

PROJECT # ZMA-3-20

# CONSTRUCTION DRAWINGS FOR

# MERRITT HINTON OAKS BLVD

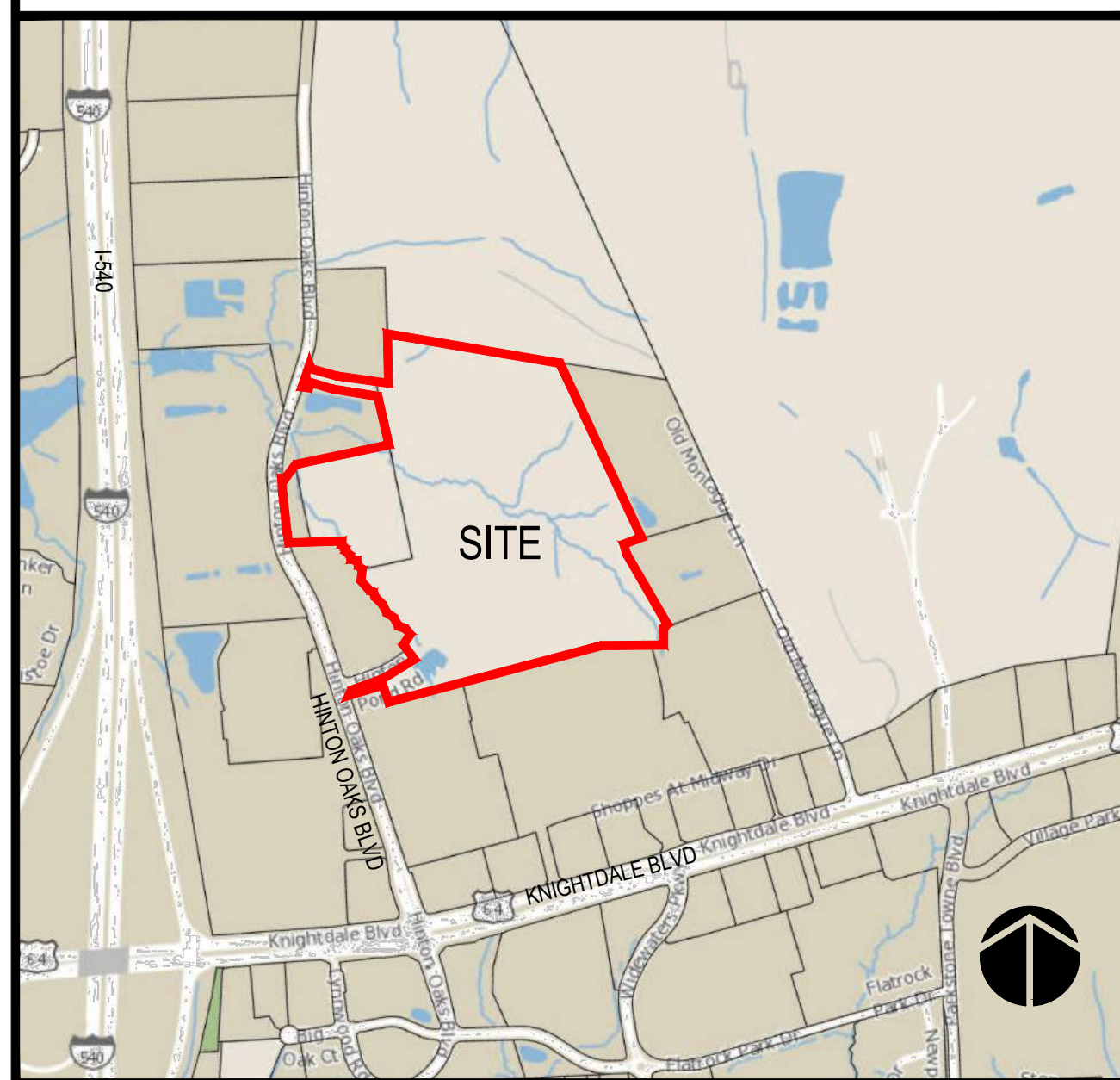
## 123 HINTON OAKS BLVD, KNIGHTDALE, NC ST. MATTHEW'S TOWNSHIP

NOVEMBER 11, 2021

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.

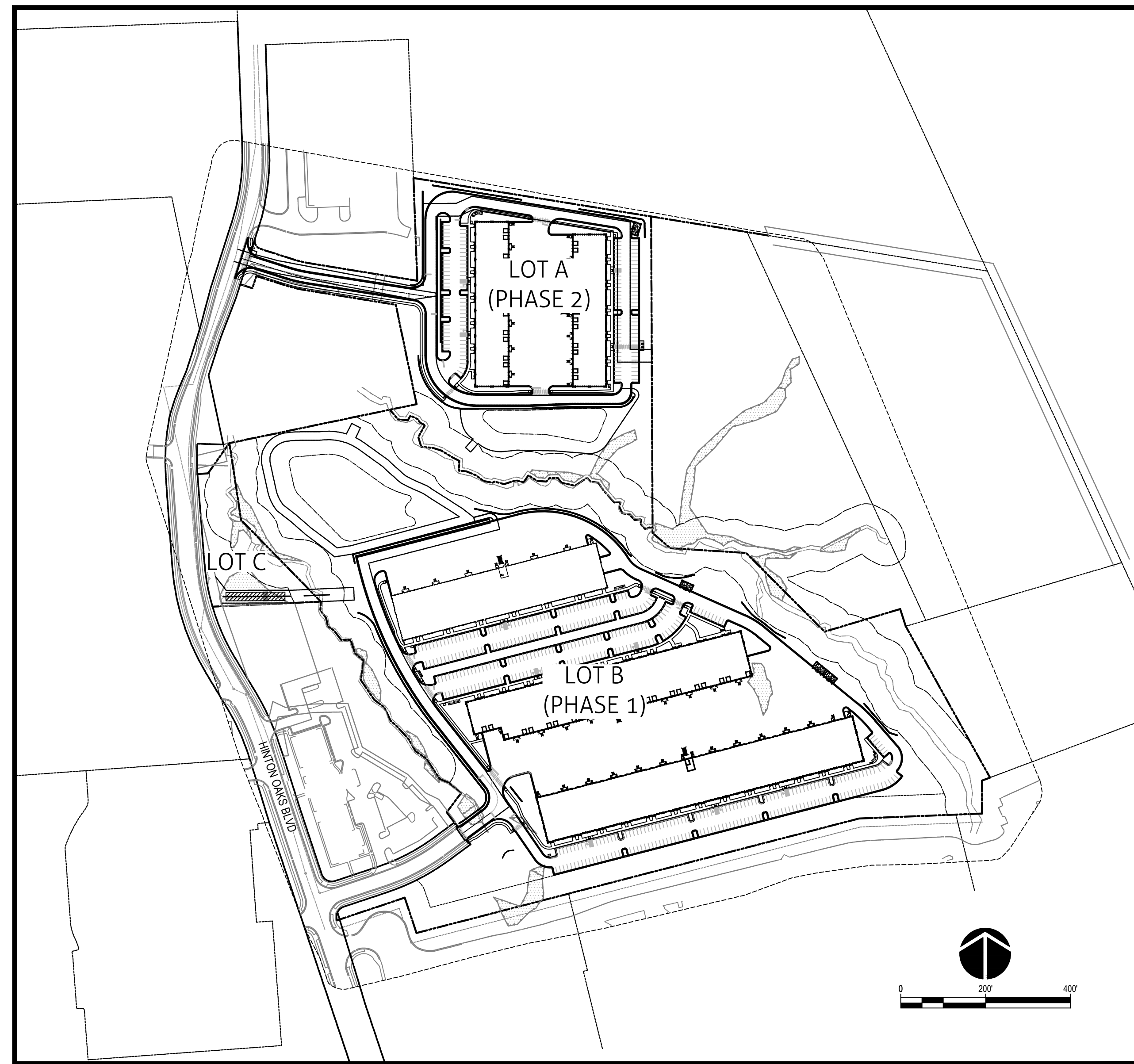
CONSTRUCTION DRAWINGS FOR: MERRITT HINTON OAKS BLVD WR PROJECT NO. 09190080.00

VICINITY MAP  
1"=800'



SITE DATA TABLE

PROPERTY INFORMATION:	
OWNER NAME:	MERRITT-MW1, LLC
OWNER ADDRESS:	1 TW ALEXANDER DRIVE, #115 DURHAM, NC 27703
DEVELOPER NAME: MERRITT-MW1, LLC	
DEVELOPER ADDRESS:	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
BUILDING SETBACKS:	
PRINCIPAL FRONT:	10'
STREET SIDE/SECONDARY FRONT:	0' or 6'
CORNER SIDE SETBACK:	10'
REAR/SIDE (FROM ADJACENT LOT):	10'
EXISTING BUILDING AREA: 0	
LOT AREA:	LOT A: 9.29 AC      LOT B: 26.29 AC
PHASE:	2      1
BUILDING AREA:	60,000 SF      211,450 SF
REQUIRED PARKING (2 PER KSF GFA):	120      423
PROPOSED PARKING:	138      425
REQUIRED BIKE RACK SPACES (1/10 SPACES):	14      42
PROPOSED BIKE RACK SPACES:	14      42
THIS SITE LIES WITHIN A TYPE "X" FLOOD HAZARD AREA PER MAP 3720174400J, EFFECTIVE DATE 5-2-2006.	



Sheet List Table	
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C1.0	OVERALL EXISTING CONDITIONS
C1.1	EXISTING CONDITIONS & DEMOLITION PLAN
C1.2	EXISTING CONDITIONS & DEMOLITION PLAN
C2.0	OVERALL SITE PLAN
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C2.3	SITE PLAN
C2.4	SITE PLAN
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C5.0	OVERALL EROSION CONTROL PLAN - STAGE 1
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C5.3	EROSION CONTROL BASIN DRAINAGE AREAS
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C6.0	SCM 1 PLAN AND DETAILS
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C6.3	CULVERT PLAN AND PROFILE
C7.0	STORM PROFILES
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C7.3	PIPE AND STRUCTURE TABLES
C8.0	SEWER PROFILES
C8.1	SEWER PROFILES
C8.2	SEWER PROFILES
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C9.2	UTILITY DETAILS
C9.3	UTILITY DETAILS

Sheet List Table	
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C9.6	EROSION CONTROL DETAILS
C9.7	NOG01 DETAILS
C10.0	OVERALL TRAFFIC AND MARKINGS PLAN
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C10.2	TRAFFIC SIGNS AND MARKING PLAN
C10.3	TRAFFIC SIGNS AND MARKING PLAN
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L1.0	OVERALL LANDSCAPE PLAN
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L1.2	LANDSCAPE PLAN
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L1.5	SCM LANDSCAPE PLAN
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, \_\_\_\_\_, PE, certify that the Standard Specifications of the Town of Knightdale have been thoroughly checked and found to be applicable to this project. All exceptions to the applicable Town standards have been previously approved by the Town of Knightdale and said exceptions are shown on Sheet(s) \_\_\_\_\_ of these drawings.

Seal By: \_\_\_\_\_, PE  
Date: \_\_\_\_\_

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

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

PUBLIC IMPROVEMENT QUANTITIES	
Number of Lot (s)	2
Number of Buildings	5
Water Service Stubs	2
Public Sewer - 6" (LF)	0
Public Sewer - 8" (LF)	1,843
Sewer Service Stubs	2

DEVELOPER/OWNER

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

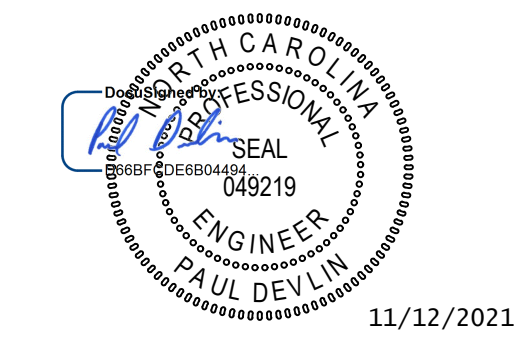
ATTN: NATHAN ROBB  
NROBB@MERRITTPROPERTIES.COM

PREPARED BY:



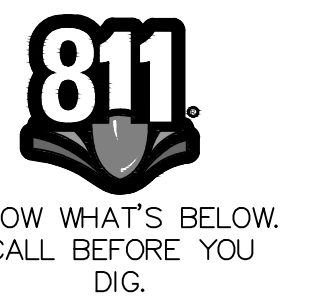
137 S Wilmington Street | Suite 200 | Raleigh, NC 27601 | t: 919.469.3340 | license #: C-0832 | www.withersravenel.com

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:  
LOFTEE SMITH, P.E., PROJECT MANAGER  
WITHERSRAVENEL, INC.  
137 S WILMINGTON, RALEIGH, NC 27601  
TELEPHONE: (919) 535-5175  
LSMITH@WITHERSRAVENEL.COM



**GENERAL SITE NOTES:**

- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH TOWN OF KNIGHTDALE, NCDOT, AND CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT STANDARD DETAILS AND SPECIFICATIONS, LATEST REVISIONS.
- 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.
- 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.
- THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL JOB-SITE SAFETY, INCLUDING BUT NOT LIMITED TO TRENCH SAFETY, DURING ALL PHASES OF CONSTRUCTION.
- 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.
- 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.
- 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.
- THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING OR OBTAINING ALL REQUIRED PERMITS AND APPROVALS PRIOR TO COMMENCING CONSTRUCTION.
- ALL ENVIRONMENTAL PERMITS APPLICABLE TO THE PROJECT MUST BE OBTAINED FROM NCDWQ, USACE, AND/OR FEMR FOR ANY RIPARIAN BUFFER, WETLANDS AND/OR FLOODPLAIN IMPACTS (RESPECTIVELY) PRIOR TO COMMENCING CONSTRUCTION.
- 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:**

- 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.
  - 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.
- TOWN OF KNIGHTDALE CURRENT STANDARD SPECIFICATIONS AND DETAILS ARE AVAILABLE ONLINE AT KNIGHTDALENC.GOV, UNDER THE ENGINEERING DEPARTMENT PAGE.
  - 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 §11 PROVIDES A COMMUNICATIONS LINK WITH YOUR LOCAL UTILITY PROVIDERS. CONTRACTOR PROVIDES INFORMATION ABOUT EXCAVATION, NC §11 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.)
  - 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.
  - 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.
  - THE CONTRACTOR SHALL SUPPLY THE CITY INSPECTOR CONSTRUCTION MATERIAL TESTING DOCUMENTATION THROUGHOUT THE PROJECT.
  - 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.
  - NO BURNING OF DEMO DEBRIS DURING CLEARING AND GRUBBING.
  - THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS PRIOR TO CONSTRUCTION.
  - 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.
    - 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.
    - 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.
    - LANDSCAPE BEDDING SHALL BE OF A SIZE AND COLOR TO MATCH EXISTING BEDDING AND SHALL BE SPREAD A MINIMUM OF TWO INCHES THICK.
    - THE ENGINEERING DEPARTMENT AND PUBLIC WORKS DEPARTMENT SHALL BE CONTACTED TO INSPECT ALL WORK BEFORE A CERTIFICATE OF OCCUPANCY IS ISSUED.
  - 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.
  - 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.
  - CONSTRUCTION OF CONCRETE OR PAVING ITEMS SHALL NOT COMMENCE UNTIL ALL UNDERGROUND WORK HAS BEEN INSPECTED, TESTED, AND APPROVED.
  - 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.
  - TRAFFIC CONTROL SHALL BE MAINTAINED IN ACCORDANCE WITH THE NCDOT AND MUTCD SPECIFICATIONS.
  - 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.
  - ANY CONSTRUCTION DETOURS WILL REQUIRE AN ALL-WEATHER ROAD SURFACE.

**GENERAL UTILITY NOTES:**

- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST TOWN OF KNIGHTDALE AND CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT STANDARD SPECIFICATIONS AND DETAILS.
- ALL CONSTRUCTION WITHIN THE NCDOT PUBLIC RIGHT-OF-WAY SHALL BE IN ACCORDANCE WITH THE LATEST NCDOT STANDARD SPECIFICATIONS.
- ALL STORM DRAINAGE SHALL BE CLASS III RCP UNLESS OTHERWISE NOTED.
- ALL UTILITY LINES SHALL HAVE EASEMENTS CENTERED ON THE LINES UNLESS LOCATED COMPLETELY IN ROAD ROW.
- 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.
- A 3' - 5' CLEARANCE SHALL BE MAINTAINED AROUND ALL FIRE HYDRANTS, INCLUDING CLEARANCE FROM TREES AND SHRUBS.
- 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.
- 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.
- 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.
- 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.
- SANITARY SEWER MAINS SHALL HAVE A MINIMUM VERTICAL SEPARATION OF 24 INCHES BETWEEN STORM SEWERS.
- 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:**

- 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.
- CONTRACTOR SHALL COORDINATE WITH THE UTILITY COMPANIES FOR ANY REQUIRED UTILITY ADJUSTMENTS AND/OR RELOCATIONS.
- 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.
- 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.
- 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.
- ALL DEMOLITION DEBRIS AND OTHER EXCESS MATERIAL SHALL BE HAULED OFF-SITE.
- REFERENCE STRUCTURAL DRAWINGS AND SPECIFICATIONS (IF APPLICABLE) AND GEOTECHNICAL REPORT FOR BUILDING PAD AND PAVING SUBGRADE INFORMATION.
- PROPOSED CONTOURS AND GUTTER GRADIENTS ARE APPROXIMATE. PROPOSED SPOT ELEVATIONS ARE TO BE USED IN CASE OF DISCREPANCY.
- 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.
- CONTRACTOR SHALL INCLUDE IN THE CONTRACT PRICE ANY DEWATERING NECESSARY TO CONSTRUCT THE PROJECT AS SHOWN ON THE PLANS.
- 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.
- CONTRACTOR SHALL PROVIDE ALL MATERIALS AND APPURTENANCES NECESSARY FOR COMPLETE INSTALLATION OF THE STORM SEWER.
- ALL RCP STORM SEWER SHALL BE MINIMUM CLASS II REINFORCED CONCRETE PIPE, UNLESS OTHERWISE NOTED.
- 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.
- 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 | T: 919-669-3340 | License #: C-0832 | www.withersravenel.com

MERRITT HINTON  
OAKS BLVD  
Knightdale, NC

**GENERAL NOTES**

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

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

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

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

- 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:

Knightdale 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 Knightdale 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.



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MERRITT HINTON OAKS BLVD
Knightdale, NC

APPROVED ZONING CONDITIONS

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

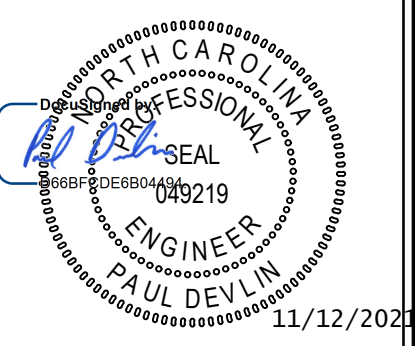


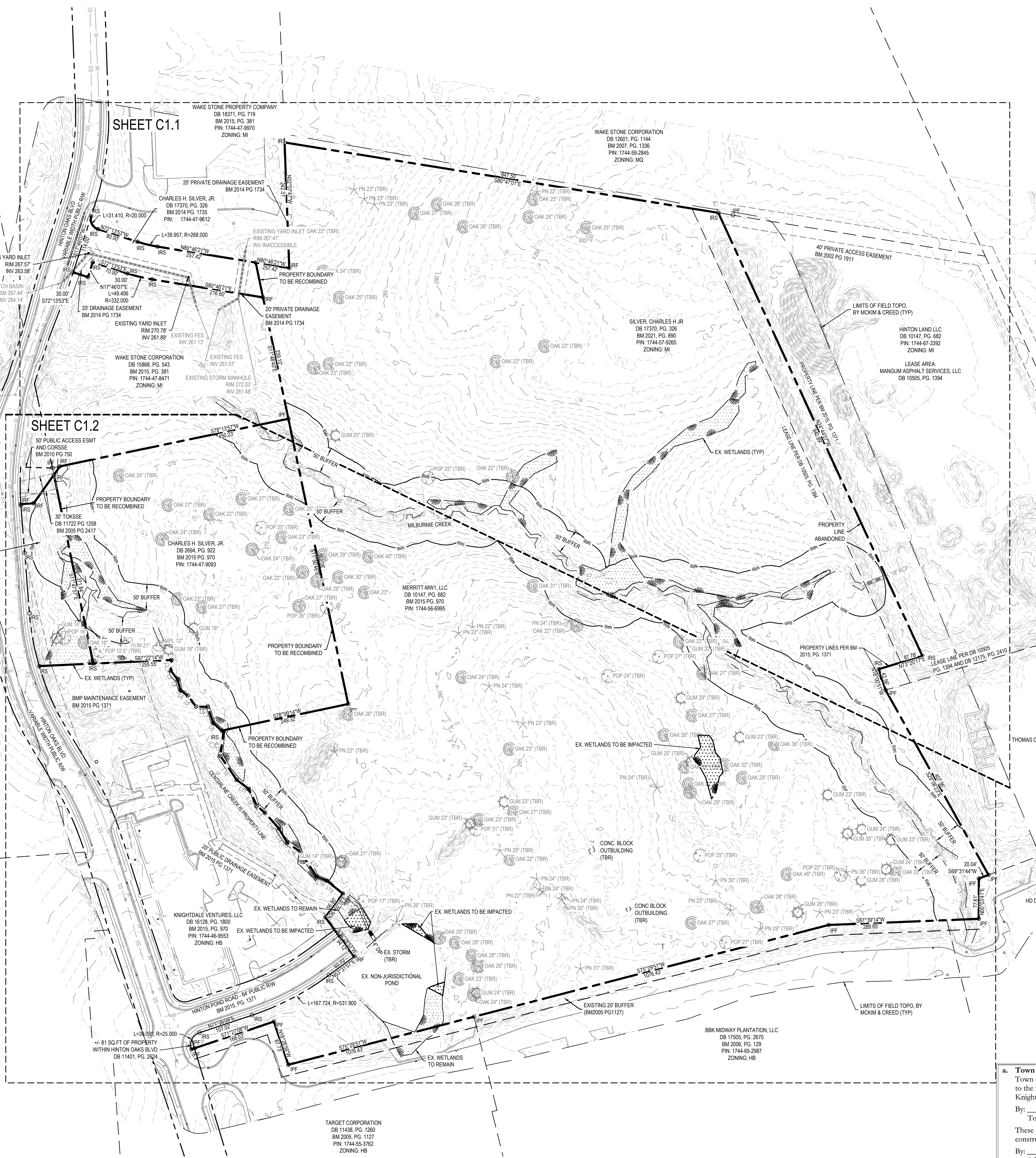
Table with Revisions, Description, Date

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

Sheet No.
C0.2

11/15/2020 10:00:00 AM: merritt hinton\merritt hinton\cadd\working\mhc\overall\existing\conditions\sheet C1.0 overall existing conditions.dwg: Thursday, November 11, 2021, 11:44:29 AM: ETELIER, RANDALL

Line #	Length	Direction
L1	20.360	N04° 01' 26.69"E
L2	22.314	N36° 58' 56.50"W
L3	20.873	N13° 14' 07.20"W
L4	17.458	N55° 28' 04.64"W
L5	26.765	N36° 48' 55.68"W
L6	22.793	N88° 18' 19.75"W
L7	32.317	N17° 58' 01.52"W
L8	22.388	N48° 13' 25.79"W
L9	47.371	N07° 18' 36.51"E
L10	55.432	N34° 19' 16.29"W
L11	29.345	N53° 05' 13.03"W
L12	35.745	N25° 49' 03.64"W
L13	21.232	N47° 55' 04.48"W
L14	40.256	N42° 05' 39.20"W
L15	31.224	N29° 37' 44.92"W
L16	31.586	N55° 06' 23.15"W
L17	57.067	N33° 22' 37.46"W
L18	21.097	N68° 03' 19.30"W
L19	39.741	N51° 13' 59.71"W



- EXISTING CONDITIONS AND DEMOLITION NOTES:**
1. SURVEY INFORMATION PROVIDED BY MCKIM & CREED, RALEIGH, NORTH CAROLINA OFFICE IN DIGITAL FORMAT IN JANUARY 09, 2019.
  2. THE SUBJECT PROPERTY DOES NOT LIE WITHIN A F.E.M.A. DESIGNATED AREA OF MINIMAL FLOOD HAZARD, ZONE X PER F.I.R.M. NUMBER 3720174400J, WITH AN EFFECTIVE DATE OF MAY 2, 2006.
  3. ON-SITE WETLANDS AND STREAMS FIELD DELINEATED AND SURVEYED BY WITHERSRAVENEL.
  4. ALL WORK SHALL BE IN ACCORDANCE WITH TOWN OF KNIGHTDALE STANDARDS AND SPECIFICATIONS.
  5. THE CONTRACTOR SHALL COORDINATE ALL REMOVAL EFFORTS WITH THE DEVELOPER PRIOR TO COMMENCING WORK.
  6. SPECIAL CARE SHALL BE TAKEN TO PROTECT AND MAINTAIN ALL EXISTING FEATURES, INCLUDING BELOW GROUND, NOT MARKED FOR REMOVAL. IN THE EVENT OF ANY IMPACT TO SUCH FEATURES, THE CONTRACTOR SHALL PERFORM REPAIR AND/OR RESTORE TO ORIGINAL CONDITION AS OF START OF WORK.
  7. NO DEMOLITION DEBRIS IS TO BE STORED ON SITE. ALL DEMOLITION MATERIAL IS TO BE PROMPTLY REMOVED FROM THE SITE OR PLACED IN APPROPRIATE CONTAINERS.
  8. SITE DEMOLITION SEQUENCE TO BE PROVIDED BY THE CONTRACTOR.
  9. IF UNFORESEEN CONDITIONS DEVELOP DURING CONSTRUCTION, REFER TO TOWN OF KNIGHTDALE'S TECHNICAL SPECIFICATIONS AND CONTACT PUBLIC WORKS FOR FURTHER GUIDANCE.
  10. PRIOR TO START OF CONSTRUCTION, THE CONTRACTOR SHALL SCHEDULE A PRE-CONSTRUCTION MEETING WITH THE TOWN OF KNIGHTDALE PUBLIC WORKS DEPARTMENT TO REVIEW THE SPECIFIC COMPONENTS OF THE PLAN AND OPERATION OF THESE FACILITIES DURING CONSTRUCTION.
  11. THE CONTRACTOR SHALL CONDUCT THE WORK IN A SAFE MANNER AND WITH A MINIMUM AMOUNT OF INCONVENIENCE TO TRAFFIC.
  12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TRAFFIC CONTROL AND SHALL ADHERE TO THE PROVISIONS OF THE MUTCD (MOST CURRENT EDITION).
  13. PRIOR TO CONSTRUCTION BEGINNING, ALL SIGNAGE AND TRAFFIC CONTROL SHALL BE IN PLACE.
  14. CONTRACTOR IS EXPLICITLY ADVISED TO FIELD LOCATE AND VERIFY LOCATION OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION. LOCATION OF EXISTING UNDERGROUND UTILITIES SHOWN ON PLANS IS APPROXIMATE BASED ON BEST AVAILABLE INFORMATION. CONTRACTOR TO REPORT ANY DISCREPANCIES TO THE ENGINEER AND CALL 811 FOR FIELD LOCATION OF UNDERGROUND UTILITIES PRIOR TO ANY CONSTRUCTION ACTIVITIES.
  15. NO BURNING OF DEMO DEBRIS DURING CLEARING AND GRUBBING.
  16. 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.
  17. 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.

**LEGEND**

**WIDTH LEGEND:**

- CONCRETE SIDEWALK
- WETLANDS
- LINETYPE LEGEND (SEE OTHERWISE NOTED)
- ADJONER
- BOUNDARY
- EASEMENT
- RIGHT OF WAY
- RAILROAD
- POND EDGE
- SEWER LINE
- OVERHEAD POWER LINE
- TREE LINE
- WETLANDS
- STORM DRAINAGE
- CONTOUR MAJOR
- CONTOUR MINOR

**LEGEND (UNLESS OTHERWISE NOTED):**

- ASP - ASPHALT
- C&G - CURB AND GUTTER
- CONC - CONCRETE
- CB - CATCH BASIN
- CM - CORRUGATED METAL PIPE
- CP - CORRUGATED PLASTIC PIPE
- DI - DROP INLET
- DI - DUCTILE IRON PIPE
- EOP - EDGE OF PAVEMENT
- F&S - SPLINT FENCE
- FG - CHAIN LINK FENCE
- FWD - WOOD FENCE
- GW - GUY WIRE
- IF - IRON PIPE FOUND
- IR - IRON ROD FOUND
- IP - UTILITY PIPE FOUND
- REB - REBAR FOUND
- RCP - REINFORCED CONCRETE PIPE
- SMH - SEWER MANHOLE
- TIP - TELEPHONE PEDestal
- TBR - TO BE REMOVED
- WMH - WATER MANHOLE
- WATER VALVE
- UTILITY POLE
- SI - SIGN
- SANITARY SEWER MANHOLE
- TEMPORARY BENCH MARK
- FLARED END SECTION
- FIRE HYDRANT
- TELEPHONE/FIBER OPTIC PEDestal

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

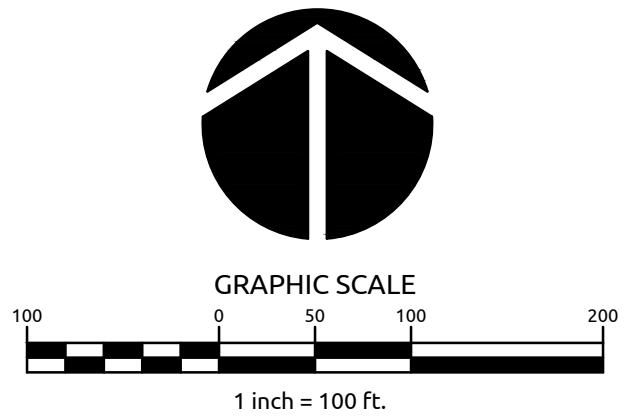
By: \_\_\_\_\_ Date: \_\_\_\_\_

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Administrator



**WithersRavenel**  
Engineers | Planners

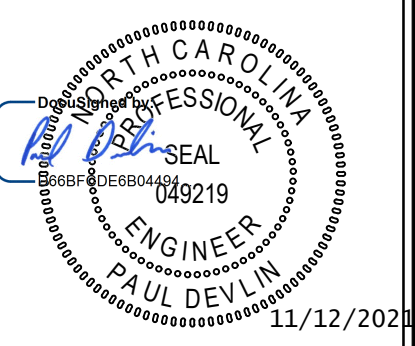
137 S. Wilmington Street, Suite 200, Raleigh, NC 27601 | T: 919-468-3300 | License #: C-0821 | www.withersravenel.com

**MERRITT HINTON**  
**OAKS BLVD**

Knightdale, NC

**OVERALL EXISTING CONDITIONS**

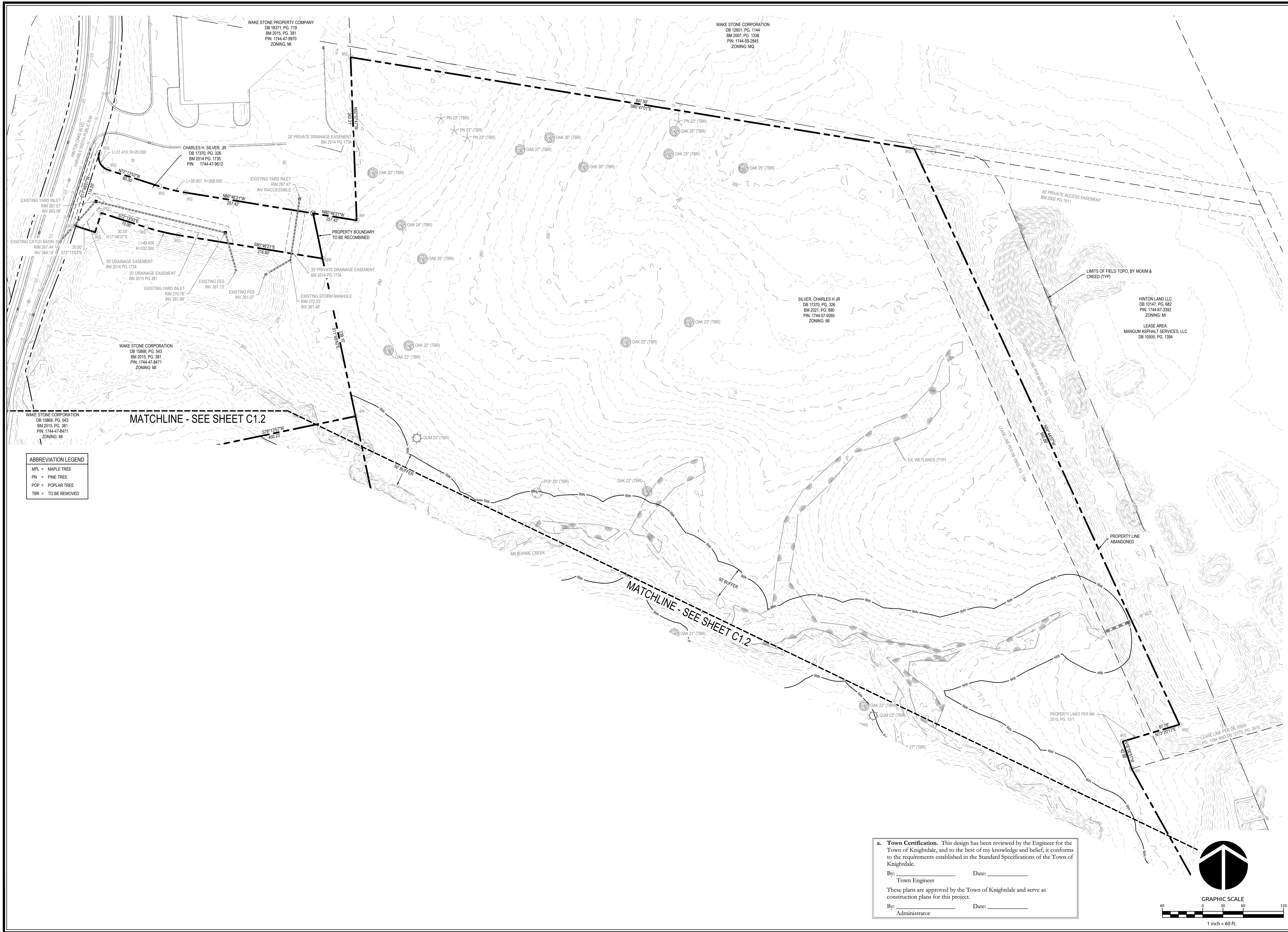
Job No. 09190080.00 Drawn By: WR  
Date: 09/15/2020 Designer: WR



**Revisions**

No.	REVISION TO	DATE
9	SIGNATURE SUBMITTAL	8/27/21
10	REVISION TO APPROVED PLANS	11/11/21

Sheet No.  
**C1.0**



**ABBREVIATION LEGEND**

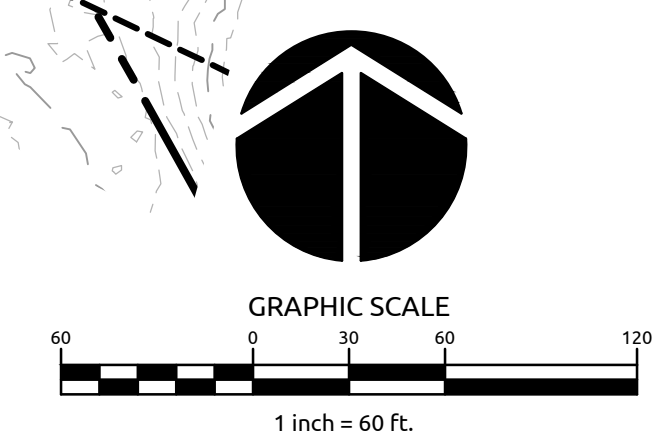
MPL	=	MAPLE TREE
PN	=	PINE TREE
POP	=	POPLAR TREE
TBR	=	TO BE REMOVED

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**WithersRavenel**  
Engineers | Planners

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**MERRITT HINTON  
OAKS BLVD**

Knightdale, NC

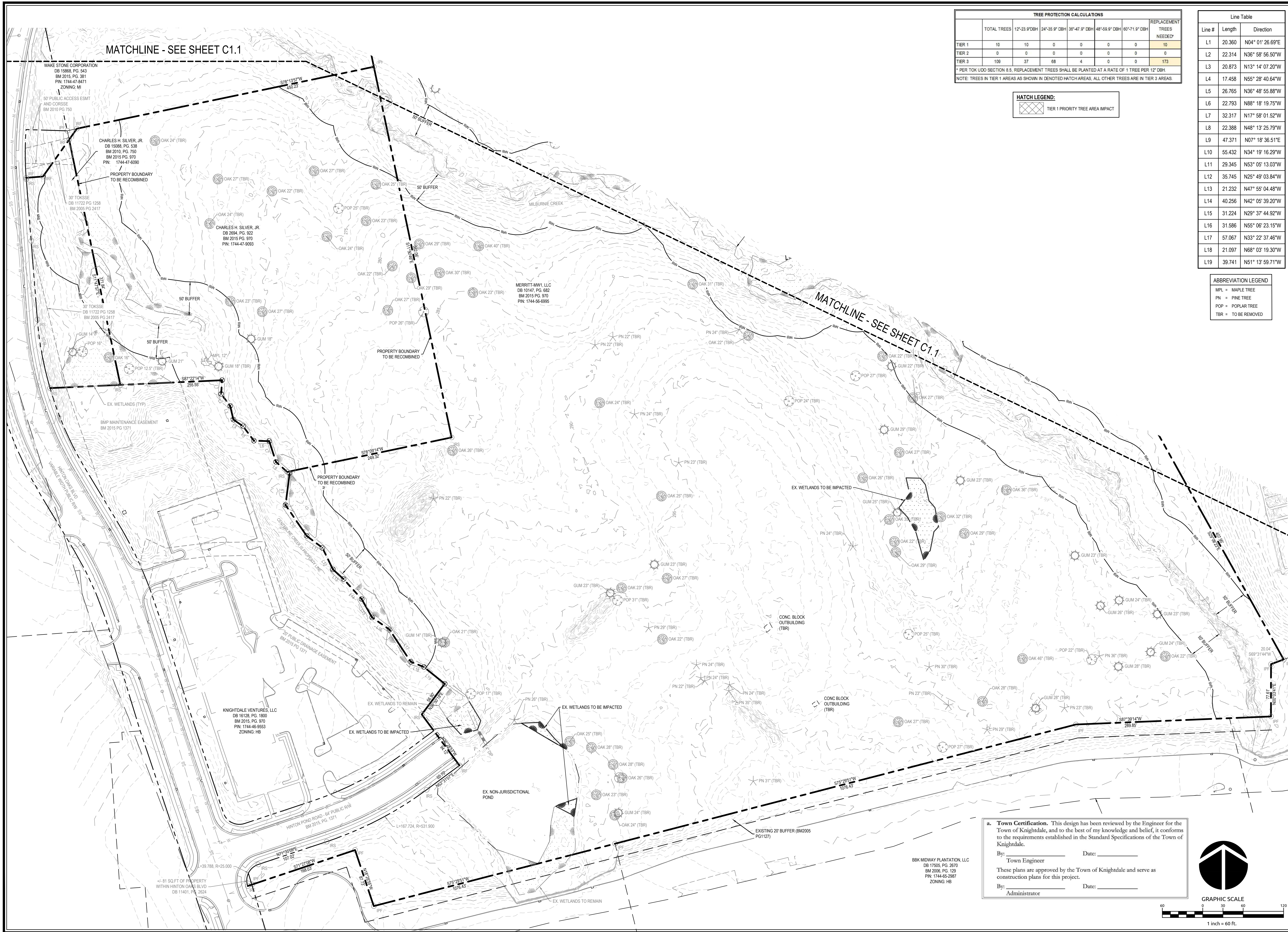
**EXISTING CONDITIONS &  
DEMOLITION PLAN**

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

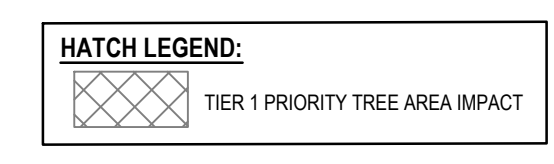
Sheet No.  
**C1.1**



**TREE PROTECTION CALCULATIONS**

	TOTAL TREES	12"-23" DBH	24"-35" DBH	36"-47" DBH	48"-59" DBH	60"-71" DBH	REPLACEMENT TREES NEEDED*
TIER 1	10	10	0	0	0	0	10
TIER 2	0	0	0	0	0	0	0
TIER 3	109	37	68	4	0	0	173

\* PER TOK UDD SECTION 8.5. REPLACEMENT TREES SHALL BE PLANTED AT A RATE OF 1 TREE PER 12" DBH.  
NOTE: TREES IN TIER 1 AREAS AS SHOWN IN DENOTED HATCH AREAS. ALL OTHER TREES ARE IN TIER 3 AREAS.



**Line Table**

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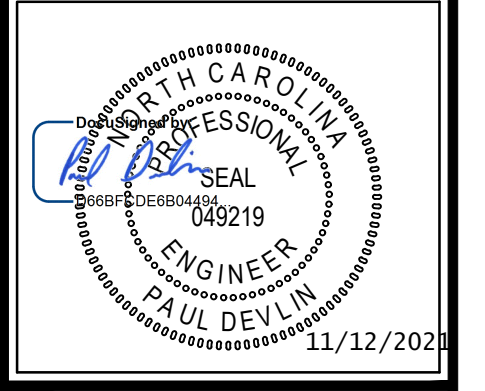
MPL = MAPLE TREE  
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 POP = POPLAR TREE  
 TBR = TO BE REMOVED

**WithersRavenel**  
 Engineers | Planners

MERRITT HINTON  
 OAKS BLVD  
 Knightdale, NC

**EXISTING CONDITIONS & DEMOLITION PLAN**

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



**Revisions**

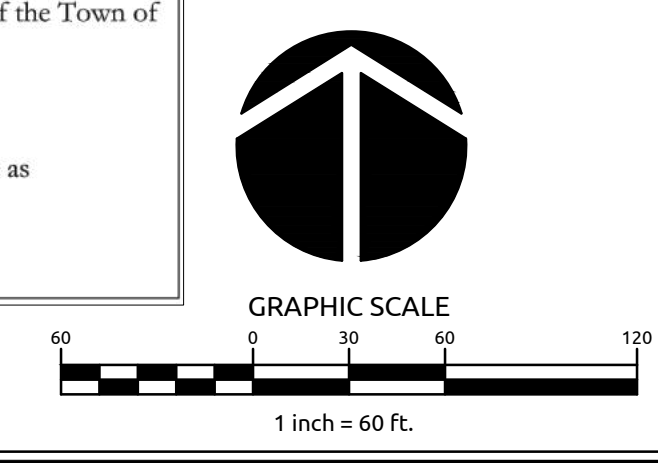
9	SIGNATURE SUBMITTAL	8/27/21
10	REVISION TO APPROVED PLANS	11/11/21

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 Town Engineer

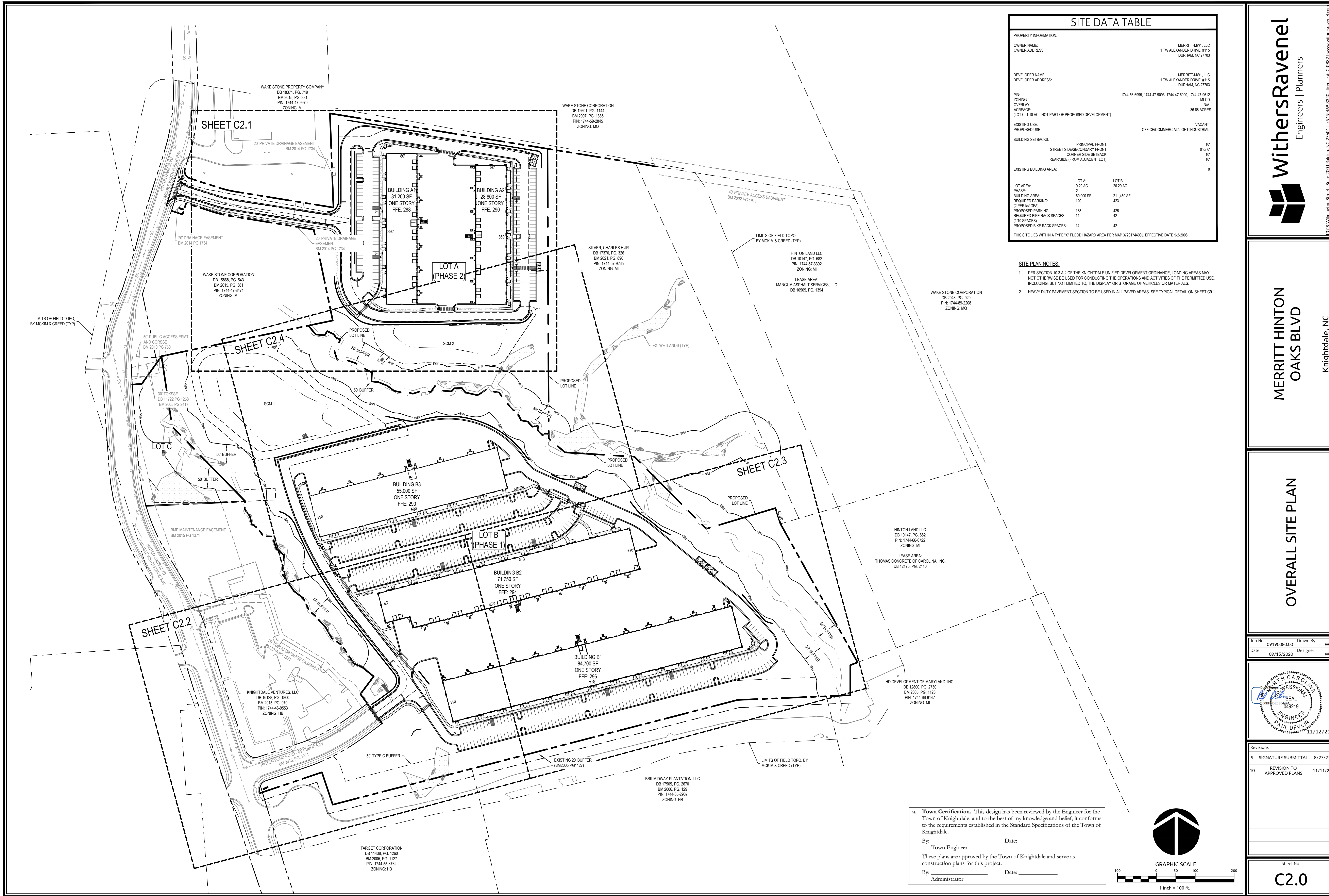
These plans are approved by the Town of Knightdale and serve as construction plans for this project.

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



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 A:	9.29 AC
LOT B:	26.29 AC
PHASE:	2
BUILDING AREA:	60,000 SF
REQUIRED PARKING:	120
(2 PER 100 GFA)	423
PROPOSED PARKING:	138
REQUIRED BIKE RACK SPACES:	14
(170 SPACES)	42
PROPOSED BIKE RACK SPACES:	14
	42
THIS SITE LIES WITHIN A TYPE "X" FLOOD HAZARD AREA PER MAP 37201744001, EFFECTIVE DATE 5-2-2006.	

- 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.

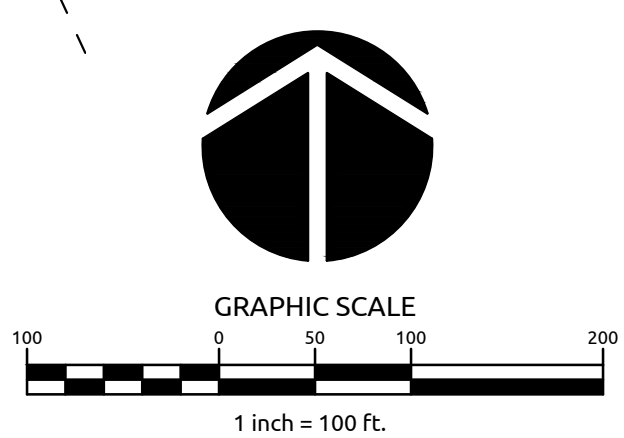


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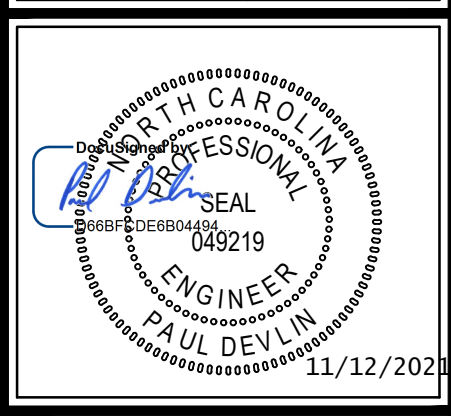
**WithersRavenel**  
Engineers | Planners

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MERRITT HINTON  
OAKS BLVD  
Knightdale, NC

OVERALL SITE PLAN

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

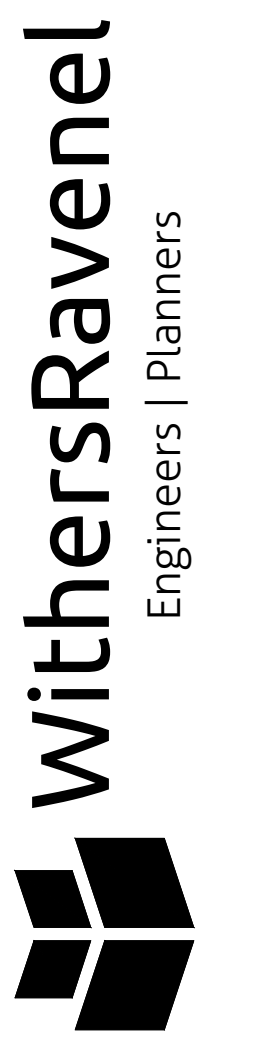
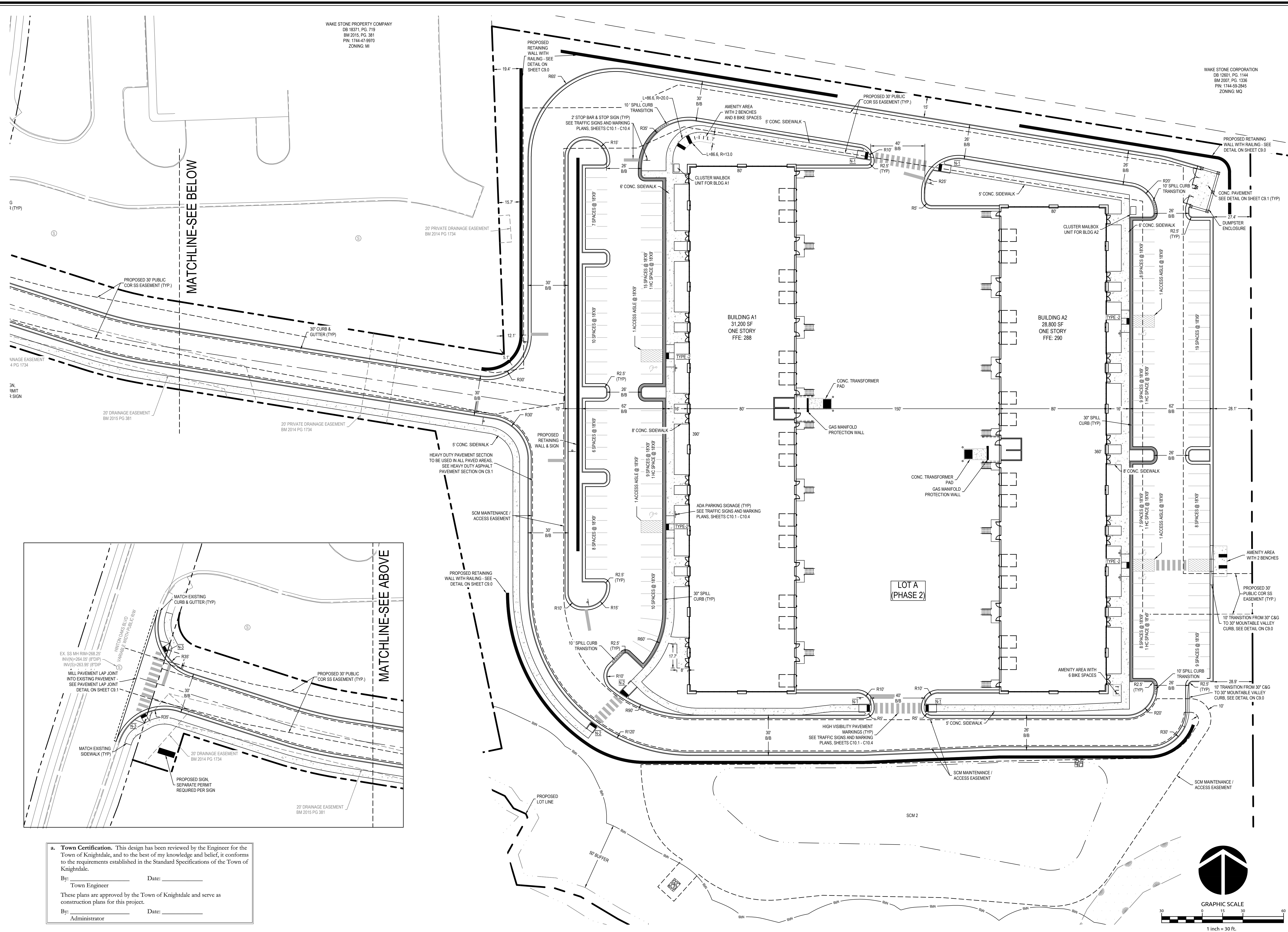


Revisions		
9	SIGNATURE SUBMITTAL	8/27/21
10	REVISION TO APPROVED PLANS	11/11/21

Sheet No.  
**C2.0**

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

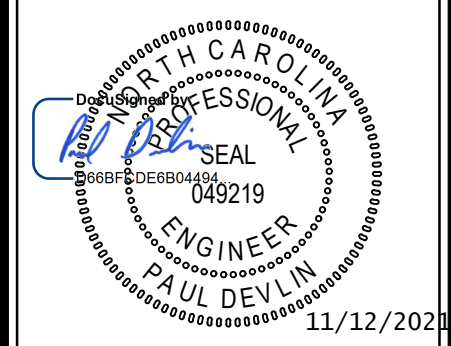
WAKE STONE CORPORATION  
DB 12601, PG. 1144  
BM 2007, PG. 1336  
PIN: 1744-59-2845  
ZONING: MQ



MERRITT HINTON  
OAKS BLVD  
Knightdale, NC

SITE 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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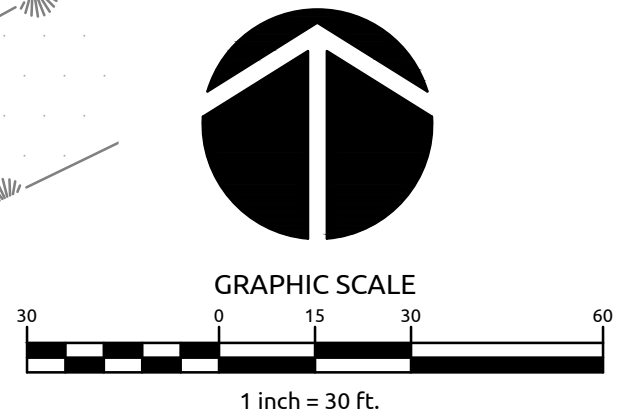
Sheet No.  
**C2.1**

**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.

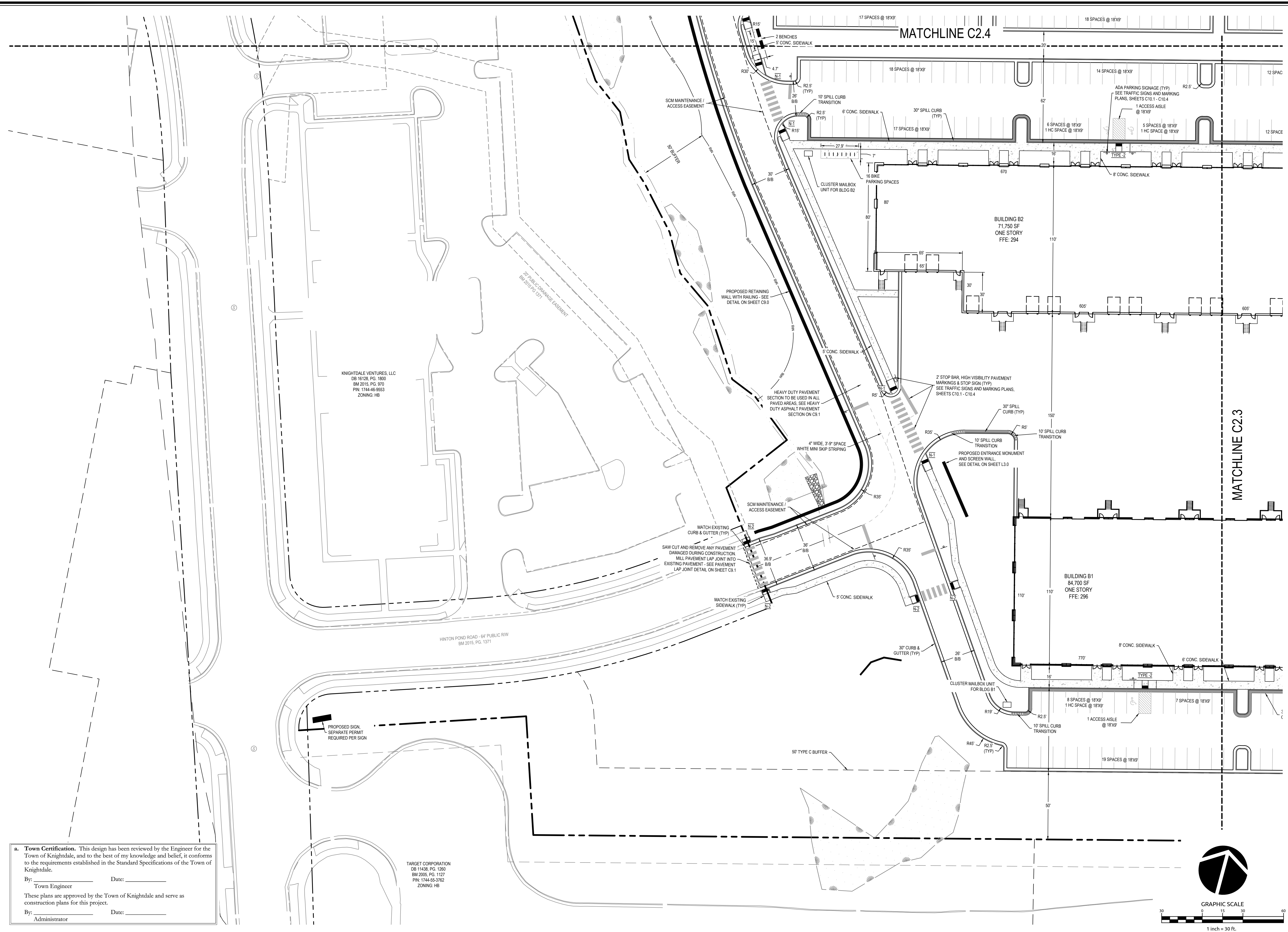
By: \_\_\_\_\_ Date: \_\_\_\_\_  
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By: \_\_\_\_\_ Date: \_\_\_\_\_  
Administrator







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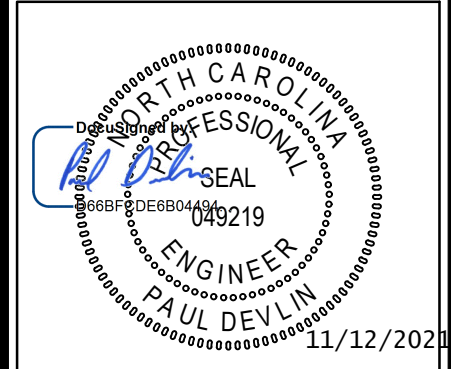
By: \_\_\_\_\_ Date: \_\_\_\_\_  
Administrator

TARGET CORPORATION  
DB 11438, PG. 1260  
BM 2005, PG. 1127  
PIN: 1744-55-3782  
ZONING: HB

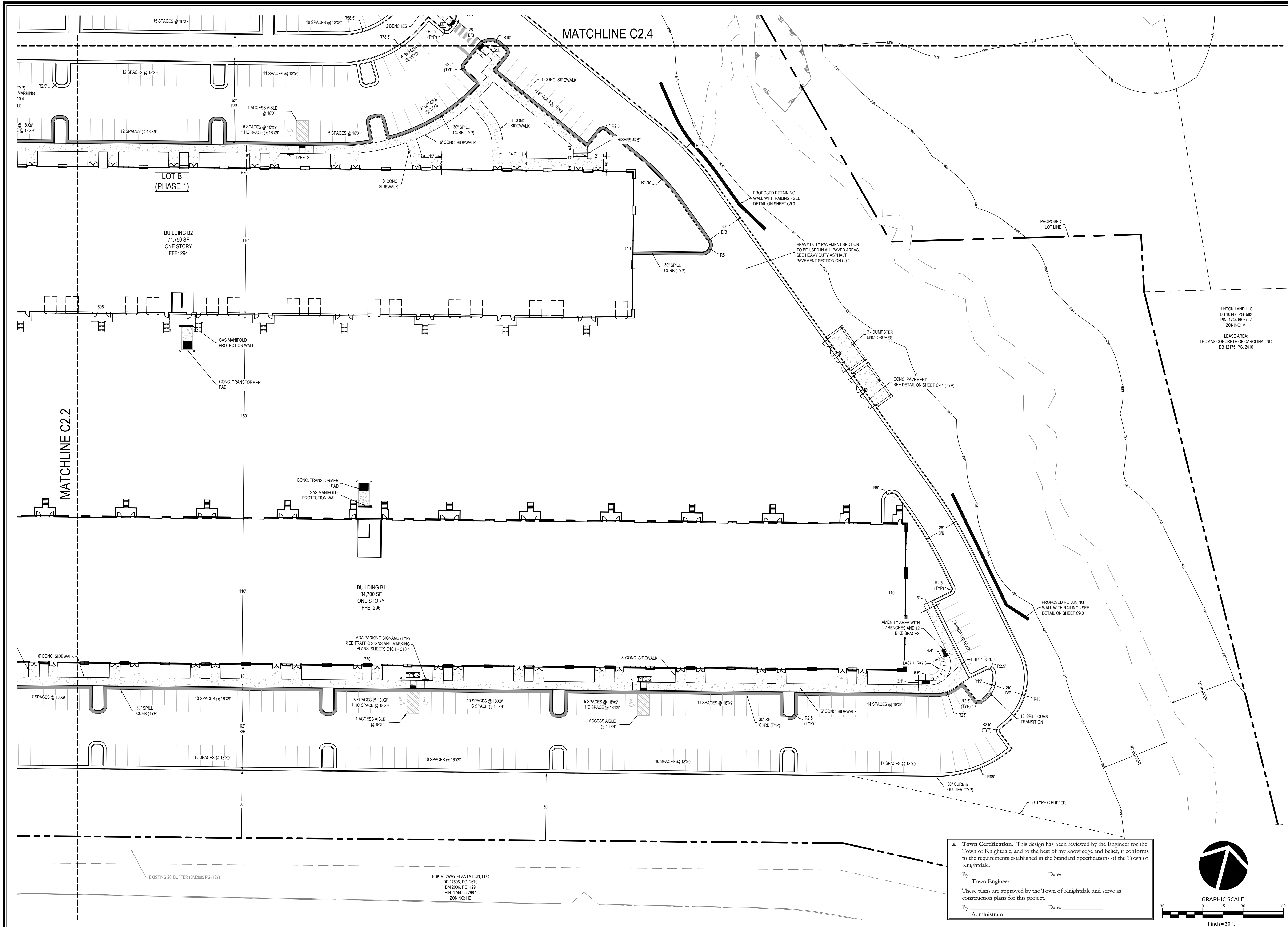
KNIGHTDALE VENTURES, LLC  
DB 18128, PG. 1800  
BM 2015, PG. 970  
PIN: 1744-46-5553  
ZONING: HB

