

PROJECT # ZMA-3-20

# CONSTRUCTION DRAWINGS FOR

# MERRITT HINTON OAKS BLVD

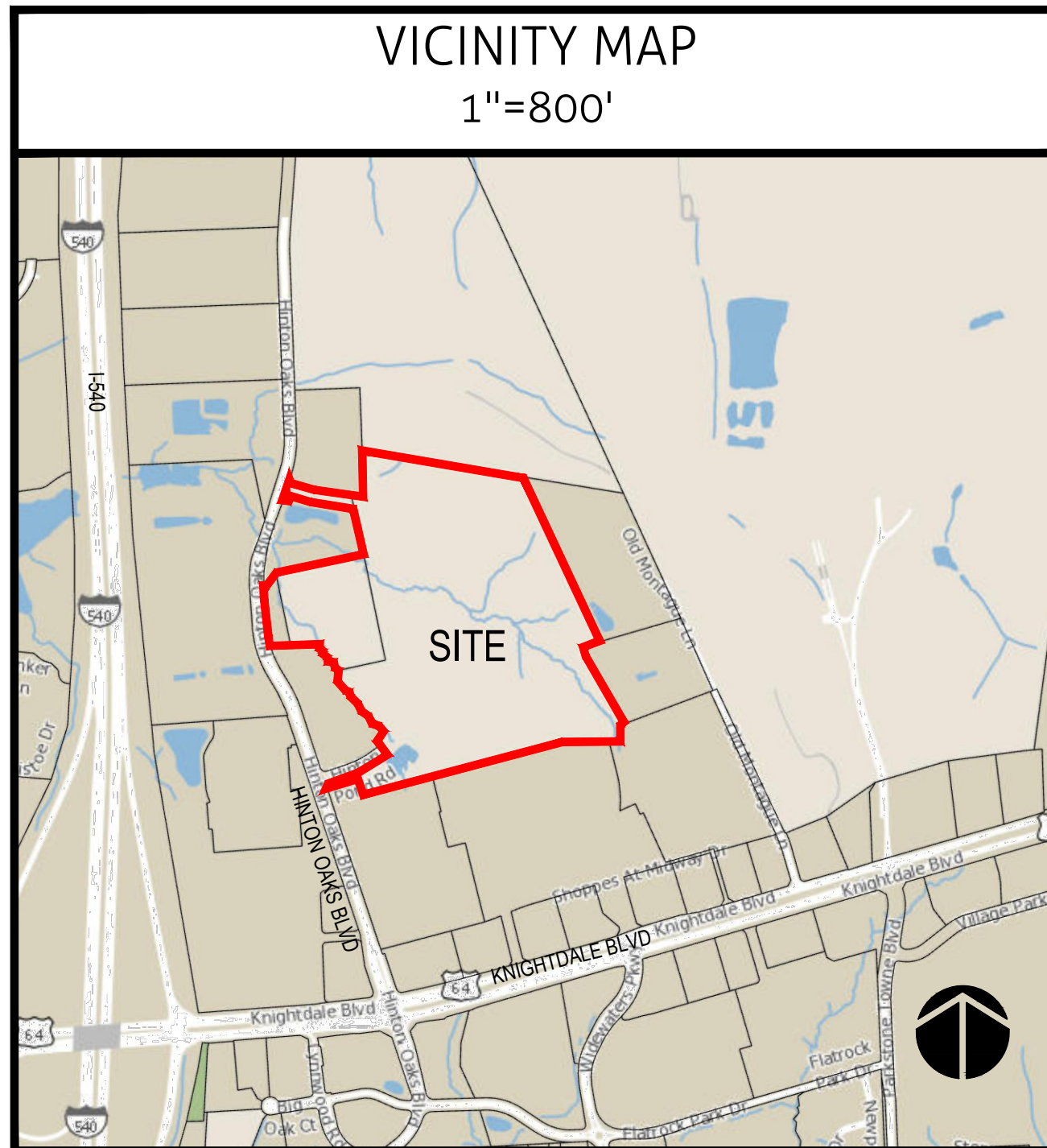
## 123 HINTON OAKS BLVD, KNIGHTDALE, NC ST. MATTHEW'S TOWNSHIP

NOVEMBER 22, 2024

A PLAT OF NECESSARY RIGHT-OF-WAY DEDICATIONS, RECOMBINATIONS, AND CORSE MUST BE SUBMITTED FOR REVIEW, COMMENTS AND APPROVAL BY CORPUD PRIOR TO THE ISSUANCE OF UTILITY BUILDING PERMITS BY THE TOWN OF KNIGHTDALE.

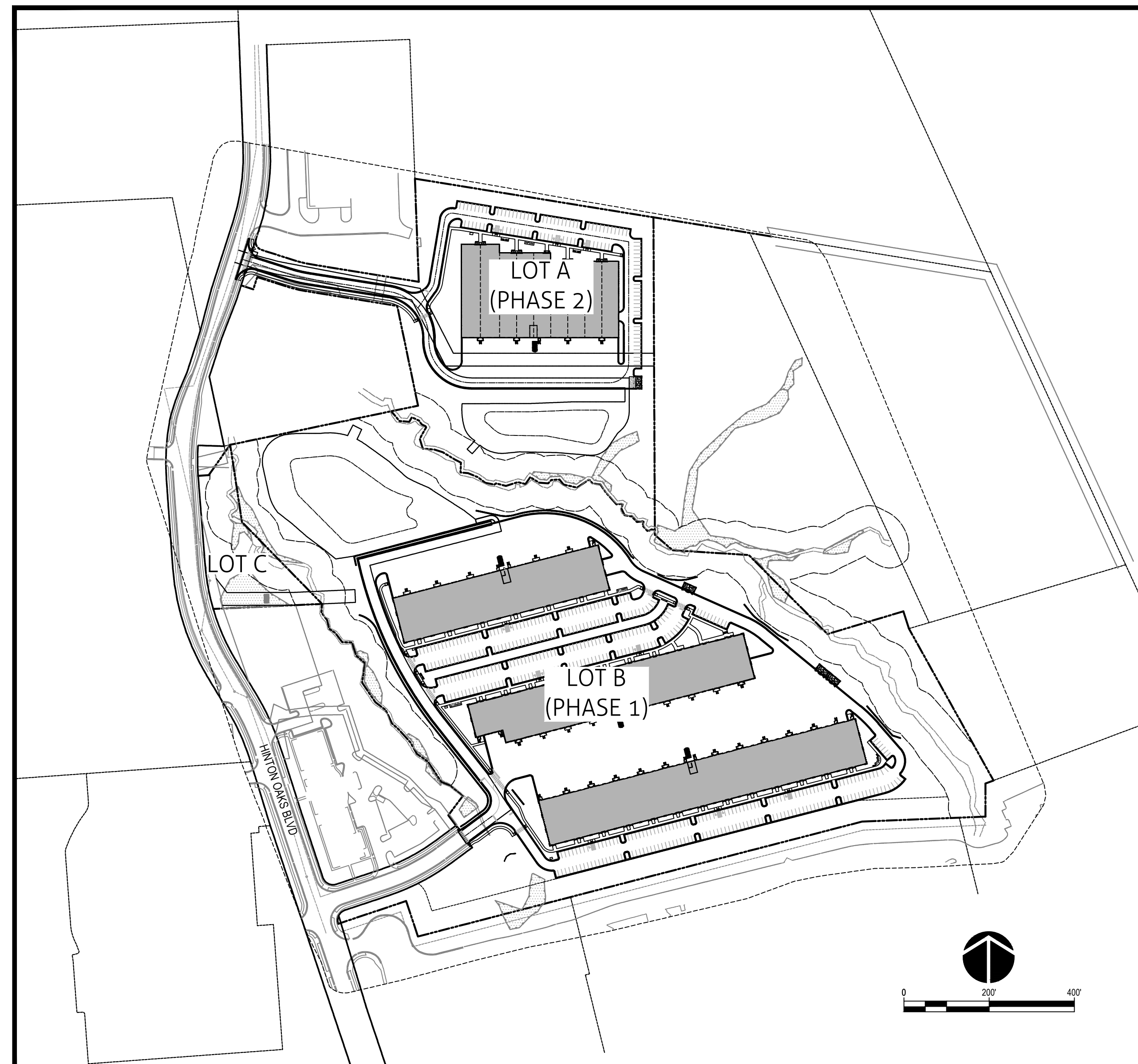
CONSTRUCTION DRAWINGS FOR: MERRITT HINTON OAKS BLVD WR PROJECT NO. 09190080.00

VICINITY MAP  
1"=800'



SITE DATA TABLE

<b>PROPERTY INFORMATION:</b>	
OWNER NAME:	MERRITT-MW1, LLC
OWNER ADDRESS:	1 TW ALEXANDER DRIVE, #115 DURHAM, NC 27703
<b>DEVELOPER NAME:</b>	
DEVELOPER ADDRESS:	MERRITT-MW1, LLC 1 TW ALEXANDER DRIVE, #115 DURHAM, NC 27703
PIN:	1744-56-6995, 1744-47-9093, 1744-47-6090, 1744-47-9612
ZONING OVERLAY:	MI-CD N/A
ACREAGE:	36.68 ACRES
(LOT C: 1.10 AC - NOT PART OF PROPOSED DEVELOPMENT)	
EXISTING USE:	VACANT
PROPOSED USE:	OFFICE/COMMERCIAL/LIGHT INDUSTRIAL
<b>BUILDING SETBACKS:</b>	
PRINCIPAL FRONT:	10'
STREET SIDE/SECONDARY FRONT:	0' or 6'
CORNER SIDE SETBACK:	10'
REAR/SIDE (FROM ADJACENT LOT):	10'
EXISTING BUILDING AREA:	0
<b>LOT AREA:</b>	
LOT A:	26.29 AC
LOT B:	211,450 SF
PHASE:	2
BUILDING AREA:	423
MAXIMUM PARKING:	145
(2 PER KSF GFA)	
MINIMUM PARKING:	73
(1/2 MAXIMUM)	
PROPOSED PARKING:	109
REQUIRED BIKE RACK SPACES:	42
(1/10 SPACES)	
PROPOSED BIKE RACK SPACES:	12
THIS SITE LIES WITHIN A TYPE "X" FLOOD HAZARD AREA PER MAP 3720174400K, EFFECTIVE DATE 7-19-2022.	



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Sheet List Table	
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L2.0	LANDSCAPE DETAILS
L3.0	ENTRANCE MONUMENT PLAN
SL1.0	LIGHTING PLAN
SL1.1	LIGHTING DETAILS

**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: \_\_\_\_\_  
Town Engineer

These plans are approved by the Town of Knightdale and serve as construction plans for this project.

By: \_\_\_\_\_ Date: \_\_\_\_\_  
Administrator

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

Seal By: \_\_\_\_\_, P.E.  
Date: \_\_\_\_\_

### 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

### SITE PERMITTING APPROVAL

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

The City of Raleigh consents to the connection and extension of the City's Public Sewer System as shown on this plan. The material and construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. City of Raleigh Public Utilities Department Permit # 5-4880(R)

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 # \_\_\_\_\_

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

City of Raleigh Public Utilities Department Permit # 5-4879P(R)

PUBLIC IMPROVEMENT QUANTITIES	
Number of Lot (s)	2
Number of Buildings	4
Water Service Stubs	2
Public Sewer - 6" (LF)	30
Public Sewer - 8" (LF)	1,414
Sewer Service Stubs	3

### DEVELOPER/OWNER

MERRITT-MW1, LLC  
1 TW ALEXANDER DRIVE, #115  
DURHAM, NC 27703

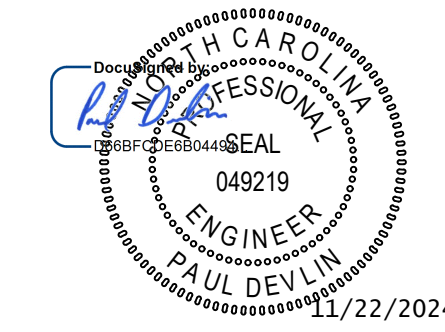
ATTN: NATHAN ROBB  
NROBB@MERRITTPROPERTIES.COM

### PREPARED BY:



137 S Wilmington Street | Suite 200 | Raleigh, NC 27601 | t: 919.469.3340 | license #: F-1479 | www.withersravenel.com

### SEAL



ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CURRENT TOWN OF KNIGHTDALE STANDARDS AND SPECIFICATIONS AND NCDOT, IF APPLICABLE

### PERSON TO CONTACT REGARDING STAFF COMMENTS OR QUESTIONS:

PAUL DEVLIN, P.E., PROJECT MANAGER  
WITHERSRAVENEL, INC.  
137 S WILMINGTON, RALEIGH, NC 27601  
TELEPHONE: (919) 238-0432  
PDEVLIN@WITHERSRAVENEL.COM



KNOW WHAT'S BELOW.  
CALL BEFORE YOU DIG.

GENERAL SITE NOTES:

- 1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH TOWN OF KNIGHTDALE, NCDOT, AND CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT STANDARD DETAILS AND SPECIFICATIONS, LATEST REVISIONS.
2. WORK ON THIS PROJECT SHALL CONFORM TO THESE PLANS, THE LATEST EDITIONS OF THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION (NCDOT) ROAD AND BRIDGE SPECIFICATIONS, THE NCDOT ROAD AND BRIDGE STANDARDS, THE NORTH CAROLINA EROSION AND SEDIMENT CONTROL HANDBOOK, THE NORTH CAROLINA EROSION AND SEDIMENT CONTROL REGULATIONS, AND TOWN OF KNIGHTDALE STANDARDS AND SPECIFICATIONS, THE FINAL GEOTECHNICAL REPORT, AND GENERAL DESIGN STANDARDS IN THE EVENT OF CONFLICT BETWEEN ANY OF THESE STANDARDS, SPECIFICATIONS, OR PLANS, THE MOST STRINGENT SHALL GOVERN UNLESS OTHERWISE NOTED IN THESE PLANS.
3. ANY DISCREPANCIES FOUND BETWEEN THE DRAWINGS AND SPECIFICATIONS AND SITE CONDITIONS OR ANY INCONSISTENCIES OR AMBIGUITIES IN DRAWINGS OR SPECIFICATIONS SHALL BE IMMEDIATELY REPORTED TO THE ENGINEER IN WRITING, WHO SHALL PROMPTLY ADDRESS SUCH INCONSISTENCIES OR AMBIGUITIES. WORK DONE BY THE CONTRACTOR AFTER THE DISCOVERY OF SUCH DISCREPANCIES, INCONSISTENCIES, OR AMBIGUITIES SHALL BE DONE AT THE CONTRACTOR'S RISK.
4. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL JOB-SITE SAFETY, INCLUDING BUT NOT LIMITED TO TRENCH SAFETY, DURING ALL PHASES OF CONSTRUCTION.
5. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING AND LOCATING ALL EXISTING UTILITIES PRIOR TO STARTING CONSTRUCTION. LOCATION OF EXISTING UTILITIES SHOWN ON PLANS IS BASED ON BEST AVAILABLE INFORMATION BUT CAN BE CONSIDERED ONLY AS APPROXIMATE.
6. THE CONTRACTOR SHALL PROTECT ALL SIGNS, MANHOLES, TELEPHONE RISERS, WATER VALVES, ETC. DURING ALL PHASES OF CONSTRUCTION. THE CONTRACTOR SHALL REPAIR AT THEIR OWN EXPENSE, ANY EXISTING UTILITIES DAMAGED DURING CONSTRUCTION.
7. TRAFFIC CONTROL ON PUBLIC STREETS IS THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE IN CONFORMANCE WITH THESE PLANS, THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, AND AS FURTHER DIRECTED BY THE TOWN OF KNIGHTDALE AND NCDOT.
8. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING OR OBTAINING ALL REQUIRED PERMITS AND APPROVALS PRIOR TO COMMENCING CONSTRUCTION.
9. ALL ENVIRONMENTAL PERMITS APPLICABLE TO THE PROJECT MUST BE OBTAINED FROM NCDWQ, USACE, AND/OR FEMA FOR ANY RIPARIAN BUFFER, WETLANDS AND/OR FLOODPLAIN IMPACTS (RESPECTIVELY) PRIOR TO COMMENCING CONSTRUCTION.
10. NCDOT ENCROACHMENT AGREEMENTS ARE REQUIRED FOR ANY UTILITY WORK (INCLUDING MAIN EXTENSIONS AND/OR SERVICE TAPS) OR ROADWAY CONSTRUCTION WITHIN STATE ROW PRIOR TO COMMENCING CONSTRUCTION.

GENERAL NOTES:

- 1. THE PERMITEE OR DESIGNEE SHALL SCHEDULE THE PRE-CONSTRUCTION MEETING SEVEN (7) DAYS PRIOR TO COMMENCING WORK WITH THE TOWN OF KNIGHTDALE PUBLIC UTILITIES INSPECTOR.
2. THE PERMITEE OR DESIGNEE SHALL NOTIFY THE CITY PUBLIC UTILITIES OFFICE FORTY-EIGHT (48) HOURS PRIOR TO STARTING EACH PHASE OF CONSTRUCTION, EXCLUDING WEEKENDS AND HOLIDAYS. ONCE THE WORK HAS BEGUN, AT LEAST A FORTY-EIGHT (48) NOTICE SHALL BE GIVEN PRIOR TO ANY SORT OF DISRUPTION TO THE CITY'S SERVICES SUCH AS WORKING IN A CITY ROADWAY, TAPPING WATER MAINS, PLUGGING SEWER, ETC. NO WORK SHALL BE PERFORMED ON WEEKENDS, AFTER WORK HOURS OR HOLIDAYS UNLESS GIVEN PRIOR APPROVAL.
NOTIFICATION MUST BE PROVIDED BY DIRECT COMMUNICATION, VOICE MAIL, OR EMAIL, WILL NOT BE A CONSIDERED NOTIFICATION UNLESS ADEQUATELY RESPONDED TO BY A TOWN OF KNIGHTDALE REPRESENTATIVE.
THE PERMITEE OR DESIGNEE SHALL BE RESPONSIBLE FOR NOTIFYING ALL CUSTOMERS AFFECTED BY SERVICE INTERRUPTIONS. THE TOWN OF KNIGHTDALE WILL NOT APPROVE SERVICES INTERRUPTIONS UNTIL PROOF IS PROVIDED THAT PROPER CUSTOMER NOTIFICATIONS HAVE BEEN PROVIDED.
3. TOWN OF KNIGHTDALE CURRENT STANDARD SPECIFICATIONS AND DETAILS ARE AVAILABLE ONLINE AT KNIGHTDALE.NC.GOV, UNDER THE ENGINEERING DEPARTMENT PAGE.
4. THE CONTRACTOR SHALL UNCOVER ALL EXISTING CITY UTILITY LINES BEING TIED INTO TO VERIFY THEIR TYPE, CONDITION, LOCATION, INVERT, SLOPE, AND ANY OTHER INFORMATION NEEDED TO DETERMINE THAT THE UTILITY CONNECTION WILL FUNCTION AS DESIGNED. THE CONTRACTOR IS RESPONSIBLE FOR MAKING ANY REPAIRS NECESSARY TO THE LATERAL OR MAIN LINES OF THE CITY WATER, SANITARY SEWER, AND/OR STORM DRAIN SYSTEM NECESSARY FOR THE CONNECTION TO FUNCTION AS DESIGNED. THE CONTRACTOR SHALL LOCATE OR HAVE LOCATED ALL EXISTING UNDERGROUND PRIVATE UTILITIES (ELECTRIC, TELEPHONE, PIPELINES, ETC.) AND STRUCTURES IN ADVANCE OF CONSTRUCTION AND SHALL ELIMINATE ALL CONFLICTS PRIOR TO START OF CONSTRUCTION. NOTE: NORTH CAROLINA 811 PROVIDES A COMMUNICATIONS LINK WITH YOUR LOCAL UTILITY PROVIDERS. CONTRACTOR PROVIDES INFORMATION ABOUT EXCAVATION, NC 811 TRANSMITS THE INFORMATION TO THE UTILITIES AND SENDS OUT LOCATORS TO MARK YOUR UNDERGROUND LINES FOR FREE. CALL 811 OR 1-800-632-4949 THREE WORKING DAYS BEFORE DIGGING.)
5. BACKFILLING SHALL NOT BE STARTED UNTIL LINES ARE APPROVED BY THE CITY INSPECTOR, AND GEOTECHNOLOGICAL FIRM. ALL BACKFILL SHALL BE #78 STONE, SCREENINGS, OR NATIVE MATERIAL UNLESS OTHERWISE APPROVED ON THE PLANS, AND SHALL BE INSTALLED IN ACCORDANCE WITH TYPE 1 TO 95% COMPACTION. BACKFILL PLACEMENT AND SURFACE REPLACEMENT SHALL BE IN ACCORDANCE WITH 16" MIN DEPTH ABC SHELF.
6. AN APPROVED SET OF PLANS SHALL BE MAINTAINED ON THE JOB SITE AT ALL TIMES THAT WORK IS IN PROGRESS. DEVIATION FROM THE PLANS SHALL NOT BE ALLOWED WITHOUT AN APPROVED PLAN REVISION.
7. THE CONTRACTOR SHALL SUPPLY THE CITY INSPECTOR CONSTRUCTION MATERIAL TESTING DOCUMENTATION THROUGHOUT THE PROJECT.
8. EXISTING VALVES SHALL BE OPERATED ONLY BY TOWN OF KNIGHTDALE STAFF OR IN CASE OF AN EMERGENCY, IN THE PRESENCE OF CITY STAFF. THE TOWN REQUIRES A 48-HOUR NOTICE FOR SYSTEM SHUTDOWNS. CONTRACTOR IS REQUIRED TO NOTIFY AFFECTED CUSTOMERS 24 HOURS PRIOR TO SHUTTING DOWN. BUSINESSES MAY REQUIRE AFTER HOUR SHUTDOWNS. RESIDENTIAL FLOWS AFTER SHUTDOWN MAY REQUIRE A PUMP. CONTRACTOR IS RESPONSIBLE TO INSTALL 2" TAPS TO RELIEVE PRESSURE AND ALLEVIATE RESIDUAL FLOWS WHEN NEEDED.
9. NO BURNING OF DEMO DEBRIS DURING CLEARING AND GRUBBING.
10. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS PRIOR TO CONSTRUCTION.
11. PRIOR TO ANY CONSTRUCTION IN THE PUBLIC RIGHT-OF-WAY, THE CONTRACTOR/DEVELOPER SHALL NOTIFY THE CITY INSPECTOR OF ANY CONSTRUCTION WITHIN THE PUBLIC RIGHT-OF-WAY. IT SHALL BE RESTORED TO ORIGINAL CONDITIONS USING THE FOLLOWING REQUIREMENTS.
A. ALL TREES IMPACTED BY CONSTRUCTION THAT ARE NOT PART OF THE APPROVED PLANS, SHALL BE REPLACED WITH THE SAME SIZE AND TYPE OF TREE AT A LOCATION DETERMINED BY THE CITY.
B. ALL IRRIGATION SYSTEMS SHALL BE RESTORED TO FULLY FUNCTIONING STATUS. ANY IRRIGATION LOCATED BENEATH ASPHALT OR CONCRETE SHALL BE SLEEVED WITH SCHEDULE 40 PVC TWO NOMINAL SIZES LARGER.
C. LANDSCAPE BEDDING SHALL BE OF A SIZE AND COLOR TO MATCH EXISTING BEDDING AND SHALL BE SPREAD A MINIMUM OF TWO INCHES THICK.
D. THE ENGINEERING DEPARTMENT AND PUBLIC WORKS DEPARTMENT SHALL BE CONTACTED TO INSPECT ALL WORK BEFORE A CERTIFICATE OF OCCUPANCY IS ISSUED.
12. ANY WORK PERFORMED WITHOUT THE APPROVAL OF THE CITY PUBLIC UTILITIES DIRECTOR, OR DESIGNEE, AND/OR ALL WORK AND MATERIAL NOT IN CONFORMANCE WITH THE SPECIFICATIONS IS SUBJECT TO REMOVAL AND REPLACEMENT AT THE CONTRACTOR'S EXPENSE.
13. THE TOWN OF KNIGHTDALE IS NOT RESPONSIBLE FOR LIABILITY INCURRED DUE TO DELAYS AND/OR DAMAGES TO UTILITIES IN CONJUNCTION WITH THIS CONSTRUCTION. THE CITY WILL NOT PARTICIPATE IN THE COST OF CONSTRUCTION OR UTILITY RELOCATION.
14. CONSTRUCTION OF CONCRETE OR PAVING ITEMS SHALL NOT COMMENCE UNTIL ALL UNDERGROUND WORK HAS BEEN INSPECTED, TESTED, AND APPROVED.
15. DISPOSAL OF AND STOCKPILING OF EXCESS MATERIAL WITHIN THE TOWN OF KNIGHTDALE LIMITS OR PLANNING AREA SHALL BE DONE IN SUCH A WAY THAT WILL NOT CREATE A NUISANCE, AND MUST BE DONE IN ACCORDANCE TO THE APPROVED PLANS. THE PLACING OF MATERIAL ON PRIVATE PROPERTY OF ANOTHER REQUIRES WRITTEN AUTHORIZATION.
16. TRAFFIC CONTROL SHALL BE MAINTAINED IN ACCORDANCE WITH THE NCDOT AND MUTCD SPECIFICATIONS.
17. THE CONTRACTOR SHALL PROVIDE ADEQUATE MEANS FOR CLEANING TRUCKS AND/OR OTHER EQUIPMENT OF MUD PRIOR TO ENTERING PUBLIC STREETS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CLEAN STREETS, ALLAY DUST, AND TAKE WHATEVER MEASURES ARE NECESSARY TO ENSURE THAT ALL ROADS ARE MAINTAINED IN A CLEAN, MUD AND DUST-FREE CONDITION AT ALL TIMES THE CONTRACTOR SHALL UTILIZE A STREET SWEEPER FOR STREET CLEANING.
18. ANY CONSTRUCTION DETOURS WILL REQUIRE AN ALL-WEATHER ROAD SURFACE.

GENERAL UTILITY NOTES:

- 1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST TOWN OF KNIGHTDALE AND CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT STANDARD SPECIFICATIONS AND DETAILS.
2. ALL CONSTRUCTION WITHIN THE NCDOT PUBLIC RIGHT-OF-WAY SHALL BE IN ACCORDANCE WITH THE LATEST NCDOT STANDARD SPECIFICATIONS.
3. ALL STORM DRAINAGE SHALL BE CLASS III RCP UNLESS OTHERWISE NOTED.
4. ALL UTILITY LINES SHALL HAVE EASEMENTS CENTERED ON THE LINES UNLESS LOCATED COMPLETELY IN ROAD ROW.
5. WATERLINE SHALL BE 3" MINIMUM OFF EDGE OF PAVEMENT UNLESS SHOWN OTHERWISE. ALL WATER LINES SHALL BE PVC OR DUCTILE IRON PIPE. WATERLINE SHALL BE INSTALLED AT A MINIMUM DEPTH OF 3' FROM FINISHED GRADE.
6. A 3' - 5' CLEARANCE SHALL BE MAINTAINED AROUND ALL FIRE HYDRANTS, INCLUDING CLEARANCE FROM TREES AND SHRUBS.
7. WATER MAINS SHALL BE LAID AT LEAST 10 FEET LATERALLY FROM EXISTING OR PROPOSED SEWERS, UNLESS LOCAL CONDITIONS OR BARRIERS PREVENT A 10-FOOT LATERAL SEPARATION. IN WHICH CASE, THE WATER MAIN IS LAID IN A SEPARATE TRENCH WITH THE ELEVATION OF THE BOTTOM OF THE WATER MAIN AT LEAST 18 INCHES ABOVE THE TOP OF THE SEWER, OR, THE WATER MAIN IS LAID IN THE SAME TRENCH AS THE SEWER WITH THE WATER MAIN LOCATED AT ONE SIDE ON A BENCH OF UNDISTURBED EARTH, AND WITH THE ELEVATION OF THE BOTTOM OF THE WATER MAIN AT LEAST 18 INCHES ABOVE THE TOP OF THE SEWER.
8. WHEN A WATER MAIN MUST CROSS OVER A SEWER MAIN, THE BOTTOM OF THE WATER MAIN SHALL BE AT LEAST 18 INCHES ABOVE THE TOP OF THE SEWER MAIN. IF THIS SEPARATION CANNOT BE OBTAINED WHILE MAINTAINING THE REQUIRED COVER, BOTH THE WATER AND SEWER MAIN SHALL BE DUCTILE IRON PIPE, WITH JOINTS EQUIVALENT TO WATER MAIN STANDARDS, FOR 10 FEET ON EACH SIDE OF THE POINT OF CROSSING. A JOINT OF WATER MAIN PIPE SHALL BE CENTERED AT THE POINT OF CROSSING.
9. WHEN A WATER MAIN MUST CROSS UNDER A SEWER MAIN, BOTH THE WATER AND SEWER MAINS SHALL BE DUCTILE IRON PIPE, WITH JOINTS EQUIVALENT TO WATER MAIN STANDARDS, FOR 10 FEET ON EACH SIDE OF THE POINT OF CROSSING. A SECTION OF WATER MAIN PIPE SHALL BE CENTERED AT THE POINT OF CROSSING. VERTICAL SEPARATION BETWEEN THE TOP OF THE WATER MAIN AND THE BOTTOM OF THE SEWER MAIN SHALL BE MINIMUM 18 INCHES.
10. WHEN A WATER MAIN PIPE CROSSES OVER OR UNDER A STORM SEWER, VERTICAL SEPARATION BETWEEN THE PIPES SHALL BE MINIMUM 18 INCHES UNLESS BOTH PIPES ARE DUCTILE IRON OR ENCASED IN CONCRETE FOR 10 FEET EITHER SIDE OF THE CROSSING.
11. SANITARY SEWER MAINS SHALL HAVE A MINIMUM VERTICAL SEPARATION OF 24 INCHES BETWEEN STORM SEWERS.
12. CONTRACTOR SHALL VERIFY LOCATION OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION. LOCATION OF EXISTING UTILITIES SHOWN ON PLANS IS BASED ON BEST AVAILABLE INFORMATION BUT CAN BE CONSIDERED ONLY AS APPROXIMATE.

STORM DRAINAGE/GRADING NOTES:

- 1. ALL AREAS SHALL BE GRADED FOR POSITIVE DRAINAGE, AND AS SHOWN ON THESE PLANS, THE CONTRACTOR SHALL MAINTAIN ADEQUATE SITE DRAINAGE DURING ALL PHASES OF CONSTRUCTION. IN ADDITION TO THE MEASURES SHOWN IN THESE PLANS, THE CONTRACTOR SHALL USE INTERIM DIVERSION DITCHES, BERMS, OR OTHER METHODS AS REQUIRED TO DIRECT DRAINAGE AS SHOWN ON THESE PLANS AND TO PREVENT SILT AND CONSTRUCTION DEBRIS FROM FLOWING ONTO ADJACENT PROPERTIES OR ROADWAYS.
2. CONTRACTOR SHALL COORDINATE WITH THE UTILITY COMPANIES FOR ANY REQUIRED UTILITY ADJUSTMENTS AND/OR RELOCATIONS.
3. ALL MATERIALS USED FOR BACKFILL SHALL BE FREE OF WOOD, ROOTS, ROCKS, BOULDERS, OR ANY OTHER NON-COMPATIBLE SOIL TYPE MATERIAL. UNSATISFACTORY MATERIALS ALSO INCLUDE MAN-MADE FILLS AND REFUSE DEBRIS DERIVED FROM ANY SOURCE. ALL FILL MATERIAL SHALL BE TESTED AND APPROVED BY PROJECT GEOTECHNICAL ENGINEER. ALL FILL SHALL BE PLACED IN ACCORDANCE WITH PROJECT GEOTECHNICAL ENGINEER DIRECTION AND RECOMMENDATIONS. TESTING RESULTS SHALL BE PROVIDED TO OWNER TO VERIFY PROPER PLACEMENT.
4. MATERIALS USED TO CONSTRUCT EMBANKMENTS FOR ANY PURPOSE, BACKFILL AROUND DRAINAGE STRUCTURES, OR IN UTILITY TRENCHES FOR ANY OTHER DEPRESSION REQUIRING FILL OR BACKFILL SHALL MEET THE REQUIREMENTS OF THE FINAL GEOTECHNICAL REPORT RECOMMENDATIONS.
5. THE CONTRACTOR SHALL, PRIOR TO ANY OPERATIONS INVOLVING FILLING OR BACKFILLING, SUBMIT THE RESULTS OF THE PROCTOR TEST TOGETHER WITH A CERTIFICATION THAT THE SOIL TESTED IS REPRESENTATIVE OF THE MATERIALS TO BE USED ON THE PROJECT. TESTS SHALL BE CONDUCTED BY A CERTIFIED MATERIALS TESTING LABORATORY AND CERTIFICATIONS MADE BY A LICENSED PROFESSIONAL ENGINEER REPRESENTING THE LABORATORY. ALL SOIL USED SHALL BE IN ACCORDANCE WITH PROJECT GEOTECHNICAL ENGINEER REQUIREMENTS.
6. ALL DEMOLITION DEBRIS AND OTHER EXCESS MATERIAL SHALL BE HAULED OFF-SITE.
7. REFERENCE STRUCTURAL DRAWINGS AND SPECIFICATIONS (IF APPLICABLE) AND GEOTECHNICAL REPORT FOR BUILDING PAD AND PAVING SUBGRADE INFORMATION.
8. PROPOSED CONTOURS AND GUTTER GRADIENTS ARE APPROXIMATE. PROPOSED SPOT ELEVATIONS ARE TO BE USED IN CASE OF DISCREPANCY.
9. CONTRACTOR SHALL OBTAIN ALL PERMITS REQUIRED FOR BLASTING ROCK IF BLASTING ROCK IS ENCOUNTERED. CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR COMPLYING WITH ALL BLASTING AND SAFETY REQUIREMENTS.
10. CONTRACTOR SHALL INCLUDE IN THE CONTRACT PRICE ANY DEWATERING NECESSARY TO CONSTRUCT THE PROJECT AS SHOWN ON THE PLANS.
11. CONTRACTOR SHALL VERIFY AND COORDINATE ALL DIMENSIONS SHOWN, INCLUDING THE HORIZONTAL AND VERTICAL LOCATION OF CURB INLETS AND GRATE INLETS AND ALL UTILITIES CROSSING THE STORM SEWER.
12. CONTRACTOR SHALL PROVIDE ALL MATERIALS AND APPURTENANCES NECESSARY FOR COMPLETE INSTALLATION OF THE STORM SEWER.
13. ALL RCP STORM SEWER SHALL BE MINIMUM CLASS II REINFORCED CONCRETE PIPE, UNLESS OTHERWISE NOTED.
14. THE LOCATIONS OF EXISTING STORM SEWER STRUCTURES SHOWN ON THESE PLANS ARE APPROXIMATE. WHERE PROPOSED STORM SEWER PIPING TIES TO EXISTING STRUCTURES, PIPES, SWALES, ETC., THE CONTRACTOR SHALL FIELD ADJUST PROPOSED STORM SEWERS TO MATCH THE LOCATIONS OF THESE EXISTING FEATURES.
15. CONTRACTOR SHALL REMOVE ALL TOPSOIL THAT IS DETERMINED BY THE PROJECT GEOTECHNICAL ENGINEER TO BE UNSUITABLE.



137 S Wilmington Street, Suite 200, Raleigh, NC 27601 | Tel: 919-469-3340 | License #: F-1479 | www.withersravenel.com

MERRITT MIDWAY BUSINESS PARK

Knightdale, NC

GENERAL NOTES

Table with Job No., Date, Drawn By, Designer, and their respective values.



Revisions table with columns for revision number, description, and date.

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: [Signature] Date: [Date]
Town Engineer
These plans are approved by the Town of Knightdale and serve as construction plans for this project.
By: [Signature] Date: [Date]
Administrator

Sheet No. C0.1



TOWN OF KNIGHTDALE

950 Steeple Square Court
Knightdale, NC 27545
KnightdaleNC.gov

ORDINANCE #20-08-19-003
AN ORDINANCE TO AMEND THE UNIFIED DEVELOPMENT ORDINANCE OF THE TOWN OF KNIGHTDALE WHICH INCLUDES THE ZONING DISTRICT MAP

ZMA-3-20 Merritt Hinton Oaks Boulevard Conditional District

WHEREAS, the Town of Knightdale has received a petition to amend the zoning of property from Highway Business (HB) and Manufacturing & Industrial (MI) to Manufacturing & Industrial Conditional District (MI-CD) and;

WHEREAS, the Town Council finds the proposed zoning map amendment is consistent with the KnightdaleNext 2035 Comprehensive Plan as it addresses several of the guiding principles such as achieving infill development of under-utilized land and promoting economic vitality by adding new and unique non-residential development for small and locally owned businesses.

NOW, THEREFORE, BE IT ORDAINED by the Town Council of the Town of Knightdale, North Carolina:

SECTION 1: That the Unified Development Ordinance of the Town of Knightdale Code, which includes the Zoning District Map, be amended to rezone four tracts of land totaling approximately 46.21± acres located within the Town of Knightdale's Extraterritorial Jurisdiction, east of Hinton Oaks Boulevard, addressed 123 Hinton Oaks Blvd., and identified as Wake County PINs 1744-56-6995, 1744-47-9093, 1744-47-6090, and 1744-47-9612 from Highway Business (HB) and Manufacturing & Industrial (MI) to Manufacturing & Industrial Conditional District (MI-CD) as indicated.

SECTION 2. That the additional conditions contained within the application identified as ZMA-3-20 and List of Reasonable Land Uses and Conditions (Exhibit A), and listed below apply as additional zoning conditions to the parcel of land identified as PINs 1744-56-6995, 1744-47-9093, 1744-47-6090, and 1744-47-9612:

- 1. The following uses shall be permitted (P) by right in accordance with UDO Section 2.3.C:
• Animal Services
• ATM
• Banks, Credit Unions, Financial Services

- Business Support Services
• Government Services
• Medical Services
• Post Office
• Professional Services
• Studio – Art, dance, martial arts, music
• Auto Parts Sales
• Amusements, Indoor – 5,000 sf or less
• Amusements, Indoor – 5,001 sf – 20,000 sf
• Amusements, Indoor – Greater than 20,000 sf
• Cultural or Community Facility
• Recreation Facilities, Indoor
• Laboratory - medical, analytical, research & development
• Laundry, dry cleaning plant
• Manufacturing, Light
• Manufacturing, Neighborhood
• Media Production
• Metal Products Fabrication, machine or welding shop
• Research and Development
• Public Safety Facility
• Schools – Vocational/Technical
• Utilities-Class 1 & 2
• Utilities-Class 3

2. The following uses are permitted subject to additional standards (PS):

- Agribusiness
• Personal Services
• Tattoo Shops
• Storage - Warehouse, indoor storage
• Wholesaling and Distribution
• Transit, Road & Ground Passenger Services
• Wireless Telecommunication Facility-Stealth
• Wireless Telecommunication Facility-Tower

3. The following shall be required Conditional Districts within the MI zoning district (CD), in accordance with UDO Sections 2.3.C, 2.16, 3.3, and 15.6.C.4 :

- Hospital
• Theater, Live Performance
• Theater, Movie

4. The following uses shall be permitted subject to additional standards proposed by the applicant and approved by Town Council. These uses shall be subject to additional standards present in the UDO not otherwise stated below, in accordance with UDO Sections 2.3.C, 3.3, or elsewhere.

- Equipment Rental
1. All equipment for sale or rent must be displayed within an enclosed building.
2. All equipment shall be stored within an enclosed building, opaque fence or wall and restricted to the rear yard.
• Vehicle Service – Maintenance/Body Work/Repair Conditions
1. All vehicles, materials or equipment shall be stored within an enclosed building.
2. Any operation which results in the creation of noxious vibrations, odors, dust, glare or sound is prohibited.
• Vehicle/Heavy Equipment Sales
1. Vehicles, materials or equipment shall be stored within an enclosed building.
5. All other uses shall not be permitted.
6. Improvements recommended by the Transportation Impact Analysis (Exhibit B) shall be made by the applicant prior to issuance of any final Certificates of Occupancy. The recommendations are as follows:

Knightsdale Blvd:

- Modify the traffic signal phasing/timings to reduce queuing at the intersection.
• Extend the dual eastbound left-turn lanes to provide 400 feet of storage for each.

Hinton Oaks Blvd:

- Provide two northbound through lanes on Hinton Oaks Blvd from Knightsdale Blvd to the Midway Commons/Shoppes at Midway Plantation driveway with the inside lane dropping as a left-turn lane at the Midway Commons driveway.
• Construct an exclusive northbound right-turn lane with 75 feet of storage at Shoppes at Midway Drive.
7. Additional pedestrian improvements shall be considered by the applicant and staff through the Construction Drawing process.
8. The submitted Master Plan (Exhibit B) and building elevations (Exhibit C) will serve as the site-specific development plan. However, the applicant must submit Construction Drawings to the Town for approval that are in conformance with the approved conditions of the MI-CD zoning district, Master Plan comments, Unified Development Ordinance, and comments from the June 11, 2020 DRC meeting.

SECTION 3. That the Master Plan attached as ZMA-3-20 Merritt Hinton Oaks Blvd be adopted in its entirety to be included in this Ordinance and to have the same effect in law.

SECTION 4. That all laws and clauses of law in conflict herewith are hereby repealed to the extent of said conflict.

SECTION 5. That if this ordinance or application thereof to any person or circumstance is held invalid, such invalidity shall not affect other provisions of this ordinance which can be given separate effect and to the end the provisions of this ordinance are declared to be severable.

SECTION 6. That this ordinance has been adopted following a duly advertised public hearing of the Town Council and following review and recommendation by the Land Use Review Board.

SECTION 7. That this ordinance shall be enforced as provided in G.S. 160A-175 or as provided for in the Knightdale Town Code

SECTION 8. That this ordinance shall become effective upon its adoption by Town Council.

Adopted this 19th day of August, 2020

James A. Roberson, Mayor

ATTEST:

Heather M. Smith, Town Clerk

APPROVED AS TO FORM:

Roger Knight, Town Attorney

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: \_\_\_\_\_
Town Engineer
These plans are approved by the Town of Knightdale and serve as construction plans for this project.
By: \_\_\_\_\_ Date: \_\_\_\_\_
Administrator

WithersRavenel Engineers | Planners
137 S Wilmington Street | Suite 200 | Raleigh, NC 27601 | t: 919-469-3340 | license #: F-1479 | www.withersravenel.com

MERRITT MIDWAY BUSINESS PARK
Knightdale, NC

APPROVED ZONING CONDITIONS

Table with Job No., Date, Drawn By, Designer

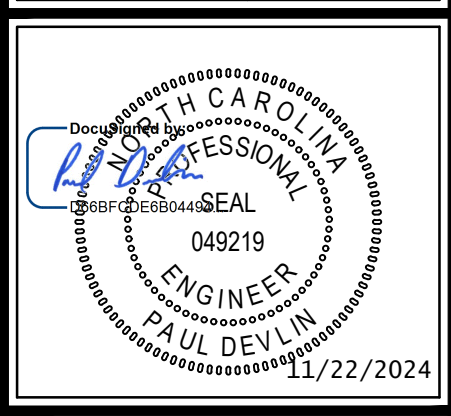
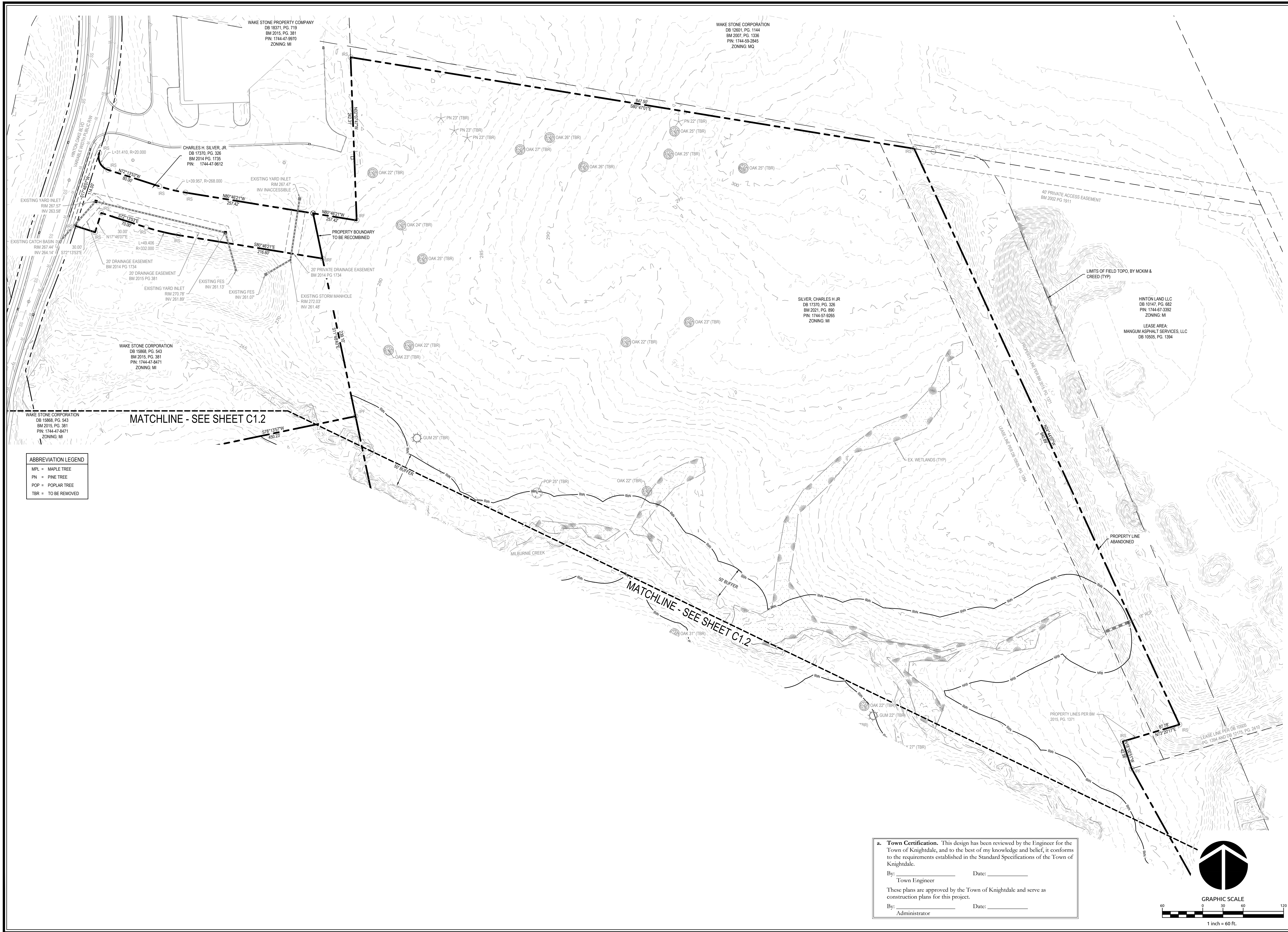


Table with Revisions, No., Description, Date

Sheet No. C0.2





**ABBREVIATION LEGEND**

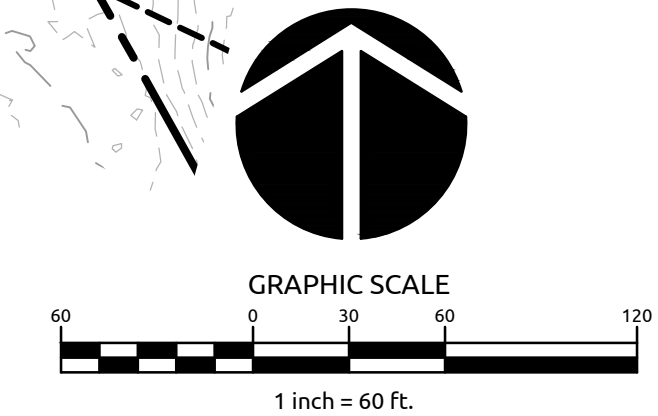
MPL	=	MAPLE TREE
PN	=	PINE TREE
POP	=	POPLAR TREE
TBR	=	TO BE REMOVED

**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: \_\_\_\_\_  
Town Engineer

These plans are approved by the Town of Knightdale and serve as construction plans for this project.

By: \_\_\_\_\_ Date: \_\_\_\_\_  
Administrator



**WithersRavenel**  
Engineers | Planners

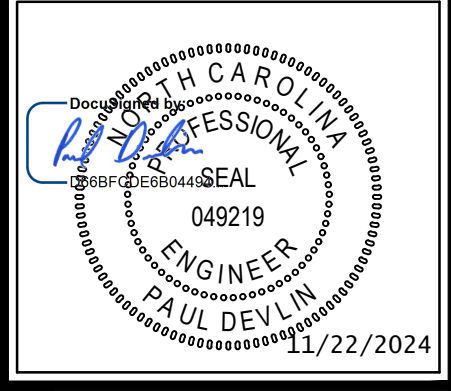
137 S Wilmington Street | Suite 200 | Raleigh, NC 27601 | T: 919-469-3340 | License #: F-1479 | www.withersravenel.com

**MERRITT MIDWAY  
BUSINESS PARK**

Knightdale, NC

**EXISTING CONDITIONS &  
DEMOLITION PLAN**

Job No.	09190080.00	Drawn By	WR
Date	09/15/2020	Designer	WR



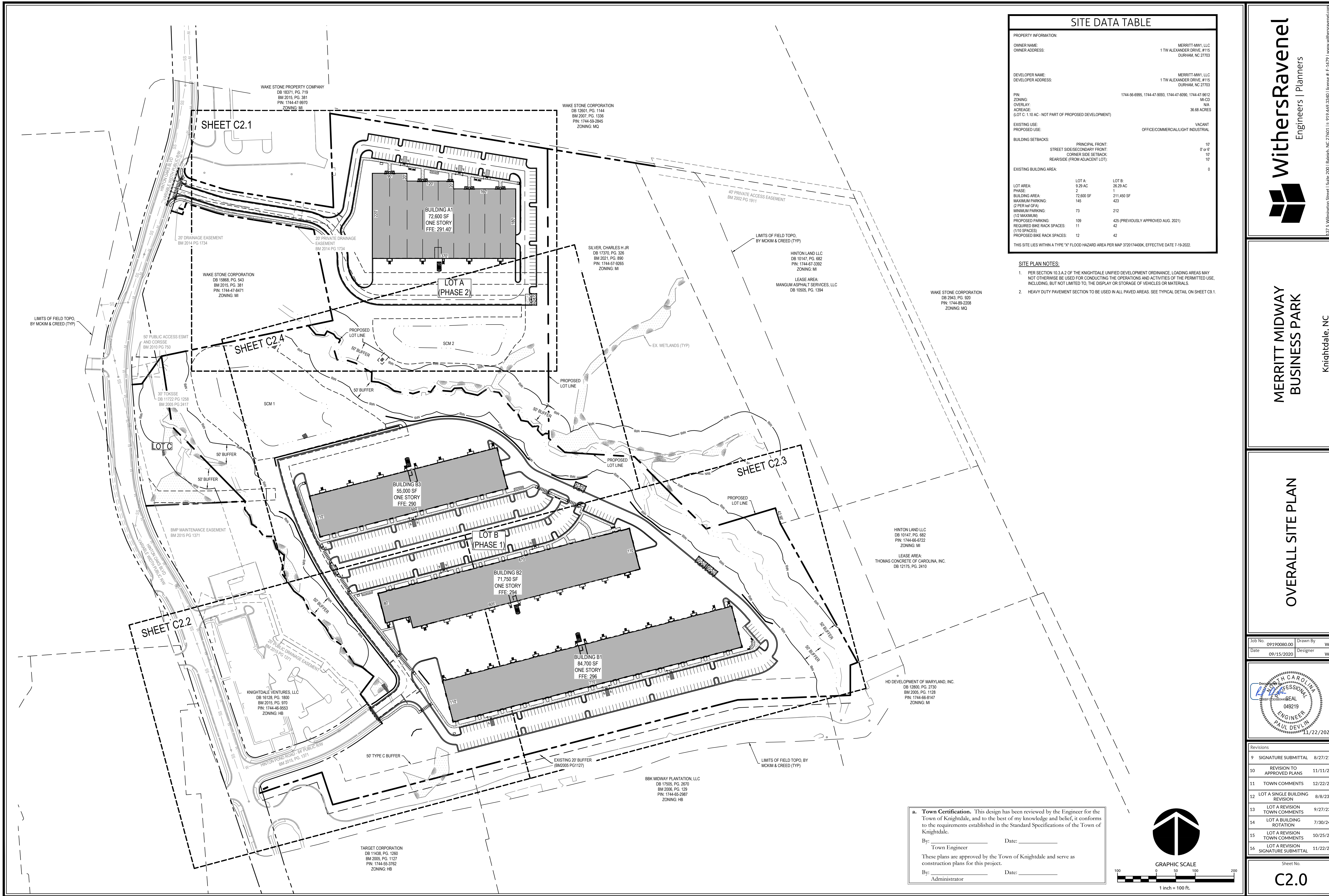
Revisions		
9	SIGNATURE SUBMITTAL	8/27/21
10	REVISION TO APPROVED PLANS	11/11/21
11	TOWN COMMENTS	12/22/21
12	LOT A SINGLE BUILDING REVISION	8/8/23
13	LOT A REVISION TOWN COMMENTS	9/27/23
14	LOT A BUILDING ROTATION	7/30/24
15	LOT A REVISION TOWN COMMENTS	10/25/24
16	LOT A REVISION SIGNATURE SUBMITTAL	11/22/24

Sheet No.  
**C1.1**

SITE DATA TABLE	
<b>PROPERTY INFORMATION:</b>	
OWNER NAME:	MERRITT-MWY, LLC
OWNER ADDRESS:	1 TW ALEXANDER DRIVE, #115 DURHAM, NC 27703
<b>DEVELOPER NAME:</b>	
DEVELOPER ADDRESS:	MERRITT-MWY, LLC 1 TW ALEXANDER DRIVE, #115 DURHAM, NC 27703
PIN:	1744-56-6995, 1744-47-9093, 1744-47-6090, 1744-47-9612
ZONING:	M-CO
OVERLAY:	N/A
ACREAGE:	36.88 ACRES
(LOT C: 1.10 AC - NOT PART OF PROPOSED DEVELOPMENT)	
EXISTING USE:	VACANT
PROPOSED USE:	OFFICE/COMMERCIAL/LIGHT INDUSTRIAL
<b>BUILDING SETBACKS:</b>	
PRINCIPAL FRONT:	10'
STREET SIDE/SECONDARY FRONT:	0' or 5'
CORNER SIDE SETBACK:	10'
REAR/SIDE (FROM ADJACENT LOT):	10'
<b>EXISTING BUILDING AREA:</b>	
LOT AREA:	LOT A: 9.29 AC LOT B: 26.29 AC
PHASE:	2
BUILDING AREA:	72,600 SF
MAXIMUM PARKING:	145
(2 PER 100 GFA)	423
MINIMUM PARKING:	73
(1/2 MAXIMUM)	212
PROPOSED PARKING:	109
REQUIRED BIKE RACK SPACES:	425 (PREVIOUSLY APPROVED AUG. 2021)
(1/10 SPACES)	42
PROPOSED BIKE RACK SPACES:	12
	42

**SITE PLAN NOTES:**

- PER SECTION 10.3.A.2 OF THE KNIGHTDALE UNIFIED DEVELOPMENT ORDINANCE, LOADING AREAS MAY NOT OTHERWISE BE USED FOR CONDUCTING THE OPERATIONS AND ACTIVITIES OF THE PERMITTED USE, INCLUDING, BUT NOT LIMITED TO, THE DISPLAY OR STORAGE OF VEHICLES OR MATERIALS.
- HEAVY DUTY PAVEMENT SECTION TO BE USED IN ALL PAVED AREAS. SEE TYPICAL DETAIL ON SHEET C9.1.



