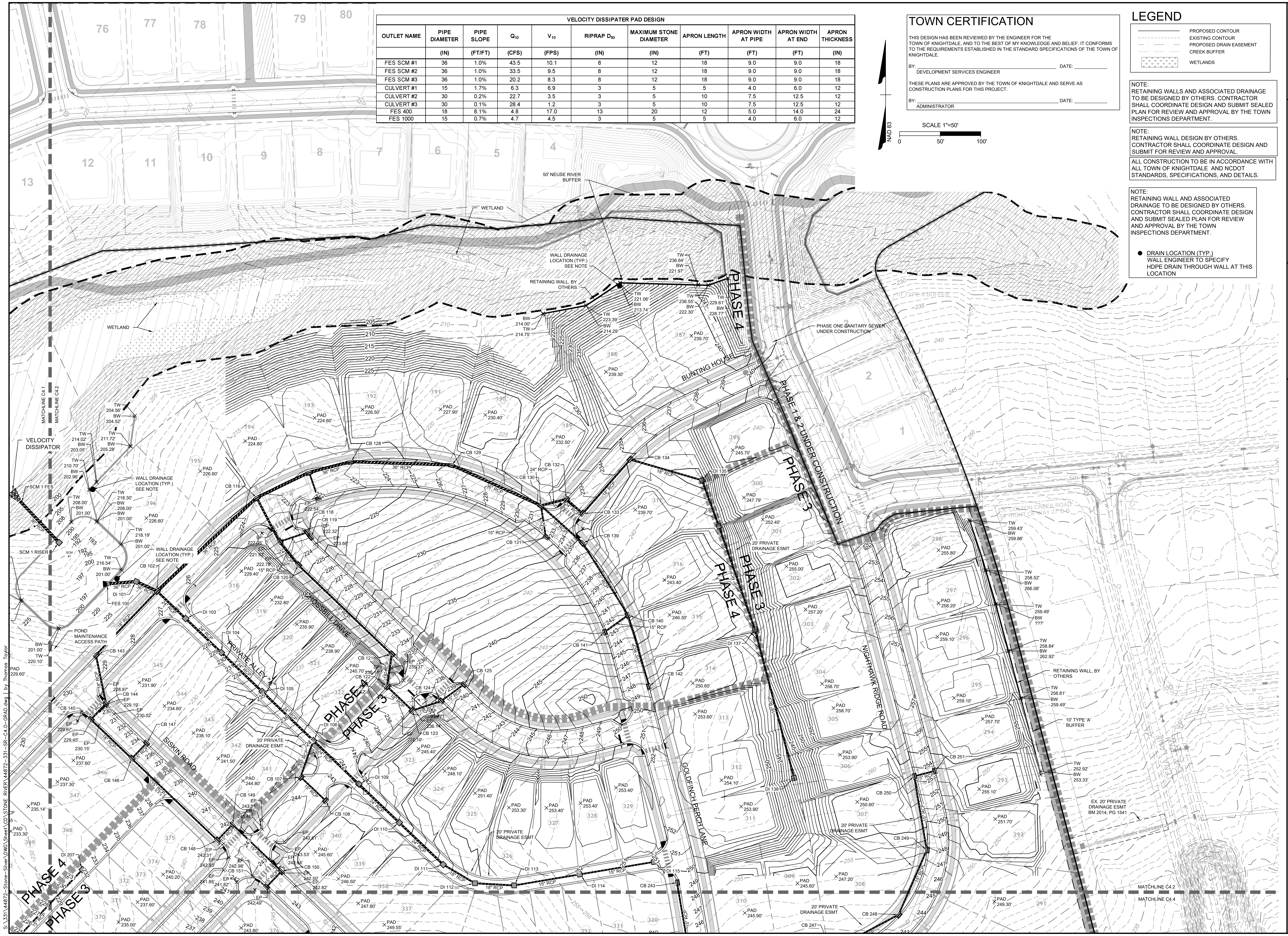
GRADING AND DRAINAGE PLAN - SHEET 1 OF 4

JOB NO.
44872

SHEET NO.
C4.1

FOR REVIEW ONLY: NOT FOR CONSTRUCTION

S:\331\44872-Stone-Silver\DWG\Sheet\CD\STONE RIVER\44872-331-SR-C4.0-GRAD.dwg | by Thomas Taylor



50' NEUSE RIVER BUFFER
WETLAND
WALL DRAINAGE LOCATION (TYP.) SEE NOTE
RETAINING WALL, BY OTHERS
PHASE 4
PHASE 3
PHASE 1 & 2 UNDER CONSTRUCTION
PHASE ONE SANITARY SEWER UNDER CONSTRUCTION
BUNTING HOUSE
PRIVATE ALLEY
SISKIN ROAD
GOLDFINCH PERCH LANE
NIGHTHAWK RIDGE ROAD
VELOCITY DISSIPATOR
SCM 1 FES
SCM 1 RISER
FES 1000
POND MAINTENANCE ACCESS PATH
20' PRIVATE DRAINAGE ESMT
10' TYPE 'A' BUFFER
EX. 20' PRIVATE DRAINAGE ESMT BM 2014, PG 1541
MATCHLINE C4.1
MATCHLINE C4.2
MATCHLINE C4.4
NAD 83

VELOCITY DISSIPATER PAD DESIGN

OUTLET NAME	PIPE DIAMETER	PIPE SLOPE	Q_{10}	V_{10}	RIPRAP D_{50}	MAXIMUM STONE DIAMETER	APRON LENGTH	APRON WIDTH AT PIPE	APRON WIDTH AT END	APRON THICKNESS
	(IN)	(FT/FT)	(CFS)	(FPS)	(IN)	(IN)	(FT)	(FT)	(FT)	(IN)
FES SCM #1	36	1.0%	43.5	10.1	8	12	18	9.0	9.0	18
FES SCM #2	36	1.0%	33.5	9.5	8	12	18	9.0	9.0	18
FES SCM #3	36	1.0%	20.2	8.3	8	12	18	9.0	9.0	18
CULVERT #1	15	1.7%	6.3	6.9	3	5	5	4.0	6.0	12
CULVERT #2	30	0.2%	22.7	3.5	3	5	10	7.5	12.5	12
CULVERT #3	30	0.1%	28.4	1.2	3	5	10	7.5	12.5	12
FES 400	18	8.1%	4.8	17.0	13	20	12	5.0	14.0	24
FES 1000	15	0.7%	4.7	4.5	3	5	5	4.0	6.0	12

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

SCALE 1"=50'
0 50' 100'

LEGEND

———	PROPOSED CONTOUR
- - - -	EXISTING CONTOUR
— · —	PROPOSED DRAIN EASEMENT
— — —	CREEK BUFFER
▨	WETLANDS

NOTE:
RETAINING WALLS 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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● DRAIN LOCATION (TYP.)
WALL ENGINEER TO SPECIFY HDPE DRAIN THROUGH WALL AT THIS LOCATION

MICHAEL V. ZACCARDO
6/22/21

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	06/22/2021
DRAWN BY	JD. MACMILLAN
DESIGNED BY	JD. MACMILLAN
CHECKED BY	M. ZACCARDO
SCALE	1" = 50'

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

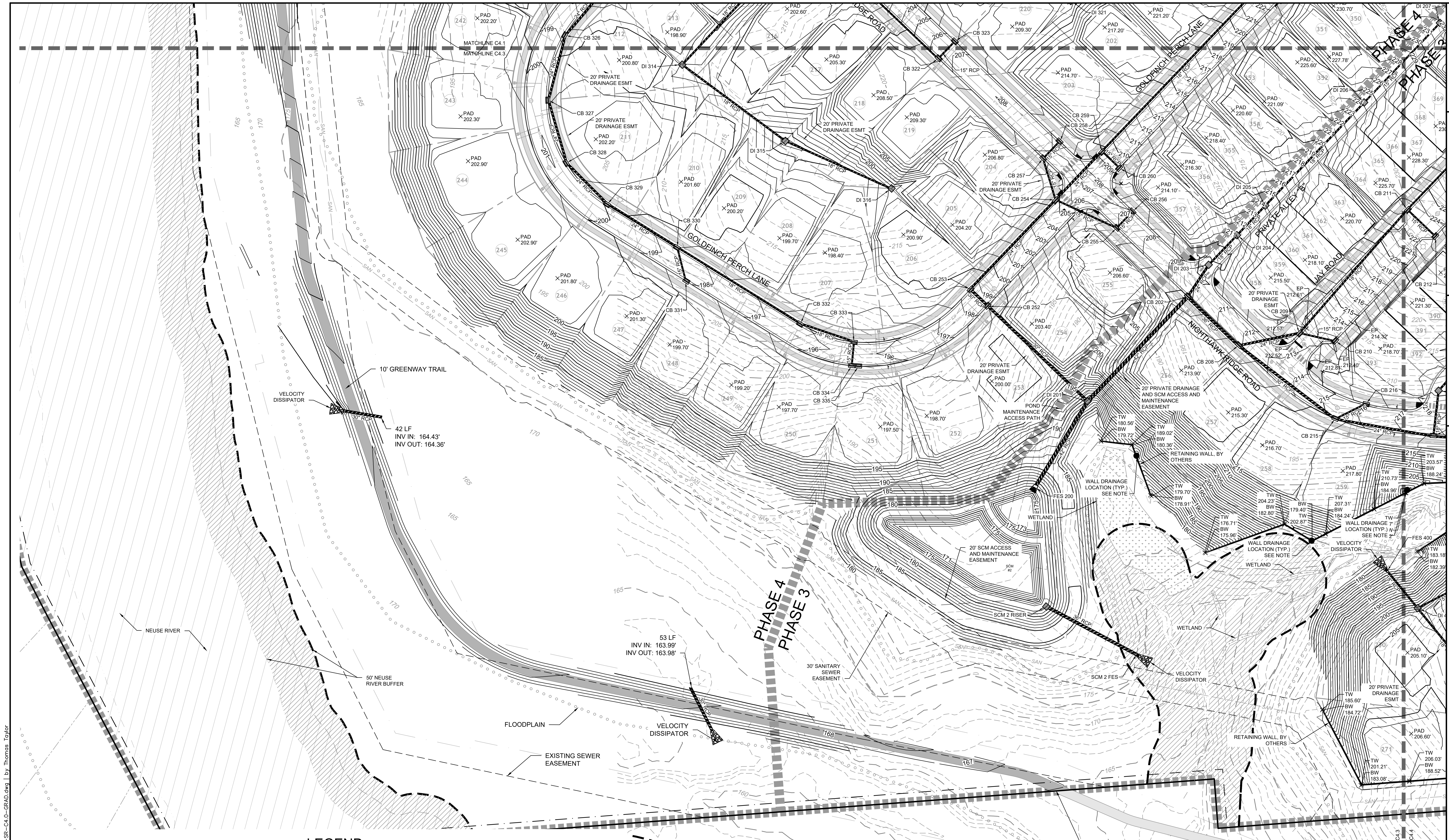
STONERIVER SUBDIVISION
KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA

GRADING AND DRAINAGE PLAN - SHEET 2 OF 4

JOB NO.
44872

SHEET NO.
C4.2

FOR REVIEW ONLY: NOT FOR CONSTRUCTION



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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

NAD 83

SCALE 1"=50'
0 50' 100'

LEGEND

———	PROPOSED CONTOUR
- - - -	EXISTING CONTOUR
— · — · —	PROPOSED DRAIN EASEMENT
— — —	CREEK BUFFER
▨	WETLANDS

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● DRAIN LOCATION (TYP.)
WALL ENGINEER TO SPECIFY HDPE DRAIN THROUGH WALL AT THIS LOCATION

VELOCITY DISSIPATER PAD DESIGN

OUTLET NAME	PIPE DIAMETER	PIPE SLOPE	Q_{10}	V_{10}	RIPRAP D_{50}	MAXIMUM STONE DIAMETER	APRON LENGTH	APRON WIDTH AT PIPE	APRON WIDTH AT END	APRON THICKNESS
	(IN)	(FT/FT)	(CFS)	(FPS)	(IN)	(IN)	(FT)	(FT)	(FT)	(IN)
FES SCM #1	36	1.0%	43.5	10.1	8	12	18	9.0	9.0	18
FES SCM #2	36	1.0%	33.5	9.5	8	12	18	9.0	9.0	18
FES SCM #3	36	1.0%	20.2	8.3	8	12	18	9.0	9.0	18
CULVERT #1	15	1.7%	6.3	6.9	3	5	5	4.0	6.0	12
CULVERT #2	30	0.2%	22.7	3.5	3	5	10	7.5	12.5	12
CULVERT #3	30	0.1%	28.4	1.2	3	5	10	7.5	12.5	12
FES 400	18	8.1%	4.8	17.0	13	20	12	5.0	14.0	24
FES 1000	15	0.7%	4.7	4.5	3	5	5	4.0	6.0	12

S:\331\44872-Stone-Silver\DWG\Sheet\CD\STONE RIVER\44872-331-SR-C4.0-GRAD.dwg | by: Thomas Taylor

MICHAEL V. ZACCARDO
6/22/21

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DATE	REVISION DESCRIPTION

DATE	06/22/2021
DRAWN BY	JD. MACMILLAN
DESIGNED BY	JD. MACMILLAN
CHECKED BY	M. ZACCARDO
SCALE	1" = 50'

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION
KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA

GRADING AND DRAINAGE PLAN - SHEET 3 OF 4

JOB NO.
44872

SHEET NO.
C4.3

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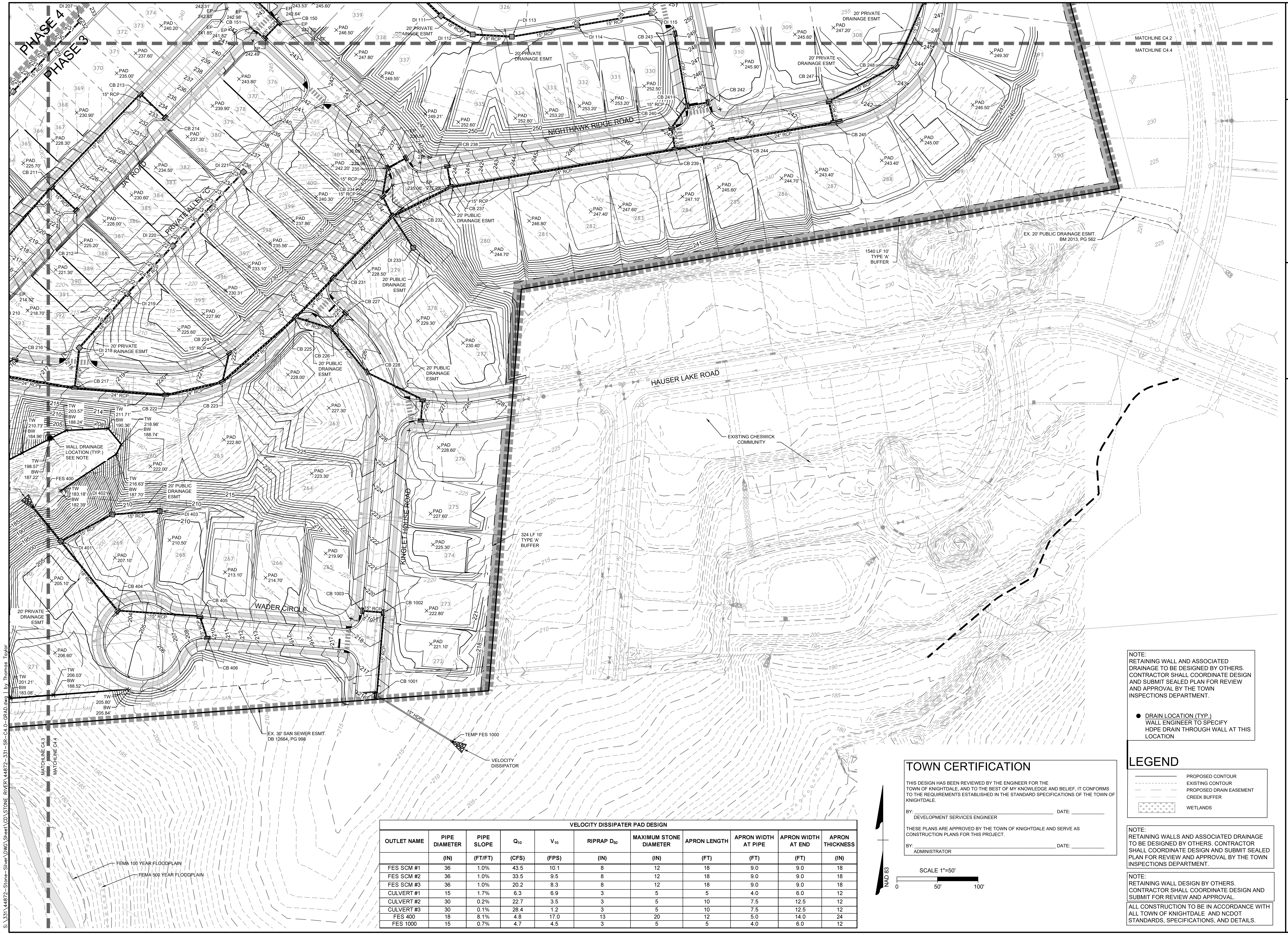
PHASE 4
PHASE 3
MATCHLINE C4.2
MATCHLINE C4.4
MATCHLINE C4.3
MATCHLINE C4.4
NIGHTHAWK RIDGE ROAD
JAY ROAD
PRIVATE ALLEY "C"
HAUSER LAKE ROAD
KINGLET HOUSE ROAD
WADER CIRCLE
20' PRIVATE DRAINAGE ESMT
20' PUBLIC DRAINAGE ESMT
EX. 20' PUBLIC DRAINAGE ESMT. BM 2013, PG 562
1540 LF 10' TYPE 'A' BUFFER
324 LF 10' TYPE 'A' BUFFER
EXISTING CHESWICK COMMUNITY
WALL DRAINAGE LOCATION (TYP.) SEE NOTE
EX. 30' SAN SEWER ESMT. DB 12664, PG 998
TEMP FES 1000
VELOCITY DISSIPATOR
15" HDPE
FES 400
FEMA 100 YEAR FLOODPLAIN
FEMA 500 YEAR FLOODPLAIN
NAD 83
S:\331\44872-Stone-Silver\DWG\Sheet\CD\STONE RIVER\44872-331-SR-C4.0-GRAD.dwg | by: Thomas Taylor

NOTE:
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● DRAIN LOCATION (TYP.)
WALL ENGINEER TO SPECIFY HDPE DRAIN THROUGH WALL AT THIS LOCATION

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DEVELOPMENT SERVICES ENGINEER

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BY: ______________________ DATE: __________
ADMINISTRATOR

SCALE 1"=50'
0 50' 100'

LEGEND

———	PROPOSED CONTOUR
- - - -	EXISTING CONTOUR
— · — ·	PROPOSED DRAIN EASEMENT
—— ——	CREEK BUFFER
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VELOCITY DISSIPATER PAD DESIGN

OUTLET NAME	PIPE DIAMETER	PIPE SLOPE	Q_{10}	V_{10}	RIPRAP D_{50}	MAXIMUM STONE DIAMETER	APRON LENGTH	APRON WIDTH AT PIPE	APRON WIDTH AT END	APRON THICKNESS
	(IN)	(FT/FT)	(CFS)	(FPS)	(IN)	(IN)	(FT)	(FT)	(FT)	(IN)
FES SCM #1	36	1.0%	43.5	10.1	8	12	18	9.0	9.0	18
FES SCM #2	36	1.0%	33.5	9.5	8	12	18	9.0	9.0	18
FES SCM #3	36	1.0%	20.2	8.3	8	12	18	9.0	9.0	18
CULVERT #1	15	1.7%	6.3	6.9	3	5	5	4.0	6.0	12
CULVERT #2	30	0.2%	22.7	3.5	3	5	10	7.5	12.5	12
CULVERT #3	30	0.1%	28.4	1.2	3	5	10	7.5	12.5	12
FES 400	18	8.1%	4.8	17.0	13	20	12	5.0	14.0	24
FES 1000	15	0.7%	4.7	4.5	3	5	5	4.0	6.0	12

MICHAEL V. ZACCARDO
ENGINEER
6/22/21

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DRAWN BY	JD. MACMILLAN
DESIGNED BY	JD. MACMILLAN
CHECKED BY	M. ZACCARDO
SCALE	1" = 50'

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION
KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA

GRADING AND DRAINAGE PLAN - SHEET 4 OF 4

JOB NO. 44872
SHEET NO. C4.4

FOR REVIEW ONLY: NOT FOR CONSTRUCTION

STORM DRAINAGE SCHEDULE

STRUCTURE UP	HEIGHT	TOP	INV IN	INV OUT	OUTLET PIPE	STRUCTURE DOWN
CB 404	7.08'	203.42	196.59' (15" RCP) CB 405	196.34' (18" RCP)	111' @ 8.71%	DI 401
CB 405	4.02'	209.20	205.28' (15" RCP) CB 406	205.18' (15" RCP)	102' @ 8.44%	CB 404
CB 406	3.82'	209.88		206.06' (15" RCP)	29' @ 2.66%	CB 405
DI 401	14.75'	201.46	186.71' (18" RCP) CB 404 186.71' (15" RCP) DI 402	186.71' (18" RCP)	53' @ 8.09%	FES 400
DI 402	12.37'	206.25	195.88' (15" RCP) DI 403	193.88' (15" RCP)	72' @ 10.00%	DI 401
DI 403	4.00'	205.45		201.45' (15" RCP)	59' @ 9.50%	DI 402
FES 400	N/A	184.17	182.46' (18" RCP) DI 401			

STORM DRAINAGE SCHEDULE

STRUCTURE UP	HEIGHT	TOP	INV IN	INV OUT	OUTLET PIPE	STRUCTURE DOWN
CB 1001	4.07'	216.33	212.36' (15" RCP) CB 1002	212.26' (15" RCP)	108' @ 0.72%	TEMP FES 1000
CB 1002	4.28'	219.57	215.39' (15" RCP) CB 1003	215.29' (15" RCP)	103' @ 2.85%	CB 1001
CB 1003	4.04'	219.56		215.52' (15" RCP)	27' @ 0.48%	CB 1002
TEMP FES 1000	N/A	212.92	211.48' (15" RCP) CB 1001			

STORM DRAINAGE SCHEDULE

STRUCTURE UP	HEIGHT	TOP	INV IN	INV OUT	OUTLET PIPE	STRUCTURE DOWN
SCM 1 FES	N/A	199.33	196.00' (36" RCP) SCM 1 RISER			
SCM 2 FES	N/A	179.33	175.00' (36" RCP) SCM 2 RISER			
SCM 3 FES	N/A	174.33	171.00' (36" RCP) SCM 3 RISER			

STORM DRAINAGE SCHEDULE

STRUCTURE UP	HEIGHT	TOP	INV IN	INV OUT	OUTLET PIPE	STRUCTURE DOWN
CB 301	9.61'	192.40	182.89' (42" RCP) CB 309 184.39' (24" RCP) CB 302	182.79' (42" RCP)	31' @ 2.51%	FES 300
CB 302	6.23'	191.11	184.98' (24" RCP) CB 303	184.88' (24" RCP)	97' @ 0.50%	CB 301
CB 303	5.80'	191.11	185.41' (24" RCP) CB 304	185.31' (24" RCP)	27' @ 1.22%	CB 302
CB 304	5.09'	192.97	188.38' (18" RCP) CB 306 188.63' (15" RCP) CB 305	187.88' (24" RCP)	92' @ 2.67%	CB 303
CB 305	4.00'	194.50		190.50' (15" RCP)	45' @ 4.12%	CB 304
CB 306	4.75'	197.85	193.35' (15" RCP) CB 307	193.10' (18" RCP)	93' @ 5.09%	CB 304
CB 307	4.23'	202.62	198.49' (15" RCP) CB 308	198.39' (15" RCP)	85' @ 5.90%	CB 306
CB 308	4.00'	202.62		198.62' (15" RCP)	27' @ 0.48%	CB 307
CB 309	8.91'	192.42	184.01' (36" RCP) CB 310 185.01' (24" RCP) CB 324	183.51' (42" RCP)	27' @ 2.30%	CB 301
CB 310	7.34'	191.49	184.75' (30" RCP) CB 312 186.00' (15" RCP) CB 311	184.15' (36" RCP)	31' @ 0.46%	CB 309
CB 311	4.17'	191.49		187.32' (15" RCP)	27' @ 4.89%	CB 310
CB 312	11.07'	196.31	186.49' (15" RCP) CB 322 185.74' (24" RCP) CB 317 186.24' (18" RCP) DI 313	185.24' (30" RCP)	94' @ 0.52%	CB 310
CB 317	10.44'	196.31	185.97' (24" RCP) DI 318	185.87' (24" RCP)	27' @ 0.48%	CB 312
CB 322	4.73'	206.89	202.26' (15" RCP) CB 323	202.16' (15" RCP)	200' @ 7.85%	CB 312
CB 323	4.50'	206.89		202.39' (15" RCP)	27' @ 0.48%	CB 322
CB 324	9.80'	197.34	187.64' (24" RCP) CB 326 193.21' (15" RCP) CB 325	187.54' (24" RCP)	179' @ 1.42%	CB 309
CB 325	4.26'	197.61		193.35' (15" RCP)	29' @ 0.49%	CB 324
CB 326	11.27'	199.24	188.07' (24" RCP) CB 327	187.97' (24" RCP)	66' @ 0.50%	CB 324
CB 327	12.47'	200.91	188.54' (24" RCP) CB 328	188.44' (24" RCP)	73' @ 0.51%	CB 326
CB 328	12.29'	201.19	188.90' (24" RCP) CB 329	188.90' (24" RCP)	71' @ 0.50%	CB 327
CB 329	11.17'	200.38	189.31' (24" RCP) CB 330	189.21' (24" RCP)	63' @ 0.49%	CB 328
CB 330	9.27'	199.03	194.16' (15" RCP) CB 331 190.26' (18" RCP) CB 332	189.76' (24" RCP)	90' @ 0.50%	CB 329
CB 331	4.26'	198.61		194.35' (15" RCP)	39' @ 0.49%	CB 330
CB 332	5.59'	196.65	191.16' (18" RCP) CB 333	191.06' (18" RCP)	159' @ 0.50%	CB 330
CB 333	4.64'	196.11	191.82' (15" RCP) CB 334	191.47' (18" RCP)	62' @ 0.50%	CB 332
CB 334	4.16'	196.11	191.95' (15" RCP) CB 335	191.95' (15" RCP)	27' @ 0.48%	CB 333
CB 335	4.17'	196.12		191.95' (15" RCP)	7' @ 0.00%	CB 334
DI 313	4.01'	192.65	188.74' (18" RCP) DI 314	188.64' (18" RCP)	37' @ 6.40%	CB 312
DI 314	7.49'	197.04	189.65' (18" RCP) DI 315	189.55' (18" RCP)	161' @ 0.50%	DI 313
DI 315	3.21'	193.56	190.45' (18" RCP) DI 316	190.35' (18" RCP)	141' @ 0.50%	DI 314
DI 316	4.92'	198.24		193.32' (18" RCP)	127' @ 2.26%	DI 315
DI 318	5.74'	191.91	186.67' (18" RCP) DI 319	186.17' (24" RCP)	39' @ 0.51%	CB 317
DI 319	6.15'	193.93	188.03' (15" RCP) DI 320	187.78' (18" RCP)	80' @ 1.40%	DI 318
DI 320	3.10'	202.95	199.95' (15" RCP) DI 321	199.85' (15" RCP)	139' @ 8.50%	DI 319
DI 321	2.94'	206.97		204.03' (15" RCP)	120' @ 3.40%	DI 320
FES 300	N/A	185.88	182.00' (42" RCP) CB 301			

STORM DRAINAGE SCHEDULE

STRUCTURE UP	HEIGHT	TOP	INV IN	INV OUT	OUTLET PIPE	STRUCTURE DOWN
CB 202	11.35'	210.28	201.93' (36" RCP) CB 208 202.93' (24" RCP) DI 203	198.93' (42" RCP)	158' @ 10.03%	DI 201
CB 208	6.26'	212.33	206.57' (30" RCP) CB 215 207.07' (24" RCP) CB 209	206.07' (36" RCP)	77' @ 5.36%	CB 202
CB 209	5.19'	212.95	208.26' (18" RCP) CB 211 208.51' (15" RCP) CB 210	207.76' (24" RCP)	68' @ 1.01%	CB 208
CB 210	4.24'	213.22		208.98' (15" RCP)	41' @ 1.15%	CB 209
CB 211	4.62'	223.34	218.97' (15" RCP) CB 213 218.97' (15" RCP) CB 212	218.72' (18" RCP)	180' @ 5.82%	CB 209
CB 212	4.16'	223.34		219.18' (15" RCP)	43' @ 0.49%	CB 211
CB 213	4.57'	233.66	229.19' (15" RCP) CB 214	229.09' (15" RCP)	158' @ 6.39%	CB 211
CB 214	4.26'	233.66		229.40' (15" RCP)	43' @ 0.49%	CB 213
CB 215	6.52'	215.72	209.70' (24" RCP) CB 217 210.45' (15" RCP) CB 216	209.20' (30" RCP)	133' @ 1.98%	CB 208
CB 216	5.38'	216.38		211.00' (15" RCP)	38' @ 1.44%	CB 215
CB 217	6.66'	218.17	211.61' (24" RCP) CB 222 212.11' (18" RCP) DI 218	211.51' (24" RCP)	109' @ 1.66%	CB 215
CB 222	5.10'	220.43	215.43' (24" RCP) CB 223	215.33' (24" RCP)	112' @ 3.31%	CB 217
CB 223	5.00'	221.76	216.76' (24" RCP) CB 225 217.51' (15" RCP) CB 224	216.78' (24" RCP)	72' @ 1.88%	CB 222
CB 224	4.48'	222.27		217.79' (15" RCP)	37' @ 0.75%	CB 223
CB 225	6.36'	225.10	218.84' (24" RCP) CB 231 219.34' (18" RCP) CB 226	218.74' (24" RCP)	121' @ 1.64%	CB 223
CB 226	5.66'	225.23	219.82' (15" RCP) CB 227 219.82' (15" RCP) CB 228	219.57' (18" RCP)	45' @ 0.51%	CB 225
CB 227	5.09'	225.23		220.14' (15" RCP)	27' @ 1.19%	CB 226
CB 228	6.55'	226.71	220.27' (15" RCP) CB 229	220.17' (15" RCP)	70' @ 0.50%	CB 226
CB 229	5.49'	226.14	220.75' (15" RCP) CB 230	220.65' (15" RCP)	77' @ 0.50%	CB 228
CB 230	5.26'	226.14		220.88' (15" RCP)	27' @ 0.48%	CB 229
CB 231	8.70'	228.10	219.50' (24" RCP) CB 232	219.40' (24" RCP)	67' @ 0.84%	CB 225
CB 232	13.94'	234.46	224.72' (24" RCP) CB 237 229.40' (15" RCP) CB 234 221.27' (15" RCP) DI 233	220.52' (24" RCP)	105' @ 0.97%	CB 231
CB 234	3.92'	234.79	230.97' (15" RCP) CB 235	230.87' (15" RCP)	28' @ 5.23%	CB 232
CB 235	4.57'	236.39	231.92' (15" RCP) CB 236	231.82' (15" RCP)	35' @ 2.45%	CB 234
CB 236	4.05'	236.82		232.77' (15" RCP)	27' @ 3.15%	CB 235
CB 237	7.05'	239.84	232.89' (24" RCP) CB 239 233.64' (15" RCP) CB 238	232.79' (24" RCP)	80' @ 10.04%	CB 232
CB 238	3.91'	239.84		235.93' (15" RCP)	27' @ 8.48%	CB 237
CB 239	9.58'	245.23	235.65' (24" RCP) CB 244 236.40' (15" RCP) CB 240	235.65' (24" RCP)	280' @ 0.98%	CB 237
CB 240	6.23'	245.23	239.18' (15" RCP) CB 241	239.00' (15" RCP)	27' @ 9.63%	CB 239
CB 241	4.59'	244.75	240.26' (15" RCP) CB 242 240.26' (15" RCP) CB 243	240.16' (15" RCP)	33' @ 2.97%	CB 240
CB 242	4.36'	244.75		240.39' (15" RCP)	27' @ 0.48%	CB 241
CB 243	4.48'	249.58		245.10' (15" RCP)	90' @ 5.36%	CB 241
CB 244	7.84'	243.82	236.07' (24" RCP) CB 245	235.98' (24" RCP)	70' @ 0.47%	CB 239
CB 245	5.24'	241.95	237.21' (18" RCP) CB 247 237.46' (15" RCP) CB 246	236.71' (24" RCP)	128' @ 0.50%	CB 244
CB 246	4.50'	241.96		237.46' (15" RCP)	7' @ 0.00%	CB 245
CB 247	4.60'	241.94	237.68' (15" RCP) CB 248	237.34' (18" RCP)	27' @ 0.48%	CB 245
CB 248	4.58'	243.65	239.17' (15" RCP) CB 249	239.07' (15" RCP)	93' @ 1.49%	CB 247
CB 249	4.58'	248.20	243.72' (15" RCP) CB 250	243.62' (15" RCP)	87' @ 5.12%	CB 248
CB 250	4.49'	253.80	249.41' (15" RCP) CB 251	249.31' (15" RCP)	92' @ 6.07%	CB 249
CB 251	4.26'	253.80		249.54' (15" RCP)	27' @ 0.48%	CB 250
CB 252	6.09'	198.98	193.09' (30" RCP) CB 253	192.89' (30" RCP)	151' @ 5.87%	DI 201
CB 253	5.76'	198.98	193.72' (24" RCP) CB 254	193.22' (30" RCP)	27' @ 0.48%	CB 252
CB 254	5.15'	205.28	200.13' (24" RCP) CB 259 200.88' (15" RCP) CB 255 200.88' (15" RCP) CB 257	200.13' (24" RCP)	135' @ 4.74%	CB 253
CB 255	4.23'	207.14	203.01' (15" RCP) CB 256	202.91' (15" RCP)	74' @ 2.75%	CB 254
CB 256	4.00'	207.14		203.14' (15" RCP)	26' @ 0.50%	CB 255
CB 257	4.55'	207.23	202.78' (15" RCP) CB 258	202.68' (15" RCP)	47' @ 3.81%	CB 254
CB 258	4.32'	207.23		202.91' (15" RCP)	27' @ 0.48%	CB 257
CB 259	5.22'	209.71	204.99' (18" RCP) CB 261 205.24' (15" RCP) CB 260	204.49' (24" RCP)	74' @ 5.92%	CB 254
CB 260	4.39'	209.76		205.37' (15" RCP)	27' @ 0.48%	CB 259
CB 261	4.97'	221.74	216.87' (18" RCP) CB 262	216.77' (18" RCP)	240' @ 4.90%	CB 259
CB 262	4.56'	221.80	217.49' (15" RCP) CB 263	217.24' (18" RCP)	33' @ 1.12%	CB 261
CB 263	4.54'	222.97	218.53' (15" RCP) CB 264	218.43' (15" RCP)	27' @ 3.48%	CB 262
CB 264	5.57'	226.39	220.82' (15" RCP) CB 265	220.82' (15" RCP)	35' @ 6.48%	CB 263
CB 265	5.73'	226.68		220.95' (15" RCP)	27' @ 0.48%	CB 264
DI 201	7.93'	188.70	183.03' (42" RCP) CB 202 184.03' (30" RCP) CB 252	180.77' (42" RCP)	111' @ 2.50%	FES 200
DI 203	6.29'	209.42	203.63' (18" RCP) DI 204	203.13' (24" RCP)	42' @ 0.48%	CB 202
DI 204	4.60'	211.04	206.54' (18" RCP) DI 205	206.44' (18" RCP)	45' @ 6.26%	DI 203
DI 205	4.60'	213.96	209.46' (18" RCP) DI 206	209.36' (18" RCP)	45' @ 6.28%	DI 204
DI 206	4.25'	224.13	220.13' (15" RCP) DI 207	219.88' (18" RCP)	157' @ 6.66%	DI 205
DI 207	4.36'	231.88		227.52' (15" RCP)	120' @ 6.13%	DI 206
DI 218	4.98'	217.34	212.46' (18" RCP) DI 219	212.36' (18" RCP)	50' @ 0.50%	CB 217
DI 219	4.59'	221.94	217.44' (18" RCP) DI 220	217.35' (18" RCP)	89' @ 5.47%	DI 218
DI 220	4.25'	227.22	223.22' (15" RCP) DI 221	222.97' (18" RCP)	81' @ 6.81%	DI 219
DI 221	4.00'	235.39		231.39' (15" RCP)	126' @ 6.48%	DI 220
DI 233	2.95'	224.45		221.50' (15" RCP)	46' @ 0.50%	CB 232
FES 200	N/A	181.88	178.00' (42" RCP) DI 201			

STORM DRAINAGE SCHEDULE

STRUCTURE UP	HEIGHT	TOP	INV IN	INV OUT	OUTLET PIPE	STRUCTURE DOWN
CB 102	12.20'	227.03	215.83' (24" RCP) DI 103 216.33' (18" RCP) CB 143 214.83' (36" RCP) CB 116	214.83' (36" RCP)	28' @ 10.28%	DI 101
CB 107	4.38'	243.81	239.53' (15" RCP) CB 108	239.43' (15" RCP)	47' @ 5.44%	DI 106
CB 108	4.06'	243.80		239.74' (15" RCP)	43' @ 0.49%	CB 107
CB 116	7.94'	223.70	215.86' (36" RCP) CB 126 216.86' (24" RCP) CB 117	215.76' (36" RCP)	168' @ 0.55%	CB 102
CB 117	5.10'	222.34	217.34' (24" RCP) CB 120 218.09' (15" RCP) CB 118	217.24' (24" RCP)	61' @ 0.62%	CB 116
CB 118	3.39'	222.82	220.00' (15" RCP) CB 119	219.43' (15" RCP)	37' @ 3.67%	CB 117
CB 119	3.27'	223.27		220.00' (15" RCP)	7' @ 0.00%	CB 118
CB 120	5.91'	224.43	219.02' (18" RCP) CB 121	218.52' (24" RCP)	37' @ 3.19%	CB 117
CB 121	5.25'	234.11	228.96' (18" RCP) CB 122	228.86' (18" RCP)	159' @ 6.18%	CB 120
CB 122	4.51'	236.76	232.35' (18" RCP) CB 123	232.25' (18" RCP)	40' @ 8.24%	CB 121
CB 123	4.20'	236.79	232.84' (15" RCP) CB 124	232.59' (18" RCP)	43' @ 0.56%	CB 122
CB 124	4.24'	239.31	235.16' (15" RCP) CB 125	235.07' (15" RCP)	37' @ 6.04%	CB 123
CB 125	4.34'	239.68		235.34' (15" RCP)	36' @ 0.50%	CB 124
CB 126	6.70'	222.92	216.32' (36" RCP) CB 128 218.07' (15" RCP) CB 127	216.22' (36" RCP)	72' @ 0.50%	CB 116
CB 127	4.00'	222.24		218.24' (15" RCP)	35' @ 0.49%	CB 126
CB 128	6.10'	223.39	217.39' (36" RCP) CB 129	217.29' (36" RCP)	53' @ 1.83%	CB 126
CB 129	6.10'	226.71	220.71' (36" RCP) CB 130	220.61' (36" RCP)	124' @ 2.59%	CB 128
CB 130	5.77'	231.21	226.94' (18" RCP) CB 139 226.44' (24" RCP) CB 132 227.19' (15" RCP) CB 131	225.44' (36" RCP)	121' @ 3.91%	CB 129
CB 131	4.27'	233.14		228.87' (15" RCP)	40' @ 4.24%	CB 130
CB 132	5.36'	232.66	227.40' (24" RCP) CB 133	227.30' (24" RCP)	32' @ 2.68%	CB 130
CB 133	5.26'	233.50	228.74' (18" RCP) CB 134	228.24' (24" RCP)	27' @ 3.11%	CB 132
CB 134	5.27'	235.20	229.93' (18" RCP) DI 135	229.93' (18" RCP)	89' @ 1.34%	CB 133
CB 139	4.34'	235.75	231.66' (15" RCP) CB 140	231.41' (18" RCP)	69' @ 6.48%	CB 130
CB 140	4.34'	242.52	238.28' (15" RCP) CB 142 238.28' (15" RCP) CB 141	238.18' (15" RCP)	105' @ 6.21%	CB 139
CB 141	4.51'	242.97		238.46' (15" RCP)	36' @ 0.50%	CB 140
CB 142	4.27'	248.64		244.37' (15" RCP)	91' @ 6.66%	CB 140
CB 143	5.92'	229.23	223.41' (18" RCP) CB 144	223.31' (18" RCP)	109' @ 6.41%	CB 102
CB 144	5.89'	229.60	223.81' (18" RCP) CB 145	223.71' (18" RCP)	61' @ 0.49%	CB 143
CB 145	5.94'	229.88	224.04' (18" RCP) CB 146	223.94' (18" RCP)	27' @ 0.48%	CB 144
CB 146	4.91'	235.28	230.62' (15" RCP) CB 148 230.62' (15" RCP) CB 147	230.37' (18" RCP)	70' @ 9.08%	CB 145
CB 147	4.53'	235.28		230.75' (15" RCP)	27' @ 0.48%	CB 146
CB 148	4.68'	242.52	237.94' (15" RCP) CB 149	237.84' (15" RCP)	146' @ 4.95%	CB 146
CB 149	4.45'	242.52	238.17' (15" RCP) CB 150	238.07' (15" RCP)	27' @ 0.48%	CB 148
CB 150	3.88'	242.90	239.02' (15" RCP) CB 151	239.04' (15" RCP)	83' @ 1.04%	CB 149
CB 151	3.75'	242.90		239.15' (15" RCP)	27' @ 0.48%	CB 150
DI 101	17.79'	222.88	211.93' (36" RCP) CB 102	205.09' (36" RCP)	36' @ 9.97%	FES 100
DI 103	6.31'	226.23	220.02' (24" RCP) DI 104	219.92' (24" RCP)	49' @ 8.38%	CB 102
DI 104	5.13'	229.34	224.31' (24" RCP) DI 105	224.21' (24" RCP)	61' @ 6.89%	DI 103
DI 105	5.16'	234.61	229.55' (24" RCP) DI 106	229.45' (24" RCP)	69' @ 7.41%	DI 104
DI 106	5.18'	241.18	236.10' (24" RCP) DI 109 236.85' (15" RCP) CB 107	236.00' (24" RCP)	88' @ 7.36%	DI 105
DI 109	5.06'	241.78	236.82' (24" RCP) DI 110	236.72' (24" RCP)	77' @ 0.80%	DI 106
DI 110	4.91'	244.09	239.28' (24" RCP) DI 111	239.18' (24" RCP)	69' @ 3.44%	DI 109
DI 111	4.76'	247.42	243.16' (18" RCP) DI 112	242.66' (24" RCP)	75' @ 4.52%	DI 110
DI 112	4.70'	249.46	244.86' (18" RCP) DI 113	244.76' (18" RCP)	45' @ 3.52%	DI 111
DI 113	6.12'	251.22	245.35' (15" RCP) DI 114	245.10' (18" RCP)	48' @ 0.50%	DI 112
DI 114	6.13'	251.89	245.86' (15" RCP) DI 115	245.76' (15" RCP)	82' @ 0.50%	DI 113
DI 115	3.87'	250.17		246.30' (15" RCP)	93' @ 0.48%	DI 114
DI 135	3.82'	234.21	230.39' (18" RCP) DI 136	230.39' (18" RCP)	92' @ 0.50%	CB 134
DI 136	3.21'	237.32	234.21' (18" RCP) DI 137	234.11' (18" RCP)	60' @ 6.19%	DI 135
DI 137	8.12'	244.03	236.01' (18" RCP) DI 138	235.91' (18" RCP)	135' @ 1.26%	DI 136
DI 138	3.21'	240.16		236.95' (18" RCP)	189' @ 0.50%	DI 137
FES 100	N/A	204.83	201.50' (36" RCP) DI 101			

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

MICHAEL V. ZACCARDO
6/22/21

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 06/22/2021
DRAWN BY JD. MACMILLAN
DESIGNED BY JD. MACMILLAN
CHECKED BY M. ZACCARDO
SCALE N/A

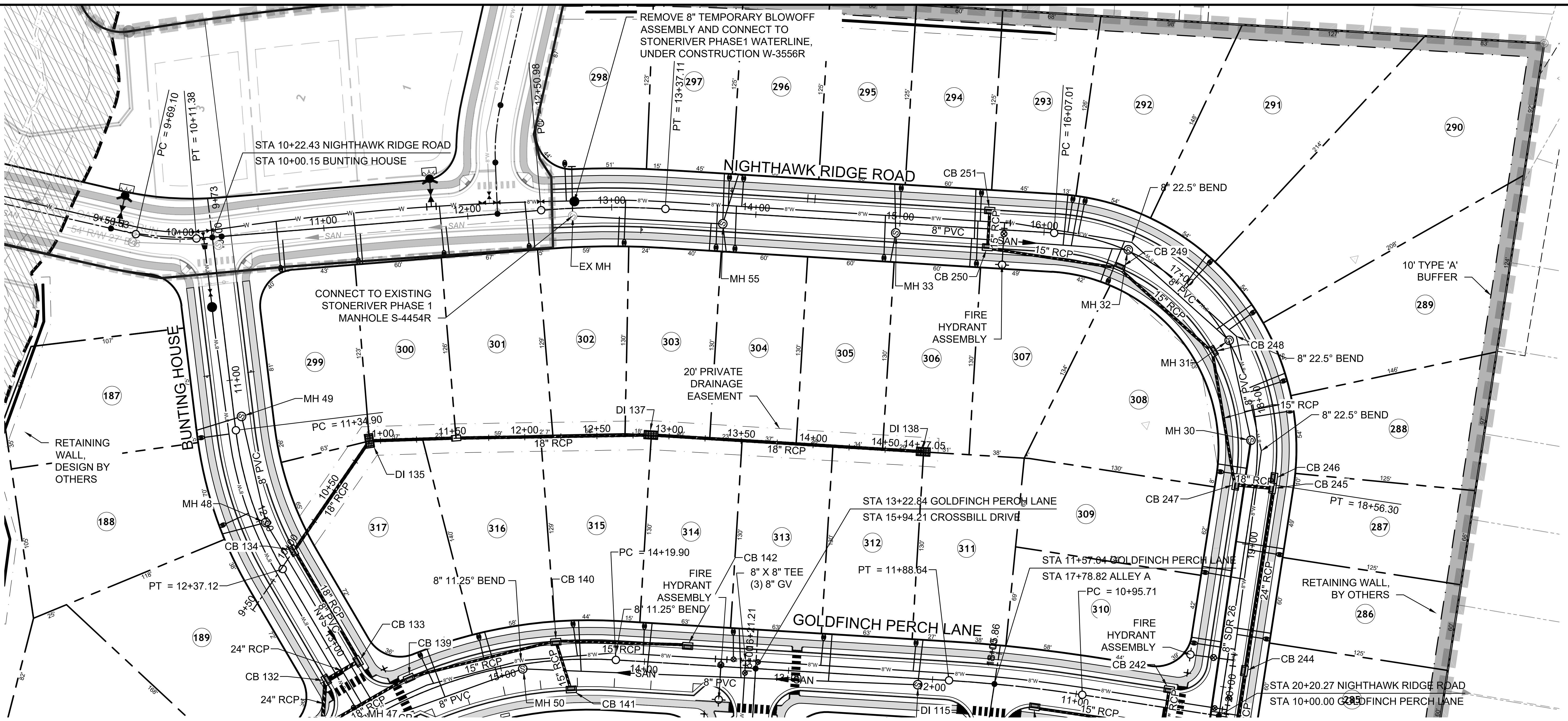
TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

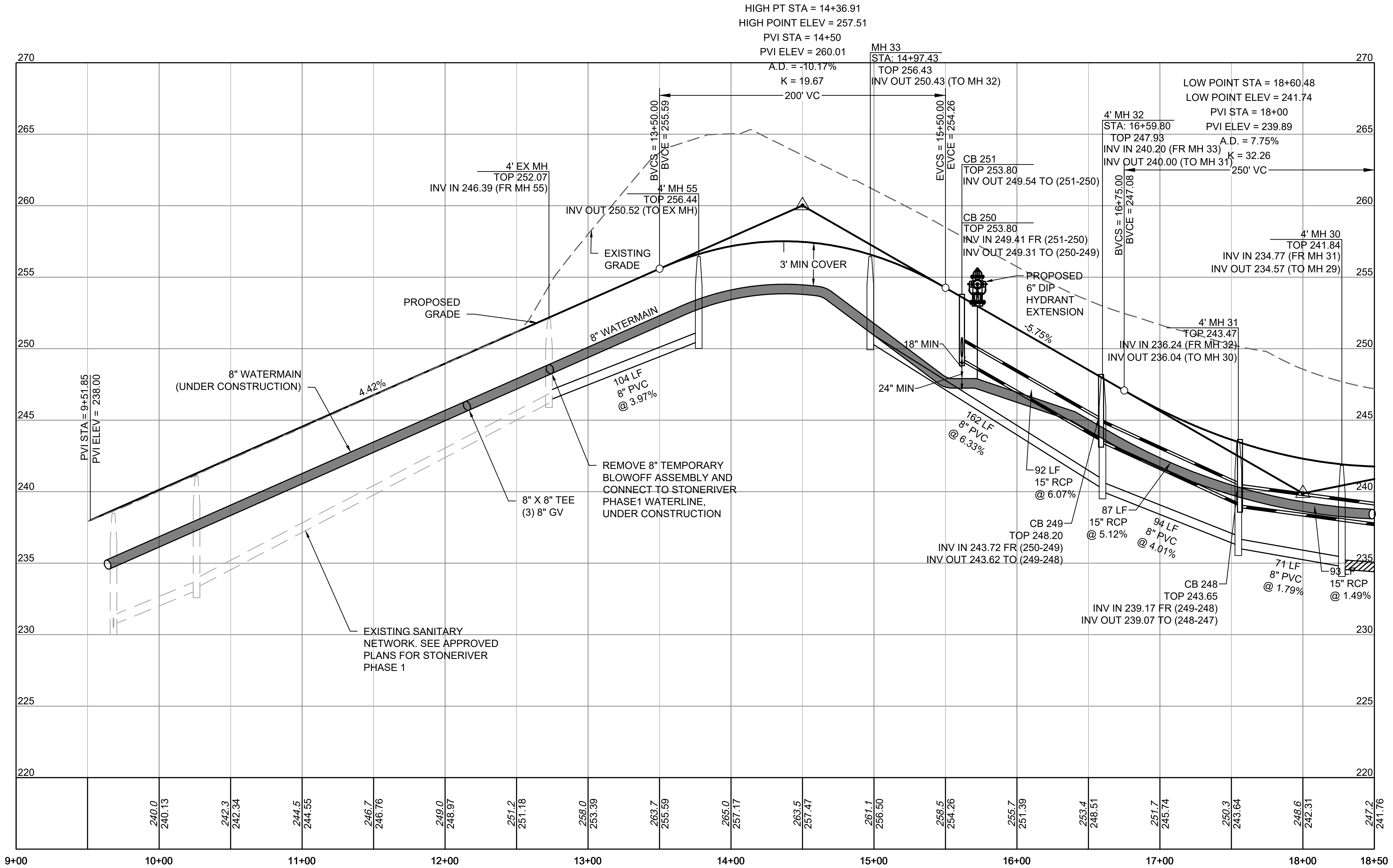
STONERIVER SUBDIVISION
KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA
STORM SEWER SCHEDULE

JOB NO. 44872
SHEET NO. C4.5

FOR REVIEW ONLY: NOT FOR CONSTRUCTION

S:\331\44872-Stone-Silver\DWG\Sheet\CD\STONE RIVER\44872-331-SR-C4.0-GRAD.dwg | by: Thomas Taylor



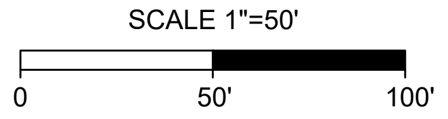


NIGHTHAWK RIDGE ROAD PROFILE (STA 9+00 TO 18+50)

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

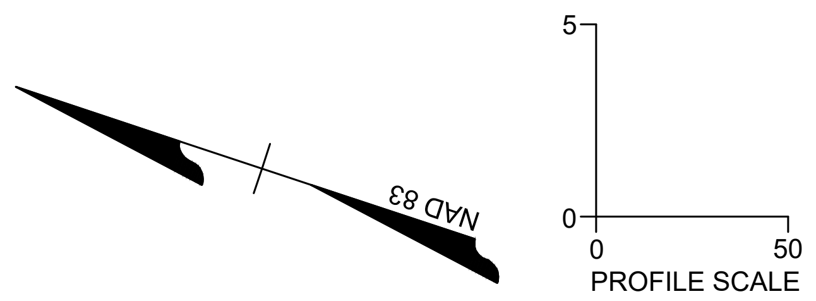


CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

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

City of Raleigh Development Approval ____________________

Raleigh Water Review Officer



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-5745

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-3737

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 # ________________

S:\331\44872-Stone-Siver\DWG\Sheet\CD\STONE RIVER\44872-331-SR-C5.1-PROF.dwg | by: Thomas Taylor

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: ______________________________ DATE: __________
DEVELOPMENT SERVICES ENGINEER

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

BY: ______________________________ DATE: __________
ADMINISTRATOR

MICHAEL V. ZACCARDO
6/22/21

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	06/22/2021
DRAWN BY	JD. MACMILLAN
DESIGNED BY	JD. MACMILLAN
CHECKED BY	M. ZACCARDO
SCALE	H: 1" = 50' V: 1" = 5'

FOR REVIEW ONLY: NOT FOR CONSTRUCTION

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION

KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA

NIGHTHAWK RIDGE ROAD PLAN & PROFILE

JOB NO.	44872
SHEET NO.	C5.1

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.

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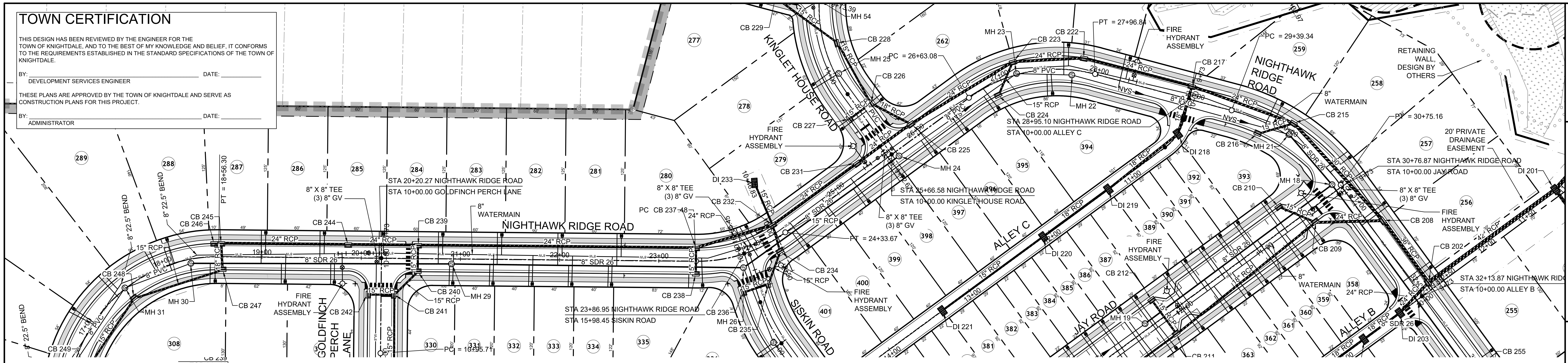
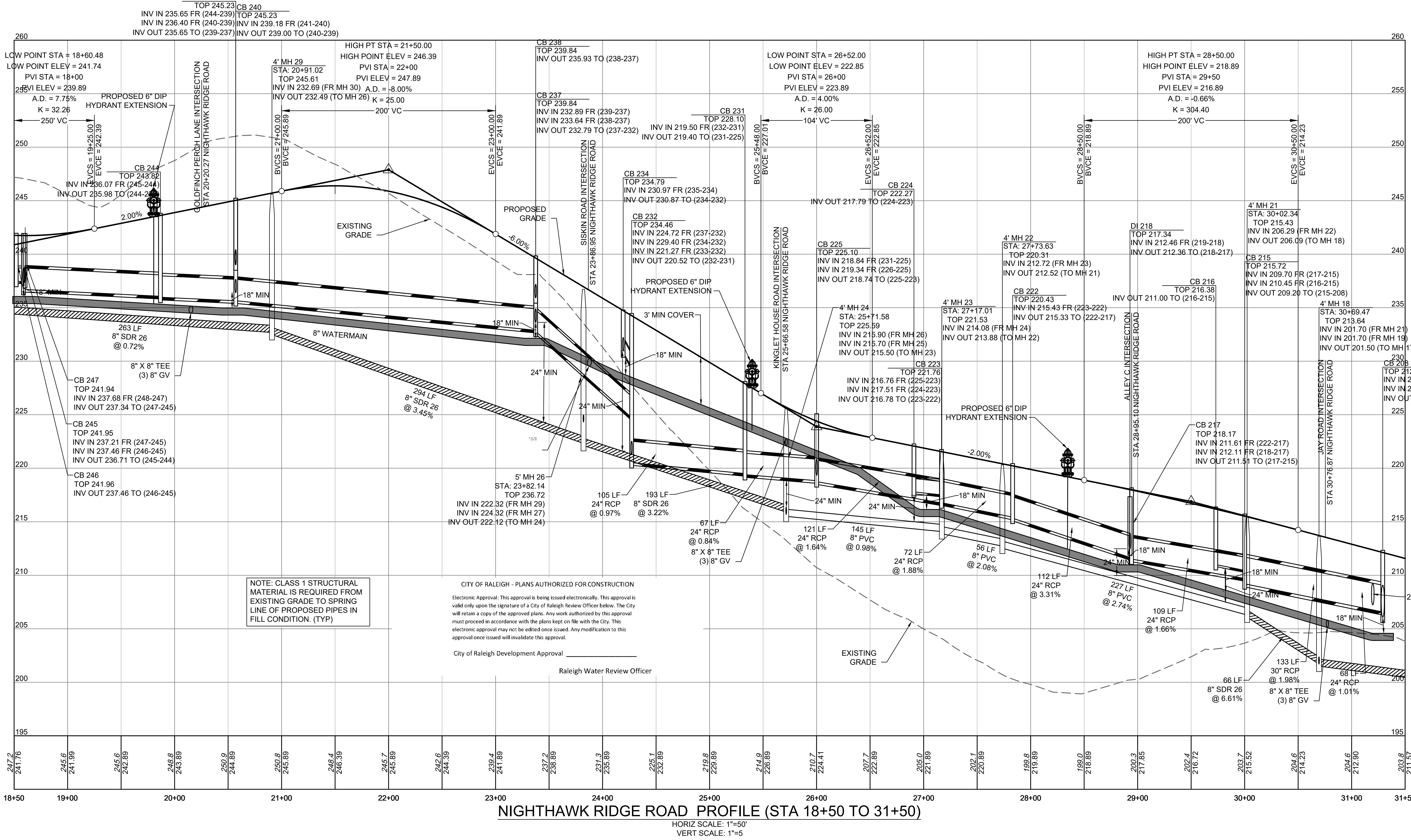
ADMINISTRATOR


NIGHTHAWK RIDGE ROAD
KINGLET HOUSE ROAD
SISKIN ROAD
ALLEY C
ALLEY B
JAY ROAD
GOLDFINCH PERCH LANE
STA 20+20.27 NIGHTHAWK RIDGE ROAD
STA 10+00.00 GOLDFINCH PERCH LANE
STA 23+86.95 NIGHTHAWK RIDGE ROAD
STA 15+98.45 SISKIN ROAD
STA 25+66.58 NIGHTHAWK RIDGE ROAD
STA 10+00.00 KINGLET HOUSE ROAD
STA 28+95.10 NIGHTHAWK RIDGE ROAD
STA 10+00.00 ALLEY C
STA 30+76.87 NIGHTHAWK RIDGE ROAD
STA 10+00.00 JAY ROAD
STA 32+13.87 NIGHTHAWK RIDGE ROAD
STA 10+00.00 ALLEY B
PT = 18+56.30
PC = 19+95.71
PT = 24+33.67
PC 26+63.08
PT = 27+96.84
PC = 29+39.34
PT = 30+75.16
8" X 8" TEE (3) 8" GV
8" WATERMAIN
8" SDR 26
8" PVC
8" 22.5° BEND
FIRE HYDRANT ASSEMBLY
RETAINING WALL, DESIGN BY OTHERS
20' PRIVATE DRAINAGE EASEMENT
15" RCP
18" RCP
24" RCP
CB 202 CB 208 CB 209 CB 210 CB 212 CB 215 CB 216 CB 217 CB 222 CB 223 CB 224 CB 225 CB 226 CB 227 CB 228 CB 229 CB 231 CB 232 CB 234 CB 235 CB 236 CB 237 CB 238 CB 239 CB 240 CB 241 CB 242 CB 244 CB 245 CB 246 CB 247 CB 248 CB 249 CB 255
DI 201 DI 203 DI 218 DI 219 DI 220 DI 221 DI 233
MH 18 MH 19 MH 21 MH 22 MH 23 MH 24 MH 25 MH 26 MH 29 MH 30 MH 31 MH 54
255 256 257 258 259 262 277 278 279 280 281 282 283 284 285 286 287 288 289 308 330 331 332 333 334 335 359 360 361 362 363 381 382 383 384 385 386 387 389 390 391 392 393 394 395 397 398 399 400 401

CB 240
TOP 245.23
INV IN 239.18 FR (241-240)
INV OUT 239.00 TO (240-239)


260
255
250
245
240
235
230
225
220
215
210
205
200
195
LOW POINT STA = 18+60.48
LOW POINT ELEV = 241.74
PVI STA = 18+00
PVI ELEV = 239.89
A.D. = 7.75%
K = 32.26
250' VC
HIGH PT STA = 21+50.00
HIGH POINT ELEV = 246.39
PVI STA = 22+00
PVI ELEV = 247.89
A.D. = -8.00%
K = 25.00
200' VC
LOW POINT STA = 26+52.00
LOW POINT ELEV = 222.85
PVI STA = 26+00
PVI ELEV = 223.89
A.D. = 4.00%
K = 26.00
104' VC
HIGH PT STA = 28+50.00
HIGH POINT ELEV = 218.89
PVI STA = 29+50
PVI ELEV = 216.89
A.D. = -0.66%
K = 304.40
200' VC
EVCS = 19+25.00
EVCE = 242.39
BVCS = 21+00.00
BVCE = 245.89
EVCS = 23+00.00
EVCE = 241.89
BVCS = 25+48.00
BVCE = 227.01
EVCS = 26+52.00
EVCE = 222.85
BVCS = 28+50.00
BVCE = 218.89
EVCS = 30+50.00
EVCE = 214.23
2.00%
-6.00%
-2.00%
PROPOSED 6" DIP HYDRANT EXTENSION
EXISTING GRADE
PROPOSED GRADE
3' MIN COVER
GOLDFINCH PERCH LANE INTERSECTION STA 20+20.27 NIGHTHAWK RIDGE ROAD
SISKIN ROAD INTERSECTION STA 23+86.95 NIGHTHAWK RIDGE ROAD
KINGLET HOUSE ROAD INTERSECTION STA 25+66.58 NIGHTHAWK RIDGE ROAD
ALLEY C INTERSECTION STA 28+95.10 NIGHTHAWK RIDGE ROAD
JAY ROAD INTERSECTION STA 30+76.87 NIGHTHAWK RIDGE ROAD
CB 244 TOP 248.82 INV IN 236.07 FR (245-244) INV OUT 235.98 TO (244-239)
CB 239 TOP 245.23 INV IN 235.65 FR (244-239) INV IN 236.40 FR (240-239) INV OUT 235.65 TO (239-237)
4' MH 29 STA: 20+91.02 TOP 245.61 INV IN 232.69 (FR MH 30) INV OUT 232.49 (TO MH 26)
CB 238 TOP 239.84 INV OUT 235.93 TO (238-237)
CB 237 TOP 239.84 INV IN 232.89 FR (239-237) INV IN 233.64 FR (238-237) INV OUT 232.79 TO (237-232)
CB 231 TOP 228.10 INV IN 219.50 FR (232-231) INV OUT 219.40 TO (231-225)
CB 234 TOP 234.79 INV IN 230.97 FR (235-234) INV OUT 230.87 TO (234-232)
CB 232 TOP 234.46 INV IN 224.72 FR (237-232) INV IN 229.40 FR (234-232) INV IN 221.27 FR (233-232) INV OUT 220.52 TO (232-231)
CB 224 TOP 222.27 INV OUT 217.79 TO (224-223)
CB 225 TOP 225.10 INV IN 218.84 FR (231-225) INV IN 219.34 FR (226-225) INV OUT 218.74 TO (225-223)
4' MH 24 STA: 25+71.58 TOP 225.59 INV IN 215.90 (FR MH 26) INV IN 215.70 (FR MH 25) INV OUT 215.50 (TO MH 23)
CB 223 TOP 221.76 INV IN 216.76 FR (225-223) INV IN 217.51 FR (224-223) INV OUT 216.78 TO (223-222)
4' MH 22 STA: 27+73.63 TOP 220.31 INV IN 212.72 (FR MH 23) INV OUT 212.52 (TO MH 21)
4' MH 23 STA: 27+17.01 TOP 221.53 INV IN 214.08 (FR MH 24) INV OUT 213.88 (TO MH 22)
CB 222 TOP 220.43 INV IN 215.43 FR (223-222) INV OUT 215.33 TO (222-217)
DI 218 TOP 217.34 INV IN 212.46 FR (219-218) INV OUT 212.36 TO (218-217)
CB 216 TOP 216.38 INV OUT 211.00 TO (216-215)
4' MH 21 STA: 30+02.34 TOP 215.43 INV IN 206.29 (FR MH 22) INV OUT 206.09 (TO MH 18)
CB 215 TOP 215.72 INV IN 209.70 FR (217-215) INV IN 210.45 FR (216-215) INV OUT 209.20 TO (215-208)
4' MH 18 STA: 30+69.47 TOP 213.64 INV IN 201.70 (FR MH 21) INV IN 201.70 (FR MH 19) INV OUT 201.50 (TO MH 17)
CB 208 TOP 212.33 INV IN 206.57 FR (215-208) INV IN 207.07 FR (209-208) INV OUT 206.07 TO (208-202)
CB 217 TOP 218.17 INV IN 211.61 FR (222-217) INV IN 212.11 FR (218-217) INV OUT 211.51 TO (217-215)
CB 247 TOP 241.94 INV IN 237.68 FR (248-247) INV OUT 237.34 TO (247-245)
CB 245 TOP 241.95 INV IN 237.21 FR (247-245) INV IN 237.46 FR (246-245) INV OUT 236.71 TO (245-244)
CB 246 TOP 241.96 INV OUT 237.46 TO (246-245)
5' MH 26 STA: 23+82.14 TOP 236.72 INV IN 222.32 (FR MH 29) INV IN 224.32 (FR MH 27) INV OUT 222.12 (TO MH 24)
263 LF 8" SDR 26 @ 0.72%
8" X 8" TEE (3) 8" GV
8" WATERMAIN
294 LF 8" SDR 26 @ 3.45%
105 LF 24" RCP @ 0.97%
193 LF 8" SDR 26 @ 3.22%
67 LF 24" RCP @ 0.84%
121 LF 24" RCP @ 1.64%
145 LF 8" PVC @ 0.98%
72 LF 24" RCP @ 1.88%
56 LF 8" PVC @ 2.08%
112 LF 24" RCP @ 3.31%
227 LF 8" PVC @ 2.74%
109 LF 24" RCP @ 1.66%
66 LF 8" SDR 26 @ 6.61%
133 LF 30" RCP @ 1.98%
68 LF 24" RCP @ 1.01%
18" MIN
24" MIN
24 inch RCP
247.2 241.76
245.6 241.99
245.6 242.89
248.8 243.89
250.9 244.89
250.8 245.89
248.4 246.39
245.7 245.89
242.6 244.39
239.4 241.89
237.2 238.89
231.3 235.89
225.1 232.89
218.8 229.89
214.9 226.89
210.7 224.41
207.7 222.89
205.0 221.89
202.1 220.89
199.8 219.89
199.0 218.89
200.3 217.85
202.4 216.72
203.7 215.52
204.6 214.23
204.6 212.90
203.8 211.57
18+50
19+00
20+00
21+00
22+00
23+00
24+00
25+00
26+00
27+00
28+00
29+00
30+00
31+00
31+50

NOTE: CLASS 1 STRUCTURAL MATERIAL IS REQUIRED FROM EXISTING GRADE TO SPRING LINE OF PROPOSED PIPES IN FILL CONDITION. (TYP)

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

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City of Raleigh Development Approval ____________________

Raleigh Water Review Officer

NIGHTHAWK RIDGE ROAD PROFILE (STA 18+50 TO 31+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

SCALE 1"=50'
0 50' 100'

Water and Sewer Permits (If applicable)

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City of Raleigh Public Utilities Department Permit # ______________

NAD 83

PROFILE SCALE
5
0 50

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MICHAEL V. ZACCARDO
ENGINEER
6/22/21

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TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

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DATE	REVISION DESCRIPTION

DATE 06/22/2021
DRAWN BY JD. MACMILLAN
DESIGNED BY JD. MACMILLAN
CHECKED BY M. ZACCARDO
SCALE H: 1" = 50' V: 1" = 5'

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION
KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA

NIGHTHAWK RIDGE ROAD PLAN & PROFILE

JOB NO. 44872
SHEET NO. C5.2

FOR REVIEW ONLY: NOT FOR CONSTRUCTION

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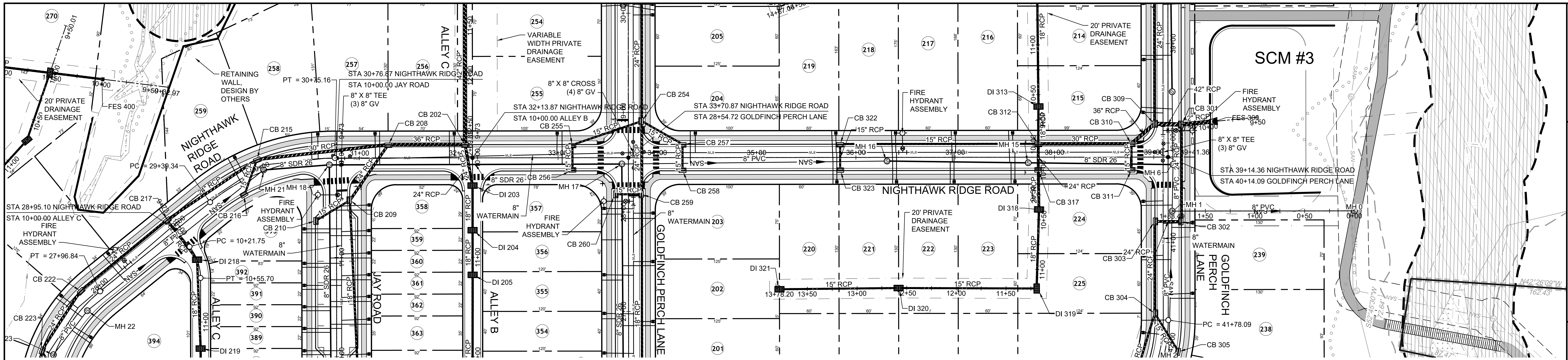
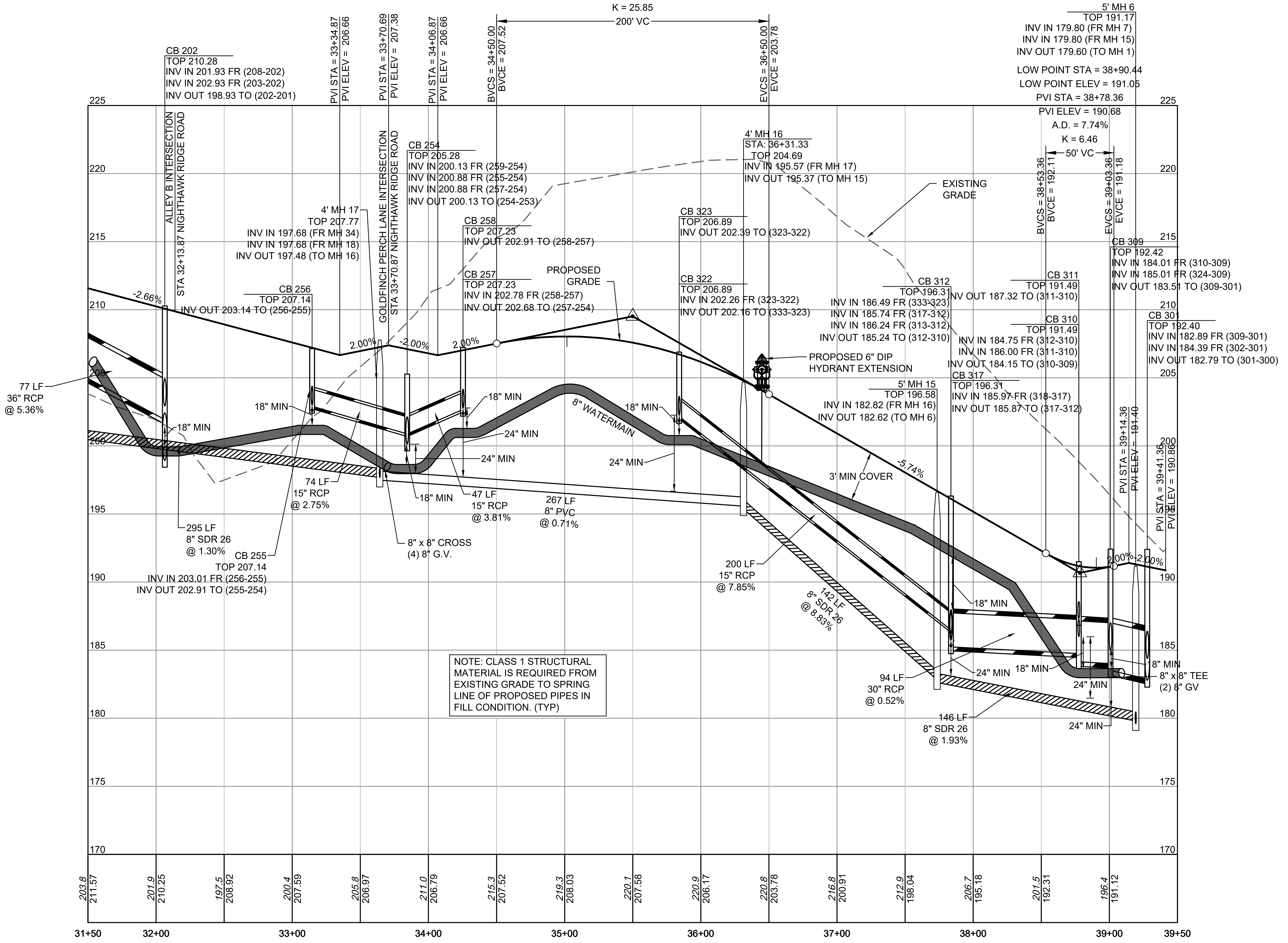




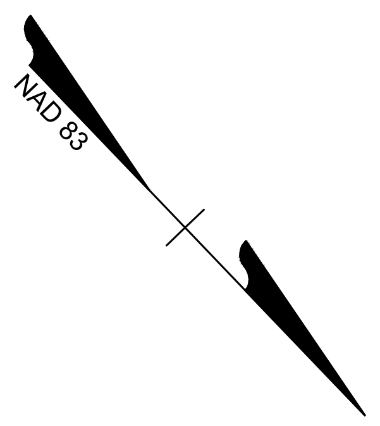
NIGHTHAWK RIDGE ROAD PROFILE (STA 31+50 TO 39+50)

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

SCALE 1"=50'
0 50' 100'



5
0
0 50
PROFILE SCALE

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

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City of Raleigh Development Approval ____________________

Raleigh Water Review Officer

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City of Raleigh Public Utilities Department Permit # ________________

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: ______________________ DATE: ________
DEVELOPMENT SERVICES ENGINEER

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

BY: ______________________ DATE: ________
ADMINISTRATOR

MICHAEL V. ZACCARDO
6/22/21

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YOUR VISION ACHIEVED THROUGH OURS.

DATE	REVISION DESCRIPTION

DATE	06/22/2021
DRAWN BY	JD. MACMILLAN
DESIGNED BY	JD. MACMILLAN
CHECKED BY	M. ZACCARDO
SCALE	H: 1" = 50' V: 1" = 5'

TIMMONS GROUP

NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION

KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA

NIGHTHAWK RIDGE ROAD PLAN & PROFILE

JOB NO. 44872

SHEET NO. C5.3

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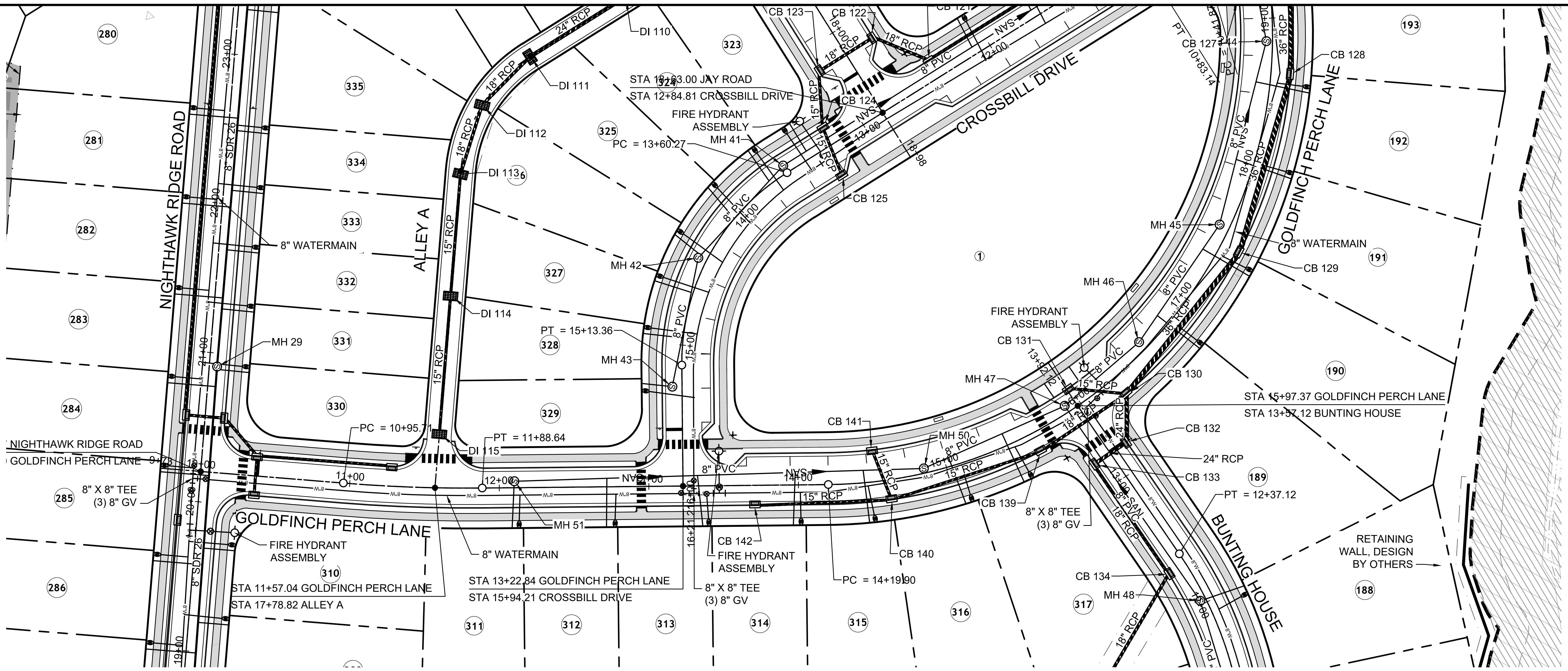

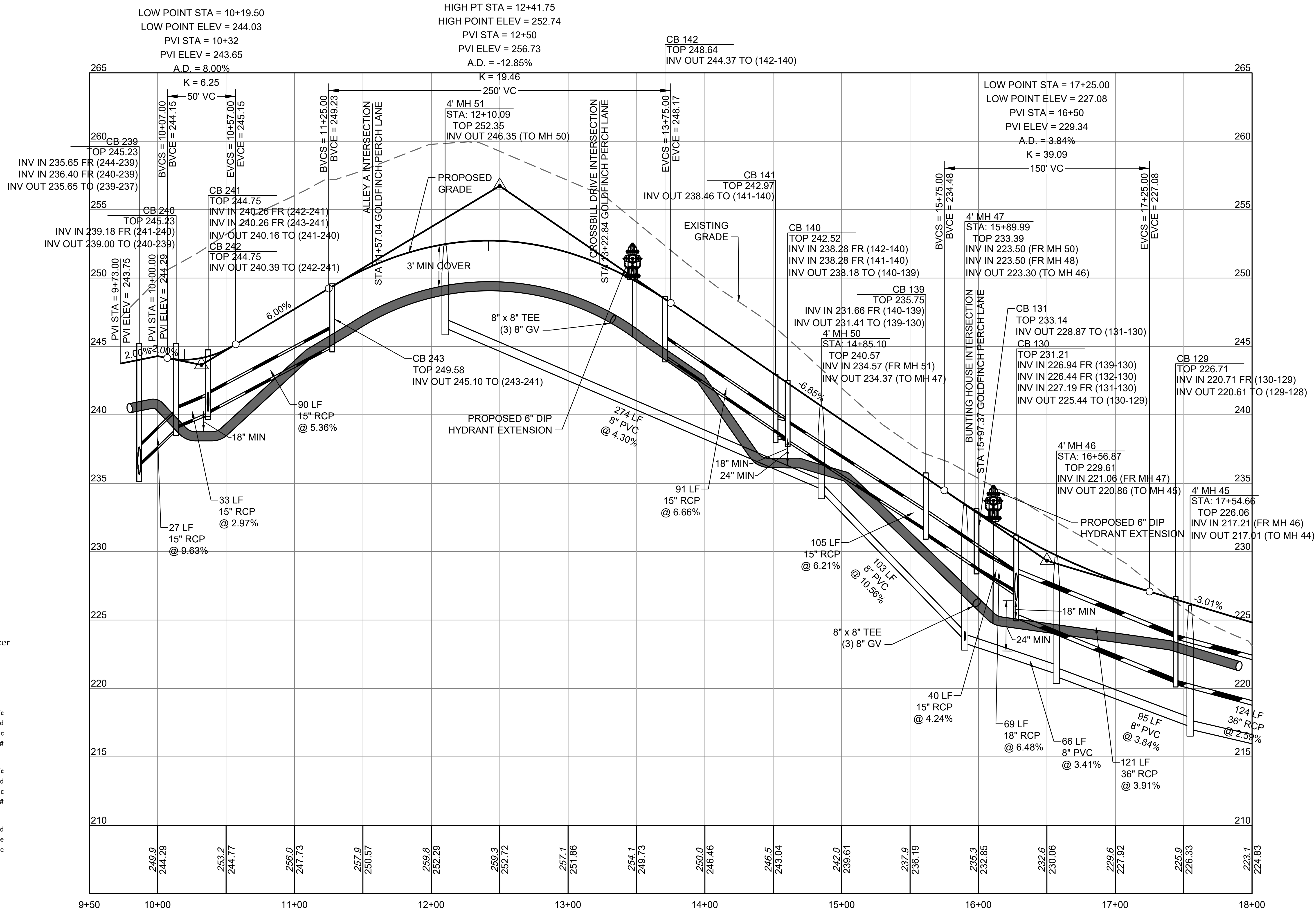

GOLDFINCH PERCH LANE PROFILE (STA 9+50 TO 18+00)

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

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

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City of Raleigh Development Approval ____________________

Raleigh Water Review Officer

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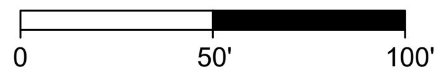
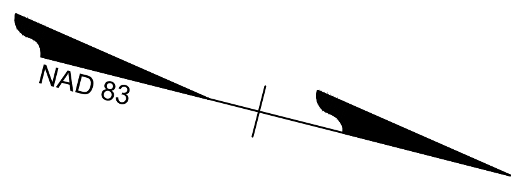
City of Raleigh Public Utilities Department Permit # ________________

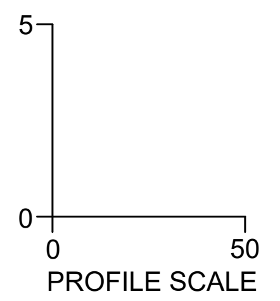
UTILITY LEGEND

——SAN——▶——	PROPOSED SEWER LINE
——8"W——	PROPOSED WATER LINE
——┬——	WATER LINE TEE
⊗	FIRE HYDRANT
⊕	WATER METER
◁	REDUCER
⊗	GATE VALVE.
⊗⊗	BLOWOFF ASSEMBLY

SCALE 1"=50'







PROFILE SCALE

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

TOWN CERTIFICATION

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BY: ______________________________ DATE: ___________
DEVELOPMENT SERVICES ENGINEER

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BY: ______________________________ DATE: ___________
ADMINISTRATOR

MICHAEL V. ZACCARDO
6/22/21

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DATE	REVISION DESCRIPTION

DATE
06/22/2021

DRAWN BY
JD. MACMILLAN

DESIGNED BY
JD. MACMILLAN

CHECKED BY
M. ZACCARDO

SCALE
H: 1" = 50'
V: 1" = 5'

TIMMONS GROUP

NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION

KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA

GOLDFINCH PERCH LANE PLAN & PROFILE

JOB NO.
44872

SHEET NO.
C5.4

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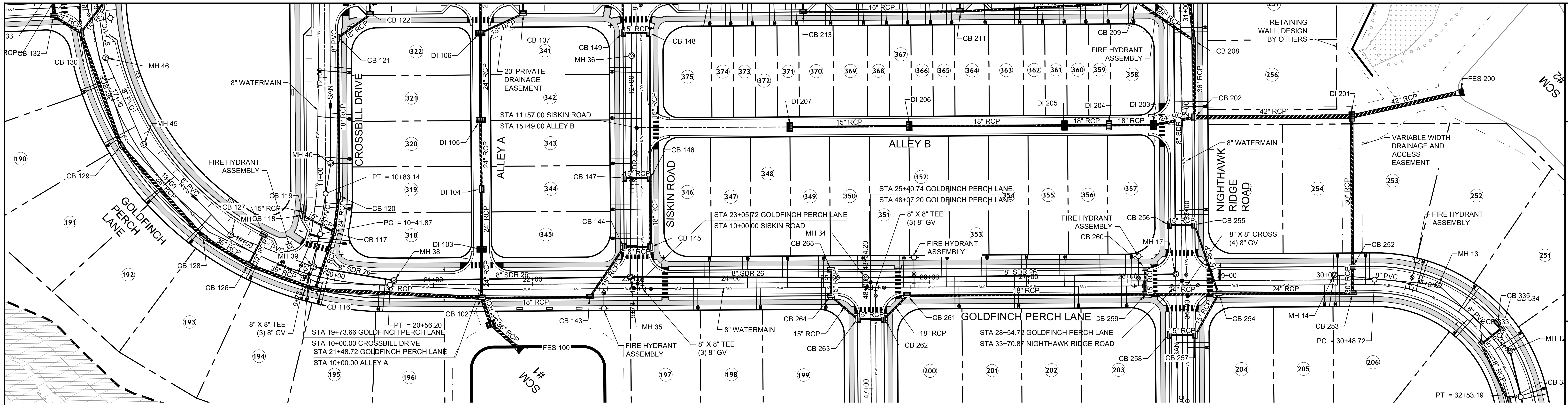

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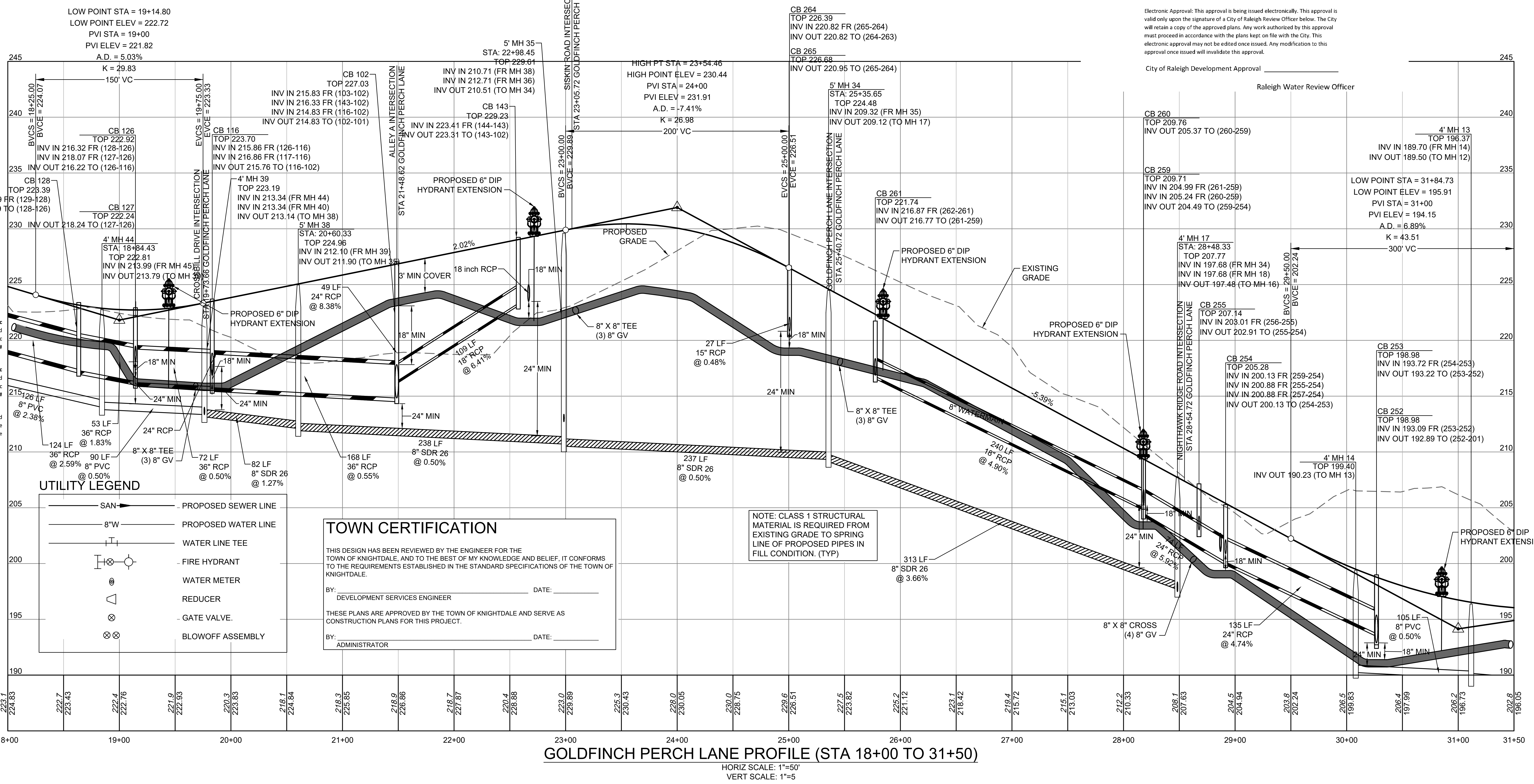
Raleigh Water Review Officer



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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BY: ____________________ DATE: __________
DEVELOPMENT SERVICES ENGINEER

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BY: ____________________ DATE: __________
ADMINISTRATOR

NOTE: CLASS 1 STRUCTURAL MATERIAL IS REQUIRED FROM EXISTING GRADE TO SPRING LINE OF PROPOSED PIPES IN FILL CONDITION. (TYP)

GOLDFINCH PERCH LANE PROFILE (STA 18+00 TO 31+50)
HORIZ SCALE: 1"=50'
VERT SCALE: 1"=5

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City of Raleigh Public Utilities Department Permit # ____________

SCALE 1"=50'
0 50' 100'

NAD 83

PROFILE SCALE
0 5 0 50

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MICHAEL V. ZACCARDO
6/22/21

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REVISION DESCRIPTION

DATE

DATE	06/22/2021
DRAWN BY	JD. MACMILLAN
DESIGNED BY	JD. MACMILLAN
CHECKED BY	M. ZACCARDO
SCALE	H: 1" = 50' V: 1" = 5'
JOB NO.	44872
SHEET NO.	C5.5

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION

KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA

GOLDFINCH PERCH LANE PLAN & PROFILE

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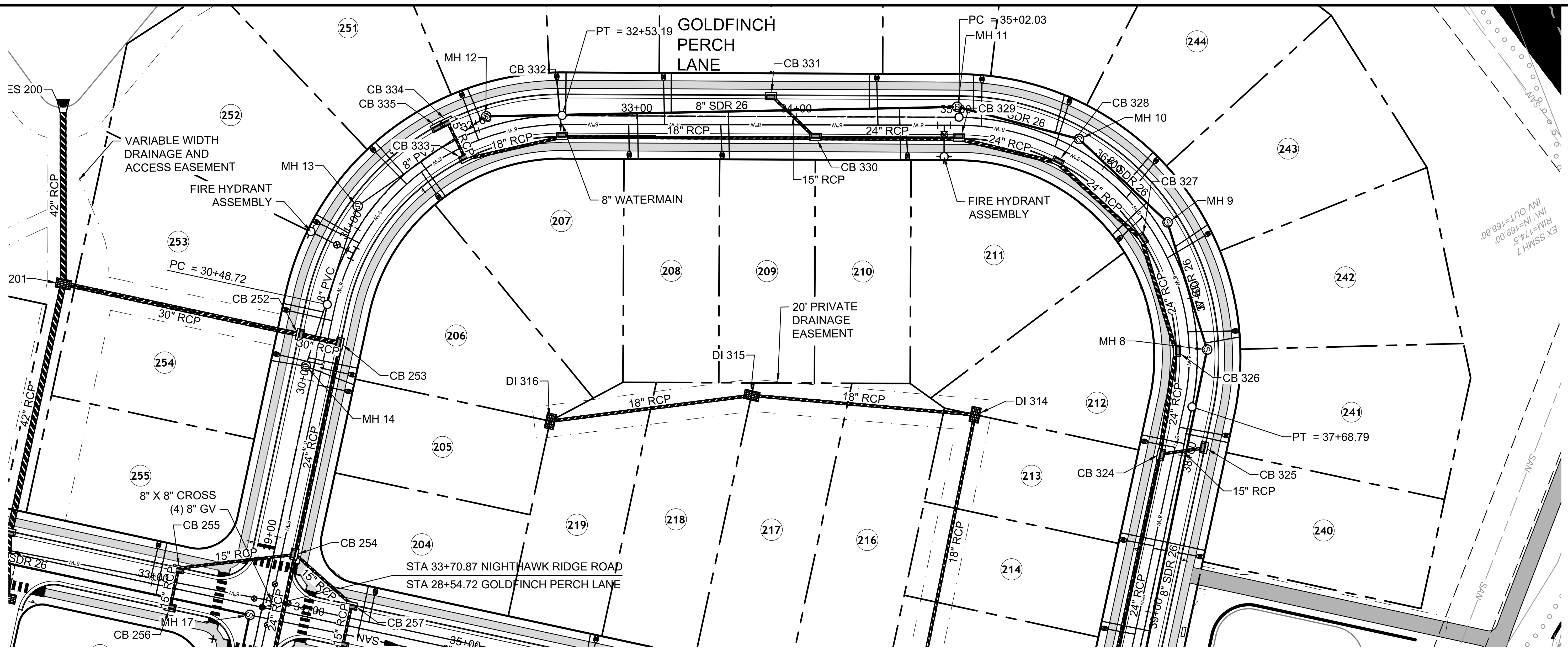

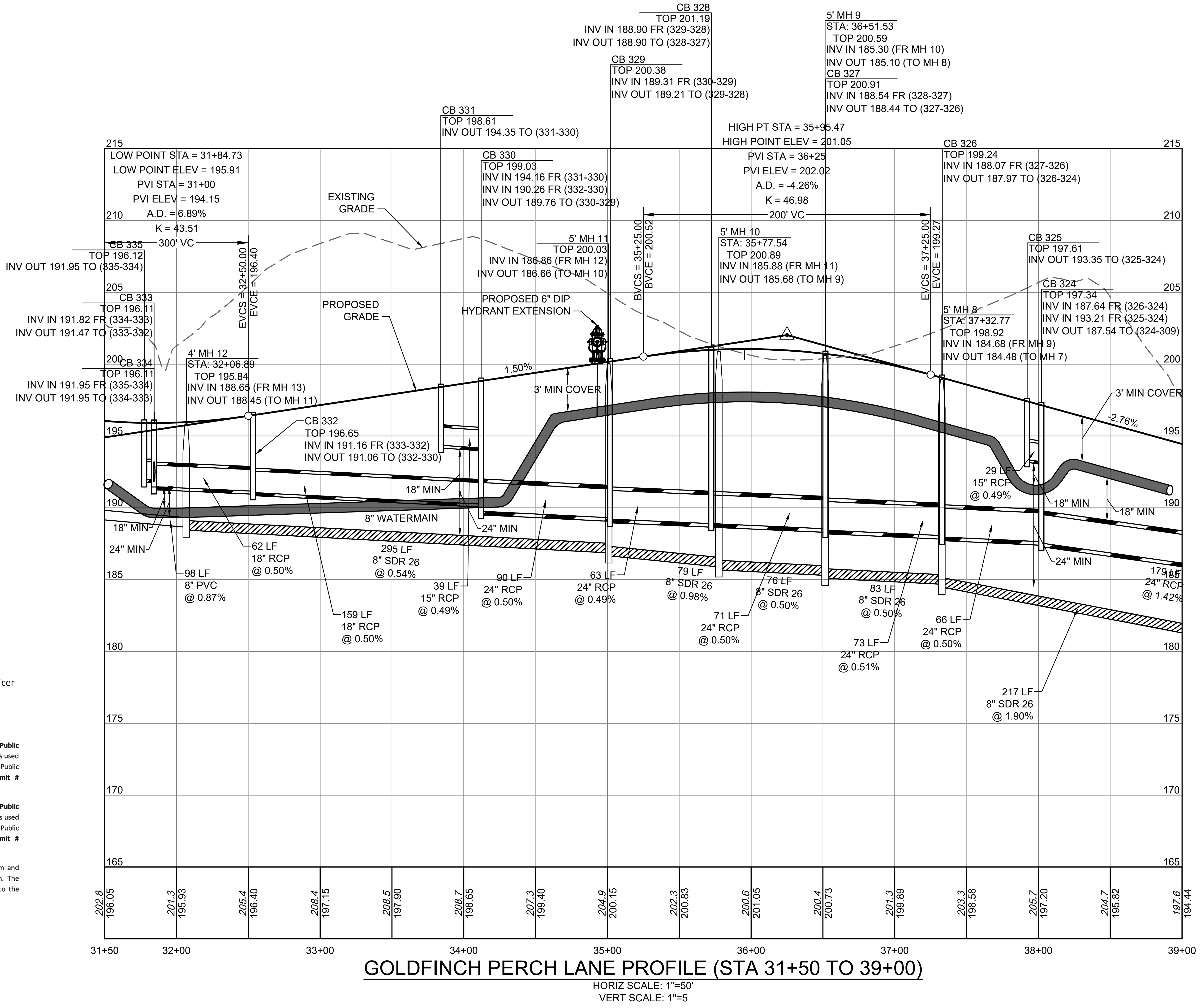

GOLDFINCH PERCH LANE PROFILE (STA 31+50 TO 39+00)

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VERT SCALE: 1"=5

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City of Raleigh Public Utilities Department Permit # ________________

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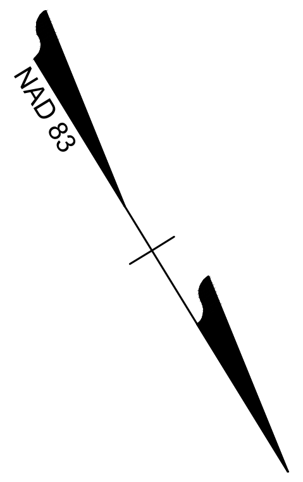
UTILITY LEGEND

—SAN➤—	PROPOSED SEWER LINE
—8"W—	PROPOSED WATER LINE
—┬—	WATER LINE TEE
⊢⊗–◯	FIRE HYDRANT
◍	WATER METER
◁	REDUCER
⊗	GATE VALVE.
⊗⊗	BLOWOFF ASSEMBLY

SCALE 1"=50'
0 50' 100'



5
0
0 50
PROFILE SCALE

TOWN CERTIFICATION

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DEVELOPMENT SERVICES ENGINEER

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ADMINISTRATOR

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M. V. ZACCARDO
6/22/21

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DESIGNED BY	JD. MACMILLAN
CHECKED BY	M. ZACCARDO
SCALE	H: 1" = 50' V: 1" = 5'

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION
KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA
GOLDFINCH PERCH LANE PLAN & PROFILE

JOB NO.
44872

SHEET NO.
C5.6

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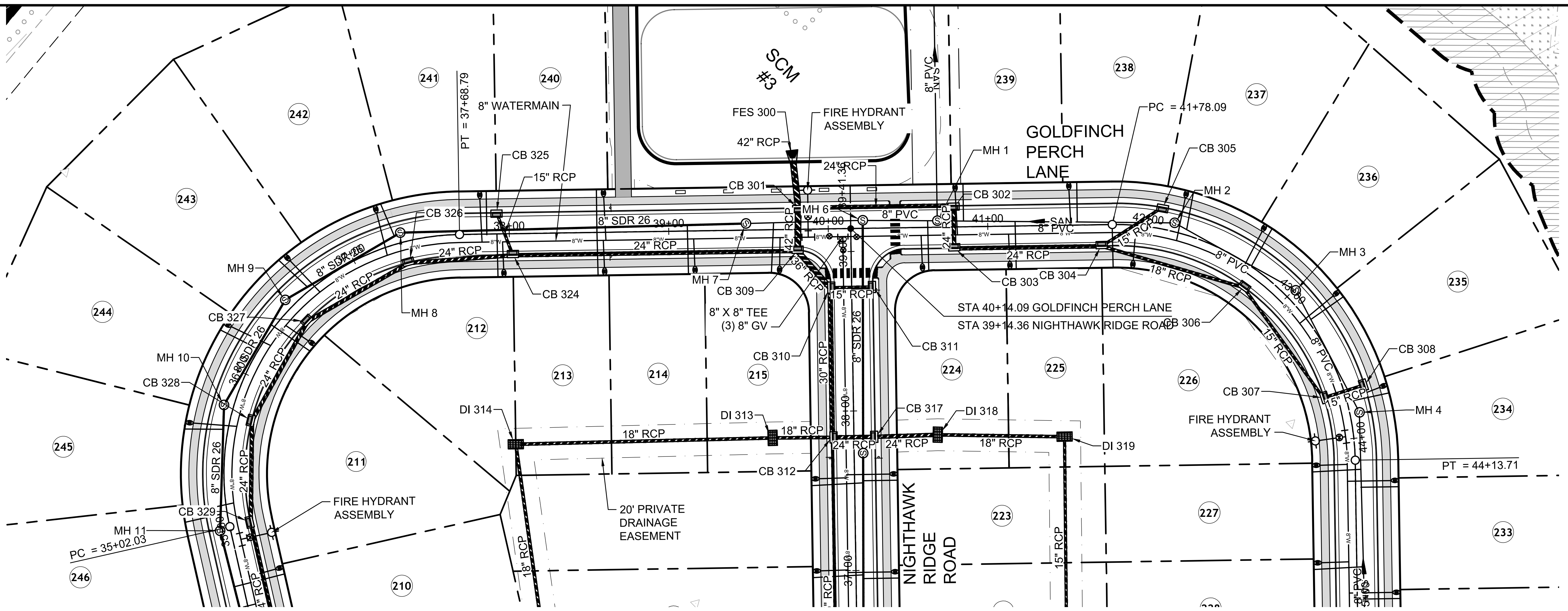

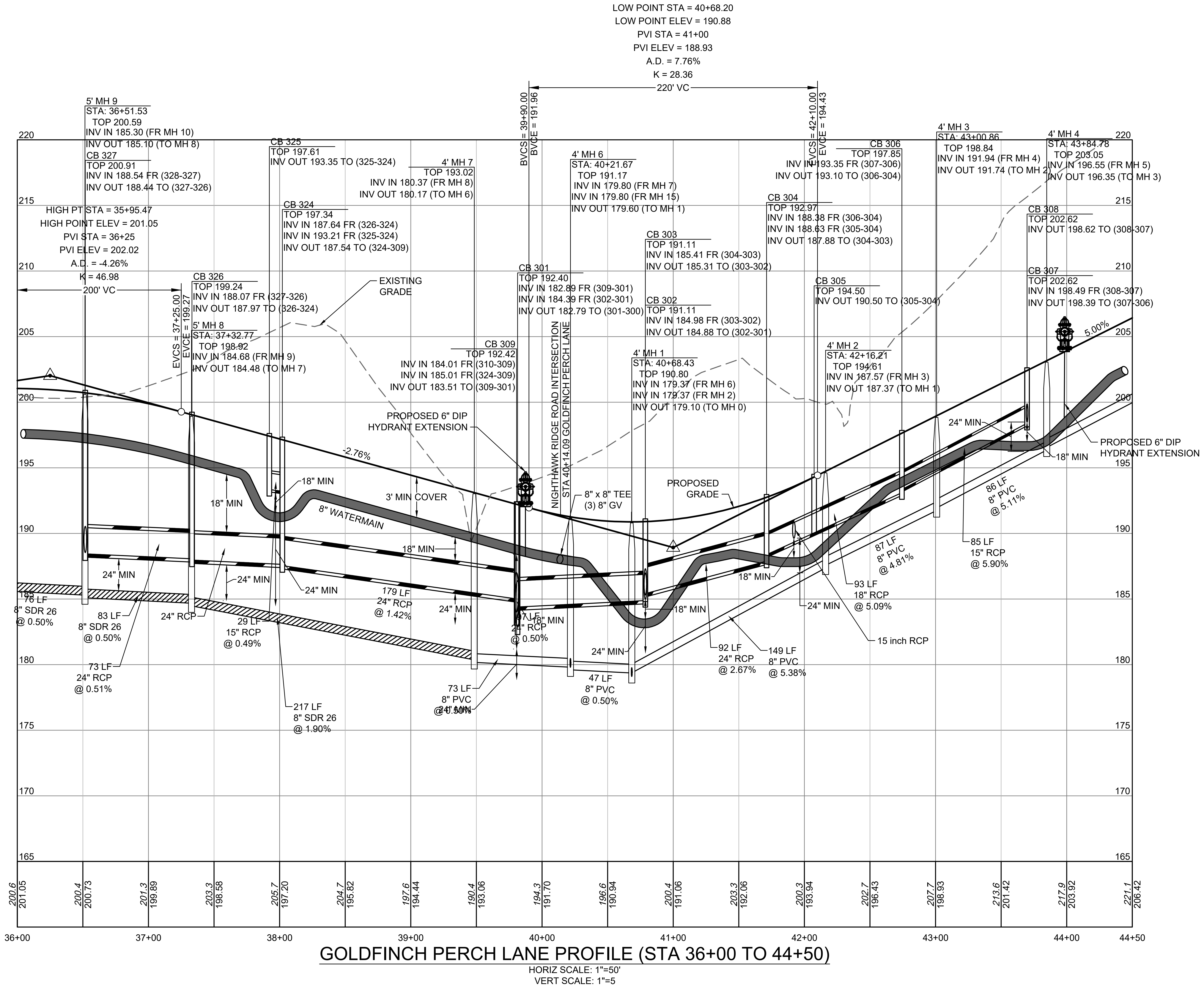

GOLDFINCH PERCH LANE PROFILE (STA 36+00 TO 44+50)

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

SCALE 1"=50'
0 50' 100'

NAD 83

PROFILE SCALE
5
0
0 50

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

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City of Raleigh Development Approval ____________________

Raleigh Water Review Officer

Water and Sewer Permits (If applicable)

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City of Raleigh Public Utilities Department Permit # ________________

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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

MICHAEL V. ZACCARDO
6/22/21

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YOUR VISION ACHIEVED THROUGH OURS.