HINTON POND ROAD - 64' PUBLIC RW  
BM 2015, PG. 1371

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



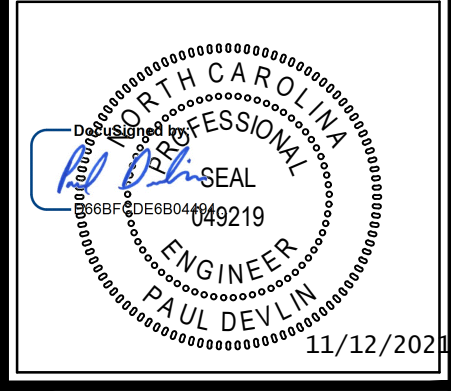
**WithersRavenel**  
Engineers | Planners

137 S Wilmington Street | Suite 200 | Raleigh, NC 27601 | T: 919-469-3340 | License #: C-0832 | www.withersravenel.com

**MERRITT HINTON**  
**OAKS BLVD**  
Knightdale, NC

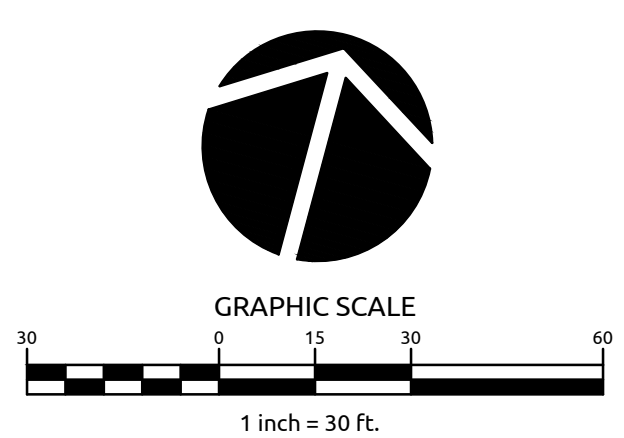
**SITE PLAN**

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



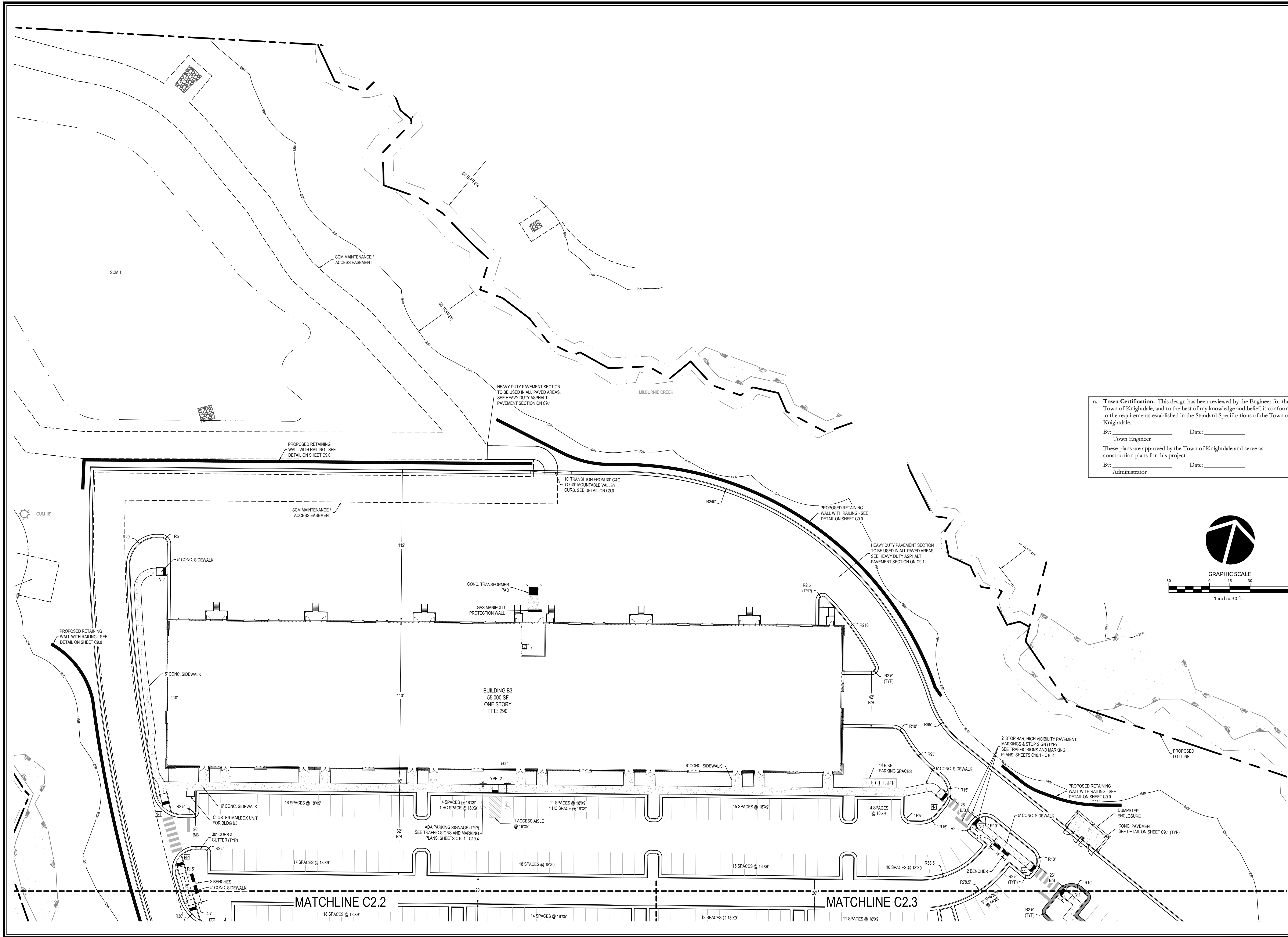
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By: \_\_\_\_\_ Date: \_\_\_\_\_  
Administrator



BBK MIDWAY PLANTATION, LLC  
DB 17505, PG. 2670  
BM 2006, PG. 129  
PIN: 1744-65-2987  
ZONING: HB

Sheet No.  
**C2.3**

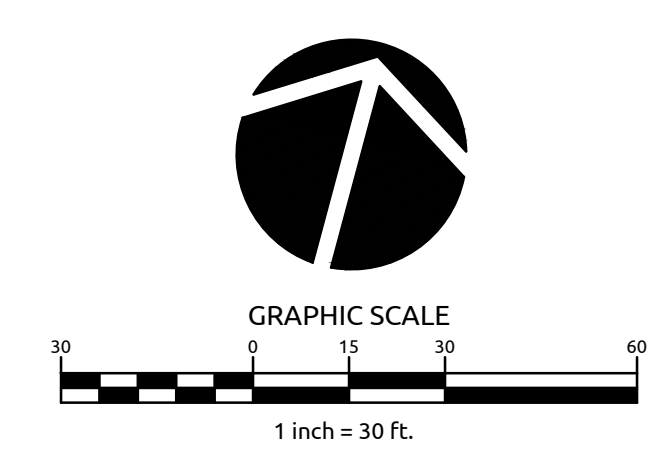


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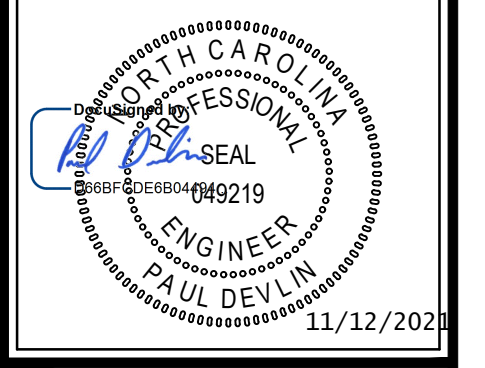
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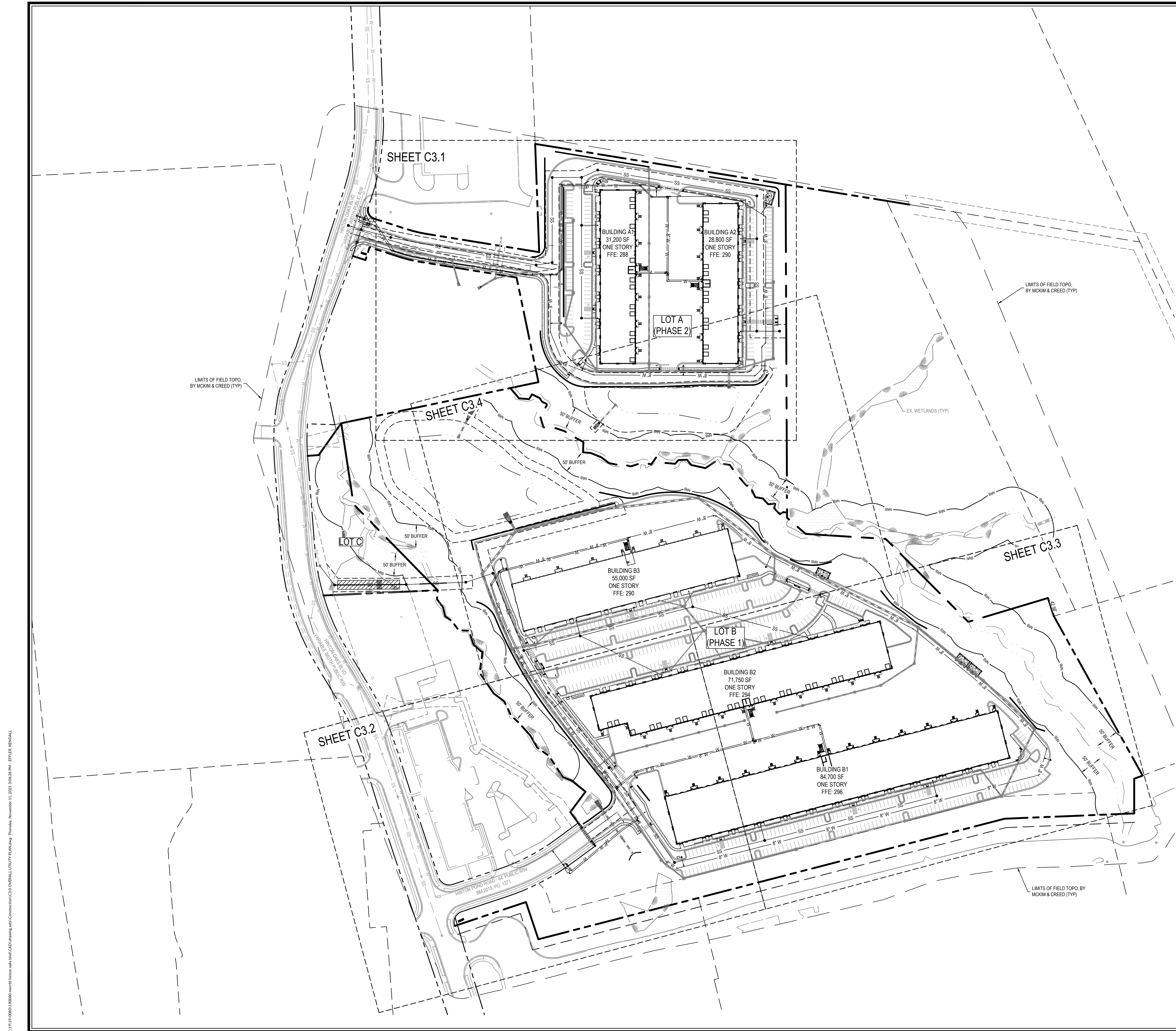
By: \_\_\_\_\_ Date: \_\_\_\_\_  
Administrator



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



Revisions		
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- 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.
  - CONTRACTOR SHALL MAINTAIN CONTINUOUS WATER & SEWER SERVICE TO EXISTING RESIDENCES & BUSINESSES THROUGHOUT CONSTRUCTION OF PROJECT. ANY NECESSARY SERVICE INTERRUPTIONS SHALL BE PRECEDED BY A 24 HOUR ADVANCE NOTICE TO THE CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT.
  - 3.0' MINIMUM COVER IS REQUIRED ON ALL WATER MAINS & SEWER FORCEMAINS. 4.0' MINIMUM COVER IS REQUIRED ON ALL REUSE MAINS.
  - IT IS THE DEVELOPER'S RESPONSIBILITY TO ABANDON OR REMOVE EXISTING WATER & SEWER SERVICES NOT BEING USED IN REDEVELOPMENT OF A SITE UNLESS OTHERWISE DIRECTED BY THE CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT. THIS INCLUDES ABANDONING TAP AT MAIN & REMOVAL OF SERVICE FROM ROW OR EASEMENT PER CORPUD HANDBOOK PROCEDURE.
  - INSTALL 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 4" PVC SEWER SERVICES @ 1.0% MINIMUM GRADE WITH CLEANOUTS LOCATED AT ROW OR EASEMENT LINE & SPACED EVERY 75 LINEAR FEET MAXIMUM.
  - PRESSURE REDUCING VALVES ARE REQUIRED ON ALL WATER SERVICES EXCEEDING 80 PSI. BACKWATER VALVES ARE REQUIRED ON ALL SANITARY SEWER SERVICES HAVING BUILDING DRAINS LOWER THAN 1.0' ABOVE THE NEXT UPSTREAM MANHOLE.
  - ALL ENVIRONMENTAL PERMITS APPLICABLE TO THE PROJECT MUST BE OBTAINED FROM NCDWQ, USACE & OR FEMA FOR ANY RIPARIAN BUFFER, WETLAND &/OR FLOODPLAIN IMPACTS (RESPECTIVELY) PRIOR TO CONSTRUCTION.
  - NCDOT /RAILROAD ENROACHMENT AGREEMENTS ARE REQUIRED FOR ANY UTILITY WORK (INCLUDING MAIN EXTENSIONS & SERVICE TAPS) WITHIN STATE OR RAILROAD ROW PRIOR TO CONSTRUCTION.
  - GREASE INTERCEPTOR / OIL WATER SEPARATOR SIZING CALCULATIONS & INSTALLATION SPECIFICATIONS SHALL BE APPROVED BY THE CORPUD FOG PROGRAM COORDINATOR PRIOR TO ISSUANCE OF A BUILDING PERMIT. CONTACT TIM BEASLEY AT (919) 996-2334 OR TIMOTHY.BEASLEY@RALEIGHNC.GOV FOR MORE INFORMATION.
  - CROSS-CONNECTION CONTROL PROTECTION DEVICES ARE REQUIRED BASED ON DEGREE OF HEALTH HAZARD INVOLVED AS LISTED IN APPENDIX B OF THE RULES GOVERNING PUBLIC WATER SYSTEMS IN NORTH CAROLINA. THESE GUIDELINES ARE THE MINIMUM REQUIREMENTS. THE DEVICES SHALL MEET AMERICAN SOCIETY OF SANITARY ENGINEERING (ASSE) STANDARDS OR BE ON THE UNIVERSITY OF SOUTHERN CALIFORNIA APPROVAL LIST. THE DEVICES SHALL BE INSTALLED AND TESTED (BOTH INITIAL AND PERIODIC TESTING THEREAFTER) IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS OR THE LOCAL CROSS-CONNECTION CONTROL PROGRAM. WHENEVER MORE STRINGENT, CONTACT JOANIE HARTLEY AT (919) 996-9923 OR JOANIE.HARTLEY@RALEIGHNC.GOV FOR MORE INFORMATION.

**CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION**

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

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

**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**

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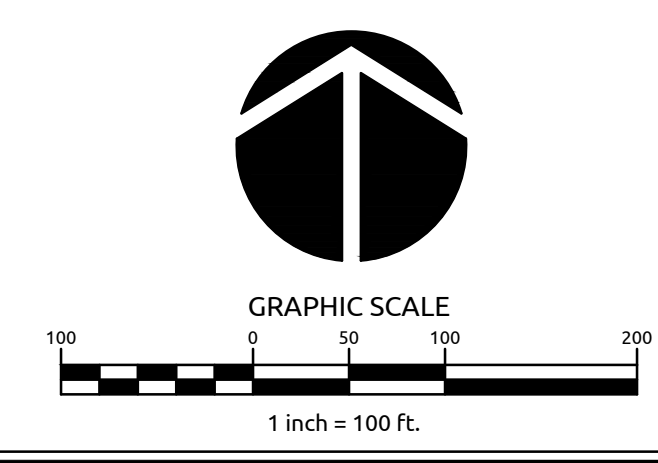
City of Raleigh Public Utilities Department Permit # **5-4879P**

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

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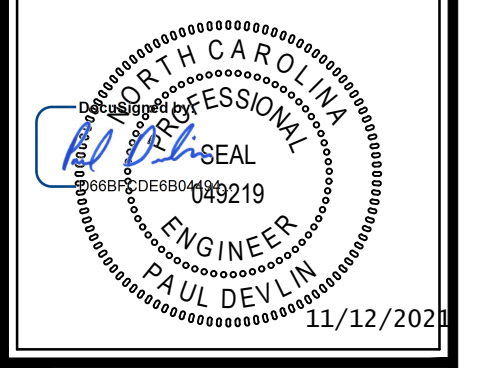
**WithersRavenel**  
 Engineers | Planners

137 S Wilmington Street | Suite 200 | Raleigh, NC 27601 | T: 919 469 3300 | License #: C-0832 | www.withersravenel.com

**MERRITT HINTON**  
**OAKS BLVD**  
 Knightdale, NC

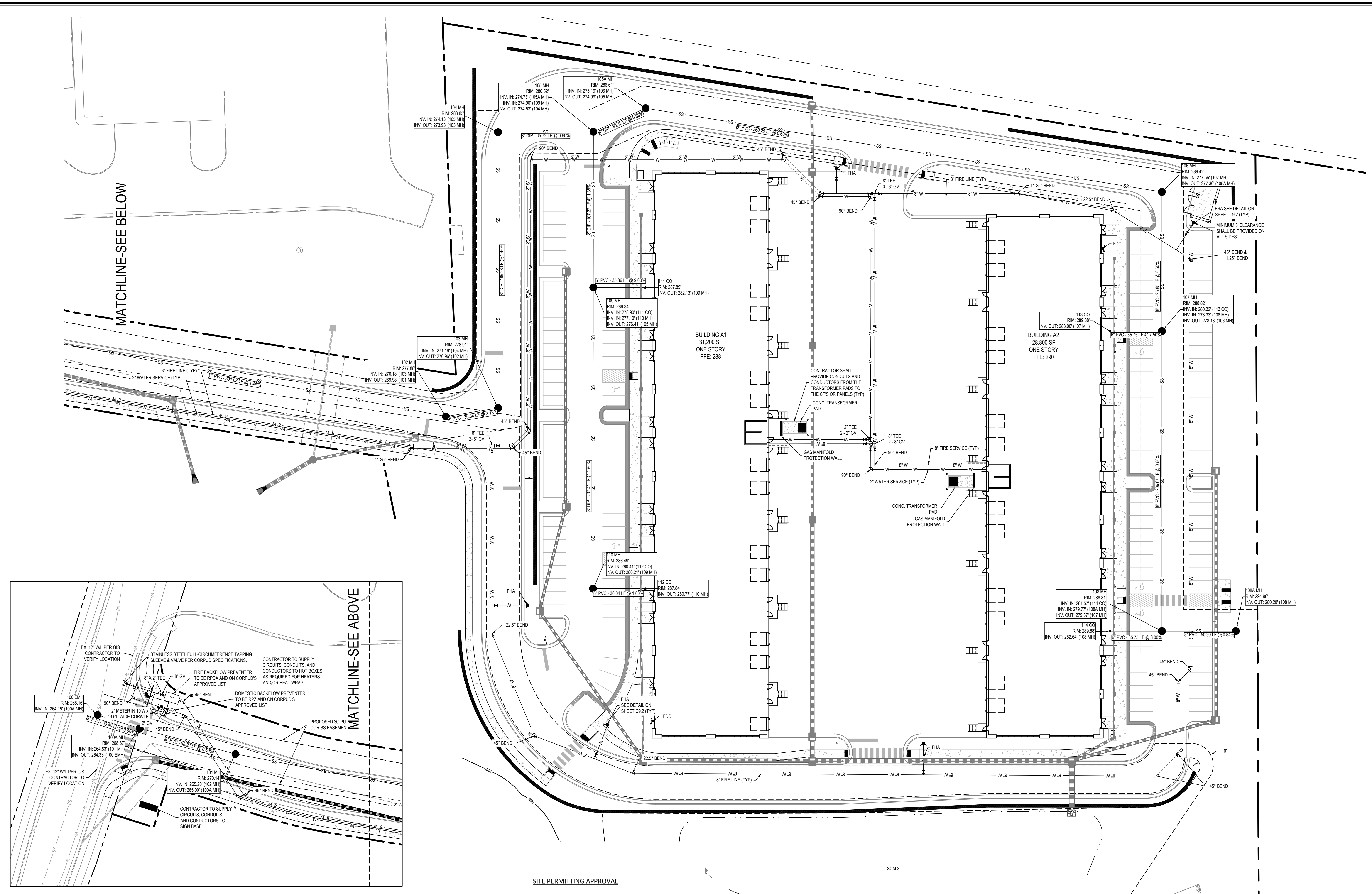
**OVERALL UTILITY PLAN**

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

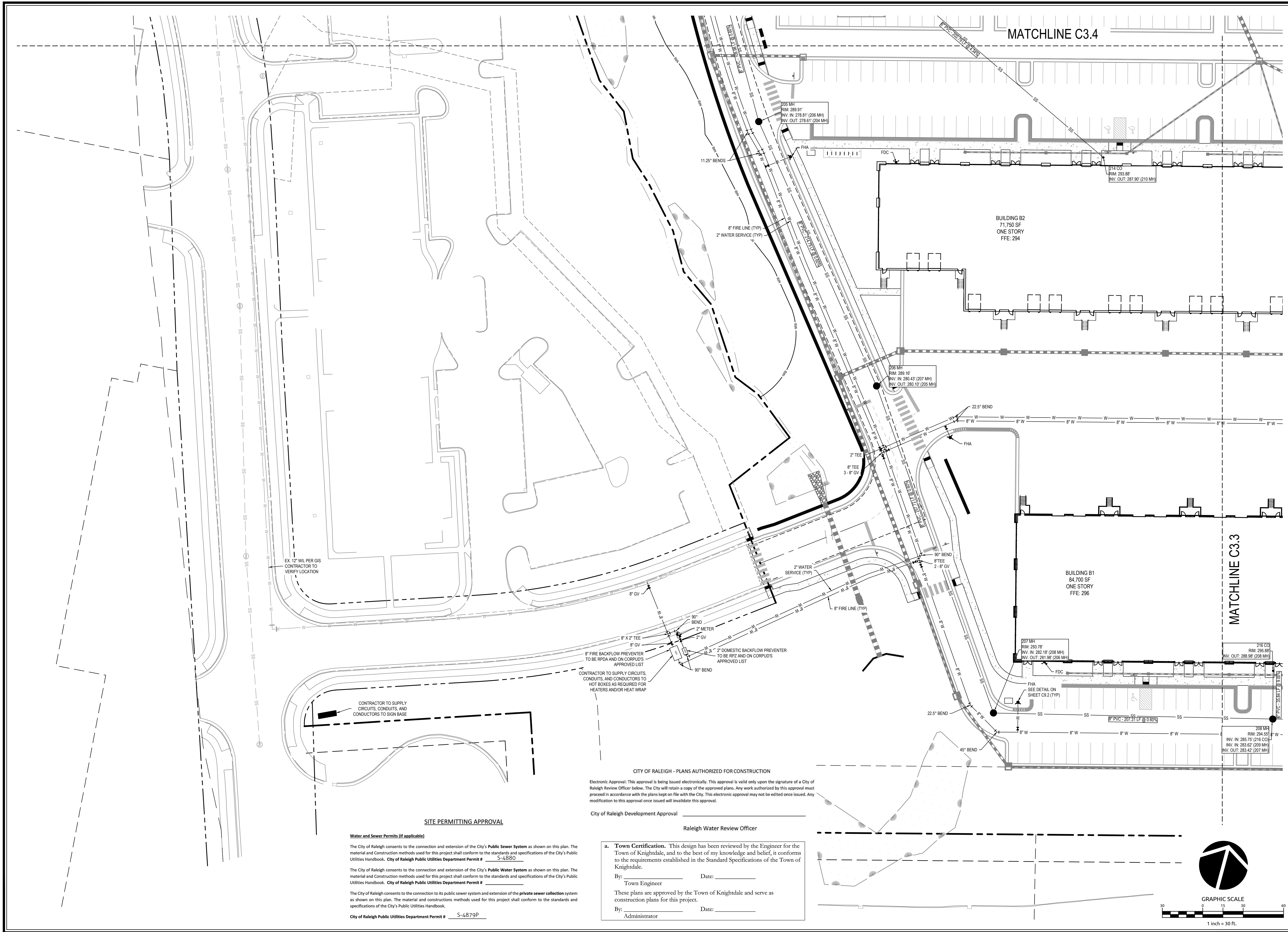


Revisions		
9	SIGNATURE SUBMITTAL	8/27/21
10	REVISION TO APPROVED PLANS	11/11/21

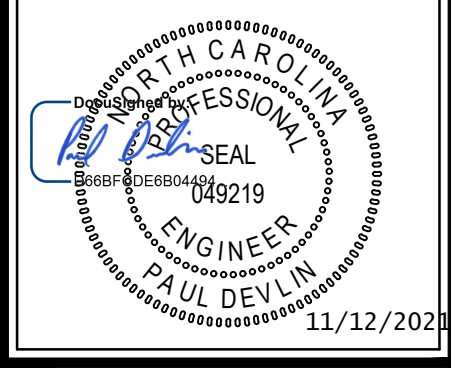
Sheet No.  
**C3.0**



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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

Sheet No.	<b>C3.2</b>
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**SITE PERMITTING APPROVAL**

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

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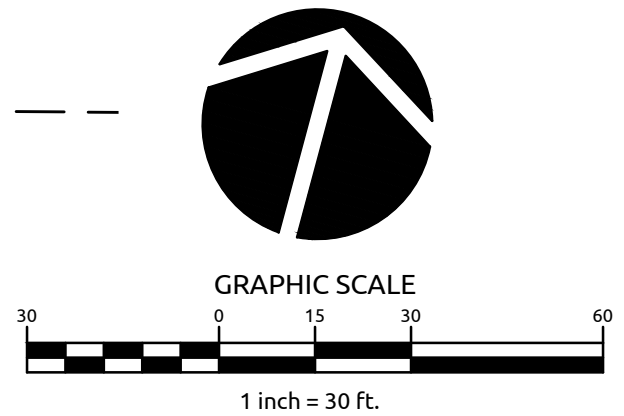
City of Raleigh Development Approval \_\_\_\_\_  
Raleigh Water Review Officer \_\_\_\_\_

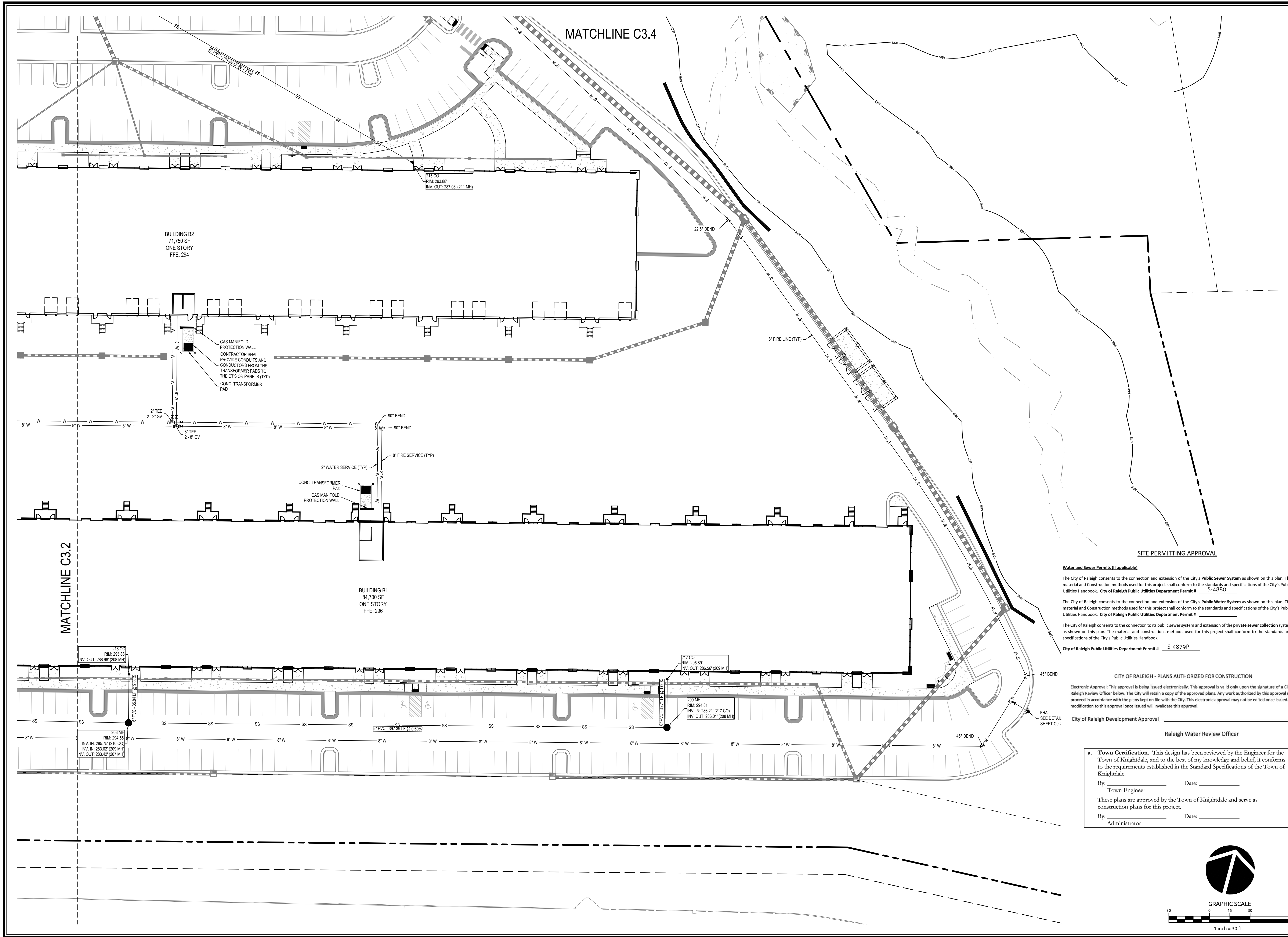
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By: \_\_\_\_\_ Date: \_\_\_\_\_  
Administrator





MATCHLINE C3.4

MATCHLINE C3.2

BUILDING B2  
71,750 SF  
ONE STORY  
FFE: 294

BUILDING B1  
84,700 SF  
ONE STORY  
FFE: 296

GAS MANIFOLD  
PROTECTION WALL  
CONTRACTOR SHALL  
PROVIDE CONDUITS AND  
CONDUCTORS FROM THE  
TRANSFORMER PADS TO  
THE CTS OR PANELS (TYP)  
CONC. TRANSFORMER  
PAD

CONC. TRANSFORMER  
PAD  
GAS MANIFOLD  
PROTECTION WALL

SITE PERMITTING APPROVAL

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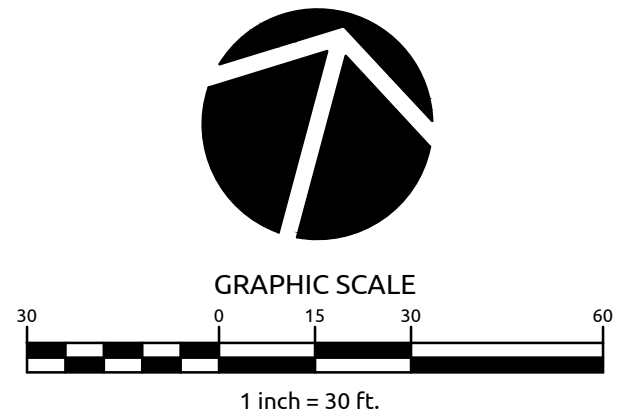
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**MERRITT HINTON**  
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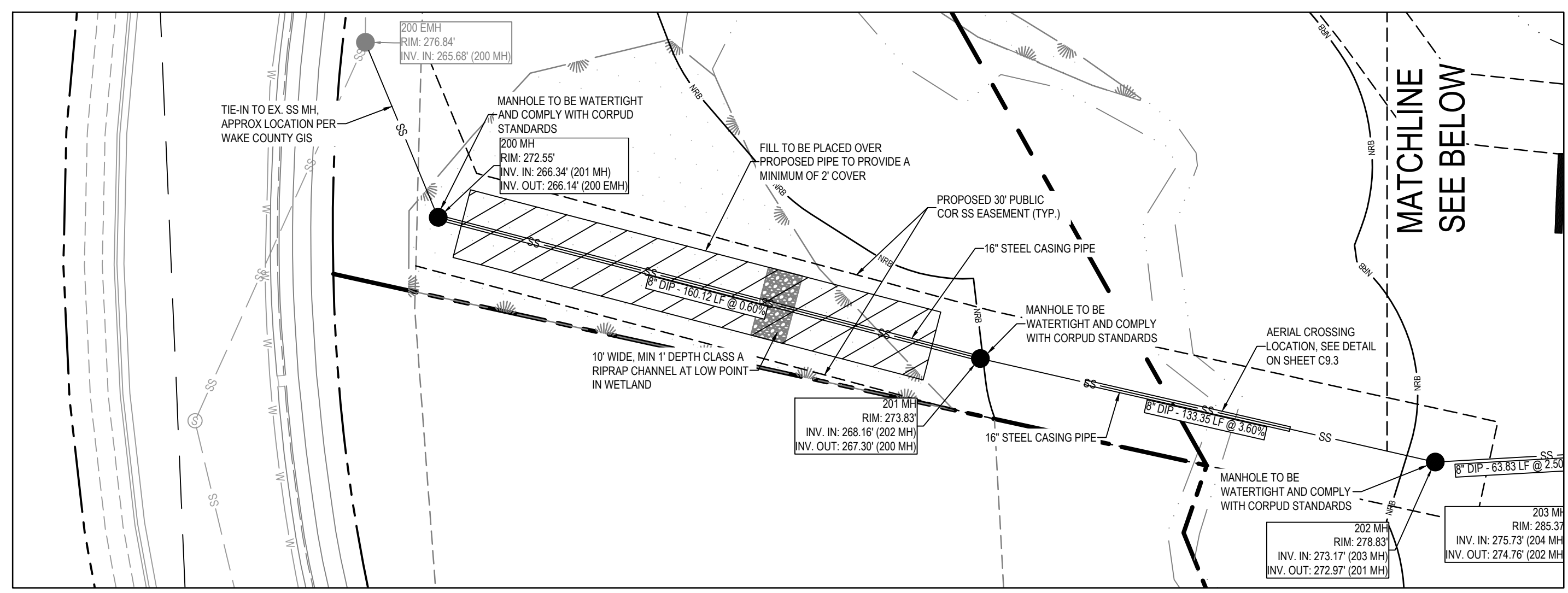
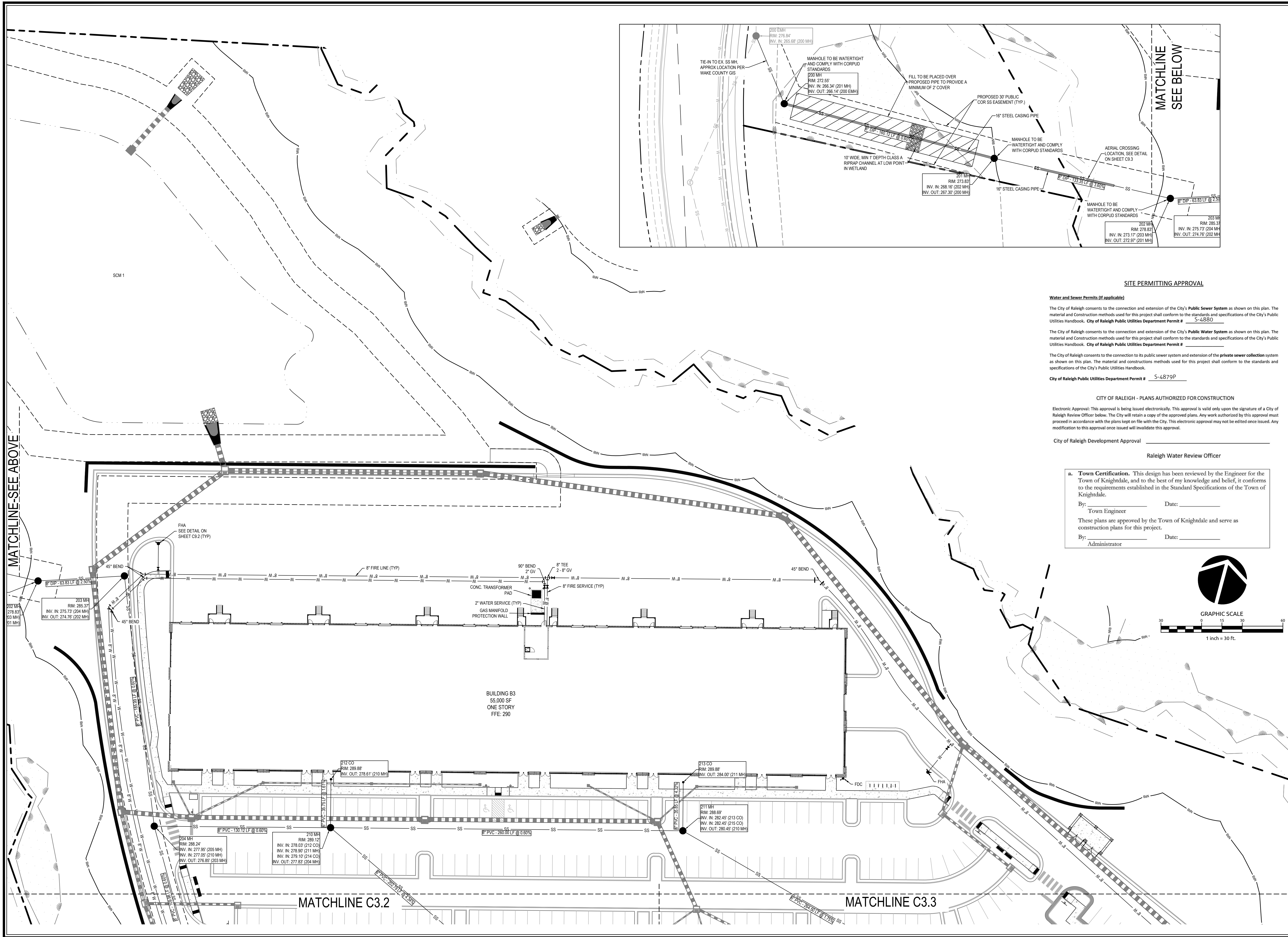
**UTILITY PLAN**

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

Sheet No.  
**C3.3**



**SITE PERMITTING APPROVAL**

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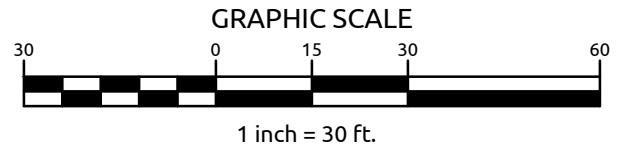
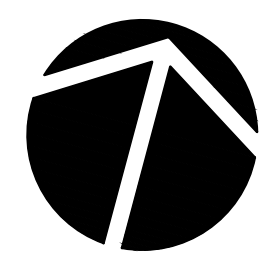
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Administrator



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**WithersRavenel**  
Engineers | Planners

137 S Wilmington Street | Suite 200 | Raleigh, NC 27601 | T: 919-469-3340 | License # C-0832 | www.withersravenel.com

**MERRITT HINTON**  
**OAKS BLVD**  
Knightdale, NC

**UTILITY PLAN**

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

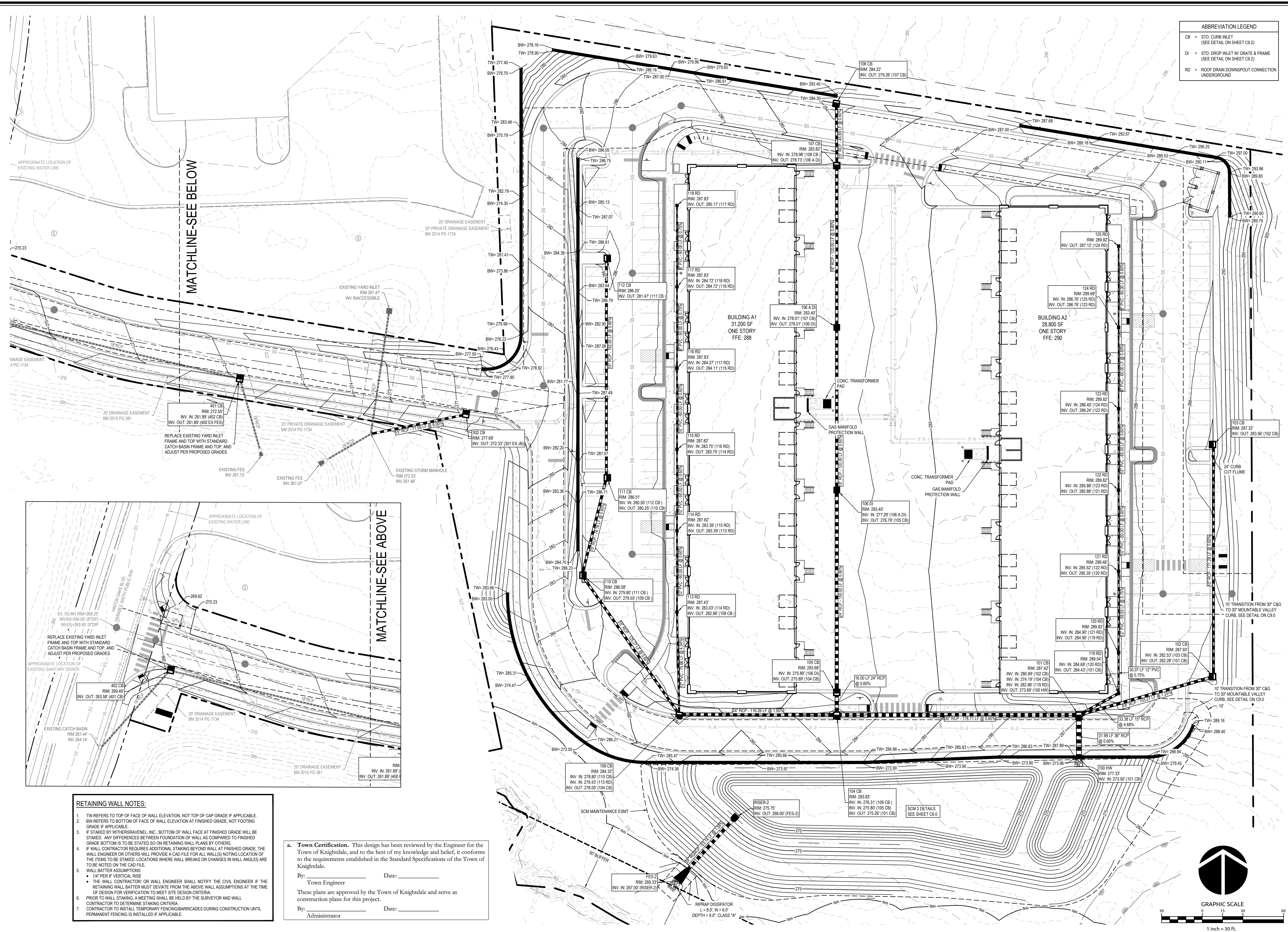


Revisions		
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Sheet No.  
**C3.4**







**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

MATCHLINE-SEE BELOW

MATCHLINE-SEE ABOVE

**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 STAKED 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.

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.

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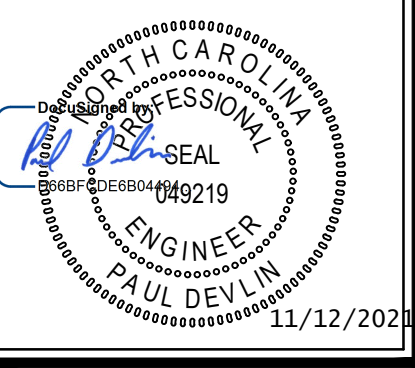
By: \_\_\_\_\_ Date: \_\_\_\_\_  
Administrator



MERRITT HINTON  
OAKS BLVD  
Knightdale, NC

**GRADING AND DRAINAGE PLAN**

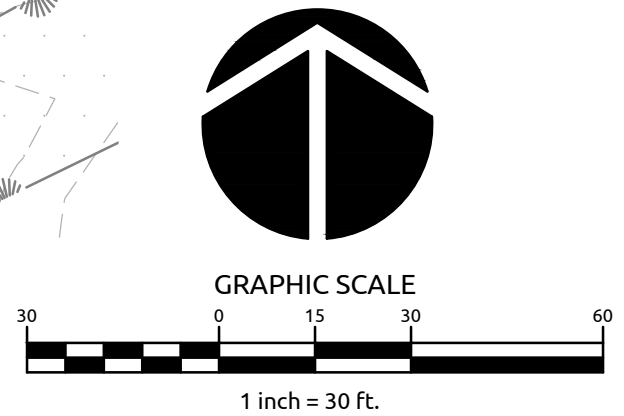
Job No. 0919080.00 Drawn By WR  
Date 09/15/2020 Designer WR

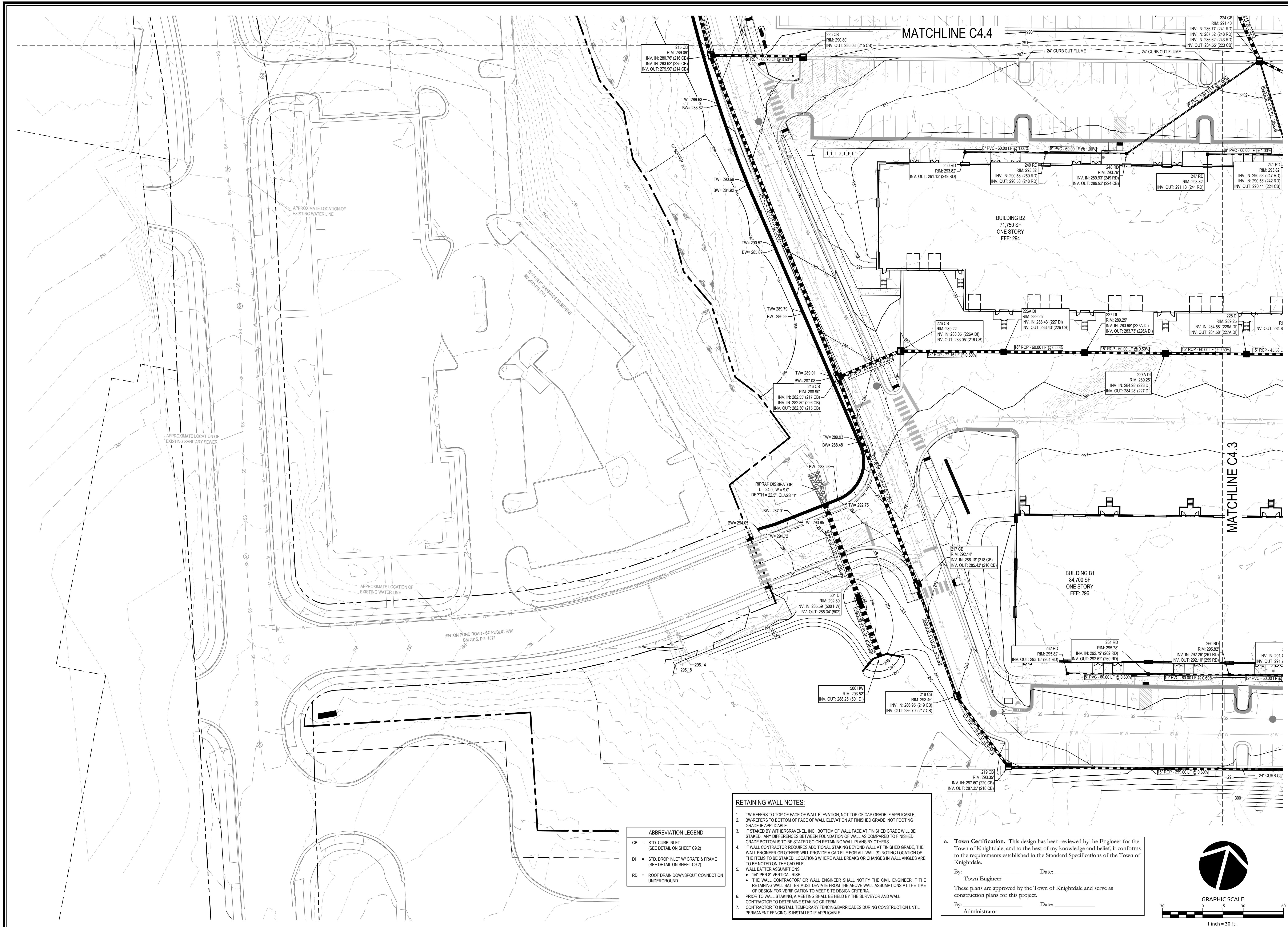


Revisions

9	SIGNATURE SUBMITTAL	8/27/21
10	REVISION TO APPROVED PLANS	11/11/21

Sheet No.  
**C4.1**





11/15/2020 10:00:00 AM Merritt Hinton\oklahoma\cadd\grading and drainage\merritt\Construction\C4.3 Grading and Drainage Plan.dwg Thursday, November 11, 2020 12:24:52 PM - ETELEK, REGINALD

**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

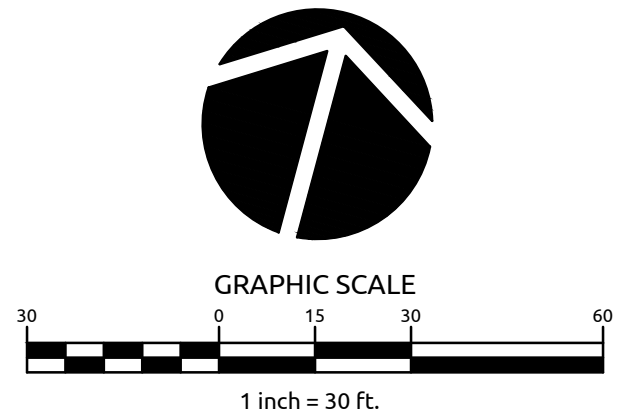
- RETAINING WALL NOTES:**
1. TW REFERS TO TOP OF FACE OF WALL ELEVATION, NOT TOP OF CAP GRADE IF APPLICABLE.
  2. BW REFERS TO BOTTOM OF FACE OF WALL ELEVATION AT FINISHED GRADE, NOT FOOTING GRADE IF APPLICABLE.
  3. IF STAKED BY WITHERSRAVENEL, INC., BOTTOM OF WALL FACE AT FINISHED GRADE WILL BE STAKED. ANY DIFFERENCES BETWEEN FOUNDATION OF WALLS AS COMPARED TO FINISHED GRADE BOTTOM IS TO BE STATED SO ON RETAINING WALL PLANS BY OTHERS.
  4. IF WALL CONTRACTOR REQUIRES ADDITIONAL STAKING BEYOND WALL AT FINISHED GRADE, THE WALL ENGINEER OR OTHERS WILL PROVIDE A CAD FILE FOR ALL WALL(S) 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.
  5. WALL BATTER ASSUMPTIONS
    - 1/4" 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.
  6. PRIOR TO WALL STAKING, A MEETING SHALL BE HELD BY THE SURVEYOR AND WALL CONTRACTOR TO DETERMINE STAKING CRITERIA.
  7. CONTRACTOR TO INSTALL TEMPORARY FENCING/BARRICADES DURING CONSTRUCTION UNTIL PERMANENT FENCING IS INSTALLED IF APPLICABLE.