**WithersRavenel**  
Engineers | Planners

MERRITT MIDWAY  
BUSINESS PARK  
Knightdale, NC

OVERALL SITE PLAN

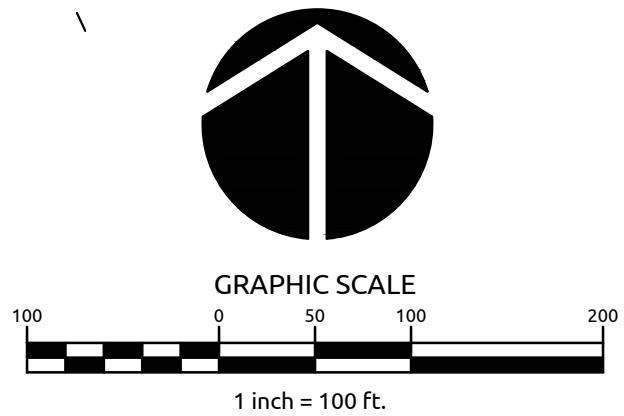
Job No. 09190080.00 Drawn By WR  
Date 09/15/2020 Designer WR



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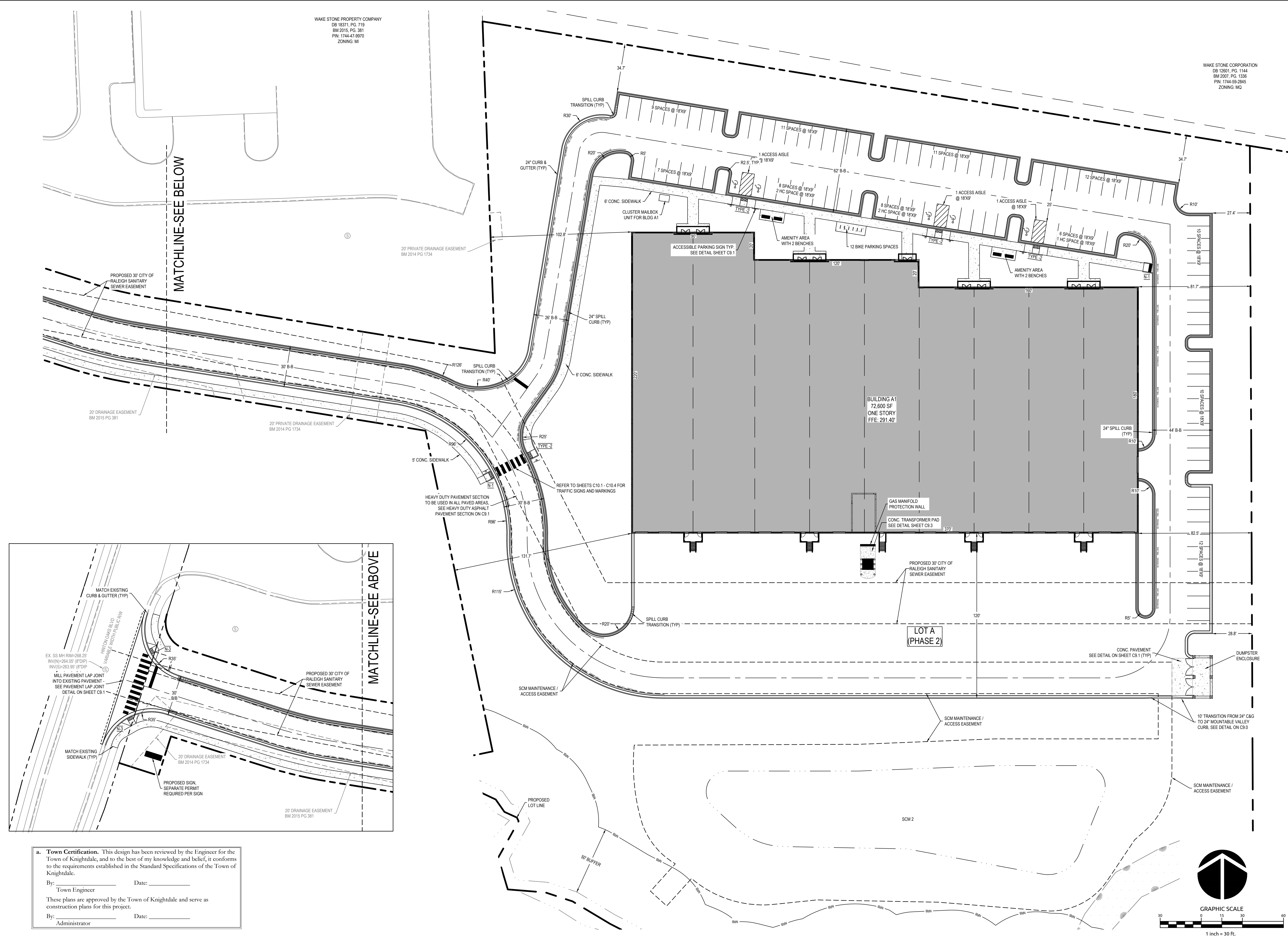
Sheet No.  
**C2.0**

**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: \_\_\_\_\_  
Town Engineer  
These plans are approved by the Town of Knightdale and serve as construction plans for this project.  
By: \_\_\_\_\_ Date: \_\_\_\_\_  
Administrator



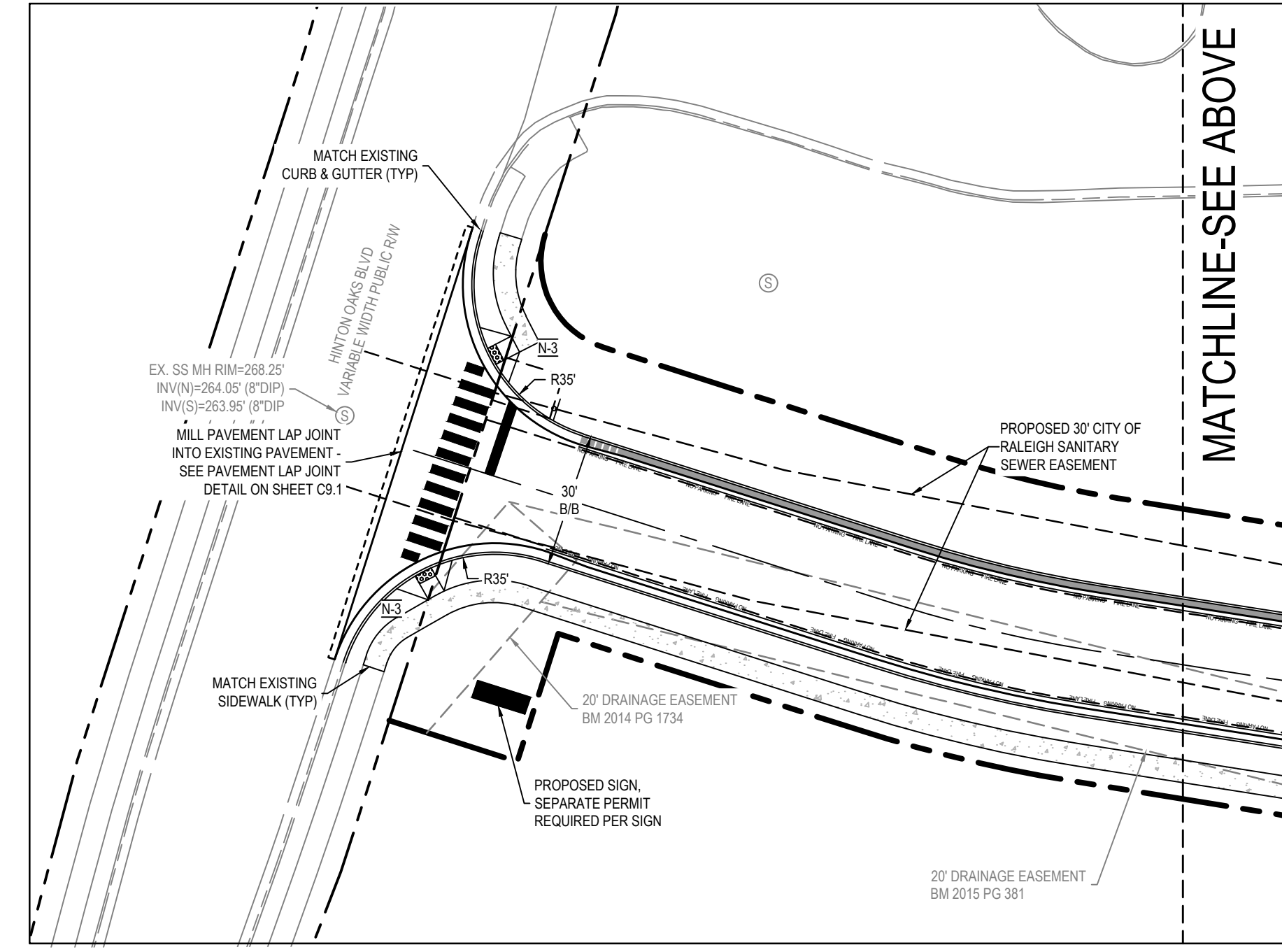
WAKE STONE PROPERTY COMPANY  
DB 18371, PG. 719  
BM 2015, PG. 381  
PIN: 1744-41-9270  
ZONING: M1

WAKE STONE CORPORATION  
DB 12601, PG. 1144  
BM 2007, PG. 1336  
PIN: 1744-59-2845  
ZONING: M2

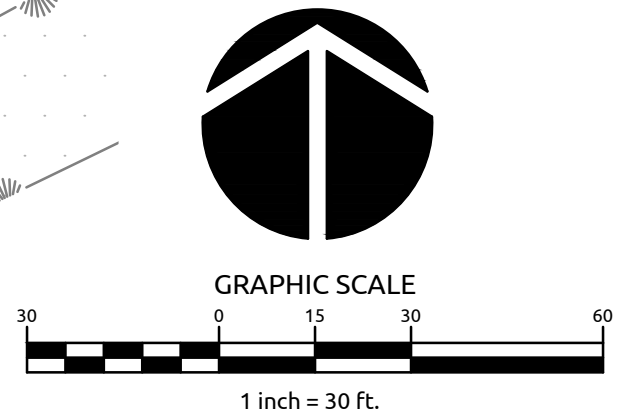


MATCHLINE-SEE BELOW

MATCHLINE-SEE ABOVE



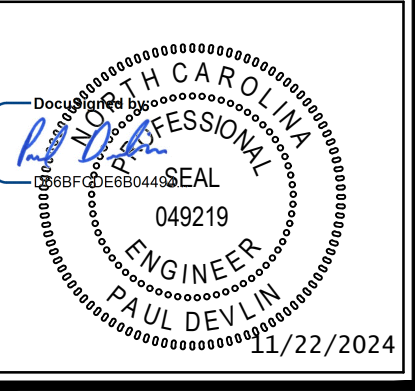
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MERRITT MIDWAY  
BUSINESS PARK  
Knightdale, NC

SITE PLAN

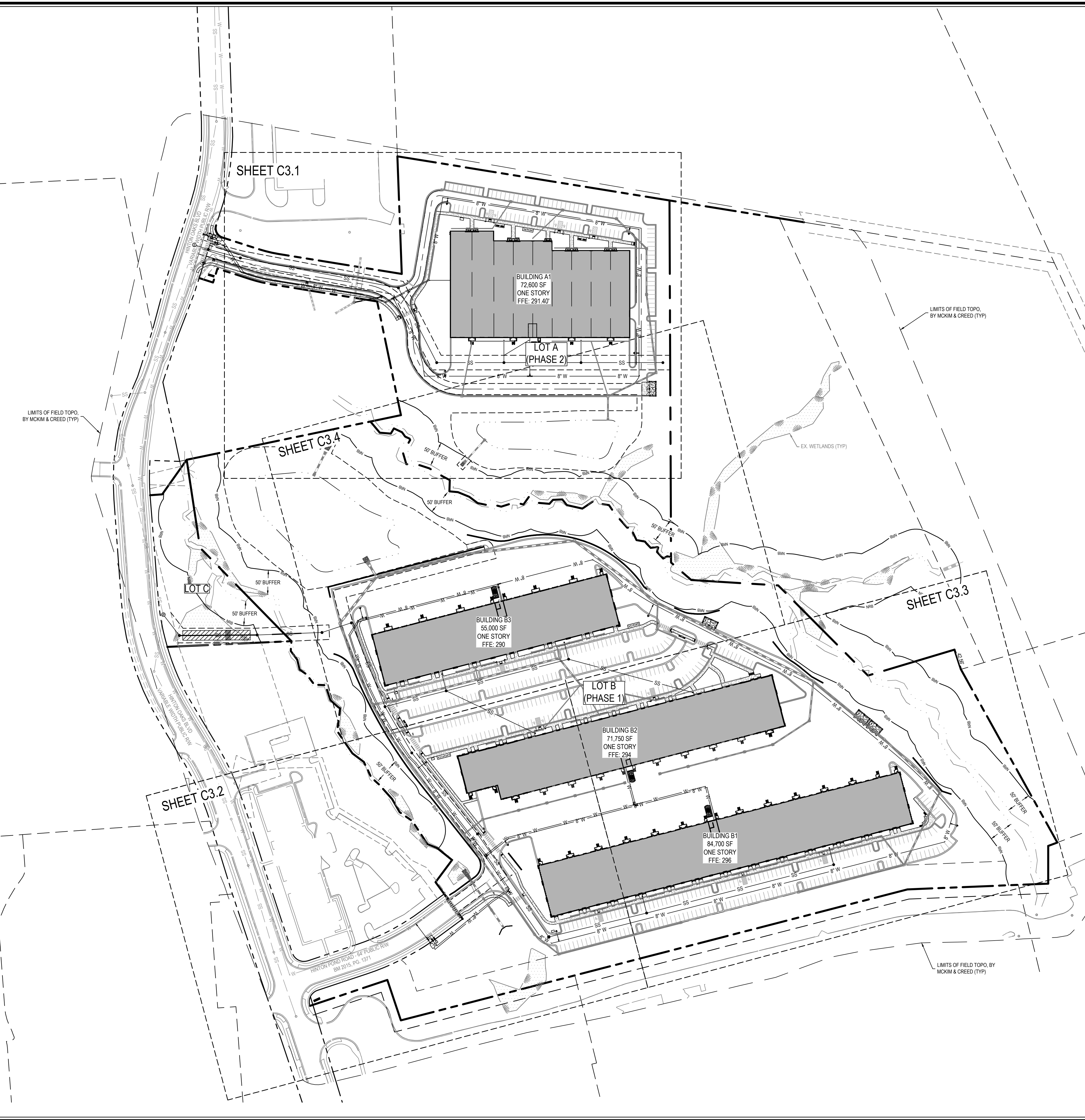
Job No. 09190080.00 Drawn By WR  
Date 09/15/2020 Designer WR



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Sheet No.  
**C2.1**



- COR APPENDIX D STANDARD UTILITY NOTES:**
- ALL STANDARD MATERIALS & CONSTRUCTION METHODS SHALL BE IN ACCORDANCE WITH CITY OF RALEIGH DESIGN STANDARD, DETAILS & SPECIFICATIONS (REFERENCE CORPUD HANDBOOK, CURRENT EDITION)
  - UTILITY SEPARATION REQUIREMENTS:
    - A DISTANCE OF 10' SHALL BE MAINTAINED BETWEEN SANITARY SEWER & ANY PRIVATE OR PUBLIC WATER SUPPLY SOURCE SUCH AS AN IMPOUNDED RESERVOIR USED AS A SOURCE OF DRINKING WATER. IF ADEQUATE LATERAL SEPARATION CANNOT BE ACHIEVED, FERROUS SANITARY SEWER PIPE SHALL BE SPECIFIED & INSTALLED TO WATERLINE SPECIFICATIONS. HOWEVER, THE MINIMUM SEPARATION SHALL NOT BE LESS THAN 25' FROM A PRIVATE WELL OR 50' FROM A PUBLIC WELL.
    - 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.
    - WHERE IT IS IMPOSSIBLE TO OBTAIN PROPER SEPARATION, OR ANYTIME A SANITARY SEWER PASSES OVER A WATERMAIN, DIP MATERIALS OR STEEL ENCASMENT EXTENDED 10' ON EACH SIDE OF CROSSING MUST BE SPECIFIED & INSTALLED TO WATERLINE SPECIFICATIONS.
    - 5.0' MINIMUM HORIZONTAL SEPARATION IS REQUIRED BETWEEN ALL SANITARY SEWER & STORM SEWER FACILITIES, UNLESS DIP MATERIAL IS SPECIFIED FOR SANITARY SEWER.
    - MAINTAIN 18" MIN. VERTICAL SEPARATION AT ALL WATERMAIN & RCP STORM DRAIN CROSSINGS. MAINTAIN 24" MIN. VERTICAL SEPARATION AT ALL SANITARY SEWER & RCP STORM DRAIN CROSSINGS WHERE ADEQUATE SEPARATIONS CANNOT BE ACHIEVED. SPECIFY DIP MATERIALS & A CONCRETE CRADLE HAVING 6" MIN. CLEARANCE (PER CORPUD DETAILS W-41 & S-49).
    - ALL OTHER UNDERGROUND UTILITIES SHALL CROSS WATER & SEWER FACILITIES WITH 18" MIN. VERTICAL SEPARATION REQUIRED.
  - ANY NECESSARY FIELD REVISIONS ARE SUBJECT TO REVIEW & APPROVAL OF AN AMENDED PLAN &/OR PROFILE BY THE CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT PRIOR TO CONSTRUCTION.
  - DEVELOPER SHALL PROVIDE 30 DAYS ADVANCE WRITTEN NOTICE TO OWNER FOR ANY WORK REQUIRED WITHIN AN EXISTING CITY OF RALEIGH UTILITY EASEMENT TRAVERSING PRIVATE PROPERTY.
  - 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.
  - SEWER BYPASS PUMPING - A BYPASS PLAN SEALED BY AN NC PROFESSIONAL ENGINEER SHALL BE PROVIDED TO RALEIGH WATER PRIOR TO PUMPING OPERATIONS FOR APPROVAL. THE OPERATIONS AND EQUIPMENT SHALL COMPLY WITH THE PUBLIC UTILITIES HANDBOOK.
  - 3.0' MINIMUM COVER IS REQUIRED ON ALL WATER MAINS & SEWER FORCE MAINS. 4.0' MINIMUM COVER IS REQUIRED ON ALL REUSE MAINS.
  - IT IS THE DEVELOPER'S RESPONSIBILITY TO ABANDON OR REMOVE EXISTING WATER & SEWER SERVICES NOT BEING USED IN REDEVELOPMENT OF A SITE UNLESS OTHERWISE DIRECTED BY THE CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT. THIS INCLUDES ABANDONING TAP AT MAIN & REMOVAL OF SERVICE FROM ROW OR EASEMENT PER CORPUD HANDBOOK PROCEDURE.
  - INSTALL 1/2" COPPER WATER SERVICES WITH METERS LOCATED AT ROW OR WITHIN A 2'X2' WATERLINE EASEMENT IMMEDIATELY ADJACENT. *NOTE: IT IS THE APPLICANT'S RESPONSIBILITY TO PROPERLY SIZE THE WATER SERVICE FOR EACH CONNECTION TO PROVIDE ADEQUATE FLOW & PRESSURE.*
  - INSTALL 6" PVC SEWER SERVICES @ 1.0% MINIMUM GRADE WITH CLEANOUTS LOCATED AT ROW OR EASEMENT LINE & SPACED EVERY 75 LINEAR FEET MAXIMUM.
  - PRESSURE REDUCING VALVES ARE REQUIRED ON ALL WATER SERVICES EXCEEDING 80 PSI. BACKWATER VALVES ARE REQUIRED ON ALL SANITARY SEWER SERVICES HAVING BUILDING DRAINS LOWER THAN 1.0' ABOVE THE NEXT UPSTREAM MANHOLE.
  - ALL ENVIRONMENTAL PERMITS APPLICABLE TO THE PROJECT MUST BE OBTAINED FROM NCDOW, USACE & OR FEMA FOR ANY RRAPRAN BUFFER, WETLAND & OR FLOODPLAIN IMPACTS (RESPECTIVELY) PRIOR TO CONSTRUCTION.
  - NCDOT / RAILROAD ENCROACHMENT AGREEMENTS ARE REQUIRED FOR ANY UTILITY WORK (INCLUDING MAIN EXTENSIONS & SERVICE TAPS) WITHIN STATE OR RAILROAD ROW PRIOR TO CONSTRUCTION.
  - GREASE INTERCEPTOR / OIL WATER SEPARATOR SIZING CALCULATIONS & INSTALLATION SPECIFICATIONS SHALL BE APPROVED BY THE RW FOG PROGRAM COORDINATOR PRIOR TO ISSUANCE OF A LC AND/OR BUILDING PERMIT. CONTACT (919) 996-4416 OR FOG@RALEIGH.GOV FOR MORE INFORMATION.
  - CROSS-CONNECTION CONTROL PROTECTION DEVICES ARE REQUIRED BASED ON DEGREE OF HEALTH HAZARD INVOLVED AS LISTED IN APPENDIX-B OF THE RULES GOVERNING PUBLIC WATER SYSTEMS IN NORTH CAROLINA.
  - THE DEVICES SHALL MEET THE AMERICAN SOCIETY OF SANITARY ENGINEERING (ASAE) STANDARDS AND BE ON THE UNIVERSITY OF SOUTHERN CALIFORNIA APPROVAL LIST.
  - THE DEVICE AND INSTALLATION SHALL MEET THE GUIDELINES OF APPENDIX A - GUIDELINES AND REQUIREMENTS FOR THE CROSS CONNECTION PROGRAM IN RALEIGH'S SERVICE AREA.
  - THE DEVICES SHALL BE INSTALLED AND TESTED (BOTH, INITIAL AND PERIODIC TESTING THEREAFTER) IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS OR THE LOCAL CROSS CONNECTION CONTROL PROGRAM, WHICHEVER IS MORE STRINGENT. CONTACT CROSS.CONNECTION@RALEIGH.GOV FOR MORE INFORMATION.
  - NOTICE FOR PROJECTS THAT INVOLVE AN OVERSIZED MAIN OR URBAN MAIN REPLACEMENT: ANY CITY REIMBURSEMENT GREATER THAN \$250,000.00 MUST UNDERGO THE PUBLIC BIDDING PROCESS.

**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

**SITE PERMITTING APPROVAL**

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

The City of Raleigh consents to the connection and extension of the City's **Public Sewer System** as shown on this plan. The material and construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. **City of Raleigh Public Utilities Department Permit # S-4880(R)**

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 # \_\_\_\_\_**

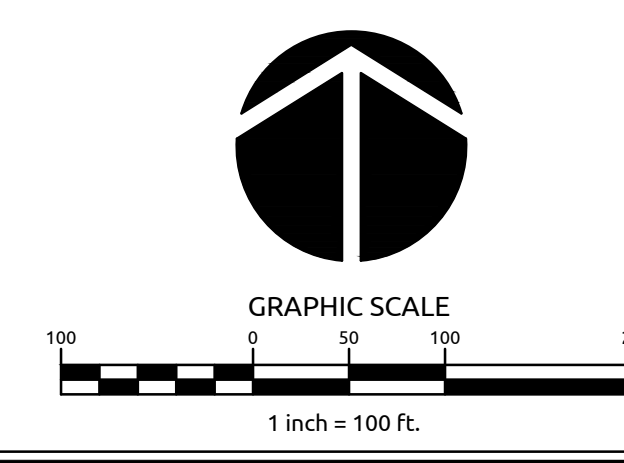
The City of Raleigh consents to the connection to its public sewer system and extension of the private sewer collection system as shown on this plan. The material and construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. **City of Raleigh Public Utilities Department Permit # S-4879P(R)**

**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: \_\_\_\_\_  
 Town Engineer

These plans are approved by the Town of Knightdale and serve as construction plans for this project.

By: \_\_\_\_\_ Date: \_\_\_\_\_  
 Administrator



**WithersRavenel**  
 Engineers | Planners

137 S. Wilmington Street | Suite 200 | Raleigh, NC 27601 | T: 919.469.3340 | License #: F-1479 | www.withersravenel.com

**MERRITT MIDWAY  
 BUSINESS PARK**  
 Knightdale, NC

**OVERALL UTILITY PLAN**

Job No.	09190080.00	Drawn By	WR
Date	09/15/2020	Designer	WR

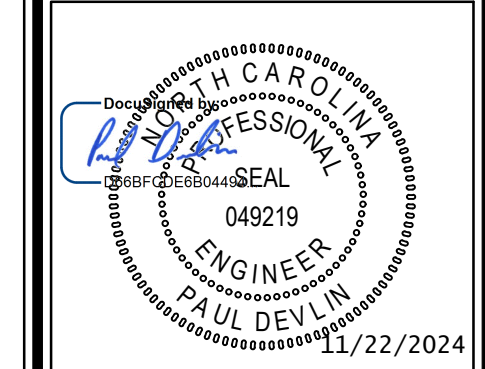


Revisions		
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Sheet No.  
**C3.0**

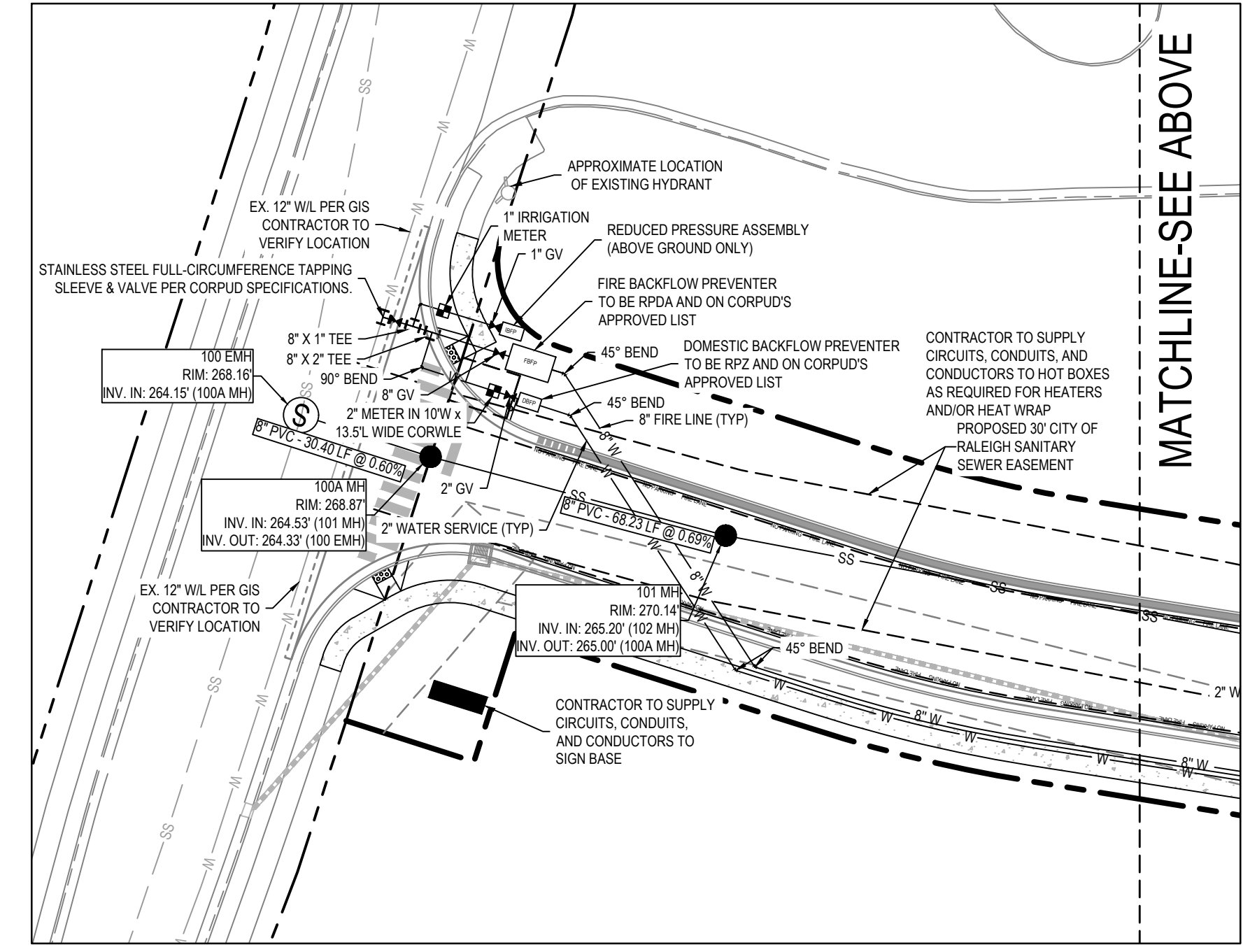
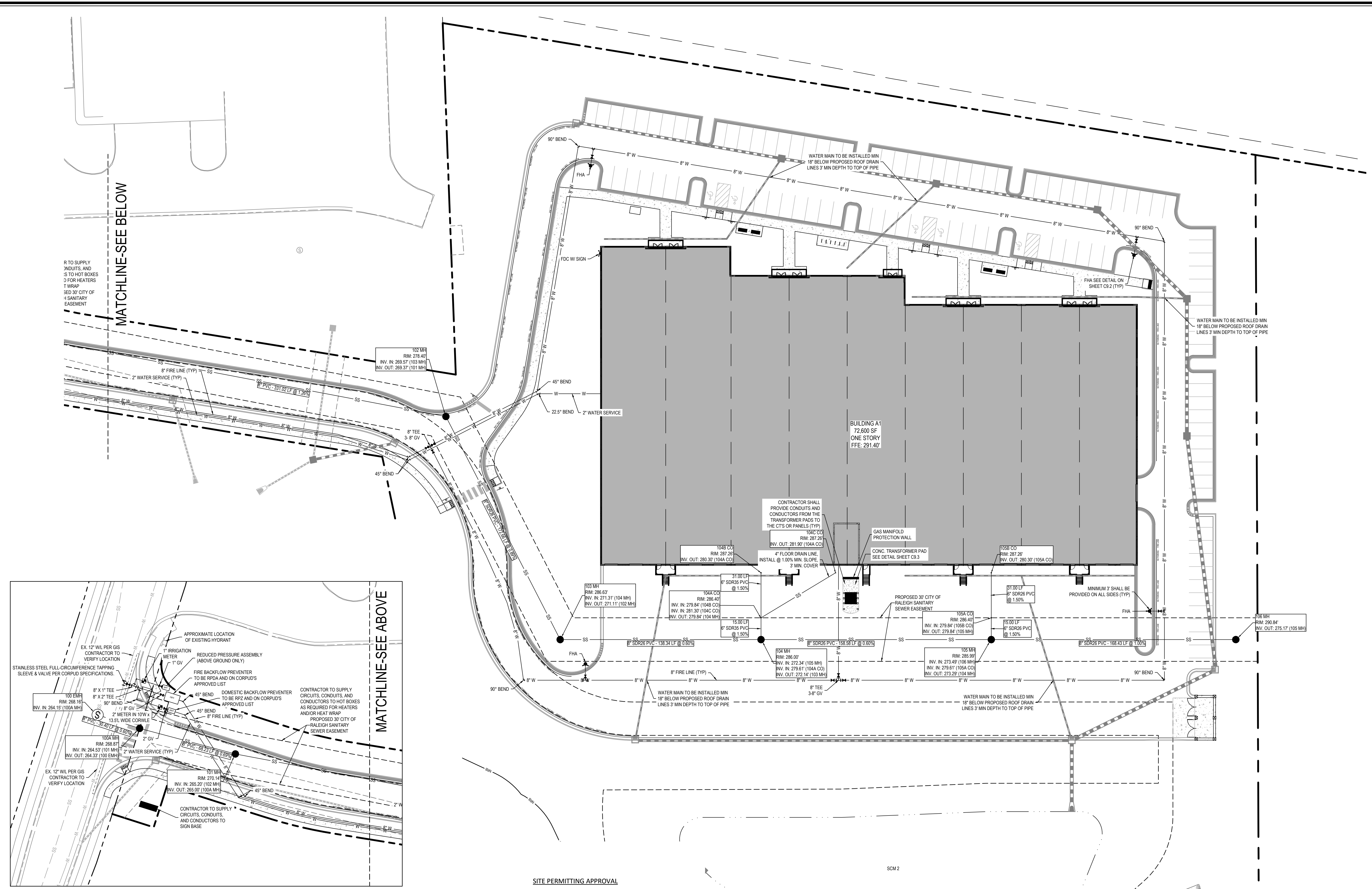


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Sheet No.  
**C3.1**



**SITE PERMITTING APPROVAL**

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

The City of Raleigh consents to the connection and extension of the City's **Public Sewer System** as shown on this plan. The material and construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. **City of Raleigh Public Utilities Department Permit # 5-4880(R)**

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 # 5-4879(P)**

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

**City of Raleigh Public Utilities Department Permit # 5-4879(P)**

**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.

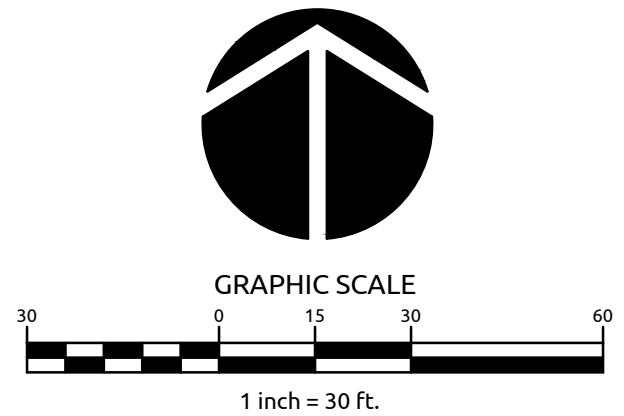
City of Raleigh Development Approval \_\_\_\_\_  
Raleigh Water Review Officer

**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.

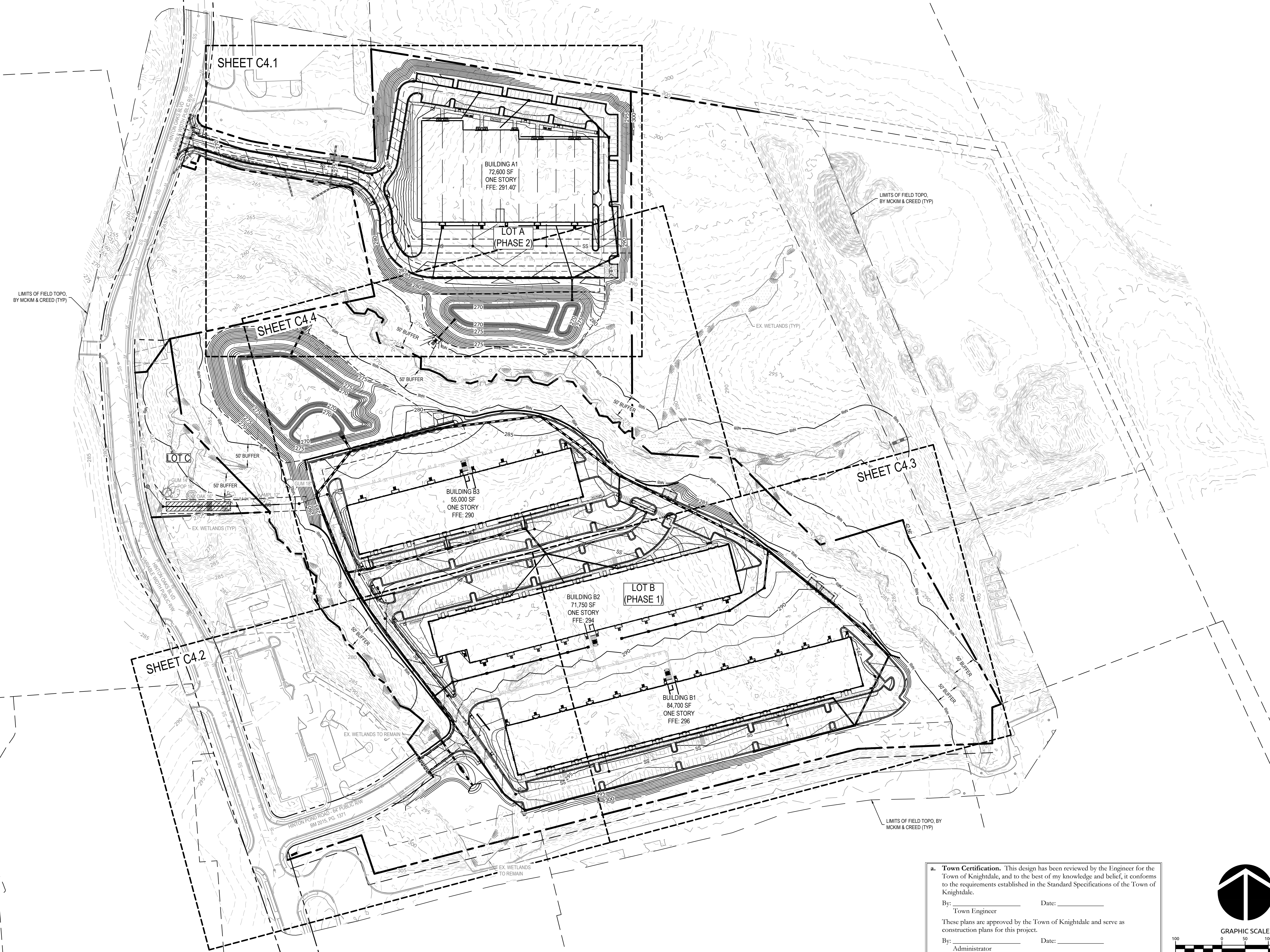
By: \_\_\_\_\_ Date: \_\_\_\_\_  
Town Engineer

These plans are approved by the Town of Knightdale and serve as construction plans for this project.

By: \_\_\_\_\_ Date: \_\_\_\_\_  
Administrator



U:\1711\2020\150000\Meeting\Hatch\04\Bldg\GIS\Drawings\Set\Construction\GIS\OVERALL GRADING AND DRAINAGE PLAN.dwg, November 22, 2024, 10:11 PM, TAYLOR, ALEC

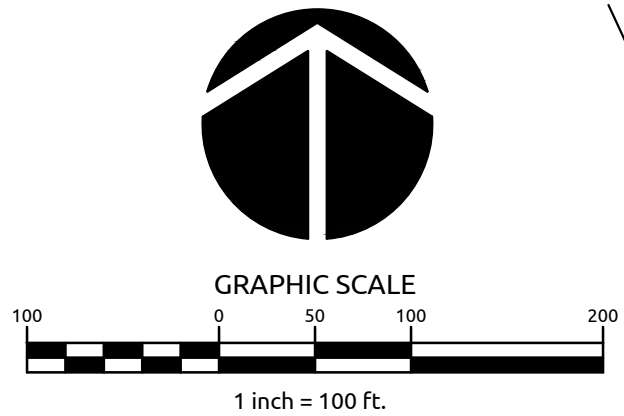


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**WithersRavenel**  
Engineers | Planners

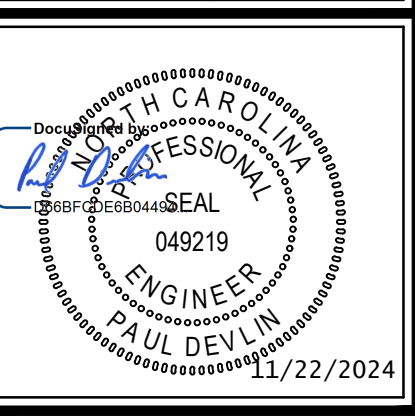
137 S Wilmington Street | Suite 200 | Raleigh, NC 27601 | T: 919.469.3340 | License #: F-1479 | www.withersravenel.com

**MERRITT MIDWAY  
BUSINESS PARK**

Knightdale, NC

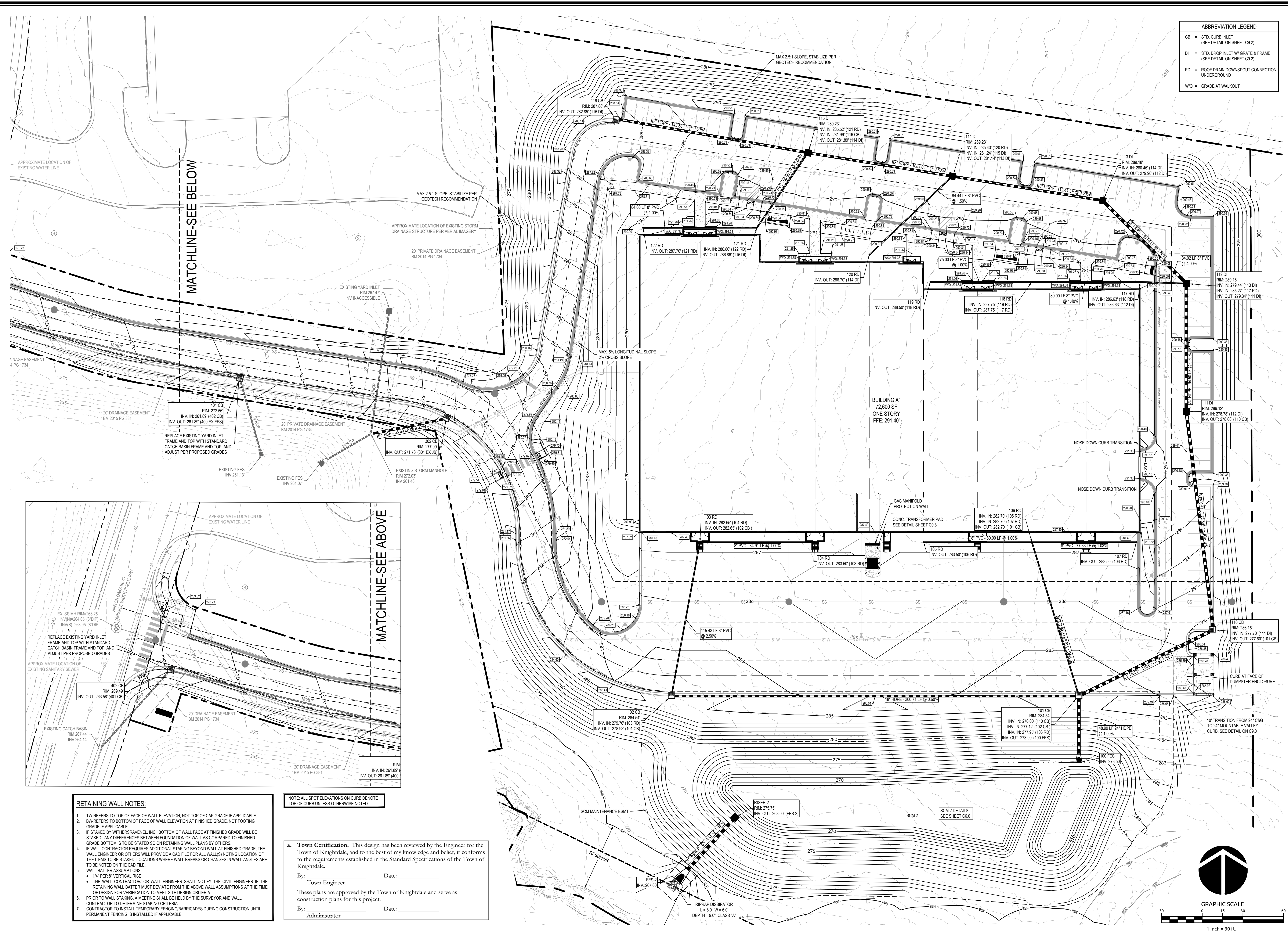
**OVERALL GRADING AND  
DRAINAGE PLAN**

Job No. 09190080.00 Drawn By WR  
Date 09/15/2020 Designer WR



Revisions		
9	SIGNATURE SUBMITTAL	8/27/21
10	REVISION TO APPROVED PLANS	11/11/21
11	TOWN COMMENTS	12/22/21
12	LOT A SINGLE BUILDING REVISION	8/8/23
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14	LOT A BUILDING ROTATION	7/30/24
15	LOT A REVISION TOWN COMMENTS	10/25/24
16	LOT A REVISION SIGNATURE SUBMITTAL	11/22/24

Sheet No.  
**C4.0**



**ABBREVIATION LEGEND**

- CB = STD. CURB INLET (SEE DETAIL ON SHEET C9.2)
- DI = STD. DROP INLET W/ GRATE & FRAME (SEE DETAIL ON SHEET C9.2)
- RD = ROOF DRAIN DOWNSPOUT CONNECTION UNDERGROUND
- WO = GRADE AT WALKOUT

**WithersRavenel**  
Engineers | Planners

**MERRITT MIDWAY BUSINESS PARK**  
Knightdale, NC

**GRADING AND DRAINAGE PLAN**

Job No. 09190080.00 Drawn By WR  
Date 09/15/2020 Designer WR



**Revisions**

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15	LOT A REVISION TOWN COMMENTS	10/25/24
16	LOT A REVISION SIGNATURE SUBMITTAL	11/22/24

Sheet No. **C4.1**

- RETAINING WALL NOTES:**
- TW-REFERS TO TOP OF FACE OF WALL ELEVATION, NOT TOP OF CAP GRADE IF APPLICABLE.
  - BW-REFERS TO BOTTOM OF FACE OF WALL ELEVATION AT FINISHED GRADE, NOT FOOTING GRADE IF APPLICABLE.
  - IF STAKED BY WITHERSRAVENEL, INC., BOTTOM OF WALL FACE AT FINISHED GRADE WILL BE STAKED. ANY DIFFERENCES BETWEEN FOUNDATION OF WALL AS COMPARED TO FINISHED GRADE BOTTOM IS TO BE STATED SO ON RETAINING WALL PLANS BY OTHERS.
  - IF WALL CONTRACTOR REQUIRES ADDITIONAL STAKING BEYOND WALL AT FINISHED GRADE, THE WALL ENGINEER OR OTHERS WILL PROVIDE A CAD FILE FOR ALL WALLS NOTING LOCATION OF THE ITEMS TO BE STAKED. LOCATIONS WHERE WALL BREAKS OR CHANGES IN WALL ANGLES ARE TO BE NOTED ON THE CAD FILE.
  - WALL BATTER ASSUMPTIONS
    - 14" PER 8' VERTICAL RISE
    - THE WALL CONTRACTOR OR WALL ENGINEER SHALL NOTIFY THE CIVIL ENGINEER IF THE RETAINING WALL BATTER MUST DEVIATE FROM THE ABOVE WALL ASSUMPTIONS AT THE TIME OF DESIGN FOR VERIFICATION TO MEET SITE DESIGN CRITERIA.
  - PRIOR TO WALL STAKING, A MEETING SHALL BE HELD BY THE SURVEYOR AND WALL CONTRACTOR TO DETERMINE STAKING CRITERIA.
  - CONTRACTOR TO INSTALL TEMPORARY FENCING/BARRICADES DURING CONSTRUCTION UNTIL PERMANENT FENCING IS INSTALLED IF APPLICABLE.

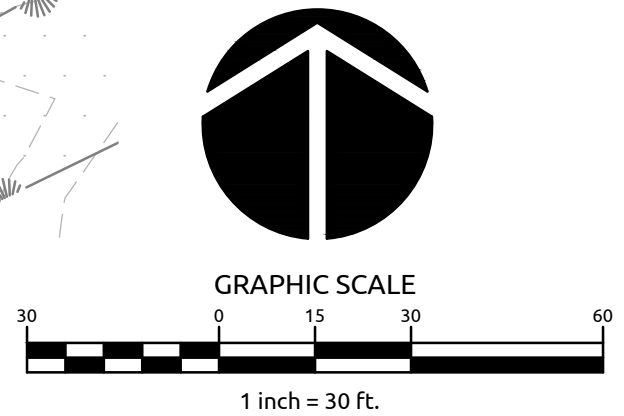
NOTE: ALL SPOT ELEVATIONS ON CURB DENOTE TOP OF CURB UNLESS OTHERWISE NOTED.

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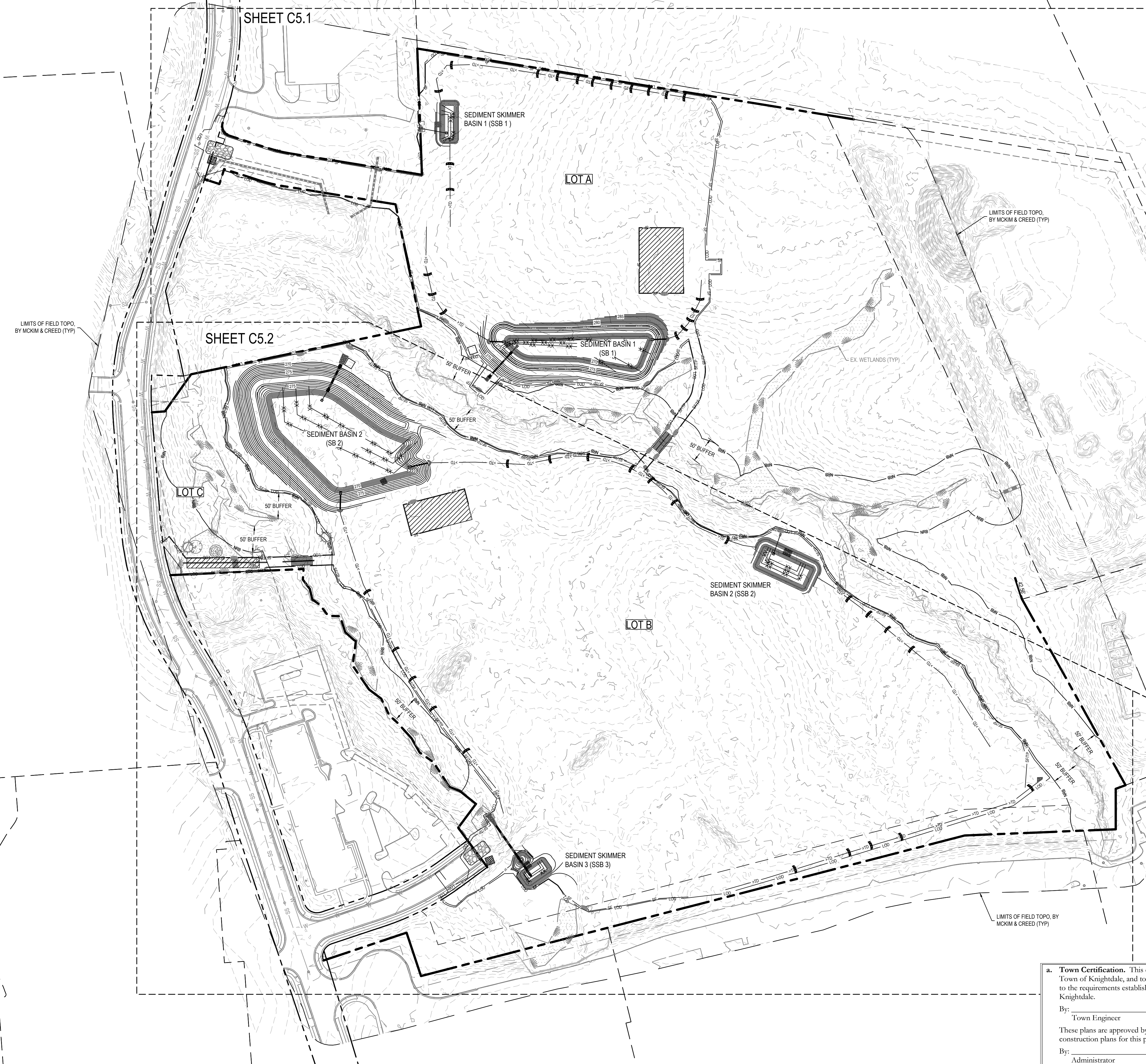
By: \_\_\_\_\_ Date: \_\_\_\_\_  
Town Engineer

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By: \_\_\_\_\_ Date: \_\_\_\_\_  
Administrator



U:\01\15\2020\150000\Asst\Hatch\04\Bldg\GIS\Drawings\Site\Construction\SSO\Overall Erosion Control - RAN - STAGE 1.dwg, November 22, 2024 4:08:19 PM - TAYLOR.ALC



SHEET C5.1

SHEET C5.2

INFRASTRUCTURE PROPOSED TO BE APPROVED BY THE TOWN OF KNIGHTDALE OR NCDOT, AS APPLICABLE

TOTAL SITE AREA: 36.69 AC  
TOTAL DISTURBED AREA: 28.05 AC

NOTE: LIMITS OF DISTURBANCE & SILT FENCE SHOWN OFFSET FOR READABILITY PURPOSES. ALL FENCING SHALL BE PLACED AT EDGE OF LIMITS OF DISTURBANCE.

ABBREVIATION LEGEND  
SSB = SKIMMER SEDIMENT BASIN  
SB = SEDIMENT BASIN

**EROSION CONTROL LEGEND**

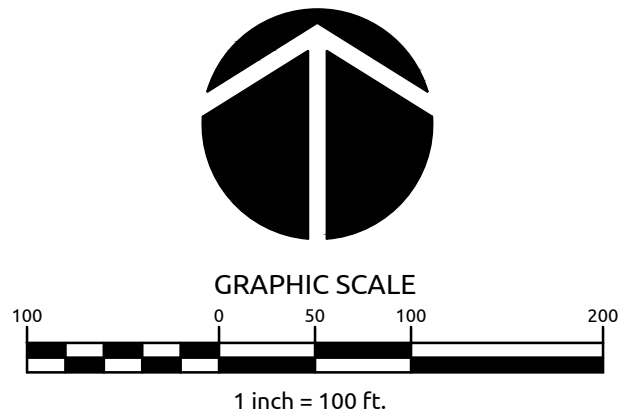
---	LIMITS OF DISTURBANCE
SF	SILT FENCE
>TD	TEMPORARY DIVERSION DITCH
XX XX	SCM BAFFLES
---	TEMPORARY SLOPE DRAIN
[Symbol]	HORSESHOE INLET PROTECTION
[Symbol]	INLET PROTECTION
[Symbol]	SILT FENCE OUTLET
[Symbol]	ROCK CHECK DAM
[Symbol]	TEMPORARY CONCRETE WASHOUT AREA
[Symbol]	SKIMMER BASIN
[Symbol]	TEMPORARY GRAVEL CONSTRUCTION ENTRANCE

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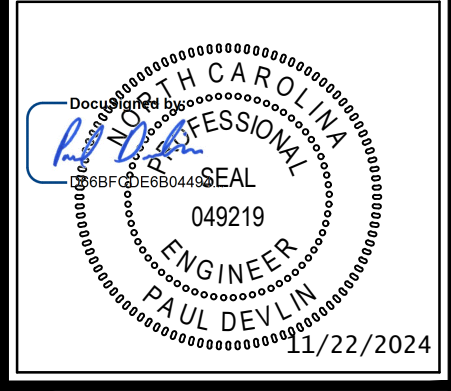
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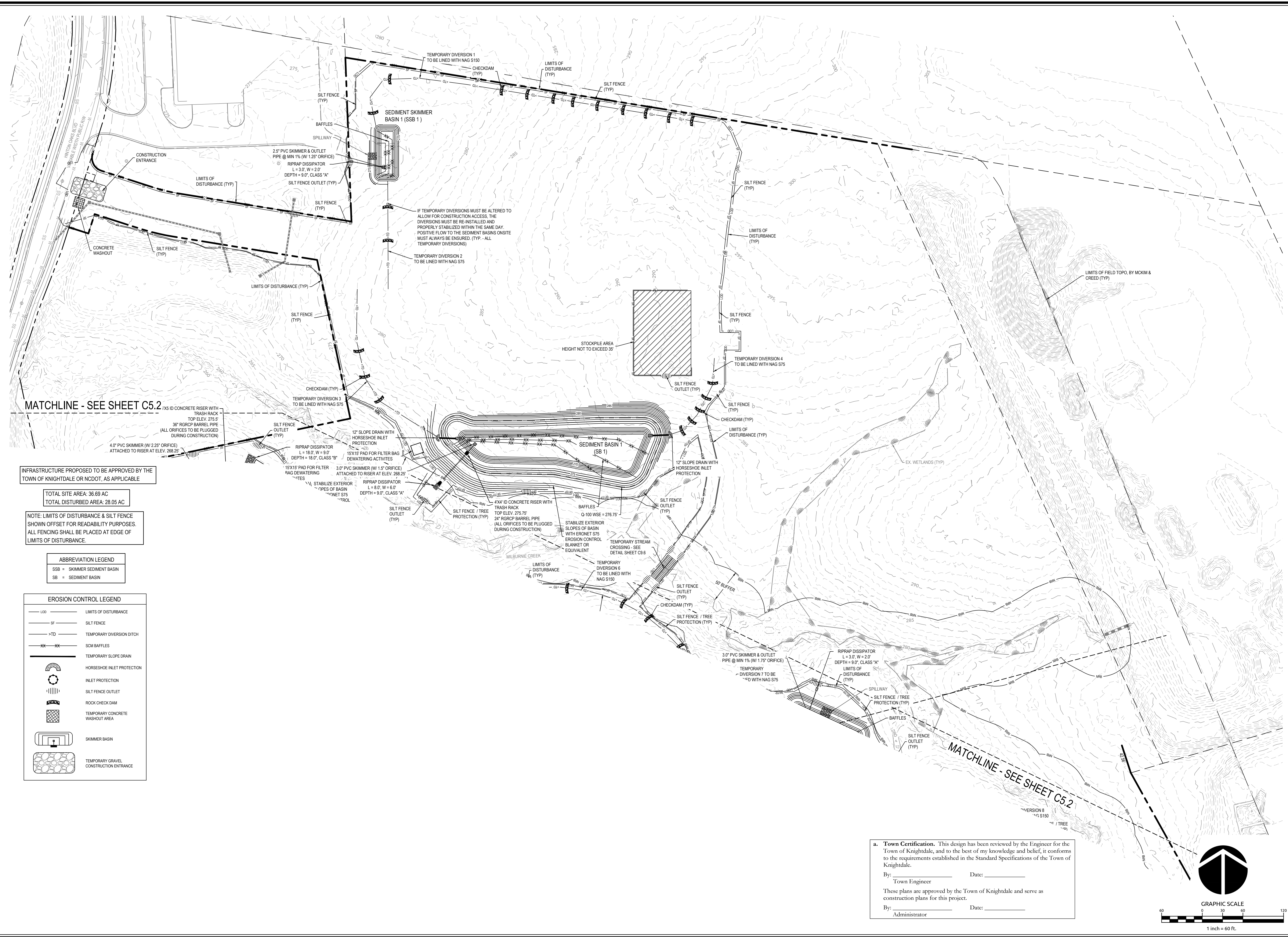


Job No. 09190080.00 Drawn By WR  
Date 09/15/2020 Designer WR



**Revisions**

9	SIGNATURE SUBMITTAL	8/27/21
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16	LOT A REVISION SIGNATURE SUBMITTAL	11/22/24



MATCHLINE - SEE SHEET C5.2

MATCHLINE - SEE SHEET C5.2

INFRASTRUCTURE PROPOSED TO BE APPROVED BY THE TOWN OF KNIGHTDALE OR NCDOT, AS APPLICABLE

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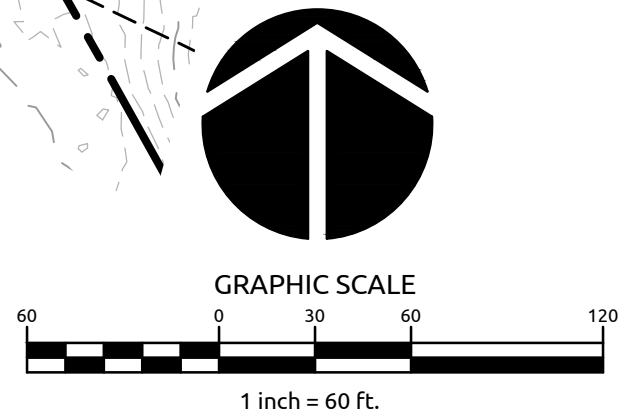
---	LIMITS OF DISTURBANCE
SF	SILT FENCE
->TD	TEMPORARY DIVERSION DITCH
XX XX	SCM BAFFLES
---	TEMPORARY SLOPE DRAIN
⌋	HORSESHOE INLET PROTECTION
⌋	INLET PROTECTION
	SILT FENCE OUTLET
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▬	TEMPORARY CONCRETE WASHOUT AREA
▭	SKIMMER BASIN
▭	TEMPORARY GRAVEL CONSTRUCTION ENTRANCE

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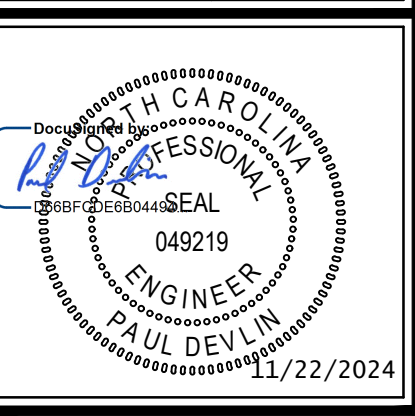
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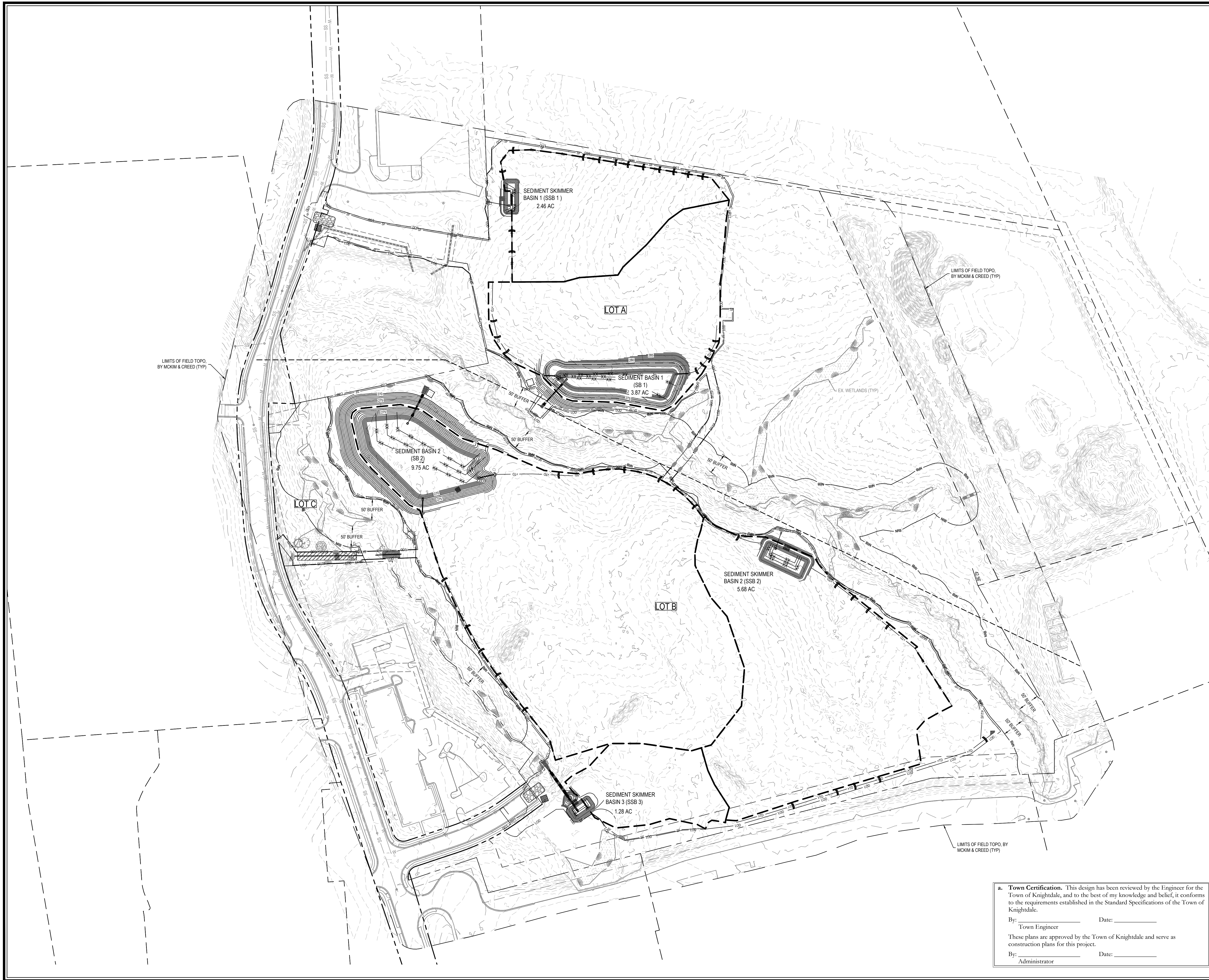
Job No. 09190080.00 Drawn By WR  
Date 09/15/2020 Designer WR



Revisions

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16	LOT A REVISION SIGNATURE SUBMITTAL	11/22/24

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**LEGEND**

--- DRAINAGE AREA BOUNDARY

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Administrator

**GRAPHIC SCALE**

0 50 100 200  
1 inch = 100 ft.

**WithersRavenel**  
Engineers | Planners

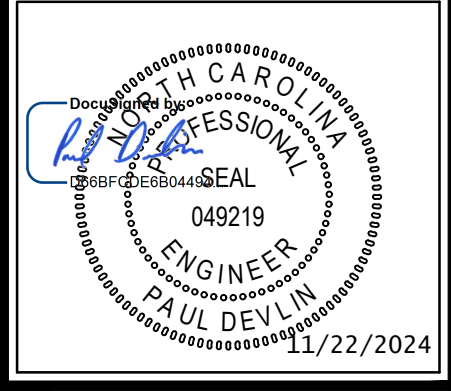
137 S Wilmington Street | Suite 200 | Raleigh, NC 27601 | T: 919.469.3340 | License #: F-1479 | www.withersravenel.com

**MERRITT MIDWAY  
BUSINESS PARK**

Knightdale, NC

**EROSION CONTROL BASIN  
DRAINAGE AREAS**

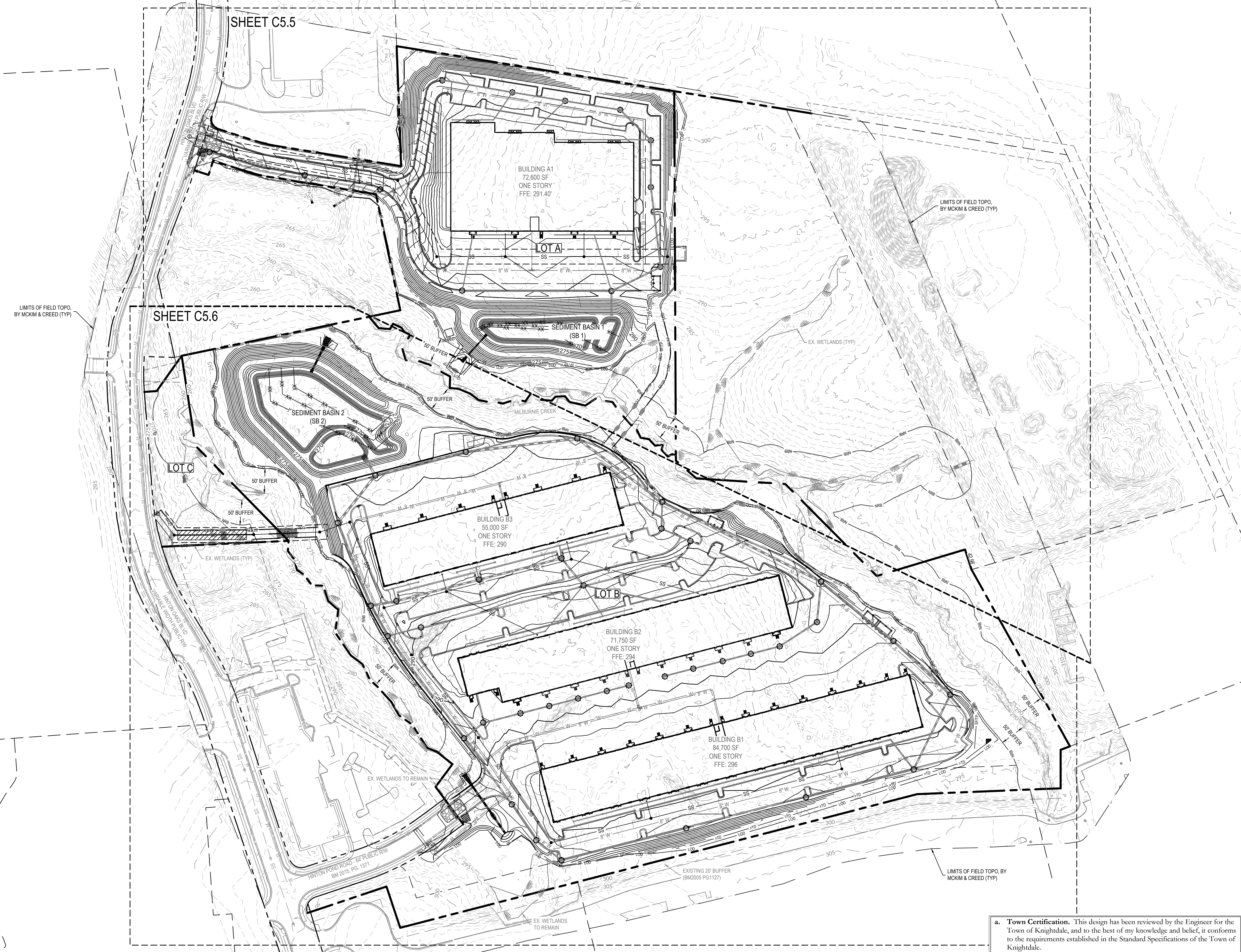
Job No.	09190080.00	Drawn By	WR
Date	09/15/2020	Designer	WR



Revisions		
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16	LOT A REVISION SIGNATURE SUBMITTAL	11/22/24

Sheet No.  
**C5.3**

U:\171-0000\150000\Asst\Hatch\0416\Bldg\GIS\Drawings\Site\Construction\CSA\OVERALL EROSION CONTROL PLAN - STAGE 2.dwg, November 22, 2024, 4:12:07 PM, TAYLOR, A.L.C.



INFRASTRUCTURE PROPOSED TO BE APPROVED BY THE TOWN OF KNIGHTDALE OR NCDOT, AS APPLICABLE

TOTAL SITE AREA: 36.69 AC  
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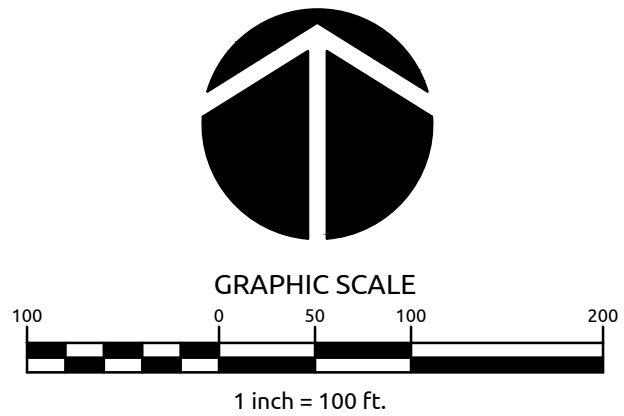
NOTE: LIMITS OF DISTURBANCE & SILT FENCE SHOWN OFFSET FOR READABILITY PURPOSES. ALL FENCING SHALL BE PLACED AT EDGE OF LIMITS OF DISTURBANCE.