DATE	REVISION DESCRIPTION

DATE
06/22/2021
DRAWN BY
JD. MACMILLAN
DESIGNED BY
JD. MACMILLAN
CHECKED BY
M. ZACCARDO
SCALE
H: 1" = 50'
V: 1" = 5'

TIMMONS GROUP

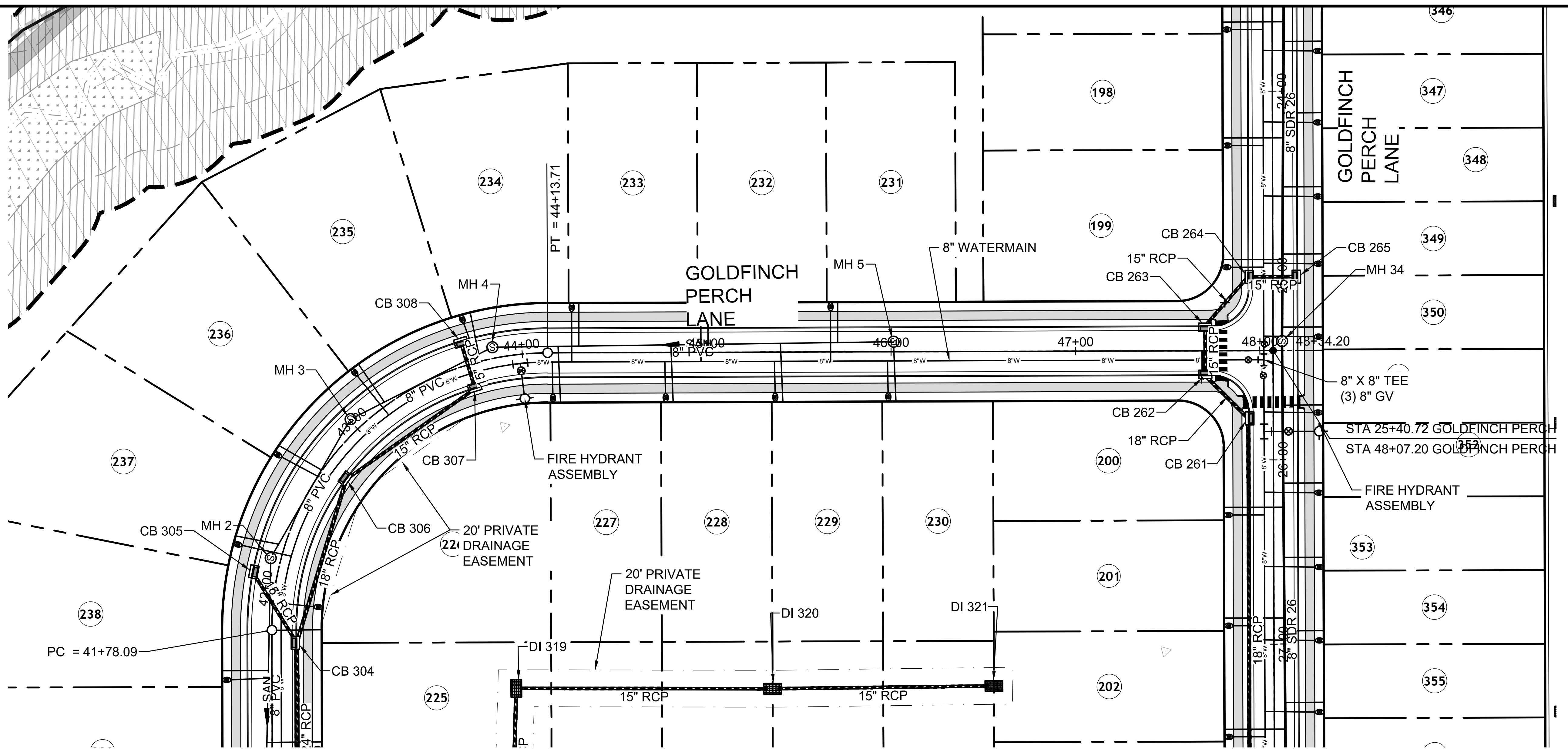
NORTH CAROLINA LICENSE NO. C-1652

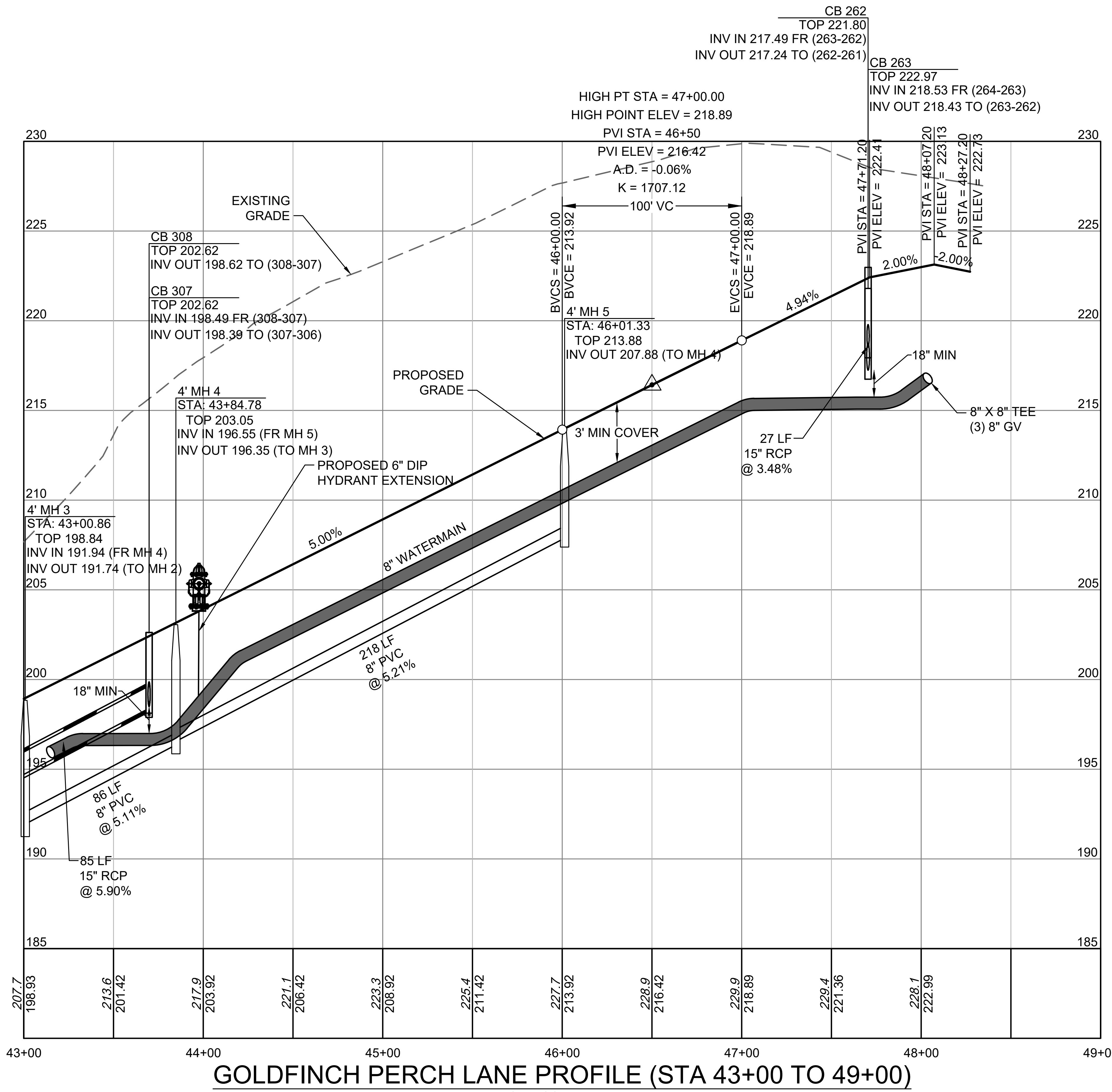
STONERIVER SUBDIVISION

KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA

GOLDFINCH PERCH LANE PLAN & PROFILE

JOB NO.
44872
SHEET NO.
C5.7





GOLDFINCH PERCH LANE PROFILE (STA 43+00 TO 49+00)

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

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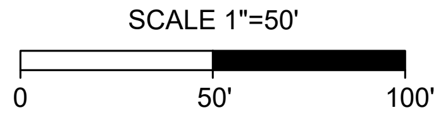
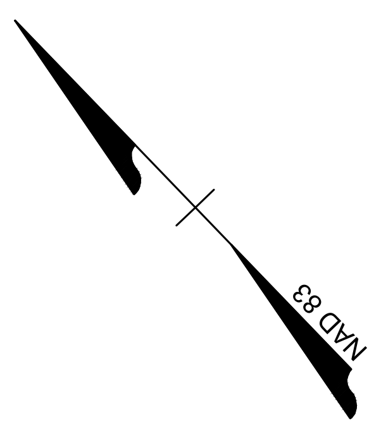
City of Raleigh Public Utilities Department Permit # ________________

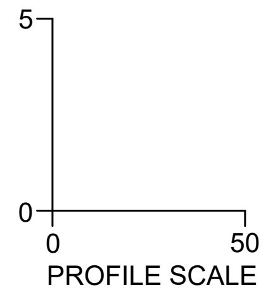
S:\331\44872-Stone-Silver\DWG\Sheet\CD\STONE RIVER\44872-331-SR-C5.2-PROF.dwg | by: Thomas Taylor

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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BY: ______________________________ DATE: __________
DEVELOPMENT SERVICES ENGINEER

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BY: ______________________________ DATE: __________
ADMINISTRATOR

MICHAEL V. ZACCARDO
6/22/21

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DATE	REVISION DESCRIPTION

TIMMONS GROUP

NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION

KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA

GOLDFINCH PERCH LANE PLAN & PROFILE

DATE
06/22/2021

DRAWN BY
JD. MACMILLAN

DESIGNED BY
JD. MACMILLAN

CHECKED BY
M. ZACCARDO

SCALE
H: 1" = 50'
V: 1" = 5'

JOB NO.
44872

SHEET NO.
C5.8

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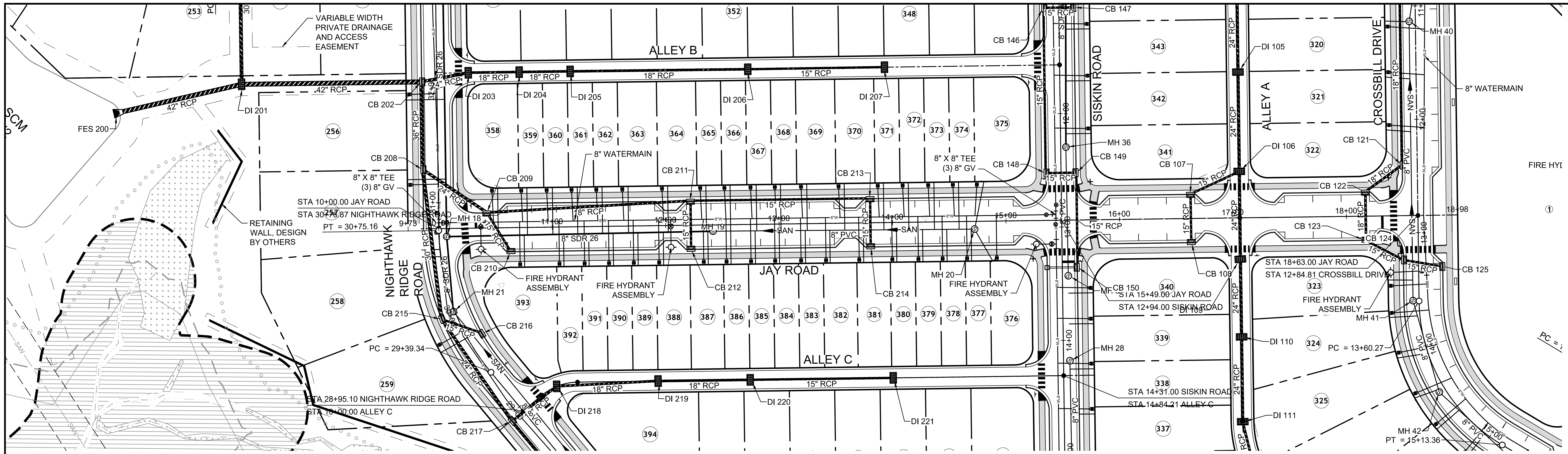

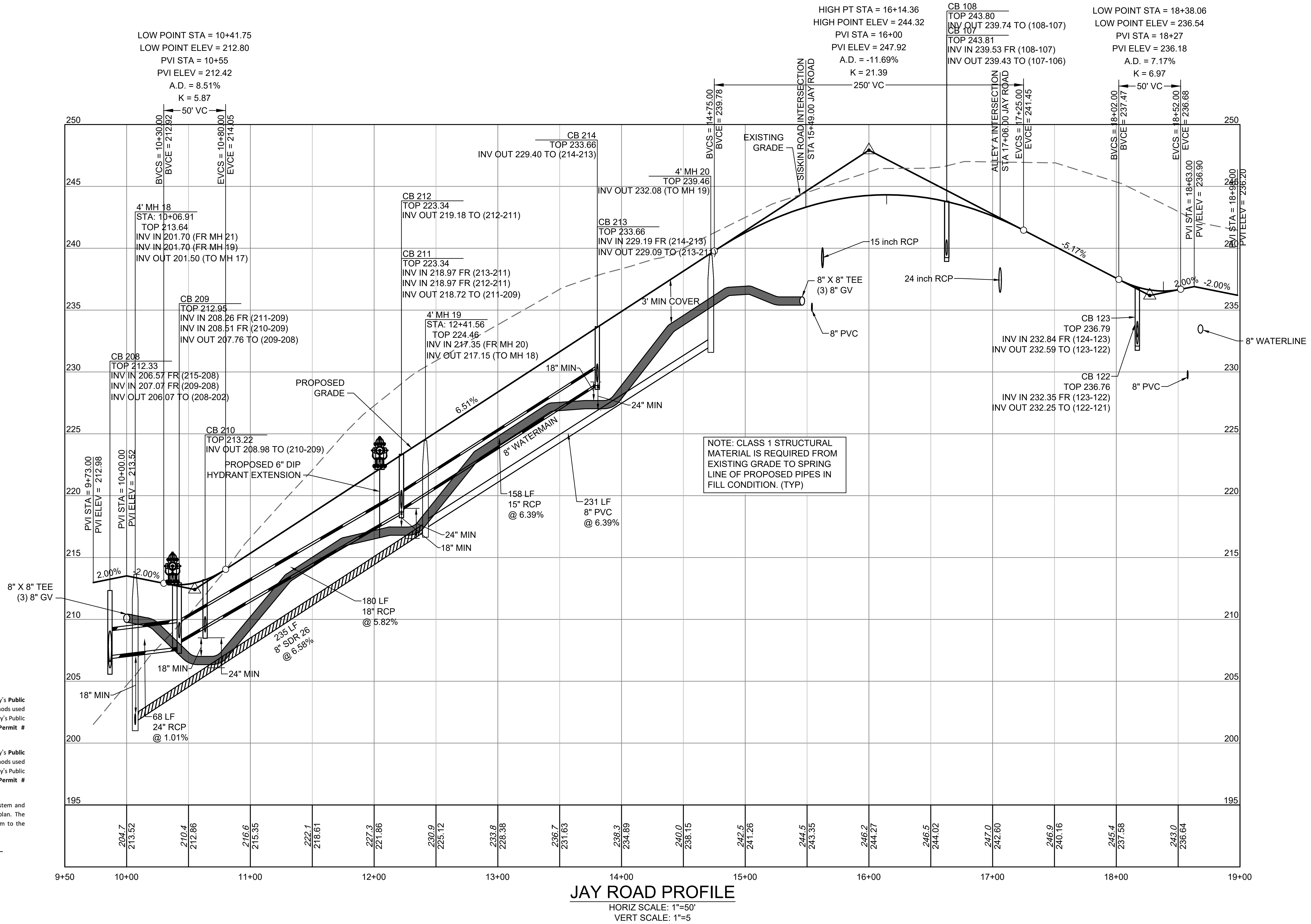

JAY ROAD PROFILE
HORIZ SCALE: 1"=50'
VERT SCALE: 1"=5

UTILITY LEGEND

——SAN——▶——	PROPOSED SEWER LINE
——8"W——	PROPOSED WATER LINE
——┬┬——	WATER LINE TEE
⊢⊗—○	FIRE HYDRANT
◍	WATER METER
◁	REDUCER
⊗	GATE VALVE.
⊗⊗	BLOWOFF ASSEMBLY

SCALE 1"=50'
0 50' 100'

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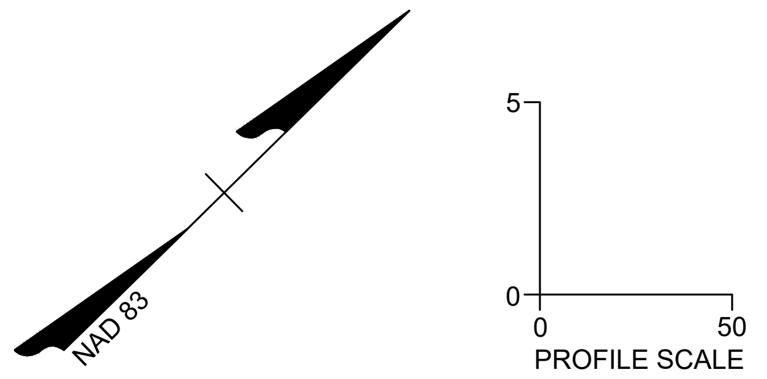
City of Raleigh Development Approval ____________________

Raleigh Water Review Officer



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DEVELOPMENT SERVICES ENGINEER

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BY: ______________________________ DATE: __________
ADMINISTRATOR

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MICHAEL V. ZACCARDO
6/22/21

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TIMMONS GROUP

NORTH CAROLINA LICENSE NO. C-1652

DATE	REVISION DESCRIPTION

DATE	06/22/2021
DRAWN BY	JD. MACMILLAN
DESIGNED BY	JD. MACMILLAN
CHECKED BY	M. ZACCARDO
SCALE	H: 1" = 50' V: 1" = 5'

STONERIVER SUBDIVISION

KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA

JAY ROAD PLAN & PROFILE

JOB NO.	44872
SHEET NO.	C5.9

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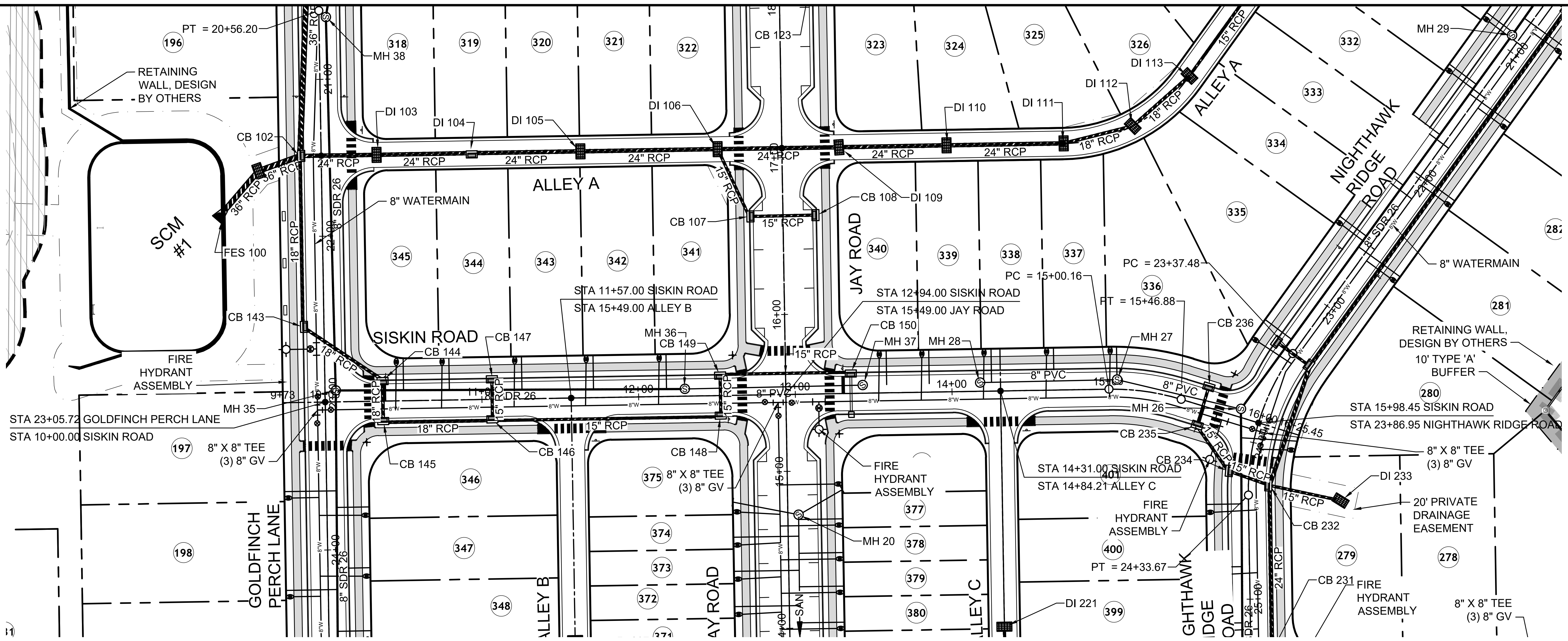
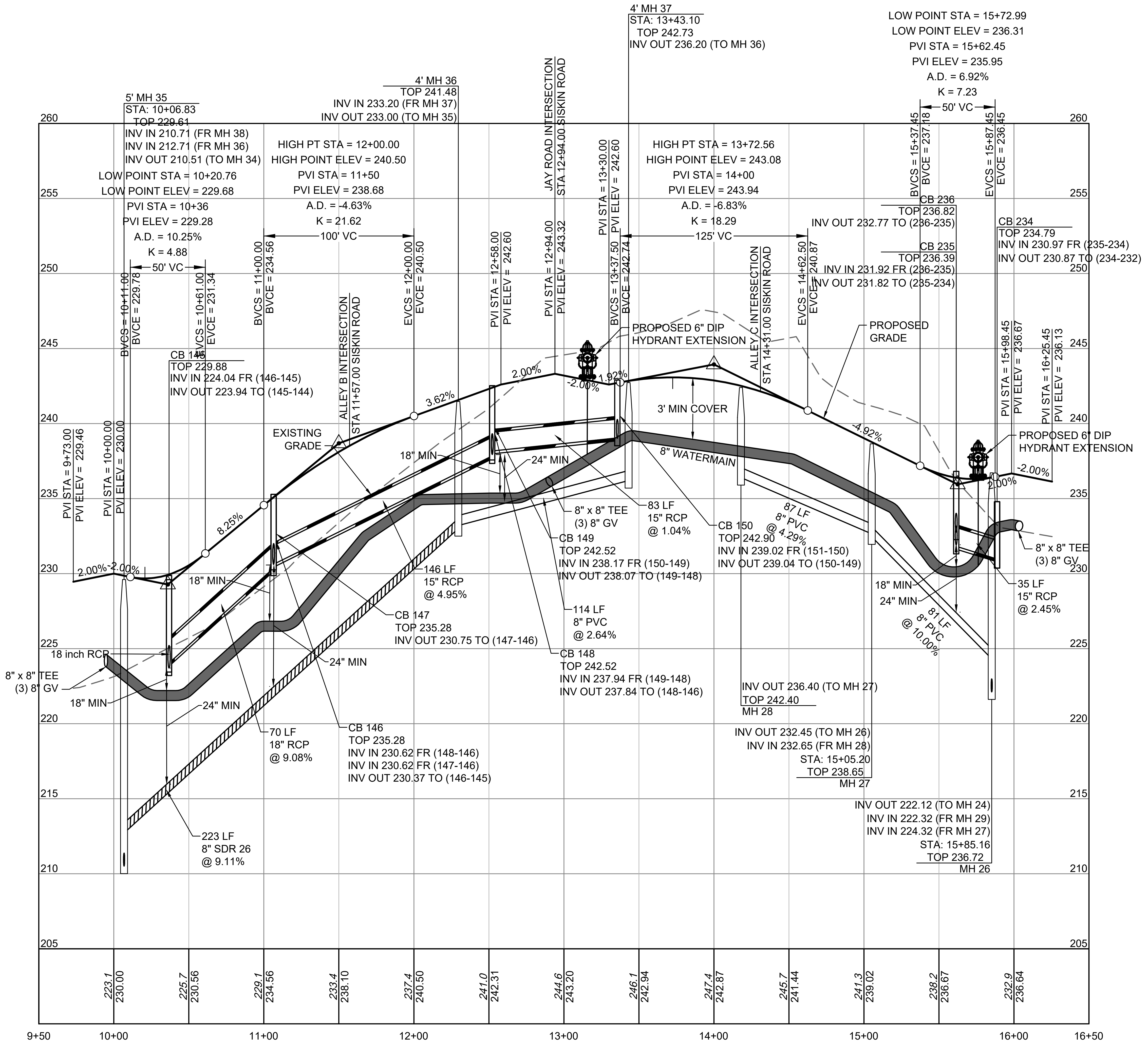


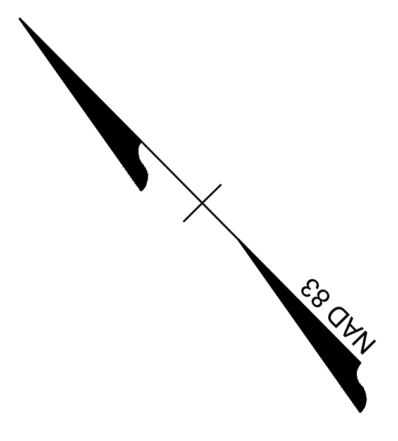


SISKIN ROAD PROFILE
HORIZ SCALE: 1"=50'
VERT SCALE: 1"=5

UTILITY LEGEND

——SAN——▶——	PROPOSED SEWER LINE
——8"W——	PROPOSED WATER LINE
——┬——	WATER LINE TEE
⊢⊗—○	FIRE HYDRANT
⊕	WATER METER
◁	REDUCER
⊗	GATE VALVE.
⊗⊗	BLOWOFF ASSEMBLY

SCALE 1"=50'
0 50' 100'



5
0
0 50
PROFILE SCALE

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DEVELOPMENT SERVICES ENGINEER

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ADMINISTRATOR

MICHAEL V. ZACCARDO
SEAL 032331
6/22/21

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DATE	REVISION DESCRIPTION

DATE
06/22/2021
DRAWN BY
JD. MACMILLAN
DESIGNED BY
JD. MACMILLAN
CHECKED BY
M. ZACCARDO
SCALE
H: 1" = 50'
V: 1" = 5'

TIMMONS GROUP

NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION

KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA

SISKIN ROAD PLAN & PROFILE

JOB NO.
44872
SHEET NO.
C5.10

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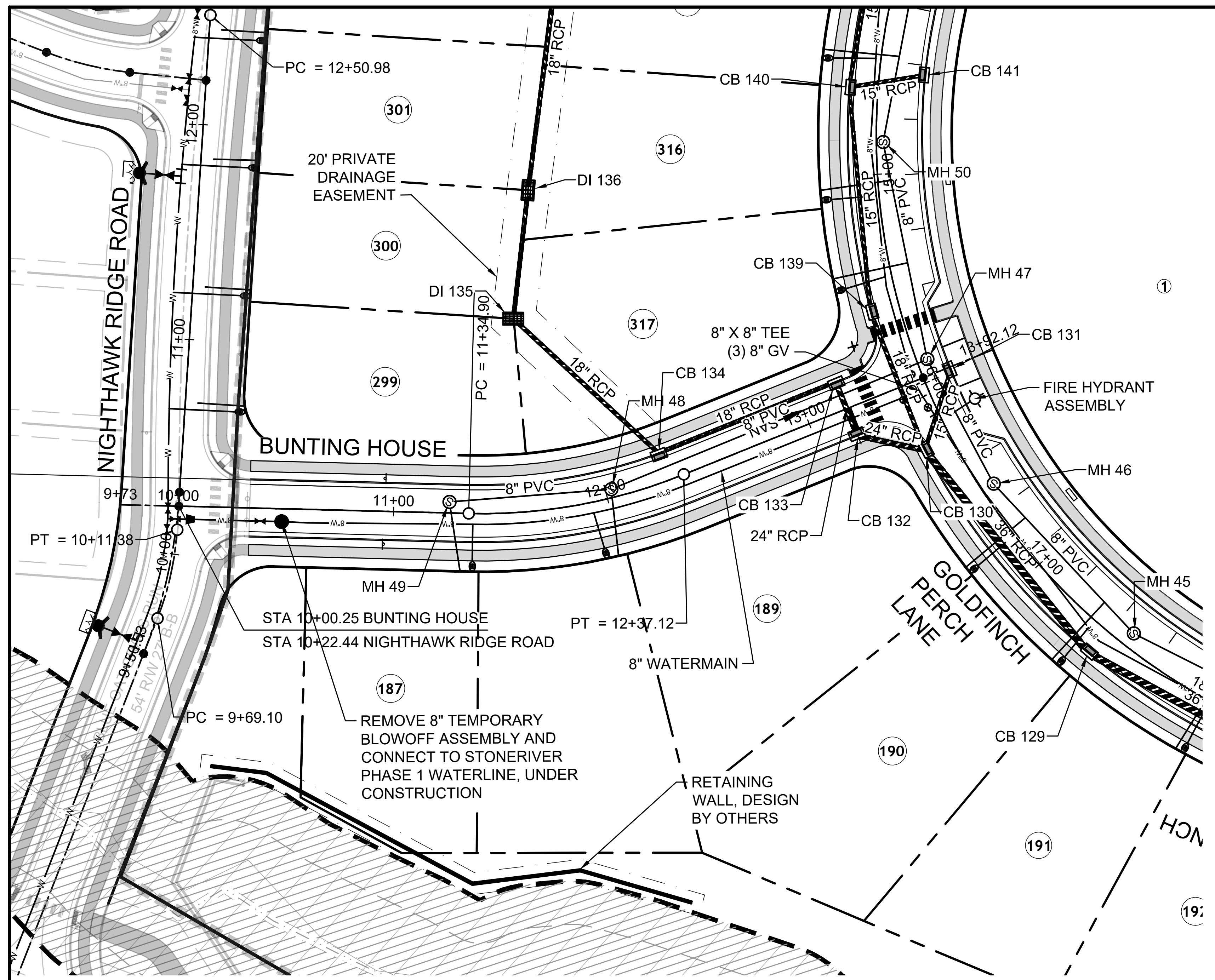

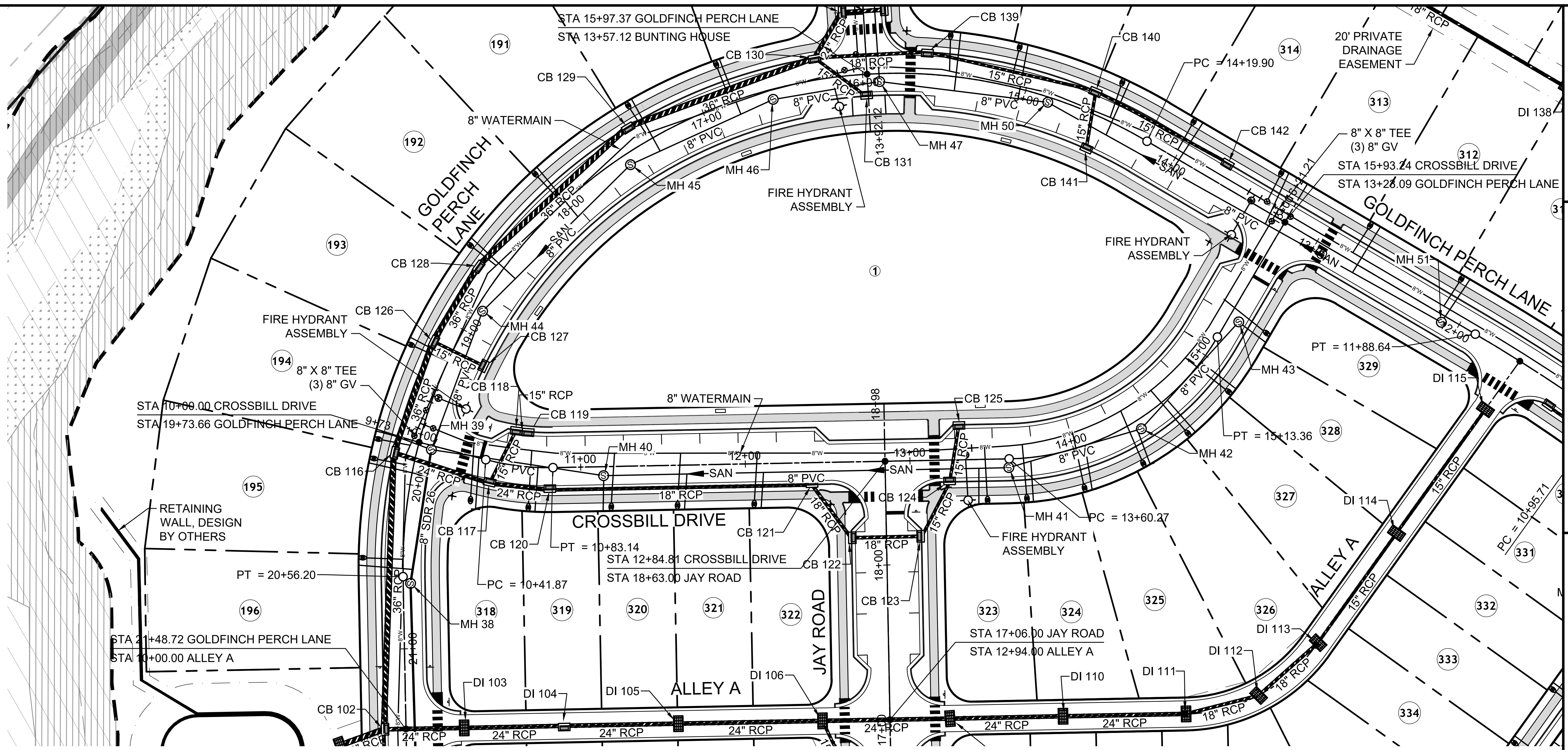

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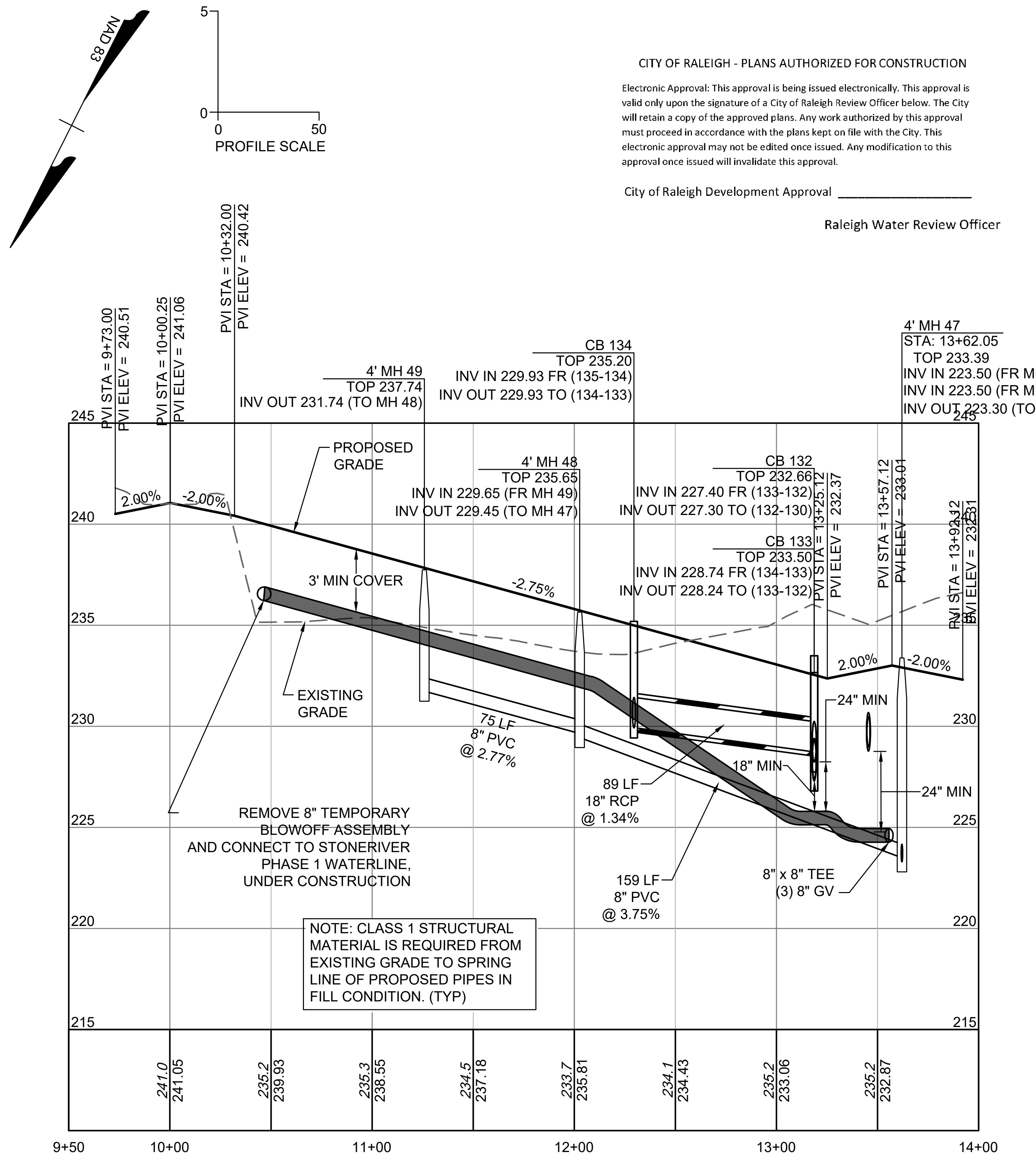
Raleigh Water Review Officer

UTILITY LEGEND

—SAN→—	PROPOSED SEWER LINE
—8"W—	PROPOSED WATER LINE
⊥	WATER LINE TEE
⊗○	FIRE HYDRANT
⊕	WATER METER
◁	REDUCER
⊗	GATE VALVE.
⊗⊗	BLOWOFF ASSEMBLY

SCALE 1"=50'
0 50' 100'



BUNTING HOUSE PROFILE

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

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City of Raleigh Public Utilities Department Permit # ____________

NAD 83

PROFILE SCALE
0 50

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DEVELOPMENT SERVICES ENGINEER

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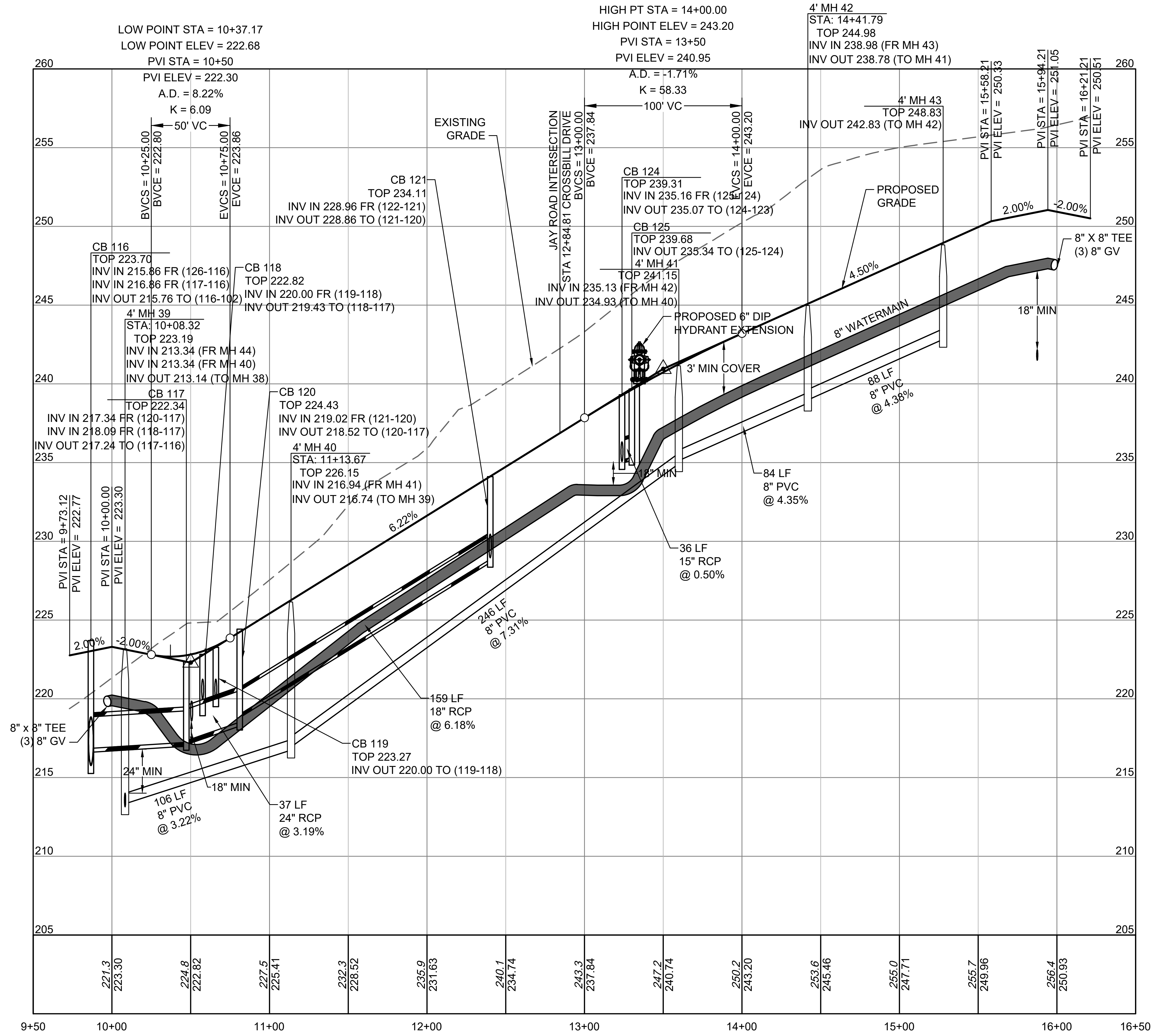
ADMINISTRATOR



CROSSBILL DRIVE PROFILE

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

MICHAEL V. ZACCARDO
6/22/21

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DATE	REVISION DESCRIPTION

DATE
06/22/2021

DRAWN BY
JD. MACMILLAN

DESIGNED BY
JD. MACMILLAN

CHECKED BY
M. ZACCARDO

SCALE
H: 1" = 50'
V: 1" = 5'

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION
KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA

BUNTING HOUSE & CROSSBILL DRIVE PLAN & PROFILE

JOB NO.
44872

SHEET NO.
C5.11

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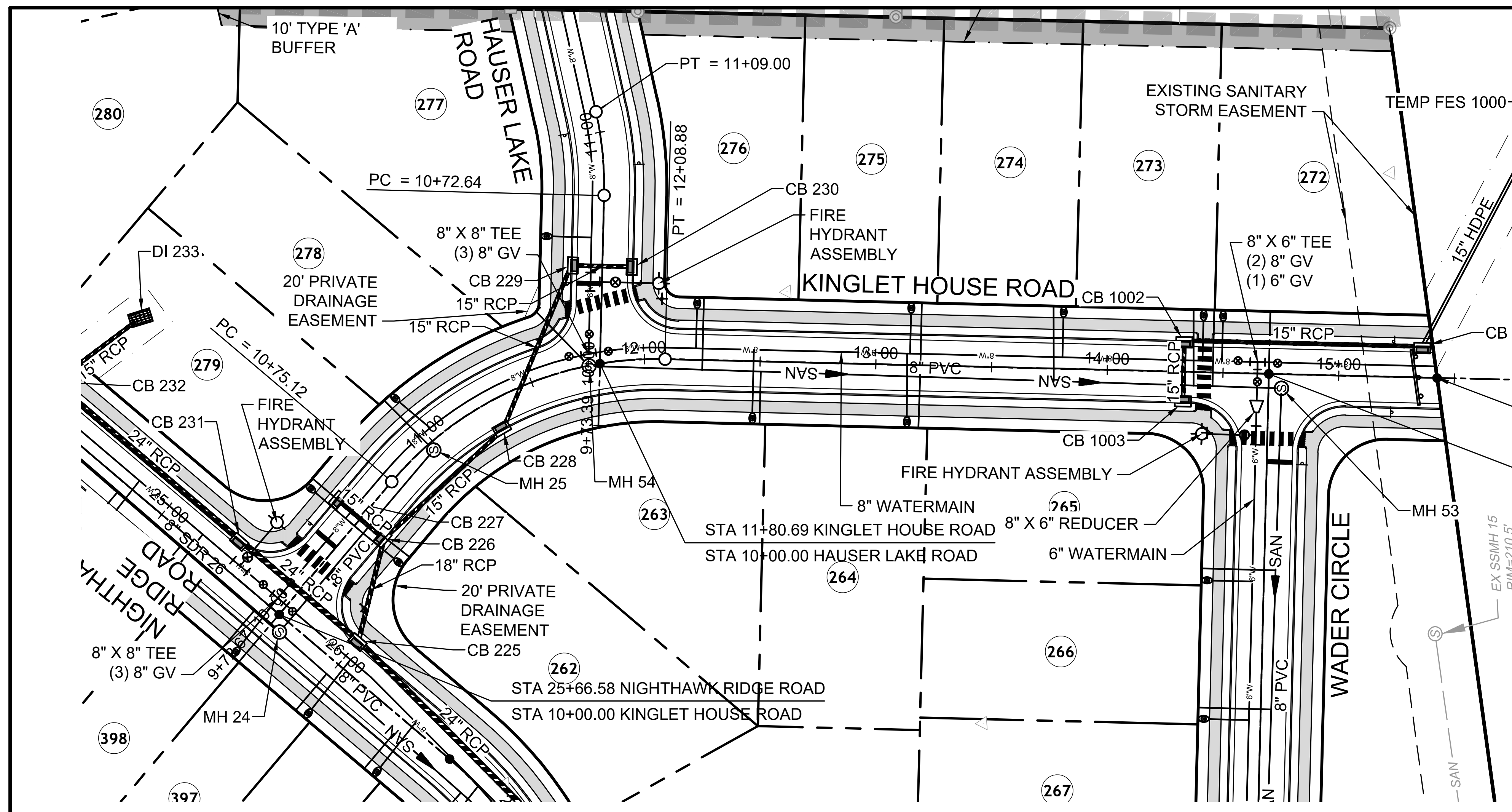
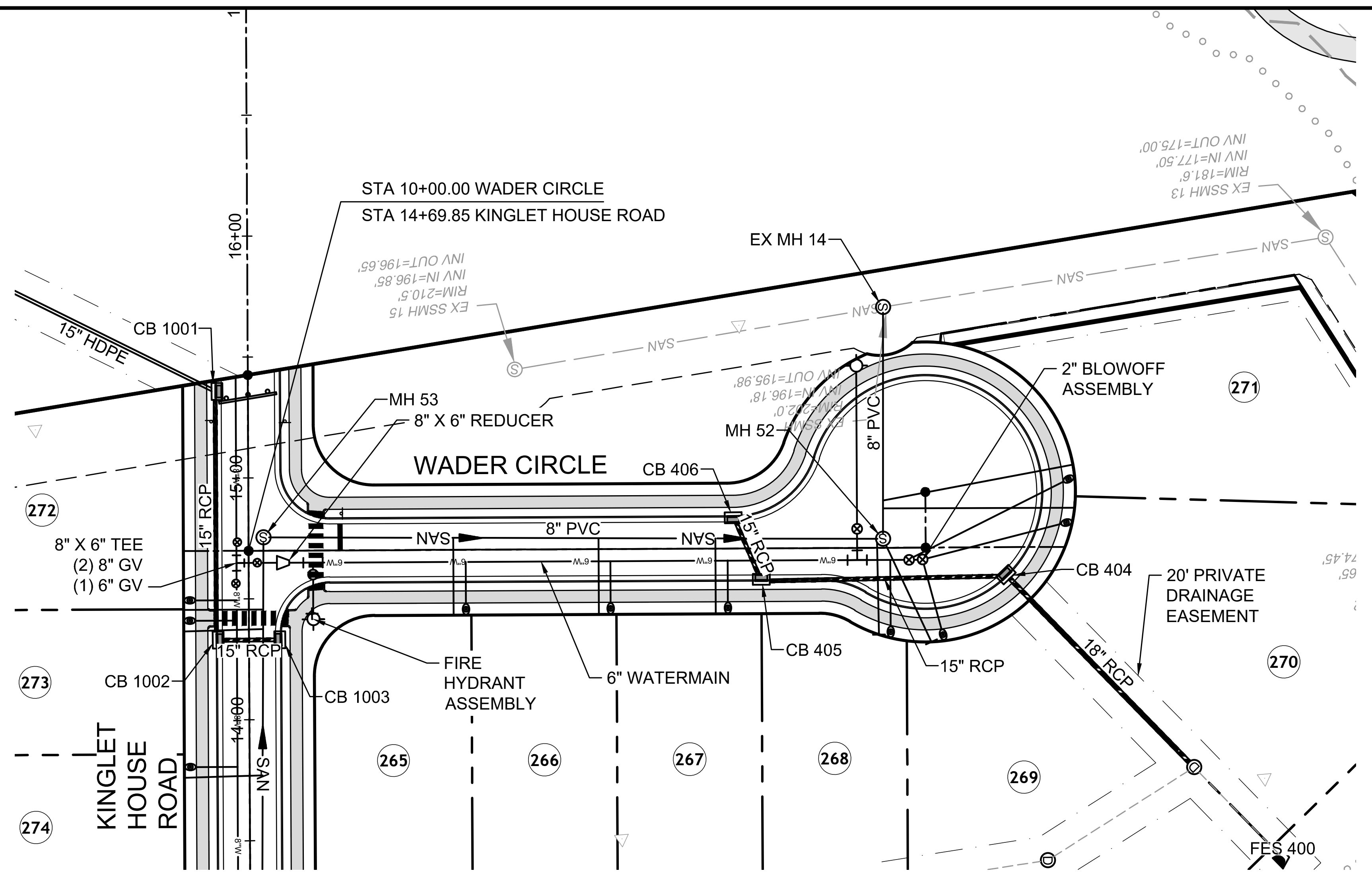
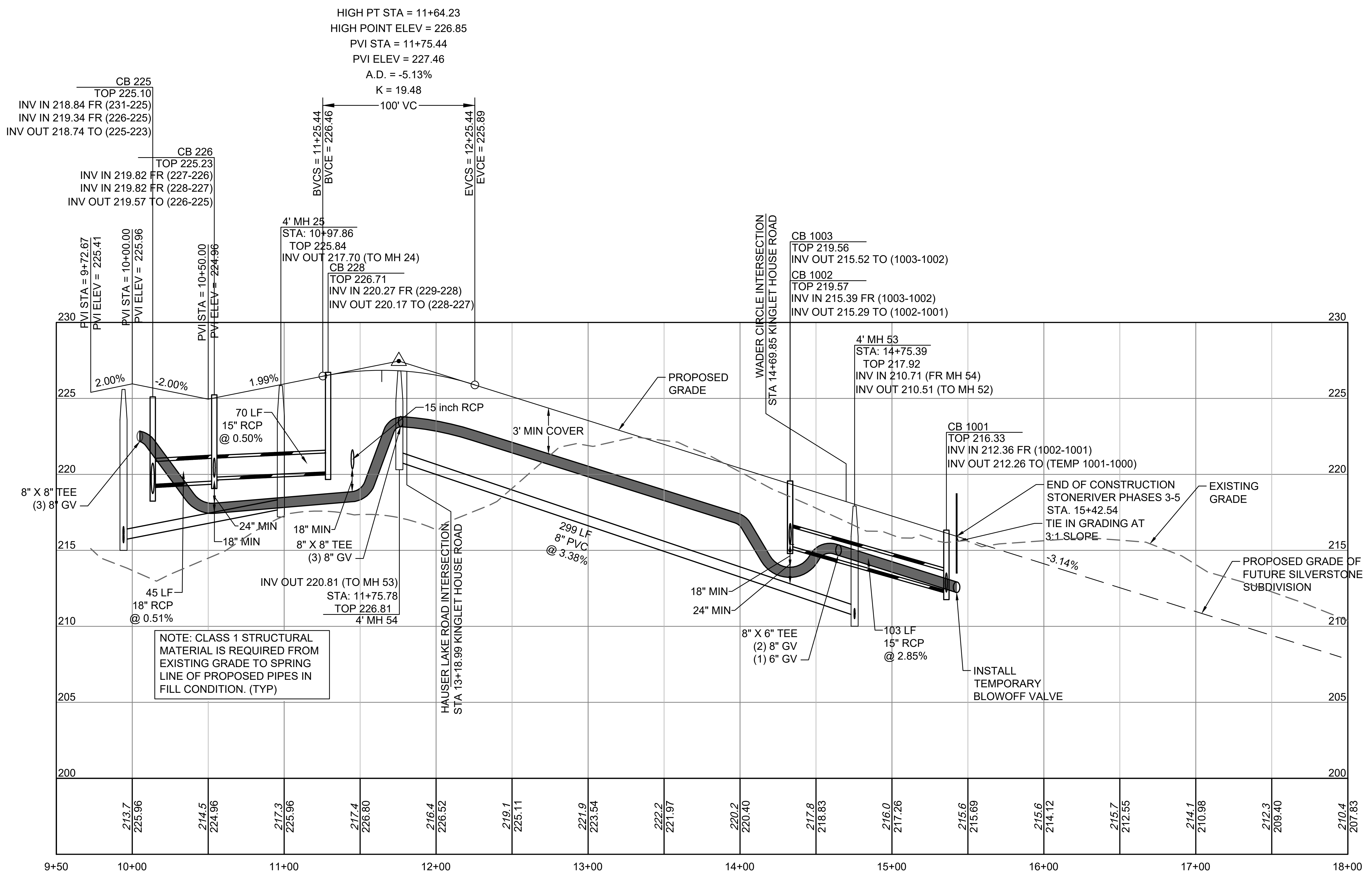
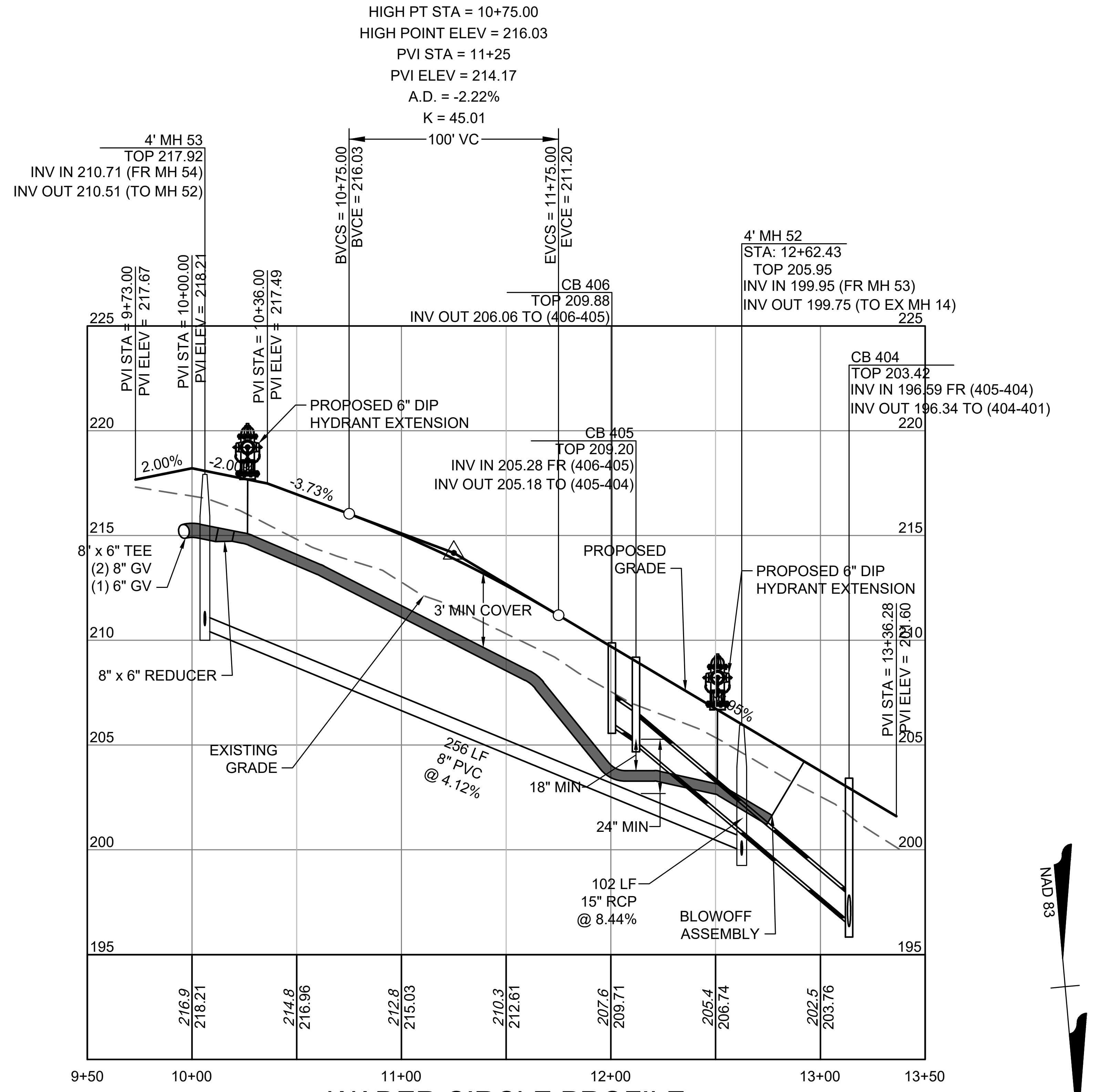






KINGLET HOUSE ROAD PROFILE

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



WADER CIRCLE PROFILE

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

NAD 83

5
0
0 50
PROFILE SCALE

UTILITY LEGEND

—SAN▶—	PROPOSED SEWER LINE
—8"W—	PROPOSED WATER LINE
—┬—	WATER LINE TEE
⊗—○	FIRE HYDRANT
◎	WATER METER
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SCALE 1"=50'
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Raleigh Water Review Officer

NAD 83

5
0
0 50
PROFILE SCALE

S:\331\44872-Stone-Silver\DWG\Sheet\CD\STONE RIVER\44872-331-SR-C5.2-PROF.dwg | by: Thomas Taylor

MICHAEL V. ZACCARDO
6/22/21

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CHECKED BY M. ZACCARDO
SCALE

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION

KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA

KINGLET HOUSE ROAD & WADER CIRCLE PLAN & PROFILE

JOB NO. 44872
SHEET NO. C5.12

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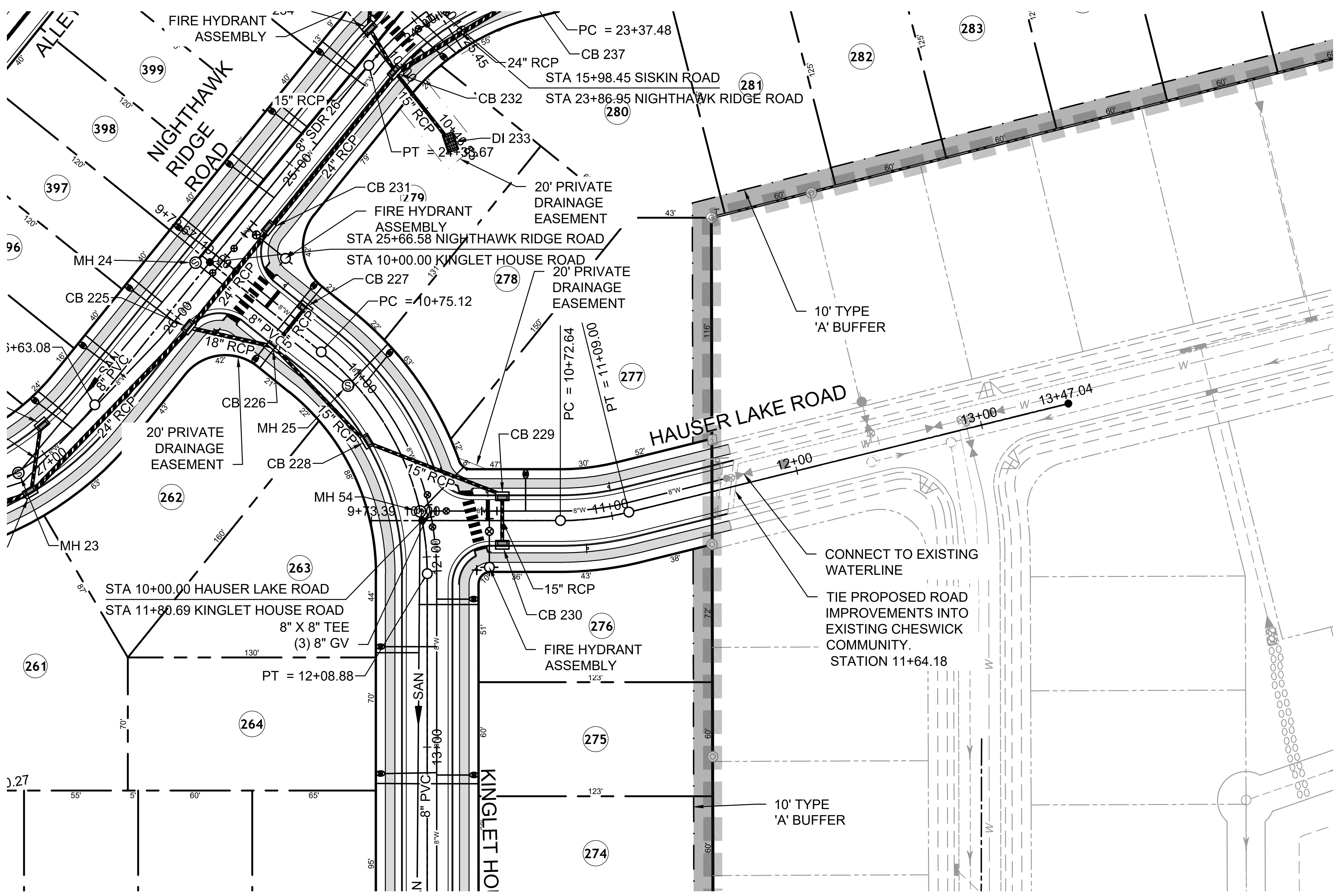

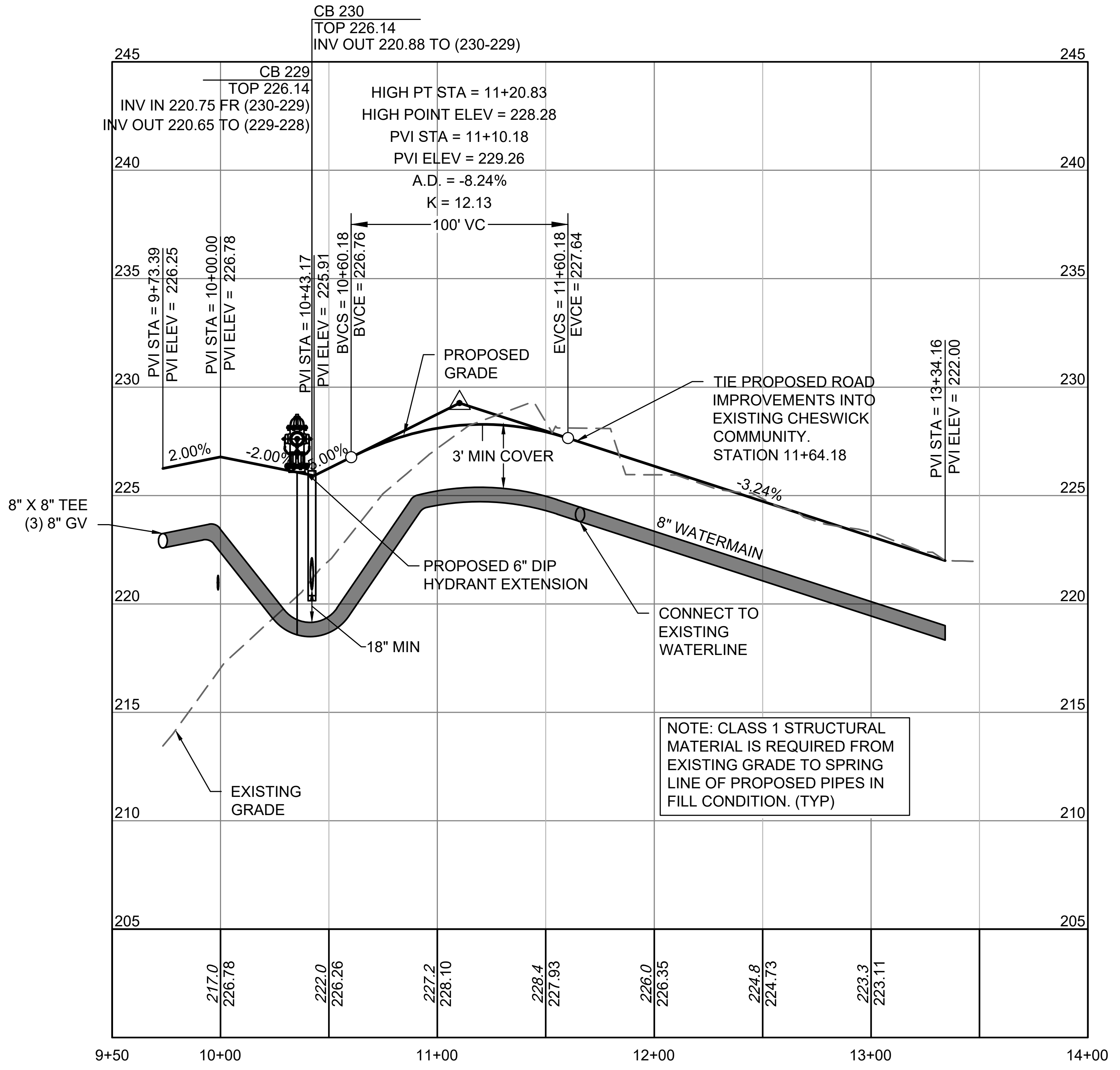

HAUSER LAKE ROAD PROFILE

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

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

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City of Raleigh Development Approval ____________________

Raleigh Water Review Officer

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-5745

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-3737

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 # ________________

S:\331\44872-Stone-Silver\DWG\Sheet\CD\STONE RIVER\44872-331-SR-C5.1-PROF.dwg | by: Thomas Taylor

UTILITY LEGEND

—SAN—▶—	PROPOSED SEWER LINE
—8"W—	PROPOSED WATER LINE
┬	WATER LINE TEE
⊗—○	FIRE HYDRANT
●	WATER METER
◁	REDUCER
⊗	GATE VALVE.
⊗⊗	BLOWOFF ASSEMBLY

SCALE 1"=50'
0 50' 100'

NAD 83

PROFILE SCALE
0 5
0 50

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TOWN CERTIFICATION

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

BY: ______________________ DATE: __________
DEVELOPMENT SERVICES ENGINEER

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

BY: ______________________ DATE: __________
ADMINISTRATOR

MICHAEL V. ZACCARDO
6/22/21

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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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DATE	REVISION DESCRIPTION

DATE
06/22/2021
DRAWN BY
JD. MACMILLAN
DESIGNED BY
JD. MACMILLAN
CHECKED BY
M. ZACCARDO
SCALE
H: 1" = 50'
V: 1" = 5'

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION
KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA
HAUSER LAKE ROAD PLAN & PROFILE

JOB NO.
44872
SHEET NO.
C5.13

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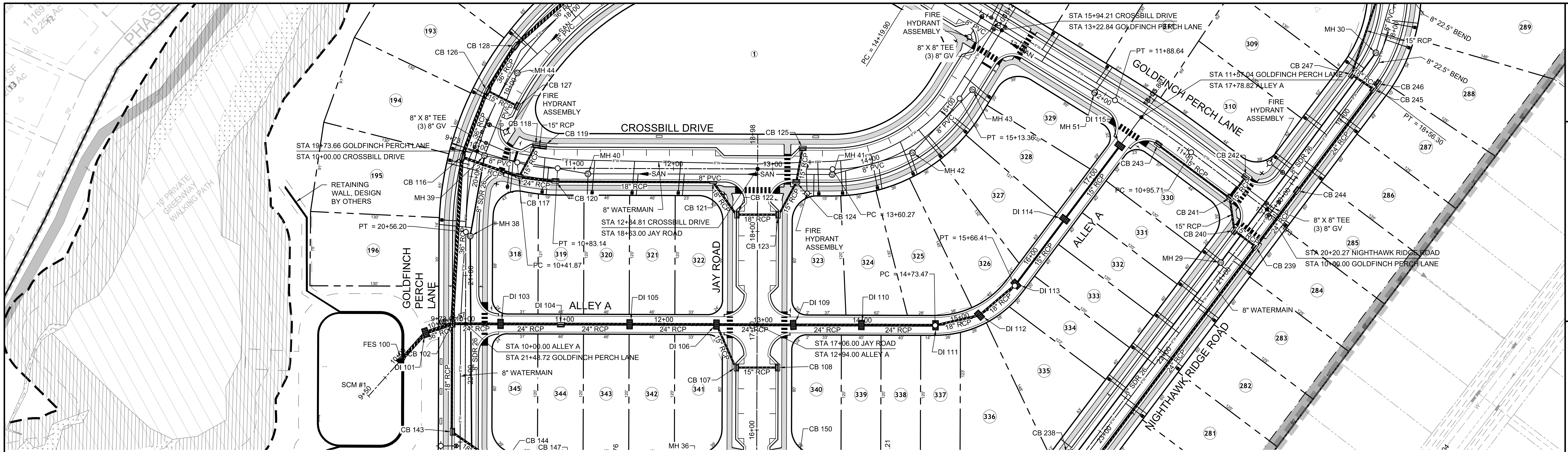
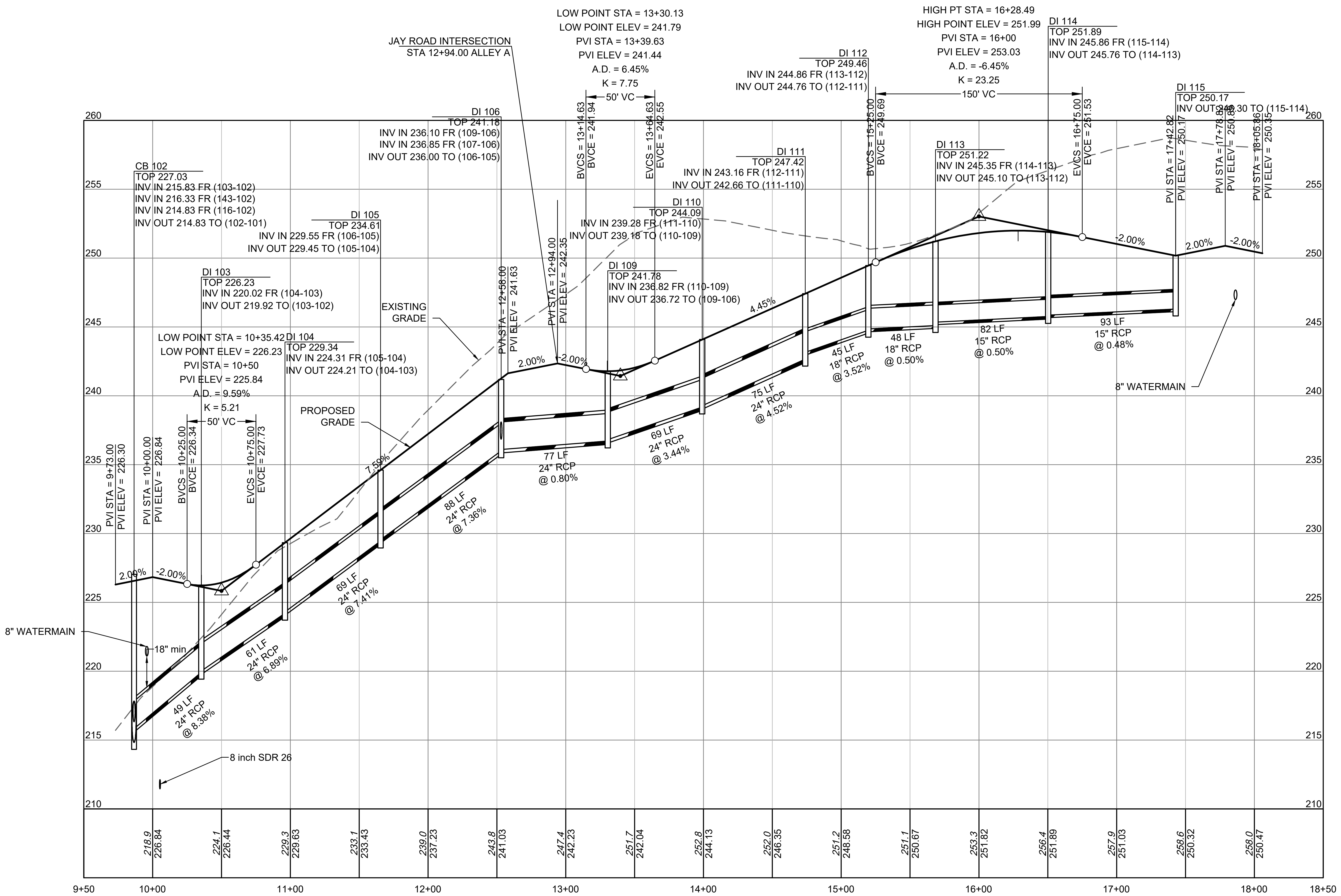




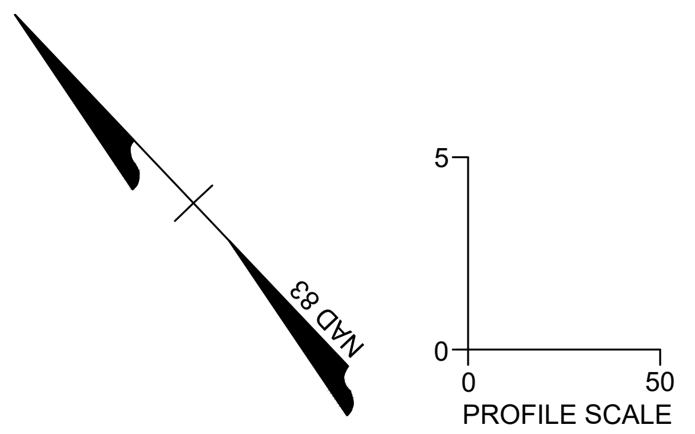
ALLEY A PROFILE

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

UTILITY LEGEND

—SAN—▶—	PROPOSED SEWER LINE
—8"W—	PROPOSED WATER LINE
—T—	WATER LINE TEE
⊢⊕—○	FIRE HYDRANT
⊕	WATER METER
◁	REDUCER
⊗	GATE VALVE.
⊗⊗	BLOWOFF ASSEMBLY

SCALE 1"=50'
0 50' 100'



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TOWN CERTIFICATION

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BY: ______________________________ DATE: __________
DEVELOPMENT SERVICES ENGINEER

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BY: ______________________________ DATE: __________
ADMINISTRATOR

MICHAEL V. ZACCARDO
6/22/21

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DATE	REVISION DESCRIPTION

DATE
06/22/2021

DRAWN BY
JD. MACMILLAN

DESIGNED BY
JD. MACMILLAN

CHECKED BY
M. ZACCARDO

SCALE
H: 1" = 50'
V: 1" = 5'

TIMMONS GROUP

NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION

KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA

ALLEY A PLAN & PROFILE

JOB NO.
44872

SHEET NO.
C5.14

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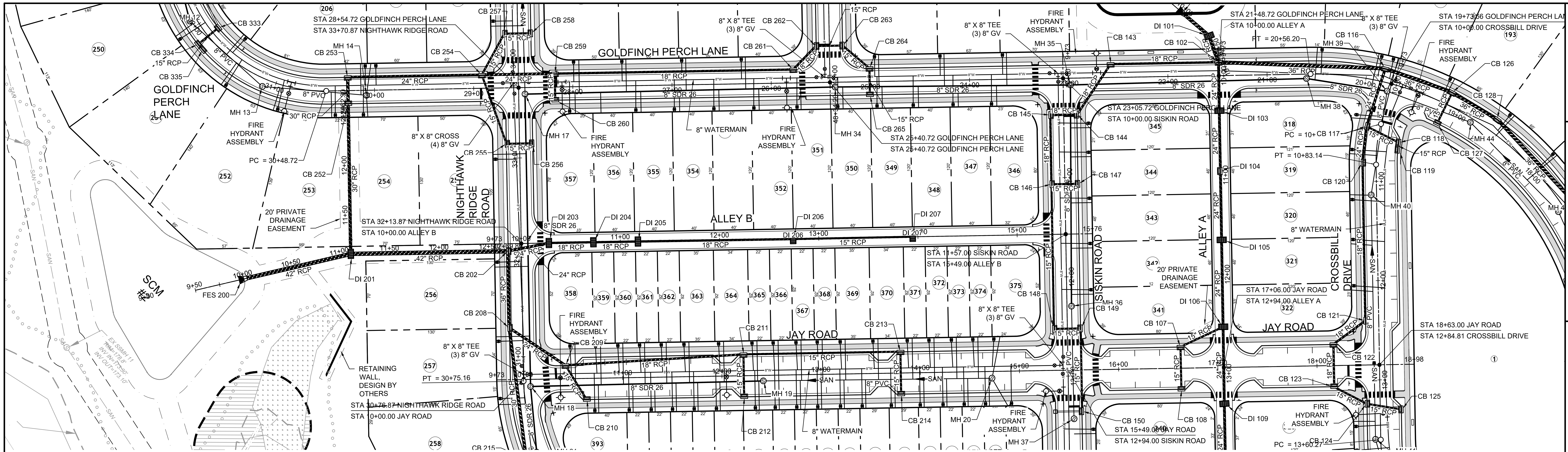
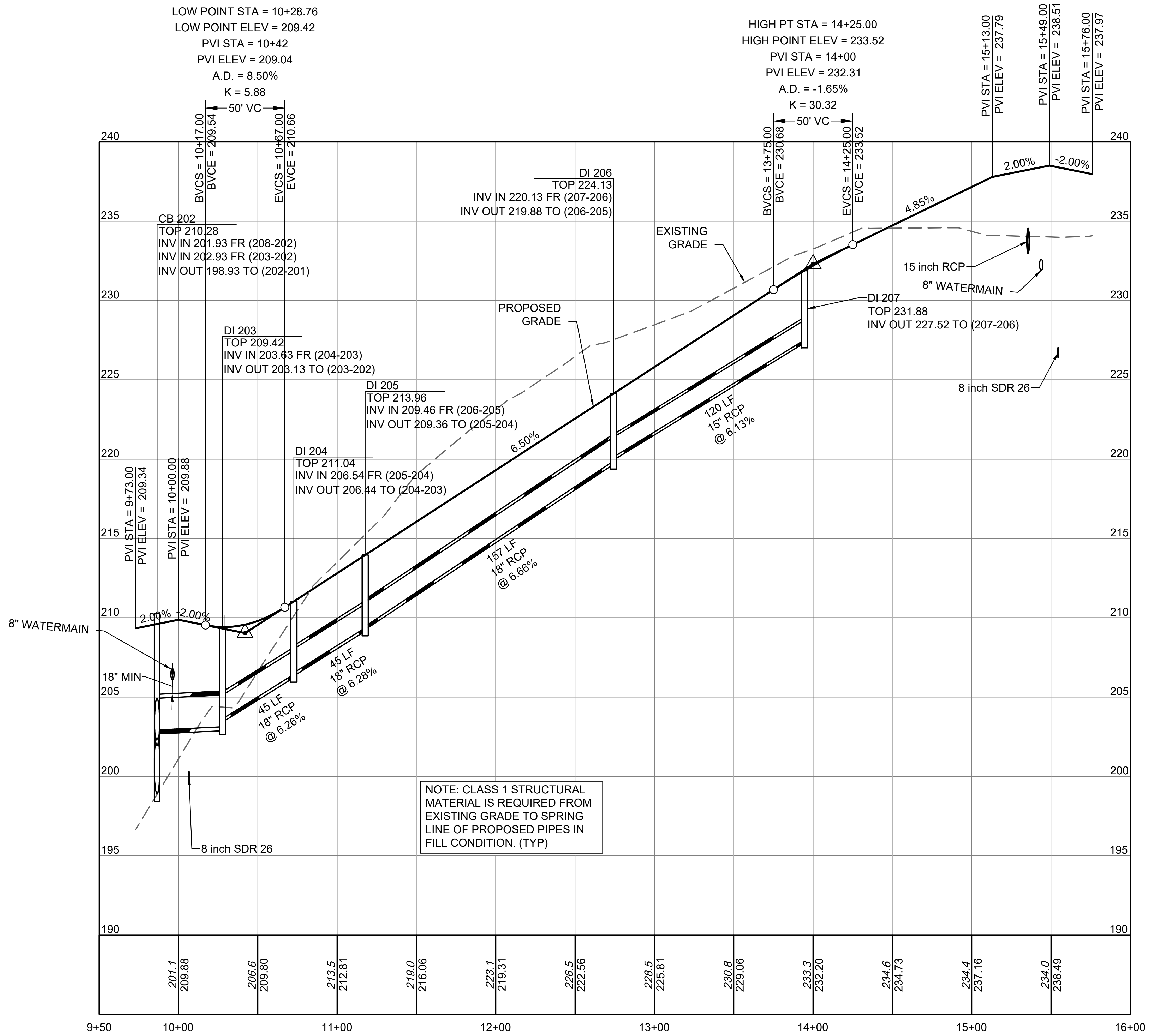


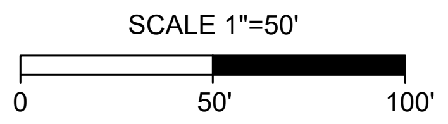


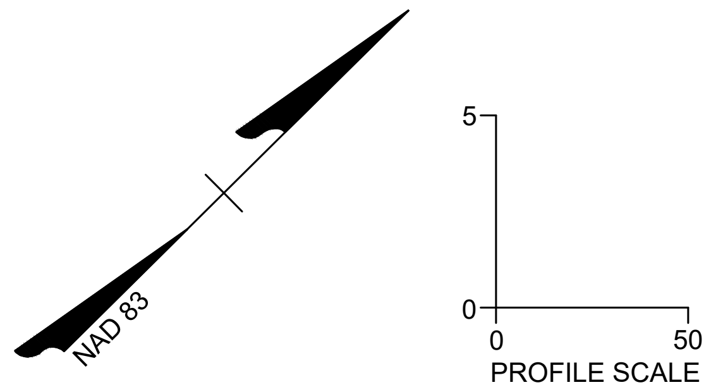
ALLEY B PROFILE

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





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TOWN CERTIFICATION

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BY: ______________________ DATE: __________
DEVELOPMENT SERVICES ENGINEER

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BY: ______________________ DATE: __________
ADMINISTRATOR

MICHAEL V. ZACCARDO
6/22/21

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YOUR VISION ACHIEVED THROUGH OURS.

DATE	REVISION DESCRIPTION

DATE
06/22/2021
DRAWN BY
JD. MACMILLAN
DESIGNED BY
JD. MACMILLAN
CHECKED BY
M. ZACCARDO
SCALE
H: 1" = 50'
V: 1" = 5'

TIMMONS GROUP

NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION

KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA

ALLEY B PLAN & PROFILE

JOB NO.
44872
SHEET NO.
C5.15

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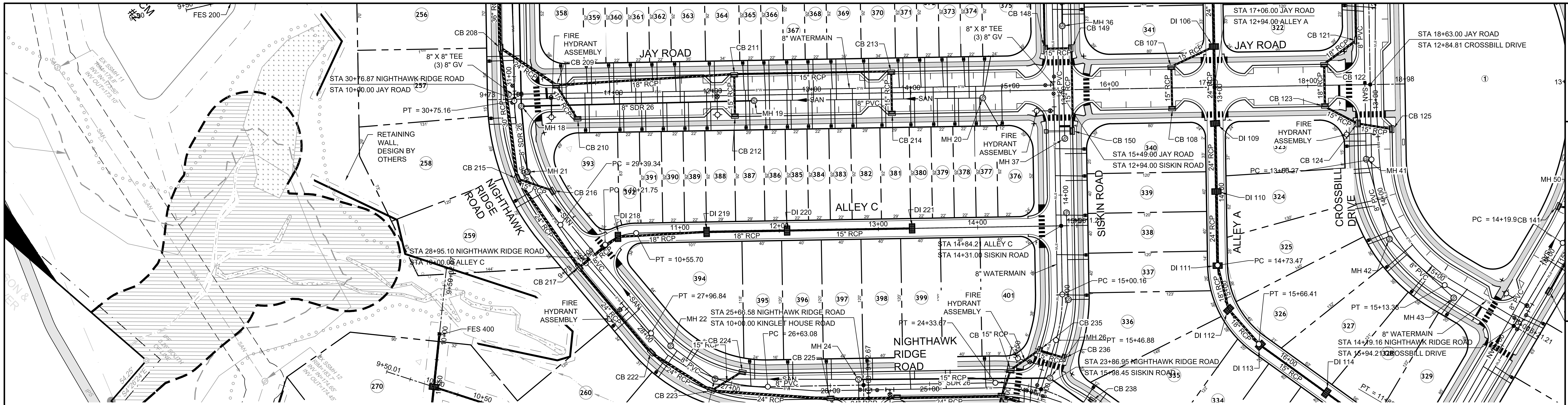
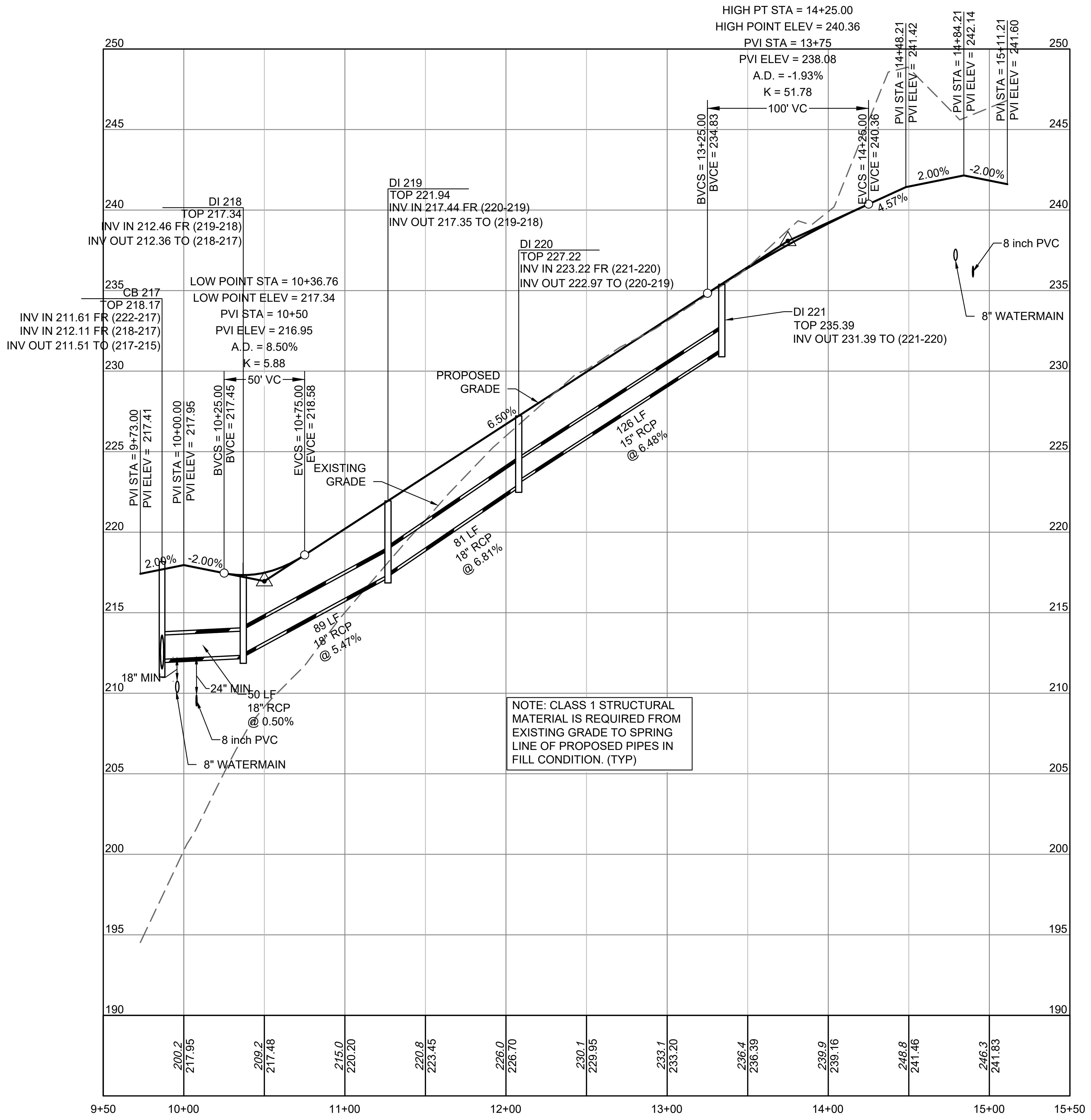




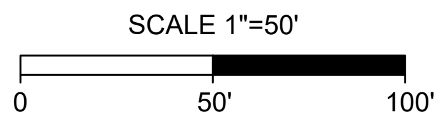
NOTE: CLASS 1 STRUCTURAL MATERIAL IS REQUIRED FROM EXISTING GRADE TO SPRING LINE OF PROPOSED PIPES IN FILL CONDITION. (TYP)

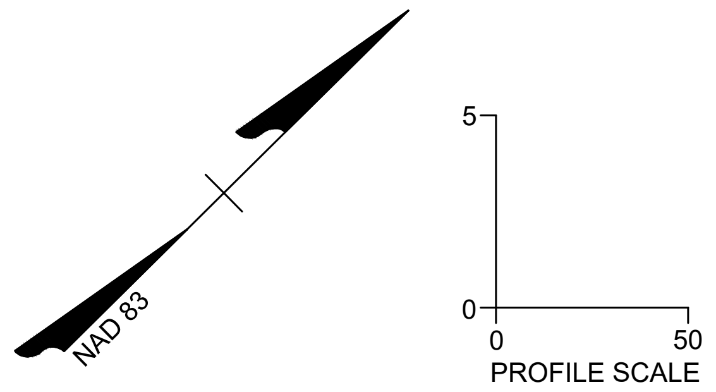
ALLEY C PROFILE

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





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BY: ______________________________ DATE: __________
DEVELOPMENT SERVICES ENGINEER

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BY: ______________________________ DATE: __________
ADMINISTRATOR

MICHAEL V. ZACCARDO
6/22/21

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TIMMONS GROUP

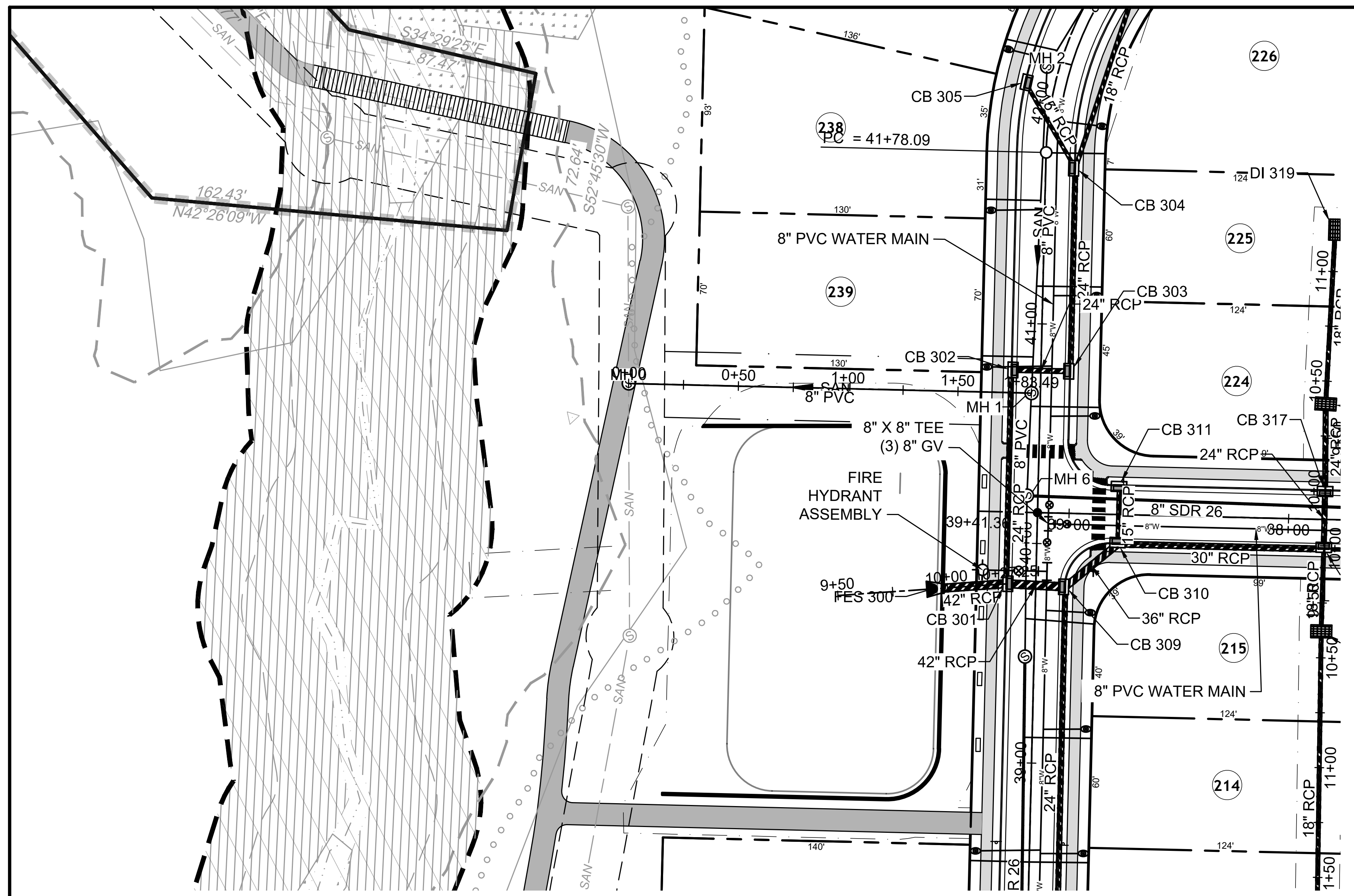
NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION

KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA

ALLEY C PLAN & PROFILE

DATE
06/22/2021
DRAWN BY
JD. MACMILLAN
DESIGNED BY
JD. MACMILLAN
CHECKED BY
M. ZACCARDO
SCALE
H: 1" = 50'
V: 1" = 5'
JOB NO.
44872
SHEET NO.
C5.16



CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

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City of Raleigh Development Approval ____________________

Raleigh Water Review Officer

Water and Sewer Permits (If applicable)

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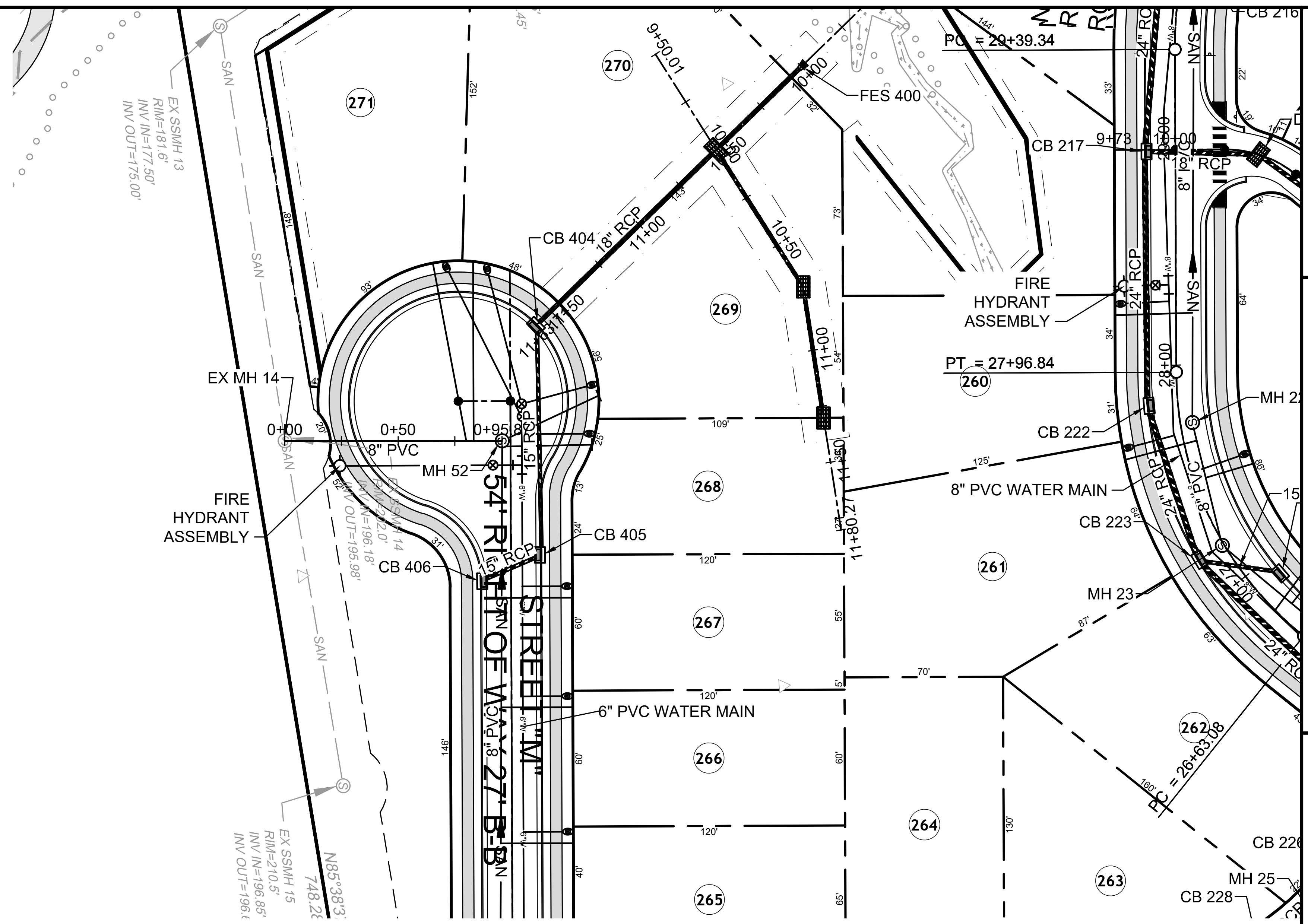
City of Raleigh Public Utilities Department Permit # ________________



UTILITY LEGEND

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

TOWN CERTIFICATION

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BY: ______________________ DATE: __________
DEVELOPMENT SERVICES ENGINEER

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BY: ______________________ DATE: __________
ADMINISTRATOR

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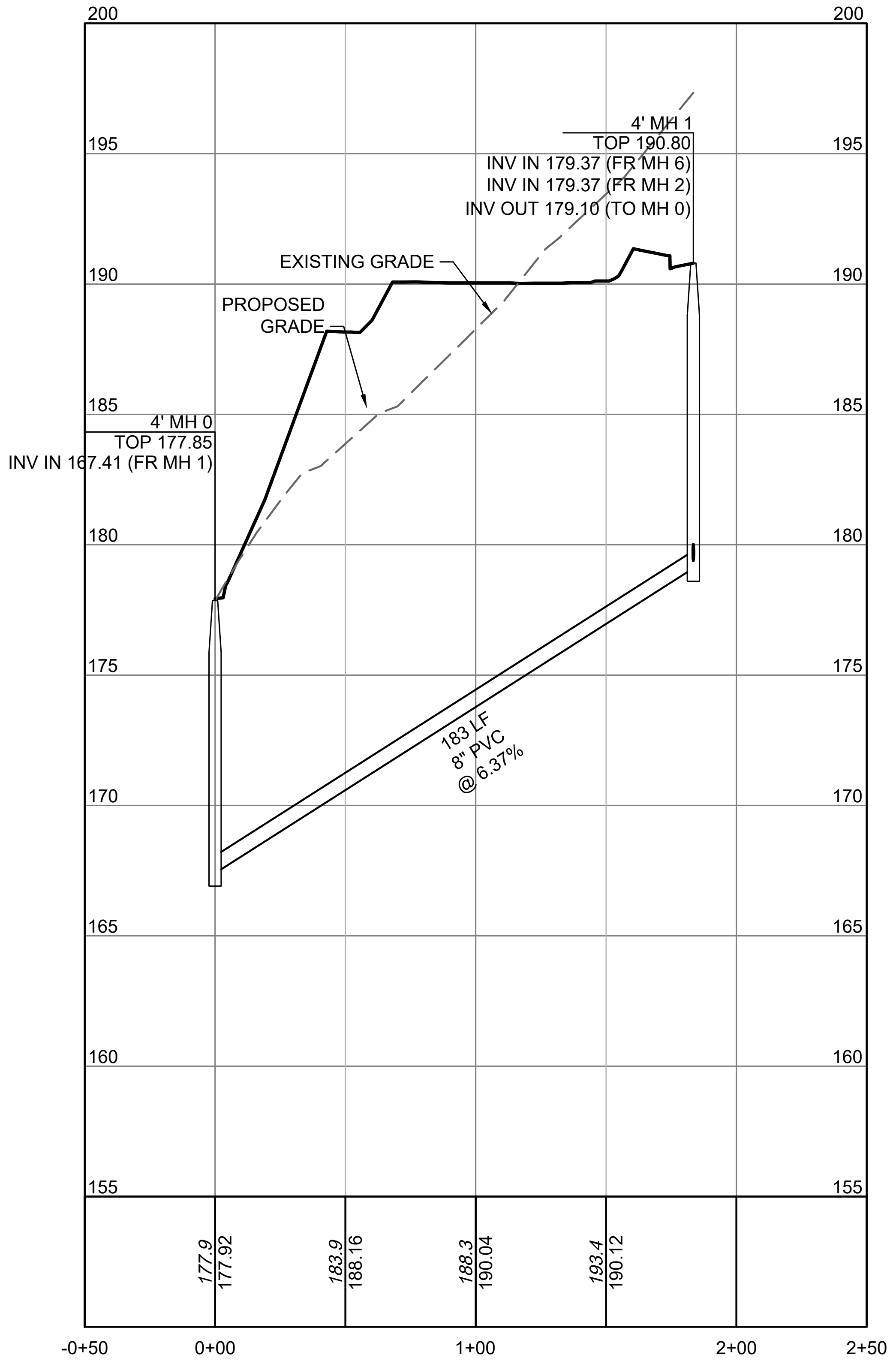
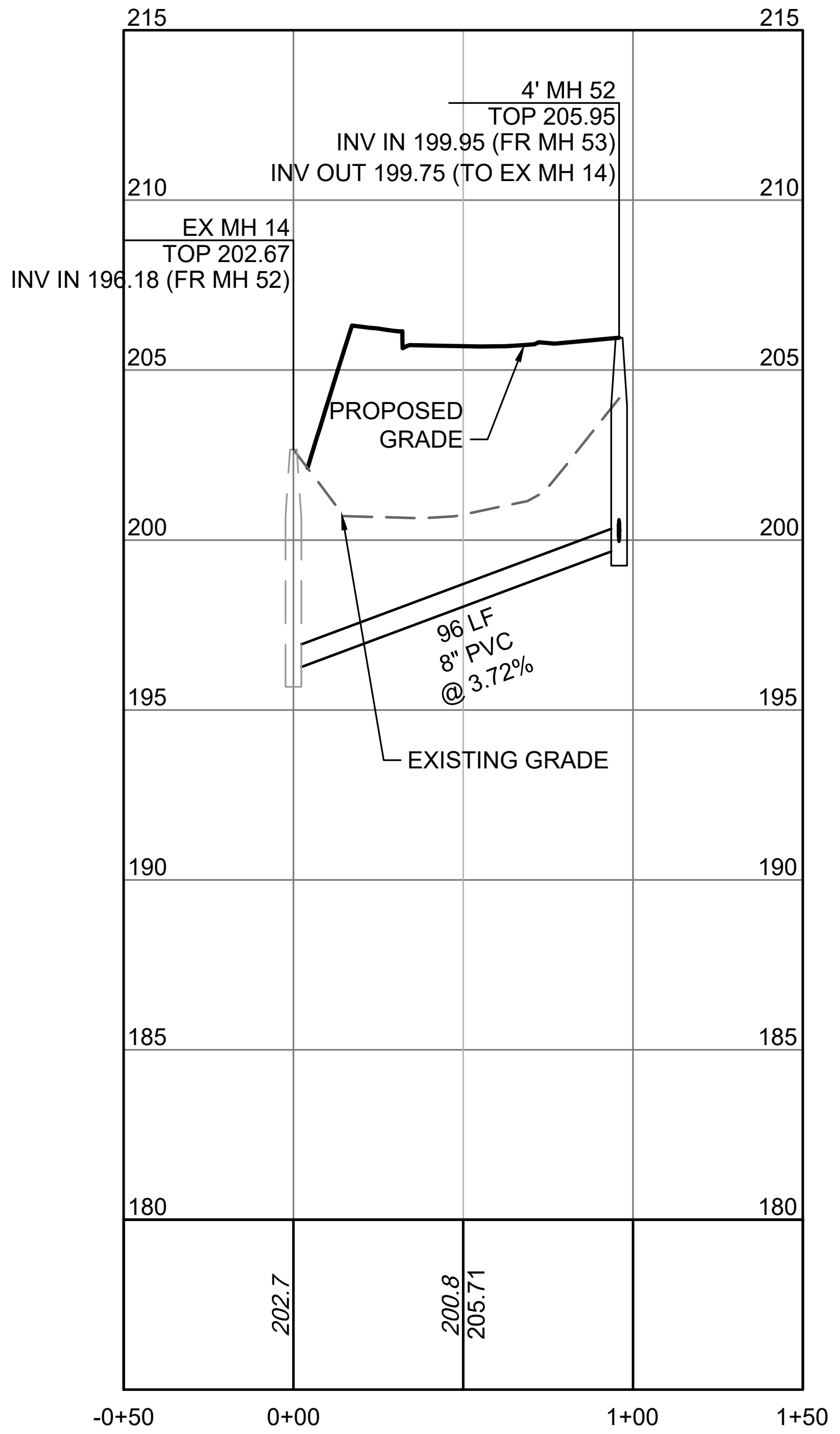