**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



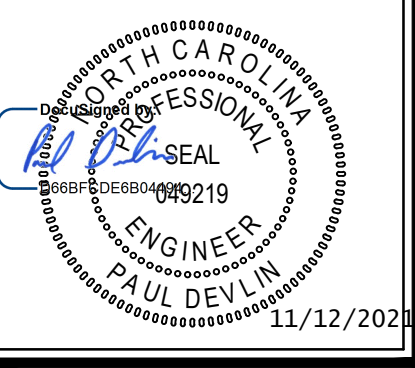
**WithersRavenel**  
Engineers | Planners

1375 Wilmington Street | Suite 200 | Raleigh, NC 27601 | T: 919.469.3340 | License #: C-0832 | www.withersravenel.com

**MERRITT HINTON**  
**OAKS BLVD**  
Knightdale, NC

**GRADING AND DRAINAGE**  
**PLAN**

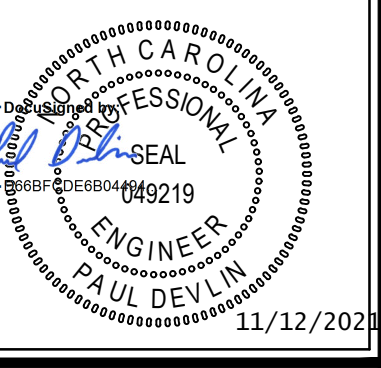
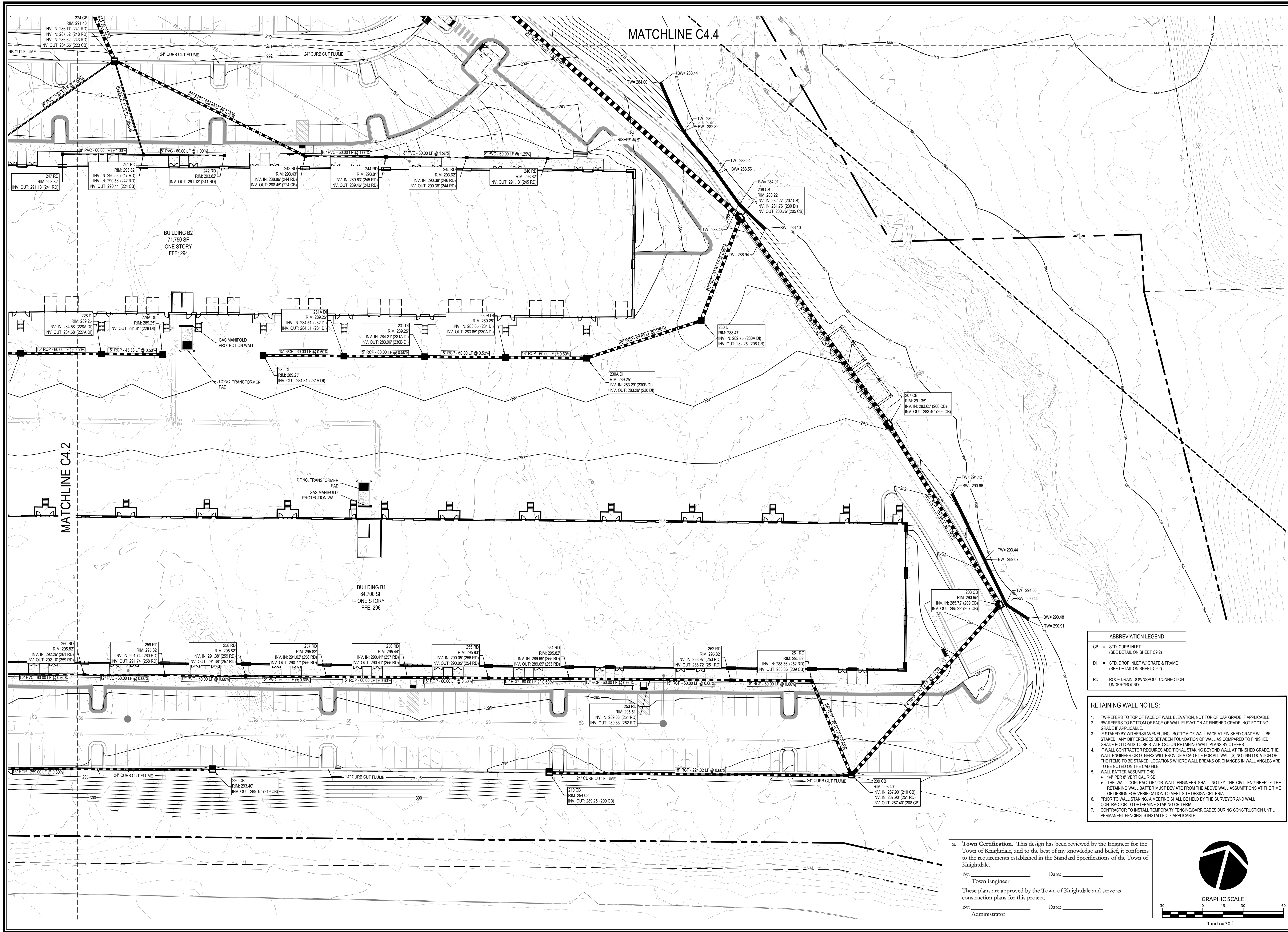
Job No. 09190080.00 Drawn By WR  
Date 09/15/2020 Designer WR



**Revisions**

9	SIGNATURE SUBMITTAL	8/27/21
10	REVISION TO APPROVED PLANS	11/11/21

Sheet No.  
**C4.2**



Revisions	Signature	Submittal	Date
9	SIGNATURE	SUBMITTAL	8/27/21
10	REVISION TO APPROVED PLANS		11/11/21

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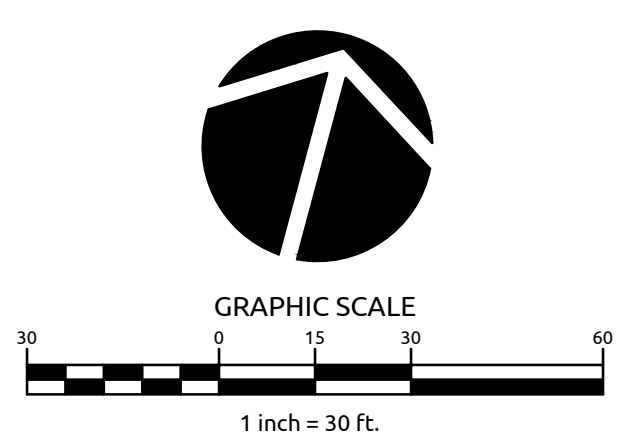
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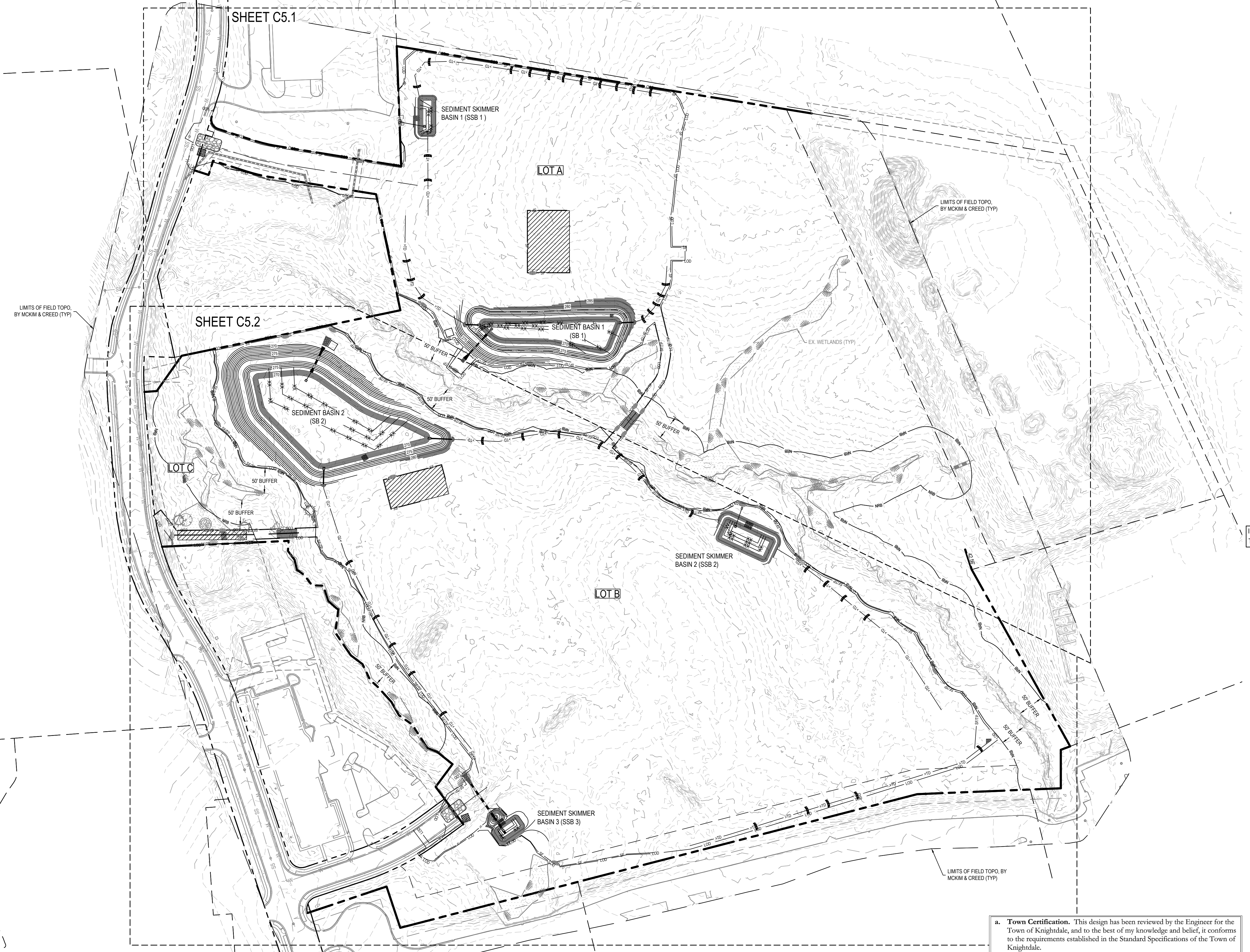
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By: \_\_\_\_\_ Date: \_\_\_\_\_  
Administrator





U:\19\0805\190805\merritt hinton\oaks\blvd\CD\Overall Erosion Control Plan - Stage 1.dwg Thursday, November 11, 2021 11:59:31 AM ETETER, MERRILL



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

TOTAL SITE AREA: 36.69 AC  
TOTAL DISTURBED AREA: 28.00 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

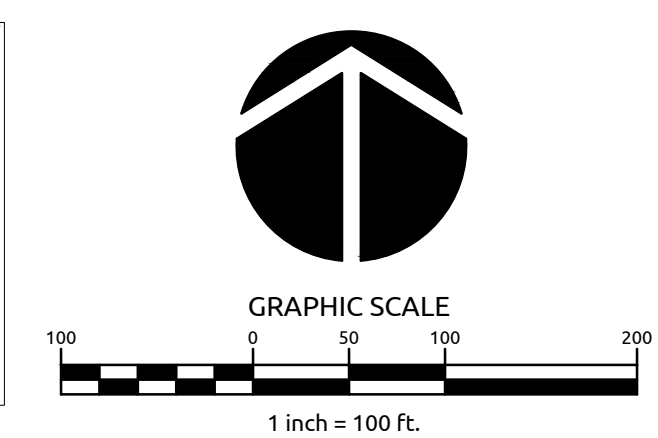
---	LIMITS OF DISTURBANCE
-sf-	SILT FENCE
>TD	TEMPORARY DIVERSION DITCH
---XX---	SCM BAFLES
---	TEMPORARY SLOPE DRAIN
⌒	HORSESHOE INLET PROTECTION
⊙	INLET PROTECTION
	SILT FENCE OUTLET
⌘	ROCK CHECK DAM
▒	TEMPORARY CONCRETE WASHOUT AREA
⌊	SKIMMER BASIN
⊞	TEMPORARY GRAVEL CONSTRUCTION ENTRANCE

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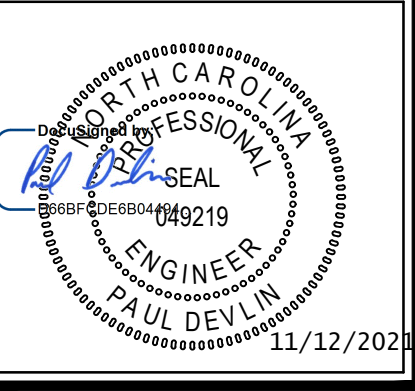
By: \_\_\_\_\_ Date: \_\_\_\_\_  
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Administrator

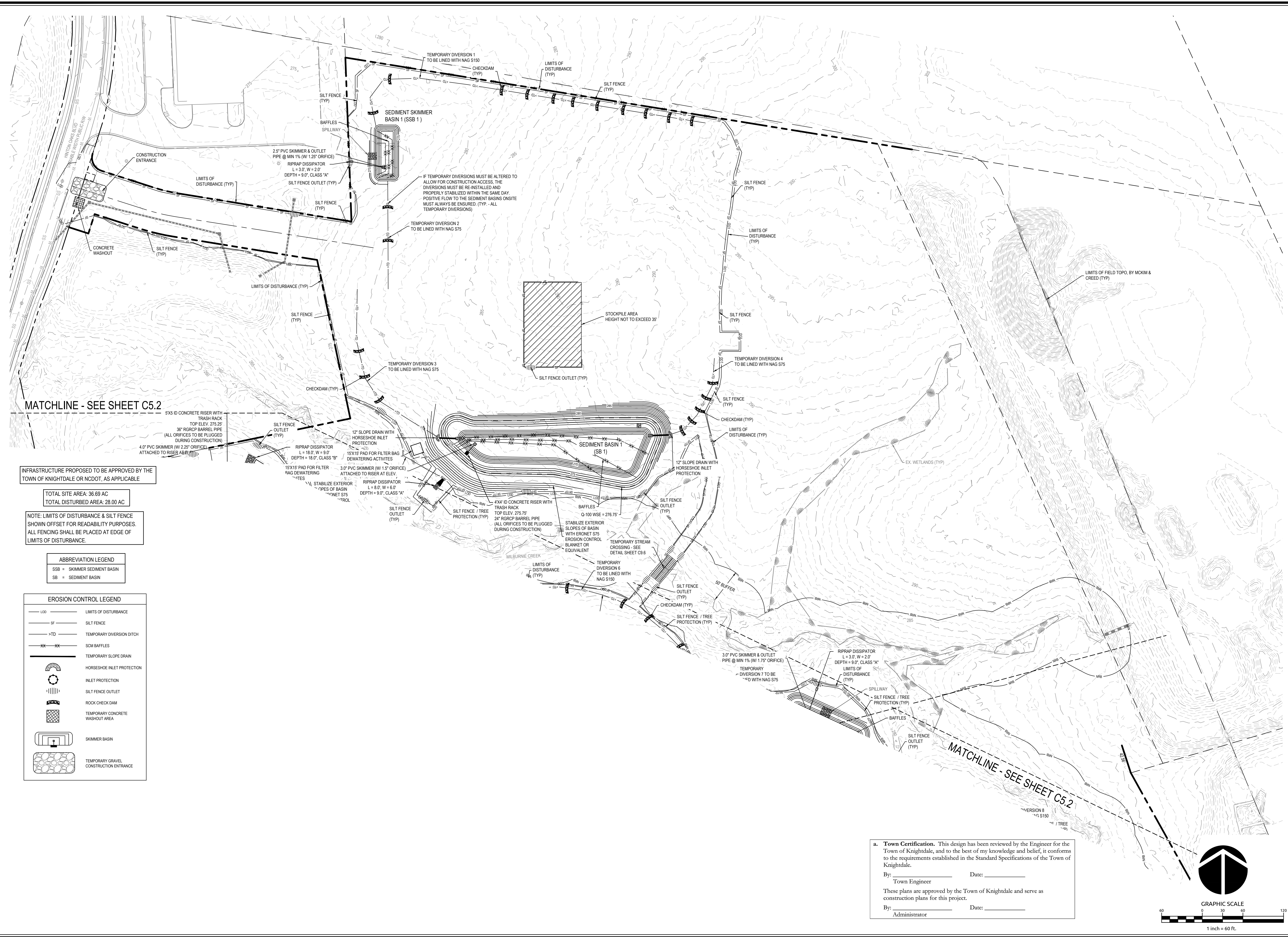


Job No.	09190080.00	Drawn By	WR
Date	09/15/2020	Designer	WR



Revisions

9	SIGNATURE SUBMITTAL	8/27/21
10	REVISION TO APPROVED PLANS	11/11/21



MATCHLINE - SEE SHEET C5.2

MATCHLINE - SEE SHEET C5.2

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

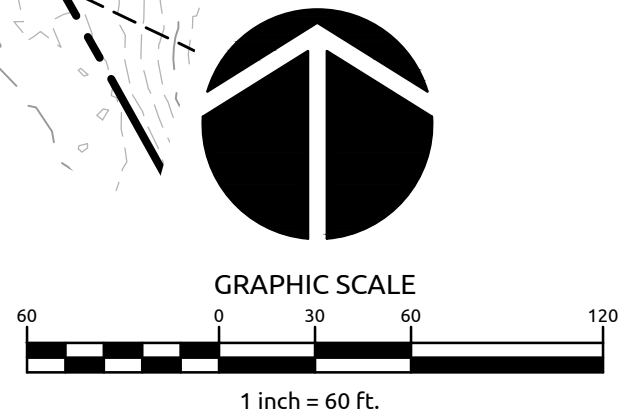
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EROSION CONTROL LEGEND	
---	LIMITS OF DISTURBANCE
—S—	SILT FENCE
->TD	TEMPORARY DIVERSION DITCH
XX XX	SCM BAFFLES
—	TEMPORARY SLOPE DRAIN
⌢	HORSESHOE INLET PROTECTION
⌢	INLET PROTECTION
	SILT FENCE OUTLET
⌢	ROCK CHECK DAM
⌢	TEMPORARY CONCRETE WASHOUT AREA
⌢	SKIMMER BASIN
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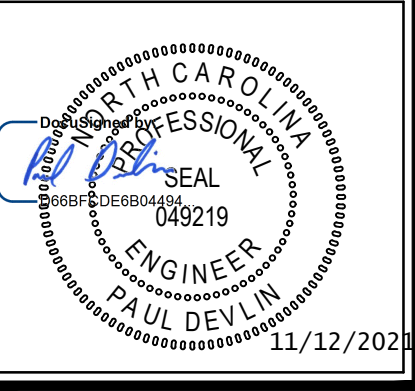


**WithersRavenel**  
Engineers | Planners

MERRITT HINTON  
OAKS BLVD  
Knightdale, NC

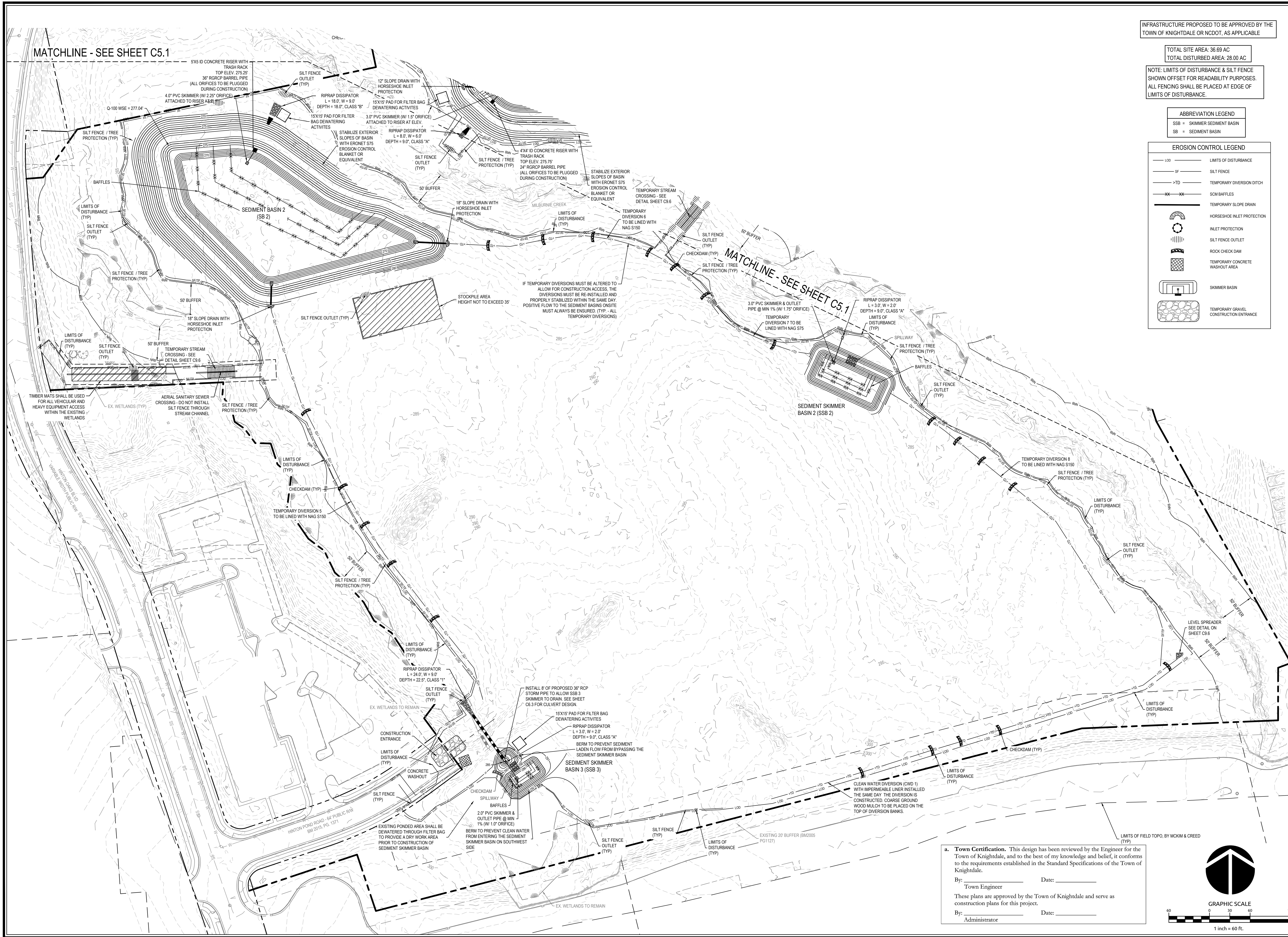
EROSION CONTROL PLAN -  
STAGE 1

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

Sheet No.  
**C5.1**

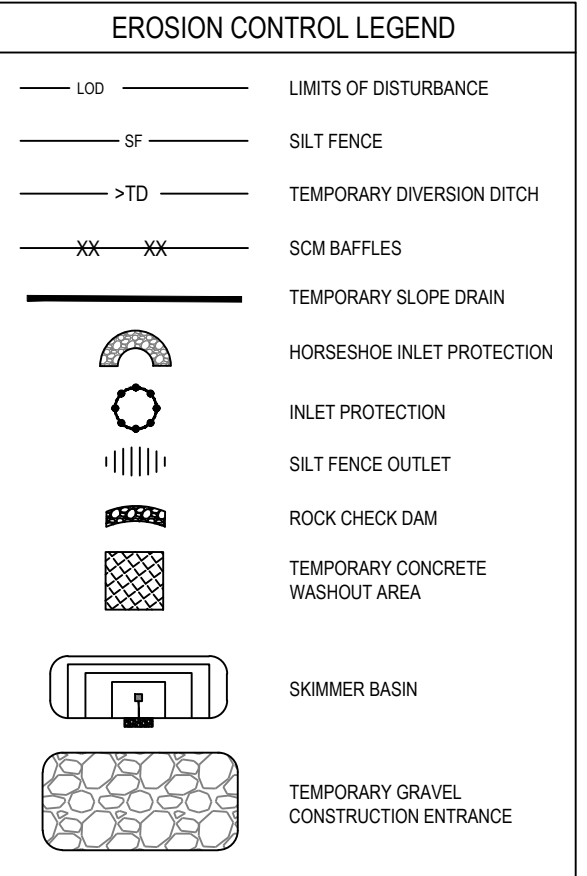


INFRASTRUCTURE PROPOSED TO BE APPROVED BY THE TOWN OF KNIGHTDALE OR NCDOT, AS APPLICABLE

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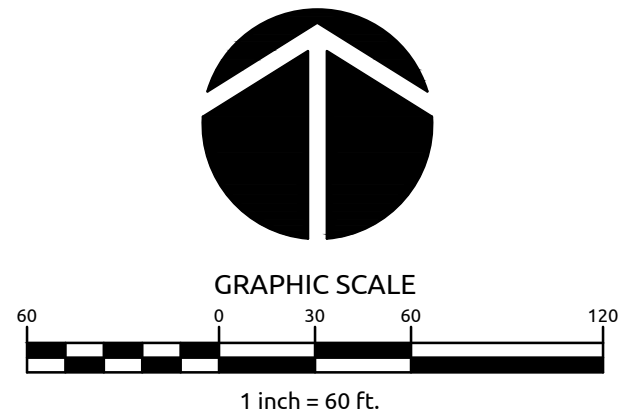
IF TEMPORARY DIVERSIONS MUST BE ALTERED TO ALLOW FOR CONSTRUCTION ACCESS, THE DIVERSIONS MUST BE RE-INSTALLED AND PROPERLY STABILIZED WITHIN THE SAME DAY. POSITIVE FLOW TO THE SEDIMENT BASINS ON SITE MUST ALWAYS BE ENSURED. (TYP. - ALL TEMPORARY DIVERSIONS)

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



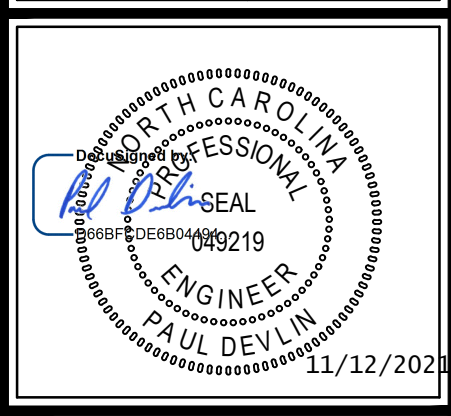
11/15/15 09:00:00 Merritt Hinton withersravenel.com\c:\projects\2021\12012021\plan\_01\EROSION CONTROL PLAN\_STAGE1.dwg 11/15/2021 12:00:00 PM ET/ETD: KJH/KAL

**WithersRavenel**  
Engineers | Planners

MERRITT HINTON  
OAKS BLVD  
Knightdale, NC

**EROSION CONTROL PLAN -  
STAGE 1**

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



Revisions	Signature	Date
9	SIGNATURE SUBMITTAL	8/27/21
10	REVISION TO APPROVED PLANS	11/11/21

Sheet No.  
**C5.2**





**LEGEND**

--- DRAINAGE AREA BOUNDARY

---

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Administrator

**GRAPHIC SCALE**

1 inch = 100 ft.

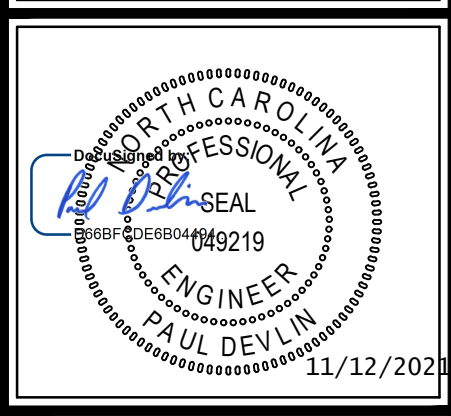
**WithersRavenel**  
Engineers | Planners

137 S Wilmington Street | Suite 200 | Raleigh, NC 27601 | T: 919.469.3340 | License #: C-0832 | www.withersravenel.com

**MERRITT HINTON  
OAKS BLVD**  
Knightdale, NC

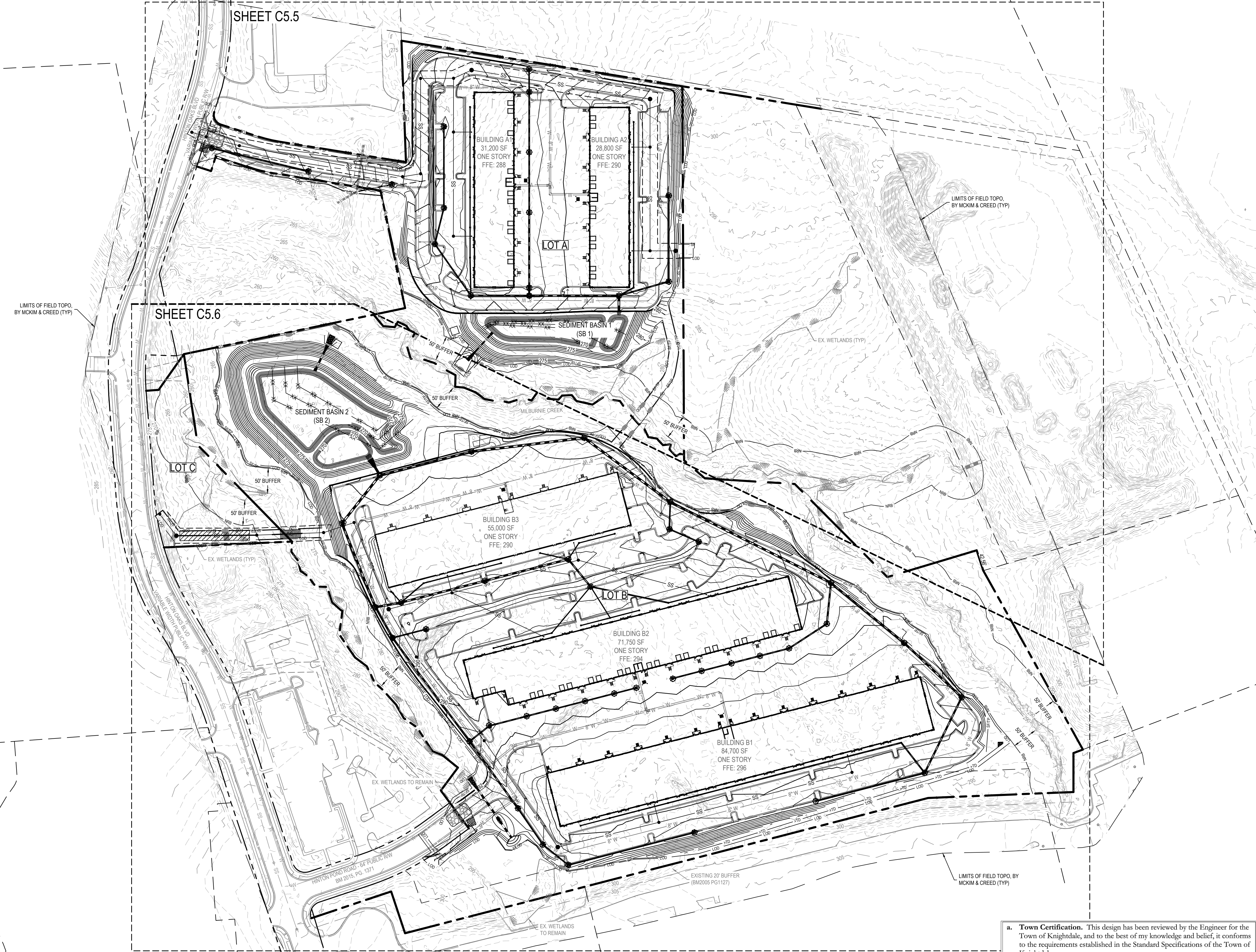
**EROSION CONTROL BASIN  
DRAINAGE AREAS**

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


Sheet No.  
**C5.3**



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

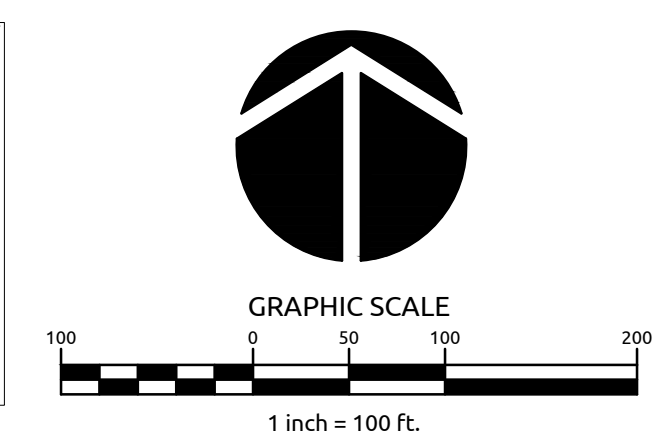
TOTAL SITE AREA: 36.69 AC  
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NOTE: LIMITS OF DISTURBANCE & SILT FENCE SHOWN OFFSET FOR READABILITY PURPOSES. ALL FENCING SHALL BE PLACED AT EDGE OF LIMITS OF DISTURBANCE.

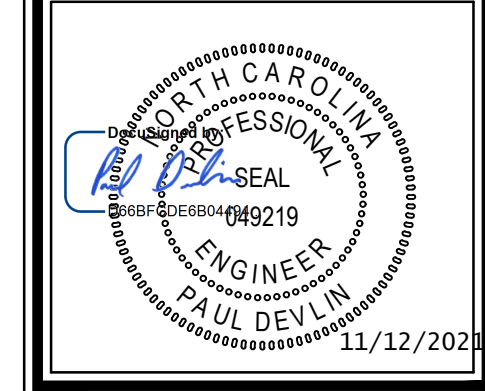
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EROSION CONTROL LEGEND	
---	LIMITS OF DISTURBANCE
-S-	SILT FENCE
>TD	TEMPORARY DIVERSION DITCH
XX XX	SCM BARRIERS
---	TEMPORARY SLOPE DRAIN
	HORSESHOE INLET PROTECTION
	INLET PROTECTION
	SILT FENCE OUTLET
	ROCK CHECK DAM
	TEMPORARY CONCRETE WASHOUT AREA
	SKIMMER BASIN
	TEMPORARY GRAVEL CONSTRUCTION ENTRANCE

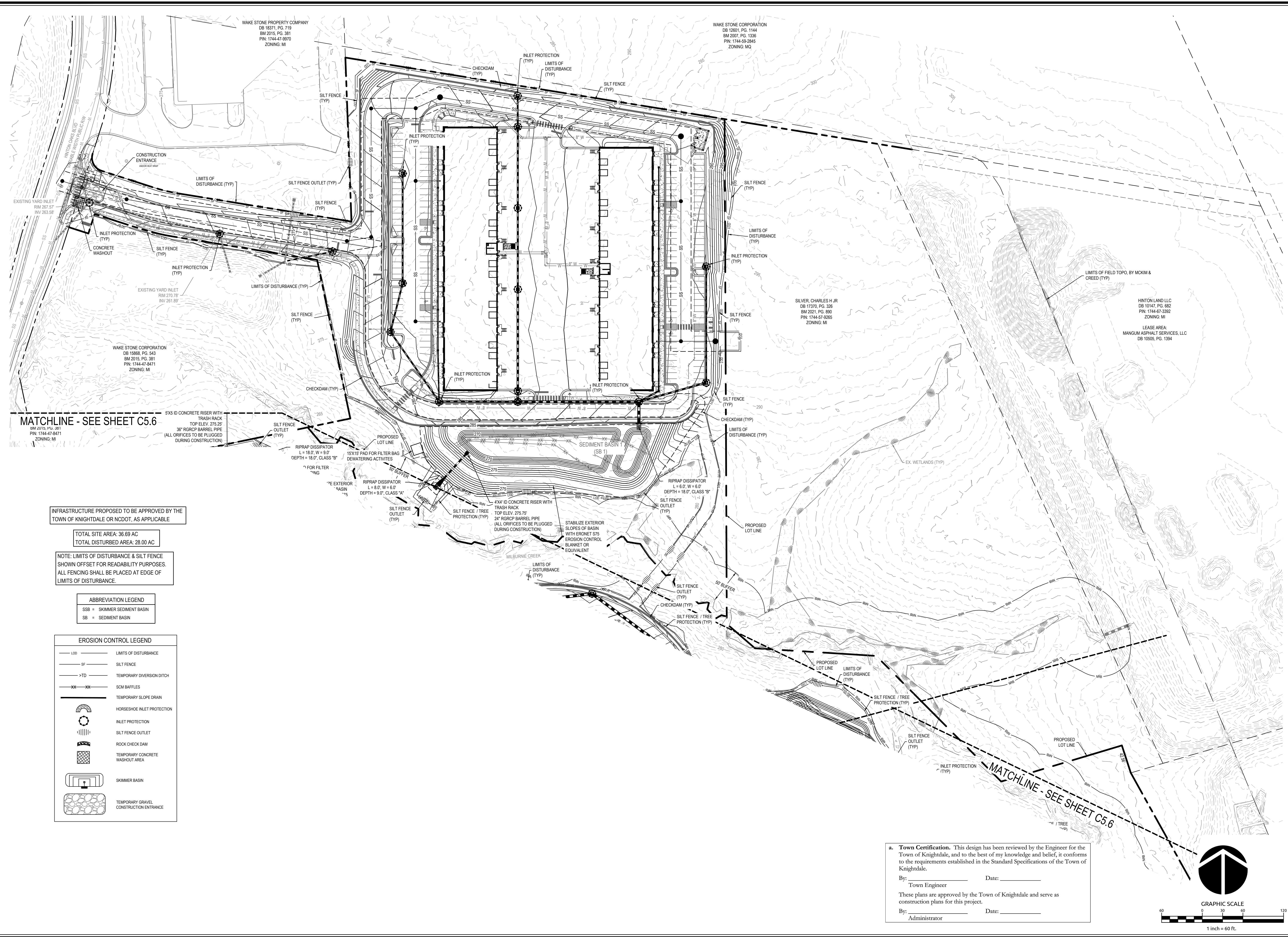
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Administrator



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



Revisions		
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**MATCHLINE - SEE SHEET C5.6**

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

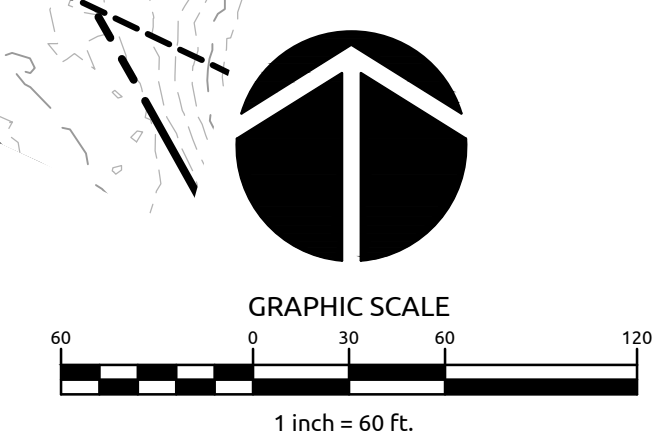
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SF	SILT FENCE
-TD-	TEMPORARY DIVERSION DITCH
XX XX	SCM BAFFLES
---	TEMPORARY SLOPE DRAIN
---	HORSESHOE INLET PROTECTION
---	INLET PROTECTION
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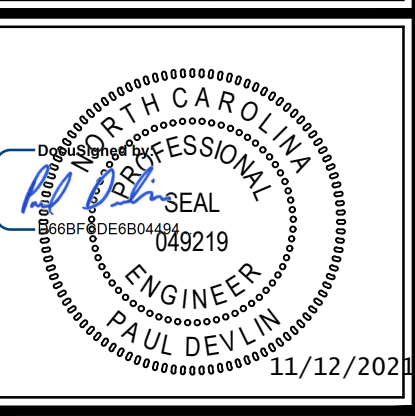


**WithersRavenel**  
Engineers | Planners

MERRITT HINTON  
OAKS BLVD  
Knightdale, NC

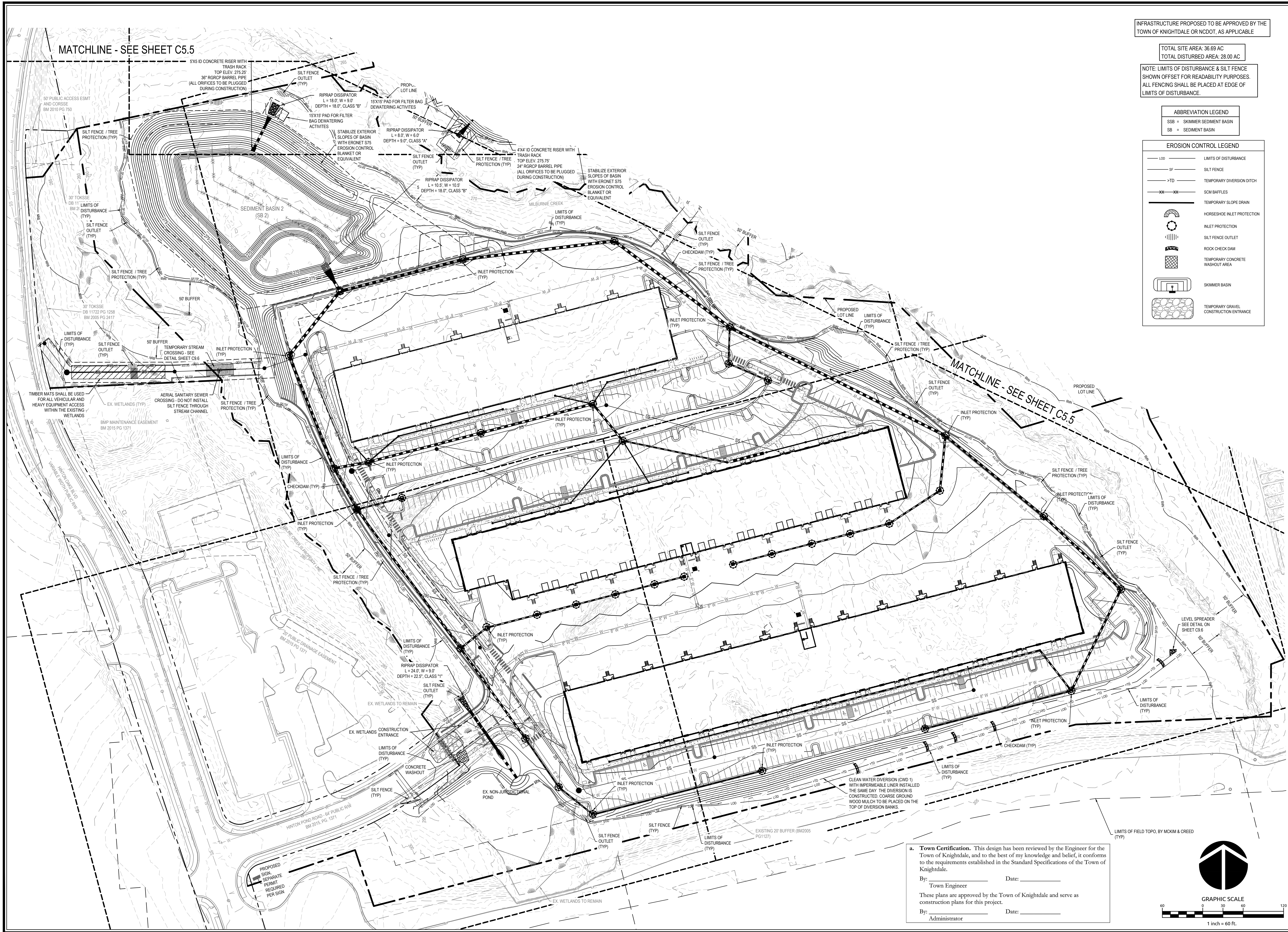
**EROSION CONTROL PLAN -  
STAGE 2**

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

Sheet No.  
**C5.5**



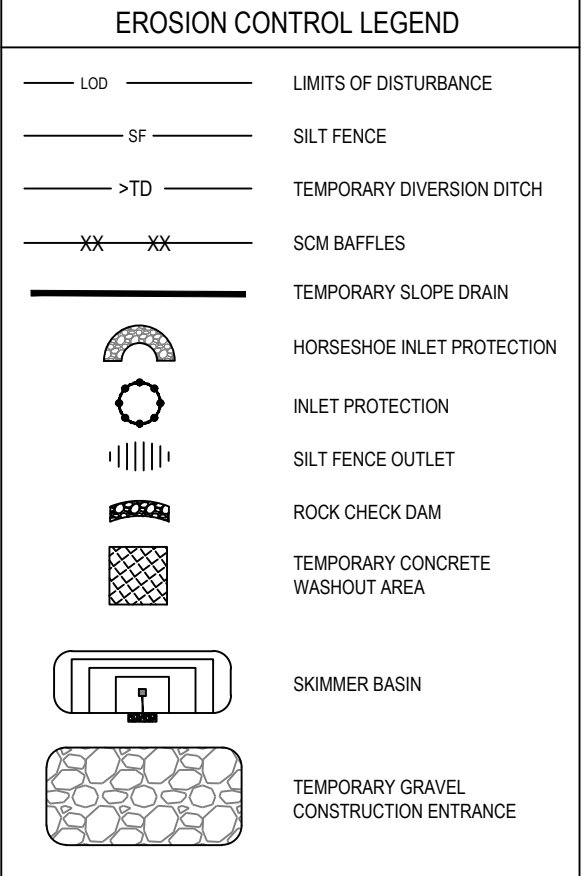
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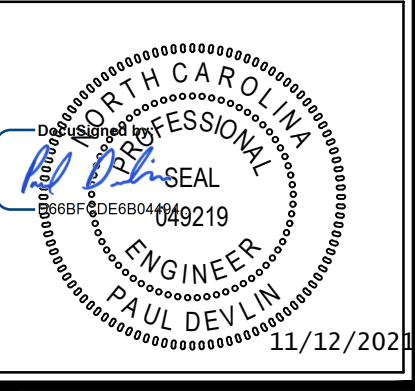


**WithersRavenel**  
Engineers | Planners

MERRITT HINTON  
OAKS BLVD  
Knightdale, NC

EROSION CONTROL PLAN -  
STAGE 2

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



Revisions

9	SIGNATURE SUBMITTAL	8/27/21
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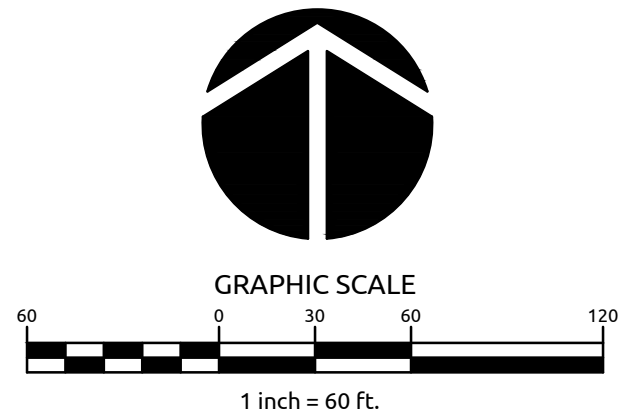
Sheet No.  
**C5.6**

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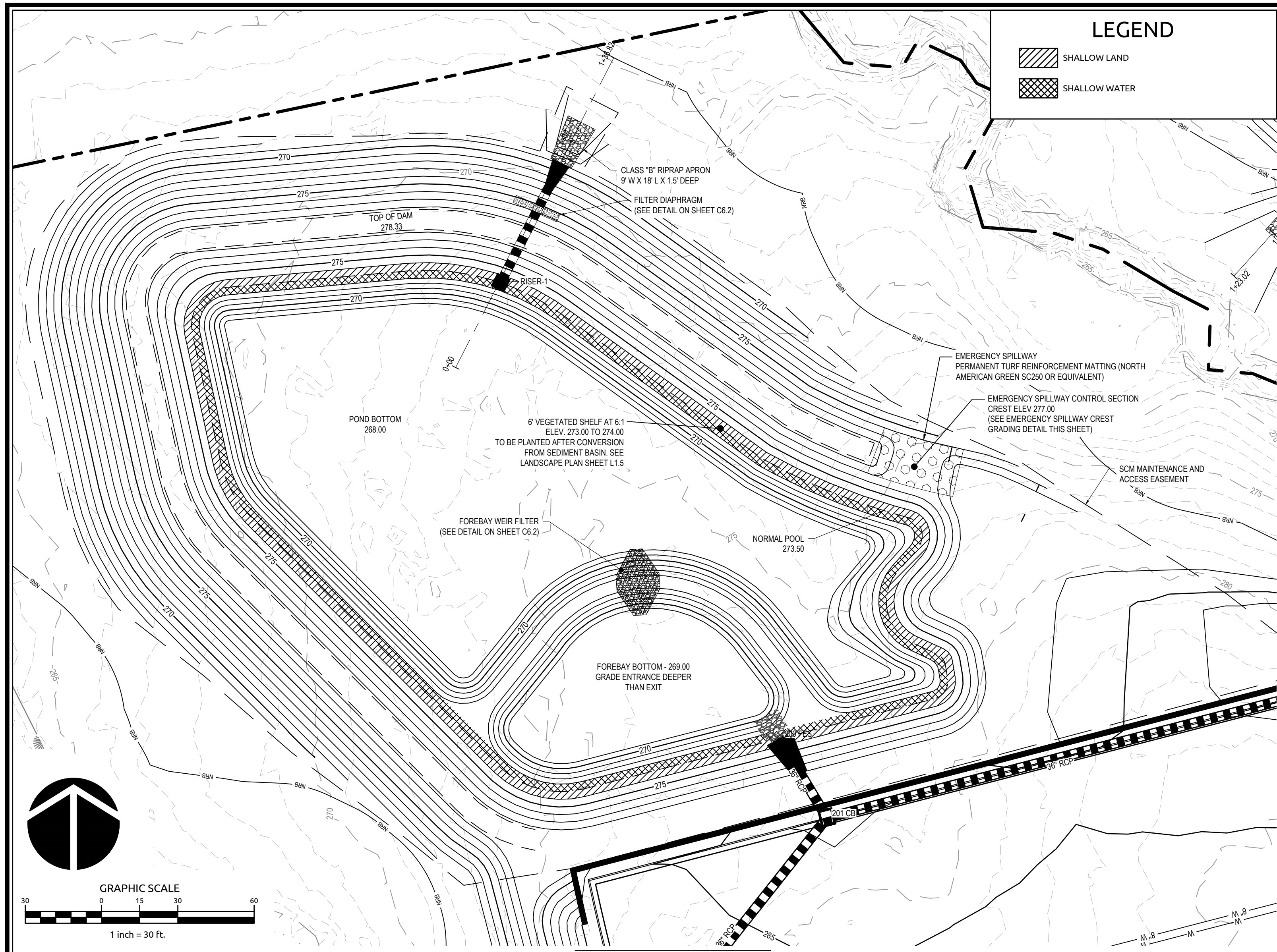
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By: \_\_\_\_\_ Date: \_\_\_\_\_  
Administrator



U:\19\0080\190080.mxd WithersRavenel\khalid\2020\Drawings\444\Construction\C5.6 EROSION CONTROL PLAN - STAGE 2.dwg Thursday, November 11, 2021 1:34:40 PM - ET/EST: KHALID



SCM #1 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 #78 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 SCHEDULING 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 BERMS(S) SHALL NOT BE INSTALLED DURING THE INITIAL CONSTRUCTION OR WHILE THE SCM IS USED AS AN EROSION CONTROL MEASURE.
- THE FOREBAY BERMS(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 = 41,593 SF
  - WEIR CREST ELEVATION = N/A
  - RISER CREST ELEVATION = 275.50 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  $1 \times 10^{-8}$  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 CLAY/SOIL, 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

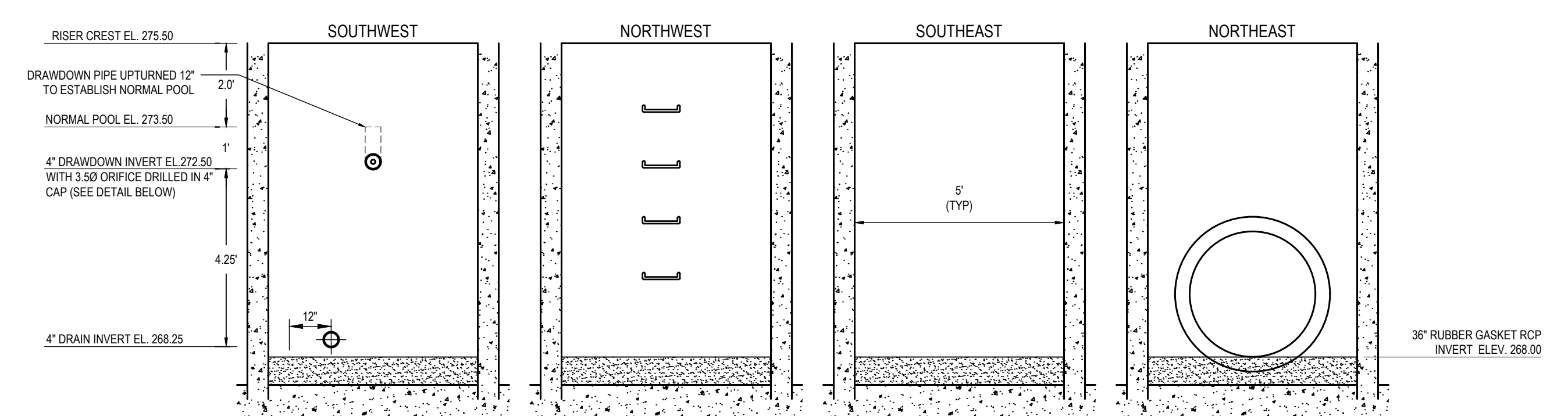
- ADDITIONAL REQUIREMENTS**
- SCMS MUST BE LOCATED WITHIN COMMON OPEN SPACE, AND WITHIN AN ACCESS AND MAINTENANCE EASEMENT.
  - AN OPERATIONS AND MAINTENANCE MANUAL AND MAINTENANCE AGREEMENT SHALL BE PREPARED AND PROVIDED TO THE OWNER. ADDITIONAL REQUIREMENTS (e.g. RECORDATION OF EASEMENTS, AGREEMENTS, 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.

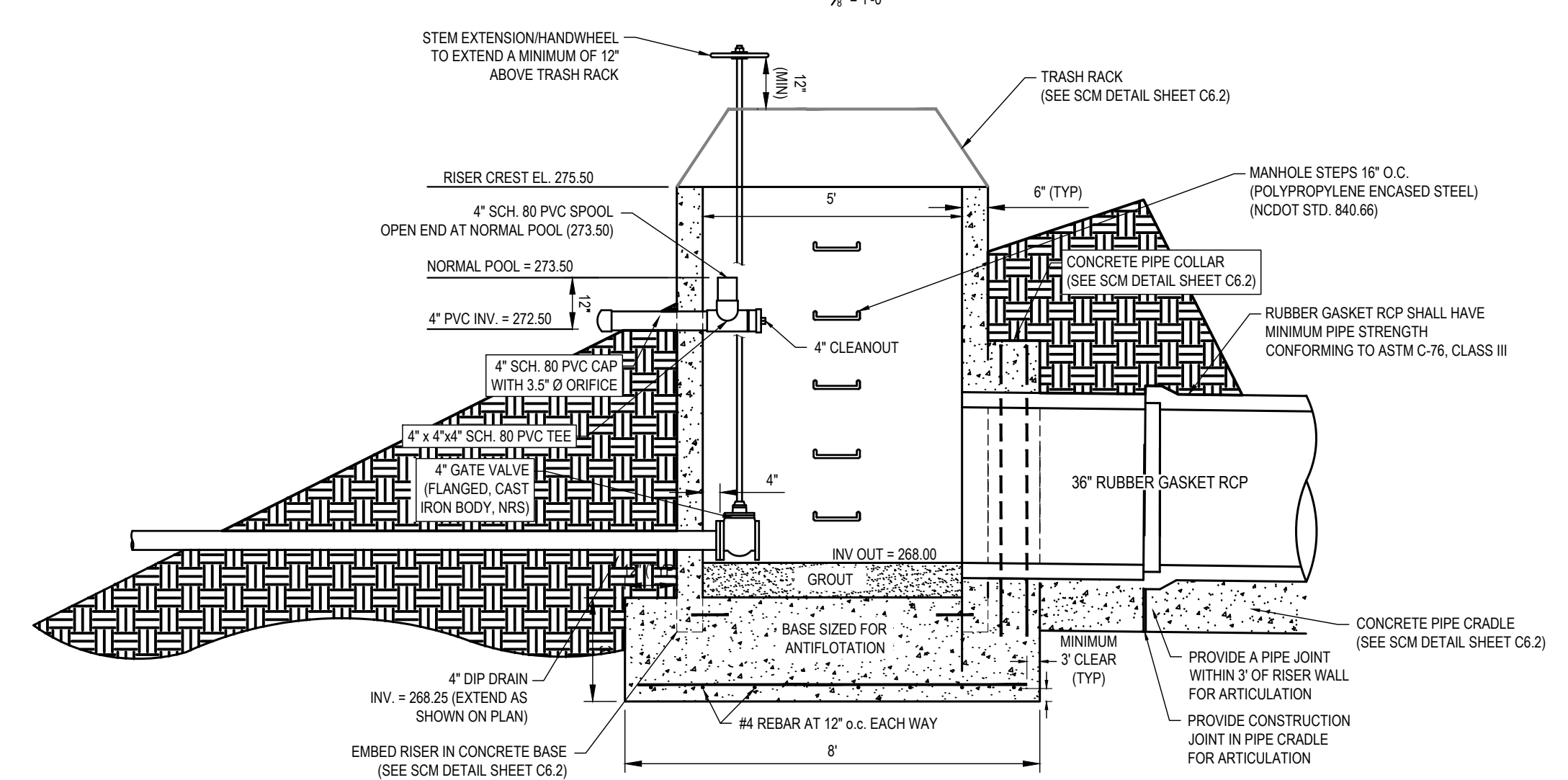
By: \_\_\_\_\_ Date: \_\_\_\_\_  
 Town Engineer

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

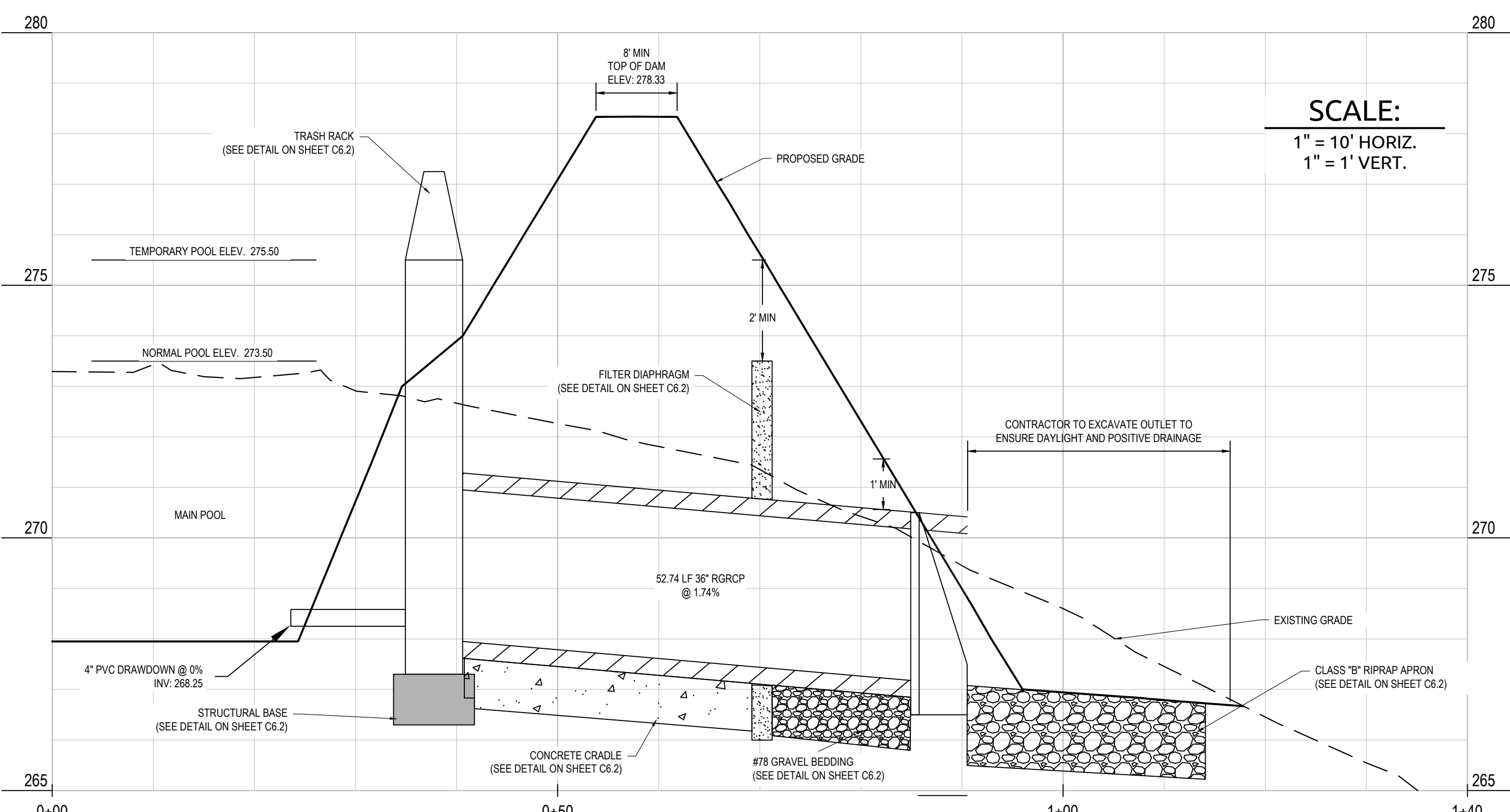
By: \_\_\_\_\_ Date: \_\_\_\_\_  
 Administrator



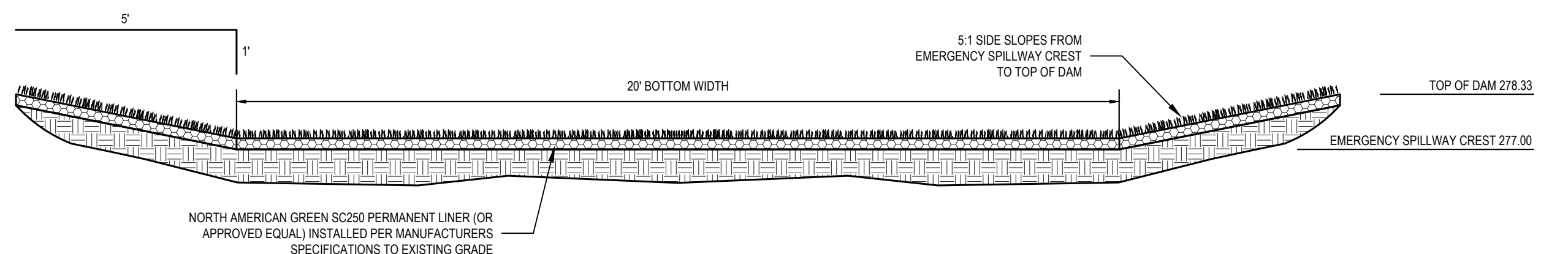
RISER 1 WALL ELEVATIONS



RISER 1 DRAWDOWN DEVICE DETAIL



SCM #1 PROFILE VIEW



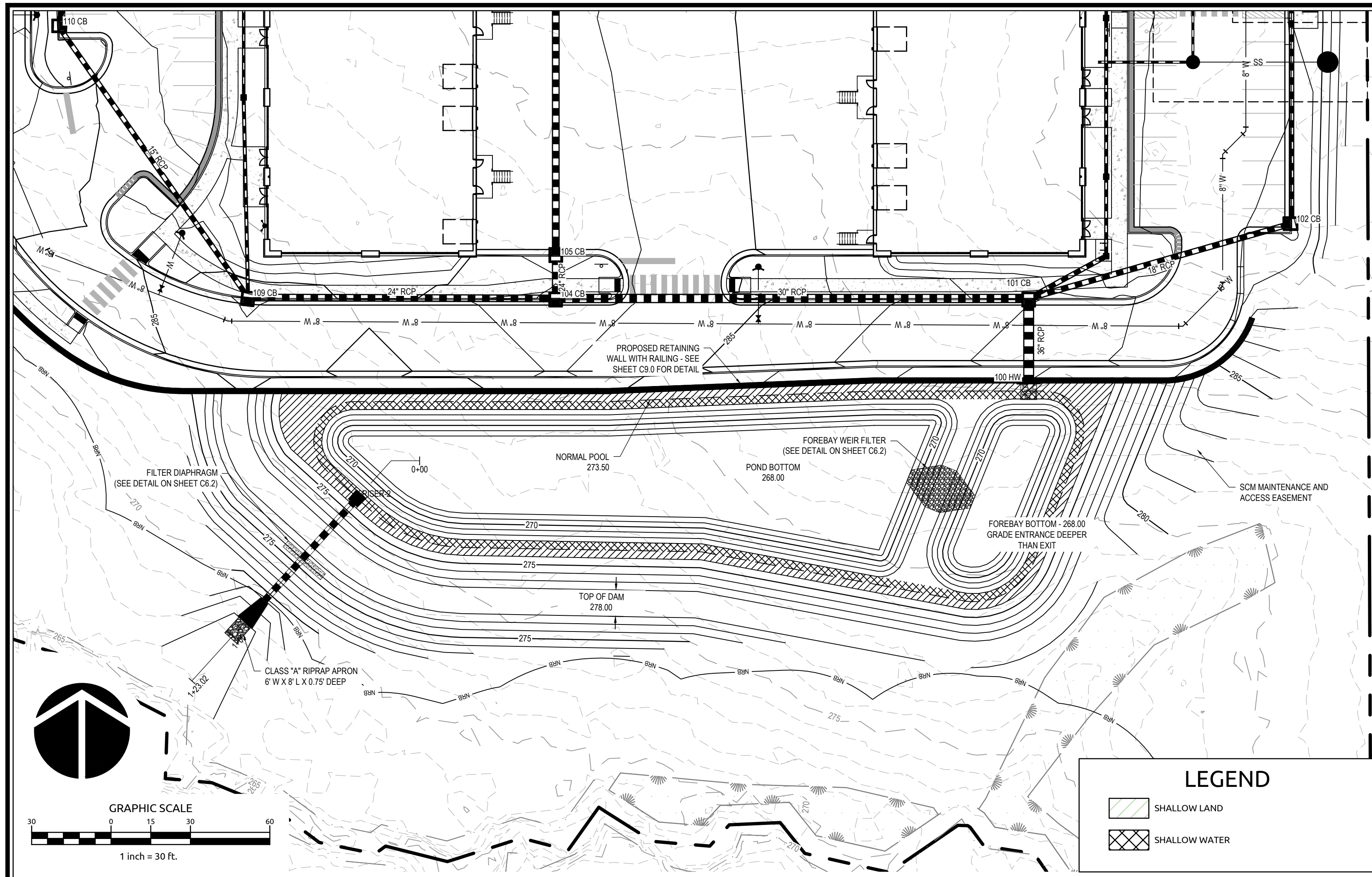
SCM #1 EMERGENCY SPILLWAY CREST GRADING DETAIL

SCALE:  
1" = 10' HORIZ.  
1" = 1' VERT.

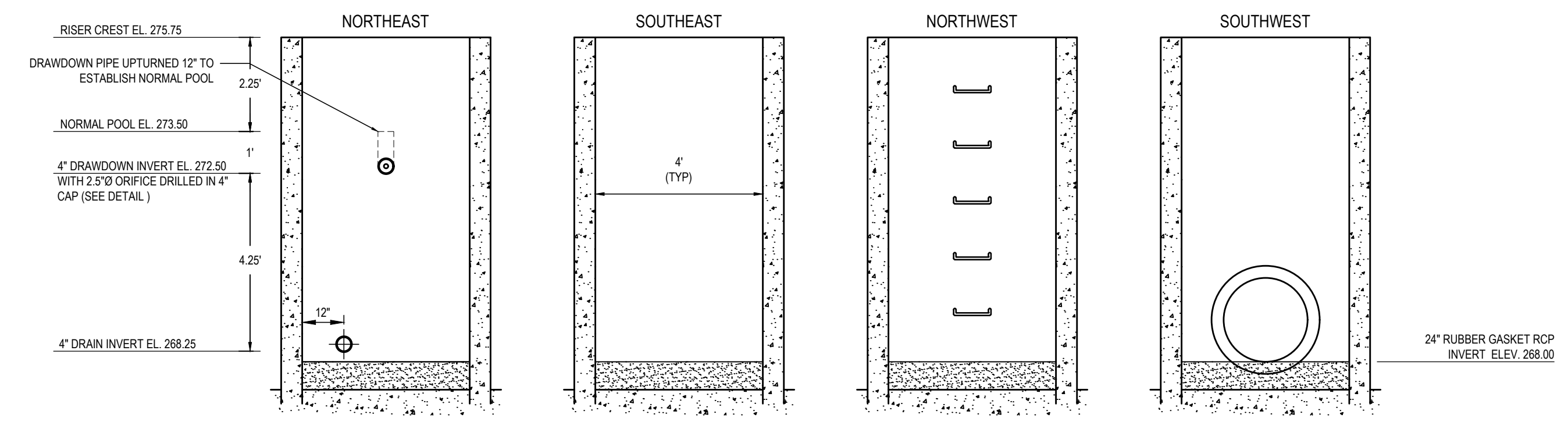
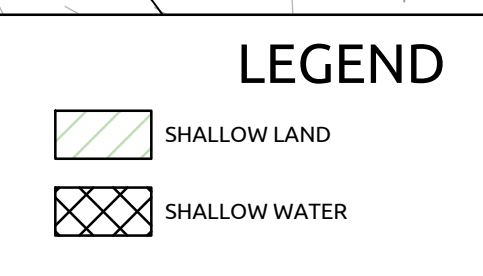
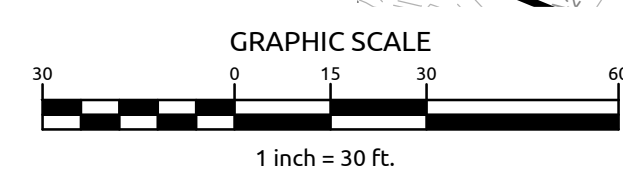
Job No.	09190080.00	Drawn By	WR
Date	09/15/2020	Designer	WR



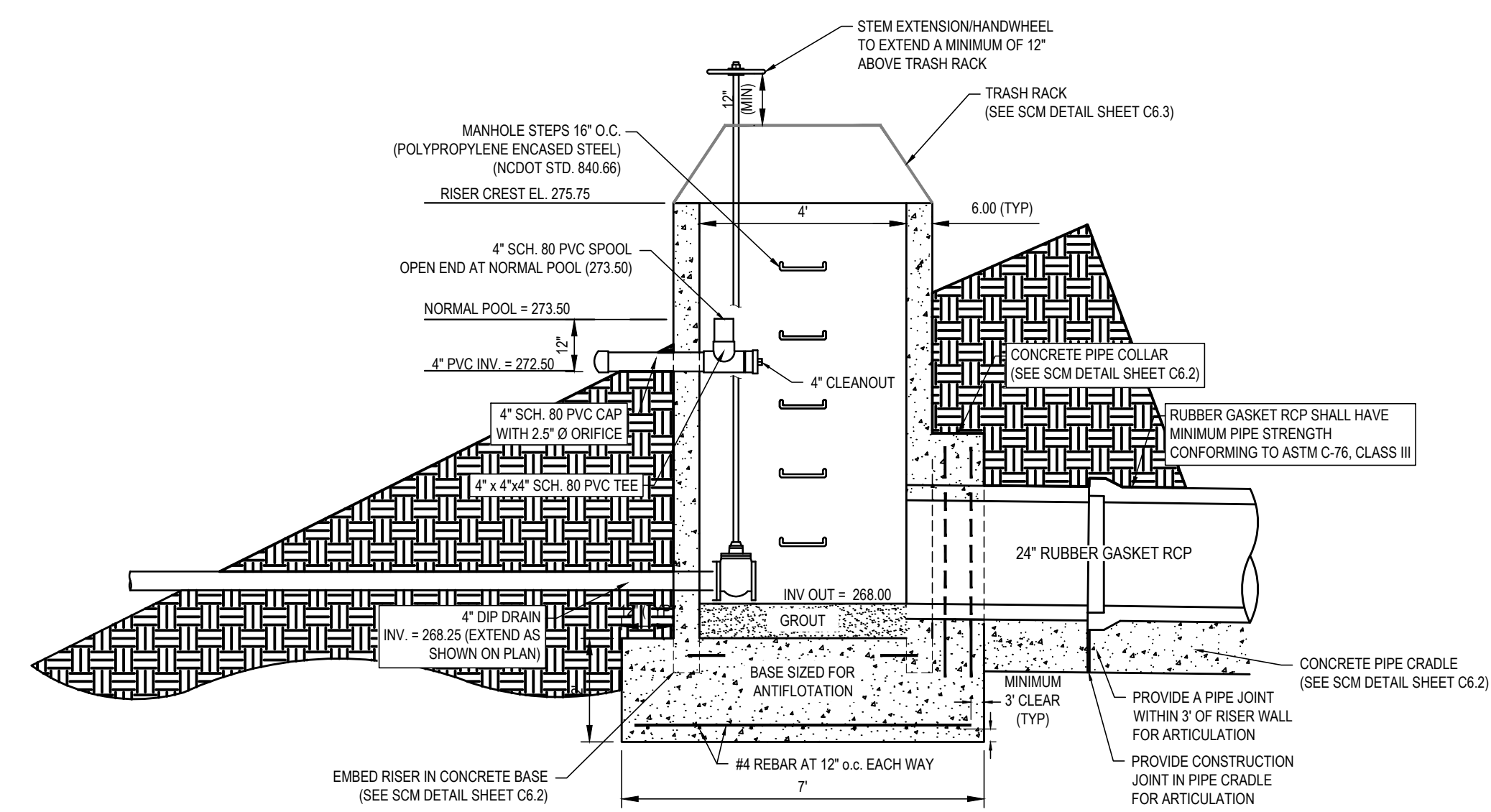
Revisions		
9	SIGNATURE SUBMITTAL	8/27/21
10	REVISION TO APPROVED PLANS	11/11/21



SCM #2 PLAN VIEW



RISER 2 WALL ELEVATIONS



RISER 2 DRAWDOWN DEVICE DETAIL

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 TESTS 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 #78 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 SHELFS SHALL BE CONSTRUCTED AS SHOWN ON THE PLAN.
  - VEGETATED SHELFS 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 SHELFS 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 C390.