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EROSION CONTROL LEGEND

---	LIMITS OF DISTURBANCE
-S-	SILT FENCE
>TD	TEMPORARY DIVERSION DITCH
XX XX	SCM BARRIERS
---	TEMPORARY SLOPE DRAIN
⌋	HORSESHOE INLET PROTECTION
⊕	INLET PROTECTION
⊖	SILT FENCE OUTLET
⌊	ROCK CHECK DAM
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⊞	SKIMMER BASIN
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Town Engineer  
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By: \_\_\_\_\_ Date: \_\_\_\_\_  
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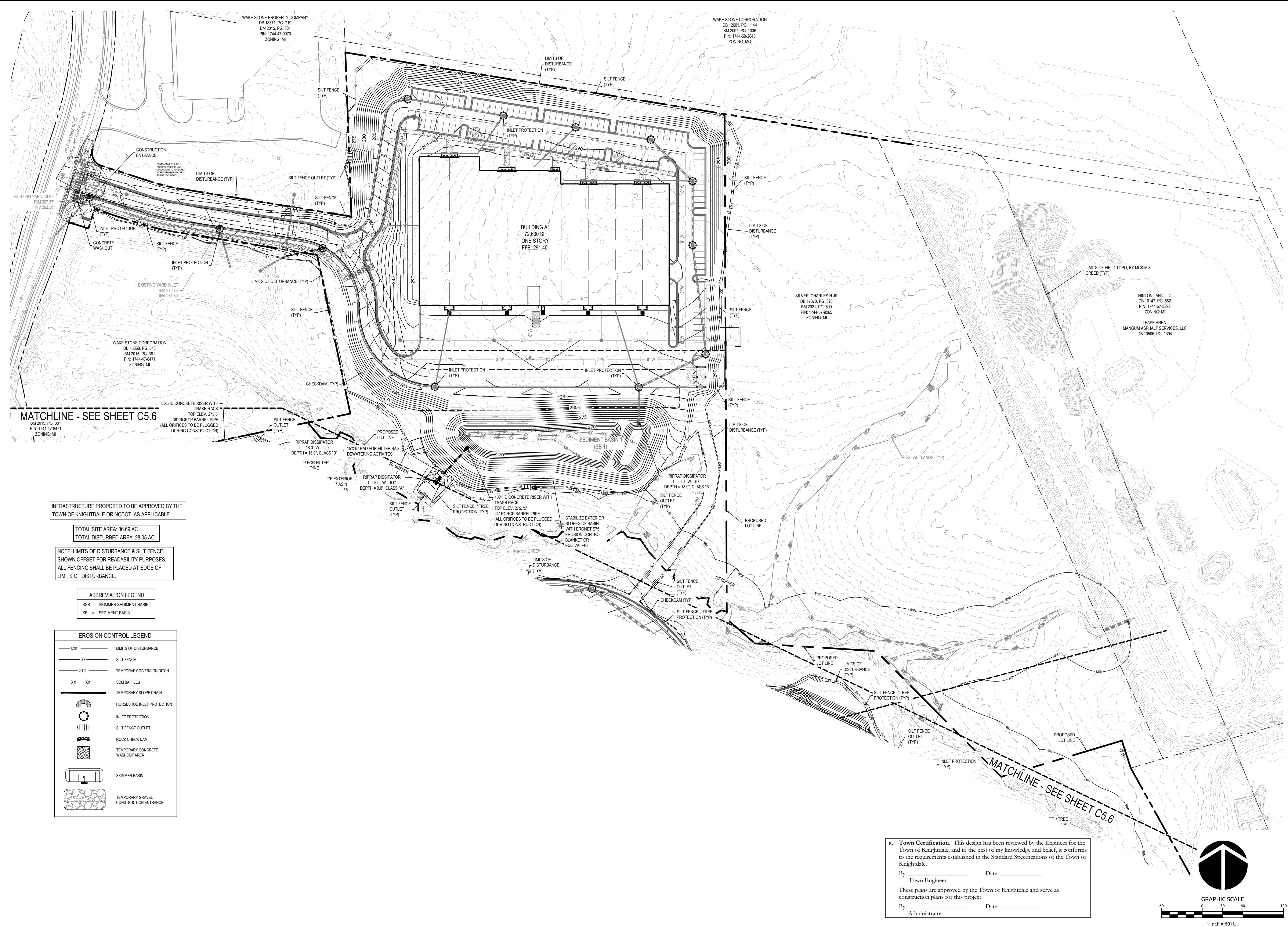


Job No. 09190080.00 Drawn By WR  
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16	LOT A REVISION SIGNATURE SUBMITTAL	11/22/24



**MATCHLINE - SEE SHEET C5.6**  
 BM 2015, PLS. 301  
 PIN: 1744-47-8471  
 ZONING: MI

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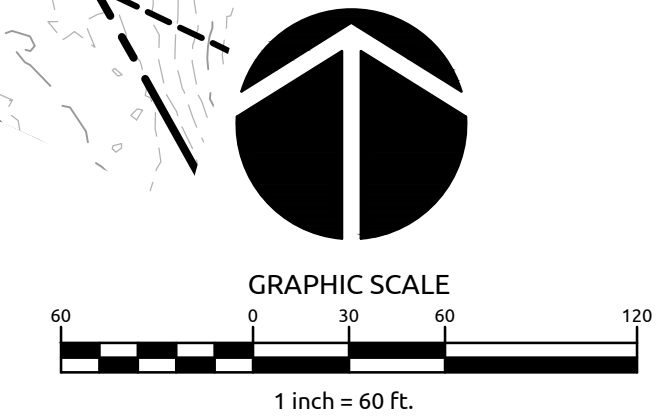
---	LIMITS OF DISTURBANCE
SF	SILT FENCE
-TD-	TEMPORARY DIVERSION DITCH
XX XX	SOM BAFFLES
---	TEMPORARY SLOPE DRAIN
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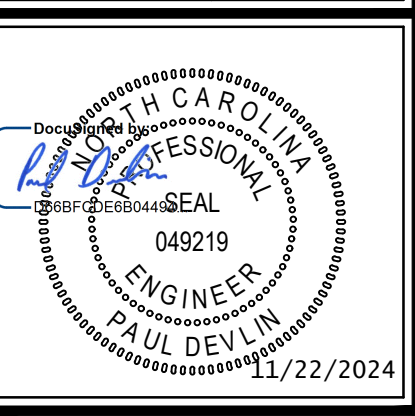
**WithersRavenel**  
 Engineers | Planners

137 S Wilmington Street | Suite 200 | Raleigh, NC 27601 | T: 919-469-3340 | License #: F-1479 | www.withersravenel.com

**MERRITT MIDWAY BUSINESS PARK**  
 Knightdale, NC

**EROSION CONTROL PLAN - STAGE 2**

Job No. 09190080.00 Drawn By WR  
 Date 09/15/2020 Designer WR

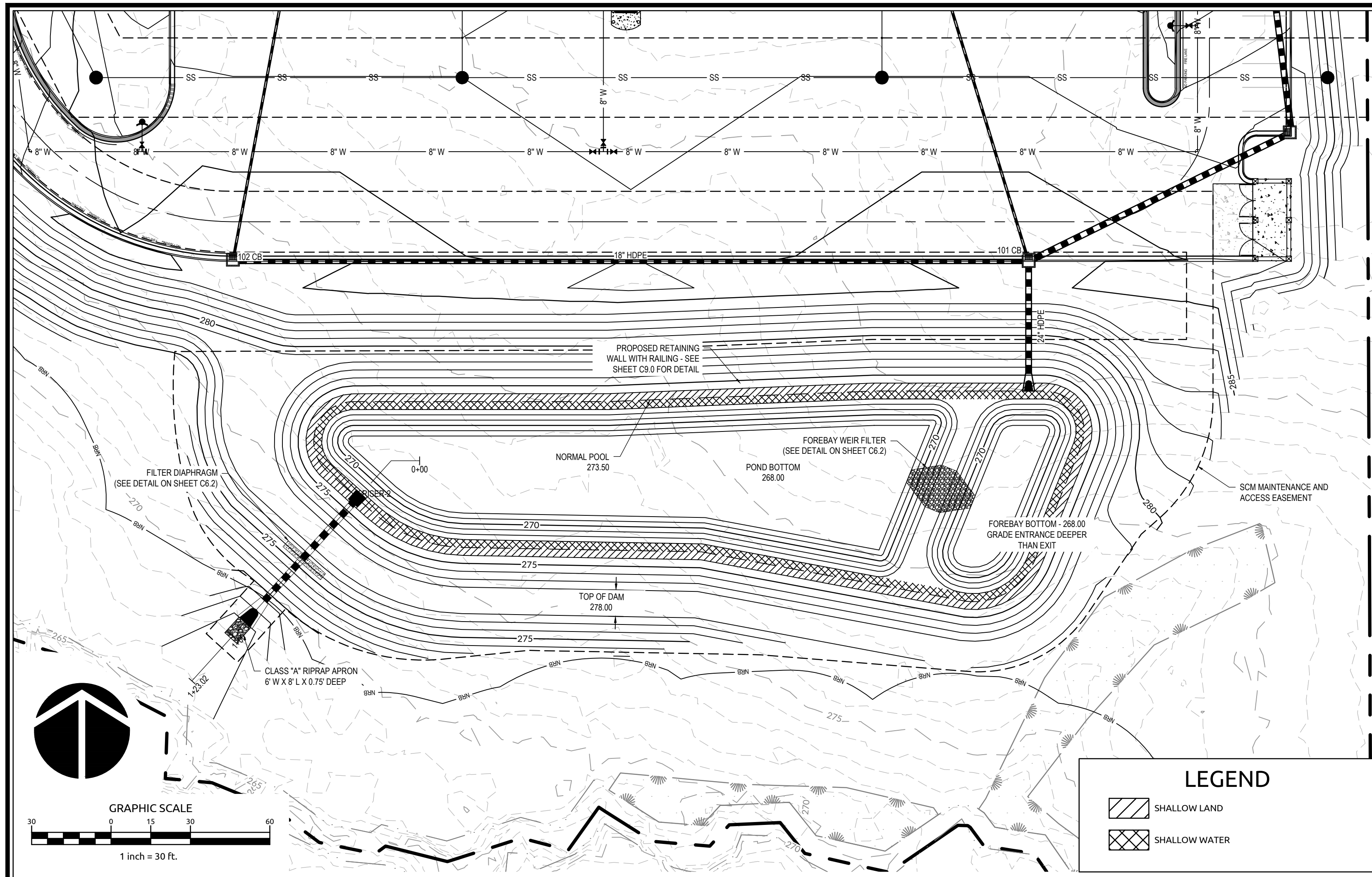


Revisions

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15	LOT A REVISION TOWN COMMENTS	10/25/24
16	LOT A REVISION SIGNATURE SUBMITTAL	11/22/24

Sheet No.  
**C5.5**





SCM #2 PLAN VIEW

- WET POND STORMWATER CONTROL MEASURE (SCM) GENERAL NOTES:**
- PRIOR TO OR DURING CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES IN THE PLANS OR SPECIFICATIONS.
  - ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE (e.g. MINIMUM DESIGN CRITERIA), AND LOCAL STANDARDS AND SPECIFICATIONS, HEREBY INCORPORATED BY REFERENCE.
  - CONTRACTOR SHALL OBTAIN A COPY OF THE SITE GEOTECHNICAL REPORT. THE REPORT AND ITS RECOMMENDATION SHALL BE PART OF THE STANDARDS AND SPECIFICATIONS FOR CONSTRUCTION OF THE SCM. UPON COMPLETION OF CONSTRUCTION, CERTIFICATION OF THE SCM BY THE GEOTECHNICAL ENGINEER WILL BE REQUIRED PRIOR TO FINAL SCM ACCEPTANCE.
  - THE GEOTECHNICAL ENGINEER SHALL EVALUATE SOILS FOR SUITABILITY FOR DAM CONSTRUCTION AND SLOPE STABILITY.
  - PRIOR TO PLACEMENT OF EMBANKMENT FILL, THE GEOTECHNICAL ENGINEER WILL SUPERVISE THE FOUNDATION PREPARATION AND APPROVE THE DEPTH AND EXTENT OF THE CUTOFF TRENCH.
  - THE DAM AND FOREBAY BERMS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE FOLLOWING SPECIFICATIONS UNLESS SUPERCEDED BY THE GEOTECHNICAL ENGINEER'S RECOMMENDATIONS.
    - BORROW MATERIALS FOR USE AS EMBANKMENT FILL SHALL BE FREE OF ORGANICS, ROOTS AND OTHER WOODY VEGETATION OR ORGANIC DEBRIS.
    - FILL MATERIALS SHALL CONSIST OF SOILS WHICH CLASSIFY AS SC, SM, CL, CL-CH AND ML IN ACCORDANCE WITH THE UNIFIED CLASSIFICATION SYSTEM OR AS APPROVED BY THE GEOTECHNICAL ENGINEER.
    - FILL MATERIALS SHALL HAVE A MAXIMUM PARTICLE SIZE OF 3 INCHES IN MEAN DIAMETER.
    - FILL SHALL BE PLACED IN 8 INCH (MAXIMUM) LOOSE LIFTS UNDER THE SUPERVISION OF THE GEOTECHNICAL ENGINEER OR THEIR REPRESENTATIVE. FILL SHALL BE BROUGHT UP BY BENCHING INTO THE EXISTING SLOPE. A MAXIMUM HEIGHT OF 2 FEET SHALL BE USED FOR EACH BENCH LIFT TAKING CARE TO REMOVE ROOT STRUCTURES AS THE FILL PROCEEDS. THE SURFACE OF EACH LIFT SHALL BE SCARIFIED PRIOR TO PLACEMENT OF THE NEXT LIFT IN ORDER TO EFFECTIVELY TIE THE FILL LIFTS TOGETHER.
    - ALL COMPACTION SHALL BE TESTED BY THE SAND CONE METHOD (ASTM D-1586) OR NUCLEAR METHOD (ASTM D-6938) AT A RATE OF AT LEAST ONE TEST PER 5,000 SF PER ONE FOOT OF COMPACTED FILL THICKNESS IN GENERAL AREA FILLS AND ONE TEST PER 50 LINEAL FEET PER LIFT ALONG THE BARREL.
    - THE MINIMUM COMPACTION SHALL BE A MINIMUM OF 95% OF THE MAXIMUM STANDARD PROCTOR DENSITY (ASTM D-698) AT MOISTURE CONTENTS VARYING FROM 2 PERCENT BELOW TO 3 PERCENT ABOVE OPTIMUM MOISTURE CONTENT DETERMINED BY STANDARD PROCTOR TEST TO WITHIN 3 FEET OF THE FINAL GRADE.
  - SUBGRADE FOR THE RISER STRUCTURE AND OUTLET PIPE SHALL BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO PLACEMENT. IF THE GEOTECHNICAL ENGINEER REQUIRES ADDITIONAL SUBGRADE PREPARATION, THE ADDITIONAL COST SHALL BE APPROVED BY THE ENGINEER PRIOR TO PLACEMENT.
  - THE OUTLET PIPE SHALL BE BEDDED IN CONCRETE FOR 2/3 OF THE PIPE LENGTH, BEGINNING AT THE RISER, AND IN 7/8 STONE FOR 1/3 OF PIPE LENGTH TO THE OUTLET. SEE DETAILS ON SHEET C6.2.
  - EMBANKMENT AND SIDE SLOPES OF THE BASIN SHALL BE STABILIZED PER SEEDING SCHEDULE ON EROSION CONTROL, DETAILS SHEET OR SODDED. SEE LANDSCAPE PLAN AND DETAILS ON SHEET L1.5 FOR FURTHER PLANTING DETAILS.
  - IF, DURING CONSTRUCTION, THE SCM IS TO BE USED AS AN EROSION CONTROL MEASURE, THE FOREBAY BERM(S) SHALL NOT BE INSTALLED DURING THE INITIAL CONSTRUCTION OR WHILE THE SCM IS USED AS AN EROSION CONTROL MEASURE.
  - THE FOREBAY BERM(S) SHALL BE CONSTRUCTED WITH THE SAME REQUIREMENTS, AND USING THE SAME METHODS AS THE DAM (SEE NOTE 5).
  - UNLESS OTHERWISE NOTED, ALL PERMANENT STRUCTURES (e.g. RISER BARREL, WEIR WALLS, ETC.) ARE TO BE INSTALLED WITH THE INITIAL DAM CONSTRUCTION.
  - PRIOR TO FINAL GRADING OF THE SCM, THE CONTRACTOR SHALL PROVIDE SUFFICIENT AS-BUILT SURVEY INFORMATION TO CONFIRM THAT THE FINISHED SCM WILL MEET THE SPECIFIC DIMENSIONAL REQUIREMENTS APPLICABLE TO THE SCM. THOSE REQUIREMENTS INCLUDE:
    - POND BOTTOM ELEVATION (MAIN POOL) = 268.0 FT
    - DRAWDOWN OVERFLOW ELEVATION (NORMAL POOL) = 273.50 FT
    - MINIMUM SURFACE AREA AT NORMAL POOL ELEVATION = 40,097 SF
    - WEIR CREST ELEVATION = N/A
    - RISER CREST ELEVATION = 275.75 FT
    - LOW POINT TOP OF EMBANKMENT (EMERGENCY SPILLWAY) = 277.00 FT
    - AVERAGE TOP OF EMBANKMENT (+/- 0.1 FT) = 278.00 FT
  - ELEVATIONS SHOULD BE WITHIN 0.1 FEET OF THE ABOVE ELEVATIONS FOR EARTHWORK, AND 0.05 FEET FOR OUTLET STRUCTURE. ALL SURFACE AREAS ARE THE MINIMUMS AREAS. REQUEST FOR A REDUCTIONS IN THE MINIMUM VALUES WILL BE CONSIDERED ON A CASE BY CASE BASIS.
  - ONCE THE PROJECT SITE HAS BEEN STABILIZED, CONTRACTOR SHALL OBTAIN APPROVAL BY EROSION CONTROL INSPECTOR IN ORDER TO REMOVE TEMPORARY EROSION CONTROL DEVICES.
    - ONCE ALL SEDIMENT AND EROSION CONTROL DEVICES HAVE BEEN REMOVED, THE SCM SHALL BE CONVERTED TO A PERMANENT SCM.

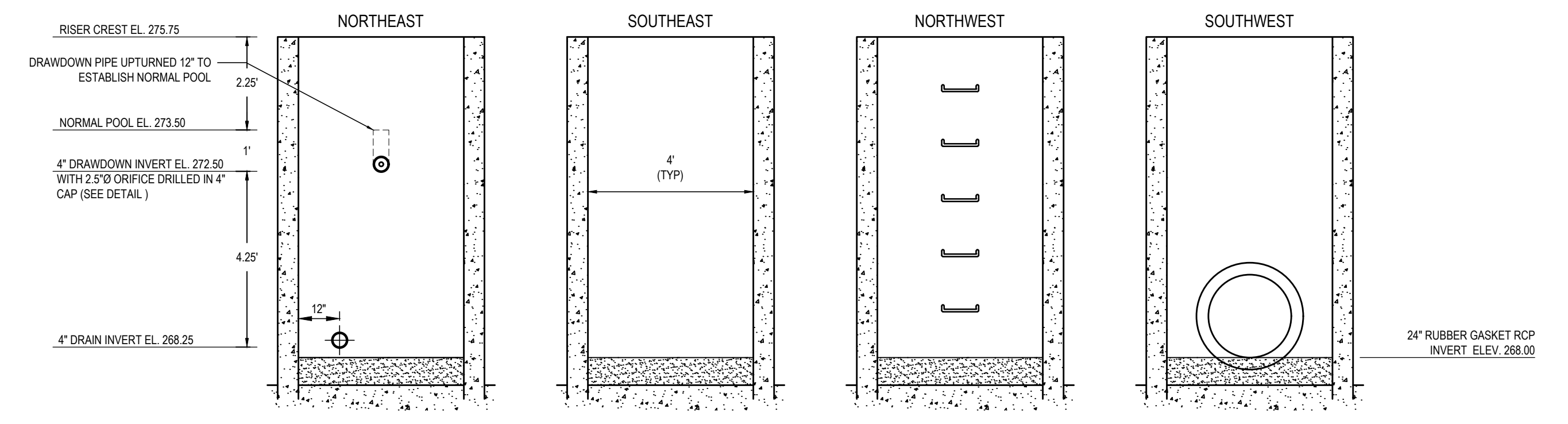
- ALL SEDIMENT SHALL BE REMOVED AND DISPOSED OF PROPERLY.
  - FOREBAY AND VEGETATED SHELF SHALL BE CONSTRUCTED AS SHOWN ON THE PLAN.
  - VEGETATED SHELF SHALL BE PLANTED PER PLANT SCHEDULE ON LANDSCAPE PLAN AND DETAILS (SEE SHEETS L1.0 AND L2.0).
- 16. FINAL CERTIFICATION OF THE SCM BY A PROFESSIONAL ENGINEER IS REQUIRED.**
- CLAY LINER SPECIFICATIONS:**
- THE CONTRACTOR SHALL INSTALL A CLAY LINER TO MAINTAIN A PERMANENT POOL AT THE DESIGN ELEVATION. IF THE SITE GEOTECHNICAL ENGINEER DETERMINES THAT THE EXISTING SITE CONDITIONS (SOIL PROPERTIES, EXISTING WATER TABLE, ETC.) INDICATE THAT NORMAL POOL CAN BE MAINTAINED WITHOUT A CLAY LINER, THE GEOTECHNICAL ENGINEER WILL PROVIDE NOTICE IN WRITING TO THE PROJECT ENGINEER THAT THE CLAY LINER IS NOT REQUIRED. IF THE CLAY LINER IS NOT INSTALLED, THE OWNER SHALL RECEIVE A CREDIT FOR THE DELETION OF THE LINER.
- AT A MINIMUM, THE CLAY LINER MATERIAL FOR THE WET POND SHALL MEET THE FOLLOWING SPECIFICATIONS:
- UNIFIED SOIL CLASSIFICATION SYSTEM DESIGNATION OF CL, CH, ML, OR SC
  - MINIMUM OF 40% PASSING #200 SIEVE
  - MINIMUM PLASTICITY INDEX OF 12
  - MAXIMUM PERMEABILITY OF  $1 \times 10^{-10}$  cm/sec
  - A MINIMUM OF 2 TESTS OF EACH ABOVE PARAMETER SHALL BE PROVIDED FROM AN APPROVED LABORATORY ON THE LINER MATERIAL AND PRESENTED TO THE ENGINEER FOR APPROVAL PRIOR TO PLACEMENT OF THE MATERIAL.
  - COMPACTION TO A MINIMUM OF 95% OF THE MAXIMUM STANDARD PROCTOR DENSITY (ASTM D-698), AND WITHIN 3% OF THE OPTIMUM MOISTURE CONTENT (MINIMUM OF 1 COMPACTION DENSITY TEST PER 2500 SQUARE FEET).
  - AN IN-PLACE MAXIMUM INFILTRATION RATE OF 0.01 INCHES PER HOUR.
  - RECOMMENDATIONS OF THE SITE GEOTECHNICAL ENGINEER MAY SUPERCEDE THE ABOVE SPECIFICATIONS.
- THE CLAY LINER SHALL BE PLACED UNDER THE BOTTOM OF THE SCM PERMANENT POOL TO A MINIMUM THICKNESS OF 8 INCHES. A MINIMUM OF 4 INCHES OF TOPSOIL SHALL BE PLACED ABOVE THE CLAY LINER TO THE FINISHED GRADE AT THE VEGETATED SHELF AS SHOWN ON THE DRAWINGS AND/OR DETAILS. CARE SHALL BE TAKEN WHEN PLACING THE TOPSOIL SO AS TO DAMAGE THE CLAY LINER. A CLAYSOIL, NO ORGANICS, MIXTURE MAY BE USED IF THE ABOVE SPECIFICATIONS ARE SATISFIED AND WITH WRITTEN APPROVAL BY THE GEOTECHNICAL ENGINEER.
- PRECAST CONCRETE MATERIALS NOTES:**
- ALL PRECAST CONCRETE STRUCTURES SHALL CONFORM TO ASTM C913 (RECTANGULAR) OR C478 (ROUND).
  - ALL REINFORCED CONCRETE PIPE SHALL CONFORM TO ASTM C76, CLASS III (UNLESS OTHERWISE NOTED).
    - O-RING JOINTS (RGRC) SHALL CONFORM TO ASTM C43 & ASTM C361.
    - NON O-RING JOINTS (RCP) SHALL CONFORM TO ASTM C990
- ADDITIONAL REQUIREMENTS**
- SCMS MUST BE LOCATED WITHIN COMMON OPEN SPACE, AND WITHIN AN ACCESS AND MAINTENANCE EASEMENT.
  - AN OPERATIONS AND MAINTENANCE MANUAL AND MAINTENANCE AGREEMENT SHALL BE PREPARED AND PROVIDED TO THE OWNER. ADDITIONAL REQUIREMENTS (e.g. RECORDATION OF EASEMENTS, AGREEMENTS, ETC.) MAY APPLY.

**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.

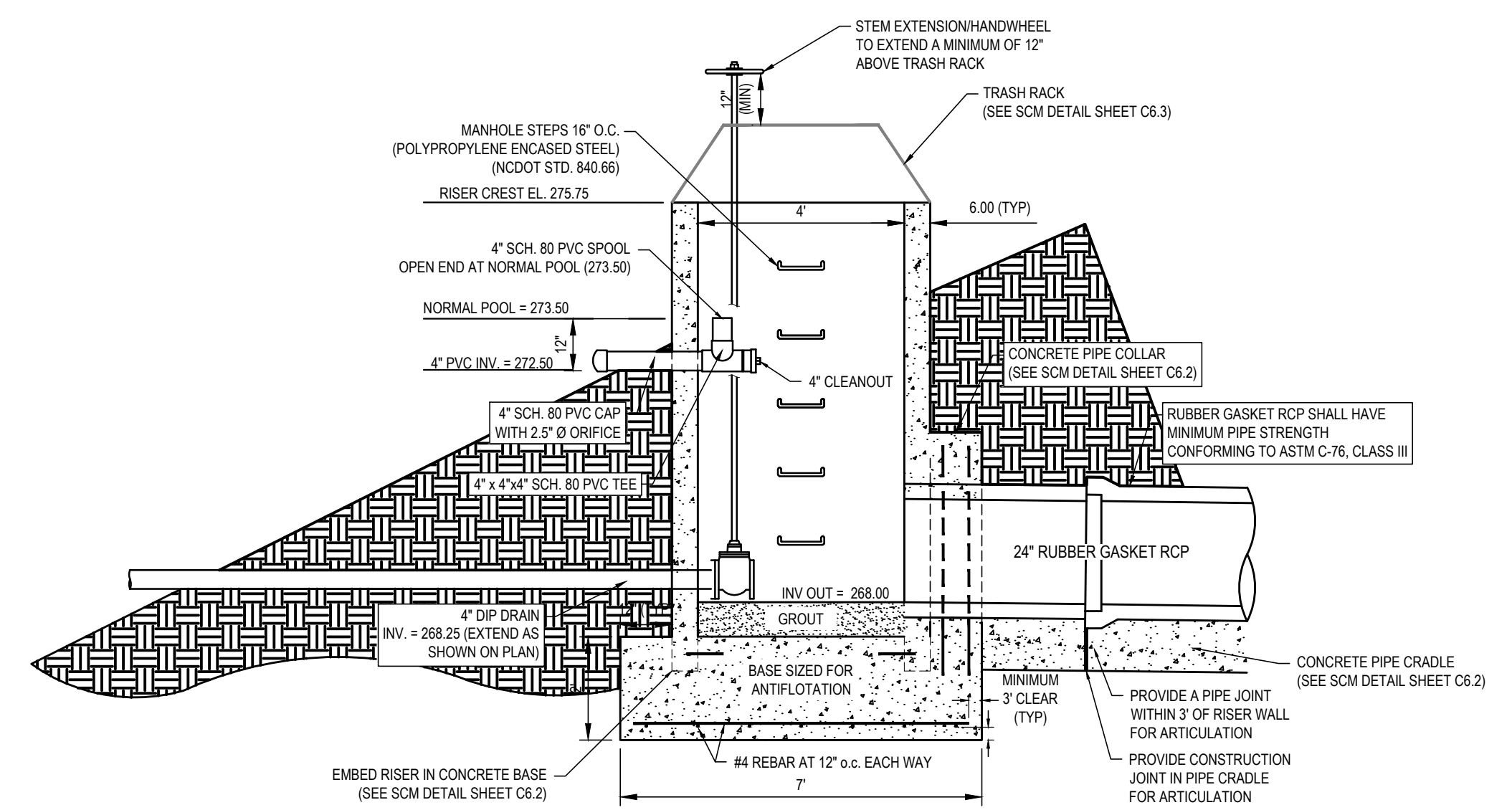
By: \_\_\_\_\_ Date: \_\_\_\_\_  
Town Engineer

These plans are approved by the Town of Knightdale and serve as construction plans for this project.

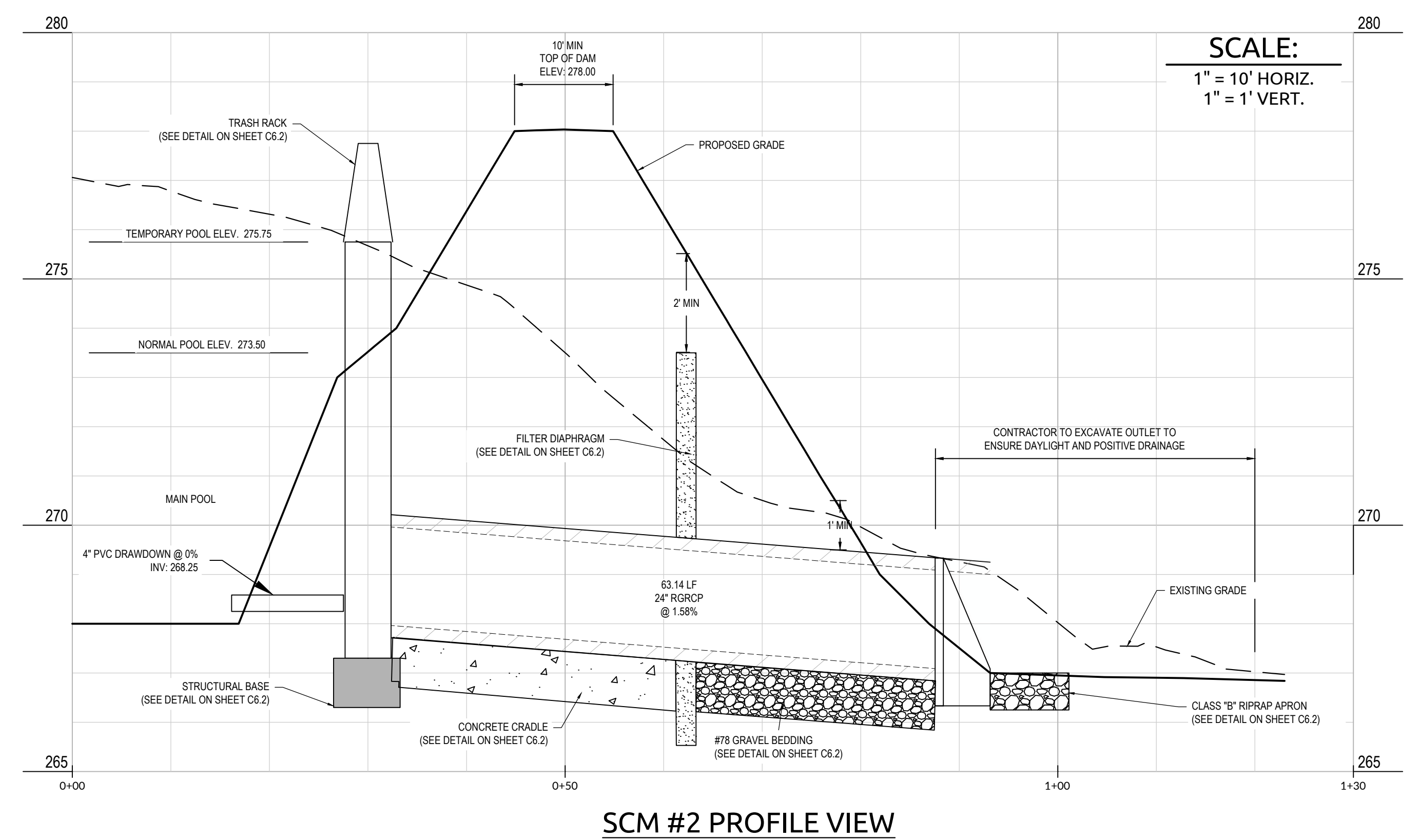
By: \_\_\_\_\_ Date: \_\_\_\_\_  
Administrator



RISER 2 WALL ELEVATIONS

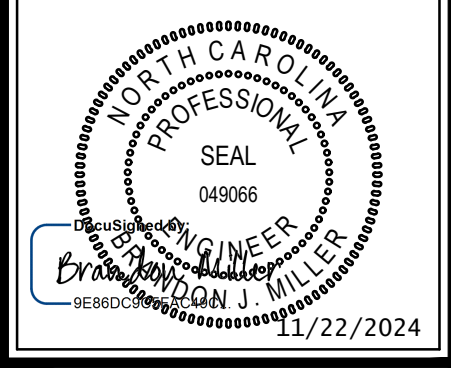


RISER 2 DRAWDOWN DEVICE DETAIL

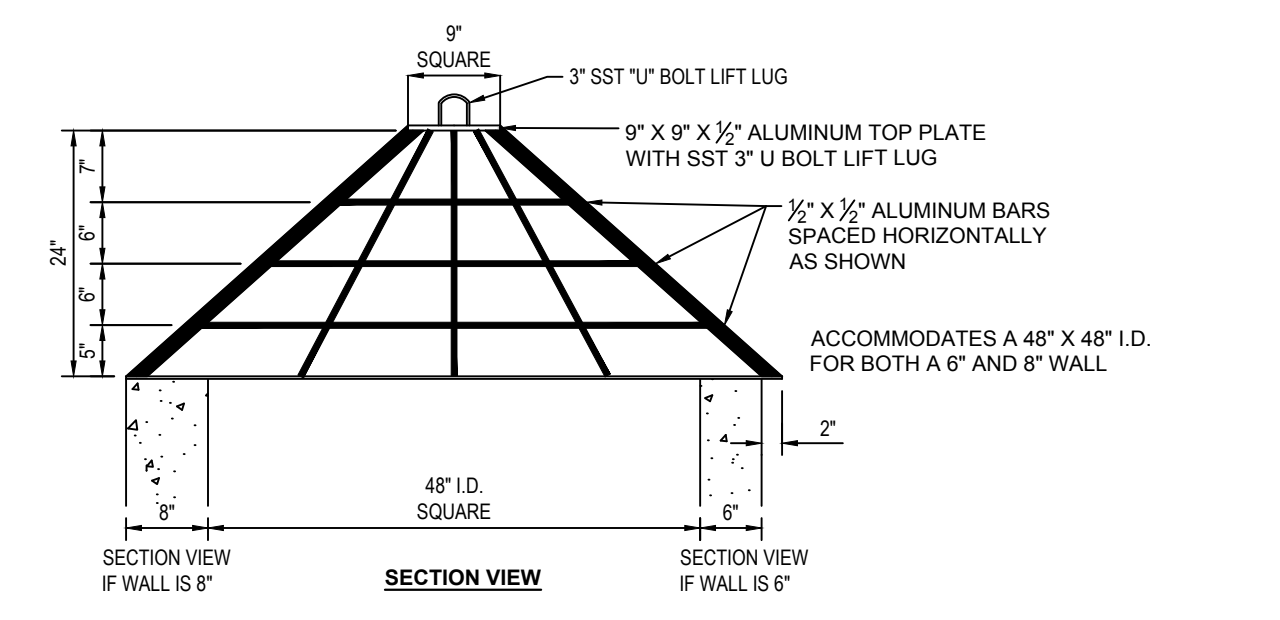
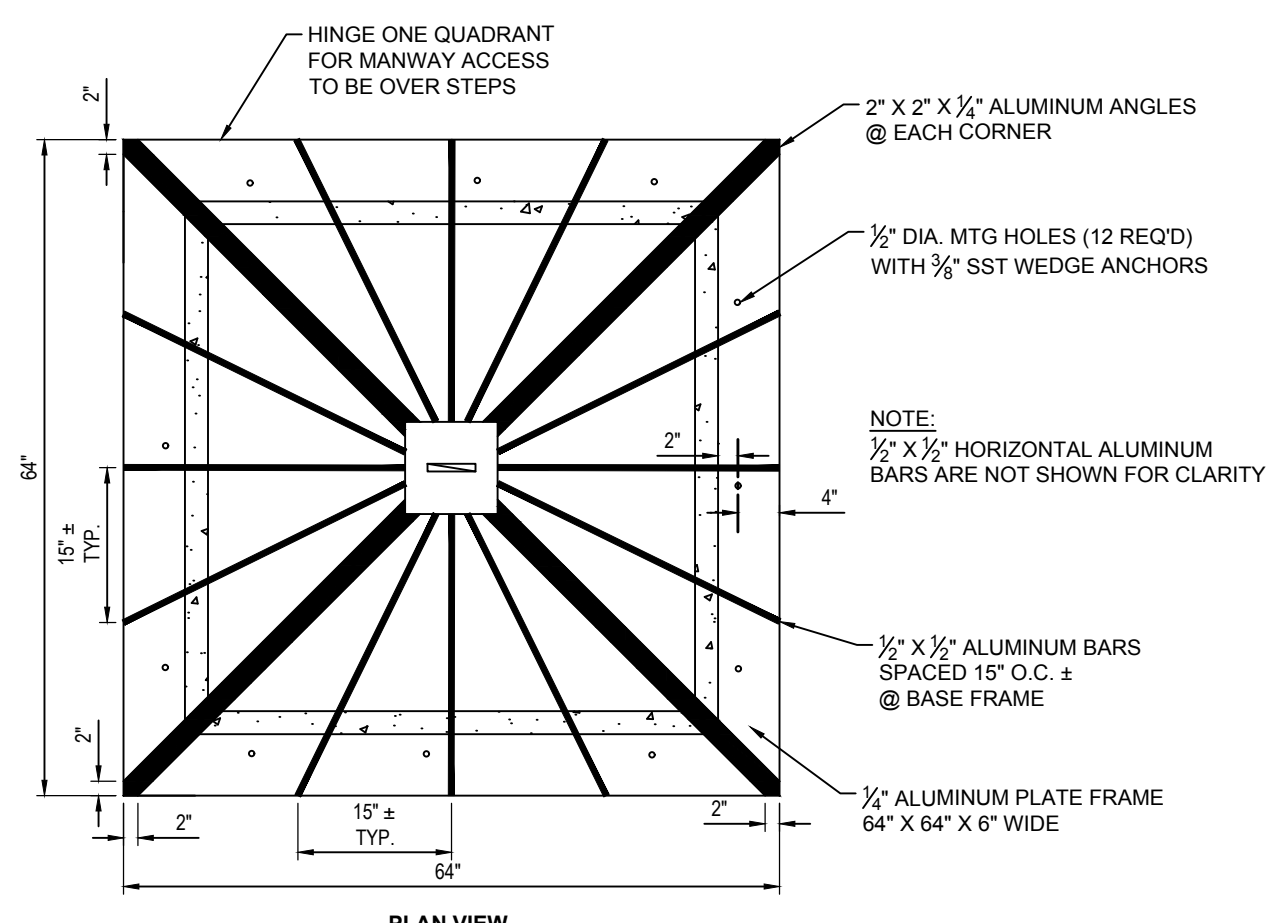


SCM #2 PROFILE VIEW

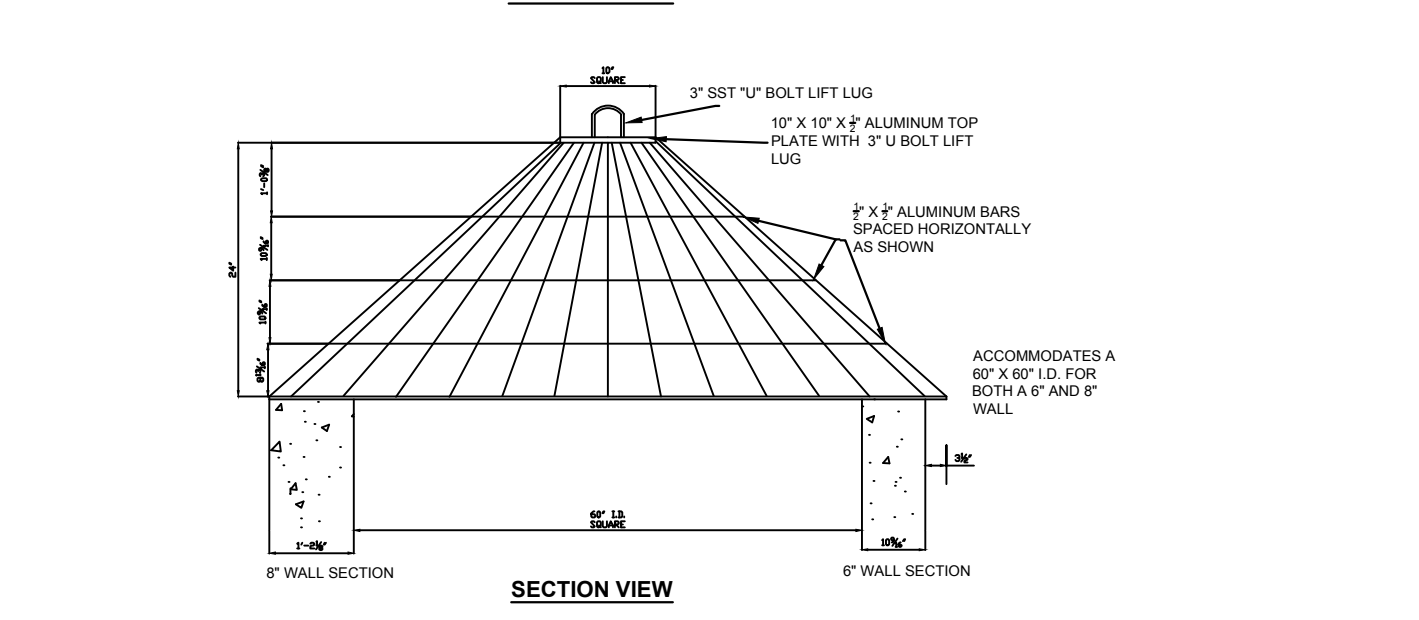
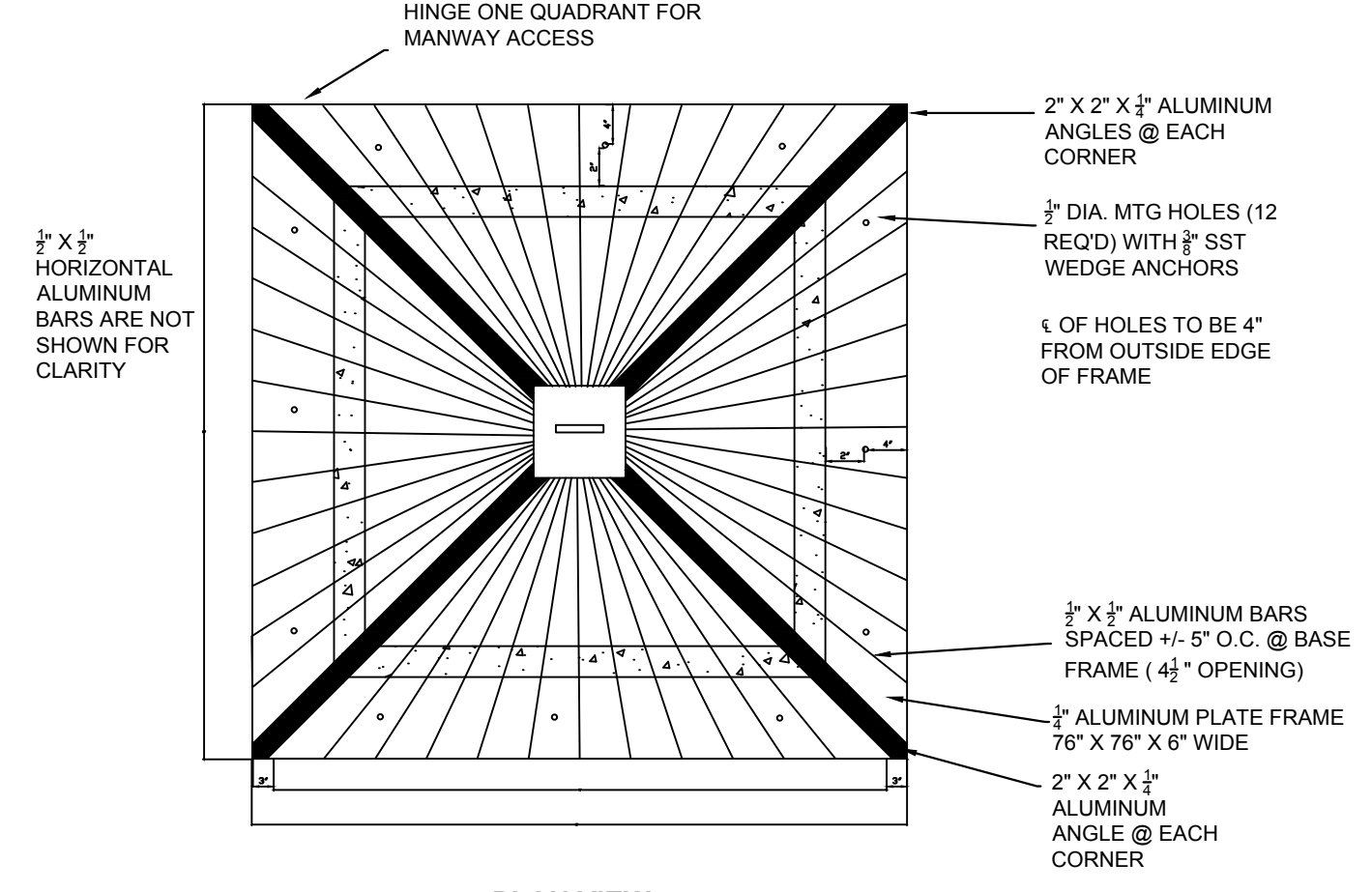
Job No. 09190080.00 Drawn By WR  
Date 09/15/2020 Designer WR



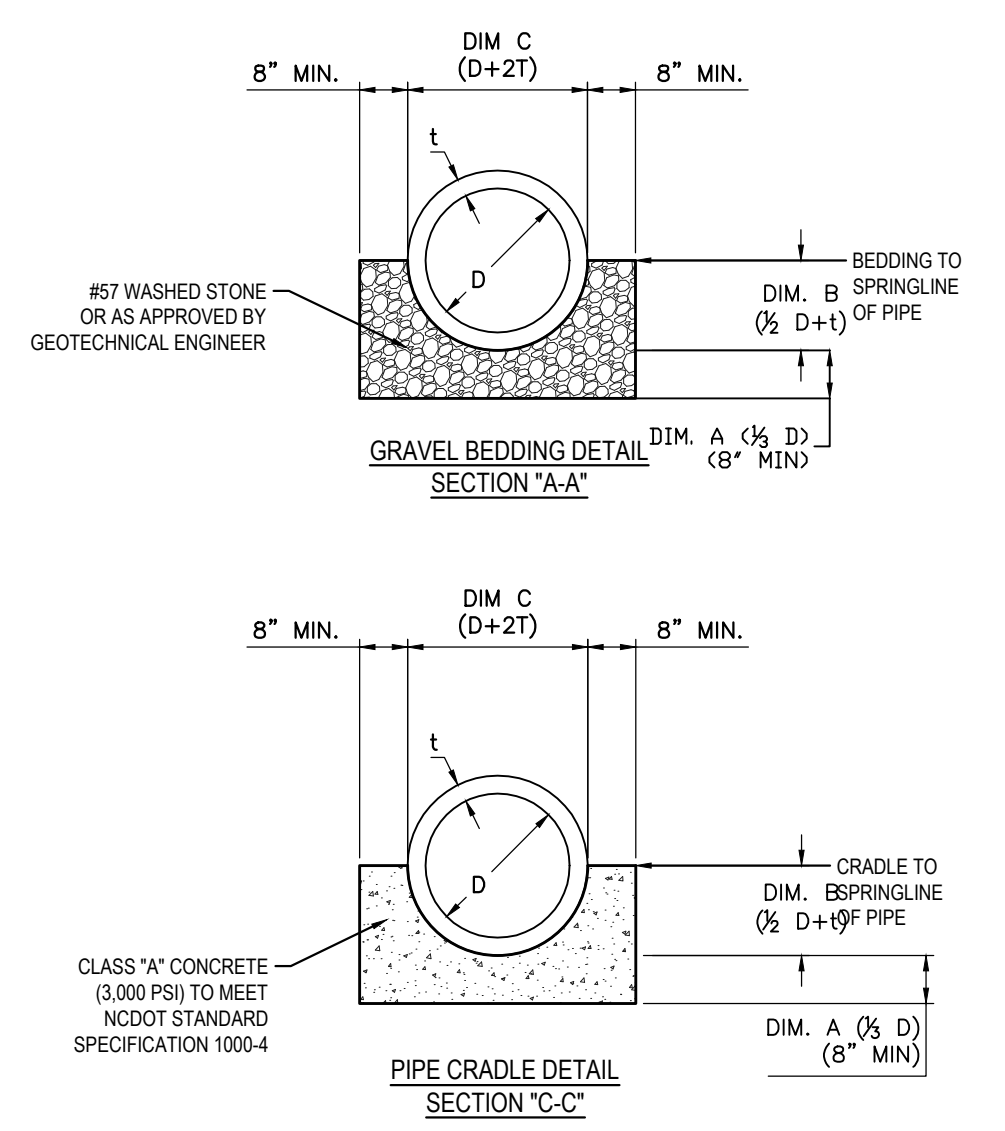
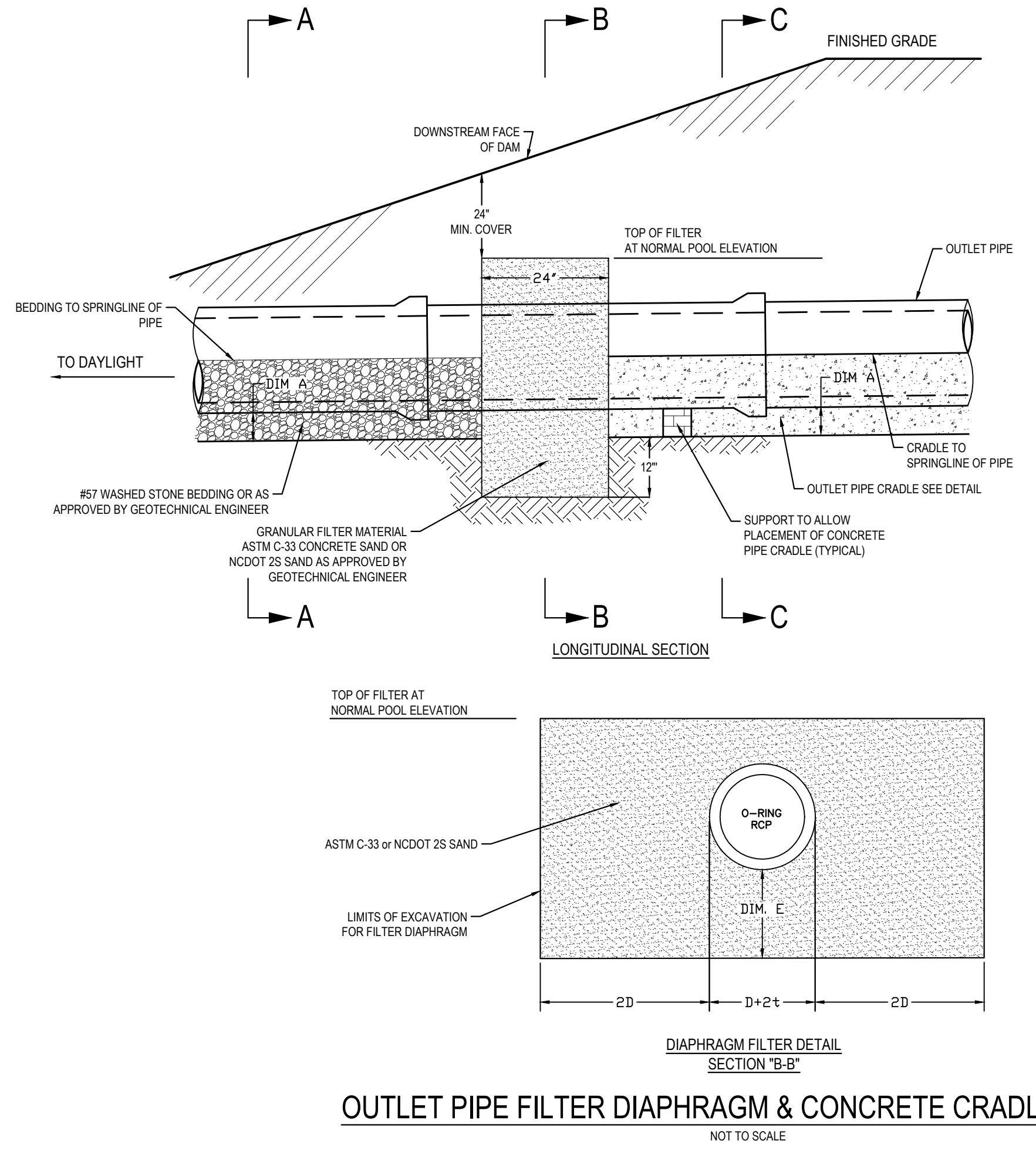
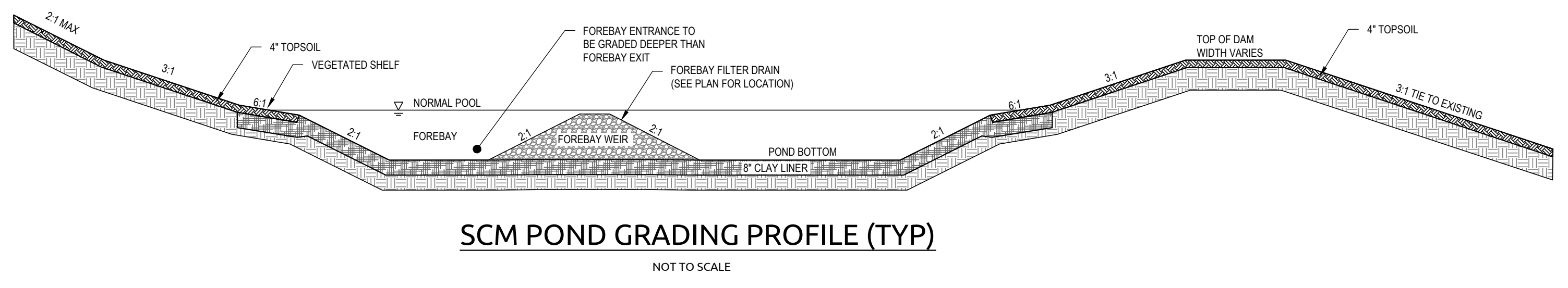
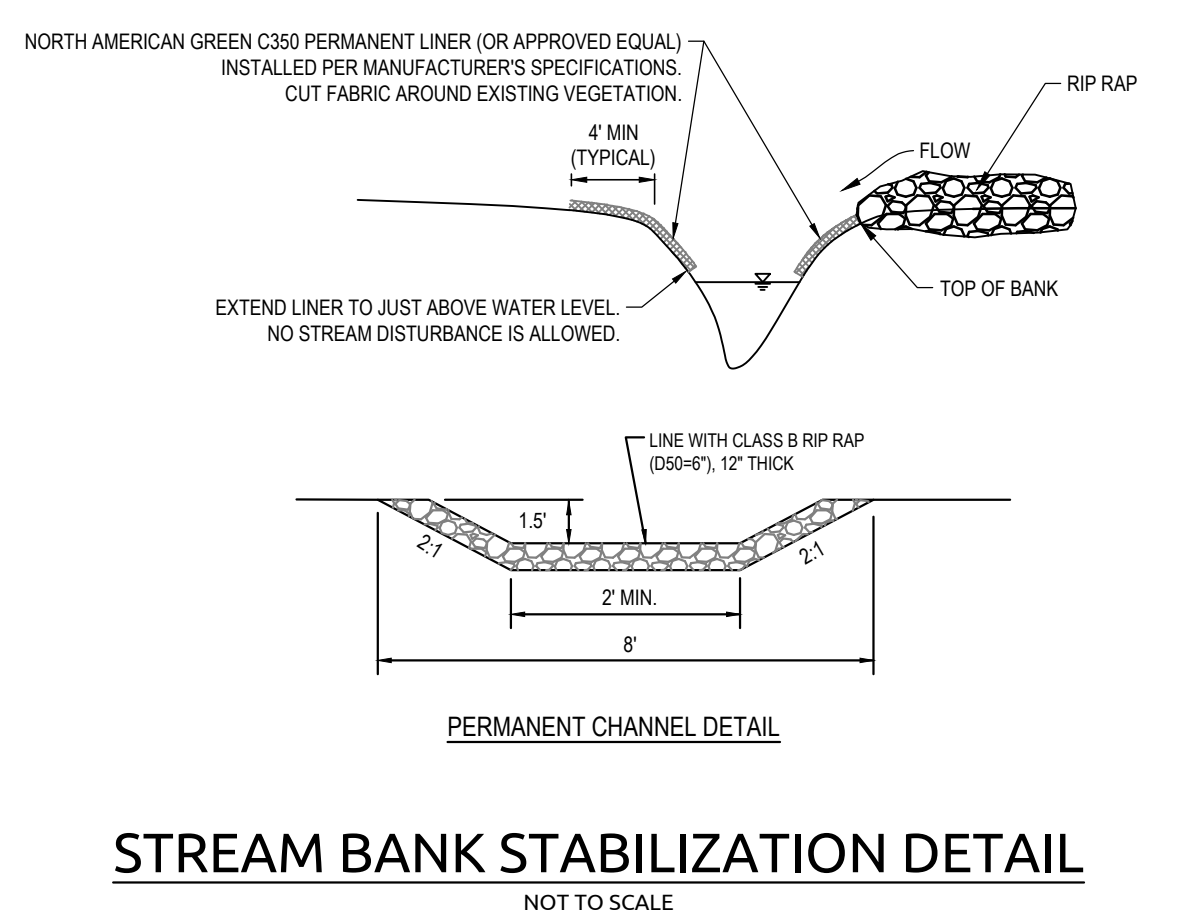
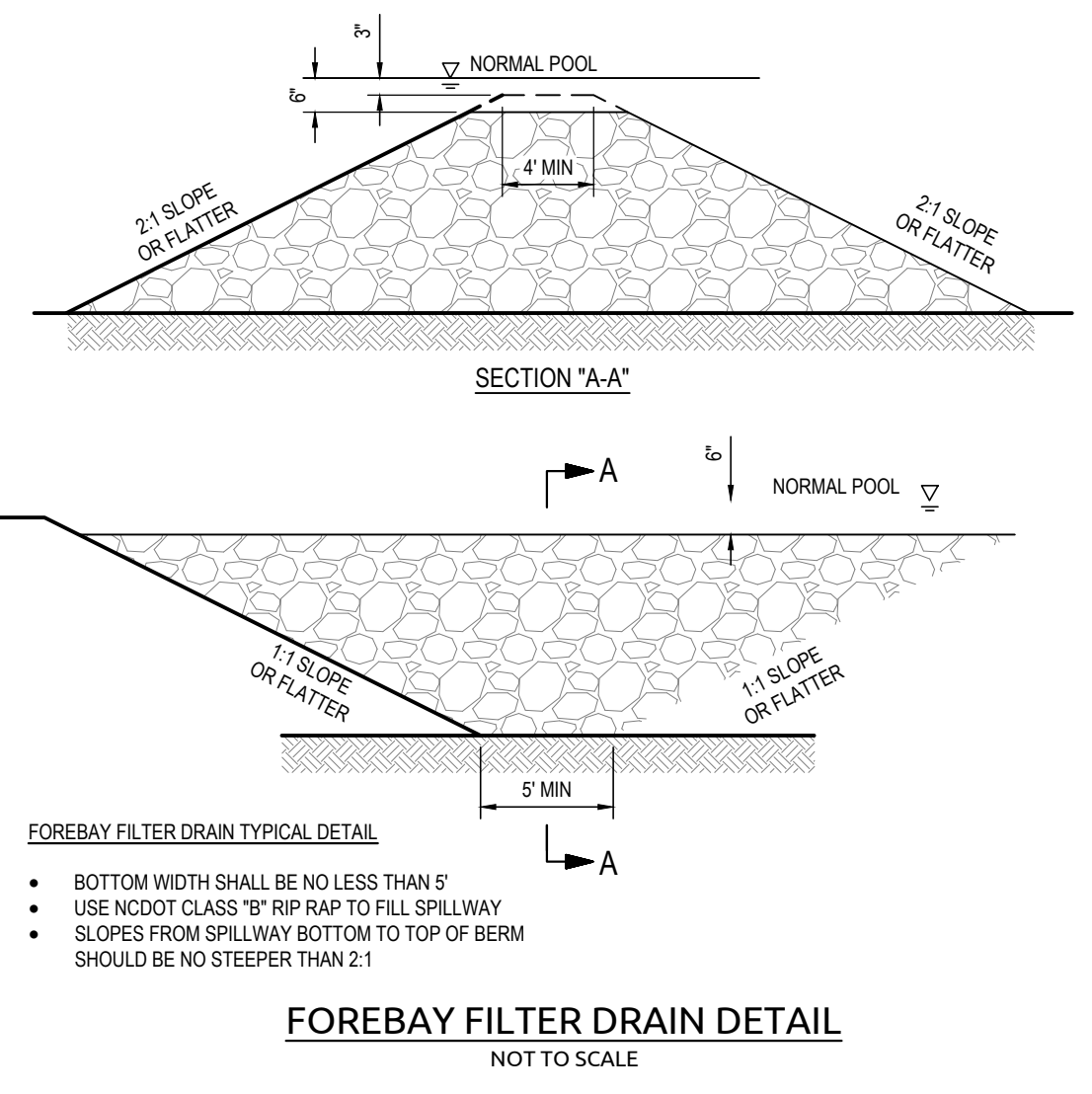
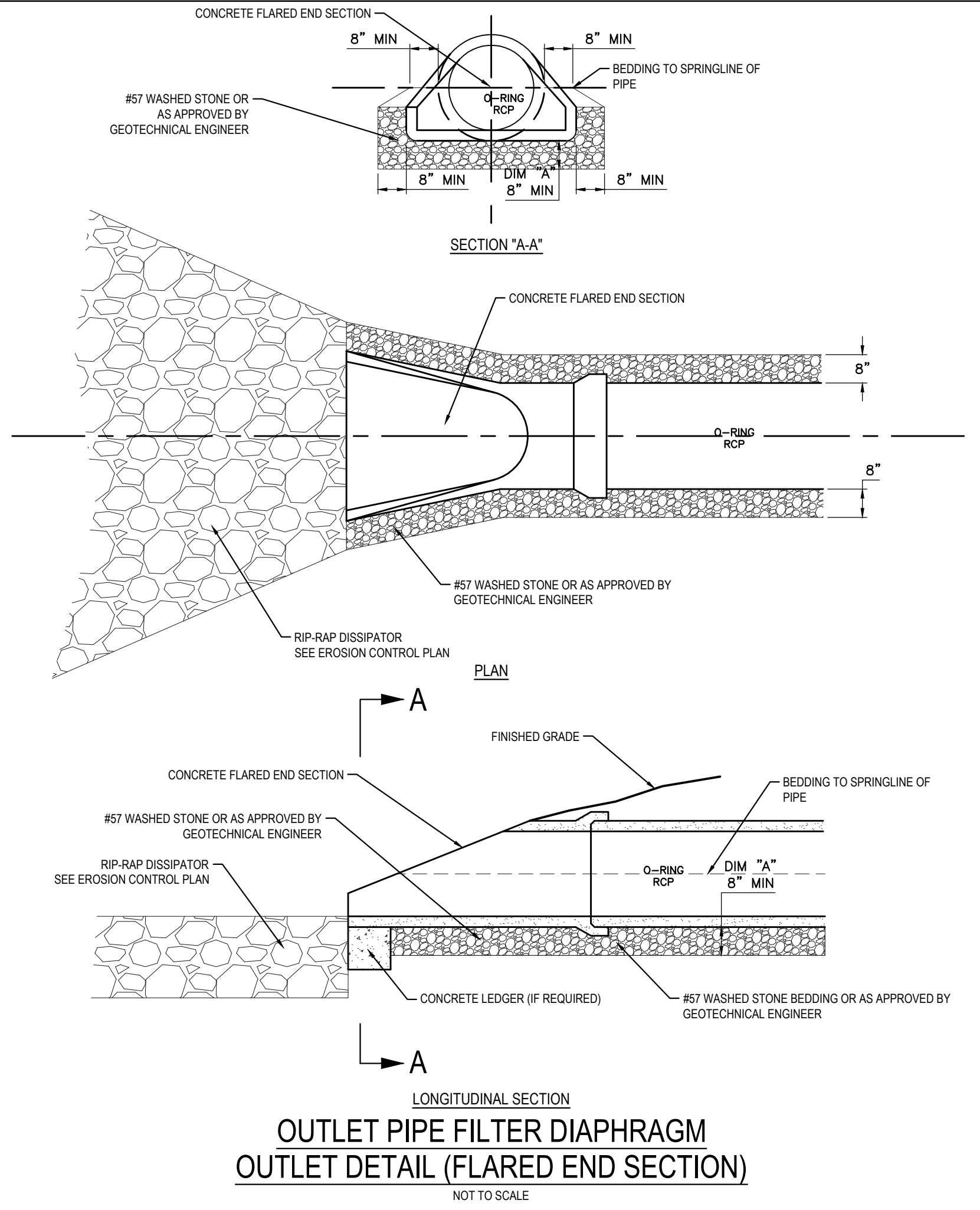
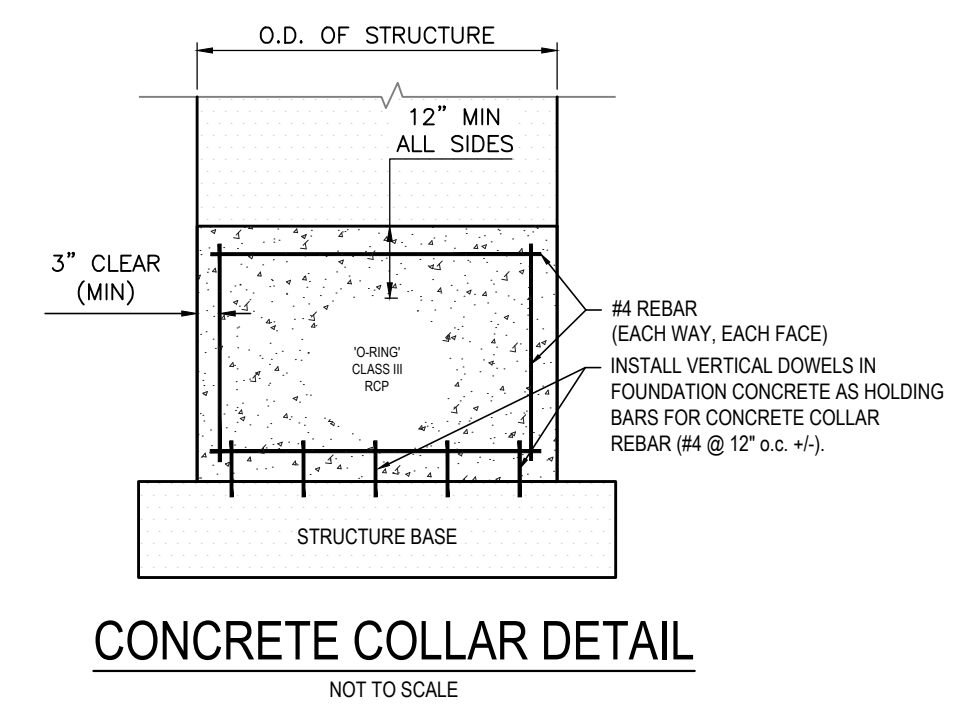
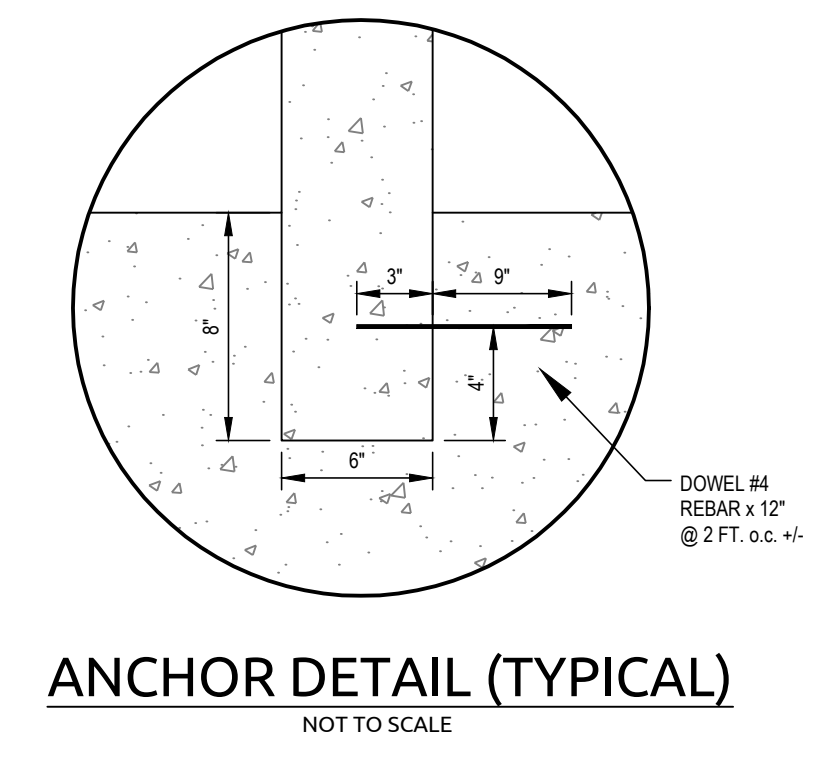
Revisions		
9	SIGNATURE SUBMITTAL	8/27/21
10	REVISION TO APPROVED PLANS	11/11/21
11	TOWN COMMENTS	12/22/21
12	LOT A SINGLE BUILDING REVISION	8/8/23
13	LOT A REVISION TOWN COMMENTS	9/27/23
14	LOT A BUILDING ROTATION	7/30/24
15	LOT A REVISION TOWN COMMENTS	10/25/24
16	LOT A REVISION SIGNATURE SUBMITTAL	11/22/24



- NOTES**
- TRASH RACK DETAIL BASED ON POMONA PIPE PRODUCTS "STANDARD ALUMINUM BAR & ANGLE PEAKED ROOF TRASH RACK WITH ONE QUADRANT HINGED FOR MANWAY ACCESS TO FIT 48"X48" I.D. CONCRETE RISER WITH 6" OR 8" THICK WALLS".
  - TRASH RACK TO BE POWDER-COATED BLACK.