SANITARY SEWER OUTFALL A PROFILE
HORIZ SCALE: 1"=50'
VERT SCALE: 1"=5

SCALE 1"=50'
0 50' 100'

NAD 83

5
0
0 50
PROFILE SCALE



SANITARY SEWER OUTFALL B PROFILE
HORIZ SCALE: 1"=50'
VERT SCALE: 1"=5

SCALE 1"=50'
0 50' 100'

NAD 83

5
0
0 50
PROFILE SCALE

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NORTH CAROLINA SEAL 033331 ENGINEER MICHAEL V. ZACCARDO
6/22/21

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DATE	REVISION DESCRIPTION

DATE	06/22/2021
DRAWN BY	JD. MACMILLAN
DESIGNED BY	JD. MACMILLAN
CHECKED BY	M. ZACCARDO
SCALE	H: 1" = 50' V: 1" = 5'

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION
KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA
SANITARY SEWER OUTFALL

JOB NO. 44872
SHEET NO. C5.17

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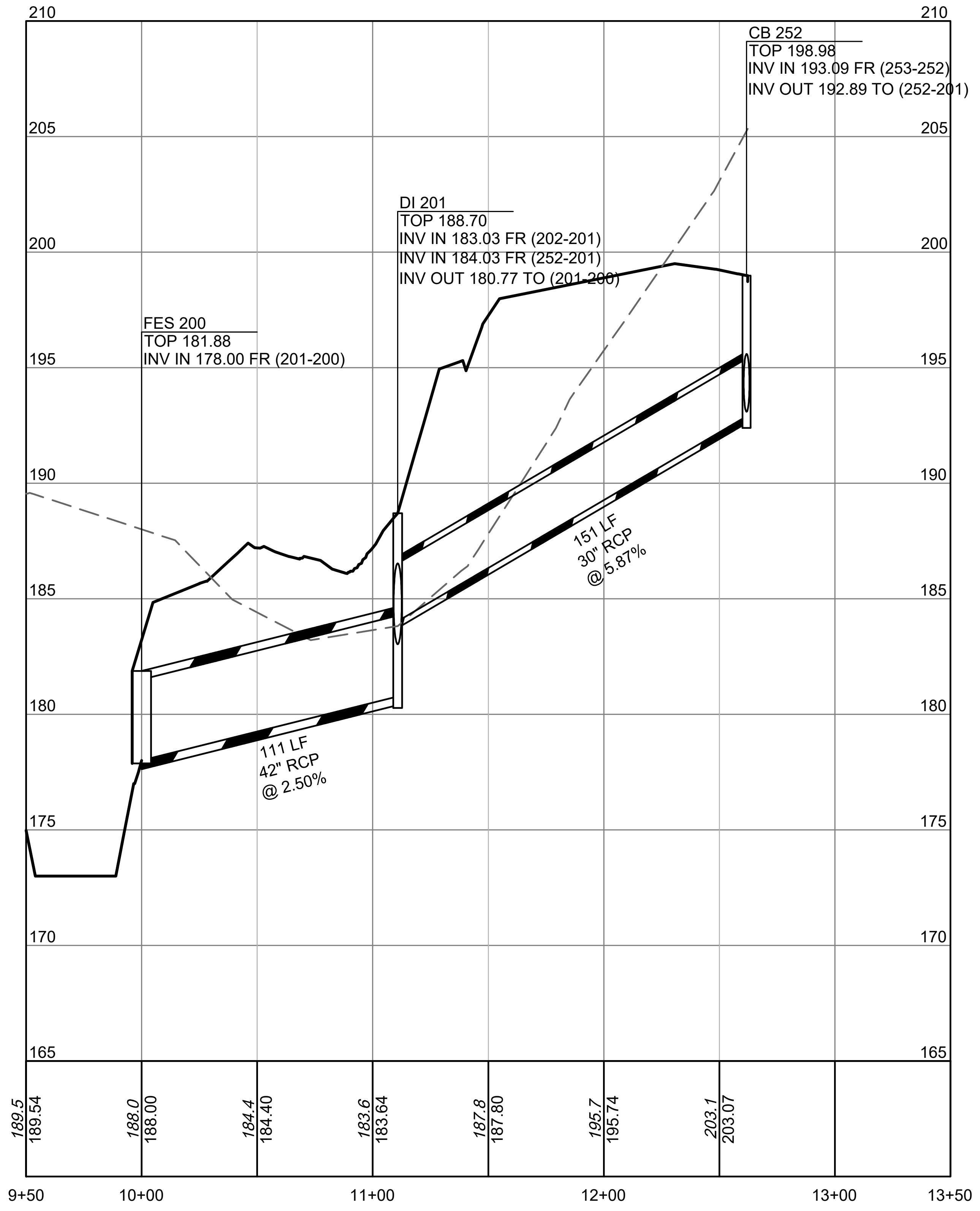
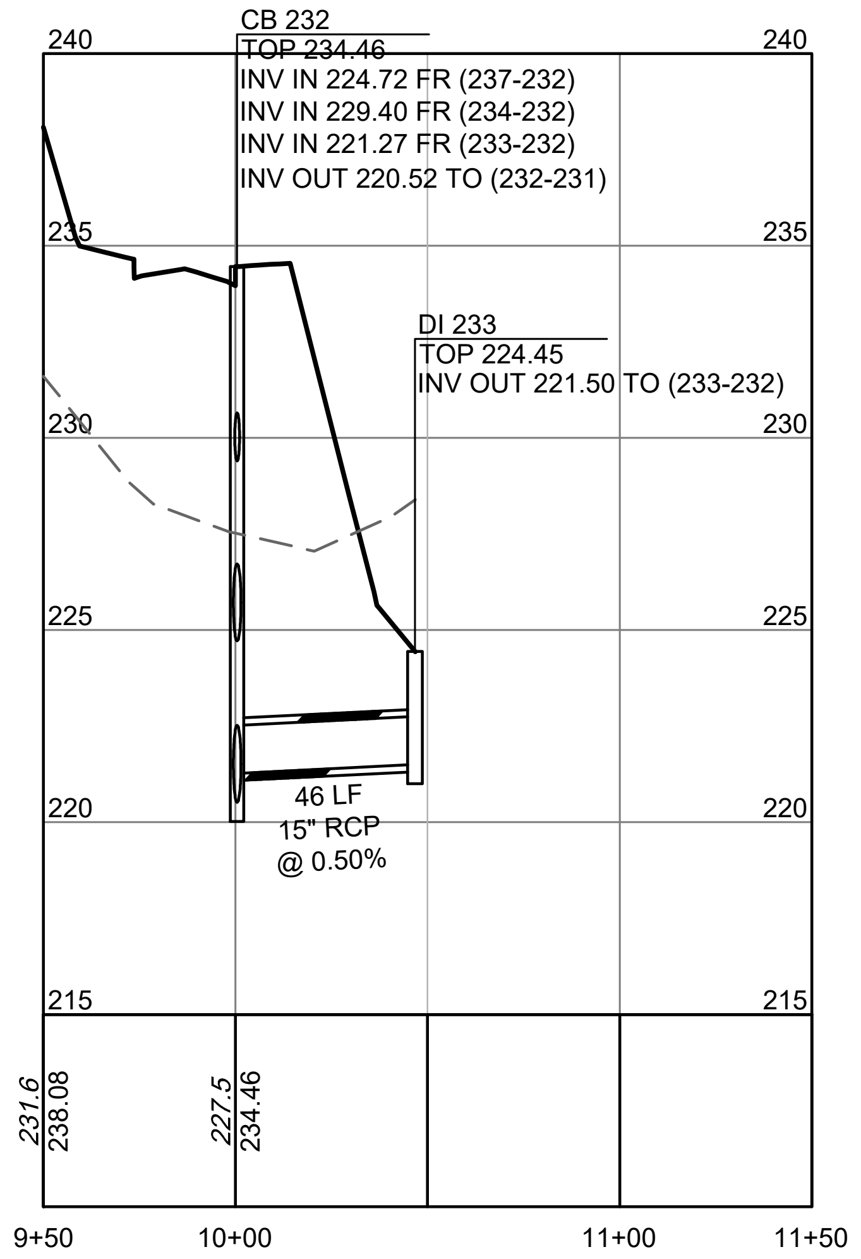


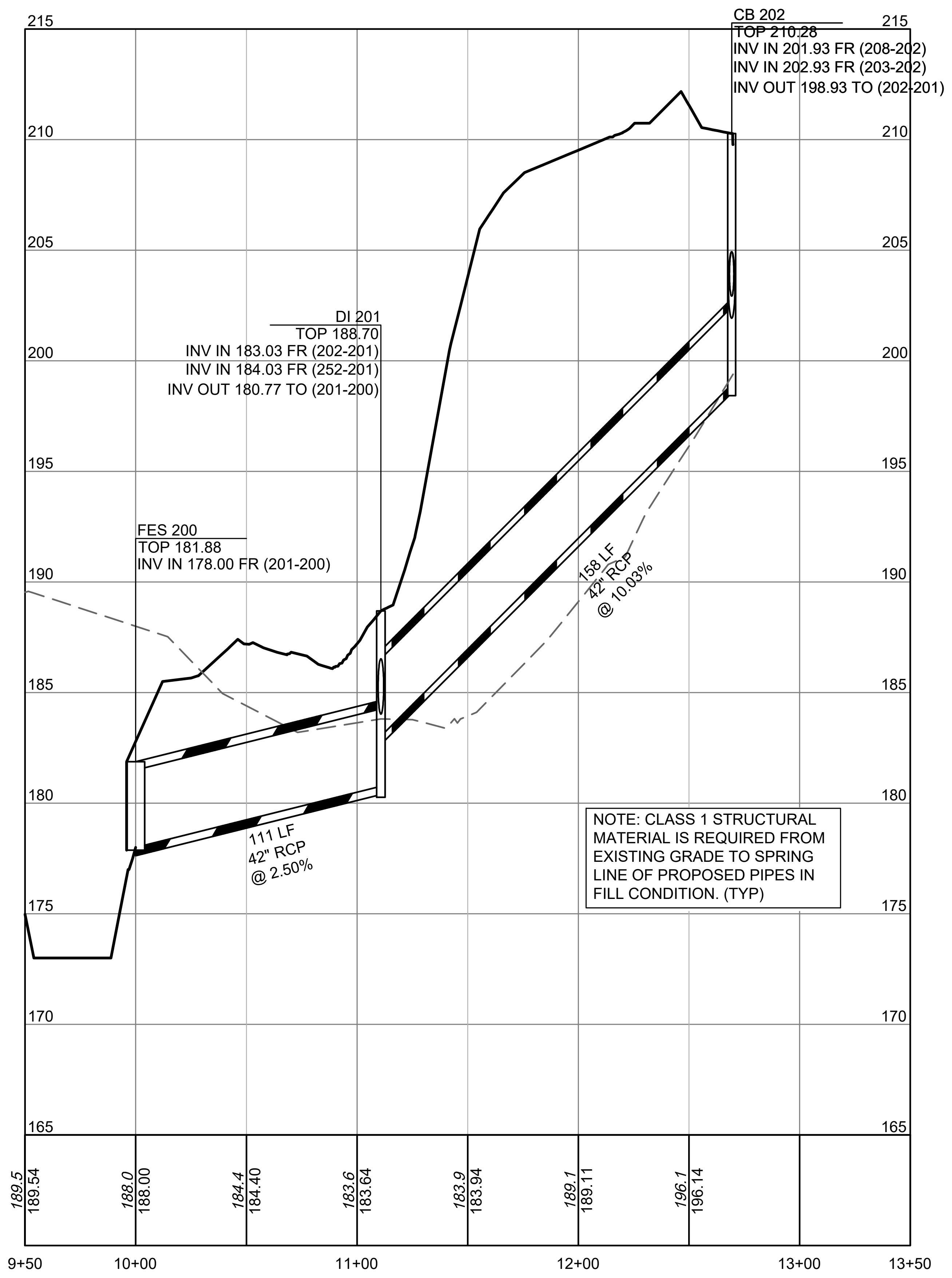
STRM 200-252 PROFILE

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


CB 232
TOP 234.46
INV IN 224.72 FR (237-232)
INV IN 229.40 FR (234-232)
INV IN 221.27 FR (233-232)
INV OUT 220.52 TO (232-231)
DI 233
TOP 224.45
INV OUT 221.50 TO (233-232)
46 LF
15" RCP
@ 0.50%
240
235
230
225
220
215
231.6
238.08
227.5
234.46
9+50
10+00
11+00
11+50

STRM 233-232 PROFILE

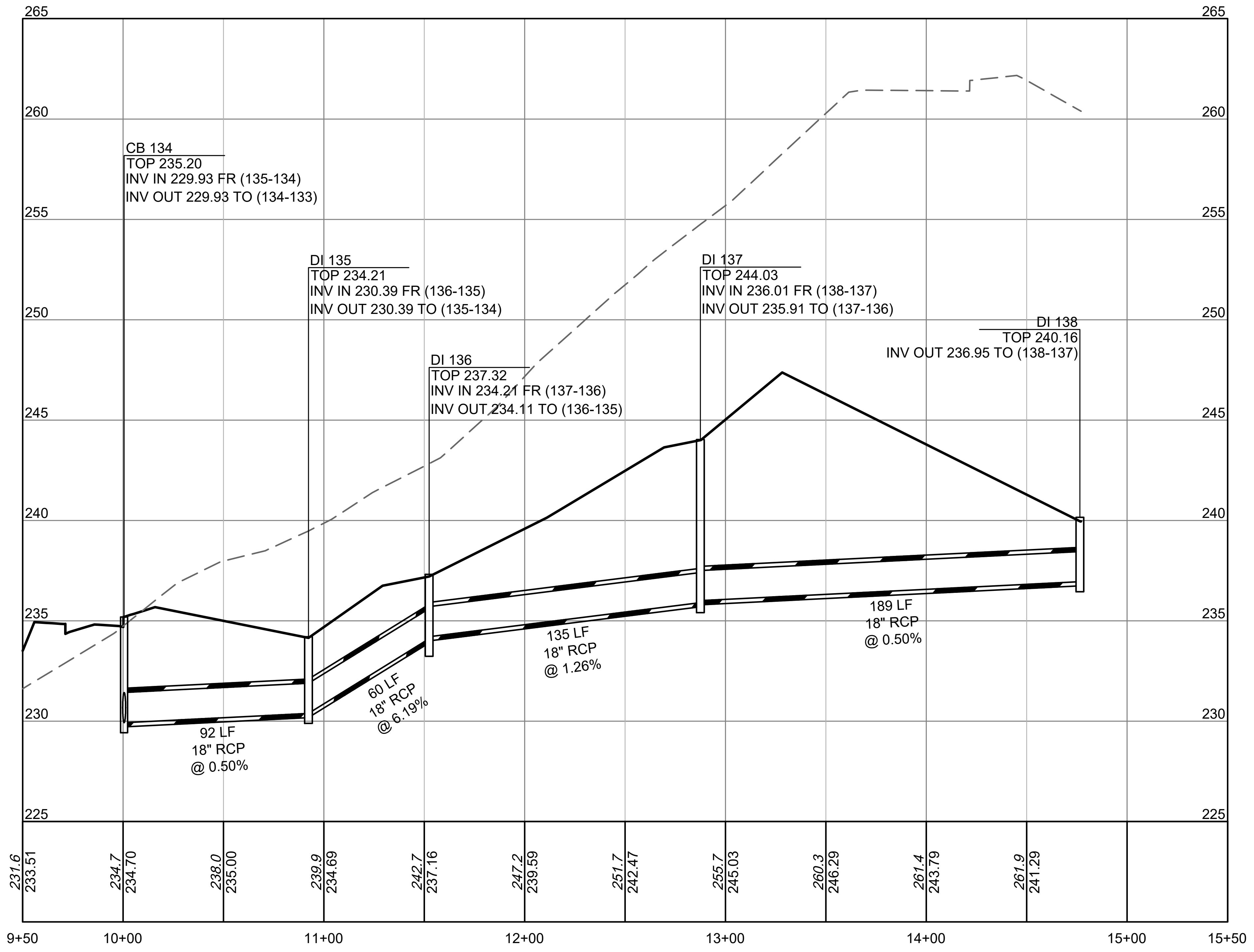
HORIZ SCALE: 1"=50'
VERT SCALE: 1"=5



NOTE: CLASS 1 STRUCTURAL MATERIAL IS REQUIRED FROM EXISTING GRADE TO SPRING LINE OF PROPOSED PIPES IN FILL CONDITION. (TYP)

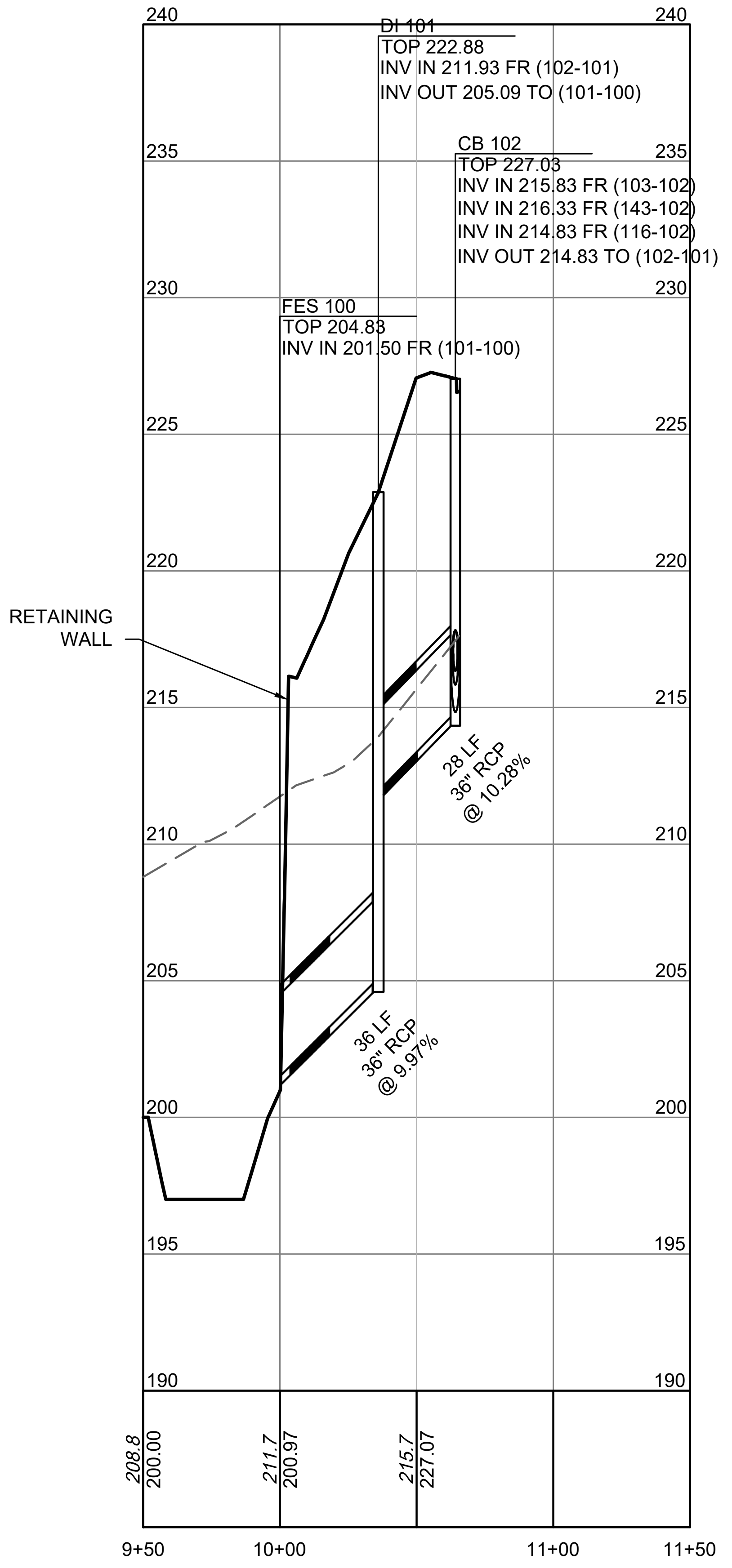
STRM 200-202 PROFILE

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



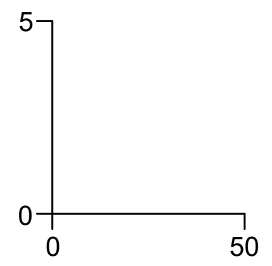
STRM 134-138 PROFILE

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



STRM 100-102 PROFILE

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



PROFILE SCALE

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TOWN CERTIFICATION

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BY: ______________________ DATE: ________
DEVELOPMENT SERVICES ENGINEER

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BY: ______________________ DATE: ________
ADMINISTRATOR

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MICHAEL V. ZACCARDO
6/22/21

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DATE
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DRAWN BY
JD. MACMILLAN

DESIGNED BY
JD. MACMILLAN

CHECKED BY
M. ZACCARDO

SCALE
H: 1" = 50'
V: 1" = 5'

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION

KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA

STORM DRAINAGE OUTFALL PROFILES

JOB NO.
44872

SHEET NO.
C5.18

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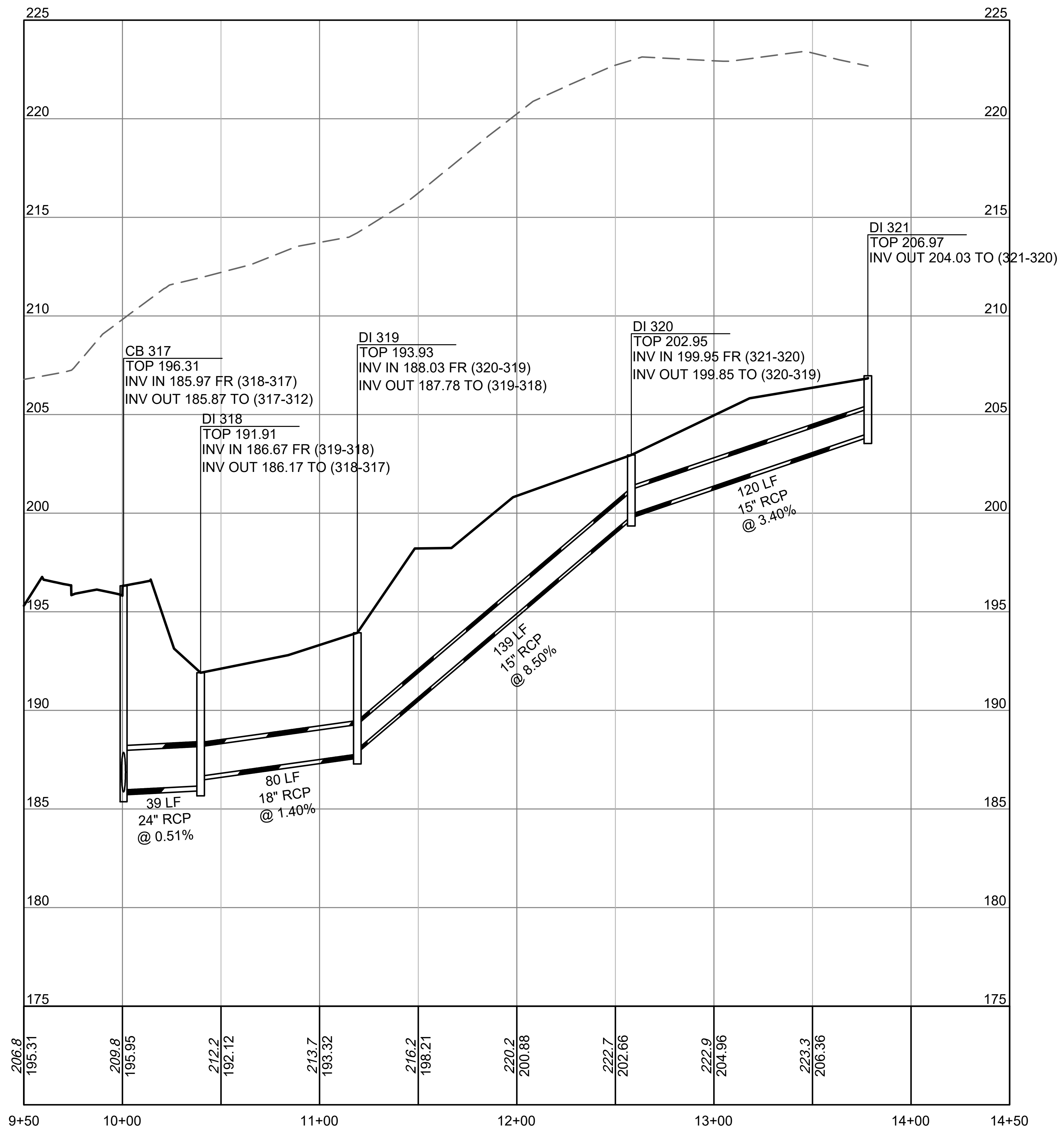
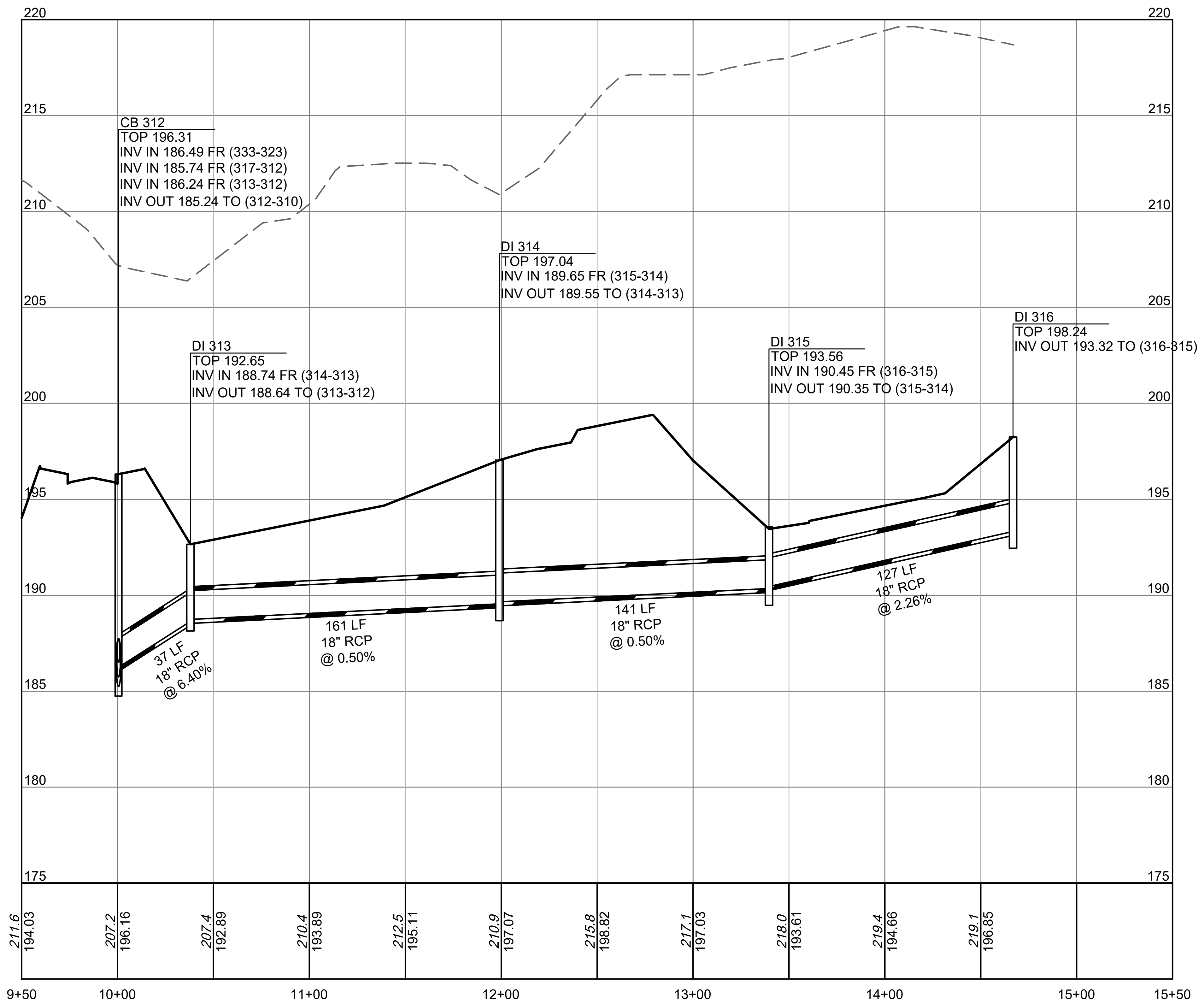


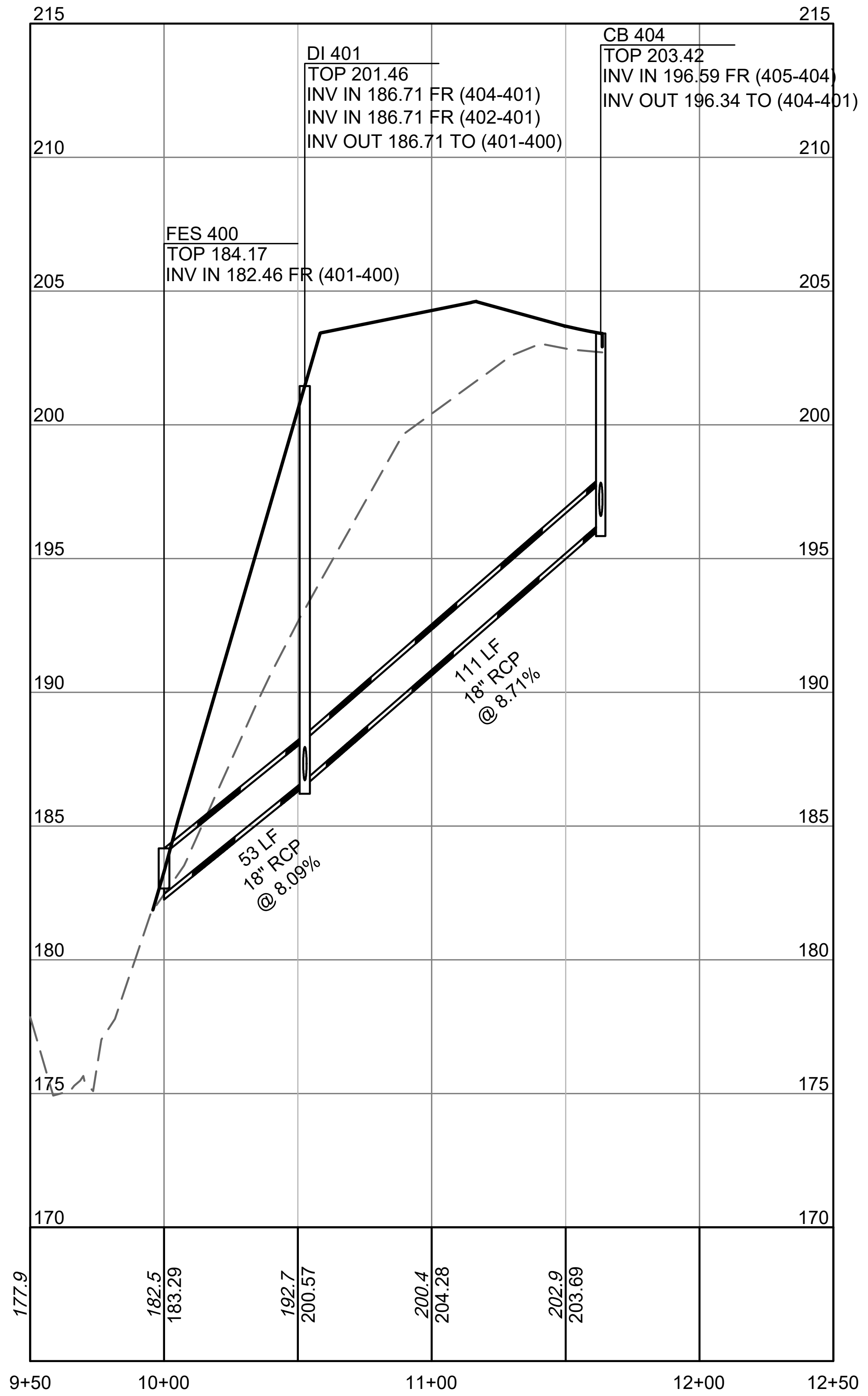
STRM 317-321 PROFILE

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



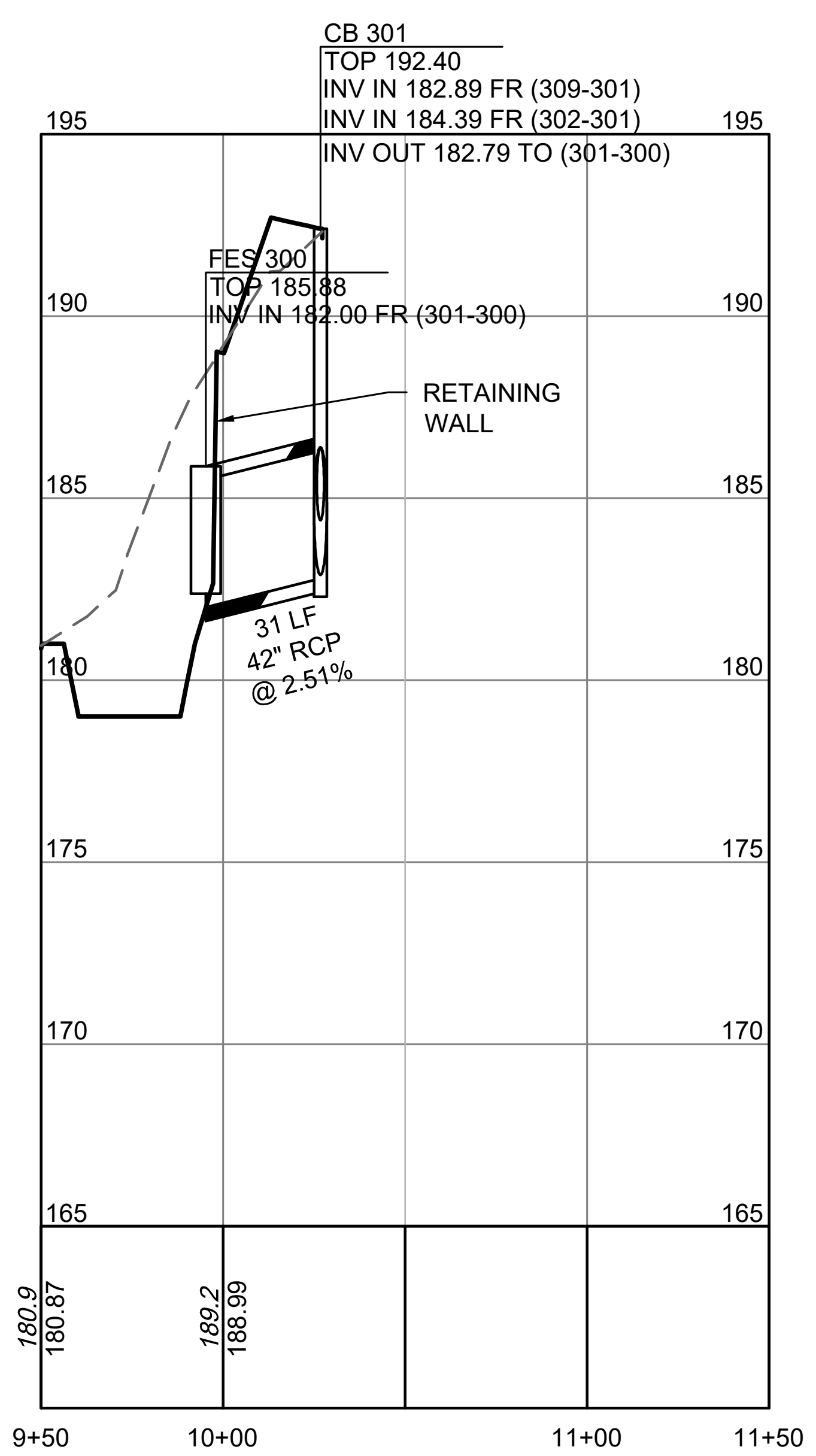
STRM 312-316 PROFILE

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



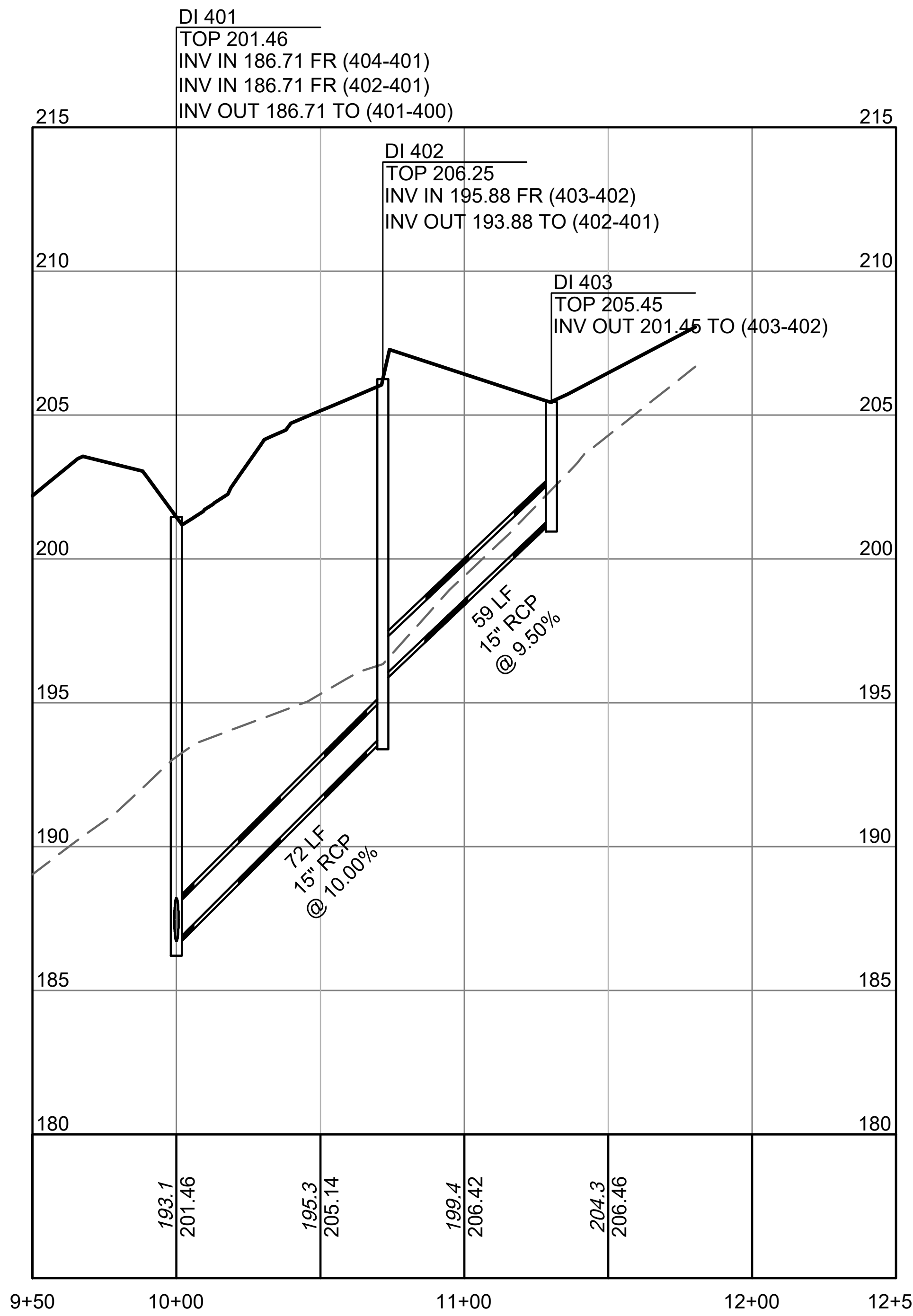
STRM 400-401 PROFILE

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



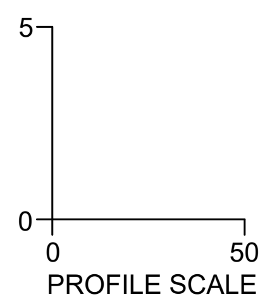
STRM 300-301 PROFILE

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



STRM 401-404 PROFILE

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



PROFILE SCALE

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: ______________________ DATE: ________
DEVELOPMENT SERVICES ENGINEER

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

BY: ______________________ DATE: ________
ADMINISTRATOR

MICHAEL V. ZACCARDO
6/22/21

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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	06/22/2021
DRAWN BY	JD. MACMILLAN
DESIGNED BY	JD. MACMILLAN
CHECKED BY	M. ZACCARDO
SCALE	H: 1" = 50' V: 1" = 5'

TIMMONS GROUP

NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION

KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA

STORM DRAINAGE OUTFALL PROFILES

JOB NO.
44872

SHEET NO.
C5.19

FOR REVIEW ONLY: NOT FOR CONSTRUCTION

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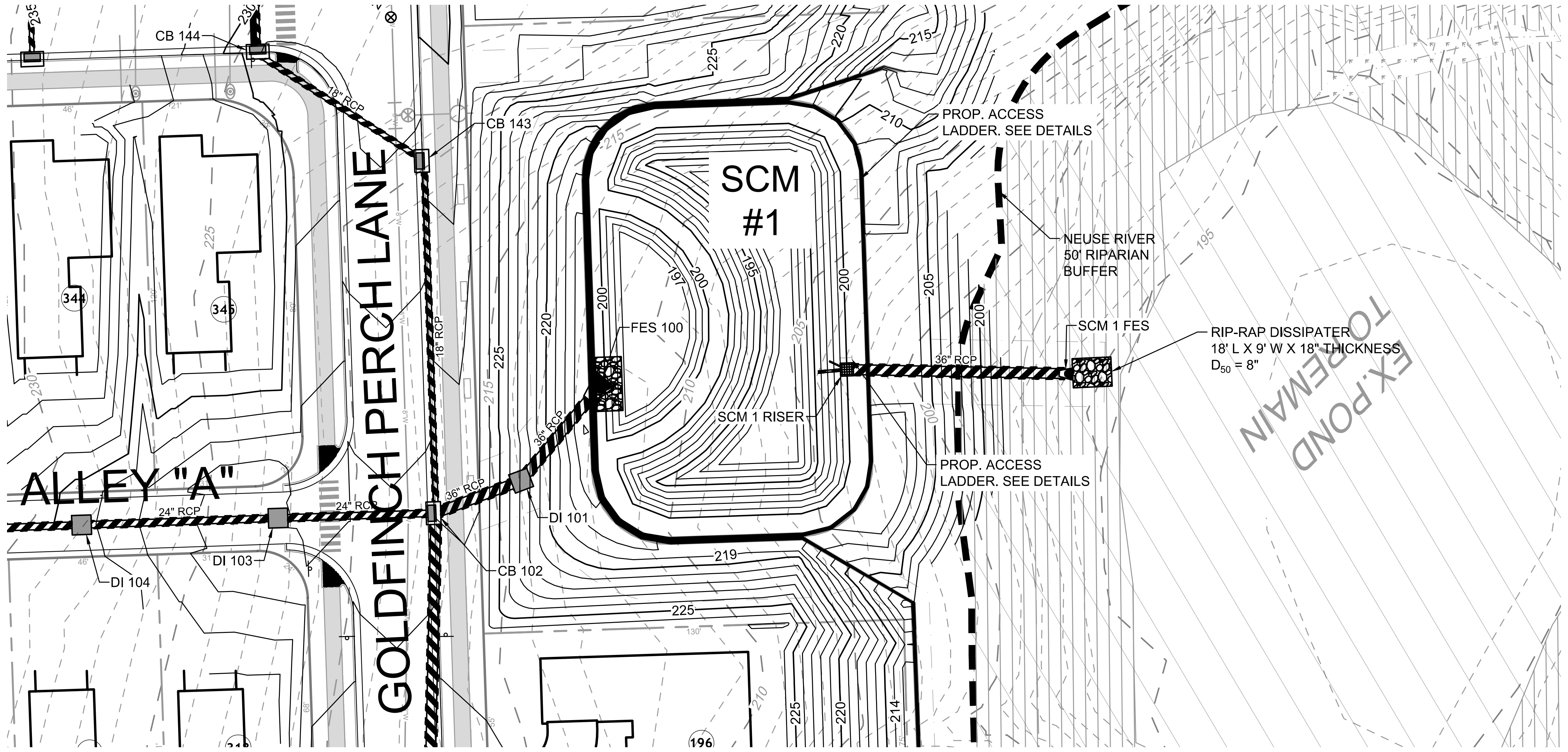
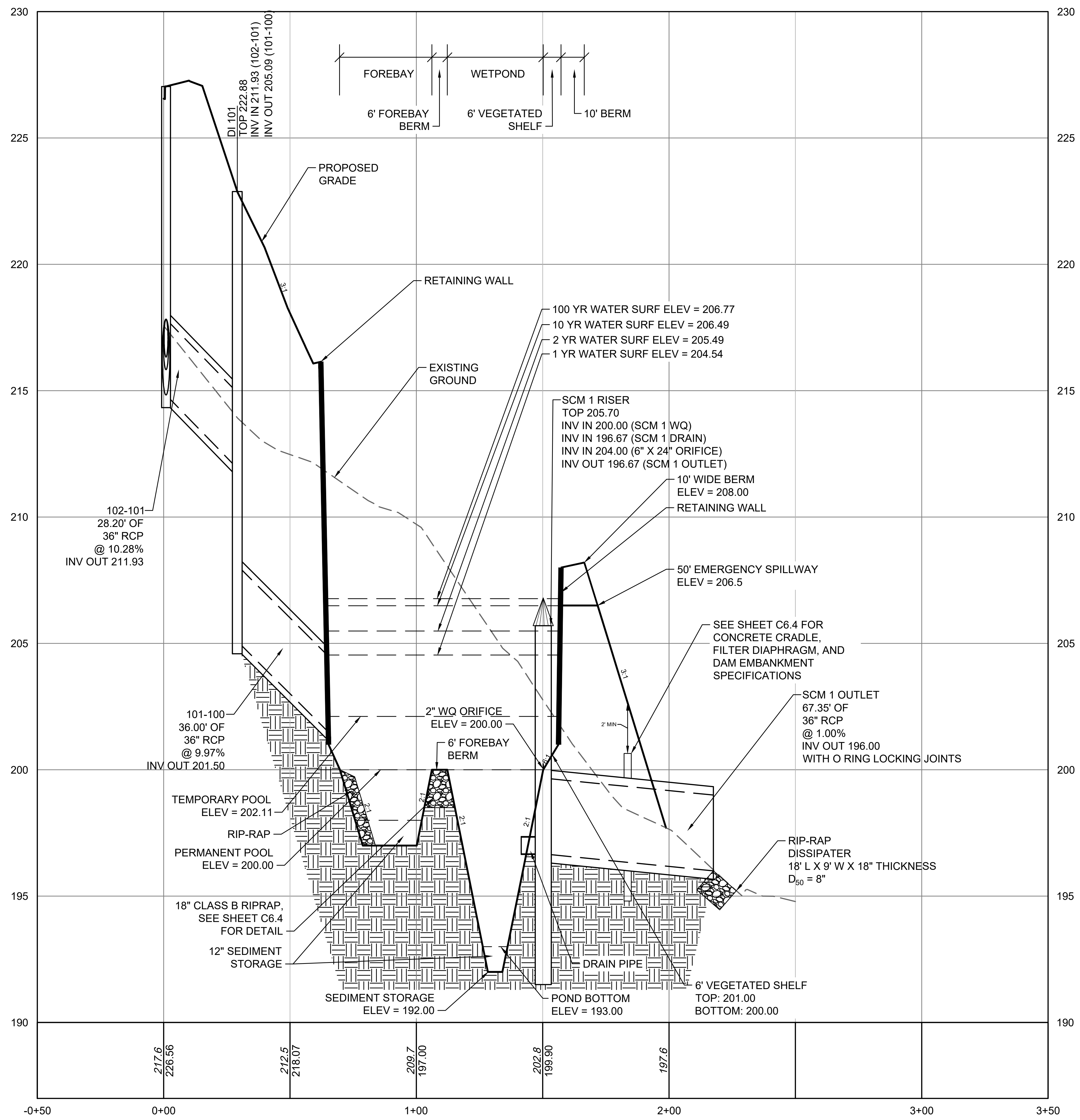
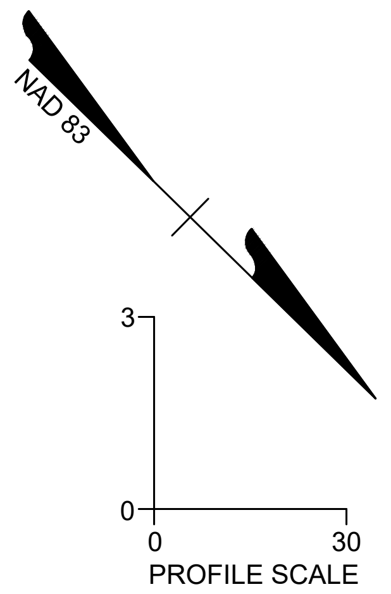


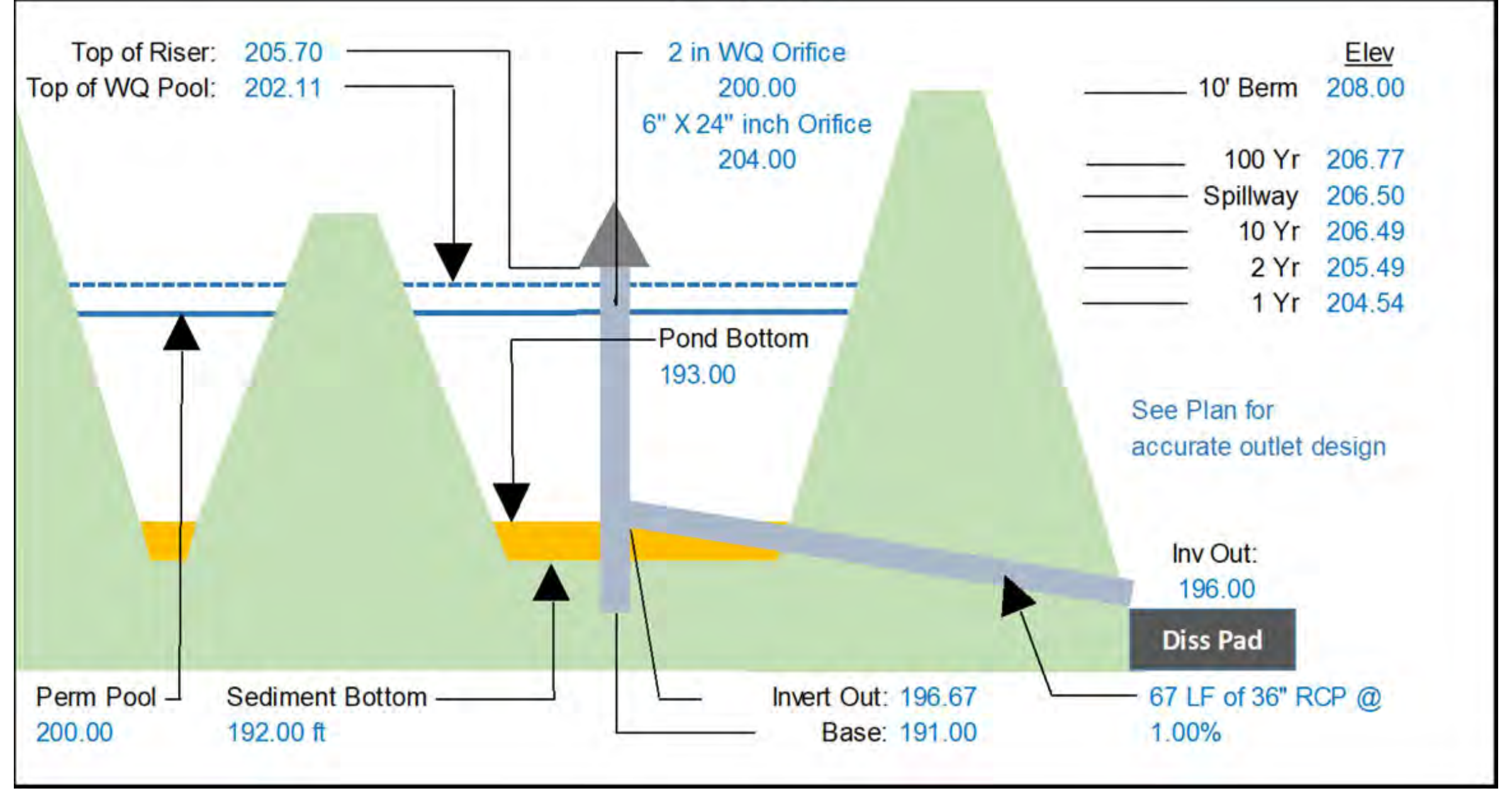




Pond / Riser Data & Elevations

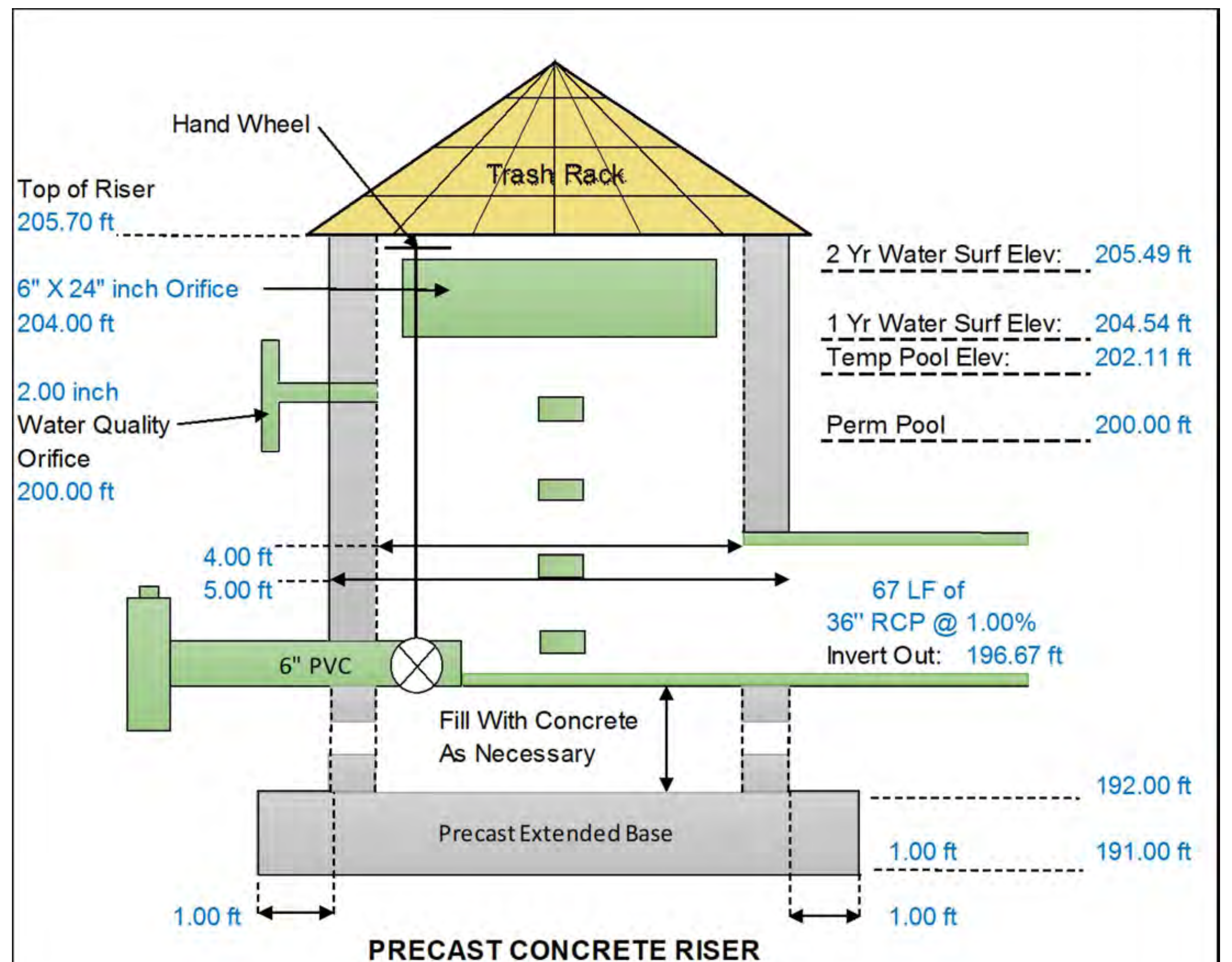
Pond Type	Wet Pond		
TSS Removal	85%		
Top of Pond / Berm	208.00 ft		
Secondary Spillway Width	50.00 ft		
Bottom of Secondary Spillway	206.50 ft		
Top of Riser	205.70 ft	(at least 1' above TPE)	
Riser Type / Size	4x4 ft	NCDOT Drop Inlet	
Top of Water Quality / Temp Pool Elev	202.11 ft	(1" Runoff)	
Top of Veg. Shelf	201.00		
Permanent Pool Elevation (Normal Pool)	200.00 ft		
Water Quality Orifice Elevation & Size	200.00 ft		2.00 in
Secondary Orifice Elevation & Size	204.00 ft		6" X 24" in
Bottom of Veg. Shelf	200.00		
Top of Sediment Storage / Pond Bottom	193.00 ft		
Bottom of Sediment Storage	192.00 ft	(Min 1 ft)	
Invert Out of Riser	196.67 ft		
Outlet Pipe Size	36.00 in	Diameter RCP	
Outlet Pipe Length & Slope	67.00 ft		1.00 %
Downstream Outlet Elevation	196.00 ft		
1 Yr Water Surface Elev / Peak Flow (CFS)	204.54 ft		2.81 CFS
2 Yr Water Surface Elev Peak Flow (CFS)	205.49 ft		5.60 CFS
10 Yr Water Surface Elev Peak Flow (CFS)	206.49 ft		44.55 CFS
100 Yr Water Surface Elev Peak Flow (CFS)	206.77 ft		84.53 CFS

Pond Detail



Anti-Bouyancy Calculations for the Riser Structure

Riser Dimensions		Weight of Structure		Displaced Volume	
Outside Width	5.00 ft	Walls =	18,495 LBS	V = LxWx(HT+Base) = C.F.	
Inside Width	4.00 ft	Base =	7,350 LBS		
Outside Length	5.00 ft	Fill =	11,208 LBS	Displaced Water =	
Inside Length	4.00 ft			C.F. * 62.4 PCF = LBS	
Height	13.70 ft	Outlet Pipe =	530 LBS		
Base Thick' (ft)	1.00 ft	WQ Orifice =	2 LBS		
Wall Thick' (ft)	0.50 ft				
Ext Base (ft)	1.00 ft	Weir #1 =	75 LBS	V =	368 C.F.
Areas removed from Riser		Weir #2 =	0 LBS	Disp. Water =	22,932 LBS
Outlet Pipe	7.07 ft	Weir #3 =	0 LBS		
WQ Orifice	0.02 ft	Weir #4 =	0 LBS		
Orifice #1	1.00 ft	Other #1 =	0 LBS	Saftety Factor	1.59
Orifice #2	0.00 ft				
Orifice #3	0.00 ft	**Weight =**	**36,446 LBS**	**Weight =**	**22,932 LBS**
Orifice #4	0.00 ft	**Precast Concrete Riser Structure to be 4 ft x 4 ft x 13.7 ft Tall, With a 1 ft Thick Precast Extended Base**			
Other	0.00 ft				



PRECAST CONCRETE RISER

4 ft x 4 ft x 13.7 ft Tall, With a 1 ft Thick
Precast Extended Base

AS-BUILT SURVEY REQUIREMENTS

NOTE: CONTRACTOR SHALL PROVIDE AS-BUILT TOPOGRAPHIC SURVEY PERFORMED BY A PROFESSIONAL LAND SURVEYOR CERTIFYING STORMWATER POND AREA DIMENSIONS, ELEVATIONS, OUTLET STRUCTURE INVERTS, ORIFICE DIAMETER, PIPE SIZES AND CLEANOUT LOCATIONS. TOPOGRAPHY SHALL EXTEND 20 FEET OUTSIDE LIMITS OF POND.

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TOWN CERTIFICATION

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DEVELOPMENT SERVICES ENGINEER

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BY: ______________________ DATE: __________
ADMINISTRATOR

MICHAEL V. ZACCARDO
022321
6/22/21

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REVISION DESCRIPTION	DATE

DATE	06/22/2021
DRAWN BY	JD. MACMILLAN
DESIGNED BY	JD. MACMILLAN
CHECKED BY	M. ZACCARDO
SCALE	H: 1" = 30' V: 1" = 3'

TIMMONS GROUP

NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION

KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA

SCM 1 PLAN & PROFILE

JOB NO. 44872

SHEET NO. C6.1

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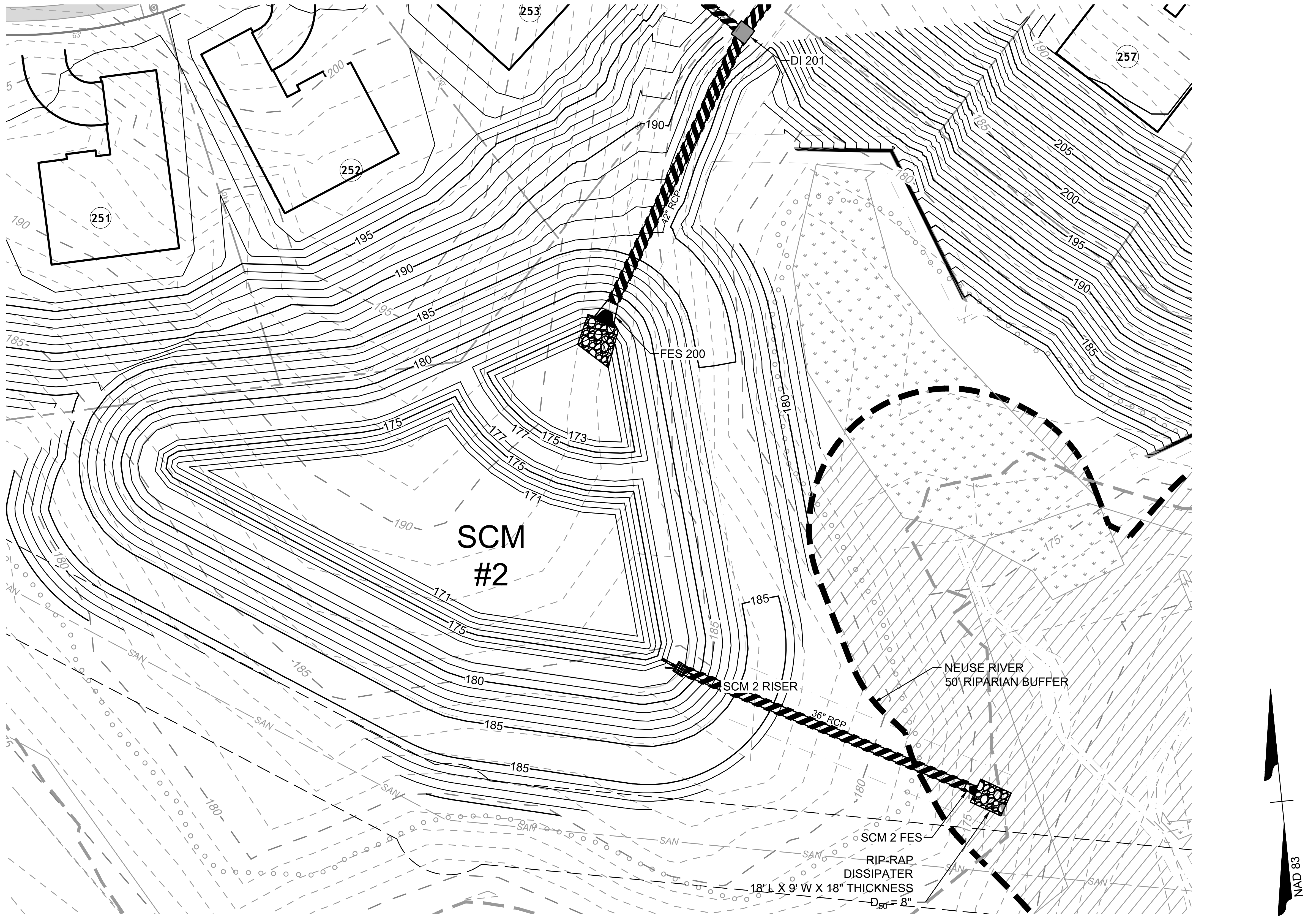

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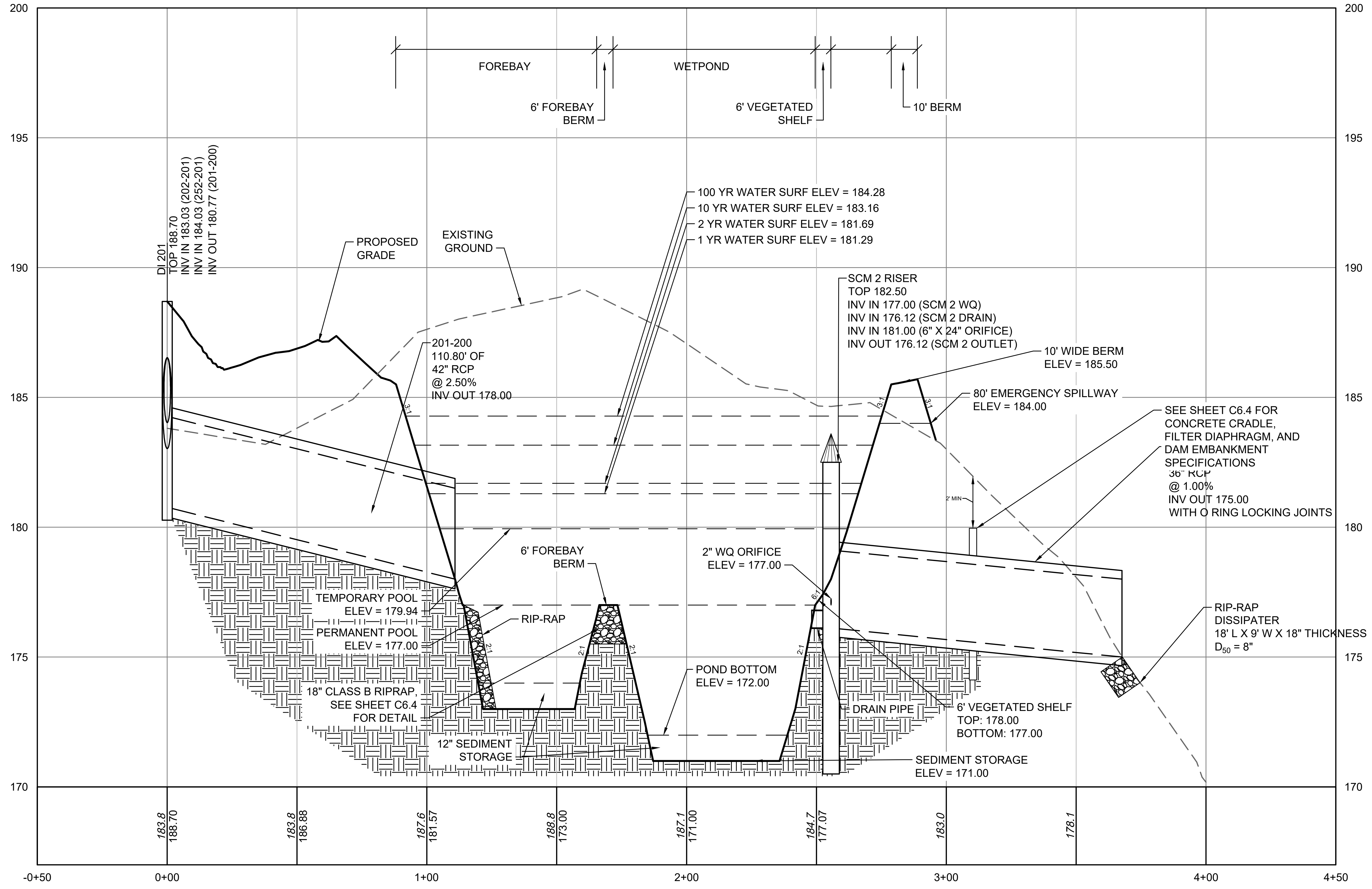
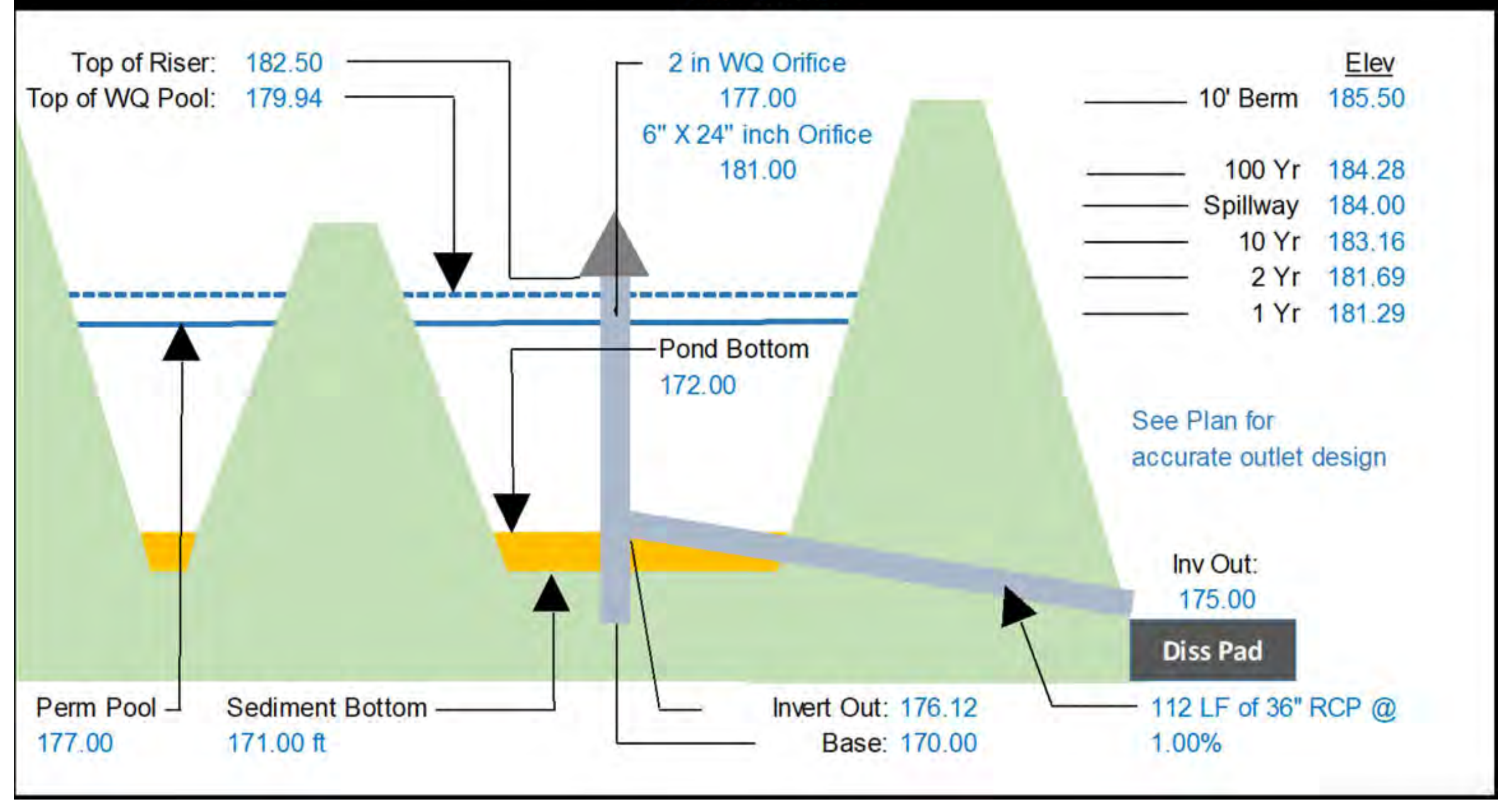
PROFILE SCALE



Pond / Riser Data & Elevations

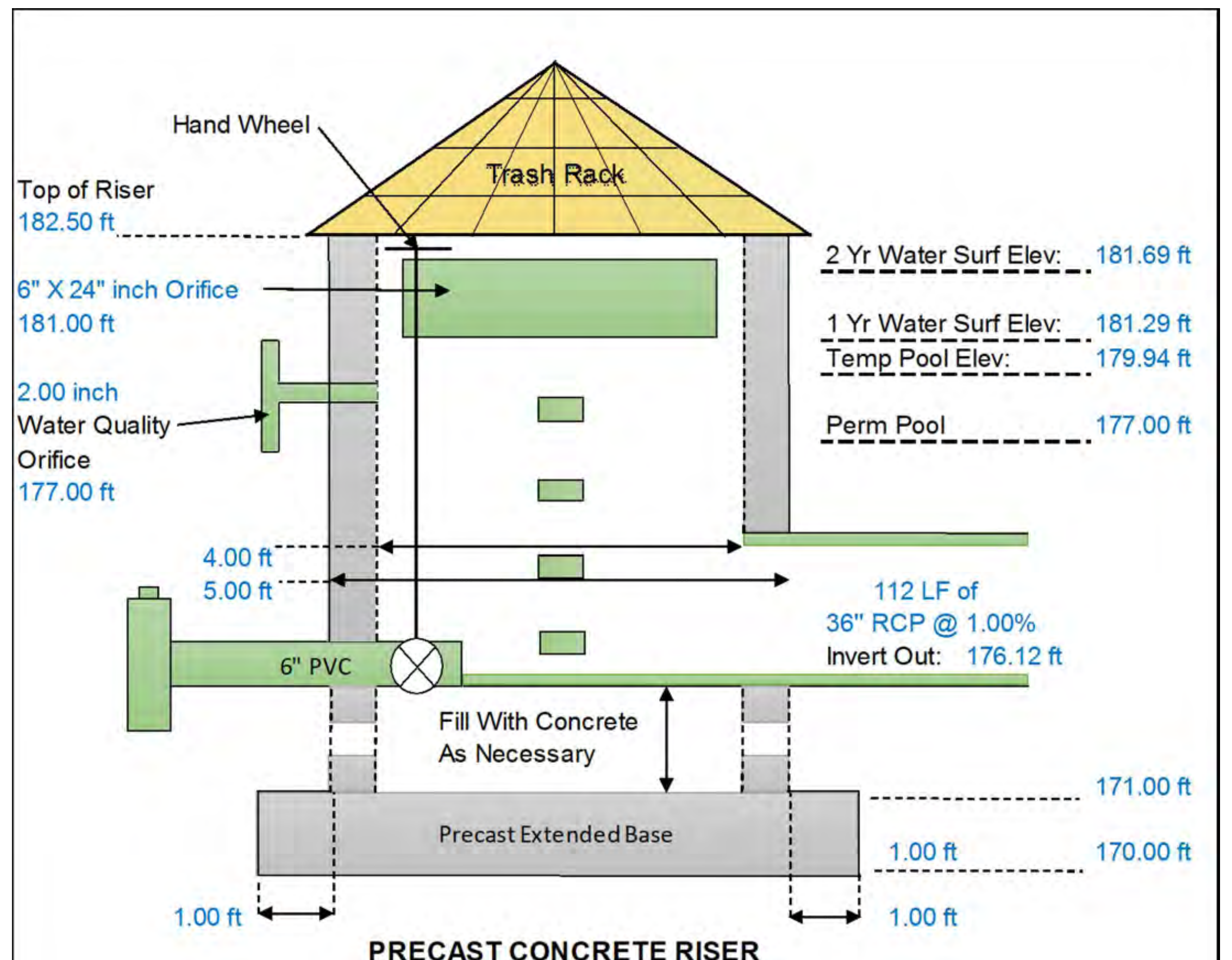
Pond Type	Wet Pond		
TSS Removal	85%		
Top of Pond / Berm	185.50 ft		
Secondary Spillway Width	80.00 ft		
Bottom of Secondary Spillway	184.00 ft		
Top of Riser	182.50 ft	(at least 1' above TPE)	
Riser Type / Size	4x4 ft	NCDOT Drop Inlet	
Top of Water Quality / Temp Pool Elev	179.94 ft	(1" Runoff)	
Top of Veg. Shelf	178.00		
Permanent Pool Elevation (Normal Pool)	177.00 ft		
Water Quality Orifice Elevation & Size	177.00 ft		2.00 in
Secondary Orifice Elevation & Size	181.00 ft		6" X 24" in
Bottom of Veg. Shelf	177.00		
Top of Sediment Storage / Pond Bottom	172.00 ft		
Bottom of Sediment Storage	171.00 ft	(Min 1 ft)	
Invert Out of Riser	176.12 ft		
Outlet Pipe Size	36.00 in	Diameter RCP	
Outlet Pipe Length & Slope	112.00 ft		1.00 %
Downstream Outlet Elevation	175.00 ft		
1 Yr Water Surface Elev / Peak Flow (CFS)	181.29 ft		1.26 CFS
2 Yr Water Surface Elev Peak Flow (CFS)	181.69 ft		3.44 CFS
10 Yr Water Surface Elev Peak Flow (CFS)	183.16 ft		34.78 CFS
100 Yr Water Surface Elev Peak Flow (CFS)	184.28 ft		112.99 CFS

Pond Detail



Anti-Bouyancy Calculations for the Riser Structure

Riser Dimensions		Weight of Structure		Displaced Volume	
Outside Width	5.00 ft	Walls =	15,525 LBS	V = LxWx(HT+Base) = C.F.	
Inside Width	4.00 ft	Base =	7,350 LBS		
Outside Length	5.00 ft	Fill =	12,288 LBS	Displaced Water =	
Inside Length	4.00 ft			C.F. * 62.4 PCF = LBS	
Height	11.50 ft	Outlet Pipe =	530 LBS		
Base Thick' (ft)	1.00 ft	WQ Orifice =	2 LBS		
Wall Thick' (ft)	0.50 ft				
Ext Base (ft)	1.00 ft	Weir #1 =	75 LBS	V =	313 C.F.
Areas removed from Riser		Weir #2 =	0 LBS	Disp. Water =	19,500 LBS
Outlet Pipe	7.07 ft	Weir #3 =	0 LBS		
WQ Orifice	0.02 ft	Weir #4 =	0 LBS		
Orifice #1	1.00 ft	Other #1 =	0 LBS	Saftety Factor	1.77
Orifice #2	0.00 ft				
Orifice #3	0.00 ft	**Weight =**	**34,556 LBS**	**Weight =**	**19,500 LBS**
Orifice #4	0.00 ft	**Precast Concrete Riser Structure to be 4 ft x 4 ft x 11.5 ft Tall, With a 1 ft Thick Precast Extended Base**			
Other	0.00 ft				



PRECAST CONCRETE RISER

4 ft x 4 ft x 11.5 ft Tall, With a 1 ft Thick
Precast Extended Base

AS-BUILT SURVEY REQUIREMENTS

NOTE: CONTRACTOR SHALL PROVIDE AS-BUILT TOPOGRAPHIC SURVEY PERFORMED BY A PROFESSIONAL LAND SURVEYOR CERTIFYING STORMWATER POND AREA DIMENSIONS, ELEVATIONS, OUTLET STRUCTURE INVERTS, ORIFICE DIAMETER, PIPE SIZES AND CLEANOUT LOCATIONS. TOPOGRAPHY SHALL EXTEND 20 FEET OUTSIDE LIMITS OF POND.

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BY: ______________________________ DATE: ____________
ADMINISTRATOR

M. V. ZACCARDO
6/22/21

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YOUR VISION ACHIEVED THROUGH OURS.

DATE	REVISION DESCRIPTION

DATE
06/22/2021

DRAWN BY
JD. MACMILLAN

DESIGNED BY
JD. MACMILLAN

CHECKED BY
M. ZACCARDO

SCALE
H: 1" = 30'
V: 1" = 3'

TIMMONS GROUP

NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION

KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA

SCM 2 PLAN & PROFILE

JOB NO.
44872

SHEET NO.
C6.2

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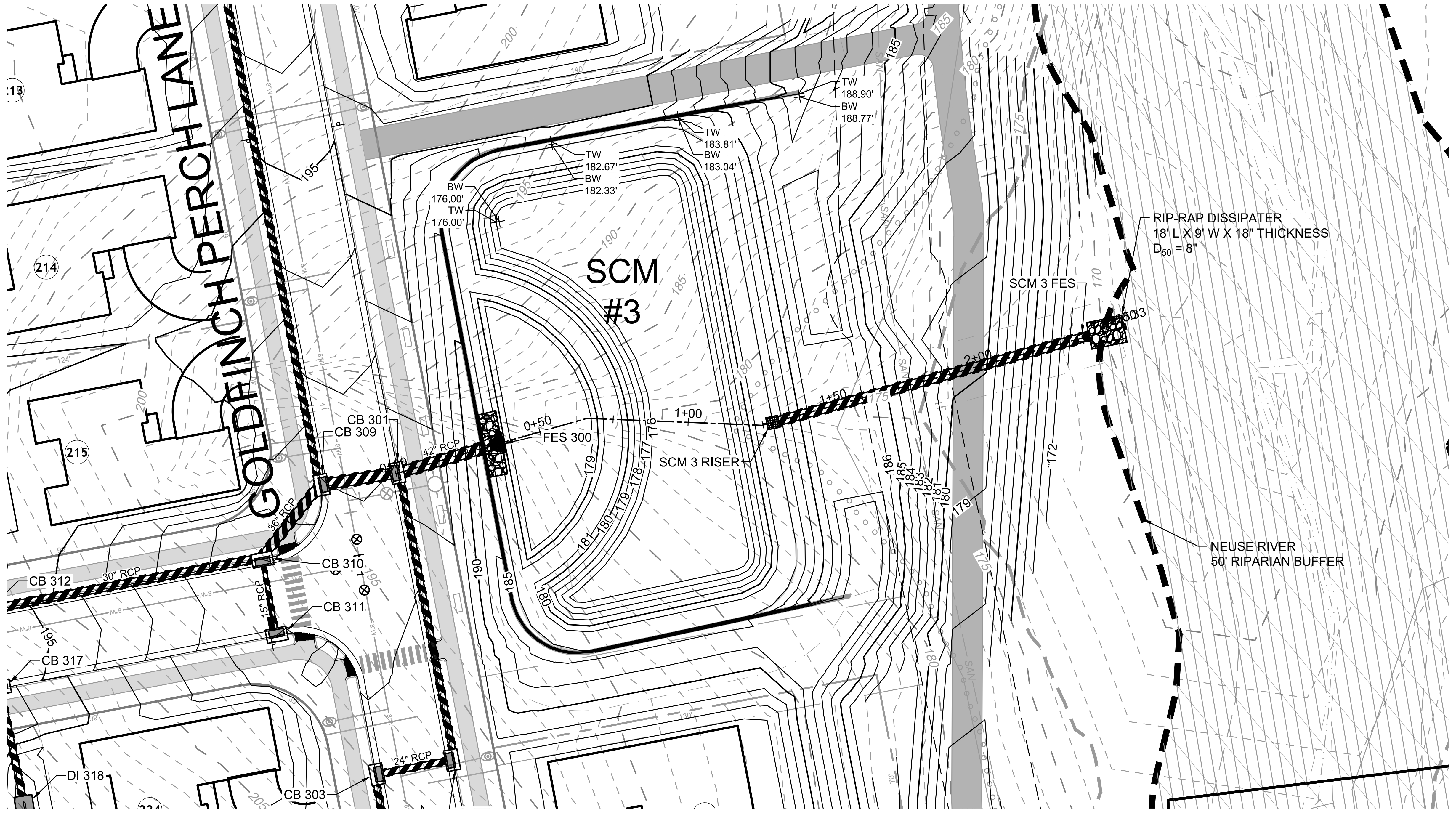
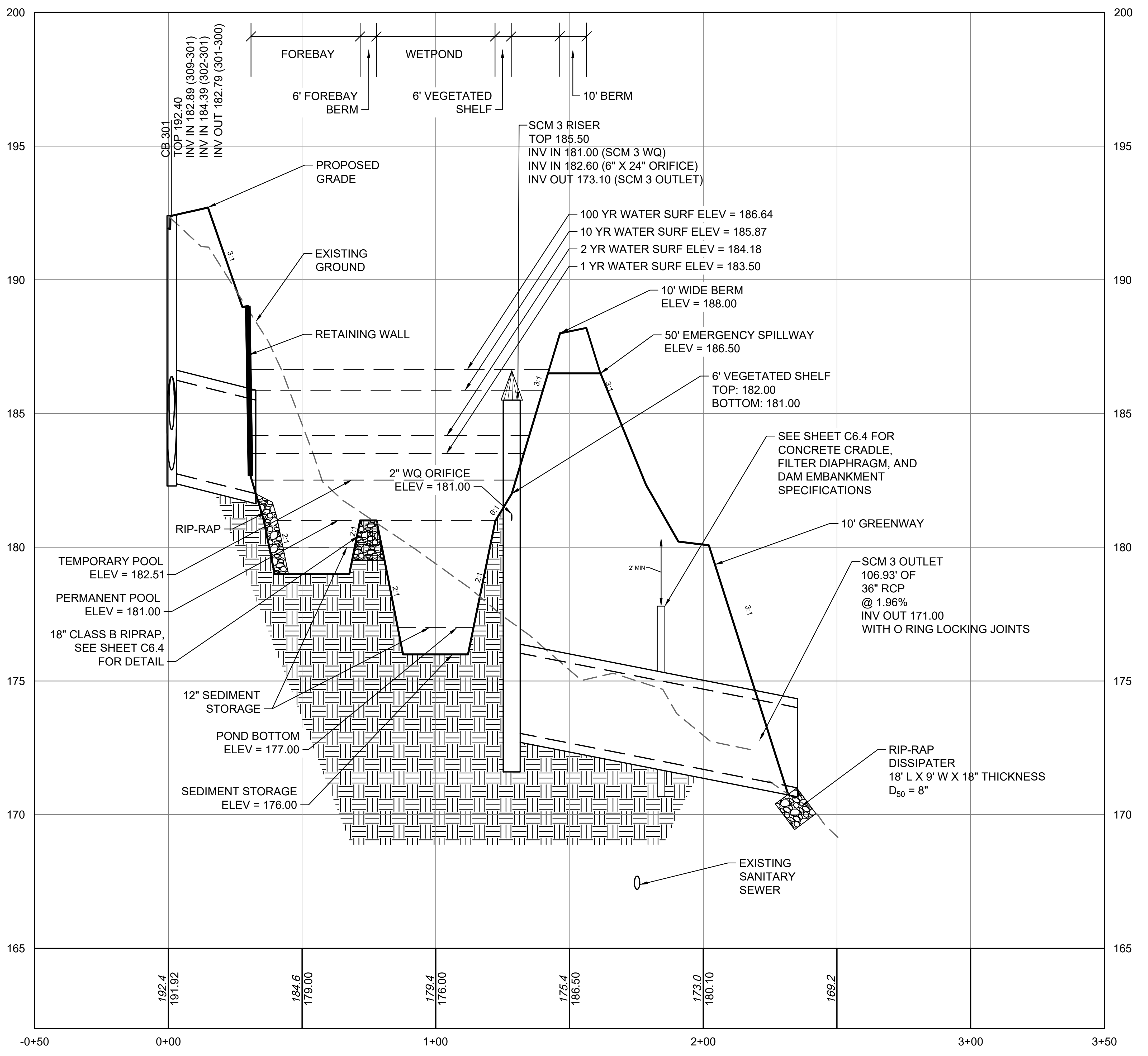
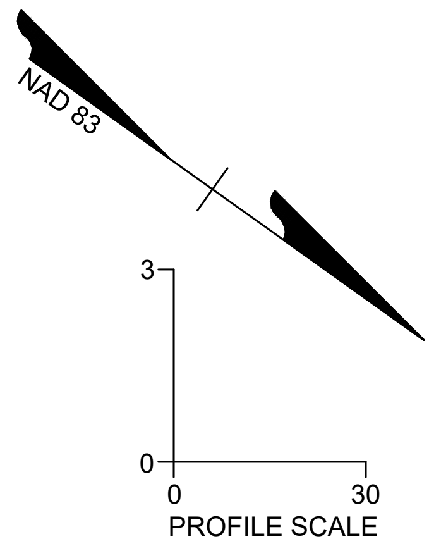


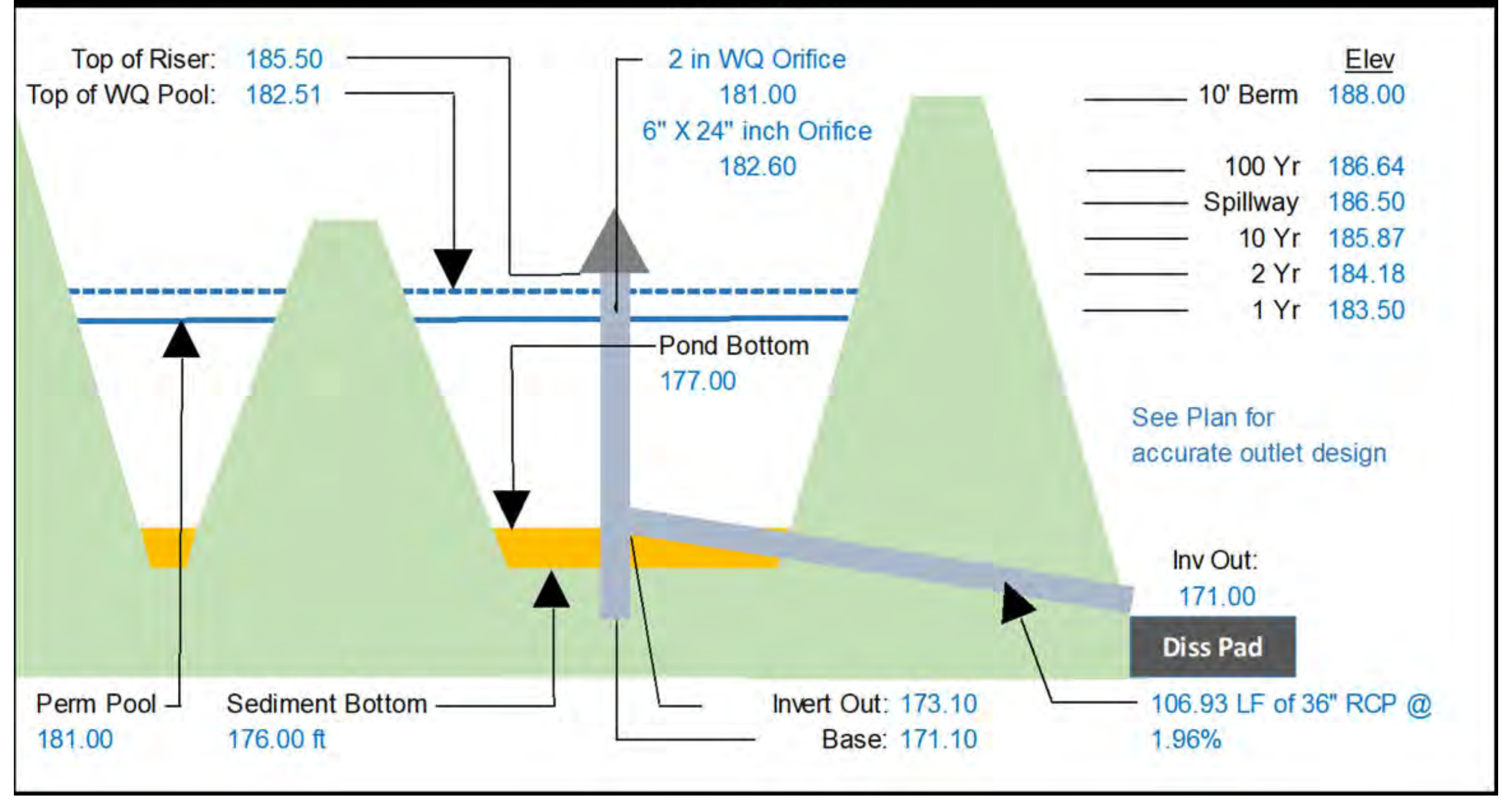




Pond / Riser Data & Elevations

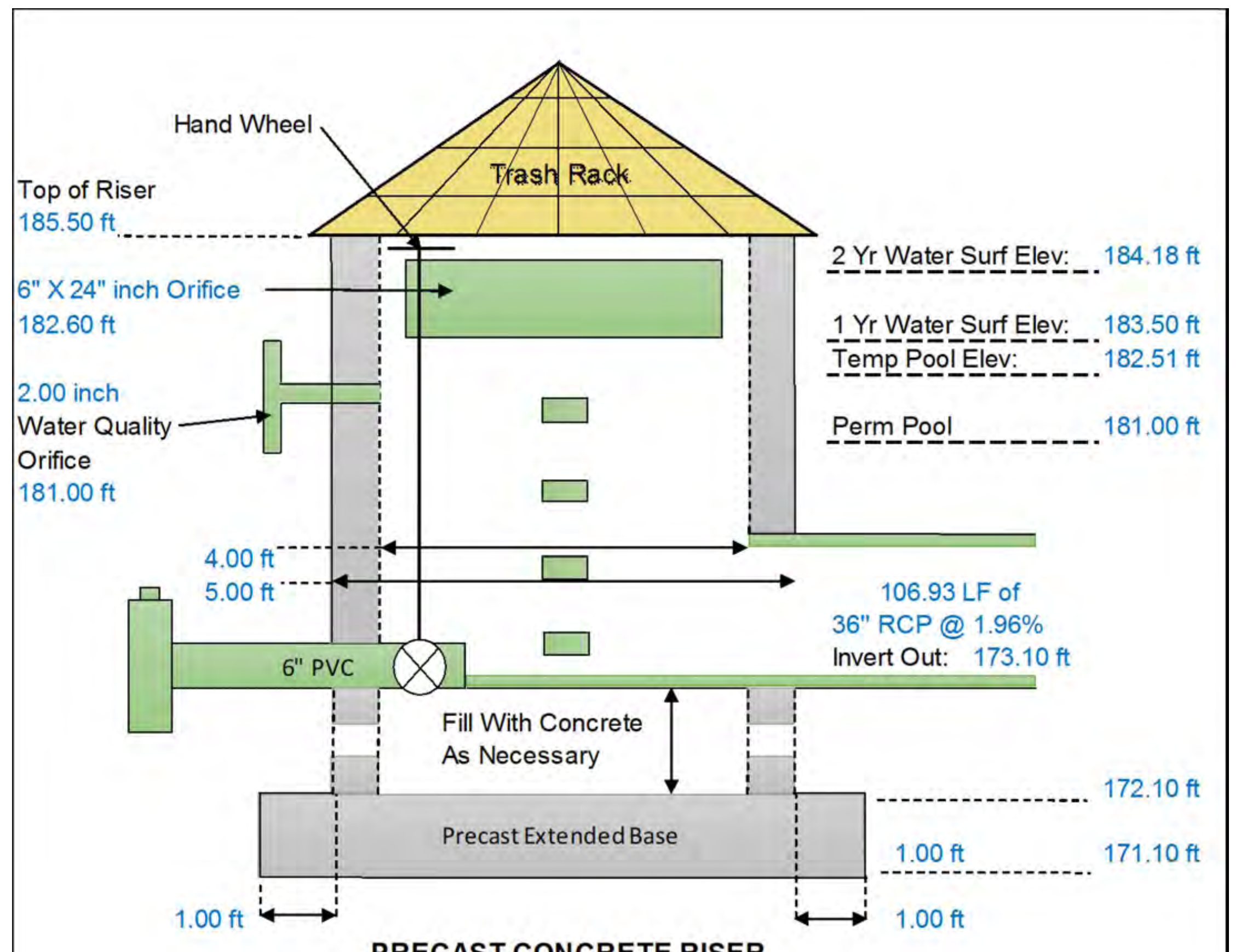
Pond Type	Wet Pond		
TSS Removal	85%		
Top of Pond / Berm	188.00 ft		
Secondary Spillway Width	50.00 ft		
Bottom of Secondary Spillway	186.50 ft		
Top of Riser	185.50 ft	(at least 1' above TPE)	
Riser Type / Size	4x4 ft	NCDOT Drop Inlet	
Top of Water Quality / Temp Pool Elev	182.51 ft	(1" Runoff)	
Top of Veg. Shelf	182.00		
Permanent Pool Elevation (Normal Pool)	181.00 ft		
Water Quality Orifice Elevation & Size	181.00 ft		2.00 in
Secondary Orifice Elevation & Size	182.60 ft		6" X 24" in
Bottom of Veg. Shelf	181.00		
Top of Sediment Storage / Pond Bottom	177.00 ft		
Bottom of Sediment Storage	176.00 ft	(Min 1 ft)	
Invert Out of Riser	173.10 ft		
Outlet Pipe Size	36.00 in	Diameter RCP	
Outlet Pipe Length & Slope	106.93 ft		1.96 %
Downstream Outlet Elevation	171.00 ft		
1 Yr Water Surface Elev / Peak Flow (CFS)	183.50 ft		4.05 CFS
2 Yr Water Surface Elev Peak Flow (CFS)	184.18 ft		5.74 CFS
10 Yr Water Surface Elev Peak Flow (CFS)	185.87 ft		20.54 CFS
100 Yr Water Surface Elev Peak Flow (CFS)	186.64 ft		81.72 CFS

Pond Detail



Anti-Bouyancy Calculations for the Riser Structure

Riser Dimensions		Weight of Structure		Displaced Volume	
Outside Width	5.00 ft	Walls =	18,090 LBS	V = LxWx(HT+Base) = C.F.	
Inside Width	4.00 ft	Base =	7,350 LBS		
Outside Length	5.00 ft	Fill =	2,400 LBS	Displaced Water =	
Inside Length	4.00 ft			C.F. * 62.4 PCF = LBS	
Height	13.40 ft	Outlet Pipe =	530 LBS		
Base Thick' (ft)	1.00 ft	WQ Orifice =	2 LBS		
Wall Thick' (ft)	0.50 ft				
Ext Base (ft)	1.00 ft	Weir #1 =	75 LBS	V =	360 C.F.
Areas removed from Riser		Weir #2 =	0 LBS	Disp. Water =	22,464 LBS
Outlet Pipe	7.07 ft	Weir #3 =	0 LBS		
WQ Orifice	0.02 ft	Weir #4 =	0 LBS		
Orifice #1	1.00 ft	Other #1 =	0 LBS	Saftety Factor	1.21
Orifice #2	0.00 ft				
Orifice #3	0.00 ft	**Weight =**	**27,233 LBS**	**Weight =**	**22,464 LBS**
Orifice #4	0.00 ft	**Precast Concrete Riser Structure to be 4 ft x 4 ft x 13.4 ft Tall, With a 1 ft Thick Precast Extended Base**			
Other	0.00 ft				



PRECAST CONCRETE RISER

4 ft x 4 ft x 13.4 ft Tall, With a 1 ft Thick
Precast Extended Base

AS-BUILT SURVEY REQUIREMENTS

NOTE: CONTRACTOR SHALL PROVIDE AS-BUILT TOPOGRAPHIC SURVEY PERFORMED BY A PROFESSIONAL LAND SURVEYOR CERTIFYING STORMWATER POND AREA DIMENSIONS, ELEVATIONS, OUTLET STRUCTURE INVERTS, ORIFICE DIAMETER, PIPE SIZES AND CLEANOUT LOCATIONS. TOPOGRAPHY SHALL EXTEND 20 FEET OUTSIDE LIMITS OF POND.

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BY: ______________________________ DATE: __________
DEVELOPMENT SERVICES ENGINEER

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ADMINISTRATOR

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6/22/21

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DATE	REVISION DESCRIPTION

DATE
06/22/2021

DRAWN BY
JD. MACMILLAN

DESIGNED BY
JD. MACMILLAN

CHECKED BY
M. ZACCARDO

SCALE
H: 1" = 30'
V: 1" = 3'

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TIMMONS GROUP

NORTH CAROLINA LICENSE NO. C-1652

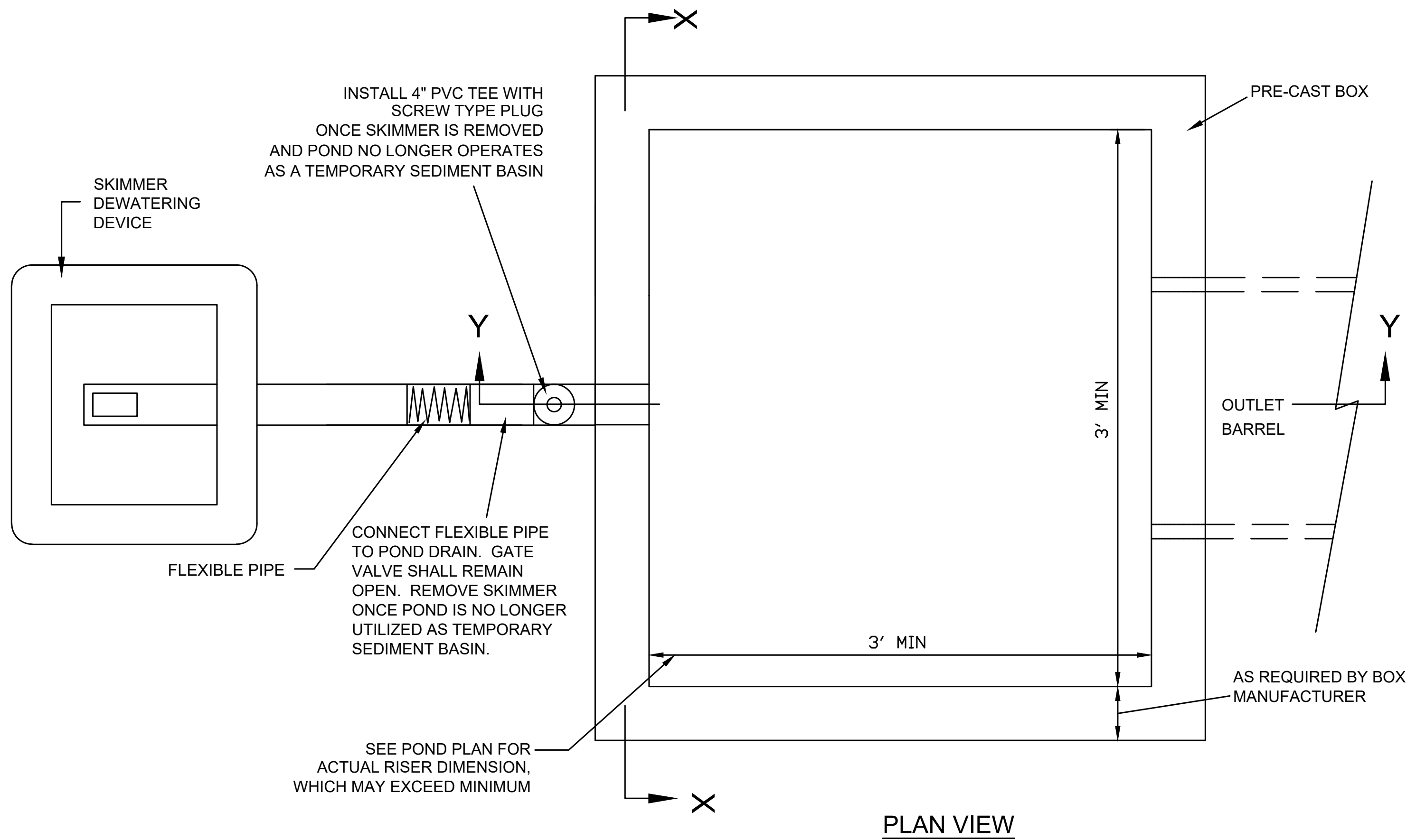
STONERIVER SUBDIVISION

KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA

SCM 3 PLAN & PROFILE

JOB NO.
44872

SHEET NO.
C6.3

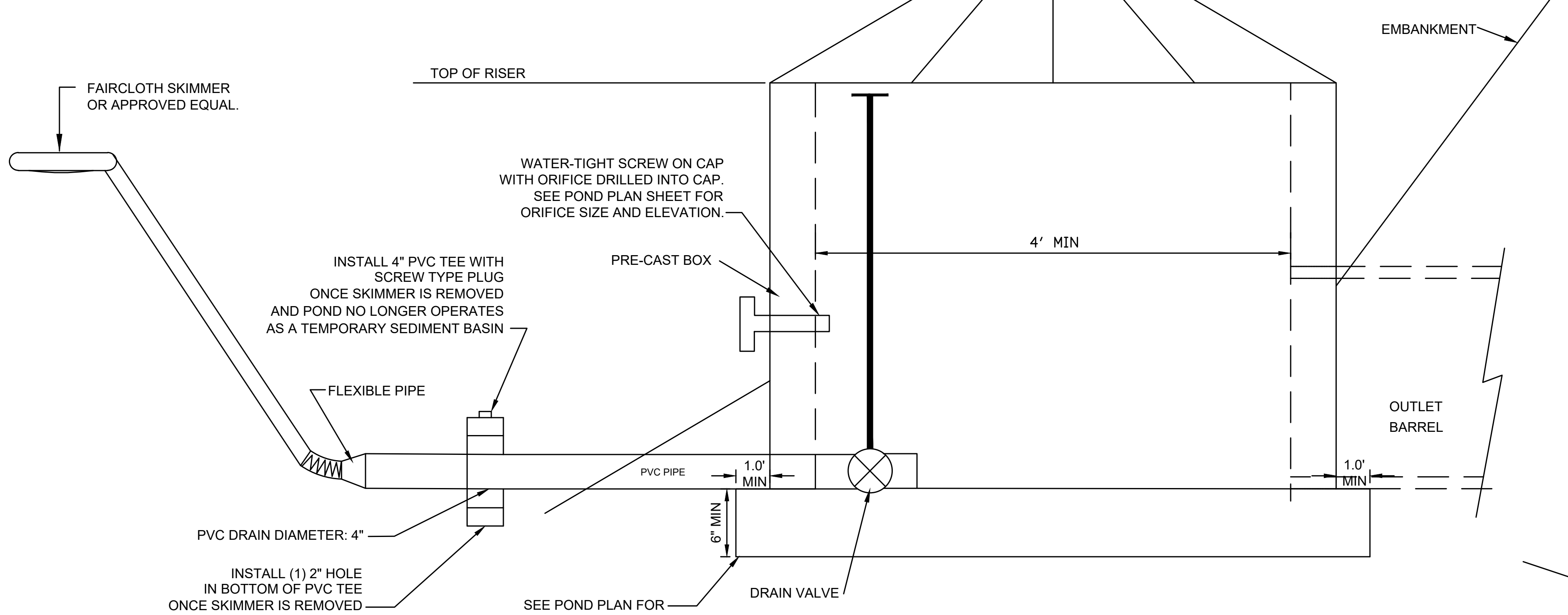


SKIMMER DEWATERING DEVICE
INSTALL 4" PVC TEE WITH SCREW TYPE PLUG ONCE SKIMMER IS REMOVED AND POND NO LONGER OPERATES AS A TEMPORARY SEDIMENT BASIN
PRE-CAST BOX
X
Y
3' MIN
OUTLET BARREL
Y
FLEXIBLE PIPE
CONNECT FLEXIBLE PIPE TO POND DRAIN. GATE VALVE SHALL REMAIN OPEN. REMOVE SKIMMER ONCE POND IS NO LONGER UTILIZED AS TEMPORARY SEDIMENT BASIN.
3' MIN
AS REQUIRED BY BOX MANUFACTURER
SEE POND PLAN FOR ACTUAL RISER DIMENSION, WHICH MAY EXCEED MINIMUM
X

PLAN VIEW

NOT TO SCALE

1. DEPTH OF NO MORE THAN ONE-HALF THE HEIGHT OF THE RISER.
2. CLEAN OR REPLACE STONE FILTER WHEN DEVICE NO LONGER DRAINS PROPERLY.
3. PROVIDE PAINT MARK ON RISER AT 12" HEIGHT. CLEAN AND REPAIR ONCE SEDIMENT REACHES MARK.
4. INSTALL ALL COMPONENTS OF POND EMBANKMENT, OUTLET STRUCTURE, SKIMMER, EMERGENCY SPILLWAY, ETC. (UNLESS NOTED) PRIOR TO BEGINING CLEARING OPERATIONS.