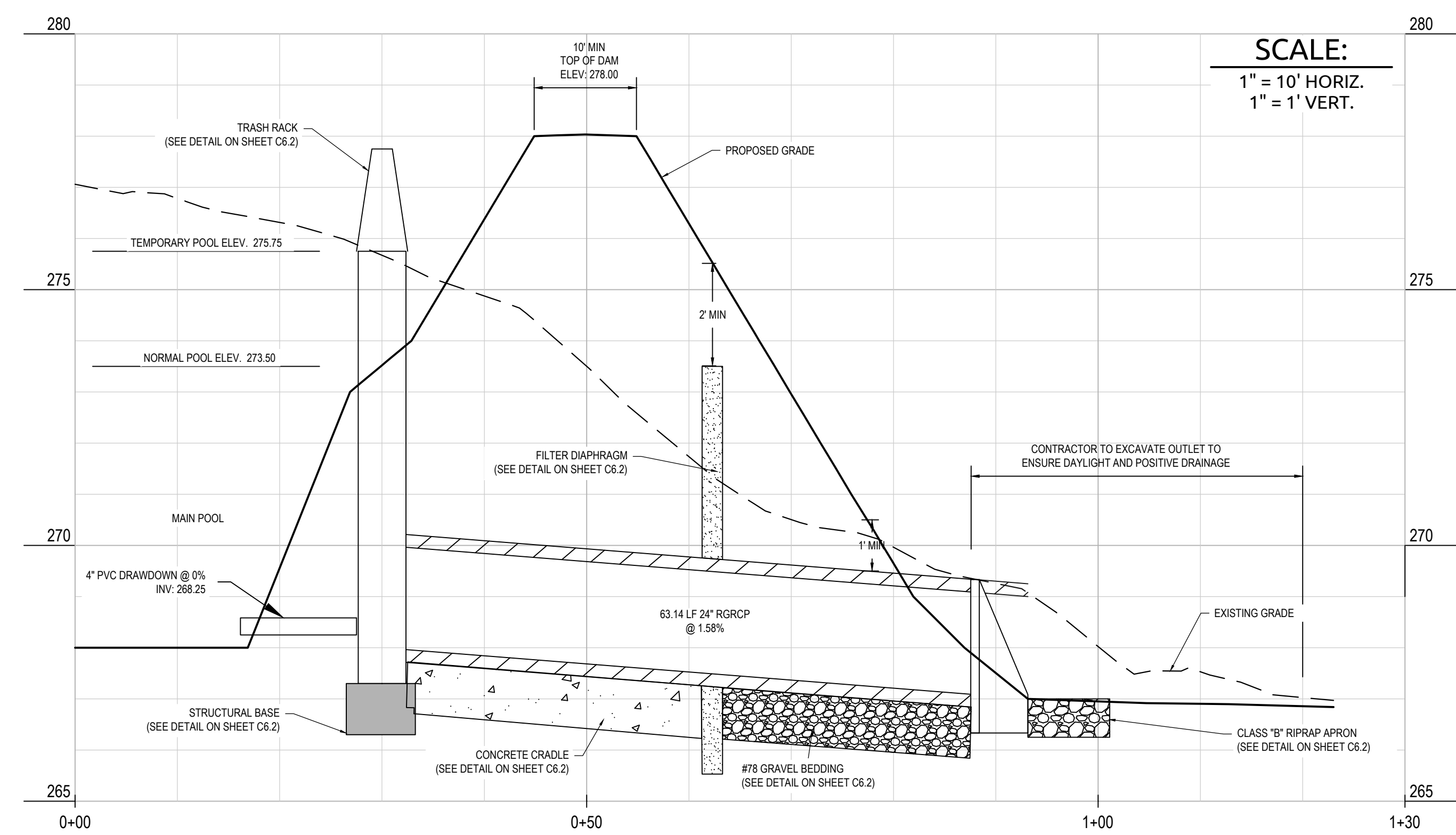
- ADDITIONAL REQUIREMENTS**
- SCMS MUST BE LOCATED WITHIN COMMON OPEN SPACE, AND WITHIN AN ACCESS AND MAINTENANCE EASEMENT.
  - AN OPERATIONS AND MAINTENANCE MANUAL AND MAINTENANCE AGREEMENT SHALL BE PREPARED AND PROVIDED TO THE OWNER. ADDITIONAL REQUIREMENTS (e.g. RECORDATION OF EASEMENTS, AGREEMENTS, 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



SCM #2 PROFILE VIEW

SCALE:  
 1" = 10' HORIZ.  
 1" = 1' VERT.

**WithersRavenel**  
 Engineers | Planners

137 S Wilmington Street | Suite 200 | Raleigh, NC 27601 | T: 919-469-3340 | License #: C-0832 | www.withersravenel.com

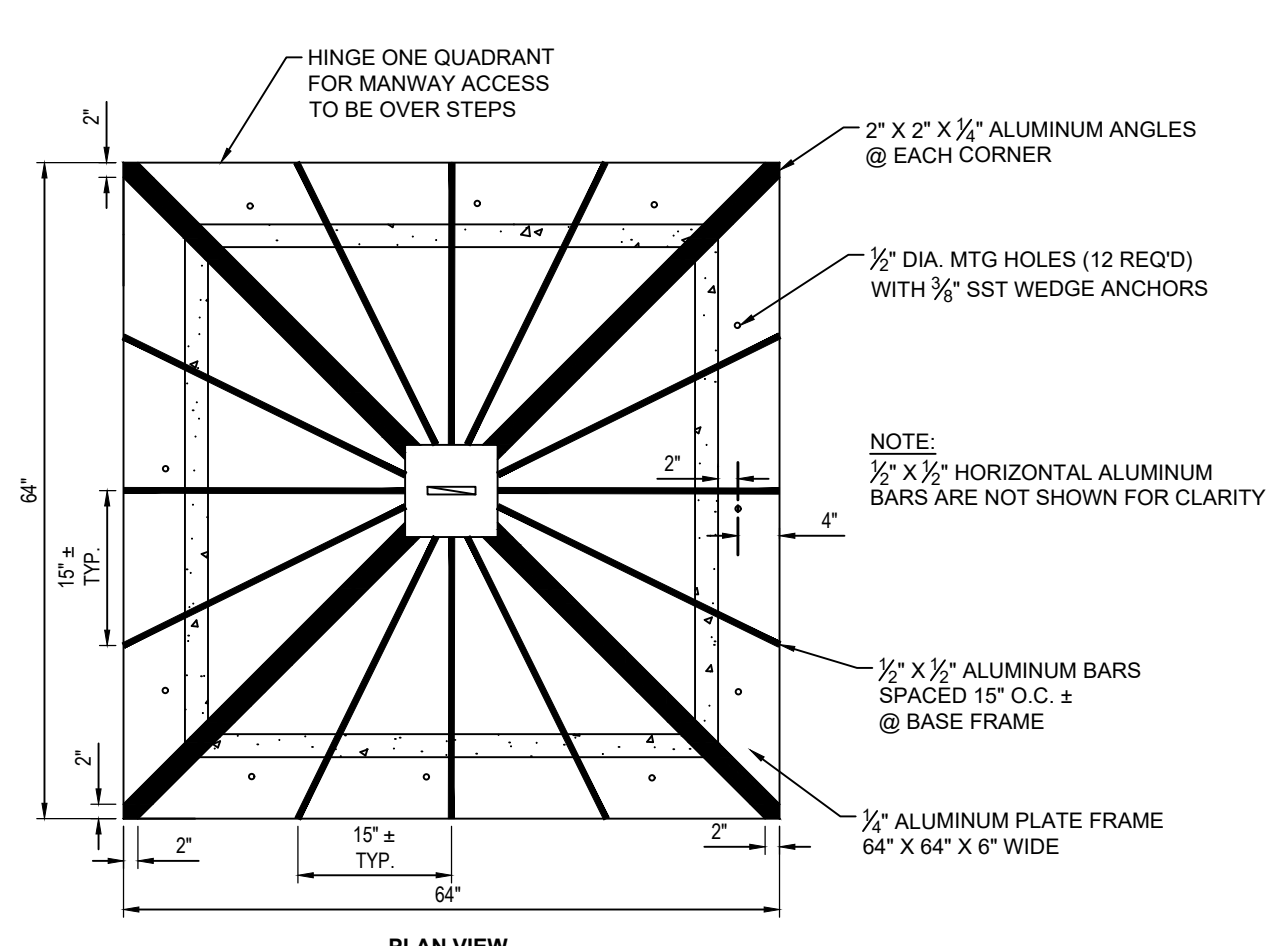
MERRITT HINTON  
 OAKS BLVD  
 Knightdale, NC

SCM 2 PLAN AND DETAILS

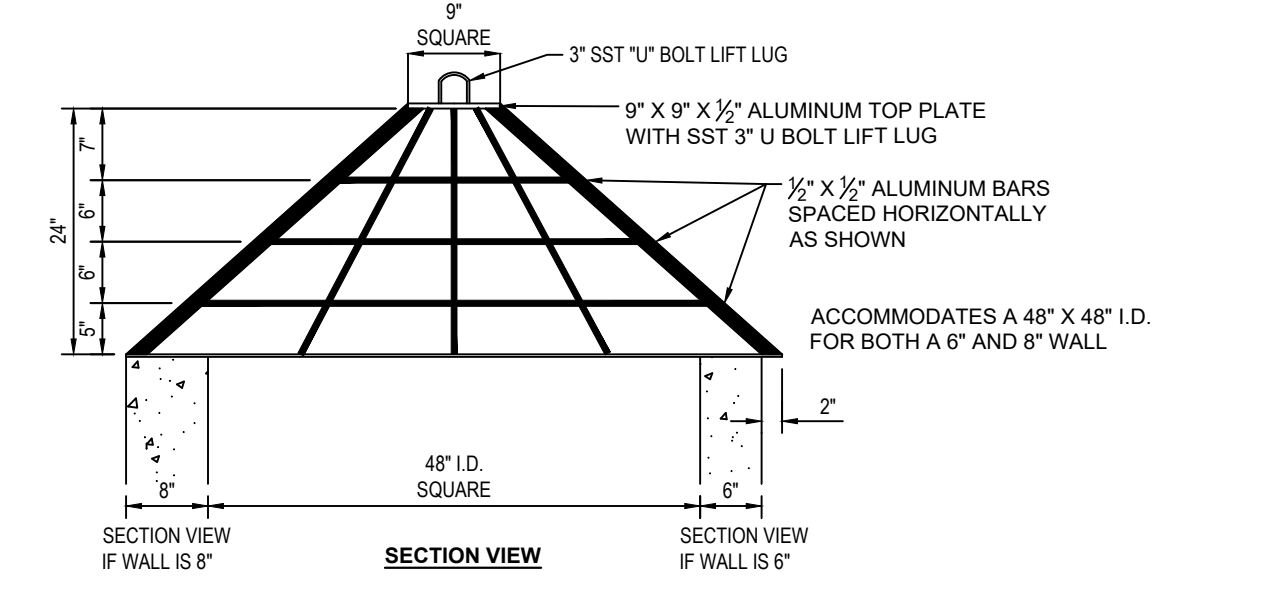
Job No.	09190080.00	Drawn By	WR
Date	09/15/2020	Designer	WR

Revisions		
9	SIGNATURE SUBMITTAL	8/27/21
10	REVISION TO APPROVED PLANS	11/11/21

Sheet No.  
**C6.1**



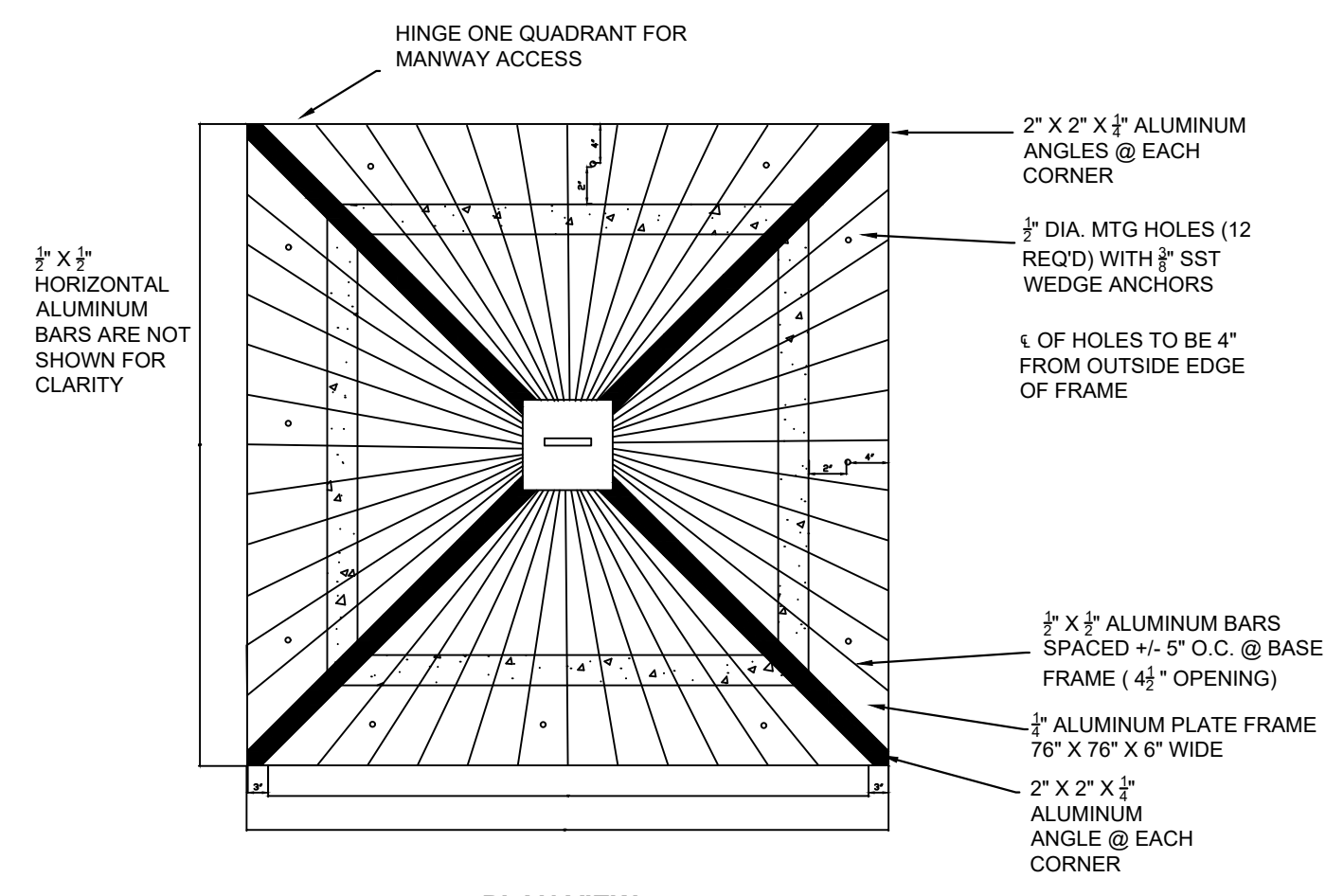
PLAN VIEW



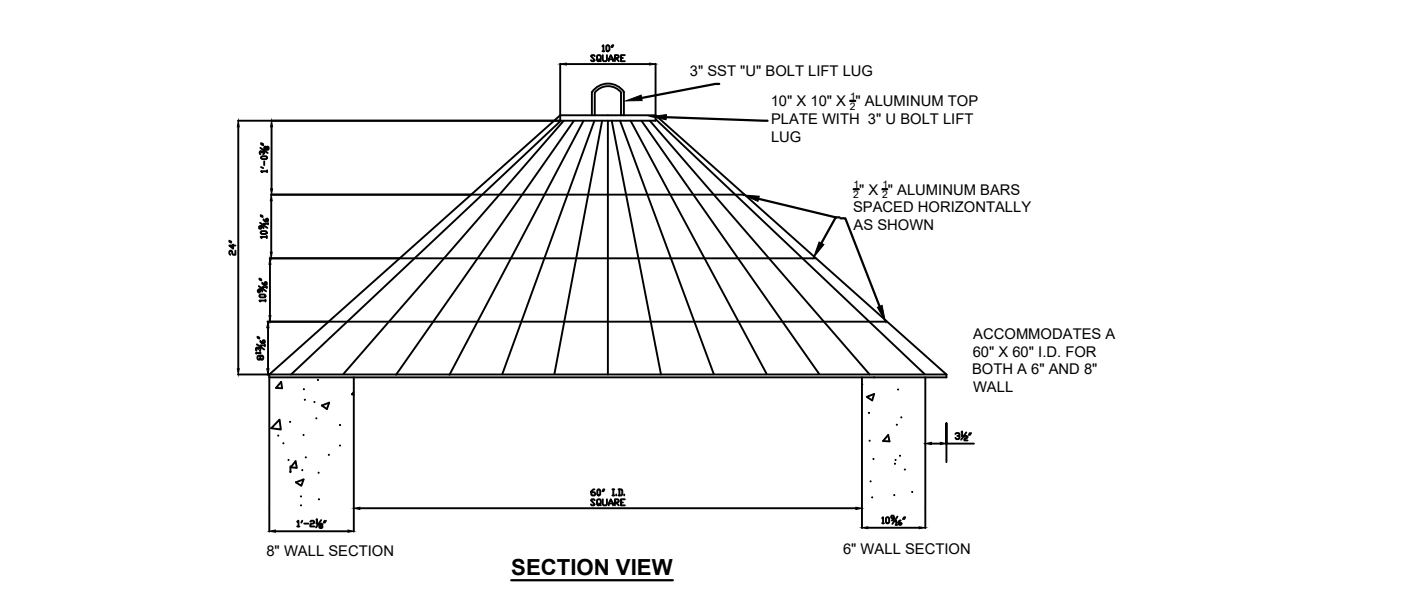
SECTION VIEW

- 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.

**4' TRASH RACK**  
NOT TO SCALE



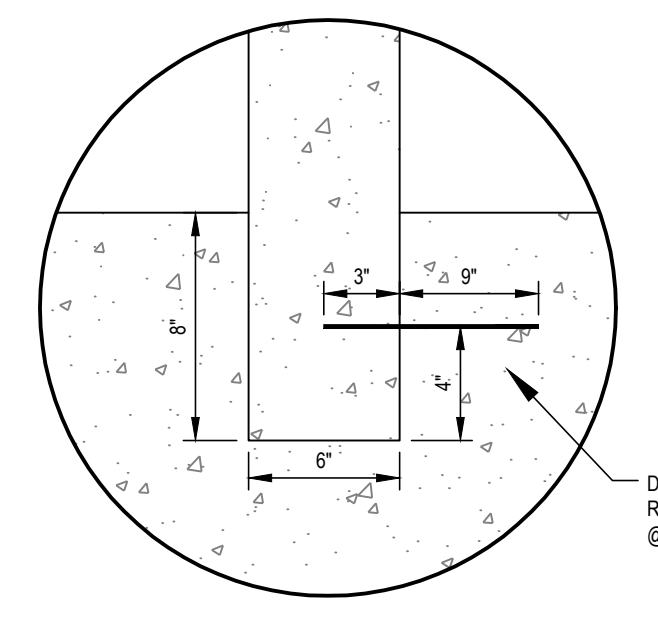
PLAN VIEW



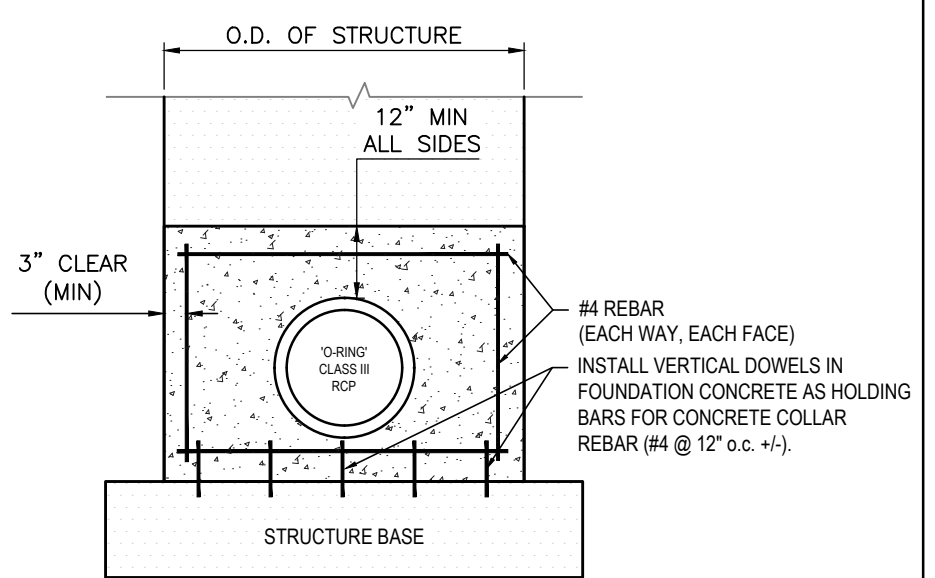
SECTION VIEW

- 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.

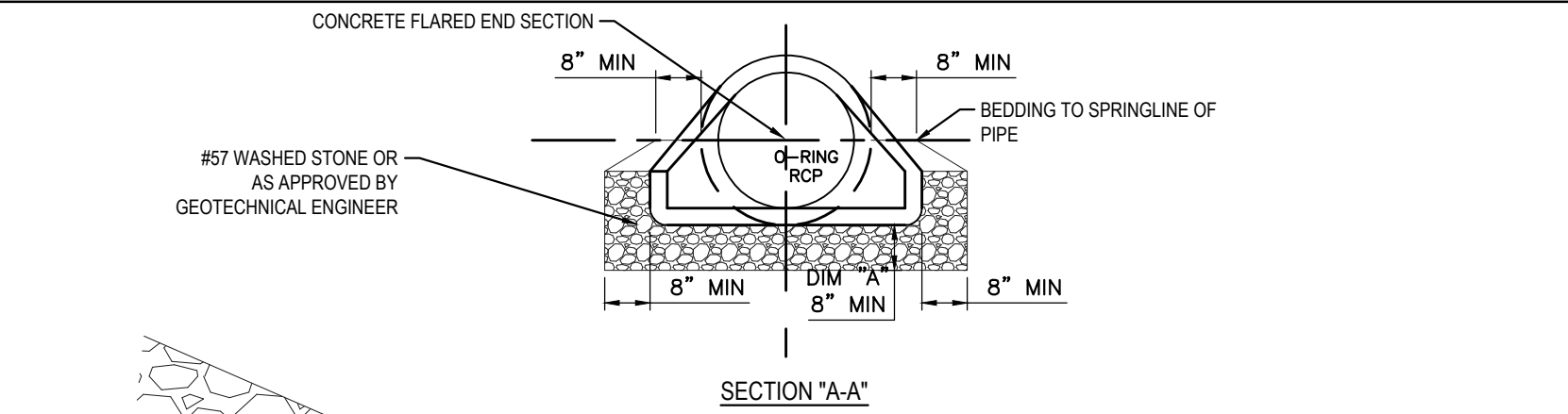
**5' TRASH RACK**  
NOT TO SCALE



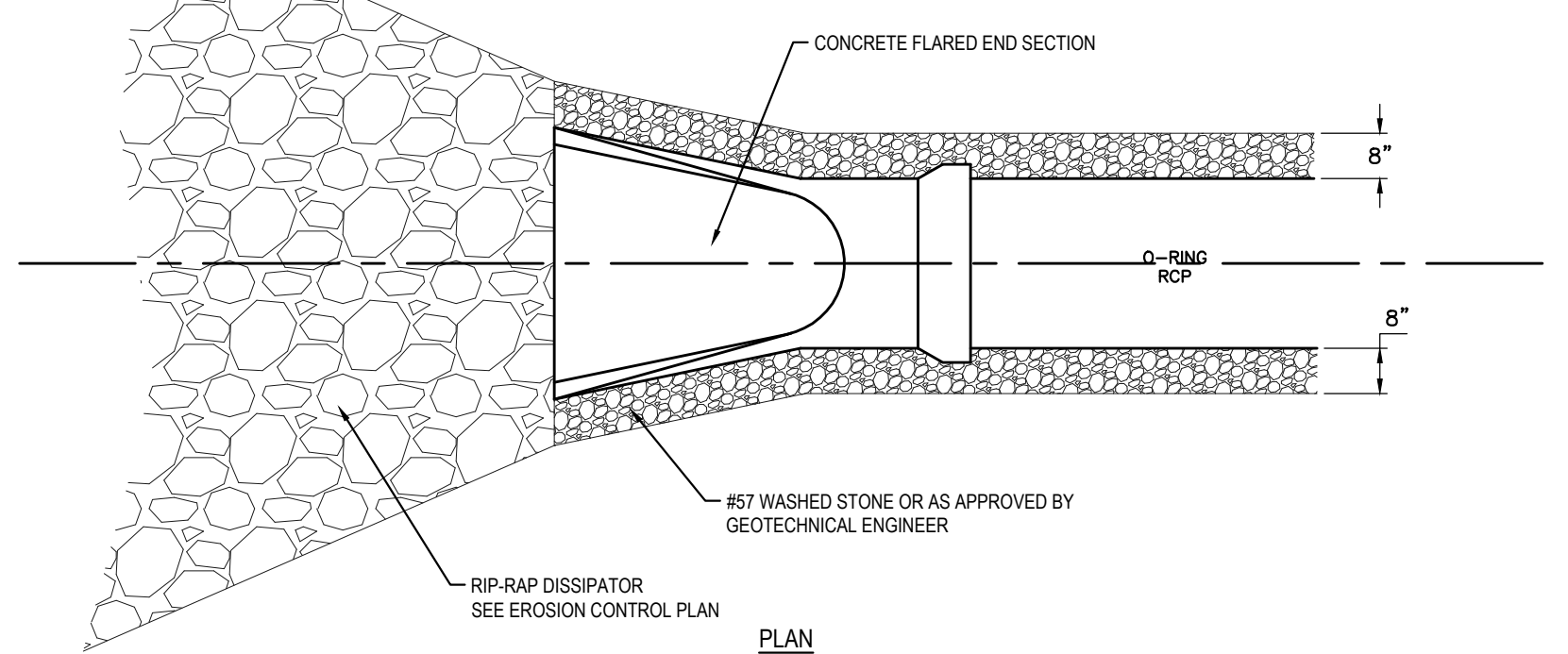
**ANCHOR DETAIL (TYPICAL)**  
NOT TO SCALE



**CONCRETE COLLAR DETAIL**  
NOT TO SCALE

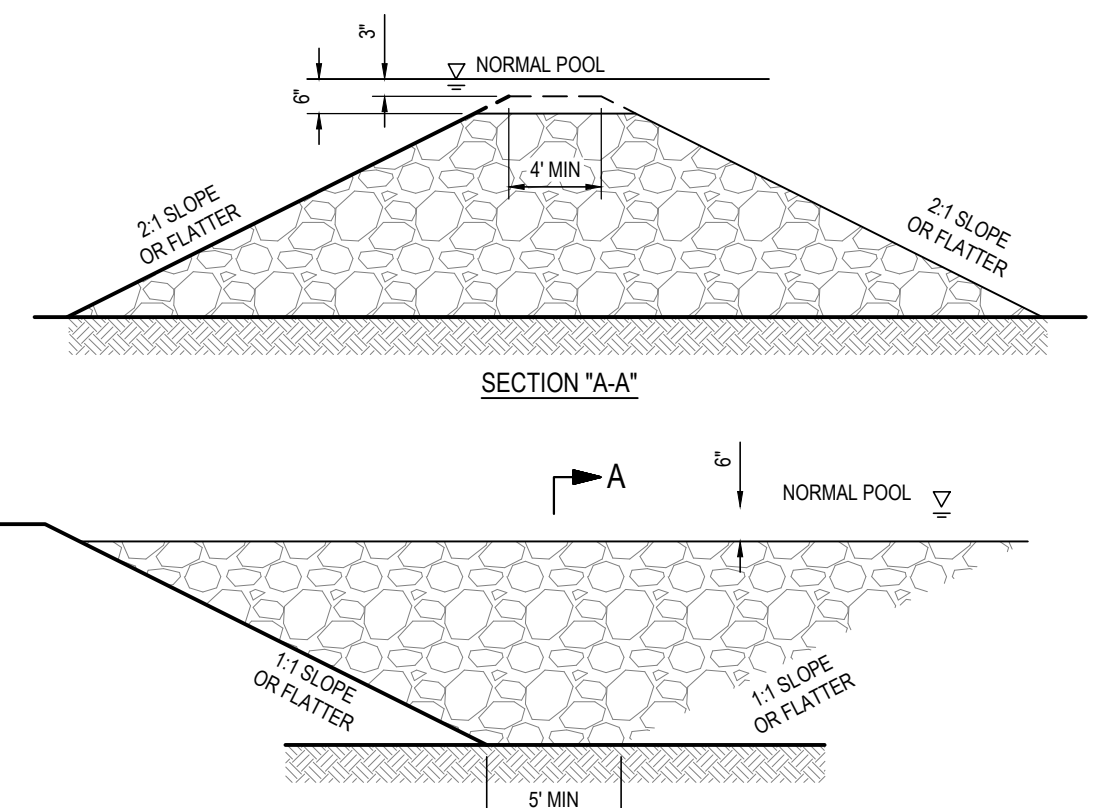


SECTION "A-A"



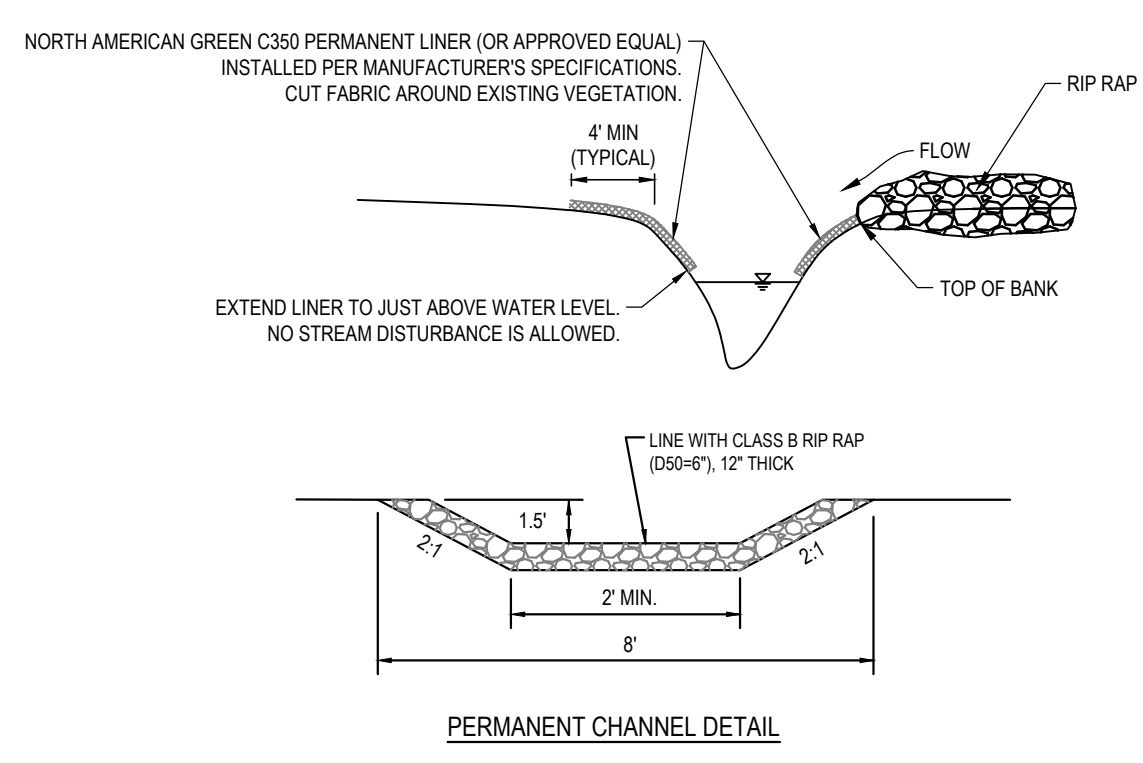
LONGITUDINAL SECTION

**OUTLET PIPE FILTER DIAPHRAGM  
OUTLET DETAIL (FLARED END SECTION)**  
NOT TO SCALE

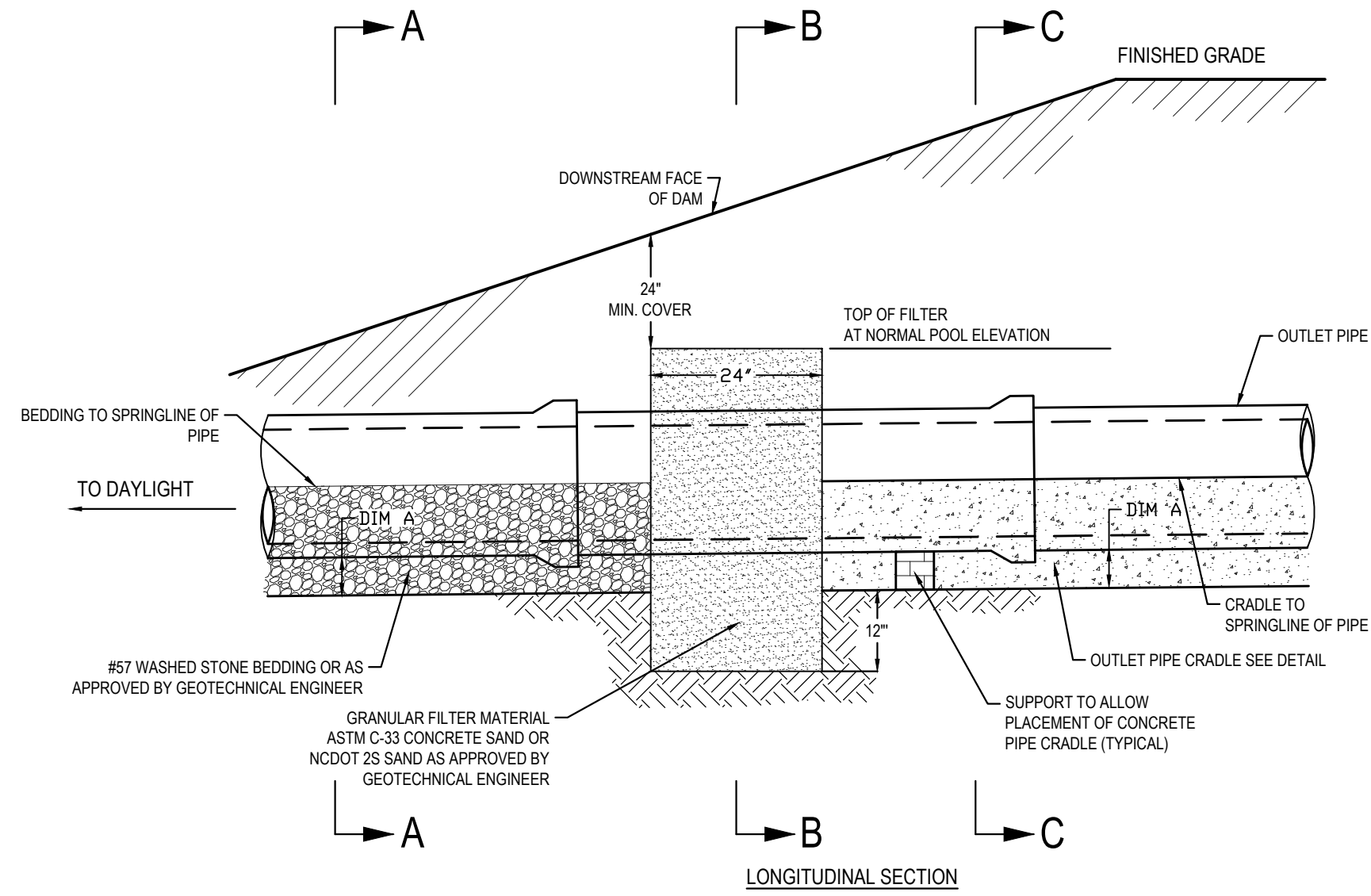


**FOREBAY FILTER DRAIN TYPICAL DETAIL**  
NOT TO SCALE

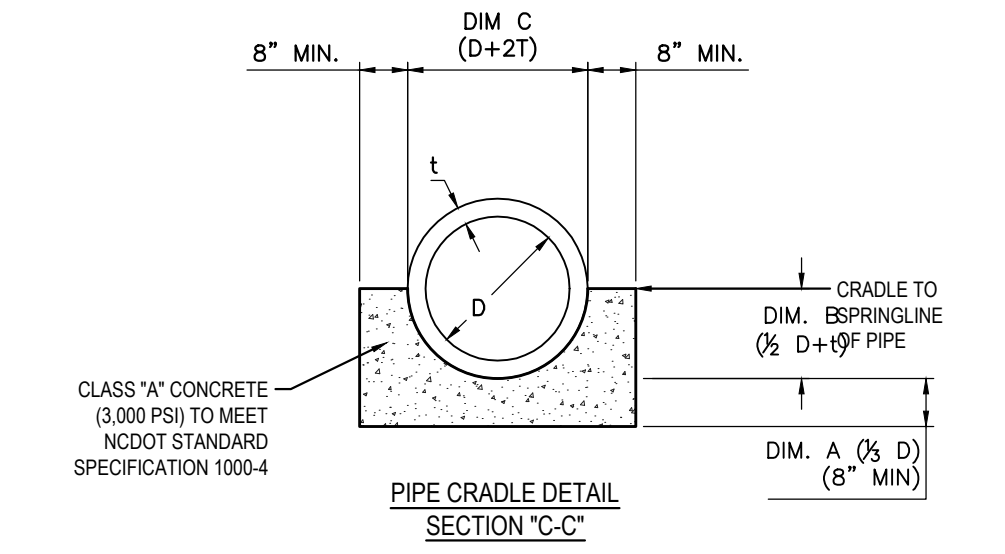
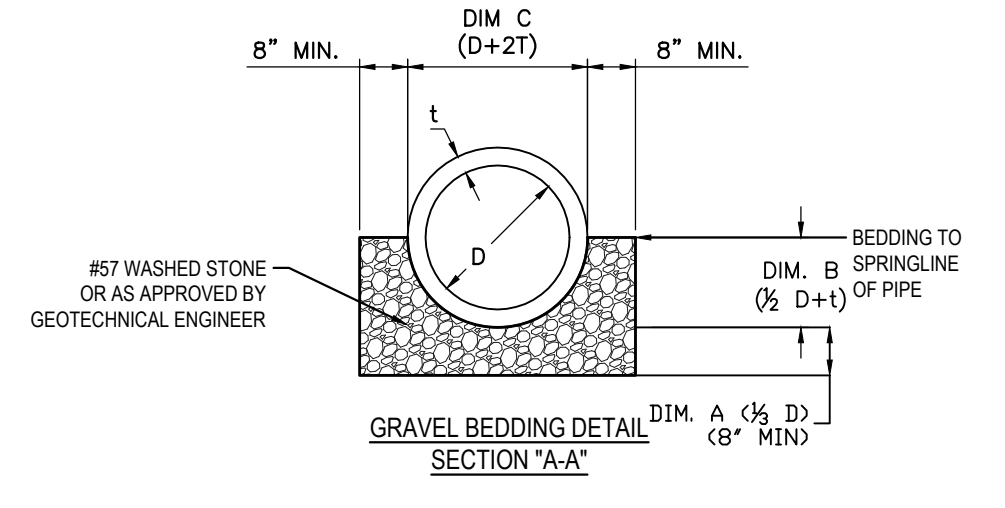
- BOTTOM WIDTH SHALL BE NO LESS THAN 5'
- USE NCDOT CLASS "B" RIP RAP TO FILL SPILLWAY
- SLOPES FROM SPILLWAY BOTTOM TO TOP OF BERM SHOULD BE NO STEEPER THAN 2:1



**STREAM BANK STABILIZATION DETAIL**  
NOT TO SCALE



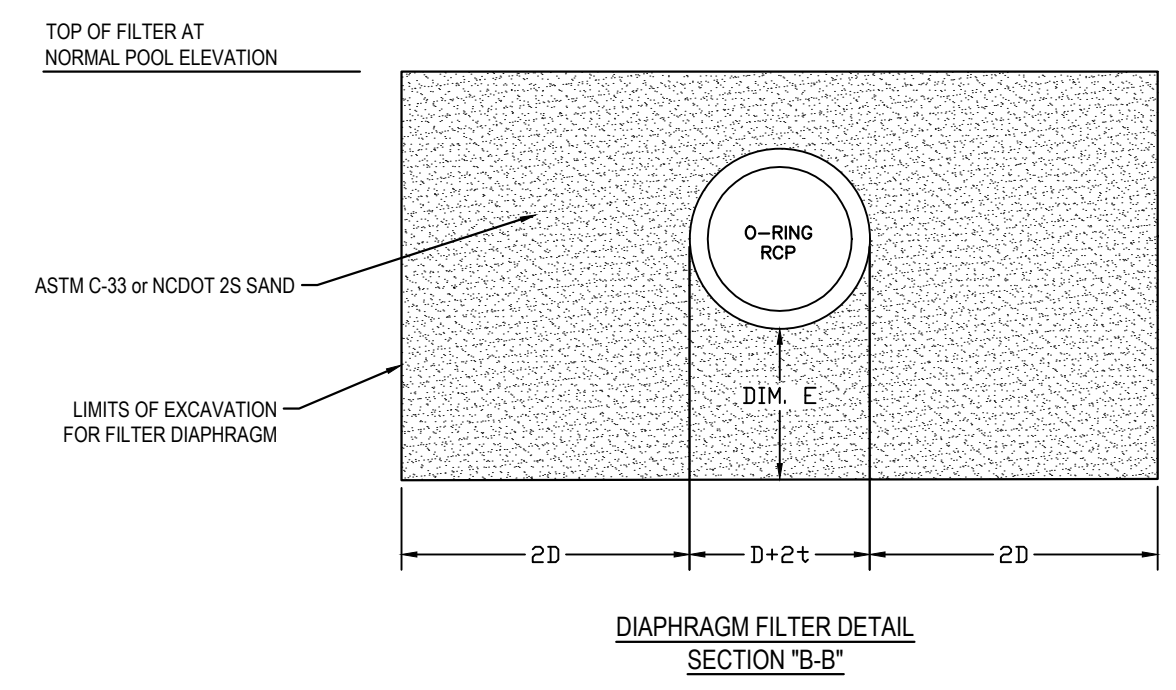
LONGITUDINAL SECTION



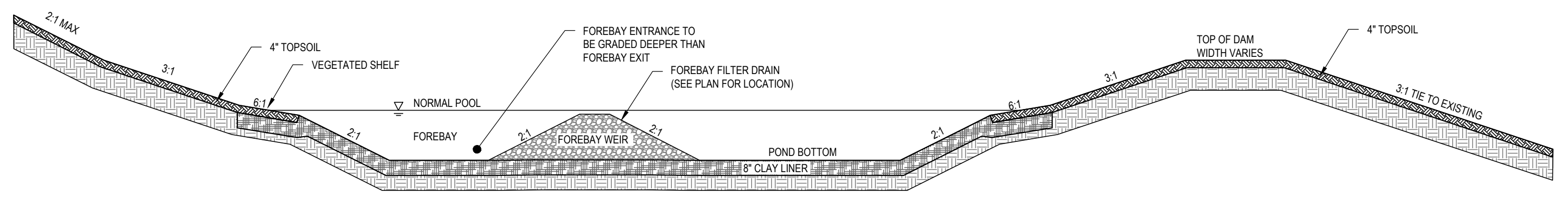
**NOTE:**  
IF PIPE IS INSTALLED IN EXCAVATED TRENCH, THEN SIDE WALLS MAY CONFORM TO TRENCH (TRENCH MAY BE USED AS CRADLE FORM)

NOMINAL PIPE SIZE	DIM A* (1/3 D)	DIM B (1/2 D + 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

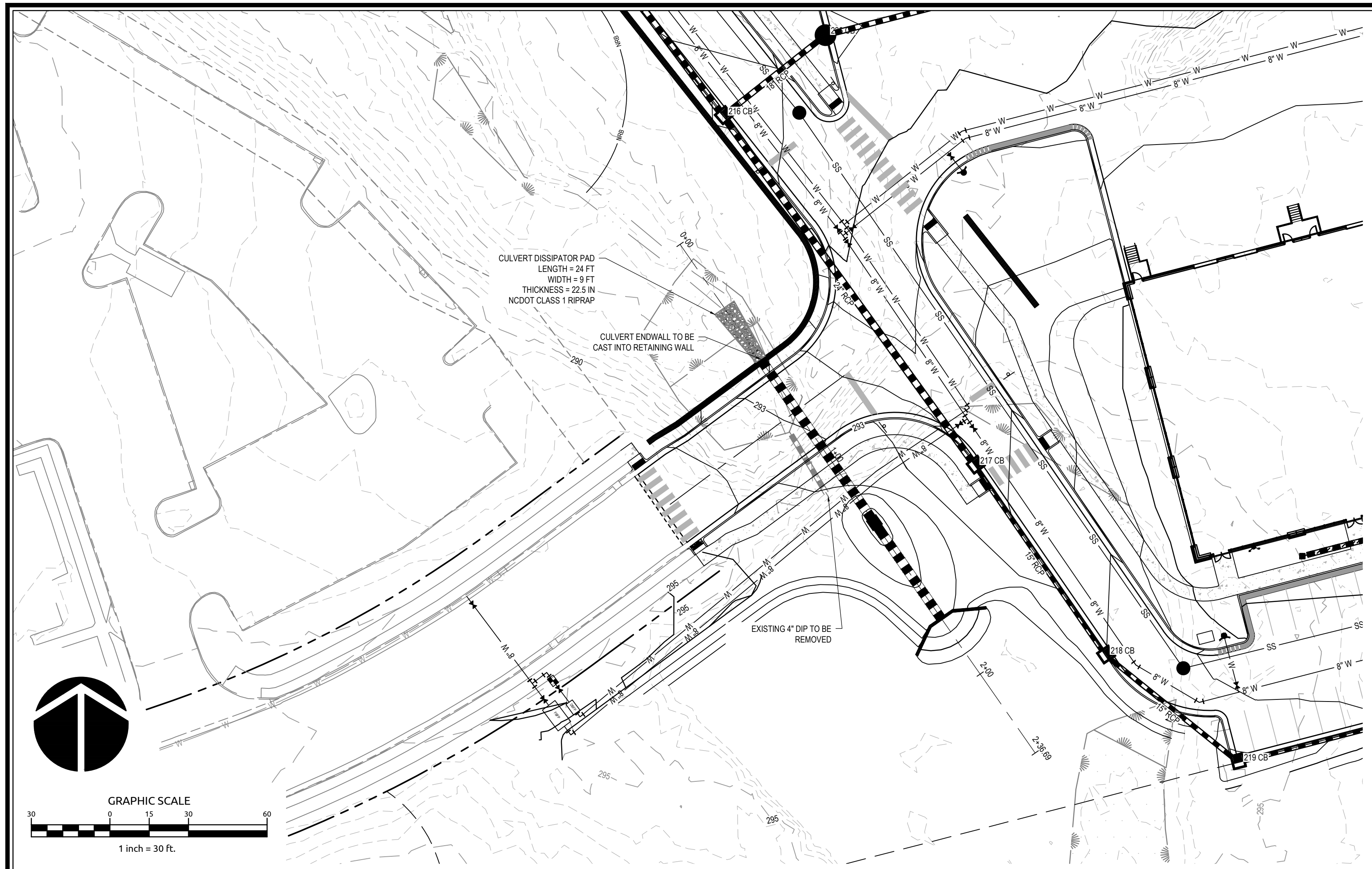


**OUTLET PIPE FILTER DIAPHRAGM & CONCRETE CRADLE DETAIL**  
NOT TO SCALE

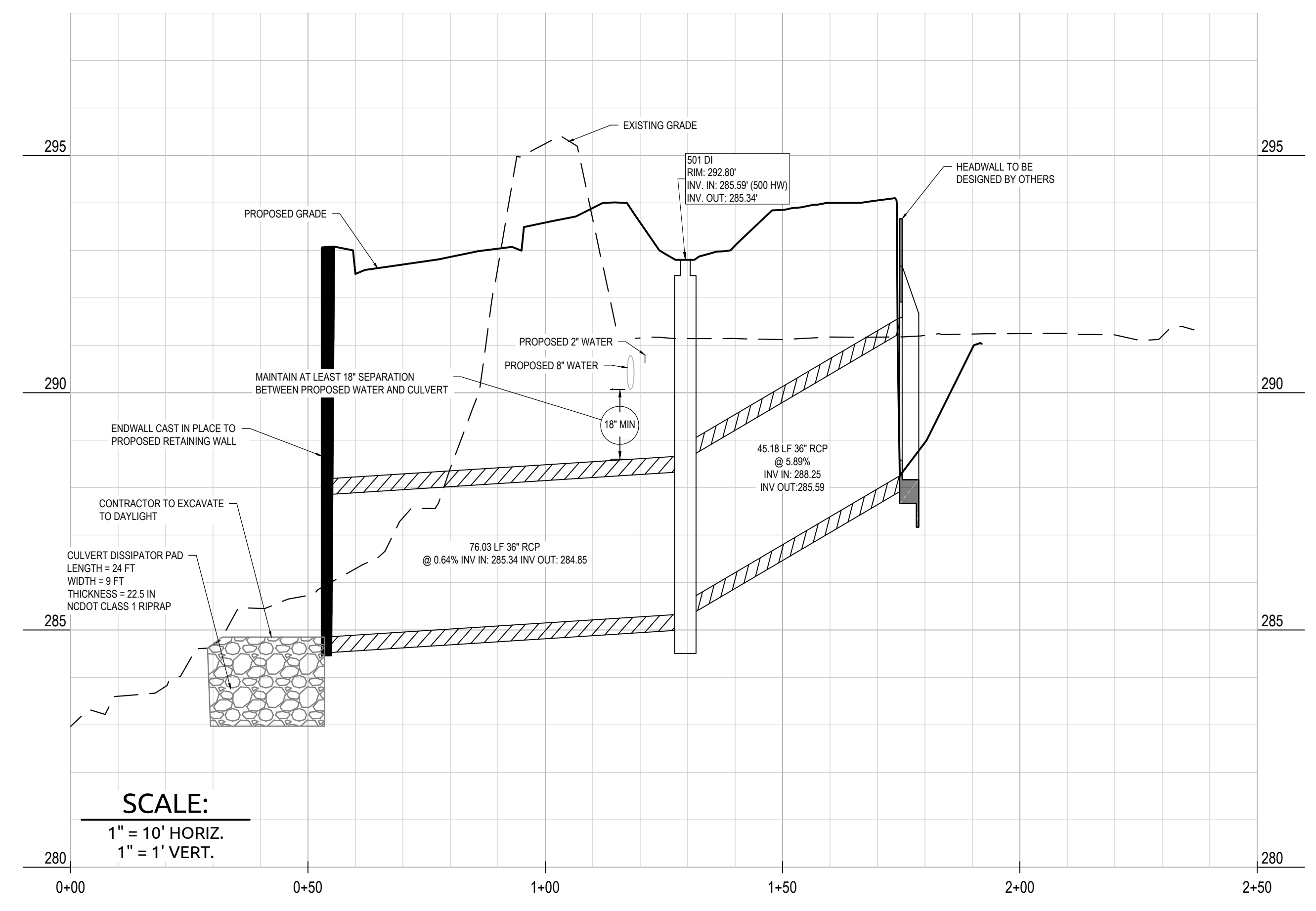


**SCM POND GRADING PROFILE (TYP)**  
NOT TO SCALE

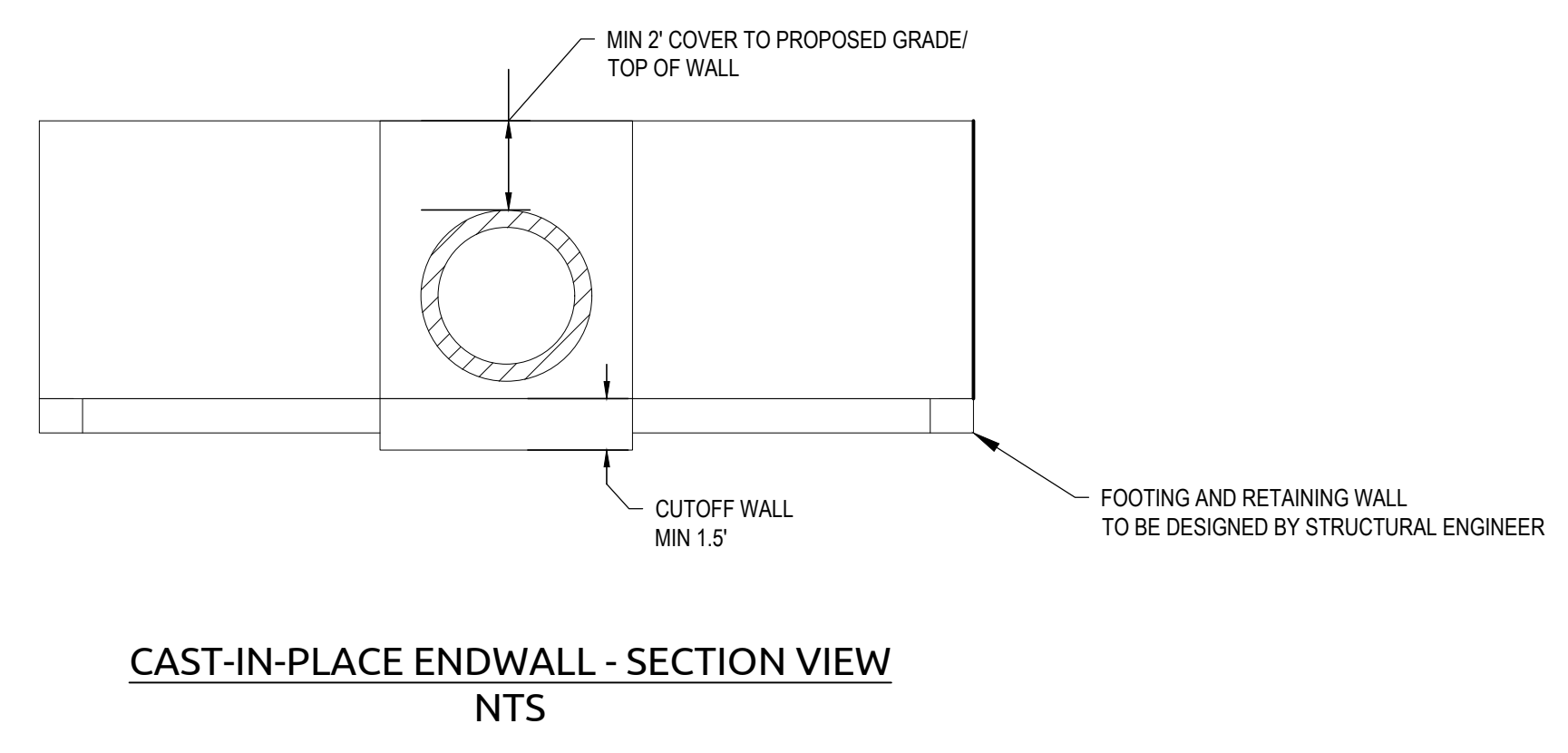
**a. Town Certification.** This design has been reviewed by the Engineer for the Town of Knightdale, and to the best of my knowledge and belief, it conforms to the requirements established in the Standard Specifications of the Town of Knightdale.  
By: \_\_\_\_\_ Date: \_\_\_\_\_  
Town Engineer  
These plans are approved by the Town of Knightdale and serve as construction plans for this project.  
By: \_\_\_\_\_ Date: \_\_\_\_\_  
Administrator



PROPOSED CULVERT PLAN VIEW



PROPOSED CULVERT PROFILE VIEW



CAST-IN-PLACE ENDWALL - SECTION VIEW  
NTS

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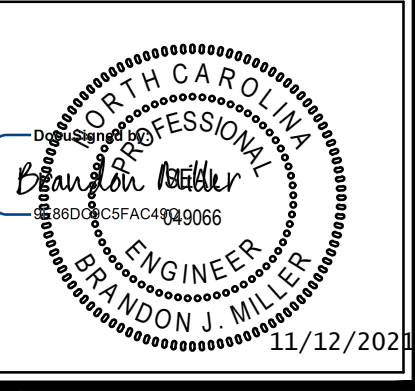
**WithersRavenel**  
Engineers | Planners