- NOTES**
- TRASH RACK DETAIL BASED ON POMONA PIPE PRODUCTS "STANDARD ALUMINUM BAR & ANGLE PEAKED ROOF TRASH RACK WITH ONE QUADRANT HINGED FOR MANWAY ACCESS TO FIT 60"X60" I.D. CONCRETE RISER WITH 6" OR 8" THICK WALLS".
  - TRASH RACK TO BE POWDER-COATED BLACK.



NOMINAL PIPE SIZE	DIM A* (1/3 D)	DIM B (1/2 D + t)	DIM C (D + 2t)	DIM D (PIPE ID)	DIM E (DIM A + 12")	DIM t (WALL)
18	8	11.5	23	18	20	2.5
24	8	15.0	30	24	20	3.0
30	10	18.5	37	30	22	3.5
36	12	22.0	44	36	24	4.0
42	14	25.5	51	42	26	4.5
48	16	29.0	58	48	28	5.0

ALL DIMENSIONS IN INCHES  
DIM A - 8" MINIMUM  
18" MINIMUM PIPE DIAMETER

Job No. 09190080.00  
Date 09/15/2020  
Drawn By WR  
Designer WR



Revisions

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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: \_\_\_\_\_  
Town Engineer

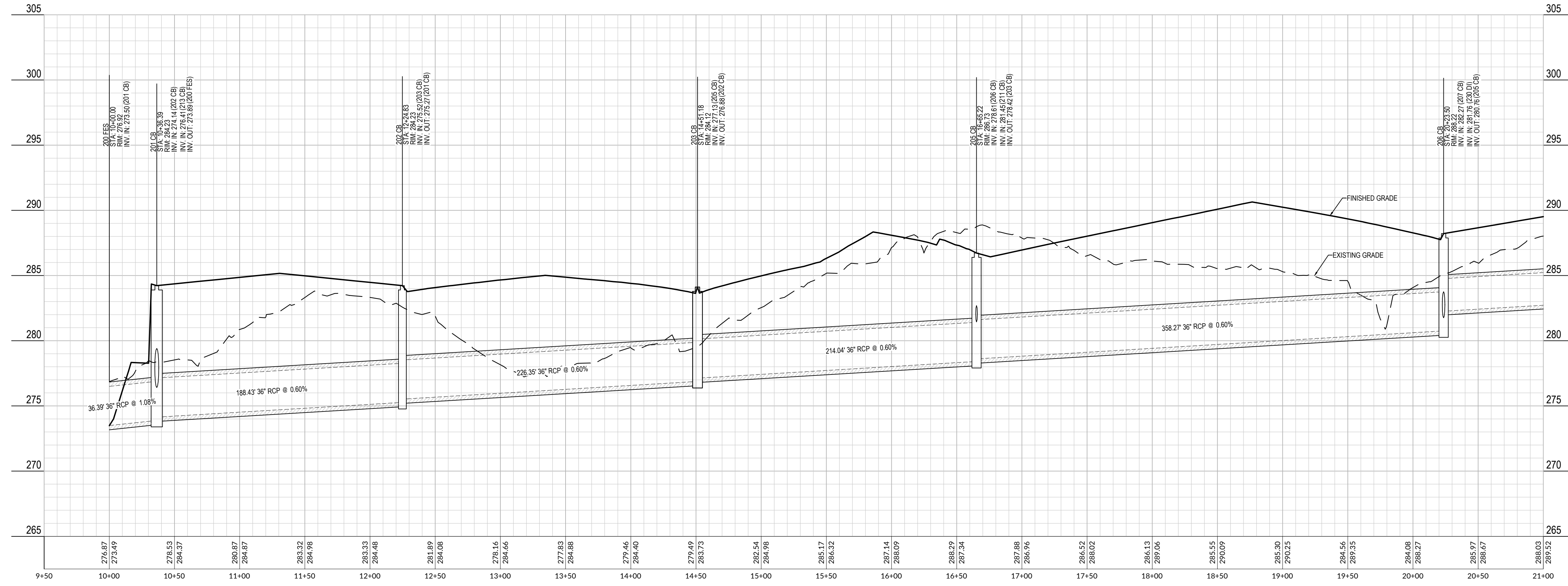
These plans are approved by the Town of Knightdale and serve as construction plans for this project.

By: \_\_\_\_\_ Date: \_\_\_\_\_  
Administrator

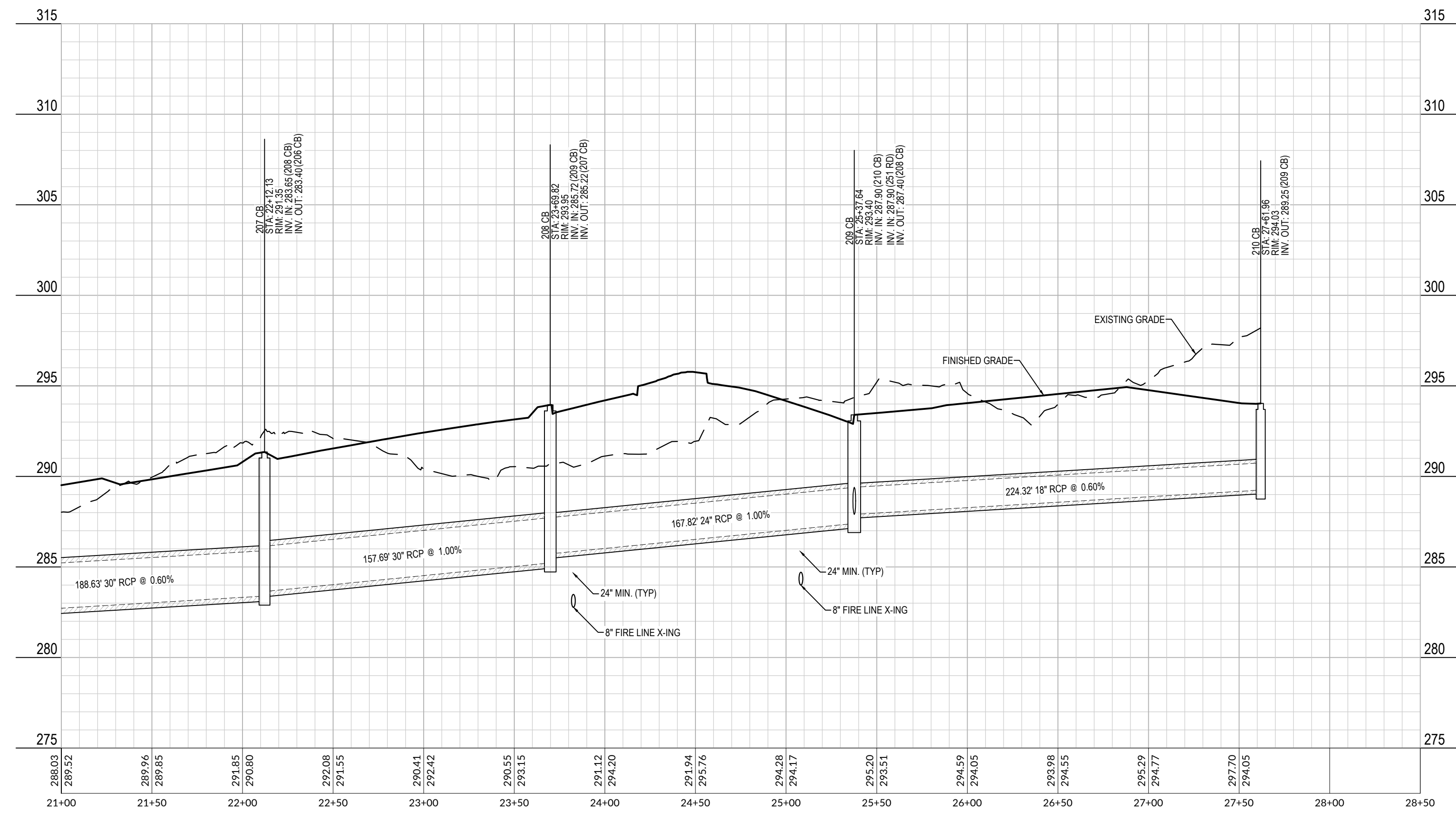


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200 FES to 256 RD



200 FES to 256 RD



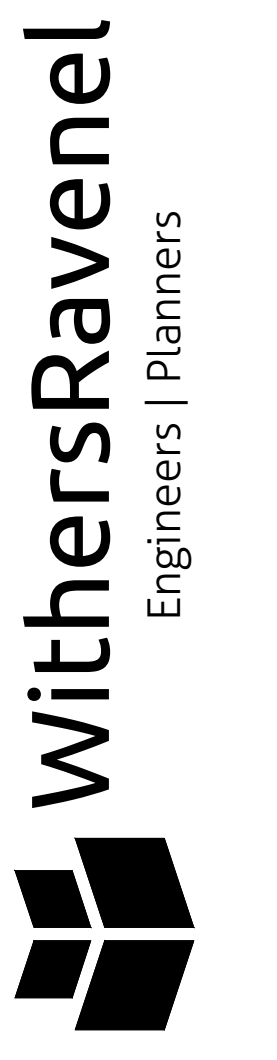
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Administrator

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



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MERRITT MIDWAY  
BUSINESS PARK  
Knightdale, NC

STORM PROFILES

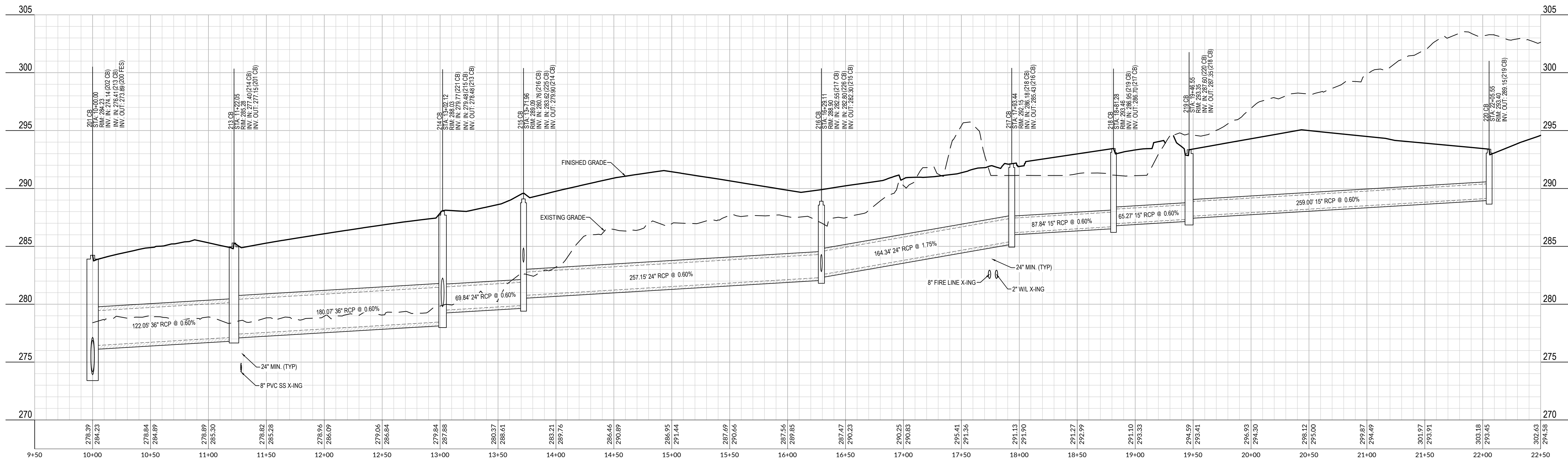
Job No. 09190080.00 Drawn By WR  
Date 09/15/2020 Designer WR



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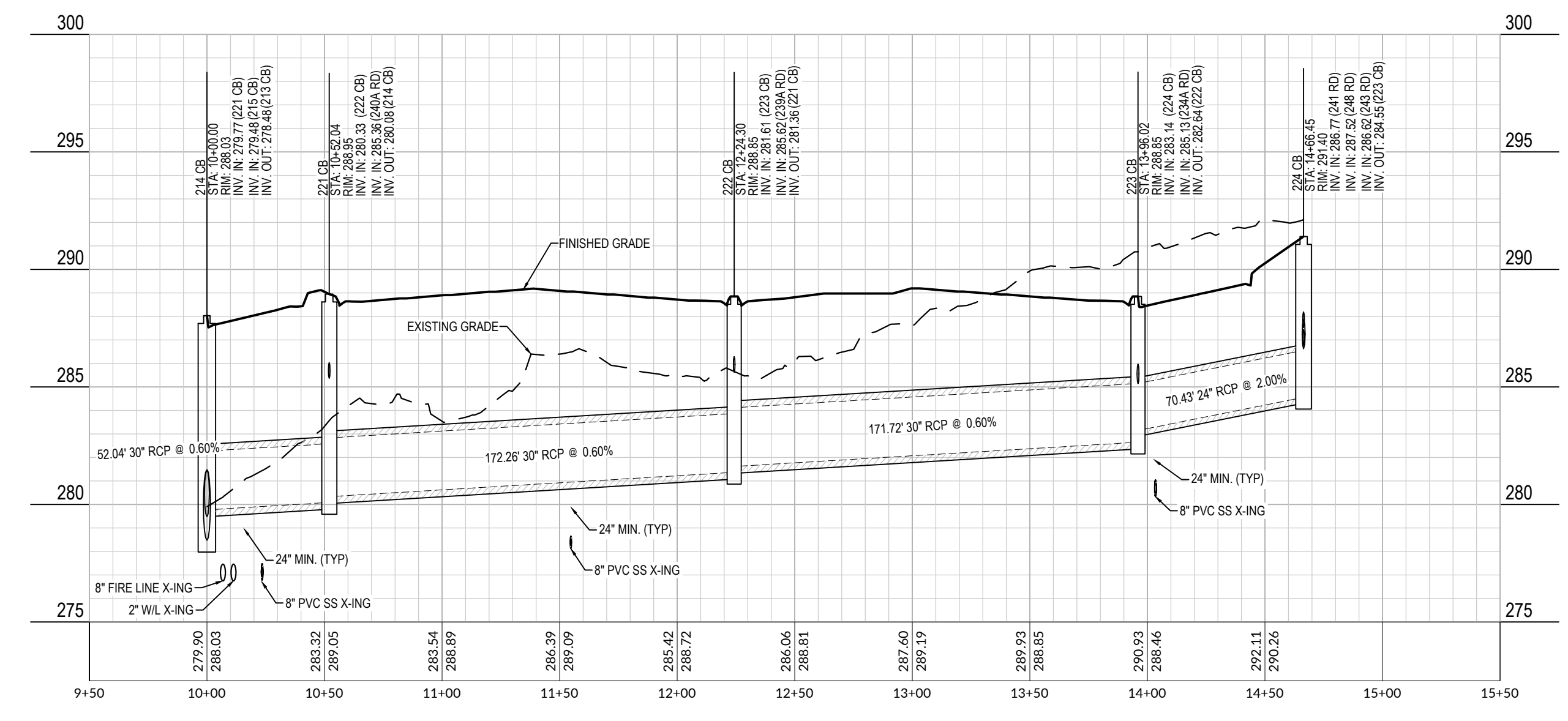
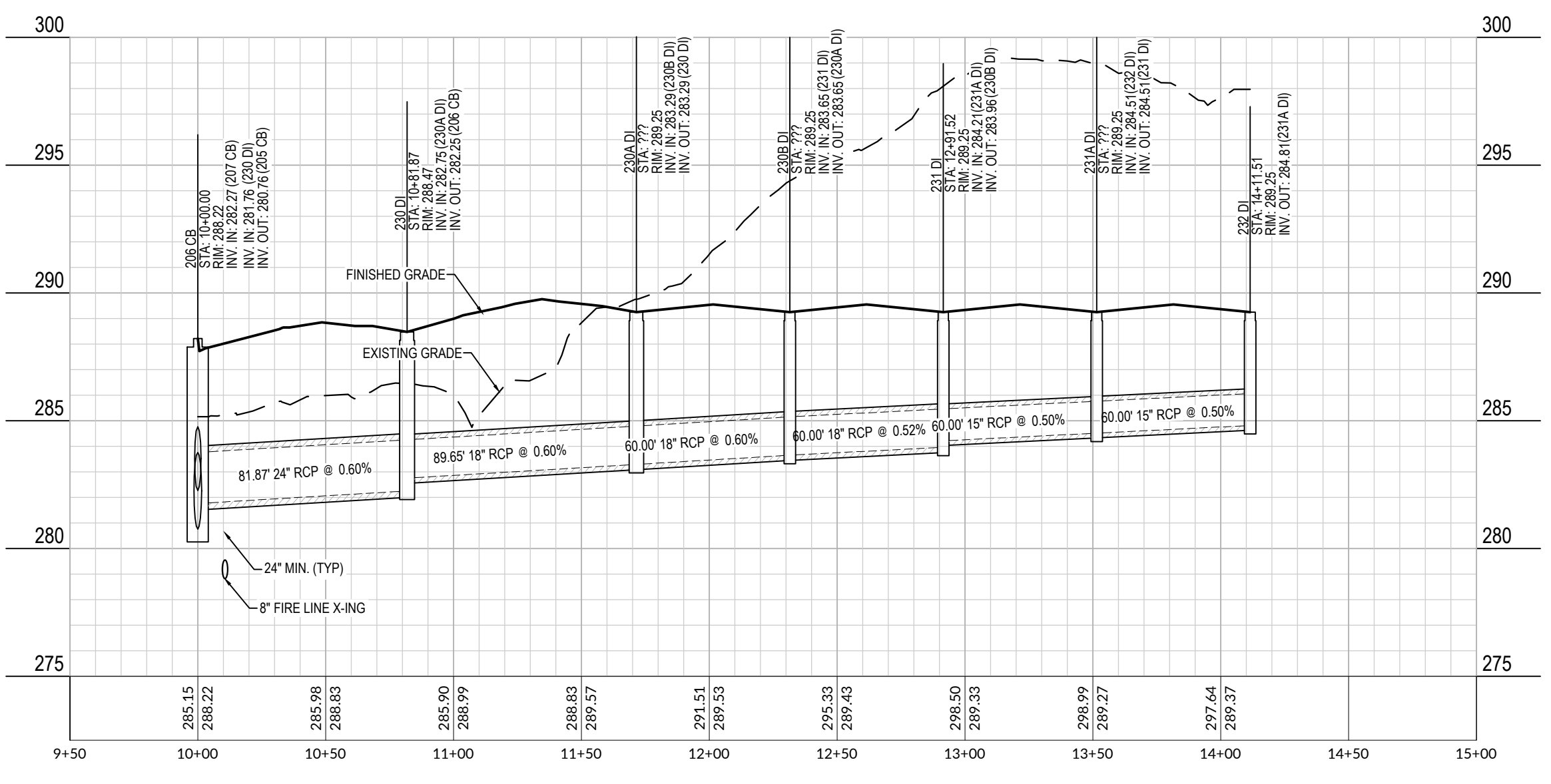
Sheet No.  
**C7.1**

201 CB to 220 CB



206 CB to 232 DI

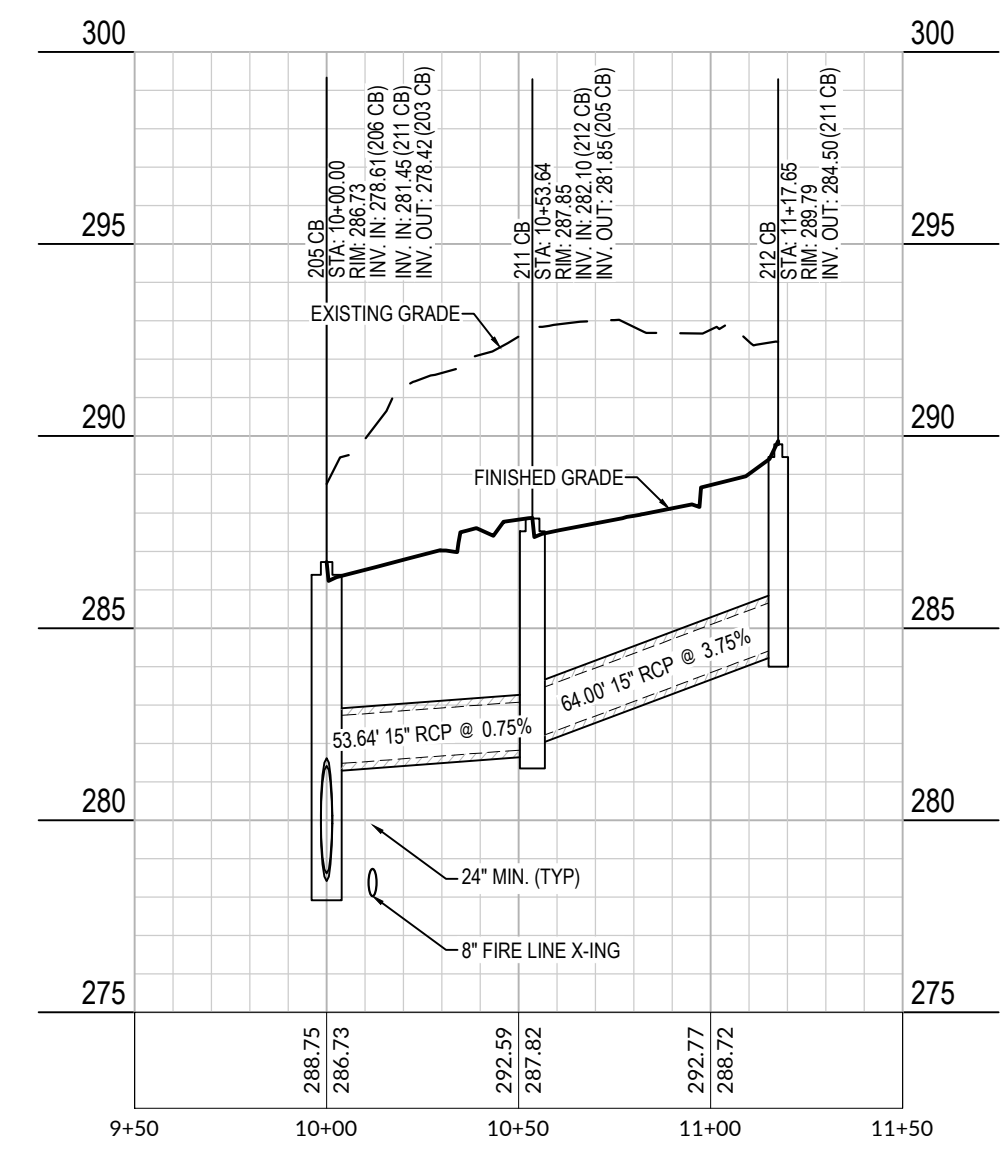
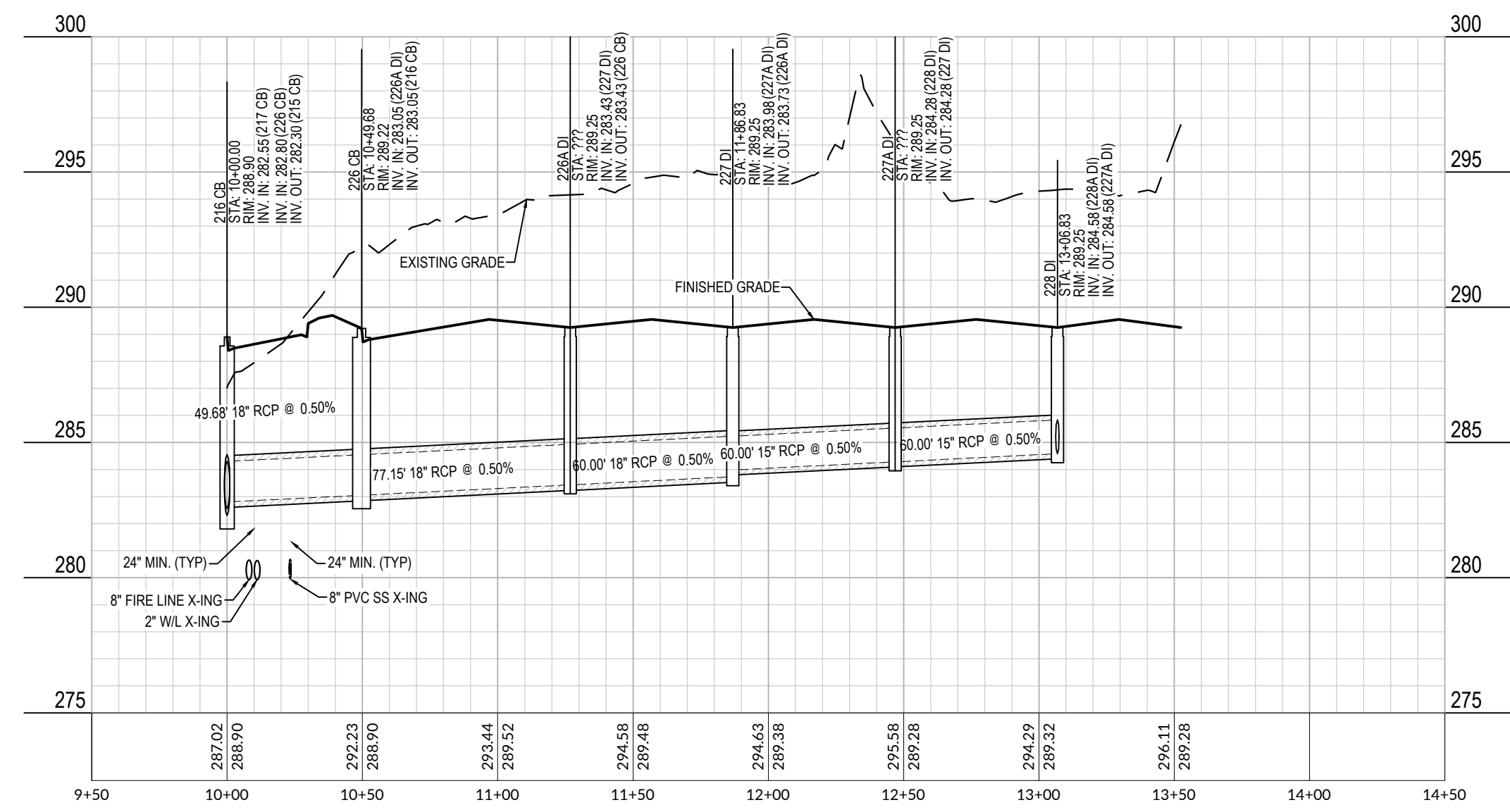
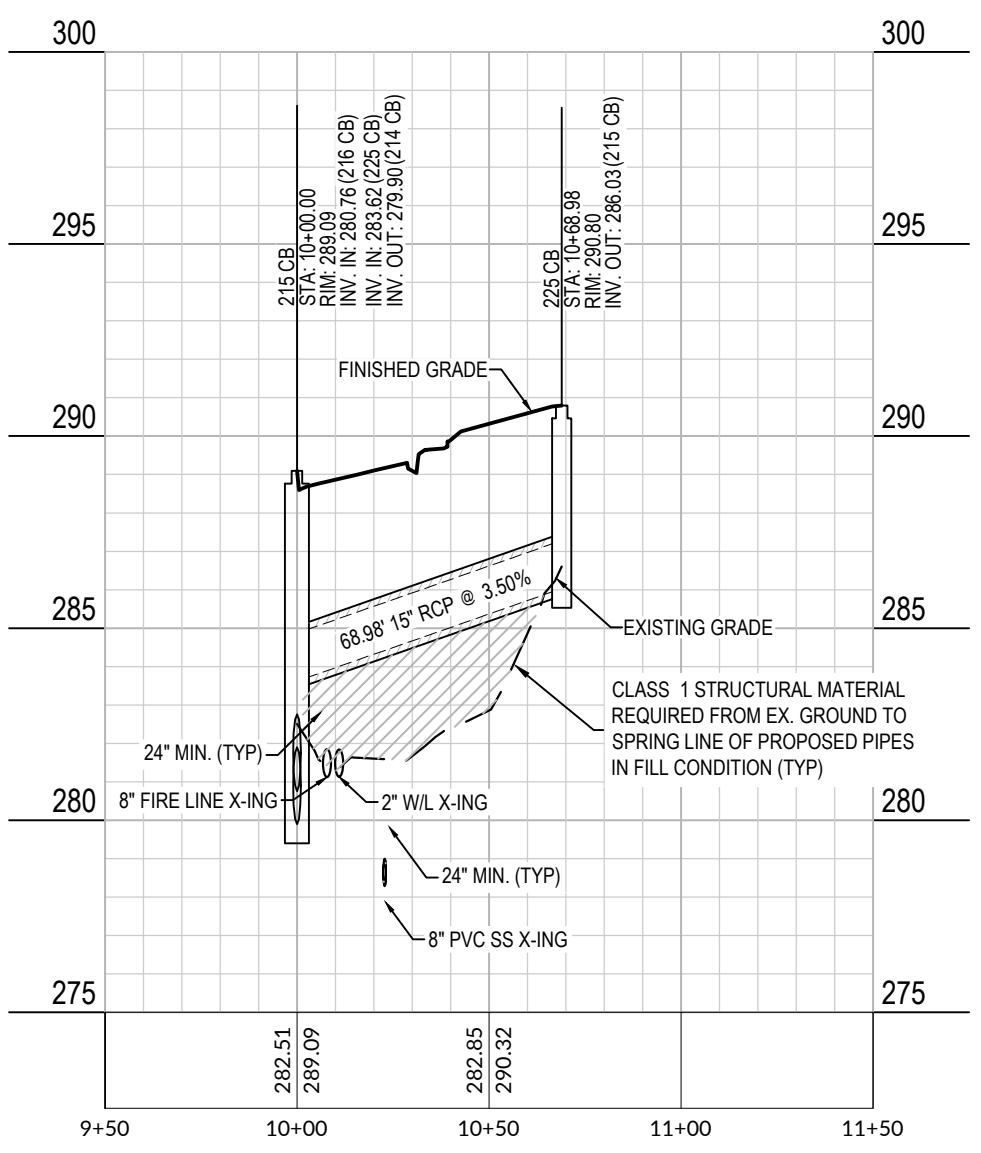
214 CB to 224 CB



215 CB to 225 CB

216 CB to 228A DI

205 CB to 212 CB



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: \_\_\_\_\_  
Town Engineer

These plans are approved by the Town of Knightdale and serve as construction plans for this project.

By: \_\_\_\_\_ Date: \_\_\_\_\_  
Administrator

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



MERRITT MIDWAY  
BUSINESS PARK  
Knightdale, NC

STORM PROFILES

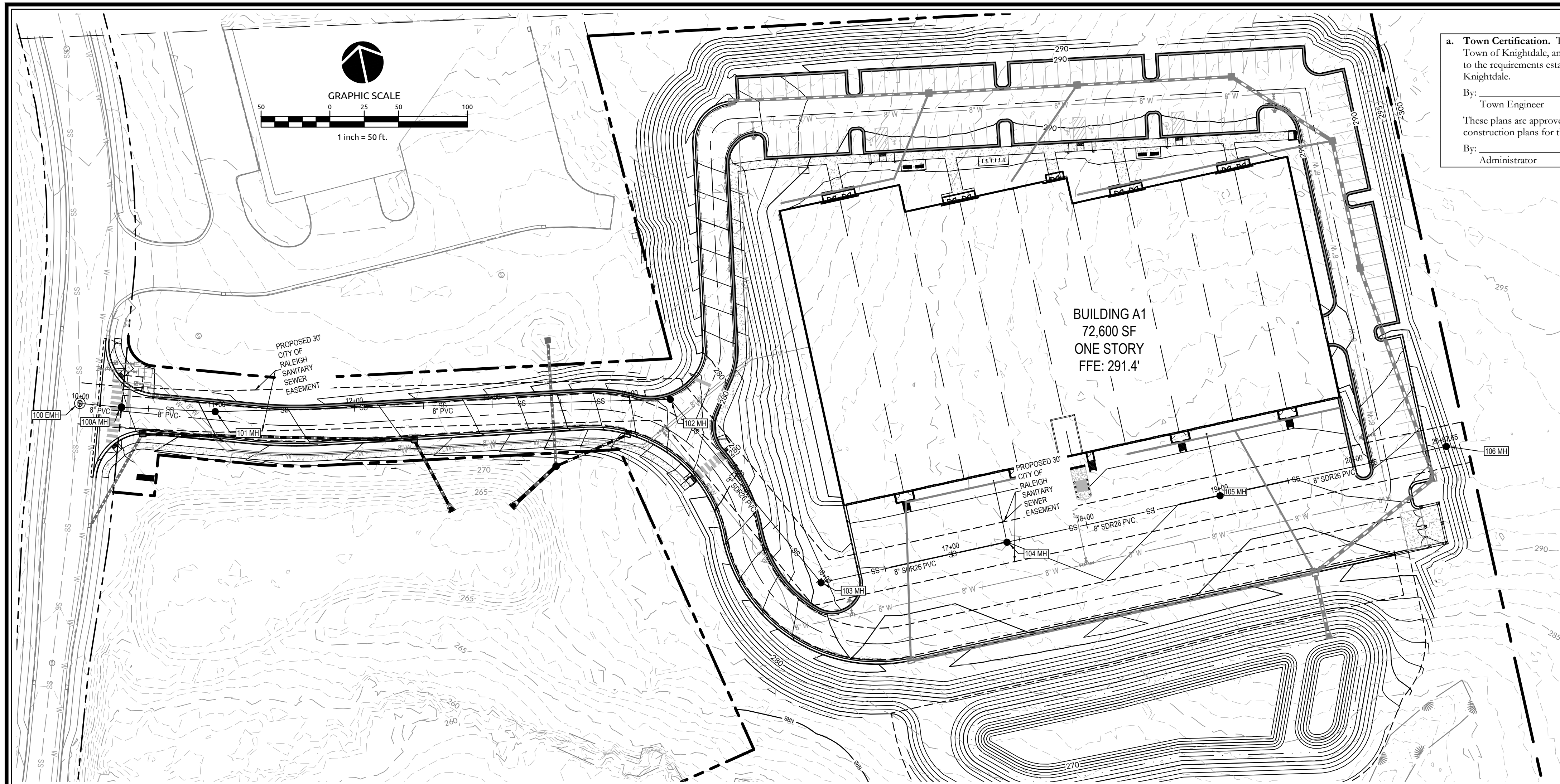
Job No. 09190080.00 Drawn By WR  
Date 09/15/2020 Designer WR



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15	LOT A REVISION TOWN COMMENTS	10/25/24
16	LOT A REVISION SIGNATURE SUBMITTAL	11/22/24

Sheet No.  
**C7.2**





**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: \_\_\_\_\_  
Town Engineer

These plans are approved by the Town of Knightdale and serve as construction plans for this project.

By: \_\_\_\_\_ Date: \_\_\_\_\_  
Administrator

**SITE PERMITTING APPROVAL**

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

The City of Raleigh consents to the connection and extension of the City's **Public Sewer System** as shown on this plan. The material and construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. **City of Raleigh Public Utilities Department Permit # 5-4880(R)**

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 # \_\_\_\_\_**

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

**City of Raleigh Public Utilities Department Permit # 5-4879(P)**

**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 \_\_\_\_\_

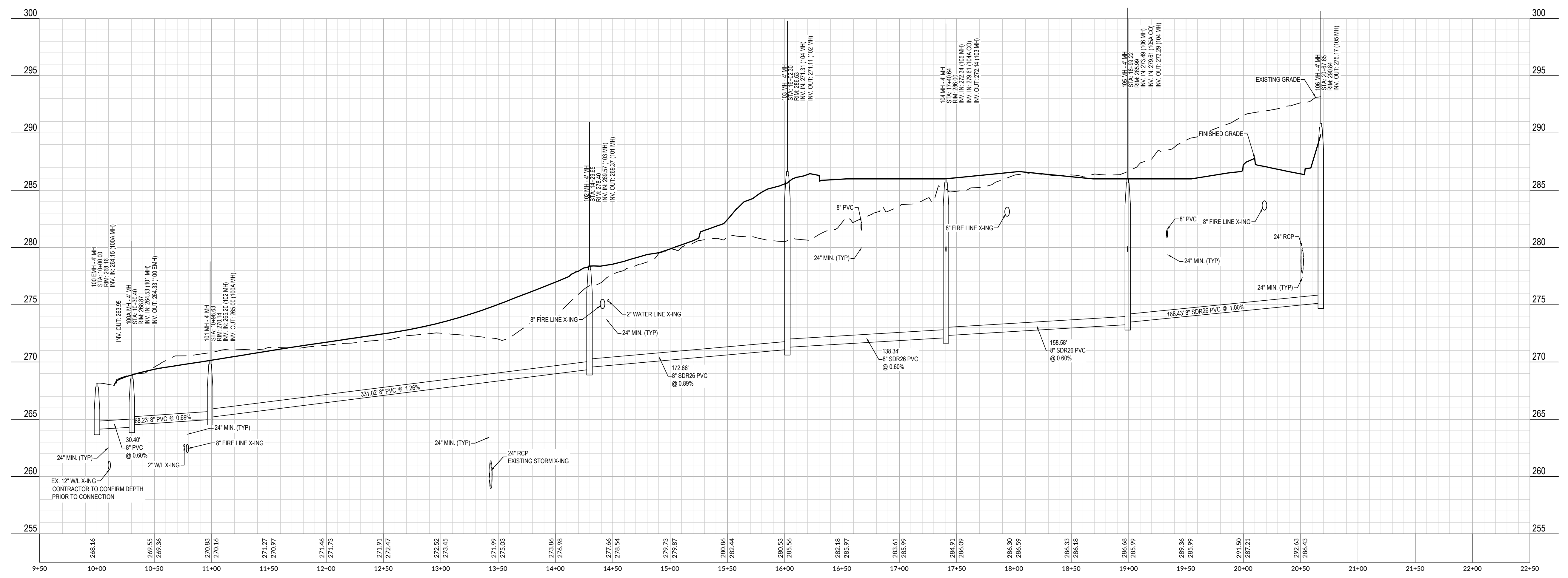
**WithersRavenel**  
Engineers | Planners

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**MERRITT MIDWAY BUSINESS PARK**  
Knightdale, NC

**100 MH to 106 MH**

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



**SEWER PROFILES**

Job No.	09190080.00	Drawn By	WR
Date	09/15/2020	Designer	WR

Professional Engineer Seal: PAUL DEVLIN, License # 049219, dated 11/22/2024.

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16	LOT A REVISION SIGNATURE SUBMITTAL	11/22/24

Sheet No. **C8.0**

SANITARY SEWER STRUCTURE TABLE				
STRUCTURE	RIM EL.	STRUCTURE IN	INVERT IN	INVERT OUT
100 EMH	268.16	100A MH	264.15	
100A MH	268.87	101 MH	264.53	264.33
101 MH	270.14	102 MH	265.20	265.00
102 MH	278.40	103 MH	269.57	269.37
103 MH	286.63	104 MH	271.31	271.11
104 MH	286.00	105 MH 104A CO	272.34 279.61	272.14
104A CO	286.40	104B CO 104C CO	279.84 281.30	279.84
104B CO	287.26			280.30
104C CO	287.26			281.90
105 MH	285.99	106 MH 105A CO	273.49 279.61	273.29
105A CO	286.40	105B CO	279.84	279.84
105B CO	287.26			280.30
106 MH	290.84			275.17
200 EMH	276.84	200 MH	265.68	
200 MH	272.55	201 MH	266.34	266.14
201 MH	273.83	202 MH	268.16	267.30
202 MH	278.83	203 MH	273.17	272.97
203 MH	285.37	204 MH	275.73	274.76
204 MH	288.24	205 MH 210 MH	277.95 277.05	276.85
205 MH	289.91	206 MH	278.81	278.61
206 MH	289.16	207 MH	280.43	280.10
207 MH	293.78	208 MH	282.18	281.98
208 MH	294.55	216 CO 209 MH	285.75 283.62	283.42
209 MH	294.81	217 CO	286.21	286.01
210 MH	289.12	212 CO 211 MH 214 CO	278.03 278.90 279.10	277.83
211 MH	288.69	213 CO 215 CO	282.45 282.45	280.45
212 CO	289.88			278.61
213 CO	289.88			284.00
214 CO	293.88			287.90
215 CO	293.88			287.08
216 CO	295.88			288.98
217 CO	295.89			286.56

SANITARY SEWER SYSTEM DATA							
UPSTREAM STRUCTURE	DOWNSTREAM STRUCTURE	SIZE	LENGTH	SLOPE	MATERIAL	UPSTREAM INVERT	DOWNSTREAM INVERT
100A MH	100 EMH	8	30.40	0.60%	PVC	264.33	264.15
101 MH	100A MH	8	68.23	0.69%	PVC	265.00	264.53
102 MH	101 MH	8	331.02	1.26%	PVC	269.37	265.20
103 MH	102 MH	8	172.66	0.89%	SDR26 PVC	271.11	269.57
104 MH	103 MH	8	138.34	0.60%	SDR26 PVC	272.14	271.31
104A CO	104 MH	6	15.00	1.50%	SDR35 PVC	279.84	279.61
104B CO	104A CO	6	31.00	1.50%	SDR35 PVC	280.30	279.84
104C CO	104A CO	4	59.97	1.00%	PVC	281.90	281.30
105 MH	104 MH	8	158.58	0.60%	SDR26 PVC	273.29	272.34
105A CO	105 MH	6	15.00	1.50%	SDR26 PVC	279.84	279.61
105B CO	105A CO	6	31.00	1.50%	SDR26 PVC	280.30	279.84
106 MH	105 MH	8	168.43	1.00%	SDR26 PVC	275.17	273.49
200 MH	200 EMH	8	54.16	0.85%	PVC	266.14	265.68
201 MH	200 MH	8	160.12	0.60%	DIP	267.30	266.34
202 MH	201 MH	8	133.35	3.60%	DIP	272.97	268.16
203 MH	202 MH	8	63.83	2.50%	DIP	274.76	273.17
204 MH	203 MH	8	185.99	0.60%	PVC	276.85	275.73
205 MH	204 MH	8	109.98	0.60%	PVC	278.61	277.95
206 MH	205 MH	8	214.79	0.60%	PVC	280.10	278.81
207 MH	206 MH	8	257.72	0.60%	PVC	281.98	280.43
208 MH	207 MH	8	207.31	0.60%	PVC	283.42	282.18
209 MH	208 MH	8	397.39	0.60%	PVC	286.01	283.62
210 MH	204 MH	8	130.12	0.60%	PVC	277.83	277.05
211 MH	210 MH	8	260.00	0.60%	PVC	280.45	278.90
212 CO	210 MH	6	35.75	1.61%	PVC	278.61	278.03
213 CO	211 MH	6	35.85	4.32%	PVC	284.00	282.45
214 CO	210 MH	6	202.79	4.34%	PVC	287.90	279.10
215 CO	211 MH	6	264.50	1.75%	PVC	287.08	282.45
216 CO	208 MH	6	35.84	9.00%	PVC	288.98	285.75
217 CO	209 MH	6	35.71	1.00%	PVC	286.56	286.21

SITE PERMITTING APPROVAL

Job No.	09190080.00	Drawn By	WR
Date	09/15/2020	Designer	WR

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-4880(R)**.

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 #** \_\_\_\_\_.

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

City of Raleigh Public Utilities Department Permit # S-4879P(R)

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

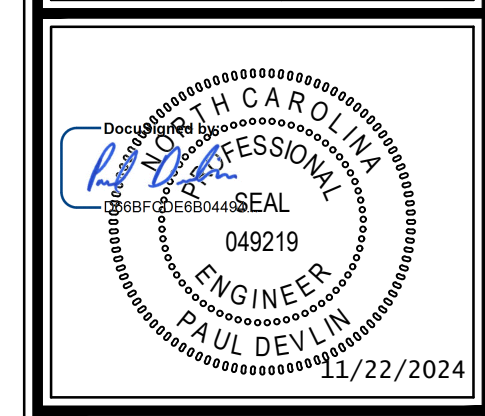
**a. Town Certification.** This design has been reviewed by the Engineer for the Town of Knightdale, and to the best of my knowledge and belief, it conforms to the requirements established in the Standard Specifications of the Town of Knightdale.

By: \_\_\_\_\_ Date: \_\_\_\_\_  
Town Engineer

These plans are approved by the Town of Knightdale and serve as construction plans for this project.

By: \_\_\_\_\_ Date: \_\_\_\_\_  
Administrator

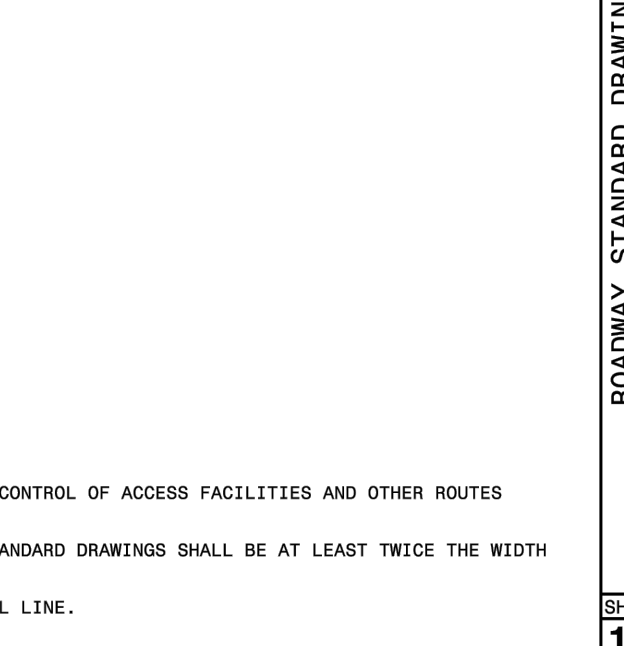
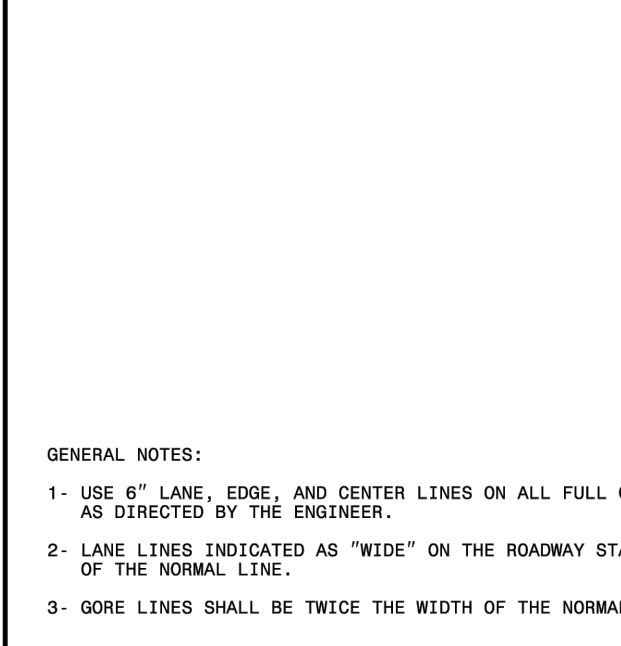
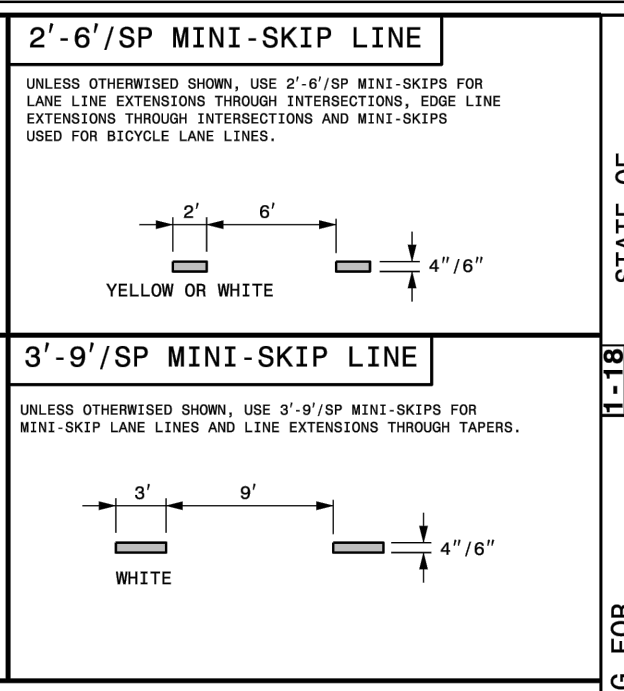
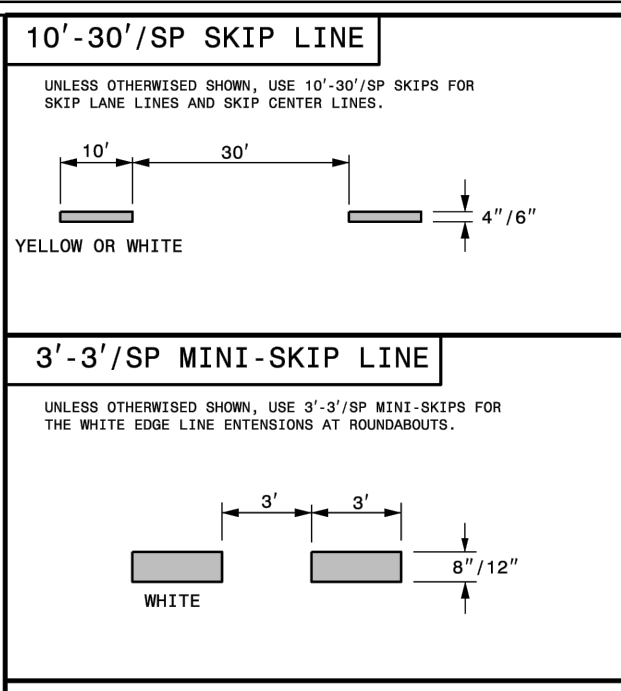
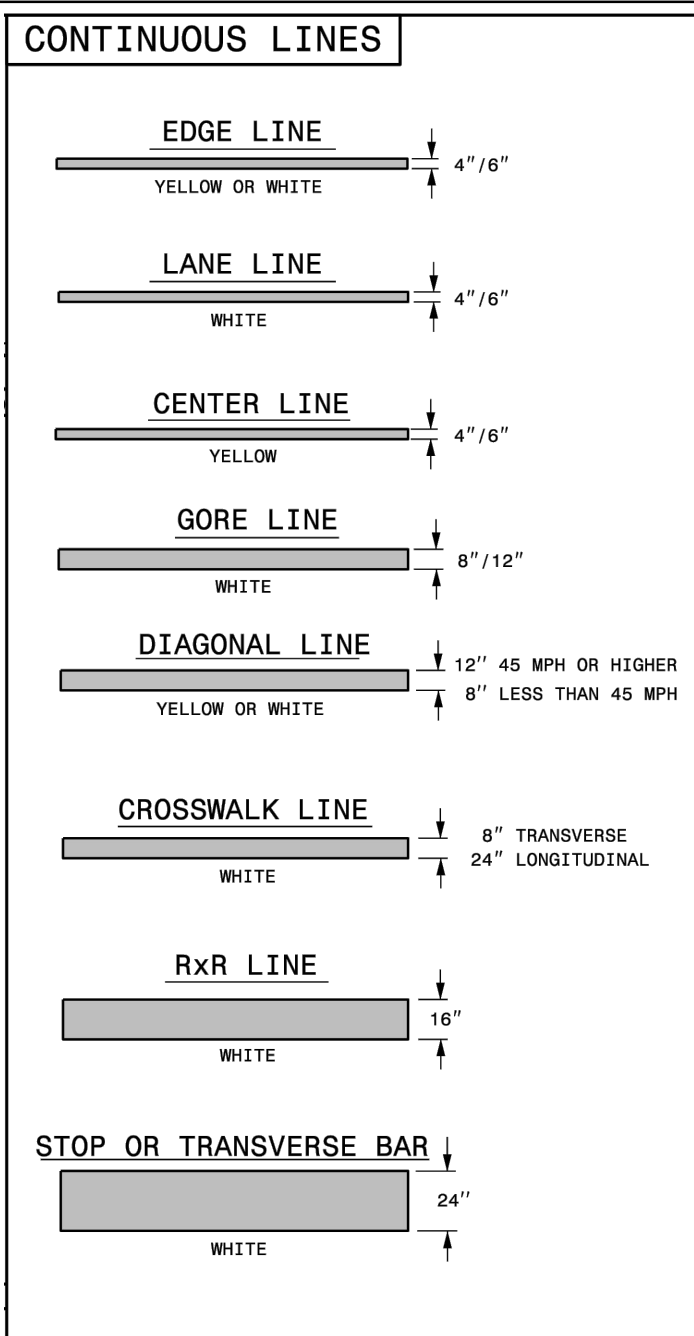
Job No.	09190080.00	Drawn By	WR
Date	09/15/2020	Designer	WR



Revisions	
9	SIGNATURE SUBMITTAL 8/27/21
10	REVISION TO APPROVED PLANS 11/11/21
11	TOWN COMMENTS 12/22/21
12	LOT A SINGLE BUILDING REVISION 8/8/23
13	LOT A REVISION TOWN COMMENTS 9/27/23
14	LOT A REVISION ROTATION 7/30/24
15	LOT A REVISION TOWN COMMENTS 10/25/24
16	LOT A REVISION SIGNATURE SUBMITTAL 11/22/24