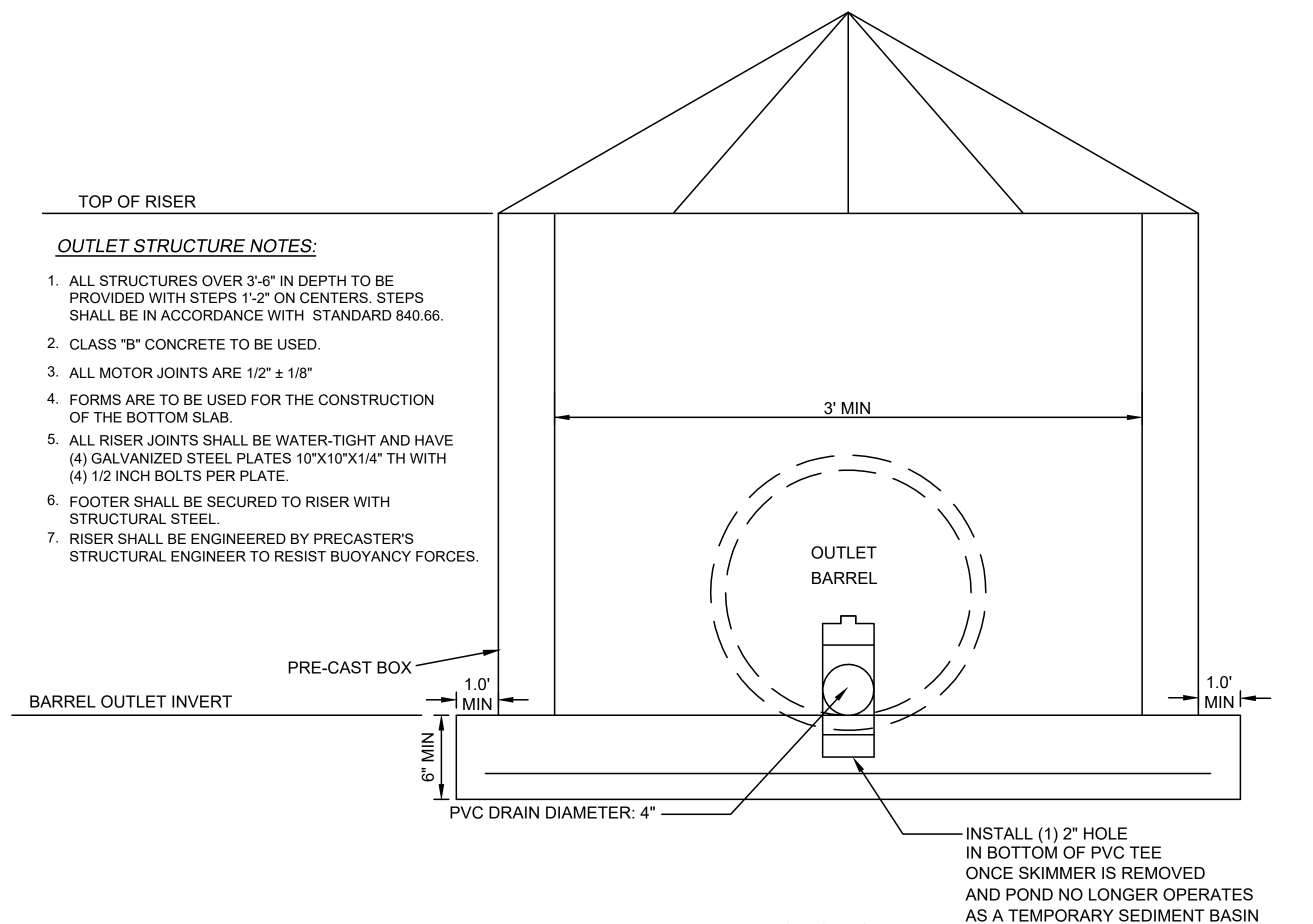
FAIRCLOTH SKIMMER OR APPROVED EQUAL.
Y
TOP OF RISER
EMBANKMENT
WATER-TIGHT SCREW ON CAP WITH ORIFICE DRILLED INTO CAP. SEE POND PLAN SHEET FOR ORIFICE SIZE AND ELEVATION.
PRE-CAST BOX
4' MIN
INSTALL 4" PVC TEE WITH SCREW TYPE PLUG ONCE SKIMMER IS REMOVED AND POND NO LONGER OPERATES AS A TEMPORARY SEDIMENT BASIN
FLEXIBLE PIPE
OUTLET BARREL
PVC PIPE
1.0' MIN
1.0' MIN
6" MIN
PVC DRAIN DIAMETER: 4"
INSTALL (1) 2" HOLE IN BOTTOM OF PVC TEE ONCE SKIMMER IS REMOVED AND POND NO LONGER OPERATES AS A TEMPORARY SEDIMENT BASIN
SEE POND PLAN FOR ACTUAL FOOTER DIMENSION, WHICH MAY EXCEED MINIMUM
DRAIN VALVE

PERMANENT OUTLET STRUCTURE
SECTION Y-Y

NOT TO SCALE

OUTLET STRUCTURE NOTES:

1. ALL STRUCTURES OVER 3'-6" IN DEPTH TO BE PROVIDED WITH STEPS 1'-2" ON CENTERS. STEPS SHALL BE IN ACCORDANCE WITH STANDARD 840.66.
2. CLASS "B" CONCRETE TO BE USED.
3. ALL MOTOR JOINTS ARE 1/2" ± 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"X1/4" TH WITH (4) 1/2 INCH 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.



TOP OF RISER
3' MIN
OUTLET BARREL
PRE-CAST BOX
BARREL OUTLET INVERT
1.0' MIN
1.0' MIN
6" MIN
PVC DRAIN DIAMETER: 4"
INSTALL (1) 2" HOLE IN BOTTOM OF PVC TEE ONCE SKIMMER IS REMOVED AND POND NO LONGER OPERATES AS A TEMPORARY SEDIMENT BASIN

SECTION X-X
OUTLET STRUCTURE

NOT TO SCALE

NOTES:

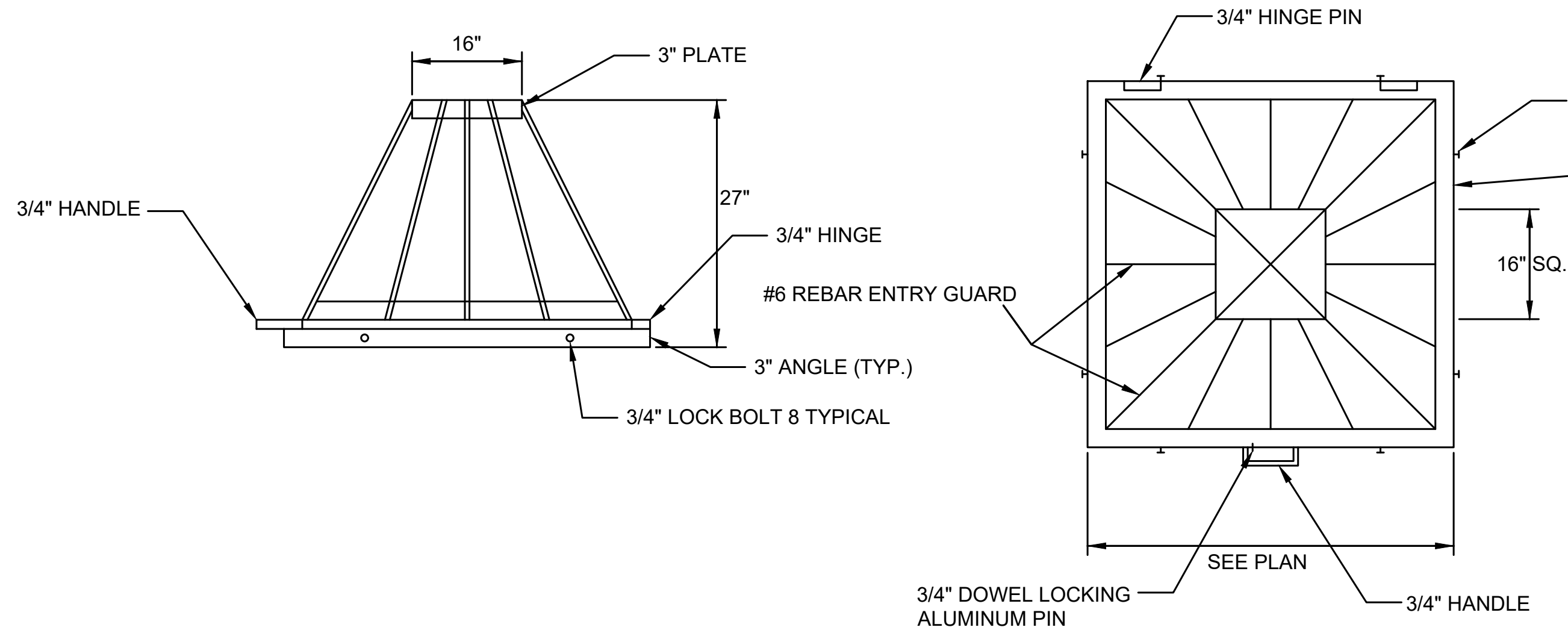
MINIMUM DENSITY SHALL NOT BE LESS THAN 95% OF MAXIMUM DRY DENSITY WITH MOISTURE CONTENT WITHIN +/- 2% OF THE OPTIMUM. EACH LIFT OF FILL SHALL BE COMPACTED AS NECESSARY TO OBTAIN THAT DENSITY. ALL COMPACTION IS DETERMINED PER AASHTO METHOD T-99 (STANDARD PROCTOR).

DAM EMBANKMENT IS TO BE SEEDED IMMEDIATELY AFTER DAM CONSTRUCTION IS COMPLETE.

STORMWATER MANAGEMENT STRUCTURE IS TO BE UTILIZED AS A TEMPORARY EROSION CONTROL DEVICE INITIALLY. ONCE CONSTRUCTION IS COMPLETED AND UPSTREAM SURFACES HAVE BEEN PERMANENTLY STABILIZED, 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.

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.

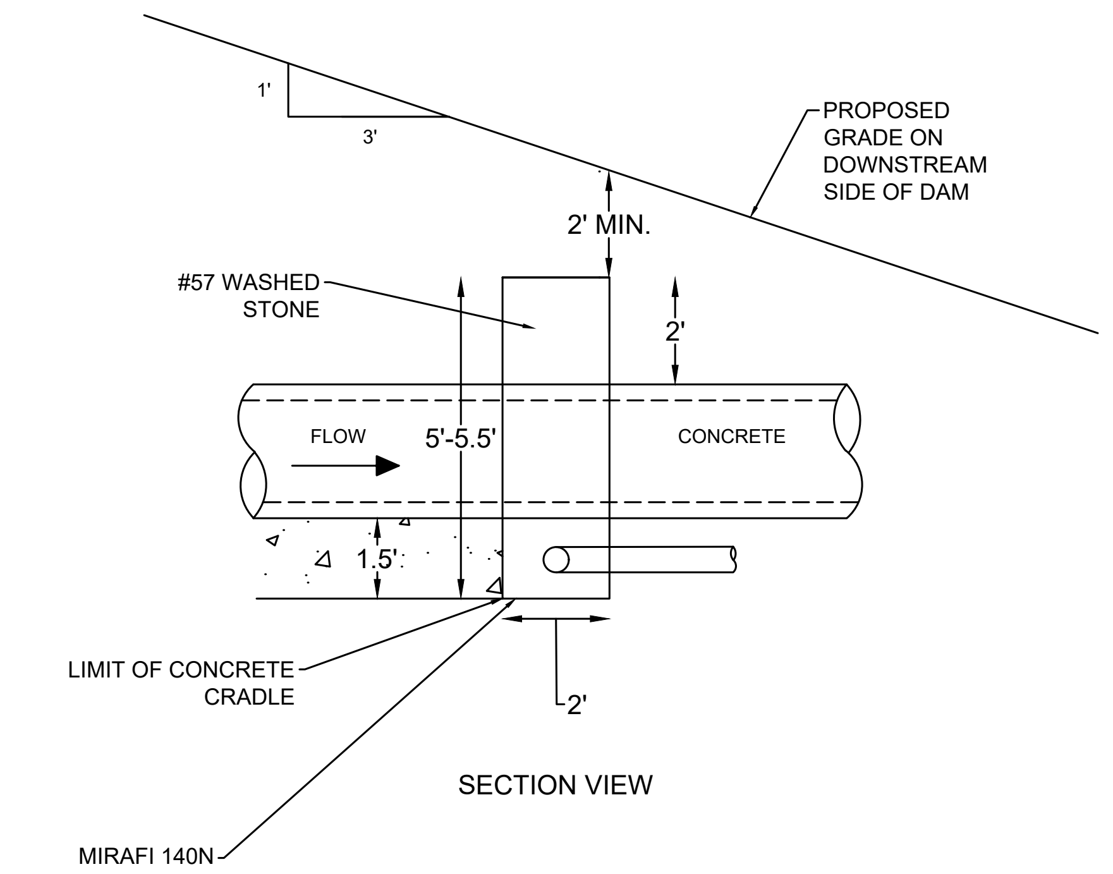


COAT ALL STEEL SURFACES W/ FOX INDUSTRIES FX-420 COAL TAR EPOXY COATING OR APPROVED EQUAL.

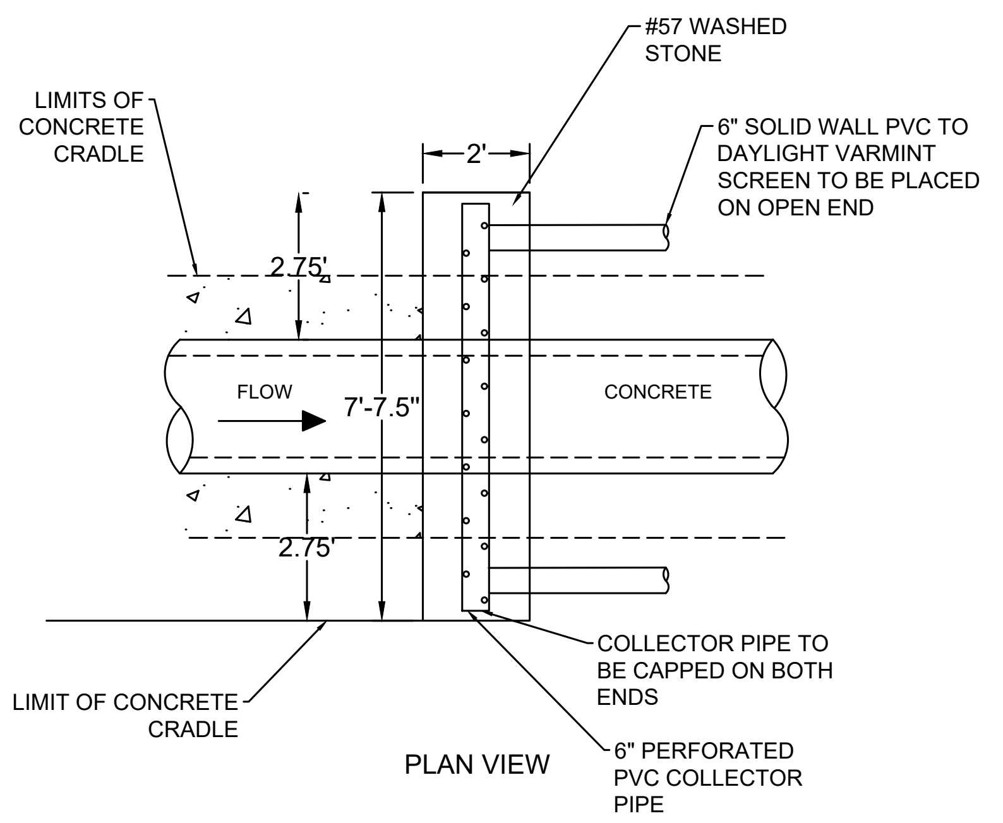
STEEL SURFACES WHICH ARE TO RECEIVE FX-240 COAL TAR EPOXY COATING SHOULD BE PREPARED BY ABRASIVE BLASTING TO A COMMERCIAL GRAY METAL (SP-6) STANDARD. ANY SURFACE BLASTED SHOULD BE COATED THE SAME DAY. IF PREPARED SURFACES ARE CONTAMINATED BY RUST OR OTHER CONTAMINANTS, THEY MUST BE RE-BLASTED.

TRASH RACK DETAIL

NTS



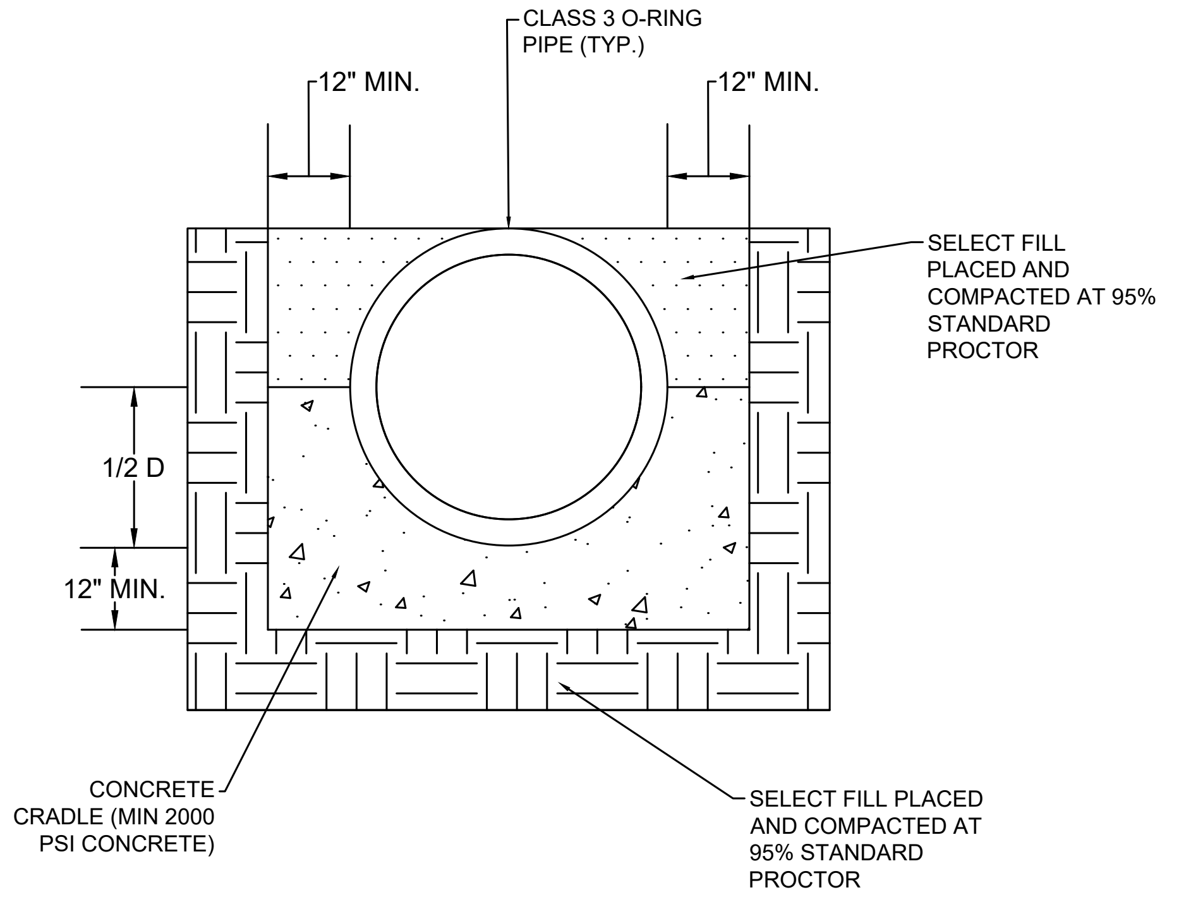
1'
3'
PROPOSED GRADE ON DOWNSTREAM SIDE OF DAM
2' MIN.
#57 WASHED STONE
2'
FLOW
5'-5.5'
CONCRETE
1.5'
LIMIT OF CONCRETE CRADLE
2'
SECTION VIEW
MIRAFI 140N GEOSYNTHETIC FABRIC WITH 18-INCH OVERLAP AT ALL SEAMS (TYP)



#57 WASHED STONE
LIMITS OF CONCRETE CRADLE
2'
6" SOLID WALL PVC TO DAYLIGHT VARMINT SCREEN TO BE PLACED ON OPEN END
2.75'
FLOW
7'-7.5"
CONCRETE
2.75'
LIMIT OF CONCRETE CRADLE
COLLECTOR PIPE TO BE CAPPED ON BOTH ENDS
PLAN VIEW
6" PERFORATED PVC COLLECTOR PIPE

FILTER DIAPHRAGM DETAIL

NOT TO SCALE



CLASS 3 O-RING PIPE (TYP.)
12" MIN.
12" MIN.
SELECT FILL PLACED AND COMPACTED AT 95% STANDARD PROCTOR
1/2 D
12" MIN.
CONCRETE CRADLE (MIN 2000 PSI CONCRETE)
SELECT FILL PLACED AND COMPACTED AT 95% STANDARD PROCTOR

CONCRETE CRADLE DETAIL

NOT TO SCALE

DURING EROSION CONTROL STAGES, ALL RISER ORIFICES SHALL BE TEMPORARILY PLUGGED, EXCEPT FOR THE TEMPORARY SKIMMER.

AT TIME OF SKIMMER REMOVAL, THE DRAIN VALVE SHALL BE CLOSED AND ALL RISER ORIFICES SHALL BE UNPLUGGED.

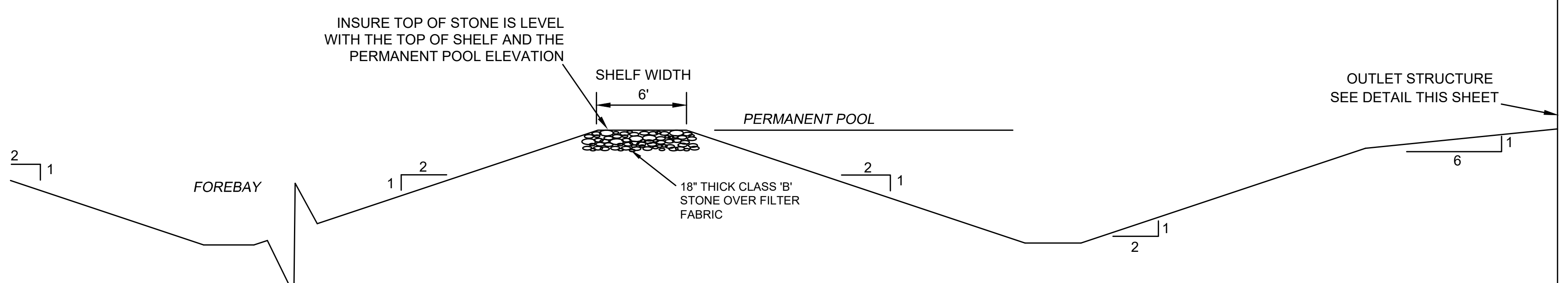
TOWN CERTIFICATION

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.

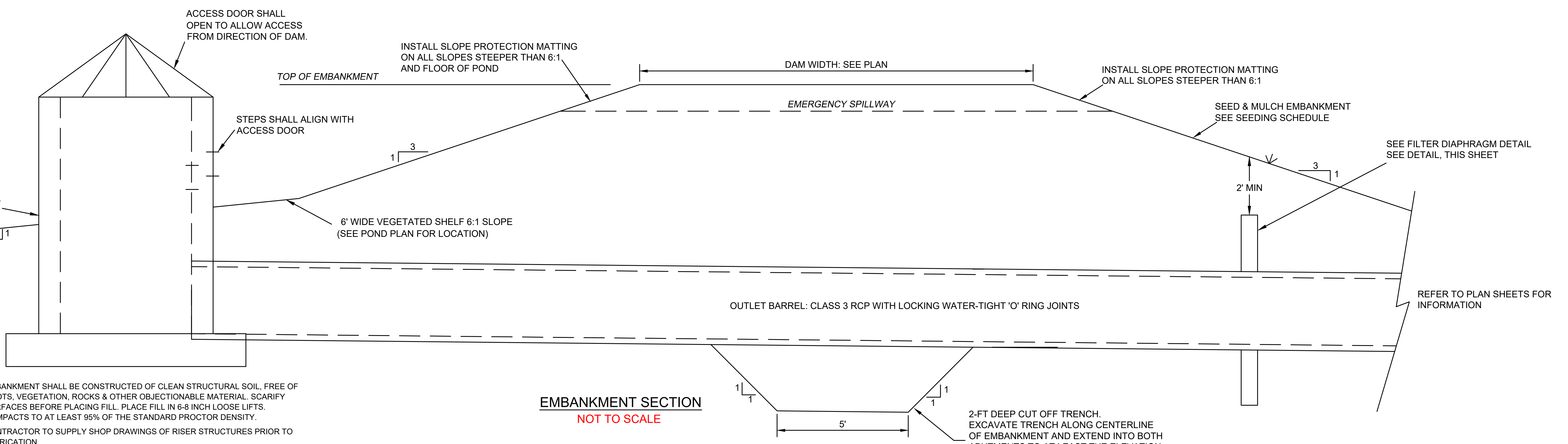
BY: ______________________________ DATE: ____________
ADMINISTRATOR



INSURE TOP OF STONE IS LEVEL WITH THE TOP OF SHELF AND THE PERMANENT POOL ELEVATION
SHELF WIDTH
6'
PERMANENT POOL
2
1
FOREBAY
1
2
2
1
18" THICK CLASS 'B' STONE OVER FILTER FABRIC
1
2
6
1
OUTLET STRUCTURE SEE DETAIL THIS SHEET

POND SECTION

NOT TO SCALE



ACCESS DOOR SHALL OPEN TO ALLOW ACCESS FROM DIRECTION OF DAM.
TOP OF EMBANKMENT
INSTALL SLOPE PROTECTION MATTING ON ALL SLOPES STEEPER THAN 6:1 AND FLOOR OF POND
DAM WIDTH: SEE PLAN
INSTALL SLOPE PROTECTION MATTING ON ALL SLOPES STEEPER THAN 6:1
EMERGENCY SPILLWAY
SEED & MULCH EMBANKMENT SEE SEEDING SCHEDULE
STEPS SHALL ALIGN WITH ACCESS DOOR
3
1
SEE FILTER DIAPHRAGM DETAIL SEE DETAIL, THIS SHEET
3
1
2' MIN
6' WIDE VEGETATED SHELF 6:1 SLOPE (SEE POND PLAN FOR LOCATION)
OUTLET BARREL: CLASS 3 RCP WITH LOCKING WATER-TIGHT 'O' RING JOINTS
REFER TO PLAN SHEETS FOR INFORMATION
1
1
1
1
5'

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.
2. CONTRACTOR TO SUPPLY SHOP DRAWINGS OF RISER STRUCTURES PRIOR TO FABRICATION.
3. ALL RISERS SHALL BE PRECAST CONCRETE SOLID 6" WALL STRUCTURES.
4. 4-6 INCH LAYER OF AMENDED SOIL IS RECOMMENDED IN ANY AREA WHERE PLANTINGS ARE REQUIRED (SEE NCDENR BMP DESIGN MANUAL).

EMBANKMENT SECTION

NOT TO SCALE

2-FT DEEP CUT OFF TRENCH.
EXCAVATE TRENCH ALONG CENTERLINE OF EMBANKMENT AND EXTEND INTO BOTH ABUTMENTS TO AT LEAST THE ELEVATION OF THE RISER CREST. VERIFY DIMENSIONS WITH GEOTECHNICAL ENGINEER BASED UPON FIELD INSPECTION.

STORMWATER WET POND DETAIL

GEOTECHNICAL CERTIFICATION NOTE:

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

MICHAEL V. ZACCARDO
ENGINEER
6/22/21

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
06/22/2021

DRAWN BY
JD. MACMILLAN

DESIGNED BY
JD. MACMILLAN

CHECKED BY
M. ZACCARDO

SCALE
N.T.S

TIMMONS GROUP

NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION

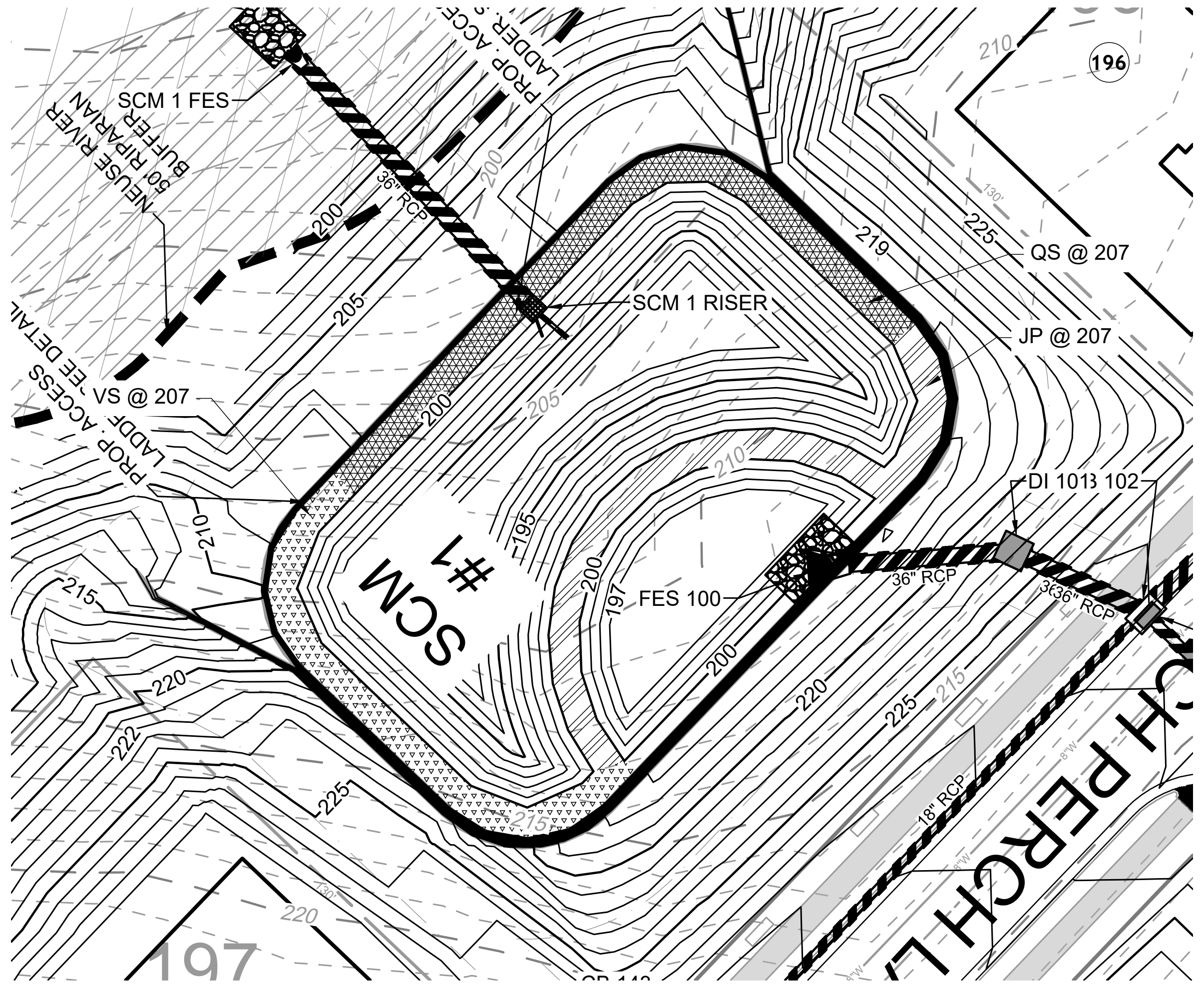
KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA

SCM DETAILS

JOB NO.
44872

SHEET NO.
C6.4

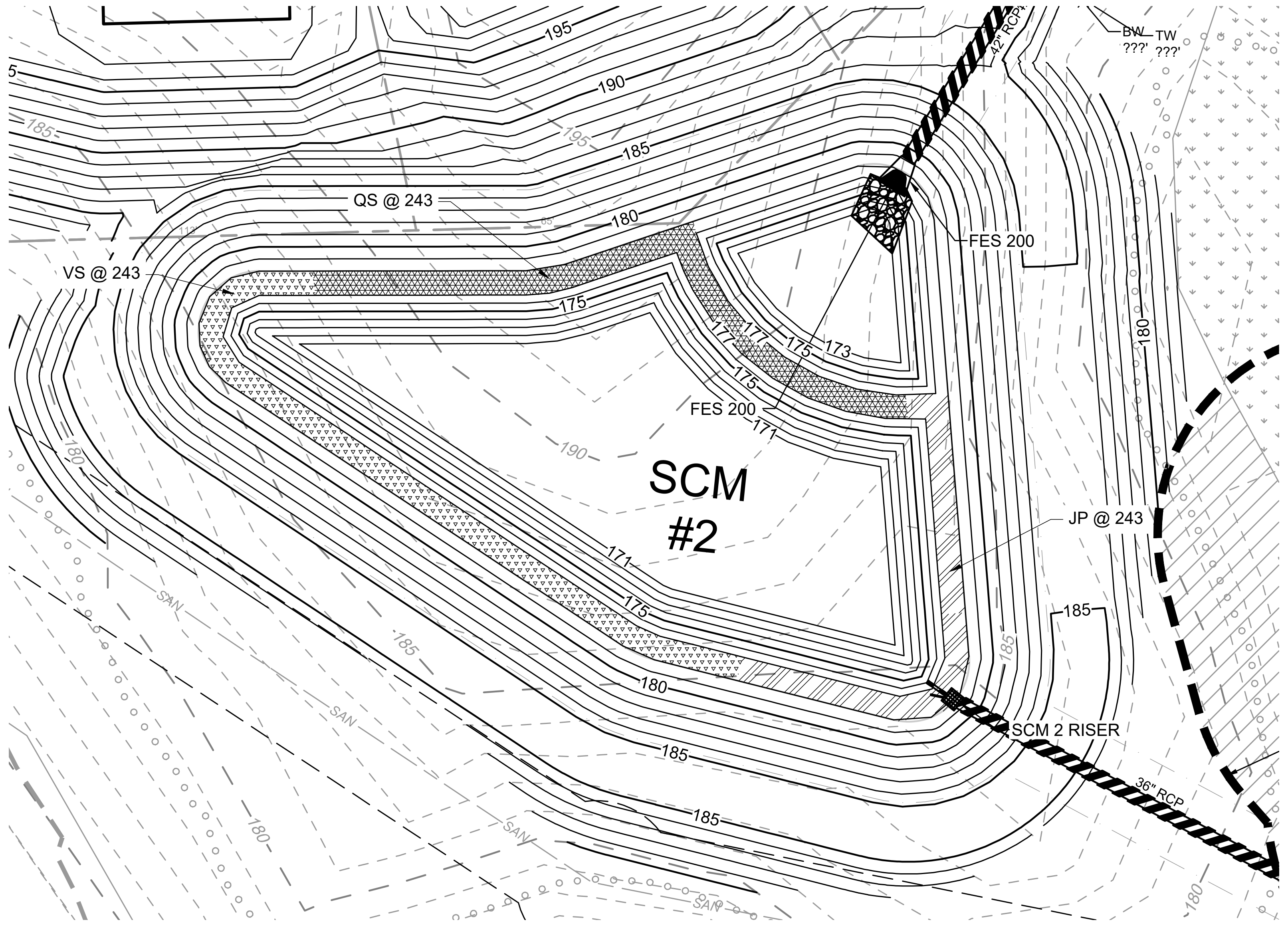
FOR REVIEW ONLY: NOT FOR CONSTRUCTION



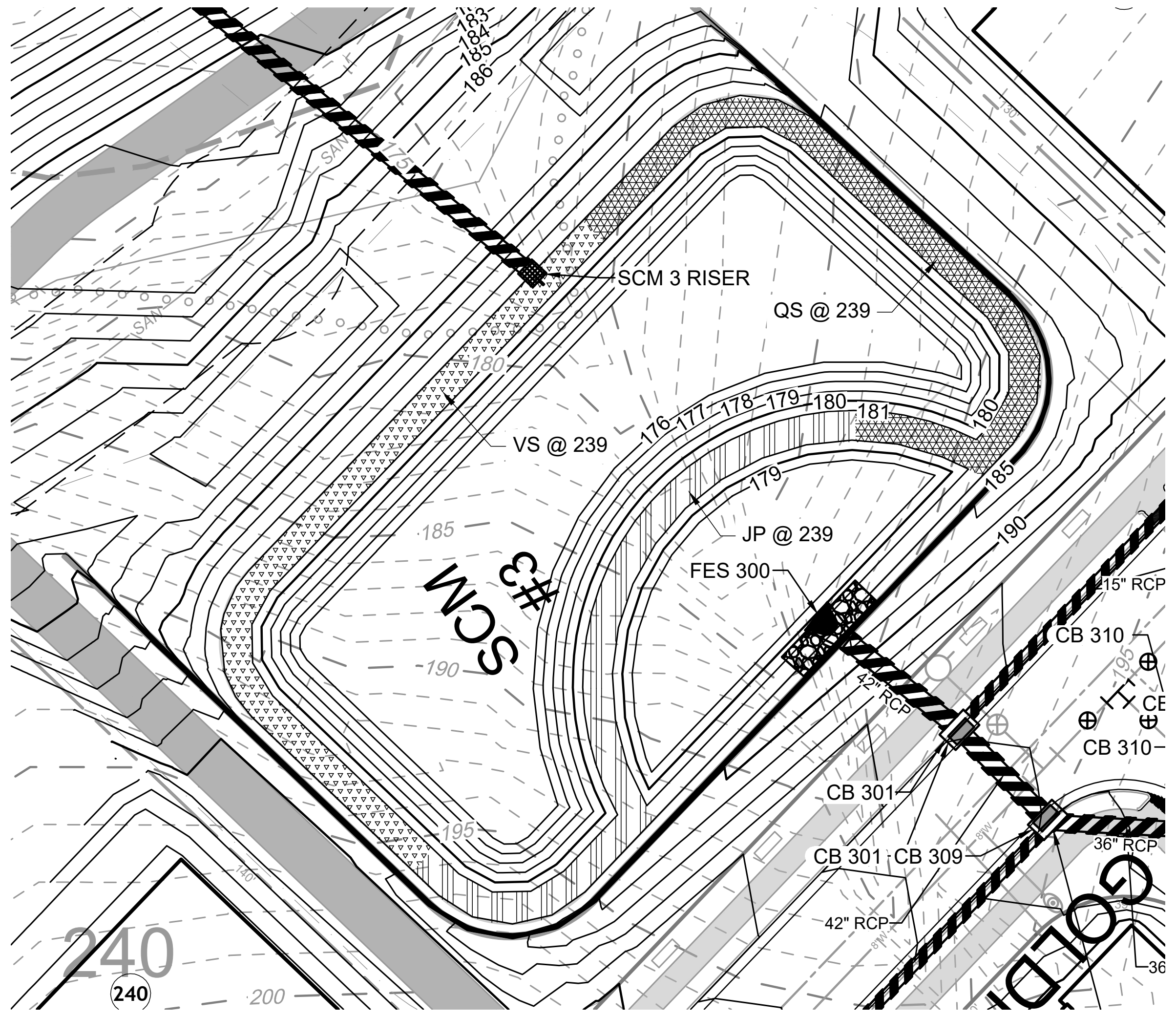
PLANTING PLAN LEGEND

- ▩ QUAIL SEDGE (CEREZ TENERA)
- ░ VIRGINIA SWEETSPIRE (ITEA VIRGINICA)
- ▨ JOE PYE WEED (EUPAT' FISTULOSUS)

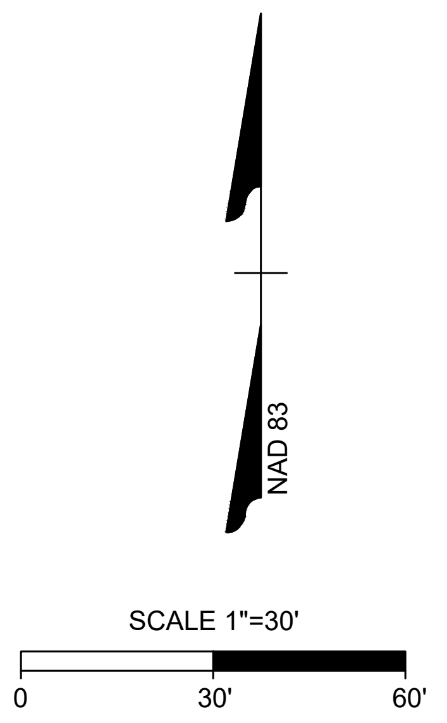
Planting Summary Requirements						
	Dam / Berm			Non-Clumping Turf Grass		
6' Shelf Length 413		Area of Shelf = 2478 SF		(50 Plants per 200 SF of Area)		
Quantity	Type	Root	Common Name	Scientific Name	Planting Size	Notes
207	Herbaceous	Container	Quill Sedge	Cerex Tenera	4" Pot	24"-36" OC
207	Herbaceous	Container	Virginia Sweetspire	Itea Virginica	4" Pot	24"-36" OC
207	Herbaceous	Container	Joe Pye Weed	Eupat' Fistulosus	4" Pot	24"-36" OC



Planting Summary Requirements						
	Dam / Berm			Non-Clumping Turf Grass		
6' Shelf Length 485		Area of Shelf = 2910 SF		(50 Plants per 200 SF of Area)		
Quantity	Type	Root	Common Name	Scientific Name	Planting Size	Notes
243	Herbaceous	Container	Quill Sedge	Cerex Tenera	4" Pot	24"-36" OC
243	Herbaceous	Container	Virginia Sweetspire	Itea Virginica	4" Pot	24"-36" OC
243	Herbaceous	Container	Joe Pye Weed	Eupat' Fistulosus	4" Pot	24"-36" OC



Planting Summary Requirements						
	Dam / Berm			Non-Clumping Turf Grass		
6' Shelf Length 477		Area of Shelf = 2862 SF		(50 Plants per 200 SF of Area)		
Quantity	Type	Root	Common Name	Scientific Name	Planting Size	Notes
239	Herbaceous	Container	Quill Sedge	Cerex Tenera	4" Pot	24"-36" OC
239	Herbaceous	Container	Virginia Sweetspire	Itea Virginica	4" Pot	24"-36" OC
239	Herbaceous	Container	Joe Pye Weed	Eupat' Fistulosus	4" Pot	24"-36" OC



AS-BUILT SURVEY REQUIREMENTS

NOTE: CONTRACTOR SHALL PROVIDE AS-BUILT TOPOGRAPHIC SURVEY PERFORMED BY A PROFESSIONAL LAND SURVEYOR CERTIFYING STORMWATER POND AREA DIMENSIONS, ELEVATIONS, OUTLET STRUCTURE INVERTS, ORIFICE DIAMETER, PIPE SIZES AND CLEANOUT LOCATIONS. TOPOGRAPHY SHALL EXTEND 20 FEET OUTSIDE LIMITS OF POND.

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: ______________________________ DATE: ___________
DEVELOPMENT SERVICES ENGINEER

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

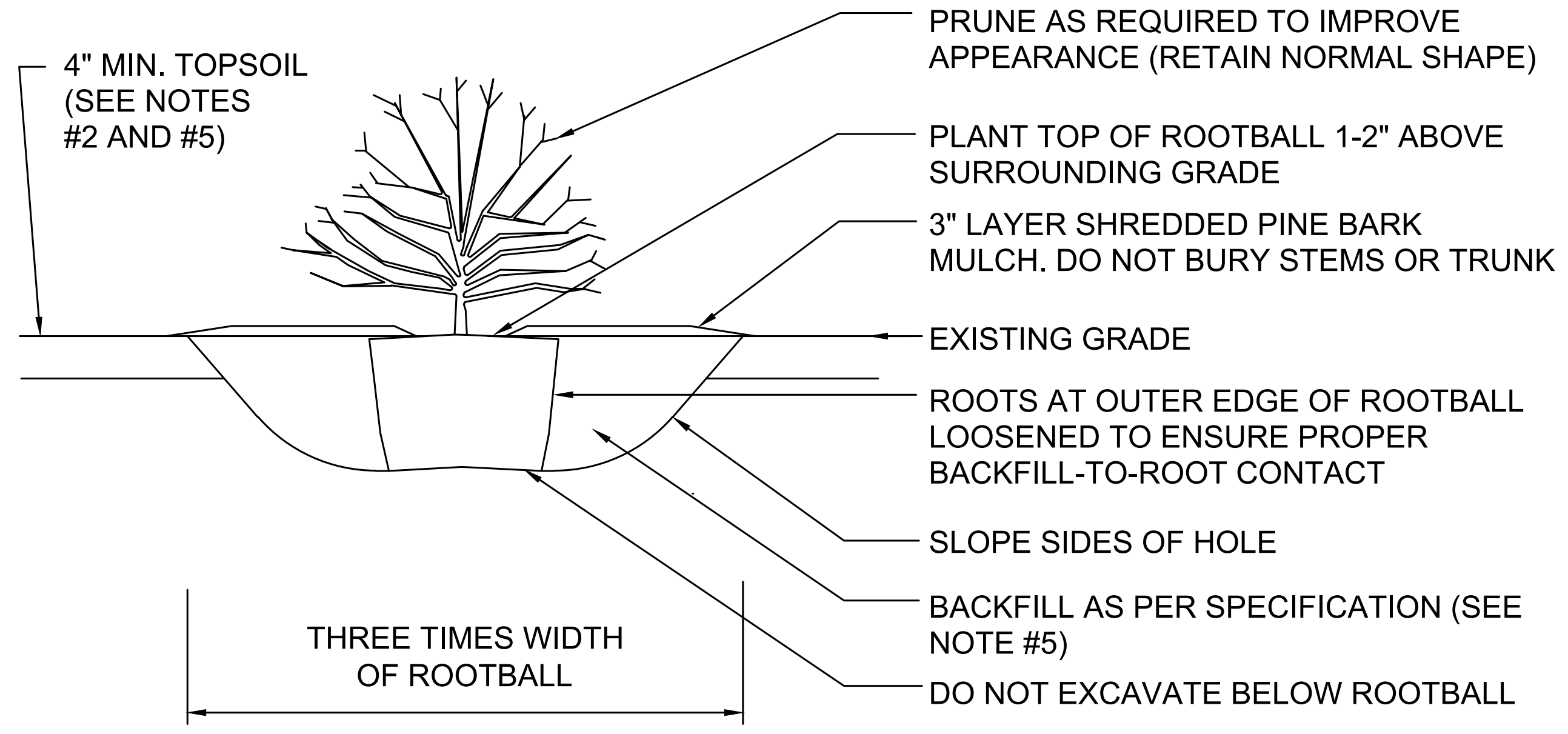
BY: ______________________________ DATE: ___________
ADMINISTRATOR

PLANTING NOTES:

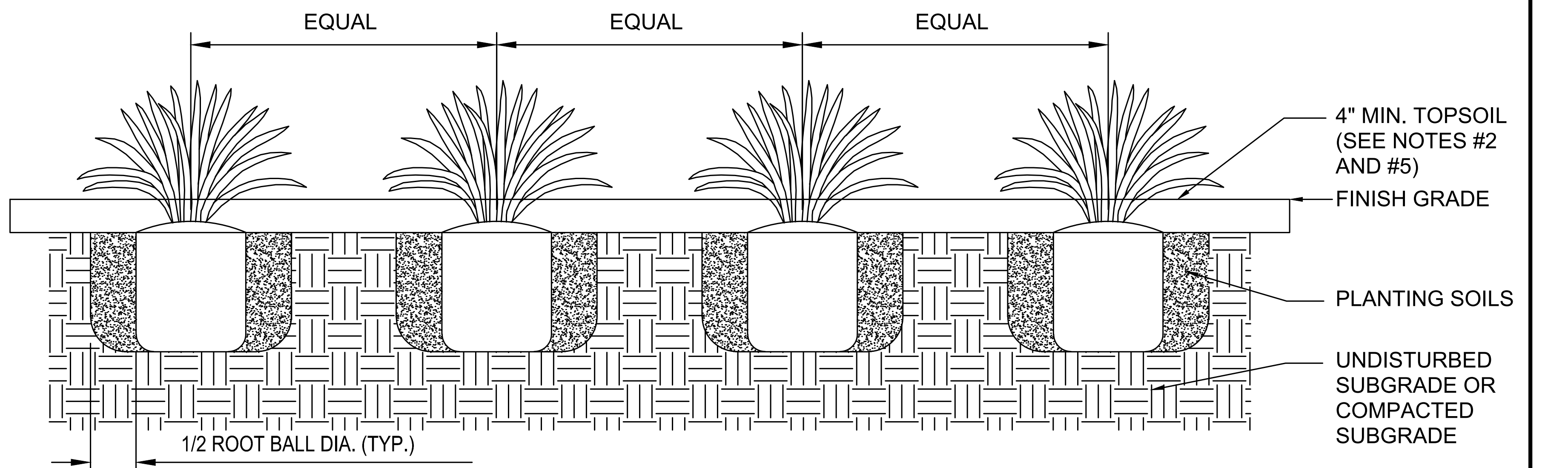
1. THE DAM STRUCTURE, INCLUDING FRONT AND BACK EMBANKMENT SLOPES, OF THE POND SHALL BE VEGETATED WITH NON-CLUMPING TURF GRASS OR SOD. TREES AND WOODY SHRUBS SHALL NOT BE ALLOWED.
2. THE VEGETATED SHELF SHALL BE PLANTED WITH A MINIMUM OF THREE DIVERSE SPECIES OF HERBACEOUS, NATIVE VEGETATION AT A MINIMUM DENSITY OF 50 PLANTS PER 200 SQUARE FEET OF SHELF AREA.
3. CONTRACTOR TO WORK WITH SOILS SCIENTIST TO ENSURE SOILS ARE ADEQUATE TO SUPPORT ESTABLISHMENT AND GROWTH OF THE WETLAND 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 DISTURBED AREAS AROUND THE OUTSIDE OF THE WET POND SHALL BE SEEDED WITH A LAWN AREA SEED MIX (PER SEEDING SPECIFICATIONS) NATIVE GRASSES, LEGUMES, CLOVERS AND WILDFLOWERS.
5. IF THE WETPOND 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 THE CONSTRUCTION.
6. 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 MUNICIPALITY.

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.


4" MIN. TOPSOIL (SEE NOTES #2 AND #5)
PRUNE AS REQUIRED TO IMPROVE APPEARANCE (RETAIN NORMAL SHAPE)
PLANT TOP OF ROOTBALL 1-2" ABOVE SURROUNDING GRADE
3" LAYER SHREDDED PINE BARK MULCH. DO NOT BURY STEMS OR TRUNK
EXISTING GRADE
ROOTS AT OUTER EDGE OF ROOTBALL LOOSENED TO ENSURE PROPER BACKFILL-TO-ROOT CONTACT
SLOPE SIDES OF HOLE
BACKFILL AS PER SPECIFICATION (SEE NOTE #5)
THREE TIMES WIDTH OF ROOTBALL
DO NOT EXCAVATE BELOW ROOTBALL

SHRUB PLANTING DETAIL N.T.S.


EQUAL
EQUAL
EQUAL
4" MIN. TOPSOIL (SEE NOTES #2 AND #5)
FINISH GRADE
PLANTING SOILS
UNDISTURBED SUBGRADE OR COMPACTED SUBGRADE
1/2 ROOT BALL DIA. (TYP.)

HERBACEOUS PLANTING DETAIL N.T.S.

SEAL
MICHAEL V. ZACCARDO
ENGINEER
6/22/21

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	06/22/2021
DRAWN BY	JD. MACMILLAN
DESIGNED BY	JD. MACMILLAN
CHECKED BY	M. ZACCARDO
SCALE	1" = 30'

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION
KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA
SCM DETAILS

JOB NO. 44872
SHEET NO. C6.5

FOR REVIEW ONLY: NOT FOR CONSTRUCTION

S:\331\44872-Stone-Silver\DWG\Sheet\CD\STONE RIVER\44872-331-SR-C6.1-SCM.dwg | by: Thomas Taylor

TOWN CERTIFICATION

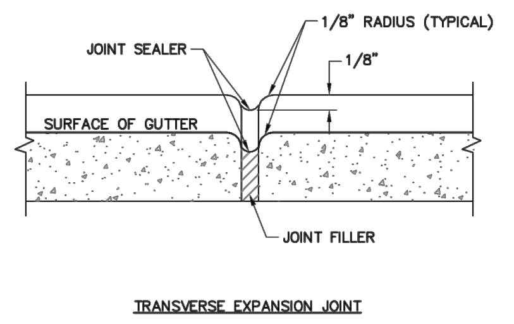
THIS DESIGN HAS BEEN REVIEWED BY THE ENGINEER FOR THE TOWN OF KNIGHTDALE, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF, IT CONFORMS TO THE REQUIREMENTS ESTABLISHED IN THE STANDARD SPECIFICATIONS OF THE TOWN OF KNIGHTDALE.

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

MICHAEL V. ZACCARDO
6/22/21



TRANSVERSE EXPANSION JOINT

NOTES:

1. CONTRACTION JOINTS SHALL BE SPACED AT 10-FOOT INTERVALS. JOINT SPACING MAY BE ALTERED BY THE ENGINEER TO PREVENT UNCONTROLLED CRACKING.
2. CONTRACTION JOINTS MAY BE INSTALLED BY THE USE OF TEMPLATES OR FORMED BY OTHER APPROVED METHODS. WHERE SUCH JOINTS ARE NOT FORMED BY TEMPLATES, A MINIMUM DEPTH OF 1-1/2" SHALL BE 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

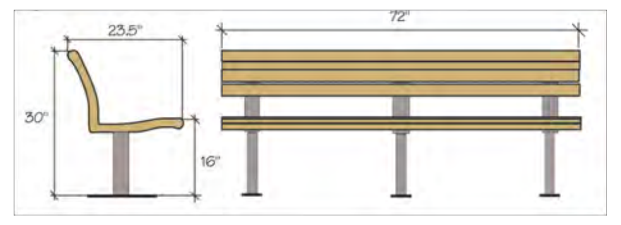
3 of 3

TOWN OF KNIGHTDALE STANDARD DETAILS | CURB AND GUTTER | STD. NO. 4.01

Benches

Benches along trails allow users to rest, congregate or contemplate. Trail benches should comfortably accommodate the average adult. They should be located at the primary and secondary entrances to the trail and at regular intervals, and should be set back three feet from the trail edge.

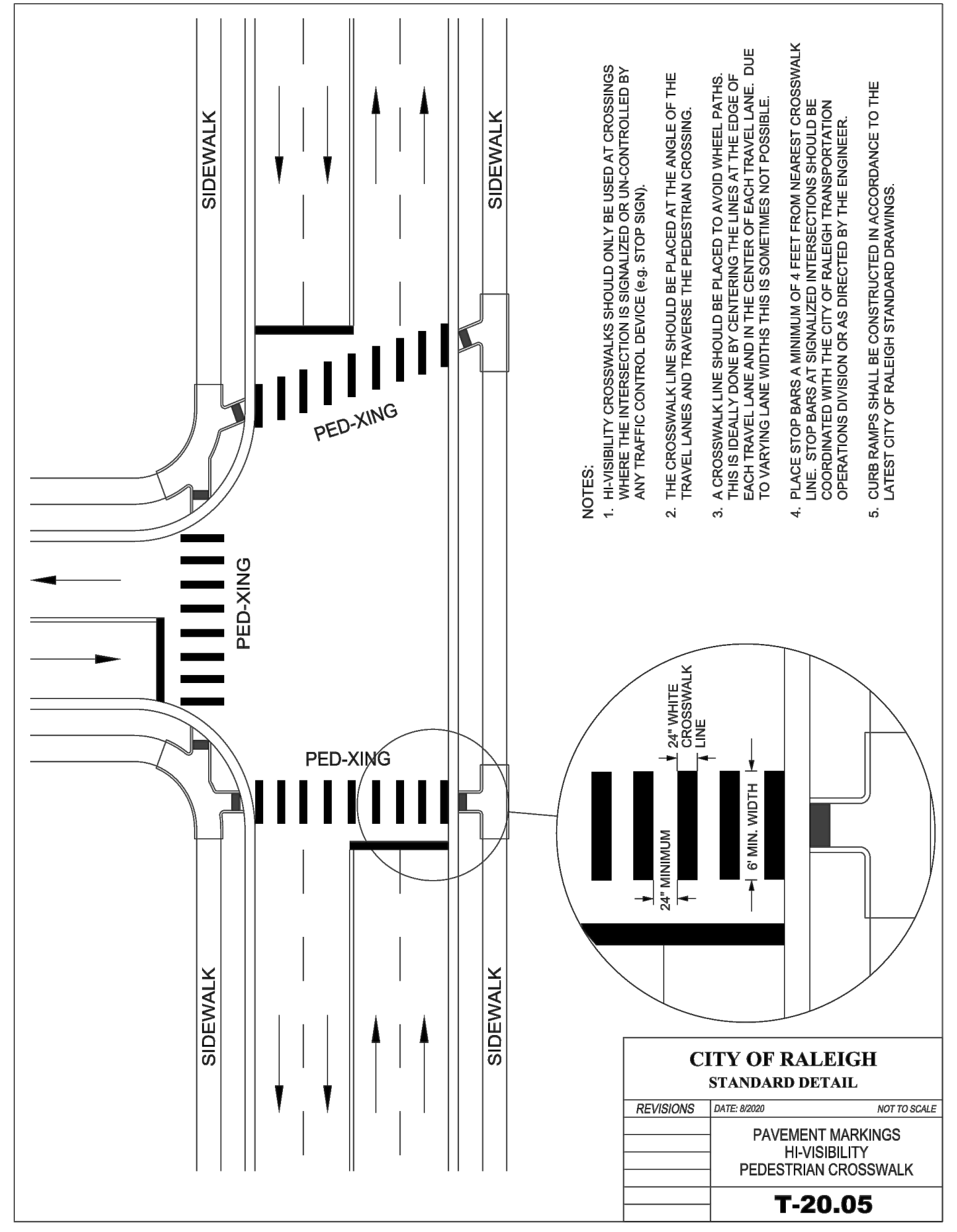
The graphics below illustrate a bench that can be manufactured using recycled plastic lumber or conventional treated wood lumber. The prefabricated plastic lumber units cost more initially but last longer and require little or no maintenance.



Typical Bench Detail

Design Guidelines - Revised September 2006

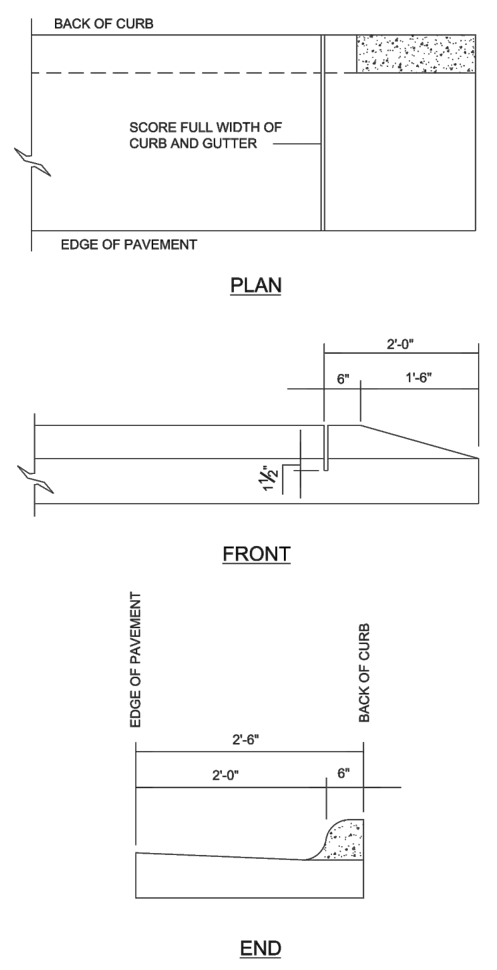
C-21



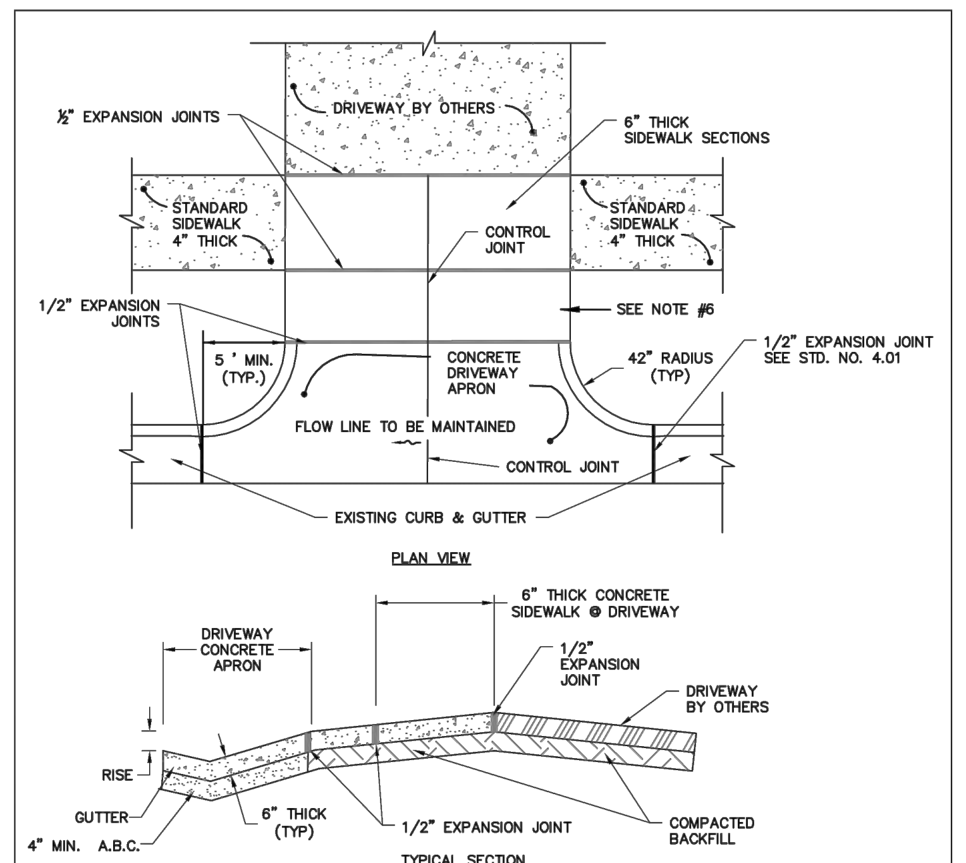
NOTES:

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



CITY OF RALEIGH STANDARD DETAIL
REVISIONS | DATE: 8/2020 | NOT TO SCALE
STANDARD METHOD OF ENDING CURB AND GUTTER
T-10.25

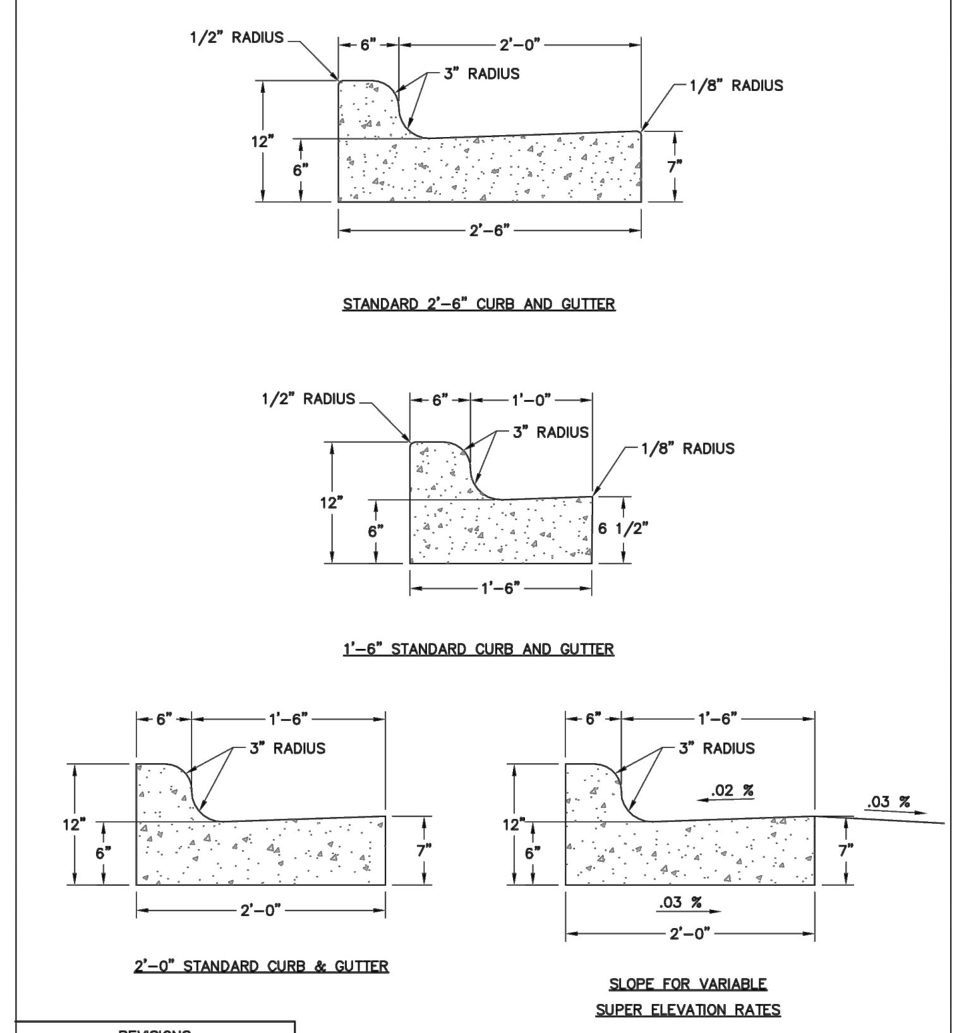


NOTES:

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

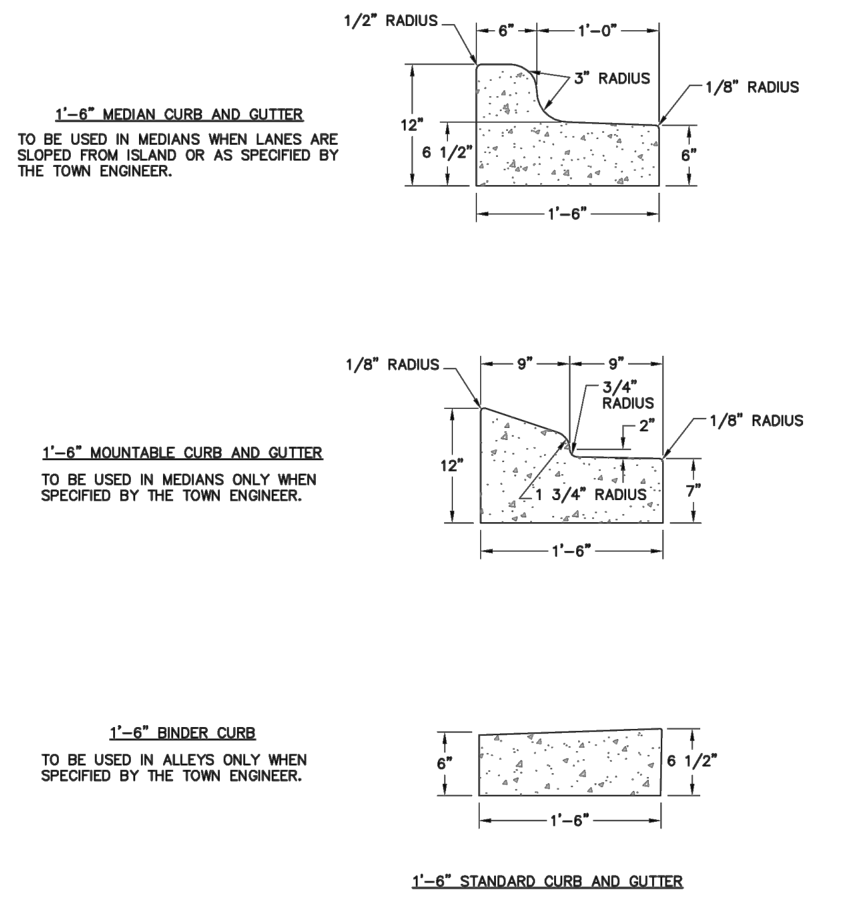
TOWN OF KNIGHTDALE STANDARD DETAILS | STANDARD DRIVEWAY APRON | STD. NO. 4.03



REVISIONS	
DATE	DESCRIPTION

1 of 3

TOWN OF KNIGHTDALE STANDARD DETAILS | CURB AND GUTTER | STD. NO. 4.01



1'-6" MEDIAN CURB AND GUTTER
TO BE USED IN MEDIANS WHEN LANES ARE SLOPED FROM ISLAND OR AS SPECIFIED BY THE TOWN ENGINEER.

1'-6" MOUNTABLE CURB AND GUTTER
TO BE USED IN MEDIANS ONLY WHEN SPECIFIED BY THE TOWN ENGINEER.

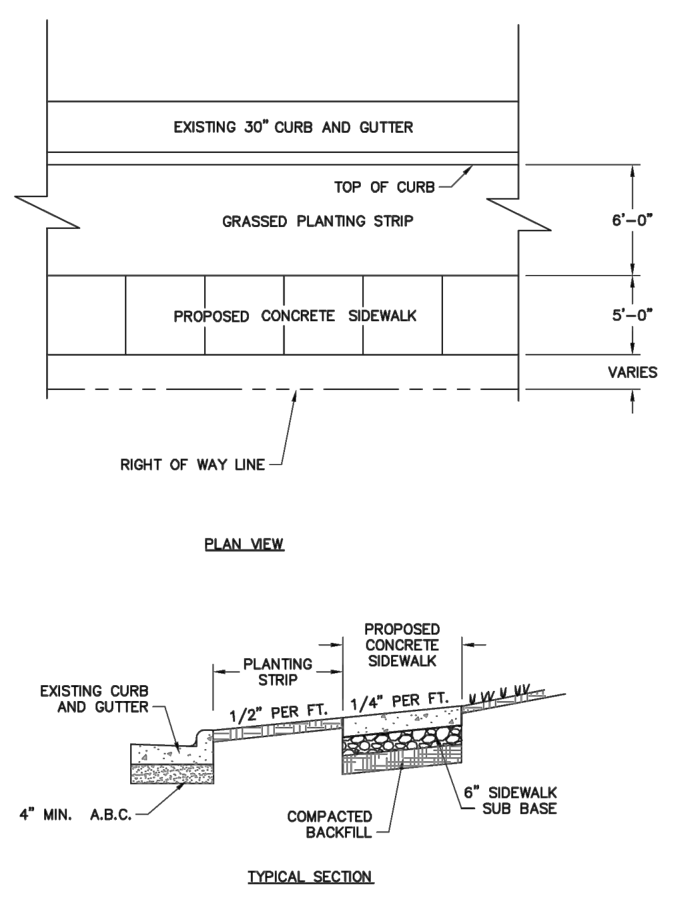
1'-6" BINDER CURB
TO BE USED IN ALLEYS ONLY WHEN SPECIFIED BY THE TOWN ENGINEER.

1'-6" STANDARD CURB AND GUTTER

REVISIONS	
DATE	DESCRIPTION

2 of 3

TOWN OF KNIGHTDALE STANDARD DETAILS | CURB AND GUTTER | STD. NO. 4.01



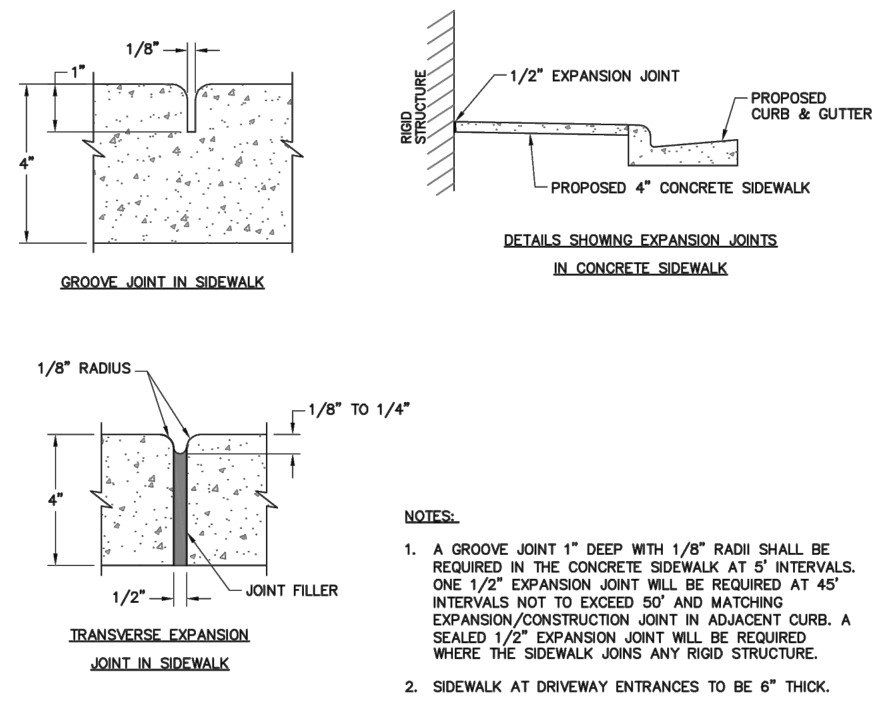
NOTES:

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.
4. SIDEWALK SUB BASE TO BE A MIXTURE OF 70 PERCENT #57 STONE AND ASTM C33 SAND OR EQUAL.

REVISIONS	
DATE	DESCRIPTION

1 of 2

TOWN OF KNIGHTDALE STANDARD DETAILS | CONCRETE SIDEWALKS | STD. NO. 4.04



NOTES:

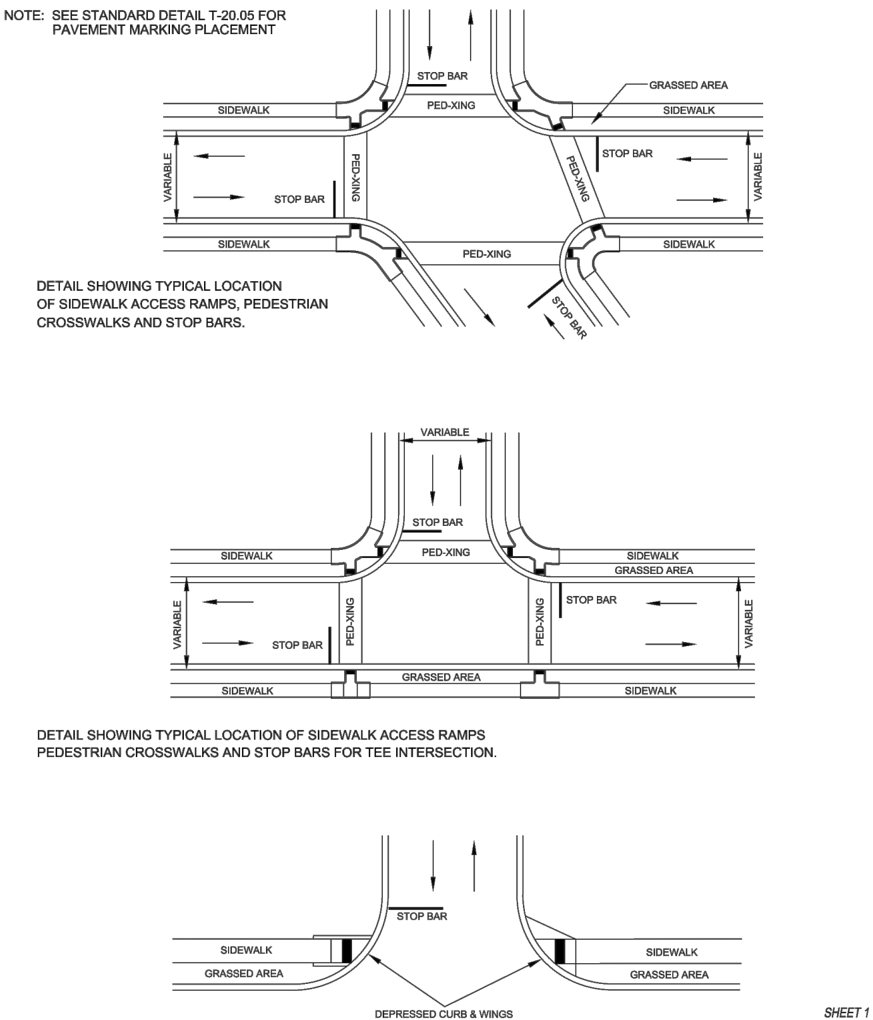
1. A GROOVE JOINT 1" DEEP WITH 1/8" RADII SHALL BE REQUIRED IN THE CONCRETE SIDEWALK AT 5' INTERVALS. ONE 1/2" EXPANSION JOINT WILL BE REQUIRED AT 45' INTERVALS NOT TO EXCEED 50' AND MATCHING EXPANSION/CONSTRUCTION JOINT IN ADJACENT CURB. A SEALED 1/2" EXPANSION JOINT WILL BE REQUIRED WHERE THE SIDEWALK JOINS ANY RIGID STRUCTURE.
2. SIDEWALK AT DRIVEWAY ENTRANCES TO BE 6" THICK.
3. WIDTH OF SIDEWALK ON THOROUGHFARE STREETS SHALL BE A MINIMUM OF 5'. WIDTH OF SIDEWALKS IN THE CENTRAL BUSINESS DISTRICT WILL BE DETERMINED BY THE TOWN ENGINEER.
4. WIDTH OF SIDEWALKS ON NON-THOROUGHFARE STREETS SHALL BE A MINIMUM OF 5' UNLESS OTHERWISE SPECIFIED BY THE TOWN'S UNIFIED DEVELOPMENT ORDINANCE.
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

NOTE: SEE STANDARD DETAIL T-20.05 FOR PAVEMENT MARKING PLACEMENT



DETAIL SHOWING TYPICAL LOCATION OF SIDEWALK ACCESS RAMPS, PEDESTRIAN CROSSWALKS AND STOP BARS.

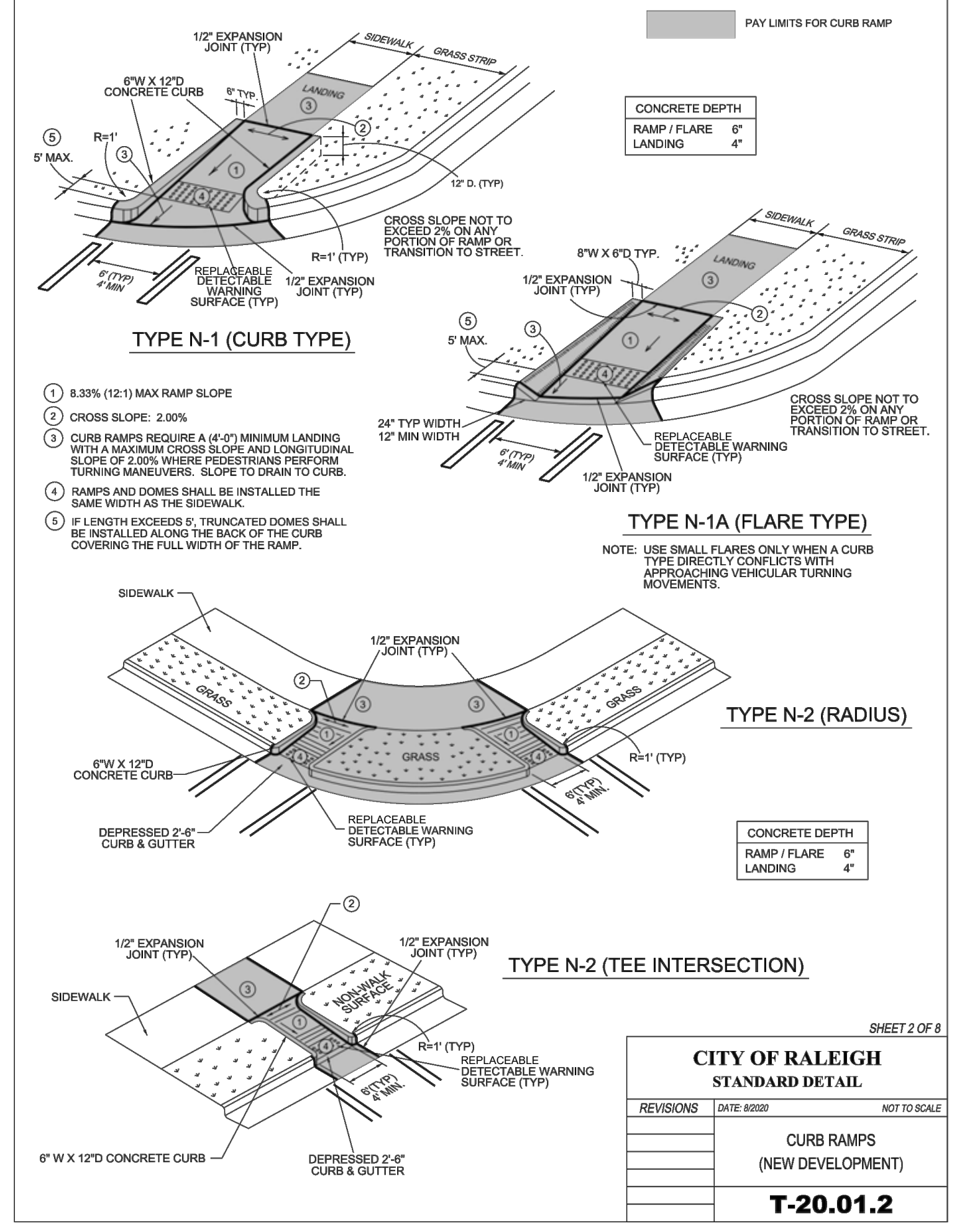
DETAIL SHOWING TYPICAL LOCATION OF SIDEWALK ACCESS RAMPS PEDESTRIAN CROSSWALKS AND STOP BARS FOR TEE INTERSECTION.

FOR RAMPS AT ASPHALT TO ASPHALT STREET TYPE DRIVEWAYS OR PRIVATE STREET TIE IN.

SHEET 1 OF 8

CITY OF RALEIGH STANDARD DETAIL
REVISIONS | DATE: 8/2020 | NOT TO SCALE
CURB RAMPS
T-20.01.1

PAY LIMITS FOR CURB RAMP



1/2" EXPANSION JOINT (TYP)
SIDEWALK
GRASS STRIP
6"W X 12"D CONCRETE CURB
6" TYP.
LANDING
R=1'
5' MAX.
12" D. (TYP)
R=1' (TYP)
REPLACEABLE DETECTABLE WARNING SURFACE (TYP)
1/2" EXPANSION JOINT (TYP)
6' (TYP) 4' MIN
CROSS SLOPE NOT TO EXCEED 2% ON ANY PORTION OF RAMP OR TRANSITION TO STREET.
TYPE N-1 (CURB TYPE)
8"W X 6"D TYP.
1/2" EXPANSION JOINT (TYP)
24" TYP WIDTH
12" MIN WIDTH
REPLACEABLE DETECTABLE WARNING SURFACE (TYP)
TYPE N-1A (FLARE TYPE)
SIDEWALK
GRASS
TYPE N-2 (RADIUS)
6"W X 12"D CONCRETE CURB
DEPRESSED 2'-6" CURB & GUTTER
REPLACEABLE DETECTABLE WARNING SURFACE (TYP)
R=1' (TYP)
TYPE N-2 (TEE INTERSECTION)
NON-WALK SURFACE
6" W X 12"D CONCRETE CURB
DEPRESSED 2'-6" CURB & GUTTER

CONCRETE DEPTH	
RAMP / FLARE	6"
LANDING	4"

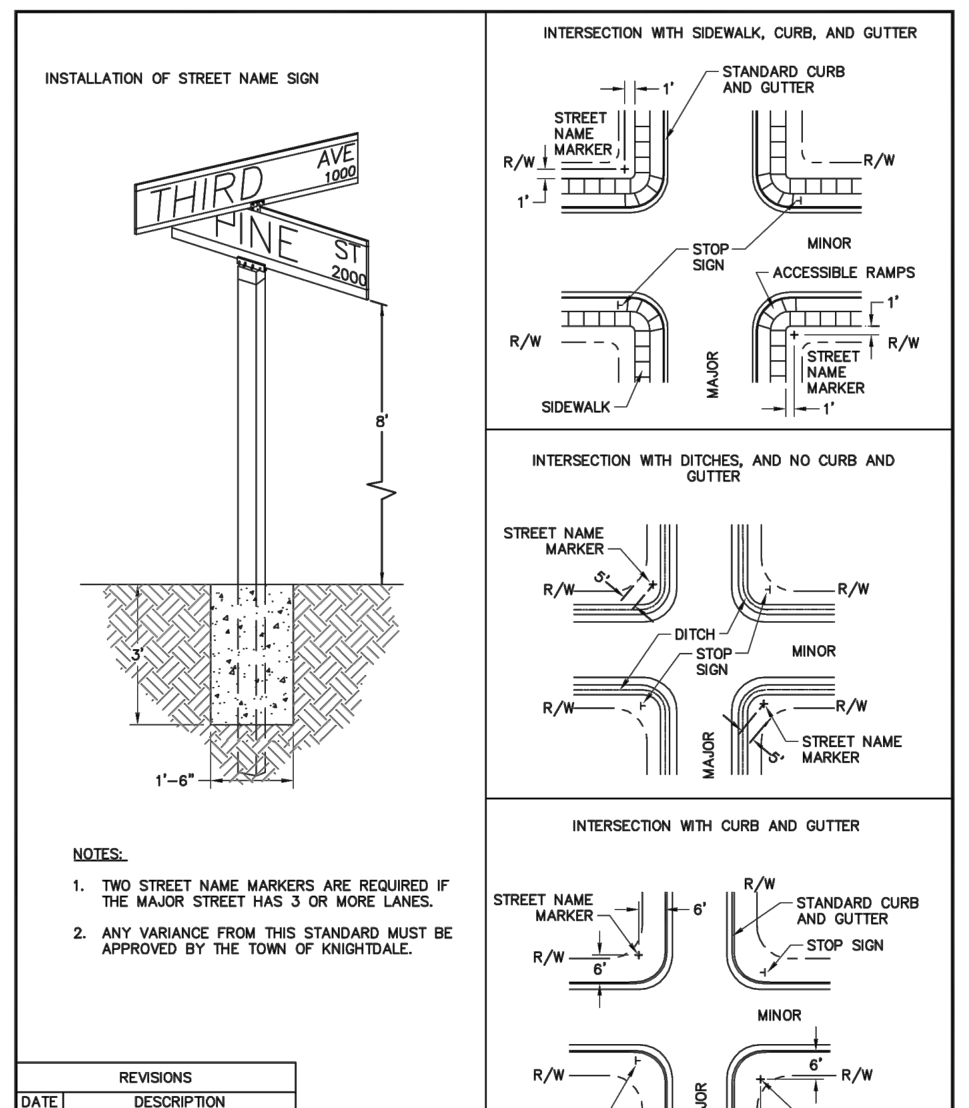
① 8.33% (12:1) MAX RAMP SLOPE
② CROSS SLOPE: 2.00%
③ CURB RAMPS REQUIRE A (4'-0") MINIMUM LANDING WITH A MAXIMUM CROSS SLOPE AND LONGITUDINAL SLOPE OF 2.00% WHERE PEDESTRIANS PERFORM TURNING MANEUVERS. SLOPE TO DRAIN TO CURB.
④ RAMPS AND DOMES SHALL BE INSTALLED THE SAME WIDTH AS THE SIDEWALK.
⑤ IF LENGTH EXCEEDS 5', TRUNCATED DOMES SHALL BE INSTALLED ALONG THE BACK OF THE CURB COVERING THE FULL WIDTH OF THE RAMP.

NOTE: USE SMALL FLARES ONLY WHEN A CURB TYPE DIRECTLY CONFLICTS WITH APPROACHING VEHICULAR TURNING MOVEMENTS.

SHEET 2 OF 8

CITY OF RALEIGH STANDARD DETAIL
REVISIONS | DATE: 8/2020 | NOT TO SCALE
CURB RAMPS (NEW DEVELOPMENT)
T-20.01.2

INSTALLATION OF STREET NAME SIGN

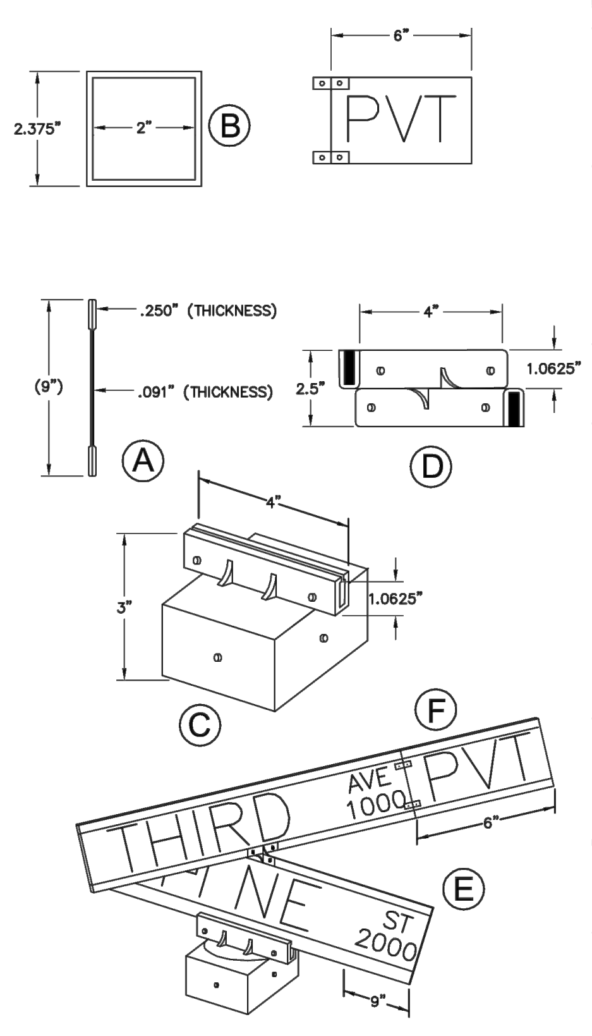


NOTES:

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

REVISIONS	
DATE	DESCRIPTION

TOWN OF KNIGHTDALE STANDARD DETAILS | STREET NAME SIGN 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, GLOSS GALVANIZED STEEL CONTINUOUS MILL DIPPED, WITH NO RAW ENDS; OR 40, 1540 WALL ALUMINUM (SEE DETAIL 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).

REVISIONS	
DATE	DESCRIPTION

TOWN OF KNIGHTDALE STANDARD DETAILS | STREET NAME SIGN | STD. NO. 3.17

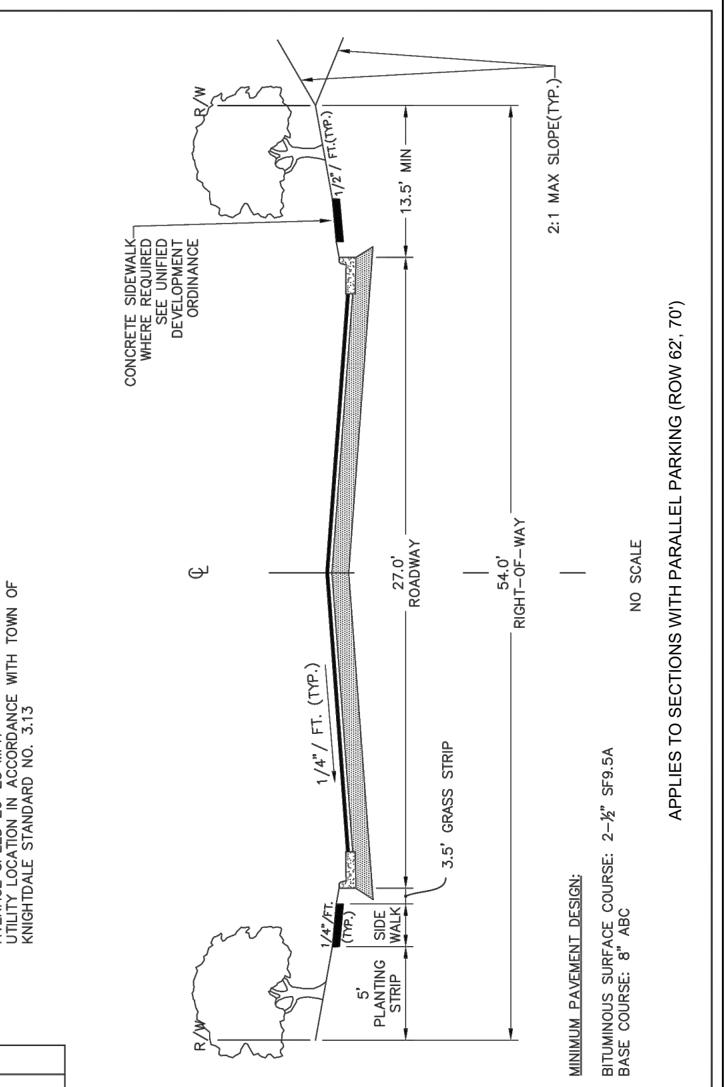
STREET FEATURES:

COORDINATE STREET DESIGN ELEMENTS WITH TOWN STAFF
FLEXIBLE STREET DESIGN:
- REQUIRES 54 FT. OF RIGHT-OF-WAY
- ROADWAY WIDTH OF 27 FT. TO PROVIDE TWO - 11 FT. LANES FOR TWO WAY OPERATION
- 30 IN. CURB & GUTTER
- INFORMAL PARKING
- PLANTING STRIPS - 5 FT. ON EACH SIDE
- SIDEWALKS - 5 FT. ON EACH SIDE

AVERAGE SPEED 20-25 MPH
UTILITY LOCATION IN ACCORDANCE WITH TOWN OF KNIGHTDALE STANDARD NO. 3.13

BUILDINGS & LAND USE:

RESIDENTIAL
- MANY RESIDENTIAL TYPES
- RESIDENCES BROUGHT CLOSE TO SIDEWALK
- CONSISTENT BUILDING LINE RECOMMENDED
- FRONT PORCHES ENCOURAGED



APPLIES TO SECTIONS WITH PARALLEL PARKING (ROW 62', 70')

MINIMUM PAVEMENT DESIGN:

BITUMINOUS SURFACE COURSE: 2-½" SF9.5A
BASE COURSE: 8" ABC

REVISIONS	
DATE	DESCRIPTION

2 OF 2

TOWN OF KNIGHTDALE STANDARD DETAILS | LOCAL STREET SECTION (TWO WAY) | STD. NO. 3.02

MINIMUM PAVEMENT DESIGN:

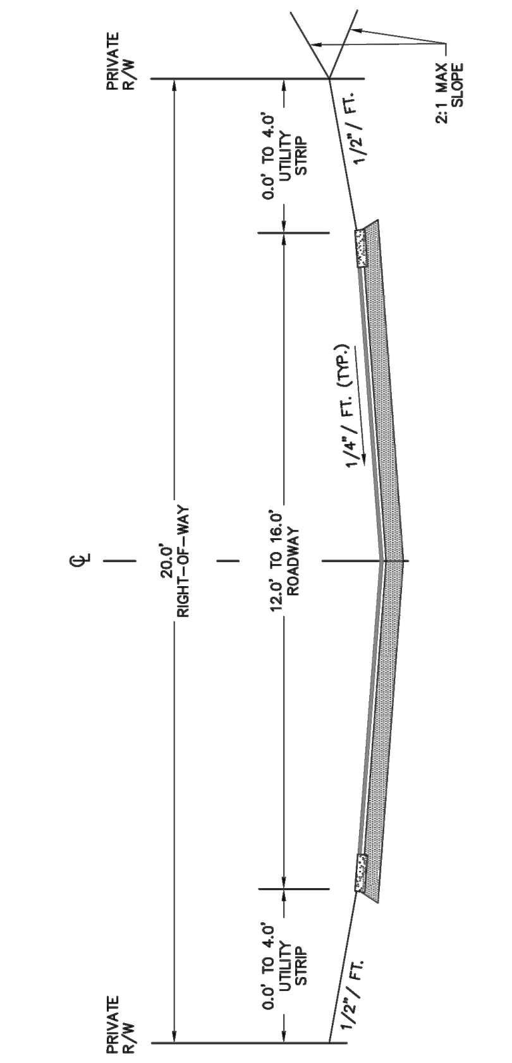
BITUMINOUS SURFACE COURSE: 2-½" S 9.5A
BASE COURSE: 8" ABC

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

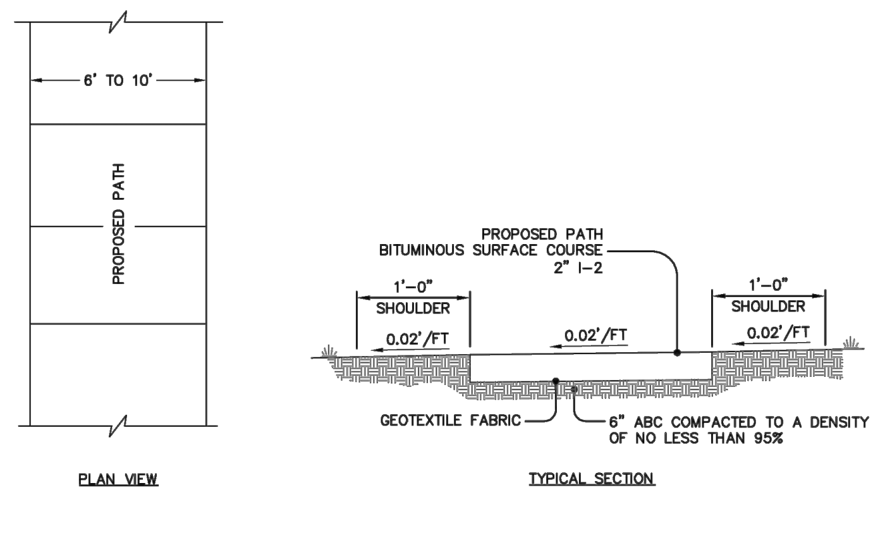
BUILDINGS & LAND USE:

RESIDENTIAL - PRIMARILY SINGLE FAMILY
COMMERCIAL



REVISIONS	
DATE	DESCRIPTION

TOWN OF KNIGHTDALE STANDARD DETAILS | ALLEY SECTION | STD. NO. 3.01

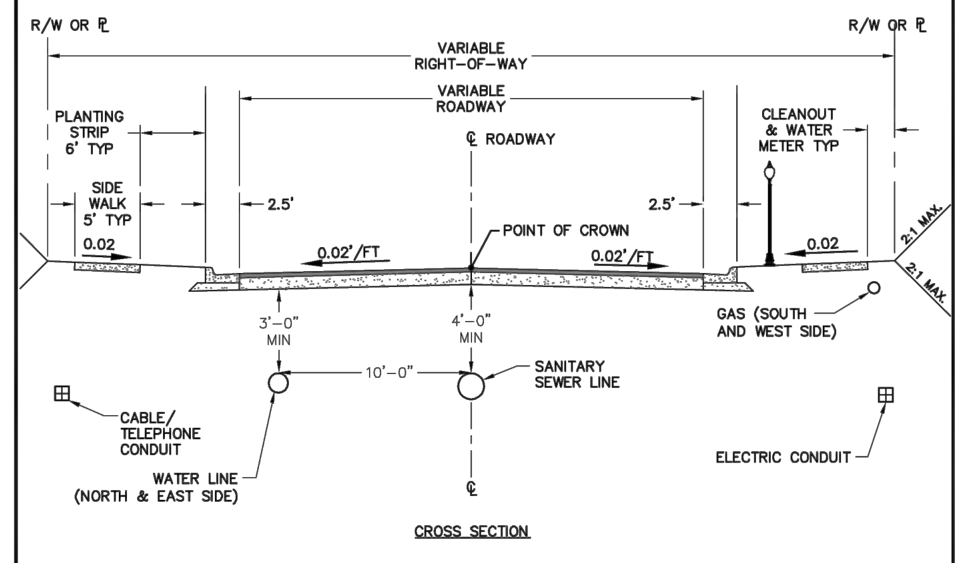


NOTES:

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

REVISIONS	
DATE	DESCRIPTION

TOWN OF KNIGHTDALE STANDARD DETAILS | STANDARD MULTI-USE PATH GREENWAY | STD. NO. 4.09



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

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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TIMMONS GROUP

NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION

KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA

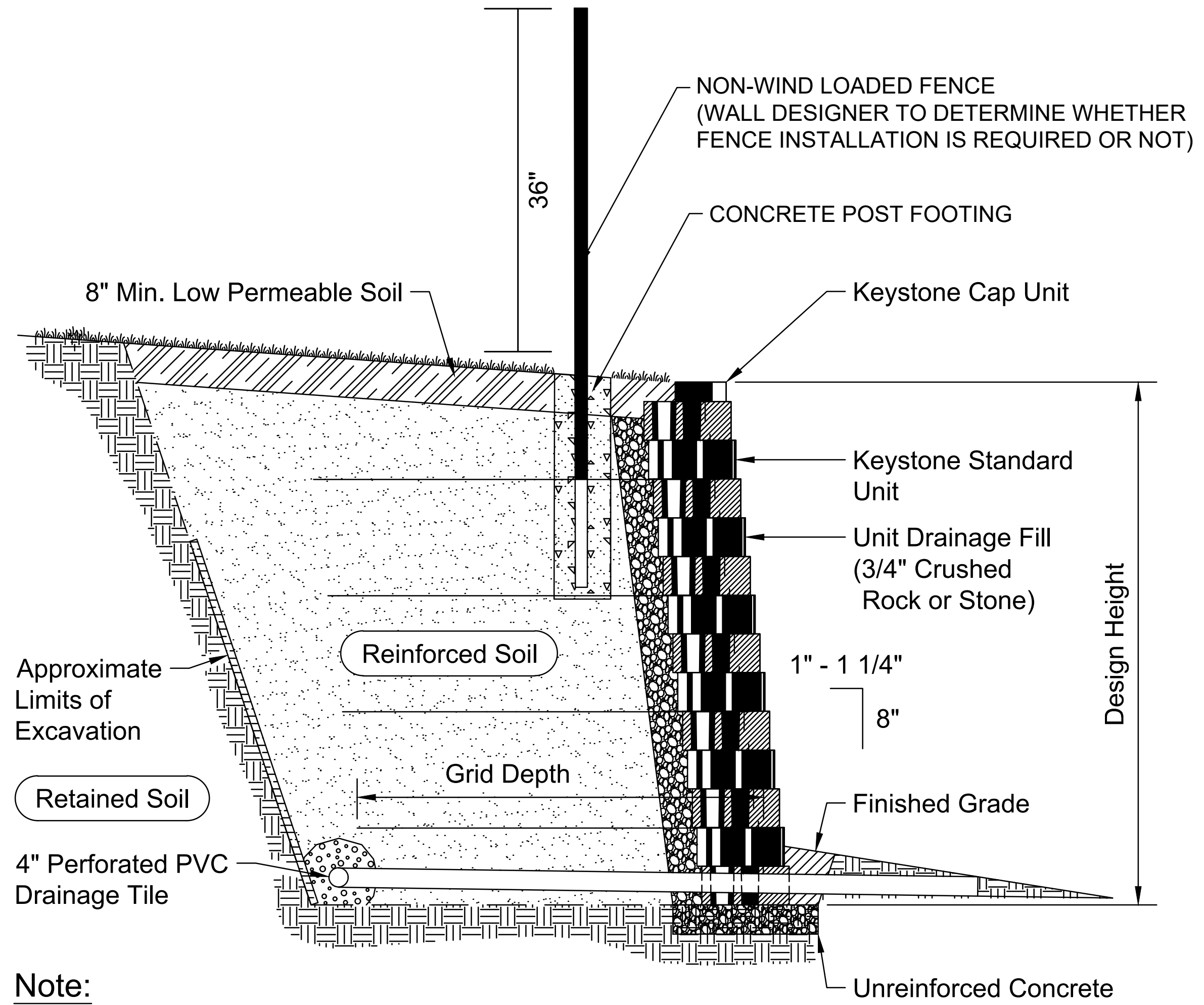
SITE DETAILS

DATE	REVISION DESCRIPTION

DATE	06/22/2021
DRAWN BY	JD. MACMILLAN
DESIGNED BY	JD. MACMILLAN
CHECKED BY	M. ZACCARDO
SCALE	N/A
JOB NO.	44872
SHEET NO.	C7.1

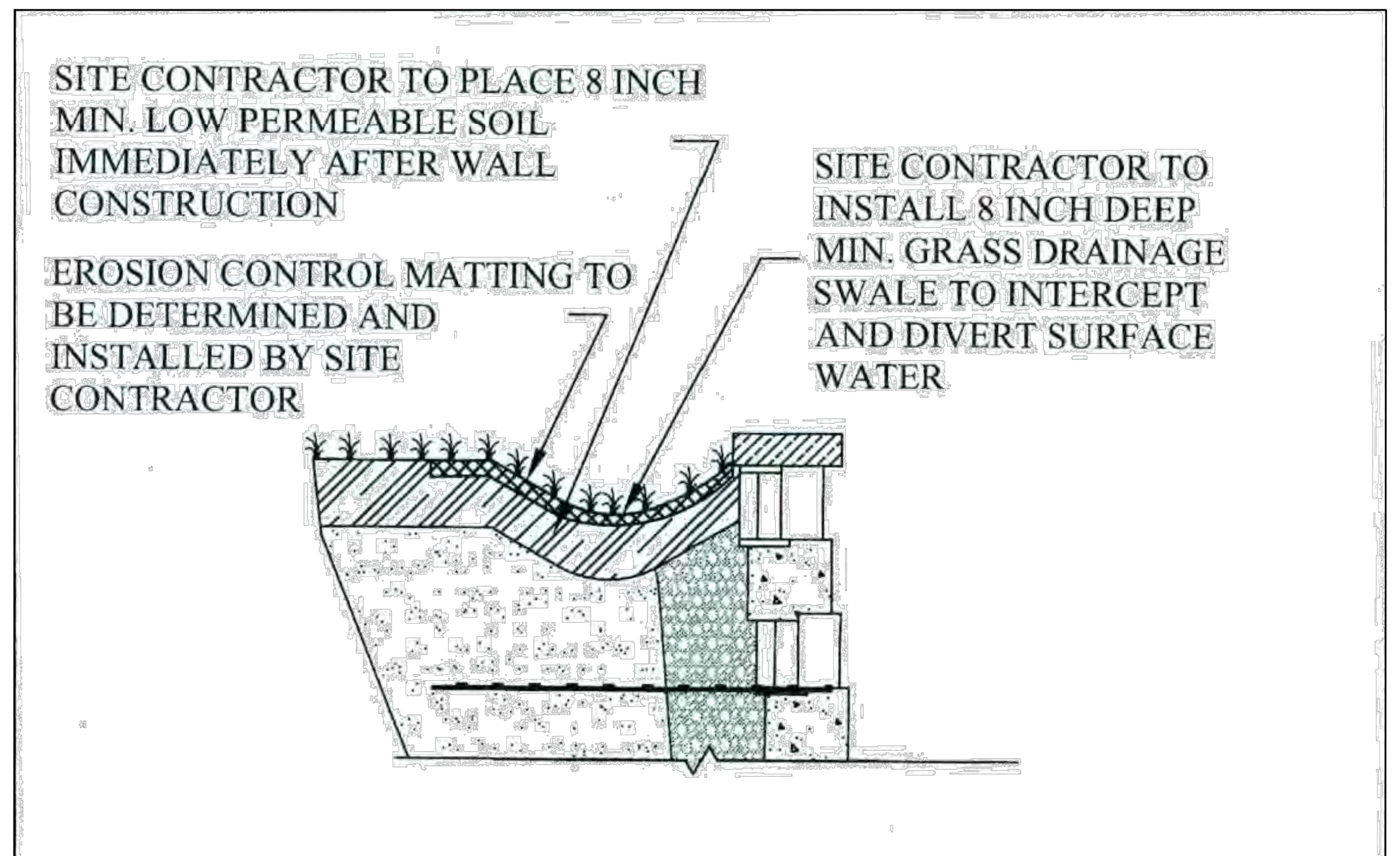
FOR REVIEW ONLY: NOT FOR CONSTRUCTION

S:\331\44872-Stone-Silver\DWG\Sheet\CD\STONE RIVER\44872-331-SR-C7.0-NTDT.dwg | by Thomas Taylor


36"
NON-WIND LOADED FENCE
(WALL DESIGNER TO DETERMINE WHETHER FENCE INSTALLATION IS REQUIRED OR NOT)
CONCRETE POST FOOTING
8" Min. Low Permeable Soil
Keystone Cap Unit
Keystone Standard Unit
Unit Drainage Fill (3/4" Crushed Rock or Stone)
Reinforced Soil
1" - 1 1/4"
8"
Design Height
Approximate Limits of Excavation
Grid Depth
Retained Soil
Finished Grade
4" Perforated PVC Drainage Tile
Unreinforced Concrete or Crushed Stone Leveling Pad
Foundation Soil

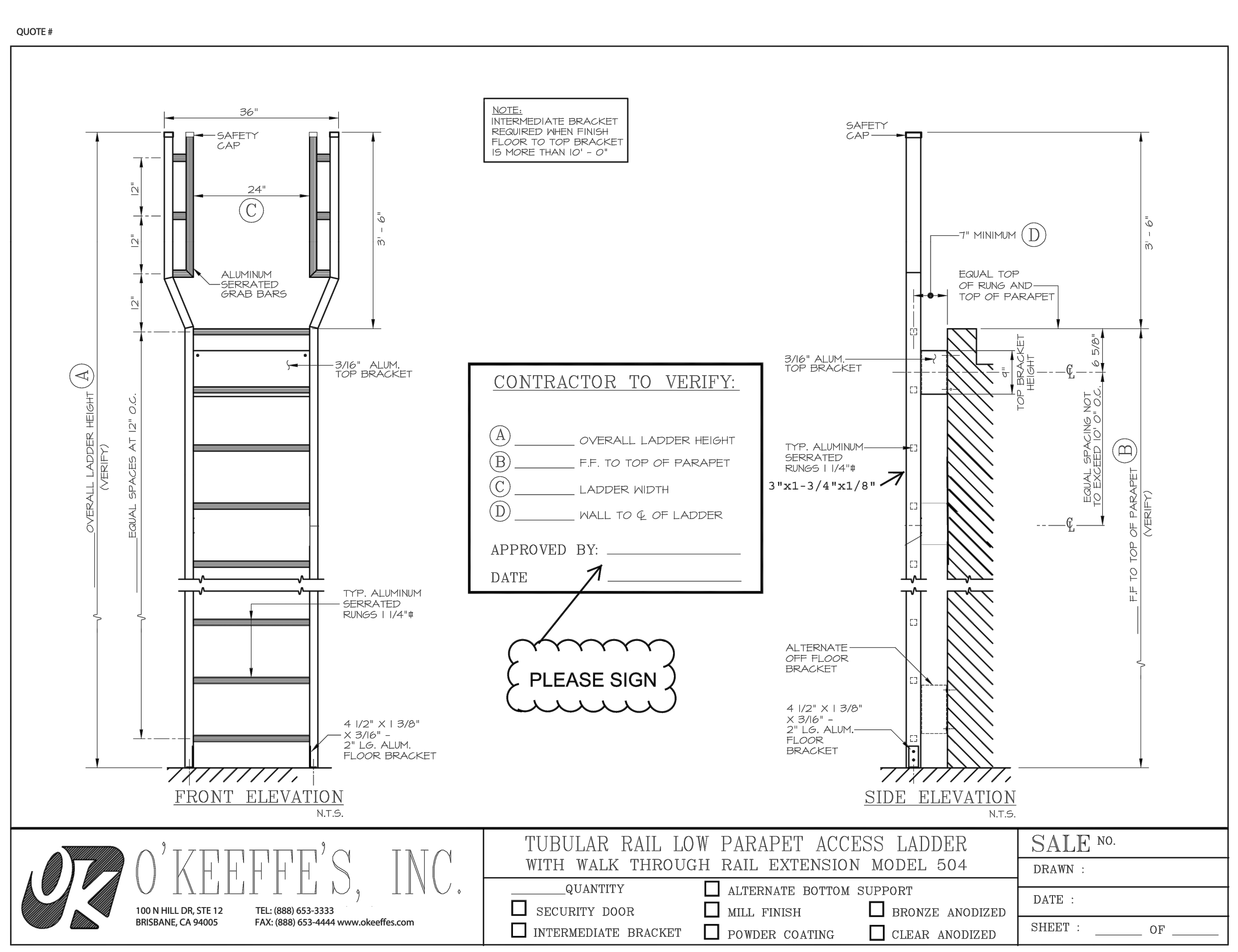
Note:
When site conditions require, wrap drainage tile in 3/4" aggregate and filter fabric with drainage composite or aggregate back drain system, as directed by geotechnical engineer.