137 S Wilmington Street | Suite 200 | Raleigh, NC 27601 | T: 919.469.3340 | License #: C-0832 | www.withersravenel.com

MERRITT HINTON  
OAKS BLVD  
Knightdale, NC

PROPOSED CULVERT PLAN  
AND PROFILE

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

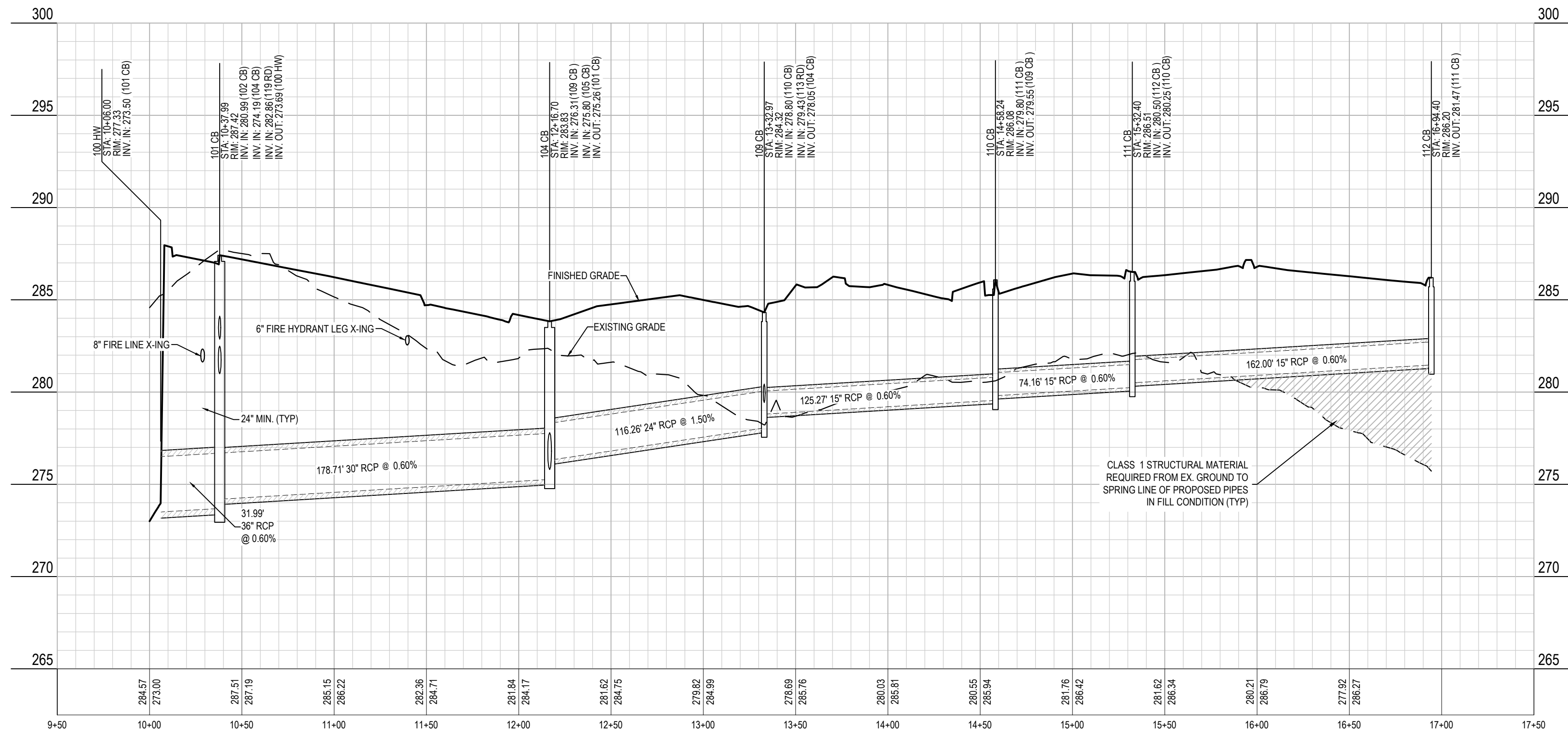


Revisions		
9	SIGNATURE SUBMITTAL	8/27/21
10	REVISION TO APPROVED PLANS	11/11/21

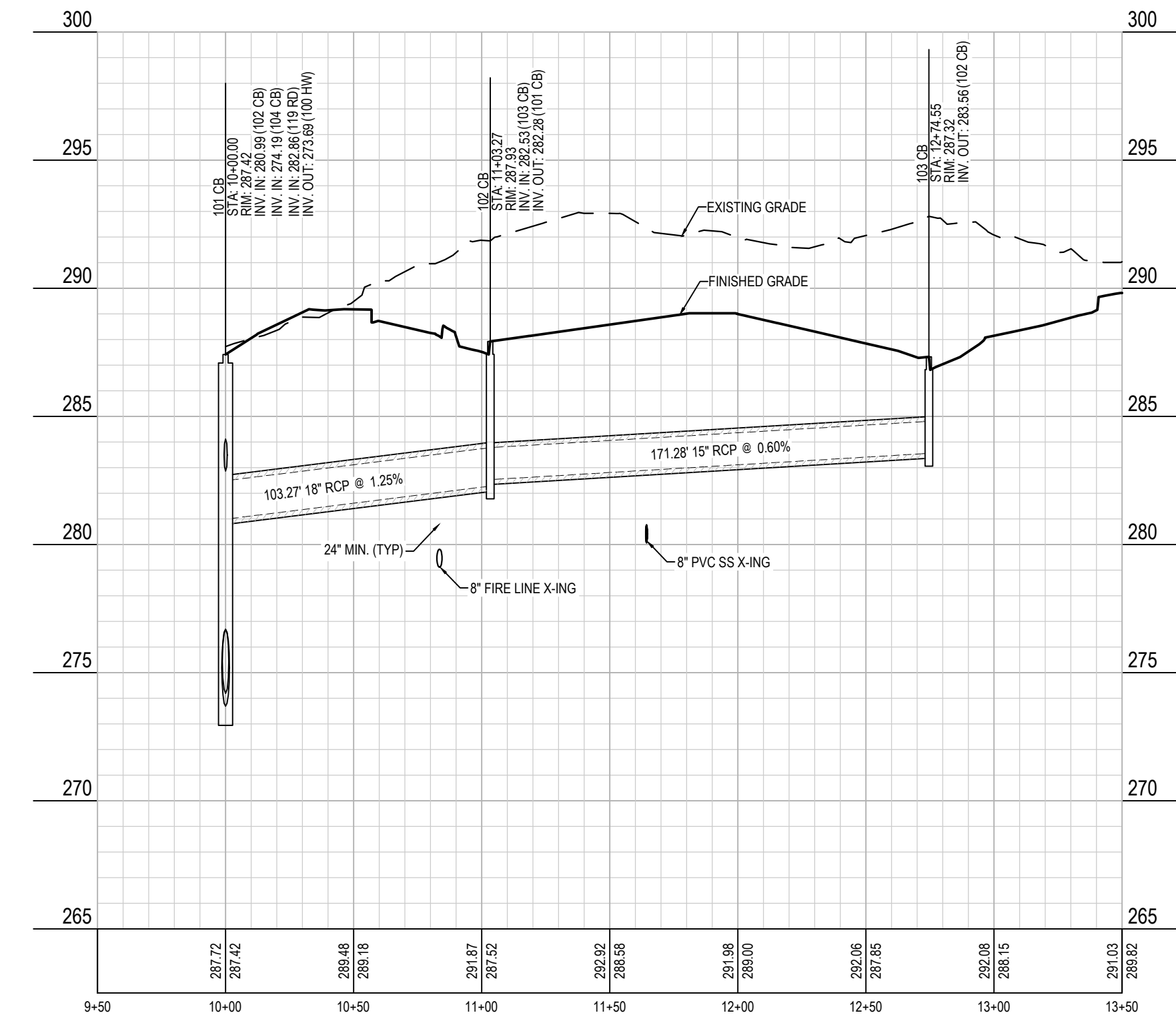

Sheet No.  
**C6.3**



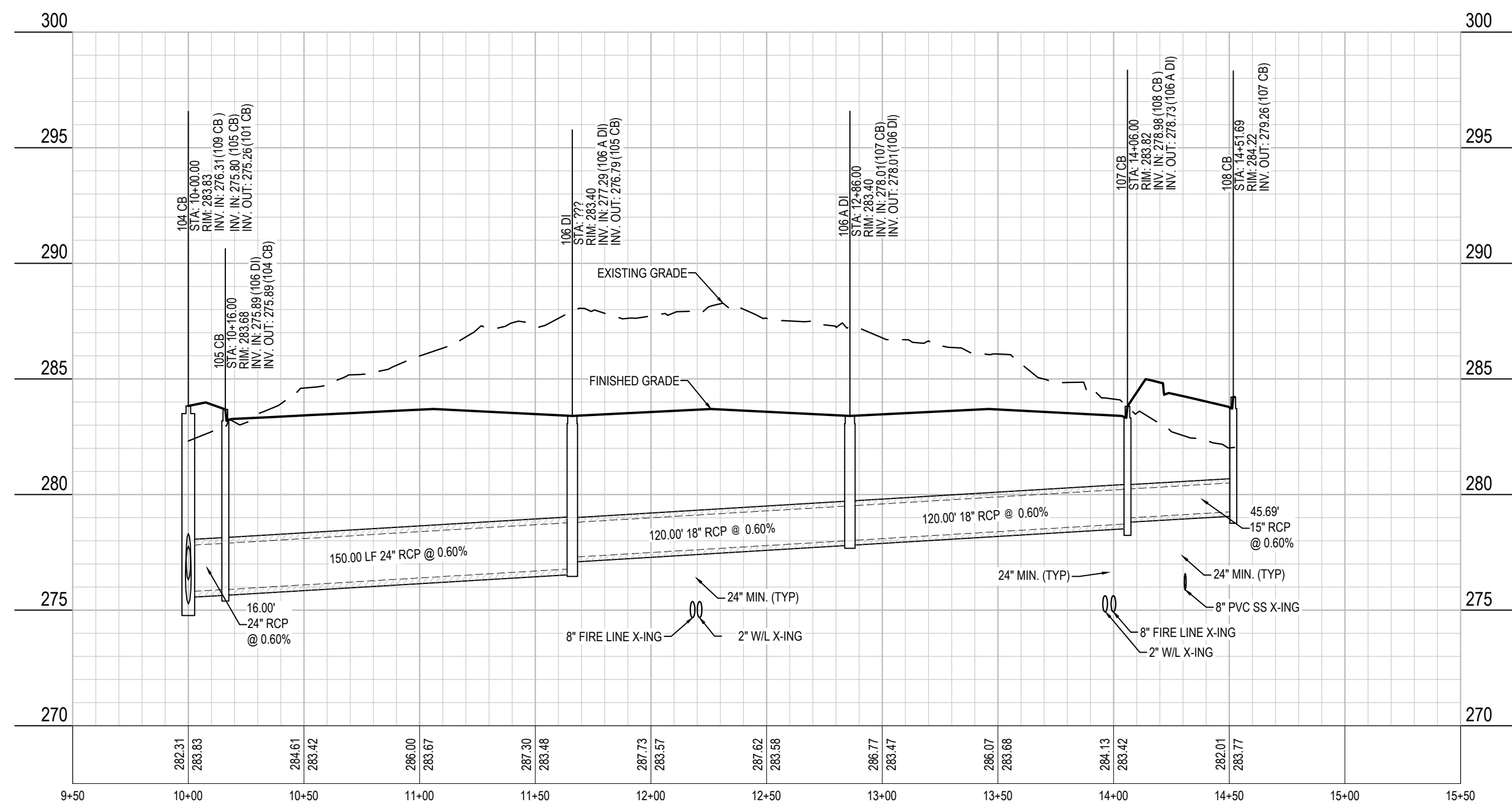
100 HW to 112 CB



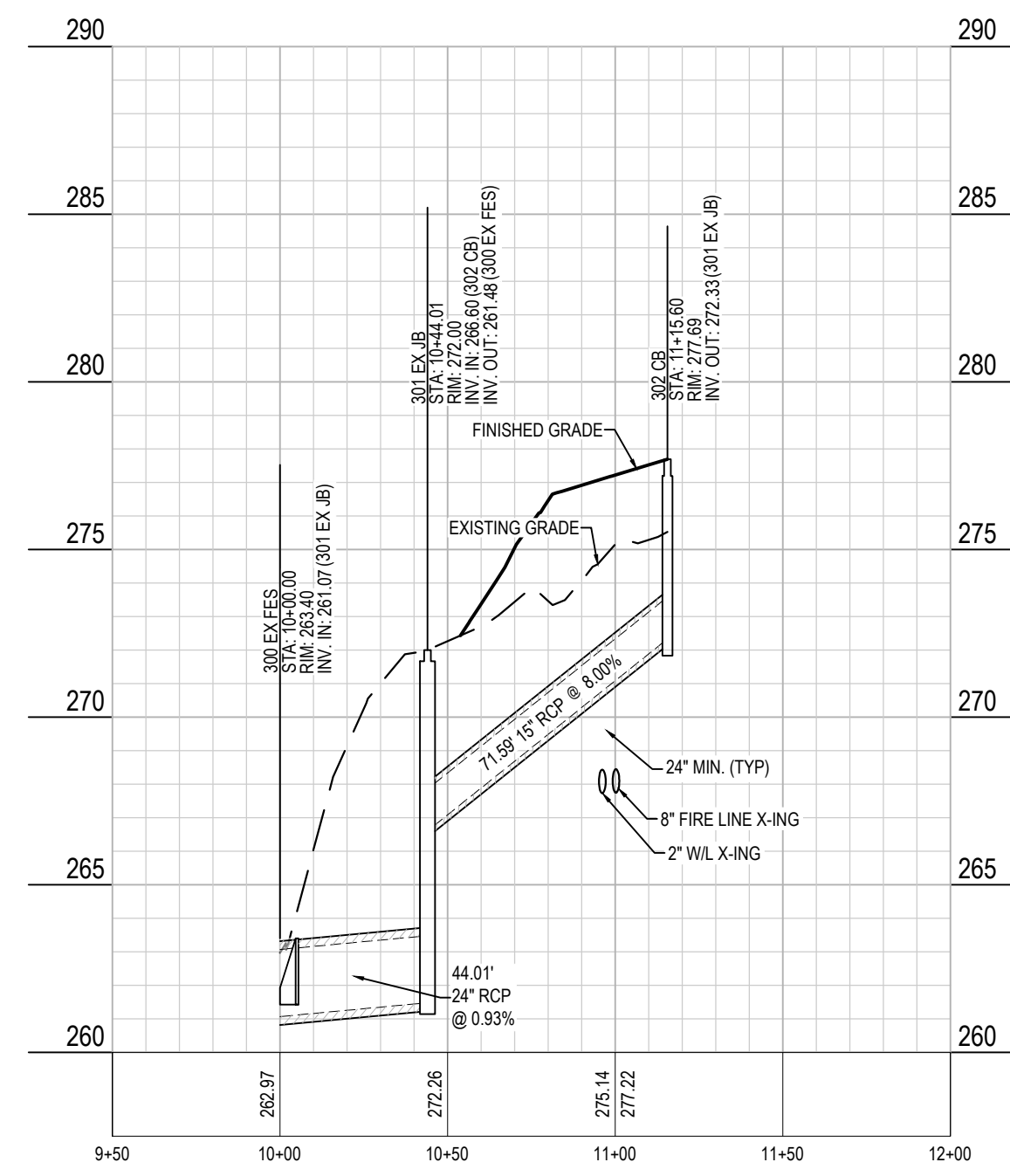
101 CB to 103 CB



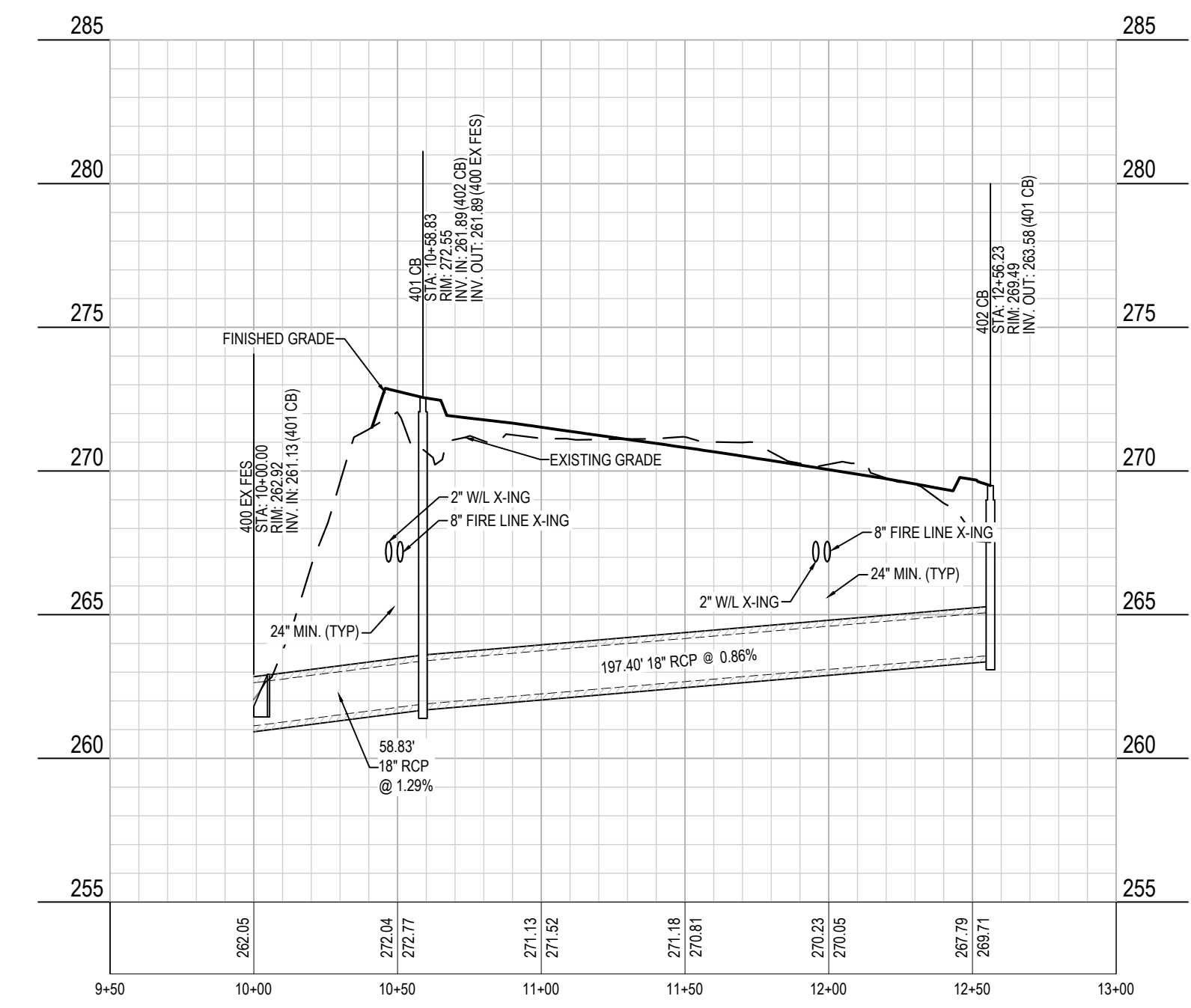
104 CB to 108 CB



300 EX FES to 302 CB



400 EX FES to 402 CB



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Administrator

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

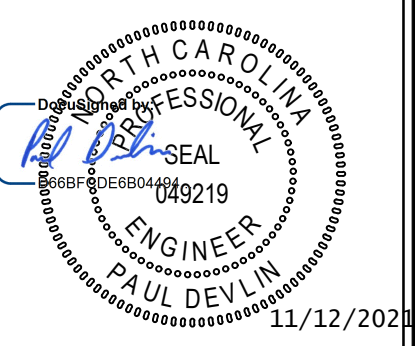


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MERRITT HINTON  
OAKS BLVD  
Knightdale, NC

STORM PROFILES

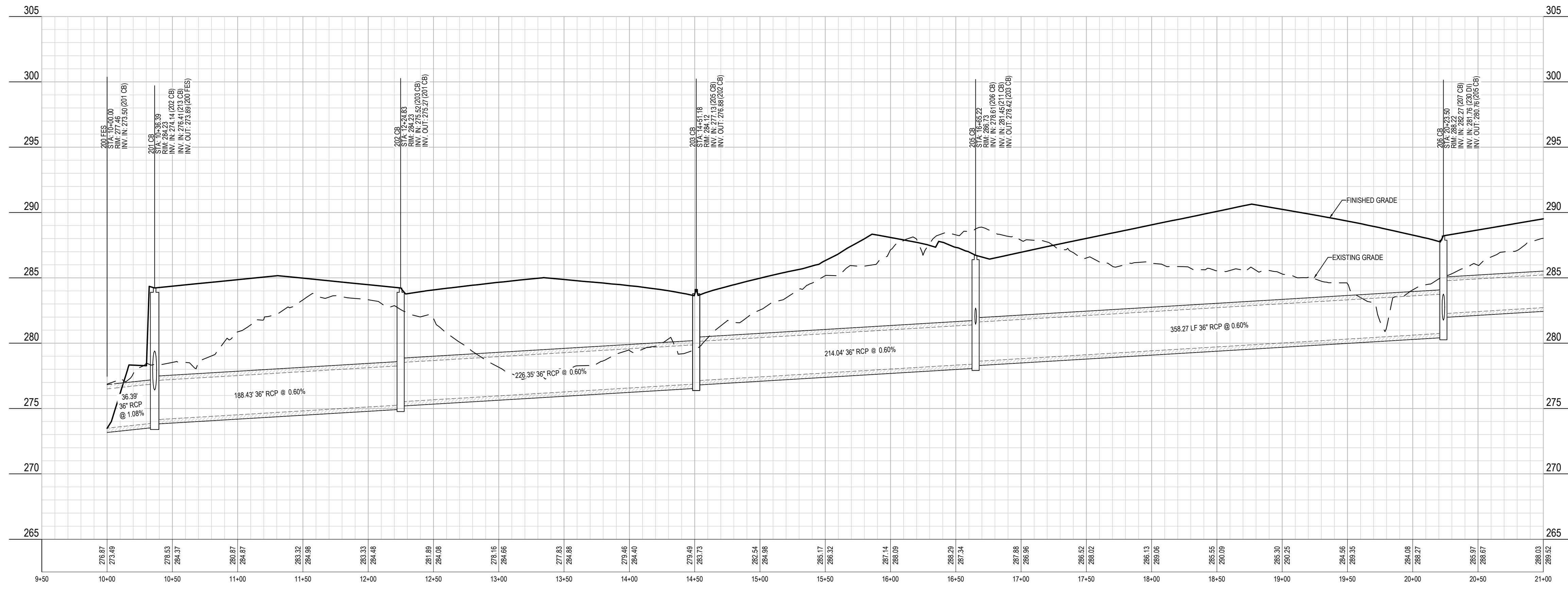
Job No. 09190080.00 Drawn By WR  
Date 09/15/2020 Designer WR



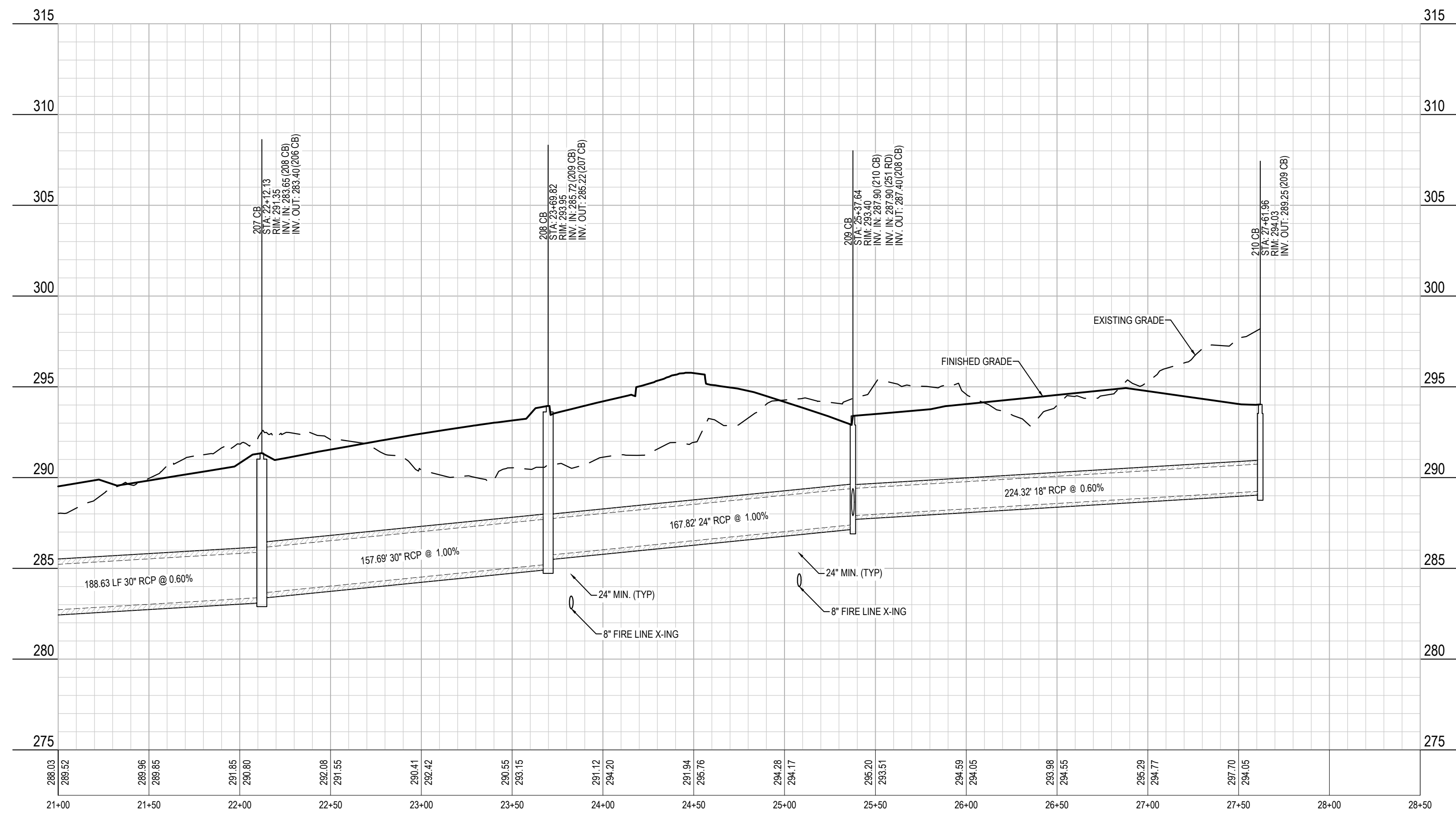
Revisions		
9	SIGNATURE SUBMITTAL	8/27/21
10	REVISION TO APPROVED PLANS	11/11/21

Sheet No.  
**C7.0**

200 FES to 210 CB



200 FES to 210 CB



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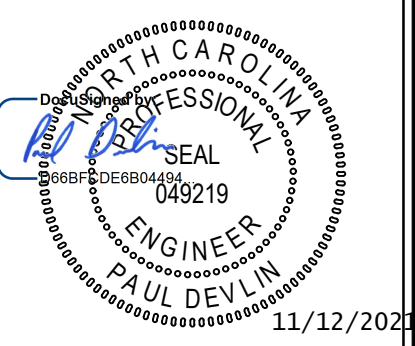


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MERRITT HINTON  
OAKS BLVD  
Knightdale, NC

STORM PROFILES

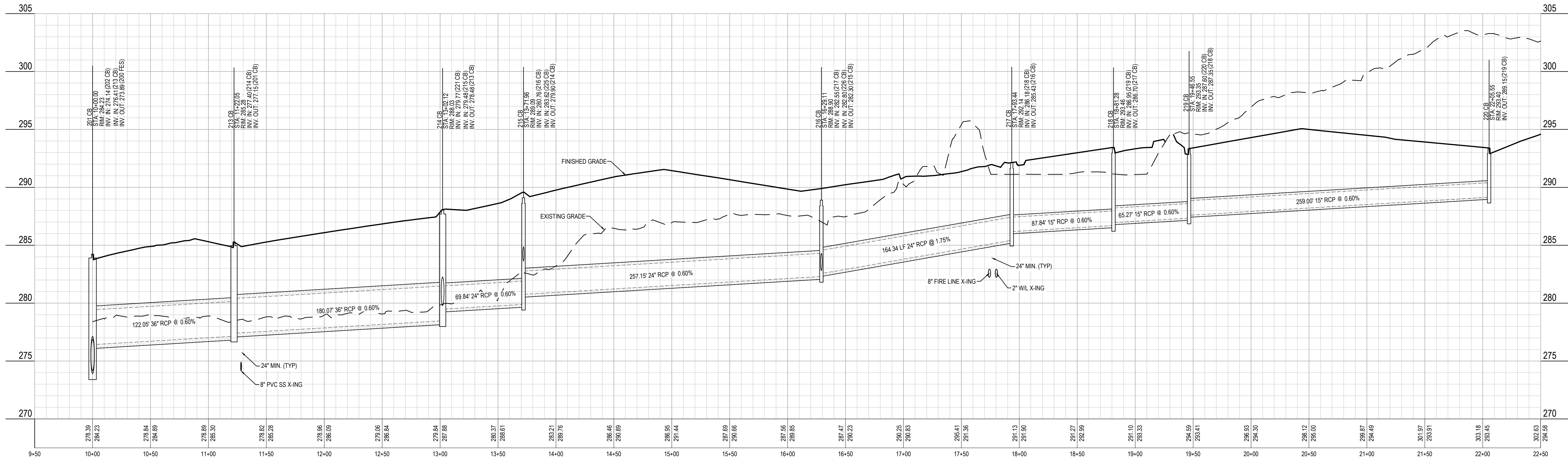
Job No. 09190080.00 Drawn By WR  
Date 09/15/2020 Designer WR



Revisions		
9	SIGNATURE SUBMITTAL	8/27/21
10	REVISION TO APPROVED PLANS	11/11/21

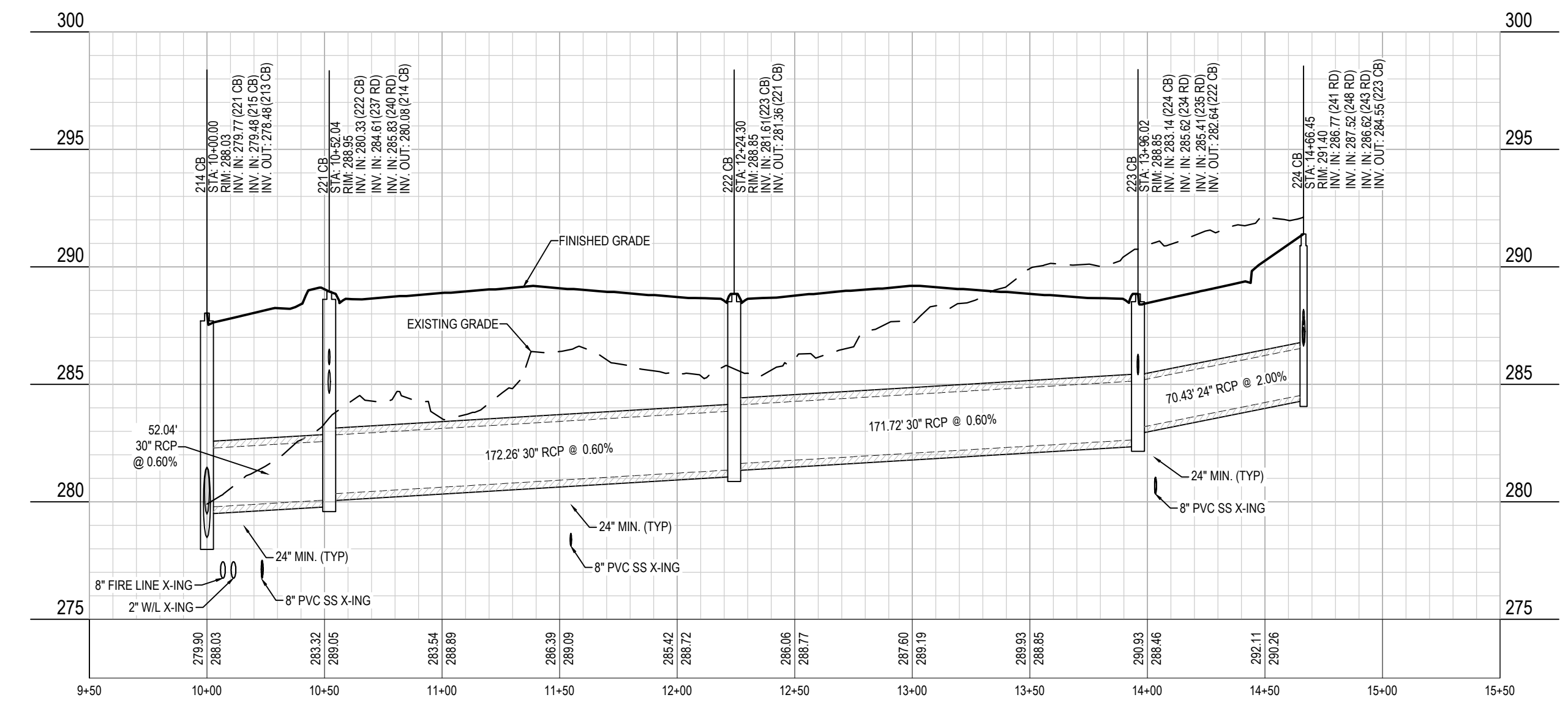
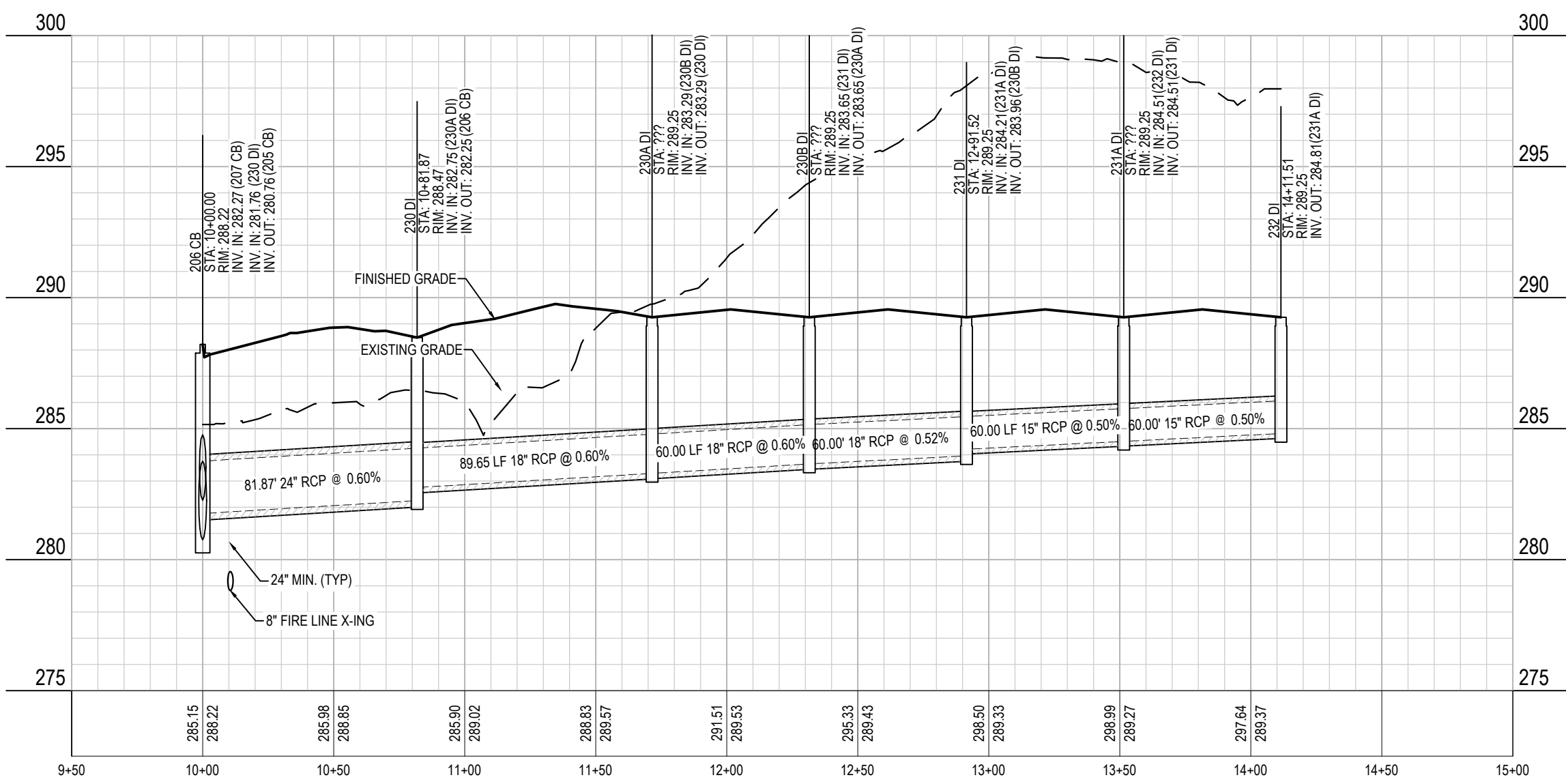
Sheet No.  
**C7.1**

201 CB to 220 CB



206 CB to 232 DI

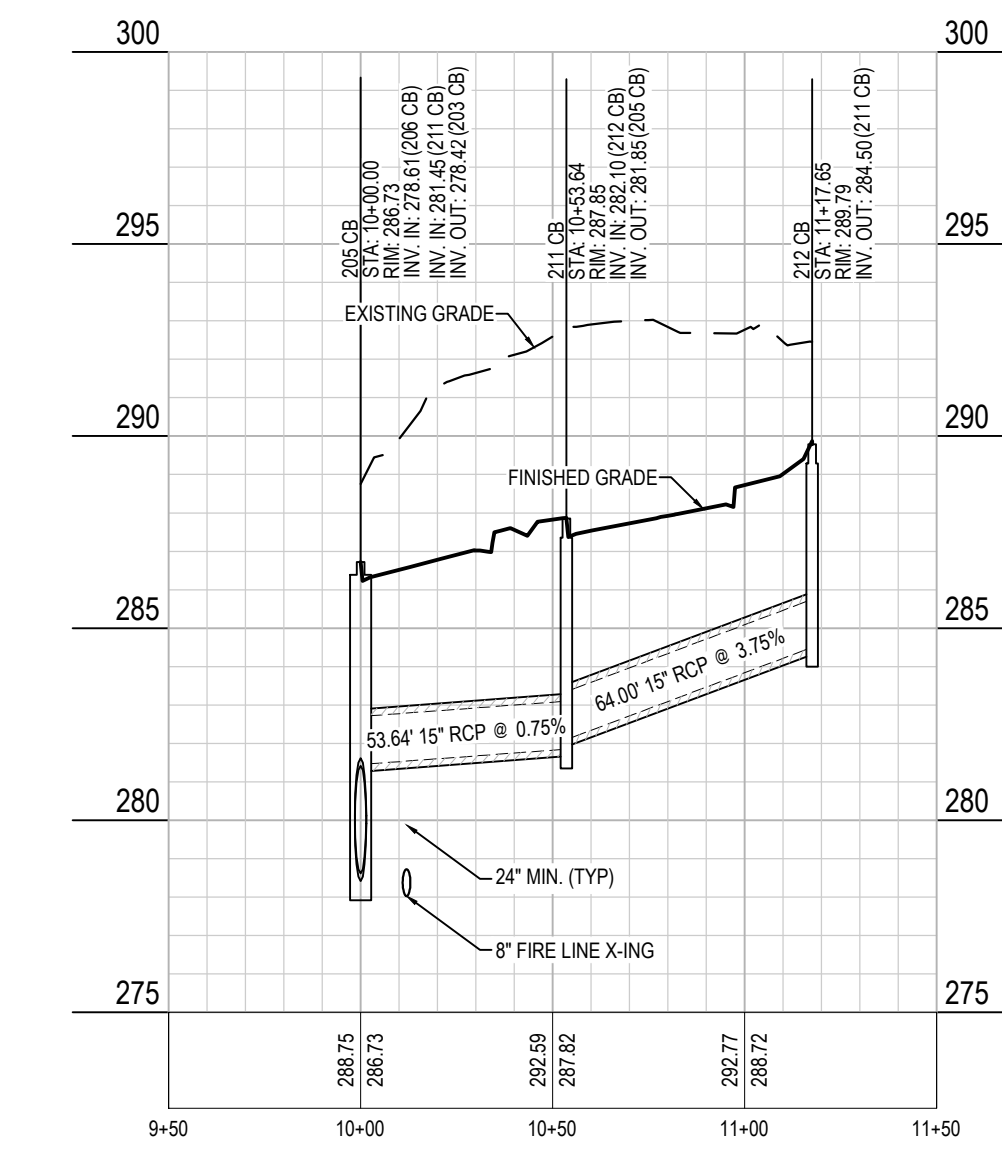
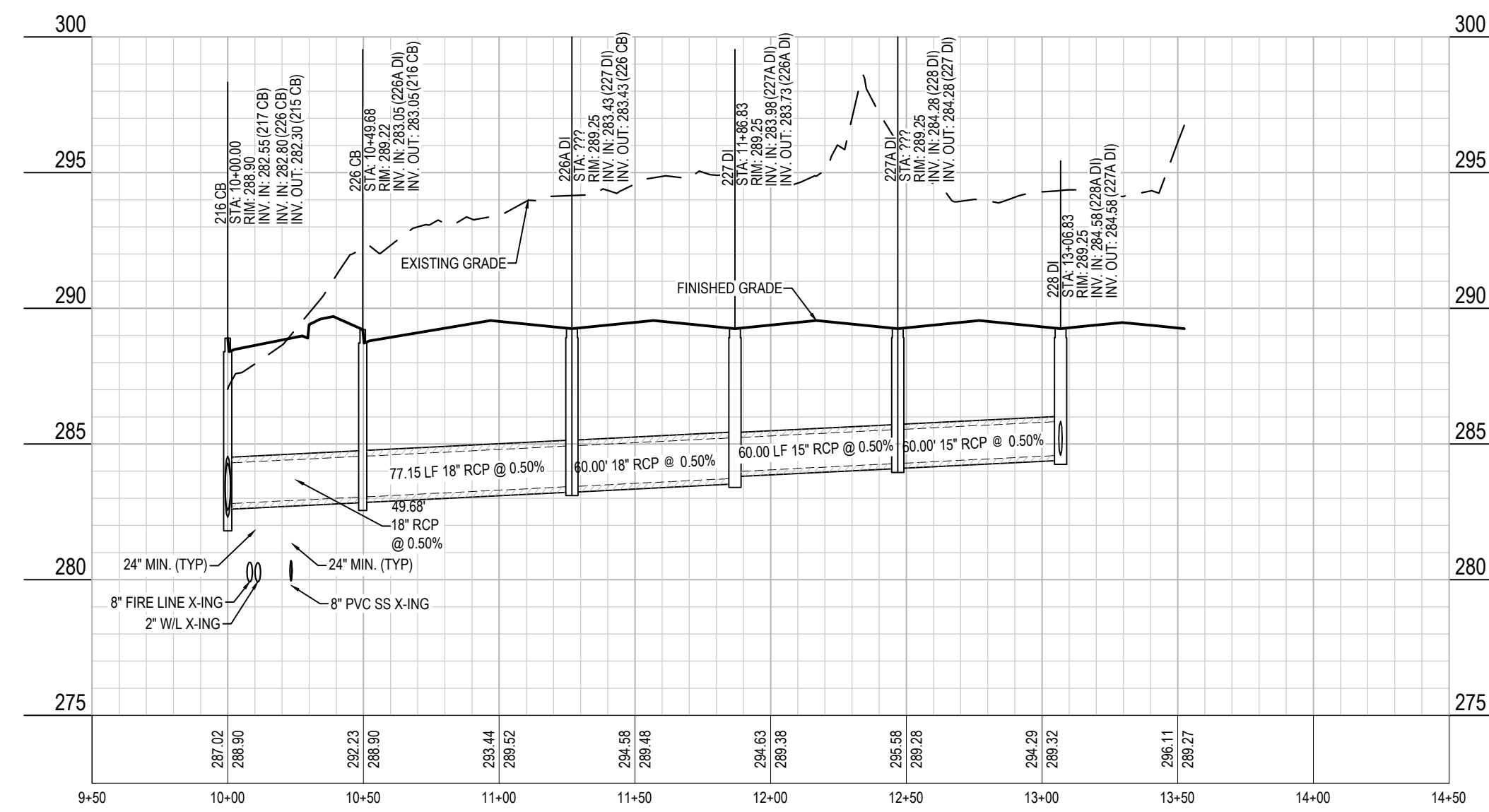
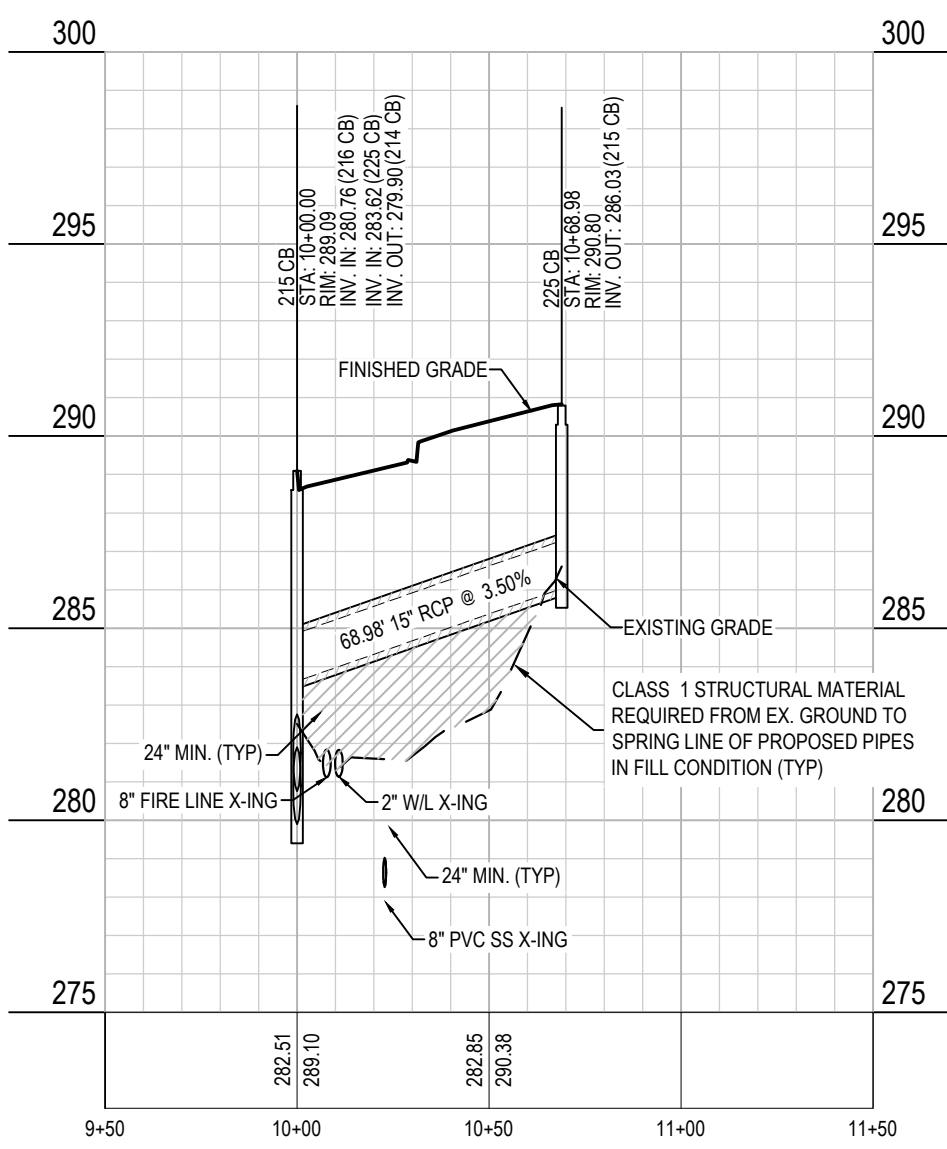
214 CB to 224 CB



215 CB to 225 CB

216 CB to 228 DI

205 CB to 212 CB



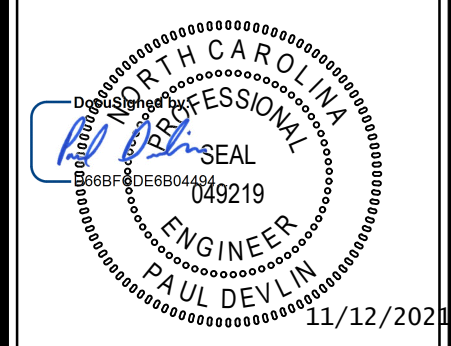
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Administrator

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



Revisions		
9	SIGNATURE SUBMITTAL	8/27/21
10	REVISION TO APPROVED PLANS	11/11/21

STORM STRUCTURE TABLE with columns: STRUCTURE, RIM EL, STRUCTURE IN, INVERT IN, INVERT OUT. Rows include 100 HW, 101 CB, 102 CB, 103 CB, 104 CB, 105 CB, 106 A DI, 106 DI, 107 CB, 108 CB, 109 CB, 110 CB, 111 CB, 112 CB, 113 RD, 114 RD, 115 RD, 116 RD, 117 RD, 118 RD, 119 RD, 120 RD, 121 RD, 122 RD, 123 RD, 124 RD, 125 RD, 200 FES, 201 CB, 202 CB, 203 CB, 204 CB, 205 CB, 206 CB, 207 CB, 208 CB, 209 CB, 210 CB, 211 CB, 212 CB, 213 CB, 214 CB, 215 CB, 216 CB, 217 CB, 218 CB, 219 CB, 220 CB, 221 CB, 222 CB, 223 CB, 224 CB, 225 CB, 226 CB, 227 DI.

STORM STRUCTURE TABLE with columns: STRUCTURE, RIM EL, STRUCTURE IN, INVERT IN, INVERT OUT. Rows include 227A DI, 228 DI, 228A DI, 228A DI, 228A DI, 230 DI, 230A DI, 230B DI, 231 DI, 231A DI, 232 DI, 234 RD, 235 RD, 236 RD, 237 RD, 238 RD, 239 RD, 240 RD, 241 RD, 242 RD, 243 RD, 244 RD, 245 RD, 246 RD, 247 RD, 248 RD, 249 RD, 250 RD, 251 RD, 252 RD, 253 RD, 254 RD, 255 RD, 256 RD, 257 RD, 258 RD, 259 RD, 260 RD, 261 RD, 262 RD, 262 RD, Structure - (246).

STORM STRUCTURE TABLE with columns: STRUCTURE, RIM EL, STRUCTURE IN, INVERT IN, INVERT OUT. Rows include 300 EX FES, 301 EX JB, 302 CB, 400 EX FES, 401 CB, 402 CB.

STORM STRUCTURE TABLE with columns: STRUCTURE, RIM EL, STRUCTURE IN, INVERT IN, INVERT OUT. Rows include 500 HW, 501 DI, 502, FES-1, FES-2, RISER-1, RISER-2.

STORM SYSTEM DATA with columns: DOWNSTREAM STRUCTURE, UPSTREAM STRUCTURE, SIZE, LENGTH, SLOPE, MATERIAL, UPSTREAM INVERT, DOWNSTREAM INVERT. Rows include 100 HW, 101 CB, 101 CB, 101 CB, 101 CB, 102 CB, 104 CB, 104 CB, 105 CB, 106 A DI, 106 DI, 107 CB, 107 CB, 107 CB, 108 CB, 109 CB, 109 CB, 110 CB, 110 CB, 111 CB, 111 CB, 113 RD, 114 RD, 114 RD, 114 RD, 115 RD, 115 RD, 116 RD, 116 RD, 117 RD, 117 RD, 119 RD, 120 RD, 120 RD, 121 RD, 121 RD, 122 RD, 122 RD, 123 RD, 123 RD, 123 RD, 124 RD, 124 RD, 124 RD, 200 FES, 201 CB, 201 CB, 201 CB, 202 CB, 202 CB, 203 CB, 203 CB, 203 CB, 205 CB, 205 CB, 205 CB, 206 CB, 206 CB, 206 CB, 206 CB, 207 CB, 207 CB, 208 CB, 208 CB, 209 CB, 209 CB, 209 CB, 211 CB, 211 CB, 211 CB, 215 CB, 215 CB, 215 CB, 215 CB, 216 CB, 216 CB, 216 CB, 217 CB, 217 CB, 218 CB, 218 CB, 219 CB, 219 CB, 219 CB, 221 CB, 221 CB, 222 CB, 222 CB, 223 CB, 223 CB, 223 CB, 224 CB, 224 CB, 224 CB, 224 CB.

STORM SYSTEM DATA with columns: DOWNSTREAM STRUCTURE, UPSTREAM STRUCTURE, SIZE, LENGTH, SLOPE, MATERIAL, UPSTREAM INVERT, DOWNSTREAM INVERT. Rows include 228 CB, 226A DI, 227 DI, 227A DI, 228 DI, 228A DI, 230 DI, 230A DI, 230B DI, 231 DI, 231A DI, 232 DI, 234 RD, 236 RD, 237 RD, 238 RD, 239 RD, 241 RD, 241 RD, 243 RD, 244 RD, 244 RD, 245 RD, 245 RD, 248 RD, 249 RD, 249 RD, 251 RD, 252 RD, 252 RD, 253 RD, 253 RD, 254 RD, 254 RD, 255 RD, 255 RD, 256 RD, 256 RD, 257 RD, 257 RD, 258 RD, 258 RD, 259 RD, 259 RD, 260 RD, 260 RD, 261 RD, 261 RD.

STORM SYSTEM DATA with columns: DOWNSTREAM STRUCTURE, UPSTREAM STRUCTURE, SIZE, LENGTH, SLOPE, MATERIAL, UPSTREAM INVERT, DOWNSTREAM INVERT. Rows include 300 EX FES, 301 EX JB, 301 EX JB, 400 EX FES, 401 CB, 401 CB, 402 CB, 402 CB.

STORM SYSTEM DATA with columns: DOWNSTREAM STRUCTURE, UPSTREAM STRUCTURE, SIZE, LENGTH, SLOPE, MATERIAL, UPSTREAM INVERT, DOWNSTREAM INVERT. Rows include 501 DI, 502, FES-1, FES-2, RISER-1, RISER-2.

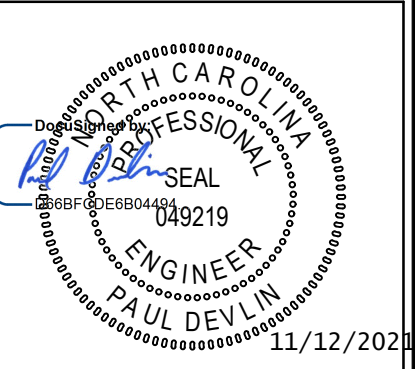
ABBREVIATION LEGEND with rows: CB = STD. CURB INLET (SEE DETAIL ON SHEET C9.2), DI = STD. DROP INLET W/ GRATE & FRAME (SEE DETAIL ON SHEET C9.2), RD = ROOF DRAIN DOWNSPOUT CONNECTION UNDERGROUND.



MERRITT HINTON OAKS BLVD Knightdale, NC

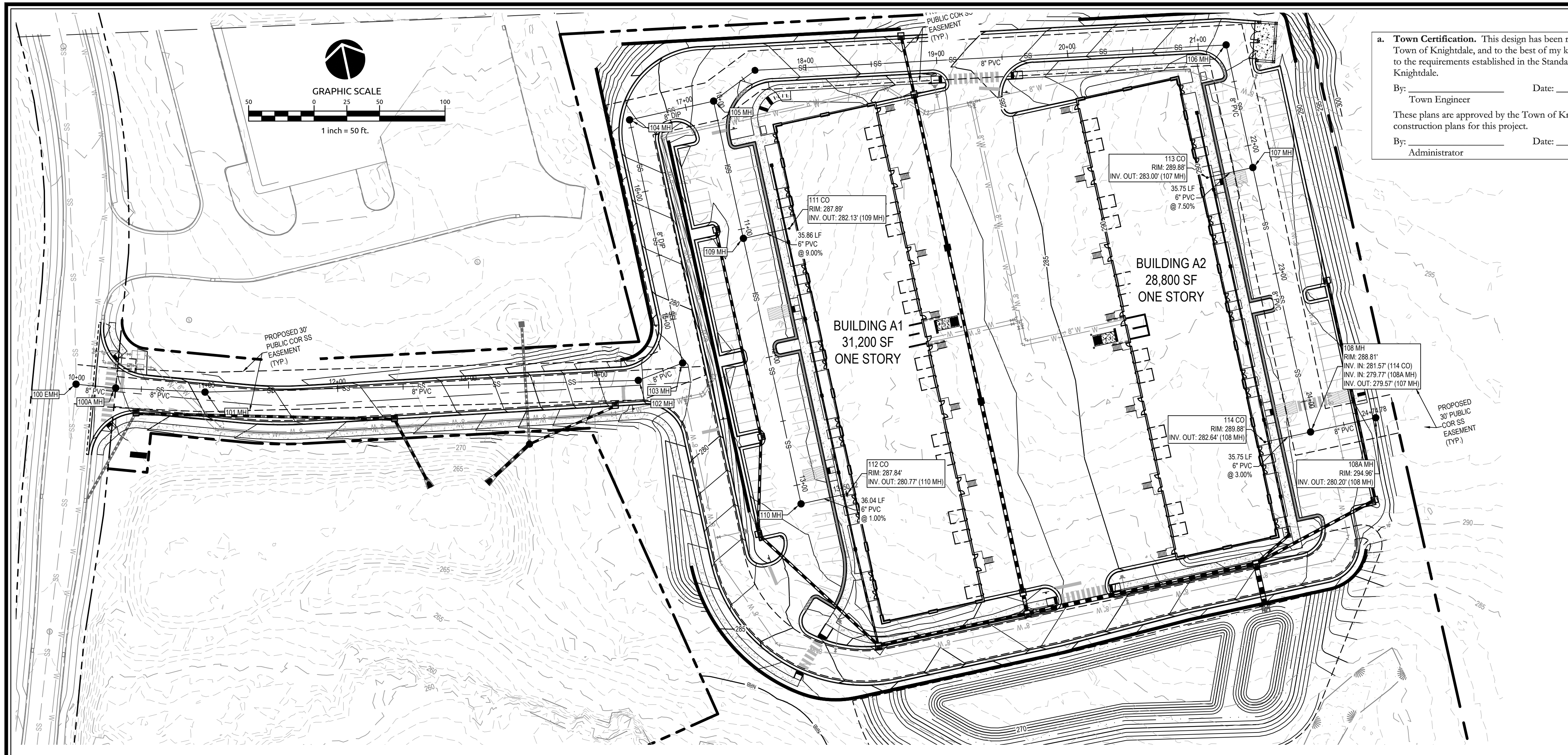
PIPE AND STRUCTURE TABLES

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



Revisions table with columns: No., Description, Date. Row 9: SIGNATURE SUBMITTAL 8/27/21. Row 10: REVISION TO APPROVED PLANS 11/11/21.