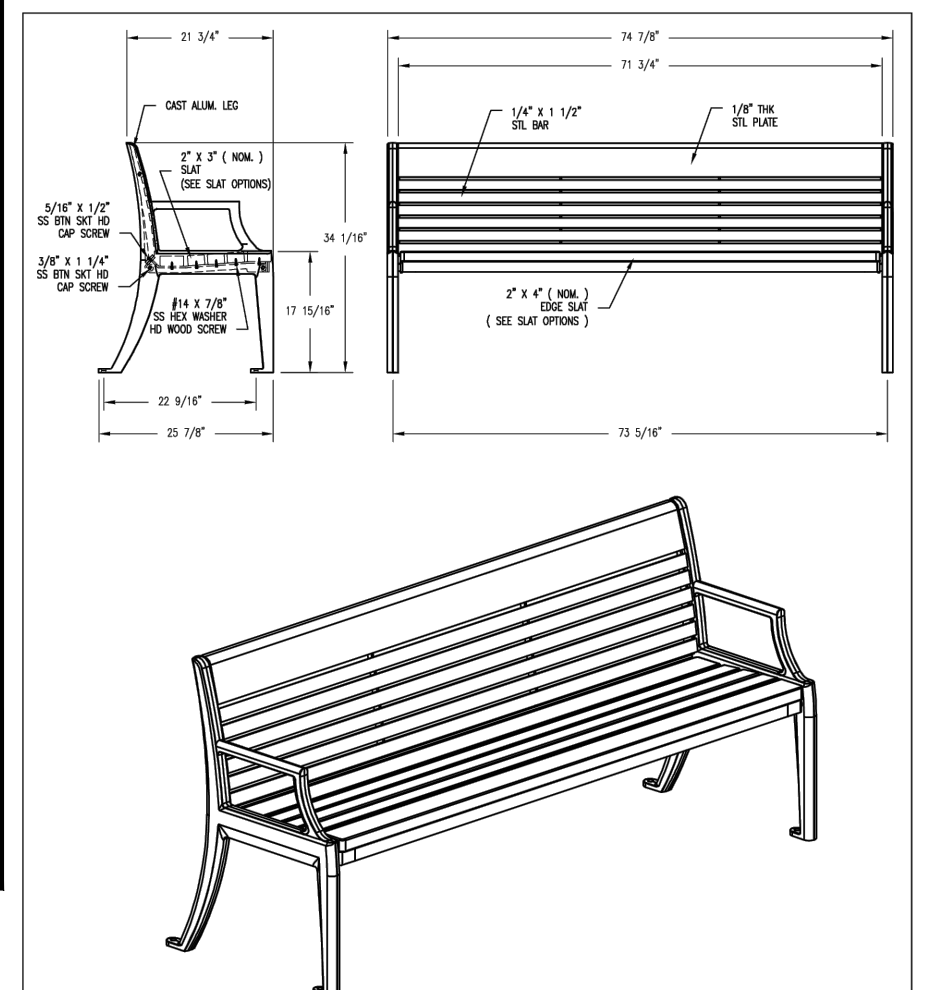
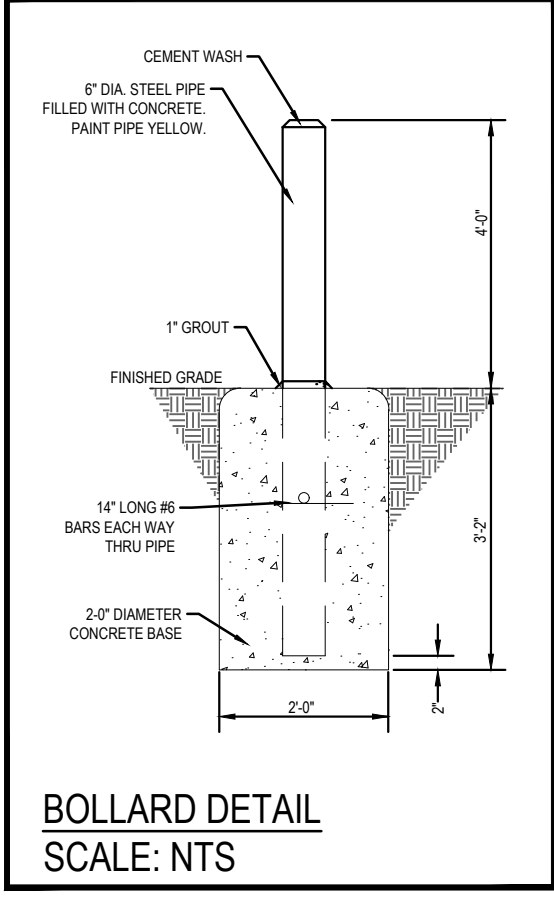
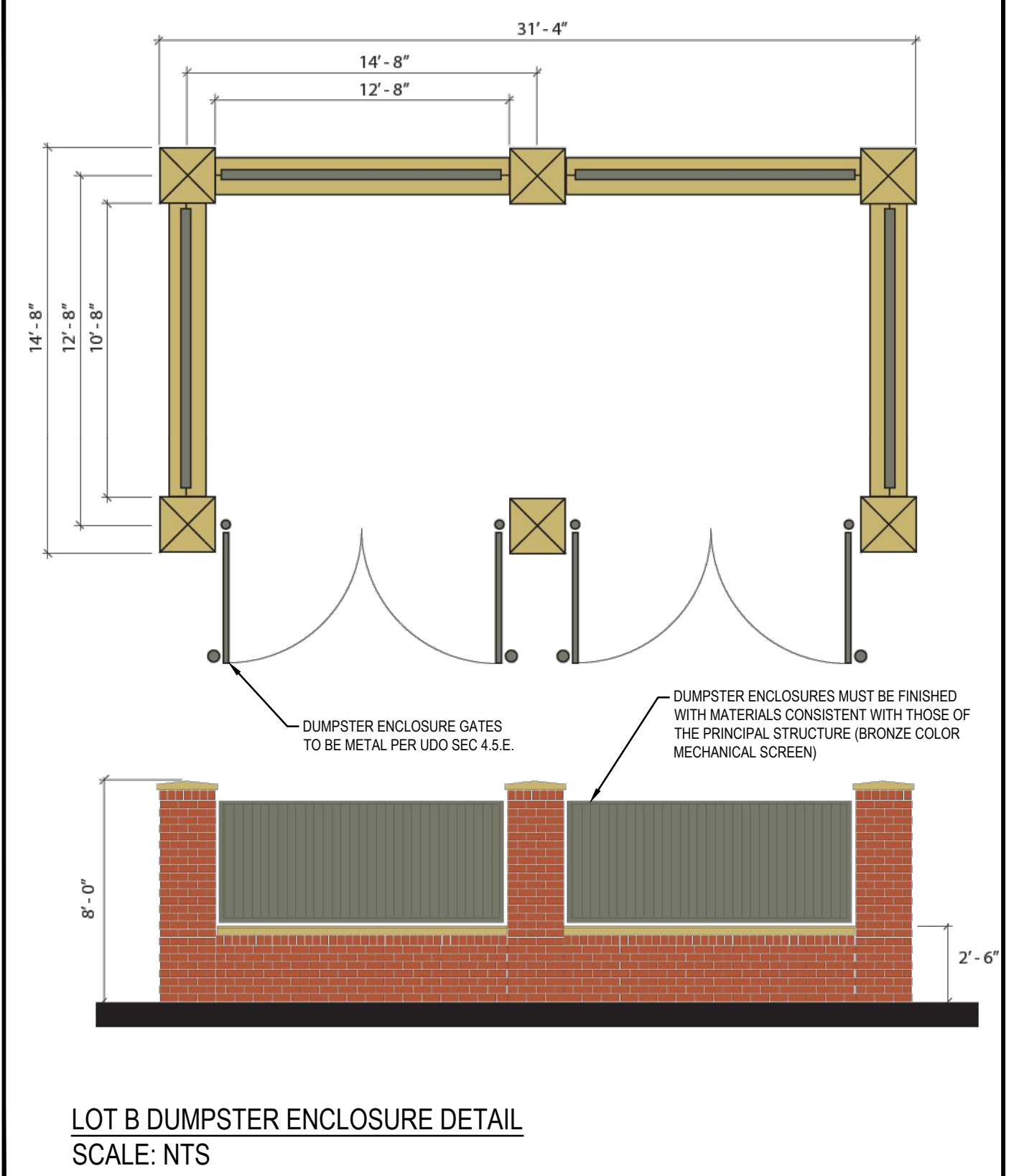
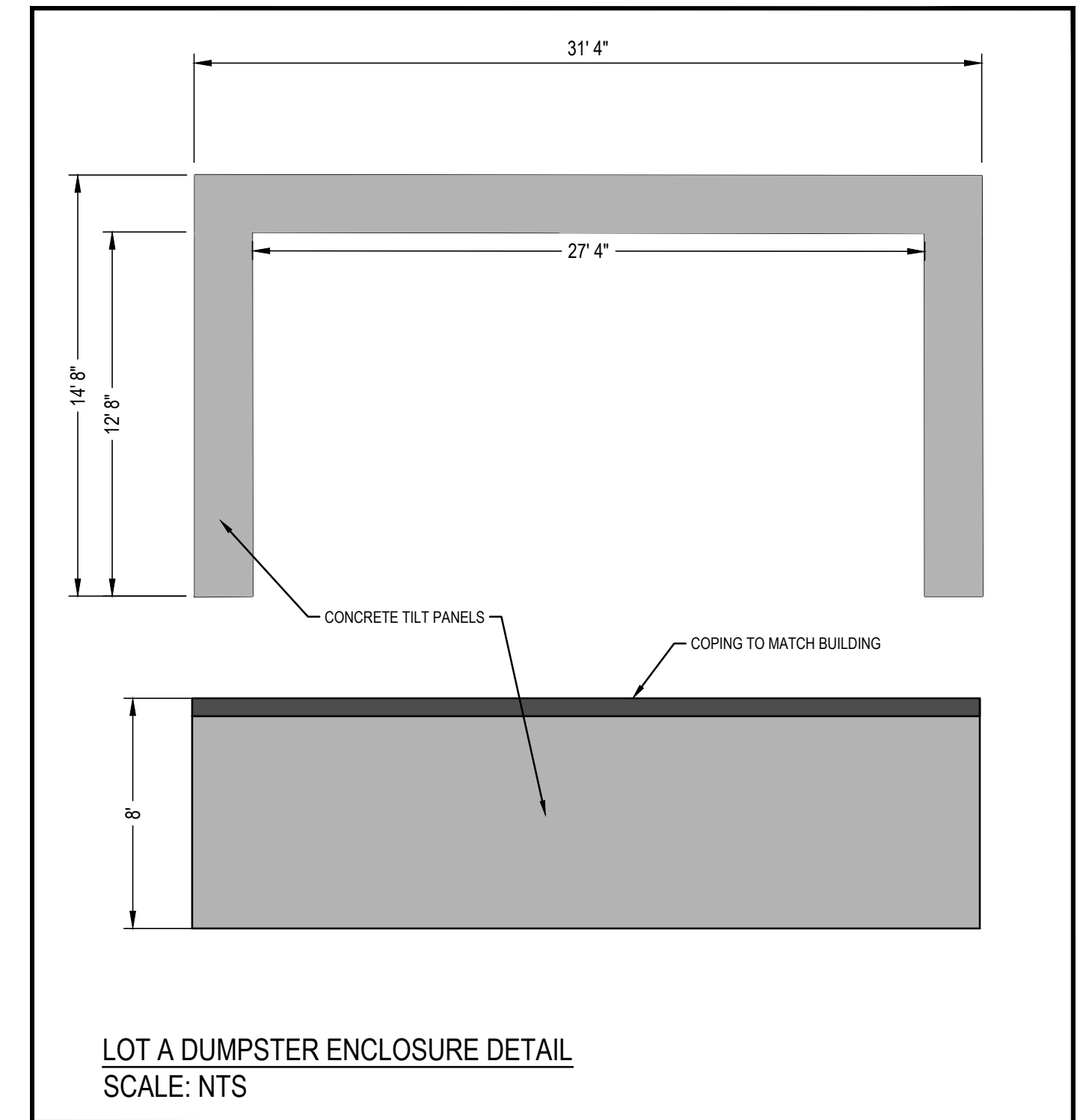
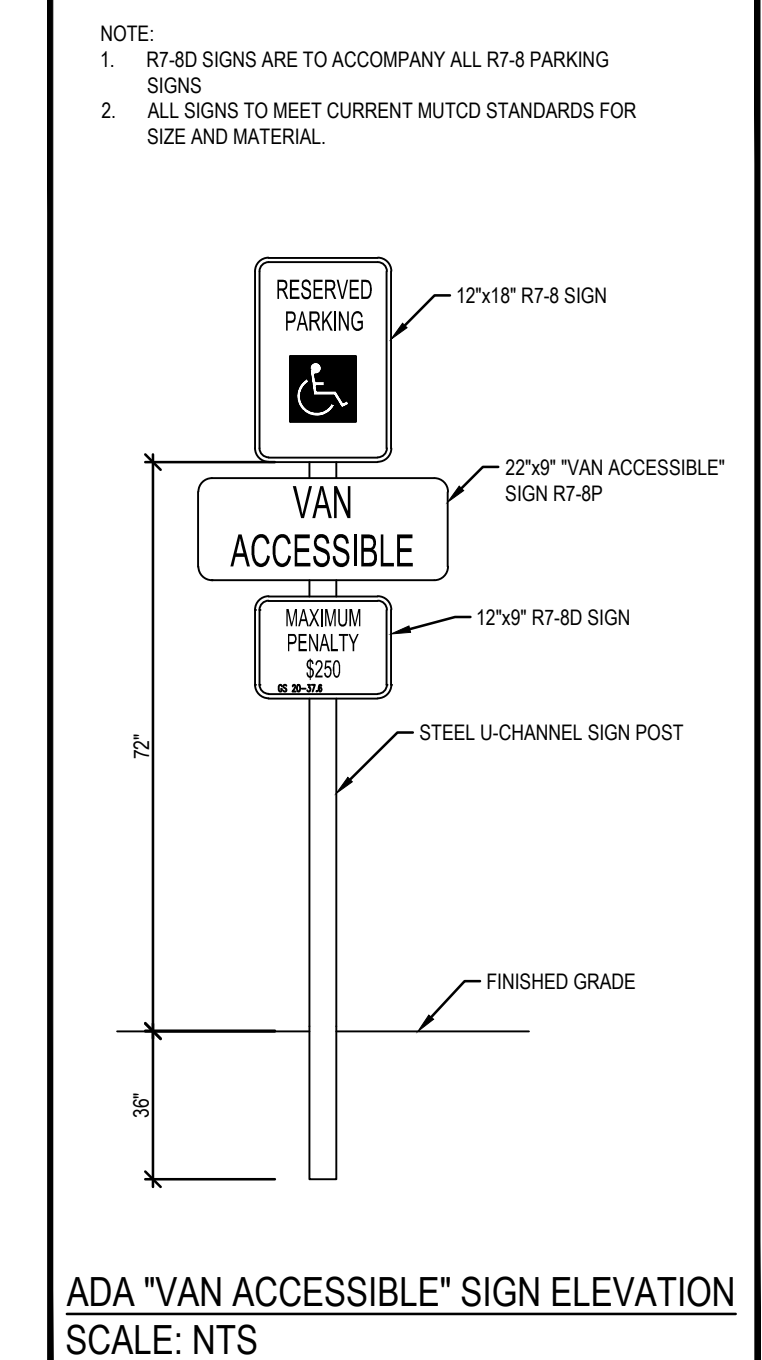
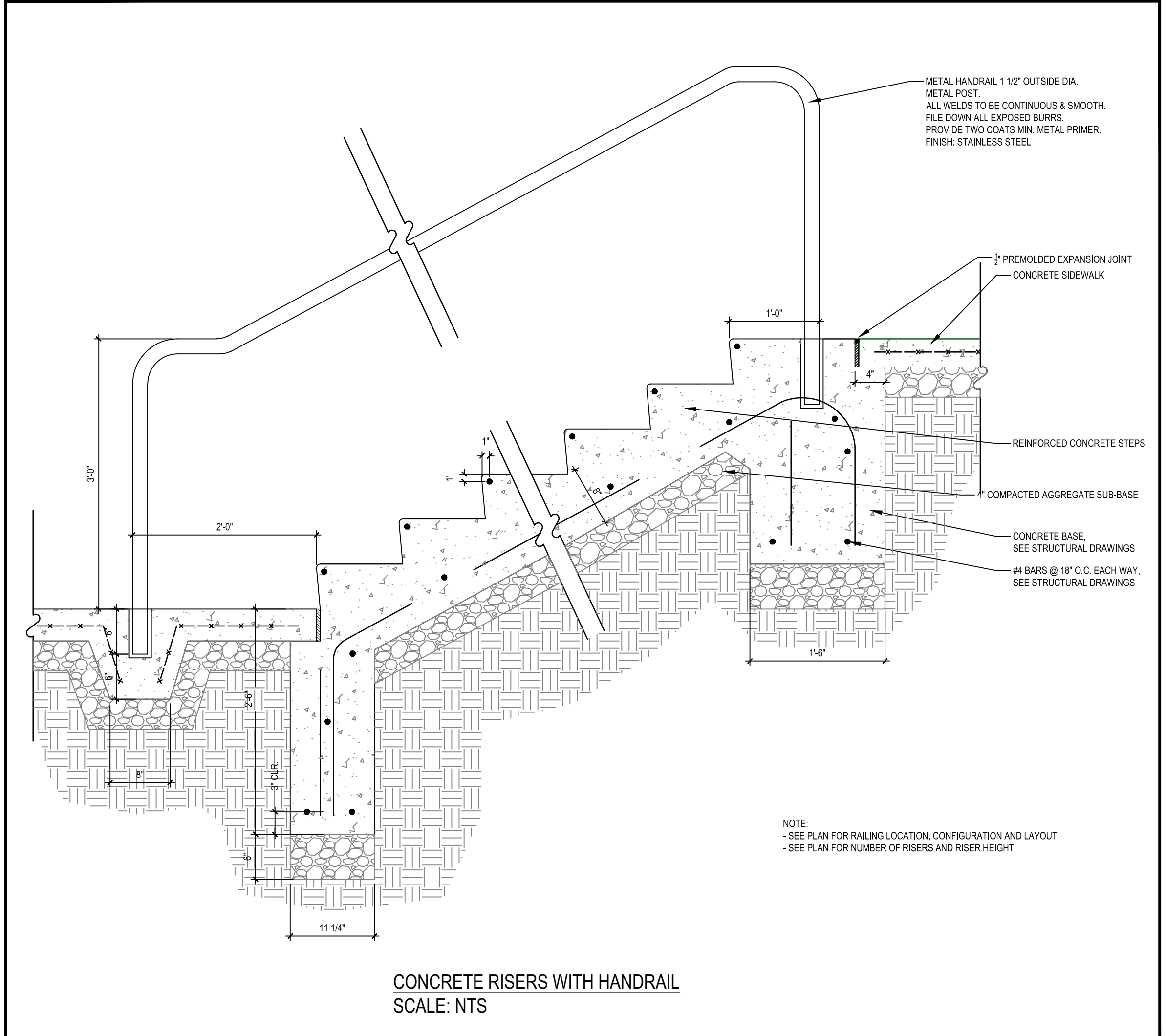
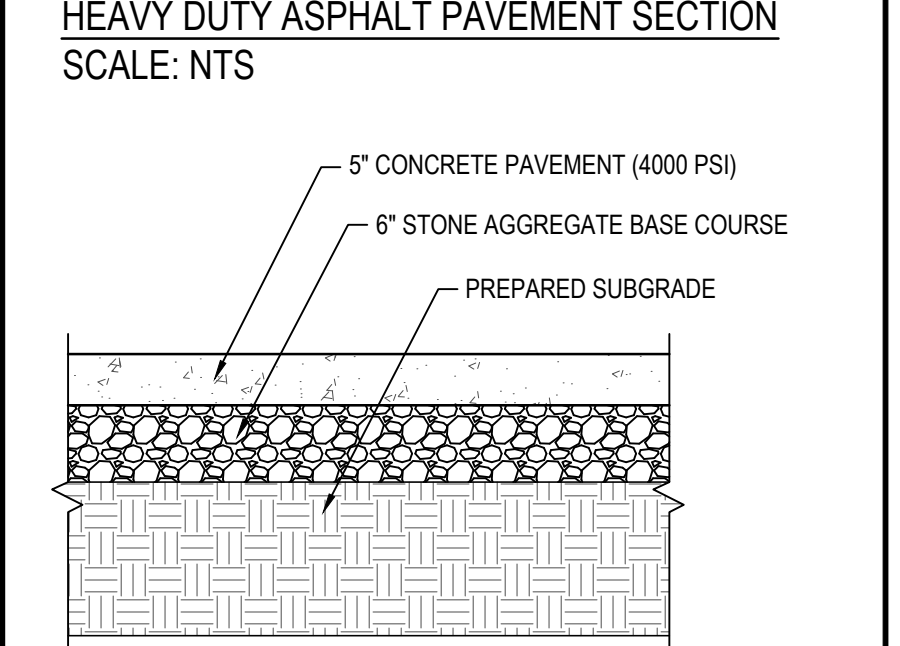
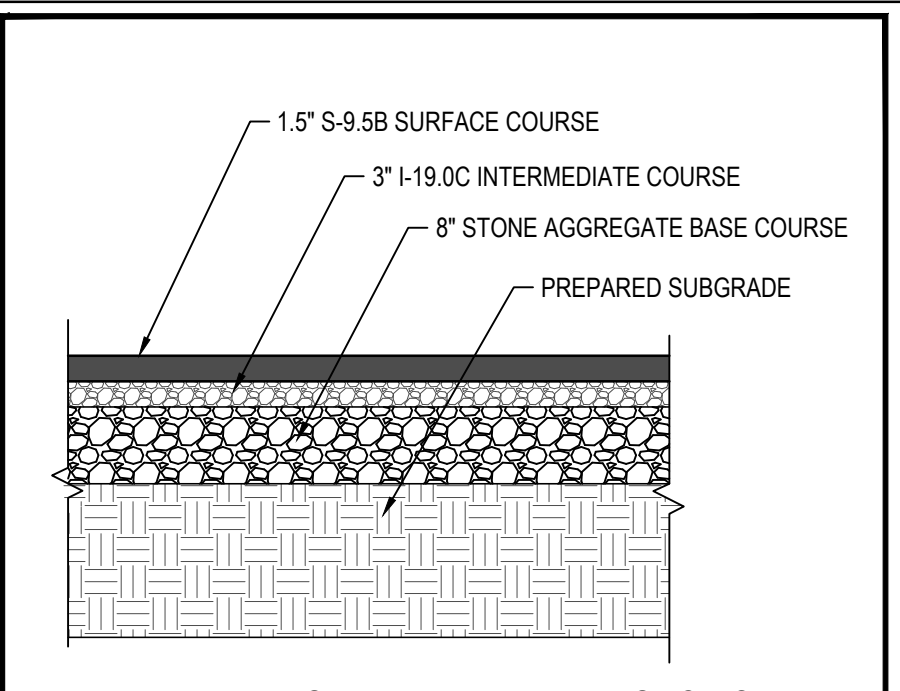
**GENERAL NOTES:**

- 1- USE 6" LANE, EDGE, AND CENTER LINES ON ALL FULL CONTROL OF ACCESS FACILITIES AND OTHER ROUTES AS DIRECTED BY THE ENGINEER.
- 2- LANE LINES INDICATED AS "WIDE" ON THE ROADWAY STANDARD DRAWINGS SHALL BE AT LEAST TWICE THE WIDTH OF THE NORMAL LINE.
- 3- GORE LINES SHALL BE TWICE THE WIDTH OF THE NORMAL LINE.

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

ROADWAY STANDARD DRAWING FOR  
**PAVEMENT MARKINGS**  
LINE TYPES AND OFFSETS

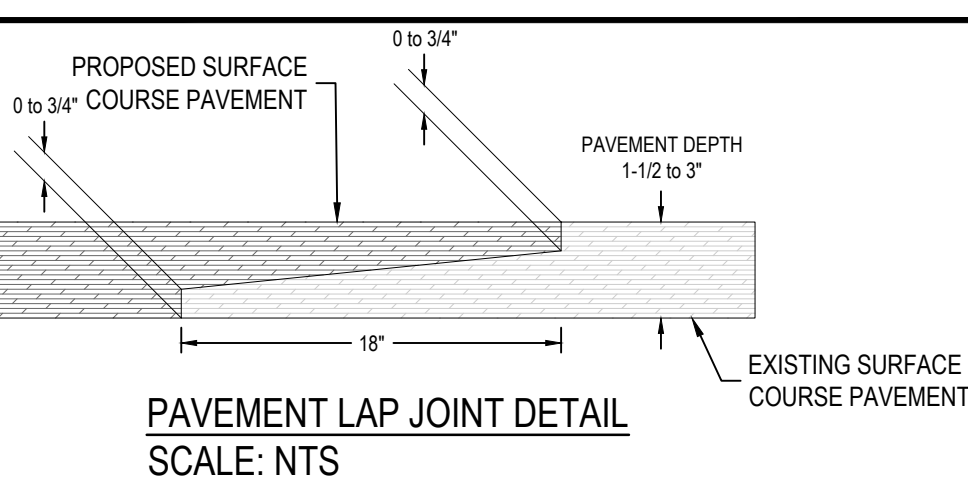
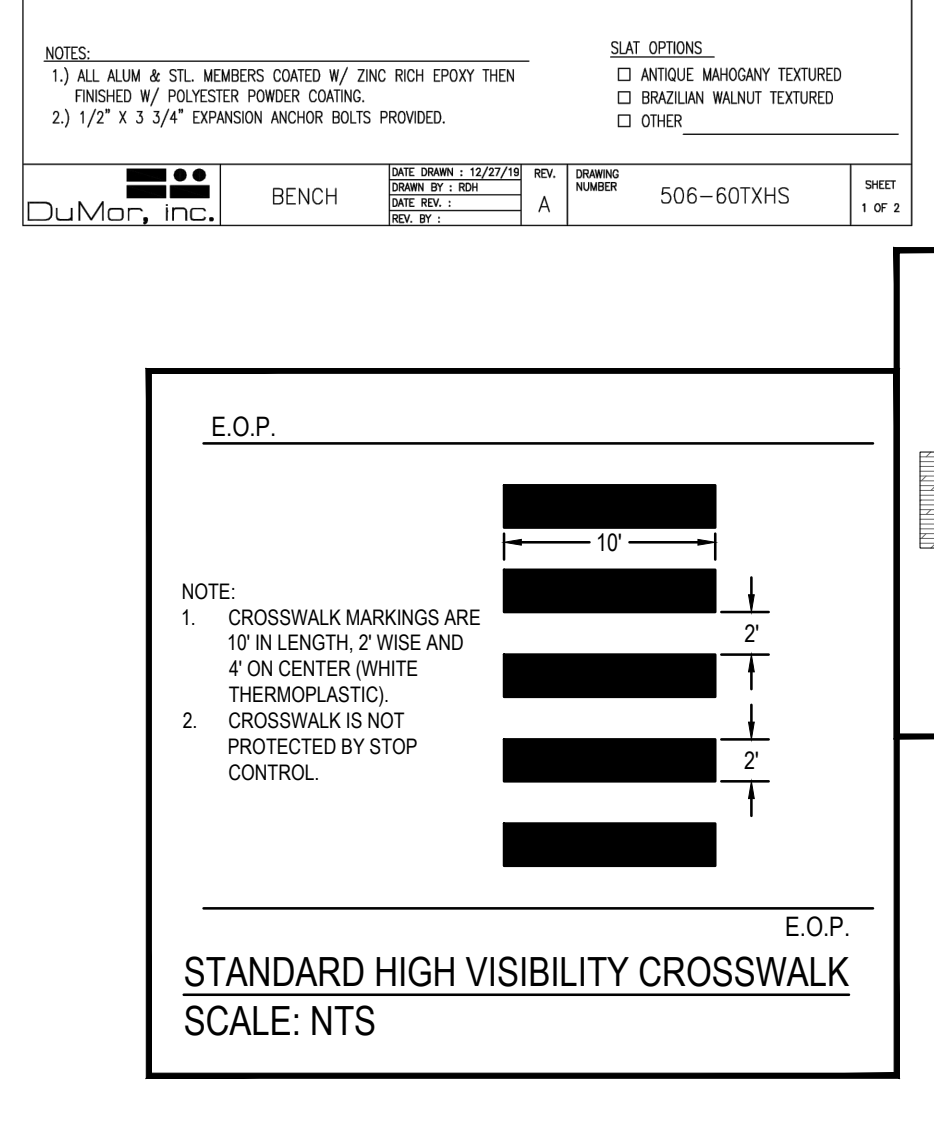
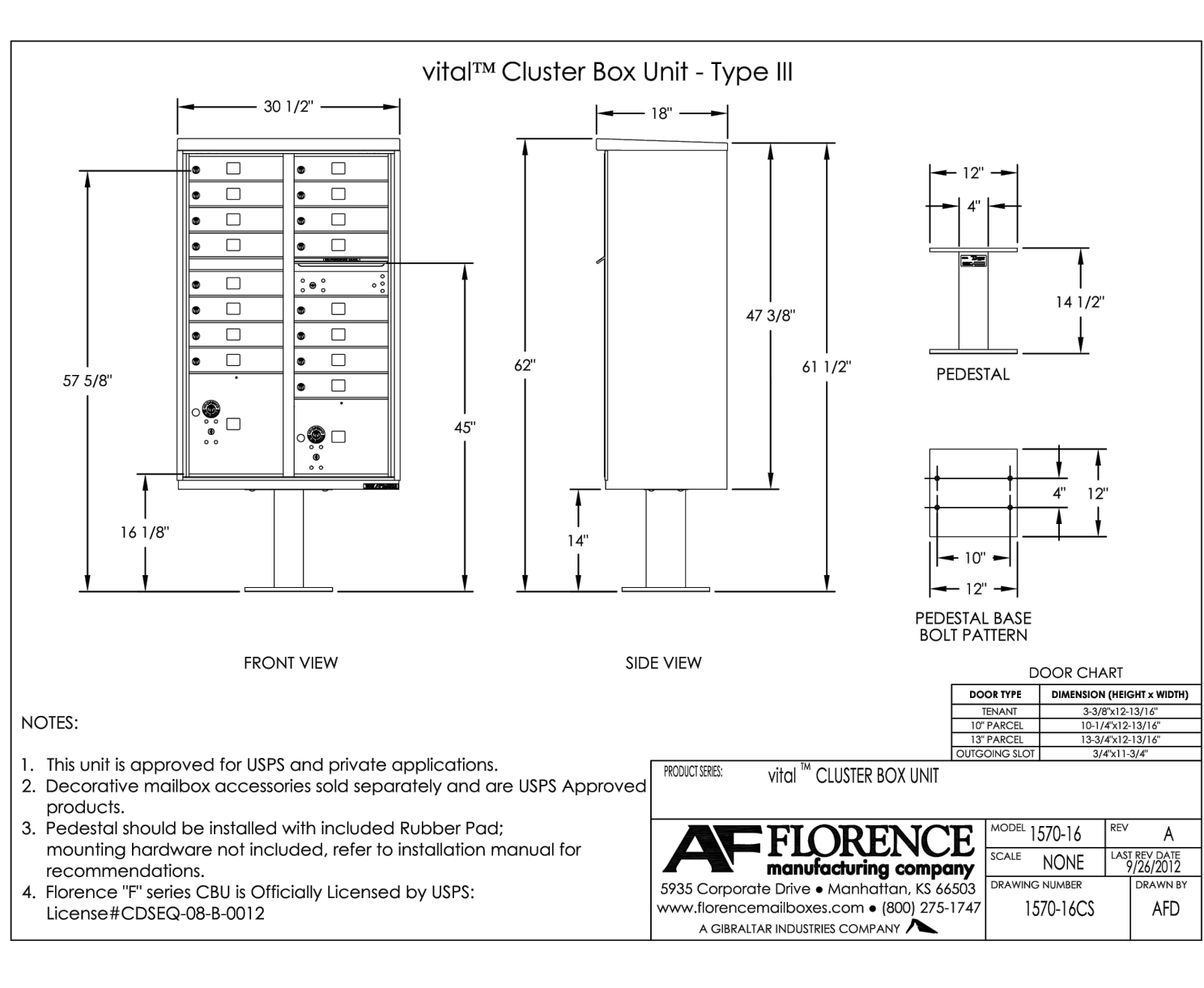
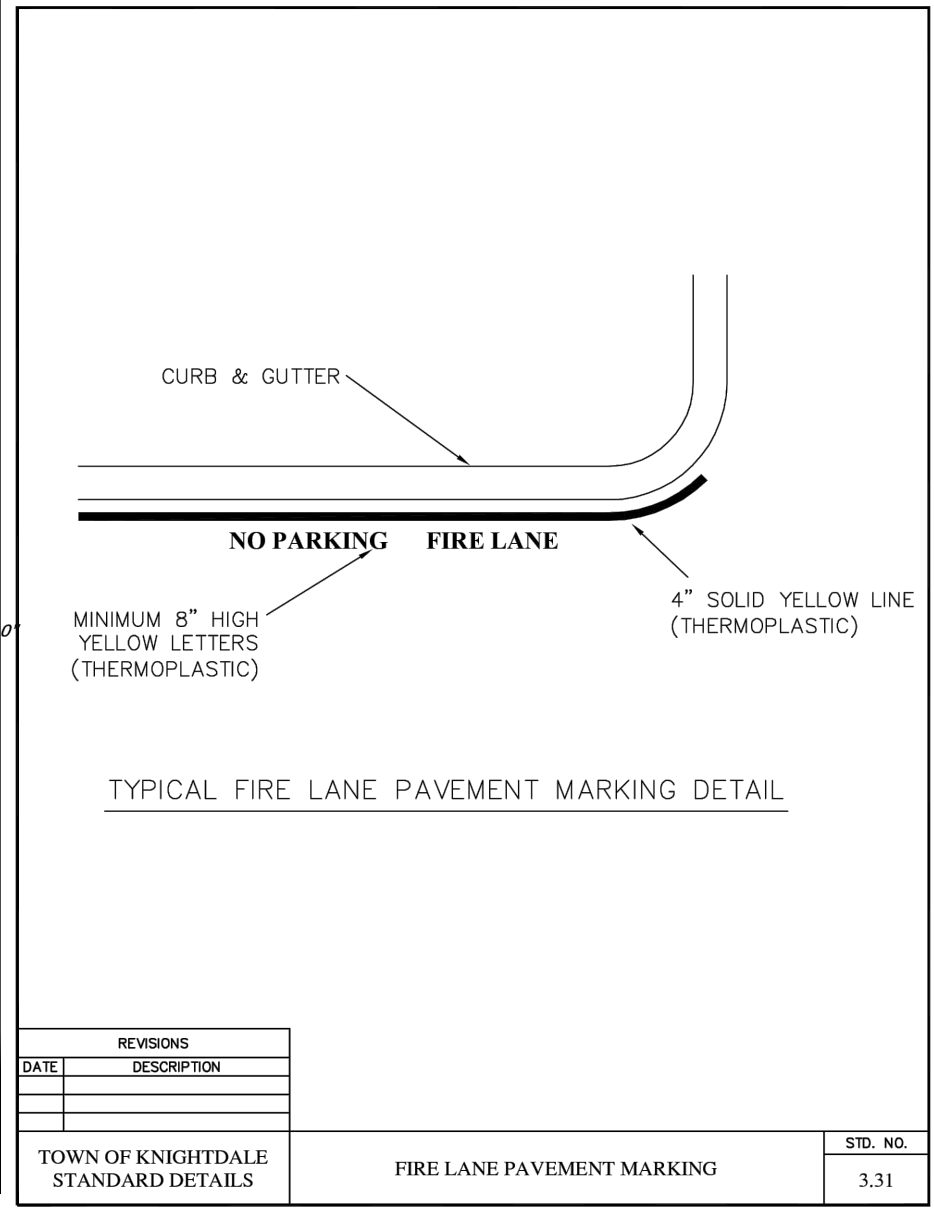
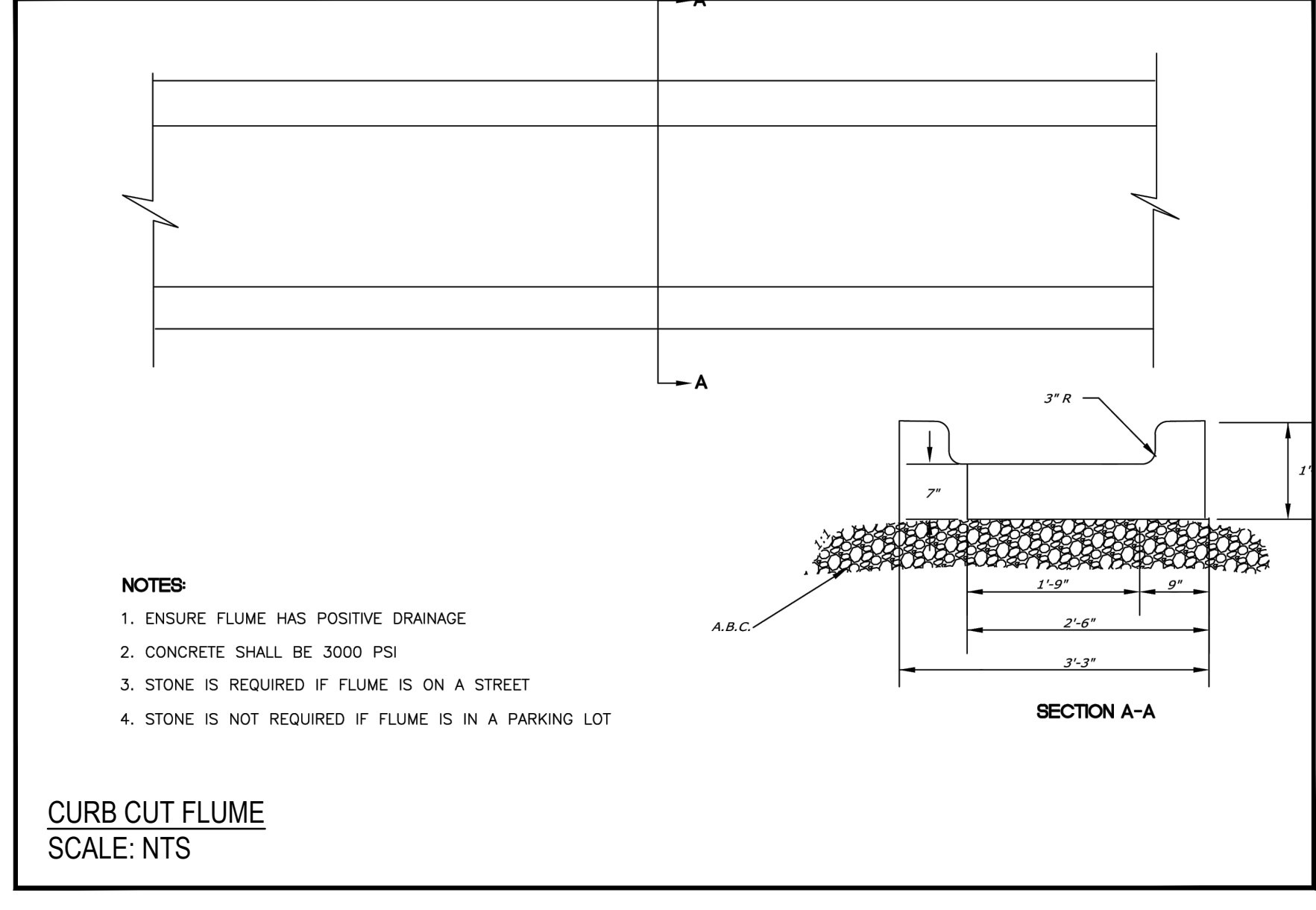
SHEET 1 OF 2  
**1205.01**



**NOTES:**

- 1) DURING ASSEMBLY PROCEDURE, DO NOT COMPLY WITH WARNING.
- 2) THE ACTUAL PARTS WILL NOT BE NUMBERED. NUMBERED PARTS ARE TO BE IDENTIFIED BY THE USER.
- 3) DIMENSIONS OF ASSEMBLY PARTS ARE GIVEN IN INCHES. ALL DIMENSIONS ARE TO BE TAKEN TO THE CENTER UNLESS OTHERWISE SPECIFIED.
- 4) MOUNT AND SECURE AS SHOWN.

REV	BY	DATE	DESCRIPTION
1	1	01/15/2020	ASSEMBLY INSTRUCTIONS
2	1	01/15/2020	ASSEMBLY INSTRUCTIONS
3	1	01/15/2020	ASSEMBLY INSTRUCTIONS
4	1	01/15/2020	ASSEMBLY INSTRUCTIONS
5	1	01/15/2020	ASSEMBLY INSTRUCTIONS
6	1	01/15/2020	ASSEMBLY INSTRUCTIONS
7	1	01/15/2020	ASSEMBLY INSTRUCTIONS
8	1	01/15/2020	ASSEMBLY INSTRUCTIONS
9	1	01/15/2020	ASSEMBLY INSTRUCTIONS



**WithersRavenel**  
Engineers | Planners

1375 Wilmington Street | Suite 200 | Raleigh, NC 27601 | (919) 469-3340 | License #: F-1479 | www.withersravenel.com

**MERRITT MIDWAY BUSINESS PARK**  
Knightdale, NC

**SITE DETAILS**

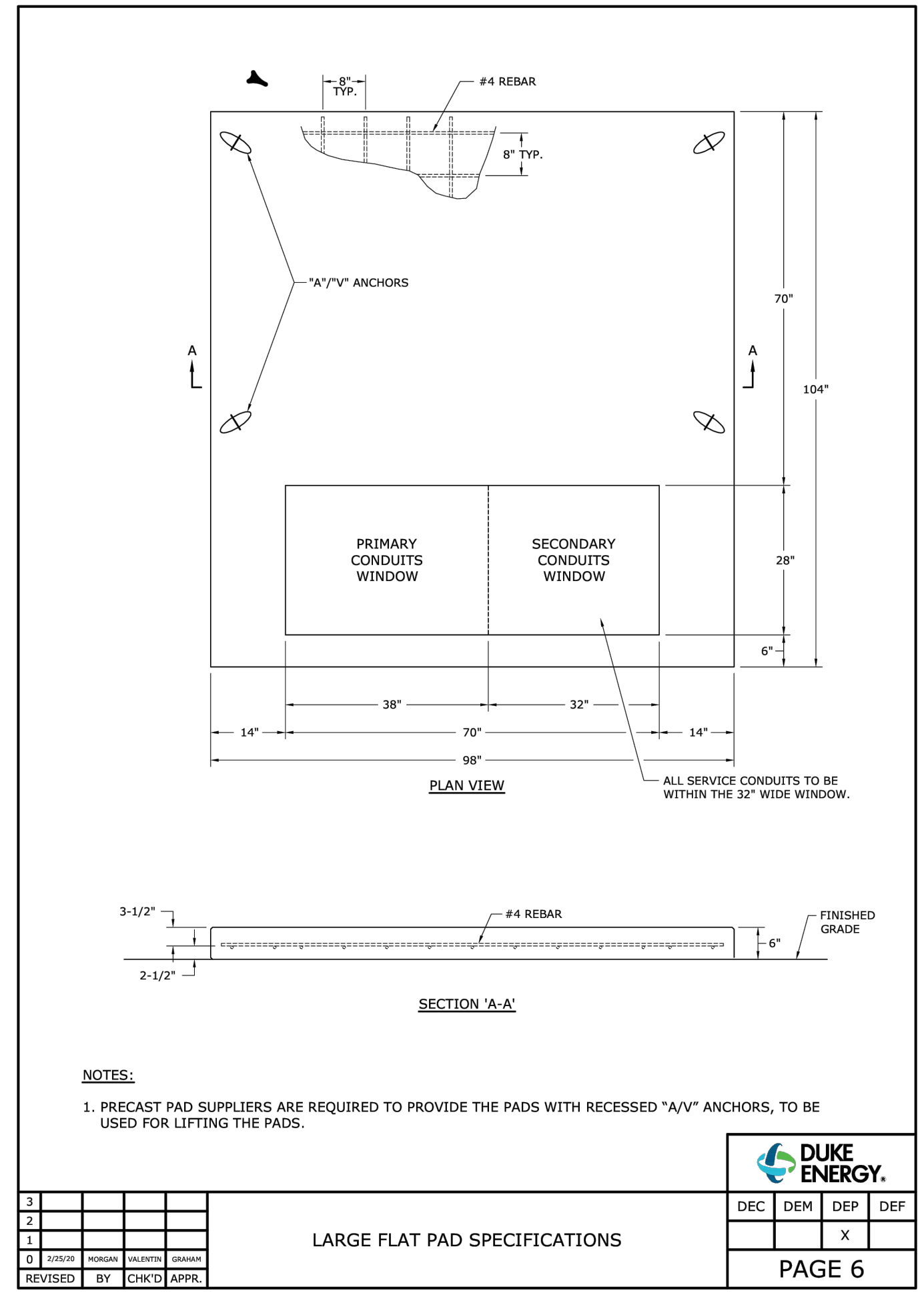
Job No.	09190080.00	Drawn By	WR
Date	09/15/2020	Designer	WR

Professional Engineer Seal  
049219  
11/22/2024

Revisions	Signature	Submittal	Date
9	SIGNATURE	SUBMITTAL	8/27/21
10	REVISION TO APPROVED PLANS		11/11/21
11	TOWN COMMENTS		12/22/21
12	LOT A SINGLE BUILDING REVISION		8/8/23
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15	LOT A REVISION TOWN COMMENTS		10/25/24
16	LOT A REVISION SIGNATURE SUBMITTAL		11/22/24

Sheet No.  
**C9.1**





**NOTES:**

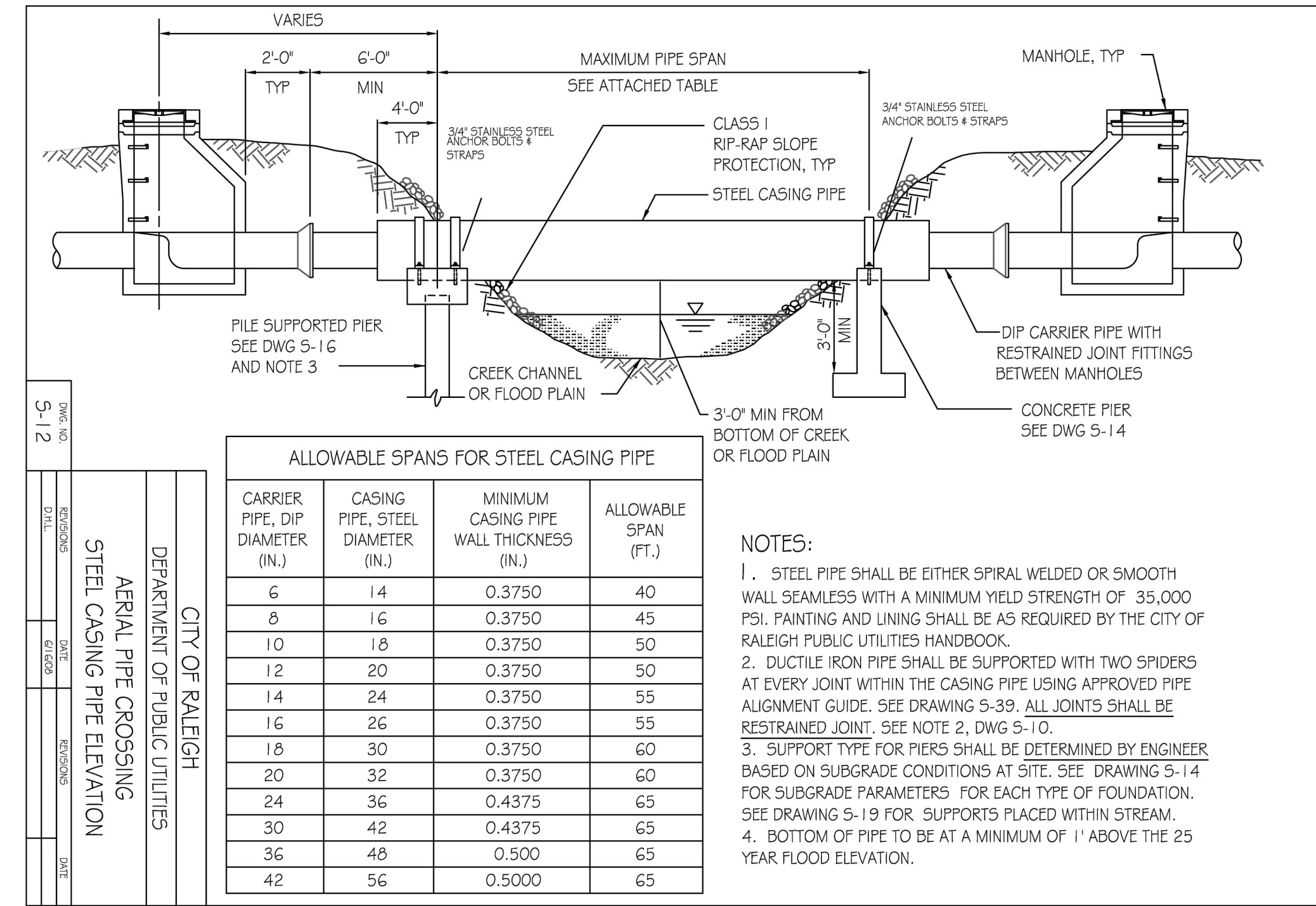
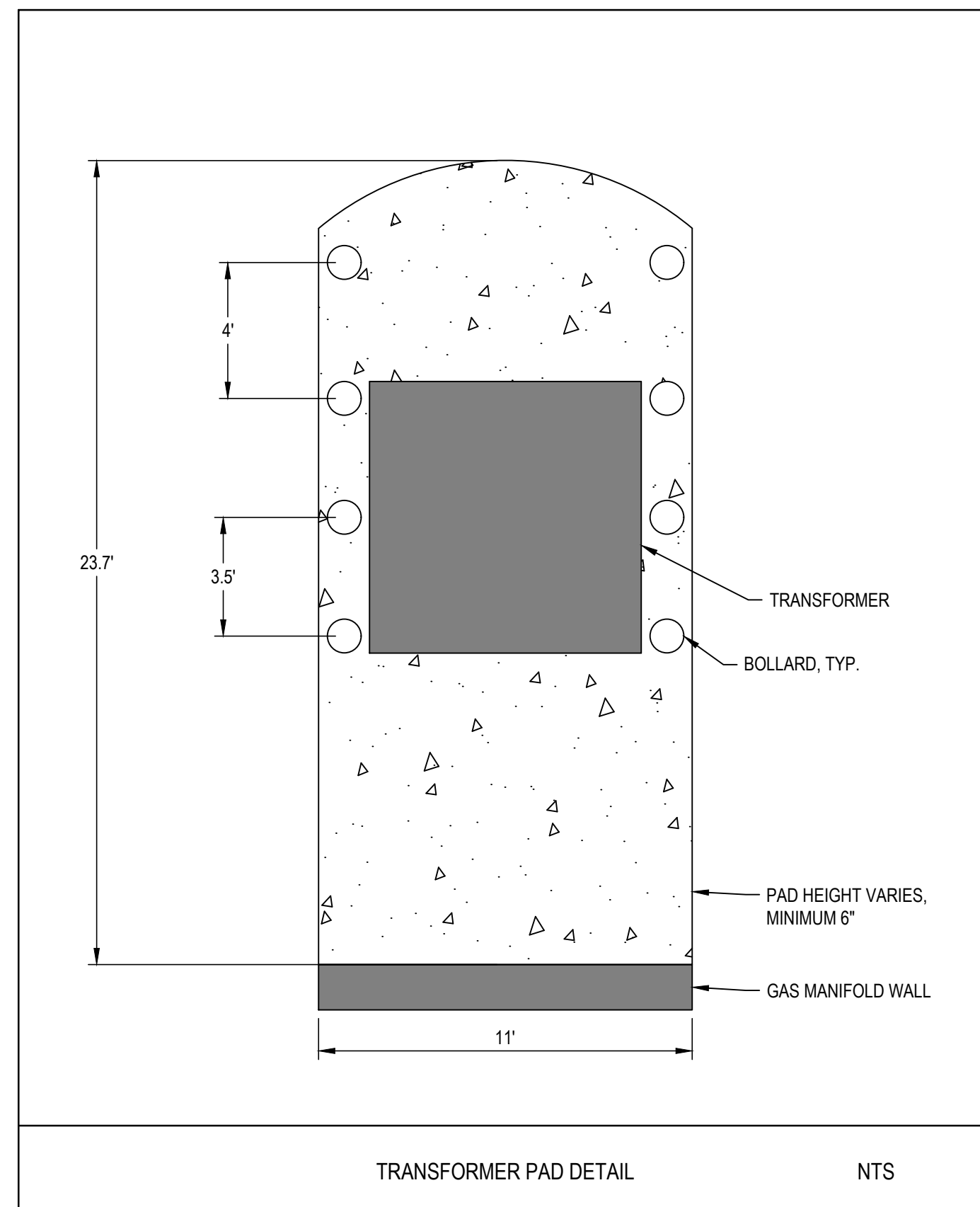
1. PRECAST PAD SUPPLIERS ARE REQUIRED TO PROVIDE THE PADS WITH RECESSED "A/A" ANCHORS, TO BE USED FOR LIFTING THE PADS.

3				
2				
1				
0	DESIGN	ISSUED	AS BUILT	ISSUED
REVISED	BY	CHK'D	APPR.	

**LARGE FLAT PAD SPECIFICATIONS**

DEC	DEM	DEP	DEF
		X	

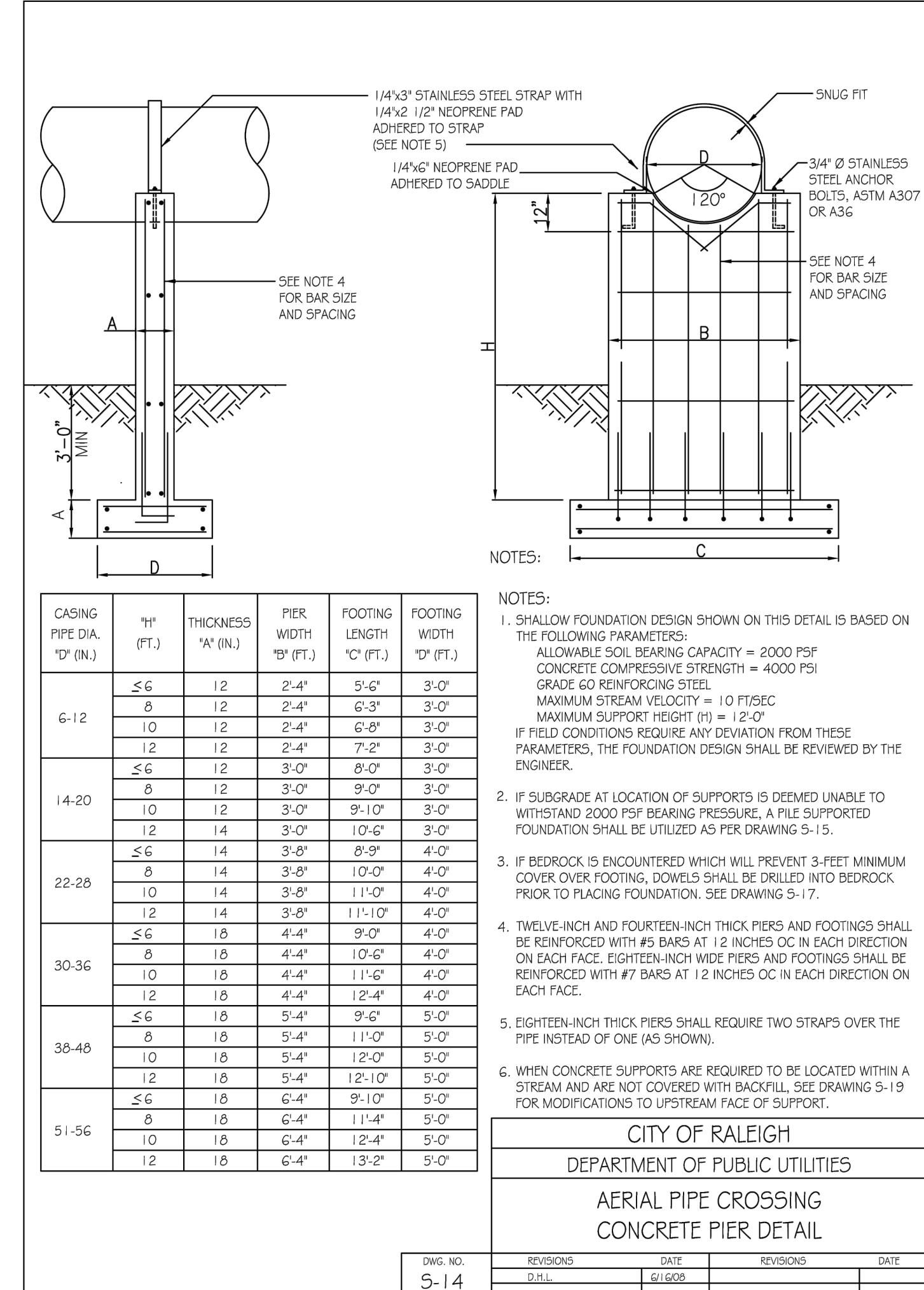
**PAGE 6**



**ALLOWABLE SPANS FOR STEEL CASING PIPE**

CARRIER PIPE DIA. (IN.)	CASING PIPE, STEEL DIA. (IN.)	MINIMUM CASING PIPE WALL THICKNESS (IN.)	ALLOWABLE SPAN (FT.)
6	14	0.3750	40
8	16	0.3750	45
10	18	0.3750	50
12	20	0.3750	50
14	24	0.3750	55
16	26	0.3750	55
18	30	0.3750	60
20	32	0.3750	60
24	36	0.4375	65
30	42	0.4375	65
36	48	0.5000	65
42	56	0.5000	65

- NOTES:**
1. STEEL PIPE SHALL BE EITHER SPIRAL WELDED OR SMOOTH WALL SEAMLESS WITH A MINIMUM YIELD STRENGTH OF 35,000 PSI. PAINTING AND LINING SHALL BE AS REQUIRED BY THE CITY OF RALEIGH PUBLIC UTILITIES HANDBOOK.
  2. DUCTILE IRON PIPE SHALL BE SUPPORTED WITH TWO SPIDERS AT EVERY JOINT WITHIN THE CASING PIPE USING APPROVED PIPE ALIGNMENT GUIDE. SEE DRAWING S-39. ALL JOINTS SHALL BE RESTRAINED JOINT. SEE NOTE 2, DWG S-10.
  3. SUPPORT TYPE FOR PIERS SHALL BE DETERMINED BY ENGINEER BASED ON SUBGRADE CONDITIONS AT SITE. SEE DRAWING S-14 FOR SUBGRADE PARAMETERS FOR EACH TYPE OF FOUNDATION. SEE DRAWING S-19 FOR SUPPORTS PLACED WITHIN STREAM.
  4. BOTTOM OF PIPE TO BE AT A MINIMUM OF 1' ABOVE THE 25 YEAR FLOOD ELEVATION.



**NOTES:**

1. SHALLOW FOUNDATION DESIGN SHOWN ON THIS DETAIL IS BASED ON THE FOLLOWING PARAMETERS:  
 ALLOWABLE SOIL BEARING CAPACITY = 2000 PSF  
 CONCRETE COMPRESSIVE STRENGTH = 4000 PSI  
 GRADE 60 REINFORCING STEEL  
 MAXIMUM STREAM VELOCITY = 10 FT/SEC  
 MAXIMUM SUPPORT HEIGHT (H) = 12'-0"
2. IF SUBGRADE AT LOCATION OF SUPPORTS IS DEEMED UNABLE TO WITHSTAND 2000 PSF BEARING PRESSURE, A PILE SUPPORTED FOUNDATION SHALL BE UTILIZED AS PER DRAWING S-15.
3. IF BEDROCK IS ENCOUNTERED WHICH WILL PREVENT 3-FEET MINIMUM COVER OVER FOOTING, DOWELS SHALL BE DRILLED INTO BEDROCK PRIOR TO PLACING FOUNDATION. SEE DRAWING S-17.
4. TWELVE-INCH AND FOURTEEN-INCH THICK PIERS AND FOOTINGS SHALL BE REINFORCED WITH #5 BARS AT 12 INCHES OC IN EACH DIRECTION ON EACH FACE. EIGHTEEN-INCH WIDE PIERS AND FOOTINGS SHALL BE REINFORCED WITH #7 BARS AT 12 INCHES OC IN EACH DIRECTION ON EACH FACE.
5. EIGHTEEN-INCH THICK PIERS SHALL REQUIRE TWO STRAPS OVER THE PIPE INSTEAD OF ONE (AS SHOWN).
6. WHEN CONCRETE SUPPORTS ARE REQUIRED TO BE LOCATED WITHIN A STREAM AND ARE NOT COVERED WITH BACKFILL, SEE DRAWING S-19 FOR MODIFICATIONS TO UPSTREAM FACE OF SUPPORT.

CASING PIPE DIA. "D" (IN.)	"H" (FT.)	THICKNESS "A" (IN.)	PIER WIDTH "B" (FT.)	FOOTING LENGTH "C" (FT.)	FOOTING WIDTH "D" (FT.)
6-12	≤ 6	12	2'-4"	5'-6"	3'-0"
	8	12	2'-4"	6'-3"	3'-0"
	10	12	2'-4"	6'-6"	3'-0"
14-20	≤ 6	12	3'-0"	8'-0"	3'-0"
	8	12	3'-0"	9'-0"	3'-0"
	10	12	3'-0"	9'-10"	3'-0"
22-28	≤ 6	14	3'-0"	10'-6"	4'-0"
	8	14	3'-0"	10'-0"	4'-0"
	10	14	3'-0"	11'-0"	4'-0"
30-36	≤ 6	16	4'-4"	9'-0"	4'-0"
	8	16	4'-4"	10'-6"	4'-0"
	10	16	4'-4"	11'-6"	4'-0"
36-48	≤ 6	18	4'-4"	12'-4"	4'-0"
	8	18	5'-4"	9'-0"	5'-0"
	10	18	5'-4"	11'-0"	5'-0"
51-56	≤ 6	18	6'-4"	12'-4"	5'-0"
	8	18	6'-4"	11'-4"	5'-0"
	10	18	6'-4"	12'-4"	5'-0"

**CITY OF RALEIGH**  
 DEPARTMENT OF PUBLIC UTILITIES  
**AERIAL PIPE CROSSING**  
**CONCRETE PIER DETAIL**

DWG NO.	REVISIONS	DATE	REVISIONS	DATE
S-14	D.H.L.	6/1/2020		

**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: \_\_\_\_\_  
 Town Engineer

These plans are approved by the Town of Knightdale and serve as construction plans for this project.