Typical Reinforced Wall Section
(Designed By Others)


SITE CONTRACTOR TO PLACE 8 INCH MIN. LOW PERMEABLE SOIL IMMEDIATELY AFTER WALL CONSTRUCTION
EROSION CONTROL MATTING TO BE DETERMINED AND INSTALLED BY SITE CONTRACTOR
SITE CONTRACTOR TO INSTALL 8 INCH DEEP MIN. GRASS DRAINAGE SWALE TO INTERCEPT AND DIVERT SURFACE WATER

DRAINAGE SWALE DETAIL

SCALE: NONE


QUOTE #

36"
SAFETY CAP
24"
C
12"
12"
12"
3' - 6"
ALUMINUM SERRATED GRAB BARS
3/16" ALUM. TOP BRACKET
OVERALL LADDER HEIGHT (VERIFY)
A
EQUAL SPACES AT 12" O.C.
TYP. ALUMINUM SERRATED RUNGS 1 1/4"ɸ
4 1/2" X 1 3/8" X 3/16" - 2" LG. ALUM. FLOOR BRACKET
FRONT ELEVATION
N.T.S.
SAFETY CAP
7" MINIMUM
D
EQUAL TOP OF RUNG AND TOP OF PARAPET
3/16" ALUM. TOP BRACKET
9"
TOP BRACKET HEIGHT
6 5/8"
TYP. ALUMINUM SERRATED RUNGS 1 1/4"ɸ
3"x1-3/4"x1/8"
EQUAL SPACING NOT TO EXCEED 10' 0" O.C.
B
F.F. TO TOP OF PARAPET (VERIFY)
ALTERNATE OFF FLOOR BRACKET
4 1/2" X 1 3/8" X 3/16" - 2" LG. ALUM. FLOOR BRACKET
SIDE ELEVATION
N.T.S.

NOTE:
INTERMEDIATE BRACKET REQUIRED WHEN FINISH FLOOR TO TOP BRACKET IS MORE THAN 10' - 0"

CONTRACTOR TO VERIFY:

Ⓐ ________ OVERALL LADDER HEIGHT
Ⓑ ________ F.F. TO TOP OF PARAPET
Ⓒ ________ LADDER WIDTH
Ⓓ ________ WALL TO ℄ OF LADDER

APPROVED BY: ____________
DATE ____________

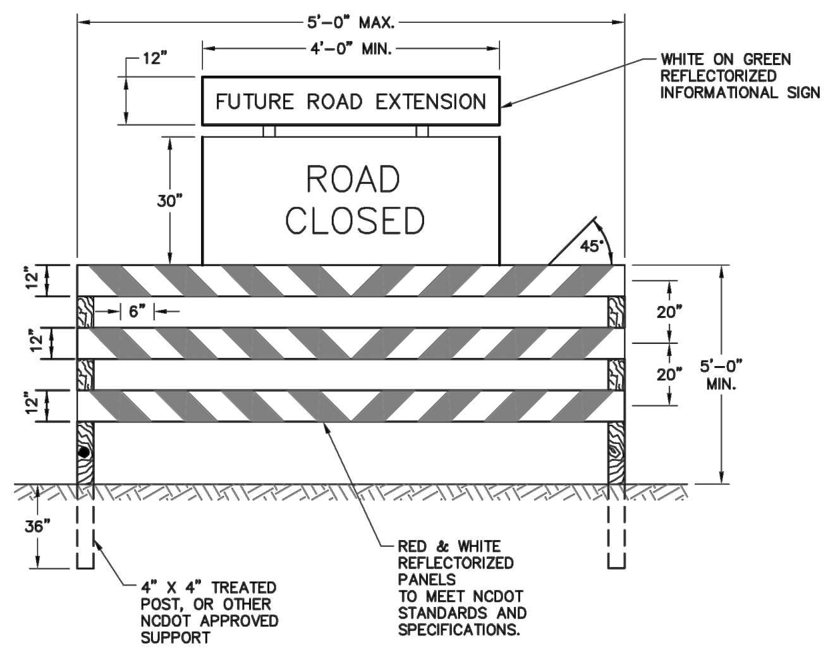
PLEASE SIGN

O'KEEFFE'S, INC.
100 N HILL DR, STE 12
BRISBANE, CA 94005
TEL: (888) 653-3333
FAX: (888) 653-4444 www.okeeffes.com

TUBULAR RAIL LOW PARAPET ACCESS LADDER
WITH WALK THROUGH RAIL EXTENSION MODEL 504

________QUANTITY
☐ SECURITY DOOR
☐ INTERMEDIATE BRACKET
☐ ALTERNATE BOTTOM SUPPORT
☐ MILL FINISH
☐ POWDER COATING
☐ BRONZE ANODIZED
☐ CLEAR ANODIZED

SALE NO.
DRAWN :
DATE :
SHEET : ______ OF ______


5'-0" MAX.
4'-0" MIN.
12"
FUTURE ROAD EXTENSION
WHITE ON GREEN REFLECTORIZED INFORMATIONAL SIGN
30"
ROAD CLOSED
45°
12"
6"
12"
12"
20"
20"
5'-0" MIN.
36"
4" X 4" TREATED POST, OR OTHER NCDOT APPROVED SUPPORT
RED & WHITE REFLECTORIZED PANELS TO MEET NCDOT STANDARDS AND SPECIFICATIONS.

NOTES:

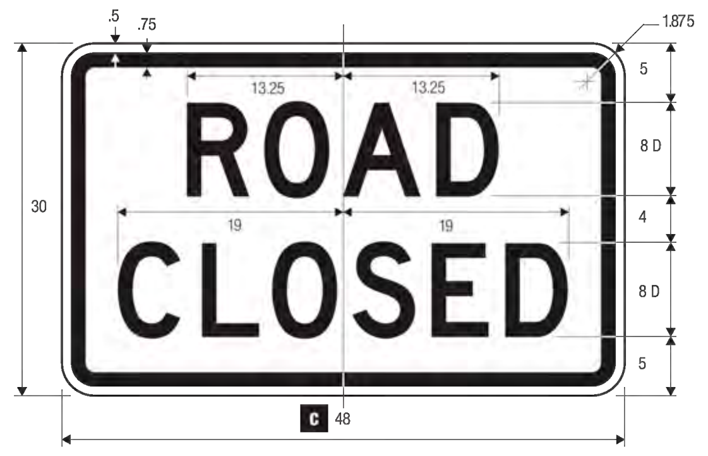
1. BARRICADE(S) TO BE ERECTED ACROSS ENTIRE ROADWAY INCLUDING CURB & GUTTER.
2. ADVANCE WARNING SIGN W14-1 (DEAD END) SHALL BE PLACED JUST AFTER LAST INTERSECTING STREET.
3. MARKINGS FOR BARRICADE RAILS SHALL BE REFLECTIVE AND ALTERNATE RED AND WHITE STRIPS.
4. "ROAD CLOSED" SIGN SHALL MEET SPECIFICATIONS 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

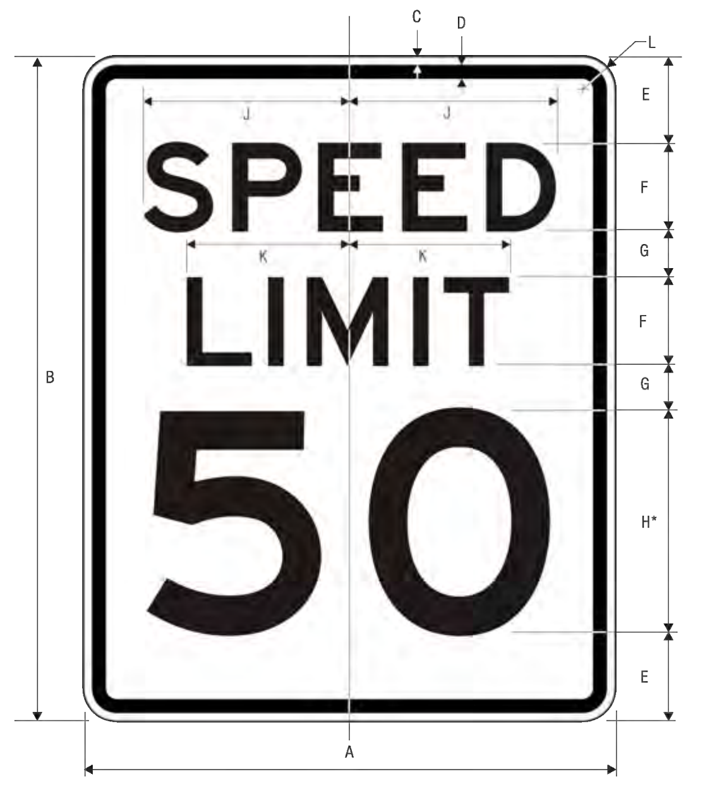
STD. NO.
3.18



R11-2
ROAD CLOSED

COLORS: LEGEND — BLACK
BACKGROUND— WHITE (RETROREFLECTIVE)

1-153



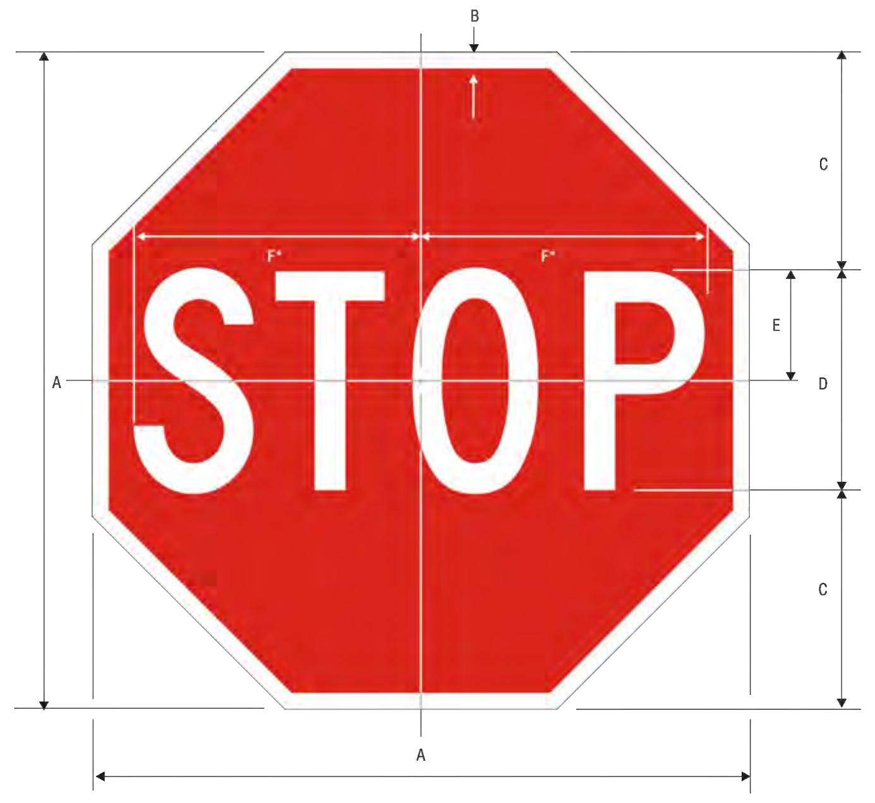
R2-1
SPEED LIMIT (ENGLISH)

*Optically space numerals about centerline

	A	B	C	D	E	F	G	H	J	K	L
	18	24	.375	.625	3	3 E	2	8 E	7.188	5.5	1.5
C	24	30	.375	.625	4	4 E	2	10 E	9.563	7.313	1.5
	36	48	.625	.875	6	6 E	5	14 E	14.375	11	2.25
	48	60	.75	1.25	8	8 E	6	16 E	19.125	14.625	3

COLORS: LEGEND — BLACK
BACKGROUND — WHITE (RETROREFLECTIVE)

1-10



R1-1
STOP

*Reduce spacing 40%

	A	B	C	D	E	F
	18	.375	6	6 C	3	7.75
	24	.625	8	8 C	4	10
C	30	.75	10	10 C	5	12.5
	36	.875	12	12 C	6	15
	48	1.25	16	16 C	8	20

COLORS: LEGEND — WHITE (RETROREFLECTIVE)
BACKGROUND — RED (RETROREFLECTIVE)

1-1

TOWN CERTIFICATION

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

BY: ____________________ DATE: ____________
DEVELOPMENT SERVICES ENGINEER

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

BY: ____________________ DATE: ____________
ADMINISTRATOR

M. V. ZACCARDO
6/22/21

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
06/22/2021
DRAWN BY
JD. MACMILLAN
DESIGNED BY
JD. MACMILLAN
CHECKED BY
M. ZACCARDO
SCALE
N/A

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION

KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA

SITE DETAILS

FOR REVIEW ONLY: NOT FOR CONSTRUCTION

JOB NO.
44872
SHEET NO.
C7.2

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S:\331\44872-Stone-River\DWG\Sheet\CD\STONE RIVER\44872-331-SR-C7.0-NTDT.dwg | by: Thomas Taylor

STANDARD UTILITY NOTES (AS APPLICABLE):

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 24" MIN. VERTICAL SEPARATION AT ALL SANITARY SEWER & RCP STORM DRAIN CROSSINGS. WHERE ADEQUATE SEPARATIONS CANNOT BE ACHIEVED, SPECIFY DIP MATERIALS & A CONCRETE CRADLE HAVING 6" MIN. CLEARANCE (PER CORPUD DETAILS W-41 & S-49)
   - f) ALL OTHER UNDERGROUND UTILITIES SHALL CROSS WATER & SEWER FACILITIES WITH 18" MIN. VERTICAL SEPARATION REQUIRED
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. 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
5. 3.0' MINIMUM COVER IS REQUIRED ON ALL WATER MAINS & SEWER FORCEMAINS. 4.0' MINIMUM COVER IS REQUIRED ON ALL REUSE MAINS
6. 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
7. INSTALL ¾" COPPER* WATER SERVICES WITH METERS LOCATED AT ROW OR WITHIN A 2'X2' WATERLINE EASEMENT IMMEDIATELY ADJACENT. NOTE: IT IS THE APPLICANT'S RESPONSIBILITY TO PROPERLY SIZE THE WATER SERVICE FOR EACH CONNECTION TO PROVIDE ADEQUATE FLOW & PRESSURE
8. INSTALL 4" PVC* SEWER SERVICES @ 1.0% MINIMUM GRADE WITH CLEANOUTS LOCATED AT ROW OR EASEMENT LINE & SPACED EVERY 75 LINEAR FEET MAXIMUM
9. PRESSURE REDUCING VALVES ARE REQUIRED ON ALL WATER SERVICES EXCEEDING 80 PSI; BACKWATER VALVES ARE REQUIRED ON ALL SANITARY SEWER SERVICES HAVING BUILDING DRAINS LOWER THAN 1.0' ABOVE THE NEXT UPSTREAM MANHOLE
10. 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.
11. NCDOT / RAILROAD ENCROACHMENT AGREEMENTS ARE REQUIRED FOR ANY UTILITY WORK (INCLUDING MAIN EXTENSIONS & SERVICE TAPS) WITHIN STATE OR RAILROAD ROW PRIOR TO CONSTRUCTION
12. GREASE INTERCEPTOR / OIL WATER SEPARATOR SIZING CALCULATIONS & INSTALLATION SPECIFICATIONS SHALL BE APPROVED BY THE CORPUD FOG PROGRAM COORDINATOR PRIOR TO ISSUANCE OF A BUILDING PERMIT. CONTACT TIM BEASLEY AT (919) 996-2334 OR TIMOTHY.BEASLEY@RALEIGHNC.GOV FOR MORE INFORMATION
13. CROSS-CONNECTION CONTROL PROTECTION DEVICES ARE REQUIRED BASED ON DEGREE OF HEALTH HAZARD INVOLVED AS LISTED IN APPENDIX-B OF THE RULES GOVERNING PUBLIC WATER SYSTEMS IN NORTH CAROLINA. THESE GUIDELINES ARE THE MINIMUM REQUIREMENTS. THE DEVICES SHALL MEET AMERICAN SOCIETY OF SANITARY ENGINEERING (ASSE) STANDARDS OR BE ON THE UNIVERSITY OF SOUTHERN CALIFORNIA APPROVAL LIST. THE DEVICES SHALL BE INSTALLED AND TESTED (BOTH INITIAL AND PERIODIC TESTING THEREAFTER) IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS OR THE LOCAL CROSS-CONNECTION CONTROL PROGRAM, WHICHEVER IS MORE STRINGENT. CONTACT JOANIE HARTLEY AT (919) 996-5923 OR JOANIE.HARTLEY@RALEIGHNC.GOV FOR MORE INFORMATION

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

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

City of Raleigh Development Approval ____________________

Raleigh Water Review Officer

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

Water and Sewer Permits (If applicable)

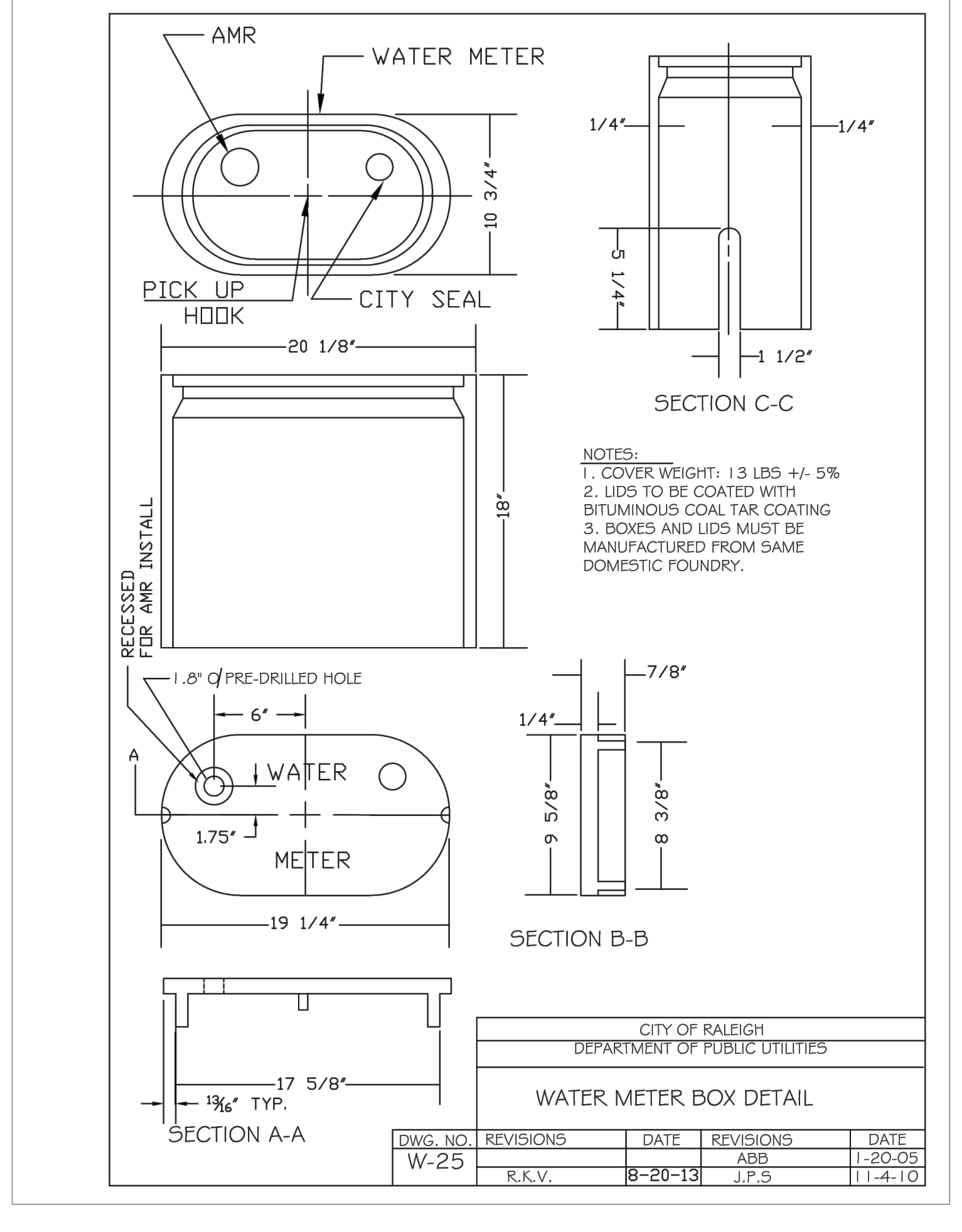
The City of Raleigh consents to the connection and extension of the City's **Public Sewer System** as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. **City of Raleigh Public Utilities Department Permit #** S-5745

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-3737

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 # ____________

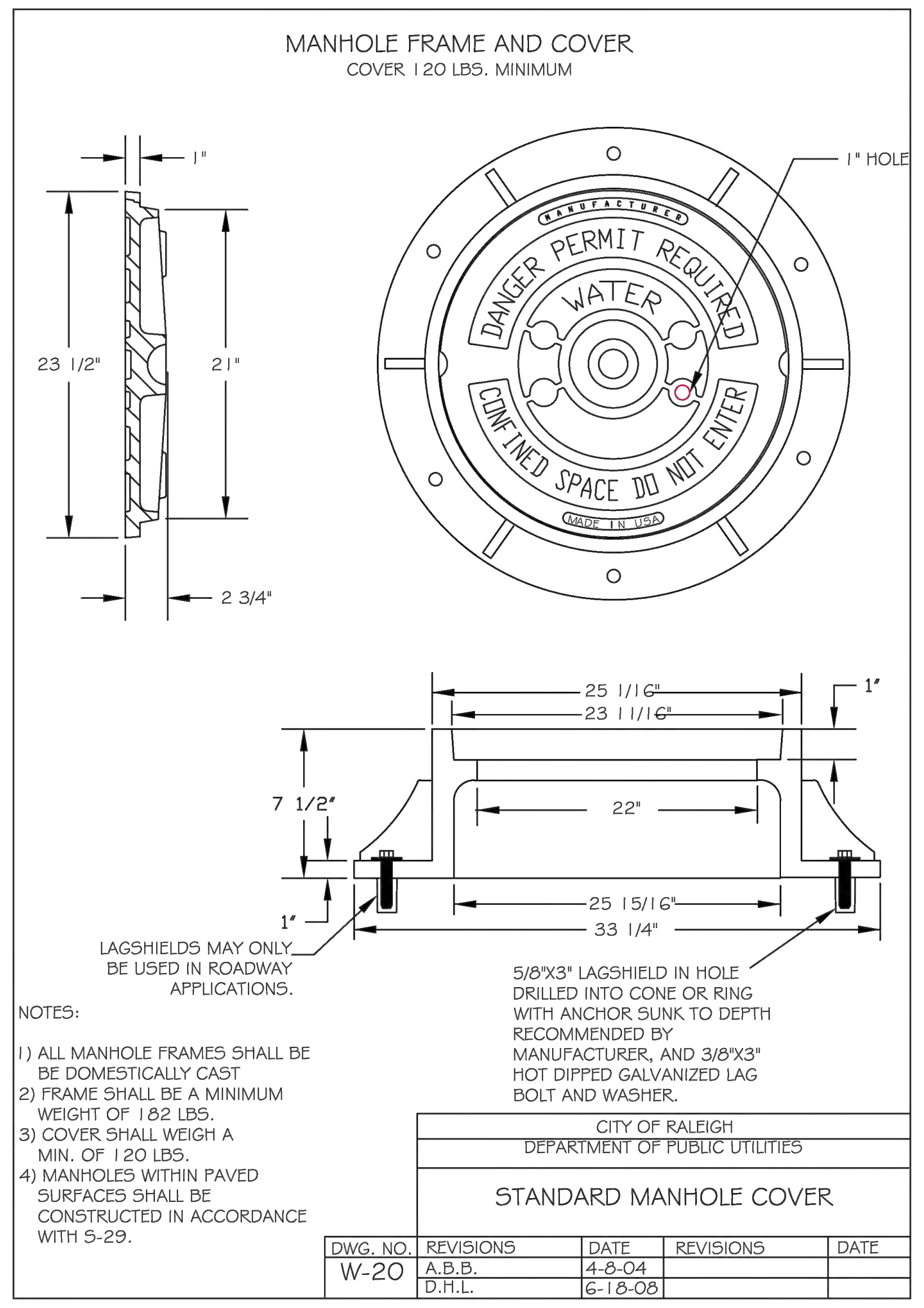
6/22/21



NOTES:
1. COVER WEIGHT: 13 LBS +/- 5%
2. LIDS TO BE COATED WITH BITUMINOUS COAL TAR COATING
3. BOXES AND LIDS MUST BE MANUFACTURED FROM SAME DOMESTIC FOUNDRY.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
WATER METER BOX DETAIL

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-25			ABB	1-20-05
	R.K.V.	8-20-13	J.P.S	11-4-10



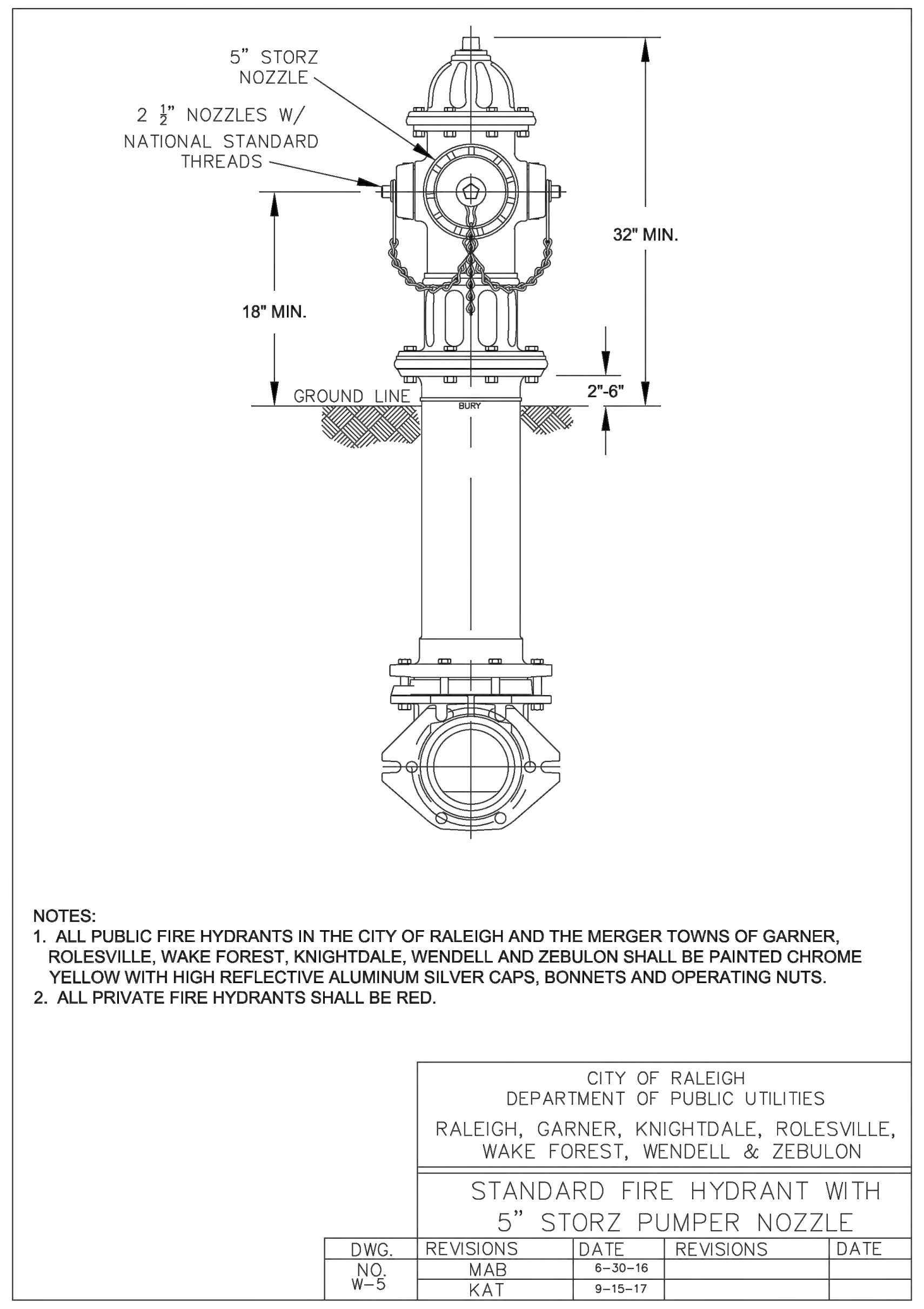
LAGSHIELDS MAY ONLY BE USED IN ROADWAY APPLICATIONS.

5/8"X3" LAGSHIELD IN HOLE DRILLED INTO CONE OR RING WITH ANCHOR SUNK TO DEPTH RECOMMENDED BY MANUFACTURER, AND 3/8"X3" HOT DIPPED GALVANIZED LAG BOLT AND WASHER.

NOTES:
1) ALL MANHOLE FRAMES SHALL BE BE DOMESTICALLY CAST
2) FRAME SHALL BE A MINIMUM WEIGHT OF 182 LBS.
3) COVER SHALL WEIGH A MIN. OF 120 LBS.
4) MANHOLES WITHIN PAVED SURFACES SHALL BE CONSTRUCTED IN ACCORDANCE WITH S-29.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
STANDARD MANHOLE COVER

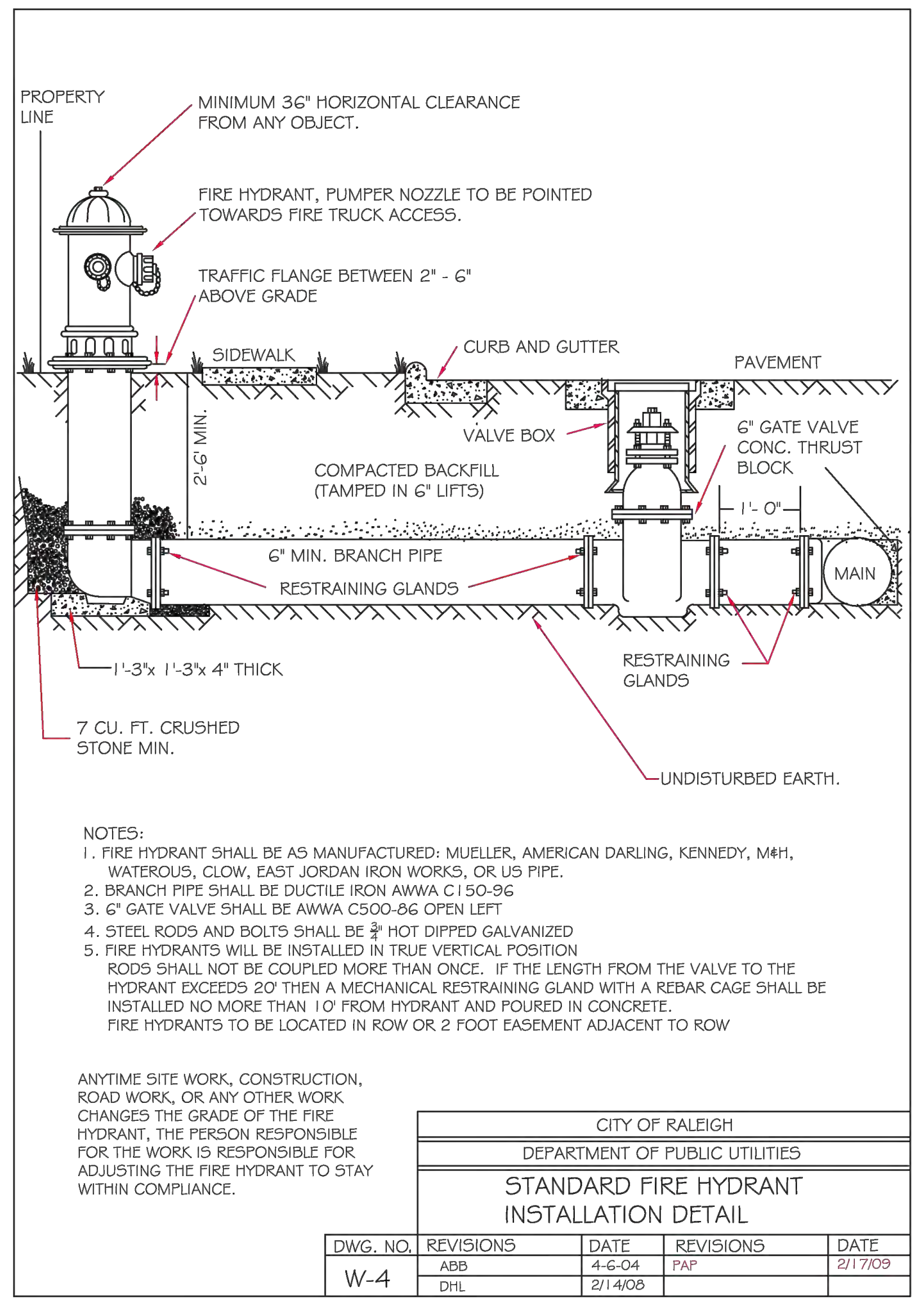
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-20	A.B.B.	4-8-04		
	D.H.L.	6-18-08		



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		

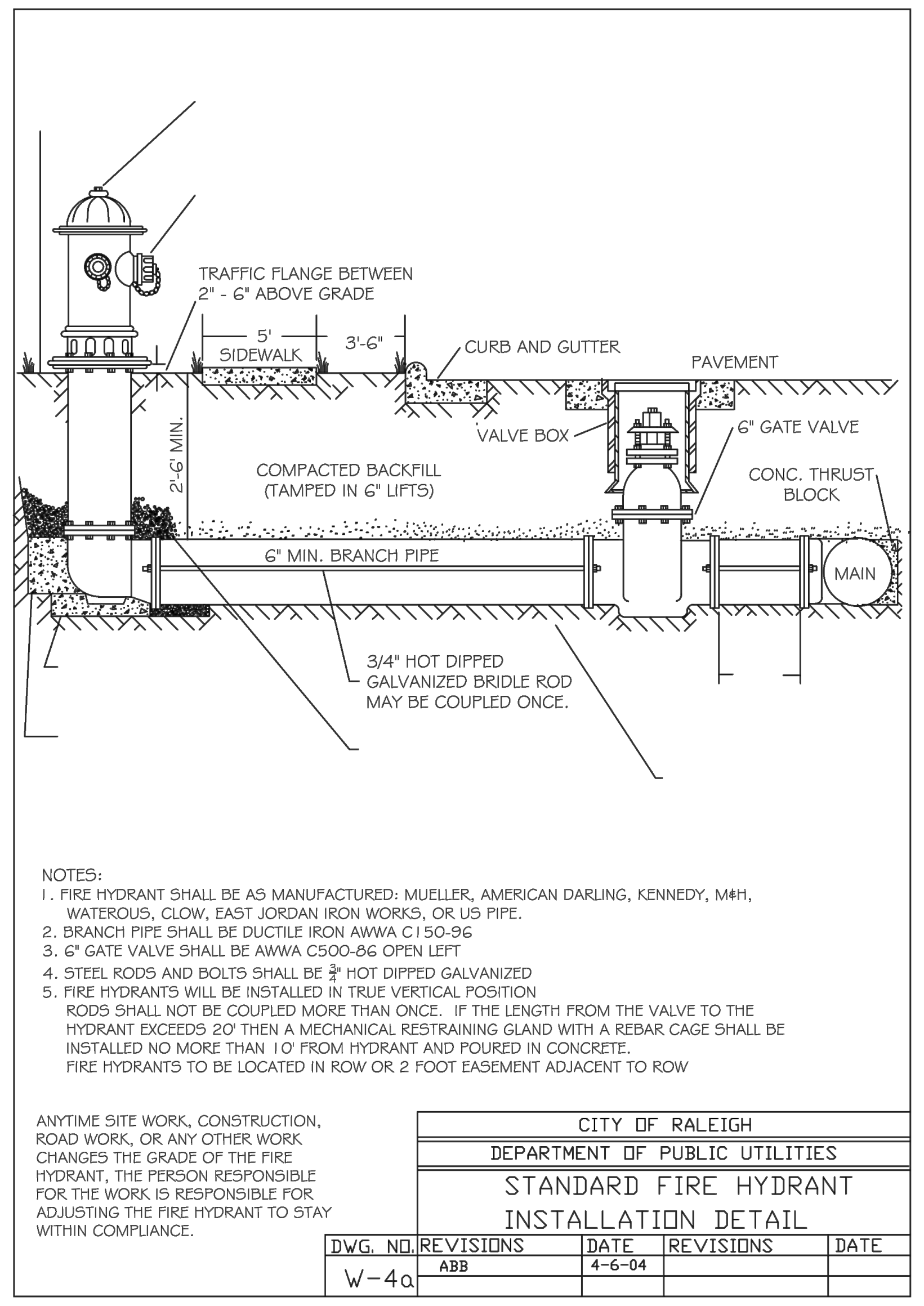

PROPERTY LINE
MINIMUM 36" HORIZONTAL CLEARANCE FROM ANY OBJECT.
FIRE HYDRANT, PUMPER NOZZLE TO BE POINTED TOWARDS FIRE TRUCK ACCESS.
TRAFFIC FLANGE BETWEEN 2" - 6" ABOVE GRADE
SIDEWALK
CURB AND GUTTER
PAVEMENT
VALVE BOX
6" GATE VALVE CONC. THRUST BLOCK
2'-6" MIN.
COMPACTED BACKFILL (TAMPED IN 6" LIFTS)
1'-0"
6" MIN. BRANCH PIPE
RESTRAINING GLANDS
MAIN
1'-3"x 1'-3"x 4" THICK
7 CU. FT. CRUSHED STONE MIN.
RESTRAINING GLANDS
UNDISTURBED EARTH.

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 $\frac{3}{4}$" 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		

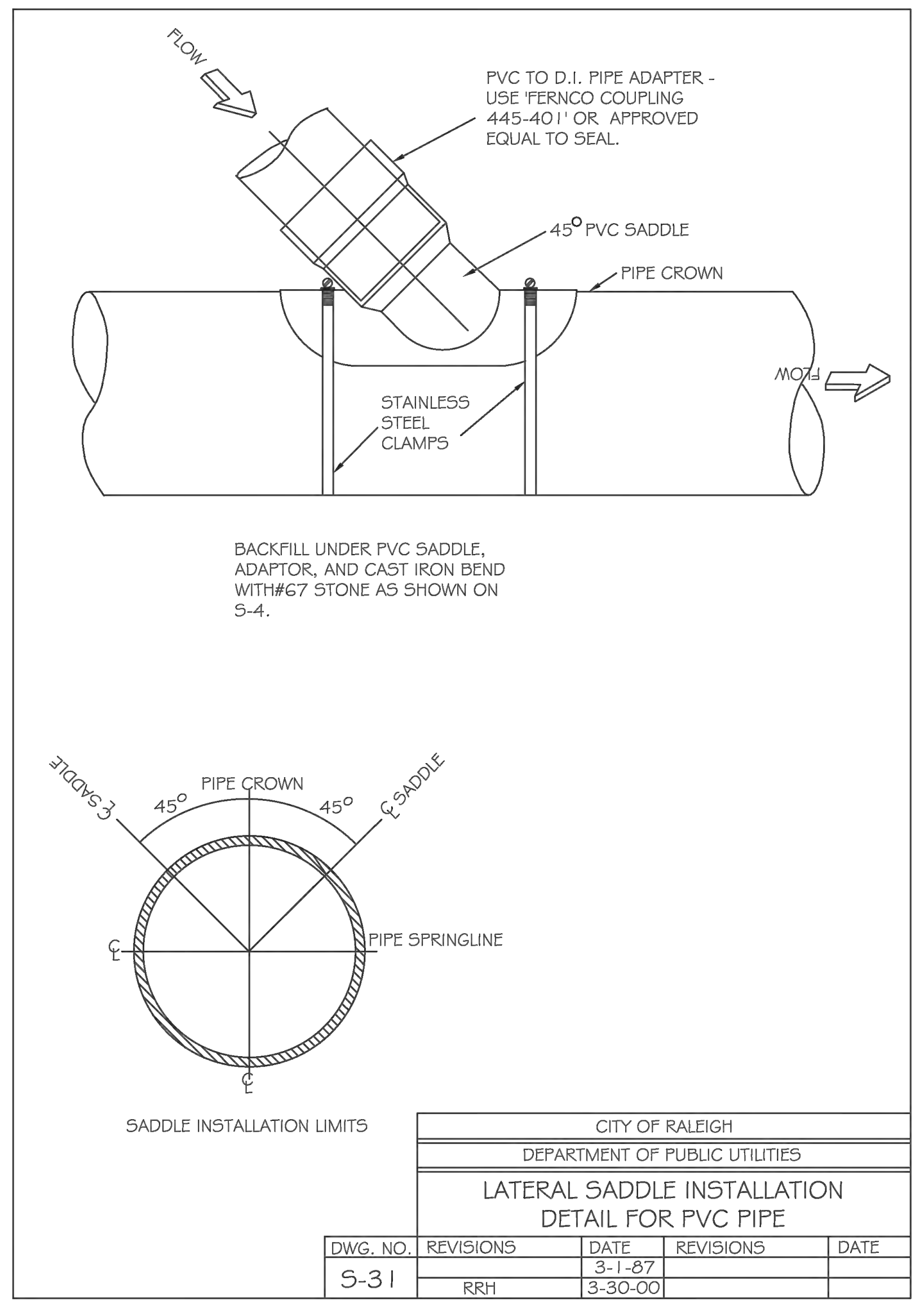

TRAFFIC FLANGE BETWEEN 2" - 6" ABOVE GRADE
5'
SIDEWALK
3'-6"
CURB AND GUTTER
PAVEMENT
VALVE BOX
6" GATE VALVE
2'-6" MIN.
COMPACTED BACKFILL (TAMPED IN 6" LIFTS)
CONC. THRUST BLOCK
6" MIN. BRANCH PIPE
MAIN
3/4" HOT DIPPED GALVANIZED BRIDLE ROD MAY BE COUPLED ONCE.

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 $\frac{3}{4}$" 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.

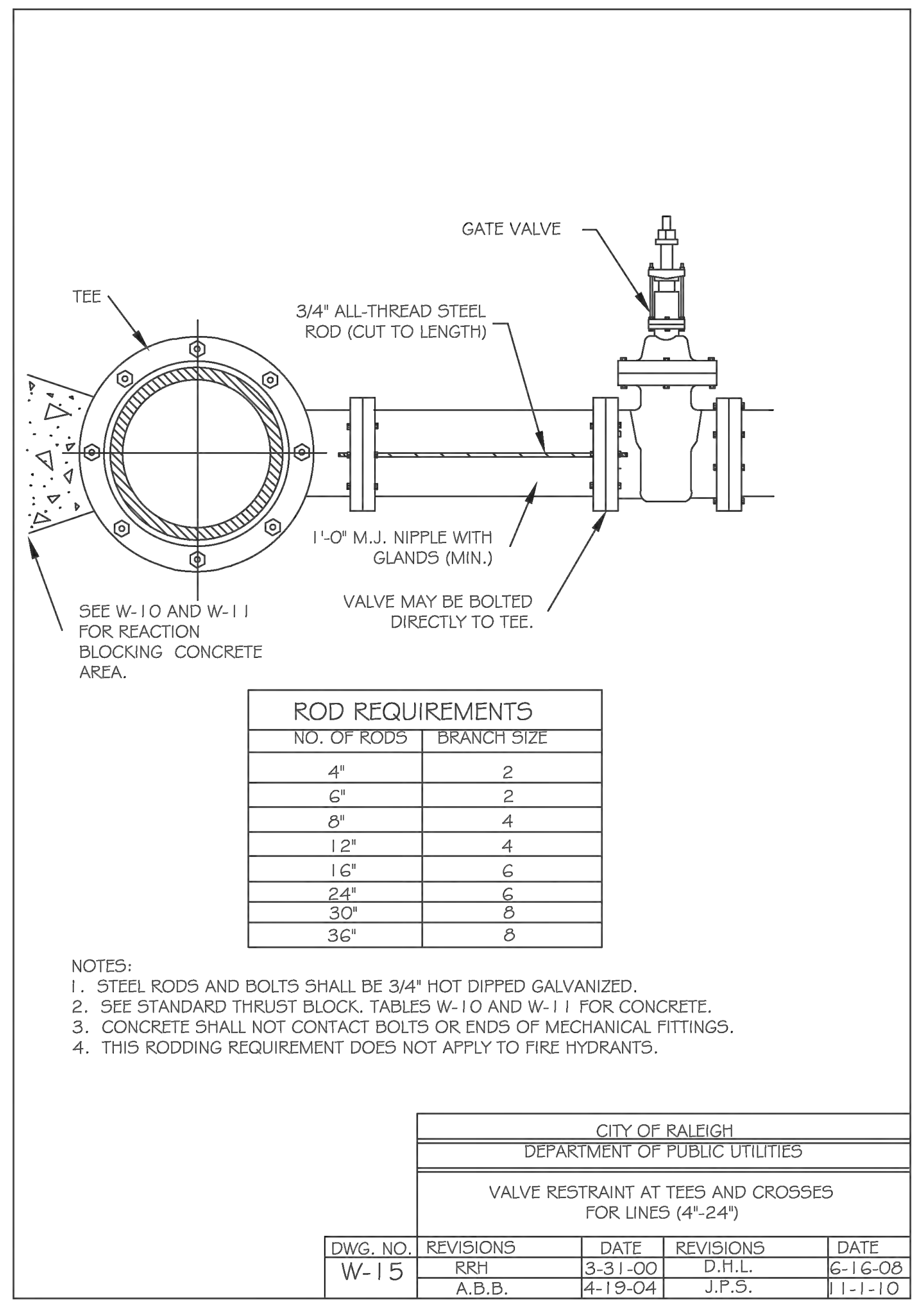
CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
STANDARD FIRE HYDRANT INSTALLATION DETAIL

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-4a	ABB	4-6-04		


FLOW
PVC TO D.I. PIPE ADAPTER - USE FERNCO COUPLING 445-401 OR APPROVED EQUAL TO SEAL.
45° PVC SADDLE
PIPE CROWN
FLOW
STAINLESS STEEL CLAMPS
BACKFILL UNDER PVC SADDLE, ADAPTOR, AND CAST IRON BEND WITH #67 STONE AS SHOWN ON S-4.
PIPE CROWN
45°
45°
SADDLE
PIPE SPRINGLINE
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		


GATE VALVE
TEE
3/4" ALL-THREAD STEEL ROD (CUT TO LENGTH)
1'-0" M.J. NIPPLE WITH GLANDS (MIN.)
VALVE MAY BE BOLTED DIRECTLY TO TEE.
SEE W-10 AND W-11 FOR REACTION BLOCKING CONCRETE AREA.

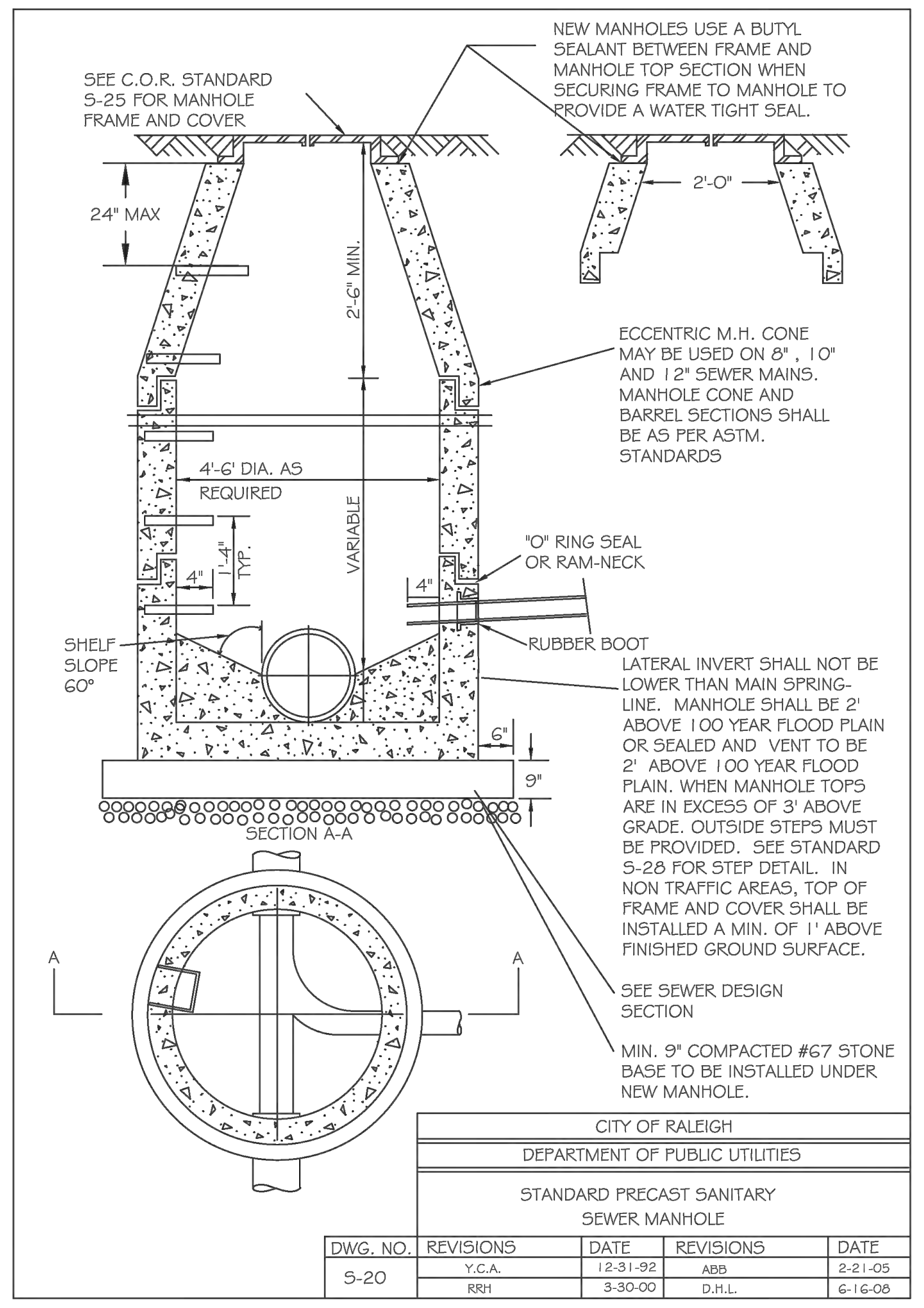
ROD REQUIREMENTS

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.

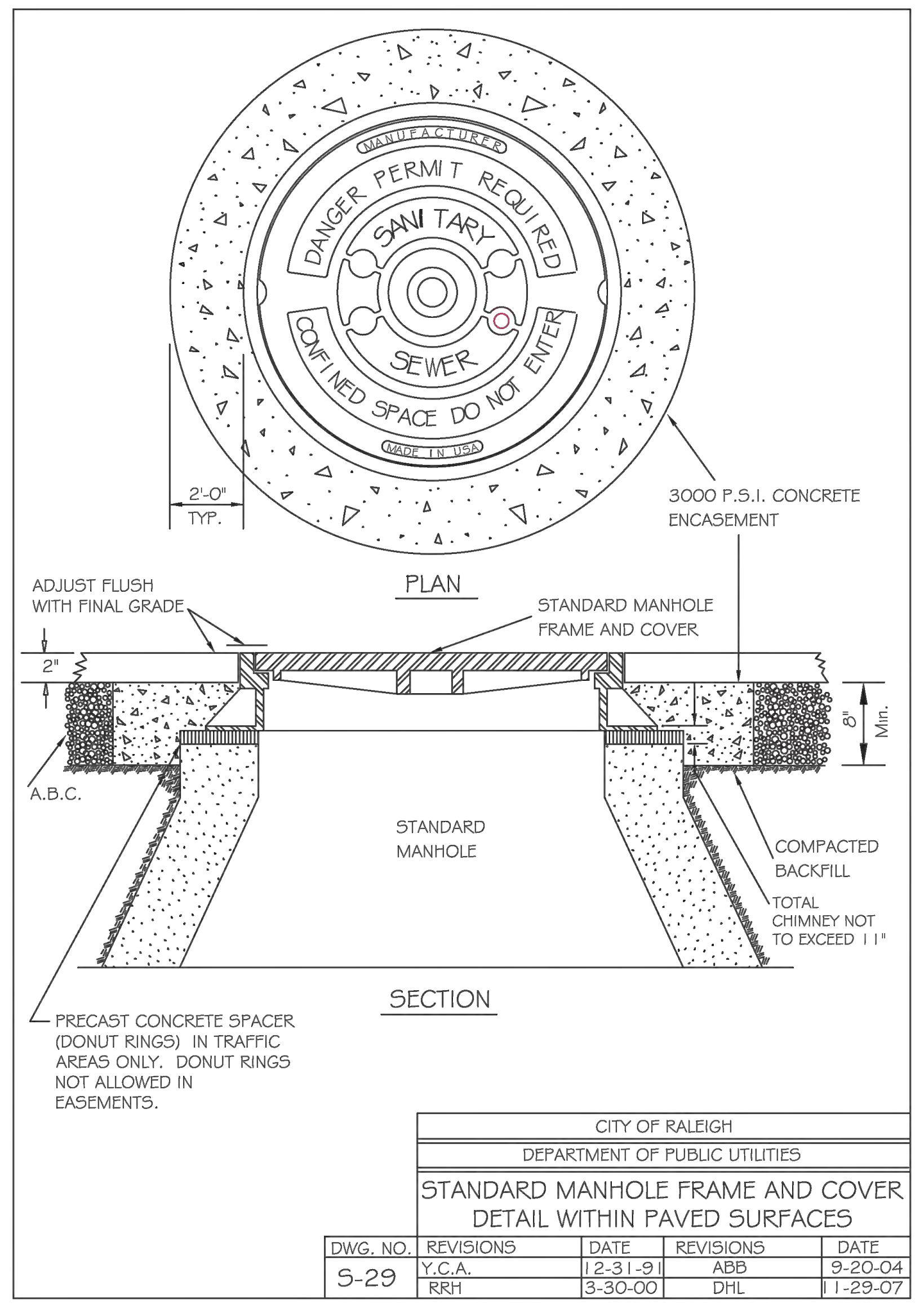
CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
VALVE RESTRAINT AT TEES AND CROSSES FOR LINES (4"-24")

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


SEE C.O.R. STANDARD S-25 FOR MANHOLE FRAME AND COVER
NEW MANHOLES USE A BUTYL SEALANT BETWEEN FRAME AND MANHOLE TOP SECTION WHEN SECURING FRAME TO MANHOLE TO PROVIDE A WATER TIGHT SEAL.
24" MAX
2'-6" MIN.
2'-0"
ECCENTRIC M.H. CONE MAY BE USED ON 8", 10" AND 12" SEWER MAINS. MANHOLE CONE AND BARREL SECTIONS SHALL BE AS PER ASTM. STANDARDS
4'-6' DIA. AS REQUIRED
VARIABLE
1'-4" TYP.
4"
"O" RING SEAL OR RAM-NECK
4"
RUBBER BOOT
SHELF SLOPE 60°
LATERAL INVERT SHALL NOT BE LOWER THAN MAIN SPRING-LINE. MANHOLE SHALL BE 2' ABOVE 100 YEAR FLOOD PLAIN OR SEALED AND VENT TO BE 2' ABOVE 100 YEAR FLOOD PLAIN. WHEN MANHOLE TOPS ARE IN EXCESS OF 3' ABOVE GRADE. OUTSIDE STEPS MUST BE PROVIDED. SEE STANDARD S-28 FOR STEP DETAIL. IN NON TRAFFIC AREAS, TOP OF FRAME AND COVER SHALL BE INSTALLED A MIN. OF 1' ABOVE FINISHED GROUND SURFACE.
6"
9"
SECTION A-A
A
A
SEE SEWER DESIGN SECTION
MIN. 9" COMPACTED #67 STONE BASE TO BE INSTALLED UNDER NEW MANHOLE.

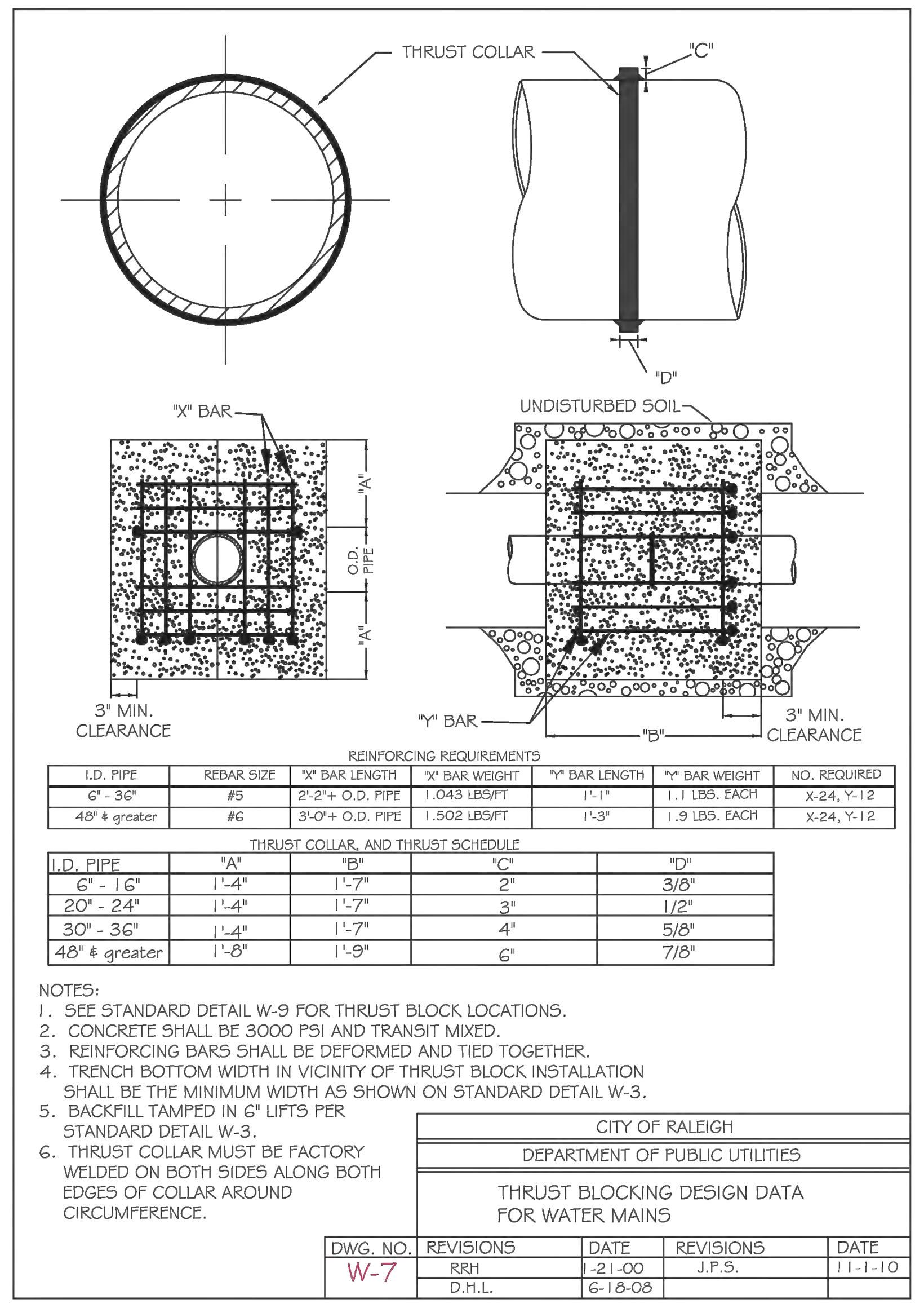
CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
STANDARD PRECAST SANITARY SEWER MANHOLE

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


DANGER PERMIT REQUIRED
SANITARY
SEWER
CONFINED SPACE DO NOT ENTER
MADE IN USA
2'-0" TYP.
3000 P.S.I. CONCRETE ENCASEMENT
PLAN
ADJUST FLUSH WITH FINAL GRADE
STANDARD MANHOLE FRAME AND COVER
2"
8" Min.
A.B.C.
STANDARD MANHOLE
COMPACTED BACKFILL
TOTAL CHIMNEY NOT TO EXCEED 11"
SECTION
PRECAST CONCRETE SPACER (DONUT RINGS) IN TRAFFIC AREAS ONLY. DONUT RINGS NOT ALLOWED IN EASEMENTS.

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



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		

THIS DRAWING PREPARED AT THE
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SCALE	N/A

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION
KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA
WATER AND SEWER DETAILS

JOB NO.	44872
SHEET NO.	C7.3

S:\331\44872-Stone-Silver\DWG\Sheet\CD\STONE RIVER\44872-331-SR-C7.0-NTDT.dwg | by: Thomas Taylor

TOWN CERTIFICATION

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

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ADMINISTRATOR

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-5745

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-3737

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.

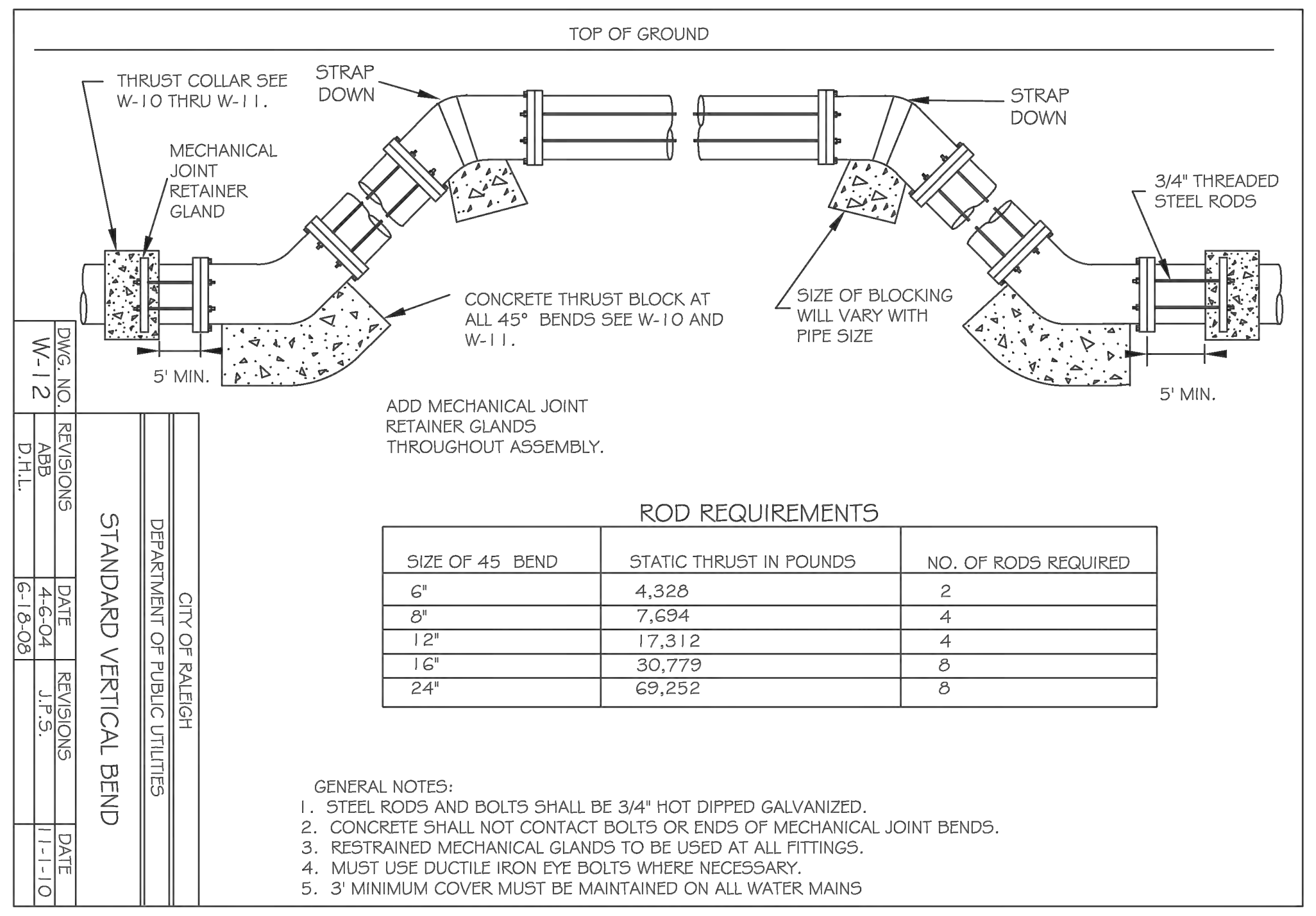
City of Raleigh Public Utilities Department Permit # ____________

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

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

City of Raleigh Development Approval ____________________

Raleigh Water Review Officer


TOP OF GROUND
THRUST COLLAR SEE W-10 THRU W-11.
STRAP DOWN
MECHANICAL JOINT RETAINER GLAND
STRAP DOWN
3/4" THREADED STEEL RODS
CONCRETE THRUST BLOCK AT ALL 45° BENDS SEE W-10 AND W-11.
SIZE OF BLOCKING WILL VARY WITH PIPE SIZE
5' MIN.
5' MIN.
ADD MECHANICAL JOINT RETAINER GLANDS THROUGHOUT ASSEMBLY.

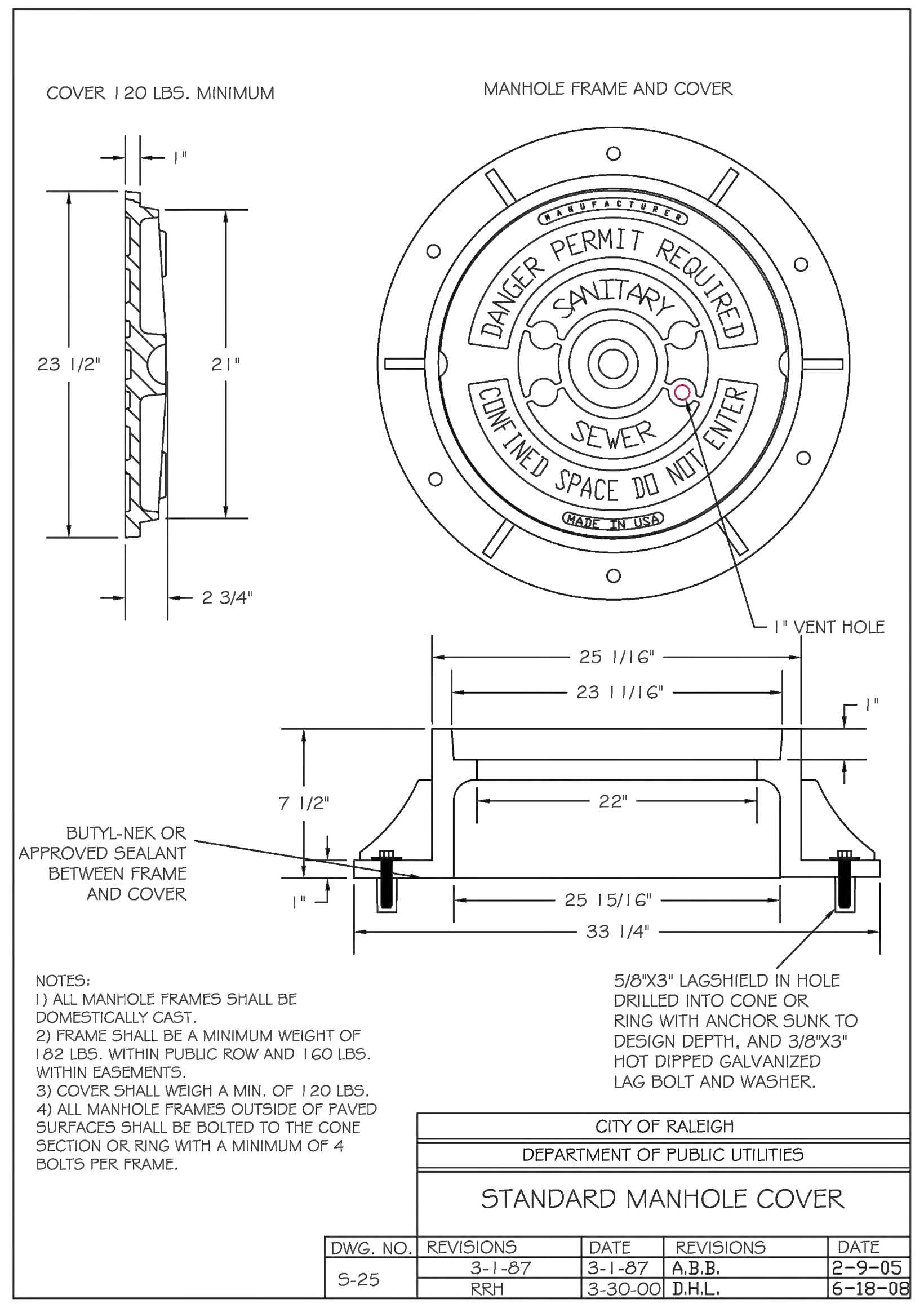
ROD REQUIREMENTS

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

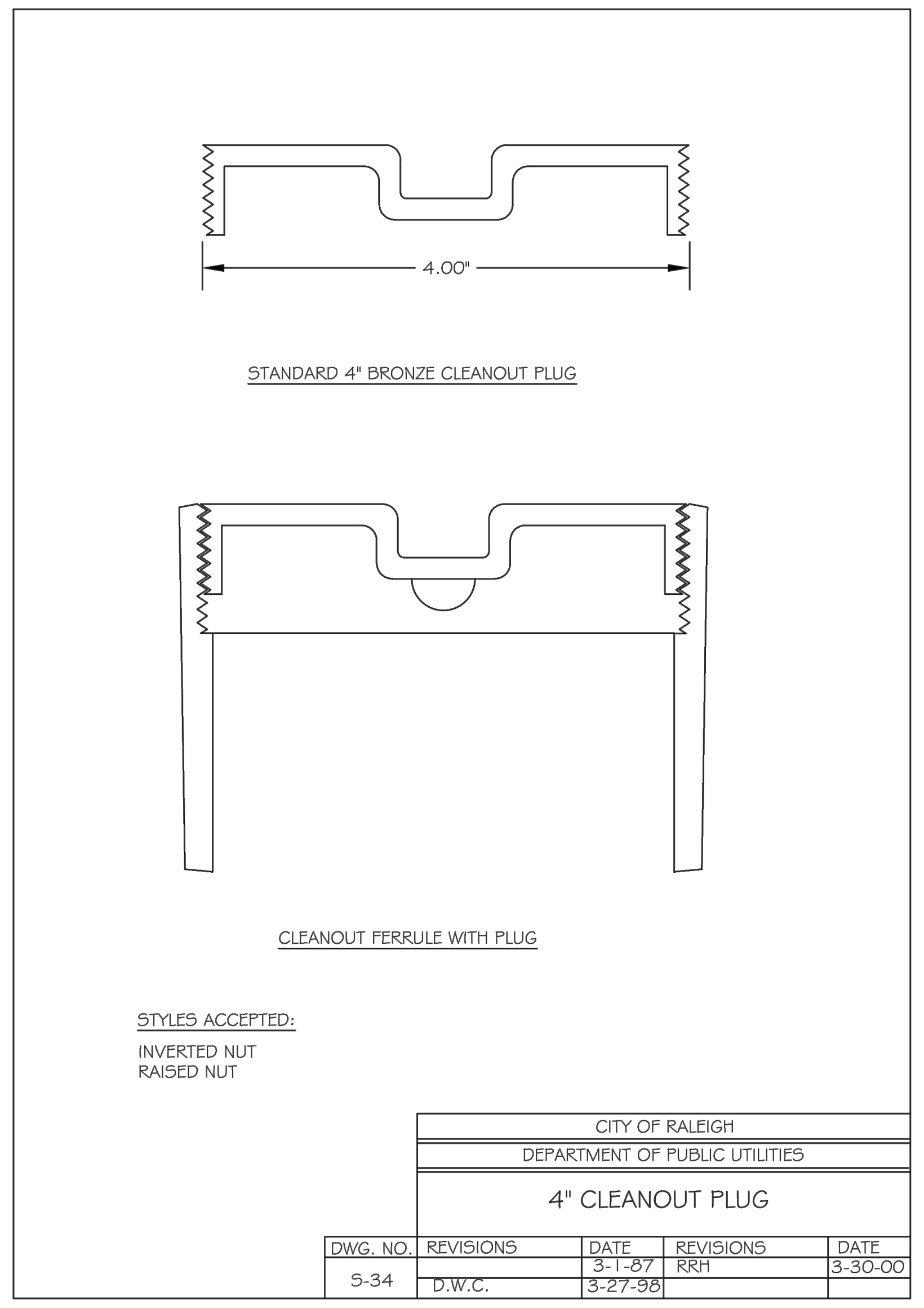
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-12	ABB D.H.L.	4-6-04 6-18-08	J.P.S.	11-1-10


COVER 120 LBS. MINIMUM
MANHOLE FRAME AND COVER
1"
23 1/2"
21"
2 3/4"
MANUFACTURER
DANGER PERMIT REQUIRED
SANITARY
SEWER
CONFINED SPACE DO NOT ENTER
MADE IN USA
1" VENT HOLE
25 1/16"
23 11/16"
1"
7 1/2"
22"
BUTYL-NEK OR APPROVED SEALANT BETWEEN FRAME AND COVER
1"
25 15/16"
33 1/4"
5/8"X3" LAGSHIELD IN HOLE DRILLED INTO CONE OR RING WITH ANCHOR SUNK TO DESIGN DEPTH, AND 3/8"X3" HOT DIPPED GALVANIZED LAG BOLT AND WASHER.

NOTES:
1) ALL MANHOLE FRAMES SHALL BE DOMESTICALLY CAST.
2) FRAME SHALL BE A MINIMUM WEIGHT OF 182 LBS. WITHIN PUBLIC ROW AND 160 LBS. WITHIN EASEMENTS.
3) COVER SHALL WEIGH A MIN. OF 120 LBS.
4) ALL MANHOLE FRAMES OUTSIDE OF PAVED SURFACES SHALL BE BOLTED TO THE CONE SECTION OR RING WITH A MINIMUM OF 4 BOLTS PER FRAME.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
STANDARD MANHOLE COVER

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-25	3-1-87 RRH	3-1-87 3-30-00	A.B.B. D.H.L.	2-9-05 6-18-08



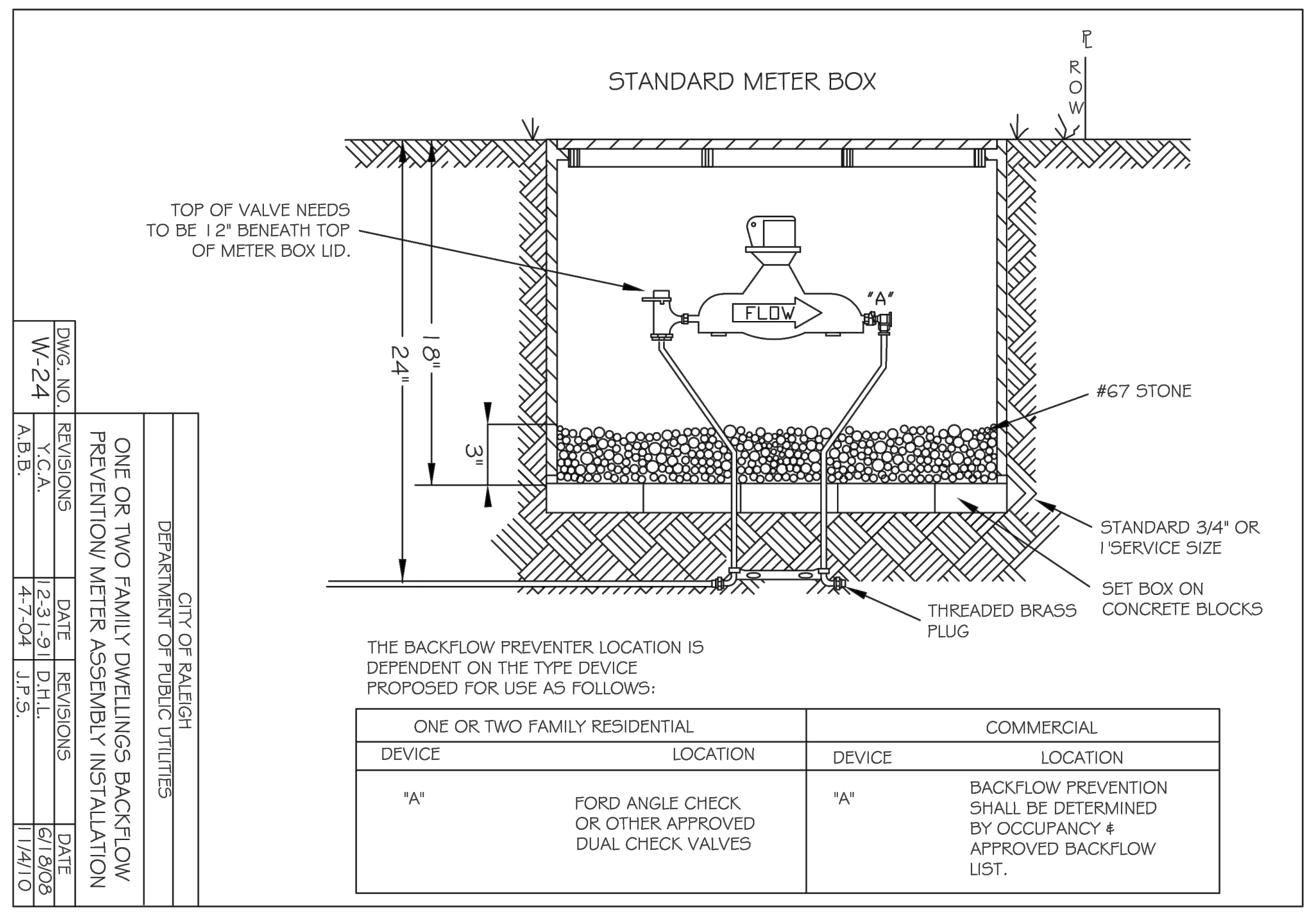
STANDARD 4" BRONZE CLEANOUT PLUG

CLEANOUT FERRULE WITH PLUG

STYLES ACCEPTED:
INVERTED NUT
RAISED NUT

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
4" CLEANOUT PLUG

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-34	 D.W.C.	3-1-87 3-27-98	RRH	3-30-00

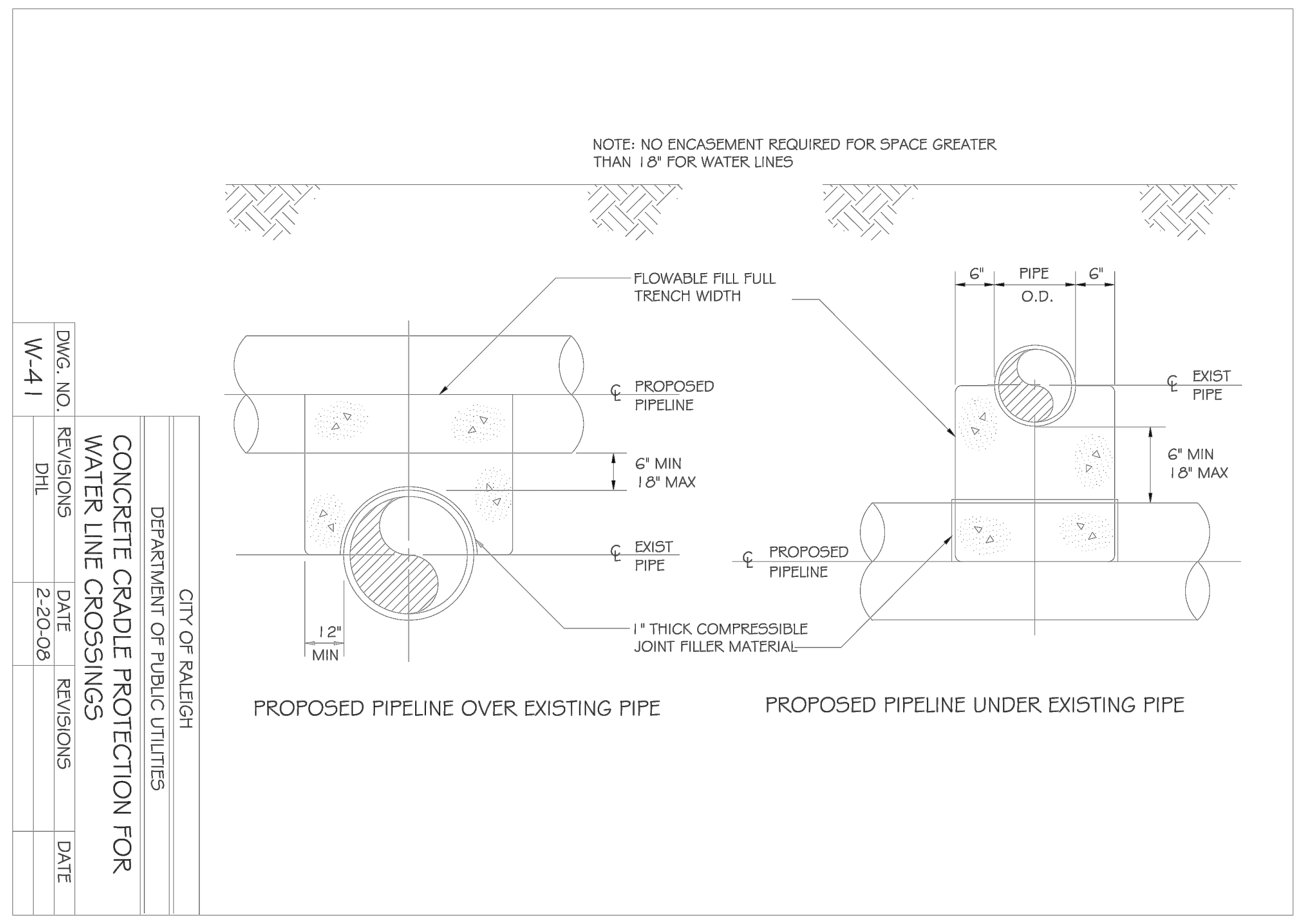

STANDARD METER BOX
℄
ROW
TOP OF VALVE NEEDS TO BE 12" BENEATH TOP OF METER BOX LID.
"A"
FLOW
18"
24"
3"
#67 STONE
STANDARD 3/4" OR 1'SERVICE SIZE
SET BOX ON CONCRETE BLOCKS
THREADED BRASS PLUG

THE BACKFLOW PREVENTER LOCATION IS DEPENDENT ON THE TYPE DEVICE PROPOSED FOR USE AS FOLLOWS:

ONE OR TWO FAMILY RESIDENTIAL		COMMERCIAL	
DEVICE	LOCATION	DEVICE	LOCATION
"A"	FORD ANGLE CHECK OR OTHER APPROVED DUAL CHECK VALVES	"A"	BACKFLOW PREVENTION SHALL BE DETERMINED BY OCCUPANCY & APPROVED BACKFLOW LIST.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
ONE OR TWO FAMILY DWELLINGS BACKFLOW PREVENTION/ METER ASSEMBLY INSTALLATION

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-24	Y.C.A. A.B.B.	12-31-91 4-7-04	D.H.L. J.P.S.	6/18/08 11/4/10



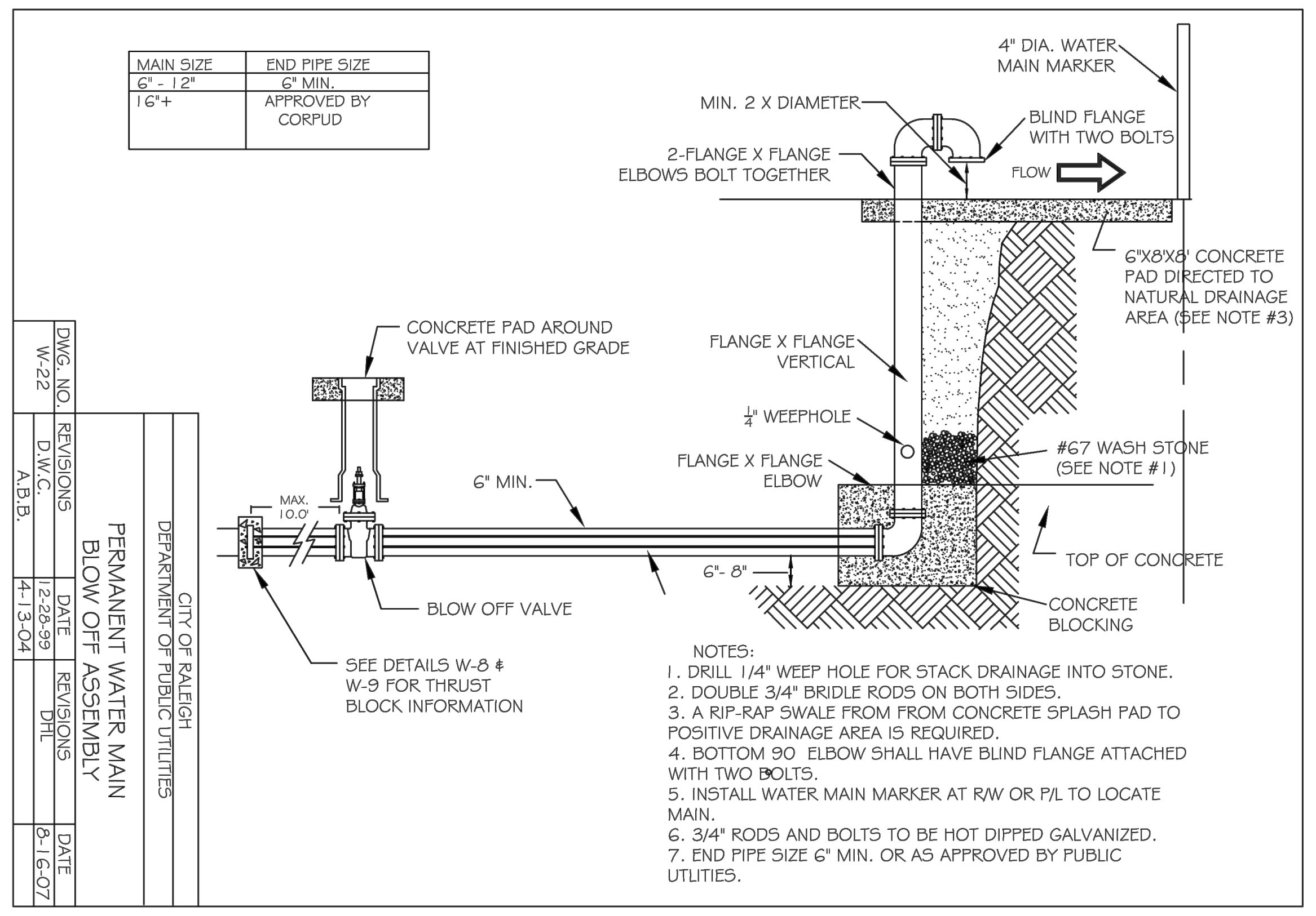
NOTE: NO ENCASEMENT REQUIRED FOR SPACE GREATER THAN 18" FOR WATER LINES

PROPOSED PIPELINE OVER EXISTING PIPE

PROPOSED PIPELINE UNDER EXISTING PIPE

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		

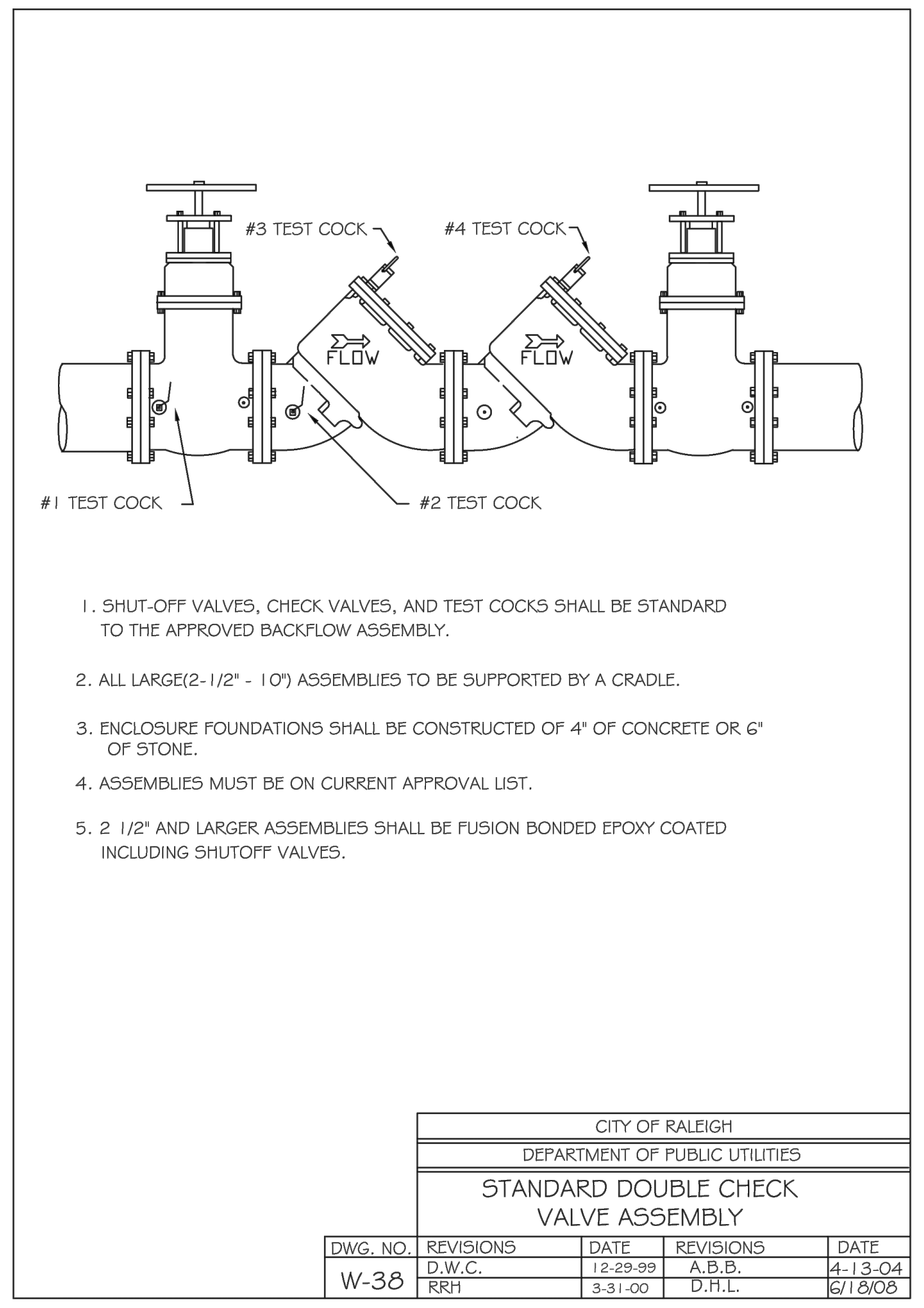

4" DIA. WATER MAIN MARKER
MIN. 2 X DIAMETER
BLIND FLANGE WITH TWO BOLTS
2-FLANGE X FLANGE ELBOWS BOLT TOGETHER
FLOW
6"X8'X8' CONCRETE PAD DIRECTED TO NATURAL DRAINAGE AREA (SEE NOTE #3)
CONCRETE PAD AROUND VALVE AT FINISHED GRADE
FLANGE X FLANGE VERTICAL
1/4" WEEPHOLE
#67 WASH STONE (SEE NOTE #1)
FLANGE X FLANGE ELBOW
6" MIN.
MAX. 10.0'
TOP OF CONCRETE
6"- 8"
BLOW OFF VALVE
CONCRETE BLOCKING
SEE DETAILS W-8 & W-9 FOR THRUST BLOCK INFORMATION

MAIN SIZE	END PIPE SIZE
6" - 12"	6" MIN.
16"+	APPROVED BY CORPUD

NOTES:
1. DRILL 1/4" WEEP HOLE FOR STACK DRAINAGE INTO STONE.
2. DOUBLE 3/4" BRIDLE RODS ON BOTH SIDES.
3. A RIP-RAP SWALE FROM FROM CONCRETE SPLASH PAD TO POSITIVE DRAINAGE AREA IS REQUIRED.
4. BOTTOM 90 ELBOW SHALL HAVE BLIND FLANGE ATTACHED WITH TWO BOLTS.
5. INSTALL WATER MAIN MARKER AT R/W OR P/L TO LOCATE MAIN.
6. 3/4" RODS AND BOLTS TO BE HOT DIPPED GALVANIZED.
7. END PIPE SIZE 6" MIN. OR AS APPROVED BY PUBLIC UTLITIES.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
PERMANENT WATER MAIN BLOW OFF ASSEMBLY

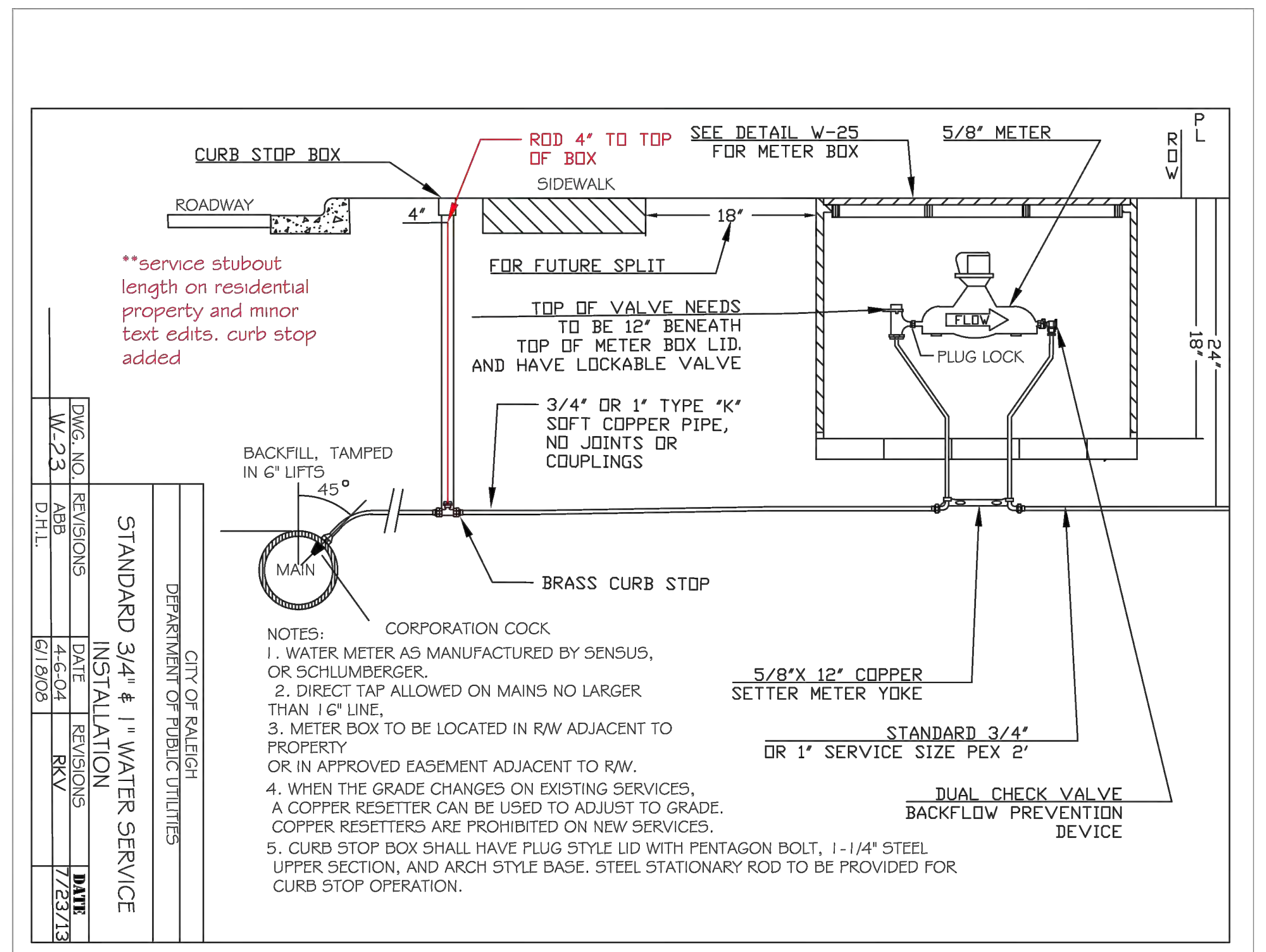
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-22	D.W.C. A.B.B.	12-28-99 4-13-04	DHL	8-16-07



1. SHUT-OFF VALVES, CHECK VALVES, AND TEST COCKS SHALL BE STANDARD TO THE APPROVED BACKFLOW ASSEMBLY.
2. ALL LARGE(2-1/2" - 10") ASSEMBLIES TO BE SUPPORTED BY A CRADLE.
3. ENCLOSURE FOUNDATIONS SHALL BE CONSTRUCTED OF 4" OF CONCRETE OR 6" OF STONE.
4. ASSEMBLIES MUST BE ON CURRENT APPROVAL LIST.
5. 2 1/2" AND LARGER ASSEMBLIES SHALL BE FUSION BONDED EPOXY COATED INCLUDING SHUTOFF VALVES.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
STANDARD DOUBLE CHECK VALVE ASSEMBLY