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



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Town Engineer

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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 # S-4880**

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

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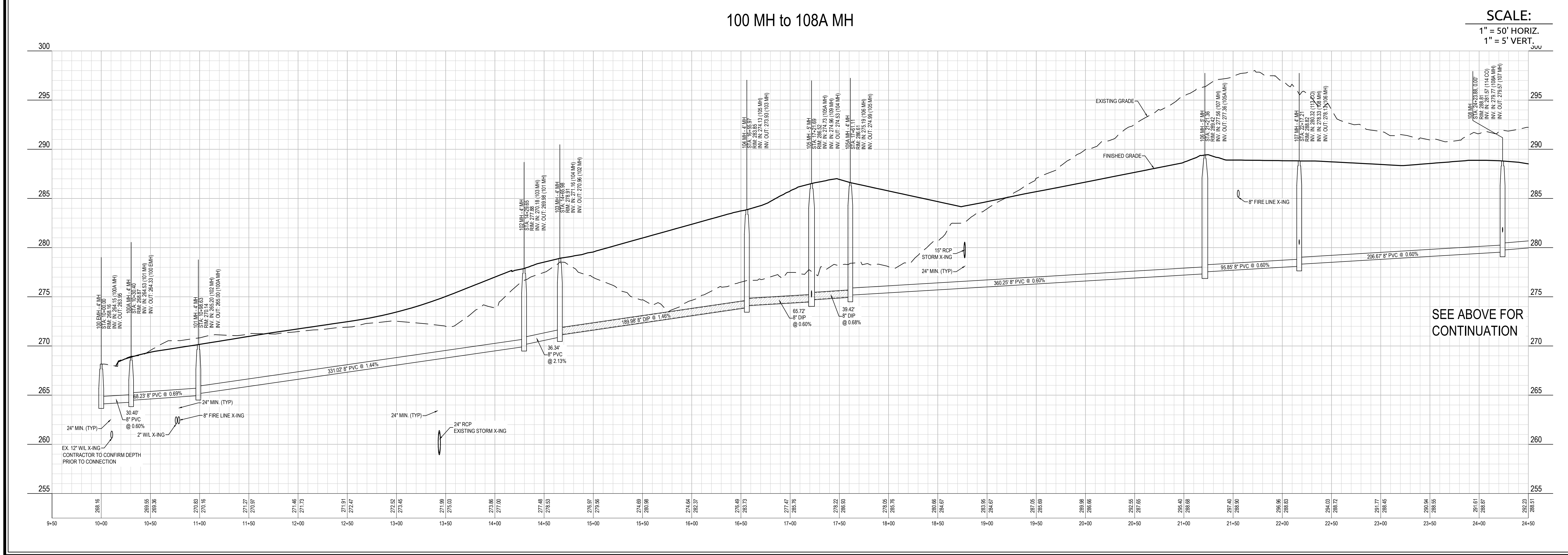
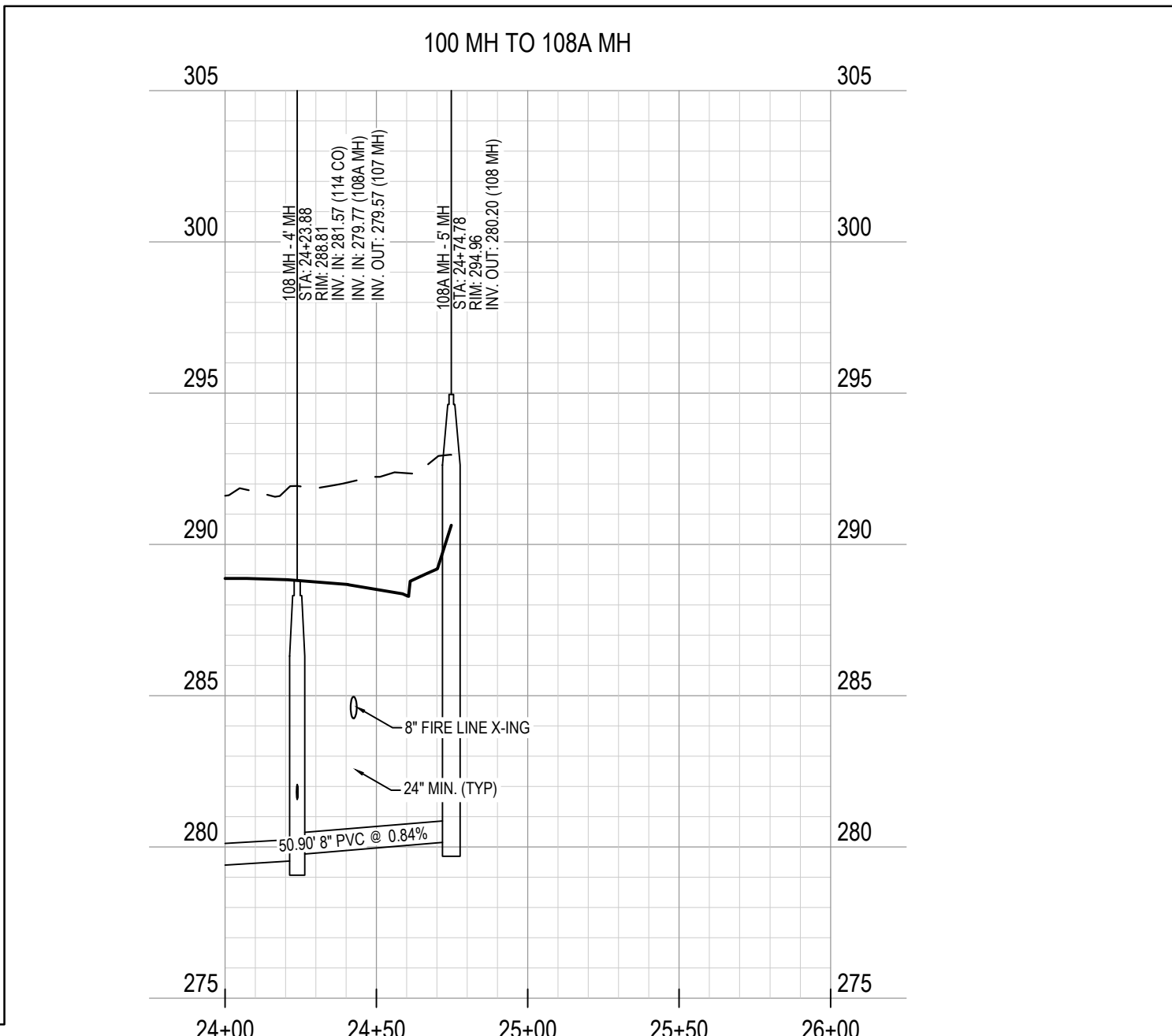
**City of Raleigh Public Utilities Department Permit # S-4879P**

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

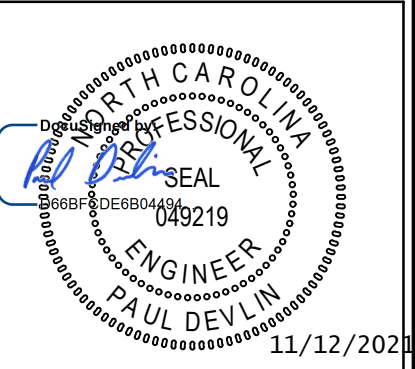
Raleigh Water Review Officer \_\_\_\_\_



**MERRITT HINTON**  
**OAKS BLVD**  
Knightdale, NC

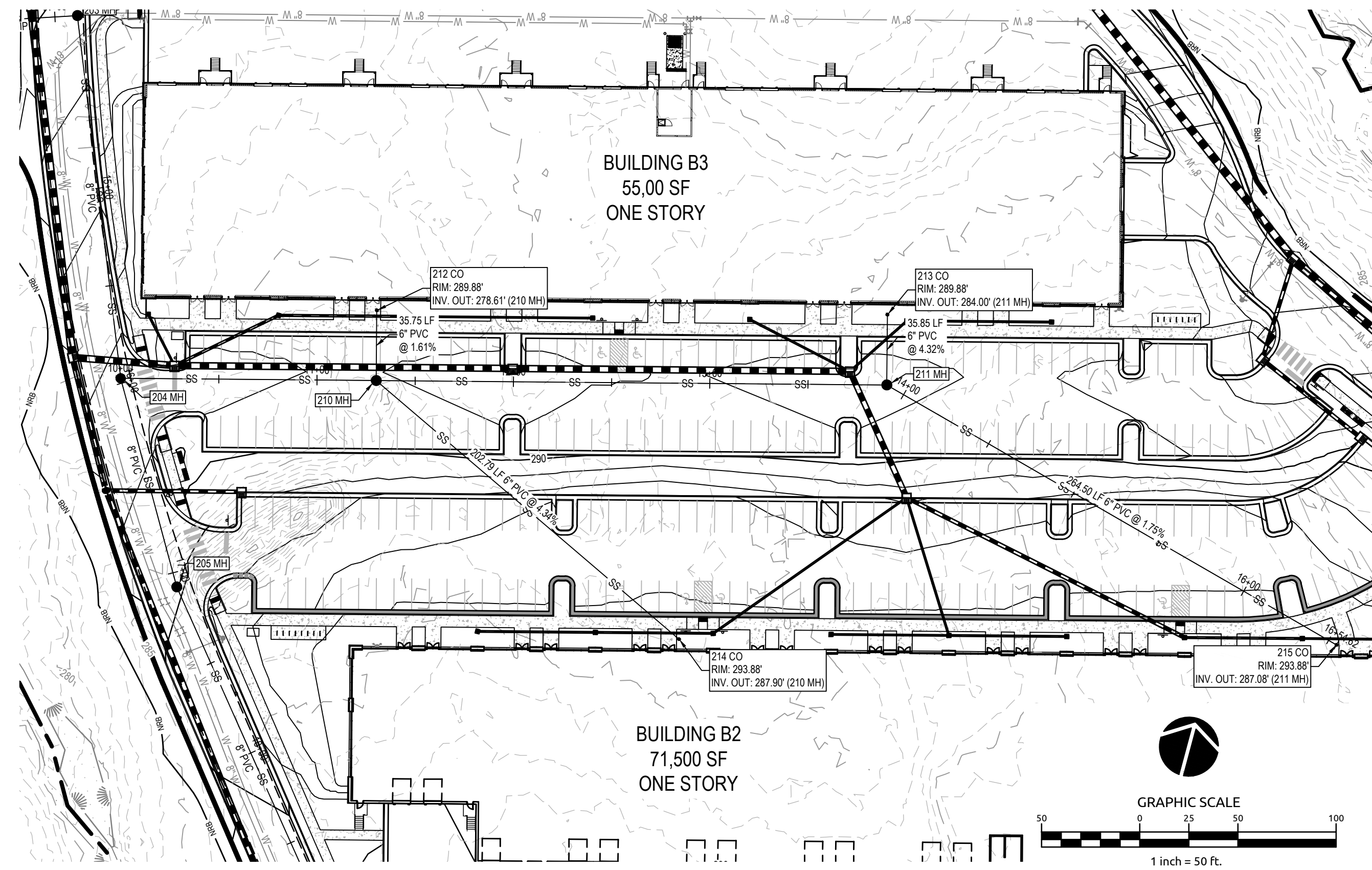
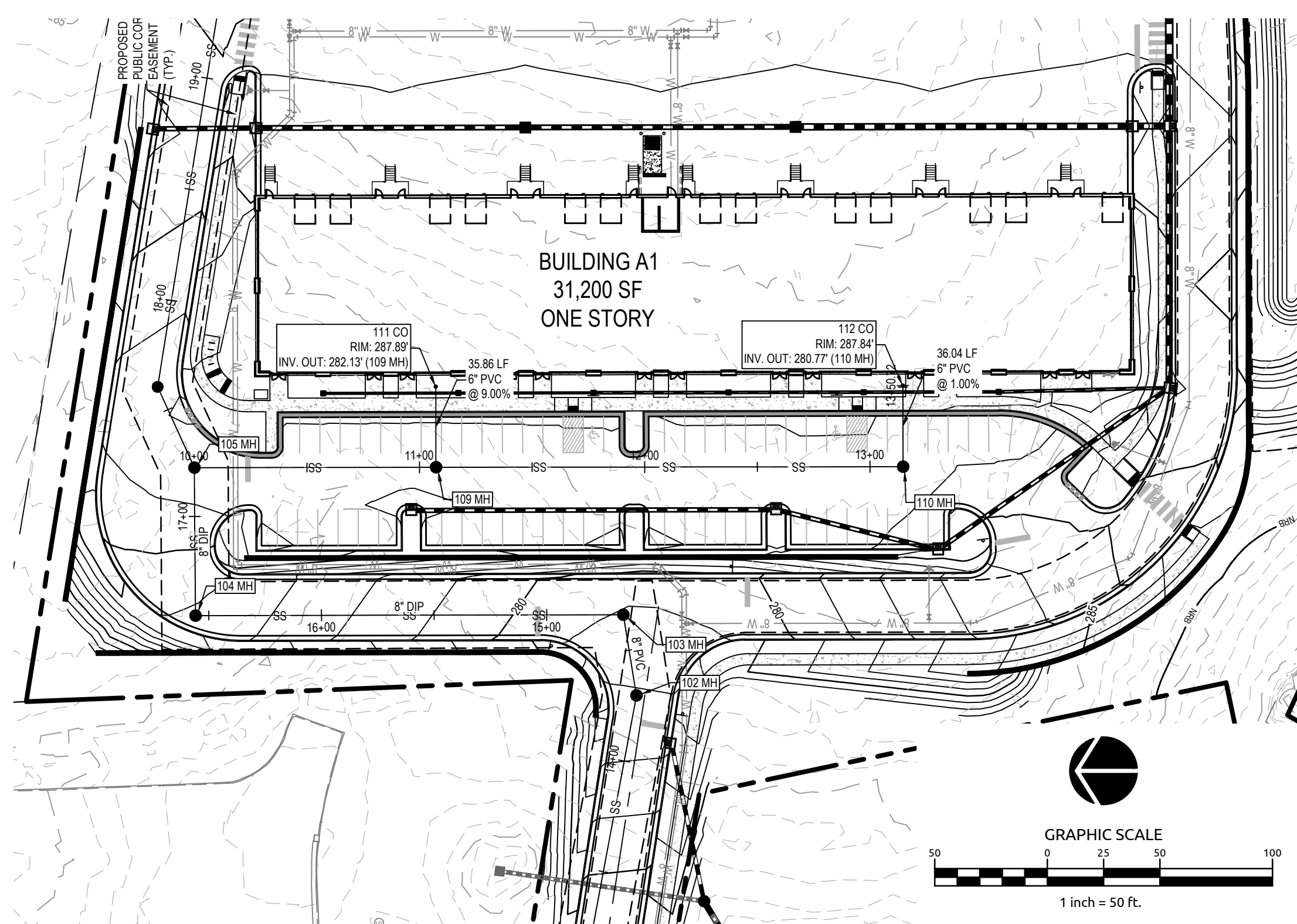
**SEWER PROFILES**

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

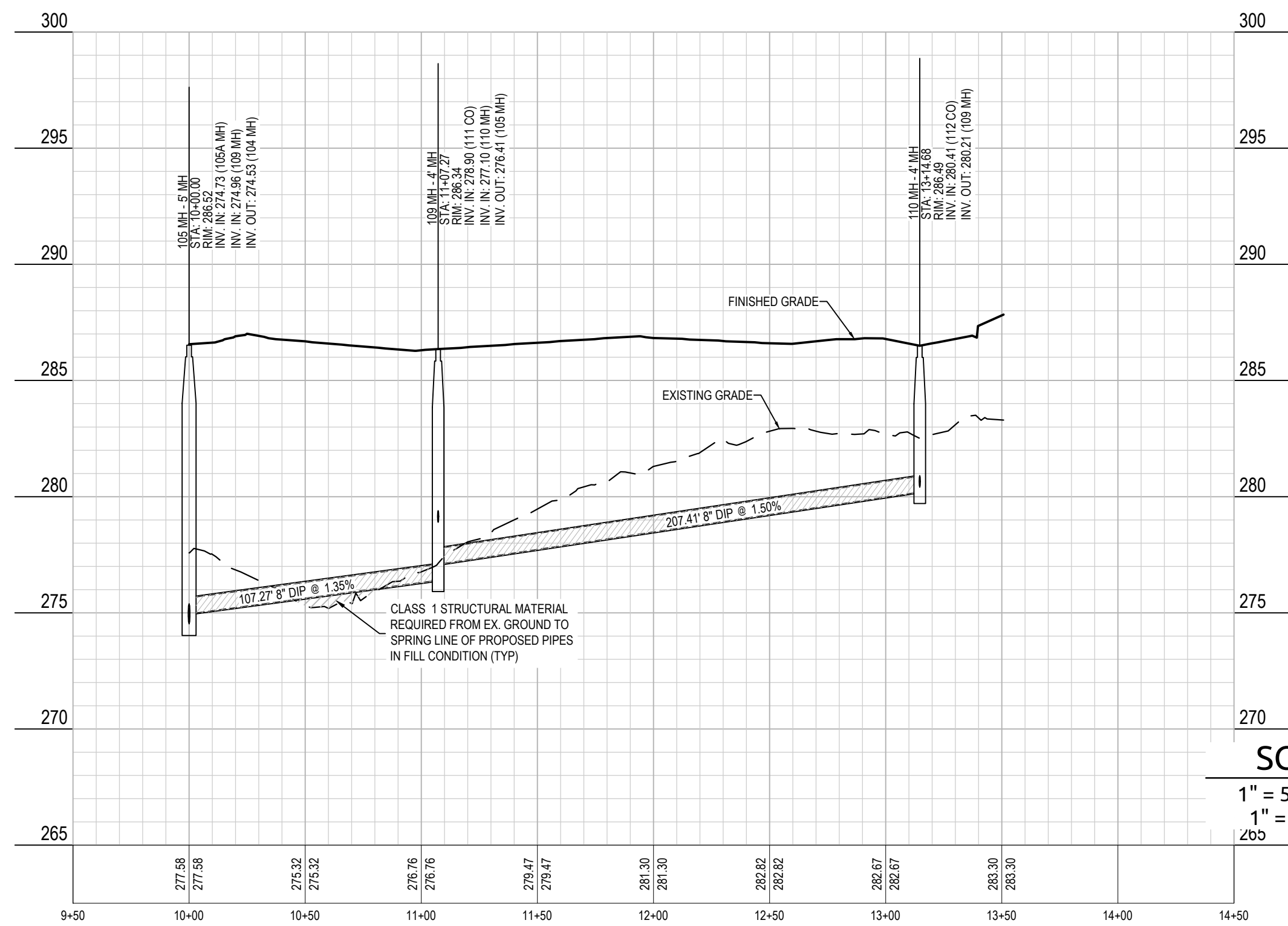


Revisions	Signature	Date
9 SIGNATURE SUBMITTAL		8/27/21
10 REVISION TO APPROVED PLANS		11/11/21

Sheet No.  
**C8.0**



105 MH to 110 MH



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

204 MH to 211 MH



**SITE PERMITTING APPROVAL**

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

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

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

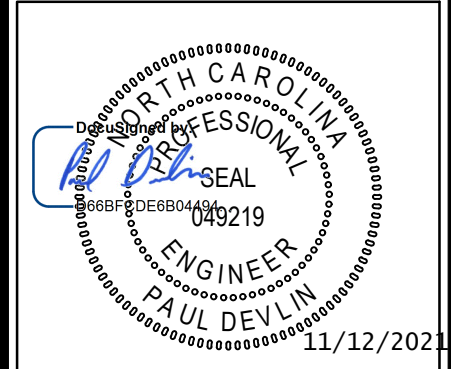
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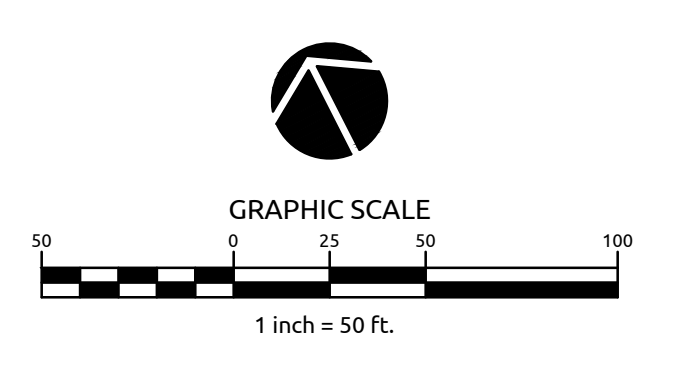
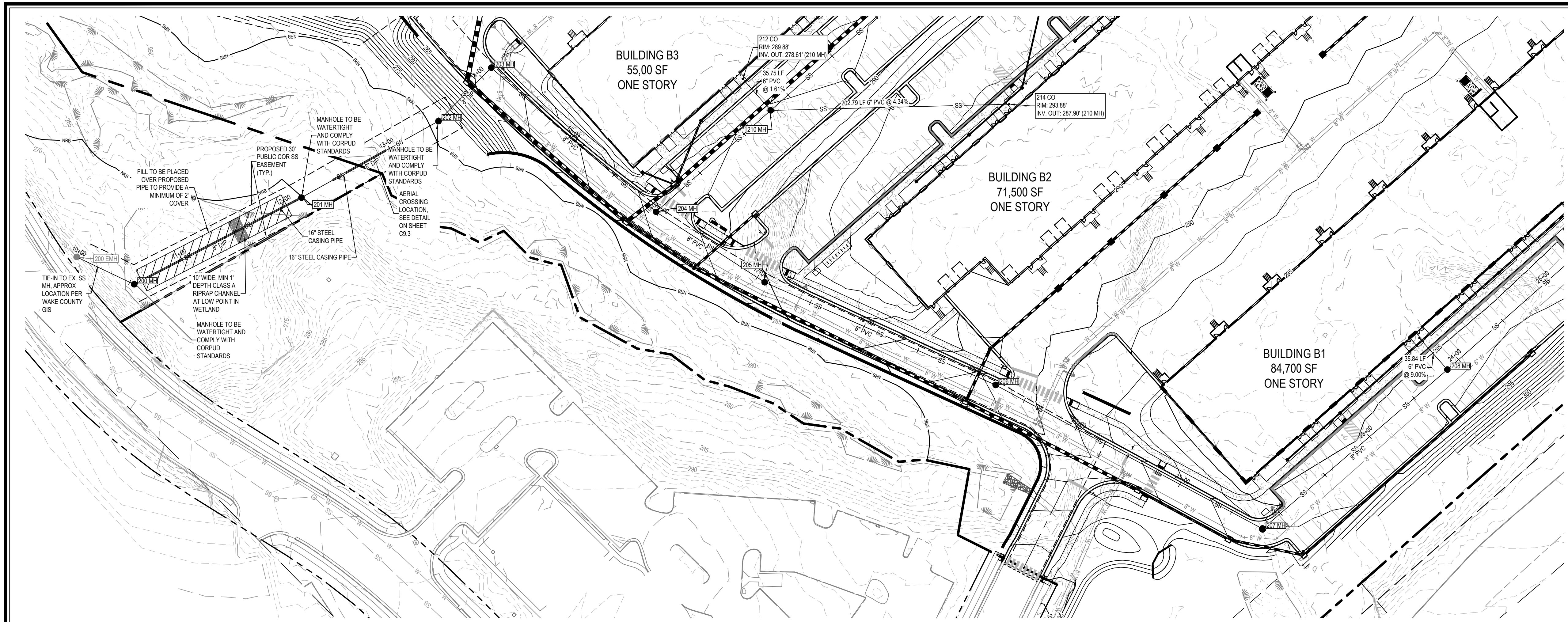
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By: \_\_\_\_\_ Date: \_\_\_\_\_  
Administrator

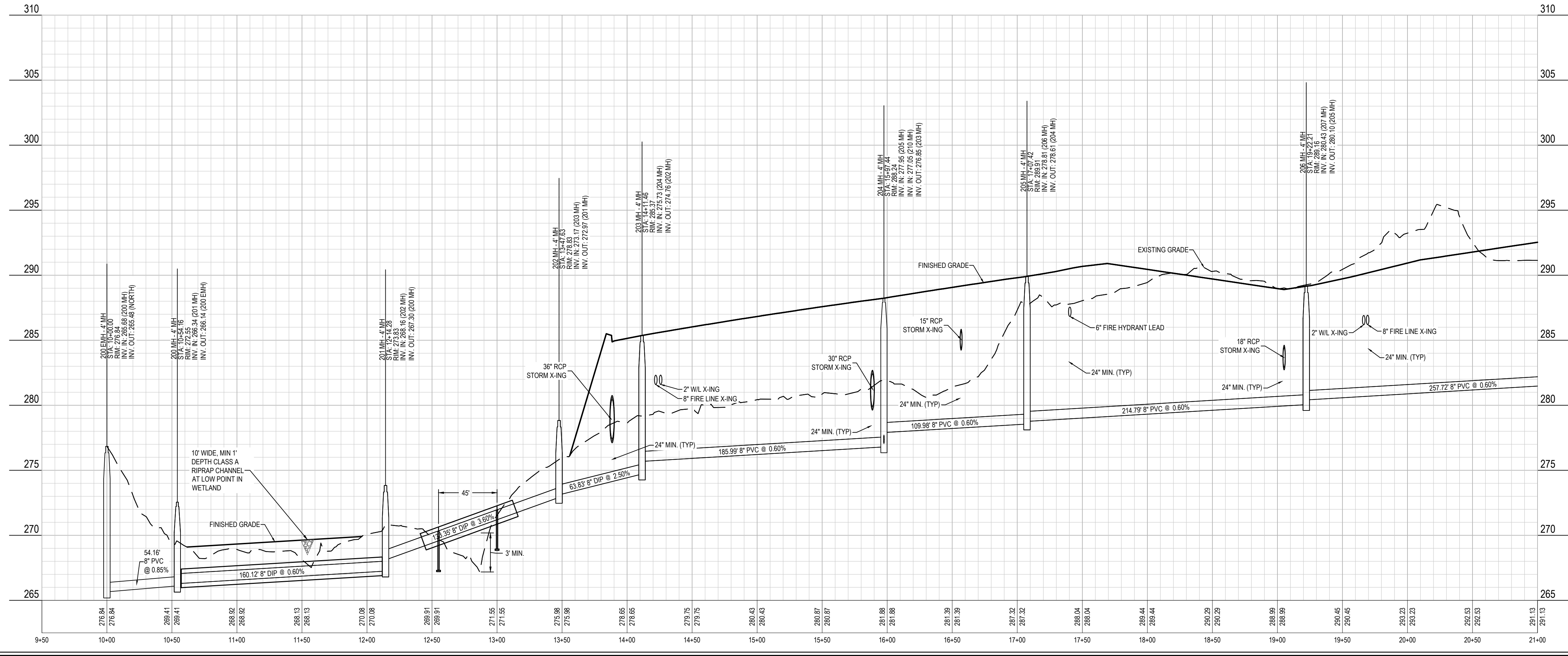
Job No. 09190080.00 Drawn By WR  
Date 09/15/2020 Designer WR



Revisions		
9	SIGNATURE SUBMITTAL	8/27/21
10	REVISION TO APPROVED PLANS	11/11/21



200 MH to 209 MH



SEE SHEET C8.3 FOR CONTINUATION

**SITE PERMITTING APPROVAL**

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Raleigh Water Review Officer \_\_\_\_\_

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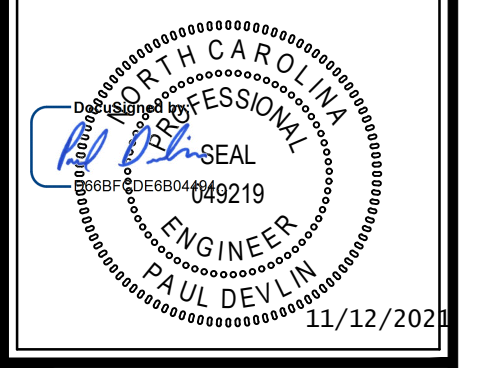
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Town Engineer

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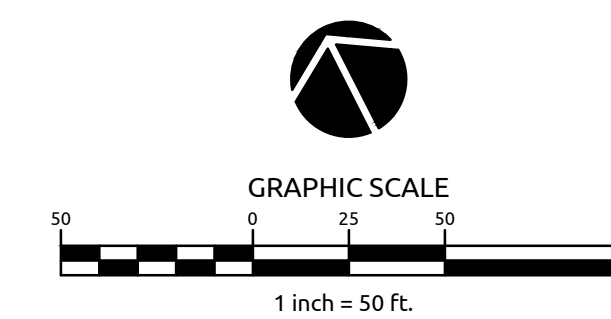
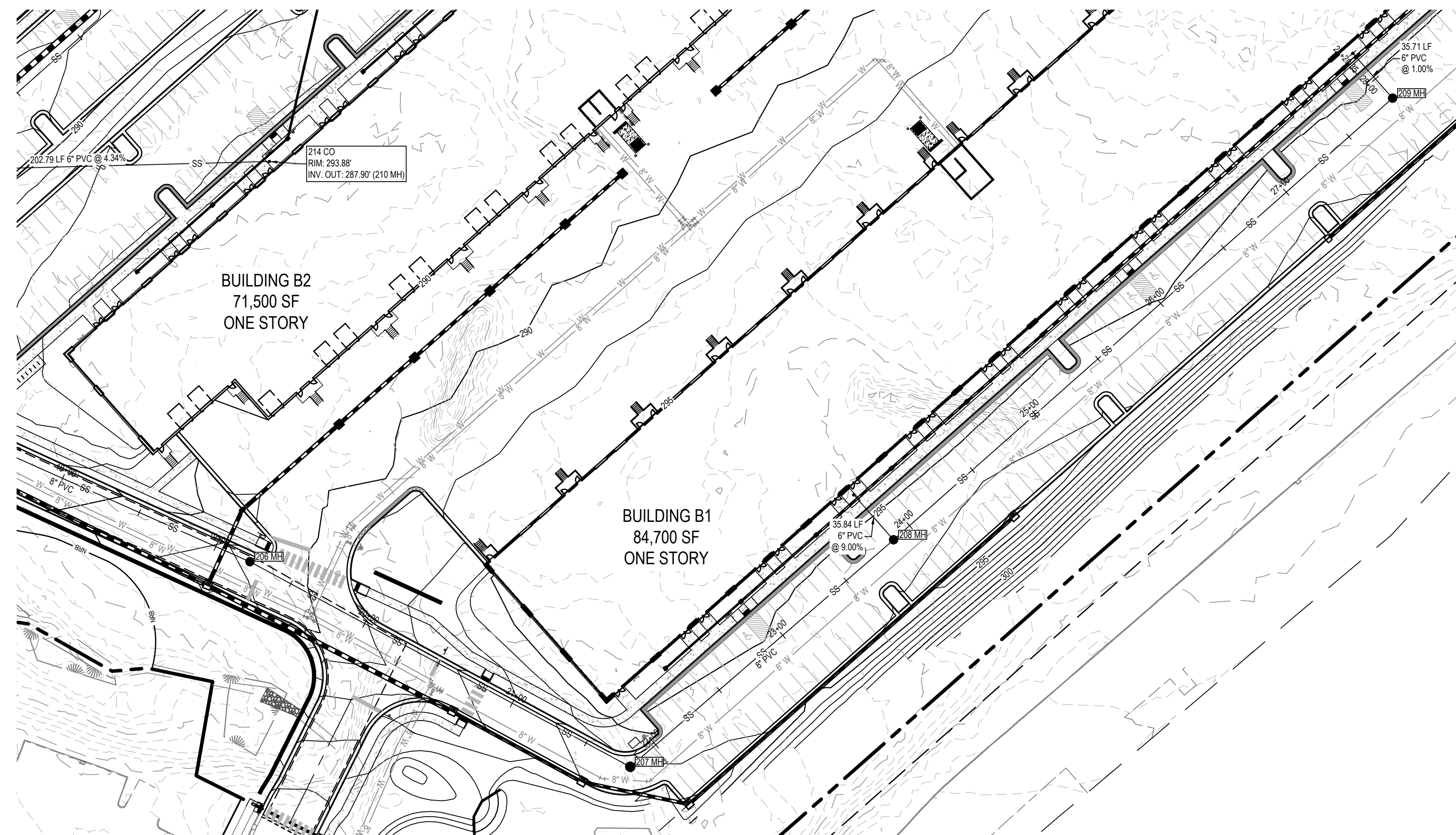
By: \_\_\_\_\_ Date: \_\_\_\_\_  
Administrator

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

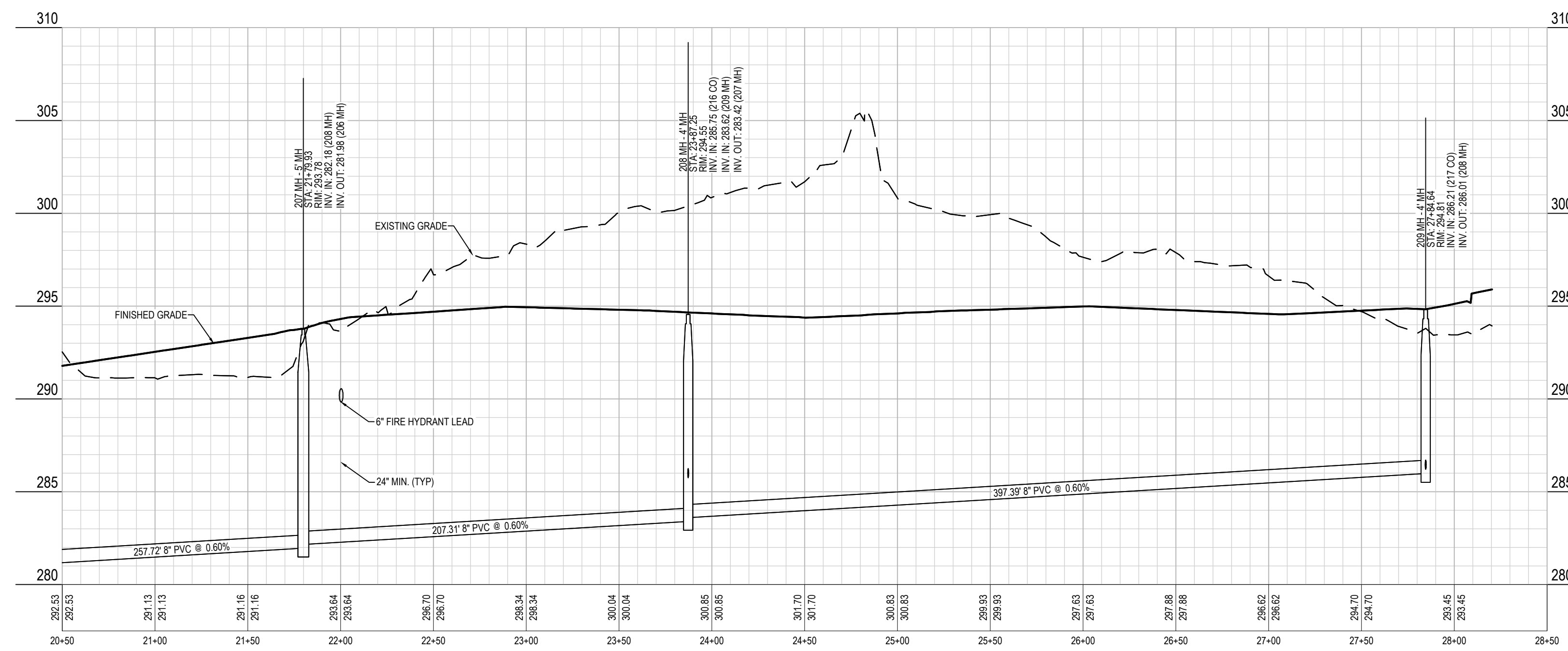
Job No.	09190080.00	Drawn By	WR
Date	09/15/2020	Designer	WR



Revisions		
9	SIGNATURE SUBMITTAL	8/27/21
10	REVISION TO APPROVED PLANS	11/11/21



200 MH to 209 MH



SEE SHEET C8.2  
FOR CONTINUATION

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

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

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 #

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

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

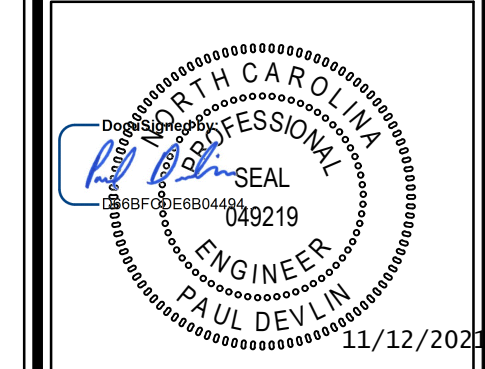
Electronic Approval: This approval is being issued electronically. This approval is valid only upon the signature of a City of Raleigh Review Officer below. The City will retain a copy of the approved plans. Any work authorized by this approval must proceed in accordance with the plans kept on file with 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

SEWER PROFILES

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






137 S Wilmington Street Suite 200 Raleigh, NC 27601 | T: 919.469.3340 | License #: C-0832 | www.withersravenel.com

MERRITT HINTON  
OAKS BLVD  
Knightdale, NC

PIPE AND STRUCTURE  
TABLES

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	277.88	103 MH	270.18	269.98
103 MH	278.91	104 MH	271.16	270.96
104 MH	283.85	105 MH	274.13	273.93
105 MH	286.52	105A MH 109 MH	274.73 274.96	274.53
105A MH	286.61	106 MH	275.19	274.99
106 MH	289.42	107 MH	277.56	277.36
107 MH	288.82	113 CO 108 MH	280.32 278.33	278.13
108 MH	288.81	114 CO 108A MH	281.57 279.77	279.57
108A MH	294.96			280.20
109 MH	286.34	111 CO 110 MH	278.90 277.10	276.41
110 MH	286.49	112 CO	280.41	280.21
111 CO	287.89			282.13
112 CO	287.84			280.77
113 CO	289.88			283.00
114 CO	289.88			282.64
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%	DIP	264.33	264.15
101 MH	100A MH	8	68.23	0.69%	DIP	265.00	264.53
102 MH	101 MH	8	331.02	1.44%	DIP	269.98	265.20
103 MH	102 MH	8	36.34	2.13%	DIP	270.96	270.18
104 MH	103 MH	8	189.98	1.46%	DIP	273.93	271.16
105 MH	104 MH	8	65.72	0.60%	DIP	274.53	274.13
105A MH	105 MH	8	39.42	0.68%	DIP	274.99	274.73
106 MH	105A MH	8	360.25	0.60%	PVC	277.36	275.19
107 MH	106 MH	8	95.85	0.60%	PVC	278.13	277.56
108 MH	107 MH	8	206.67	0.60%	PVC	279.57	278.33
108A MH	108 MH	8	50.90	0.84%		280.20	279.77
109 MH	105 MH	8	107.27	1.35%	DIP	276.41	274.96
110 MH	109 MH	8	207.41	1.50%	DIP	280.21	277.10
111 CO	109 MH	6	35.86	9.00%	PVC	282.13	278.90
112 CO	110 MH	6	36.04	1.00%	PVC	280.77	280.41
113 CO	107 MH	6	35.75	7.50%	PVC	283.00	280.32
114 CO	108 MH	6	35.75	3.00%	PVC	282.64	281.57
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%	DIP	276.85	275.73
205 MH	204 MH	8	109.98	0.60%	DIP	278.61	277.95
206 MH	205 MH	8	214.79	0.60%	DIP	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

Water and Sewer Permits (if applicable)

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

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

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

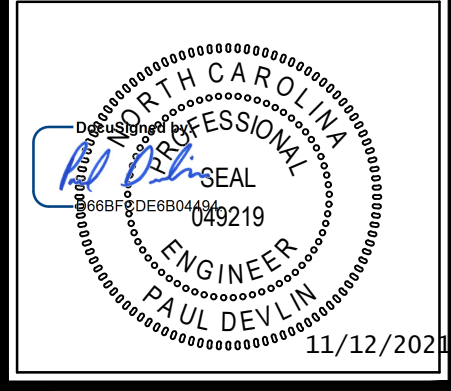
a. **Town Certification.** This design has been reviewed by the Engineer for the Town of Knightdale, and to the best of my knowledge and belief, it conforms to the requirements established in the Standard Specifications of the Town of Knightdale.

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


Sheet No.  
**C8.4**

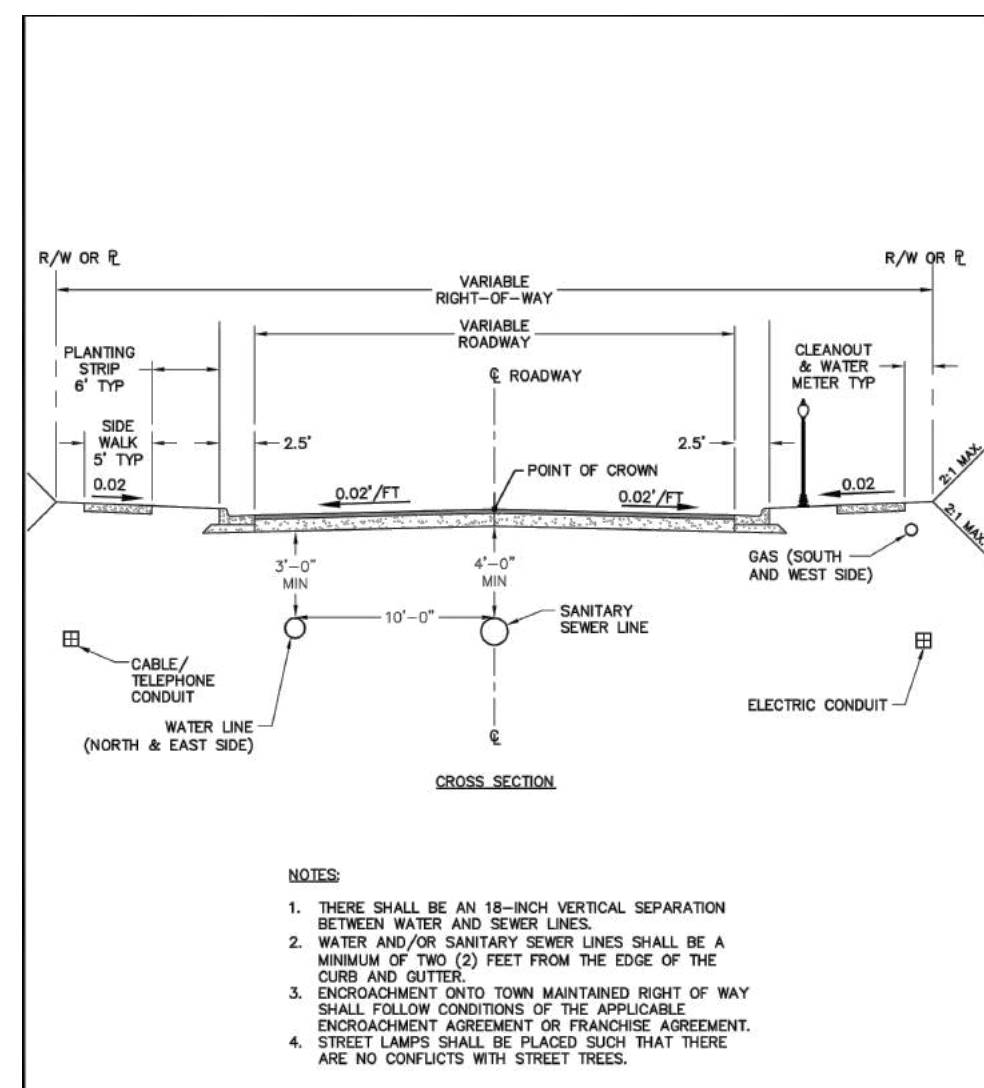


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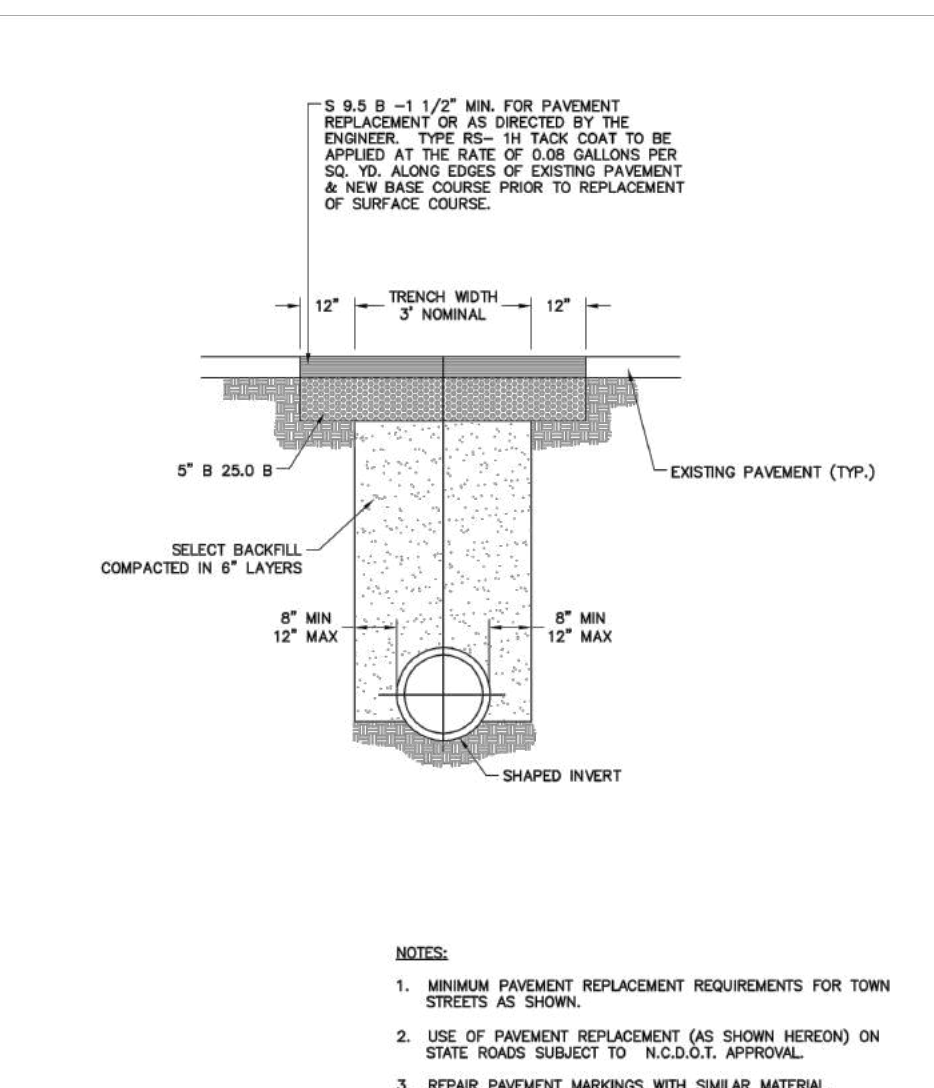


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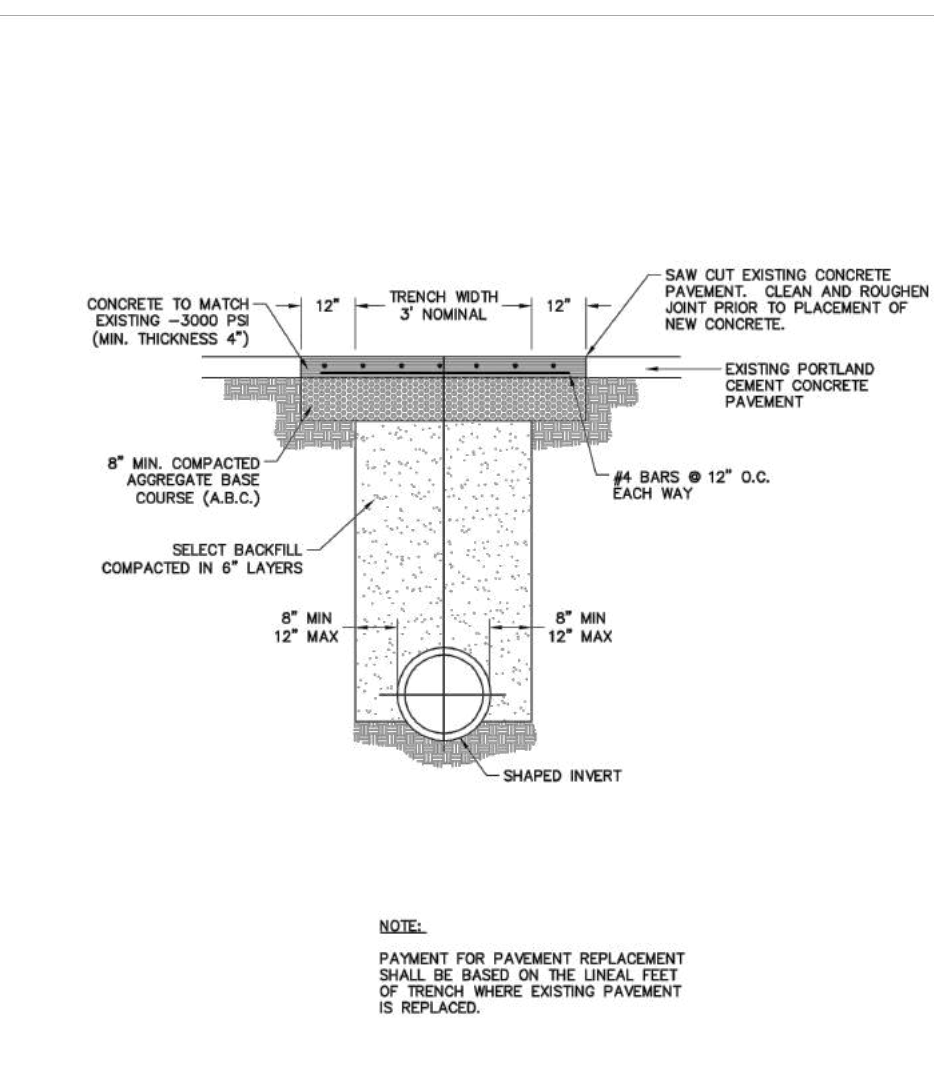


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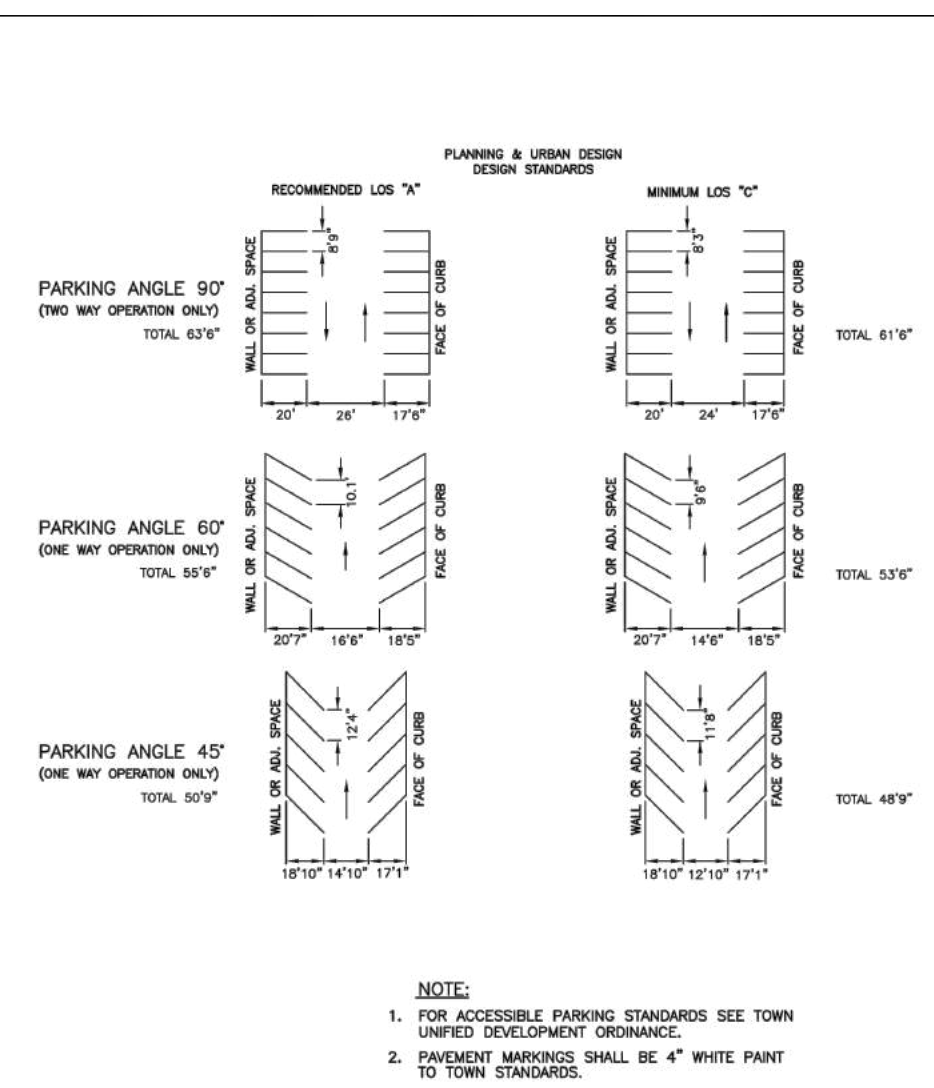


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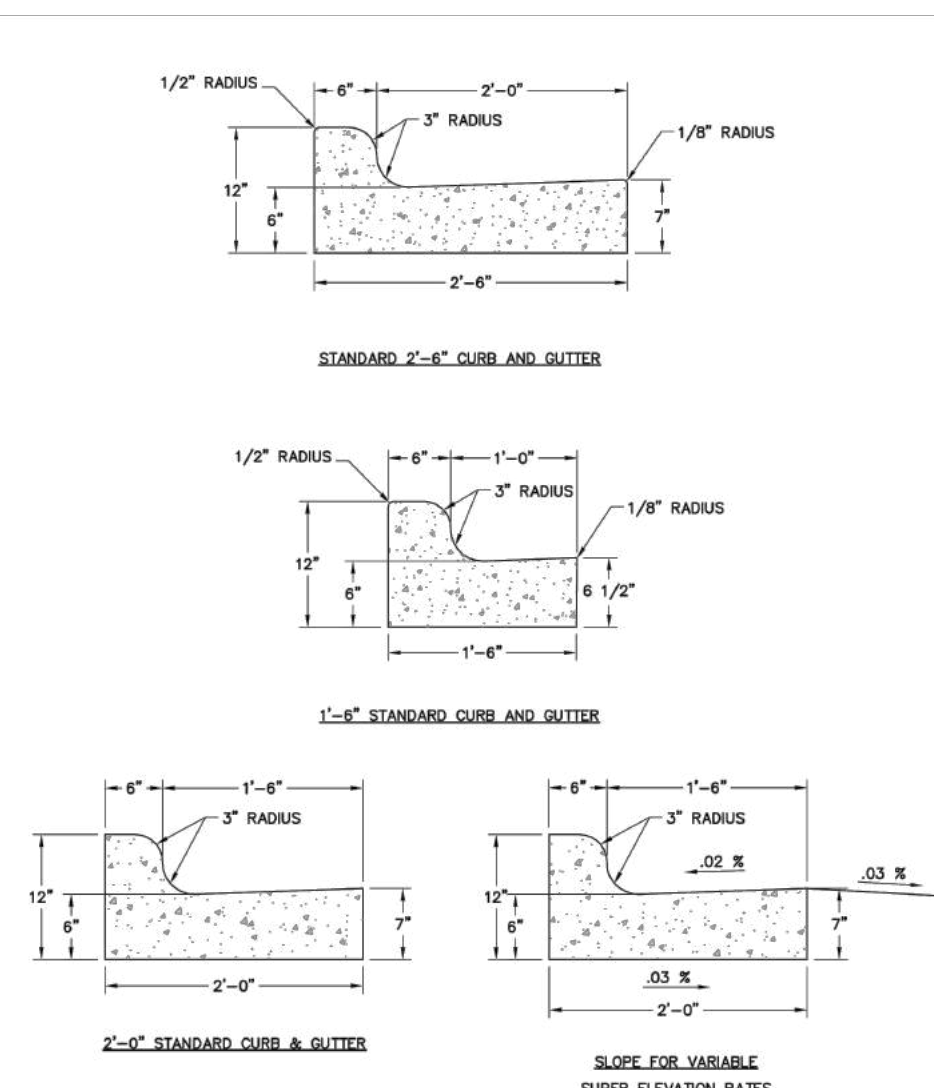


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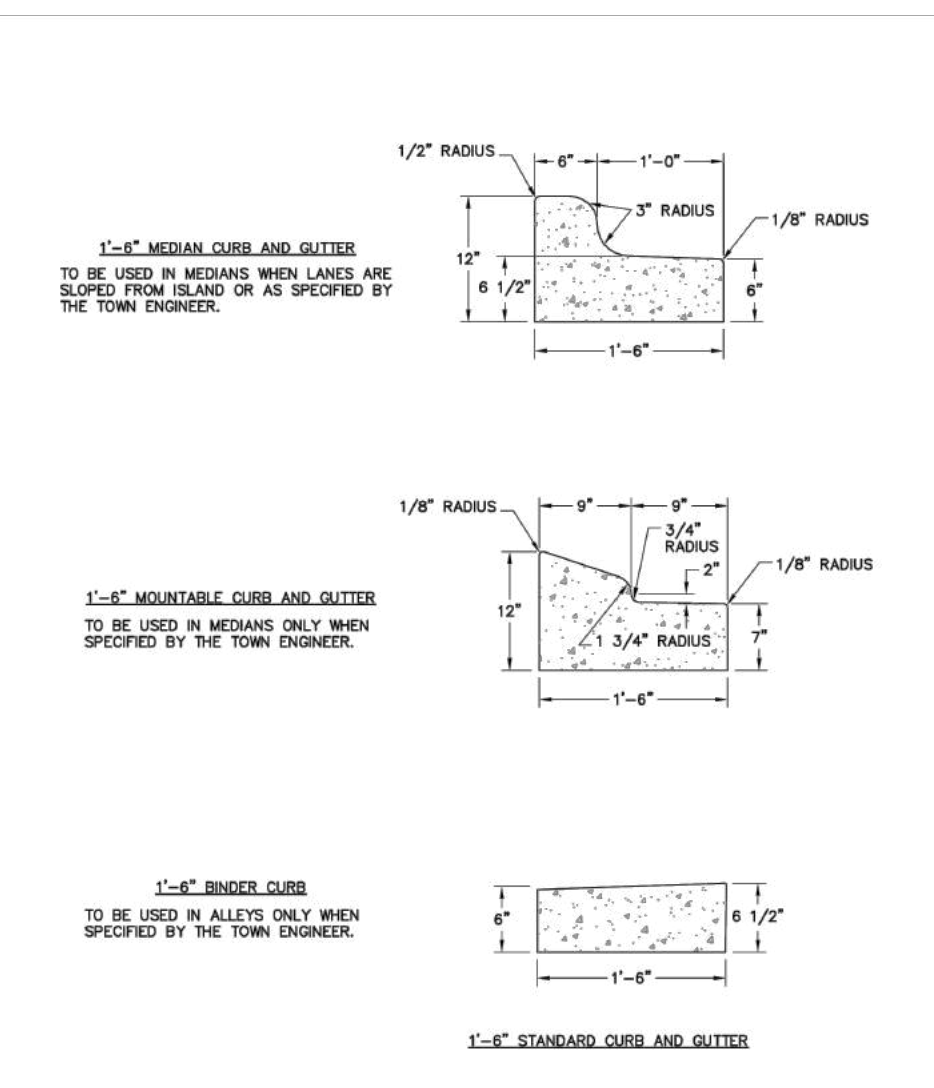


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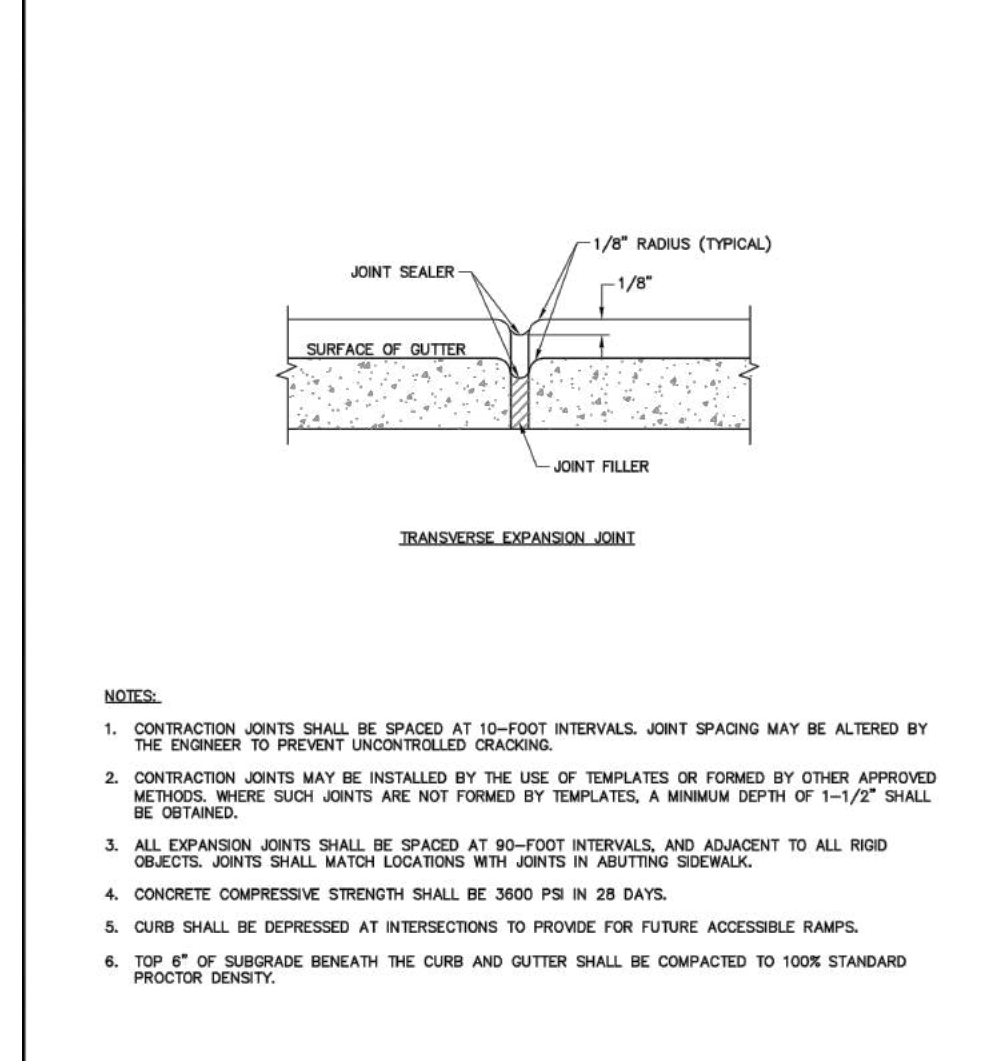


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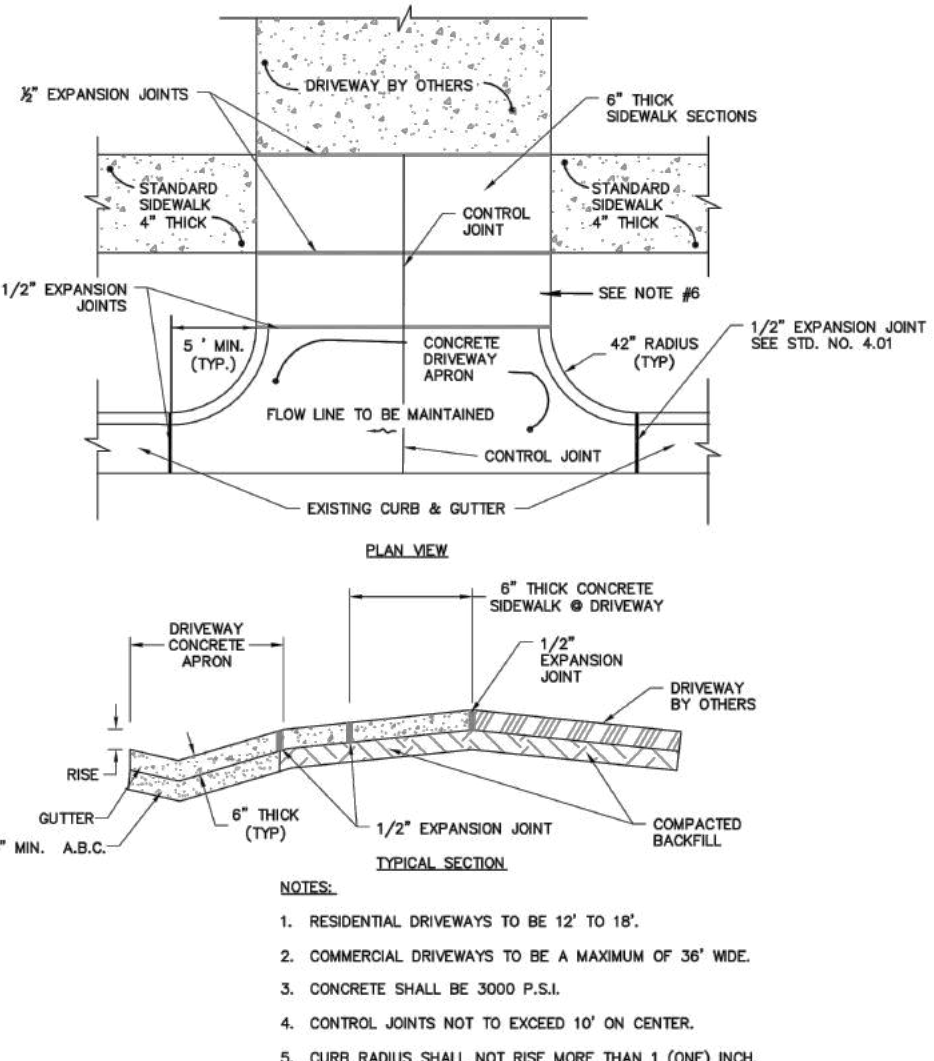


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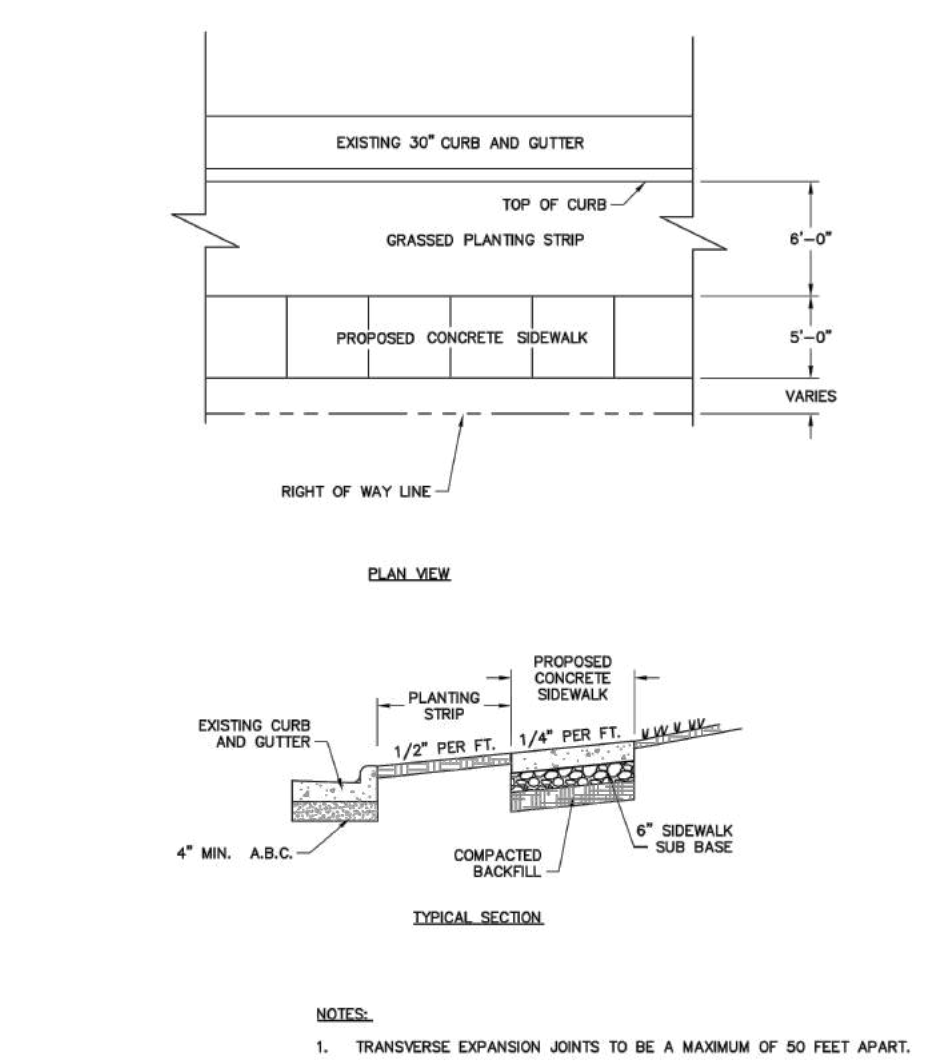