By: \_\_\_\_\_ Date: \_\_\_\_\_  
 Administrator

**WithersRavenel**  
 Engineers | Planners

137 S Wilmington Street | Suite 200 | Raleigh, NC 27601 | T: 919-469-3340 | License #: F-1479 | www.withersravenel.com

**MERRITT MIDWAY**  
**BUSINESS PARK**

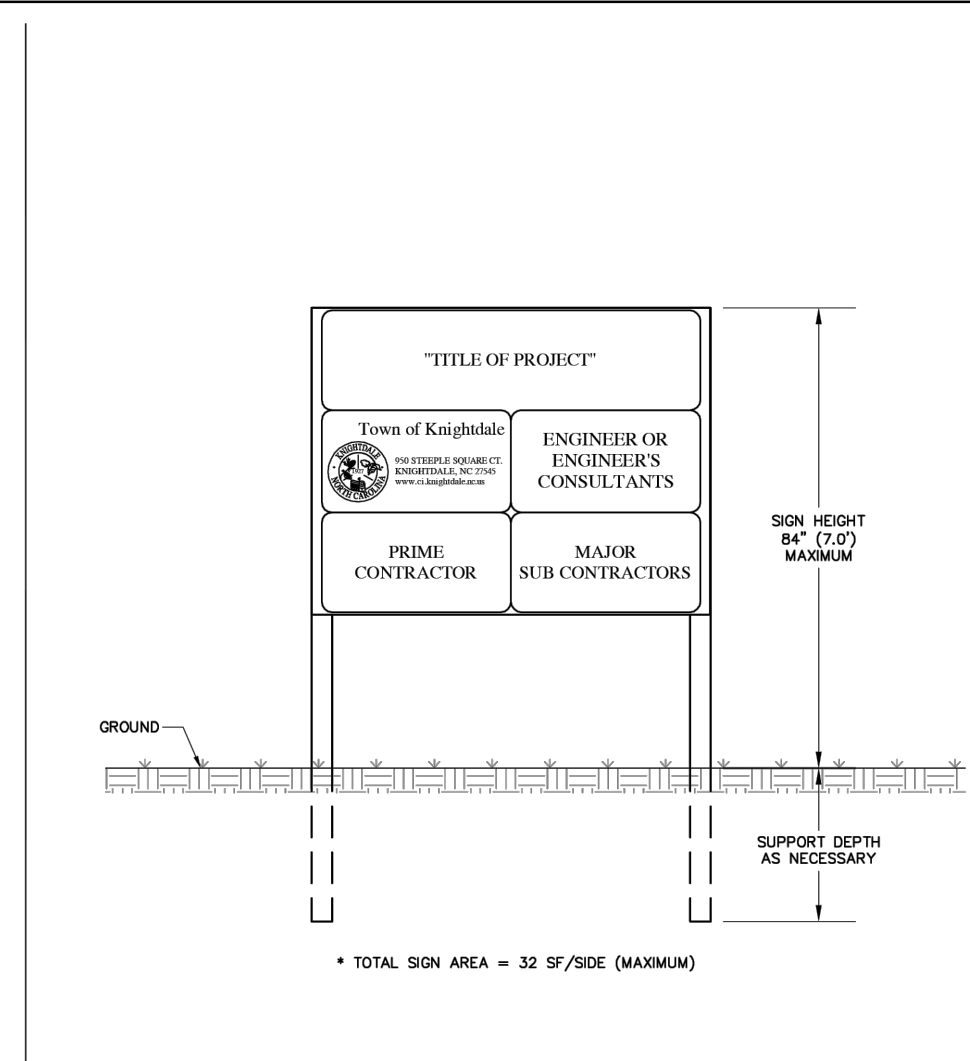
Knightdale, NC

**UTILITY DETAILS**

Job No. 09190080.00 Drawn By WR  
 Date 09/15/2020 Designer WR

Revisions	DATE
9 SIGNATURE SUBMITTAL	8/27/21
10 REVISION TO APPROVED PLANS	11/11/21
11 TOWN COMMENTS	12/22/21
12 LOT A SINGLE BUILDING REVISION	8/8/23
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15 LOT A REVISION TOWN COMMENTS	10/25/24
16 LOT A REVISION SIGNATURE SUBMITTAL	11/22/24

Sheet No.  
**C9.3**

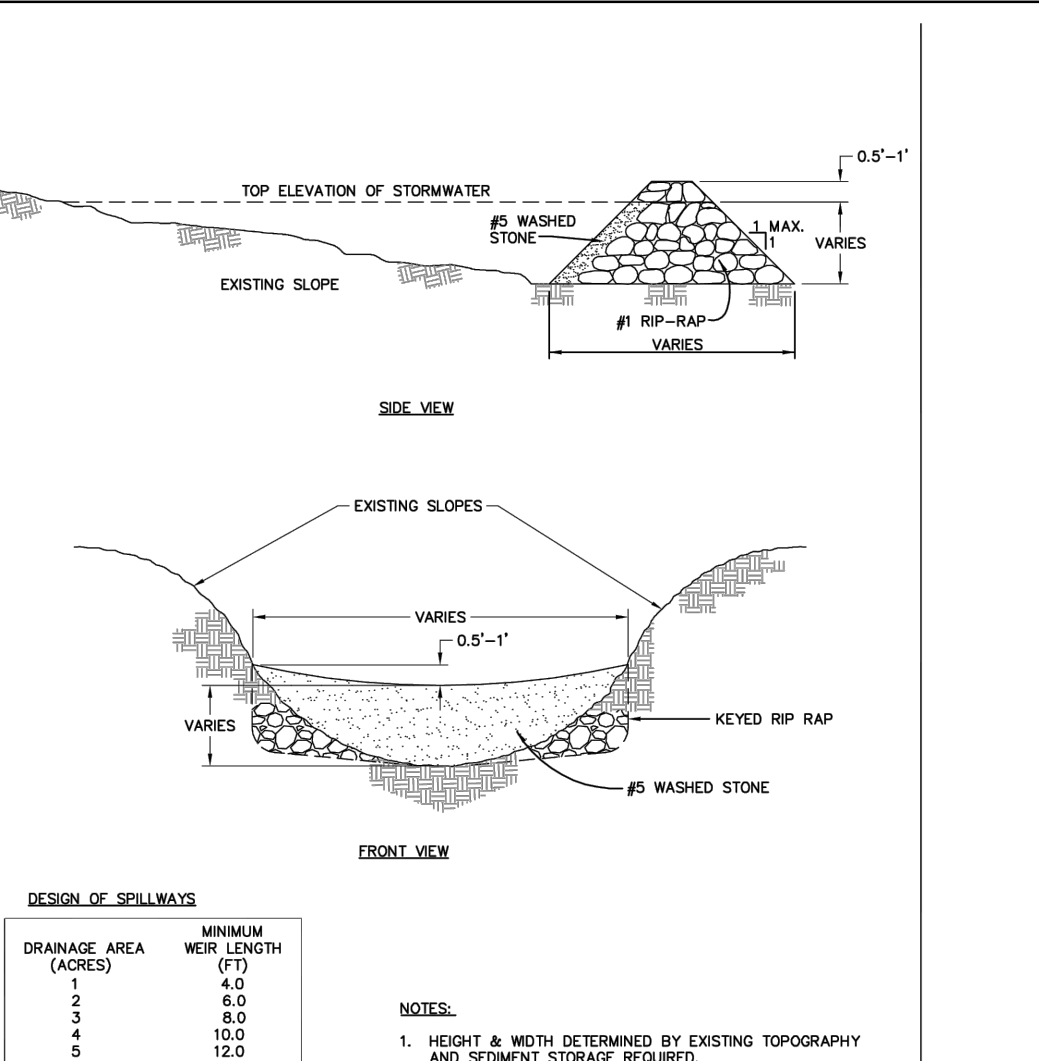
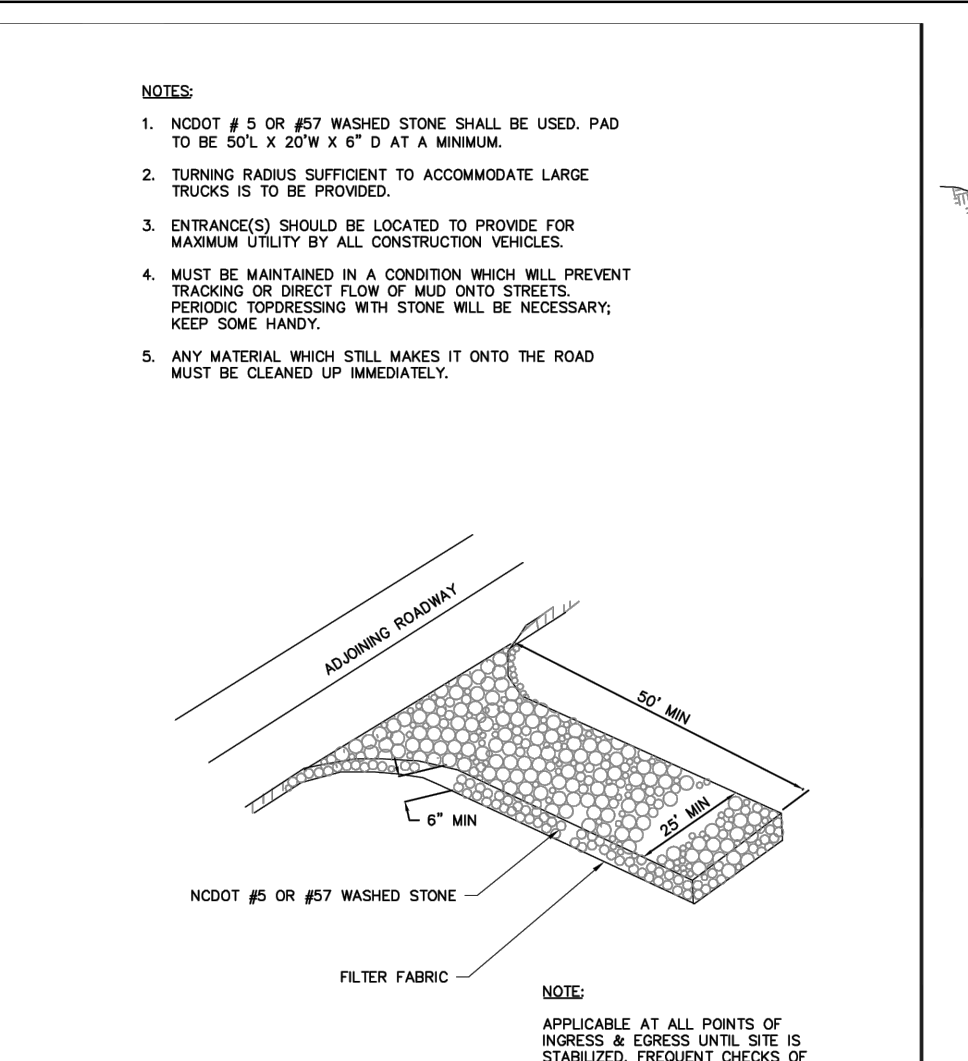
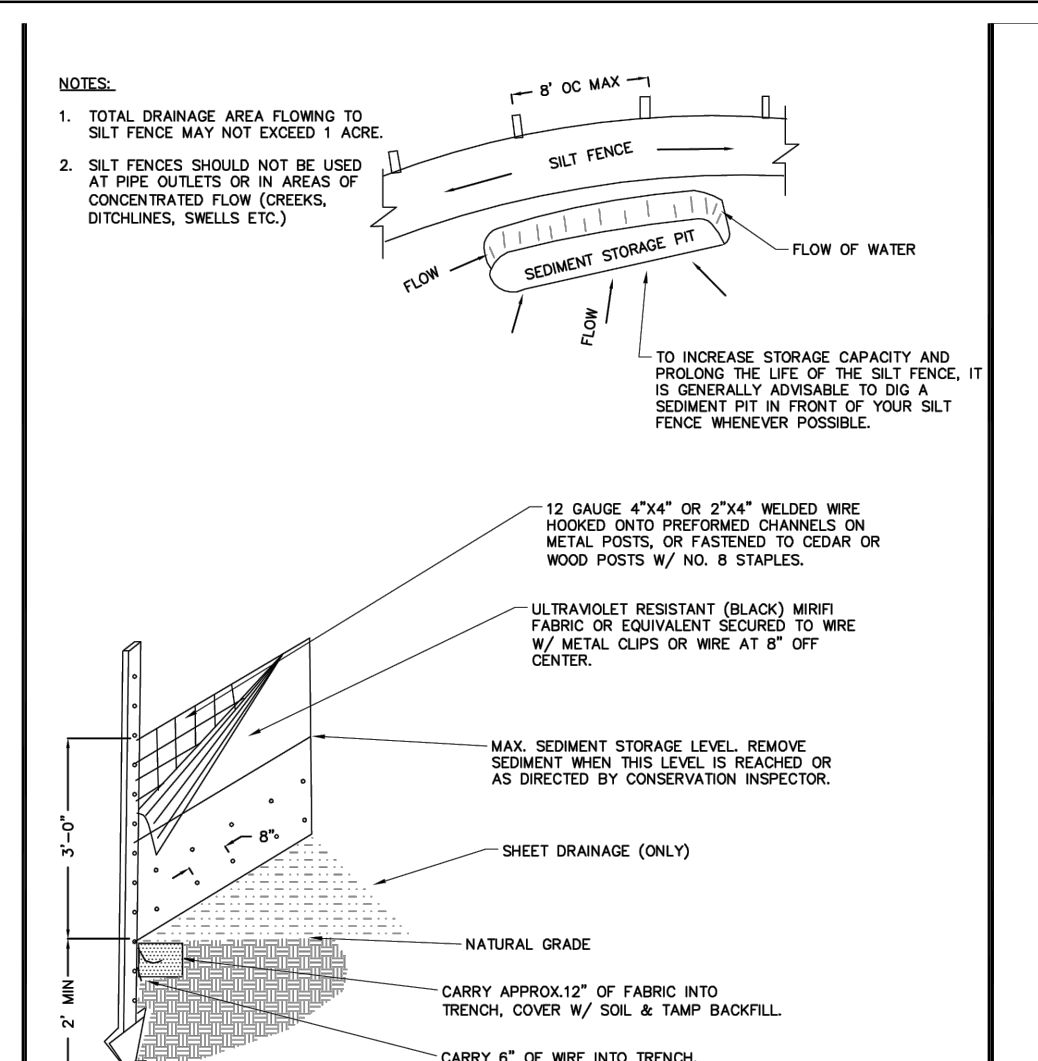
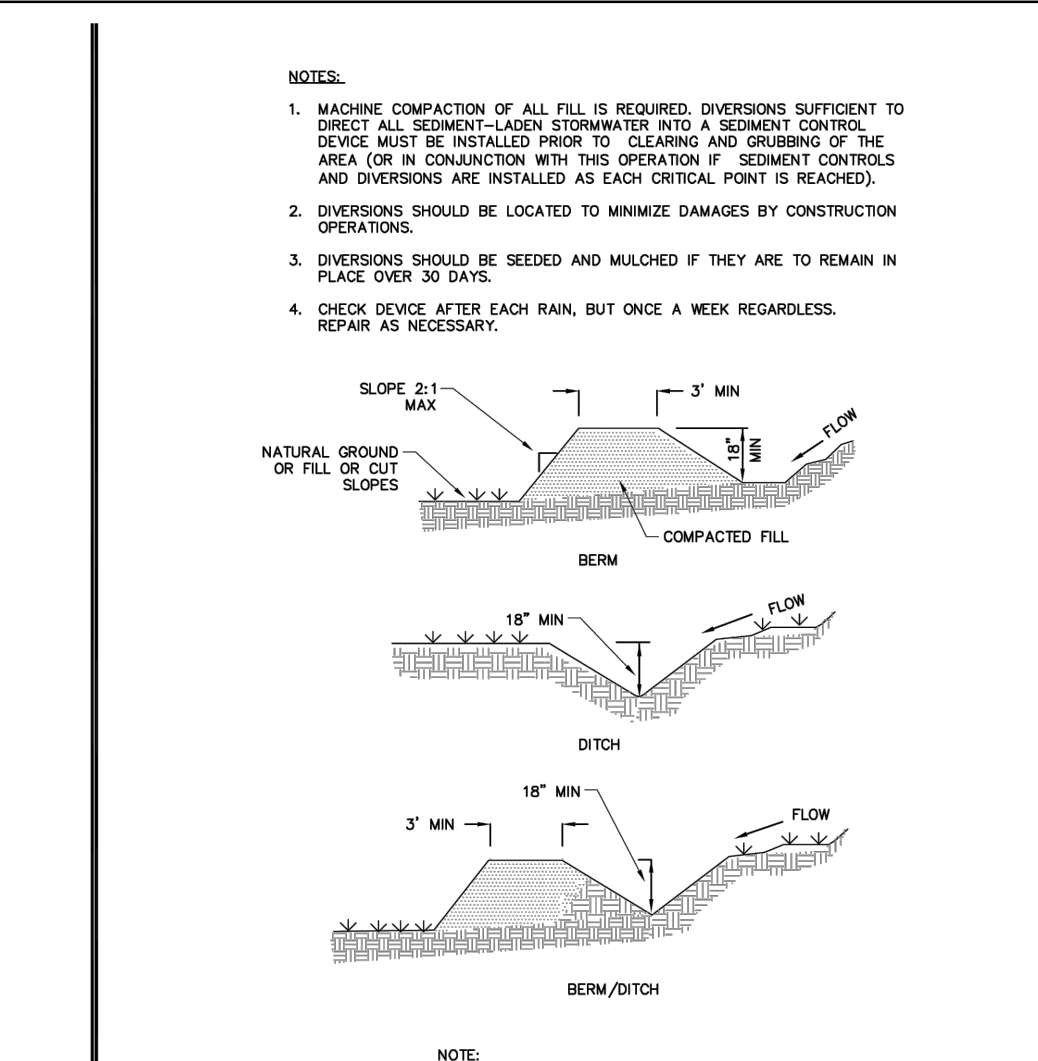


SEEDING SCHEDULE		
SEEDING PERIOD	SEEDING TYPE	APPLICATION RATE (LBS/ACRE)
AUGUST 15 - NOVEMBER 01	TALL FESCUE	300
NOVEMBER 01 - MARCH 01	TALL FESCUE AND ABRUZZI RYE	300
MARCH 01 - APRIL 15	TALL FESCUE	300
APRIL 15 - JUNE 30	HULLED COMMON BERMUDAGRASS	25
JULY 01 - AUGUST 15	TALL FESCUE AND BROWN TOP MILLET OR SORGHUM-SUDAN HYBRIDS	120
MARCH 01 - JUNE 01	BERNICA LESPEDEZA (SCARIFIED) AND TALL FESCUE OR	50
MARCH 01 - APRIL 15	TALL FESCUE OR	120
MARCH 01 - JUNE 30	HULLED COMMON BERMUDAGRASS	25
JUNE 01 - SEPTEMBER 01	BROWN TOP MILLET OR SORGHUM-SUDAN HYBRIDS	35
SEPTEMBER 01 - MARCH 01	TALL FESCUE OR	120
NOVEMBER 01 - MARCH 01	ABRUZZI RYE	25

TEMPORARY - RESEED ACCORDING TO OPTIMUM SEASON FOR DESIRED PERMANENT VEGETATION. DO NOT ALLOW TEMPORARY COVER TO GROW OVER 12" IN HEIGHT BEFORE MORNING. OTHERWISE FESCUE MAY BE SHAVED OUT. CONSULT CONSERVATION ENGINEER OR SOIL CONSERVATION SERVICE FOR ADDITIONAL INFORMATION CONCERNING OTHER ALTERNATIVES FOR VEGETATION OF DENuded AREAS. THE ABOVE VEGETATION RATES ARE THOSE WHICH DO WELL UNDER LOCAL CONDITIONS. OTHER SEEDING RATE COMBINATIONS ARE POSSIBLE.

GROUND COVER - WHEREVER LAND DISTURBING ACTIVITY IS UNDERTAKEN ON A TRACT COMPRISED MORE THAN ONE (1) ACRE, A GROUND COVER SUFFICIENT TO RESTRAIN EROSION MUST BE PLANTED OR PROVIDED WITHIN 15 WORKING DAYS OR 90 CALENDAR DAYS.

GRADED SLOPES AND FILLS - WITHIN 15 WORKING DAYS OR 30 CALENDAR DAYS, OR COMPLETION OF ANY PHASE OF GRADING, WHICHEVER PERIOD IS SHORTER, SLOPES SHALL BE PLANTED OR OTHERWISE PROVIDED GROUND COVER, SERVICES, OR STRUCTURES SUFFICIENT TO RESTRAIN EROSION.



REVISIONS	DATE	DESCRIPTION

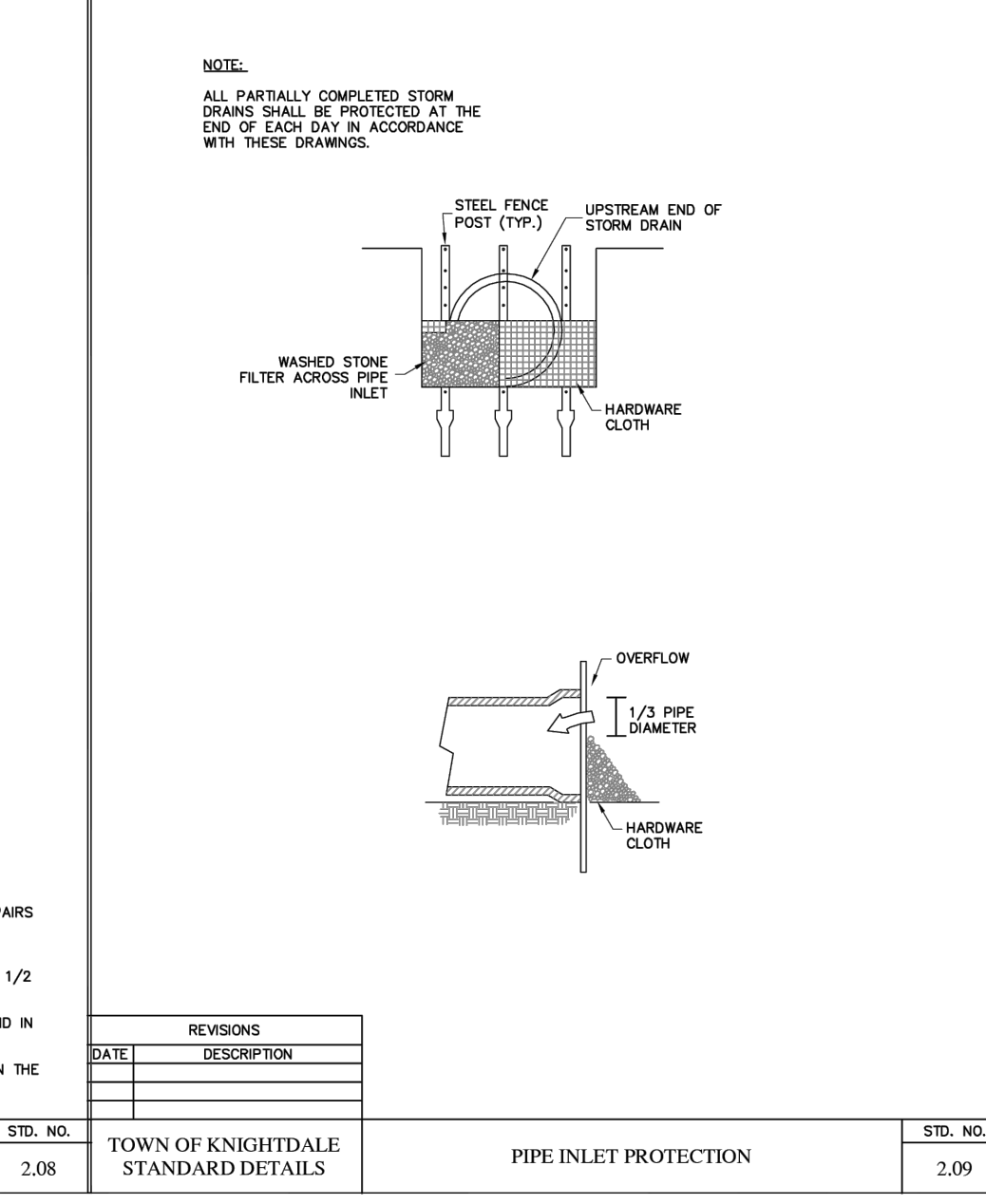
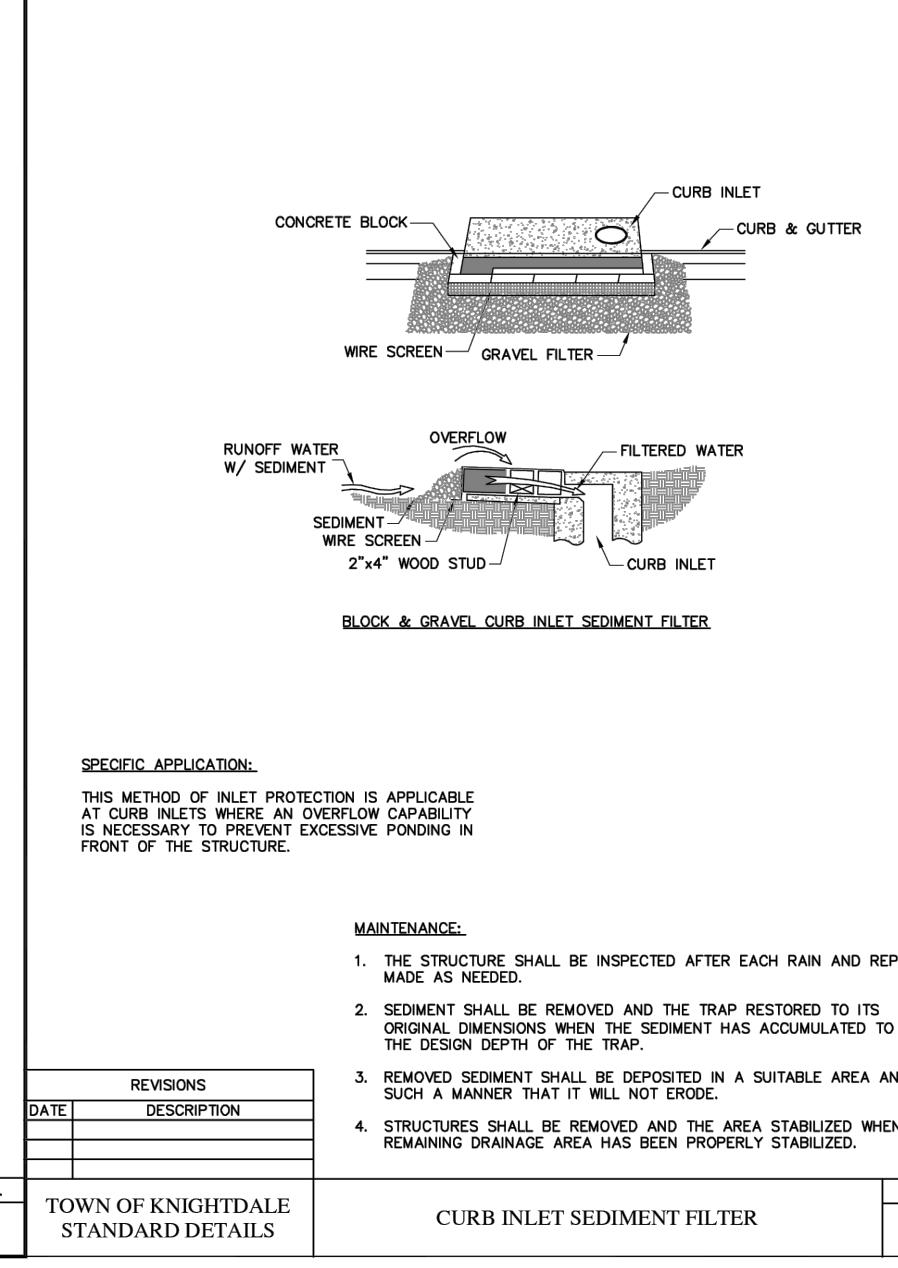
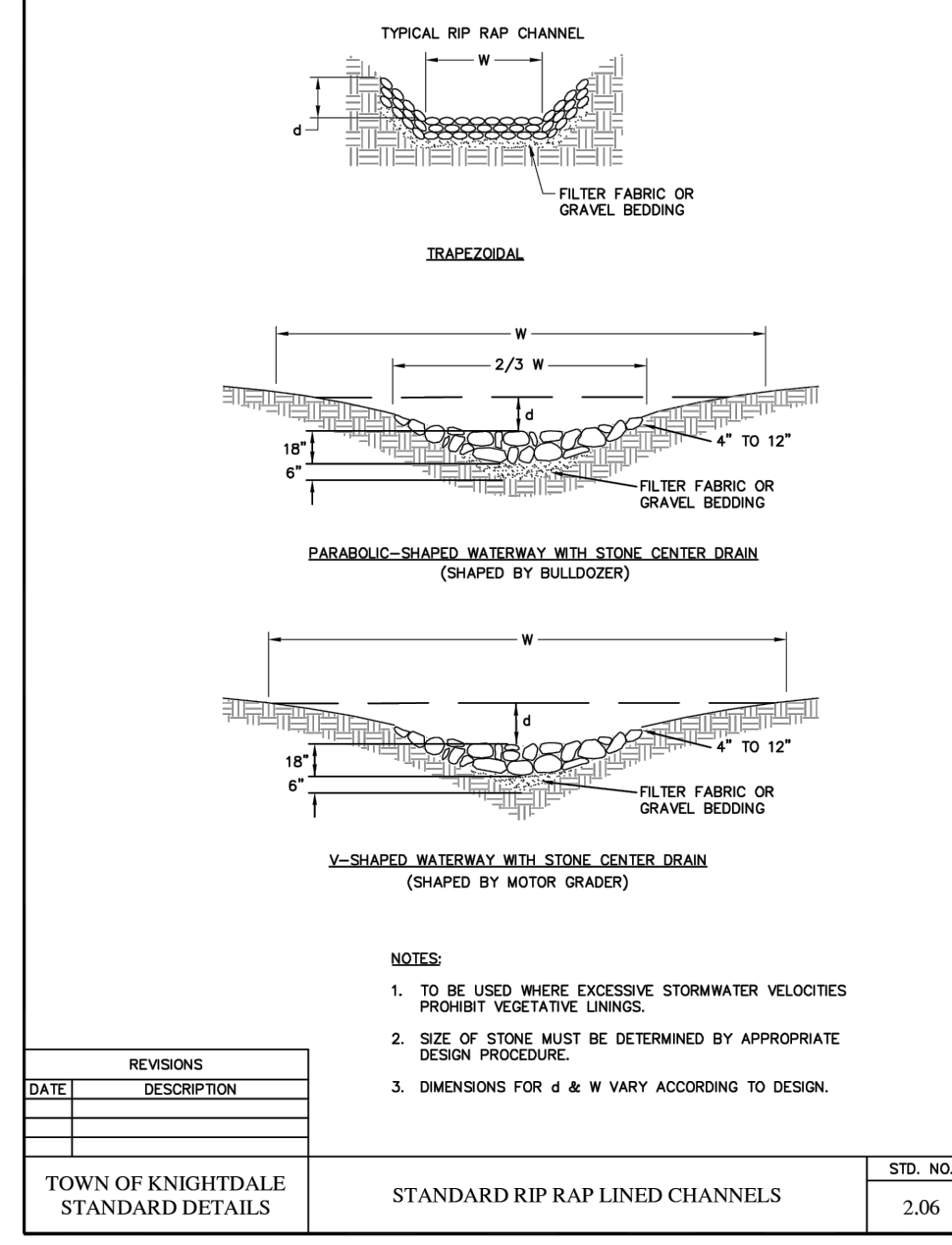
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REVISIONS	DATE	DESCRIPTION

REVISIONS	DATE	DESCRIPTION

REVISIONS	DATE	DESCRIPTION

REVISIONS	DATE	DESCRIPTION



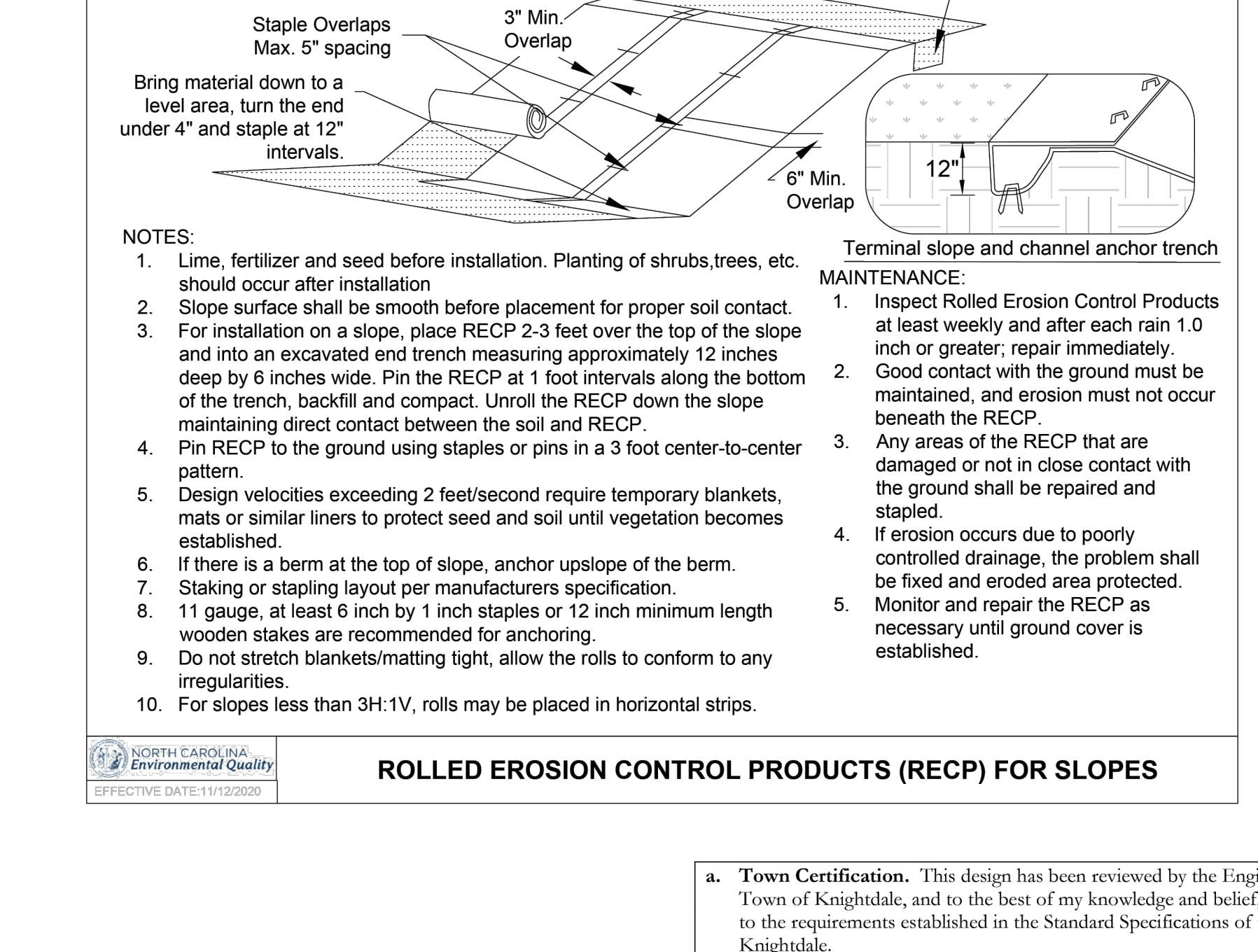
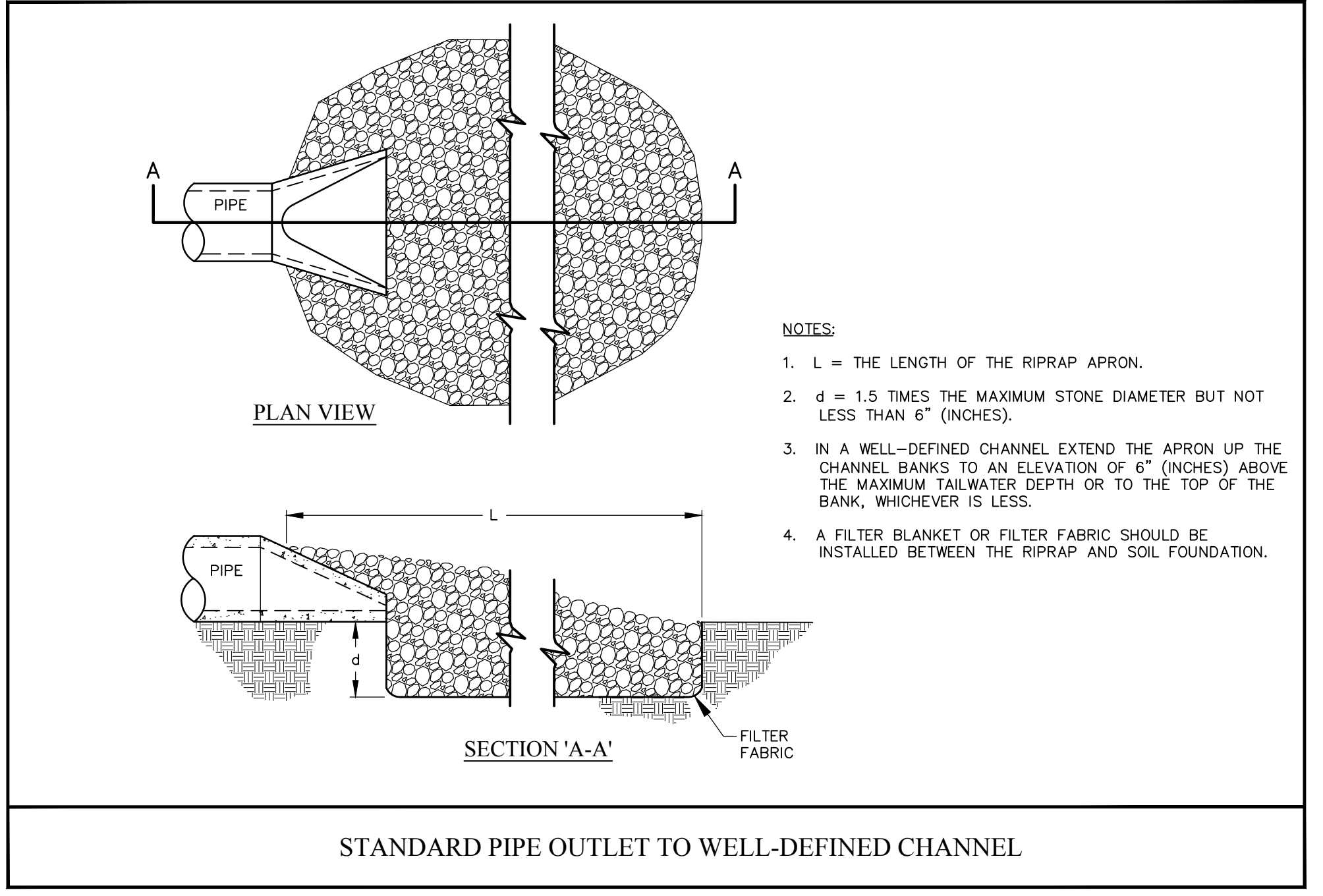
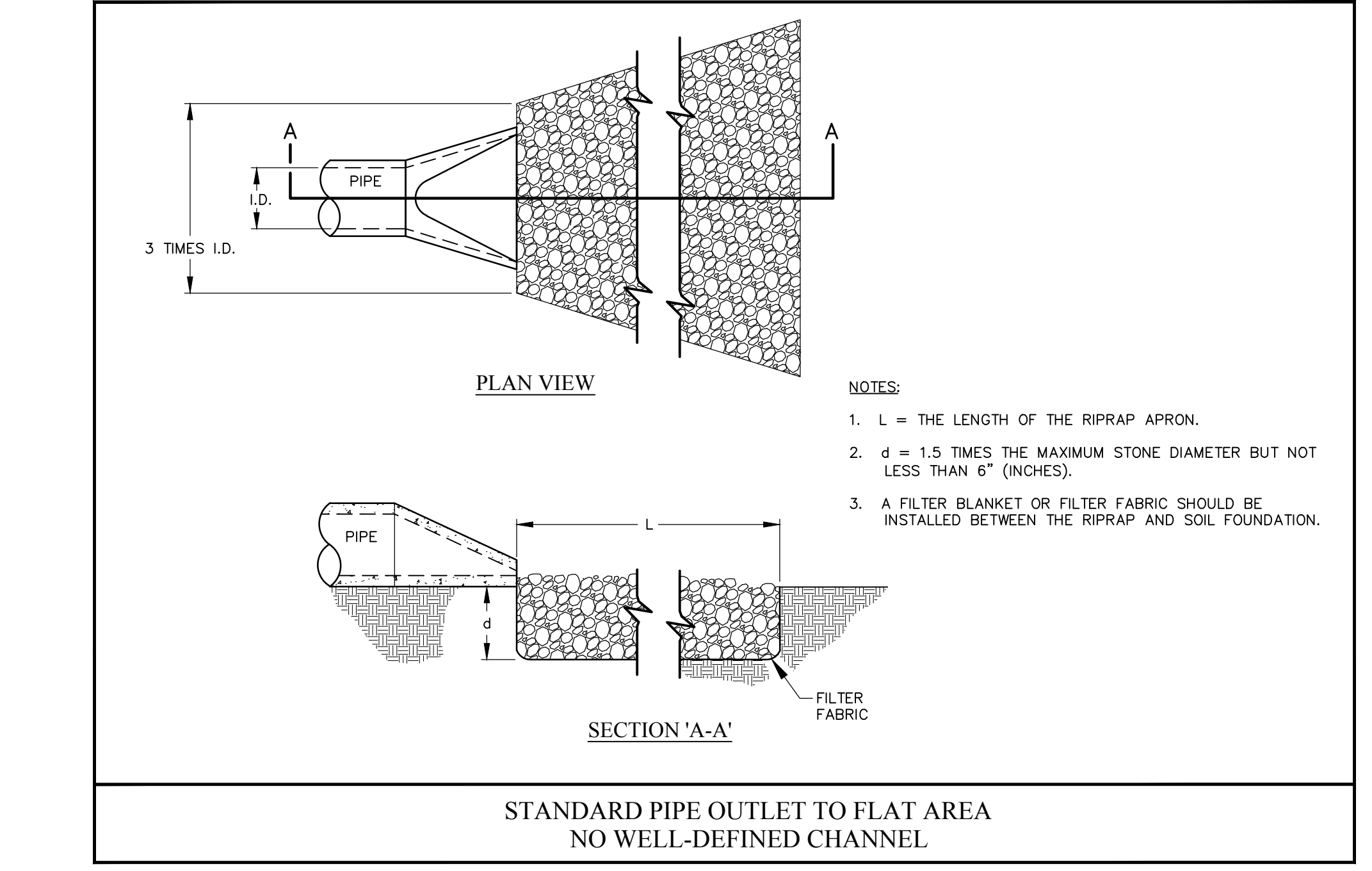
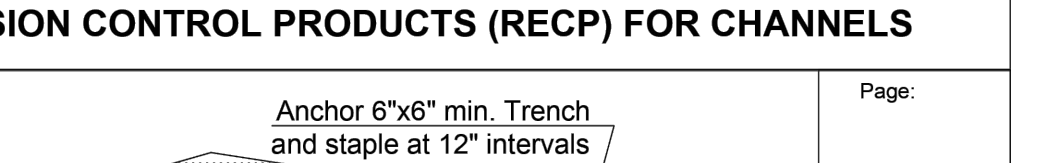
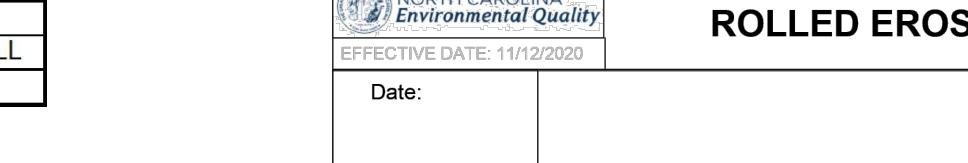
REVISIONS	DATE	DESCRIPTION

REVISIONS	DATE	DESCRIPTION

REVISIONS	DATE	DESCRIPTION

EROSION CONTROL DISSIPATER DESIGN					
DISSIPATER LOCATION	10 YR VELOCITY (ft/s)	APRON LENGTH (ft.)	APRON WIDTH (ft.)	RIPRAP DEPTH (in.)	RIPRAP SIZE
FES 100	7.2	6.0	6.0	18.0	Class B
FES 200	8.9	10.5	10.5	18.0	Class B
SB 1	4.5	8.0	6.0	9.0	Class A
SB 2	9.1	18.0	9.0	18.0	Class B
SSB 1	*	3.0	2.0	9.0	Class A
SSB 2	*	3.0	2.0	9.0	Class A
SSB 3	*	3.0	2.0	9.0	Class A

NOTES:  
STANDARD APRON SIZE OF 3'0" X 2'0" USED AT THE END OF ALL SKIMMER PIPE OUTFALLS TO BE CONSERVATIVE.

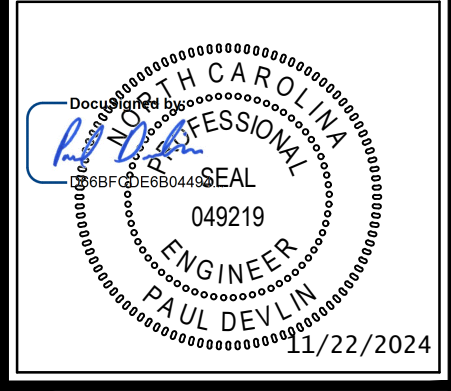


REVISIONS	DATE	DESCRIPTION

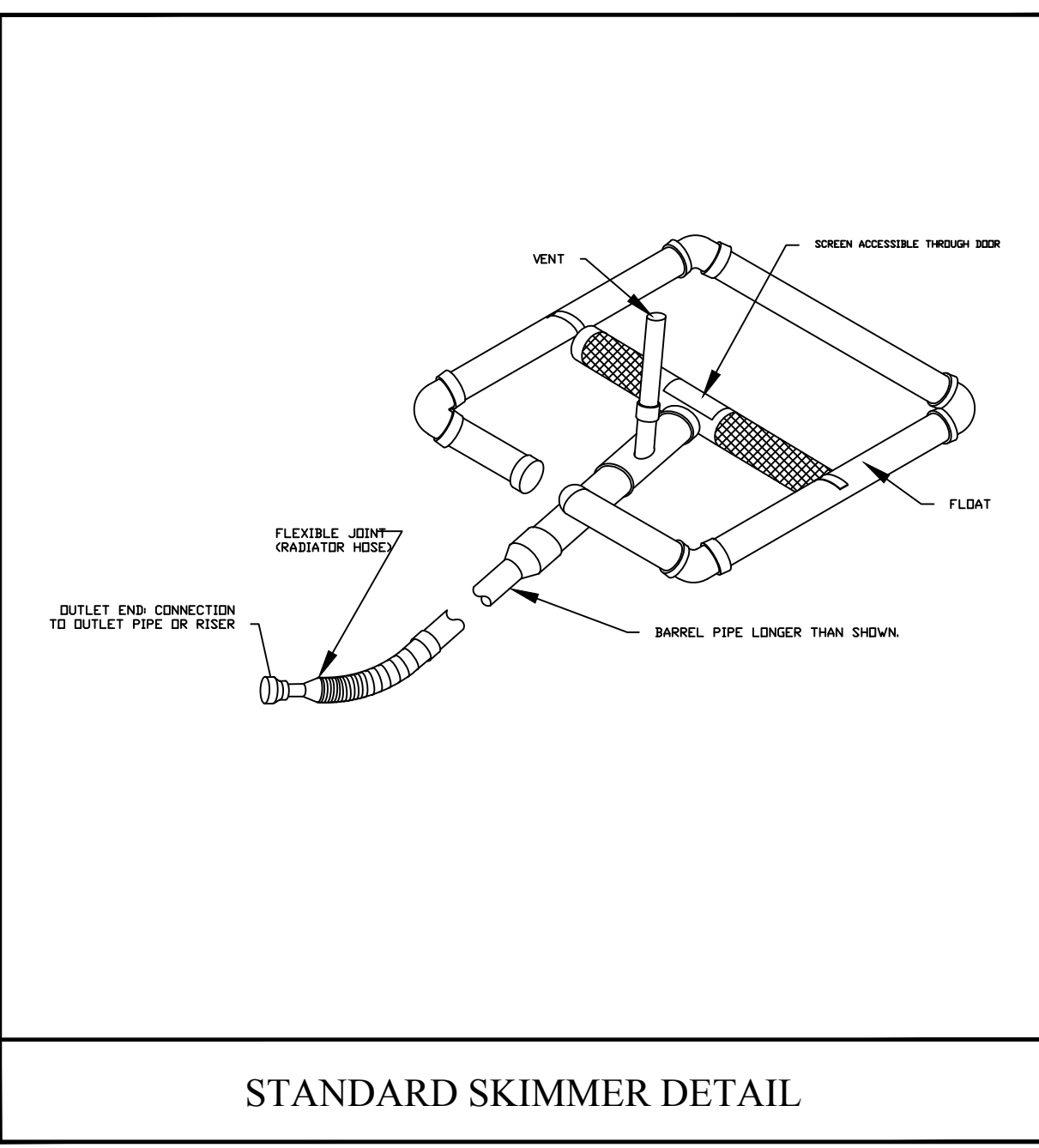
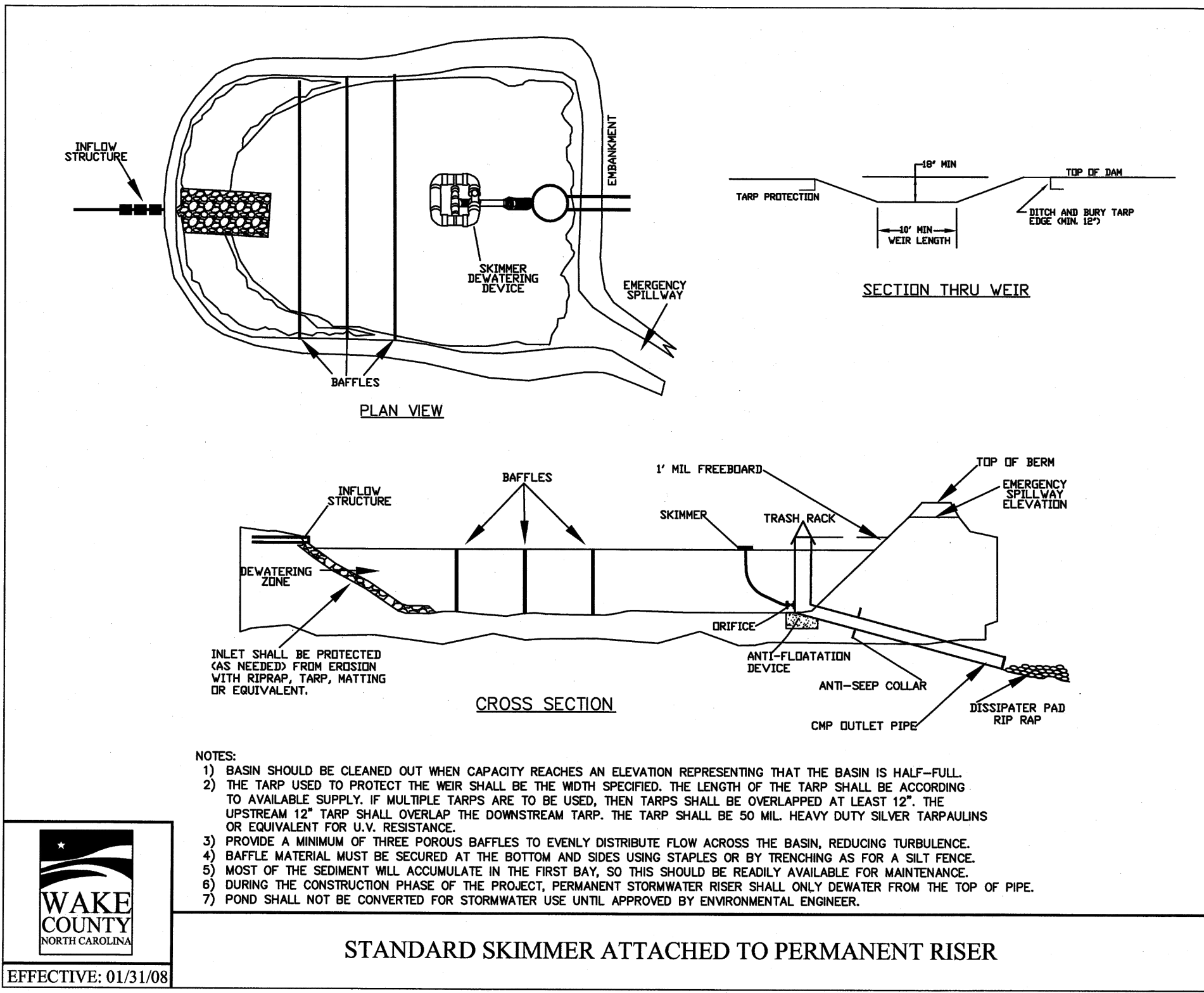
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Revisions	DATE	DESCRIPTION
9	SIGNATURE SUBMITTAL	8/27/21
10	REVISION TO APPROVED PLANS	11/11/21
11	TOWN COMMENTS	12/22/21
12	LOT A SINGLE BUILDING REVISION	8/8/23
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15	LOT A REVISION TOWN COMMENTS	10/25/24
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**SEDIMENT BASIN DESIGN TABLE**

Basin #	Drainage Area (sf)	Drainage Area (ac)	Denuded Area to Basin (ac)	Q10 (cfs)	Storage Volume Req'd (1800 cft/ac)(Denuded Area) (cft)	Surface Area Req'd (Q10)(435sf/cfs) (sf)	Length (ft)	Width (ft)	Depth (ft)	Storage Volume Provided (cft @ 10yr. Elev.)	Surface Area Provided (sf) @ 10yr. Elev.	10 yr. Ponding Elevation	Spillway Elevation	Cleanout Elevation	Baffle Zone Area (25% of SA)	*Spillway Length Req'd (ft)	Spillway Length Provided (ft)
SB 1	168842	3.87	3.87	16.86	6969	7336	SEE PLAN	5.0	5.0	59985	15117	273.5	275.75	271	3779	**	-
SB 2	381905	8.77	8.77	38.19	15781	16613	SEE PLAN	5.0	5.0	155535	36245	273.5	275.5	271	9061	**	-

**NOTE:** Min. 1' of freeboard above the emergency spillway shall be provided.  
 Q10 flows are based on Tc=5min; 110-7.26 in/hr (per NOAA); C=0.60  
 Each Basin requires 3 baffles.  
 \* Weir/Spillway length requirement based on Q10 flows  
 \*\* The riser structure proposed can pass the Q10 flows without overtopping of the embankment

**SKIMMER SEDIMENT BASIN DESIGN TABLE**

Basin #	Drainage Area (sf)	Drainage Area (ac)	Denuded Area to Basin (ac)	Q10 (cfs)	Storage Volume Req'd (1800 cft/ac)(Denuded Area) (cft)	Surface Area Req'd (Q10)(325sf/cfs) (sf)	Length (ft)	Width (ft)	Depth (ft)	Storage Volume Provided (cft @ 10yr. Elev.)	Surface Area Provided (sf) @ 10yr. Elev.	10 yr. Ponding Elevation	Spillway Elevation	Cleanout Elevation	Baffle Zone Area (25% of SA)	*Spillway Length Req'd (ft)	Spillway Length Provided (ft)
SSB 1	107034	2.46	2.46	6.24	4423	2029	75	30	3.0	4968	2230	274	275.5	272.5	558	6.25	10
SSB 2	247305	5.68	5.68	14.43	10219	4688	105	45	3.0	11583	4725	285	286.5	283.5	1181	14.43	15
SSB 3	55648	1.28	1.28	3.25	2304	1055	50	25	2.0	2500	1250	288	289.5	286.5	313	3.25	10

**NOTE:** Min. 1' of freeboard above the emergency spillway shall be provided.  
 Q10 flows are based on Tc=5min; 110-7.26 in/hr (per NOAA); C=0.35  
 Each Basin requires 3 baffles.  
 \* Weir/Spillway length requirement based on Q10 flows

**SSB Orifice Calculations**

**Orifice Equation**  $Q = Cd \cdot A \cdot (2gh)^{1/2}$

**SSB 1**

Variables	Constants
Basin Volume:	4,423 cft
Head:	0.208 ft
Dewatering time:	72 hrs 259200 sec
Basin Volume:	g = 32.2 ft/s <sup>2</sup>
Head:	0.250 ft
Dewatering time:	Cd = 0.59

**Orifice Area =** 0.00790 sf 1.13791 sq. in  
**Orifice Diameter =** 1.20 in  
**Orifice Radius =** 0.60 in  
**USE 2.5-INCH DIAMETER SKIMMER WITH 1.25-INCH ORIFICE**

**SSB Orifice Calculations**

**Orifice Equation**  $Q = Cd \cdot A \cdot (2gh)^{1/2}$

**SSB 2**

Variables	Constants
Basin Volume:	10,219 cft
Head:	0.250 ft
Dewatering time:	72 hrs 259200 sec
Basin Volume:	g = 32.2 ft/s <sup>2</sup>
Head:	0.250 ft
Dewatering time:	Cd = 0.59

**Orifice Area =** 0.01665 sf 2.39817 sq. in  
**Orifice Diameter =** 1.75 in  
**Orifice Radius =** 0.87 in  
**USE 3-INCH DIAMETER SKIMMER WITH 1.75-INCH ORIFICE**

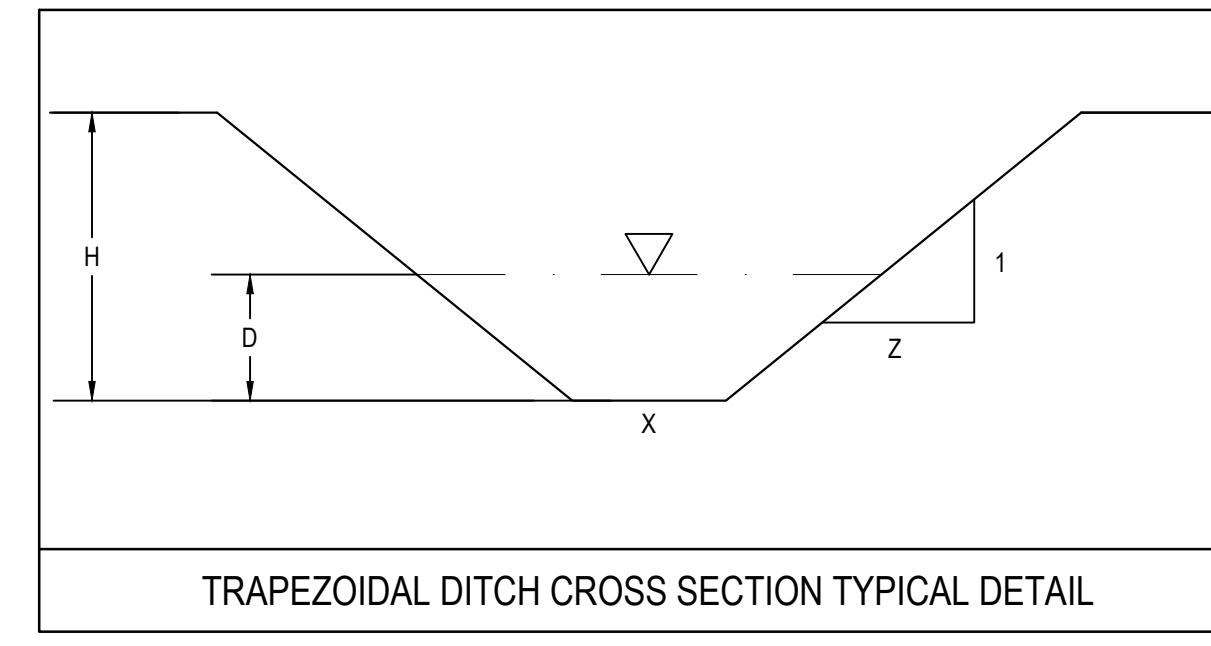
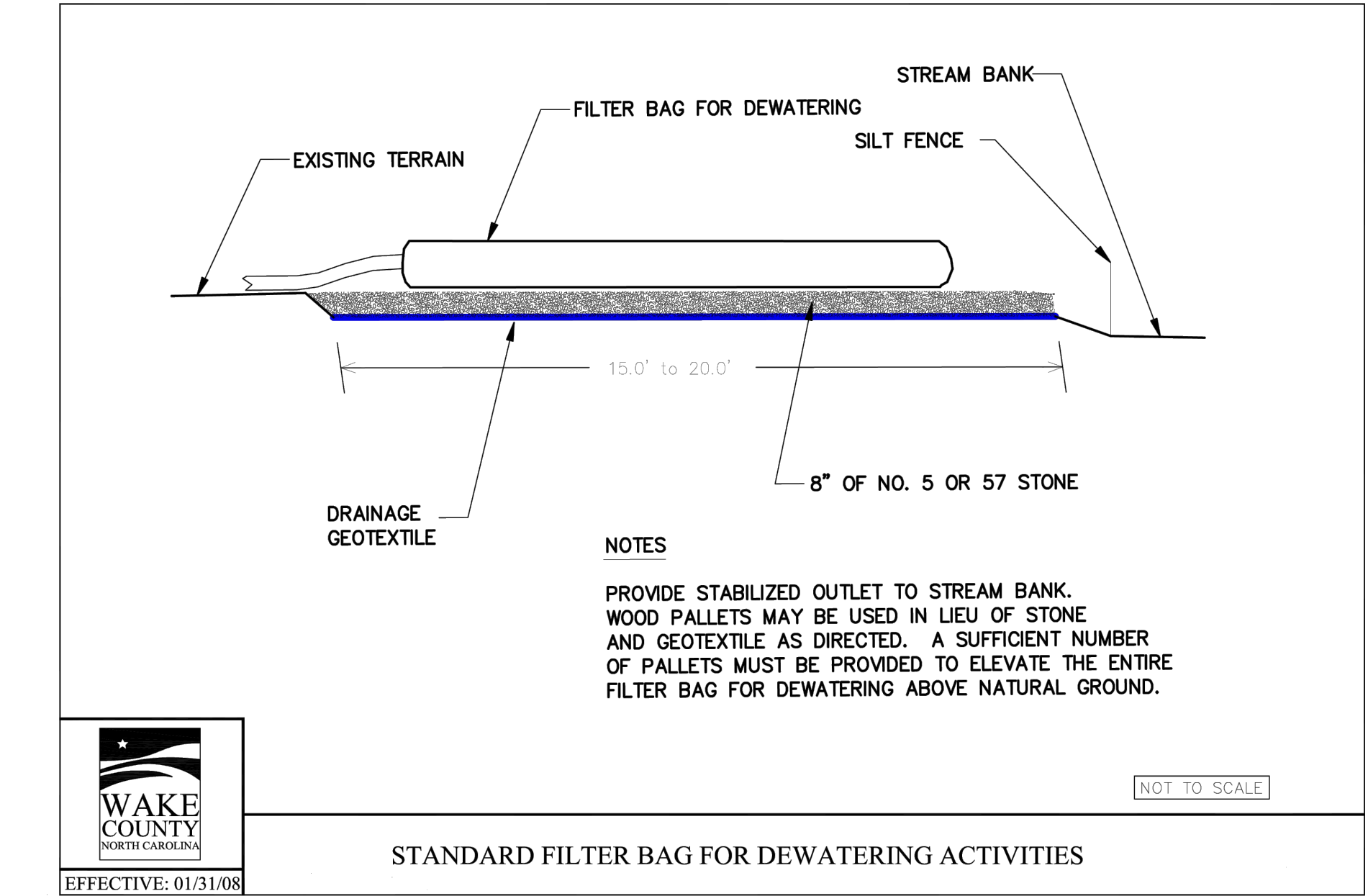
**SSB Orifice Calculations**

**Orifice Equation**  $Q = Cd \cdot A \cdot (2gh)^{1/2}$

**SSB 3**

Variables	Constants
Basin Volume:	2,304 cft
Head:	0.167 ft
Dewatering time:	72 hrs 259200 sec
Basin Volume:	g = 32.2 ft/s <sup>2</sup>
Head:	0.167 ft
Dewatering time:	Cd = 0.59

**Orifice Area =** 0.00459 sf 0.66154 sq. in  
**Orifice Diameter =** 0.92 in  
**Orifice Radius =** 0.46 in  
**USE 2-INCH DIAMETER SKIMMER WITH 1-INCH ORIFICE**



**TEMPORARY DIVERSION CHANNEL SIZING CHART**

TEMP. DIVERSION #	MAX. 10-yr FLOW (cfs)	VELOCITY (ft/s)	SHEAR STRESS (lb/ft <sup>2</sup> ) (Q10 Veg.)	MIN. SLOPE (%)	FLOW DEPTH, D (ft.)	DITCH MIN. DEPTH, H (ft.)	SLOPE, Z	DITCH LINING
TD 1	5.70	5.07	1.32	1.50	0.40	2.0	2.0	NAG S150
TD 2	1.96	3.47	0.66	1.50	0.23	2.0	2.0	NAG S75
TD 3	3.70	4.00	0.83	1.50	0.34	2.0	2.0	NAG S75
TD 4	0.46	2.70	0.50	1.50	0.08	2.0	2.0	NAG S75
TD 5	7.98	5.06	1.30	1.50	0.52	2.0	2.0	NAG S150
TD 6	6.51	5.47	1.55	1.50	0.42	2.0	2.0	NAG S150
TD 7	1.33	2.23	0.27	1.50	0.24	2.0	2.0	NAG S75
TD 8	17.39	5.65	1.57	1.50	0.84	2.0	2.0	NAG S150
CWD 1	4.35	5.37	1.53	1.50	0.31	2.0	2.0	0

**NOTES:**  
 SEE TRAPEZOIDAL DITCH CROSS SECTION TYPICAL DETAIL  
 FLOW DEPTHS, VELOCITY AND SHEAR STRESS CALCULATED USING FLOWMASTER  
 MIN. 0.3 FEET OF FREEBOARD PROVIDED

**WAKE COUNTY STABILIZATION GUIDELINES**

**STABILIZATION TIMEFRAMES** (Effective Aug. 3, 2011)

SITE AREA DESCRIPTION	STABILIZATION	TIMEFRAME EXCEPTIONS
Perimeter dikes, swales, ditches, slopes	7 days	None
High Quality Water (HQW) Zones	7 days	None
Slopes steeper than 3:1	7 days	If slopes are 10' or less in length and are not steeper than 2:1, 14 days are allowed.
Slopes 3:1 or flatter	14 days	7 days for slopes greater than 50' in length.
All other areas with slopes flatter than 4:1	14 days	None, except for perimeters and HQW Zones.

**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 LIGHTLY WITH SEEDING EQUIPMENT OR CULTIVATOR AFTER SEEDING.
7. MULCH IMMEDIATELY AFTER SEEDING AND ANCHOR MULCH.
8. INSPECT ALL SEEDBED 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&E ENVIRONMENTAL ENGINEERS ON MAINTENANCE TREATMENT AND FERTILIZATION AFTER PERMANENT COVER IS ESTABLISHED.

**MIXTURE**

Agricultural Limestone	2 tons/acre (3 tons/acre in clay soils)
Fertilizer	1,000 lbs/acre - 10-10-10
Superphosphate	500 lbs/acre - 20% analysis
Mulch	2 tons/acre - small grain straw
Anchor	Asphalt emulsion at 400 gals/acre

- WAKE COUNTY BASIN REMOVAL SEQUENCE**
1. SCHEDULE A SITE MEETING WITH THE ENVIRONMENTAL ENGINEER/CONSULTANT TO DETERMINE IF A BASIN CAN BE REMOVED. INSTALL SILT FENCING OR OTHER TEMPORARY EROSION CONTROL MEASURES AS NEEDED PRIOR TO REMOVAL OF THE BASIN.
  2. REMOVE BASINS AND ASSOCIATED TEMPORARY DIVERSION DITCHES: IF CULVERT PIPES NEED TO BE EXTENDED, PERFORM THIS OPERATION AT THIS TIME. FINE GRADE AREA IN PREPARATION FOR SEEDING.
  3. PERFORM SEEDBED PREPARATION, SEED, MULCH AND ASPHALT TACK ANY RESULTING BARE AREAS IMMEDIATELY.
  4. INSTALL VELOCITY DISSIPATORS AND/OR LEVEL SPREADERS AS REQUIRED ON THE EROSION CONTROL PLAN.
  5. WHEN SITE IS FULLY STABILIZED, CALL ENVIRONMENTAL ENGINEER/CONSULTANT FOR APPROVAL OF REMOVING REMAINING TEMPORARY EROSION CONTROL MEASURES AND ADVICE ON WHEN SITE CAN BE ISSUED A CERTIFICATE OF COMPLETION.
- NOTE:** A MEETING SHOULD ALSO BE SCHEDULED WITH THE ENVIRONMENTAL ENGINEER/CONSULTANT TO DETERMINE WHEN A BASIN MAY BE CONVERTED FOR STORMWATER USE. SOME MUNICIPALITIES MAY ALSO REQUIRE THIS.

- EROSION CONTROL NARRATIVE**
- MERRITT MIDWAY BUSINESS PARK IS LOCATED IN THE TOWN OF KNIGHTDALE, NORTH CAROLINA OFF OF HINTON OAKS BLVD, APPROXIMATELY 0.25 MILES NORTH OF THE INTERSECTION WITH KNIGHTDALE BLVD. THIS PROJECT CONSISTS OF DEMOLITION, CLEARING, GRUBBING, INSTALLATION OF EROSION CONTROL DEVICES, GRADING, UTILITY INSTALLATION, RETAINING WALL, INSTALLATION, ROAD CONSTRUCTION AND PAVEMENT MARKINGS.
  - THE FOLLOWING SEDIMENTATION AND EROSION CONTROL DEVICES ARE PROPOSED TO BE INSTALLED ON THIS PROJECT: GRAVEL CONSTRUCTION ENTRANCE, SKIMMER SEDIMENT BASINS, SEDIMENT BASINS, DIVERSION BERMS/DITCHES, CHECK DAMS, TEMPORARY SLOPE DRAINS, TEMPORARY SILT FENCE AND SILT FENCE OUTLETS, INLET PROTECTIONS, STREAM CROSSING, SEEDING, MULCHING, AND VEGETATION. OTHER MEASURES MAY BE ADDED AS NEEDED. THE CONTRACTOR AND/OR INSPECTOR HAVE THE AUTHORITY TO ADD EROSION CONTROL MEASURES, IF NECESSARY, TO PREVENT SEDIMENT OR EROSION TO PROTECT ALL PUBLIC AND PRIVATE PROPERTY FROM DAMAGE.