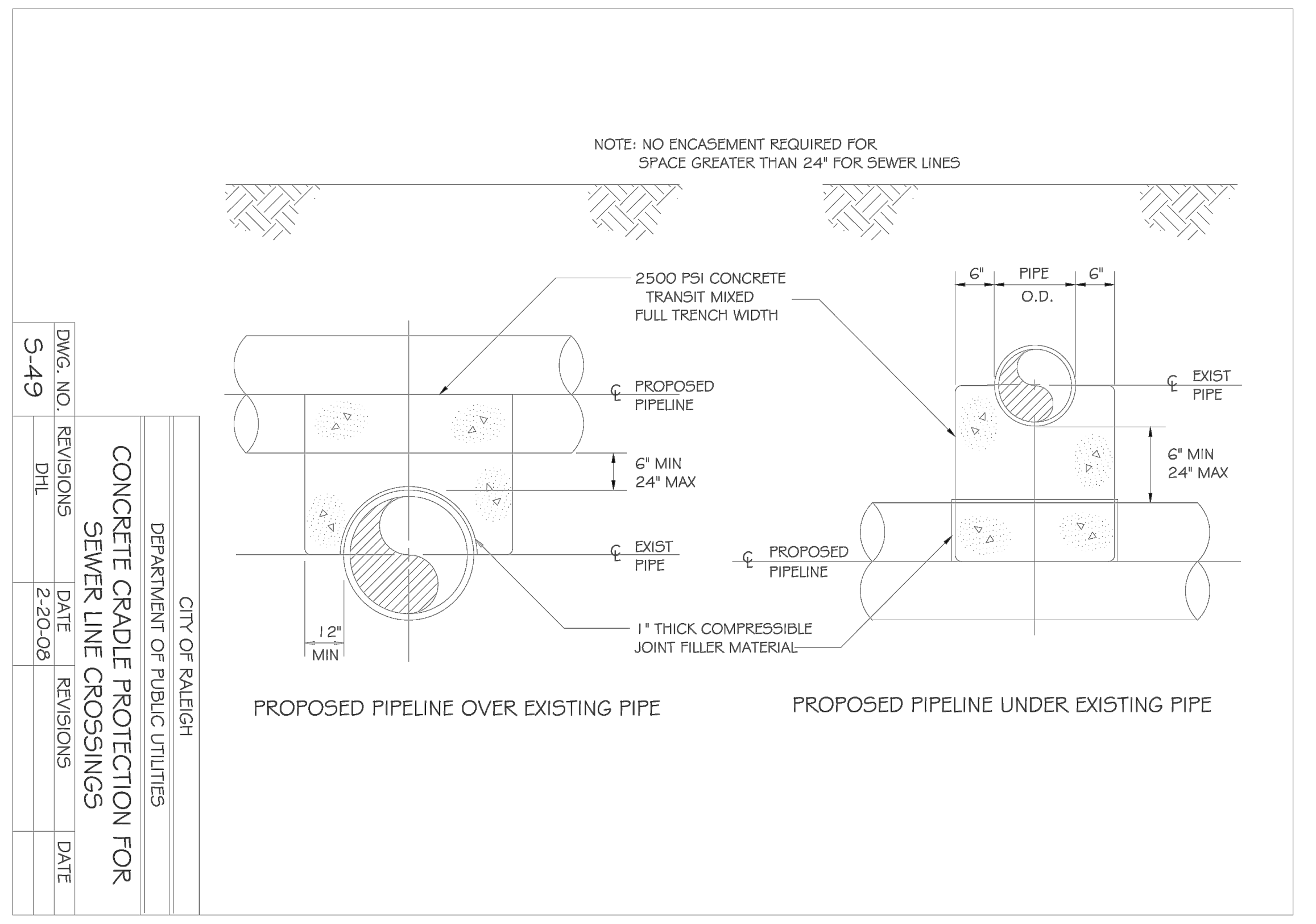
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-38	D.W.C. RRH	12-29-99 3-31-00	A.B.B. D.H.L.	4-13-04 6/18/08


CURB STOP BOX
ROD 4" TO TOP OF BOX
SEE DETAIL W-25 FOR METER BOX
5/8" METER
℄ PL
ROW
ROADWAY
SIDEWALK
4"
18"
FOR FUTURE SPLIT
**service stubout length on residential property and minor text edits. curb stop added
TOP OF VALVE NEEDS TO BE 12" BENEATH TOP OF METER BOX LID. AND HAVE LOCKABLE VALVE
FLOW
PLUG LOCK
18"
24"
3/4" OR 1" TYPE "K" SOFT COPPER PIPE, NO JOINTS OR COUPLINGS
BACKFILL, TAMPED IN 6" LIFTS
45°
MAIN
BRASS CURB STOP
CORPORATION COCK
5/8"X 12" COPPER SETTER METER YOKE
STANDARD 3/4" OR 1" SERVICE SIZE PEX 2'
DUAL CHECK VALVE BACKFLOW PREVENTION DEVICE

NOTES:
1. WATER METER AS MANUFACTURED BY SENSUS, OR SCHLUMBERGER.
2. DIRECT TAP ALLOWED ON MAINS NO LARGER THAN 16" LINE,
3. METER BOX TO BE LOCATED IN R/W ADJACENT TO PROPERTY OR IN APPROVED EASEMENT ADJACENT TO R/W.
4. WHEN THE GRADE CHANGES ON EXISTING SERVICES, A COPPER RESETTER CAN BE USED TO ADJUST TO GRADE. COPPER RESETTERS ARE PROHIBITED ON NEW SERVICES.
5. CURB STOP BOX SHALL HAVE PLUG STYLE LID WITH PENTAGON BOLT, 1-1/4" STEEL UPPER SECTION, AND ARCH STYLE BASE. STEEL STATIONARY ROD TO BE PROVIDED FOR CURB STOP OPERATION.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
STANDARD 3/4" & 1" WATER SERVICE INSTALLATION

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-23	ABB D.H.L.	4-6-04 6/18/08	RKV	7/23/13



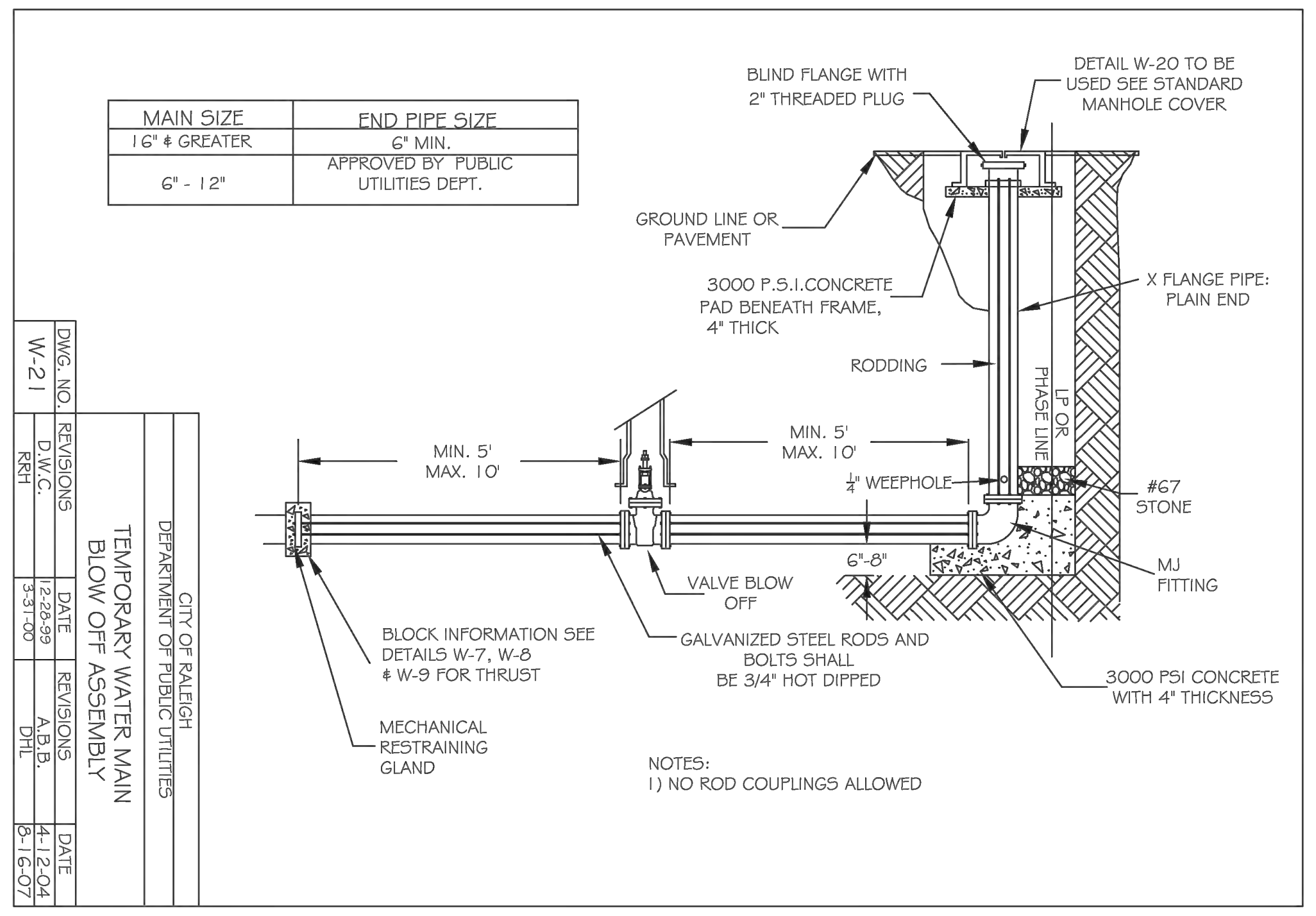
NOTE: NO ENCASEMENT REQUIRED FOR SPACE GREATER THAN 24" FOR SEWER LINES

PROPOSED PIPELINE OVER EXISTING PIPE

PROPOSED PIPELINE UNDER EXISTING PIPE

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

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-49	DHL	2-20-08		


BLIND FLANGE WITH 2" THREADED PLUG
DETAIL W-20 TO BE USED SEE STANDARD MANHOLE COVER
GROUND LINE OR PAVEMENT
3000 P.S.I.CONCRETE PAD BENEATH FRAME, 4" THICK
X FLANGE PIPE: PLAIN END
RODDING
LP OR PHASE LINE
MIN. 5' MAX. 10'
MIN. 5' MAX. 10'
1/4" WEEPHOLE
#67 STONE
6"-8"
MJ FITTING
VALVE BLOW OFF
BLOCK INFORMATION SEE DETAILS W-7, W-8 & W-9 FOR THRUST
GALVANIZED STEEL RODS AND BOLTS SHALL BE 3/4" HOT DIPPED
3000 PSI CONCRETE WITH 4" THICKNESS
MECHANICAL RESTRAINING GLAND

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. RRH	12-28-99 3-31-00	A.B.B. DHL	4-12-04 8-16-07

MICHAEL V. ZACCARDO
6/22/21

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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TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

DATE	REVISION DESCRIPTION

DATE 06/22/2021
DRAWN BY JD. MACMILLAN
DESIGNED BY JD. MACMILLAN
CHECKED BY M. ZACCARDO
SCALE N/A

STONERIVER SUBDIVISION
KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA
WATER AND SEWER DETAILS

JOB NO. 44872
SHEET NO. C7.4

FOR REVIEW ONLY: NOT FOR CONSTRUCTION

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S:\331\44872-Stone-Silver\DWG\Sheet\CD\STONE RIVER\44872-331-SR-C7.0-NTDT.dwg | by Thomas Taylor

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

DIMENSIONS FOR SINGLE PIPE HEADWALLS					
PIPE SIZE	BACK FACE			FRONT FACE	CUBIC YARDS OF CONC.
	WALL REINFORCEMENT		SLAB	HORIZONTAL	
	HORIZONTAL	VERTICAL	REINFORCEMENT	AND VERTICAL	
15"	No.3 @ 12" O.C.	No.3 @ 12" O.C.	6–6 X10–10 WW	No.4 @ 18" O.C.	1.61
18"	"	"	"	"	1.96
24"	"	"	"	"	2.67
30"	"	"	"	"	3.49
36"	"	"	"	"	4.21
42"	"	"	"	"	1.9
48"	"	"	"	"	6.33
54"	"	No.4 @ 12" O.C.	"	"	7.23
60"	"	"	"	"	11.25
66"	No.4 @ 12" O.C.	"	6–6 X 6–6 WW	"	14.67
72"	"	"	"	"	15.75
78"	"	"	"	No.4 @ 12" O.C.	18.04
84"	"	No.5 @ 12" O.C.	"	"	19.32
90"	"	"	"	"	21.92
96"	No.5 @ 12" O.C.	No.6 @ 12" O.C.	"	"	26.38
102"	"	"	"	"	32.26
108"	"	"	"	"	34.21
114"	"	No.8 @ 12" O.C.	"	"	40.78
120"	"	"	"	"	44.97

DIMENSIONS FOR DOUBLE PIPE HEADWALLS				
H	I	J	K	CUBIC YARDS OF CONC.
8'–6"	13'–0"	7'–3'	8'–9"	2.24
9'–4"	14'–4"	7'–10"	9'–5"	2.7
10'–10"	16'–10"	9'–0"	10'–7"	3.64
12'–4"	19'–4"	9'–2"	11'–9"	4.72
13'–1"	20'–9"	11'–4"	12'–11"	5.75
14'–7"	23'–3"	12'–6"	14'–1"	7.05
16'–2"	25'–9"	13'–8"	15'–3"	8.52
17'–6"	27'–2"	14'–10"	16'–5"	9.74
18'–10"	30'–5"	16'–0"	18'–4"	14.74
20'–4"	32'–11"	17'–2"	19'–6"	19.44
21'–7"	34'–3"	18'–4"	20'–8"	20.96
23'–1"	36'–9"	19'–6"	21'–10"	23.89
24'–3"	38'–1"	20'–8"	23'–0"	25.59
25'–9"	40'–8"	21'–10"	24'–2"	28.95
27'–4"	42'–0"	23'–0"	25'–4"	35.30
29'–0"	44'–11"	24'–2"	26'–11"	42.53
30'–2"	16'–4"	25'–4"	28'–1"	45.15
31'–8"	49'–1"	26'–6"	29'–6"	53.26
33'–3"	51'–8"	27'–8"	30'–9"	58.59

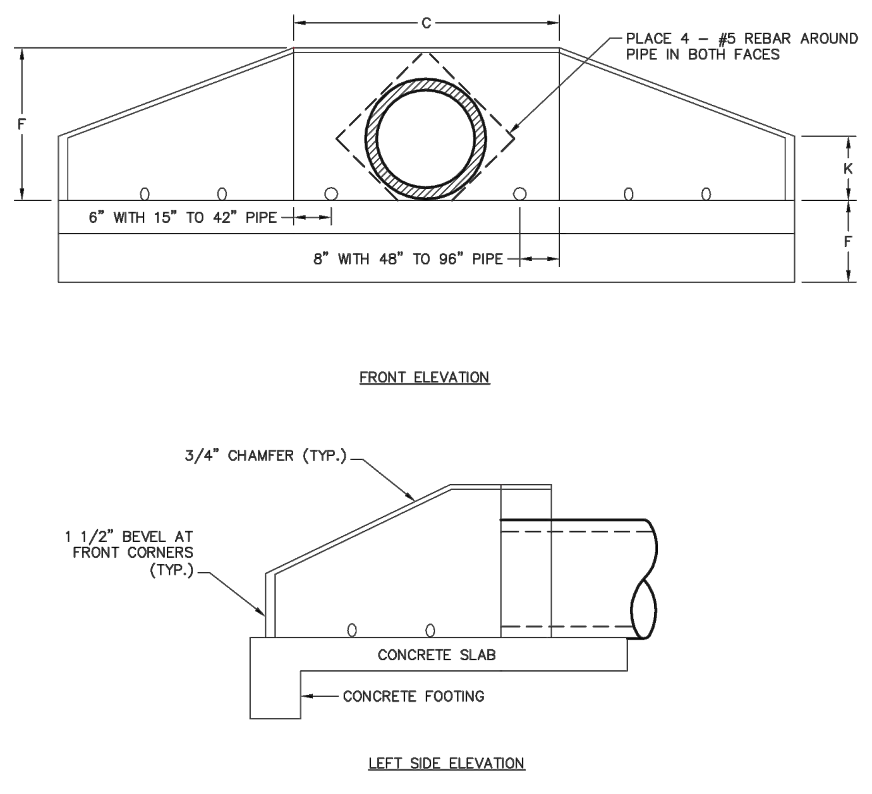
NOTE:

1. ALL DIMENSIONS FOR WING WALLS NOT LISTED ABOVE SHALL BE AS SHOWN FOR SINGLE PIPE HEADWALLS.
2. THE MINIMUM DISTANCE BETWEEN PIPES IN A DOUBLE PIPE HEADWALL IS 2'–0".

REVISIONS	
DATE	DESCRIPTION

2 of 2

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



FRONT ELEVATION

LEFT SIDE ELEVATION

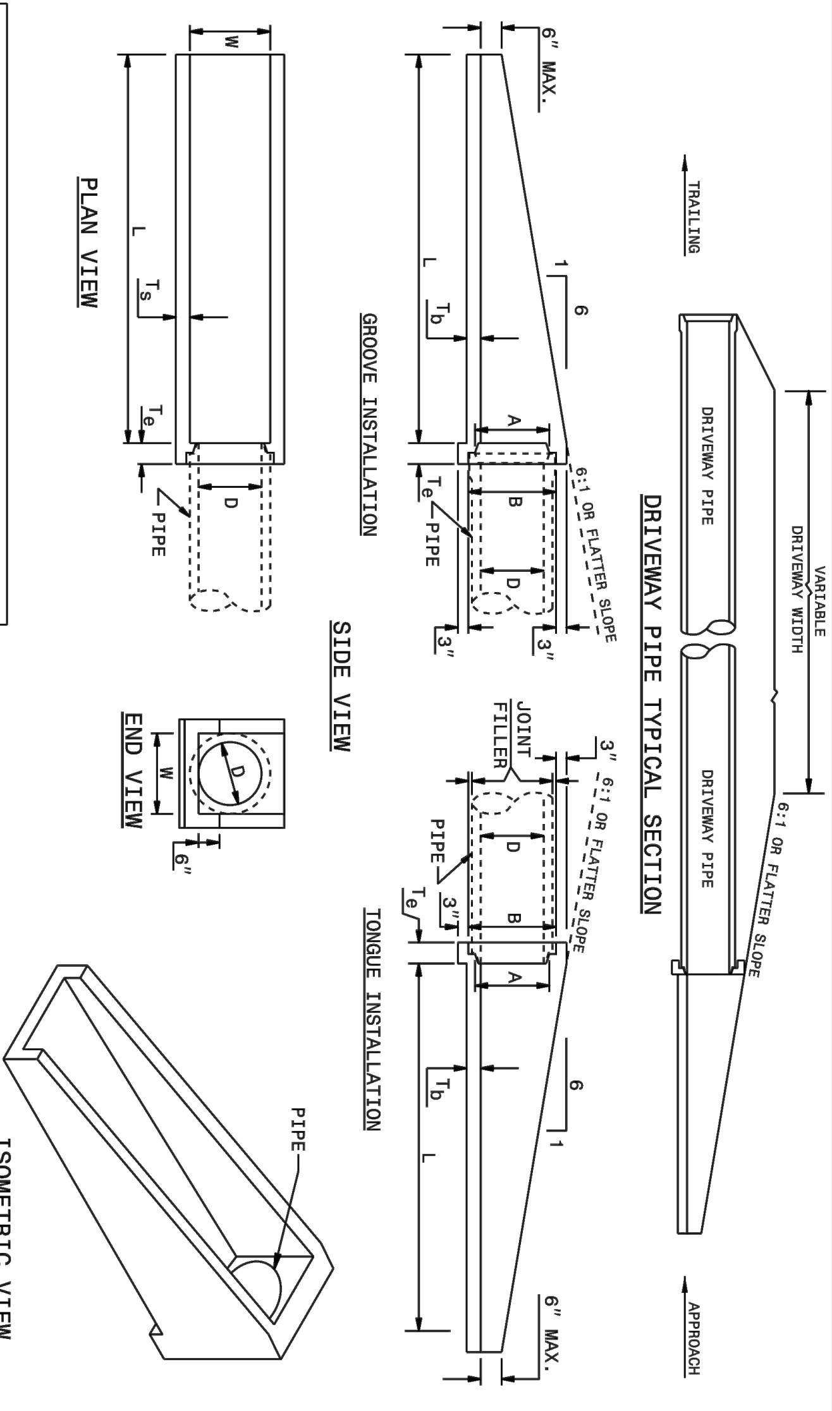
NOTES:

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

REVISIONS	
DATE	DESCRIPTION

2 of 2

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



DRIVEWAY PIPE TYPICAL SECTION

GROOVE INSTALLATION

TONGUE INSTALLATION

SIDE VIEW

PLAN VIEW

END VIEW

ISOMETRIC VIEW

END TREATMENT DIMENSIONS							
D	L	W	T_s	T_b	T_e	A	B
15″	7′-6″	19″	4″	4″	6″	17¾″	20⅞″
18″	9′-0″	23″	4″	4″	6″	21¼″	25″
24″	12′-6″	30″	4″	4″	6″	27⅞″	32″

NOTES:
1. CONSTRUCT PIPE END SECTION USING #4 REBAR SPACED 9″ EACH WAY AND MEET ALL REQUIREMENTS OF STD. SPEC. 310.
2. CHAMFER ALL EXPOSED CORNERS ¾″.

ROADWAY STANDARD DRAWING FOR
PARALLEL PIPE END SECTION
PRECAST CONCRETE SECTION FOR 15″ TO 24″ PIPE

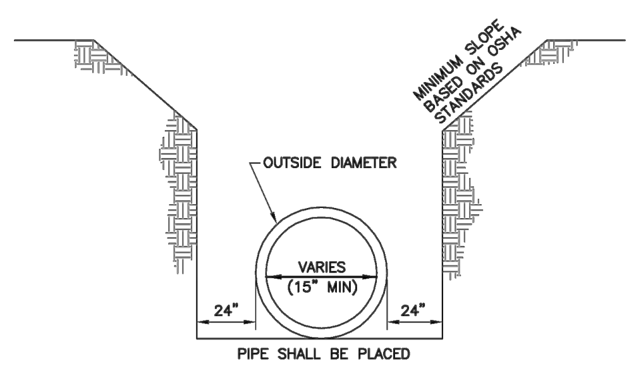
1-18

STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

SHEET 1 OF 1
310.02

NOTES:

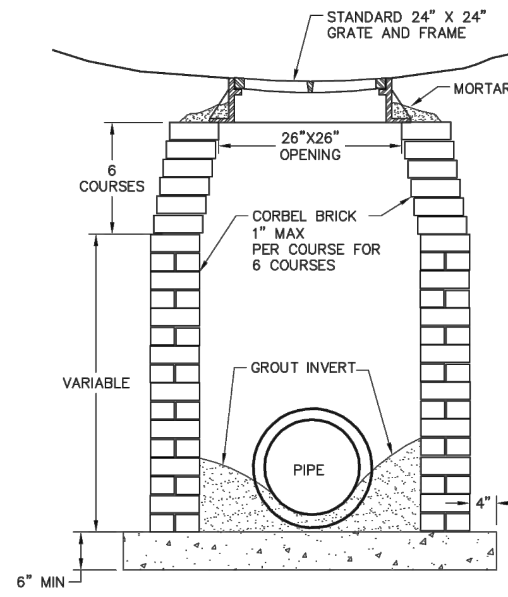
1. A MINIMUM OF 24" FROM OUTSIDE DIAMETER OF PIPE TO SIDE OF TRENCH MUST BE ALLOWED FOR COMPACTION OF FILL MATERIAL. BACKFILLING OF TRENCHES SHALL BE ACCOMPLISHED IMMEDIATELY AFTER THE PIPE IS LAID. THE FILL AROUND THE PIPE SHALL BE PLACED IN LAYERS NOT TO EXCEED 6". UNDER NO CIRCUMSTANCES SHALL WATER 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.



PIPE SHALL BE PLACED ON SUITABLE MATERIAL

REVISIONS	
DATE	DESCRIPTION

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

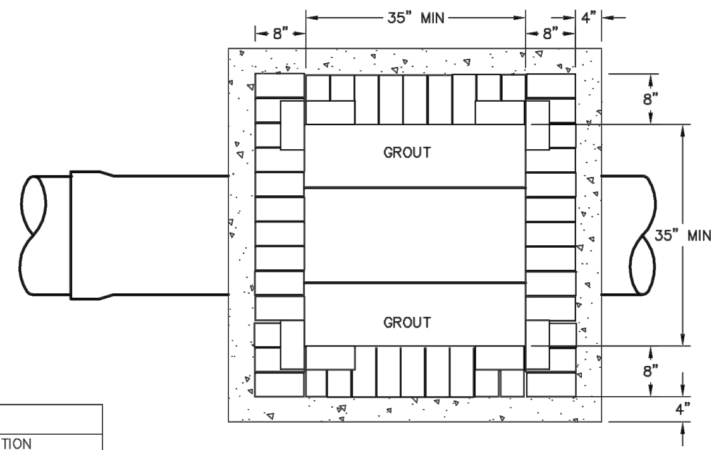


STANDARD 24" X 24" GRATE AND FRAME
MORTAR BED (TYP.)
26"X26" OPENING
6 COURSES
CORBEL BRICK 1" MAX PER COURSE FOR 6 COURSES
VARIABLE
GROUT INVERT
PIPE
4"
6" MIN

PROFILE

NOTES:

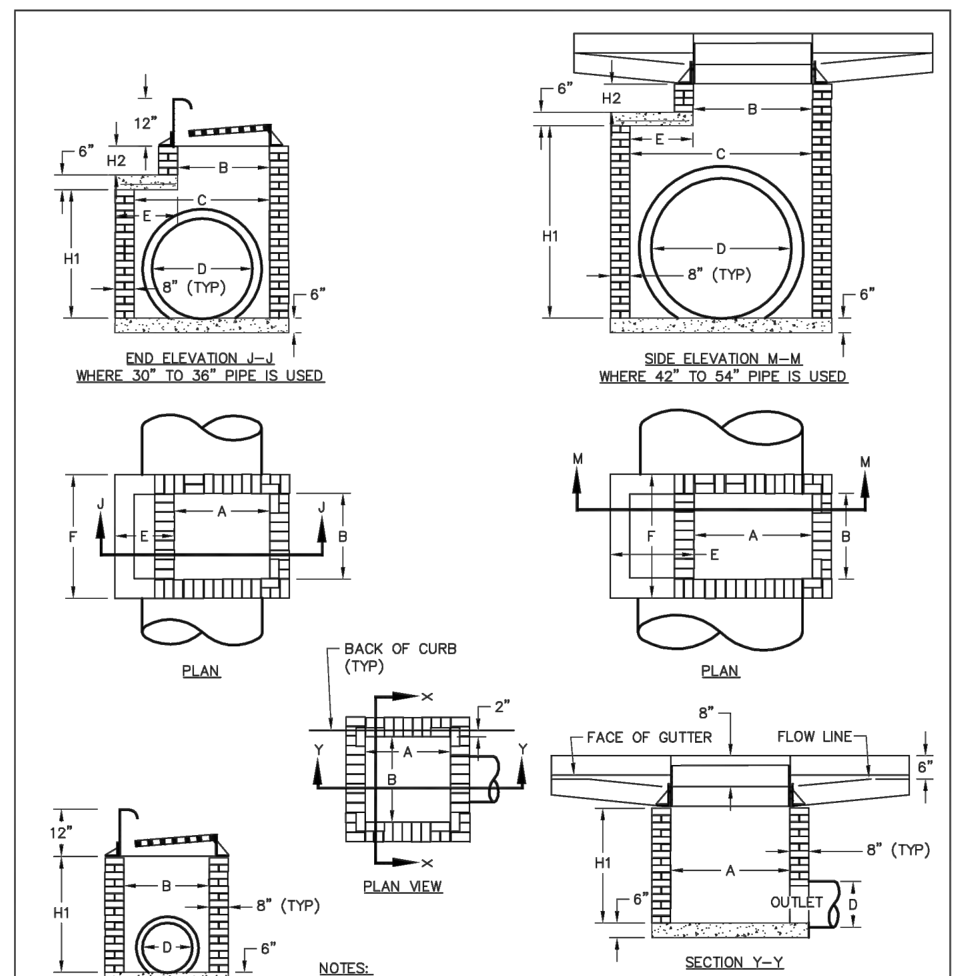
1. EITHER SOLID BRICK, SOLID BLOCK, OR PRECAST CONRETE MAY BE USED.
2. PRECAST CONCRETE WALLS SHALL BE 6" THICK MINIMUM.
3. ALL CONCRETE SHALL BE 3000 P.S.I.
4. FOR 24" PIPE AND LARGER USE PIPE DIA. PLUS 12" AS INSDE DIMENSIONS.



PLAN VIEW

REVISIONS	
DATE	DESCRIPTION

TOWN OF KNIGHTDALE STANDARD DETAILS	STANDARD DROP INLET WITH GRATE AND FRAME	STD. NO. 5.04



END ELEVATION J–J
WHERE 30" TO 36" PIPE IS USED

SIDE ELEVATION M–M
WHERE 42" TO 54" PIPE IS USED

PLAN

PLAN

PLAN VIEW

SECTION Y–Y

SECTION X–X

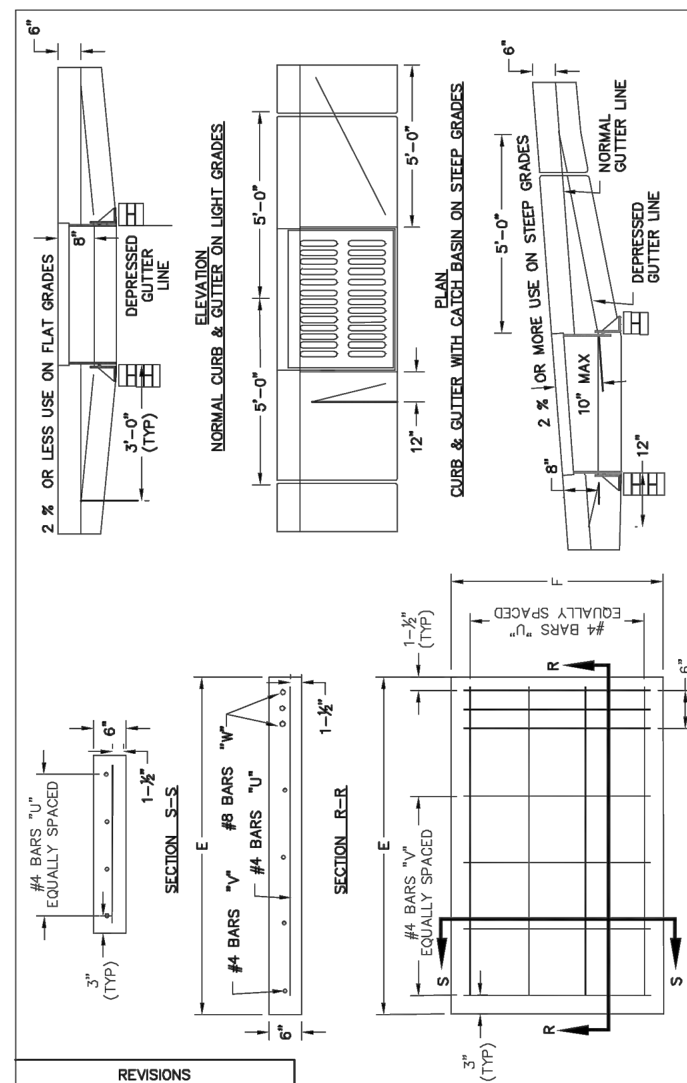
NOTES:

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. USETYPE "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 2

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



SECTION S–S

SECTION R–R

PLAN OF TOP SLAB

ELEVATION
NORMAL CURB & GUTTER ON LIGHT GRADES

PLAN
CURB & GUTTER WITH CATCH BASIN ON STEEP GRADES

ELEVATION
NORMAL CURB & GUTTER ON STEEP GRADES

DIMENSIONS AND QUANTITIES FOR BRICK CATCH BASINS																						
DIMENSIONS FOR BOX AND PIPE							COVER DIMENSIONS		REINFORCING								CUBIC YARDS OF CONCRETE IN BOX			BRICK MASONRY		DEDUCTIONS FOR ONE PIPE	
PIPE	SPAN	WIDTH	WIDTH	SPAN	HEIGHT	HEIGHT			BARS "U"		BARS "V"		BARS "W"		TOTAL LBS				H1			
D	A	B	C	G	MIN H1	H2	E	F	NO	LENGTH	NO	LENGTH	NO	LENGTH		TOP SLAB	FLOOR	TOTAL	CU YDS	PER FT Ht	CM	RC
15"	3'–0"	2'–2"			2'–6"															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"	VARIABLE	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 2

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

MICHAEL V. ZACCARDO
6/22/21

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.

DATE	REVISION DESCRIPTION

DATE	06/22/2021
DRAWN BY	JD. MACMILLAN
DESIGNED BY	JD. MACMILLAN
CHECKED BY	M. ZACCARDO
SCALE	N/A

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION
KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA
STORM DETAILS

JOB NO. 44872

SHEET NO. C7.5

FOR REVIEW ONLY: NOT FOR CONSTRUCTION

SEDIMENT TRAPS AND BARRIERS

(Wake County Minimum Requirements for Sizing Sediment Basins)

BASIN ID	BASIN TYPE	DRAINAGE AREA PRE (AC)	DISTURBED AREA (AC)	i(10)	C	Q10 (TOTAL DA) (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)	WEIR ELEV (FT)	WEIR LENGTH (FT)	Q10 TOTAL DA (CFS)	FLOW DEPTH (FT)	DEWATER DEVICE	SKIMMER SIZE (IN)	SKIMMER ORIFICE DIA (IN)	DEWATER TIME (DAYS)
DEVICE 1	SEDIMENT BASIN	12.26	12.26	7.28	0.50	44.63	22,068	39,600	165	120	2.0	19,412	19800	203.00	205.00	50	44.63	0.44	SKIMMER	3.0	2.5	3.06
DEVICE 2	SEDIMENT BASIN	9.70	9.70	7.28	0.50	35.31	17,460	38,800	194	100	2.0	15,359	19400	184.00	186.00	35	35.31	0.48	SKIMMER	2.5	2.25	3.27
DEVICE 3	SEDIMENT BASIN	7.24	7.24	7.28	0.50	26.35	13,032	43,350	170	85	3.0	11,464	14450	175.00	178.00	30	26.35	0.44	SKIMMER	2.5	2	3.09
DEVICE 4	SKIMMER BASIN	9.99	9.99	7.28	0.50	36.36	17,982	32,300	190	85	2.0	15,818	16150	187.00	189.00	40	36.36	0.45	SKIMMER	2.5	2.25	3.37
DEVICE 5	SKIMMER BASIN	3.49	3.49	7.28	0.50	12.70	6,282	14,490	115	63	2.0	5,526	7245	236.00	238.00	15	12.70	0.43	SKIMMER	1.5	1.5	3.42
DEVICE 6	SKIMMER BASIN	5.34	5.34	7.28	0.50	19.44	9,612	17,160	130	66	2.0	8,455	8580	180.00	182.00	20	19.44	0.47	SKIMMER	2.0	1.75	3.32

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 FOR RUTHERFORD.

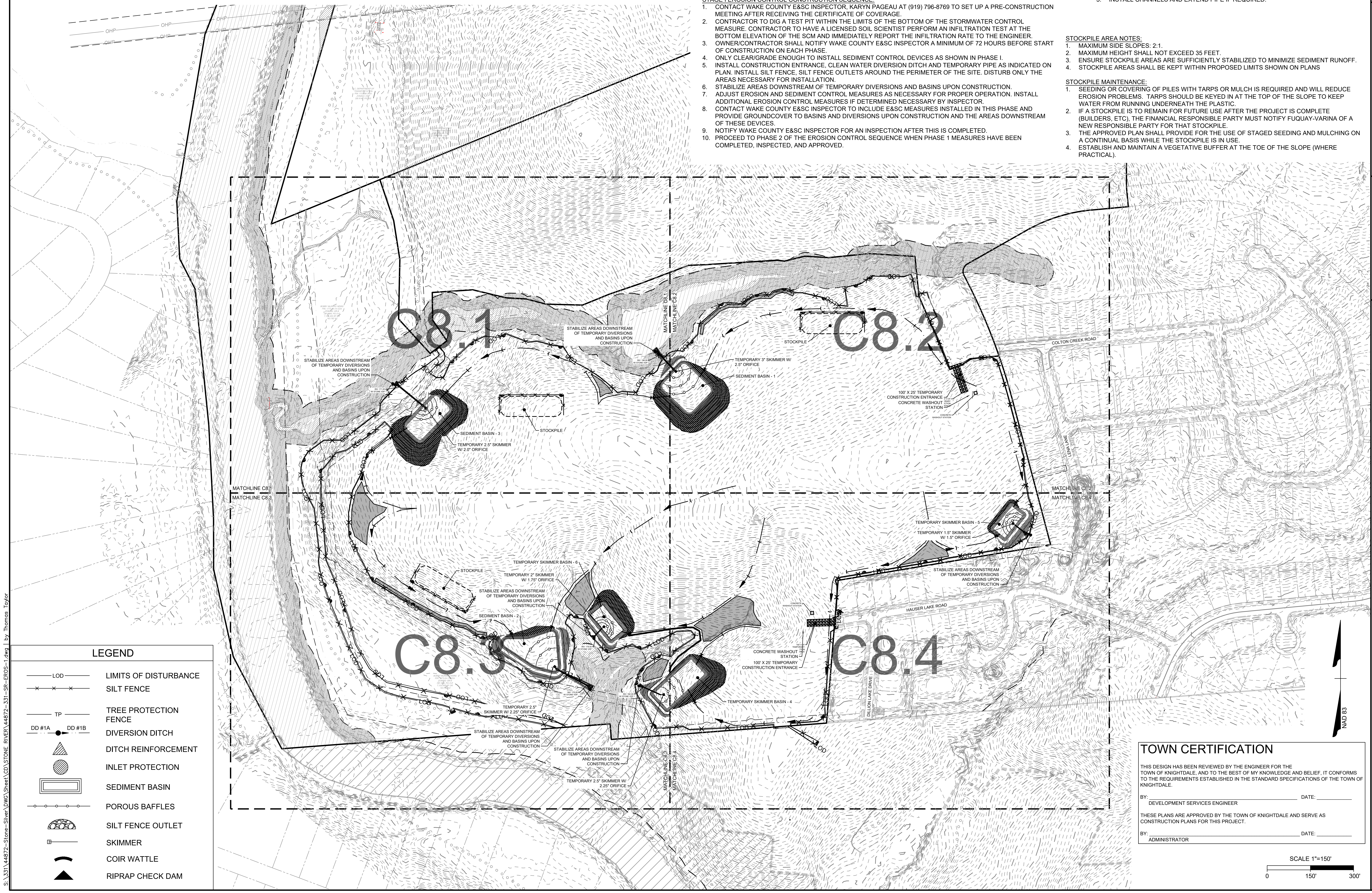
SLOPE STABILIZATION REQUIREMENTS:
3:1 AND FLATTER--GRASS
3:1 TO 2:1 SLOPE--ADAPTIVE PLANTS (SHRUBS AND VINES)
2:1 TO 1.5:1--RIP RAP
STEEPER THAN 1.5 TO 1-RETAINING WALL

SEDIMENT BASIN REMOVAL:
1. REMOVE BASINS ONLY AFTER SITE IS STABILIZED AND WITH PERMISSION FROM FUQUAY-VARINA ENVIRONMENTAL CONSULTANT.
2. REMOVE TARP AND ALL NON DIRT AND/OR ROCK MATERIAL.
3. USE BACKHOE TO FILL IN AND LEVEL BACK TO NATURAL GROUND ELEVATION.
4. SEED AND STRAW APPROPRIATELY.
5. INSTALL CHANNELS AND EXTEND PIPE IF REQUIRED.

STAGE I EROSION CONTROL CONSTRUCTION SEQUENCE:
1. CONTACT WAKE COUNTY E&SC INSPECTOR, KARYN PAGEAU AT (919) 796-8769 TO SET UP A PRE-CONSTRUCTION MEETING AFTER RECEIVING THE CERTIFICATE OF COVERAGE.
2. CONTRACTOR TO DIG A TEST PIT WITHIN THE LIMITS OF THE BOTTOM OF THE STORMWATER CONTROL MEASURE. CONTRACTOR TO HAVE A LICENSED SOIL SCIENTIST PERFORM AN INFILTRATION TEST AT THE BOTTOM ELEVATION OF THE SCM AND IMMEDIATELY REPORT THE INFILTRATION RATE TO THE ENGINEER.
3. OWNER/CONTRACTOR SHALL NOTIFY WAKE COUNTY E&SC INSPECTOR A MINIMUM OF 72 HOURS BEFORE START OF CONSTRUCTION ON EACH PHASE.
4. ONLY CLEAR/GRADE ENOUGH TO INSTALL SEDIMENT CONTROL DEVICES AS SHOWN IN PHASE I.
5. INSTALL CONSTRUCTION ENTRANCE, CLEAN WATER DIVERSION DITCH AND TEMPORARY PIPE AS INDICATED ON PLAN. INSTALL SILT FENCE, SILT FENCE OUTLETS AROUND THE PERIMETER OF THE SITE. DISTURB ONLY THE AREAS NECESSARY FOR INSTALLATION.
6. STABILIZE AREAS DOWNSTREAM OF TEMPORARY DIVERSIONS AND BASINS UPON CONSTRUCTION.
7. ADJUST EROSION AND SEDIMENT CONTROL MEASURES AS NECESSARY FOR PROPER OPERATION. INSTALL ADDITIONAL EROSION CONTROL MEASURES IF DETERMINED NECESSARY BY INSPECTOR.
8. CONTACT WAKE COUNTY E&SC INSPECTOR TO INCLUDE E&SC MEASURES INSTALLED IN THIS PHASE AND PROVIDE GROUNDCOVER TO BASINS AND DIVERSIONS UPON CONSTRUCTION AND THE AREAS DOWNSTREAM OF THESE DEVICES.
9. NOTIFY WAKE COUNTY E&SC INSPECTOR FOR AN INSPECTION AFTER THIS IS COMPLETED.
10. PROCEED TO PHASE 2 OF THE EROSION CONTROL SEQUENCE WHEN PHASE 1 MEASURES HAVE BEEN COMPLETED, INSPECTED, AND APPROVED.

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 FUQUAY-VARINA 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).


C8.1
C8.2
C8.3
C8.4
MATCHLINE C8.1
MATCHLINE C8.2
MATCHLINE C8.3
MATCHLINE C8.4
OHP
STABILIZE AREAS DOWNSTREAM OF TEMPORARY DIVERSIONS AND BASINS UPON CONSTRUCTION
SEDIMENT BASIN - 3
TEMPORARY 2.5" SKIMMER W/ 2.0" ORIFICE
STOCKPILE
TEMPORARY 3" SKIMMER W/ 2.5" ORIFICE
SEDIMENT BASIN - 1
100' X 25' TEMPORARY CONSTRUCTION ENTRANCE
CONCRETE WASHOUT STATION
COLTON CREEK ROAD
LENA LANE
TEMPORARY SKIMMER BASIN - 5
TEMPORARY 1.5" SKIMMER W/ 1.5" ORIFICE
TEMPORARY SKIMMER BASIN - 6
TEMPORARY 2" SKIMMER W/ 1.75" ORIFICE
SEDIMENT BASIN - 2
TEMPORARY 2.5" SKIMMER W/ 2.25" ORIFICE
HAUSER LAKE ROAD
CONCRETE WASHOUT STATION
100' X 25' TEMPORARY CONSTRUCTION ENTRANCE
TEMPORARY SKIMMER BASIN - 4
DILLION LAKE DRIVE
LOD
NAD 83

LEGEND

—LOD—	LIMITS OF DISTURBANCE
—×—×—×—	SILT FENCE
—TP—	TREE PROTECTION FENCE
DD #1A ● DD #1B	DIVERSION DITCH
▲	DITCH REINFORCEMENT
●	INLET PROTECTION
▭	SEDIMENT BASIN
—o—o—o—o—o—	POROUS BAFFLES
◓	SILT FENCE OUTLET
⊞—	SKIMMER
⌒	COIR WATTLE
▲	RIPRAP CHECK DAM

S:\331\44872-Stone-Silver\DWG\Sheet\CD\STONE RIVER\44872-331-SR-EROS-1.dwg | by Thomas Taylor

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

SCALE 1"=150'
0 150' 300'

6/22/21

TIMMONS GROUP
YOUR VISION ACHIEVED THROUGH OURS.

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

NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION
KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA

OVERALL EROSION AND SEDIMENT CONTROL PLAN STAGE 1

DATE	06/22/2021
DRAWN BY	JD. MACMILLAN
DESIGNED BY	JD. MACMILLAN
CHECKED BY	M. ZACCARDO
SCALE	1"=150'
JOB NO.	44872
SHEET NO.	C8.0

DATE	REVISION DESCRIPTION

FOR REVIEW ONLY: NOT FOR CONSTRUCTION

NAD 83

VELOCITY DISSIPATER PAD DESIGN

OUTLET NAME	PIPE DIAMETER	PIPE SLOPE	Q_{10}	V_{10}	RIPRAP D_{50}	NCDOT CLASS	MAXIMUM STONE DIAMETER	APRON LENGTH	APRON WIDTH AT PIPE	APRON WIDTH AT END	APRON THICKNESS
	(IN)	(FT/FT)	(CFS)	(FPS)	(IN)		(IN)	(FT)	(FT)	(FT)	(IN)
FES SCM #1	36	1.0%	44.6	10.1	8	CLASS B	12	18	9.0	9.0	18
FES SCM #2	36	1.0%	35.3	9.5	8	CLASS B	12	18	9.0	9.0	18
FES SCM #3	36	1.0%	26.4	8.3	8	CLASS B	12	18	9.0	9.0	18
FES #4	24	7.4%	36.4	21.0	14	CLASS 2	23	20	6.0	6.0	36
FES #5	24	5.5%	12.7	13.8	10	CLASS 1	17	16	6.0	6.0	24
FES #6	24	3.1%	19.4	12.6	10	CLASS 1	17	16	6.0	6.0	24

TOTAL DISTURBED AREA STAGE 1 = 56.8 ACRES

CHANNEL SCHEDULE

NAME	LENGTH	DA	C	I_{10}	Q_{10}	SLOPE	SIDE SLOPE	DEPTH	VELOCITY	SHEAR STRESS	TEMP. LINING	PERM. LINING
	(FT)	(AC)		(IN/HR)	(CFS)	(FT/FT)	(H:V)	(FT)	(FT/S)	(LBS/FT^2)		
DD #1A	1145	8.40	0.50	7.28	30.58	4.7%	3:1, 3:1	1.06	9.07	1.46	NAG C125	N/A
DD #1B	199	0.47	0.50	7.28	1.71	3.5%	3:1, 3:1	0.38	3.95	0.46	NAG C125	N/A
DD #2A	827	3.52	0.50	7.28	12.81	1.7%	3:1, 3:1	0.92	5.04	1.03	NAG C125	N/A
DD #2B	240	5.00	0.50	7.28	18.20	1.7%	3:1, 3:1	1.06	5.40	1.19	NAG C125	N/A
DD #3A	678	2.24	0.50	7.28	8.15	5.3%	3:1, 3:1	0.63	6.84	0.86	NAG C125	N/A
DD #3B	420	0.99	0.50	7.28	3.60	2.1%	3:1, 3:1	0.55	3.97	0.62	NAG C125	N/A
DD #4A	1296	2.31	0.50	7.28	8.41	3.0%	3:1, 3:1	0.71	5.56	0.87	NAG C125	N/A
DD #4B	238	1.01	0.50	7.28	3.68	3.4%	3:1, 3:1	0.51	4.72	0.63	NAG C125	N/A
DD #5A	403	1.66	0.50	7.28	6.83	3.5%	3:1, 3:1	0.64	5.56	0.80	NAG C125	N/A
DD #5B	262	0.88	0.50	7.28	3.20	6.1%	3:1, 3:1	0.43	5.77	0.59	NAG C125	N/A
DD #6A	695	1.51	0.50	7.28	5.50	7.5%	3:1, 3:1	0.51	7.05	0.74	NAG C125	N/A
DD #6B	685	2.41	0.50	7.28	8.77	8.3%	3:1, 3:1	0.60	8.12	0.89	NAG C125	N/A

TOWN CERTIFICATION

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

BY: ______________________________ DATE: ____________
DEVELOPMENT SERVICES ENGINEER

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

BY: ______________________________ DATE: ____________
ADMINISTRATOR

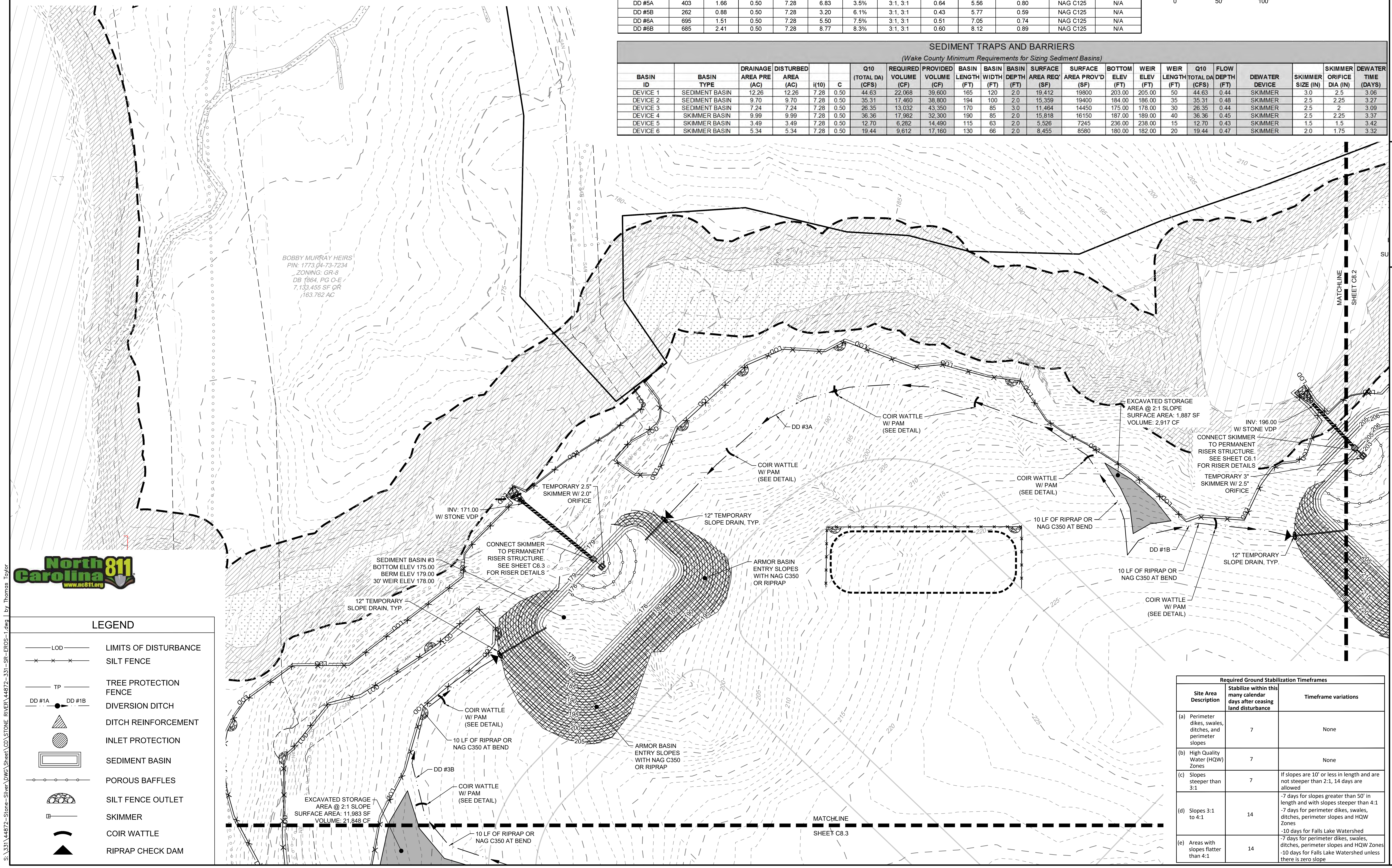
SCALE 1"=50'
0 50' 100'

MICHAEL V. ZACCARDO
6/22/21

SEDIMENT TRAPS AND BARRIERS

(Wake County Minimum Requirements for Sizing Sediment Basins)

BASIN ID	BASIN TYPE	DRAINAGE AREA PRE (AC)	DISTURBED AREA (AC)	i(10)	C	Q10 (TOTAL DA) (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)	WEIR ELEV (FT)	WEIR LENGTH (FT)	Q10 TOTAL DA (CFS)	FLOW DEPTH (FT)	DEWATER DEVICE	SKIMMER SIZE (IN)	SKIMMER ORIFICE DIA (IN)	DEWATER TIME (DAYS)
DEVICE 1	SEDIMENT BASIN	12.26	12.26	7.28	0.50	44.63	22,068	39,600	165	120	2.0	19,412	19800	203.00	205.00	50	44.63	0.44	SKIMMER	3.0	2.5	3.06
DEVICE 2	SEDIMENT BASIN	9.70	9.70	7.28	0.50	35.31	17,460	38,800	194	100	2.0	15,359	19400	184.00	186.00	35	35.31	0.48	SKIMMER	2.5	2.25	3.27
DEVICE 3	SEDIMENT BASIN	7.24	7.24	7.28	0.50	26.35	13,032	43,350	170	85	3.0	11,464	14450	175.00	178.00	30	26.35	0.44	SKIMMER	2.5	2	3.09
DEVICE 4	SKIMMER BASIN	9.99	9.99	7.28	0.50	36.36	17,982	32,300	190	85	2.0	15,818	16150	187.00	189.00	40	36.36	0.45	SKIMMER	2.5	2.25	3.37
DEVICE 5	SKIMMER BASIN	3.49	3.49	7.28	0.50	12.70	6,282	14,490	115	63	2.0	5,526	7245	236.00	238.00	15	12.70	0.43	SKIMMER	1.5	1.5	3.42
DEVICE 6	SKIMMER BASIN	5.34	5.34	7.28	0.50	19.44	9,612	17,160	130	66	2.0	8,455	8580	180.00	182.00	20	19.44	0.47	SKIMMER	2.0	1.75	3.32



BOBBY MURRAY HEIRS
PIN: 1773.04-73-7234
ZONING: GR-8
DB 1864, PG O-E
7,133,455 SF OR
163.762 AC
DD #3A
COIR WATTLE W/ PAM (SEE DETAIL)
TEMPORARY 2.5" SKIMMER W/ 2.0" ORIFICE
INV: 171.00 W/ STONE VDP
12" TEMPORARY SLOPE DRAIN, TYP.
CONNECT SKIMMER TO PERMANENT RISER STRUCTURE. SEE SHEET C6.3 FOR RISER DETAILS
SEDIMENT BASIN #3
BOTTOM ELEV 175.00
BERM ELEV 179.00
30' WEIR ELEV 178.00
ARMOR BASIN ENTRY SLOPES WITH NAG C350 OR RIPRAP
12" TEMPORARY SLOPE DRAIN, TYP.
EXCAVATED STORAGE AREA @ 2:1 SLOPE
SURFACE AREA: 1,887 SF
VOLUME: 2,917 CF
COIR WATTLE W/ PAM (SEE DETAIL)
10 LF OF RIPRAP OR NAG C350 AT BEND
DD #1B
10 LF OF RIPRAP OR NAG C350 AT BEND
COIR WATTLE W/ PAM (SEE DETAIL)
INV: 196.00 W/ STONE VDP
CONNECT SKIMMER TO PERMANENT RISER STRUCTURE. SEE SHEET C6.1 FOR RISER DETAILS
TEMPORARY 3" SKIMMER W/ 2.5" ORIFICE
12" TEMPORARY SLOPE DRAIN, TYP.
MATCHLINE SHEET C8.2
COIR WATTLE W/ PAM (SEE DETAIL)
10 LF OF RIPRAP OR NAG C350 AT BEND
DD #3B
COIR WATTLE W/ PAM (SEE DETAIL)
ARMOR BASIN ENTRY SLOPES WITH NAG C350 OR RIPRAP
EXCAVATED STORAGE AREA @ 2:1 SLOPE
SURFACE AREA: 11,983 SF
VOLUME: 21,848 CF
10 LF OF RIPRAP OR NAG C350 AT BEND
MATCHLINE SHEET C8.3
LOD
SAN
176
179
180
185
190
195
200
205
210
215
220
225

LEGEND

——LOD——	LIMITS OF DISTURBANCE
—×—×—×—	SILT FENCE
—— TP ——	TREE PROTECTION FENCE
DD #1A ·●► DD #1B	DIVERSION DITCH
▲	DITCH REINFORCEMENT
●	INLET PROTECTION
▭	SEDIMENT BASIN
—o—o—o—o—o—	POROUS BAFFLES
◓	SILT FENCE OUTLET
⊞—	SKIMMER
⌒	COIR WATTLE
▲	RIPRAP CHECK DAM

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

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	06/22/2021
DRAWN BY	JD. MACMILLAN
DESIGNED BY	JD. MACMILLAN
CHECKED BY	M. ZACCARDO
SCALE	1"=50'

TIMMONS GROUP

NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION

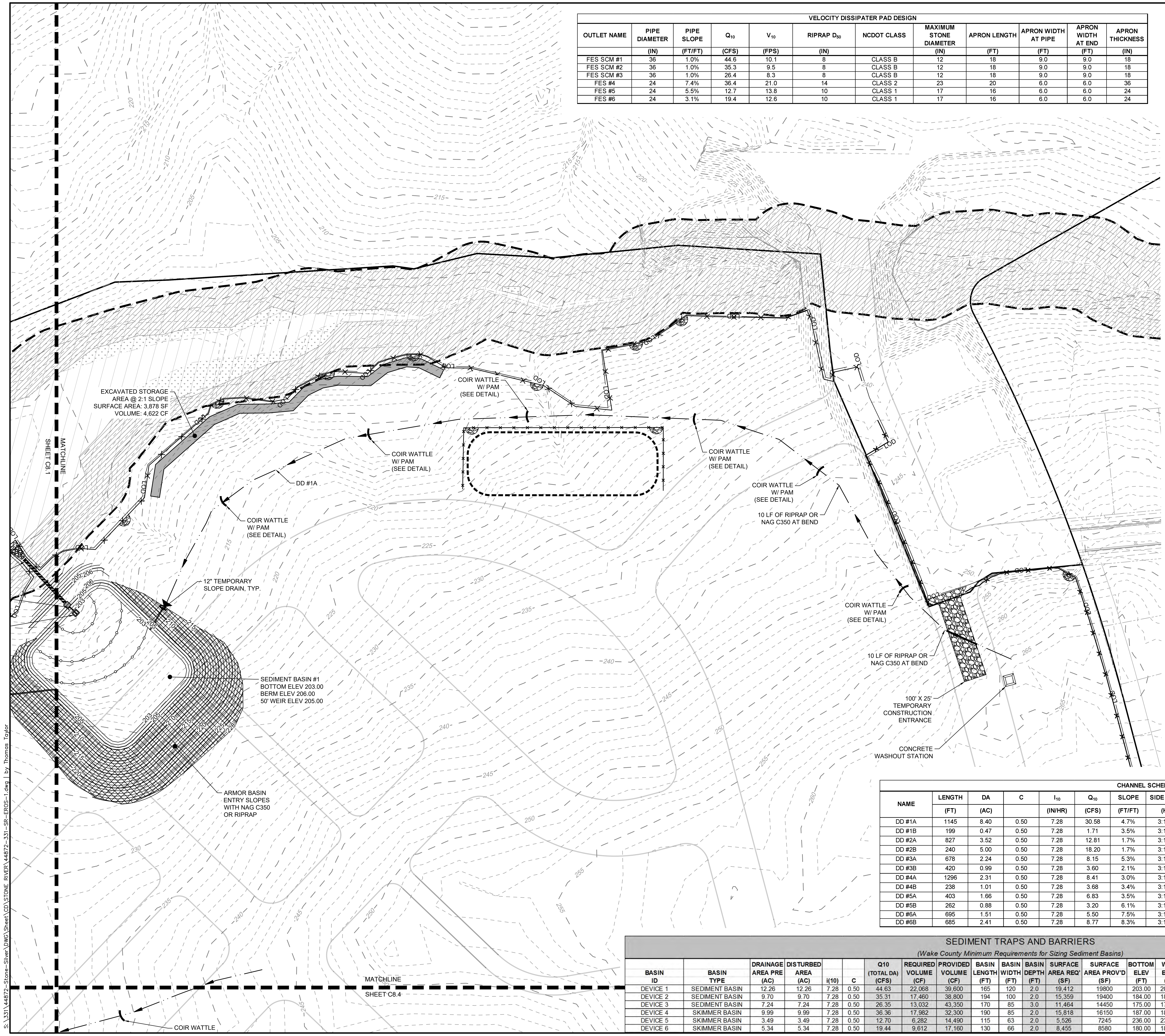
KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA

EROSION AND SEDIMENT CONTROL PLAN STAGE 1 SHEET 1 OF 4

JOB NO.
44872

SHEET NO.
C8.1

FOR REVIEW ONLY: NOT FOR CONSTRUCTION


EXCAVATED STORAGE AREA @ 2:1 SLOPE SURFACE AREA: 3,878 SF VOLUME: 4,622 CF
COIR WATTLE W/ PAM (SEE DETAIL)
COIR WATTLE W/ PAM (SEE DETAIL)
COIR WATTLE W/ PAM (SEE DETAIL)
COIR WATTLE W/ PAM (SEE DETAIL)
COIR WATTLE W/ PAM (SEE DETAIL)
COIR WATTLE W/ PAM (SEE DETAIL)
DD #1A
10 LF OF RIPRAP OR NAG C350 AT BEND
12" TEMPORARY SLOPE DRAIN, TYP.
SEDIMENT BASIN #1 BOTTOM ELEV 203.00 BERM ELEV 206.00 50' WEIR ELEV 205.00
10 LF OF RIPRAP OR NAG C350 AT BEND
100' X 25' TEMPORARY CONSTRUCTION ENTRANCE
CONCRETE WASHOUT STATION
ARMOR BASIN ENTRY SLOPES WITH NAG C350 OR RIPRAP
MATCHLINE SHEET C8.1
MATCHLINE SHEET C8.4
COIR WATTLE
LOD
NAD 83
SCALE 1"=50'
0
50'
100'

VELOCITY DISSIPATER PAD DESIGN											
OUTLET NAME	PIPE DIAMETER	PIPE SLOPE	Q_{10}	V_{10}	RIPRAP D_{50}	NCDOT CLASS	MAXIMUM STONE DIAMETER	APRON LENGTH	APRON WIDTH AT PIPE	APRON WIDTH AT END	APRON THICKNESS
	(IN)	(FT/FT)	(CFS)	(FPS)	(IN)		(IN)	(FT)	(FT)	(FT)	(IN)
FES SCM #1	36	1.0%	44.6	10.1	8	CLASS B	12	18	9.0	9.0	18
FES SCM #2	36	1.0%	35.3	9.5	8	CLASS B	12	18	9.0	9.0	18
FES SCM #3	36	1.0%	26.4	8.3	8	CLASS B	12	18	9.0	9.0	18
FES #4	24	7.4%	36.4	21.0	14	CLASS 2	23	20	6.0	6.0	36
FES #5	24	5.5%	12.7	13.8	10	CLASS 1	17	16	6.0	6.0	24
FES #6	24	3.1%	19.4	12.6	10	CLASS 1	17	16	6.0	6.0	24

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

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

North Carolina 811
www.nc811.org

LEGEND

——LOD——	LIMITS OF DISTURBANCE
—×—×—×—	SILT FENCE
——TP——	TREE PROTECTION FENCE
DD #1A —●— DD #1B	DIVERSION DITCH
▲	DITCH REINFORCEMENT
●	INLET PROTECTION
▭	SEDIMENT BASIN
—○—○—○—	POROUS BAFFLES
◠	SILT FENCE OUTLET
⊞—	SKIMMER
⌒	COIR WATTLE
▲	RIPRAP CHECK DAM

TOTAL DISTURBED AREA STAGE 1 = 56.8 ACRES

CHANNEL SCHEDULE											
NAME	LENGTH	DA	C	I_{10}	Q_{10}	SLOPE	SIDE SLOPE	DEPTH	VELOCITY	SHEAR STRESS	TEMP. LINING	PERM. LINING
	(FT)	(AC)		(IN/HR)	(CFS)	(FT/FT)	(H:V)	(FT)	(FT/S)	(LBS/FT^2)		
DD #1A	1145	8.40	0.50	7.28	30.58	4.7%	3:1, 3:1	1.06	9.07	1.46	NAG C125	N/A
DD #1B	199	0.47	0.50	7.28	1.71	3.5%	3:1, 3:1	0.38	3.95	0.46	NAG C125	N/A
DD #2A	827	3.52	0.50	7.28	12.81	1.7%	3:1, 3:1	0.92	5.04	1.03	NAG C125	N/A
DD #2B	240	5.00	0.50	7.28	18.20	1.7%	3:1, 3:1	1.06	5.40	1.19	NAG C125	N/A
DD #3A	678	2.24	0.50	7.28	8.15	5.3%	3:1, 3:1	0.63	6.84	0.86	NAG C125	N/A
DD #3B	420	0.99	0.50	7.28	3.60	2.1%	3:1, 3:1	0.55	3.97	0.62	NAG C125	N/A
DD #4A	1296	2.31	0.50	7.28	8.41	3.0%	3:1, 3:1	0.71	5.56	0.87	NAG C125	N/A
DD #4B	238	1.01	0.50	7.28	3.68	3.4%	3:1, 3:1	0.51	4.72	0.63	NAG C125	N/A
DD #5A	403	1.66	0.50	7.28	6.83	3.5%	3:1, 3:1	0.64	5.56	0.80	NAG C125	N/A
DD #5B	262	0.88	0.50	7.28	3.20	6.1%	3:1, 3:1	0.43	5.77	0.59	NAG C125	N/A
DD #6A	695	1.51	0.50	7.28	5.50	7.5%	3:1, 3:1	0.51	7.05	0.74	NAG C125	N/A
DD #6B	685	2.41	0.50	7.28	8.77	8.3%	3:1, 3:1	0.60	8.12	0.89	NAG C125	N/A

SEDIMENT TRAPS AND BARRIERS

(Wake County Minimum Requirements for Sizing Sediment Basins)

BASIN ID	BASIN TYPE	DRAINAGE AREA PRE (AC)	DISTURBED AREA (AC)	i(10)	C	Q10 (TOTAL DA) (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)	WEIR ELEV (FT)	WEIR LENGTH (FT)	Q10 TOTAL DA (CFS)	FLOW DEPTH (FT)	DEWATER DEVICE	SKIMMER SIZE (IN)	SKIMMER ORIFICE DIA (IN)	DEWATER TIME (DAYS)
DEVICE 1	SEDIMENT BASIN	12.26	12.26	7.28	0.50	44.63	22,068	39,600	165	120	2.0	19,412	19800	203.00	205.00	50	44.63	0.44	SKIMMER	3.0	2.5	3.06
DEVICE 2	SEDIMENT BASIN	9.70	9.70	7.28	0.50	35.31	17,460	38,800	194	100	2.0	15,359	19400	184.00	186.00	35	35.31	0.48	SKIMMER	2.5	2.25	3.27
DEVICE 3	SEDIMENT BASIN	7.24	7.24	7.28	0.50	26.35	13,032	43,350	170	85	3.0	11,464	14450	175.00	178.00	30	26.35	0.44	SKIMMER	2.5	2	3.09
DEVICE 4	SKIMMER BASIN	9.99	9.99	7.28	0.50	36.36	17,982	32,300	190	85	2.0	15,818	16150	187.00	189.00	40	36.36	0.45	SKIMMER	2.5	2.25	3.37
DEVICE 5	SKIMMER BASIN	3.49	3.49	7.28	0.50	12.70	6,282	14,490	115	63	2.0	5,526	7245	236.00	238.00	15	12.70	0.43	SKIMMER	1.5	1.5	3.42
DEVICE 6	SKIMMER BASIN	5.34	5.34	7.28	0.50	19.44	9,612	17,160	130	66	2.0	8,455	8580	180.00	182.00	20	19.44	0.47	SKIMMER	2.0	1.75	3.32

S:\331\44872-Stone-Silver\DWG\Sheet\CD\STONE RIVER\44872-331-SR-EROS-1.dwg | by: Thomas Taylor

MICHAEL V. ZACCARDO
6/22/21

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

DATE
06/22/2021

DRAWN BY
JD. MACMILLAN

DESIGNED BY
JD. MACMILLAN

CHECKED BY
M. ZACCARDO

SCALE
1"=50'

TIMMONS GROUP

NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION

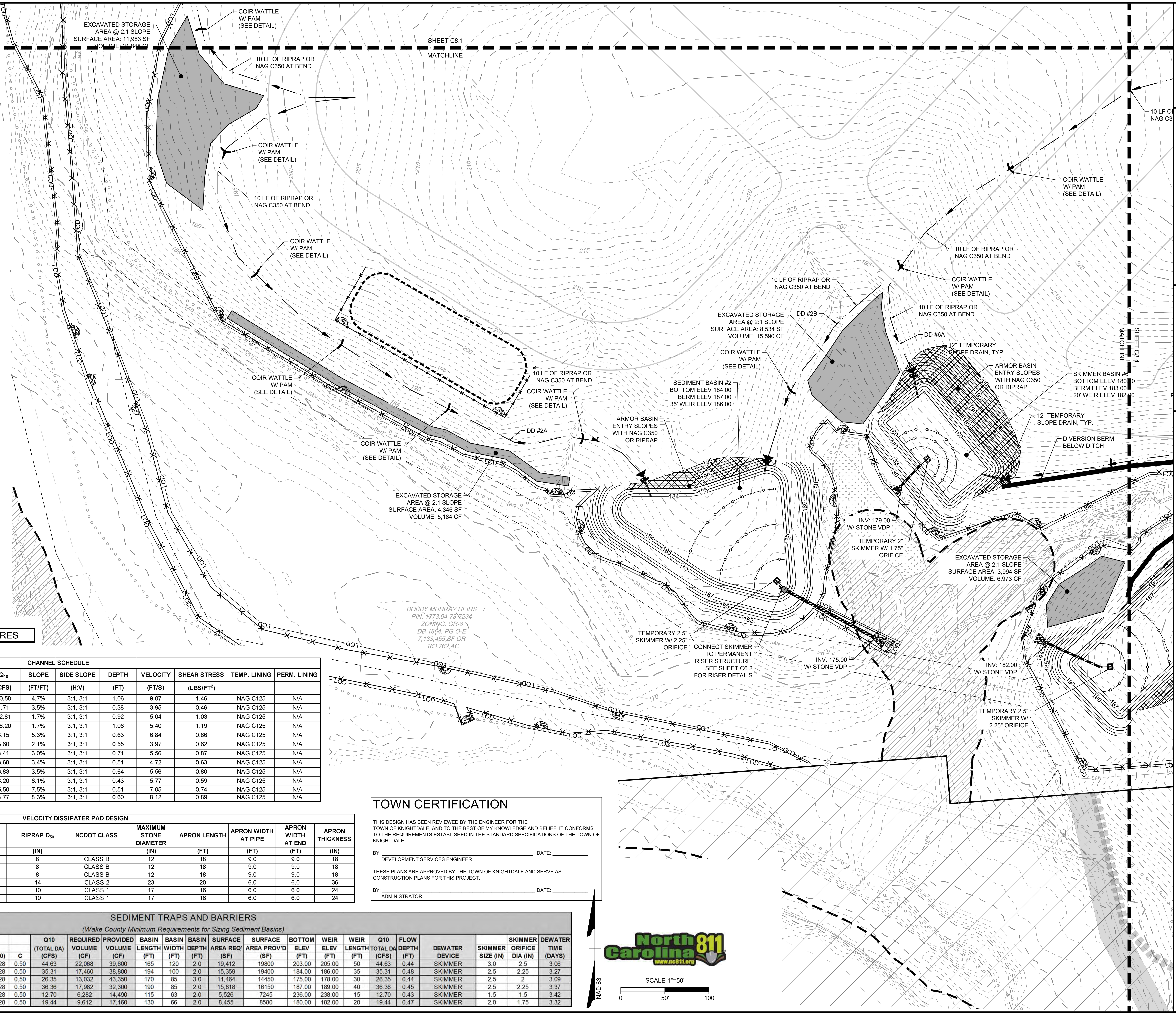
KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA

EROSION AND SEDIMENT CONTROL PLAN STAGE 1 SHEET 2 OF 4

JOB NO.
44872

SHEET NO.
C8.2

FOR REVIEW ONLY: NOT FOR CONSTRUCTION



EXCAVATED STORAGE AREA @ 2:1 SLOPE SURFACE AREA: 11,983 SF VOLUME: 21,848 CF
COIR WATTLE W/ PAM (SEE DETAIL)
SHEET C8.1
MATCHLINE
10 LF OF RIPRAP OR NAG C350 AT BEND
COIR WATTLE W/ PAM (SEE DETAIL)
10 LF OF RIPRAP OR NAG C350 AT BEND
COIR WATTLE W/ PAM (SEE DETAIL)
COIR WATTLE W/ PAM (SEE DETAIL)
COIR WATTLE W/ PAM (SEE DETAIL)
10 LF OF RIPRAP OR NAG C350 AT BEND
COIR WATTLE W/ PAM (SEE DETAIL)
DD #2A
EXCAVATED STORAGE AREA @ 2:1 SLOPE SURFACE AREA: 4,346 SF VOLUME: 5,184 CF
BOBBY MURRAY HEIRS PIN: 1773.04-73-7234 ZONING: GR-8 DB 1864, PG O-E 7,133,455 SF OR 163.762 AC
ARMOR BASIN ENTRY SLOPES WITH NAG C350 OR RIPRAP
SEDIMENT BASIN #2 BOTTOM ELEV 184.00 BERM ELEV 187.00 35' WEIR ELEV 186.00
EXCAVATED STORAGE AREA @ 2:1 SLOPE SURFACE AREA: 8,534 SF VOLUME: 15,590 CF
DD #2B
COIR WATTLE W/ PAM (SEE DETAIL)
10 LF OF RIPRAP OR NAG C350 AT BEND
10 LF OF RIPRAP OR NAG C350 AT BEND
COIR WATTLE W/ PAM (SEE DETAIL)
10 LF OF RIPRAP OR NAG C350 AT BEND
DD #6A
12" TEMPORARY SLOPE DRAIN, TYP.
ARMOR BASIN ENTRY SLOPES WITH NAG C350 OR RIPRAP
SKIMMER BASIN #6 BOTTOM ELEV 180.00 BERM ELEV 183.00 20' WEIR ELEV 182.00
12" TEMPORARY SLOPE DRAIN, TYP.
DIVERSION BERM BELOW DITCH
COIR WATTLE W/ PAM (SEE DETAIL)
10 LF OF RIPRAP OR NAG C350 AT BEND
10 LF O
NAG C3
MATCHLINE
SHEET C8.4
INV: 179.00 W/ STONE VDP
TEMPORARY 2" SKIMMER W/ 1.75" ORIFICE
EXCAVATED STORAGE AREA @ 2:1 SLOPE SURFACE AREA: 3,994 SF VOLUME: 6,973 CF
TEMPORARY 2.5" SKIMMER W/ 2.25" ORIFICE
CONNECT SKIMMER TO PERMANENT RISER STRUCTURE. SEE SHEET C6.2 FOR RISER DETAILS
INV: 175.00 W/ STONE VDP
INV: 182.00 W/ STONE VDP
TEMPORARY 2.5" SKIMMER W/ 2.25" ORIFICE
LOD
SAN
165
170
175
180
182
184
185
187
190
195
200
205
210
215
220
NAD 83
SCALE 1"=50'
0
50'
100'

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

LEGEND

——LOD——	LIMITS OF DISTURBANCE
—×—×—×—	SILT FENCE
——TP——	TREE PROTECTION FENCE
DD #1A ——— DD #1B	DIVERSION DITCH
△	DITCH REINFORCEMENT
●	INLET PROTECTION
▭	SEDIMENT BASIN
—o—o—	POROUS BAFFLES
◠	SILT FENCE OUTLET
—▫	SKIMMER
⌒	COIR WATTLE
▲	RIPRAP CHECK DAM

TOTAL DISTURBED AREA STAGE 1 = 56.8 ACRES

CHANNEL SCHEDULE												
NAME	LENGTH	DA	C	I_{10}	Q_{10}	SLOPE	SIDE SLOPE	DEPTH	VELOCITY	SHEAR STRESS	TEMP. LINING	PERM. LINING
	(FT)	(AC)		(IN/HR)	(CFS)	(FT/FT)	(H:V)	(FT)	(FT/S)	(LBS/FT^2)		
DD #1A	1145	8.40	0.50	7.28	30.58	4.7%	3:1, 3:1	1.06	9.07	1.46	NAG C125	N/A
DD #1B	199	0.47	0.50	7.28	1.71	3.5%	3:1, 3:1	0.38	3.95	0.46	NAG C125	N/A
DD #2A	827	3.52	0.50	7.28	12.81	1.7%	3:1, 3:1	0.92	5.04	1.03	NAG C125	N/A
DD #2B	240	5.00	0.50	7.28	18.20	1.7%	3:1, 3:1	1.06	5.40	1.19	NAG C125	N/A
DD #3A	678	2.24	0.50	7.28	8.15	5.3%	3:1, 3:1	0.63	6.84	0.86	NAG C125	N/A
DD #3B	420	0.99	0.50	7.28	3.60	2.1%	3:1, 3:1	0.55	3.97	0.62	NAG C125	N/A
DD #4A	1296	2.31	0.50	7.28	8.41	3.0%	3:1, 3:1	0.71	5.56	0.87	NAG C125	N/A
DD #4B	238	1.01	0.50	7.28	3.68	3.4%	3:1, 3:1	0.51	4.72	0.63	NAG C125	N/A
DD #5A	403	1.66	0.50	7.28	6.83	3.5%	3:1, 3:1	0.64	5.56	0.80	NAG C125	N/A
DD #5B	262	0.88	0.50	7.28	3.20	6.1%	3:1, 3:1	0.43	5.77	0.59	NAG C125	N/A
DD #6A	695	1.51	0.50	7.28	5.50	7.5%	3:1, 3:1	0.51	7.05	0.74	NAG C125	N/A
DD #6B	685	2.41	0.50	7.28	8.77	8.3%	3:1, 3:1	0.60	8.12	0.89	NAG C125	N/A

VELOCITY DISSIPATER PAD DESIGN											
OUTLET NAME	PIPE DIAMETER	PIPE SLOPE	Q_{10}	V_{10}	RIPRAP D_{50}	NCDOT CLASS	MAXIMUM STONE DIAMETER	APRON LENGTH	APRON WIDTH AT PIPE	APRON WIDTH AT END	APRON THICKNESS
	(IN)	(FT/FT)	(CFS)	(FPS)	(IN)		(IN)	(FT)	(FT)	(FT)	(IN)
FES SCM #1	36	1.0%	44.6	10.1	8	CLASS B	12	18	9.0	9.0	18
FES SCM #2	36	1.0%	35.3	9.5	8	CLASS B	12	18	9.0	9.0	18
FES SCM #3	36	1.0%	26.4	8.3	8	CLASS B	12	18	9.0	9.0	18
FES #4	24	7.4%	36.4	21.0	14	CLASS 2	23	20	6.0	6.0	36
FES #5	24	5.5%	12.7	13.8	10	CLASS 1	17	16	6.0	6.0	24
FES #6	24	3.1%	19.4	12.6	10	CLASS 1	17	16	6.0	6.0	24

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

SEDIMENT TRAPS AND BARRIERS

(Wake County Minimum Requirements for Sizing Sediment Basins)

BASIN ID	BASIN TYPE	DRAINAGE AREA PRE (AC)	DISTURBED AREA (AC)	i(10)	C	Q10 (TOTAL DA) (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)	WEIR ELEV (FT)	WEIR LENGTH (FT)	Q10 TOTAL DA (CFS)	FLOW DEPTH (FT)	DEWATER DEVICE	SKIMMER SIZE (IN)	SKIMMER ORIFICE DIA (IN)	DEWATER TIME (DAYS)
DEVICE 1	SEDIMENT BASIN	12.26	12.26	7.28	0.50	44.63	22,068	39,600	165	120	2.0	19,412	19800	203.00	205.00	50	44.63	0.44	SKIMMER	3.0	2.5	3.06
DEVICE 2	SEDIMENT BASIN	9.70	9.70	7.28	0.50	35.31	17,460	38,800	194	100	2.0	15,359	19400	184.00	186.00	35	35.31	0.48	SKIMMER	2.5	2.25	3.27
DEVICE 3	SEDIMENT BASIN	7.24	7.24	7.28	0.50	26.35	13,032	43,350	170	85	3.0	11,464	14450	175.00	178.00	30	26.35	0.44	SKIMMER	2.5	2	3.09
DEVICE 4	SKIMMER BASIN	9.99	9.99	7.28	0.50	36.36	17,982	32,300	190	85	2.0	15,818	16150	187.00	189.00	40	36.36	0.45	SKIMMER	2.5	2.25	3.37
DEVICE 5	SKIMMER BASIN	3.49	3.49	7.28	0.50	12.70	6,282	14,490	115	63	2.0	5,526	7245	236.00	238.00	15	12.70	0.43	SKIMMER	1.5	1.5	3.42
DEVICE 6	SKIMMER BASIN	5.34	5.34	7.28	0.50	19.44	9,612	17,160	130	66	2.0	8,455	8580	180.00	182.00	20	19.44	0.47	SKIMMER	2.0	1.75	3.32

North Carolina 811
www.nc811.org

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MICHAEL V. ZACCARDO
6/22/21

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TIMMONS GROUP

NORTH CAROLINA LICENSE NO. C-1652

REVISION DESCRIPTION	DATE

DATE	06/22/2021
DRAWN BY	JD. MACMILLAN
DESIGNED BY	JD. MACMILLAN
CHECKED BY	M. ZACCARDO
SCALE	1"=50'

STONERIVER SUBDIVISION

KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA

EROSION AND SEDIMENT CONTROL PLAN STAGE 1 SHEET 3 OF 4

JOB NO.
44872

SHEET NO.
C8.3

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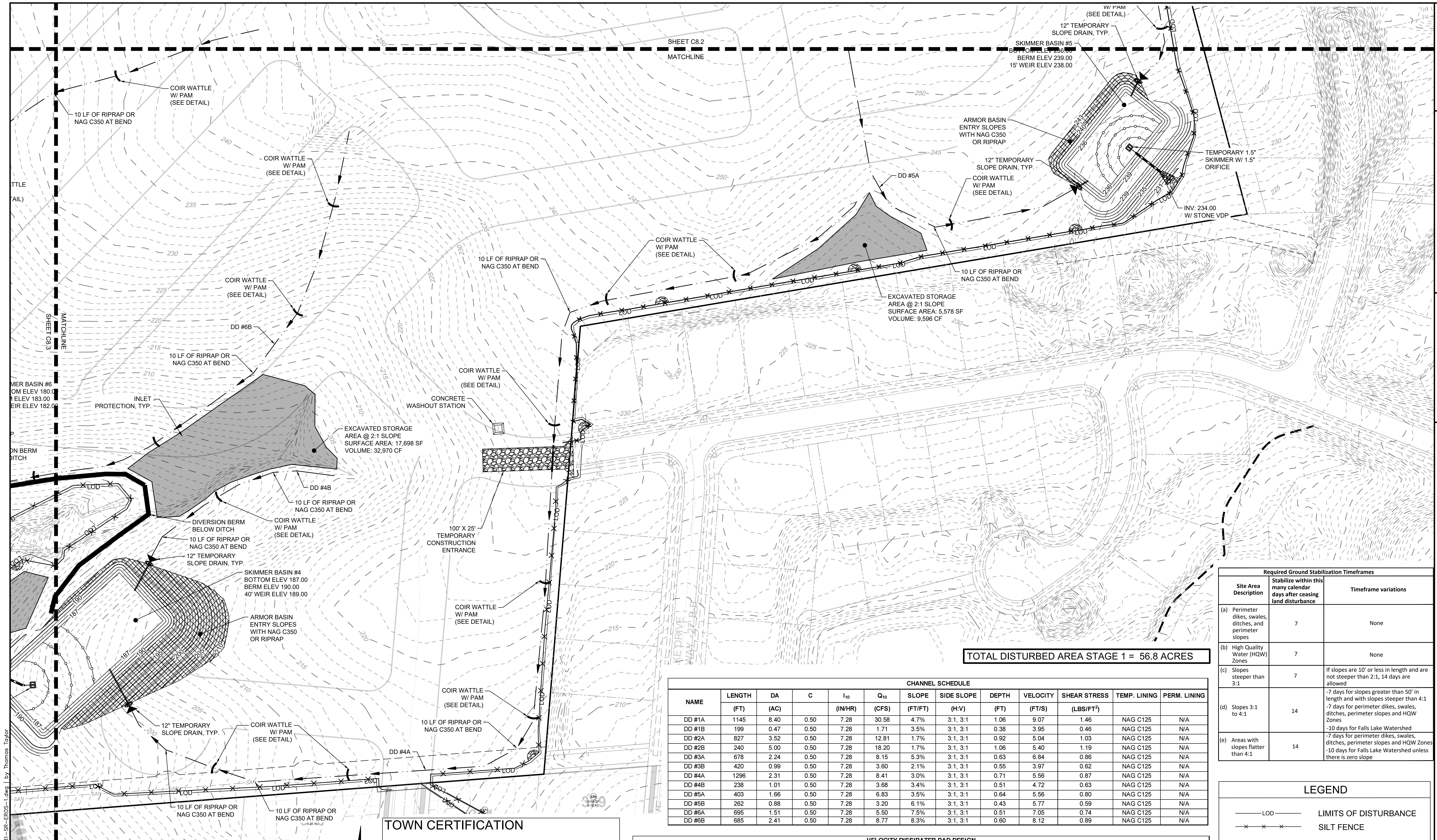
SHEET C8.2
MATCHLINE
MATCHLINE
SHEET C8.3
COIR WATTLE W/ PAM (SEE DETAIL)
10 LF OF RIPRAP OR NAG C350 AT BEND
SKIMMER BASIN #5
BOTTOM ELEV 236.00
BERM ELEV 239.00
15' WEIR ELEV 238.00
12" TEMPORARY SLOPE DRAIN, TYP.
ARMOR BASIN ENTRY SLOPES WITH NAG C350 OR RIPRAP
TEMPORARY 1.5" SKIMMER W/ 1.5" ORIFICE
INV: 234.00 W/ STONE VDP
DD #5A
EXCAVATED STORAGE AREA @ 2:1 SLOPE SURFACE AREA: 5,578 SF VOLUME: 9,596 CF
DD #6B
INLET PROTECTION, TYP.
EXCAVATED STORAGE AREA @ 2:1 SLOPE SURFACE AREA: 17,698 SF VOLUME: 32,970 CF
CONCRETE WASHOUT STATION
DD #4B
DIVERSION BERM BELOW DITCH
SKIMMER BASIN #4
BOTTOM ELEV 187.00
BERM ELEV 190.00
40' WEIR ELEV 189.00
100' X 25' TEMPORARY CONSTRUCTION ENTRANCE
DD #4A
LOD
NAD 83
SCALE 1"=50'
0
50'
100'

TOTAL DISTURBED AREA STAGE 1 = 56.8 ACRES

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

CHANNEL SCHEDULE

NAME	LENGTH	DA	C	I_{10}	Q_{10}	SLOPE	SIDE SLOPE	DEPTH	VELOCITY	SHEAR STRESS	TEMP. LINING	PERM. LINING
	(FT)	(AC)		(IN/HR)	(CFS)	(FT/FT)	(H:V)	(FT)	(FT/S)	(LBS/FT^2)		
DD #1A	1145	8.40	0.50	7.28	30.58	4.7%	3:1, 3:1	1.06	9.07	1.46	NAG C125	N/A
DD #1B	199	0.47	0.50	7.28	1.71	3.5%	3:1, 3:1	0.38	3.95	0.46	NAG C125	N/A
DD #2A	827	3.52	0.50	7.28	12.81	1.7%	3:1, 3:1	0.92	5.04	1.03	NAG C125	N/A
DD #2B	240	5.00	0.50	7.28	18.20	1.7%	3:1, 3:1	1.06	5.40	1.19	NAG C125	N/A
DD #3A	678	2.24	0.50	7.28	8.15	5.3%	3:1, 3:1	0.63	6.84	0.86	NAG C125	N/A
DD #3B	420	0.99	0.50	7.28	3.60	2.1%	3:1, 3:1	0.55	3.97	0.62	NAG C125	N/A
DD #4A	1296	2.31	0.50	7.28	8.41	3.0%	3:1, 3:1	0.71	5.56	0.87	NAG C125	N/A
DD #4B	238	1.01	0.50	7.28	3.68	3.4%	3:1, 3:1	0.51	4.72	0.63	NAG C125	N/A
DD #5A	403	1.66	0.50	7.28	6.83	3.5%	3:1, 3:1	0.64	5.56	0.80	NAG C125	N/A
DD #5B	262	0.88	0.50	7.28	3.20	6.1%	3:1, 3:1	0.43	5.77	0.59	NAG C125	N/A
DD #6A	695	1.51	0.50	7.28	5.50	7.5%	3:1, 3:1	0.51	7.05	0.74	NAG C125	N/A
DD #6B	685	2.41	0.50	7.28	8.77	8.3%	3:1, 3:1	0.60	8.12	0.89	NAG C125	N/A

TOWN CERTIFICATION

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

BY: ______________________________ DATE: ____________
DEVELOPMENT SERVICES ENGINEER

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

BY: ______________________________ DATE: ____________
ADMINISTRATOR

VELOCITY DISSIPATER PAD DESIGN

OUTLET NAME	PIPE DIAMETER	PIPE SLOPE	Q_{10}	V_{10}	RIPRAP D_{50}	NCDOT CLASS	MAXIMUM STONE DIAMETER	APRON LENGTH	APRON WIDTH AT PIPE	APRON WIDTH AT END	APRON THICKNESS
	(IN)	(FT/FT)	(CFS)	(FPS)	(IN)		(IN)	(FT)	(FT)	(FT)	(IN)
FES SCM #1	36	1.0%	44.6	10.1	8	CLASS B	12	18	9.0	9.0	18
FES SCM #2	36	1.0%	35.3	9.5	8	CLASS B	12	18	9.0	9.0	18
FES SCM #3	36	1.0%	26.4	8.3	8	CLASS B	12	18	9.0	9.0	18
FES #4	24	7.4%	36.4	21.0	14	CLASS 2	23	20	6.0	6.0	36
FES #5	24	5.5%	12.7	13.8	10	CLASS 1	17	16	6.0	6.0	24
FES #6	24	3.1%	19.4	12.6	10	CLASS 1	17	16	6.0	6.0	24

North Carolina 811
www.nc811.org

SEDIMENT TRAPS AND BARRIERS

(Wake County Minimum Requirements for Sizing Sediment Basins)

BASIN ID	BASIN TYPE	DRAINAGE AREA PRE (AC)	DISTURBED AREA (AC)	i(10)	C	Q10 (TOTAL DA) (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)	WEIR ELEV (FT)	WEIR LENGTH (FT)	Q10 TOTAL DA (CFS)	FLOW DEPTH (FT)	DEWATER DEVICE	SKIMMER SIZE (IN)	SKIMMER ORIFICE DIA (IN)	DEWATER TIME (DAYS)
DEVICE 1	SEDIMENT BASIN	12.26	12.26	7.28	0.50	44.63	22,068	39,600	165	120	2.0	19,412	19800	203.00	205.00	50	44.63	0.44	SKIMMER	3.0	2.5	3.06
DEVICE 2	SEDIMENT BASIN	9.70	9.70	7.28	0.50	35.31	17,460	38,800	194	100	2.0	15,359	19400	184.00	186.00	35	35.31	0.48	SKIMMER	2.5	2.25	3.27
DEVICE 3	SEDIMENT BASIN	7.24	7.24	7.28	0.50	26.35	13,032	43,350	170	85	3.0	11,464	14450	175.00	178.00	30	26.35	0.44	SKIMMER	2.5	2	3.09
DEVICE 4	SKIMMER BASIN	9.99	9.99	7.28	0.50	36.36	17,982	32,300	190	85	2.0	15,818	16150	187.00	189.00	40	36.36	0.45	SKIMMER	2.5	2.25	3.37
DEVICE 5	SKIMMER BASIN	3.49	3.49	7.28	0.50	12.70	6,282	14,490	115	63	2.0	5,526	7245	236.00	238.00	15	12.70	0.43	SKIMMER	1.5	1.5	3.42
DEVICE 6	SKIMMER BASIN	5.34	5.34	7.28	0.50	19.44	9,612	17,160	130	66	2.0	8,455	8580	180.00	182.00	20	19.44	0.47	SKIMMER	2.0	1.75	3.32

LEGEND

— LOD —	LIMITS OF DISTURBANCE
—×—×—×—	SILT FENCE
— TP —	TREE PROTECTION FENCE
DD #1A ● ▶ DD #1B	DIVERSION DITCH
▲	DITCH REINFORCEMENT
●	INLET PROTECTION
▭	SEDIMENT BASIN
—○—○—○—	POROUS BAFFLES
◓	SILT FENCE OUTLET
⊞—	SKIMMER
⌒	COIR WATTLE
▲	RIPRAP CHECK DAM

6/22/21

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.

DATE	REVISION DESCRIPTION

DATE
06/22/2021

DRAWN BY
JD. MACMILLAN

DESIGNED BY
JD. MACMILLAN

CHECKED BY
M. ZACCARDO

SCALE
1"=50'

TIMMONS GROUP

NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION

KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA

EROSION AND SEDIMENT CONTROL PLAN STAGE 1 SHEET 4 OF 4

JOB NO.
44872

SHEET NO.
C8.4

FOR REVIEW ONLY: NOT FOR CONSTRUCTION

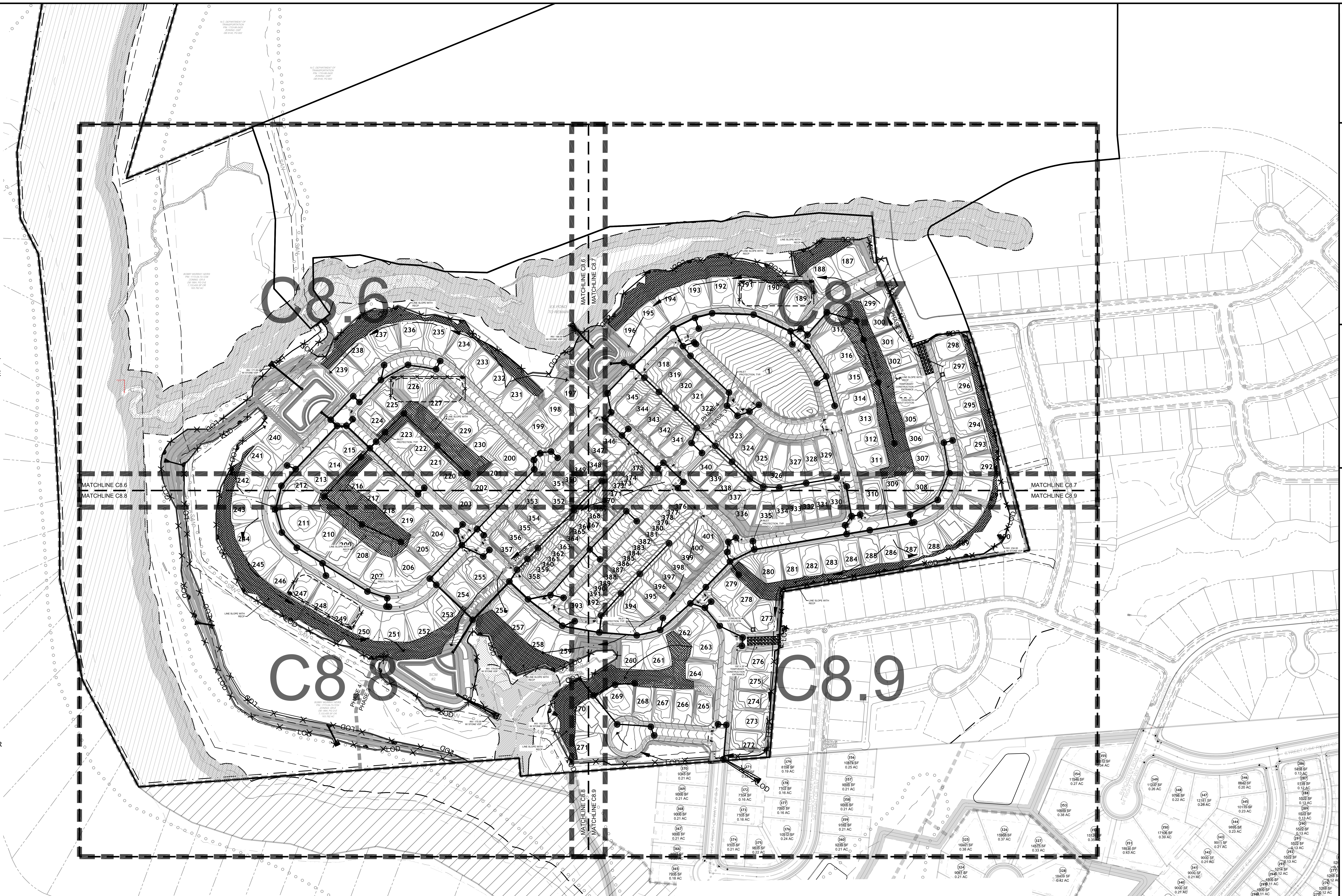
LEGEND

LOD	LIMITS OF DISTURBANCE
× × ×	SILT FENCE
TP	TREE PROTECTION FENCE
TPSF	TREE PROTECTION SILT FENCE
DD 1-A DD 1-B	DIVERSION DITCH
▲	DITCH REINFORCEMENT
●	INLET PROTECTION
▭	SEDIMENT BASIN
○ ○ ○	POROUS BAFFLES
	SILT FENCE OUTLET
	SKIMMER
	COIR WATTLE
▲	RIPRAP CHECK DAM

PHASE II EROSION CONTROL CONSTRUCTION SEQUENCE:

1. MAINTAIN ALL EXISTING EROSION CONTROL FEATURES PREVIOUSLY CONSTRUCTED AND ASSOCIATED WITH PHASE 2 EROSION CONTROL.
2. CONTINUE BRINGING FILL INTO THE SITE. IMPORTED MATERIAL WILL REQUIRE A PERMITTED SITE APPROVAL BEFORE THIS PROCESS BEGINS. ALL FILL SHALL BE BROUGHT INTO THE SITE AND EVENLY SPREAD OUT THROUGH THE SITE AS SHOWN IN LIFTS OF NO MORE THAT 1.0' AT A TIME. FILL SHALL BE ROLL COMPACTED BY A DOZER OR EQUIVALENT AS IT IS PLACED.
3. BEGIN INSTALLATION OF THE STORM PIPE SYSTEM FROM JB201 TO OCS204. ONCE THIS RUN IS COMPLETE, INSTALL SKIMMER SEDIMENT BASIN.
4. AFTER THE SEDIMENT BASIN IS CONSTRUCTED, CONTINUE INSTALLING STORM DRAINAGE SYSTEM FROM OUTLET POINT (LOW END) AND WORK UPSTREAM. PIPE INLET PROTECTION SHALL BE UTILIZED AT THE END OF EACH WORK DAY TO ASSURE PIPE NETWORK IS NOT INUNDATED WITH SEDIMENT.
5. INSTALL SITE IMPROVEMENTS, STORMWATER DRAINAGE SYSTEM, UTILITY SERVICES, SIDEWALKS AND DRIVES AS SHOWN ON THE APPROVED PLANS. ALL OPEN TRENCHES FOR UTILITY AND STORMWATER INSTALLATION SHALL BE PROTECTED FROM SEDIMENTATION BY PILING EXCAVATED MATERIAL ON THE UPHILL SIDE OF EXCAVATION.
6. INSTALL ADEQUATE EROSION AND SEDIMENT CONTROL MEASURES AND/OR INCREASE MAINTENANCE FREQUENCY WHERE APPROVED MEASURES FAIL TO PREVENT ACCELERATED EROSION, OFF-SITE SEDIMENTATION, OR REPETITIVE NON-COMPLIANCE ISSUES. ALL MEASURES MUST BE INSTALLED PER PLAN DETAIL. ENSURE CONSTRUCTION TRAFFIC IS LIMITED TO THE CONSTRUCTION ENTRANCE ONLY.
7. GROUND COVER SHALL BE PROVIDED AS FOLLOWS:
    - FOR ALL AREAS OF MODERATE AND/OR STEEP SLOPES, PROVIDE TEMPORARY GROUND COVER IF THE SLOPE HAS NOT BEEN DISTURBED FOR A PERIOD OF FOURTEEN (14) DAYS. SLOPES GREATER THAN 3:1 REQUIRE GROUND COVER IN 7 DAYS.
    - PROVIDE GROUND COVER SUFFICIENT TO RESTRAIN EROSION ON ANY PORTION OF THE SITE UPON WHICH FURTHER LAND-DISTURBING ACTIVITY IS NOT BEING UNDERTAKEN WITHIN FOURTEEN (14) CALENDAR DAYS OF TEMPORARILY OR PERMANENTLY SUSPENDING LAND DISTURBING ACTIVITY.
    - ESTABLISH PERMANENT GROUND COVER SUFFICIENT TO RESTRAIN EROSION WITHIN FOURTEEN (14) CALENDAR DAYS FOLLOWING COMPLETION OF CONSTRUCTION OR DEVELOPMENT AND/OR PRIOR TO FINAL INSPECTION.
8. INSTALL CURB & GUTTER AND GRAVEL BASE.
9. MODIFICATIONS TO THE APPROVED AND PERMITTED PLANS SHALL BE APPROVED BY EROSION CONTROL INSPECTIONS PRIOR TO REMOVAL OR INSTALLATION. CONTACT THE EROSION CONTROL INSPECTOR TO OBTAIN SIGN-OFF ON THE PLANS.
10. MAINTAIN ALL EROSION AND SEDIMENT CONTROL MEASURES IN GOOD WORKING ORDER. SILT FENCE, INLET PROTECTION, AND OTHER SIMILAR MEASURES MUST BE CLEANED OUT BEFORE THEY ARE HALF FULL. CLOGGED STONE FILTERS MUST BE REFRESHED/REPLACED. SILT FENCE CAN NOT HAVE HOLES OR TEARS.
11. INDICATE CONTACTING WAKE COUNTY E&SC INSPECTOR TO DETERMINE IF BASINS MAY BE CLOSED. ONCE WAKE COUNTY CONCURS WITH BASIN REMOVAL, PROVIDE A 10 DAY WRITTEN NOTIFICATION TO NCDEQ-DEMLR TO REQUEST DEWATERING AND REMOVAL OF BASIN PER NCG01 DETAIL SHEETS.
12. CONTRACTOR TO HAVE A LICENSED SOIL SCIENTIST PERFORM AN INFILTRATION TEST AT THE BOTTOM ELEVATION OF THE SCM AND IMMEDIATELY REPORT THE INFILTRATION RATE TO THE ENGINEER.
13. AT A MINIMUM OF SEVEN (7) DAYS PRIOR TO SCHEDULING THE STORMWATER FINAL INSPECTION, SUBMIT ANY REQUIRED PAPERWORK TO THE EROSION CONTROL INSPECTORS FOR APPROVAL. FAILURE TO DO SO WILL PREVENT A CERTIFICATE OF OCCUPANCY FROM BEING ISSUED.
14. ONCE THE STORMWATER FINAL INSPECTION IS APPROVED, CLOSE THE GRADING PERMIT AND OBTAIN A CERTIFICATE OF COMPLETION.

S:\331\44872-Stone-Silver\DWG\Sheet\CD\STONE RIVER\44872-331-SR-EROS-2.dwg | by Thomas Taylor



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 FUQUAY-VARINA 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).

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

WAKE COUNTY SEDIMENT BASIN REMOVAL SEQUENCE:

1. SCHEDULE A SITE MEETING WITH THE ENVIRONMENTAL CONSULTANT TO DETERMINE IF A BASIN CAN BE REMOVED. INSTALL SILT FENCING OR OTHER TEMPORARY EROSION CONTROL MEASURES AS NEEDED PRIOR TO REMOVAL OF THE BASIN.
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: WAKE COUNTY, WAKE COUNTY 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.
5. INSTALL VELOCITY DISSIPATORS AND/OR LEVEL SPREADERS AS REQUIRED ON THE EROSION CONTROL PLAN.
6. WHEN SITE IS FULLY STABILIZED, CALL ENVIRONMENTAL CONSULTANT 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 ENVIRONMENTAL CONSULTANT TO DETERMINE WHEN A BASIN MAY BE CONVERTED FOR STORMWATER USE. SOME MUNICIPALITIES MAY ALSO REQUIRE THIS.