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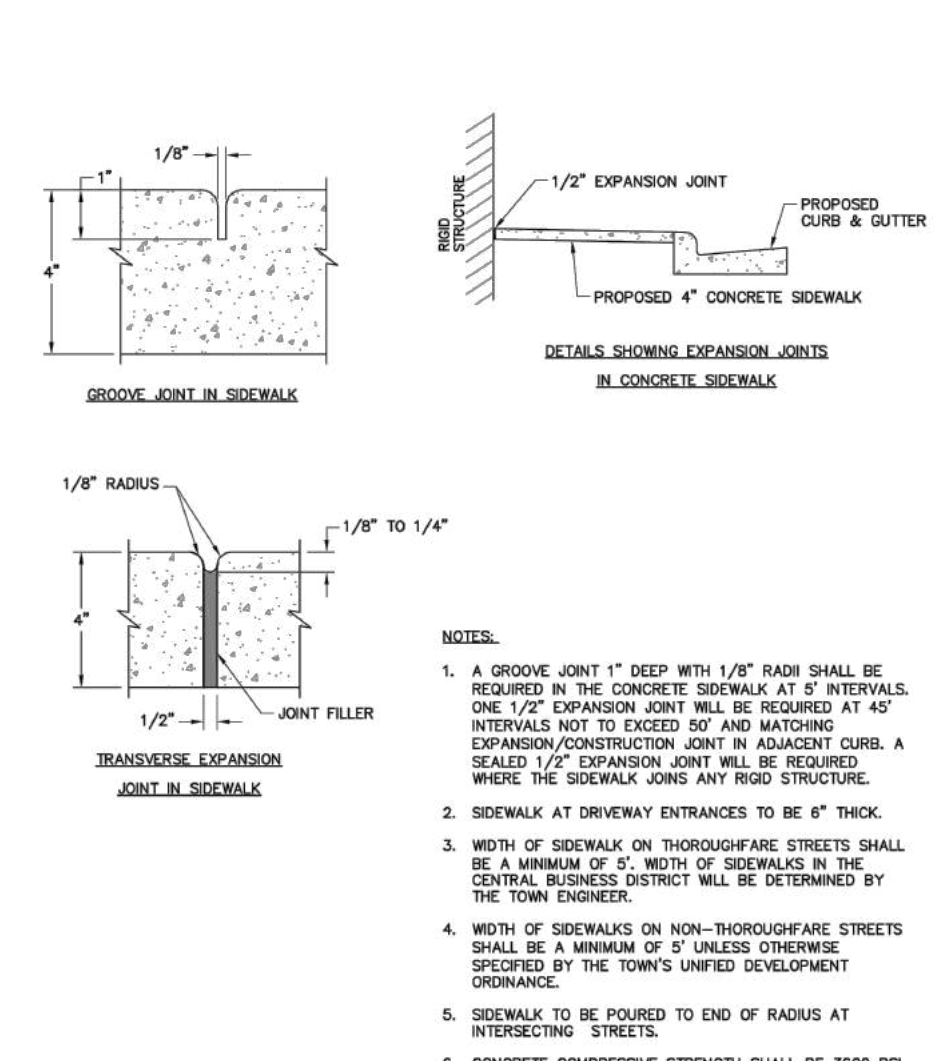


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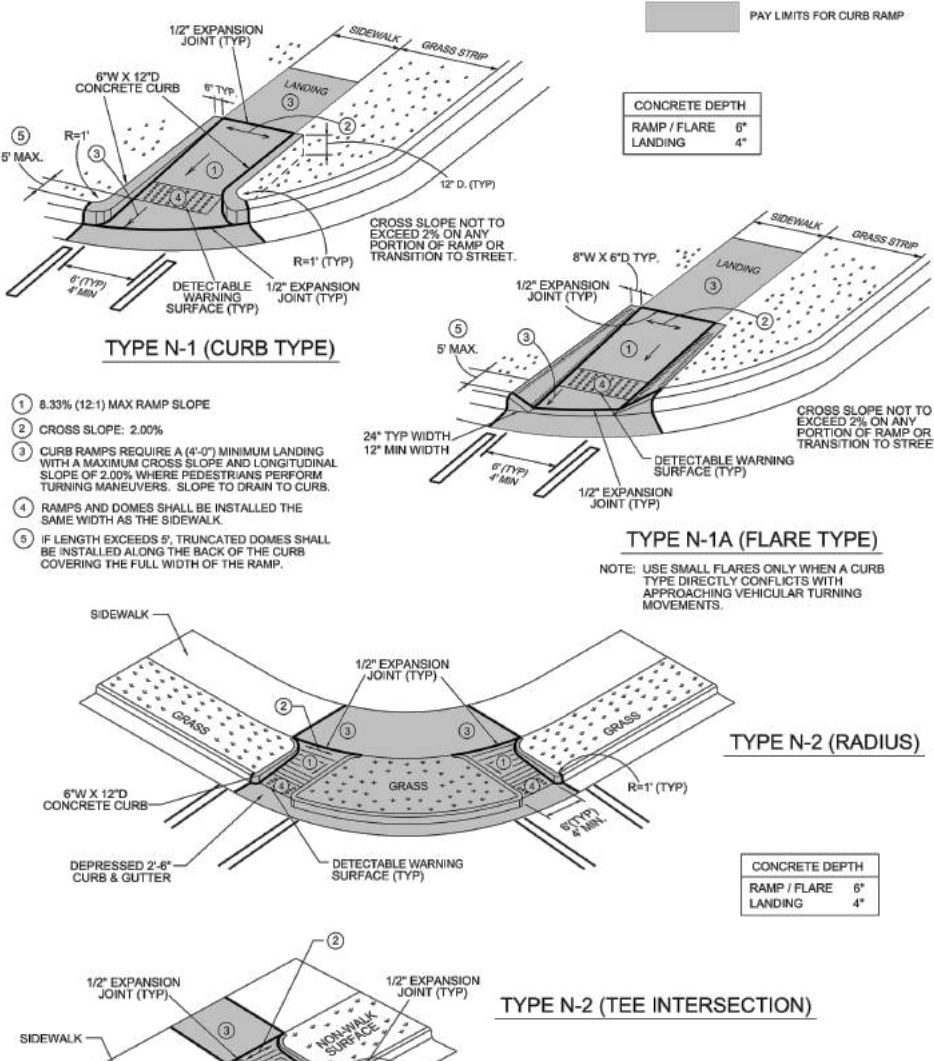


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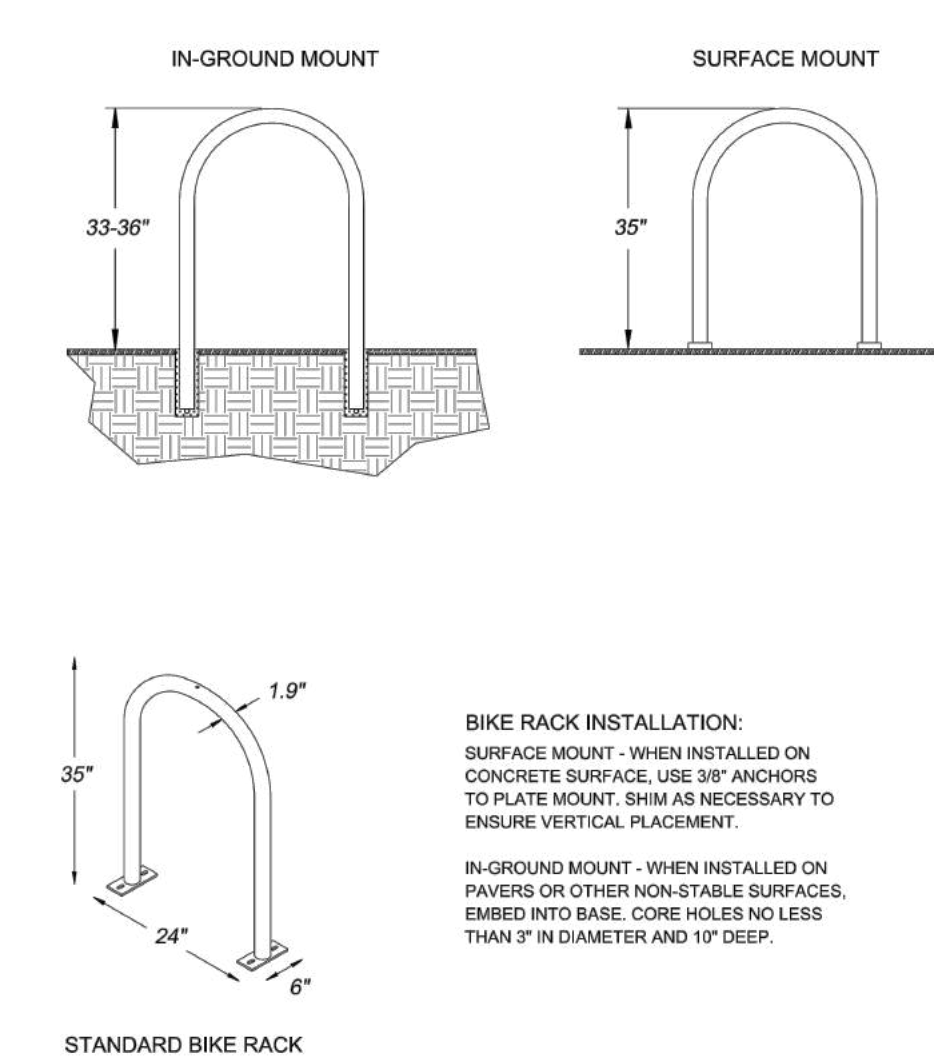


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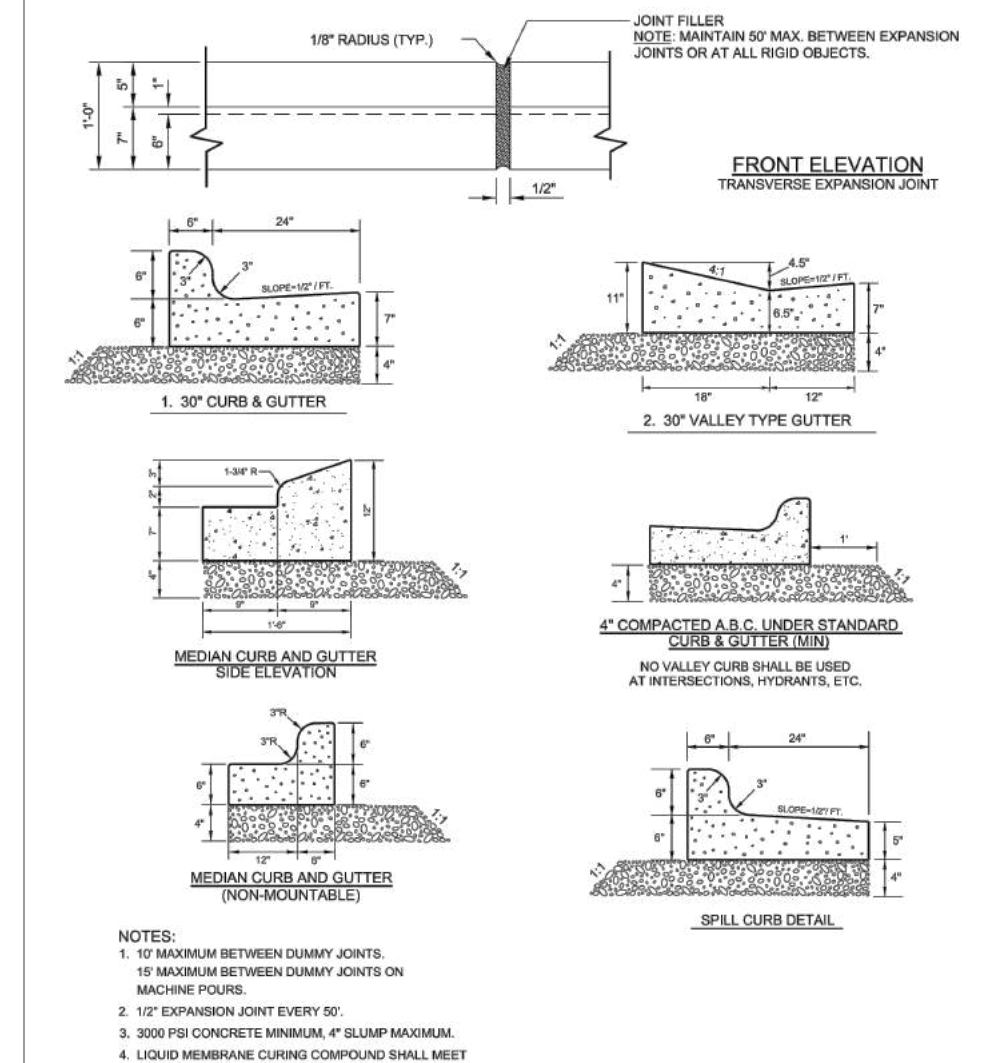


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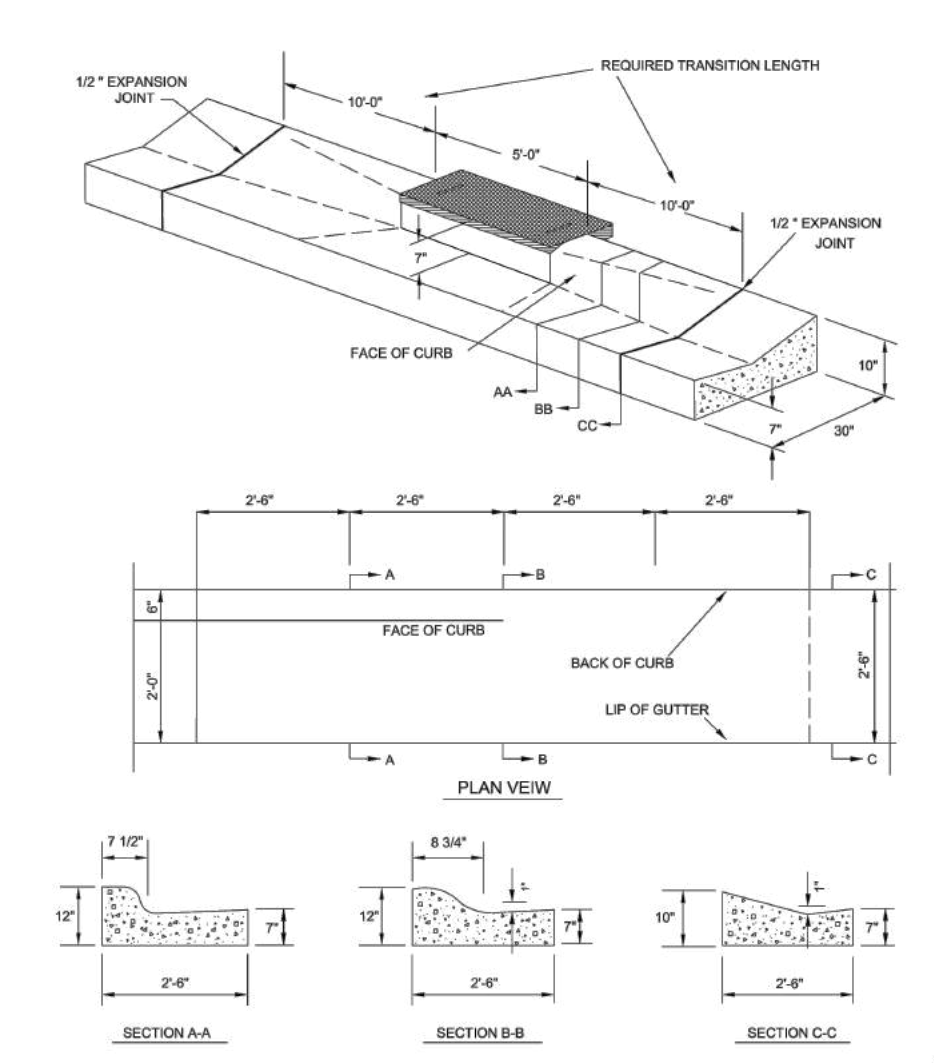


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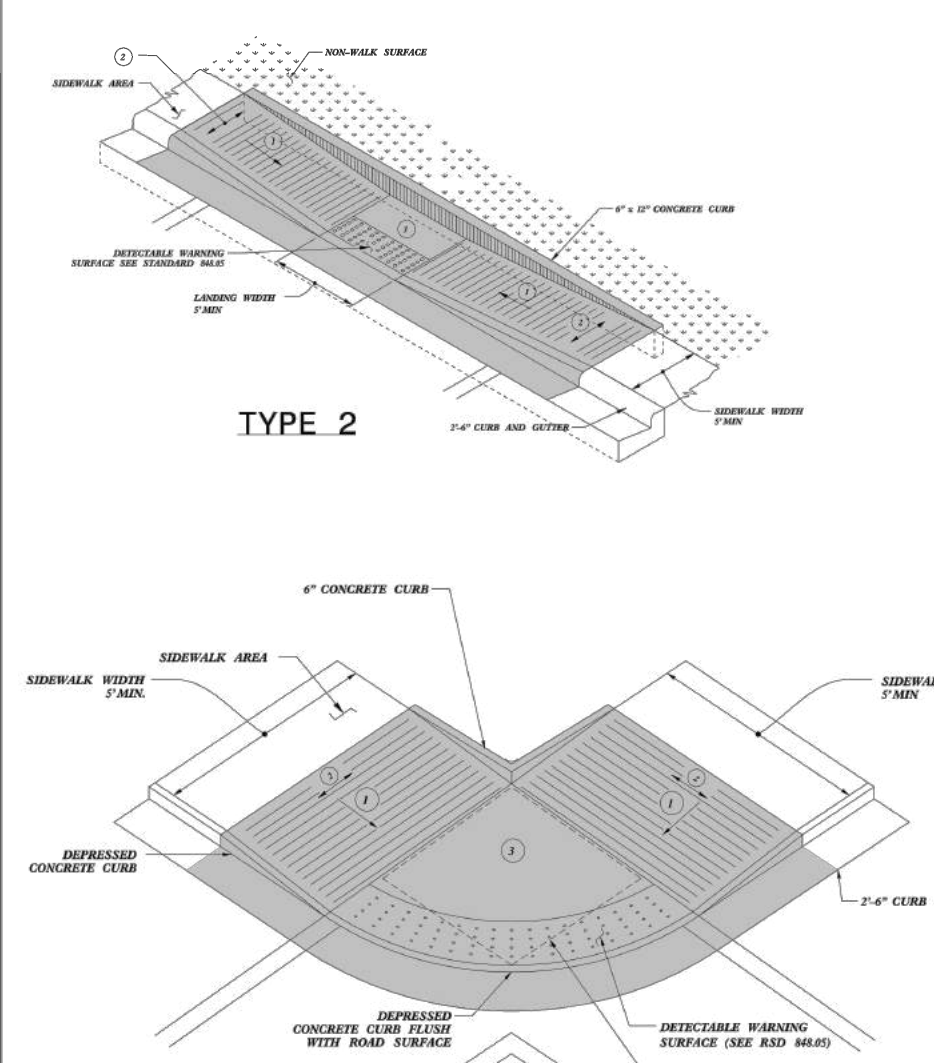


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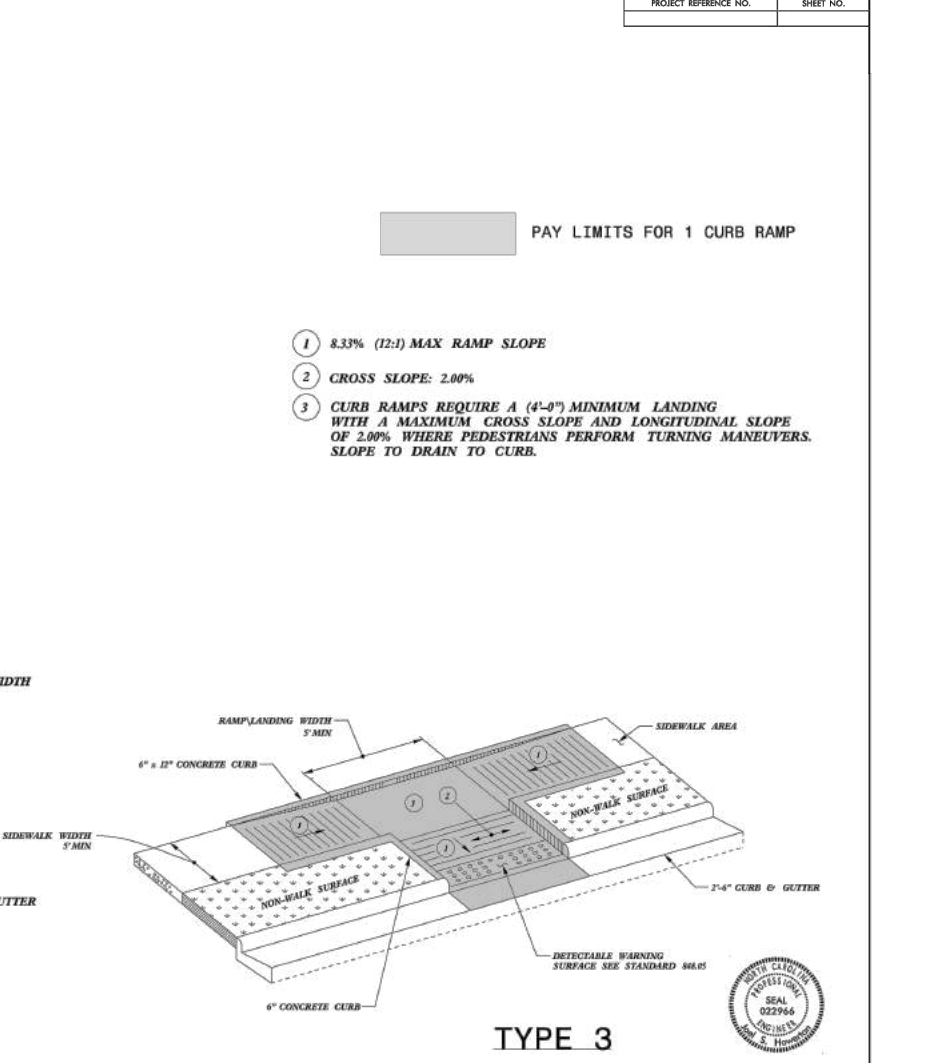


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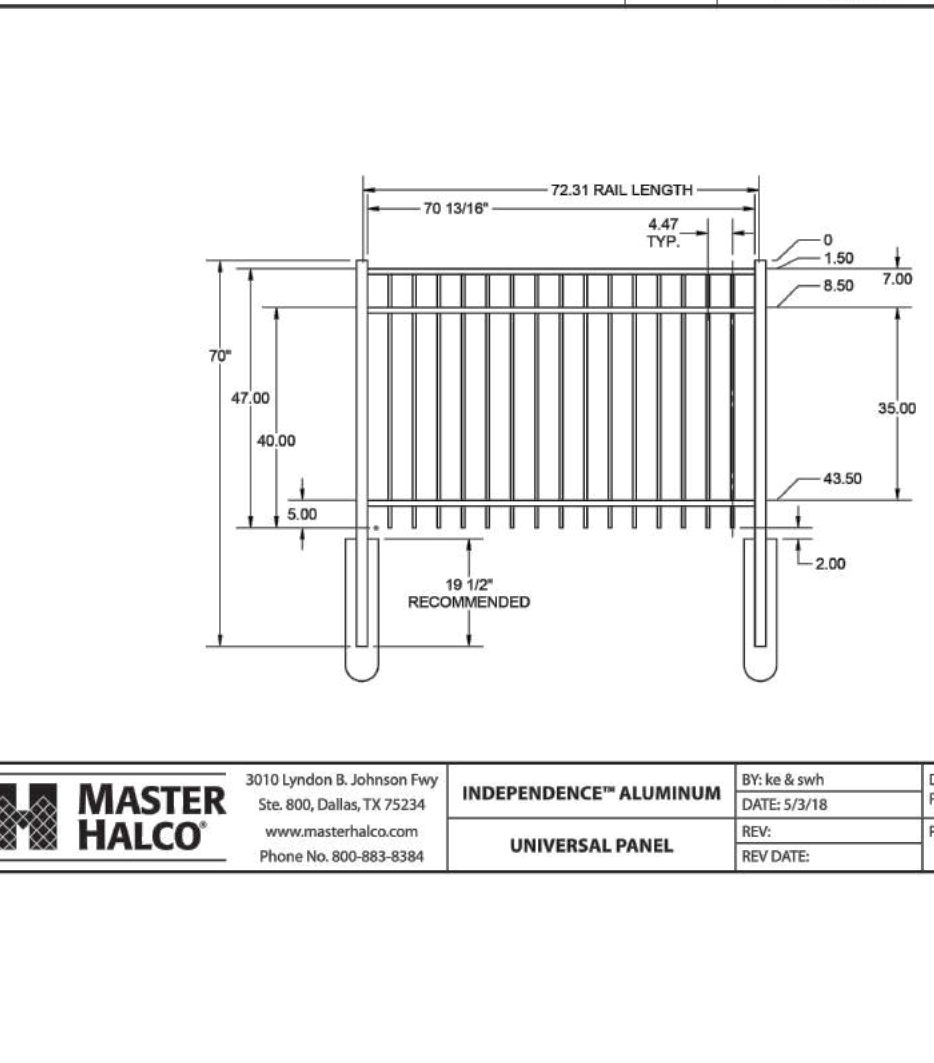


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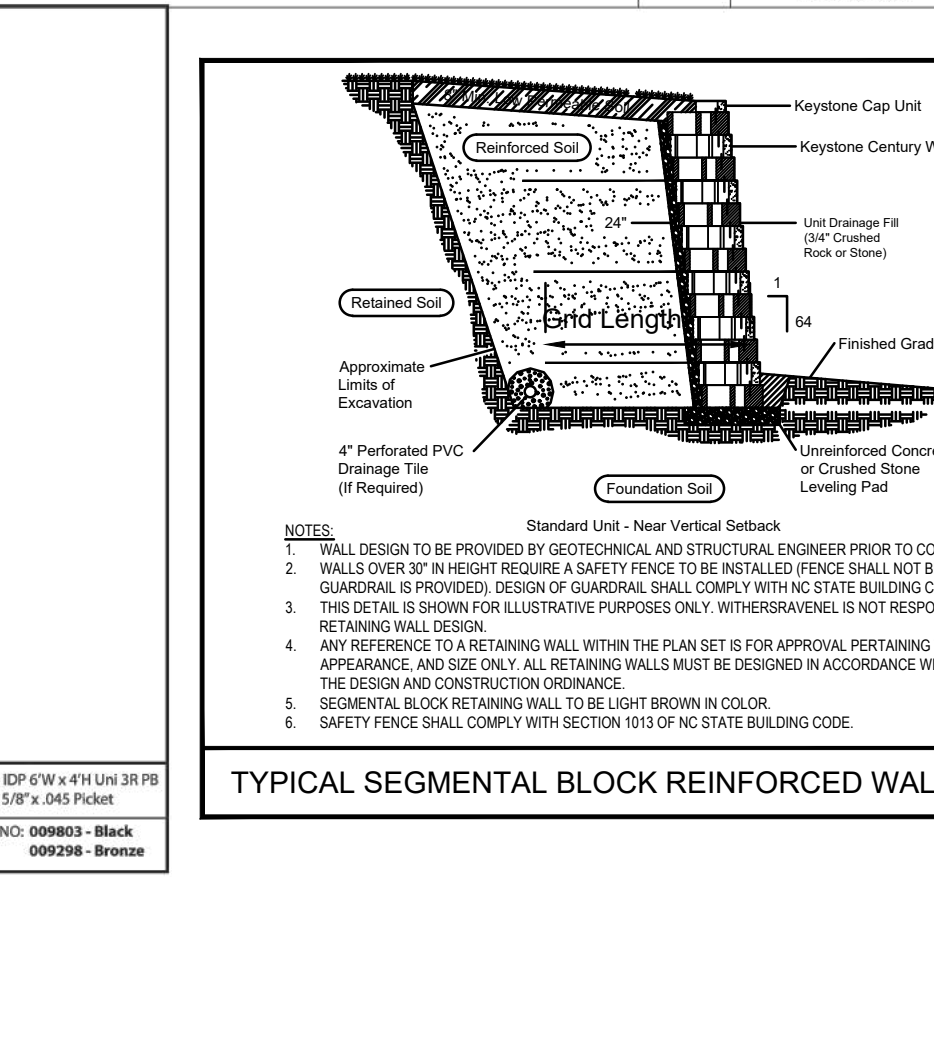


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MERRITT HINTON OAKS BLVD Knightdale, NC

SITE DETAILS

Table with 2 columns: Job No. 09190080.00, Date 09/15/2020, Drawn By WR, Designer WR.

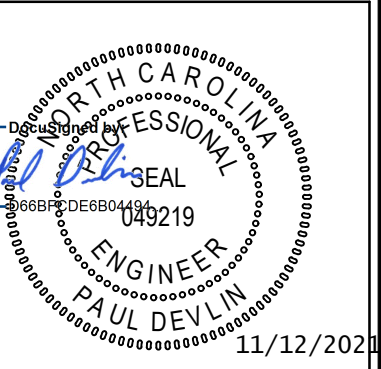


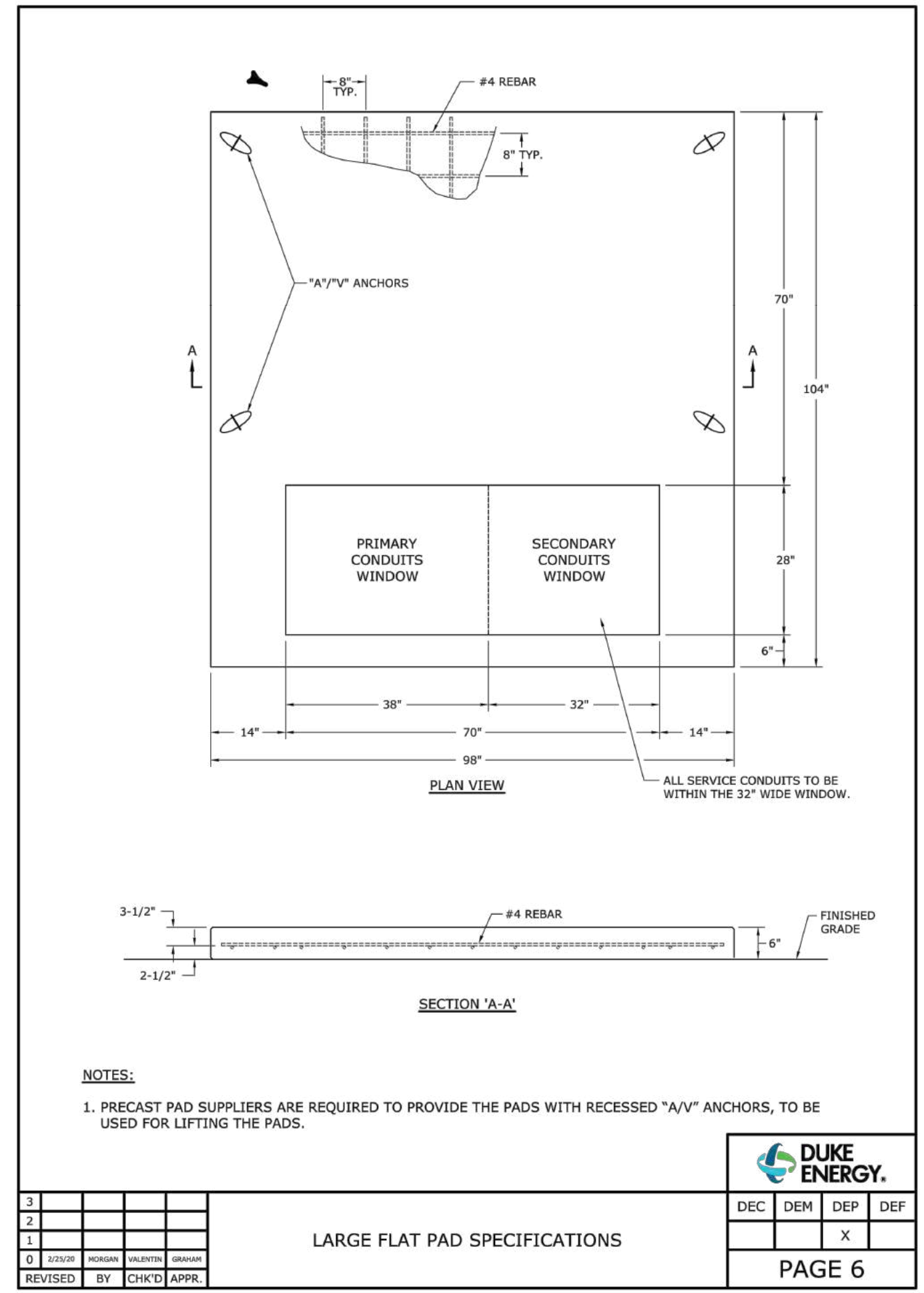
Table with 2 columns: Revisions. Includes revision 9: SIGNATURE SUBMITTAL 8/27/21 and 10: REVISION TO APPROVED PLANS 11/11/21.

Sheet No. C9.0

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.





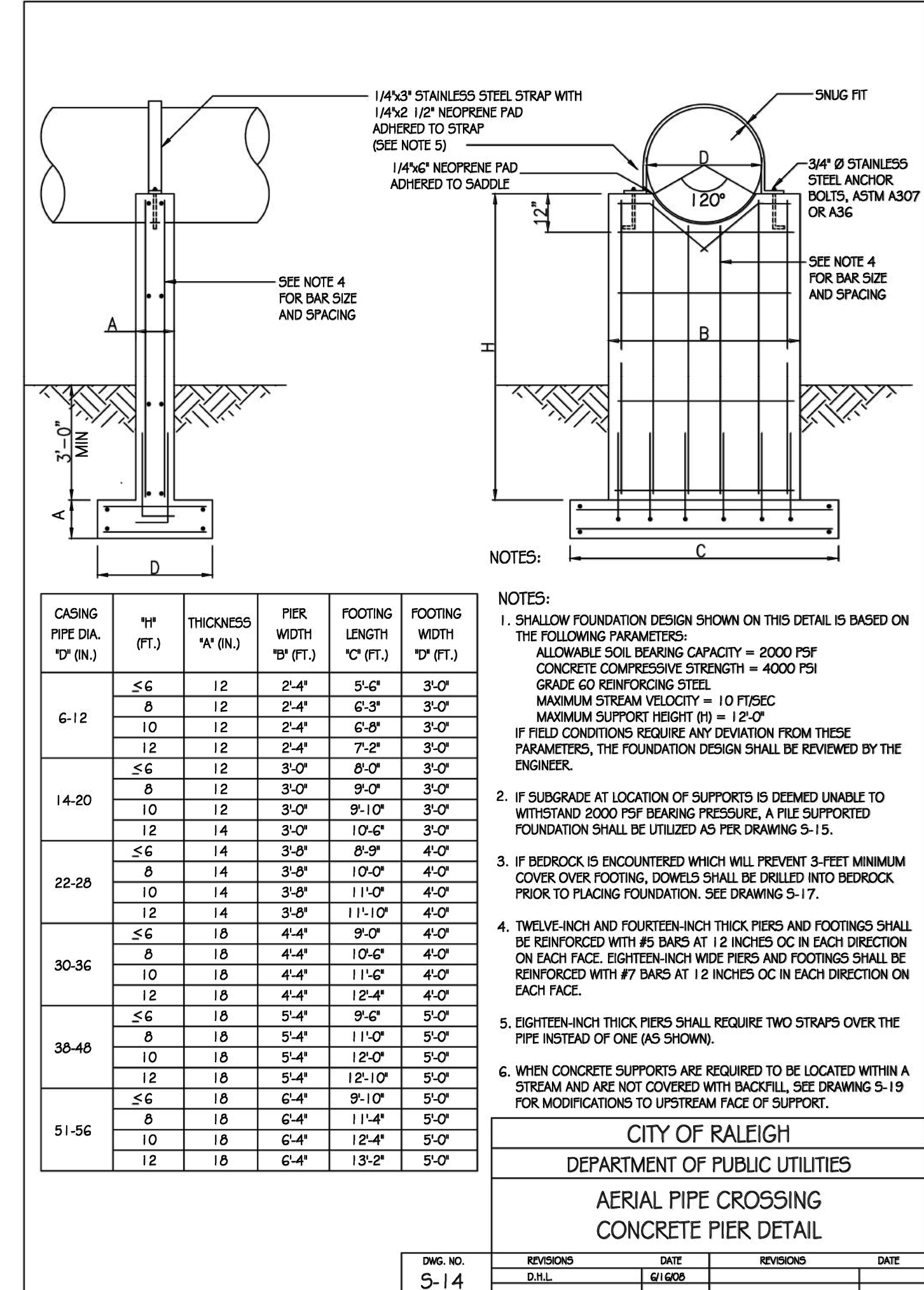
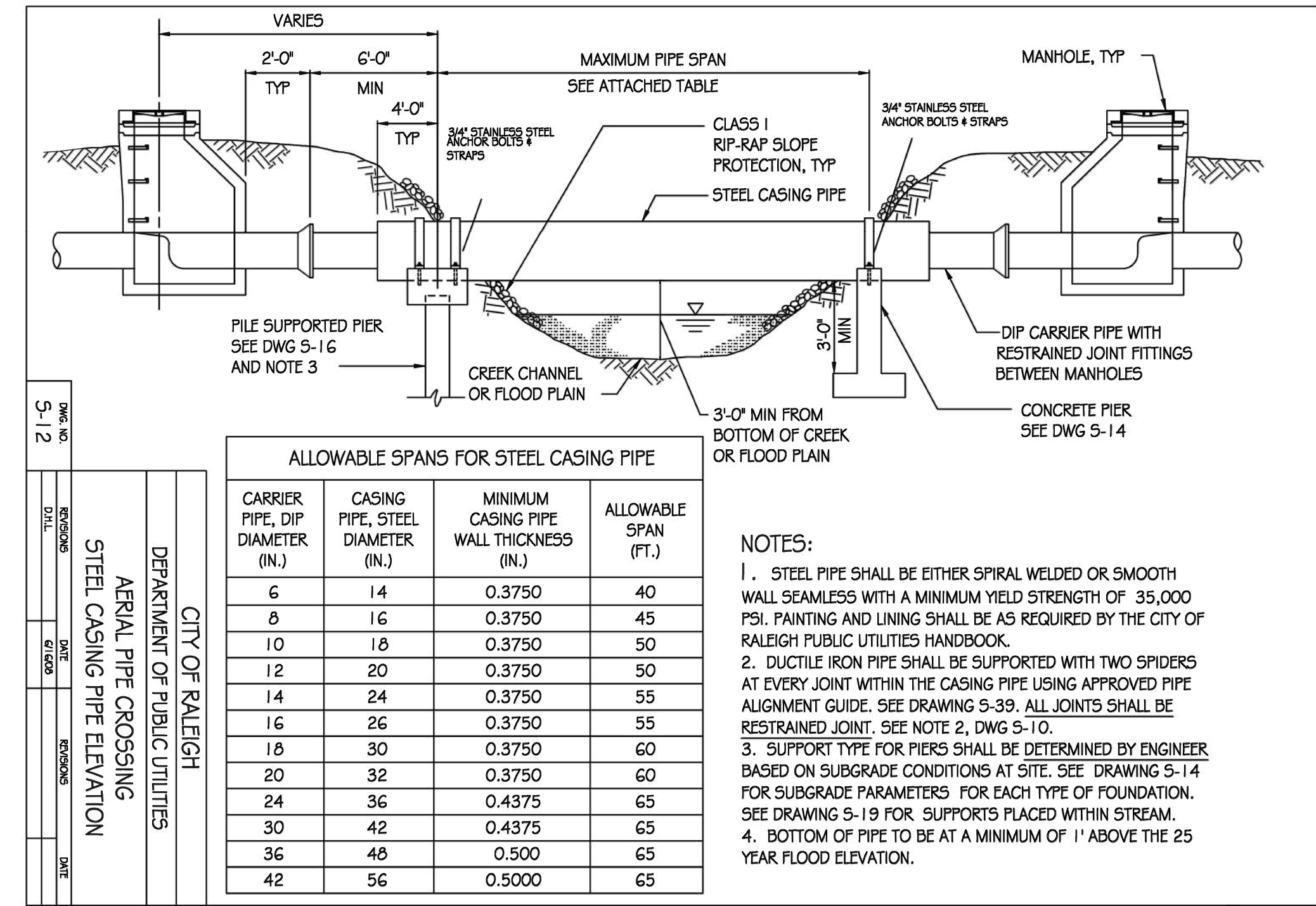


3				
2				
1				
0	ISSUED	MODIFIED	REMOVED	REVISION
REVISED	BY	CHK'D	APPR.	

LARGE FLAT PAD SPECIFICATIONS

DEC	DEM	SEP	DEF
		X	

PAGE 6



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.

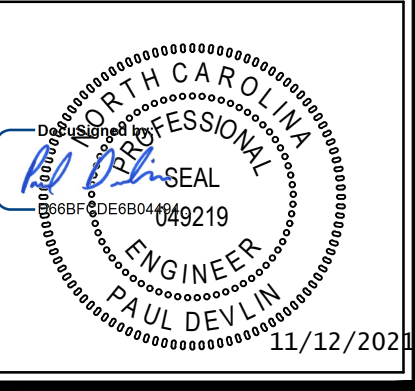
By: \_\_\_\_\_ Date: \_\_\_\_\_  
Administrator



MERRITT HINTON  
OAKS BLVD  
Knightdale, NC

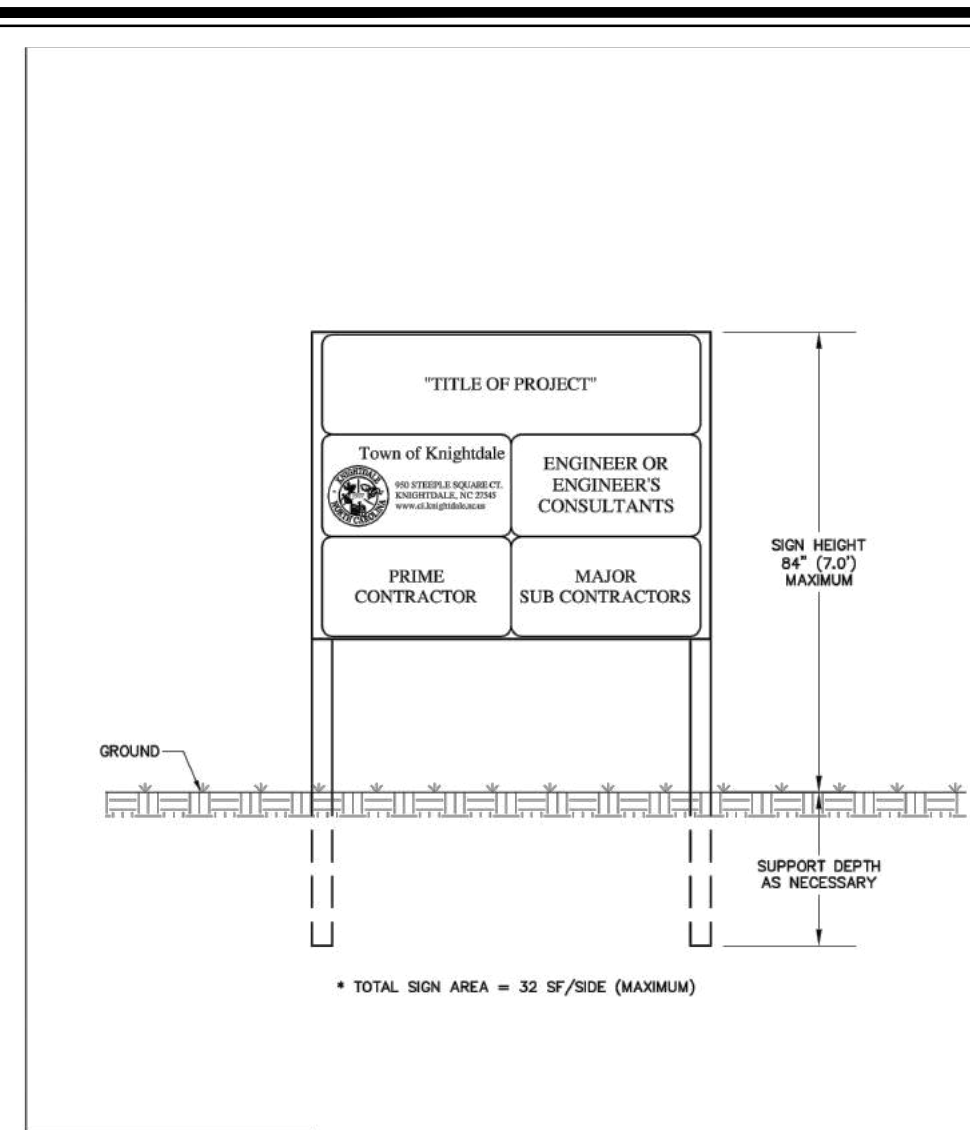
UTILITY DETAILS

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

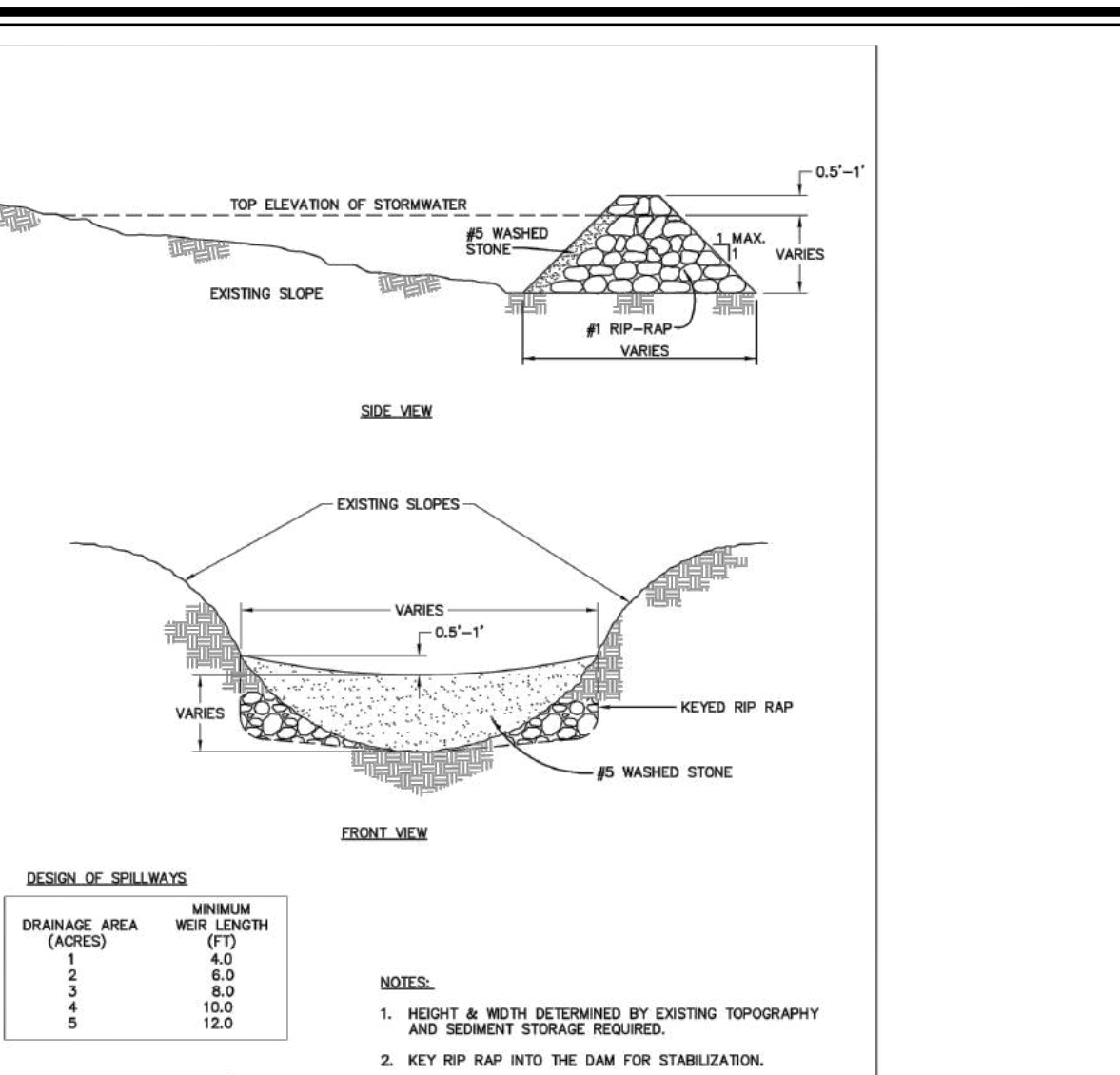
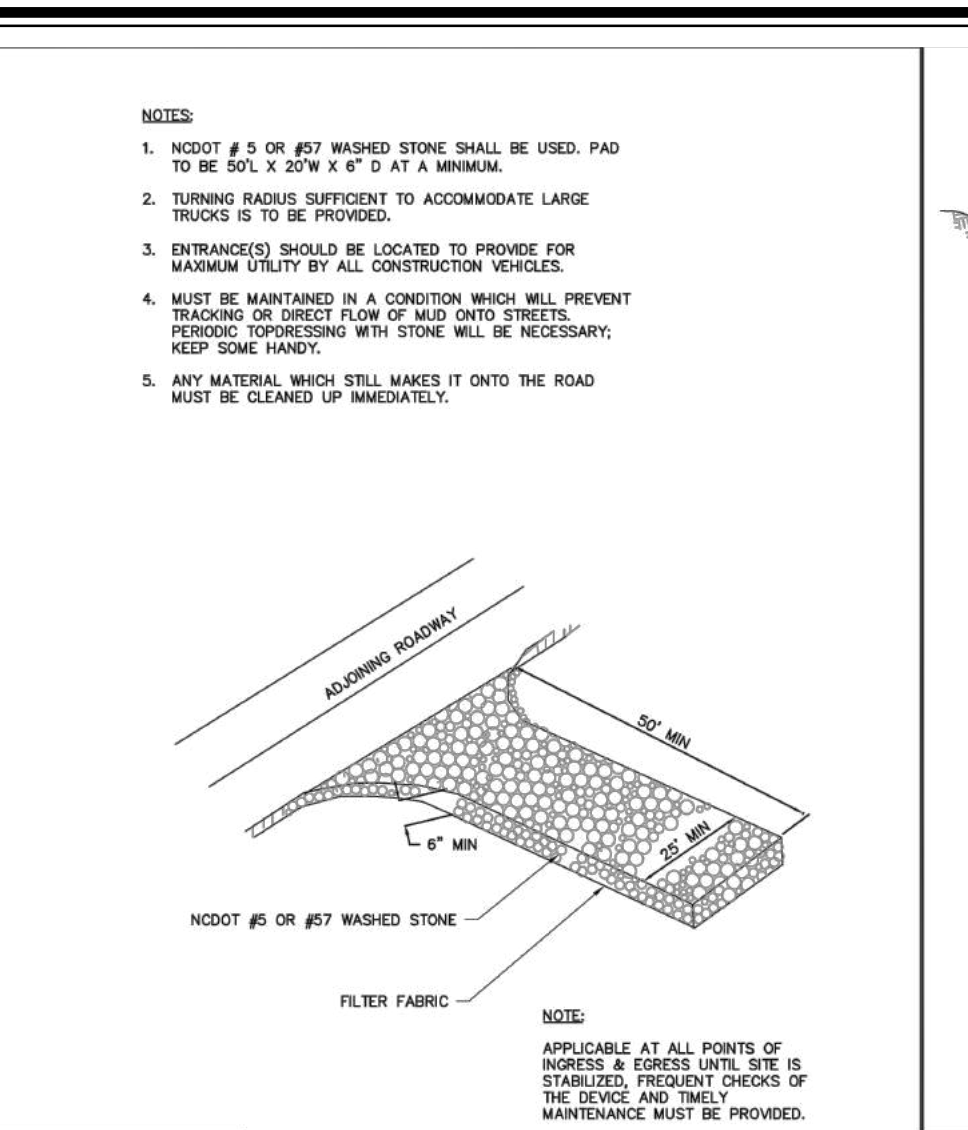
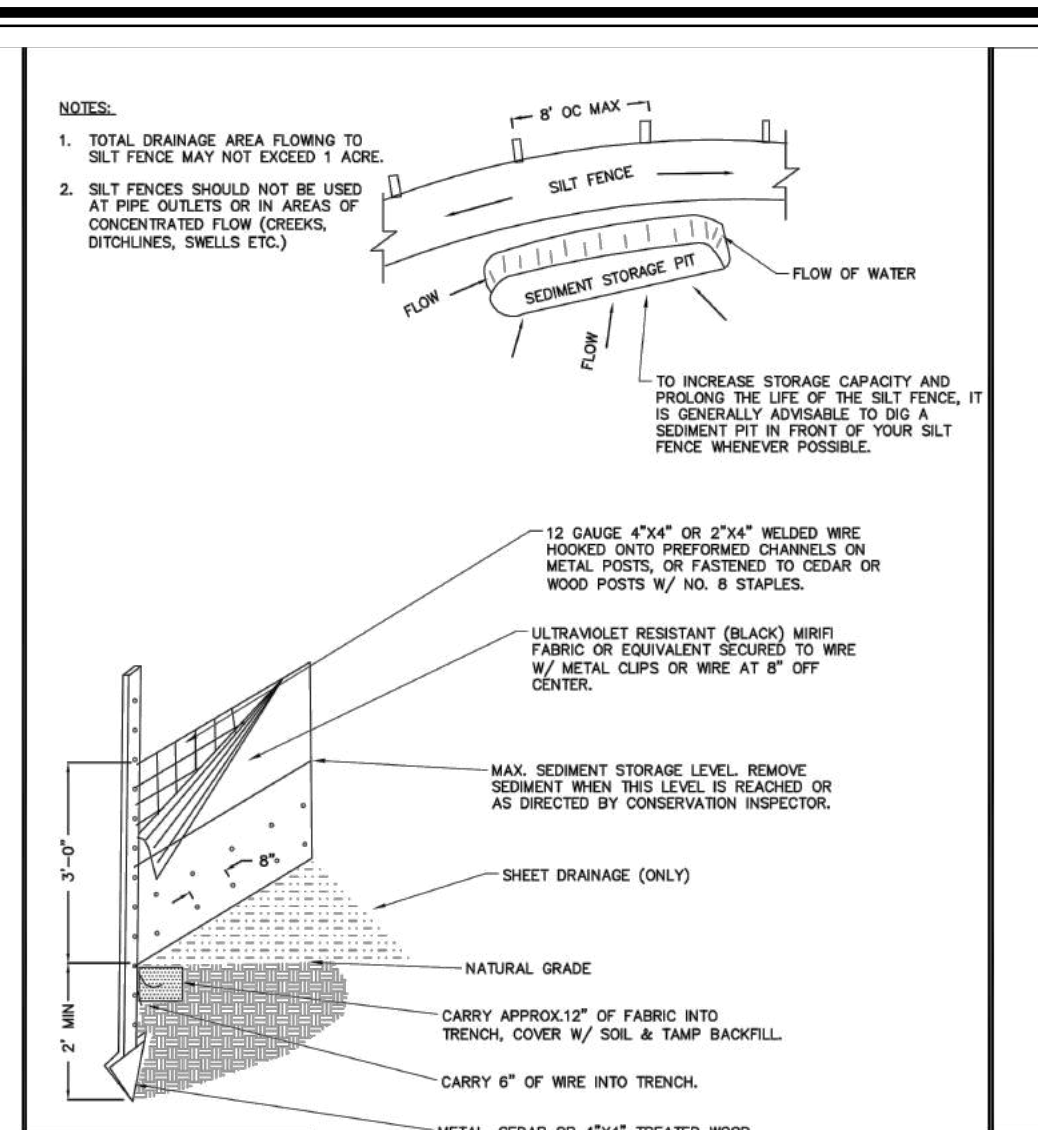
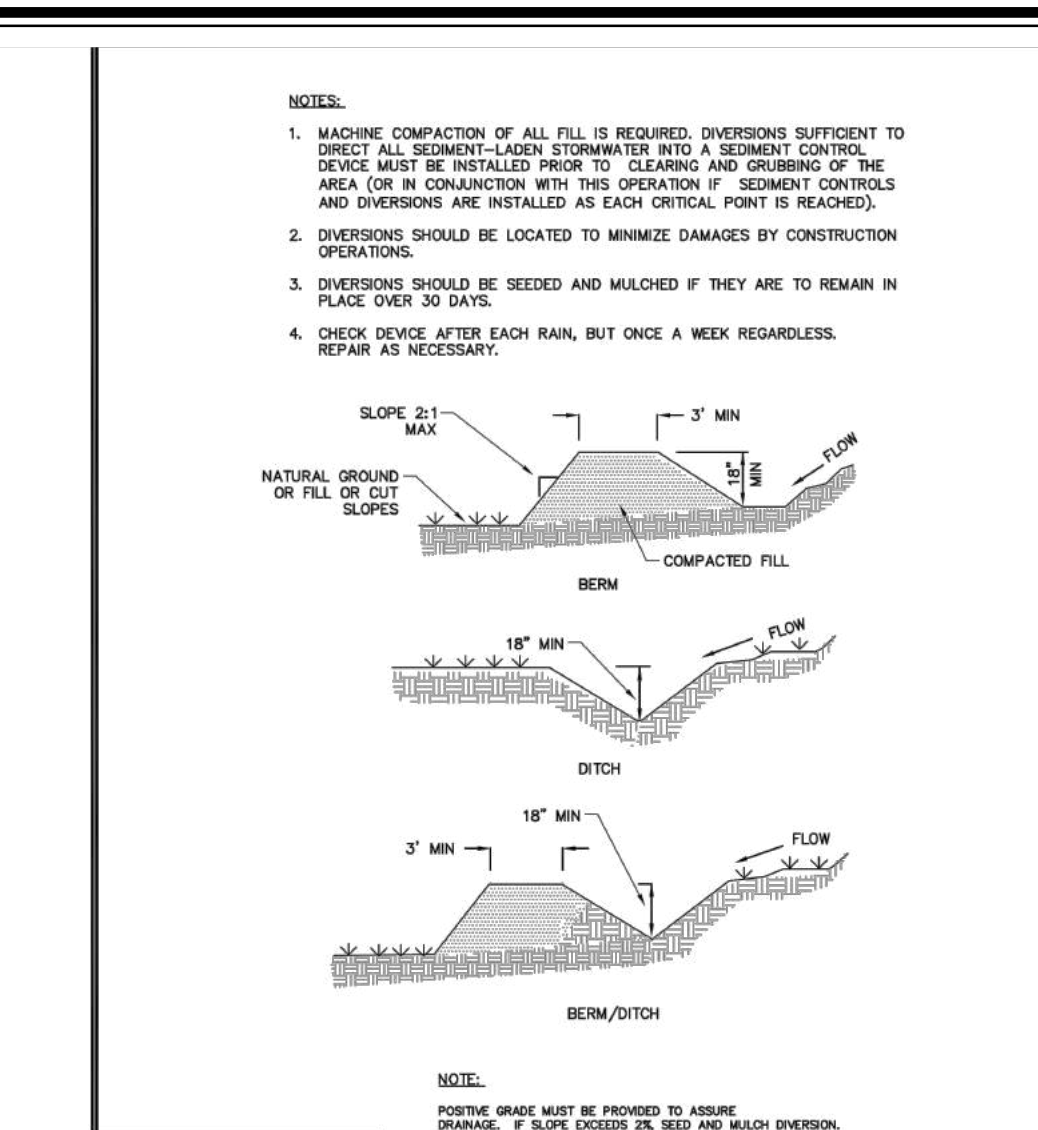


9	SIGNATURE SUBMITTAL	8/27/21
10	REVISION TO APPROVED PLANS	11/11/21

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 BERMOUDAGRASS	25
JULY 01 - AUGUST 15	TALL FESCUE AND BROWN TOP MILLET OR SORGHUM-SUDAN HYBRIDS	120
MARCH 01 - JUNE 01	BERNCA LESPEDEZA (SCAFFIED) AND TALL FESCUE OR	50
MARCH 01 - APRIL 15	ABRUZZI RYE	25
MARCH 01 - JUNE 30	HULLED COMMON BERMOUDAGRASS	25
JUNE 01 - SEPTEMBER 01	BROWN TOP MILLET OR SORGHUM-SUDAN HYBRIDS	30
SEPTEMBER 01 - MARCH 01	TALL FESCUE OR	120
NOVEMBER 01 - MARCH 01	ABRUZZI RYE	25