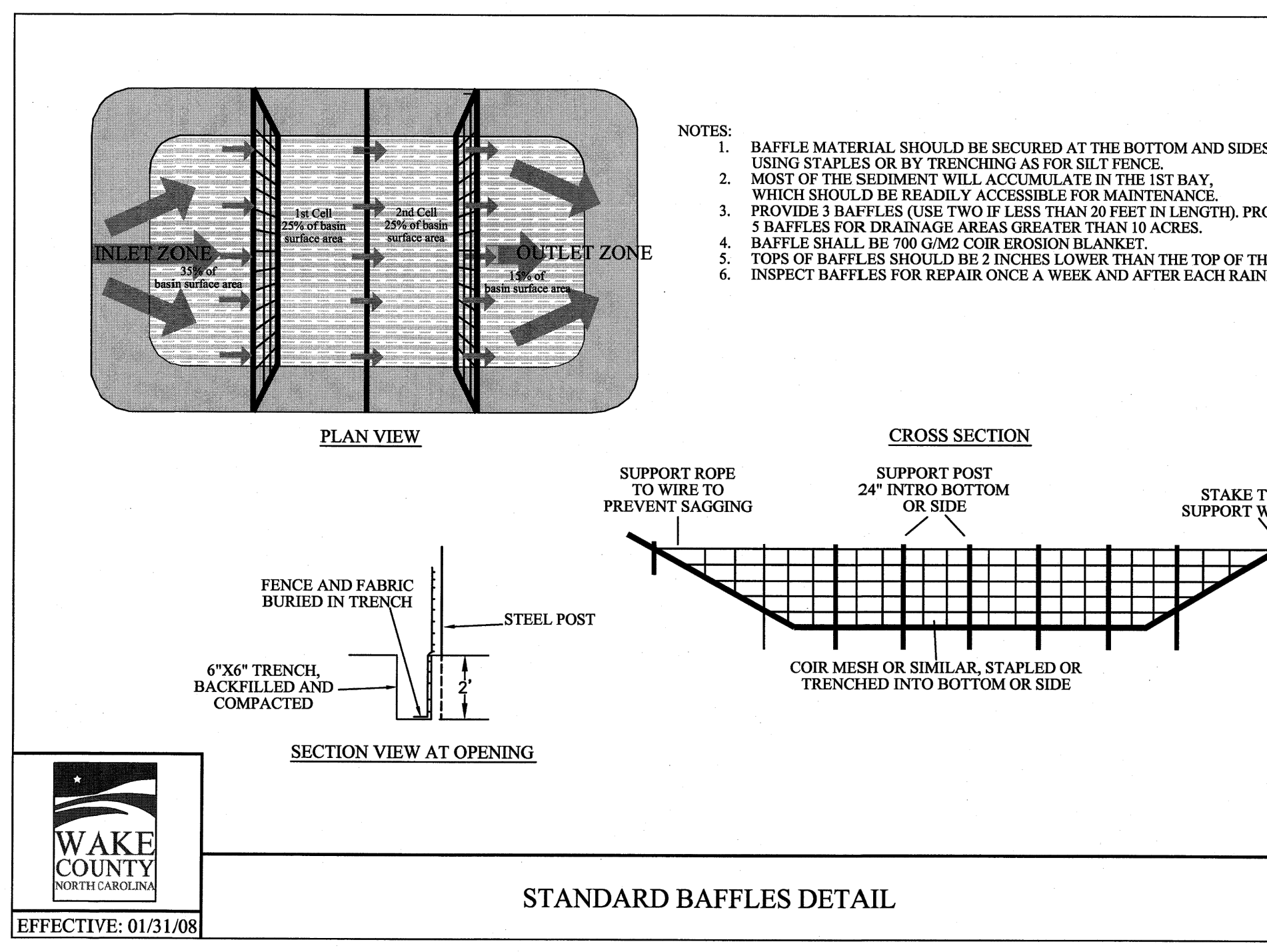
- EROSION CONTROL NOTES**
1. RECEIVING WATERCOURSE: MILBURNIE CREEK TO NEUSE RIVER
  2. THE CONTRACTOR SHALL FAITHFULLY MAINTAIN ALL SEDIMENTATION CONTROL DEVICES AND TAKE ANY PRECAUTIONARY MEASURES TO ENSURE THAT SILT DOES NOT ENTER ANY NATURAL STREAM CHANNEL LOCATED WITHIN THE SITE. DRAINAGE CHANNELS MUST BE CLEAN OF SEDIMENT AND STABILIZED BEFORE THE PROJECT IS RELEASED.
  3. IT IS THE CONTRACTOR'S RESPONSIBILITY TO SEE THAT THE CONSTRUCTION ENTRANCE PADS ARE PROPERLY MAINTAINED SO THAT MUD IS NOT TRACKED ONTO ADJACENT STRETS
  4. ALL EXISTING VEGETATION THAT IS TO BE PRESERVED SHALL BE FENCED WITH A STURDY AND VISIBLE FENCE BEFORE EXCAVATION BEGINS. THE TREE PROTECTION FENCE SHOULD BE LOCATED AS FAR AS PRACTICABLE FROM THE TREES AND VEGETATION.
  5. ALL ENVIRONMENTAL PERMITS APPLICABLE TO THE PROJECT MUST BE OBTAINED FROM NCDWR, USACE AND/OR FEMA FOR ANY RIPARIAN BUFFER, WETLANDS AND/OR FLOODPLAIN IMPACTS (RESPECTIVELY) PRIOR TO CONSTRUCTION.
  6. IF TEMPORARY DIVERSIONS MUST BE ALTERED TO ALLOW FOR CONSTRUCTION ACCESS, THE DIVERSIONS MUST BE RE-INSTALLED AND PROPERLY STABILIZED WITHIN THE SAME DAY, POSITIVE FLOW TO THE SEDIMENT BASIN ON SITE MUST ALWAYS BE ENSURED.
  7. SLOPES SHALL BE NO STEEPER THAN 2:1 (H:V), PREFERABLY FLATTER, FOR VEGETATION.
  8. VELOCITY DISSIPATORS SHALL BE INSTALLED AT THE END OF EACH FLARED END SECTION AND SHALL HAVE A FILTER FABRIC UNDERLIER.
  9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING A PERMANENT STAND OF VEGETATION ON ALL DISTURBED AREAS AND MEETING ALL NPDES FINAL STABILIZATION REQUIREMENTS. ALL AREAS AND SLOPES DISTURBED DURING CONSTRUCTION AND EXPOSED SHALL BE STABILIZED WITH TEMPORARY SEEDING AND MULCHING WITHIN 14 CALENDAR DAYS OF TEMPORARILY OR PERMANENTLY SUSPENDING LAND DISTURBING ACTIVITY. PERMANENT GROUND COVER SHALL BE PLACED WITHIN 14 CALENDAR DAYS FOLLOWING COMPLETION OF CONSTRUCTION OR DEVELOPMENT.
  10. INLET PROTECTION DEVICES SHALL BE INSPECTED AFTER EVERY RAINFALL EVENT. DAMAGED SILT FENCE SHALL BE REPLACED AND GRAVEL SHALL BE CLEANED OR REPLACED WHEN INLET NO LONGER DRAINS PROPERLY.
  11. SEE EROSION CONTROL DETAILS FOR ADDITIONAL MAINTENANCE REQUIREMENTS AND SPECIFICATIONS.

- WAKE COUNTY STOCKPILE MAINTENANCE REQUIREMENTS**
1. SEEDING OR COVERING STOCKPILES WITH TARP AND MULCH IS REQUIRED AND WILL REDUCE EROSION PROBLEMS. TARPS SHOULD BE KEVED 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 WAKE COUNTY OF A NEW RESPONSIBLE PARTY FOR THAT STOCKPILE.
  3. THE APPROVED PLAN SHALL PROVIDE FOR THE USE OF STAGES SEEDING AND MULCHING ON A CONTINUAL BASIS WHILE THE STOCKPILE IS IN USE.
  4. ESTABLISH AND MAINTAIN A VEGETATIVE BUFFER AT THE TOW OF SLOPE (WHERE PRACTICAL).

- NC GROUND COVER REQUIREMENT**
- THE ANGLE FOR GRADED SLOPES AND FILLS SHALL BE NO GREATER THAN THE ANGLE THAT CAN BE RETAINED BY VEGETATIVE COVER OR OTHER ADEQUATE EROSION CONTROL DEVICES OR STRUCTURES. IN ANY EVENT, SLOPES LEFT EXPOSED WILL, WITHIN 10 OR 14 CALENDAR DAYS OF COMPLETION OF ANY PHASE OF GRADING, BE PLANTED OR OTHERWISE PROVIDED WITH TEMPORARY GROUND COVER. DEVICES OR STRUCTURES SUFFICIENT TO RESTRAIN EROSION. PERMANENT GROUND COVER WILL BE PROVIDED FOR ALL DISTURBED AREAS WITHIN 15 WORKING DAYS OR NO MORE THAN 90 CALENDAR DAYS (WHICHEVER IS SHORTER) FOLLOWING COMPLETION OF CONSTRUCTION.

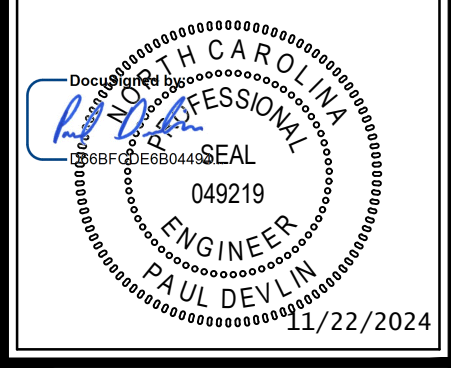
- WAKE COUNTY CONSTRUCTION SEQUENCE**
1. SCHEDULE A PRECONSTRUCTION CONFERENCE WITH THE WATERSHED MANGER, KARYN PAGEAU (919-796-8769), OBTAIN A LAND-DISTURBING PERMIT.
  2. INSTALL GRAVEL CONSTRUCTION PAD, TEMPORARY DIVERSIONS, SILT FENCE, SEDIMENT BASINS OR OTHER MEASURES AS SHOWN ON THE APPROVED PLAN. CLEAR ONLY AS NECESSARY TO INSTALL THESE DEVICES. SEED TEMPORARY DIVERSIONS, BERMS AND BASINS IMMEDIATELY AFTER CONSTRUCTION.
  3. CALL 919-796-8769 FOR AN ONSITE INSPECTION BY THE WATERSHED MANAGER TO OBTAIN A CERTIFICATE OF COMPLIANCE.
  4. BEGIN CLEARING AND GRUBBING. MAINTAIN DEVICES AS NEEDED. ROUGH GRADE SITE.
  5. INSTALL STORM SEWER, IF SHOWN, AND PROTECT INLETS WITH BLOCK AND GRAVEL. INLET CONTROLS, SEDIMENT TRAPS OR OTHER APPROVED MEASURES AS SHOWN ON THE PLAN. BEGIN CONSTRUCTION, BUILDING, ETC.
  6. WHEN CONSTRUCTION IS COMPLETE AND ALL AREAS ARE STABILIZED COMPLETELY, CALL 919-796-8769 FOR AN INSPECTION BY THE WATERSHED MANAGER.
  7. IF SITE IS APPROVED, REMOVE TEMPORARY DIVERSIONS, SILT FENCE, SEDIMENT BASINS, ETC. AND SEED OUT OR STABILIZE ANY RESULTING BARE AREAS. ALL REMAINING PERMANENT EROSION CONTROL DEVICES, SUCH AS VELOCITY DISSIPATORS, SHOULD NOW BE INSTALLED.
  8. WHEN VEGETATION HAS BECOME ESTABLISHED, CALL FOR A FINAL SITE INSPECTION BY THE WATERSHED MANAGER, KARYN PAGEAU (919-796-8769). OBTAIN A CERTIFICATE OF COMPLETION.
  9. \* STREAM CROSSING BETWEEN LOT A AND LOT B TO BE USED FOR STAGE 1 EROSION CONTROL ONLY. STREAM CROSSING TO BE REMOVED WITHOUT DISTURBANCE TO THE STREAM BED OR BANKS PRIOR TO COMMENCING STAGE 2 EROSION CONTROL PLAN.

- STORM DRAINAGE/GRADING NOTES:**
1. ALL AREAS SHALL BE GRADED FOR POSITIVE DRAINAGE, AND AS SHOWN ON THESE PLANS, THE CONTRACTOR SHALL MAINTAIN ADEQUATE SITE DRAINAGE DURING ALL PHASES OF CONSTRUCTION. IN ADDITION TO THE MEASURES SHOWN IN THESE PLANS, THE CONTRACTOR SHALL USE INTERIM DRAINAGE DITCHES, BERMS, OR OTHER METHODS AS REQUIRED TO DIRECT DRAINAGE AS SHOWN ON THESE PLANS AND TO PREVENT SILT AND CONSTRUCTION DEBRIS FROM FLOWING ONTO ADJACENT PROPERTIES OR ROADWAYS.
  2. CONTRACTOR SHALL COORDINATE WITH THE UTILITY COMPANIES FOR ANY REQUIRED UTILITY ADJUSTMENTS AND/OR RELOCATIONS.
  3. ALL MATERIALS USED FOR BACKFILL SHALL BE FREE OF WOOD, ROOTS, ROCKS, BOULDERS, OR ANY OTHER NON-COMPATIBLE SOIL TYPE MATERIAL. UNSATISFACTORY MATERIALS ALSO INCLUDE MAN-MADE FILLS AND REFUSE DEBRIS DERIVED FROM ANY SOURCE. ALL FILL MATERIAL SHALL BE TESTED AND APPROVED BY PROJECT GEOTECHNICAL ENGINEER. ALL FILL SHALL BE PLACED IN ACCORDANCE WITH PROJECT GEOTECHNICAL ENGINEER DIRECTION AND RECOMMENDATIONS. TESTING RESULTS SHALL BE PROVIDED TO OWNER TO VERIFY PROPER PLACEMENT.
  4. MATERIALS USED TO CONSTRUCT EMBANKMENTS FOR ANY PURPOSE, BACKFILL AROUND DRAINAGE STRUCTURES, OR IN UTILITY TRENCHES FOR ANY OTHER PURPOSE, SHALL MEET THE REQUIREMENTS OF THE FINAL GEOTECHNICAL REPORT RECOMMENDATIONS.
  5. THE CONTRACTOR SHALL, PRIOR TO ANY OPERATIONS INVOLVING FILLING OR BACKFILLING, SUBMIT THE RESULTS OF THE PROCTOR TEST TOGETHER WITH A CERTIFICATION THAT THE SOIL TESTED IS REPRESENTATIVE OF THE MATERIALS TO BE USED ON THE PROJECT. TESTS SHALL BE CONDUCTED BY A CERTIFIED MATERIALS TESTING LABORATORY AND CERTIFICATIONS MADE BY A LICENSED PROFESSIONAL ENGINEER REPRESENTING THE LABORATORY. ALL SOIL USED SHALL BE IN ACCORDANCE WITH PROJECT GEOTECHNICAL ENGINEER REQUIREMENTS.
  6. CONTRACTOR SHALL OBTAIN ALL PERMITS REQUIRED FOR BLASTING ROCK IF BLASTING ROCK IS ENCOUNTERED. CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR COMPLYING WITH ALL BLASTING AND SAFETY REQUIREMENTS.
  7. CONTRACTOR SHALL INCLUDE IN THE CONTRACT PRICE ANY DEWATERING NECESSARY TO CONSTRUCT THE PROJECT AS SHOWN ON THE PLANS.
  8. THE LOCATIONS OF EXISTING STORM SEWER STRUCTURES SHOWN ON THESE PLANS ARE APPROXIMATE. WHERE PROPOSED STORM SEWER PIPING TIES TO EXISTING STRUCTURES, PIPES, SWALES, ETC., THE CONTRACTOR SHALL FIELD ADJUST PROPOSED STORM SEWERS TO MATCH THE LOCATIONS OF THESE EXISTING FEATURES.



MERRITT MIDWAY BUSINESS PARK  
 BUSINESS PARK  
 Knightdale, NC

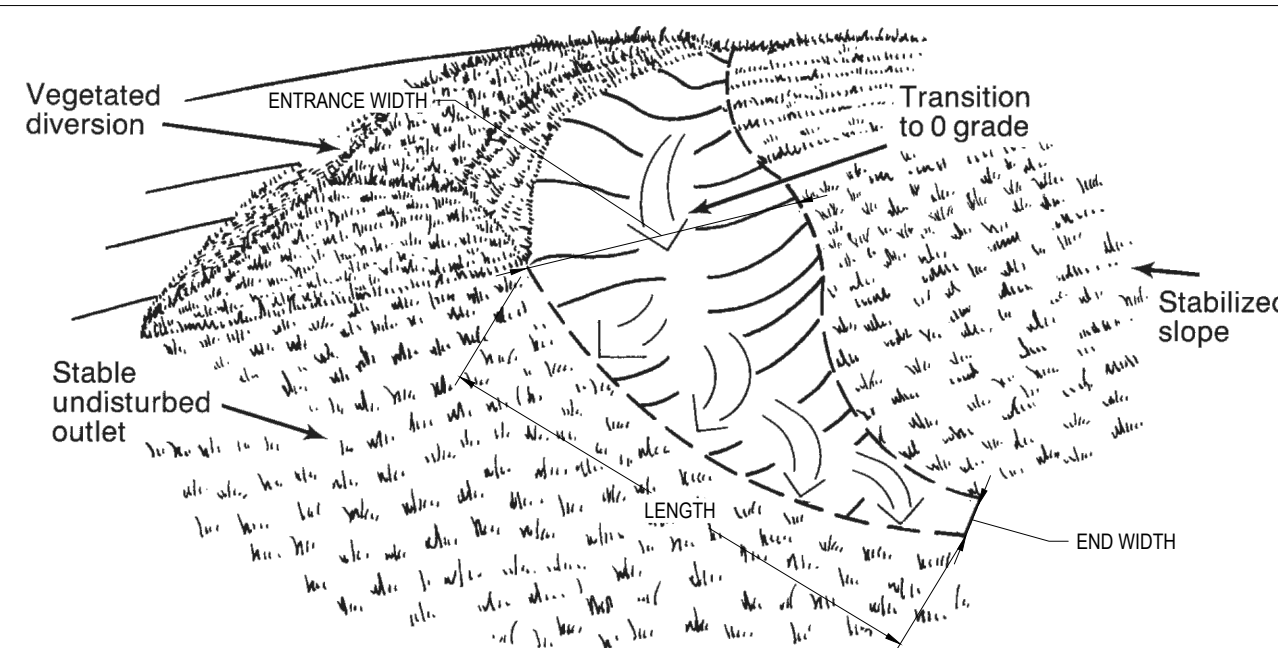
EROSION CONTROL DETAILS



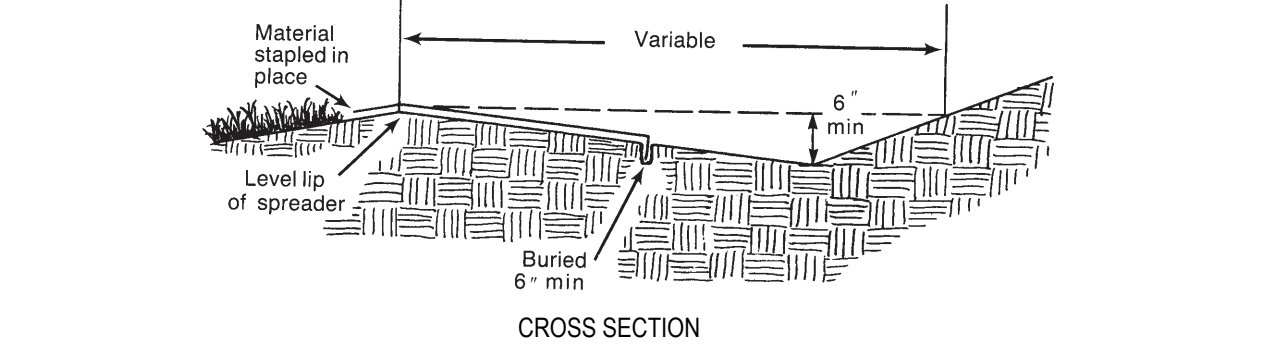
**Revisions**

9	SIGNATURE SUBMITTAL	8/27/21
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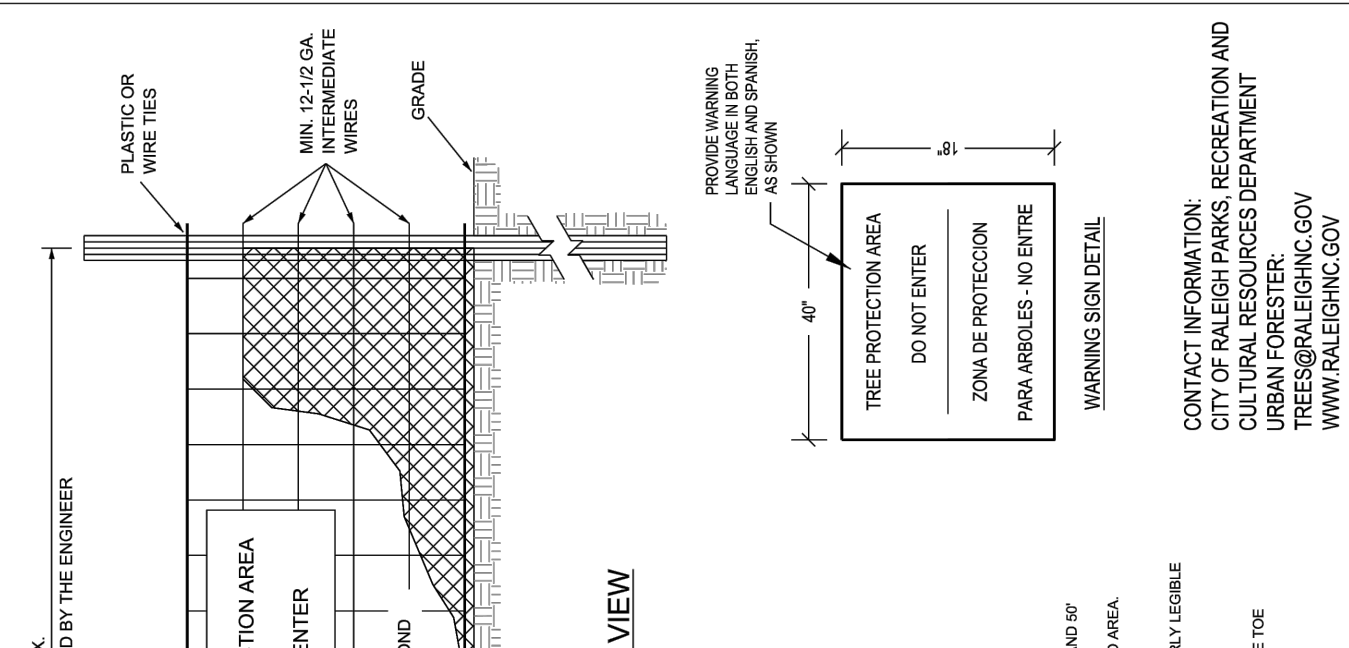
Sheet No.  
**C9.5**



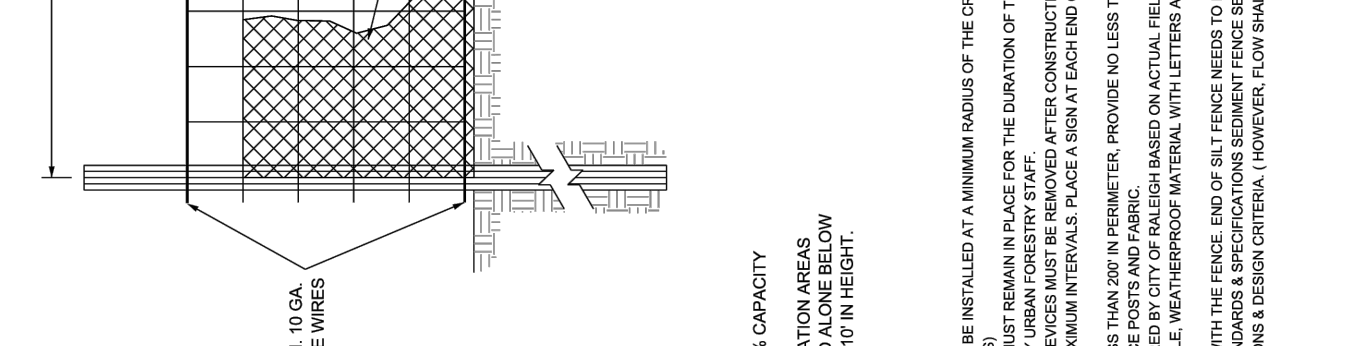
- NOTES:
- LEVEL SPREADER LIP MUST BE CONSTRUCTED IN STABLE, UNDISTURBED SOIL, AT 0% SLOPE. SPREADER CAN NOT BE CONSTRUCTED ON FILL MATERIAL.
  - A 20-FOOT TRANSITION SECTION IN THE DIVERSION CHANNEL SHOULD BE CONSTRUCTED SO THE WIDTH OF THE DIVERSION WILL SMOOTHLY MEET THE WIDTH OF THE SPREADER TO ENSURE UNIFORM OUTFLOW.
  - THE LIP OF THE SPREADER MUST BE PROTECTED WITH EROSION RESISTANT MATERIAL, MINIMUM 4" WIDE EXTENDING 6" OVER THE LIP AND BURIED 6" DEEP IN A VERTICAL TRENCH ON THE LOWER EDGE. THE UPPER EDGE SHOULD BUTT AGAINST SMOOTH CUT SO D AND BE HELD IN PLACE WITH MINIMUM 12" LONG WIRE STAPLES.



CROSS SECTION  
**LEVEL SPREADER (NTS)**  
(\*DETAIL ADAPTED FROM NCDOT ESC PLANNING AND DESIGN MANUAL, PART V, SECTION 6.40 "LEVEL SPREADER")



- CONTACT INFORMATION:  
REGISTRATION AND  
CULTURAL RESOURCES DEPARTMENT  
TREES@RALEIGH.GOV  
WWW.RALEIGH.GOV

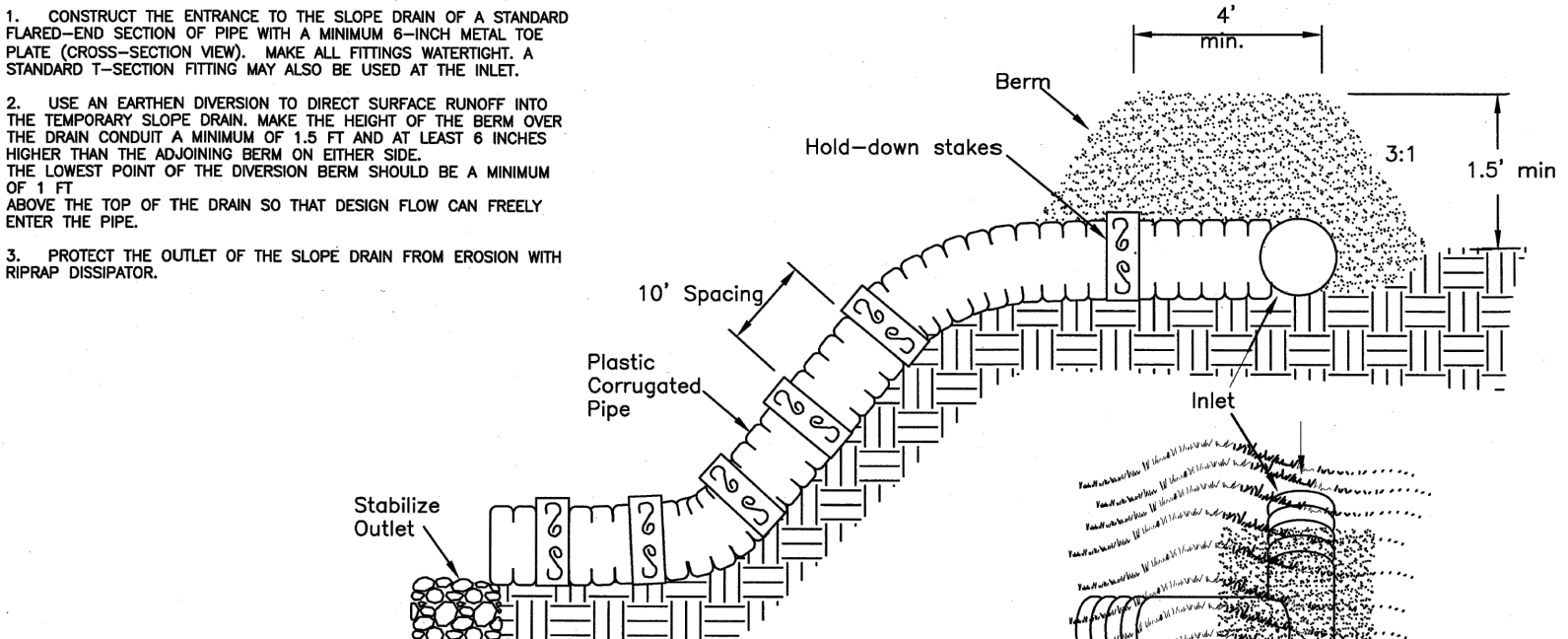


FRONT VIEW  
SIDE VIEW  
**TPP-08**

**CITY OF RALEIGH  
STANDARD DETAIL**

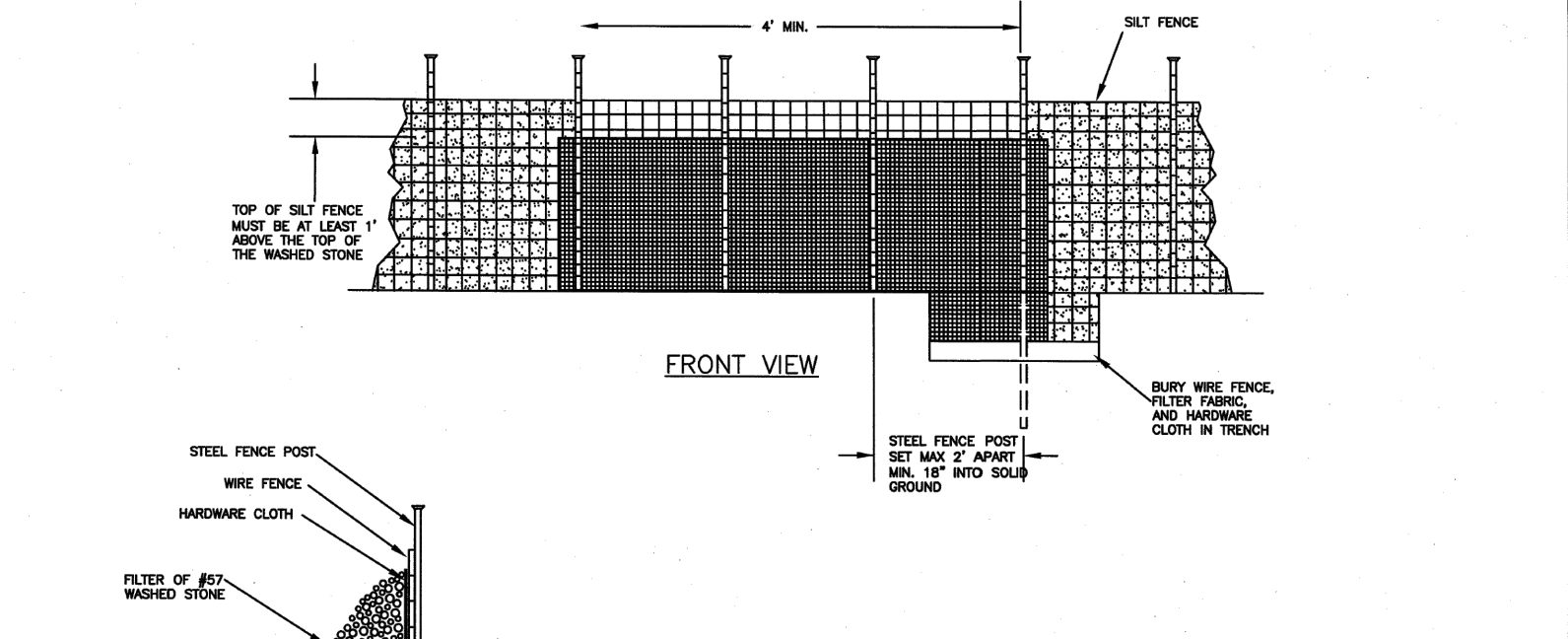
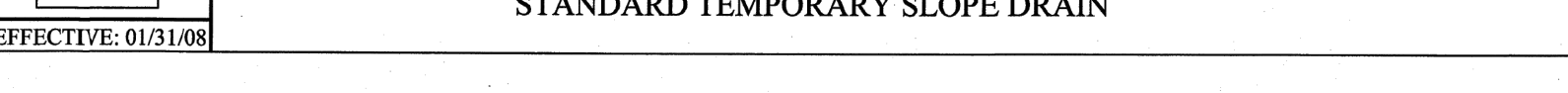
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STANDARD TEMPORARY (SEDIMENT/SILT) TREE PROTECTION FENCE  
**TPP-08**



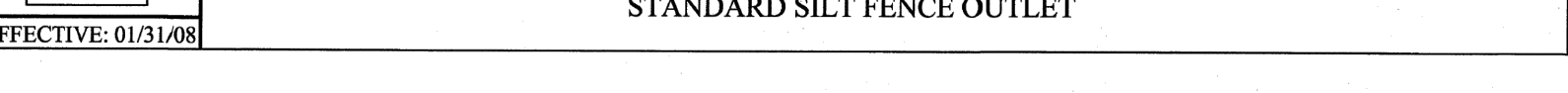
- NOTES:
- CONSTRUCT THE ENTRANCE TO THE SLOPE DRAIN OF A STANDARD FLARED-END SECTION OF PIPE WITH A MINIMUM 6-INCH METAL DE PLATE (CROSS-SECTION VIEW). MAKE ALL FITTINGS WATER-TIGHT. A STANDARD T-SECTION FITTING MAY ALSO BE USED AT THE INLET.
  - USE AN EARTHEN DIVERSION TO DIRECT SURFACE RUNOFF INTO THE TEMPORARY SLOPE DRAIN. MAKE THE HEIGHT OF THE BERM OVER THE DRAIN CONDUIT A MINIMUM OF 1.5 FT AND AT LEAST 6 INCHES HIGHER THAN THE BODDING BERM OR OTHER SOIL. THE LOWEST POINT OF THE DIVERSION BERM SHOULD BE A MINIMUM OF 1 FT ABOVE THE TOP OF THE DRAIN SO THAT DESIGN FLOW CAN FREELY ENTER THE PIPE.
  - PROTECT THE OUTLET OF THE SLOPE DRAIN FROM EROSION WITH RIPRAP DISAPPEAR.

Cross-Section View  
Plan View  
Standard T-section  
**STANDARD TEMPORARY SLOPE DRAIN**

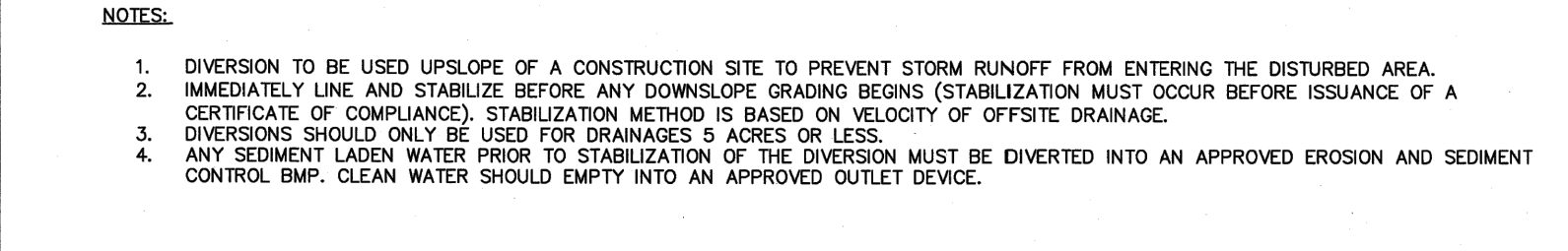


- NOTES:
- REMOVE SEDIMENT WHEN HALF OF STONE OUTLET IS COVERED.
  - REPLACE STONE AS NEEDED TO ENSURE DEWATERING.

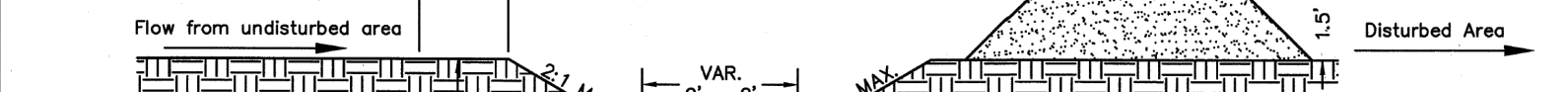
FRONT VIEW  
SECTION VIEW  
**STANDARD SILT FENCE OUTLET**



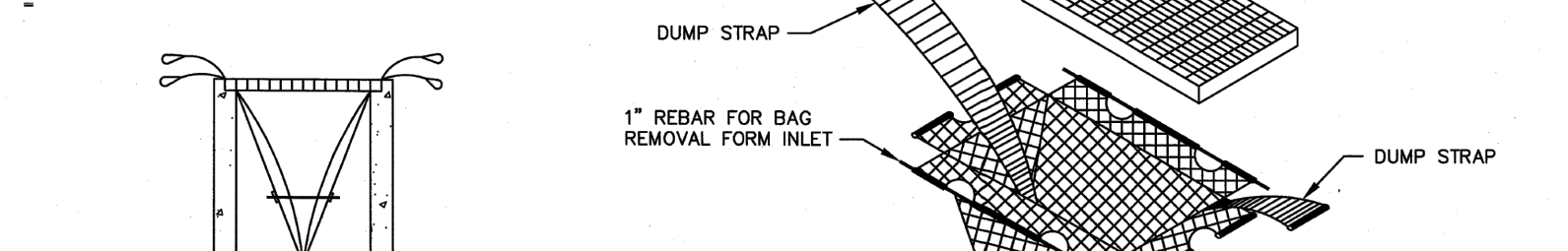
- NOTES:
- DIVERSION TO BE USED UPSLOPE OF A CONSTRUCTION SITE TO PREVENT STORM RUNOFF FROM ENTERING THE DISTURBED AREA.
  - IMMEDIATELY LINE AND STABILIZE BEFORE ANY DOWNSLOPE GRADING BEGINS (STABILIZATION MUST OCCUR BEFORE ISSUANCE OF A CERTIFICATE OF COMPLIANCE). STABILIZATION METHOD IS BASED ON VELOCITY OF OFF-SITE DRAINAGE.
  - DIVERSIONS SHOULD ONLY BE USED FOR DRAINAGES 5 ACRES OR LESS.
  - ANY SEDIMENT LADEN WATER PRIOR TO STABILIZATION OF THE DIVERSION MUST BE DIVERTED INTO AN APPROVED EROSION AND SEDIMENT CONTROL BMP. CLEAN WATER SHOULD EMPTY INTO AN APPROVED OUTLET DEVICE.



CROSS SECTIONAL VIEW  
**STANDARD CLEAN WATER DIVERSION**



- NOTES:
- SOME MUNICIPALITIES DO NOT ALLOW SUTTER PROTECTION ON PUBLIC ROADS. SILT BAGS SHOULD BE USED WITH THESE CASES.
  - BAGS SHOULD BE CLEANED OUT AFTER EVERY RAIN EVENT AND/OR AS NEEDED.



INSTALLATION DETAIL  
BAG DETAIL  
**STANDARD SILT BAG - INLET SEDIMENT CONTROL DEVICE**



**ROLLMAX™**  
ROLLED EROSION CONTROL

**Specification Sheet  
EroNet™ S75° Erosion Control Blanket**

**DESCRIPTION**  
The short-term single net erosion control blanket shall be a machine-produced mat of 100% agricultural straw with a functional longevity of up to 12 months. (NOTE: functional longevity may vary depending upon climatic conditions, soil, geographical location, and elevation). The blanket shall be of consistent thickness with the straw evenly distributed over the entire area of the mat. The blanket shall be covered on the top side with a lightweight photodegradable polypropylene netting having an approximate 0.50 x 0.50 in. (1.27 x 1.27 cm) mesh. The blanket shall be sewn together on 1.50 inch (3.81 cm) centers with degradable thread. The blanket shall be manufactured with a colored thread stretched along both outer edges (approximately 2-5 inches [5-12.5 cm] from the edge) as an overlap guide for adjacent mats.

The S75 shall meet Type 2, C specification requirements established by the Erosion Control Technology Council (ECTC) and Federal Highway Administration's (FHWA) FP-03 Section 713.17

Index Property	Test Method	Typical
Thickness	ASTM D6525	0.28 in. (7 mm)
Resiliency	ECTC Guidelines	78.8%
Water Absorbency	ASTM D1117	301%
Mass/Unit Area	ASTM D6475	9.75 oz/100 sq ft (332 g/m <sup>2</sup> )
Swell	ECTC Guidelines	15%
Smolder Resistance	ECTC Guidelines	Yes
Stiffness	ASTM D1388	6.31 oz-in (1.17 kN/m)
Light Penetration	ASTM D6567	6.0%
Tensile Strength - MD	ASTM D6818	122.4 lbs/ft (1.81 kN/m)
Elongation - MD	ASTM D6818	36.7%
Tensile Strength - TD	ASTM D6818	79.2 lbs/ft (1.17 kN/m)
Elongation - TD	ASTM D6818	26.8%
Biomass Improvement	ASTM D7322	301%

Design Permissible Shear Stress	
Unvegetated Shear Stress	1.55 psf (74 Pa)
Unvegetated Velocity	5.00 fps (1.52 m/s)

Slope Design Data: C Factors	
Slope Length (L)	≤ 31' 3.1' - 2.1' ≥ 2.1'
≤ 20 ft (6 m)	0.025 N/A N/A
20-50 ft	0.11 N/A N/A
≥ 50 ft (15.2 m)	0.19 N/A N/A

Roughness Coefficients - Unveg.	
Flow Depth	Manning's n
≤ 0.50 ft (0.15 m)	0.055
0.50 - 2.0 ft	0.055-0.021
≥ 2.0 ft (0.60 m)	0.021

**NORTH AMERICAN GREEN**  
Western Green  
4609 E. Bloomville-New Harmony Rd.  
Evansville, IN 47725  
nagreen.com  
800-772-2040

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EC\_SMK\_MPDS\_S75\_317

**ROLLMAX™**  
ROLLED EROSION CONTROL

**Specification Sheet  
EroNet™ S150° Erosion Control Blanket**

**DESCRIPTION**  
The short-term double net erosion control blanket shall be a machine-produced mat of 100% agricultural straw with a functional longevity of up to 12 months. (NOTE: functional longevity may vary depending upon climatic conditions, soil, geographical location, and elevation). The blanket shall be of consistent thickness with the straw evenly distributed over the entire area of the mat. The blanket shall be covered on the top and bottom sides with a lightweight photodegradable polypropylene netting having an approximate 0.50 x 0.50 in. (1.27 x 1.27 cm) mesh. The blanket shall be sewn together on 1.50 inch (3.81 cm) centers with degradable thread. The blanket shall be manufactured with a colored thread stretched along both outer edges (approximately 2-5 inches [5-12.5 cm] from the edge) as an overlap guide for adjacent mats.

The S150 shall meet Type 2, D specification requirements established by the Erosion Control Technology Council (ECTC) and Federal Highway Administration's (FHWA) FP-03 Section 713.17

Index Property	Test Method	Typical
Thickness	ASTM D6525	0.32 in. (8.13 mm)
Resiliency	ECTC Guidelines	80.5%
Water Absorbency	ASTM D1117	370%
Mass/Unit Area	ASTM D6475	8.15 oz/100 sq ft (277.31 g/m <sup>2</sup> )
Swell	ECTC Guidelines	15%
Smolder Resistance	ECTC Guidelines	Yes
Stiffness	ASTM D1388	6.06 oz-in (1.07 kN/m)
Light Penetration	ASTM D6567	12.4%
Tensile Strength - MD	ASTM D6818	159.6 lbs/ft (2.37 kN/m)
Elongation - MD	ASTM D6818	37.7%
Tensile Strength - TD	ASTM D6818	93.6 lbs/ft (1.39 kN/m)
Elongation - TD	ASTM D6818	26.7%
Biomass Improvement	ASTM D7322	371%

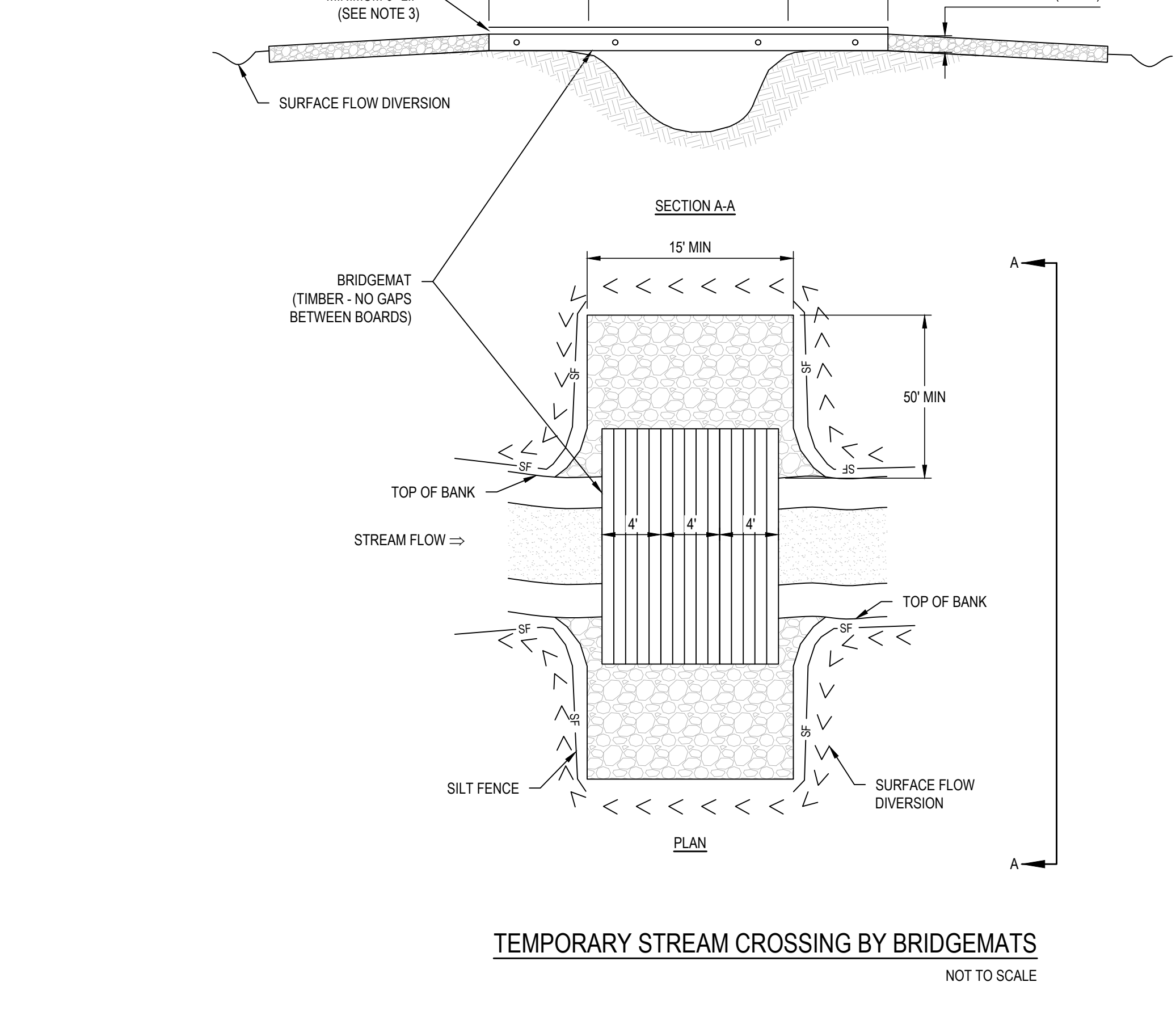
Design Permissible Shear Stress	
Unvegetated Shear Stress	1.75 psf (84 Pa)
Unvegetated Velocity	6.0 fps (1.83 m/s)

Slope Design Data: C Factors	
Slope Length (L)	≤ 31' 3.1' - 2.1' ≥ 2.1'
≤ 20 ft (6 m)	0.004 0.106 N/A
20-50 ft	0.062 0.118 N/A
≥ 50 ft (15.2 m)	0.12 0.180 N/A

Roughness Coefficients - Unveg.	
Flow Depth	Manning's n
≤ 0.50 ft (0.15 m)	0.055
0.50 - 2.0 ft	0.055-0.021
≥ 2.0 ft (0.60 m)	0.021

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EC\_SMK\_MPDS\_S150\_317



**TEMPORARY STREAM CROSSING BY BRIDGEMATS**  
NOT TO SCALE

- STREAM CROSSING NOTES:**
- KEEP CLEARING AND EXCAVATION OF THE STREAM BANKS AND BED AND APPROACH SECTIONS TO A MINIMUM.
  - CLEARING WITHIN 10 FT OF THE STREAM BANK SHALL BE DONE BY CUTTING NOT GRUBBING. THE ROOTS AND STUMPS SHALL BE LEFT IN PLACE TO HELP STABILIZE THE BANKS AND ACCELERATE RE-VEGETATION.
  - INSTALL A 6 INCH (MINIMUM) LIP (DECKBOARD) ALONG THE OUTSIDE OF THE BRIDGEMAT TO PREVENT LOOSE SEDIMENT FROM DEPOSITING IN STREAM DURING CROSSING.
  - INSTALL SILT FENCE ALONG TOPS OF BANKS AND TIE TO CROSSING.
  - DIVERT ALL SURFACE WATER FROM THE CONSTRUCTION SITE ONTO UNDISTURBED AREAS ADJOINING THE STREAM.
  - KEEP STREAM CROSSINGS AT RIGHT ANGLES TO THE STREAM FLOW.
  - ALIGN APPROACHES WITH THE CENTER LINE OF THE CROSSING FOR A MINIMUM DISTANCE OF 30 FEET AND STABILIZE WITH 8" THICK LAYER OF 2-3" WASHED STONE FOR A MINIMUM OF 50 FEET.
  - STABILIZE ALL DISTURBED AREAS SUBJECT TO FLOWING WATER, INCLUDING PLANNED OVERFLOW AREAS, WITH RIPRAP OR OTHER SUITABLE MEANS IF DESIGN VELOCITY EXCEEDS THE ALLOWABLE FOR THE IN-PLACE SOIL.
  - ENSURE THAT THE MINIMUM OF THE MAT TOTAL LENGTH IS SUPPORTED ON EACH SIDE OF THE BANK.
  - INSTALL WATER DIVERSION DEVICES ON BOTH SIDES OF THE CROSSING.
  - BRIDGEMATS SHALL REMAIN IN PLACE UNTIL COMPLETION OF CONSTRUCTION UNLESS THE CROSSING CAUSES EROSION DUE TO THE CROSSING OF THE STREAM CHANNEL. IF EROSION OCCURS THE CHANNEL BANKS SHALL BE PLACED BACK TO PRE-CONSTRUCTION CONDITIONS.
  - UPON REMOVAL OF BRIDGEMAT RESTORE THE STREAM CHANNEL TO ITS ORIGINAL CROSS-SECTION.
  - SMOOTH AND STABILIZE ALL DISTURBED AREAS.

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: \_\_\_\_\_  
Town Engineer

These plans are approved by the Town of Knightdale and serve as construction plans for this project.

By: \_\_\_\_\_ Date: \_\_\_\_\_  
Administrator

**WithersRavenel**  
Engineers | Planners

137 S Wilmington Street | Suite 200 | Raleigh, NC 27601 | T: 919.469.3340 | License #: F-1479 | www.withersravenel.com

**MERRITT MIDWAY  
BUSINESS PARK**

Knightdale, NC

**EROSION CONTROL  
DETAILS**

Job No: 09190800.00  
Date: 09/15/2020  
Drawn By: WR  
Designer: WR

**PROFESSIONAL  
ENGINEER  
PAUL DEVILIN**  
049219  
11/22/2024

Revisions		
9	SIGNATURE SUBMITTAL	8/27/21
10	REVISION TO APPROVED PLANS	11/11/21
11	TOWN COMMENTS	12/22/21
12	LOT A SINGLE BUILDING REVISION	8/8/23
13	LOT A REVISION TOWN COMMENTS	9/27/23
14	LOT A BUILDING ROTATION	7/30/24
15	LOT A REVISION TOWN COMMENTS	10/25/24
16	LOT A REVISION SIGNATURE SUBMITTAL	11/22/24

Sheet No.  
**C9.6**

# NCG01-DETAIL GROUND STABILIZATION AND HANDLING PLAN

EFFECTIVE: 04/01/19

**GROUND STABILIZATION AND MATERIALS HANDLING PRACTICES FOR COMPLIANCE WITH THE NCG01 CONSTRUCTION GENERAL PERMIT**  
Implementing the details and specifications on this plan sheet will result in the construction activity being considered compliant with the Ground Stabilization and Materials Handling sections of the NCG01 Construction General Permit (Sections E and F, respectively). The permittee shall comply with the Erosion and Sediment Control plan approved by the delegated authority having jurisdiction. All details and specifications shown on this sheet may not apply depending on site conditions and the delegated authority having jurisdiction.

## SECTION E: GROUND STABILIZATION

Site Area Description	Required Ground Stabilization Timeframes	
	Stabilize within this many calendar days after ceasing land disturbance	Timeframe variations
(a) Perimeter dikes, swales, ditches, and perimeter slopes	7	None
(b) High Quality Water (HQW) Zones	7	None
(c) Slopes steeper than 3:1	7	If slopes are 10' or less in length and are not steeper than 2:1, 14 days are allowed
(d) Slopes 3:1 to 4:1	14	-7 days for slopes greater than 50' in length and with slopes steeper than 4:1 -7 days for perimeter dikes, swales, ditches, perimeter slopes and HQW Zones -10 days for Falls Lake Watershed
(e) Areas with slopes flatter than 4:1	14	-7 days for perimeter dikes, swales, ditches, perimeter slopes and HQW Zones -10 days for Falls Lake Watershed

**Note:** After the permanent cessation of construction activities, any areas with temporary ground stabilization shall be converted to permanent ground stabilization as soon as practicable but in no case longer than 90 calendar days after the last land disturbing activity. Temporary ground stabilization shall be maintained in a manner to render the surface stable against accelerated erosion until permanent ground stabilization is achieved.

## GROUND STABILIZATION SPECIFICATION

Stabilize the ground sufficiently so that rain will not dislodge the soil. Use one of the techniques in the table below:

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

## POLYACRYLAMIDES (PAMS) AND FLOCCULANTS

- Select flocculants that are appropriate for the soils being exposed during construction, selecting from the *NC DWR List of Approved PAMS/Flocculants*.
- Apply flocculants at or before the inlets to Erosion and Sediment Control Measures.
- Apply flocculants at the concentrations specified in the *NC DWR List of Approved PAMS/Flocculants* and in accordance with the manufacturer's instructions.
- Provide ponding area for containment of treated stormwater before discharging offsite.
- Store flocculants in leak-proof containers that are kept under storm-resistant cover or surrounded by secondary containment structures.

## EQUIPMENT AND VEHICLE MAINTENANCE

- Maintain vehicles and equipment to prevent discharge of fluids.
- Provide drip pans under any stored equipment.
- Identify leaks and repair as soon as feasible, or remove leaking equipment from the project.
- Collect all spent fluids, store in separate containers and properly dispose as hazardous waste (recycle when possible).
- Remove leaking vehicles and construction equipment from service until the problem has been corrected.
- Bring used fuels, lubricants, coolants, hydraulic fluids and other petroleum products to a recycling or disposal center that handles these materials.

## LITTER, BUILDING MATERIAL AND LAND CLEARING WASTE

- Never bury or burn waste. Place litter and debris in approved waste containers.
- Provide a sufficient number and size of waste containers (e.g. dumpster, trash receptacle) on site to contain construction and domestic wastes.
- Locate waste containers at least 50 feet away from storm drain inlets and surface waters unless no other alternatives are reasonably available.
- Locate waste containers on areas that do not receive substantial amounts of runoff from upland areas and does not drain directly to a storm drain, stream or wetland.
- Cover waste containers at the end of each workday and before storm events or provide secondary containment. Repair or replace damaged waste containers.
- Anchor all lightweight items in waste containers during times of high winds.
- Empty waste containers as needed to prevent overflow. Clean up immediately if containers overflow.
- Dispose waste off-site at an approved disposal facility.
- On business days, clean up and dispose of waste in designated waste containers.

## PAINT AND OTHER LIQUID WASTE

- Do not dump paint and other liquid waste into storm drains, streams or wetlands.
- Locate paint washouts at least 50 feet away from storm drain inlets and surface waters unless no other alternatives are reasonably available.
- Contain liquid wastes in a controlled area.
- Containment must be labeled, sized and placed appropriately for the needs of site.
- Prevent the discharge of soaps, solvents, detergents and other liquid wastes from construction sites.

## PORTABLE TOILETS

- Install portable toilets on level ground, at least 50 feet away from storm drains, streams or wetlands unless there is no alternative reasonably available. If 50 foot offset is not attainable, provide relocation of portable toilet behind silt fence or place on a gravel pad and surround with sand bags.
- Provide staking or anchoring of portable toilets during periods of high winds or in high foot traffic areas.
- Monitor portable toilets for leaking and properly dispose of any leaked material. Utilize a licensed sanitary waste hauler to remove leaking portable toilets and replace with properly operating unit.

## EARTHEN STOCKPILE MANAGEMENT

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

## CONCRETE WASHOUTS

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

## HERBICIDES, PESTICIDES AND RODENTICIDES

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

## HAZARDOUS AND TOXIC WASTE

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

# NCG01-SELF INSPECTION, RECORDKEEPING & REPORTING

EFFECTIVE: 04/01/19

## PART III SELF-INSPECTION, RECORDKEEPING AND REPORTING

### SECTION A: SELF-INSPECTION

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

Inspect	Frequency (during normal business hours)	Inspection records must include:
(1) Rain gauge maintained in good working order	Daily	Daily rainfall amounts. If no daily rain gauge observations are made during weekend or holiday periods, and no individual-day rainfall information is available, record the cumulative rain measurement for those unattended days (and this will determine if a site inspection is needed). Days on which no rainfall occurred shall be recorded as "zero." The permittee may use another rain-monitoring device approved by the Division.
(2) E&SC Measures	At least once per 7 calendar days and within 24 hours of a rain event $\geq 1.0$ inch in 24 hours	1. Identification of the measures inspected, 2. Date and time of the inspection, 3. Name of the person performing the inspection, 4. Indication of whether the measures were operating properly, 5. Description of maintenance needs for the measure, 6. Description, evidence, and date of corrective actions taken.
(3) Stormwater discharge outfalls (SDOs)	At least once per 7 calendar days and within 24 hours of a rain event $\geq 1.0$ inch in 24 hours	1. Identification of the discharge outfalls inspected, 2. Date and time of the inspection, 3. Name of the person performing the inspection, 4. Evidence of indicators of stormwater pollution such as oil sheen, floating or suspended solids or discoloration, 5. Indication of visible sediment leaving the site, 6. Description, evidence, and date of corrective actions taken.
(4) Perimeter of site	At least once per 7 calendar days and within 24 hours of a rain event $\geq 1.0$ inch in 24 hours	If visible sedimentation is found outside site limits, then a record of the following shall be made: 1. Actions taken to clean up or stabilize the sediment that has left the site limits, 2. Description, evidence, and date of corrective actions taken, and 3. An explanation as to the actions taken to control future releases.
(5) Streams or wetlands onsite or offsite (where accessible)	At least once per 7 calendar days and within 24 hours of a rain event $\geq 1.0$ inch in 24 hours	If the stream or wetland has increased visible sedimentation or a stream has visible increased turbidity from the construction activity, then a record of the following shall be made: 1. Description, evidence and date of corrective actions taken, and 2. Records of the required reports to the appropriate Division Regional Office per Part III, Section C, Item 2(a) of this permit of this permit.
(6) Ground stabilization measures	After each phase of grading	1. The phase of grading (installation of perimeter E&SC measures, clearing and grubbing, installation of storm drainage facilities, completion of all land-disturbing activity, construction or redevelopment, permanent ground cover). 2. Documentation that the required ground stabilization measures have been provided within the required timeframe or an assurance that they will be provided as soon as possible.

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

## PART III SELF-INSPECTION, RECORDKEEPING AND REPORTING

### SECTION C: REPORTING

#### 1. Occurrences that must be reported

Permittees shall report the following occurrences:

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

#### 2. Reporting Timeframes and Other Requirements

After a permittee becomes aware of an occurrence that must be reported, he shall contact the appropriate Division regional office within the timeframes and in accordance with the other requirements listed below. Occurrences outside normal business hours may also be reported to the Division's Emergency Response personnel at (800) 662-7956, (800) 858-0368 or (919) 733-3300.