NAD 83

SCALE 1"=100'
0 100' 200'

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

MICHAEL V. ZACCARDO
6/22/21

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 06/22/2021
DRAWN BY JD. MACMILLAN
DESIGNED BY JD. MACMILLAN
CHECKED BY M. ZACCARDO
SCALE 1"=150'

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION
KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA

OVERALL EROSION AND SEDIMENT CONTROL PLAN STAGE 2

JOB NO. 44872
SHEET NO. C8.5

FOR REVIEW ONLY: NOT FOR CONSTRUCTION

VELOCITY DISSIPATER PAD DESIGN											
OUTLET NAME	PIPE DIAMETER	PIPE SLOPE	Q_{10}	V_{10}	RIPRAP D_{50}	NCDOT CLASS	MAXIMUM STONE DIAMETER	APRON LENGTH	APRON WIDTH AT PIPE	APRON WIDTH AT END	APRON THICKNESS
	(IN)	(FT/FT)	(CFS)	(FPS)	(IN)		(IN)	(FT)	(FT)	(FT)	(IN)
FES SCM #1	36	1.0%	44.6	10.1	8	CLASS B	12	18	9.0	9.0	18
FES SCM #2	36	1.0%	35.3	9.5	8	CLASS B	12	18	9.0	9.0	18
FES SCM #3	36	1.0%	26.4	8.3	8	CLASS B	12	18	9.0	9.0	18
FES #4	24	7.4%	36.4	21.0	14	CLASS 2	23	20	6.0	6.0	36
FES #5	24	5.5%	12.7	13.8	10	CLASS 1	17	16	6.0	6.0	24
FES #6	24	3.1%	19.4	12.6	10	CLASS 1	17	16	6.0	6.0	24

TOTAL DISTURBED AREA STAGE 1 = 56.8 ACRES

LEGEND

—LOD—	LIMITS OF DISTURBANCE
—x—x—	SILT FENCE
—TP—	TREE PROTECTION FENCE
—TPSF—	TREE PROTECTION SILT FENCE
DD 1-A —●— DD 1-B	DIVERSION DITCH
▲	DITCH REINFORCEMENT
●	INLET PROTECTION
▭	SEDIMENT BASIN
—o—o—	POROUS BAFFLES
⌓	SILT FENCE OUTLET
▫—	SKIMMER
⌒	COIR WATTLE
▲	RIPRAP CHECK DAM

NAD 83

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

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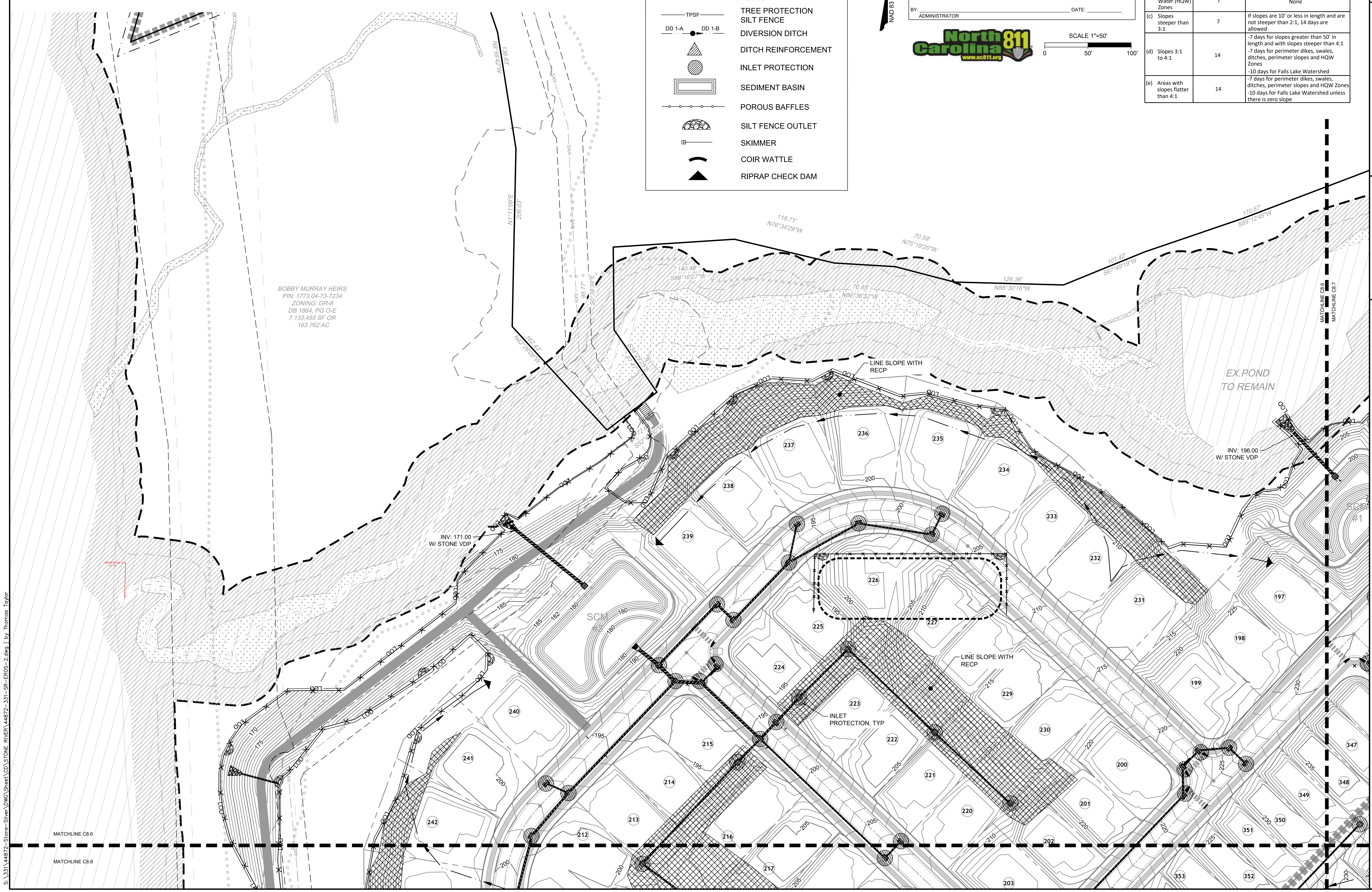
BY: ______________________________ DATE: ____________
ADMINISTRATOR

North Carolina 811 www.nc811.org

SCALE 1"=50'
0 50' 100'

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



MICHAEL V. ZACCARDO
6/22/21

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YOUR VISION ACHIEVED THROUGH OURS.

DATE	REVISION DESCRIPTION

DATE	06/22/2021
DRAWN BY	JD. MACMILLAN
DESIGNED BY	JD. MACMILLAN
CHECKED BY	M. ZACCARDO
SCALE	1"=50'

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION
KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA

EROSION AND SEDIMENT CONTROL PLAN STAGE 2 SHEET 1 OF 4

JOB NO. 44872
SHEET NO. C8.6

S:\331\44872-Stone-Silver\DWG\Sheet\CD\STONE RIVER\44872-331-SR-EROS-2.dwg | by: Thomas Taylor

VELOCITY DISSIPATER PAD DESIGN											
OUTLET NAME	PIPE DIAMETER	PIPE SLOPE	Q_{10}	V_{10}	RIPRAP D_{50}	NCDOT CLASS	MAXIMUM STONE DIAMETER	APRON LENGTH	APRON WIDTH AT PIPE	APRON WIDTH AT END	APRON THICKNESS
	(IN)	(FT/FT)	(CFS)	(FPS)	(IN)		(IN)	(FT)	(FT)	(FT)	(IN)
FES SCM #1	36	1.0%	44.6	10.1	8	CLASS B	12	18	9.0	9.0	18
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FES SCM #3	36	1.0%	26.4	8.3	8	CLASS B	12	18	9.0	9.0	18
FES #4	24	7.4%	36.4	21.0	14	CLASS 2	23	20	6.0	6.0	36
FES #5	24	5.5%	12.7	13.8	10	CLASS 1	17	16	6.0	6.0	24
FES #6	24	3.1%	19.4	12.6	10	CLASS 1	17	16	6.0	6.0	24

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BY: ______________________________ DATE: ___________
ADMINISTRATOR

NAD 83

SCALE 1"=50'
0 50' 100'

North Carolina 811
www.nc811.org

Required Ground Stabilization Timeframes		
Site Area Description	Stabilize within this many calendar days after ceasing land disturbance	Timeframe variations
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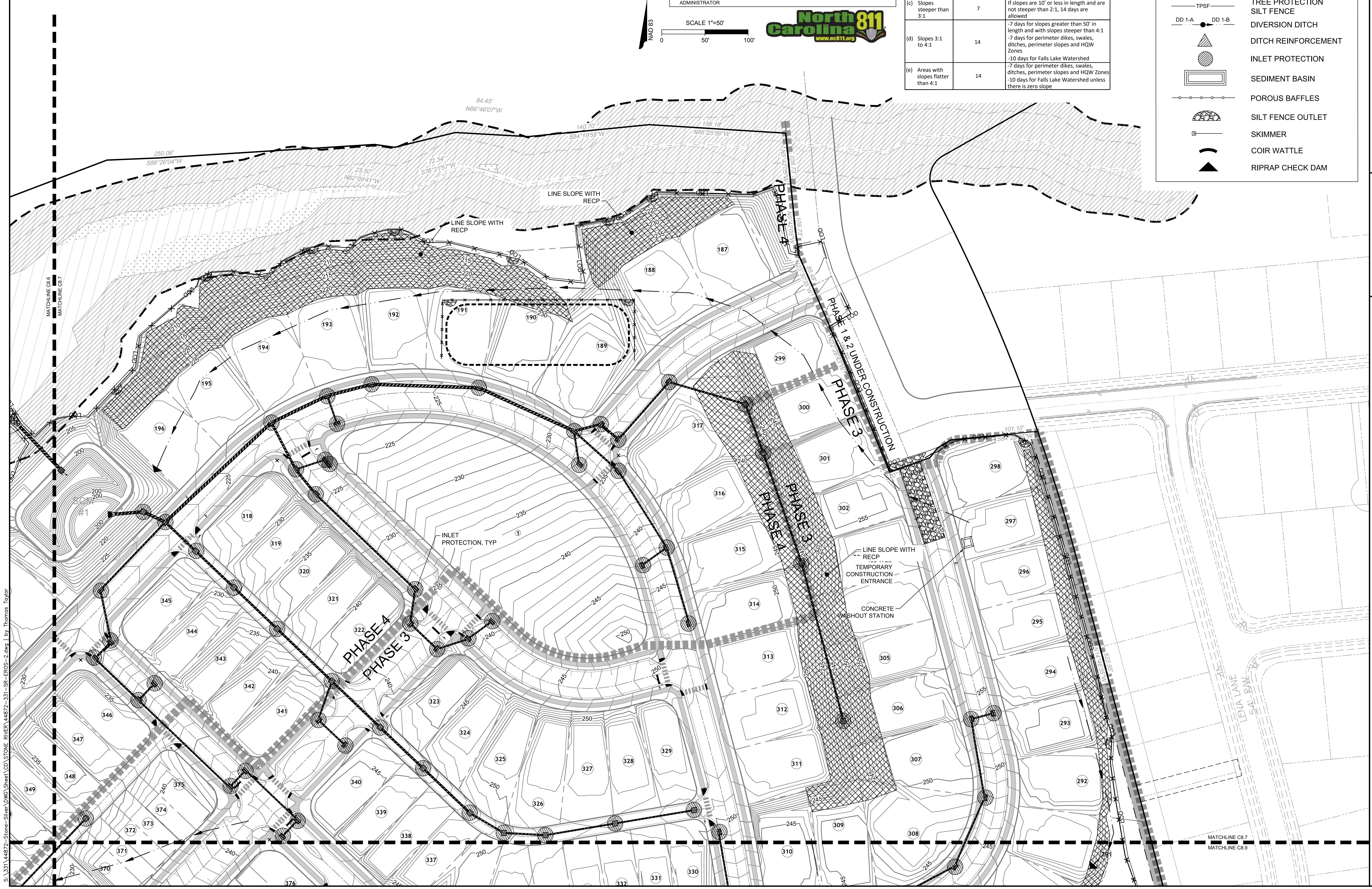
(e) Areas with slopes flatter than 4:1	14	-7 days for perimeter dikes, swales, ditches, perimeter slopes and HQW Zones -10 days for Falls Lake Watershed unless there is zero slope

TOTAL DISTURBED AREA STAGE 1 = 56.8 ACRES

LEGEND

—LOD—	LIMITS OF DISTURBANCE
—×—×—	SILT FENCE
—TP—	TREE PROTECTION FENCE
—TPSF—	TREE PROTECTION SILT FENCE
DD 1-A —●— DD 1-B	DIVERSION DITCH
▲	DITCH REINFORCEMENT
●	INLET PROTECTION
▭	SEDIMENT BASIN
—◇—◇—	POROUS BAFFLES
⌓	SILT FENCE OUTLET
⊡	SKIMMER
⌒	COIR WATTLE
▲	RIPRAP CHECK DAM



TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

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6/22/21

DATE	REVISION DESCRIPTION

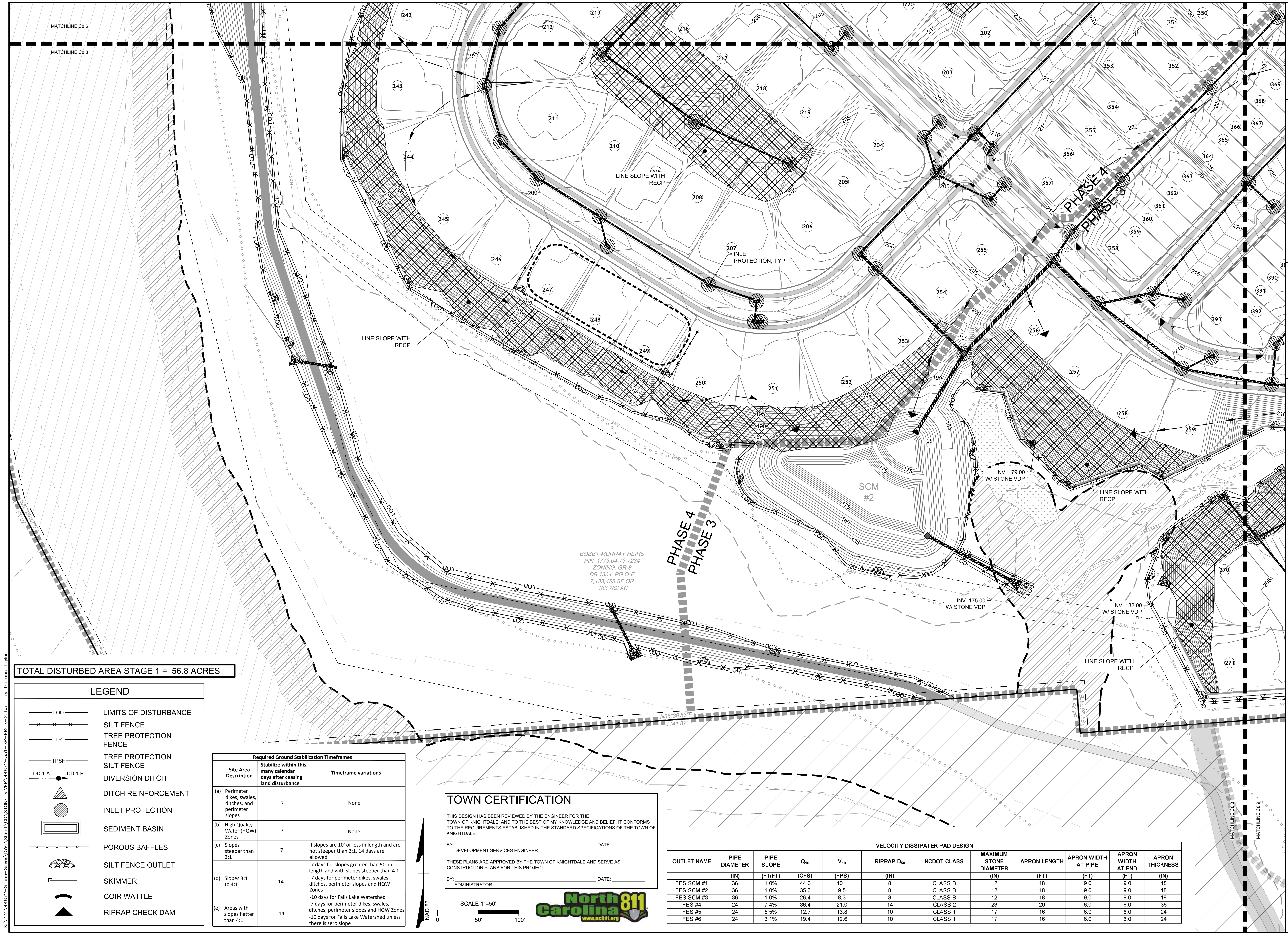
DATE 06/22/2021
DRAWN BY JD. MACMILLAN
DESIGNED BY JD. MACMILLAN
CHECKED BY M. ZACCARDO
SCALE 1"=50'

STONERIVER SUBDIVISION
KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA
EROSION AND SEDIMENT CONTROL PLAN STAGE 2 SHEET 2 OF 4

JOB NO. 44872
SHEET NO. C8.7

FOR REVIEW ONLY: NOT FOR CONSTRUCTION

S:\331\44872-Stone-Silver\DWG\Sheet\CD\STONE RIVER\44872-331-SR-EROS-2.dwg | by Thomas Taylor



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TOTAL DISTURBED AREA STAGE 1 = 56.8 ACRES

LEGEND

LOD	LIMITS OF DISTURBANCE
×—×	SILT FENCE
TP	TREE PROTECTION FENCE
TPSF	TREE PROTECTION SILT FENCE
DD 1-A — DD 1-B	DIVERSION DITCH
△	DITCH REINFORCEMENT
●	INLET PROTECTION
▭	SEDIMENT BASIN
o—o—o	POROUS BAFFLES
◠	SILT FENCE OUTLET
▫—	SKIMMER
⌒	COIR WATTLE
▲	RIPRAP CHECK DAM

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

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

North Carolina 811
www.nc811.org

VELOCITY DISSIPATER PAD DESIGN											
OUTLET NAME	PIPE DIAMETER	PIPE SLOPE	Q_{10}	V_{10}	RIPRAP D_{50}	NCDOT CLASS	MAXIMUM STONE DIAMETER	APRON LENGTH	APRON WIDTH AT PIPE	APRON WIDTH AT END	APRON THICKNESS
	(IN)	(FT/FT)	(CFS)	(FPS)	(IN)		(IN)	(FT)	(FT)	(FT)	(IN)
FES SCM #1	36	1.0%	44.6	10.1	8	CLASS B	12	18	9.0	9.0	18
FES SCM #2	36	1.0%	35.3	9.5	8	CLASS B	12	18	9.0	9.0	18
FES SCM #3	36	1.0%	26.4	8.3	8	CLASS B	12	18	9.0	9.0	18
FES #4	24	7.4%	36.4	21.0	14	CLASS 2	23	20	6.0	6.0	36
FES #5	24	5.5%	12.7	13.8	10	CLASS 1	17	16	6.0	6.0	24
FES #6	24	3.1%	19.4	12.6	10	CLASS 1	17	16	6.0	6.0	24

MICHAEL V. ZACCARDO
6/22/21

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DRAWN BY	JD. MACMILLAN
DESIGNED BY	JD. MACMILLAN
CHECKED BY	M. ZACCARDO
SCALE	1"=50'

TIMMONS GROUP

NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION

KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA

EROSION AND SEDIMENT CONTROL PLAN STAGE 2 SHEET 3 OF 4

JOB NO.
44872

SHEET NO.
C8.8

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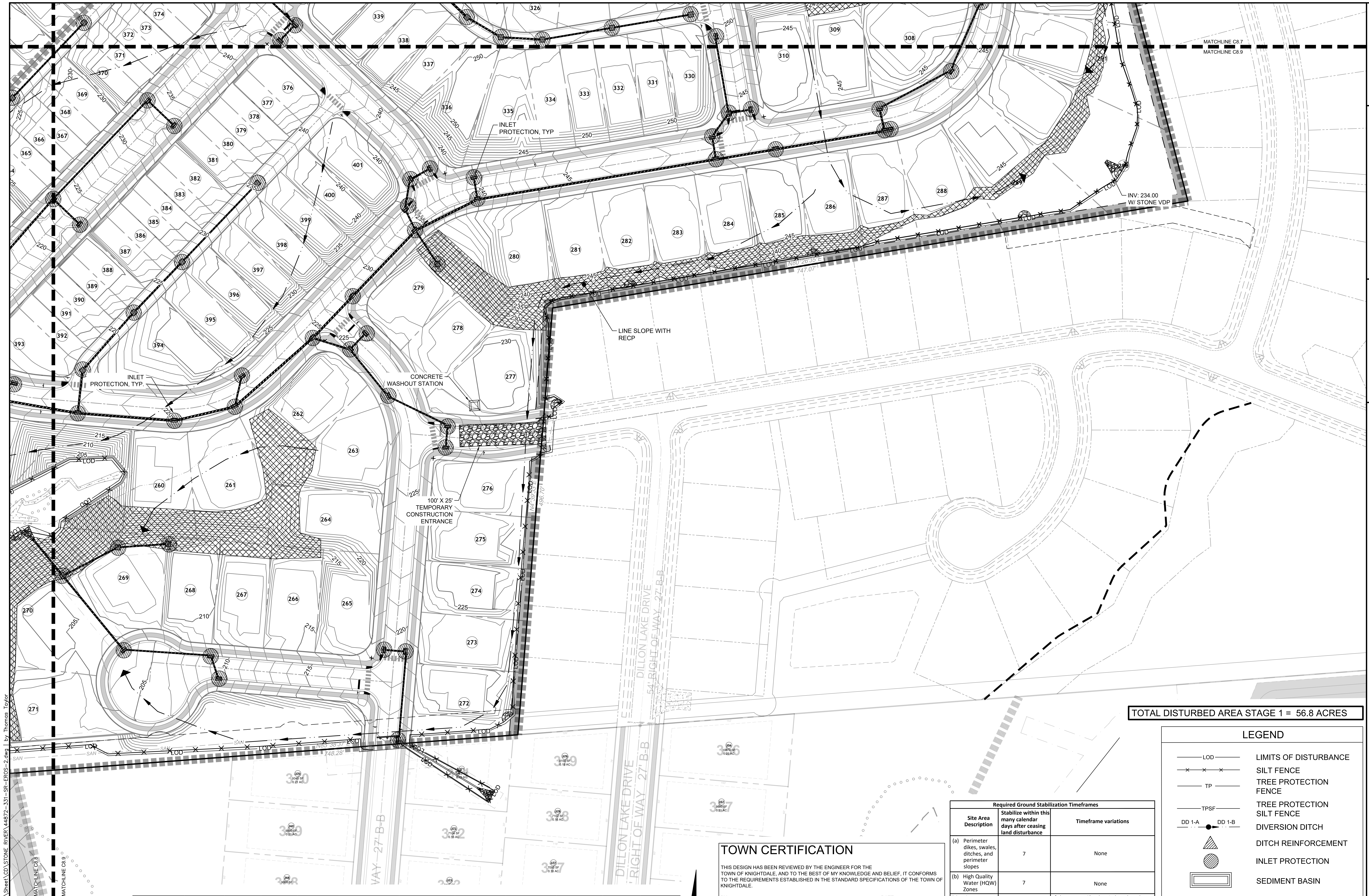

TOTAL DISTURBED AREA STAGE 1 = 56.8 ACRES

LEGEND

—LOD—	LIMITS OF DISTURBANCE
—×—×—	SILT FENCE
—TP—	TREE PROTECTION FENCE
—TPSF—	TREE PROTECTION SILT FENCE
DD 1-A —●— DD 1-B	DIVERSION DITCH
△	DITCH REINFORCEMENT
●	INLET PROTECTION
▭	SEDIMENT BASIN
—○—○—	POROUS BAFFLES
⌓	SILT FENCE OUTLET
⊞—	SKIMMER
⌒	COIR WATTLE
▲	RIPRAP CHECK DAM

VELOCITY DISSIPATER PAD DESIGN

OUTLET NAME	PIPE DIAMETER	PIPE SLOPE	Q_{10}	V_{10}	RIPRAP D_{50}	NCDOT CLASS	MAXIMUM STONE DIAMETER	APRON LENGTH	APRON WIDTH AT PIPE	APRON WIDTH AT END	APRON THICKNESS
	(IN)	(FT/FT)	(CFS)	(FPS)	(IN)		(IN)	(FT)	(FT)	(FT)	(IN)
FES SCM #1	36	1.0%	44.6	10.1	8	CLASS B	12	18	9.0	9.0	18
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FES SCM #3	36	1.0%	26.4	8.3	8	CLASS B	12	18	9.0	9.0	18
FES #4	24	7.4%	36.4	21.0	14	CLASS 2	23	20	6.0	6.0	36
FES #5	24	5.5%	12.7	13.8	10	CLASS 1	17	16	6.0	6.0	24
FES #6	24	3.1%	19.4	12.6	10	CLASS 1	17	16	6.0	6.0	24

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DEVELOPMENT SERVICES ENGINEER

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BY: ______________________ DATE: __________
ADMINISTRATOR

SCALE 1"=50'
0 50' 100'

North Carolina 811
www.nc811.org

Required Ground Stabilization Timeframes

Site Area Description	Stabilize within this many calendar days after ceasing land disturbance	Timeframe variations
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MICHAEL V. ZACCARDO
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1"=50'

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION
KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA

EROSION AND SEDIMENT CONTROL PLAN STAGE 2 SHEET 4 OF 4

JOB NO.
44872
SHEET NO.
C8.9

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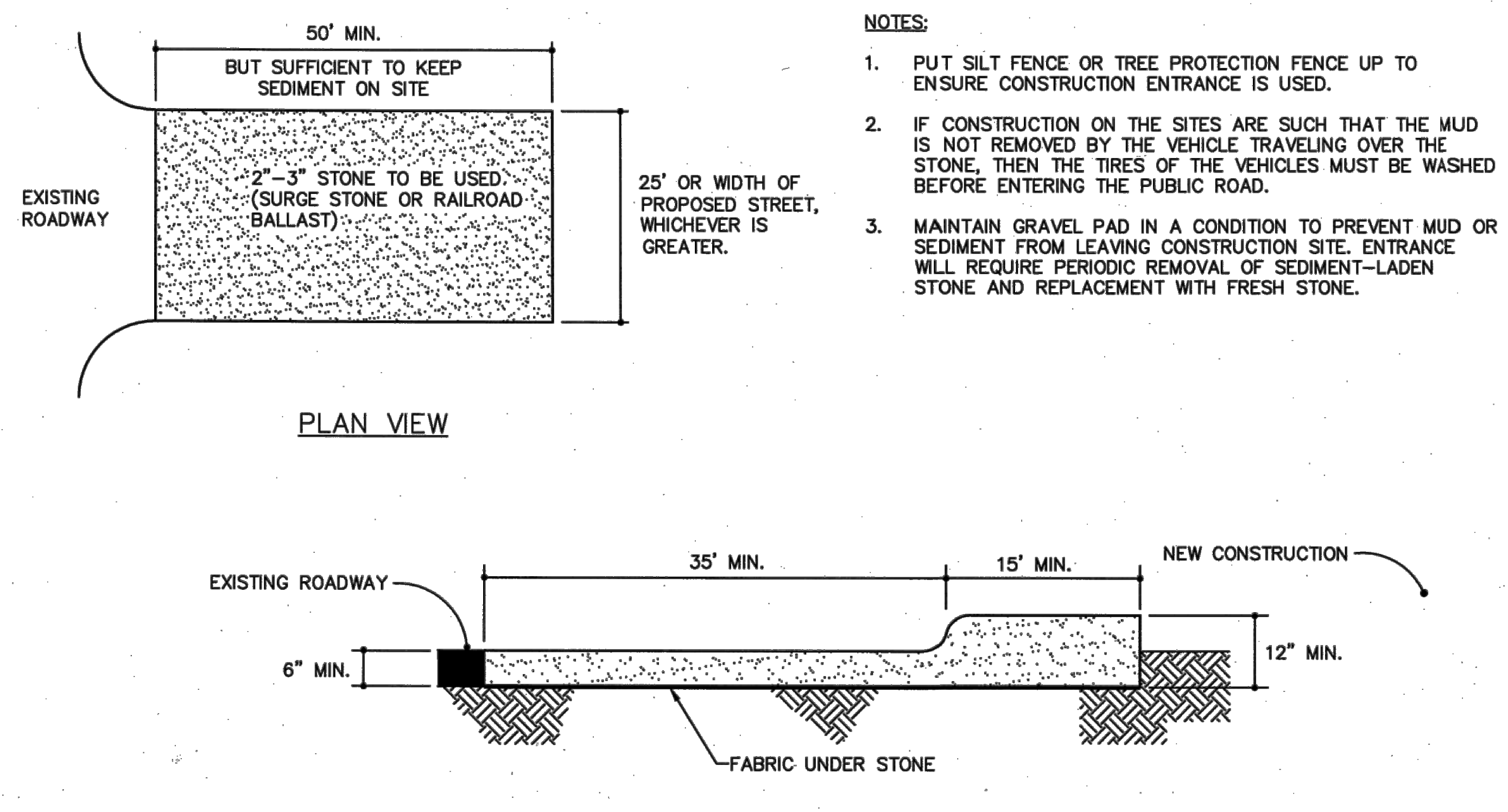

50' MIN.
BUT SUFFICIENT TO KEEP SEDIMENT ON SITE
EXISTING ROADWAY
2"–3" STONE TO BE USED. (SURGE STONE OR RAILROAD BALLAST)
25' OR WIDTH OF PROPOSED STREET, WHICHEVER IS GREATER.
PLAN VIEW
EXISTING ROADWAY
35' MIN.
15' MIN.
NEW CONSTRUCTION
6" MIN.
12" MIN.
FABRIC UNDER STONE
CROSS SECTION

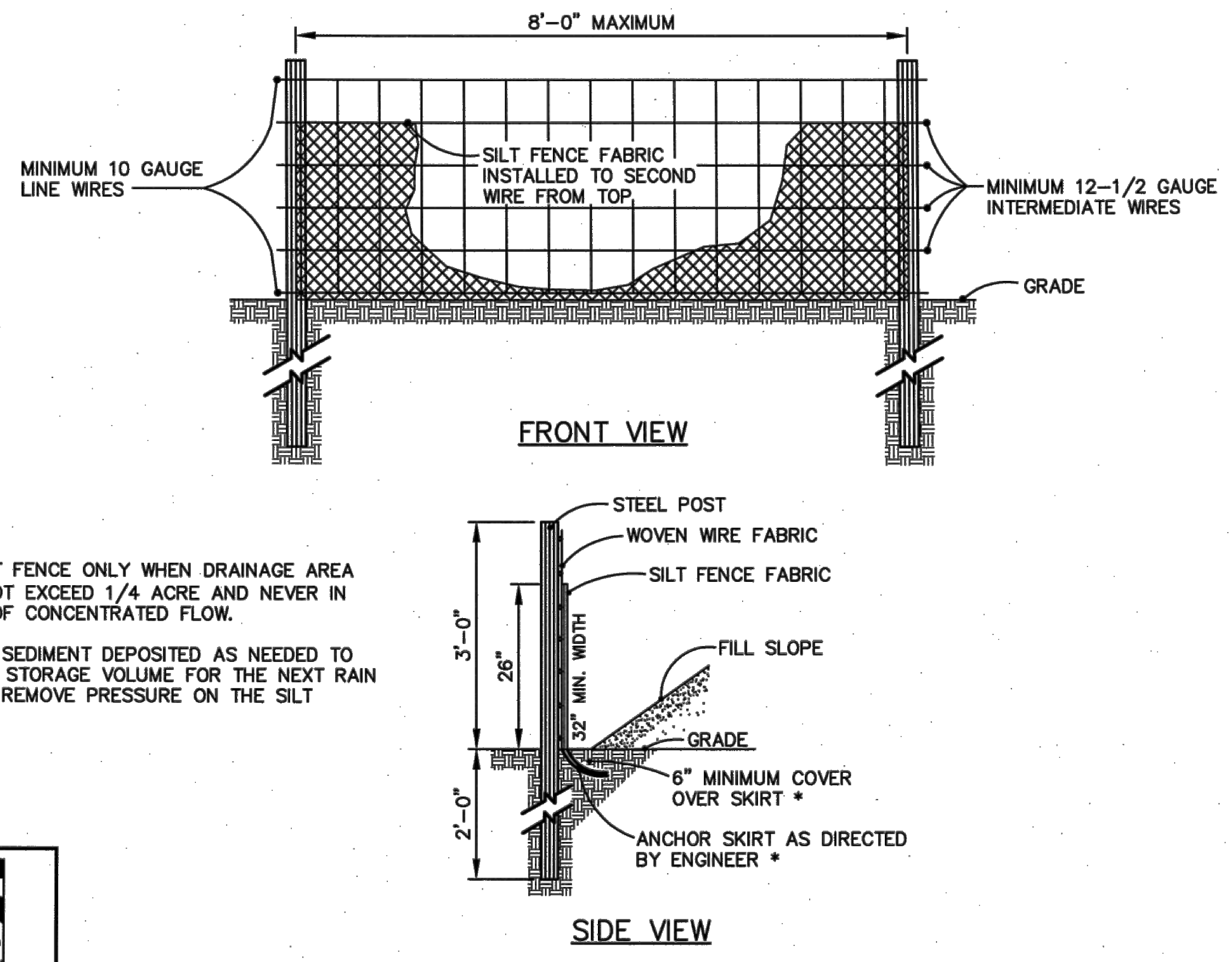
NOTES:

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.

WAKE COUNTY NORTH CAROLINA

EFFECTIVE: 01/31/08

STANDARD CONSTRUCTION ENTRANCE


8'–0" MAXIMUM
MINIMUM 10 GAUGE LINE WIRES
SILT FENCE FABRIC INSTALLED TO SECOND WIRE FROM TOP
MINIMUM 12–1/2 GAUGE INTERMEDIATE WIRES
GRADE
FRONT VIEW
STEEL POST
WOVEN WIRE FABRIC
SILT FENCE FABRIC
FILL SLOPE
GRADE
3'–0"
26"
32" MIN. WIDTH
2'–0"
6" MINIMUM COVER OVER SKIRT *
ANCHOR SKIRT AS DIRECTED BY ENGINEER *
SIDE 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.

WAKE COUNTY NORTH CAROLINA

EFFECTIVE: 01/31/08

STANDARD TEMPORARY SILT FENCE

TOWN CERTIFICATION

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BY: ______________________________ DATE: ____________
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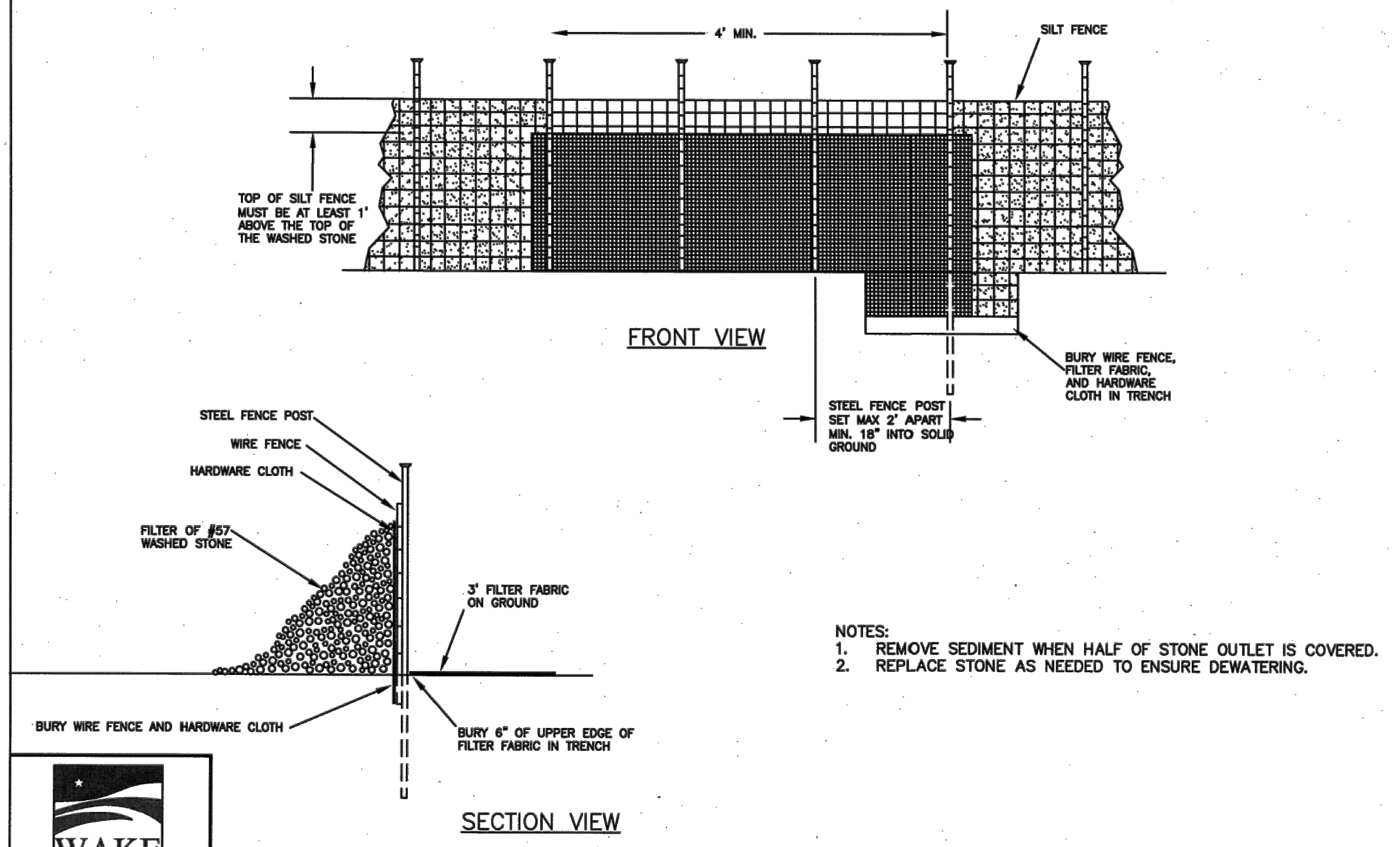
BY: ______________________________ DATE: ____________
ADMINISTRATOR

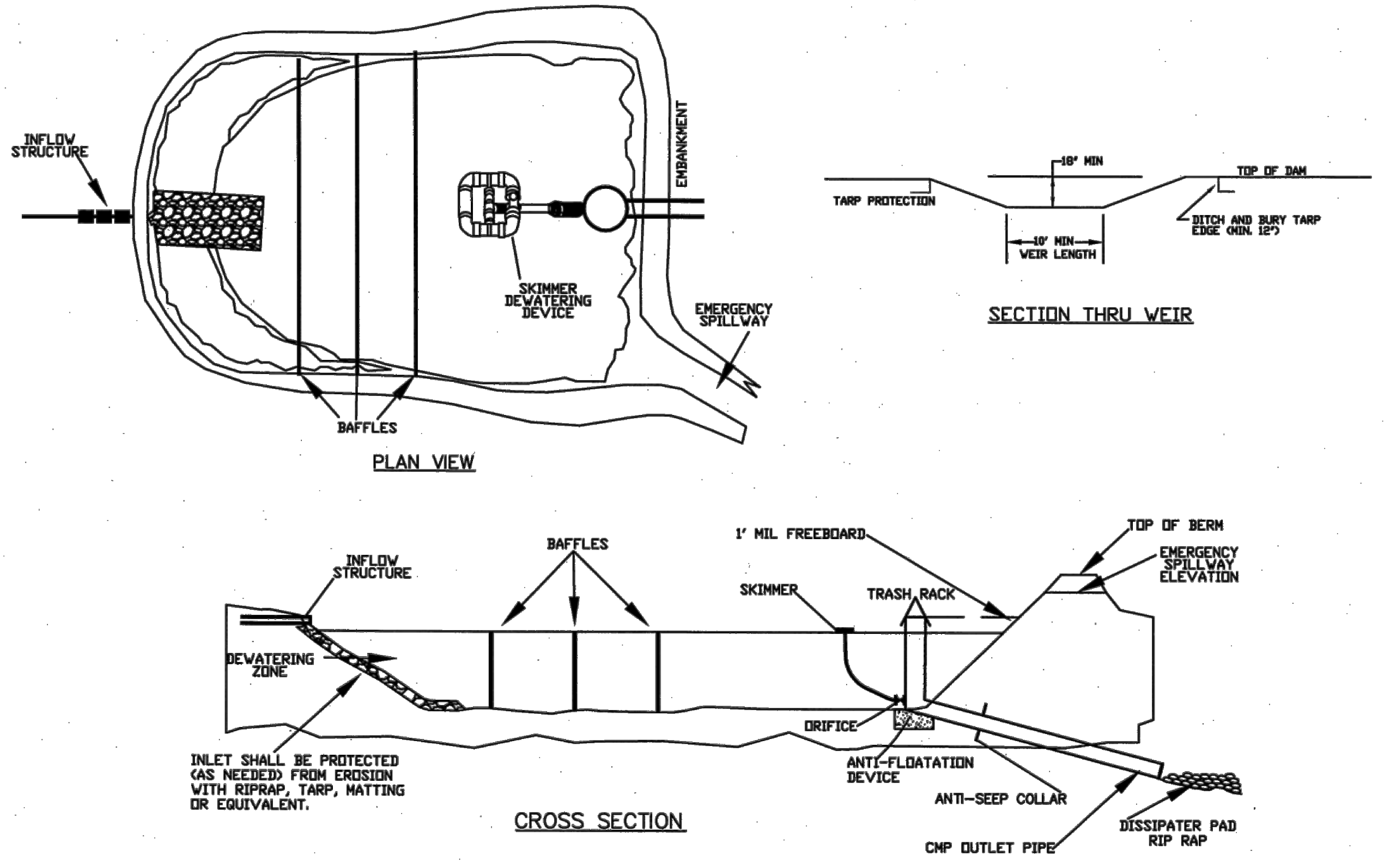

4' MIN.
SILT FENCE
TOP OF SILT FENCE MUST BE AT LEAST 1' ABOVE THE TOP OF THE WASHED STONE
FRONT VIEW
BURY WIRE FENCE, FILTER FABRIC, AND HARDWARE CLOTH IN TRENCH
STEEL FENCE POST SET MAX 2' APART MIN. 18" INTO SOLID GROUND
STEEL FENCE POST
WIRE FENCE
HARDWARE CLOTH
FILTER OF #57 WASHED STONE
3' FILTER FABRIC ON GROUND
BURY WIRE FENCE AND HARDWARE CLOTH
BURY 6" OF UPPER EDGE OF FILTER FABRIC IN TRENCH
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

EFFECTIVE: 01/31/08

STANDARD SILT FENCE OUTLET

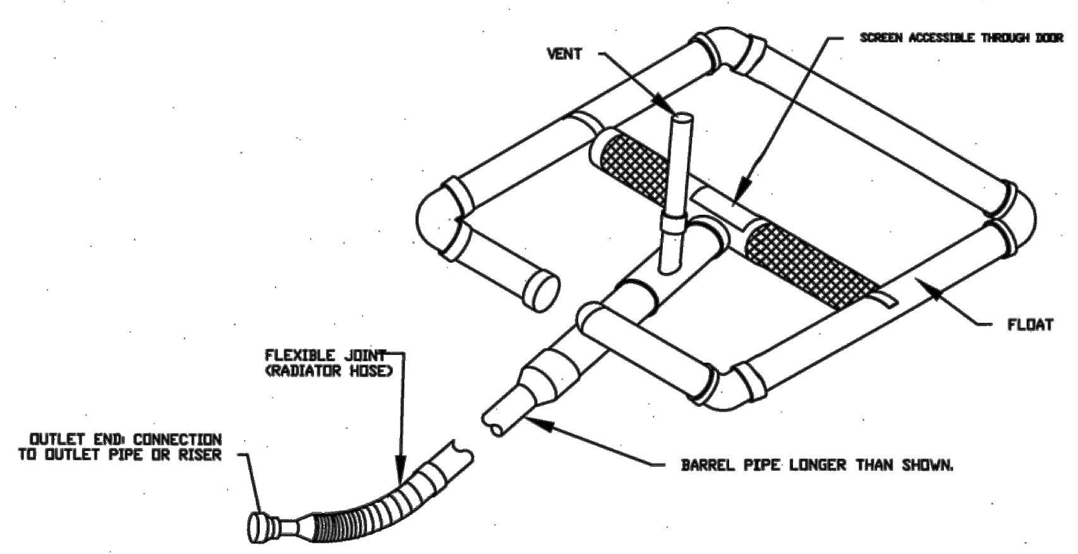


NOTES:
1) BASIN SHOULD BE CLEANED OUT WHEN CAPACITY REACHES AN ELEVATION REPRESENTING THAT THE BASIN IS HALF-FULL.
2) THE TARP USED TO PROTECT THE WEIR SHALL BE THE WIDTH SPECIFIED. THE LENGTH OF THE TARP SHALL BE ACCORDING TO AVAILABLE SUPPLY. IF MULTIPLE TARPS ARE TO BE USED, THEN TARPS SHALL BE OVERLAPPED 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

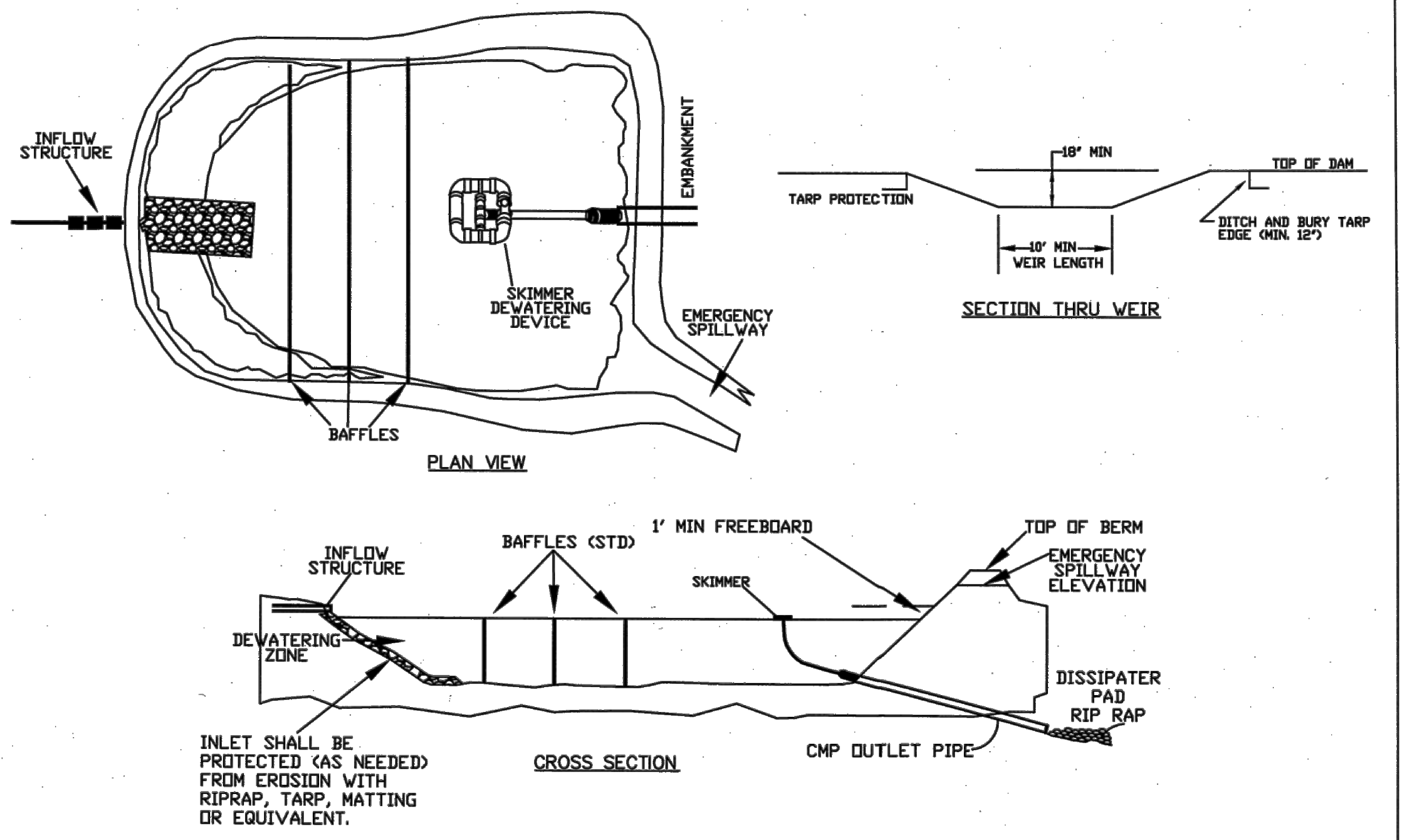
STANDARD SKIMMER ATTACHED TO PERMANENT RISER


VENT
SCREEN ACCESSIBLE THROUGH DOOR
FLOAT
FLEXIBLE JOINT (RADIATOR HOSE)
OUTLET END: CONNECTION TO OUTLET PIPE OR RISER
BARREL PIPE LONGER THAN SHOWN.

WAKE COUNTY NORTH CAROLINA

EFFECTIVE: 01/31/08

STANDARD SKIMMER DETAIL



NOTES:
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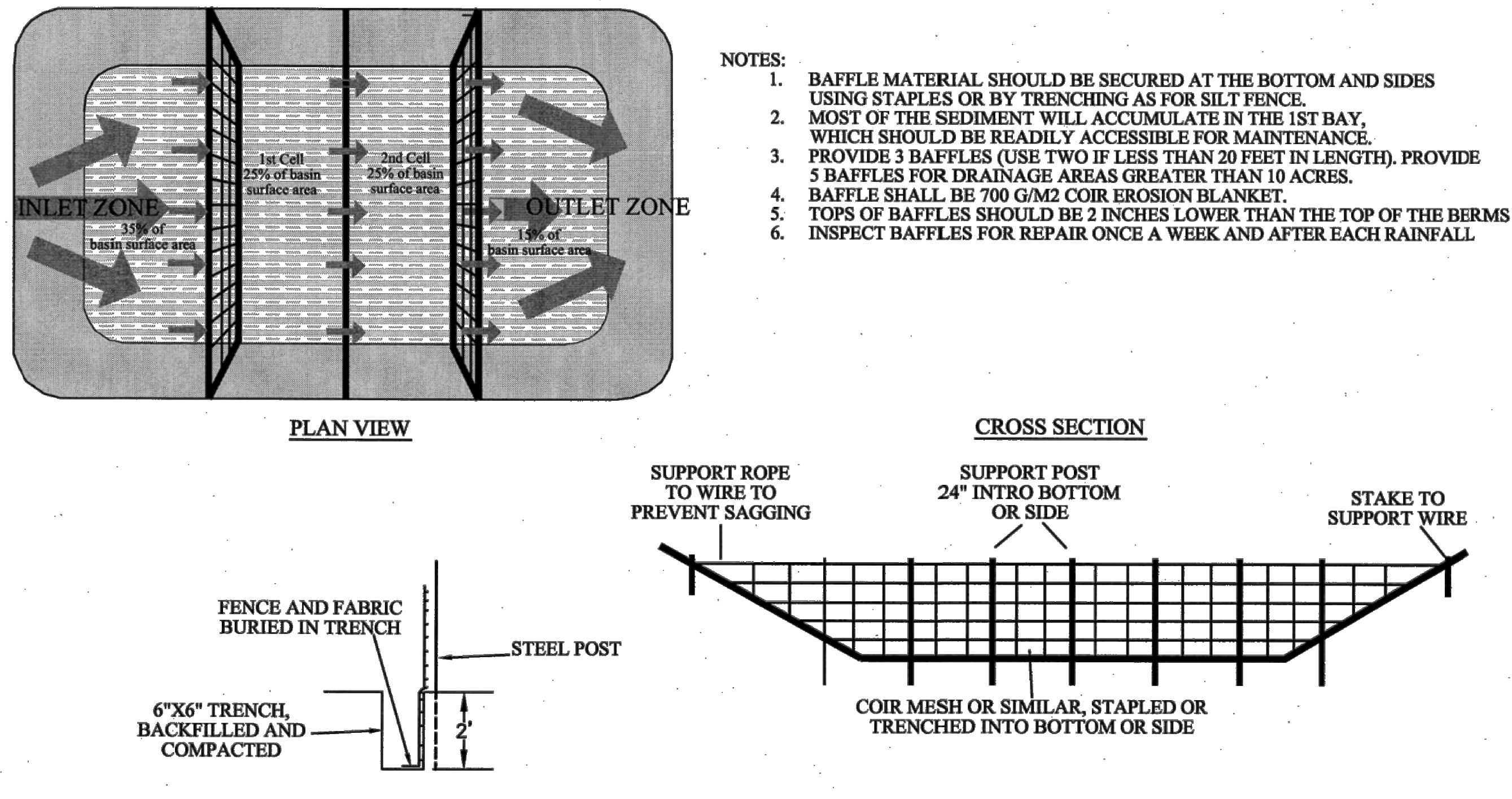
3) PROVIDE A MINIMUM OF THREE POROUS BAFFLES TO EVENLY DISTRIBUTE FLOW ACROSS THE BASIN, REDUCING TURBULENCE.
4) BAFFLE MATERIAL MUST BE SECURED AT THE BOTTOM AND SIDES USING STAPLES OR BY TRENCHING AS FOR A SILT FENCE.
5) MOST OF THE SEDIMENT WILL ACCUMULATE IN THE FIRST BAY, SO THIS SHOULD BE READILY 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

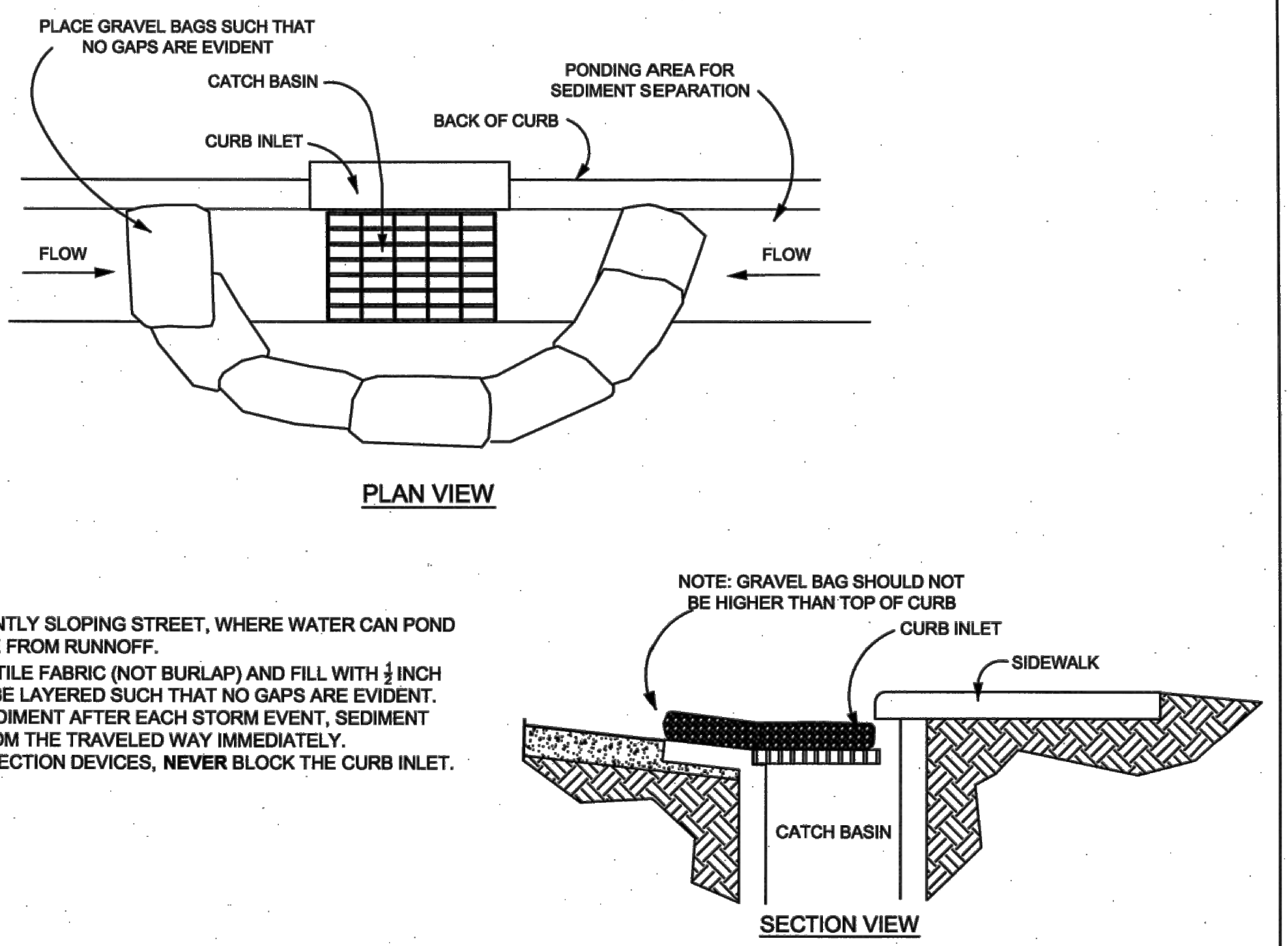

INLET ZONE
35% of basin surface area
1st Cell 25% of basin surface area
2nd Cell 25% of basin surface area
OUTLET ZONE
15% of basin surface area
PLAN VIEW
CROSS SECTION
SUPPORT ROPE TO WIRE TO PREVENT SAGGING
SUPPORT POST 24" INTRO BOTTOM OR SIDE
STAKE TO SUPPORT WIRE
COIR MESH OR SIMILAR, STAPLED OR TRENCHED INTO BOTTOM OR SIDE
FENCE AND FABRIC BURIED IN TRENCH
STEEL POST
6"X6" TRENCH, BACKFILLED AND COMPACTED
2'
SECTION VIEW AT OPENING

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

WAKE COUNTY NORTH CAROLINA

EFFECTIVE: 01/31/08

STANDARD BAFFLES DETAIL


PLACE GRAVEL BAGS SUCH THAT NO GAPS ARE EVIDENT
CATCH BASIN
PONDING AREA FOR SEDIMENT SEPARATION
BACK OF CURB
CURB INLET
FLOW
FLOW
PLAN VIEW
NOTE: GRAVEL BAG SHOULD NOT BE HIGHER THAN TOP OF CURB
CURB INLET
SIDEWALK
CATCH BASIN
SECTION VIEW

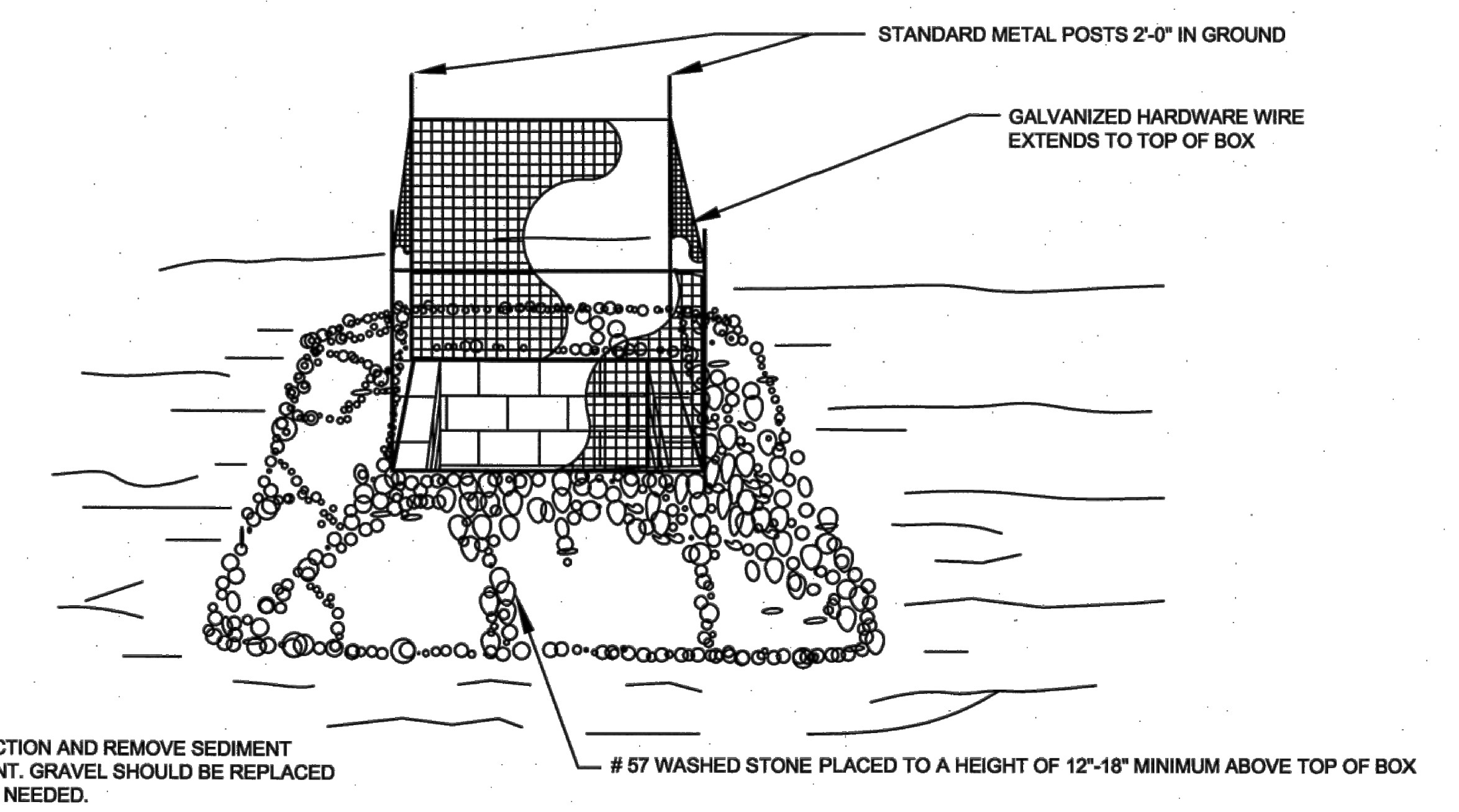
NOTES:

1. PLACE GRAVEL BAG BARRIER ON GENTLY SLOPING STREET, WHERE WATER CAN POND AND ALLOW SEDIMENT TO SEPARATE FROM RUNNOFF.
2. USE SAND BAGS OF WOVEN GEOTEXTILE FABRIC (NOT BURLAP) AND FILL WITH ½ INCH (OR SMALLER) GRAVEL. BAGS MUST BE LAYERED SUCH THAT NO GAPS ARE EVIDENT.
3. INSPECT BARRIERS AND REMOVE SEDIMENT AFTER EACH STORM EVENT, SEDIMENT AND GRAVEL MUST BE REMOVED FROM THE TRAVELED WAY IMMEDIATELY.
4. WHEN INSTALLING CURB INLET PROTECTION DEVICES, **NEVER** BLOCK THE CURB INLET.

WAKE COUNTY NORTH CAROLINA

EFFECTIVE: 01/31/08

STANDARD GRAVEL BAG CURB INLET PROTECTION


STANDARD METAL POSTS 2'-0" IN GROUND
GALVANIZED HARDWARE WIRE EXTENDS TO TOP OF BOX
# 57 WASHED STONE PLACED TO A HEIGHT OF 12"-18" MINIMUM ABOVE TOP OF BOX

NOTE:

1. INSPECT INLET PROTECTION AND REMOVE SEDIMENT AFTER EACH RAIN EVENT. GRAVEL SHOULD BE REPLACED AND REPAIRS MADE AS NEEDED.

WAKE COUNTY NORTH CAROLINA

EFFECTIVE: 01/31/08

STANDARD GRAVEL YARD INLET PROTECTION

MICHAEL V. ZACCARDO
6/22/21

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SCALE N/A

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION

KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA

EROSION AND SEDIMENT CONTROL DETAILS

JOB NO. 44872
SHEET NO. C8.10

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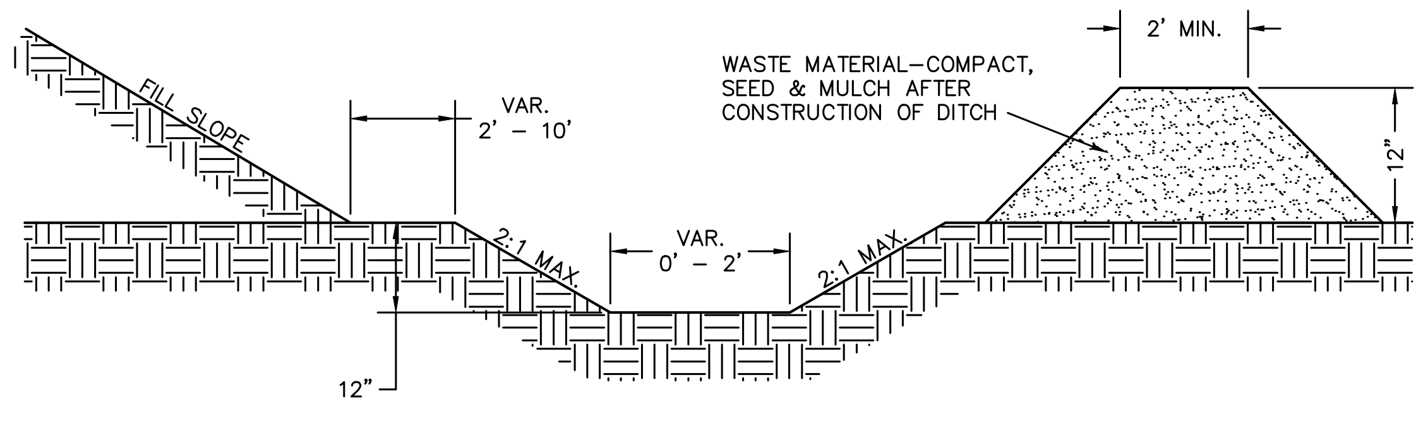
NOTES:

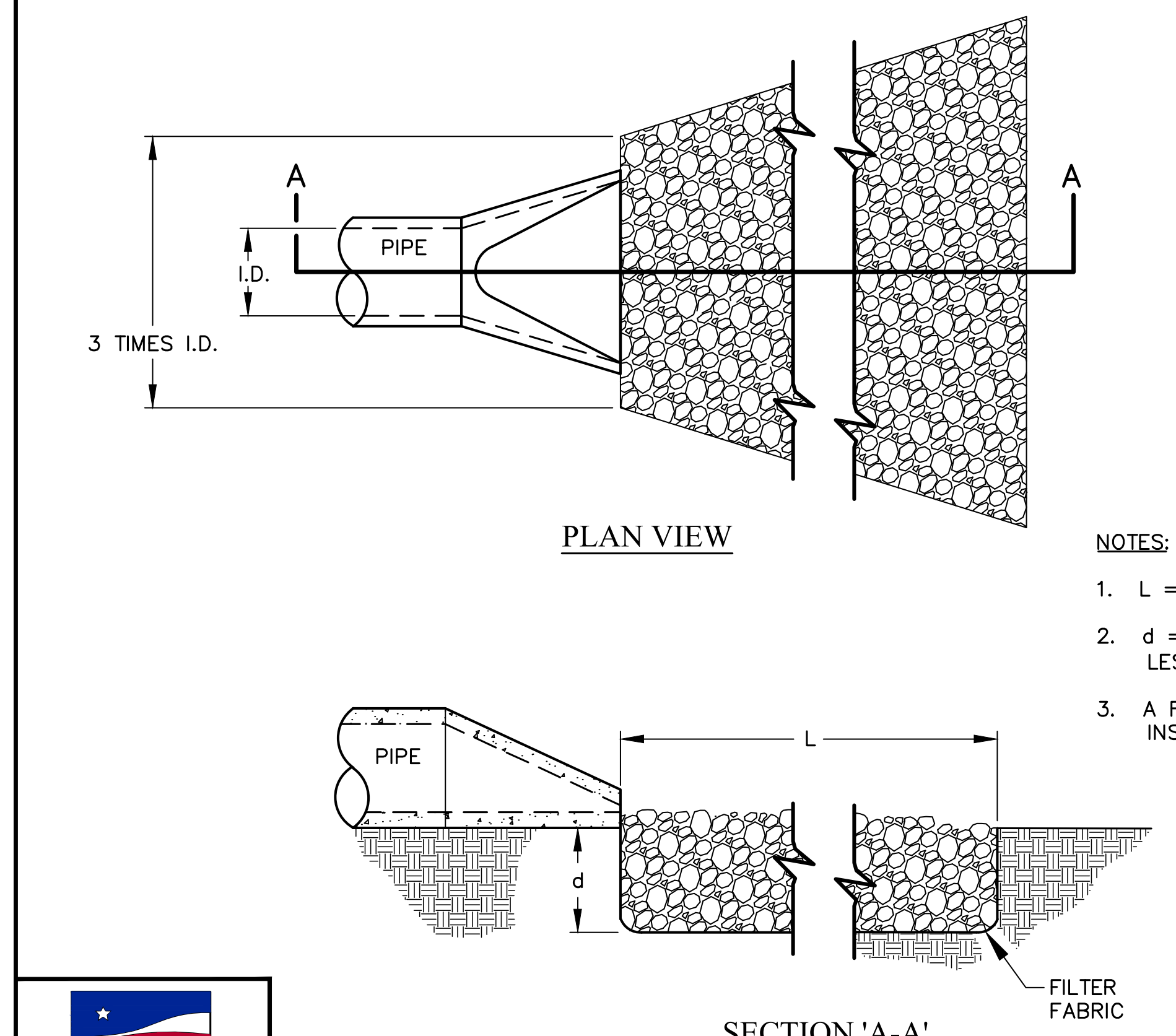
1. TEMPORARY DIVERSION DITCH TO BE USED TO INTERCEPT FLOW AND/OR DIVERT TO A SEDIMENT CONTROL MEASURE OR BMP.
2. SILT SHALL BE REMOVED WHEN DITCH IS ONE-HALF FULL.
3. DITCH SHALL BE RECONSTRUCTED WHEN DAMAGED BY EQUIPMENT OR COVERED BY FILL.
4. STABILIZE DIVERSION DITCH BERM WITH TEMPORARY SEEDING, MULCH WITH TAC, AND/OR EROSION CONTROL NETTING.


FILL SLOPE
VAR. 2' – 10'
2:1 MAX.
VAR. 0' – 2'
2:1 MAX.
12"
WASTE MATERIAL–COMPACT, SEED & MULCH AFTER CONSTRUCTION OF DITCH
2' MIN.
12"

CROSS SECTIONAL VIEW

EFFECTIVE: 01/31/08

STANDARD TEMPORARY DIVERSION DITCH



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.

EFFECTIVE: 01/31/08

STANDARD PIPE OUTLET TO FLAT AREA NO WELL-DEFINED CHANNEL

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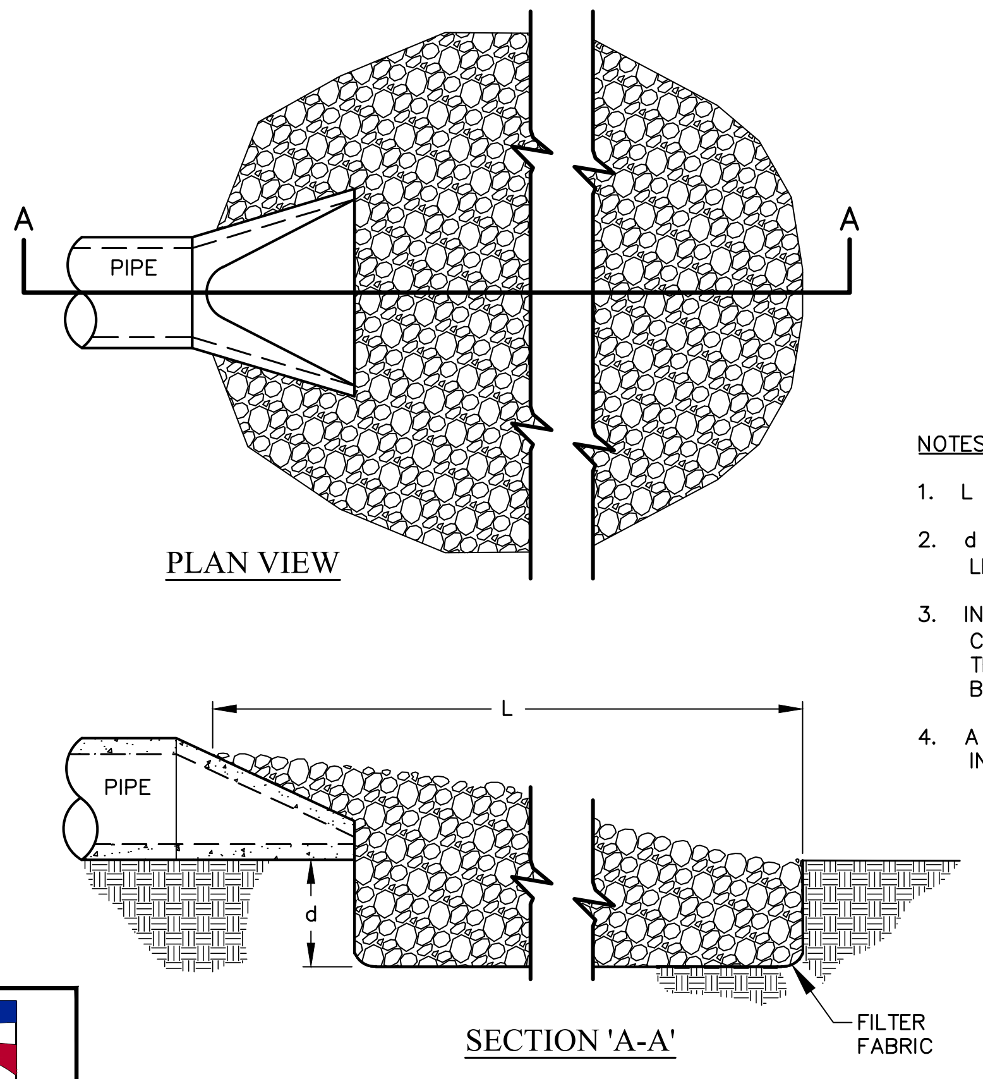
BY: ______________________ DATE: __________
ADMINISTRATOR

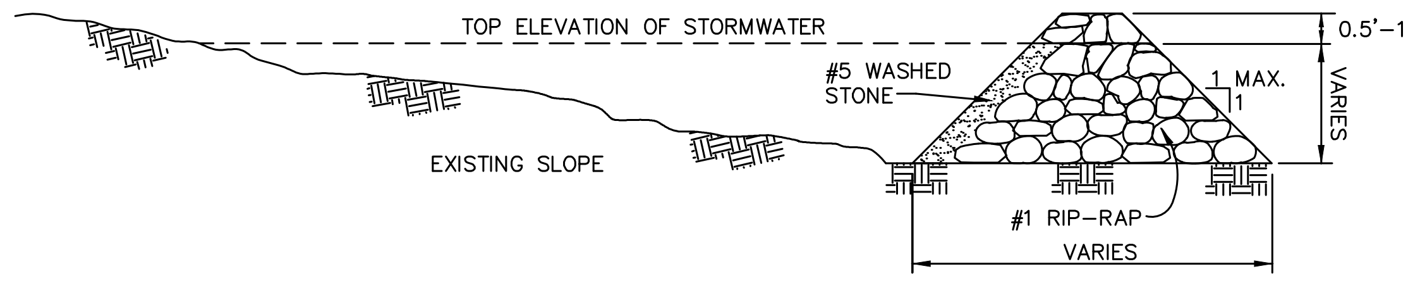


NOTES:

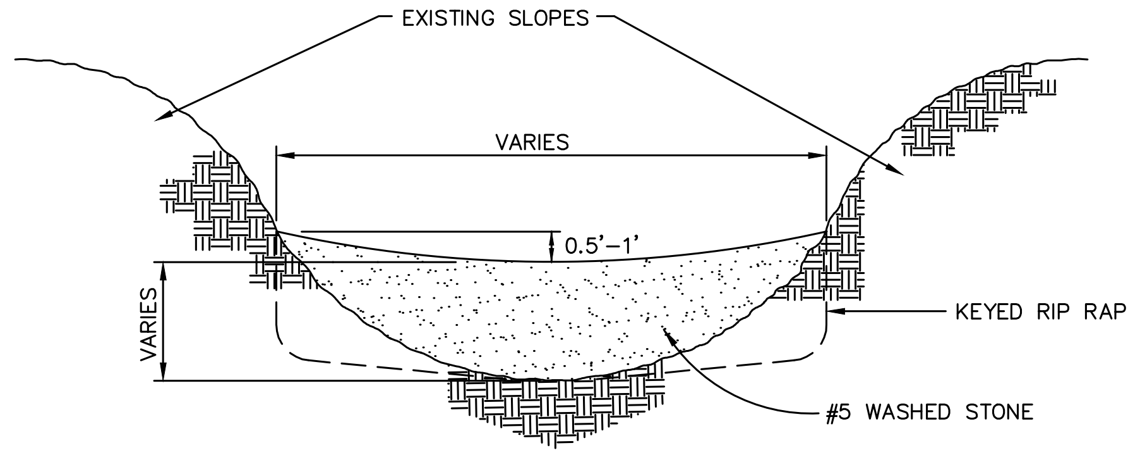
1. L = THE LENGTH OF THE RIPRAP APRON.
2. d = 1.5 TIMES THE MAXIMUM STONE DIAMETER BUT NOT LESS THAN 6" (INCHES).
3. IN A WELL-DEFINED CHANNEL EXTEND THE APRON UP THE CHANNEL BANKS TO AN ELEVATION OF 6" (INCHES) ABOVE THE MAXIMUM TAILWATER DEPTH OR TO THE TOP OF THE BANK, WHICHEVER IS LESS.
4. A FILTER BLANKET OR FILTER FABRIC SHOULD BE INSTALLED BETWEEN THE RIPRAP AND SOIL FOUNDATION.

EFFECTIVE: 01/31/08

STANDARD PIPE OUTLET TO WELL-DEFINED CHANNEL



SIDE VIEW

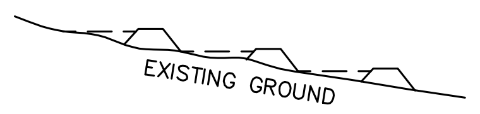


FRONT VIEW

CONSTRUCTION NOTES:

HEIGHT & WIDTH DETERMINED BY EXISTING TOPOGRAPHY AND SEDIMENT STORAGE REQUIRED.

KEY RIP RAP INTO THE DAM FOR STABILIZATION.



STEP SEQUENCE

NOTE: REMOVE SEDIMENT ACCUMULATION FROM BEHIND CHECK DAMS TO PREVENT DAMAGE TO CHANNEL VEGETATION. FLOW SHOULD BE MAINTAINED THROUGH THE DAM.

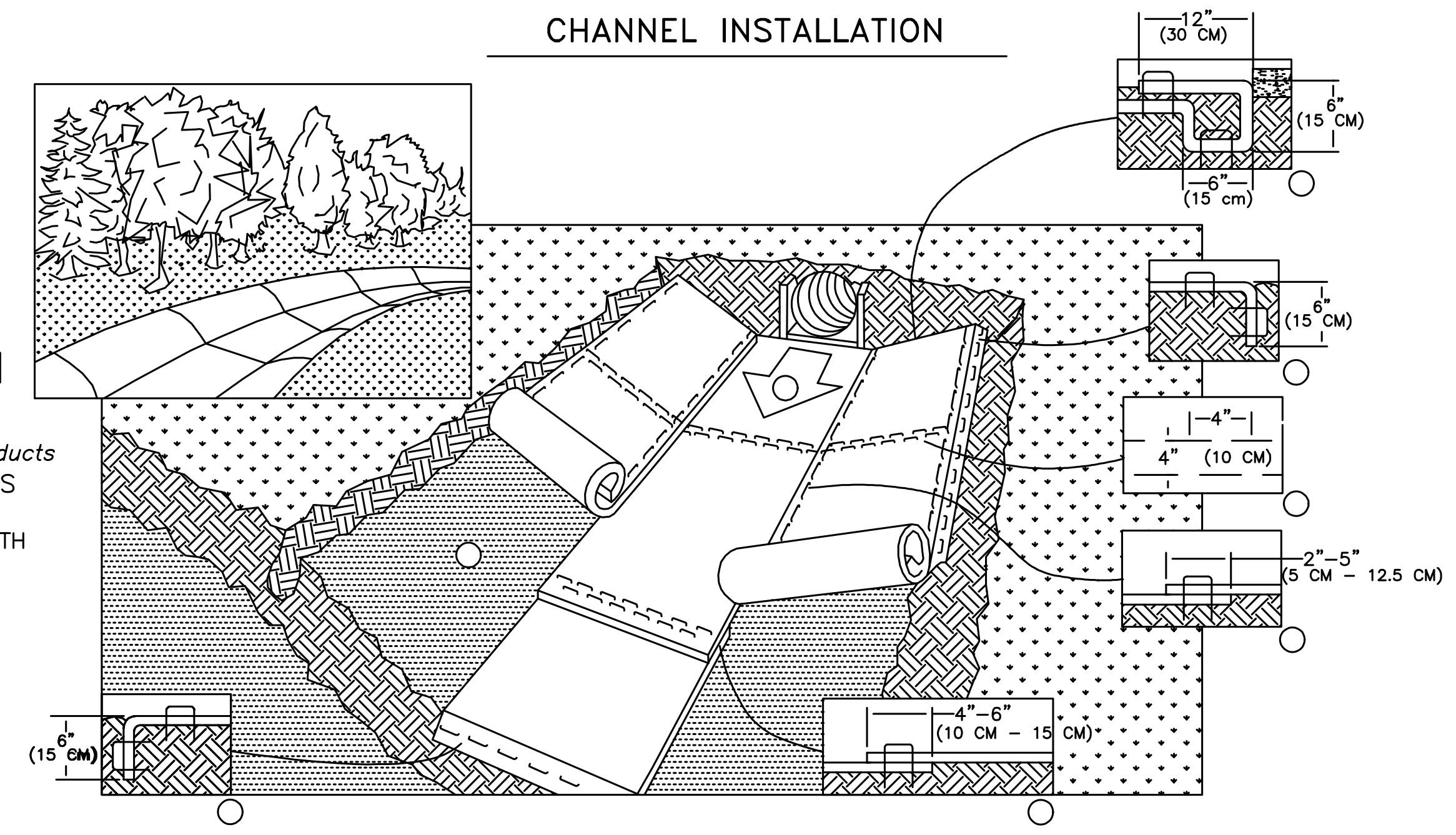
EFFECTIVE: 01/31/08

STANDARD CHECK DAM

NORTH AMERICAN GREEN
EROSION CONTROL *Products*
Guaranteed SOLUTIONS

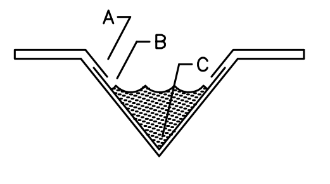
14649 HIGHWAY 41 NORTH
EVANSVILLE, IN 47725
800–772–2040
www.nagreen.com

CHANNEL INSTALLATION



1. PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECP's), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED. NOTE: WHEN USING CELL-O-SEED DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
2. BEGIN AT THE TOP OF THE CHANNEL BY ANCHORING THE RECP's IN A 6" (15 CM) DEEP X 6" (15 CM) WIDE TRENCH WITH APPROXIMATELY 12" (30 CM) OF RECP's EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE RECP's WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30 CM) APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMAPCT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" (30 CM) PORTION OF RECP's BACK OVER SEED AND COMPACTED SOIL. SECURE RECP's OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" (30 CM) ACROSS THE WIDTH OF THE RECP's.
3. ROLL CENTER RECP's IN DIRECTION OF WATER FLOW IN BOTTOM OF CHANNEL. RECP's WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL RECP's MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING THE DOT SYSTEM™, STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
4. PLACE CONSECUTIVE RECP's END OVER END (SHINGLE STYLE) WITH A 4" – 6" (10 CM –15 CM) OVERLAP. USE A DOUBLE ROW OF STAPLES STAGGERED 4" (10 CM) APART AND 4" (10 CM) ON CENTER TO SECURE RECP's.
5. FULL LENGTH EDGE OF RECP's AT TOP OF SIDE SLOPES MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30 CM) APART IN A 6" (15 CM) DEEP X 6" (15 CM) WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
6. ADJACENT RECP's MUST BE OVERLAPPED APPROXIMATELY 2" – 5" (5 CM –12.5 CM) (DEPENDING ON RECP's TYPE) AND STAPLED.
7. IN HIGH FLOW CHANNEL APPLICATIONS, A STAPLE CHECK SLOT IS RECOMMENDED AT 30 TO 40 FOOT (9 M – 12 M) INTERVALS. USE A DOUBLE ROW OF STAPLES STAGGERED 4" (10 CM) APART AND 4" (10 CM) ON CENTER OVER ENTIRE WIDTH OF THE CHANNEL.
8. THE TERMINAL END OF THE RECP's MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30 CM) APART IN A 6" (15 CM) DEEP X 6" (15 CM) WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.

NOTE:
* IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" (15 CM) MAY BE NECESSARY TO PROPERLY ANCHOR THE RECP's.



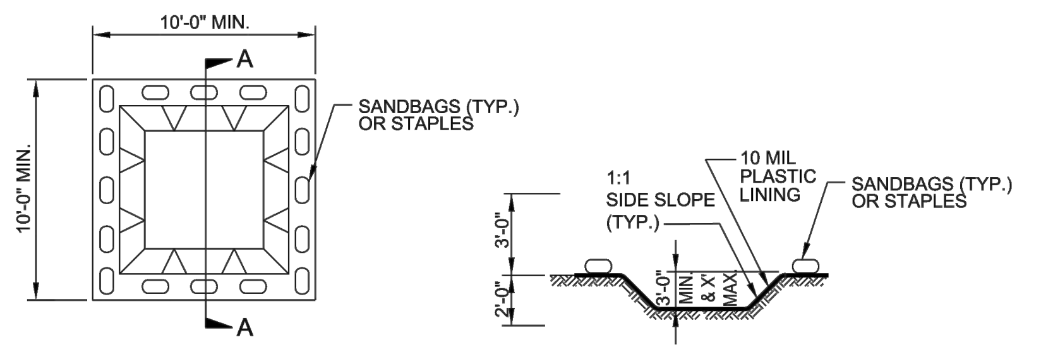
CRITICAL POINTS
A. OVERLAPS AND SEAMS
B. PROJECTED WATER LINE
C. CHANNEL BOTTOM/SIDE SLOPE VERTICES

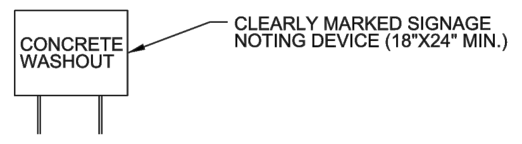
NOTE:
* HORIZONTAL STAPLE SPACING SHOULD BE ALTERED IF NECESSARY TO ALLOW STAPLES TO SECURE THE CRITICAL POINTS ALONG THE CHANNEL SURFACE.

** IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" (15 cm) MAY BE NECESSARY TO PROPERLY ANCHOR THE RECP's.

WITH LINER, NO GRAVEL APPROACH

ONSITE CONCRETE WASHOUT STRUCTURE WITH LINER





PLAN

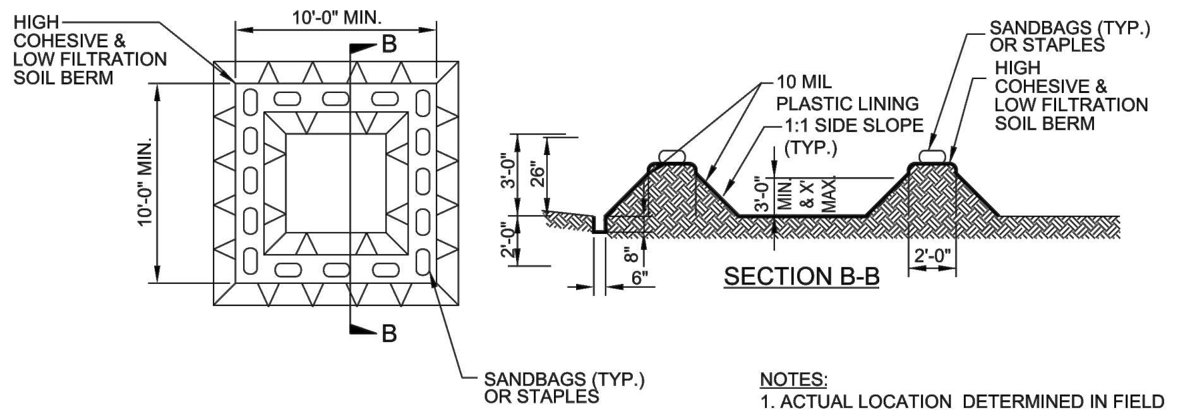
SECTION A-A

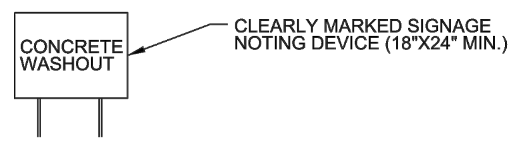
NOTES:
1. ACTUAL LOCATION DETERMINED IN FIELD

2. THE CONCRETE WASHOUT STRUCTURES SHALL BE MAINTAINED WHEN THE LIQUID AND/OR SOLID REACHES 75% OF THE STRUCTURES CAPACITY.

3.CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARY MARKED WITH SIGNAGE NOTING DEVICE.

BELOW GRADE WASHOUT STRUCTURE
NOT TO SCALE


HIGH COHESIVE & LOW FILTRATION SOIL BERM
10'-0" MIN.
B
B
10'-0" MIN.
SANDBAGS (TYP.) OR STAPLES
10 MIL PLASTIC LINING
1:1 SIDE SLOPE (TYP.)
SANDBAGS (TYP.) OR STAPLES
HIGH COHESIVE & LOW FILTRATION SOIL BERM
3'-0"
26"
2'-0"
8"
6"
3'-0" MIN & X' MAX
2'-0"
SECTION B-B



PLAN

NOTES:
1. ACTUAL LOCATION DETERMINED IN FIELD

2. THE CONCRETE WASHOUT STRUCTURES SHALL BE MAINTAINED WHEN THE LIQUID AND/OR SOLID REACHES 75% OF THE STRUCTURES CAPACITY TO PROVIDE ADEQUATE HOLDING CAPACITY WITH A MINIMUM 12 INCHES OF FREEBOARD.

3.CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARY MARKED WITH SIGNAGE NOTING DEVICE.

ABOVE GRADE WASHOUT STRUCTURE
NOT TO SCALE

PRELIMINARY DESIGN
NOT FOR CONSTRUCTION

SEEDING SCHEDULE

FOR SHOULDERS, SIDE DITCHES, SLOPES (MAX. 3:1):

DATE	TYPE	PLANTING RATE
AUG 15 - NOV 1	TALL FESCUE	300 LBS/ACRE
NOV 1 - MAR 1	TALL FESCUE & ABRUZZI RYE	300 LBS/ACRE
MAR 1 - APR 15	TALL FESCUE	300 LBS/ACRE
APR 15 - JUN 30	HULLED COMMON BERMUDAGRASS	25 LBS/ACRE
JUL 1 - AUG 15	TALL FESCUE AND BROWNTOP MILLET OR SORGHUM-SUDAN HYBRIDS***	125 LBS/ACRE (TALL FESCUE); 35 LBS/ACRE (BROWNTOP MILLET); 30 LBS/ACRE (SORGHUM-SUDAN HYBRIDS)

FOR SHOULDERS, SIDE DITCHES, SLOPES (3:1 TO 2:1):

DATE	TYPE	PLANTING RATE
MAR 1 - JUN 1	SERICEA LESPEDEZA (SCARIFIED) AND USE THE FOLLOWING COMBINATIONS:	50 LBS/ACRE (SERICEA LESPEDEZA)
MAR 1 - APR 15	ADD TALL FESCUE	120 LBS/ACRE
MAR 1 - JUN 30	OR ADD WEEPING LOVE GRASS	10 LBS/ACRE
MAR 1 - JUN 30	OR ADD HULLED COMMON BERMUDAGRASS	25 LBS/ACRE
JUN 1 - SEP 1	TALL FESCUE AND BROWNTOP MILLET OR SORGHUM-SUDAN HYBRIDS***	120 LBS/ACRE (TALL FESCUE); 35 LBS/ACRE (BROWNTOP MILLET); 30 LBS/ACRE (SORGHUM-SUDAN HYBRIDS)
SEP 1 - MAR 1	SERICEA LESPEDEZA (UNHULLED - UNSCARIFIED) AND TALL FESCUE	70 LBS/ACRE (SERICEA LESPEDEZA); 120 LBS/ACRE (TALL FESCUE)
NOV 1 - MAR 1	AND ABRUZZI RYE	25 LBS/ACRE

MIXTURE

AGRICULTURAL LIMESTONE	2 TONS/ACRE – SMALL GRAIN STRAW
FERTILIZER	1,000 LBS/ACRE – 10-10-10
SUPERPHOSPHATE	500 LBS/ACRE – 20% ANALYSIS
MULCH	2 TONS/ACRE – SMALL GRAIN STRAW
ANCHOR	2 TONS/ACRE – SMALL GRAIN STRAW

***TEMPORARY: RESEED ACCORDING TO OPTIMUM SEASON FOR DESIRED PERMANENT VEGETATION. DO NOT ALLOW TEMPORARY COVER TO GROW MORE THAN 12" IN HEIGHT BEFORE MOWING; OTHERWISE, FESCUE MAY BE SHADED OUT.

SEEDBED PREPARATION

1. CHISEL COMPACTED AREAS AND SPREAD TOPSOIL THREE INCHES DEEP OVER ADVERSE SOIL CONDITIONS, IF AVAILABLE.
2. RIP THE ENTIRE AREA TO SIX INCHES DEEP.
3. REMOVE ALL LOOSE ROCK, ROOTS AND OTHER OBSTRUCTIONS, LEAVING SURFACE REASONABLY SMOOTH AND UNIFORM.
4. APPLY AGRICULTURAL LIME, FERTILIZER AND SUPERPHOSPHATE UNIFORMLY AND MIX WITH SOIL (SEE MIXTURE BELOW).
5. CONTINUE TILLAGE UNTIL A WELL-PULVERIZED, FIRM, REASONABLY UNIFORM SEEDBED IS PREPARED FOUR TO SIX INCHES DEEP.
6. SEED ON A FRESHLY PREPARED SEEDBED AND COVER SEED LIGHTLY WITH SEEDING EQUIPMENT OR CULTIPACK AFTER SEEDING.
7. MULCH IMMEDIATELY AFTER SEEDING AND ANCHOR MULCH.
8. INSPECT ALL SEEDED AREAS AND MAKE NECESSARY REPAIRS OR RESEEDINGS WITHIN THE PLANTING SEASON, IF POSSIBLE. IF STAND SHOULD BE MORE THAN 60% DAMAGED, RE-ESTABLISH FOLLOWING THE ORIGINAL LIME, FERTILIZER AND SEEDING RATES.
9. CONSULT S&EC ENVIRONMENTAL ENGINEERS ON MAINTENANCE TREATMENT AND FERTILIZATION AFTER PERMANENT COVER IS ESTABLISHED.

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MICHAEL V. ZACCARDO
6/22/21

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

DATE	REVISION DESCRIPTION

DATE	06/22/2021
DRAWN BY	JD. MACMILLAN
DESIGNED BY	JD. MACMILLAN
CHECKED BY	M. ZACCARDO
SCALE	N/A

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION
KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA

EROSION AND SEDIMENT CONTROL DETAILS

JOB NO. 44872
SHEET NO. C8.11

FOR REVIEW ONLY: NOT FOR CONSTRUCTION

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.

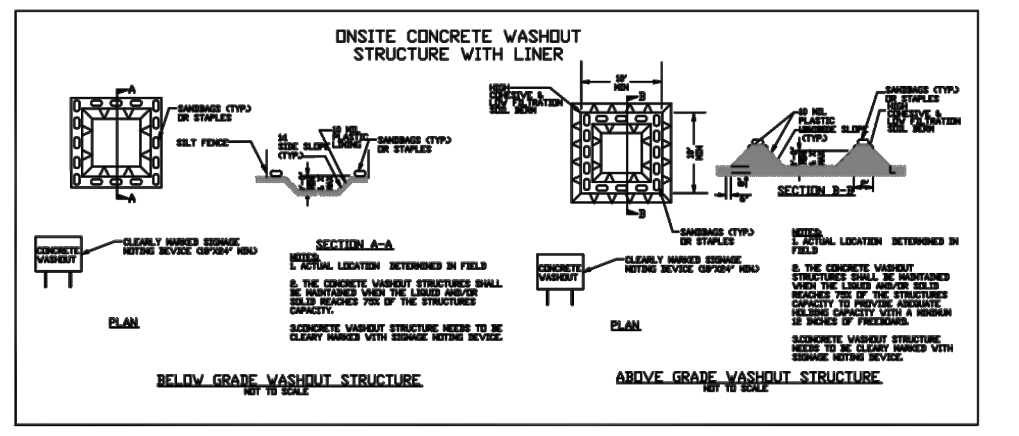
PORTABLE TOILETS

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


ONSITE CONCRETE WASHOUT STRUCTURE WITH LINER
SANDBAGS (TYP.) OR STAPLES
SILT FENCE
1:1 SIDE SLOPE (TYP.)
10 MIL PLASTIC LINING
SANDBAGS (TYP.) OR STAPLES
CONCRETE WASHOUT
CLEARLY MARKED SIGNAGE NOTING DEVICE (18"X24" MIN.)
SECTION A-A
PLAN
HIGH COHESIVE & LOW FILTRATION SOIL BERM
10' MIN
SANDBAGS (TYP.) OR STAPLES
10 MIL PLASTIC LINING
SECTION B-B
PLAN

NOTES:
1. ACTUAL LOCATION DETERMINED IN FIELD
2. THE CONCRETE WASHOUT STRUCTURES SHALL BE MAINTAINED WHEN THE LIQUID AND/OR SOLID REACHES 75% OF THE STRUCTURES CAPACITY.
3. CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARY MARKED WITH SIGNAGE NOTING DEVICE.

BELOW GRADE WASHOUT STRUCTURE
NOT TO SCALE

NOTES:
1. ACTUAL LOCATION DETERMINED IN FIELD
2. THE CONCRETE WASHOUT STRUCTURES SHALL BE MAINTAINED WHEN THE LIQUID AND/OR SOLID REACHES 75% OF THE STRUCTURES CAPACITY TO PROVIDE ADEQUATE HOLDING CAPACITY WITH A MINIMUM 12 INCHES OF FREEBOARD.
3. CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARY MARKED WITH SIGNAGE NOTING DEVICE.

ABOVE GRADE WASHOUT STRUCTURE
NOT TO SCALE

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

PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION A: SELF-INSPECTION

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

Inspect	Frequency (during normal business hours)	Inspection records must include:
(1) Rain gauge maintained in good working order	Daily	Daily rainfall amounts. If no daily rain gauge observations are made during weekend or holiday periods, and no individual-day rainfall information is available, record the cumulative rain measurement for those unattended days (and this will determine if a site inspection is needed). Days on which no rainfall occurred shall be recorded as "zero." The permittee may use another rain-monitoring device approved by the Division.
(2) E&SC Measures	At least once per 7 calendar days and within 24 hours of a rain event ≥ 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 ≥ 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 ≥ 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 ≥ 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

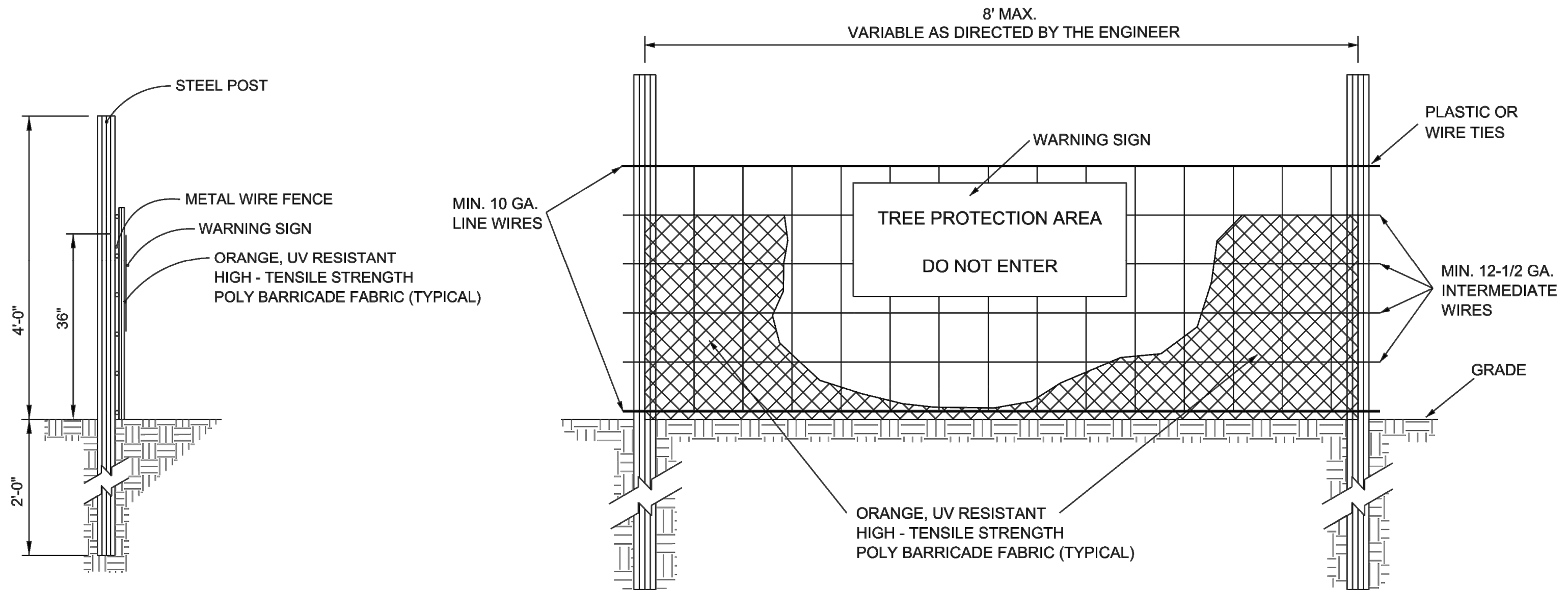
Sediment basins and traps that receive runoff from drainage areas of one acre or more shall use outlet structures that withdraw water from the surface when these devices need to be drawn down for maintenance or close out unless this is infeasible. The circumstances in which it is not feasible to withdraw 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

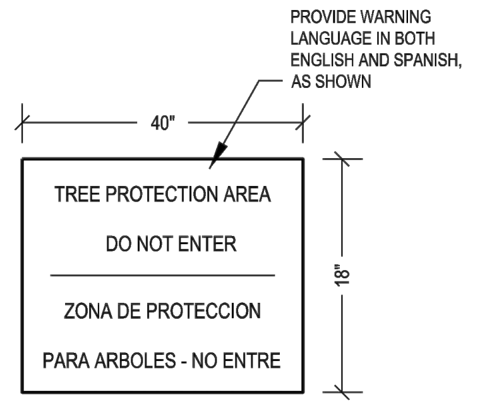
EFFECTIVE: 04/01/19


8' MAX.
VARIABLE AS DIRECTED BY THE ENGINEER
STEEL POST
METAL WIRE FENCE
WARNING SIGN
ORANGE, UV RESISTANT HIGH - TENSILE STRENGTH POLY BARRICADE FABRIC (TYPICAL)
4'-0"
36"
2'-0"
MIN. 10 GA. LINE WIRES
WARNING SIGN
TREE PROTECTION AREA
DO NOT ENTER
PLASTIC OR WIRE TIES
MIN. 12-1/2 GA. INTERMEDIATE WIRES
GRADE
ORANGE, UV RESISTANT HIGH - TENSILE STRENGTH POLY BARRICADE FABRIC (TYPICAL)

SIDE VIEW

FRONT VIEW

NOTE: FOR TREE PROTECTION ONLY



WARNING SIGN DETAIL

NOTES:
1. TREE PROTECTION FENCING MUST BE INSTALLED AT A MINIMUM RADIUS OF THE CRITICAL ROOT ZONE (SEE DETAIL TPP-02 FOR EXAMPLES)
2. THE TREE PROTECTION FENCING MUST REMAIN IN PLACE FOR THE DURATION OF THE PROJECT UNLESS OTHERWISE APPROVED BY URBAN FORESTRY STAFF.
3. APPROVED IMPACT PROTECTION DEVICES MUST BE REMOVED AFTER CONSTRUCTION WHEN APPLICABLE.
4. SIGNS SHALL BE PLACED AT 50' MAXIMUM INTERVALS. PLACE A SIGN AT EACH END OF LINEAR TREE PROTECTION AND 50' ON CENTER FOR THE REMAINDER
5. FOR TREE PROTECTION AREAS LESS THAN 200' IN PERIMETER, PROVIDE NO LESS THAN ONE SIGN PER PROTECTED AREA.
6. ATTACH SIGNS SECURELY TO FENCE POSTS AND FABRIC.
7. ADDITIONAL SIGNS MAY BE REQUIRED BY CITY OF RALEIGH BASED ON ACTUAL FIELD CONDITIONS.
8. SIGNS ARE TO BE MADE OF DURABLE, WEATHERPROOF MATERIAL WITH LETTERS A MINIMUM OF 2 1/2" HIGH, CLEARLY LEGIBLE AND SPACED AS SHOWN.

CONTACT INFORMATION:
CITY OF RALEIGH PARKS, RECREATION AND
CULTURAL RESOURCES DEPARTMENT
URBAN FORESTER:
TREES@RALEIGHNC.GOV
WWW.RALEIGHNC.GOV

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

MICHAEL V. ZACCARDO
6/22/21

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	06/22/2021
DRAWN BY	JD. MACMILLAN
DESIGNED BY	JD. MACMILLAN
CHECKED BY	M. ZACCARDO
SCALE	N/A

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION

KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA

EROSION AND SEDIMENT CONTROL NOTES

FOR REVIEW ONLY: NOT FOR CONSTRUCTION

JOB NO.	44872
SHEET NO.	C8.12

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S:\331\44872-Stone-Siver\DWG\Sheet\CD\STONE RIVER\44872-331-SR-C7.0-NTDT.dwg | by: Thomas Taylor

SCOPE OF WORK:
Furnish all labor, materials, and equipment required or indicated by the drawings and specifications to complete the work including installation of all trees, shrubs, groundcover, annuals, seed, sod and mulch.

MATERIALS AND WORK:
The selection of all materials and the execution of all work required under the contract shall be subject to approval by the owner. The owner shall have the right to reject and and all materials and any and all work, which in his opinion, does not meet the requirements of the contract.

PLANT MATERIALS:
All plant materials shall be nursery grown, freshly dug in the field, naturally shaped, well branched, fully foliated when in leaf with fully developed root systems. Trees must be self supporting, with straight trunks and leaders In tact. All plants must be free of disease, insect infestation or their eggs and shall have been grown in climatic conditions similar to those of the project site

PLANT SIZE:
Specified sizes indicates the minimum allowable size at planting. Where container and height spreads are indicated for a single species, both size requirements shall be met When only plant height or spread are indicated, container size shall be based on ANSI standards.

ORGANIC MATTER:
Aged manure, compost or pine bark fines, at the option of the contractor, material shall be air dried, finely shredded and suitable for horticultural purposes and shall contain no more than 35 moisture content by weight.

PINE BARK MULCH:
All pine bark mulch shall be clean, double ground, fine textured nugget mulch with minimal amounts of sapwood content.