Occurrence	Reporting Timeframes (After Discovery) and Other Requirements
(a) Visible sediment deposition in a stream or wetland	<ul style="list-style-type: none"> <li><b>Within 24 hours</b>, an oral or electronic notification.</li> <li><b>Within 7 calendar days</b>, a report that contains a description of the sediment and actions taken to address the cause of the deposition. Division staff may waive the requirement for a written report on a case-by-case basis.</li> <li>If the stream is named on the <a href="#">NC 303(d) list</a> as impaired for sediment-related causes, the permittee may be required to perform additional monitoring, inspections or apply more stringent practices if staff determine that additional requirements are needed to assure compliance with the federal or state impaired-waters conditions.</li> </ul>
(b) Oil spills and release of hazardous substances per Item 1(b)-(c) above	<ul style="list-style-type: none"> <li><b>Within 24 hours</b>, an oral or electronic notification. The notification shall include information about the date, time, nature, volume and location of the spill or release.</li> <li><b>A report at least ten days before the date of the bypass, if possible.</b> The report shall include an evaluation of the anticipated quality and effect of the bypass.</li> </ul>
(c) Anticipated bypasses (40 CFR 122.41(m)(3))	<ul style="list-style-type: none"> <li><b>Within 24 hours</b>, an oral or electronic notification.</li> <li><b>Within 7 calendar days</b>, a report that includes an evaluation of the quality and effect of the bypass.</li> </ul>
(d) Unanticipated bypasses (40 CFR 122.41(m)(3))	<ul style="list-style-type: none"> <li><b>Within 24 hours</b>, an oral or electronic notification.</li> <li><b>Within 7 calendar days</b>, a report that contains a description of the noncompliance, and its causes; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time noncompliance is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance. (40 CFR 122.41(i)(6)).</li> <li>Division staff may waive the requirement for a written report on a case-by-case basis.</li> </ul>
(e) Noncompliance with the conditions of this permit that may endanger health or the environment (40 CFR 122.41(i)(7))	<ul style="list-style-type: none"> <li><b>Within 24 hours</b>, an oral or electronic notification.</li> <li><b>Within 7 calendar days</b>, a report that contains a description of the noncompliance, and its causes; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time noncompliance is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance. (40 CFR 122.41(i)(6)).</li> <li>Division staff may waive the requirement for a written report on a case-by-case basis.</li> </ul>

## PART III SELF-INSPECTION, RECORDKEEPING AND REPORTING

### SECTION B: RECORDKEEPING

#### 1. E&SC Plan Documentation

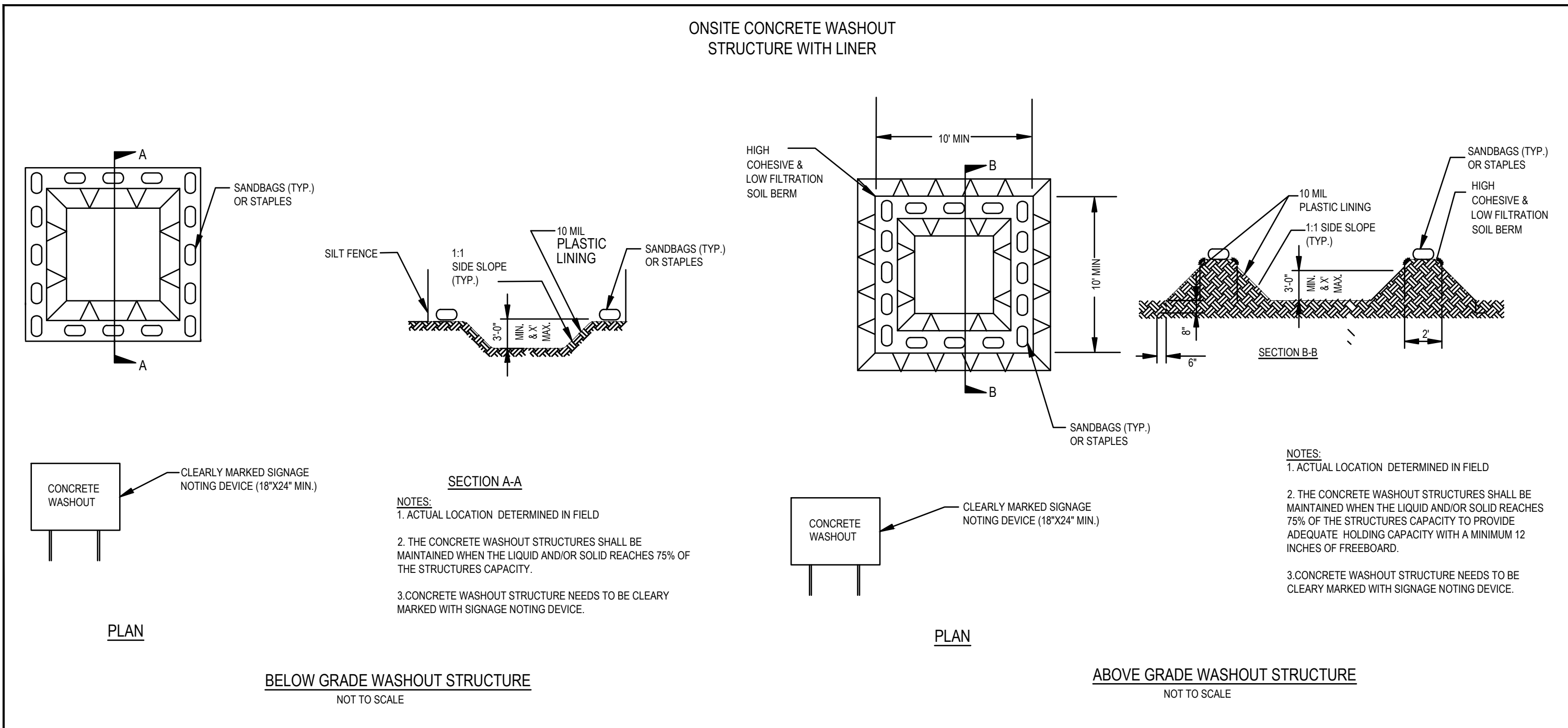
The approved E&SC plan as well as any approved deviation shall be kept on the site. The approved E&SC plan must be kept up-to-date throughout the coverage under this permit. The following items pertaining to the E&SC plan shall be documented in the manner described:

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

#### 2. Additional Documentation

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

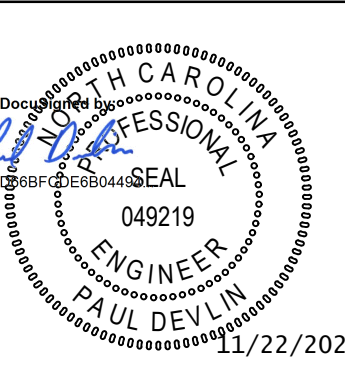
- This general permit as well as the certificate of coverage, after it is received.
- Records of inspections made during the previous 30 days. The permittee shall record the required observations on the Inspection Record Form provided by the Division or a similar inspection form that includes all the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



MERRITT MIDWAY  
BUSINESS PARK  
Knightdale, NC

NCG01 DETAILS

Job No.	09190080.00	Drawn By	WR
Date	09/15/2020	Designer	WR



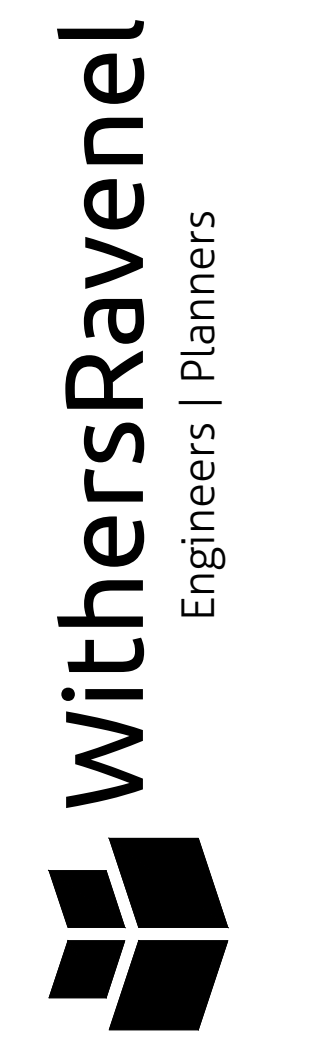
Revisions		
9	SIGNATURE SUBMITTAL	8/27/21
10	REVISION TO APPROVED PLANS	11/11/21
11	TOWN COMMENTS	12/22/21
12	LOT A SINGLE BUILDING REVISION	8/8/23
13	LOT A REVISION TOWN COMMENTS	9/27/23
14	LOT A BUILDING ROTATION	7/30/24
15	LOT A REVISION TOWN COMMENTS	10/25/24
16	LOT A REVISION SIGNATURE SUBMITTAL	11/22/24

Sheet No.  
**C9.7**

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: \_\_\_\_\_  
Town Engineer  
These plans are approved by the Town of Knightdale and serve as construction plans for this project.  
By: \_\_\_\_\_ Date: \_\_\_\_\_  
Administrator



PER THE TOWN OF KNIGHTDALE STANDARDS AND SPECIFICATIONS (3.05.a) ALL PAVEMENT MARKINGS INCLUDING TRAFFIC CONTROL, STOP BARS, FIRE LANES, AND CROSS WALKS SHALL BE MADE OF REFLECTORIZED THERMOPLASTIC STRIPING WITH A MINIMUM THICKNESS IN ACCORDANCE WITH NCDOT STANDARD SPECIFICATIONS FOR ROADS & STRUCTURES. ALL MARKINGS SHALL BE 120 MIL THICK, WITH THE EXCEPTION OF SYMBOLS, WHICH SHALL BE 90 MIL THICK. PARKING STALL STRIPING IN A PRIVATE PARKING LOT IS EXEMPT FROM USE OF THERMOPLASTICS. THE THERMOPLASTIC STRIPING TYPE OF MARKING MATERIAL SHALL BE APPLIED BY FUSING TO THE PAVEMENT SURFACE BY APPLICATION OF HEAT.

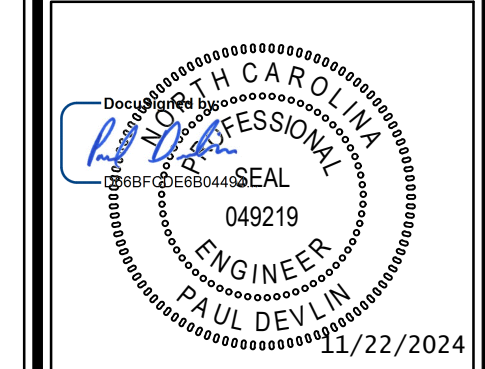


137 S Wilmington Street | Suite 200 | Raleigh, NC 27601 | t: 919-469-3340 | license #: F-1479 | www.withersravenel.com

MERRITT MIDWAY BUSINESS PARK  
Knightdale, NC

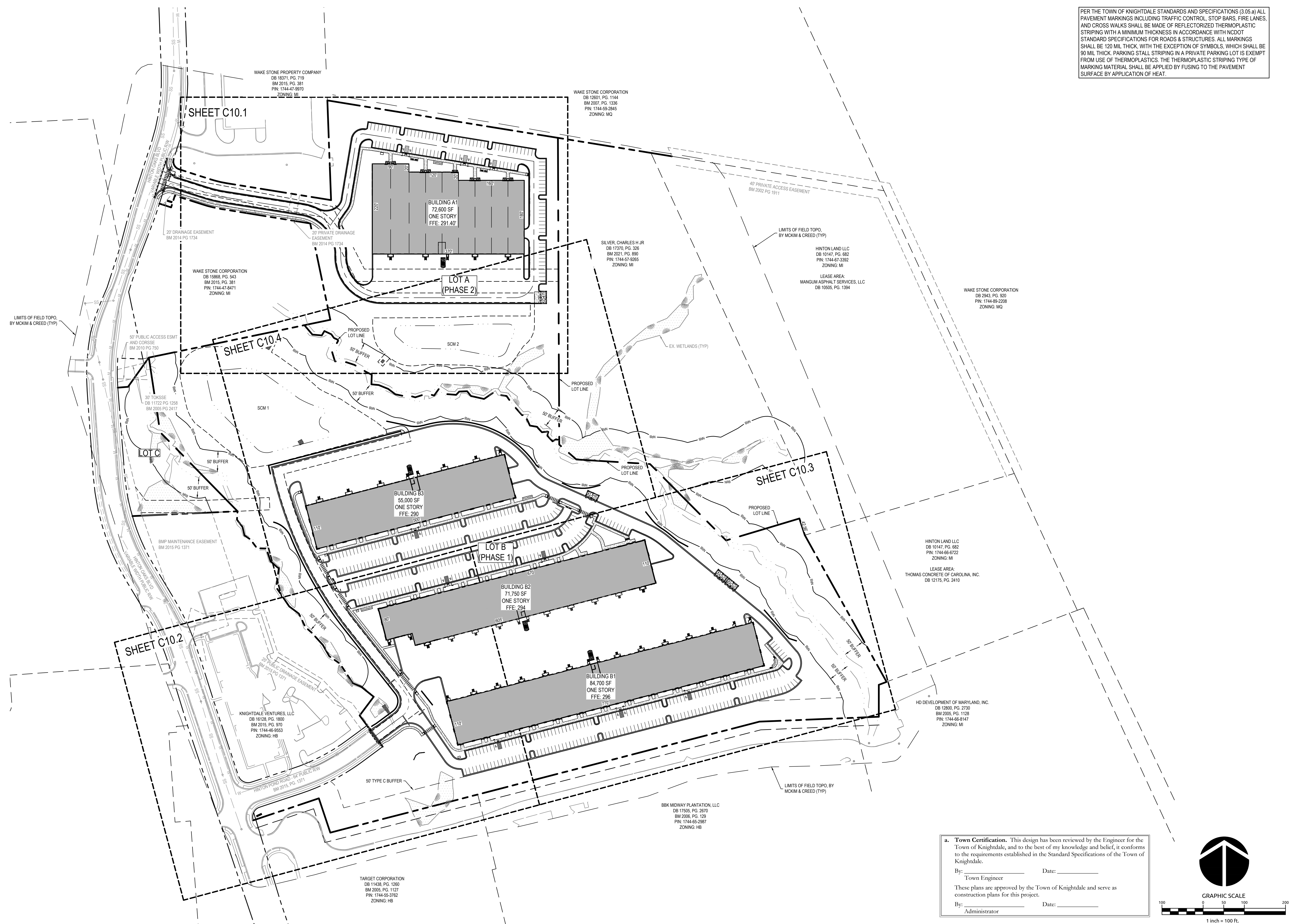
OVERALL TRAFFIC AND MARKINGS PLAN

Job No. 09190080.00 Drawn By WR  
Date 09/15/2020 Designer WR

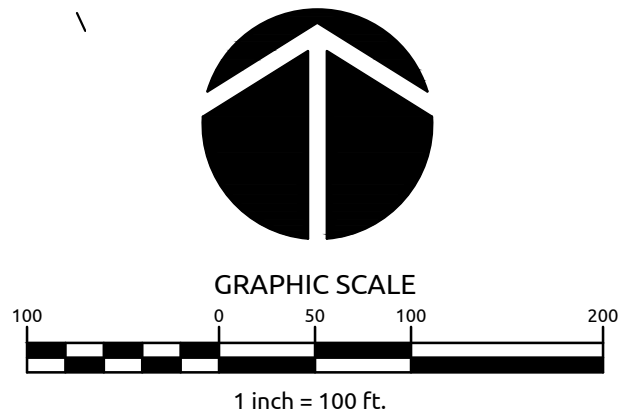


Revisions		
9	SIGNATURE SUBMITTAL	8/27/21
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16	LOT A REVISION SIGNATURE SUBMITTAL	11/22/24

Sheet No.  
**C10.0**

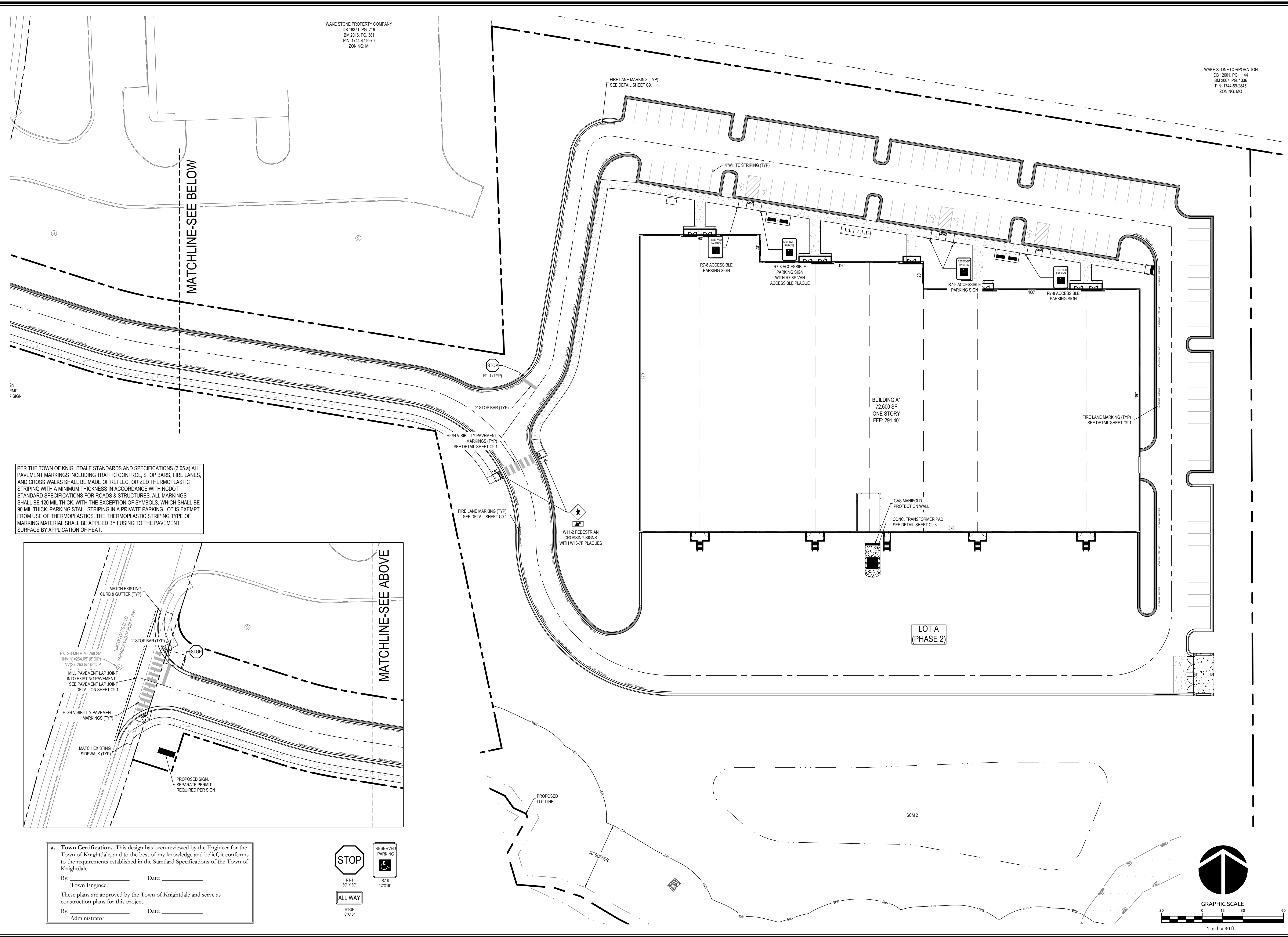


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Town Engineer  
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By: \_\_\_\_\_ Date: \_\_\_\_\_  
Administrator

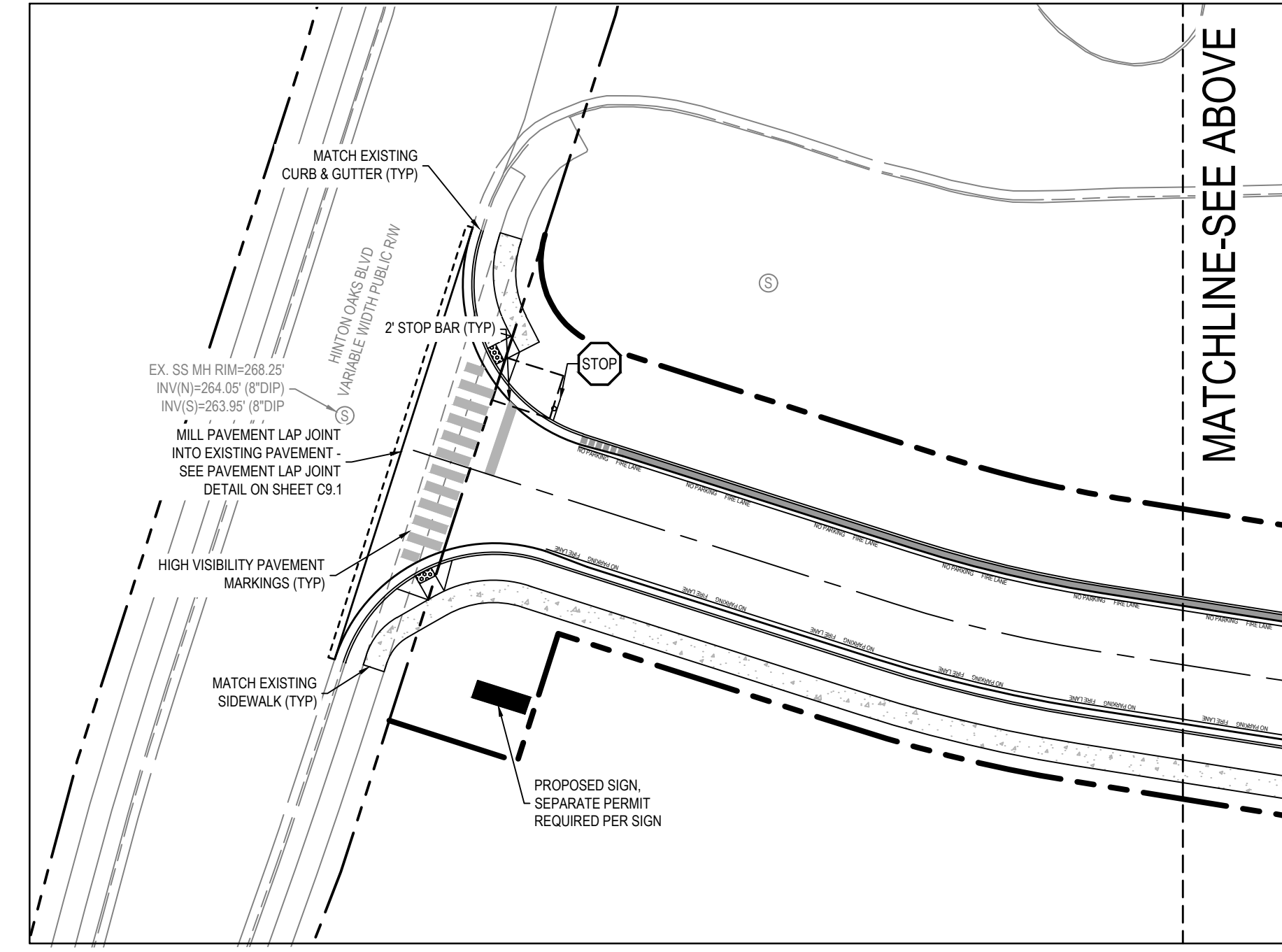


WAKE STONE PROPERTY COMPANY  
DB 18371, PG. 719  
BM 2015, PG. 381  
PIN: 1744-419270  
ZONING: M1

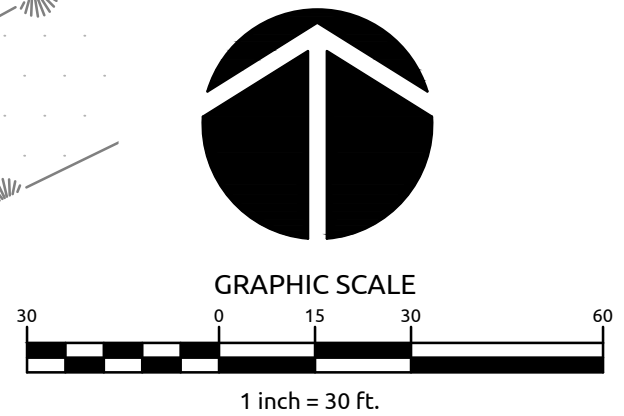
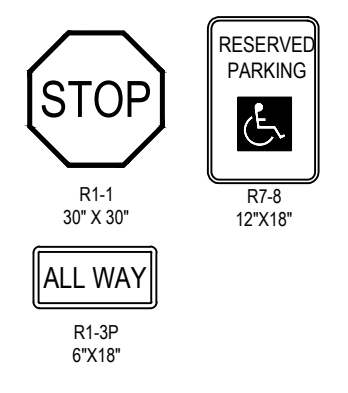
WAKE STONE CORPORATION  
DB 12601, PG. 1144  
BM 2007, PG. 1336  
PIN: 1744-59-2845  
ZONING: M2



PER THE TOWN OF KNIGHTDALE STANDARDS AND SPECIFICATIONS (3.05 a) ALL PAVEMENT MARKINGS INCLUDING TRAFFIC CONTROL, STOP BARS, FIRE LANES, AND CROSS WALKS SHALL BE MADE OF REFLECTORIZED THERMOPLASTIC STRIPING WITH A MINIMUM THICKNESS IN ACCORDANCE WITH NCDOT STANDARD SPECIFICATIONS FOR ROADS & STRUCTURES. ALL MARKINGS SHALL BE 120 MIL THICK, WITH THE EXCEPTION OF SYMBOLS, WHICH SHALL BE 90 MIL THICK. PARKING STALL STRIPING IN A PRIVATE PARKING LOT IS EXEMPT FROM USE OF THERMOPLASTICS. THE THERMOPLASTIC STRIPING TYPE OF MARKING MATERIAL SHALL BE APPLIED BY FUSING TO THE PAVEMENT SURFACE BY APPLICATION OF HEAT.



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By: \_\_\_\_\_ Date: \_\_\_\_\_  
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Administrator

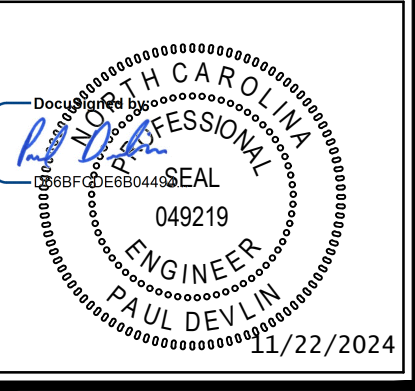


**WithersRavenel**  
Engineers | Planners

**MERRITT MIDWAY BUSINESS PARK**  
Knightdale, NC

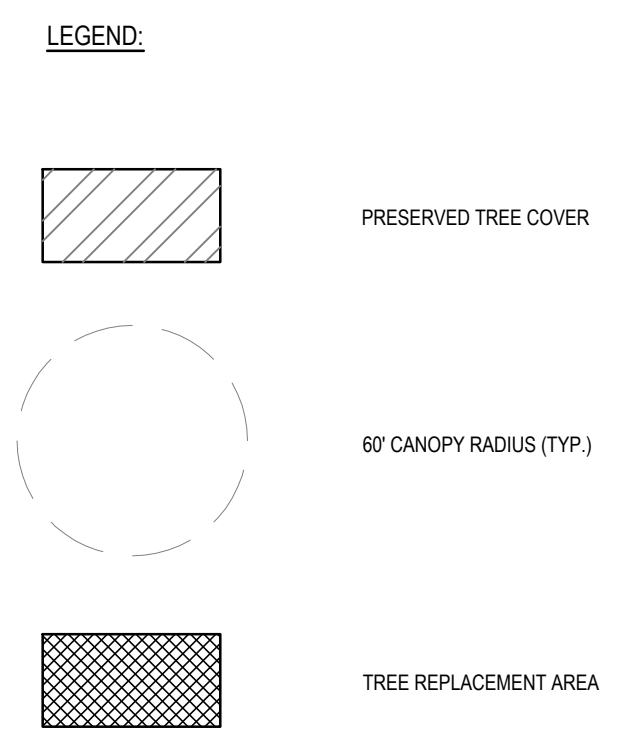
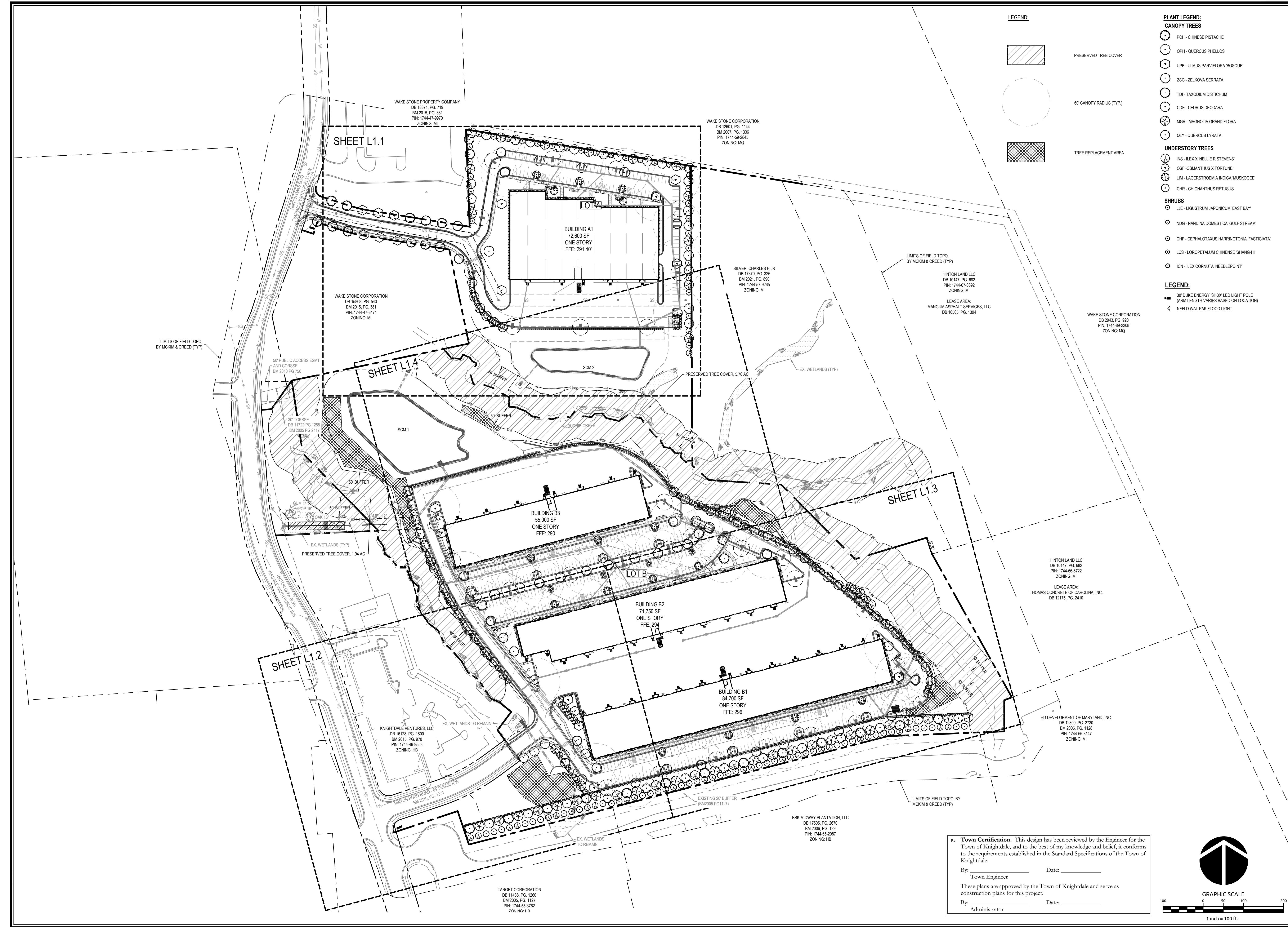
**TRAFFIC SIGNS AND MARKING PLAN**

Job No. 09190080.00 Drawn By WR  
Date 09/15/2020 Designer WR



Revisions		
9	SIGNATURE SUBMITTAL	8/27/21
10	REVISION TO APPROVED PLANS	11/11/21
11	TOWN COMMENTS	12/22/21
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16	LOT A REVISION SIGNATURE SUBMITTAL	11/22/24

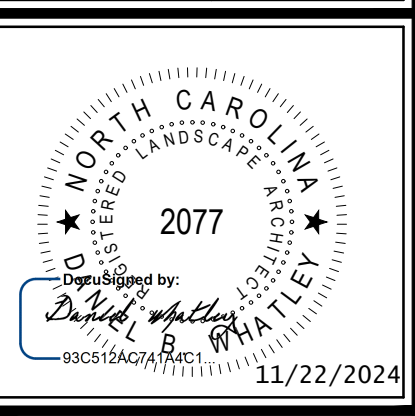
Sheet No.  
**C10.1**



- PLANT LEGEND:**
- CANOPY TREES**
- PCH - CHINESE PISTACHE
  - QPH - QUERCUS PHELLOS
  - UPB - ULMUS PARVIFLORA 'BOSSUE'
  - ZSG - ZELKOVA SERRATA
  - TDI - TAXODIUM DISTICHUM
  - CDE - CEDRUS DEODARA
  - MGR - MAGNOLIA GRANDIFLORA
  - QLY - QUERCUS LYRATA
- UNDERSTORY TREES**
- INS - ILEX X 'NELLIE R STEVENS'
  - OSF - OSMANTHUS X FORTUNEI
  - LIM - LAGERSTROEMIA INDICA 'MUSKOGEE'
  - CHR - CHIONANTHUS RETUSUS
- SHRUBS**
- LJE - LIGUSTRUM JAPONICUM 'EAST BAY'
  - NDG - NANDINA DOMESTICA 'GULF STREAM'
  - CHF - CEPHALOTAXUS HARRINGTONIA 'FASTIGIATA'
  - LCS - LOROPETALUM CHINENSE 'SHANG-HI'
  - ICN - ILEX CORNUTA 'NEEDLEPOINT'

- LEGEND:**
- 30' DUKE ENERGY 'SHBX' LED LIGHT POLE (ARM LENGTH VARIES BASED ON LOCATION)
  - NFFLD WAL-PAK FLOOD LIGHT

Job No.	09190080.00	Drawn By	WR
Date	09/15/2020	Designer	WR



Revisions

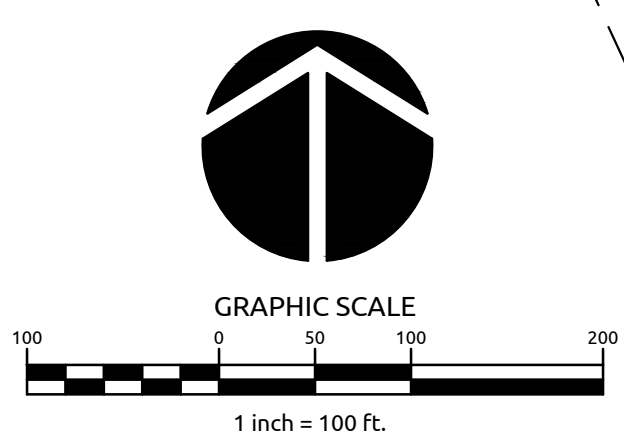
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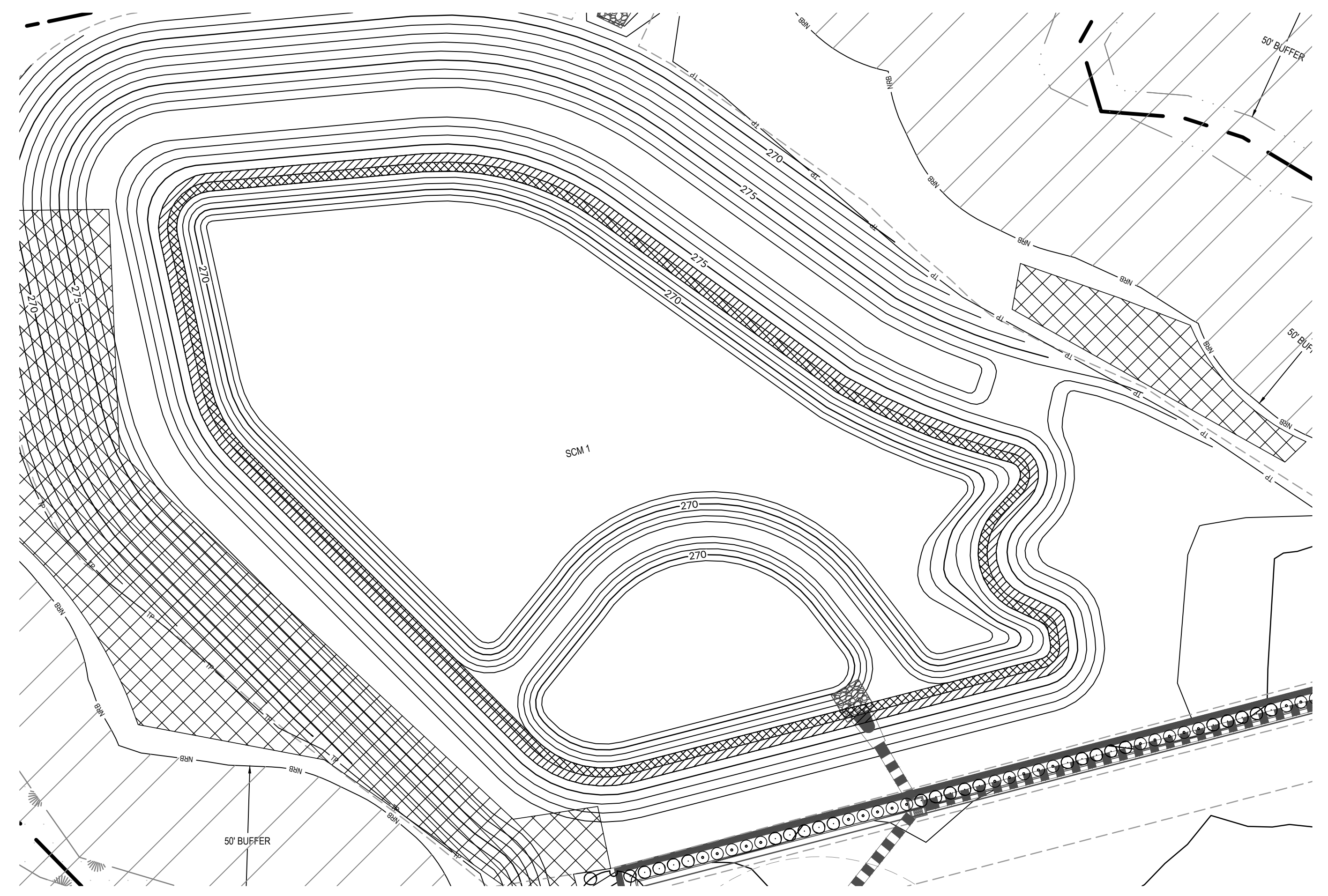
By: \_\_\_\_\_ Date: \_\_\_\_\_  
Town Engineer

These plans are approved by the Town of Knightdale and serve as construction plans for this project.

By: \_\_\_\_\_ Date: \_\_\_\_\_  
Administrator







SCM #1: WETPOND

SCALE: 1" = 30'

LEGEND:

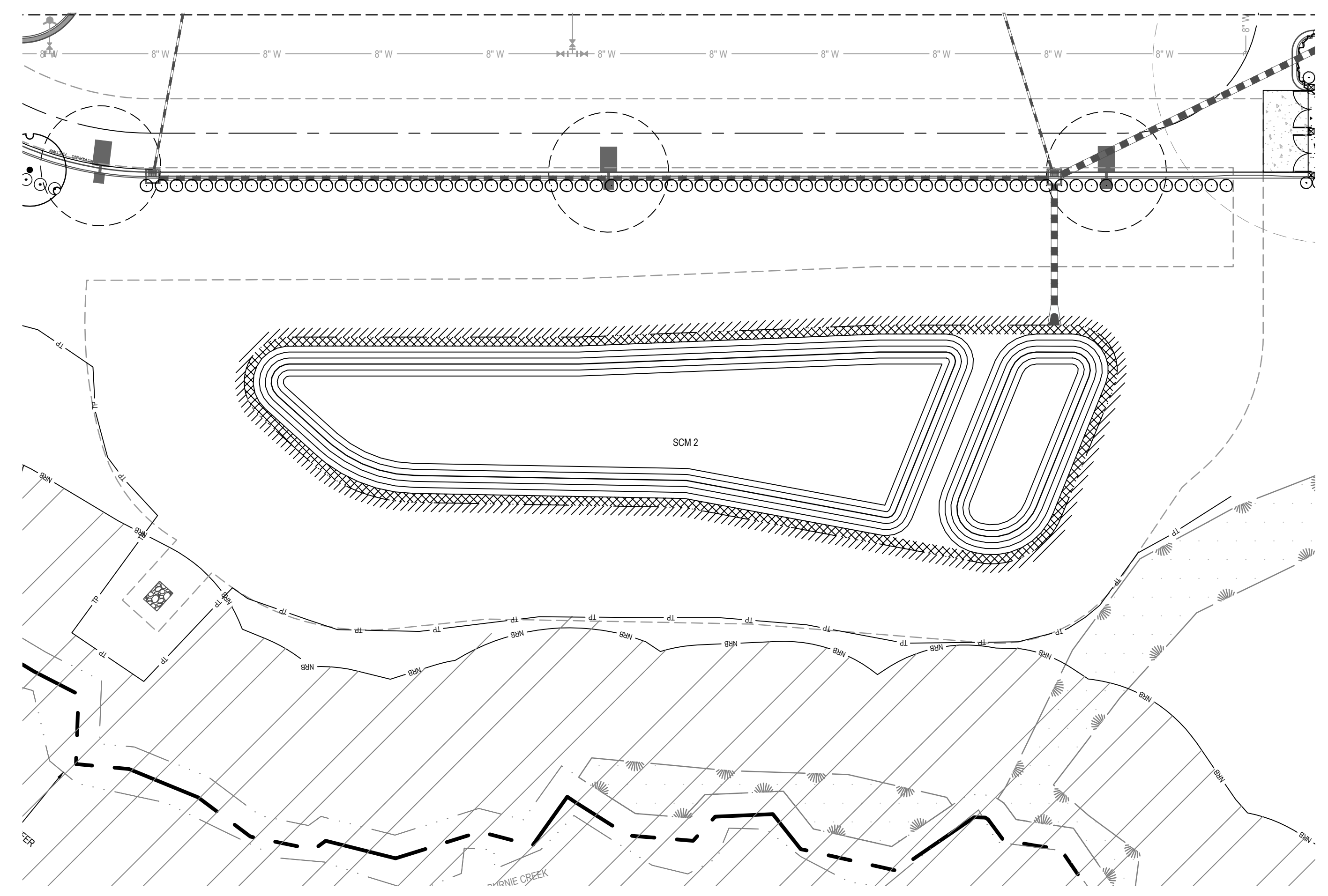
- UPPER SHELF
- LOWER SHELF

NOTES:

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

WETPOND - SCM #1						
KEY	QTY	BOTANICAL NAME	COMMON NAME	ROOT	SIZE	NOTES
<b>UPPER SHELF= 2447</b>		<b>SF WI 50 HERB. PLANTS/200 SF = 612</b>				
AAM	153	<i>Acorus americanus</i>	Sweetflag	CONT.	2.25" PLUG (32'S)	MIN. 24" O.C. 25% SHARED COVERAGE
AIN	153	<i>Asclepias incarnata</i>	Butterfly Milkweed	CONT.	2.25" PLUG (32'S)	MIN. 24" O.C. 25% SHARED COVERAGE
JNE	153	<i>Juncus effusus</i>	Soft Rush	CONT.	2.25" PLUG (32'S)	MIN. 24" O.C. 25% SHARED COVERAGE
EDU	153	<i>Eupatorium dubius</i>	Dwarf Joe Pye Weed	CONT.	2.25" PLUG (32'S)	MIN. 24" O.C. 25% SHARED COVERAGE
<b>LOWER SHELF= 2391</b>		<b>SF WI 50 HERB. PLANTS/200 SF = 600</b>				
SGL	150	<i>Sagittaria latifolia</i>	Broadleaf Arrowhead	CONT.	2.25" PLUG (32'S)	MIN. 24" O.C. 25% SHARED COVERAGE
PNC	150	<i>Pontederia cordata</i>	Pickerselweed	CONT.	2.25" PLUG (32'S)	MIN. 24" O.C. 25% SHARED COVERAGE
SAC	150	<i>Saururus cernuus</i>	Lizard's Tail	CONT.	2.25" PLUG (32'S)	MIN. 24" O.C. 25% SHARED COVERAGE
JNB	150	<i>Juncus effusus 'Blue Arrow'</i>	Soft Rush	CONT.	2.25" PLUG (32'S)	MIN. 24" O.C. 25% SHARED COVERAGE

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



SCM #2: WETPOND

SCALE: 1" = 30'

LEGEND:

- UPPER SHELF
- LOWER SHELF

NOTES:

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

WETPOND - SCM #2						
KEY	QTY	BOTANICAL NAME	COMMON NAME	ROOT	SIZE	NOTES
<b>UPPER SHELF= 1999</b>		<b>SF WI 50 HERB. PLANTS/200 SF = 500</b>				
AAM	125	<i>Acorus americanus</i>	Sweetflag	CONT.	2.25" PLUG (32'S)	MIN. 24" O.C. 25% SHARED COVERAGE
AIN	125	<i>Asclepias incarnata</i>	Butterfly Milkweed	CONT.	2.25" PLUG (32'S)	MIN. 24" O.C. 25% SHARED COVERAGE
JNE	125	<i>Juncus effusus</i>	Soft Rush	CONT.	2.25" PLUG (32'S)	MIN. 24" O.C. 25% SHARED COVERAGE
EDU	125	<i>Eupatorium dubius</i>	Dwarf Joe Pye Weed	CONT.	2.25" PLUG (32'S)	MIN. 24" O.C. 25% SHARED COVERAGE
<b>LOWER SHELF= 1947</b>		<b>SF WI 50 HERB. PLANTS/200 SF = 488</b>				
SGL	122	<i>Sagittaria latifolia</i>	Broadleaf Arrowhead	CONT.	2.25" PLUG (32'S)	MIN. 24" O.C. 25% SHARED COVERAGE
PNC	122	<i>Pontederia cordata</i>	Pickerselweed	CONT.	2.25" PLUG (32'S)	MIN. 24" O.C. 25% SHARED COVERAGE
SAC	122	<i>Saururus cernuus</i>	Lizard's Tail	CONT.	2.25" PLUG (32'S)	MIN. 24" O.C. 25% SHARED COVERAGE
JNB	122	<i>Juncus effusus 'Blue Arrow'</i>	Soft Rush	CONT.	2.25" PLUG (32'S)	MIN. 24" O.C. 25% SHARED COVERAGE

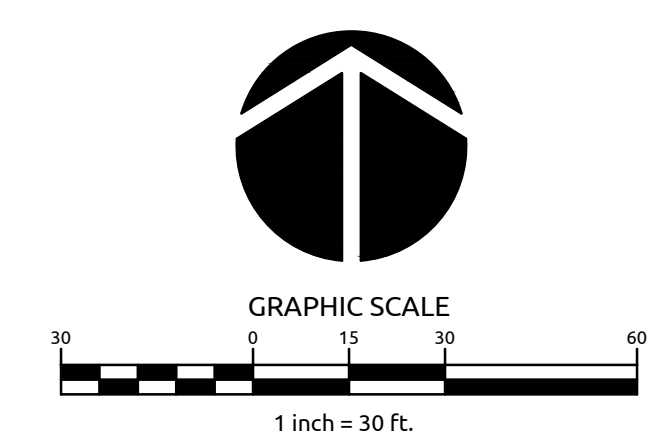
Note: "Shared coverage" means that the species will be evenly interspersed on their designated shelf across a single 24" OC square grid.

**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: \_\_\_\_\_  
Town Engineer

These plans are approved by the Town of Knightdale and serve as construction plans for this project.

By: \_\_\_\_\_ Date: \_\_\_\_\_  
Administrator

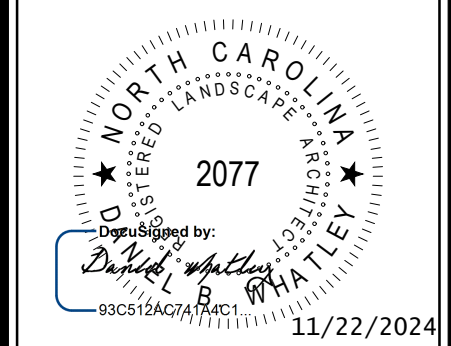


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MERRITT MIDWAY  
BUSINESS PARK  
Knightdale, NC

SCM LANDSCAPE PLAN

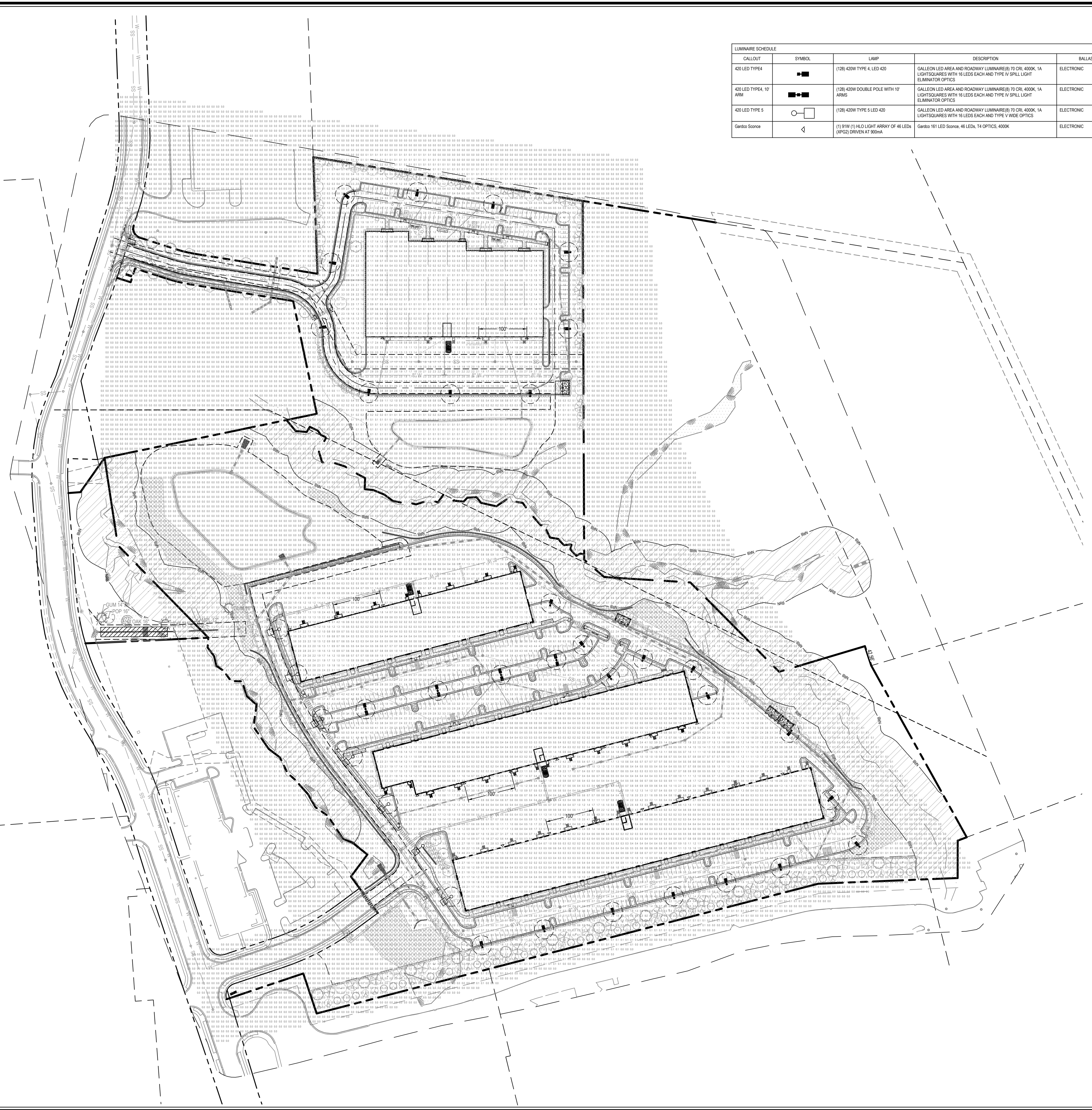
Job No. 09190080.00 Drawn By WR  
Date 09/15/2020 Designer WR



Revisions	
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Sheet No.  
**L1.5**





LUMINAIRE SCHEDULE	CALLOUT	SYMBOL	LAMP	DESCRIPTION	BALLAST	MOUNTING	MODEL	VOLTS	QUANTITY
420 LED TYPE 4			(128) 420W TYPE 4 LED 420	GALILEON LED AREA AND ROADWAY LUMINAIRE(B) 70 CRI, 4000K, 1A LIGHTSQUARES WITH 16 LEADS EACH AND TYPE IV SPILL LIGHT ELIMINATOR OPTICS	ELECTRONIC	POLE, 35 FT, 2 ARM	COOPER LIGHTING - STREETWORKS, GANAE-08-LED-U-SL4	120V 1P 2W	25
420 LED TYPE 4, 10' ARM			(128) 420W DOUBLE POLE WITH 10' ARMS	GALILEON LED AREA AND ROADWAY LUMINAIRE(B) 70 CRI, 4000K, 1A LIGHTSQUARES WITH 16 LEADS EACH AND TYPE IV SPILL LIGHT ELIMINATOR OPTICS	ELECTRONIC	POLE, 35 FT, 10' ARM	COOPER LIGHTING - STREETWORKS, GANAE-08-LED-U-SL4	120V 1P 2W	8
420 LED TYPE 5			(128) 420W TYPE 5 LED 420	GALILEON LED AREA AND ROADWAY LUMINAIRE(B) 70 CRI, 4000K, 1A LIGHTSQUARES WITH 16 LEADS EACH AND TYPE IV WIDE OPTICS	ELECTRONIC	POLE, 35, 2 ARM	COOPER LIGHTING - STREETWORKS, GANAE-08-LED-U-SL4	120V 1P 2W	7
Garbo Sconce			(1) 91W (1) H.O. LIGHT ARRAY OF 46 LEDS (XP22) DRIVEN AT 800mA	Garbo 161 LED Sconce, 46 LEDS, 74 OPTICS, 4000K	ELECTRONIC	WALL MOUNT, 18" HT	PHILIPS GARCOO - 161-46L-900-NW-Q2-4	120V 1P 2W	25

SOUTH PARKING LOT PHOTOMETRIC SCHEDULE	
AVERAGE FOOT-CANDELES	3.1
MAXIMUM FOOT-CANDELES	9.2
MINIMUM FOOT-CANDELES	0.9
MINIMUM TO MAXIMUM FC RATIO	0.09
MAXIMUM TO MINIMUM FC RATIO	10.89
AVERAGE TO MINIMUM FC RATIO	3.61

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 16.6B 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: \_\_\_\_\_

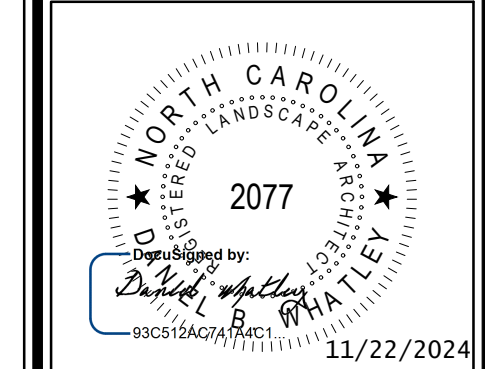
a. **Town Certification.** This design has been reviewed by the Engineer for the Town of Knightdale, and to the best of my knowledge and belief, it conforms to the requirements established in the Standard Specifications of the Town of Knightdale.

By: \_\_\_\_\_ Date: \_\_\_\_\_  
 Town Engineer

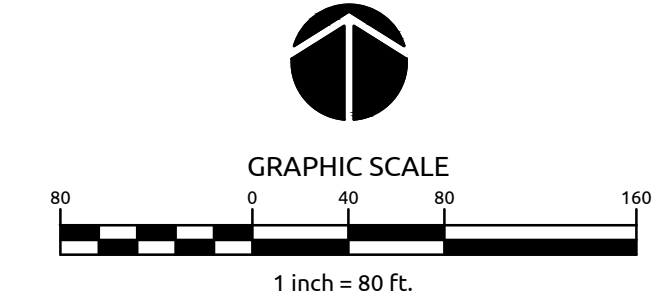
These plans are approved by the Town of Knightdale and serve as construction plans for this project.

By: \_\_\_\_\_ Date: \_\_\_\_\_  
 Administrator

Job No.	0919080.00	Drawn By	WR
Date	09/15/2020	Designer	WR



Revisions	
9	SIGNATURE SUBMITTAL 8/27/21
10	REVISION TO APPROVED PLANS 11/11/21
11	TOWN COMMENTS 12/22/21
12	LOT A SINGLE BUILDING REVISION 8/8/23
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16	LOT A REVISION SIGNATURE SUBMITTAL 11/22/24



by @ignify

Wall Sconce

LED Wall Sconce

161

Gardco LED wall sconce 161 offers distinction through its styling, powerful optical design, array of distributions, and impressive selection of control possibilities. Designed to complement the 121, this luminaire is the large and extended version of the 121, providing performance capability up to that of a 400W metal halide luminaire, while using considerably less energy.

Project: \_\_\_\_\_  
 Location: \_\_\_\_\_  
 Cat. No.: \_\_\_\_\_  
 Type: \_\_\_\_\_  
 Luminaire: \_\_\_\_\_ City: \_\_\_\_\_  
 Note: \_\_\_\_\_

**Ordering guide**

Order No.	Order Qty.	LED Color	Options	Order Qty.	Order No.	Order Qty.	LED Color	Options	Order Qty.	Order No.	Order Qty.	LED Color	Options	Order Qty.
161	46L	900	NW-G2	2	120	100	900	NW-G2	2	120	100	900	NW-G2	2

1. Not available with Dimming Driver (DD) option. 2. Not available with Dual Circuit Control (DCC) option. 3. Available in 120-277V or 120V only. 4. Not available with 480V. 5. Must specify exact input voltage.

**Accessories (order separately)**

Profile	Scheduling	Duration	Level
Median	10 PM - 6 AM	8 hours	50%
Safety	11 PM - 6 AM	7 hours	50%

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### 161 LED wall sconce

**LED Wattage and Lumen Values**

Wattage	Color	Beam Angle	Beam Diameter	Beam Length	Beam Area	Beam Volume	Beam Density	Beam Spread	Beam Shape	Beam Type
161	900	30°	1.5"	1.5"	0.02	0.02	0.02	0.02	0.02	0.02

**Distributions**

**Dimensions**

**Luminaire options**

- DD-D: 0-10V dimming driver with leads supplied through back of luminaire (for secondary dimming controls by others).
- DCC: Dual Circuit Control (DCC) option.
- DD-D: 0-10V dimming driver with leads supplied through back of luminaire (for secondary dimming controls by others).
- IMR: Infrared Motion Response Integral (IMR) module is mounted integral to luminaire. Motion response for IMR is set separately in the following fashion. The motion sensor is set to a constant 50%. When motion is detected by the PIR sensor, the luminaire returns to full power/light output. Dimming on low is factory set to 50% with 5 minute default. In 'Full power' prior to dimming back to low. When no motion is detected for 5 minutes, the motion response system reduces the wattage by 50%, to 50% of the normal constant wattage, reducing the light level. IMR can also be specified with automatic profile dimming for the added benefit of a combined dimming profile with sensor detection, where the PIR sensor will override the dimming profile when occupancy is detected.
- IR: Infrared (IR) motion sensor. WattStopper P30-271, equipped with lens. Available in 120V through 277V input only. Motion sensor off state power is 0.0 watts. The P30-271 can also be reprogrammed with WattStopper's F30-100 remote programming tool accessory.
- DCC: Dual Circuit Control permits separate switching of LED modules. Available as an option with 2 modules only.
- F1: Fusing Single (for 120, 240 or 480VAC)
- F2: Fusing Double (for 208, 240 or 480VAC)
- F3: Fusing Canadian Double Pull (for 208, 240 or 480VAC)

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### 161 LED wall sconce

**Specifications**

**Housing**  
 Main body castings made of a low copper die cast Aluminum alloy (A360) for a high resistance to corrosion, 0.100" (2.5mm) minimum thickness.

**Driver/Electrical**  
 Renewable die-cast aluminum door made of a low copper alloy (A360). Provides access to electronics components/LED drivers. Designed for robust IP60 rated seal using one-piece silicone rubber gasket surrounding the entire perimeter of the electronics compartment.

**Light Engine**  
 Electrical components are RoHS compliant. IP60 sealed light engines. LEDs tested by ISO 10523-2005 accredited lab in accordance with IESNA LM-80 guidelines extrapolations in accordance with IESNA TM-21. Metal core board ensures greater heat transfer and longer lifespan.

**LED Module**  
 Composed of high performance white LEDs. Color temperature as per ANSI/NEMA bin Neutral White (4000 Kelvin minimum (DMS +/- 275K), CR 70 Min. 161 luminaires also offer 3000K and 5000K color temperatures.

**Optical System**  
 The advanced LED optical systems provide IES Types 2, 3 and 4 distributions. Composed of high performance UV stabilized optical grade polymer reflector lenses to achieve desired distribution optimized to get maximum spacing, target lumens and a superior lighting uniformity. System is tested IP60. Performance shall be tested per LM-63, LM-79 and TM-30 (IESNA certifying its photometric performance. Dark sky compliant with 0% uplight and US per IESNA TM-15. Designed and tested to rating IK10 in accordance with European standard EN 62622 (equivalent of international standard IEC 62622-2002).

**Finish**  
 Five standard colors offered in textured black, white, bronze, dark gray and medium gray. RAL and custom color matching available. Color in accordance with the AAMA 2604 standard. Application of polyester powder coat parts (2.5 mill minimum). The thermosetting resins provides a discolored resistant finish in accordance with the ASTM D2244 standard, as well as better retention in keeping with the ASTM D2244 standard and humidity proof in accordance with the ASTM D2247 standard.

**Other Integrated Features**  
 Surge Protection: Each luminaire is provided as standard with surge protector (designed and tested in accordance with ANSI/IEEE C62.45 per ANSI/IEEE C62.41.2 Spurious 1 Category C High Exposure 100V/5kA waveforms for Line Ground, Line Neutral and Neutral Ground, and in accordance with U.S. DOE (Department of Energy) MSLC (Municipal Solid State Street Lighting Consortium) Model Specification for LED Roadway Luminaires Appendix D Electrical Transient High Test Level 10kV / 5kA.

**Wiring**  
 #12 - #14 AWG wires from the primary circuit, located inside the housing. Due to the touch current that occurs with electronic drivers, recommend using a time delay or slow blow fuse to avoid unnecessary and unwanted fuse blowing that can occur with fast acting fuses.

**Hardware**  
 All exposed screws shall be stainless steel and/or corrosion resistant and captive. All seals and sealing devices are made and/or lined with EPDM and/or silicone and/or rubber.

**Certifications and Compliance**  
 cULx Listed for Canada and USA. LED Luminaires with neutral white color temperature are DesignLights Consortium qualified. Enter luminaire is rated for operation in ambient temperature of -40°C (-40°F) up to +40°C (+104°F).

**Limited Warranty**  
 5-year limited warranty. See signify.com/warranties for details and restrictions. Visit our eCatalog or contact your local sales representative for more information.

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### Outdoor Lighting Shoebox LED

The energy-efficient Shoebox LED combines a decorative, contemporary style with versatility and ample lighting effect that is perfect for streets, parking lots, commercial buildings and residential communities. The Shoebox LED provides excellent color rendition along with a controlled light pattern that reduces glare and keeps the light directed only where you want it. Available in black, dark bronze, gray or white with one to four fixtures per pole.

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

**LED (Light Emitting Diode)**

205, 420, 530 watts

**Mounting heights**

30, 35'

**Colors**

Black  
Bronze  
Gray  
White

**Poles**

Fiberglass (205W only, 1 or 2 fixtures per pole)  
Decorative tapered metal  
Decorative square metal

Note: 35' pole available in black or bronze only.

### Outdoor Lighting Shoebox LED

Light source: LED (white)  
 Replacement for: LED Wattage 205 - up to 400-watt metal halide, LED Wattage 420, LED Wattage 530 - 1,000-watt metal halide

Warm-up and restrike time: Instant on (no warm-up or restrike time)

Wattage	BUG Rating	Light Pattern	Lumens	Color Temp
LED 205	B5-U0-G3	IESNA Type V (circular)	21,803	
LED 205	B3-U0-G4	IESNA Type IV (forward throw)	20,555	
LED 205	B2-U0-G4	IESNA Type III (low)	21,164	
LED 420	B5-U0-G5	IESNA Type V (circular)	43,317	4,000K
LED 420	B3-U0-G5	IESNA Type IV (forward throw)	39,078	
LED 530	B5-U0-G5	IESNA Type V (circular)	53,498	
LED 530	B3-U0-G5	IESNA Type IV (forward throw)	48,262	

\* These are approximate replacement suggestions; actual conditions could be different.

**Poles available:**

Name	Mounting height	Color
Round tapered decorative metal*	35'	Black Bronze
Decorative square metal*	30'	Black Bronze Gray White
Fiberglass	30'	Black (205W only, 1 or 2 fixtures per pole) Gray (205W only, 1 or 2 fixtures per pole)

**Features**

- Little or no installation cost
- Design services by lighting professionals included
- Maintenance included
- Electricity included
- Warranty included
- One low monthly cost on your electric bill
- Turnkey operation
- Backed by over 40 years of experience

**Benefits**

- Frees up capital for other projects
- Meets industry standards and lighting ordinances
- Eliminates high and unexpected repair bills
- Less expensive than metered service
- Worry-free
- Convenience and savings for you
- Provides hassle-free installation and service
- A name you can trust today... and tomorrow

\*2' raised foundation available when required on metal poles only.

**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: \_\_\_\_\_

**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: \_\_\_\_\_  
 Town Engineer

These plans are approved by the Town of Knightdale and serve as construction plans for this project.

By: \_\_\_\_\_ Date: \_\_\_\_\_  
 Administrator

**WithersRavenel**  
 Engineers | Planners

137 S Wilmington Street | Suite 200 | Raleigh, NC 27601 | T: 919.469.3340 | License #: F-1479 | www.withersravenel.com

**MERRITT MIDWAY BUSINESS PARK**  
 Knightdale, NC

**LIGHTING DETAILS**

Job No: 0919080.00 Drawn By: WR  
 Date: 09/15/2020 Designer: WR

2077  
 Notary Public  
 11/22/2024

Revisions		
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Sheet No.  
**SL1.1**