TURF AREAS:
Prior to any seeding or sod application, verify that all trenching and land disturbing activities have been completed. Ensure all areas are free of stones, large soil clods and any other construction debris.

PLAT NOTES:
1. Each single-family or duplex lot shall contain a minimum of one (1) canopy tree for every 2,000 square feet of lot area or fraction thereof up to 20,000 square feet in lot area. Any portion of the residential lot occupied by a recorded utility easement shall not be included as part of the total lot area. The location of planting to account for physical conditions may be adjusted by the Administrator. (SEE SHEET C9.1 FOR TREE REQUIRED CALCULATIONS.)

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 8.10*) 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 feet in height planted at four-foot intervals.

PLANT LIST - Street Trees (Size requirements based upon time of installation)

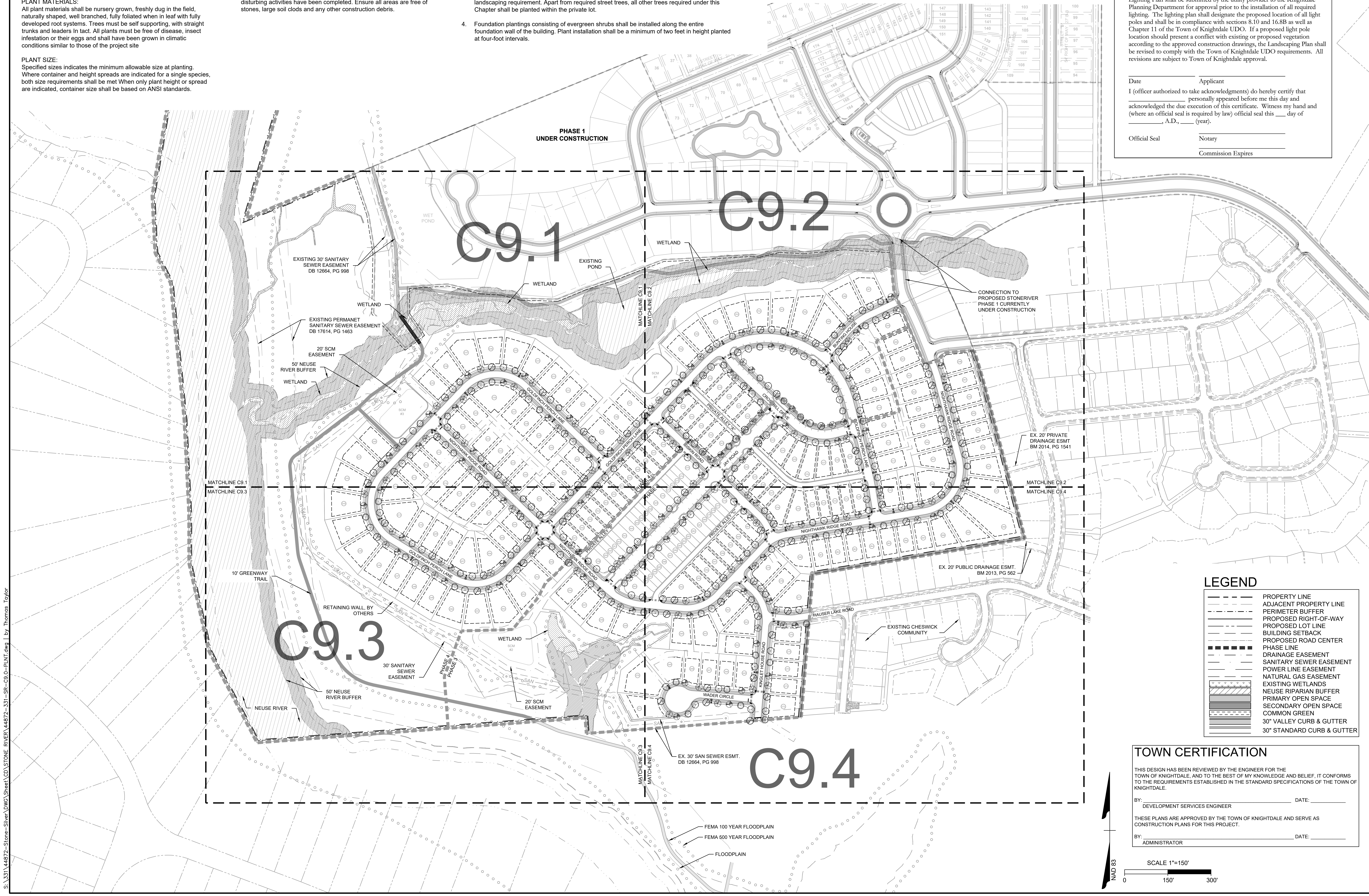
KEY	BOTANICAL NAME	COMMON NAME	QTY.	SIZE	HEIGHT	ROOT	COMMENTS
LE	Ulmus Parvifolia	Lacebark Elm	88	2" Cal.	8' Min.	B&B	
CP	Pistacia Chinensis 'Keith Davey'	Chinese Pistachio	84	2" Cal.	8' Min.	B&B	
SO	Quercus Acutissima	Sawtooth Oak	86	2" Cal.	8' Min.	B&B	
Z	Zelkova Scheideriana	Zelkova	91	2" Cal.	8' Min.	B&B	
SM	Acer Saccharum 'Bonfire'	Sugar Maple	90	2" Cal.	8' Min.	B&B	

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

______________ Date
______________ Applicant

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

Official Seal
______________ Notary
______________ Commission Expires



SCALE 1"=150'
0 150' 300'

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
▨	PRIMARY OPEN SPACE
▨	SECONDARY OPEN SPACE
▨	COMMON GREEN
═══	30" VALLEY CURB & GUTTER
═══	30" STANDARD CURB & GUTTER

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

MICHAEL V. ZACCARDO
6/22/21

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

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

DATE	*06/22/2021*
DRAWN BY	*JD. MACMILLAN*
DESIGNED BY	*JD. MACMILLAN*
CHECKED BY	*M. ZACCARDO*
SCALE	*1" = 150'*

STONERIVER SUBDIVISION
KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA
OVERALL LANDSPACE & LIGHTING PLAN

JOB NO.
44872
SHEET NO.
C9.0

FOR REVIEW ONLY: NOT FOR CONSTRUCTION

S:\331\44872-Stone-Silver\DWG\Sheet\CD\STONE RIVER\44872-331-SR-C9.0-PLNT.dwg | by Thomas Taylor

SILVERSTONE SUBDIVISION - LUMINAIRE SCHEDULE

TYP	SYMBOL	DESCRIPTION	LAMP	LUMENS	MOUNTING /BALLAST	LLF
A	25FT	LED ROADWAY TYPE II LED LIGHT FIXTURE, MOUNT ON 25' POLE	(1) 50W LED 4000 K	4476	25' DUKE ENERGY POLE	0.64

PLANT LIST - Street Trees (Size requirements based upon time of installation)

KEY	BOTANICAL NAME	COMMON NAME	QTY.	SIZE	HEIGHT	ROOT	COMMENTS
LE	Ulmus Parvifolia	Lacebark Elm	88	2" Cal.	8' Min.	B&B	
CP	Pistacia Chinensis 'Keith Davey'	Chinese Pistachio	84	2" Cal.	8' Min.	B&B	
SO	Quercus Acutissima	Sawtooth Oak	86	2" Cal.	8' Min.	B&B	
Z	Zelkova Scheideriana	Zelkova	91	2" Cal.	8' Min.	B&B	
SM	Acer Saccharum 'Bonfire'	Sugar Maple	90	2" Cal.	8' Min.	B&B	

SCOPE OF WORK:
Furnish all labor, materials, and equipment required or indicated by the drawings and specifications to complete the work including installation of all trees, shrubs, groundcover, annuals, seed, sod and mulch.

MATERIALS AND WORK:
The selection of all materials and the execution of all work required under the contract shall be subject to approval by the owner. The owner shall have the right to reject and and all materials and any and all work, which in his opinion, does not meet the requirements of the contract.

PLANT MATERIALS:
All plant materials shall be nursery grown, freshly dug in the field, naturally shaped, well branched, fully foliated when in leaf with fully developed root systems. Trees must be self supporting, with straight trunks and leaders In tact. All plants must be free of disease, insect infestation or their eggs and shall have been grown in climatic conditions similar to those of the project site

PLANT SIZE:
Specified sizes indicates the minimum allowable size at planting. Where container and height spreads are indicated for a single species, both size requirements shall be met When only plant height or spread are indicated, container size shall be based on ANSI standards.

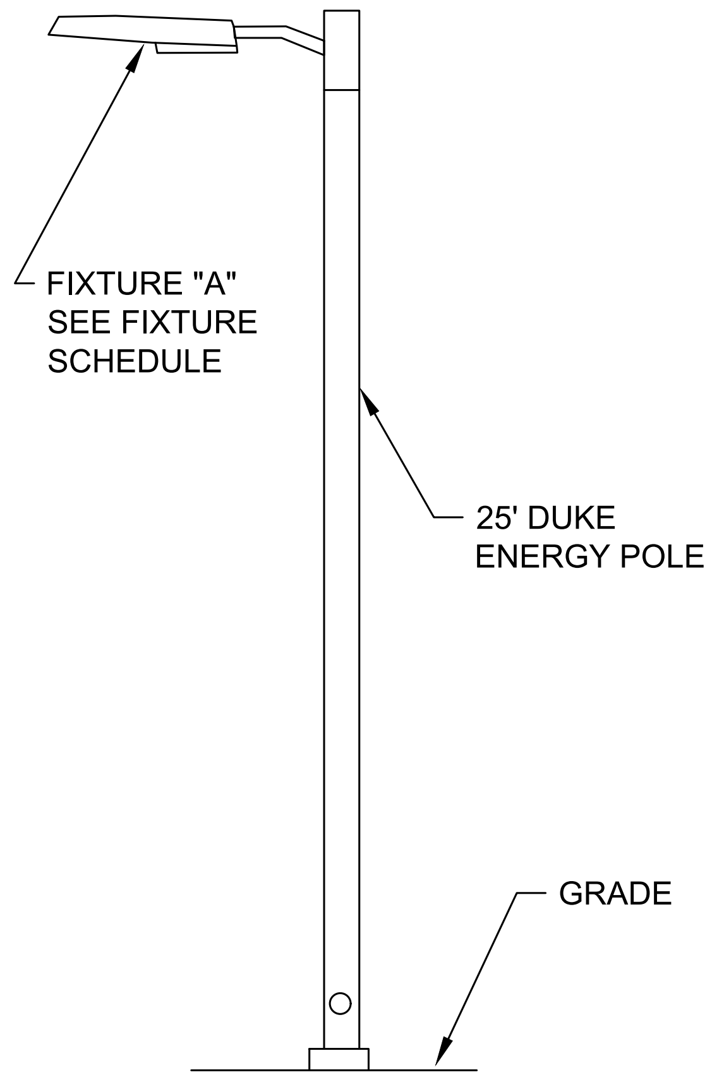
ORGANIC MATTER:
Aged manure, compost or pine bark fines, at the option of the contractor, material shall be air dried, finely shredded and suitable for horticultural purposes and shall contain no more than 35 moisture content by weight.

PINE BARK MULCH:
All pine bark mulch shall be clean, double ground, fine textured nugget mulch with minimal amounts of sapwood content.

TURF AREAS:
Prior to any seeding or sod application, verify that all trenching and land disturbing activities have been completed. Ensure all areas are free of stones, large soil clods and any other construction debris.

PLAT NOTES:

1. Each single-family or duplex lot shall contain a minimum of one (1) canopy tree for every 2,000 square feet of lot area or fraction thereof up to 20,000 square feet in lot area. Any portion of the residential lot occupied by a recorded utility easement shall not be included as part of the total lot area. The location of planting to account for physical conditions may be adjusted by the Administrator. (SEE SHEET C9.1 FOR TREE REQUIRED CALCULATIONS.)
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 8.10*) 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 feet in height planted at four-foot intervals.
5. All above ground utilities shall be screened as well per UDO Sec 8.7.C



FIXTURE "A" DETAIL

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

Date ____________________ Applicant ____________________

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

Official Seal

Notary ____________________

Commission Expires ____________________

NAD 83

SCALE 1"=50'

0 50' 100'

LEGEND

EXISTING WETLANDS	▨
PROPOSED SIDEWALK	▨
DRAINAGE EASEMENT	—— · ——
50' NEUSE RIPARIAN BUFFER	— — —
PROPERTY LINE	—— - - ——
LED STREET LIGHTS (9,500 LUMENS LED 75 ROADWAY LIGHT) ALUMINUM POLE - HEIGHT 30'	⊡
STREET / SHADE TREE	⊘

ALL CONSTRUCTION TO BE IN ACCORDANCE WITH ALL TOWN OF KNIGHTDALE AND NCDOT 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: ______________________________ 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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11.5 Additional Outdoor Lighting Standards for Specific Lighting Types

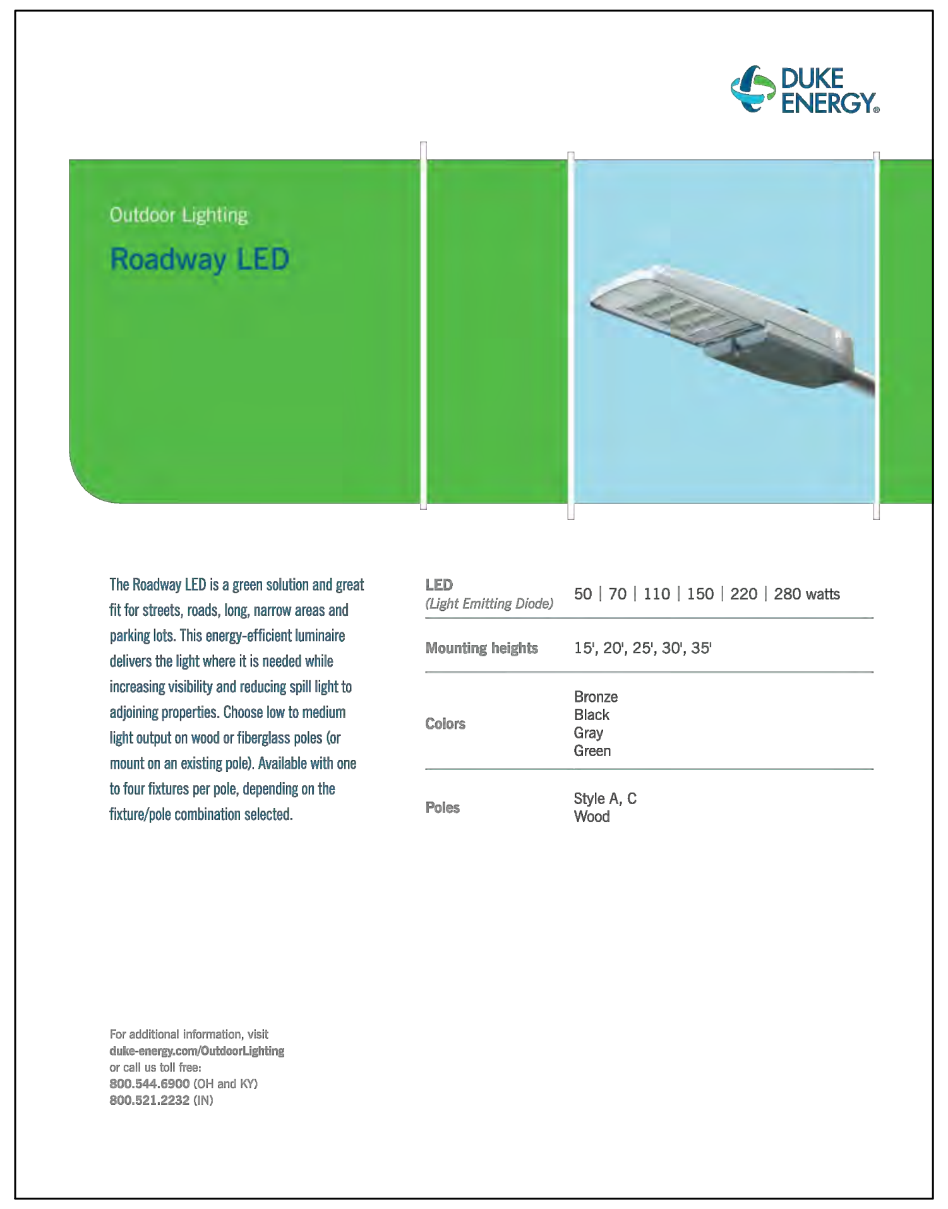
In addition to meeting the general lighting standards in Section 11.4, the following types of lighting shall also meet the additional specific standards listed below.

A. Street Lighting

Street lighting shall be placed on all streets by the developer to allow for the safe use of streets by cars, cyclists and pedestrians. Developer placed lighting shall also include all improved frontages on local and NCDOT streets. Developers requesting upgrades from the Town's minimum street light specification of a fiberglass pole with a fully-shielded, arm-mounted LED fixture shall pay the Town up front the difference in the costs of maintenance for the desired LED fixture and pole covering a period of 10 years. Developers interested in pursuing this option should consult with the Administrator concerning the Town's “Premium Lighting Policy”. All street lighting shall conform to the specific standards for LED lighting in subsection ‘B’ as well as the following design standards:

1. Average Spacing Maximums: The following maximum average spacing requirements between street lights shall apply to all local, collector and arterial street classifications according to the use context of the adjacent land as listed below, except alleys (Section 17.3A1) which are exempt from said requirements.
   a. Local & Collector Streets:
      i. Residential at less than three (<3) unit per acre - 500 feet
      ii. Residential from three (3.0) to eight (8.0) units per acre - 250 feet
      iii. Residential over eight (>8.0) units per acre - 150 feet
      iv. All other uses - 300 feet
   b. Arterial Streets: All uses - 150 feet
2. Minimum Initial Delivered Lumen Levels:
   a. Local Streets - 4,800 lumens
   b. Collector Streets in Residential Areas - 12,500 lumens
   c. Collector Streets in Other Areas - 12,500 lumens
   d. Arterial Streets - 18,500 lumens
3. BUG Rating: All street lights shall be fully-shielded (no light at or above horizontal) and shall not exceed the following BUG ratings established for each type of street:
   a. Local Streets - B1, U1, G1
   b. Collector Streets in Residential Areas - B2, U2, G2
   c. Collector Streets in Other Areas - B3, U3, G3
   d. Arterial Streets - B3, U3, G3
4. Placement:
   a. Although the primary purpose of street lighting is to provide adequate lighting for the roadway, street lighting should also promote pedestrian. Therefore, lighting should be placed in a manner to minimize the casting of shadows on sidewalks.
   b. Lighting shall be placed as far from street trees as the landscaping plan will allow.
   c. Lights on newly constructed streets shall be alternately staggered on each side of the street wherever possible.
   d. Lighting shall be placed at all street intersections, in street curves and at the end of any street or cul-de-sac.

(Note: For additional information on the connectivity and circulation of streets, please refer to Chp. 9)



DUKE ENERGY.

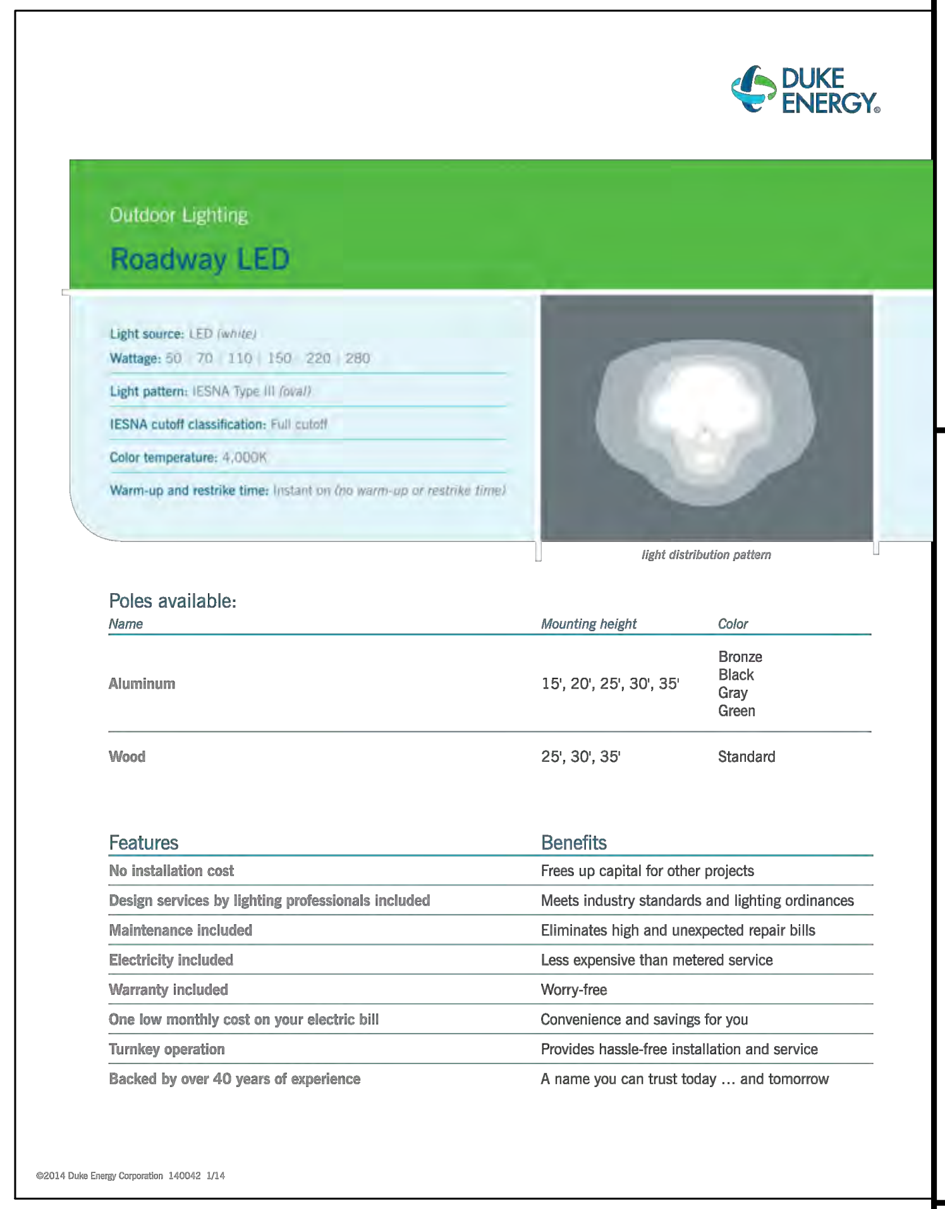
Outdoor Lighting

Roadway LED

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

LED *(Light Emitting Diode)*	50 | 70 | 110 | 150 | 220 | 280 watts
Mounting heights	15', 20', 25', 30', 35'
Colors	Bronze Black Gray Green
Poles	Style A, C Wood

For additional information, visit
duke-energy.com/OutdoorLighting
or call us toll free:
800.544.6900 (OH and KY)
800.521.2232 (IN)



DUKE ENERGY.

Outdoor Lighting

Roadway LED

Light source: LED *(white)*
Wattage: 50 | 70 | 110 | 150 | 220 | 280
Light pattern: IESNA Type III *(oval)*
IESNA cutoff classification: Full cutoff
Color temperature: 4,000K
Warm-up and restrike time: Instant on *(no warm-up or restrike time)*

light distribution pattern

Poles available:

Name	Mounting height	Color
Aluminum	15', 20', 25', 30', 35'	Bronze Black Gray Green
Wood	25', 30', 35'	Standard

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

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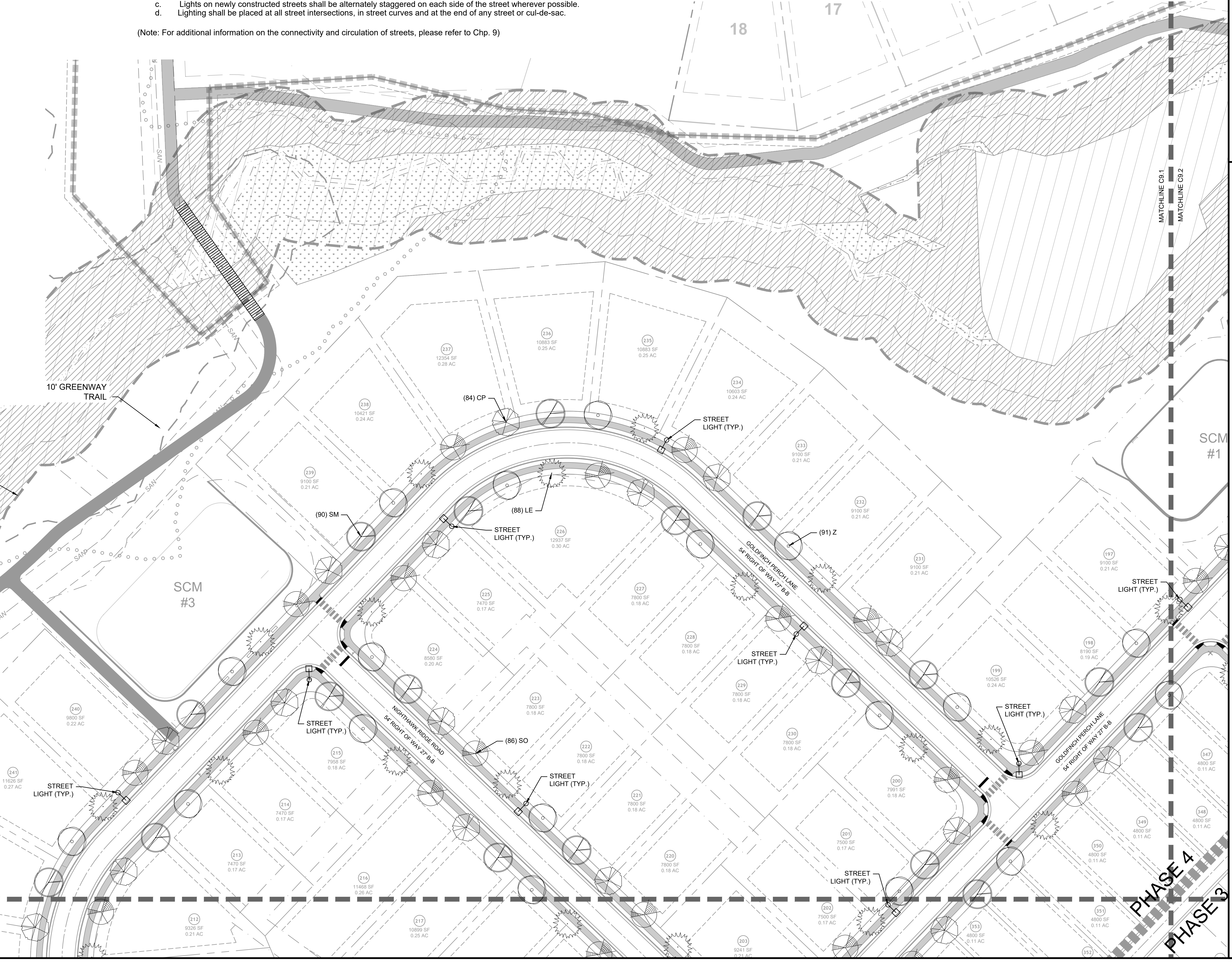

MICHAEL V. ZACCARDO
6/22/21

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5410 Trinity Road, Suite 102 | Raleigh, NC 27607
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REVISION DESCRIPTION	DATE

DATE	06/22/2021
DRAWN BY	JD. MACMILLAN
DESIGNED BY	JD. MACMILLAN
CHECKED BY	M. ZACCARDO
SCALE	1" = 50'

TIMMONS GROUP

NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION

KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA

DETAILED LANDSCAPE & LIGHTING PLAN - SHEET 1 OF 4

JOB NO. 44872

SHEET NO. C9.1

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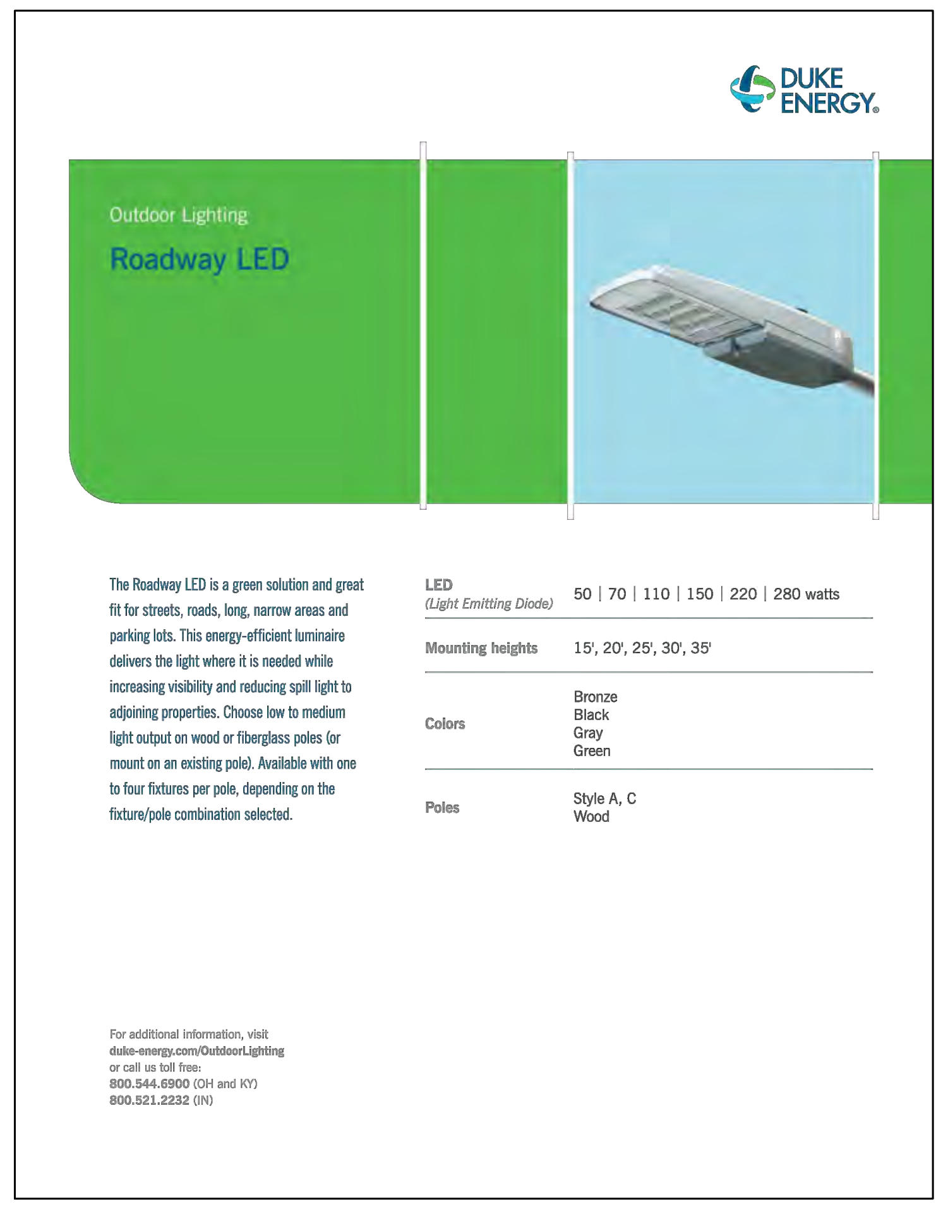


DUKE ENERGY.

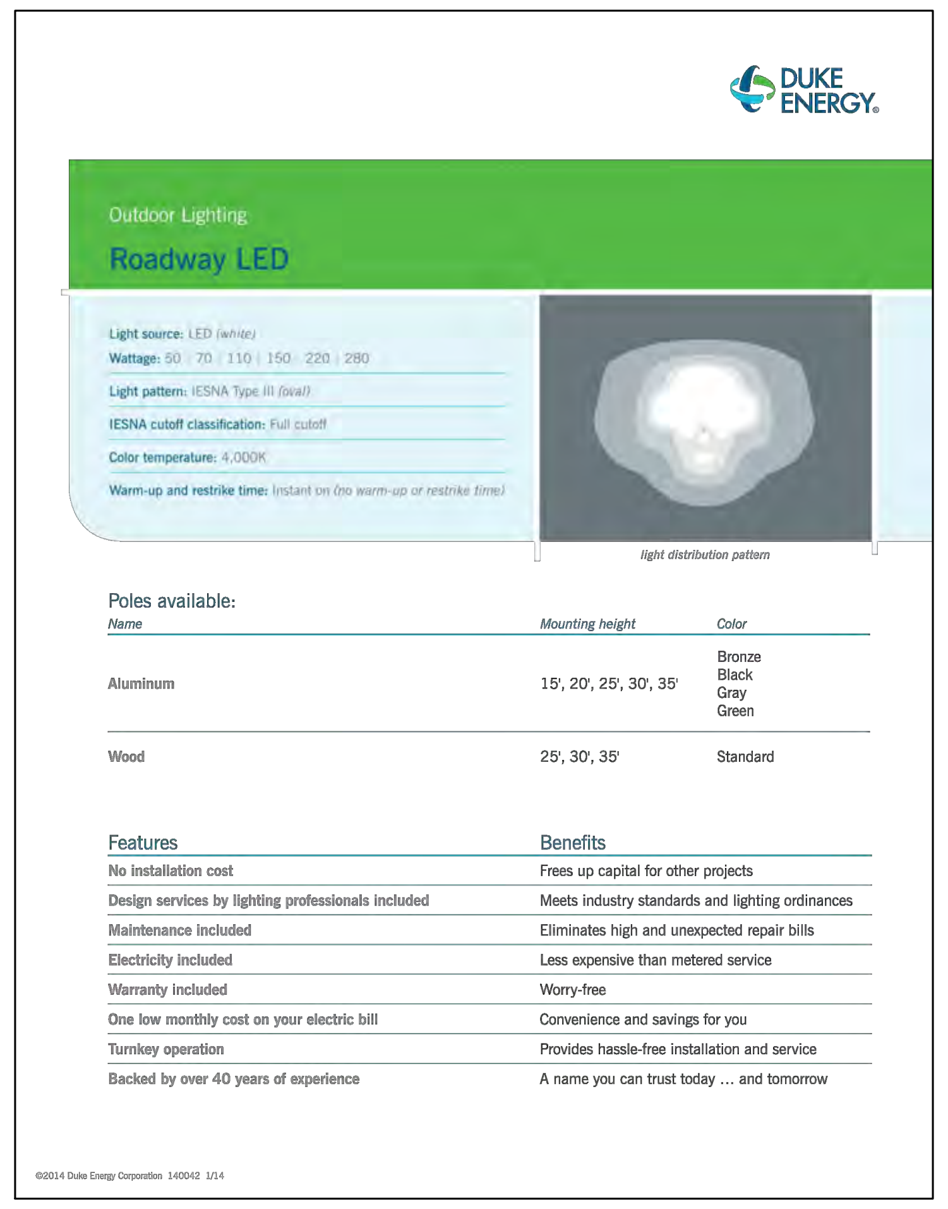
Outdoor Lighting

Roadway LED

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

LED *(Light Emitting Diode)*	50 | 70 | 110 | 150 | 220 | 280 watts
Mounting heights	15', 20', 25', 30', 35'
Colors	Bronze Black Gray Green
Poles	Style A, C Wood

For additional information, visit
duke-energy.com/OutdoorLighting
or call us toll free:
800.544.6900 (OH and KY)
800.521.2232 (IN)



DUKE ENERGY.

Outdoor Lighting

Roadway LED

Light source: LED *(white)*
Wattage: 50 | 70 | 110 | 150 | 220 | 280
Light pattern: IESNA Type III *(oval)*
IESNA cutoff classification: Full cutoff
Color temperature: 4,000K
Warm-up and restrike time: Instant on *(no warm-up or restrike time)*

light distribution pattern

Poles available:

Name	*Mounting height*	*Color*
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Wood	25', 30', 35'	Standard

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11.5 Additional Outdoor Lighting Standards for Specific Lighting Types

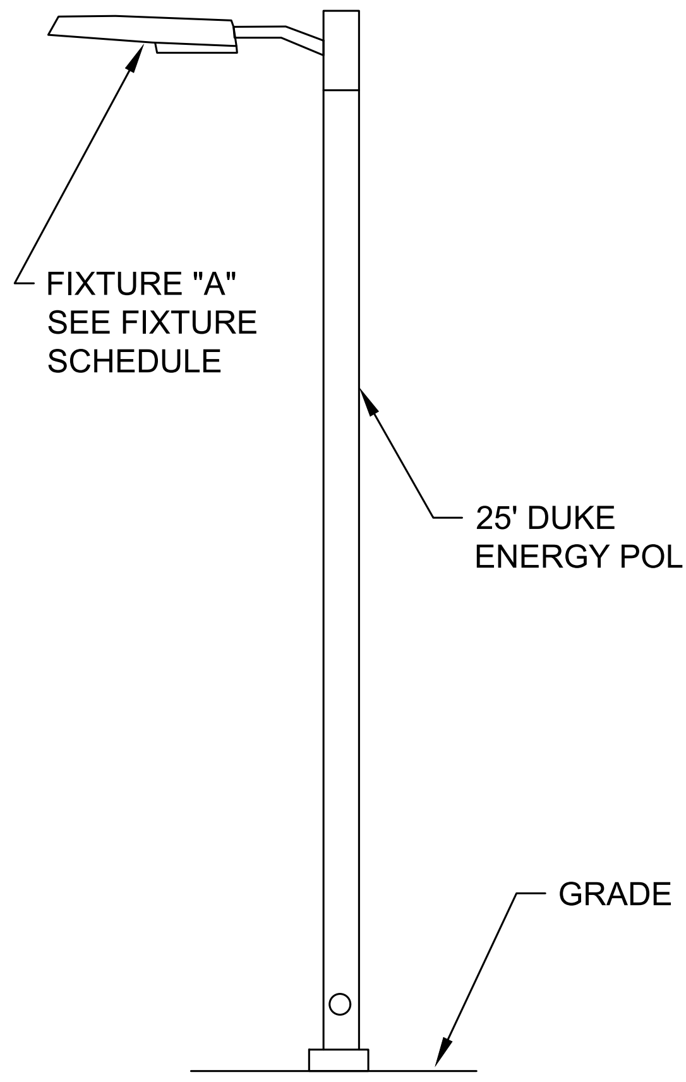
In addition to meeting the general lighting standards in Section 11.4, the following types of lighting shall also meet the additional specific standards listed below.

A. Street Lighting

Street lighting shall be placed on all streets by the developer to allow for the safe use of streets by cars, cyclists and pedestrians. Developer placed lighting shall also include all improved frontages on local and NCDOT streets. Developers requesting upgrades from the Town's minimum street light specification of a fiberglass pole with a fully-shielded, arm-mounted LED fixture shall pay the Town up front the difference in the costs of maintenance for the desired LED fixture and pole covering a period of 10 years. Developers interested in pursuing this option should consult with the Administrator concerning the Town's "Premium Lighting Policy". All street lighting shall conform to the specific standards for LED lighting in subsection 'B' as well as the following design standards:

1. Average Spacing Maximums: The following maximum average spacing requirements between street lights shall apply to all local, collector and arterial street classifications according to the use context of the adjacent land as listed below, except alleys (Section 17.3A1) which are exempt from said requirements.
    a. Local & Collector Streets:
        i. Residential at less than three (<3) unit per acre - 500 feet
        ii. Residential from three (3.0) to eight (8.0) units per acre - 250 feet
        iii. Residential over eight (>8.0) units per acre - 150 feet
        iv. All other uses - 300 feet
    b. Arterial Streets: All uses - 150 feet
2. Minimum Initial Delivered Lumen Levels:
    a. Local Streets - 4,800 lumens
    b. Collector Streets in Residential Areas - 12,500 lumens
    c. Collector Streets in Other Areas - 12,500 lumens
    d. Arterial Streets - 18,500 lumens
3. BUG Rating: All street lights shall be fully-shielded (no light at or above horizontal) and shall not exceed the following BUG ratings established for each type of street:
    a. Local Streets - B1, U1, G1
    b. Collector Streets in Residential Areas - B2, U2, G2
    c. Collector Streets in Other Areas - B3, U3, G3
    d. Arterial Streets - B3, U3, G3
4. Placement:
    a. Although the primary purpose of street lighting is to provide adequate lighting for the roadway, street lighting should also promote pedestrian. Therefore, lighting should be placed in a manner to minimize the casting of shadows on sidewalks.
    b. Lighting shall be placed as far from street trees as the landscaping plan will allow.
    c. Lights on newly constructed streets shall be alternately staggered on each side of the street wherever possible.
    d. Lighting shall be placed at all street intersections, in street curves and at the end of any street or cul-de-sac.

(Note: For additional information on the connectivity and circulation of streets, please refer to Chp. 9)



FIXTURE "A" DETAIL

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

________________ ____________________
Date Applicant

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

Official Seal ____________________
Notary
____
Commission Expires

LEGEND

EXISTING WETLANDS	▨
PROPOSED SIDEWALK	▩
DRAINAGE EASEMENT	— · —
50' NEUSE RIPARIAN BUFFER	— — —
PROPERTY LINE	— - - —
☐	LED STREET LIGHTS (9,500 LUMENS LED 75 ROADWAY LIGHT) ALUMINUM POLE - HEIGHT 30'
⊘	STREET / SHADE TREE

NAD 83

SCALE 1"=50'
0 50' 100'

ALL CONSTRUCTION TO BE IN ACCORDANCE WITH ALL TOWN OF KNIGHTDALE AND NCDOT 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: ____________________________ DATE: __________
DEVELOPMENT SERVICES ENGINEER

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

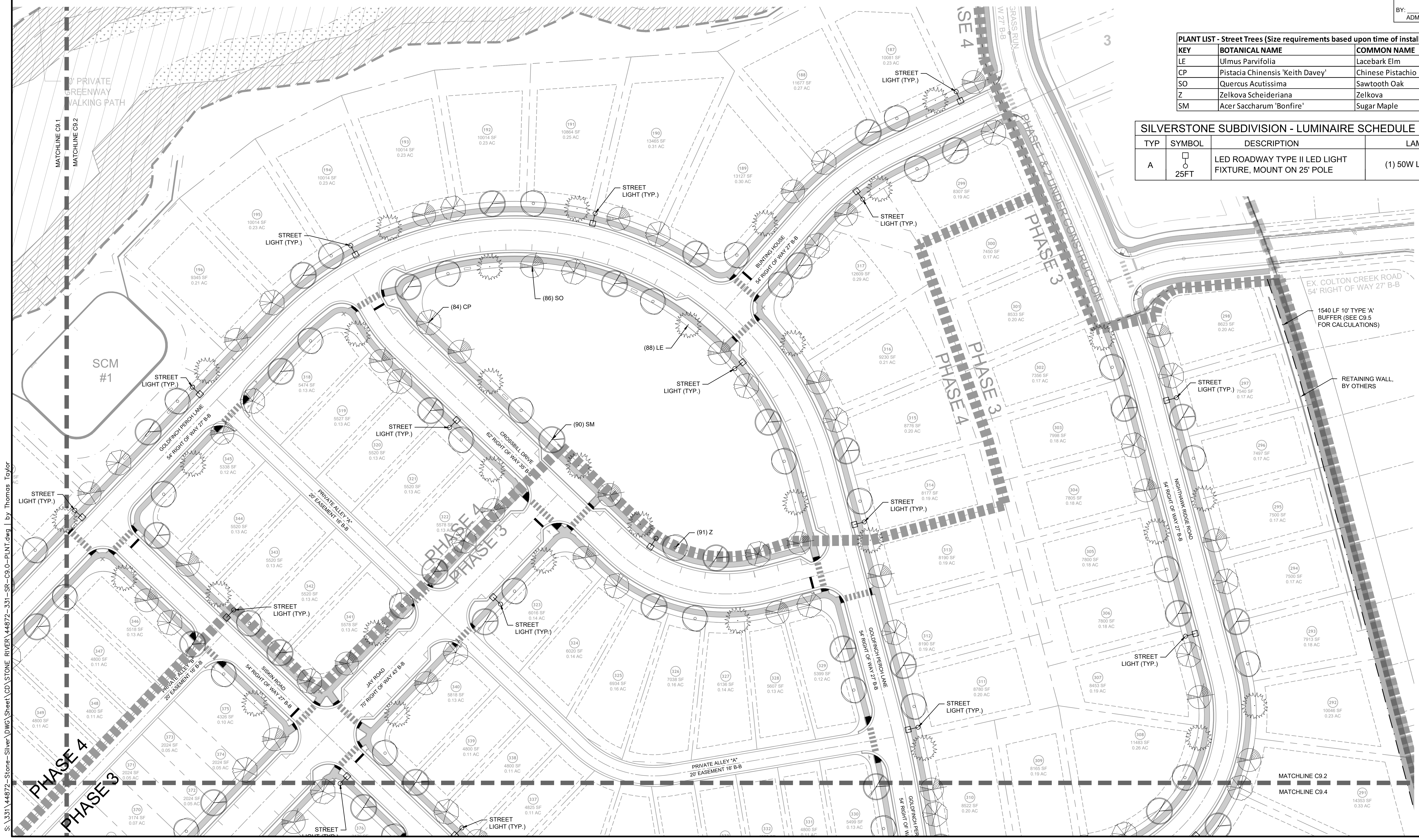
BY: ____________________________ DATE: __________
ADMINISTRATOR

PLANT LIST - Street Trees (Size requirements based upon time of installation)

KEY	BOTANICAL NAME	COMMON NAME	QTY.	SIZE	HEIGHT	ROOT	COMMENTS
LE	Ulmus Parvifolia	Lacebark Elm	88	2" Cal.	8' Min.	B&B	
CP	Pistacia Chinensis 'Keith Davey'	Chinese Pistachio	84	2" Cal.	8' Min.	B&B	
SO	Quercus Acutissima	Sawtooth Oak	86	2" Cal.	8' Min.	B&B	
Z	Zelkova Scheideriana	Zelkova	91	2" Cal.	8' Min.	B&B	
SM	Acer Saccharum 'Bonfire'	Sugar Maple	90	2" Cal.	8' Min.	B&B	

SILVERSTONE SUBDIVISION - LUMINAIRE SCHEDULE

TYP	SYMBOL	DESCRIPTION	LAMP	LUMENS	MOUNTING /BALLAST	LLF
A	☐ 25FT	LED ROADWAY TYPE II LED LIGHT FIXTURE, MOUNT ON 25' POLE	(1) 50W LED 4000 K	4476	25' DUKE ENERGY POLE	0.64



PLAT NOTES:

1. Each single-family or duplex lot shall contain a minimum of one (1) canopy tree for every 2,000 square feet of lot area or fraction thereof up to 20,000 square feet in lot area. Any portion of the residential lot occupied by a recorded utility easement shall not be included as part of the total lot area. The location of planting to account for physical conditions may be adjusted by the Administrator. (SEE SHEET C9.1 FOR TREE REQUIRED CALCULATIONS.)
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 8.10*) 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 feet in height planted at four-foot intervals.
5. All above ground utilities shall be screened as well per UDO Sec 8.7.C

SCOPE OF WORK:
Furnish all labor, materials, and equipment required or indicated by the drawings and specifications to complete the work including installation of all trees, shrubs, groundcover, annuals, seed, sod and mulch.

MATERIALS AND WORK:
The selection of all materials and the execution of all work required under the contract shall be subject to approval by the owner. The owner shall have the right to reject and and all materials and any and all work, which in his opinion, does not meet the requirements of the contract.

PLANT MATERIALS:
All plant materials shall be nursery grown, freshly dug in the field, naturally shaped, well branched, fully foliated when in leaf with fully developed root systems. Trees must be self supporting, with straight trunks and leaders In tact. All plants must be free of disease, insect infestation or their eggs and shall have been grown in climatic conditions similar to those of the project site

PLANT SIZE:
Specified sizes indicates the minimum allowable size at planting. Where container and height spreads are indicated for a single species, both size requirements shall be met When only plant height or spread are indicated, container size shall be based on ANSI standards.

ORGANIC MATTER:
Aged manure, compost or pine bark fines, at the option of the contractor, material shall be air dried, finely shredded and suitable for horticultural purposes and shall contain no more than 35 moisture content by weight.

PINE BARK MULCH:
All pine bark mulch shall be clean, double ground, fine textured nugget mulch with minimal amounts of sapwood content.

TURF AREAS:
Prior to any seeding or sod application, verify that all trenching and land disturbing activities have been completed. Ensure all areas are free of stones, large soil clods and any other construction debris.

MICHAEL V. ZACCARDO
022321
6/22/21

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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

STONERIVER SUBDIVISION

KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA

DETAILED LANDSCAPE & LIGHTING PLAN - SHEET 2 OF 4

DATE	06/22/2021
DRAWN BY	JD. MACMILLAN
DESIGNED BY	JD. MACMILLAN
CHECKED BY	M. ZACCARDO
SCALE	1" = 50'
JOB NO.	44872
SHEET NO.	C9.2

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S:\331\44872–Stone–Silver\DWG\Sheet\CD\STONE RIVER\44872–331–SR–C9.0–PLNT.dwg | by Thomas Taylor

SCOPE OF WORK:
Furnish all labor, materials, and equipment required or indicated by the drawings and specifications to complete the work including installation of all trees, shrubs, groundcover, annuals, seed, sod and mulch.

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________________ ____________________
Date Applicant

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Official Seal ____________________
Notary
____
Commission Expires

TOWN CERTIFICATION

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

BY: ______________________________ DATE: __________
DEVELOPMENT SERVICES ENGINEER

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

BY: ______________________________ DATE: __________
ADMINISTRATOR

LEGEND

EXISTING WETLANDS	⁘
PROPOSED SIDEWALK	▒
DRAINAGE EASEMENT	— · —
50' NEUSE RIPARIAN BUFFER	— — —
PROPERTY LINE	—— - - ——
⊡	LED STREET LIGHTS (9,500 LUMENS LED 75 ROADWAY LIGHT) ALUMINUM POLE - HEIGHT 30'
⊘	STREET / SHADE TREE

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

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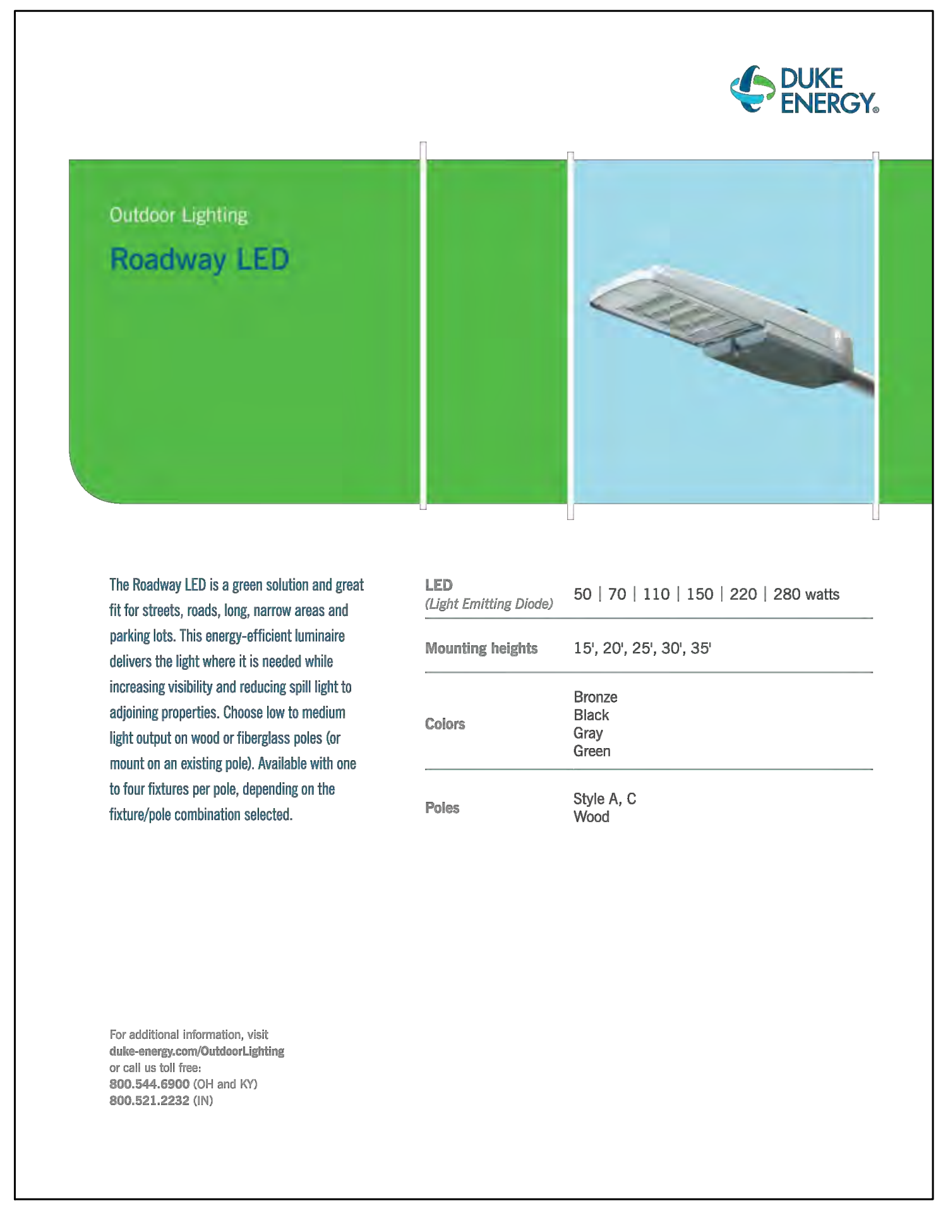
SO	Quercus Acutissima	Sawtooth Oak	86	2" Cal.	8' Min.	B&B	
Z	Zelkova Scheideriana	Zelkova	91	2" Cal.	8' Min.	B&B	
SM	Acer Saccharum 'Bonfire'	Sugar Maple	90	2" Cal.	8' Min.	B&B	

SILVERSTONE SUBDIVISION - LUMINAIRE SCHEDULE

TYP	SYMBOL	DESCRIPTION	LAMP	LUMENS	MOUNTING /BALLAST	LLF
A	⊡ 25FT	LED ROADWAY TYPE II LED LIGHT FIXTURE, MOUNT ON 25' POLE	(1) 50W LED 4000 K	4476	25' DUKE ENERGY POLE	0.64



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Outdoor Lighting

Roadway LED

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LED *(Light Emitting Diode)*	50 | 70 | 110 | 150 | 220 | 280 watts
Mounting heights	15', 20', 25', 30', 35'
Colors	Bronze Black Gray Green
Poles	Style A, C Wood

For additional information, visit
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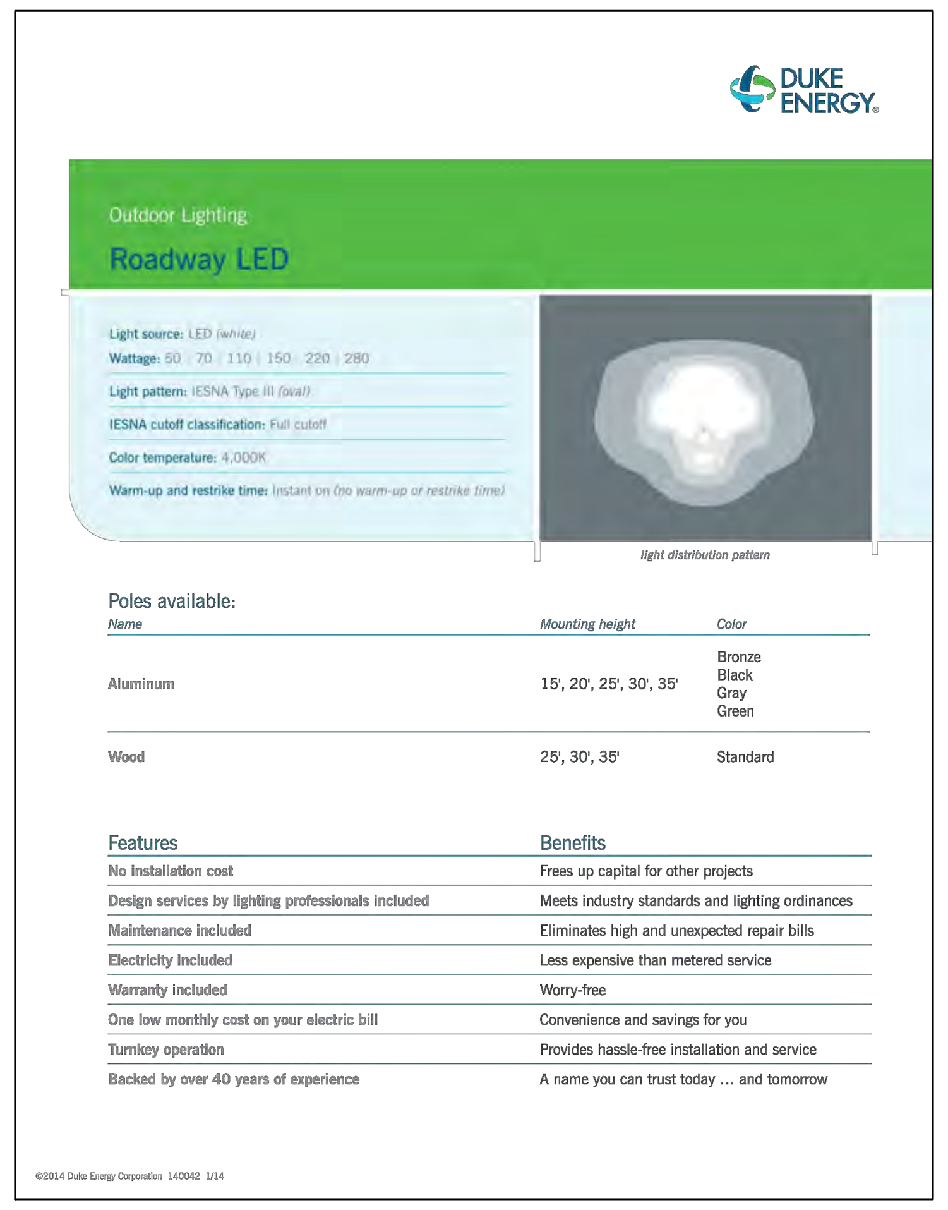

DUKE ENERGY.

Outdoor Lighting

Roadway LED

Light source: LED *(white)*
Wattage: 50 | 70 | 110 | 150 | 220 | 280
Light pattern: IESNA Type III *(oval)*
IESNA cutoff classification: Full cutoff
Color temperature: 4,000K
Warm-up and restrike time: Instant on *(no warm-up or restrike time)*

light distribution pattern

Poles available:

Name	*Mounting height*	*Color*
Aluminum	15', 20', 25', 30', 35'	Bronze Black Gray Green
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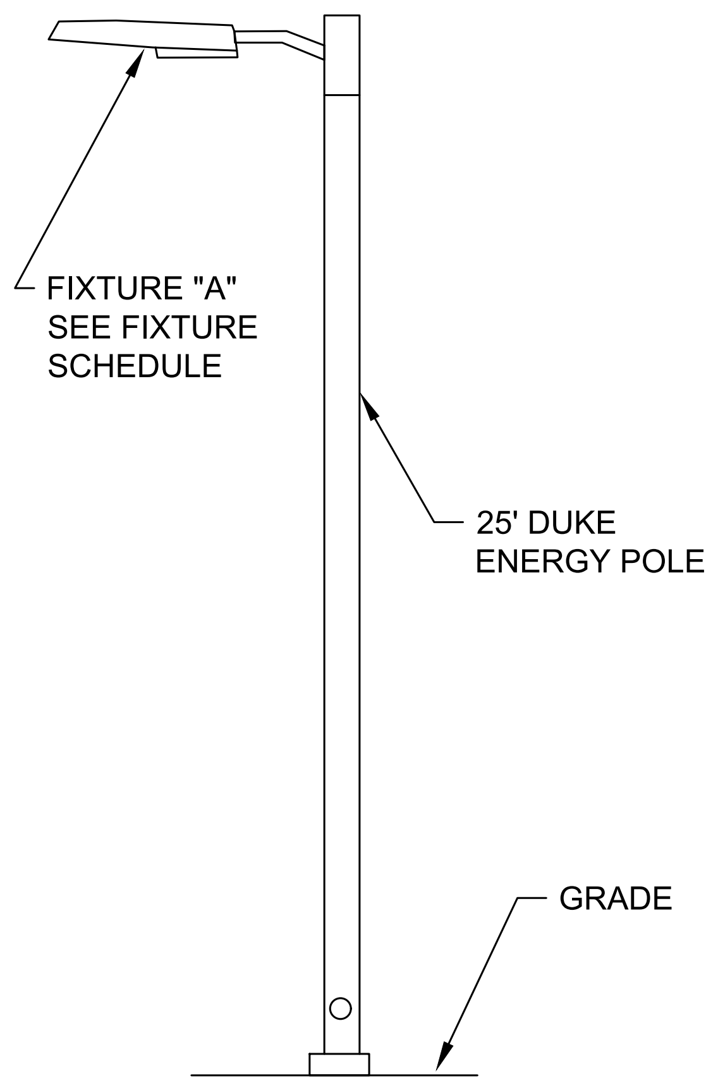
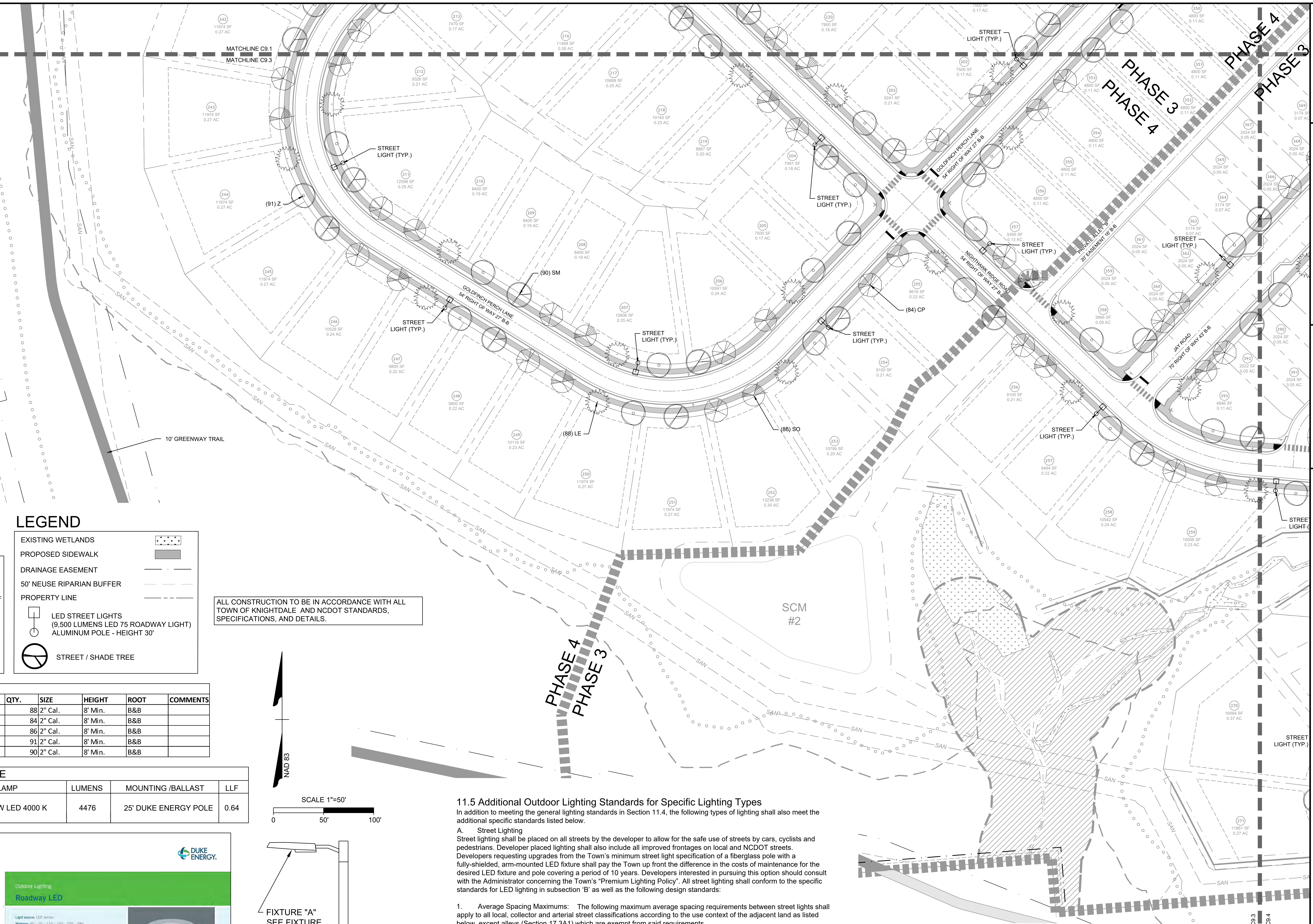


FIXTURE "A" DETAIL


MATCHLINE C9.1
MATCHLINE C9.3
STREET LIGHT (TYP.)
PHASE 3
PHASE 4
GOLDFINCH PERCH LANE 54' RIGHT OF WAY 27' B-B
NIGHTHAWK RIDGE ROAD 54' RIGHT OF WAY 27' B-B
JAY ROAD 70' RIGHT OF WAY 45' B-B
PRIVATE ALLEY 20' EASEMENT 16' B-B
(91) Z
(90) SM
(88) LE
(86) SO
(84) CP
10' GREENWAY TRAIL
SAN
SCM #2
MATCHLINE C9.3
MATCHLINE C9.4

11.5 Additional Outdoor Lighting Standards for Specific Lighting Types

In addition to meeting the general lighting standards in Section 11.4, the following types of lighting shall also meet the additional specific standards listed below.

A. Street Lighting

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   a. Local & Collector Streets:
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   b. Arterial Streets: All uses - 150 feet
2. Minimum Initial Delivered Lumen Levels:
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3. BUG Rating: All street lights shall be fully-shielded (no light at or above horizontal) and shall not exceed the following BUG ratings established for each type of street:
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   b. Collector Streets in Residential Areas - B2, U2, G2
   c. Collector Streets in Other Areas - B3, U3, G3
   d. Arterial Streets - B3, U3, G3
4. Placement:
   a. Although the primary purpose of street lighting is to provide adequate lighting for the roadway, street lighting should also promote pedestrian. Therefore, lighting should be placed in a manner to minimize the casting of shadows on sidewalks.
   b. Lighting shall be placed as far from street trees as the landscaping plan will allow.
   c. Lights on newly constructed streets shall be alternately staggered on each side of the street wherever possible.
   d. Lighting shall be placed at all street intersections, in street curves and at the end of any street or cul-de-sac.

(Note: For additional information on the connectivity and circulation of streets, please refer to Chp. 9)

PLAT NOTES:

1. Each single-family or duplex lot shall contain a minimum of one (1) canopy tree for every 2,000 square feet of lot area or fraction thereof up to 20,000 square feet in lot area. Any portion of the residential lot occupied by a recorded utility easement shall not be included as part of the total lot area. The location of planting to account for physical conditions may be adjusted by the Administrator. (SEE SHEET C9.1 FOR TREE REQUIRED CALCULATIONS.)
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5. All above ground utilities shall be screened as well per UDO Sec 8.7.C

MICHAEL V. ZACCARDO
6/22/21

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TEL 919.866.4951 FAX 919.833.8124 www.timmons.com

YOUR VISION ACHIEVED THROUGH OURS.

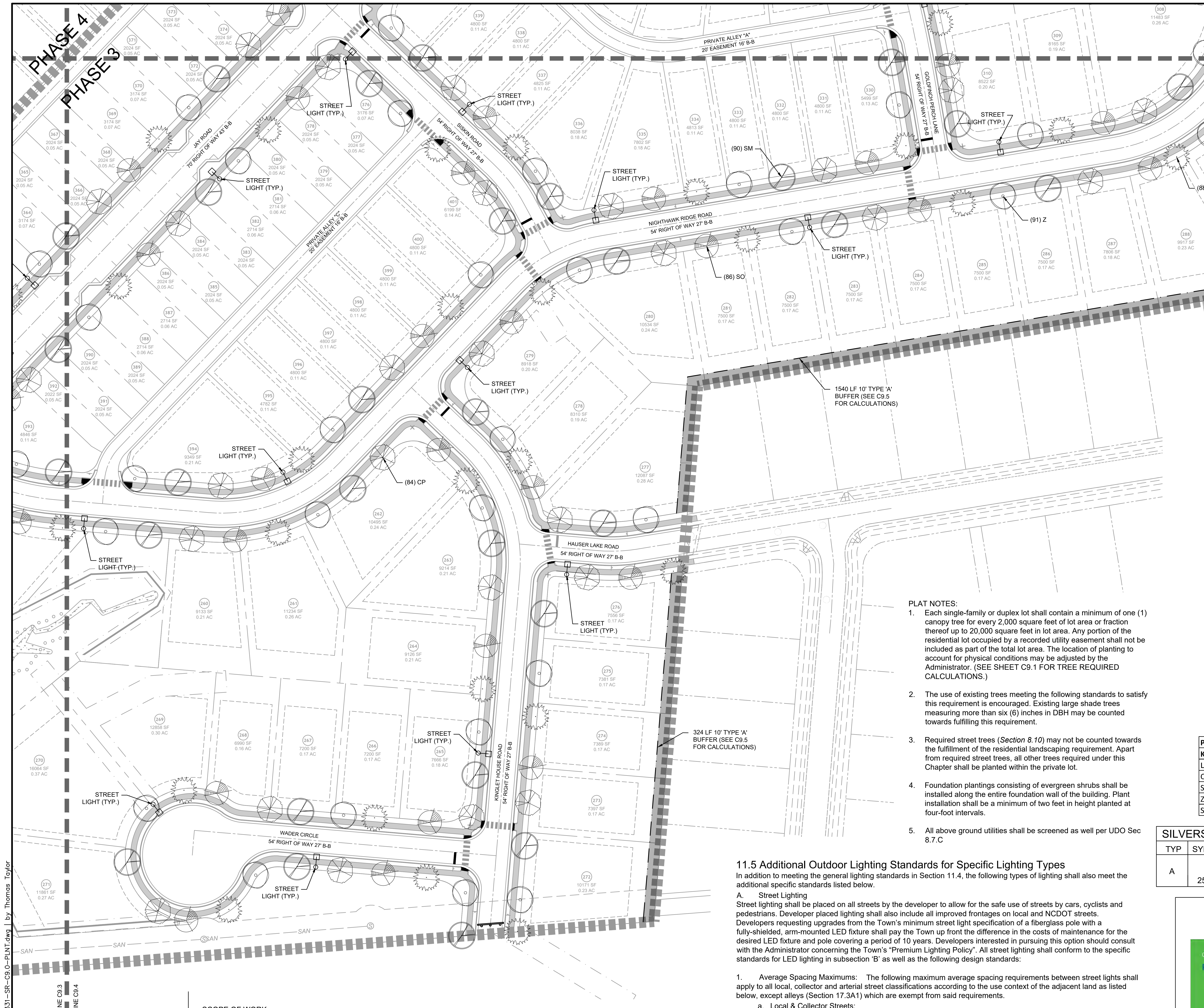
REVISION DESCRIPTION	DATE

TIMMONS GROUP
NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION
KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA
DETAILED LANDSCAPE & LIGHTING PLAN - SHEET 3 OF 4

DATE	06/22/2021
DRAWN BY	JD. MACMILLAN
DESIGNED BY	JD. MACMILLAN
CHECKED BY	M. ZACCARDO
SCALE	1" = 50'
JOB NO.	44872
SHEET NO.	C2.3

FOR REVIEW ONLY: NOT FOR CONSTRUCTION



S:\331\44872–Stone–Silver\DWG\Sheet\CD\STONE RIVER\44872–331–SR–C9.0–PLNT.dwg by Thomas Taylor

PLAT NOTES:

1. Each single-family or duplex lot shall contain a minimum of one (1) canopy tree for every 2,000 square feet of lot area or fraction thereof up to 20,000 square feet in lot area. Any portion of the residential lot occupied by a recorded utility easement shall not be included as part of the total lot area. The location of planting to account for physical conditions may be adjusted by the Administrator. (SEE SHEET C9.1 FOR TREE REQUIRED CALCULATIONS.)

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 8.10*) 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 feet in height planted at four-foot intervals.

5. All above ground utilities shall be screened as well per UDO Sec 8.7.C

11.5 Additional Outdoor Lighting Standards for Specific Lighting Types

In addition to meeting the general lighting standards in Section 11.4, the following types of lighting shall also meet the additional specific standards listed below.

A. Street Lighting

Street lighting shall be placed on all streets by the developer to allow for the safe use of streets by cars, cyclists and pedestrians. Developer placed lighting shall also include all improved frontages on local and NCDOT streets. Developers requesting upgrades from the Town's minimum street light specification of a fiberglass pole with a fully-shielded, arm-mounted LED fixture shall pay the Town up front the difference in the costs of maintenance for the desired LED fixture and pole covering a period of 10 years. Developers interested in pursuing this option should consult with the Administrator concerning the Town's "Premium Lighting Policy". All street lighting shall conform to the specific standards for LED lighting in subsection 'B' as well as the following design standards:

1. Average Spacing Maximums: The following maximum average spacing requirements between street lights shall apply to all local, collector and arterial street classifications according to the use context of the adjacent land as listed below, except alleys (Section 17.3A1) which are exempt from said requirements.
   a. Local & Collector Streets:
      i. Residential at less than three (<3) unit per acre - 500 feet
      ii. Residential from three (3.0) to eight (8.0) units per acre - 250 feet
      iii. Residential over eight (>8.0) units per acre - 150 feet
      iv. All other uses - 300 feet
   b. Arterial Streets: All uses - 150 feet
2. Minimum Initial Delivered Lumen Levels:
   a. Local Streets - 4,800 lumens
   b. Collector Streets in Residential Areas - 12,500 lumens
   c. Collector Streets in Other Areas - 12,500 lumens
   d. Arterial Streets - 18,500 lumens
3. BUG Rating: All street lights shall be fully-shielded (no light at or above horizontal) and shall not exceed the following BUG ratings established for each type of street:
   a. Local Streets - B1, U1, G1
   b. Collector Streets in Residential Areas - B2, U2, G2
   c. Collector Streets in Other Areas - B3, U3, G3
   d. Arterial Streets - B3, U3, G3
4. Placement:
   a. Although the primary purpose of street lighting is to provide adequate lighting for the roadway, street lighting should also promote pedestrian. Therefore, lighting should be placed in a manner to minimize the casting of shadows on sidewalks.
   b. Lighting shall be placed as far from street trees as the landscaping plan will allow.
   c. Lights on newly constructed streets shall be alternately staggered on each side of the street wherever possible.
   d. Lighting shall be placed at all street intersections, in street curves and at the end of any street or cul-de-sac.

(Note: For additional information on the connectivity and circulation of streets, please refer to Chp. 9)

SCOPE OF WORK:
Furnish all labor, materials, and equipment required or indicated by the drawings and specifications to complete the work including installation of all trees, shrubs, groundcover, annuals, seed, sod and mulch.

MATERIALS AND WORK:
The selection of all materials and the execution of all work required under the contract shall be subject to approval by the owner. The owner shall have the right to reject and and all materials and any and all work, which in his opinion, does not meet the requirements of the contract.

PLANT MATERIALS:
All plant materials shall be nursery grown, freshly dug in the field, naturally shaped, well branched, fully foliated when in leaf with fully developed root systems. Trees must be self supporting, with straight trunks and leaders In tact. All plants must be free of disease, insect infestation or their eggs and shall have been grown in climatic conditions similar to those of the project site

PLANT SIZE:
Specified sizes indicates the minimum allowable size at planting. Where container and height spreads are indicated for a single species, both size requirements shall be met When only plant height or spread are indicated, container size shall be based on ANSI standards.

ORGANIC MATTER:
Aged manure, compost or pine bark fines, at the option of the contractor, material shall be air dried, finely shredded and suitable for horticultural purposes and shall contain no more than 35 moisture content by weight.

PINE BARK MULCH:
All pine bark mulch shall be clean, double ground, fine textured nugget mulch with minimal amounts of sapwood content.

TURF AREAS:
Prior to any seeding or sod application, verify that all trenching and land disturbing activities have been completed. Ensure all areas are free of stones, large soil clods and any other construction debris.

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

______________ ______________
Date Applicant

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

Official Seal ______________
Notary

____
Commission Expires

LEGEND

EXISTING WETLANDS	⁘
PROPOSED SIDEWALK	▒
DRAINAGE EASEMENT	—— · ——
50' NEUSE RIPARIAN BUFFER	— — —
PROPERTY LINE	—— - - ——
☐	LED STREET LIGHTS (9,500 LUMENS LED 75 ROADWAY LIGHT) ALUMINUM POLE - HEIGHT 30'
⊘	STREET / SHADE TREE

NAD 83

SCALE 1"=50'
0 50' 100'

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

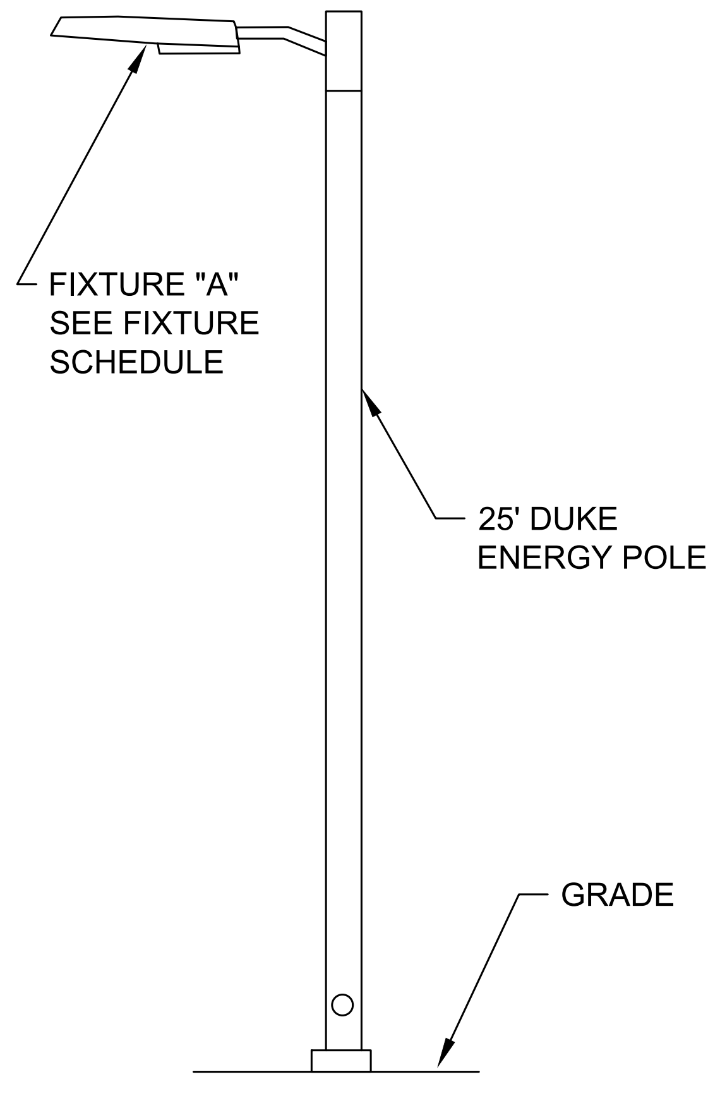
TOWN CERTIFICATION

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: ______________ DATE: ______________
DEVELOPMENT SERVICES ENGINEER

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

BY: ______________ DATE: ______________
ADMINISTRATOR



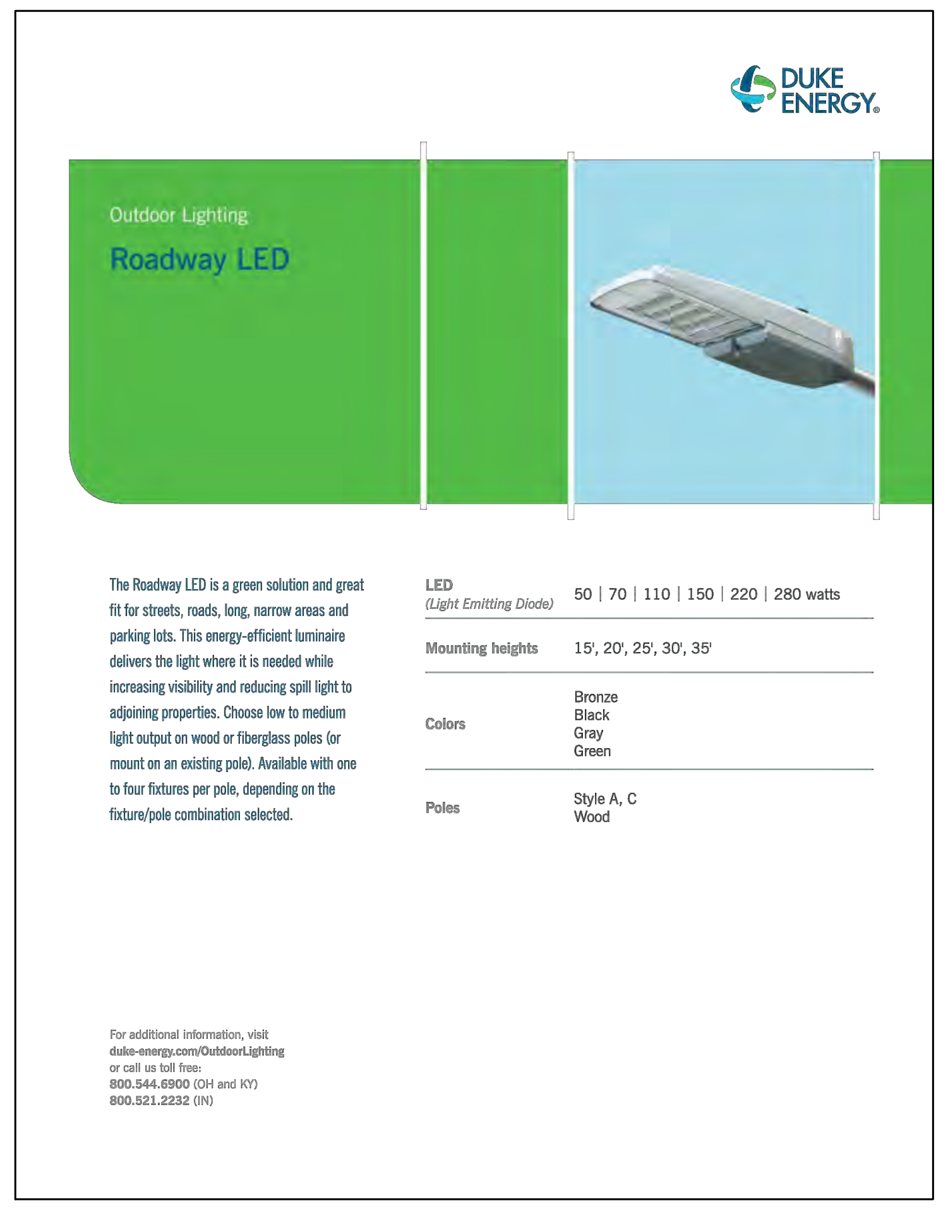
FIXTURE "A" DETAIL

PLANT LIST - Street Trees (Size requirements based upon time of installation)

KEY	BOTANICAL NAME	COMMON NAME	QTY.	SIZE	HEIGHT	ROOT	COMMENTS
LE	Ulmus Parvifolia	Lacebark Elm	88	2" Cal.	8' Min.	B&B	
CP	Pistacia Chinensis 'Keith Davey'	Chinese Pistachio	84	2" Cal.	8' Min.	B&B	
SO	Quercus Acutissima	Sawtooth Oak	86	2" Cal.	8' Min.	B&B	
Z	Zelkova Scheideriana	Zelkova	91	2" Cal.	8' Min.	B&B	
SM	Acer Saccharum 'Bonfire'	Sugar Maple	90	2" Cal.	8' Min.	B&B	

SILVERSTONE SUBDIVISION - LUMINAIRE SCHEDULE

TYP	SYMBOL	DESCRIPTION	LAMP	LUMENS	MOUNTING /BALLAST	LLF
A	☐ 25FT	LED ROADWAY TYPE II LED LIGHT FIXTURE, MOUNT ON 25' POLE	(1) 50W LED 4000 K	4476	25' DUKE ENERGY POLE	0.64


DUKE ENERGY.

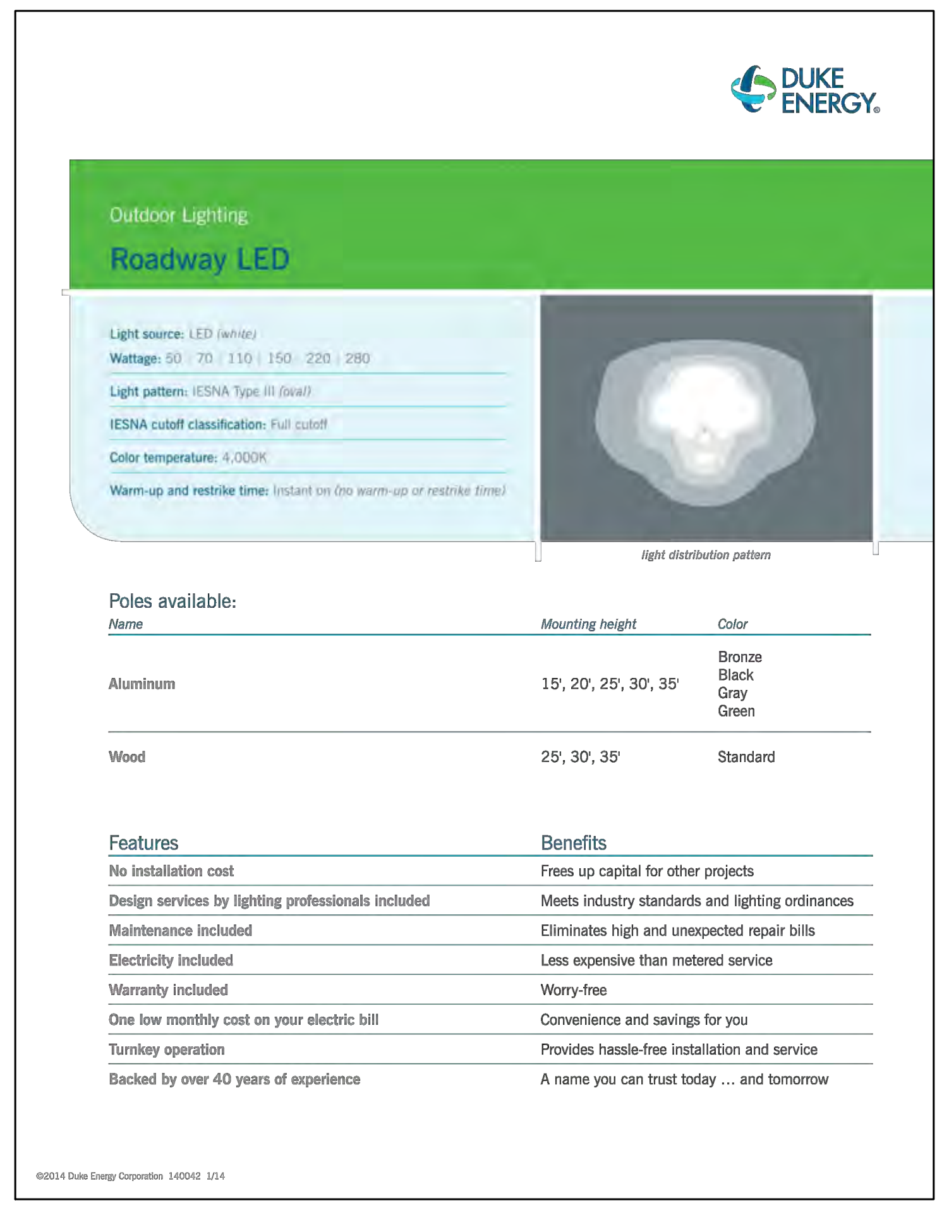
Outdoor Lighting

Roadway LED

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

LED *(Light Emitting Diode)*	50 | 70 | 110 | 150 | 220 | 280 watts
Mounting heights	15', 20', 25', 30', 35'
Colors	Bronze Black Gray Green
Poles	Style A, C Wood

For additional information, visit
duke-energy.com/OutdoorLighting
or call us toll free:
800.544.6900 (OH and KY)
800.521.2232 (IN)


DUKE ENERGY.

Outdoor Lighting

Roadway LED

Light source: LED *(white)*
Wattage: 50 | 70 | 110 | 150 | 220 | 280
Light pattern: IESNA Type III *(oval)*
IESNA cutoff classification: Full cutoff
Color temperature: 4,000K
Warm-up and restrike time: Instant on *(no warm-up or restrike time)*

light distribution pattern

Poles available:

Name	*Mounting height*	*Color*
Aluminum	15', 20', 25', 30', 35'	Bronze Black Gray Green
Wood	25', 30', 35'	Standard

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

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MICHAEL V. ZACCARDO
6/22/21

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

REVISION DESCRIPTION	DATE

DATE	06/22/2021
DRAWN BY	JD. MACMILLAN
DESIGNED BY	JD. MACMILLAN
CHECKED BY	M. ZACCARDO
SCALE	1" = 50'

TIMMONS GROUP

NORTH CAROLINA LICENSE NO. C-1652

STONERIVER SUBDIVISION

KNIGHTDALE - WAKE COUNTY - NORTH CAROLINA

DETAILED LANDSCAPE & LIGHTING PLAN - SHEET 4 OF 4

JOB NO.
44872

SHEET NO.
C9.4

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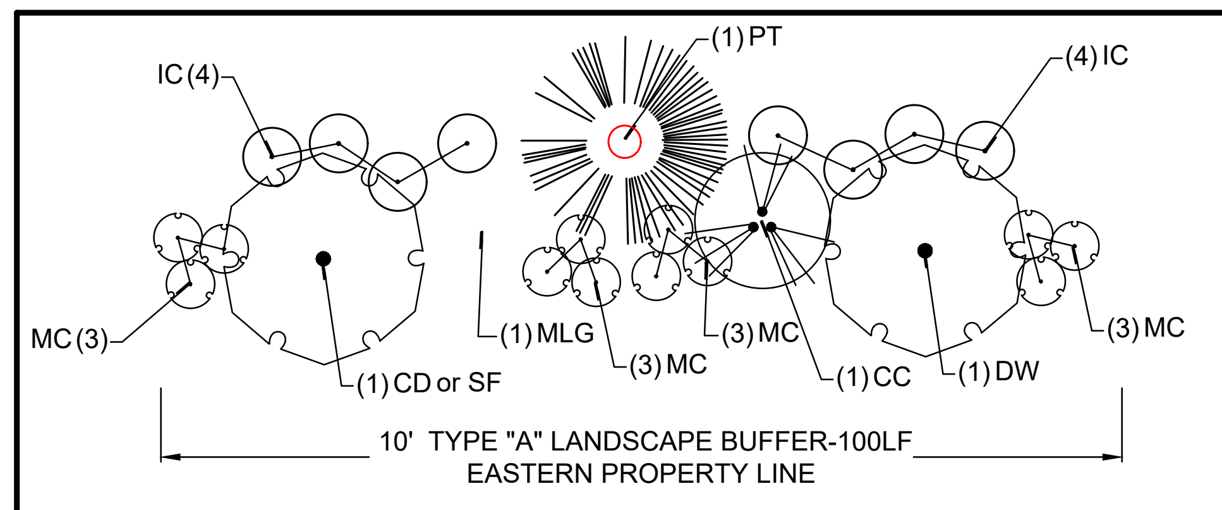

10' TYPE "A" EASTERN PROPERTY LANDSCAPE BUFFER- 1,864 LF		
TREES PER 100 LF:	**REQ.**	**PROP.**
(3) LARGE TREES:	56	56
(2) UNDERSTORY TREES:	38	38
SHRUB PER 100 LF:	**REQ.**	**PROP.**
(20) EVER. SHRUBS:	373	373

PLANT SCHEDULE TYPE "A" BUFFER

TREES	QTY	BOTANICAL NAME	COMMON NAME	MINIMUM INSTALLED SIZE	REMARKS
CD	10	CALOCEDRUS DECURRENS	INCENSE CEDAR	2" CAL., 8` HT.	CANOPY
SF	10	SASSAFRAS ALBIDUM	SASSAFRASS	2" CAL., 8` HT.	CANOPY
PT	18	PINUS TAEDA	LOBLOLLY PINE	2" CAL., 8` HT.	CANOPY
MLG	18	MAGNOLIA GRANDIFLORA 'LITTLE GEM'	LITTLE GEM MAGNOLIA	2" CAL., 8` HT,	CANOPY
CC	19	CERCIS CANADENSIS	EASTERN REDBUD	2" CAL., 8` HT.	UNDERSTORY
DW	19	CORNUS X SPP.	DOGWOOD	2" CAL., 8` HT.	UNDERSTORY

SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	MIN. INSTALLED SIZE	REMARKS
IC	151	ILEX CRENATA `HELLERI`	HELLERI HOLLY	18" HT/SPRD 3 GAL	
MC	222	MYRICA CERIFERA	WAX MYRTLE	18" HT/SPRD 3 GAL	

ALL PORTIONS OF THE BUFFER YARD NOT PLANTED WITH TREES AND SHRUBS MUST HAVE A MIN. DEPTH OF 3" OF NATURAL MULCH.

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

__________ _______________
Date Applicant

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

Official Seal _______________
Notary
____
Commission Expires

TOWN CERTIFICATION

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

BY: ____________________ DATE: ________
DEVELOPMENT SERVICES ENGINEER

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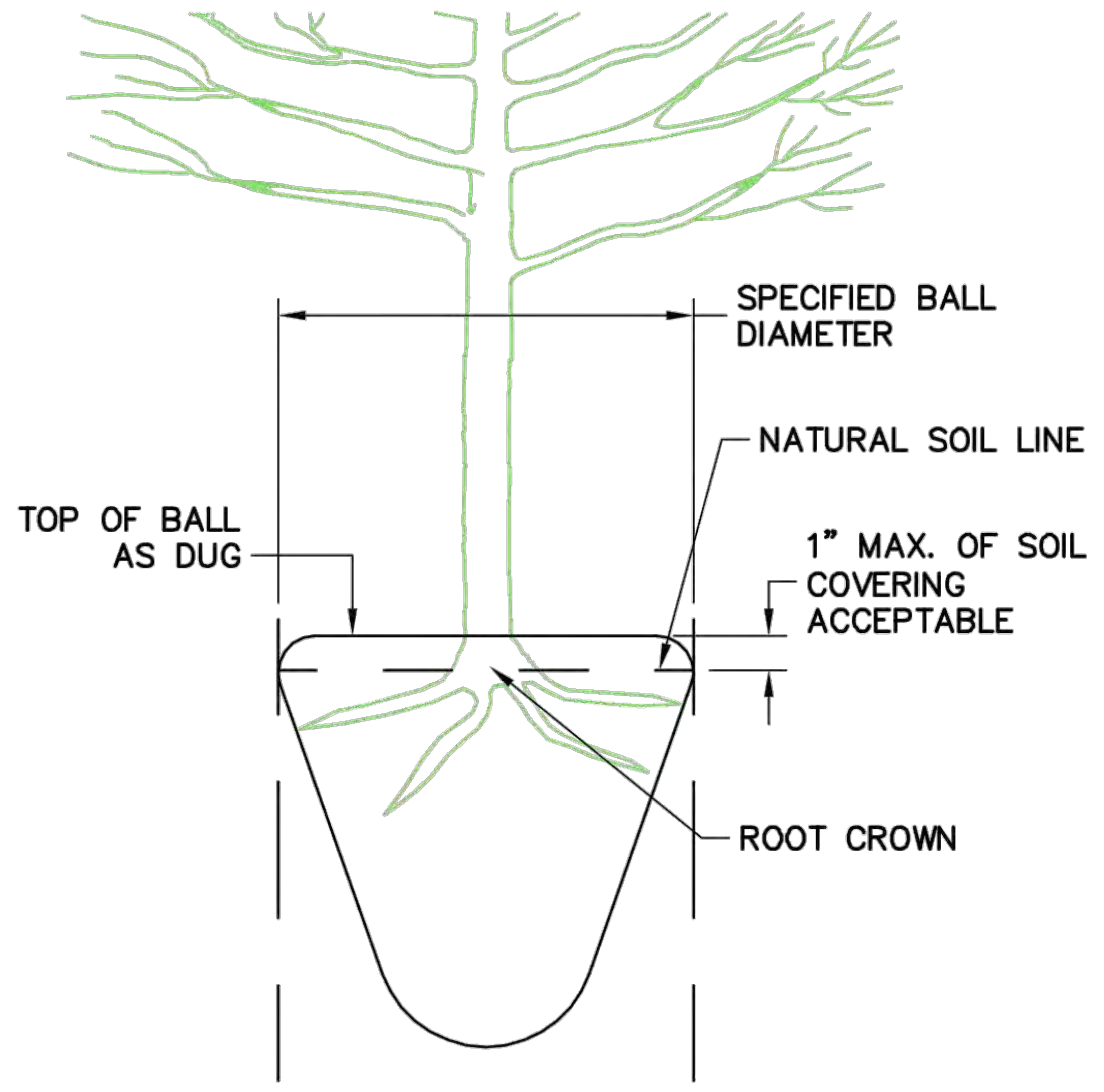
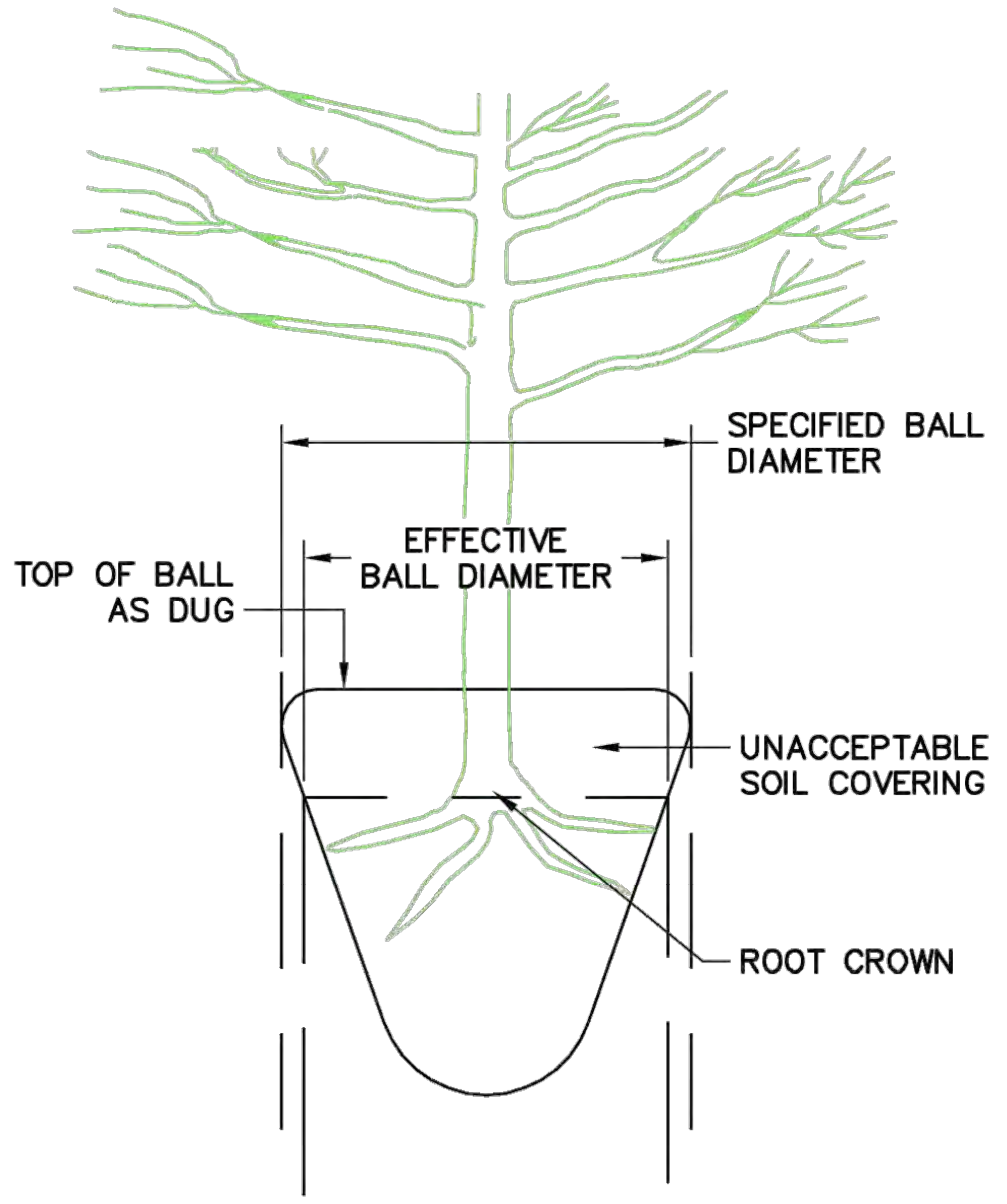
ADMINISTRATOR



ACCEPTABLE CONDITION

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.



UNACCEPTABLE CONDITION

REVISIONS	
DATE	DESCRIPTION

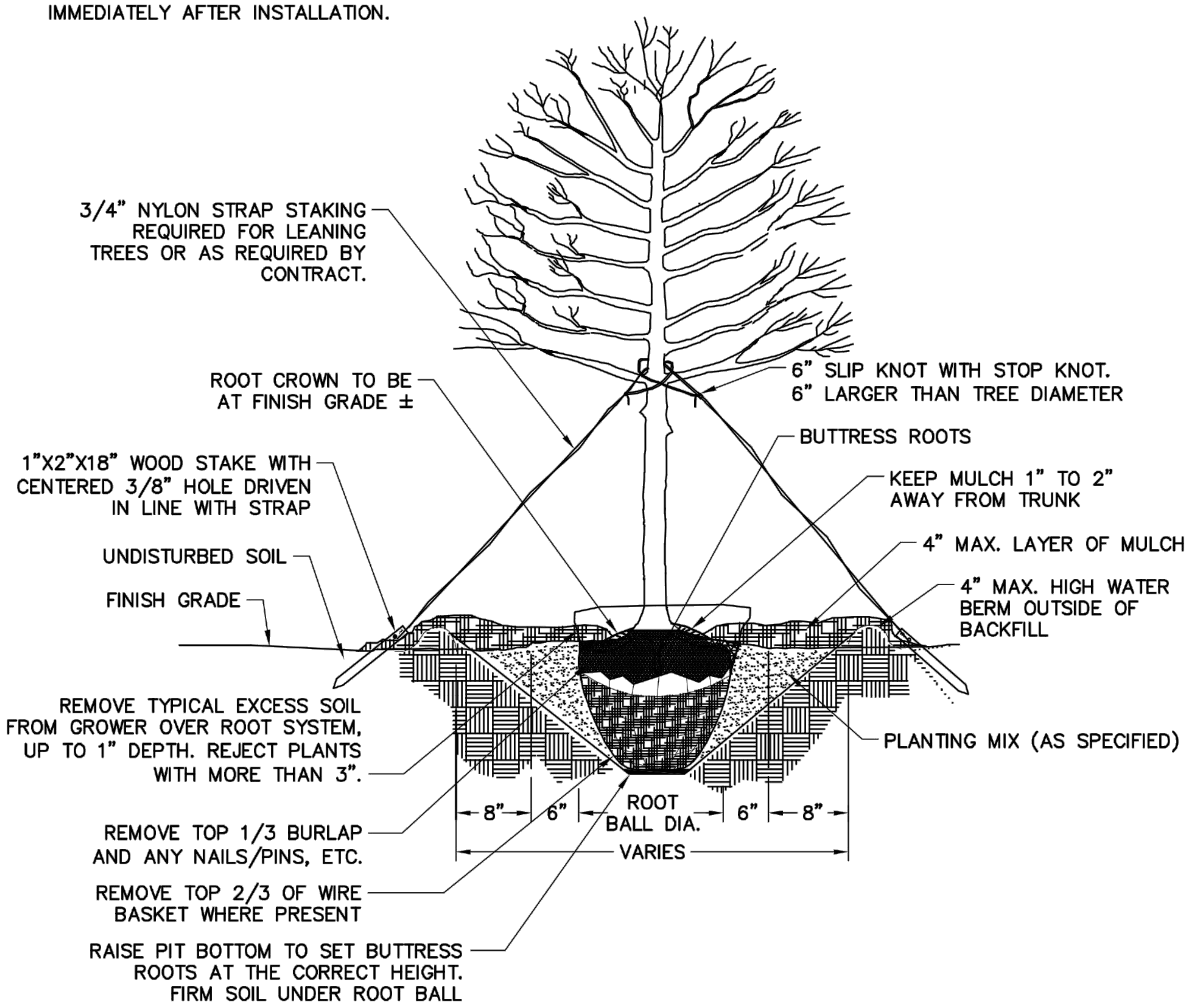
TOWN OF KNIGHTDALE
STANDARD DETAILS

ROOT CROWN DEPTHS

STD. NO.
3.21

NOTES:

1. REMOVE WIRE OR NYLON TWINE FROM BALL.
2. SOAK ROOT BALL AND PLANT PIT IMMEDIATELY AFTER INSTALLATION.


3/4" NYLON STRAP STAKING REQUIRED FOR LEANING TREES OR AS REQUIRED BY CONTRACT.
ROOT CROWN TO BE AT FINISH GRADE ±
6" SLIP KNOT WITH STOP KNOT. 6" LARGER THAN TREE DIAMETER
BUTTRESS ROOTS
1"X2"X18" WOOD STAKE WITH CENTERED 3/8" HOLE DRIVEN IN LINE WITH STRAP
KEEP MULCH 1" TO 2" AWAY FROM TRUNK
4" MAX. LAYER OF MULCH
UNDISTURBED SOIL
4" MAX. HIGH WATER BERM OUTSIDE OF BACKFILL
FINISH GRADE
REMOVE TYPICAL EXCESS SOIL FROM GROWER OVER ROOT SYSTEM, UP TO 1" DEPTH. REJECT PLANTS WITH MORE THAN 3".
PLANTING MIX (AS SPECIFIED)
8"
6"
ROOT BALL DIA.
6"
8"
VARIES
REMOVE TOP 1/3 BURLAP AND ANY NAILS/PINS, ETC.
REMOVE TOP 2/3 OF WIRE BASKET WHERE PRESENT
RAISE PIT BOTTOM TO SET BUTTRESS ROOTS AT THE CORRECT HEIGHT. FIRM SOIL UNDER ROOT BALL

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

MICHAEL V. ZACCARDO
022391
6/22/21

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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LANDSCAPE DETAILS

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SHEET NO.
C9.5

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