REVISIONS	DATE	DESCRIPTION
TOWN OF KNIGHTDALE		

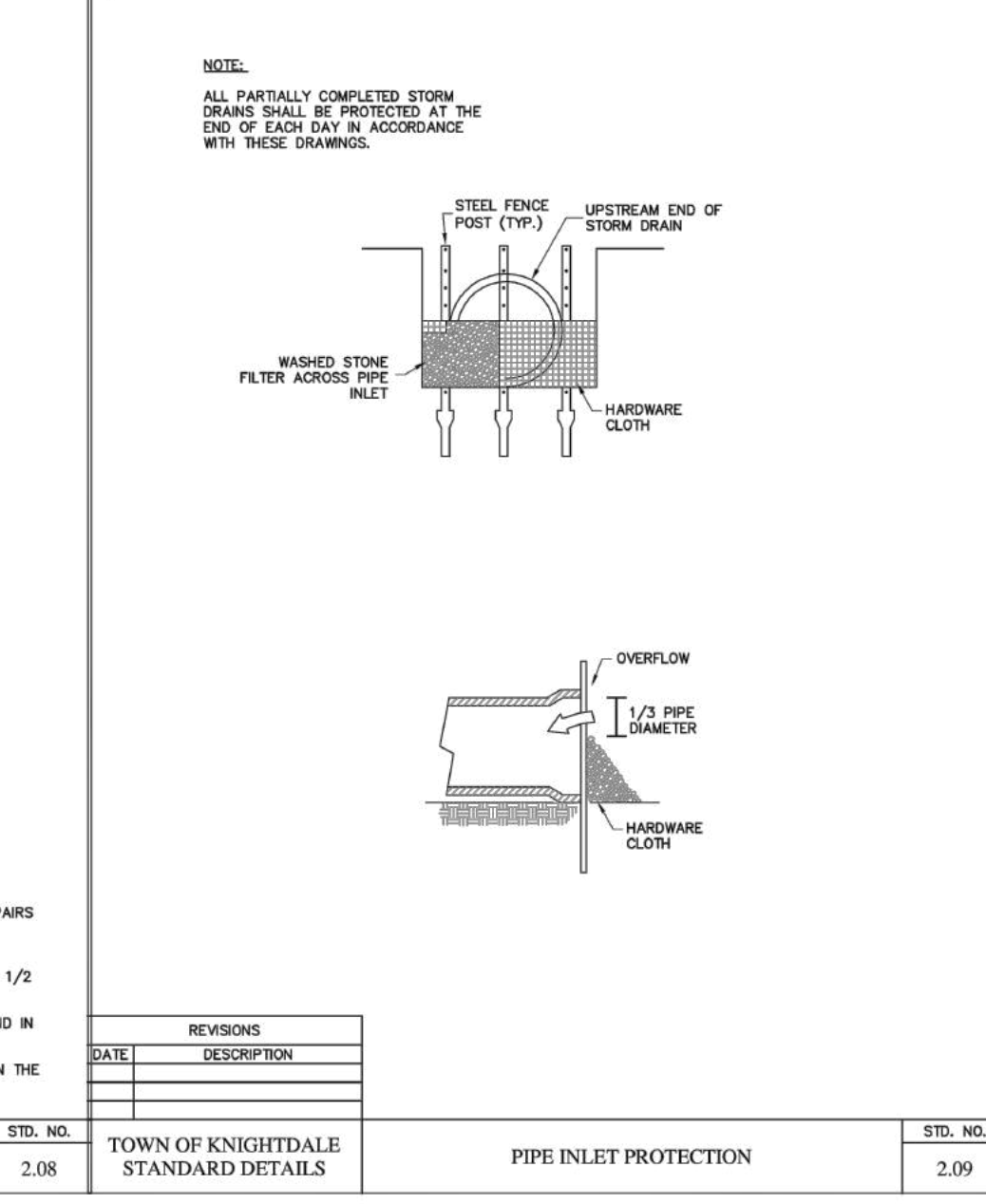
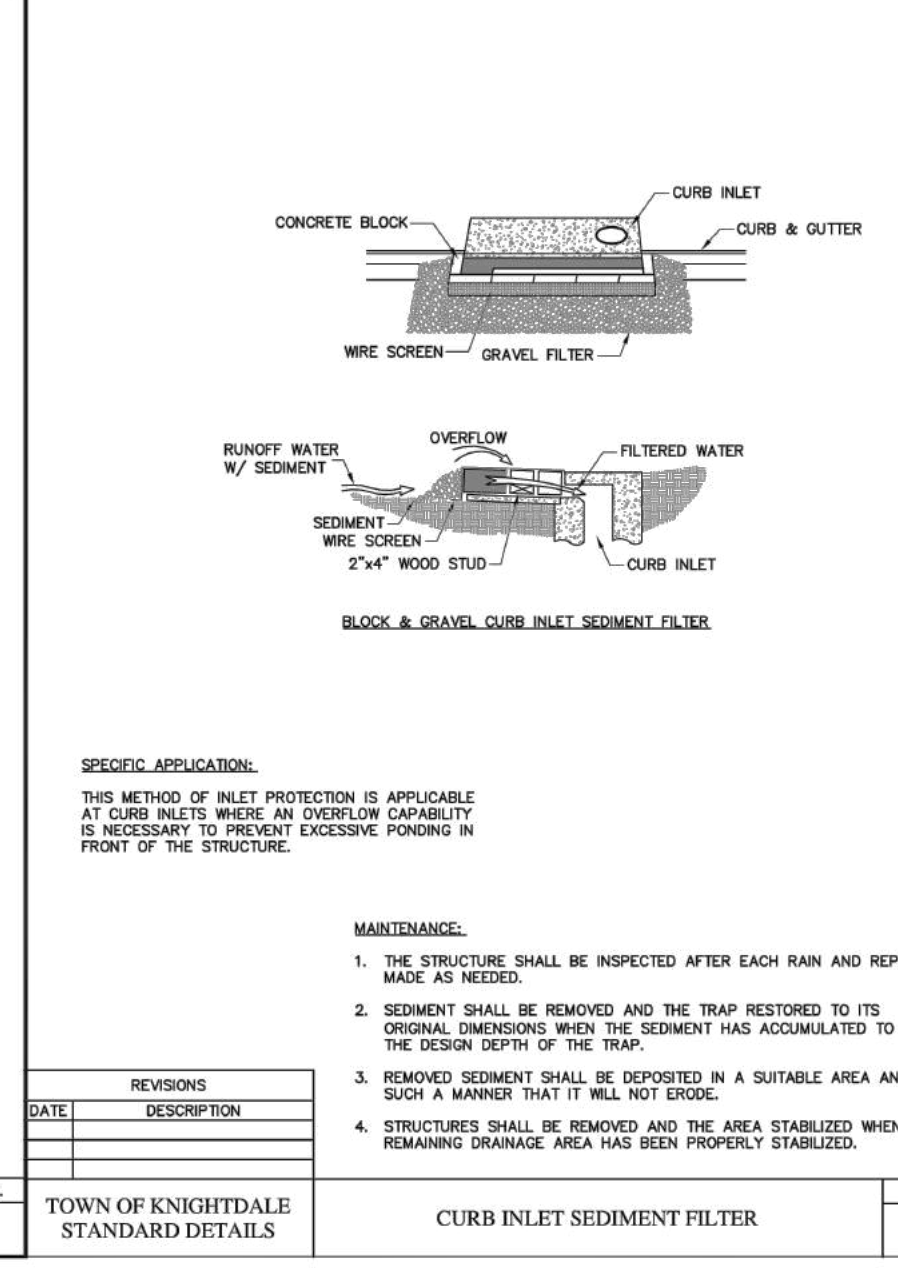
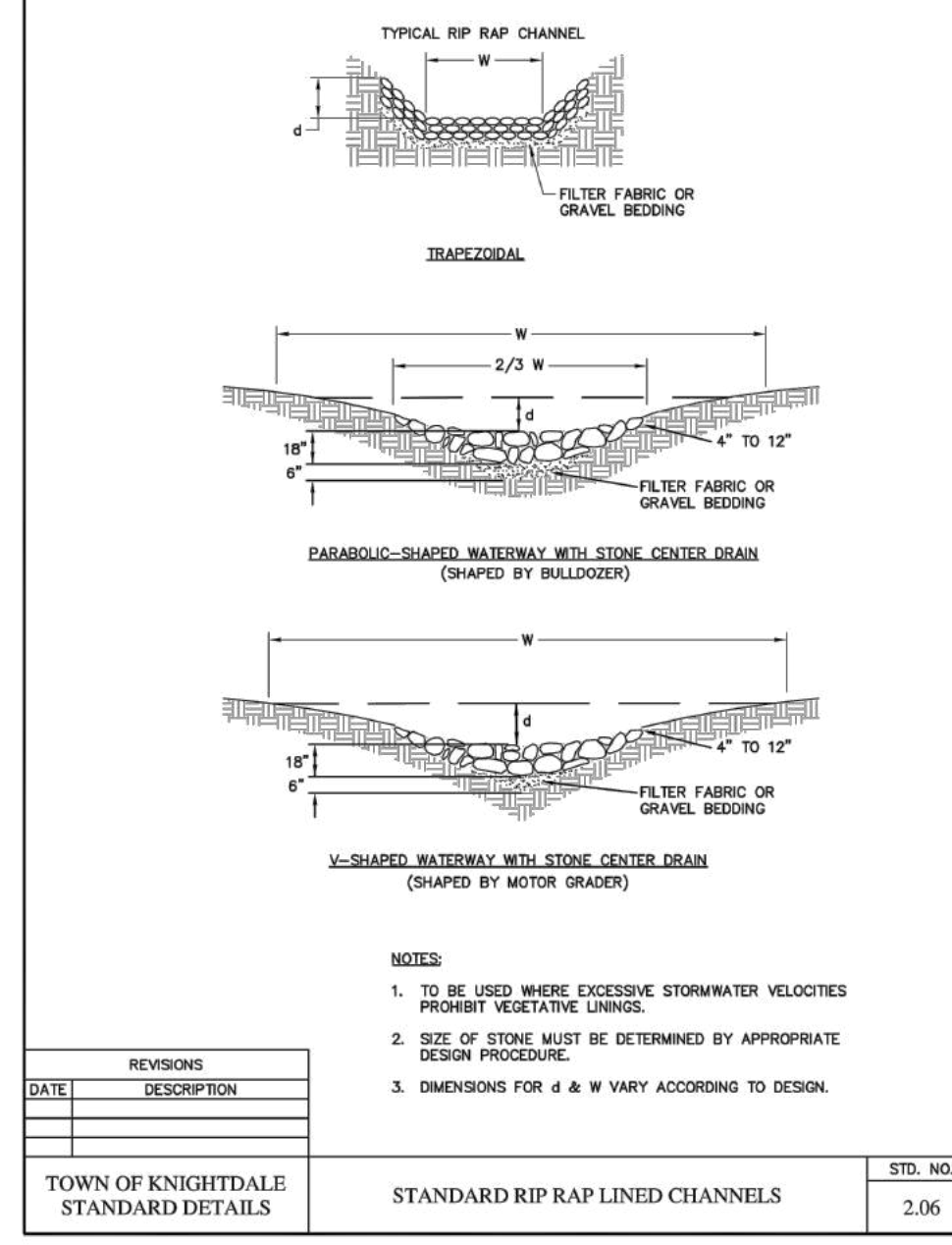
REVISIONS	DATE	DESCRIPTION
TOWN OF KNIGHTDALE		

REVISIONS	DATE	DESCRIPTION
TOWN OF KNIGHTDALE		

REVISIONS	DATE	DESCRIPTION
TOWN OF KNIGHTDALE		

REVISIONS	DATE	DESCRIPTION
TOWN OF KNIGHTDALE		

REVISIONS	DATE	DESCRIPTION
TOWN OF KNIGHTDALE		



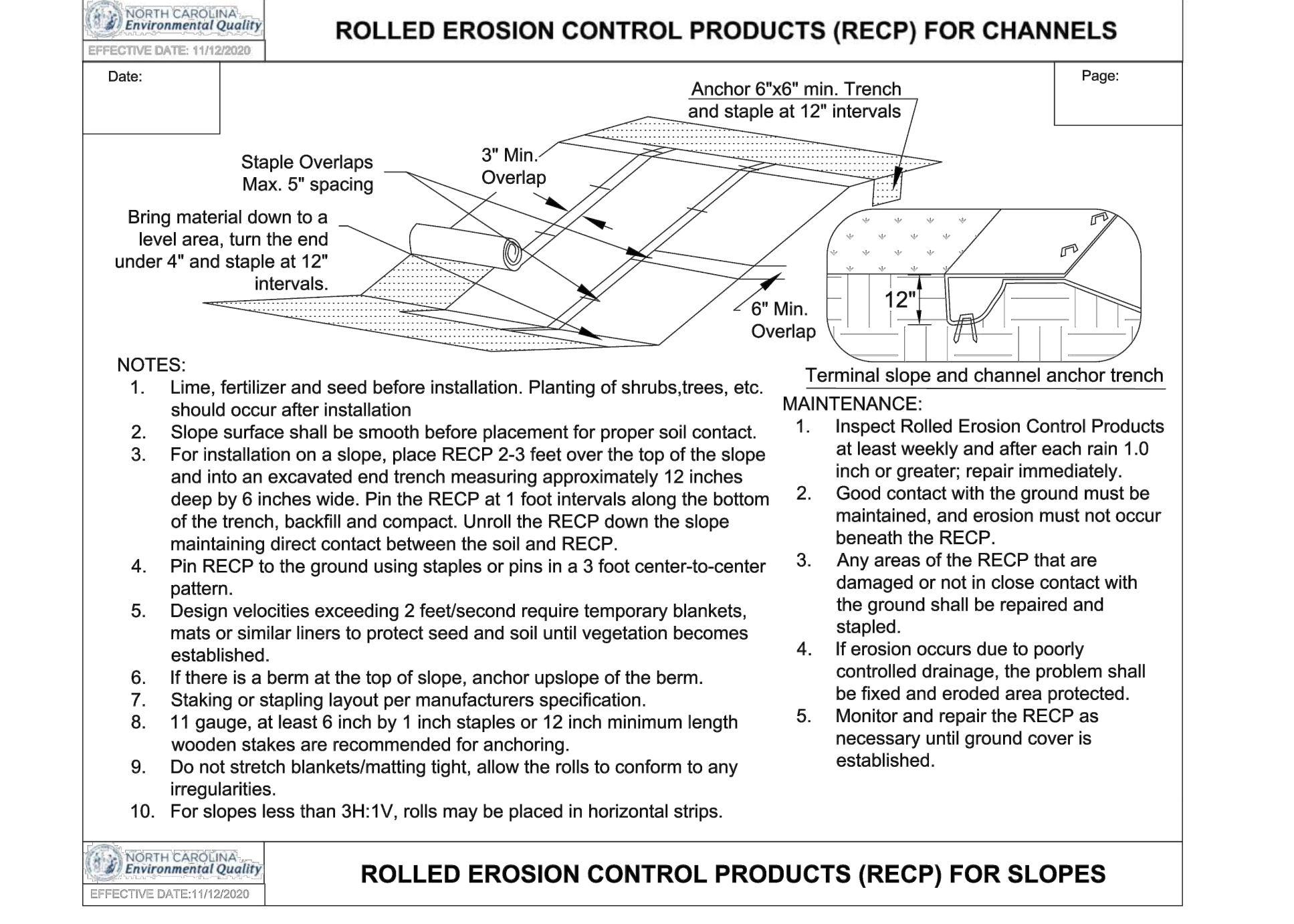
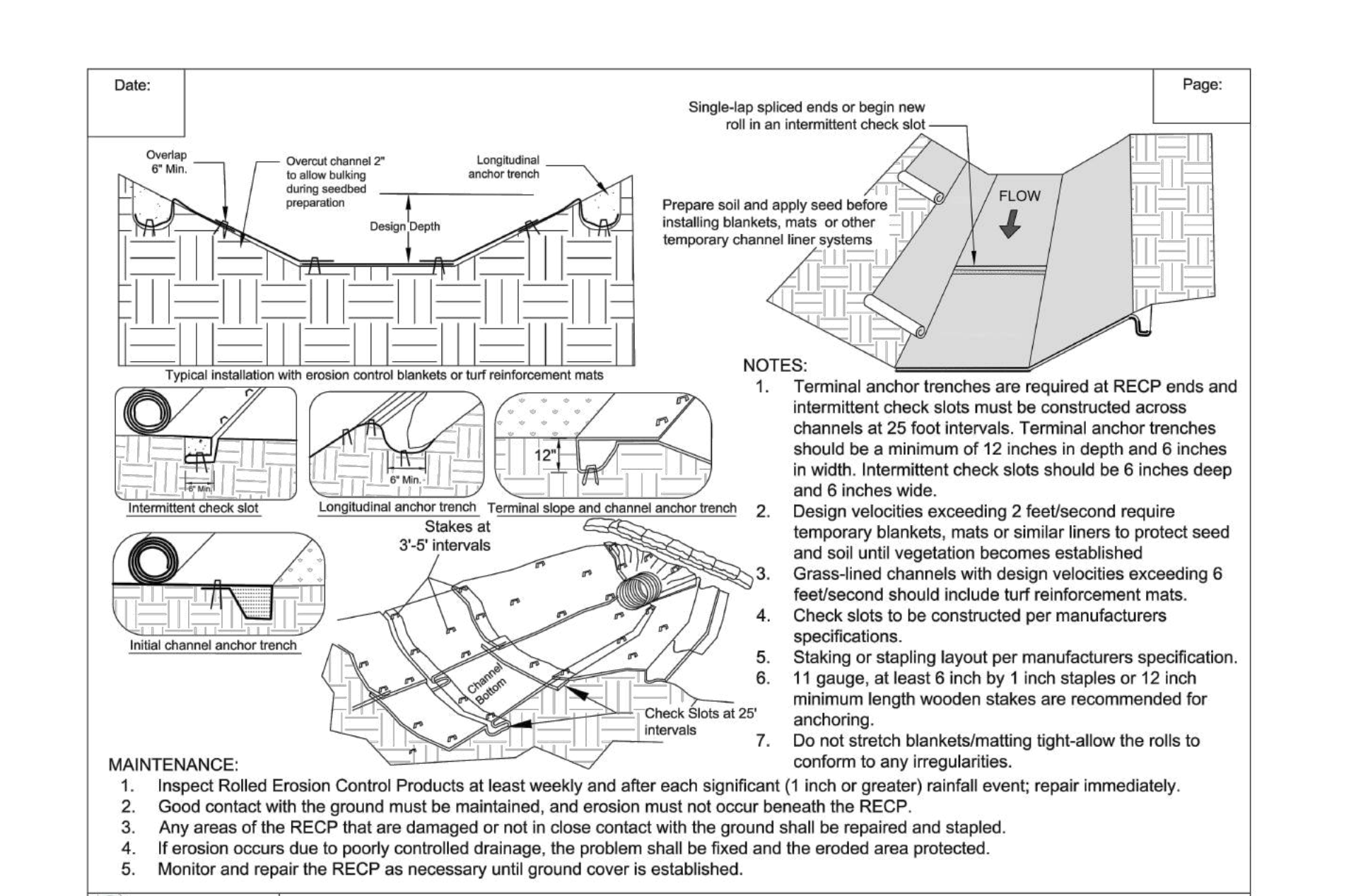
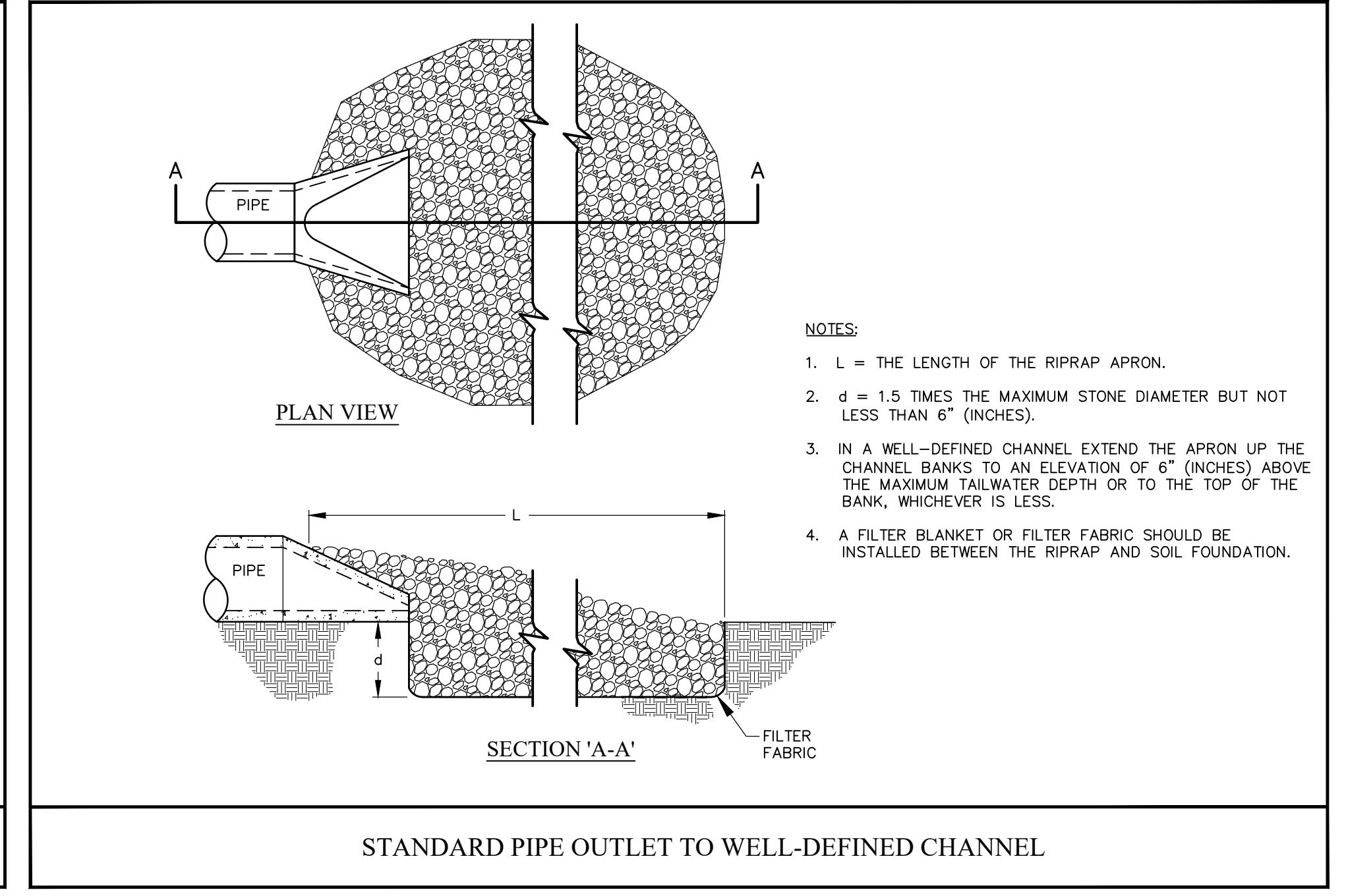
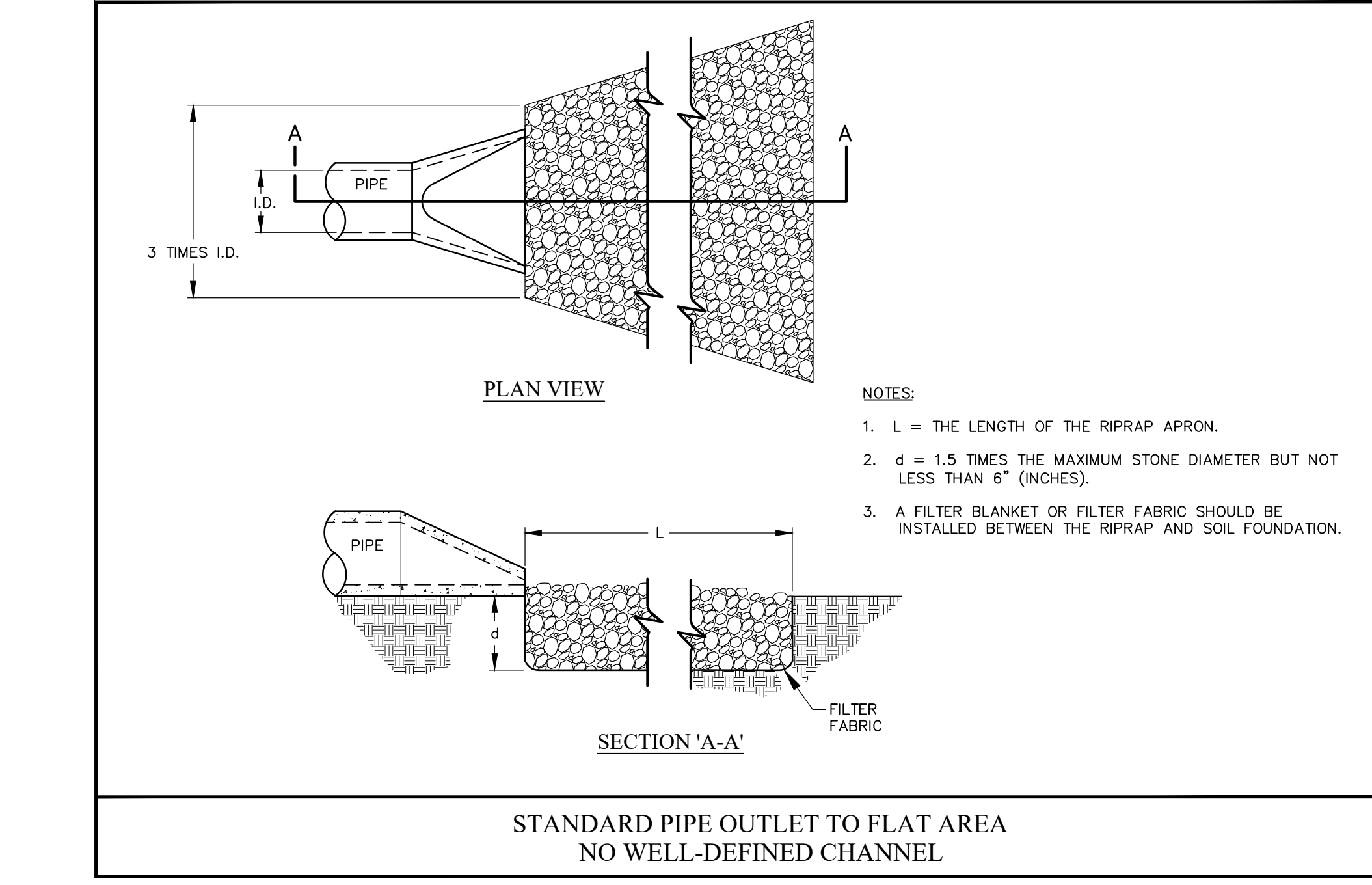
REVISIONS	DATE	DESCRIPTION
TOWN OF KNIGHTDALE		

REVISIONS	DATE	DESCRIPTION
TOWN OF KNIGHTDALE		

REVISIONS	DATE	DESCRIPTION
TOWN OF KNIGHTDALE		

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
TOWN OF KNIGHTDALE		

REVISIONS	DATE	DESCRIPTION
TOWN OF KNIGHTDALE		

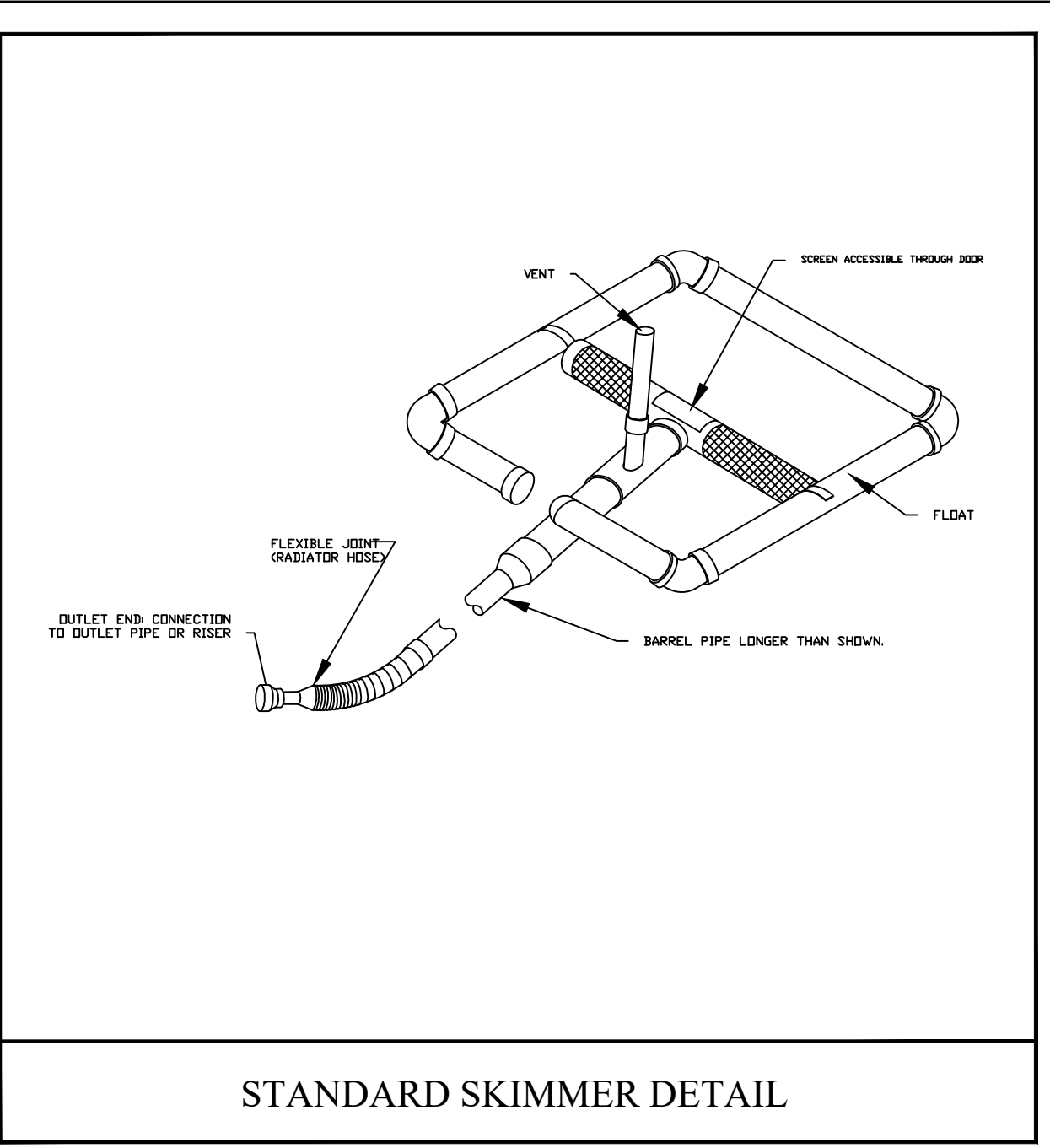
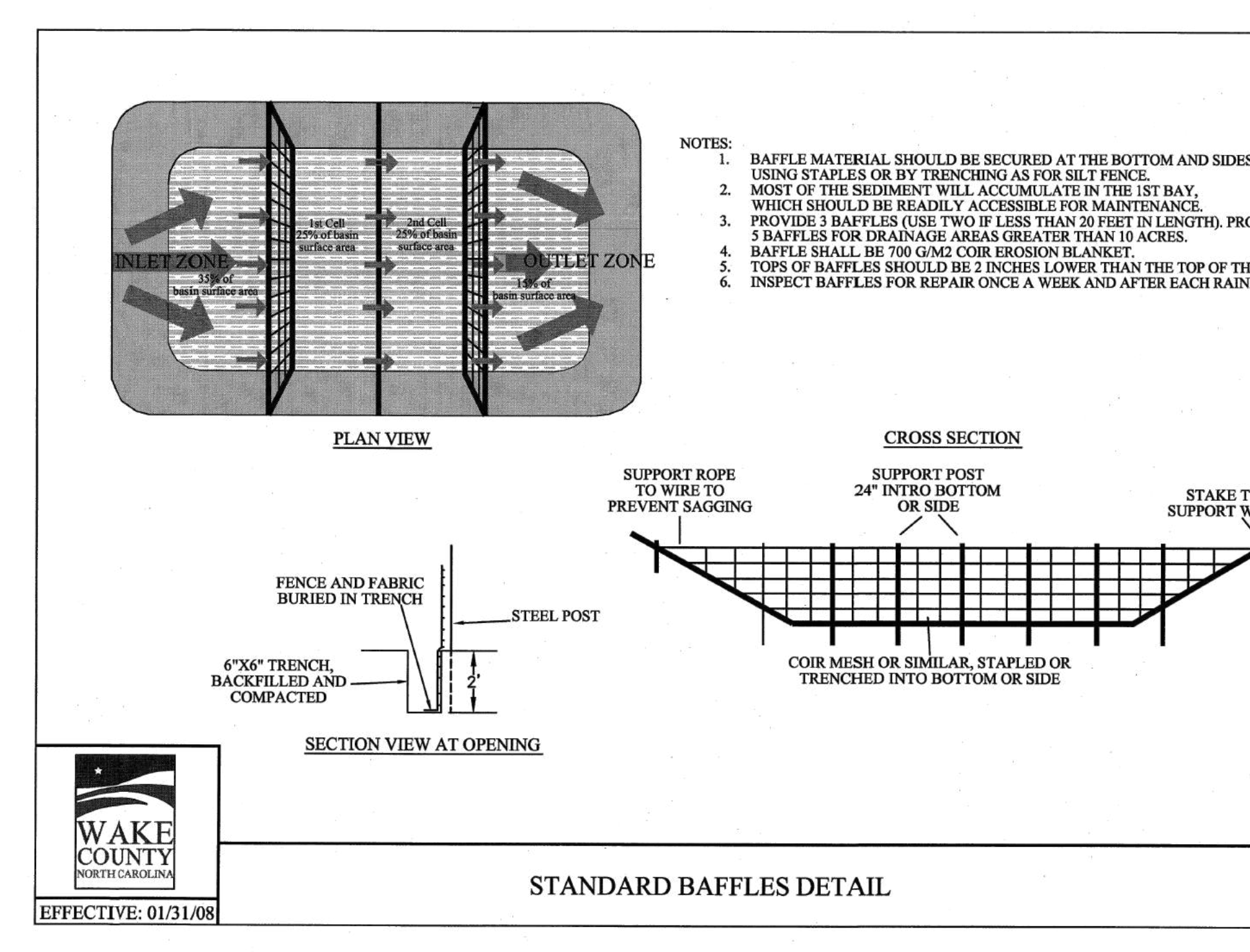
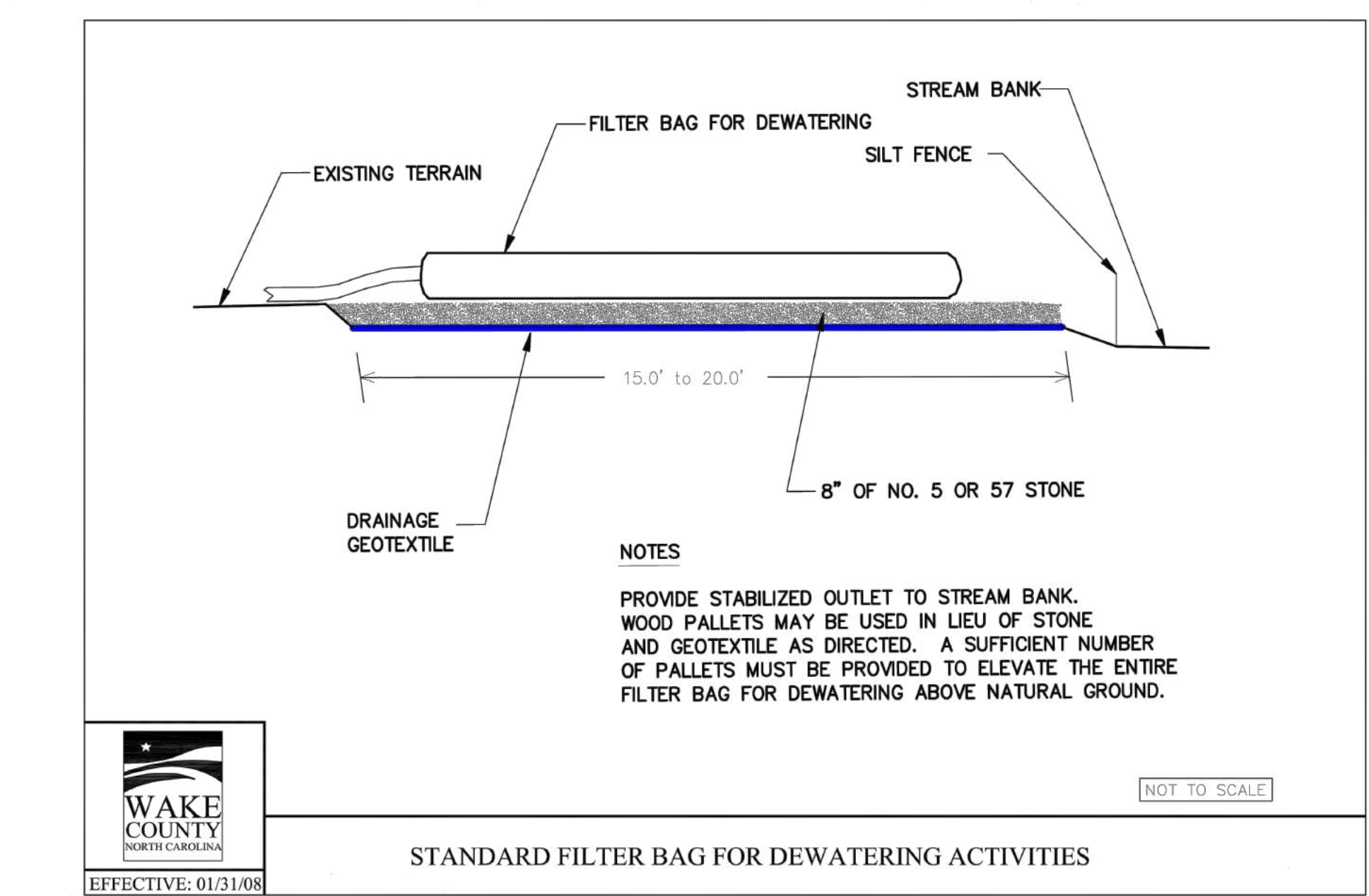
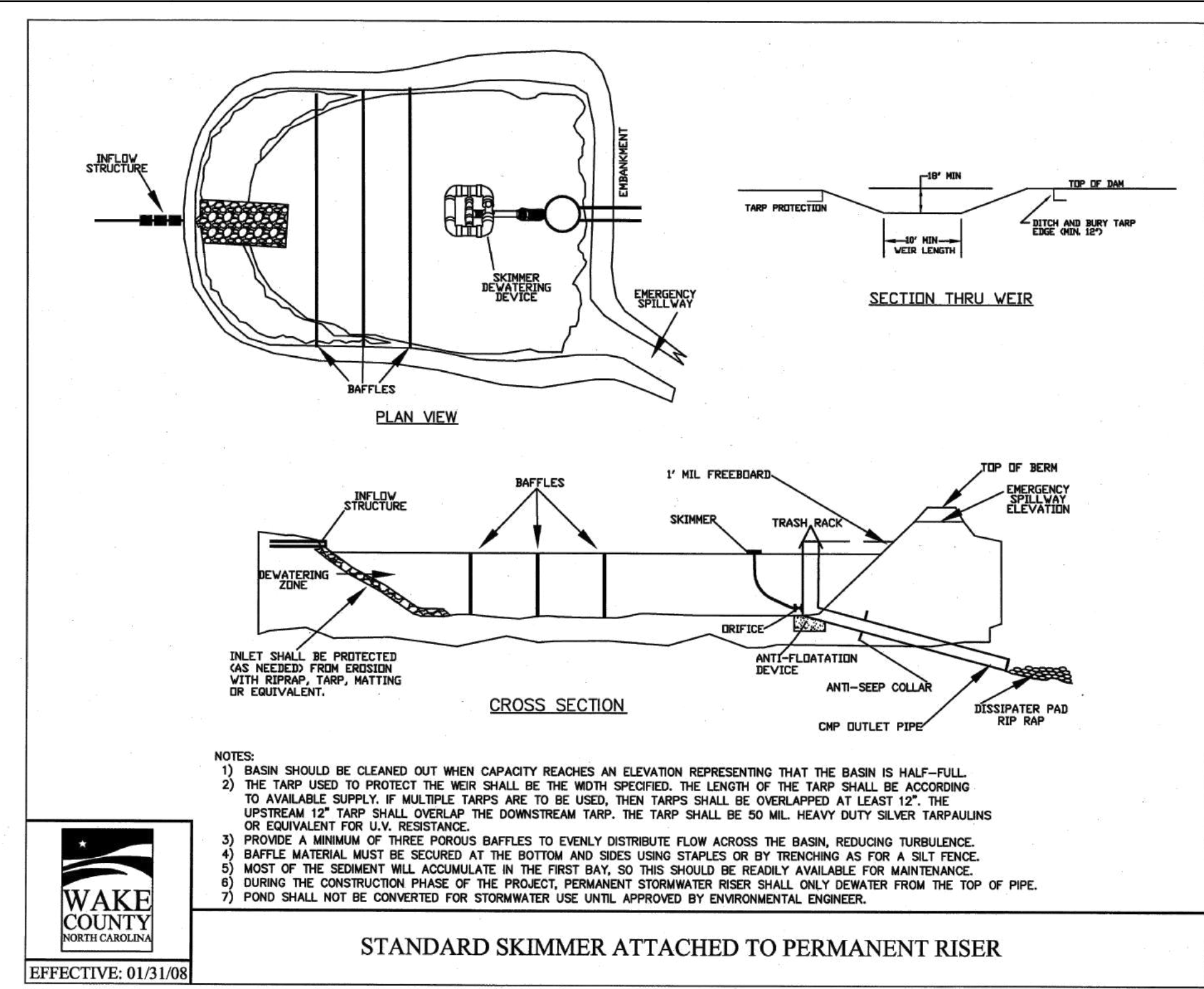
REVISIONS	DATE	DESCRIPTION
TOWN OF KNIGHTDALE		

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.

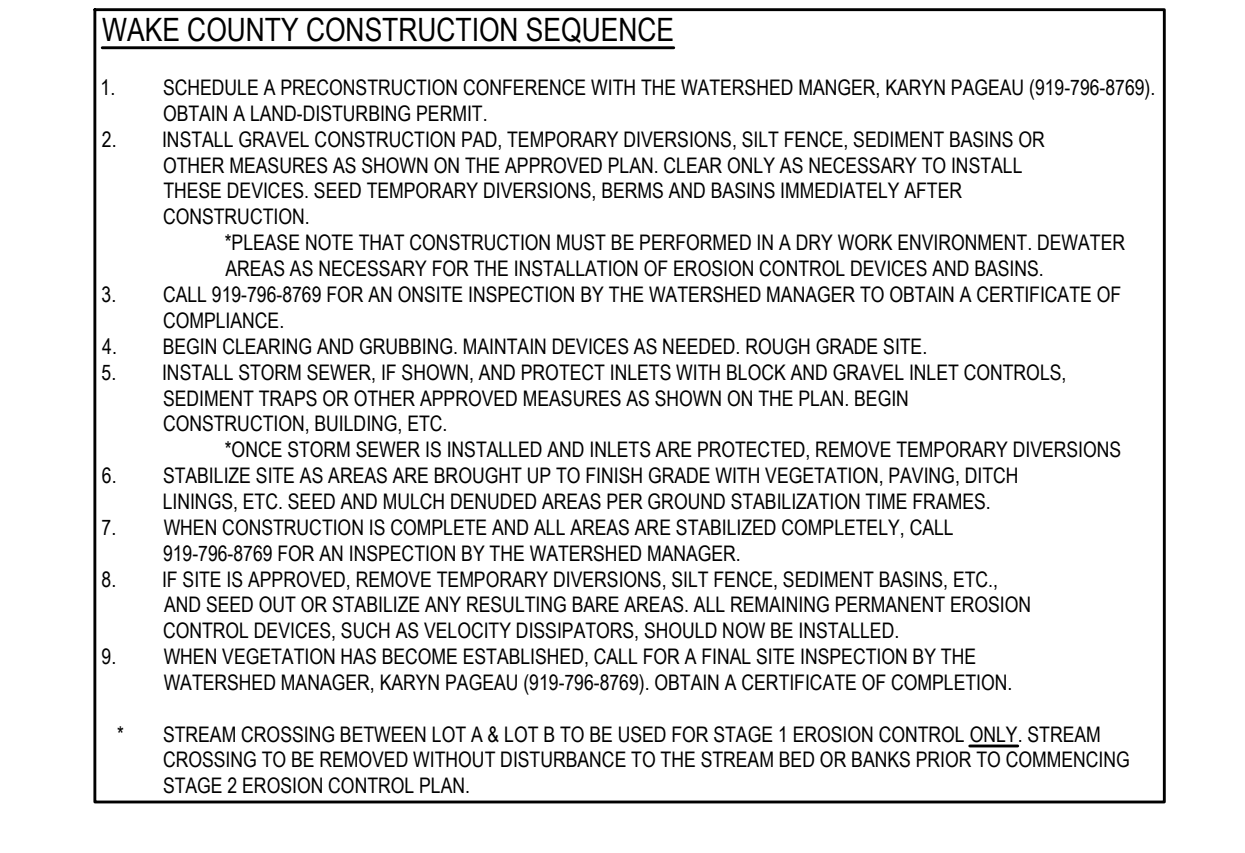
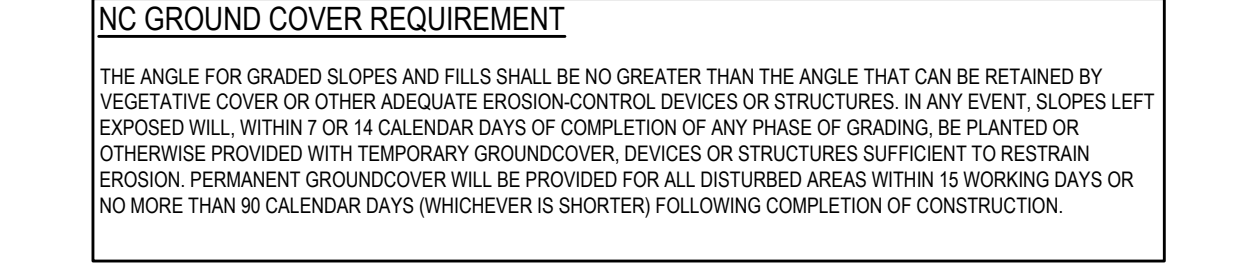
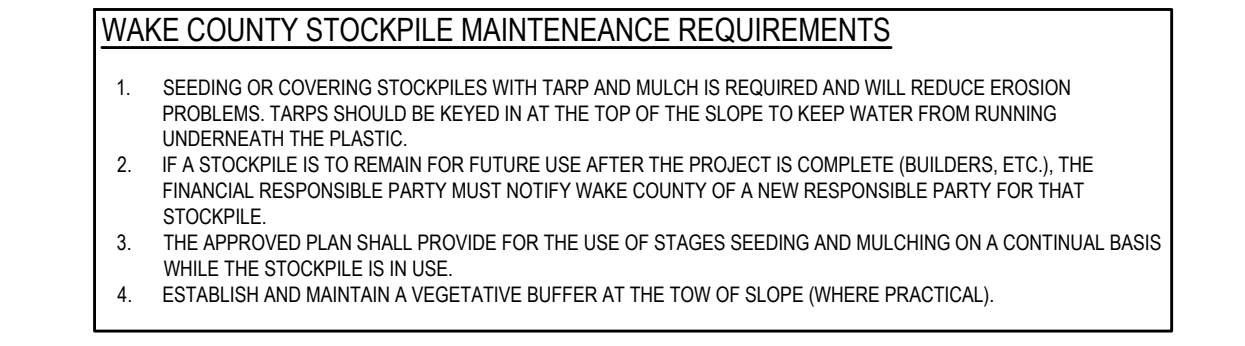
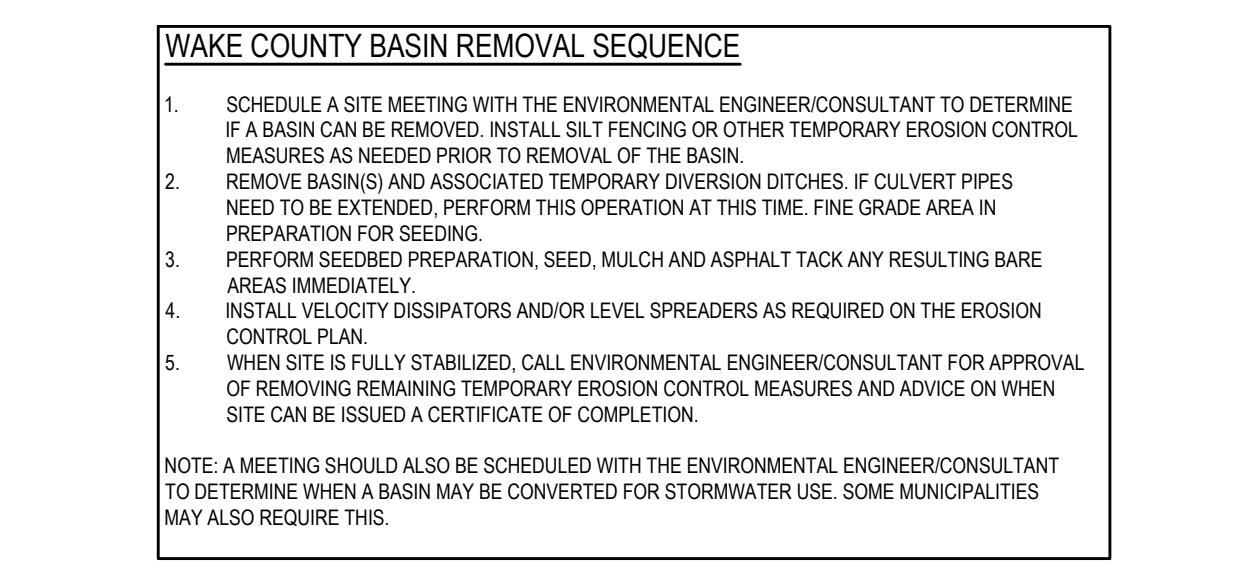
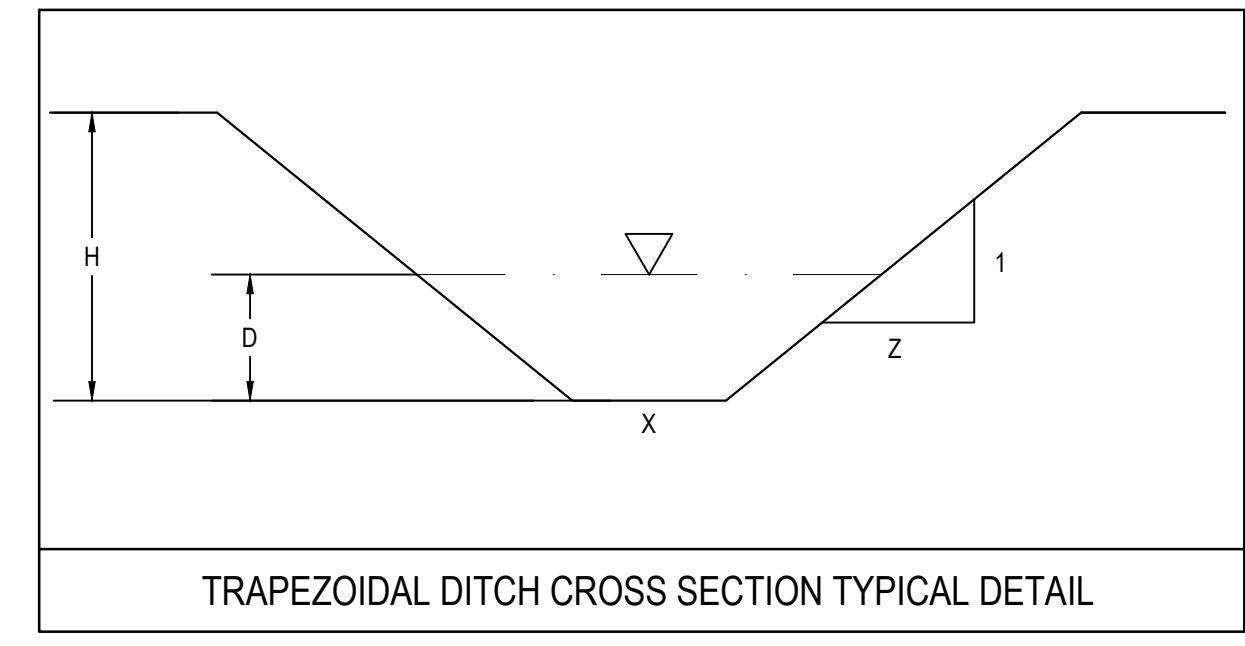
By: \_\_\_\_\_ Date: \_\_\_\_\_  
Town Engineer

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

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



STANDARD SKIMMER DETAIL



Basin #	Drainage Area (sf)	Drainage Area (ac)	Denuded Area to Basin (ac)	Q10 (cfs)	Storage Volume Req'd (1800 cf/ac)(Denuded Area) (cf)	Surface Area Req'd (Q10/435sf/ft) (sf)	Length (ft)	Width (ft)	Depth (ft)	Storage Volume Provided (cf) @ 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	171620	38597	273.5	275.25	271	9649	**	-

Basin #	Drainage Area (sf)	Drainage Area (ac)	Denuded Area to Basin (ac)	Q10 (cfs)	Storage Volume Req'd (1800 cf/ac)(Denuded Area) (cf)	Surface Area Req'd (Q10/325sf/ft) (sf)	Length (ft)	Width (ft)	Depth (ft)	Storage Volume Provided (cf) @ 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	274	558	6.25	10
SSB 2	247305	5.68	5.68	14.43	10219	4888	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

Orifice Equation	Q = Cd * A * (2gh)^(1/2)
<b>SSB 1</b>	
<b>Variables</b>	<b>Constants</b>
Basin Volume:	4,423 cf
Head:	0.208 ft
Dewatering time:	72 hrs
	259200 sec
	g = 32.2 ft/s <sup>2</sup>
	Cd = 0.59
<b>Orifice Area =</b>	<b>0.00790 sf</b>
<b>Orifice Diameter =</b>	<b>1.20 in</b>
<b>Orifice Radius =</b>	<b>0.60 in</b>

Orifice Equation	Q = Cd * A * (2gh)^(1/2)
<b>SSB 2</b>	
<b>Variables</b>	<b>Constants</b>
Basin Volume:	10,219 cf
Head:	0.250 ft
Dewatering time:	72 hrs
	259200 sec
	g = 32.2 ft/s <sup>2</sup>
	Cd = 0.59
<b>Orifice Area =</b>	<b>0.01665 sf</b>
<b>Orifice Diameter =</b>	<b>1.75 in</b>
<b>Orifice Radius =</b>	<b>0.87 in</b>

Orifice Equation	Q = Cd * A * (2gh)^(1/2)
<b>SSB 3</b>	
<b>Variables</b>	<b>Constants</b>
Basin Volume:	2,304 cf
Head:	0.167 ft
Dewatering time:	72 hrs
	259200 sec
	g = 32.2 ft/s <sup>2</sup>
	Cd = 0.59
<b>Orifice Area =</b>	<b>0.00459 sf</b>
<b>Orifice Diameter =</b>	<b>0.92 in</b>
<b>Orifice Radius =</b>	<b>0.46 in</b>

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.)	DITCH BOTTOM WIDTH, X (ft.)	SLOPE, Z	DITCH LINING
TD 1	5.70	5.07	1.32	1.50	0.40	2.0	2.0	2.0	NAG S150
TD 2	1.96	3.47	0.66	1.50	0.23	2.0	2.0	2.0	NAG S75
TD 3	3.70	4.00	0.83	1.50	0.34	2.0	2.0	2.0	NAG S75
TD 4	0.46	2.70	0.50	1.50	0.08	2.0	2.0	2.0	NAG S75
TD 5	7.98	5.06	1.30	1.50	0.52	2.0	2.0	2.0	NAG S150
TD 6	6.51	5.47	1.55	1.50	0.42	2.0	2.0	2.0	NAG S150
TD 7	1.33	2.23	0.27	1.50	0.24	2.0	2.0	2.0	NAG S75
TD 8	17.39	5.65	1.57	1.50	0.84	2.0	2.0	2.0	NAG S150
CWD 1	4.35	5.37	1.53	1.50	0.31	2.0	2.0	2.0	0

**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 MARKING.

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**

- RECEIVING WATERCOURSE: MILBURNIE CREEK TO NEUSE RIVER
- 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.
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO SEE THAT THE CONSTRUCTION ENTRANCE PADS ARE PROPERLY MAINTAINED SO THAT MUD IS NOT TRACKED ONTO ADJACENT STREETS
- 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.
- 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.
- 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.
- SLOPES SHALL BE NO STEEPER THAN 2:1 (H:V), PREFERABLY FLATTER, FOR VEGETATION.
- VELOCITY DISSIPATORS SHALL BE INSTALLED AT THE END OF EACH FLARED END SECTION AND SHALL HAVE A FILTER FABRIC UNDERLIER.
- 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.
- 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 PROPER.
- SEE EROSION CONTROL DETAILS FOR ADDITIONAL MAINTENANCE REQUIREMENTS AND SPECIFICATIONS.

**STORM DRAINAGE/GRADING NOTES:**

- 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.
- CONTRACTOR SHALL COORDINATE WITH THE UTILITY COMPANIES FOR ANY REQUIRED UTILITY ADJUSTMENTS AND/OR RELOCATIONS.
- 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.
- 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.
- 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.
- 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.
- CONTRACTOR SHALL INCLUDE IN THE CONTRACT PRICE ANY DEWATERING NECESSARY TO CONSTRUCT THE PROJECT AS SHOWN ON THE PLANS.
- THE LOCATIONS OF EXISTING STORM SEWER STRUCTURES SHOWN ON THESE PLANS ARE APPROXIMATE. WHERE PROPOSED STORM SEWER PIPES TIES TO EXISTING STRUCTURES, PIPES, SWALES, ETC., THE CONTRACTOR SHALL FIELD ADJUST PROPOSED STORM SEWER TIES TO MATCH THE LOCATIONS OF THESE EXISTING FEATURES.

**WAKE COUNTY STABILIZATION GUIDELINES**

(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**

- CHISEL COMPACTED AREAS AND SPREAD TOPSOIL, THREE INCHES DEEP OVER ADVERSE SOIL CONDITIONS, IF AVAILABLE.
- RIP THE ENTIRE AREA TO SIX INCHES DEEP.
- REMOVE ALL LOOSE ROCK, ROOTS AND OTHER OBSTRUCTIONS, LEAVING SURFACE REASONABLY SMOOTH AND UNIFORM.
- APPLY AGRICULTURAL LIME, FERTILIZER AND SUPERPHOSPHATE UNIFORMLY AND MIX WITH SOIL (SEE MIXTURE BELOW).
- CONTINUE TILLAGE UNTIL A WELL-PULVERIZED, FIRM, REASONABLY UNIFORM SEEDBED IS PREPARED FOUR TO SIX INCHES DEEP.
- SEED ON A FRESHLY PREPARED SEEDBED AND COVER LIGHTLY WITH SEEDING EQUIPMENT OR CULTIVATOR AFTER SEEDING.
- MULCH IMMEDIATELY AFTER SEEDING AND ANCHOR MULCH.
- INSPECT ALL SEEDED AREAS AND MAKE NECESSARY REPAIRS OR RESEEDINGS WITHIN THE PLANTING SEASON, IF POSSIBLE. IF STAND SHOULD BE MORE THAN 80% DAMAGED, RE-ESTABLISH FOLLOWING THE ORIGINAL LIME, FERTILIZER AND SEEDING RATES.
- CONSULT S&E ENVIRONMENTAL ENGINEERS ON MAINTENANCE TREATMENT AND FERTILIZATION AFTER PERMANENT COVER IS ESTABLISHED.

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

**Seeding Schedule**

For Shoulders, Side Ditches, Slopes (Max 3:1)

Date	Type	Planting Rate
Aug 15-Nov 1	Tall Fescue	300 lbs/acre
Nov 1-Mar 1	Tall Fescue & Abruzzi Rye	300 lbs/acre
Mar 1-Apr 15	Tall Fescue	300 lbs/acre
Apr 15-Jun 30	Hulled Common Bermudagrass	25 lbs/acre
Jul 1-Aug 15	Tall Fescue AND Browntop Millet or Sorghum-Sudan Hybrids***	125 lbs/acre (Tall Fescue); 35 lbs/acre (Browntop Millet); 30 lbs/acre (Sorghum-Sudan Hybrids)

**Seeding Schedule**

For Shoulders, Side Ditches, Slopes (3:1 to 2:1)

Date	Type	Planting Rate
Mar 1-Jun 1	Sericea Lespedeza (scarified) and use the following contractors:	50 lbs/acre (Sericea Lespedeza);
Mar 1-Apr 15	Add Tall Fescue	120 lbs/acre
Mar 1-Jun 30	Or add Weeping Love grass	10 lbs/acre
Mar 1-Jun 30	Or add Hulled Common Bermudagrass	25 lbs/acre
Jun 1-Sept 1	Tall Fescue AND Browntop	120 lbs/acre (Tall Fescue); 35 lbs/acre (Sericea Lespedeza);
Sept 1-Mar 1	Sericea Lespedeza (unhulled - unscarified) AND Tall Fescue	120 lbs/acre (Tall Fescue);

CONSULT S&E ENVIRONMENTAL ENGINEERS FOR ADDITIONAL INFORMATION CONCERNING OTHER ALTERNATIVES FOR VEGETATION OF DENUDED AREAS. THE ABOVE VEGETATION RATES ARE THOSE THAT DO WELL UNDER LOCAL CONDITIONS; OTHER SEEDING RATE COMBINATIONS ARE POSSIBLE.

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

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 | 1-919-469-3340 | License # C-0832 | www.withersravenel.com

MERRITT HINTON  
OAKS BLVD  
Knightdale, NC

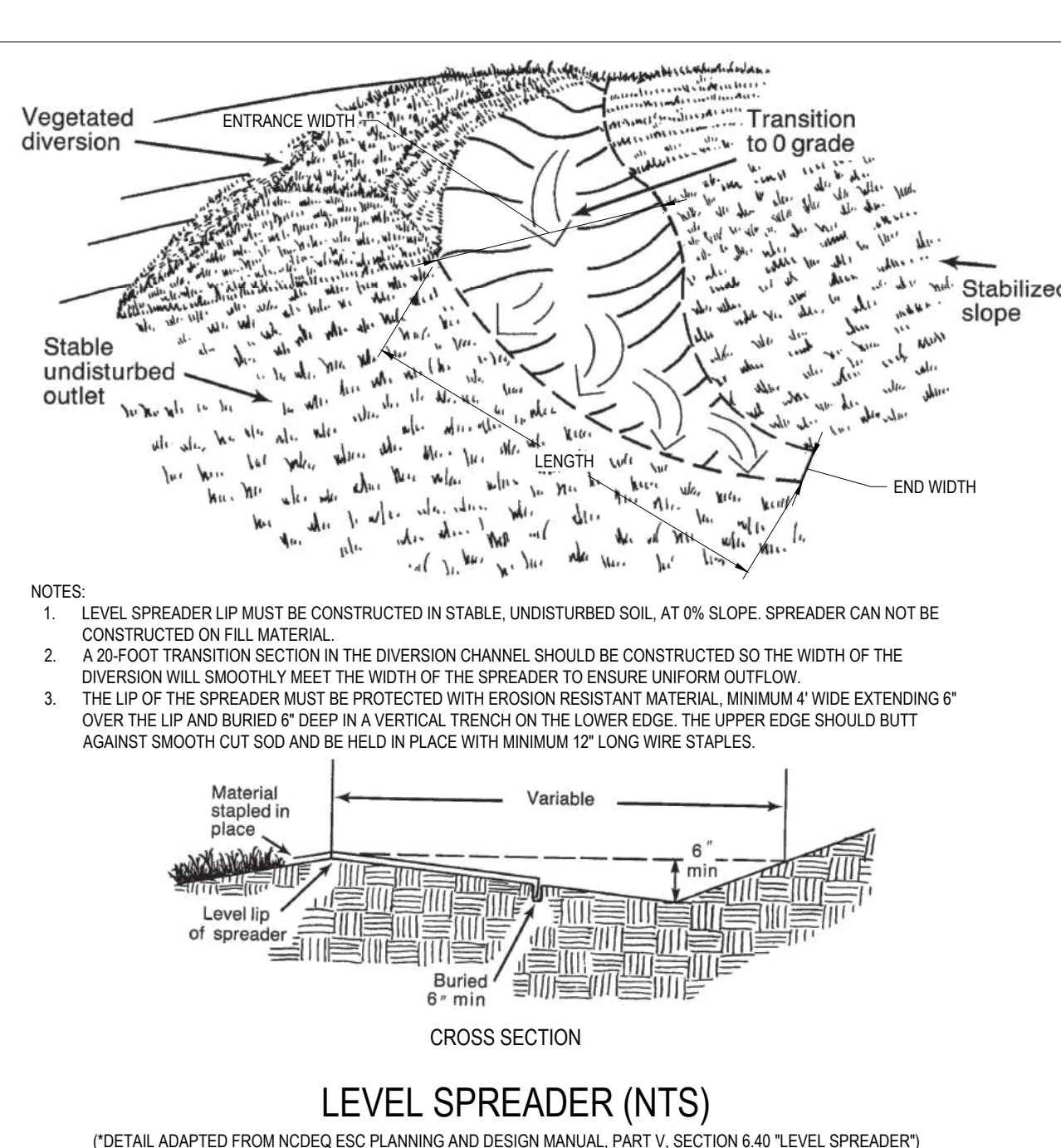
**EROSION CONTROL DETAILS**

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

Revisions

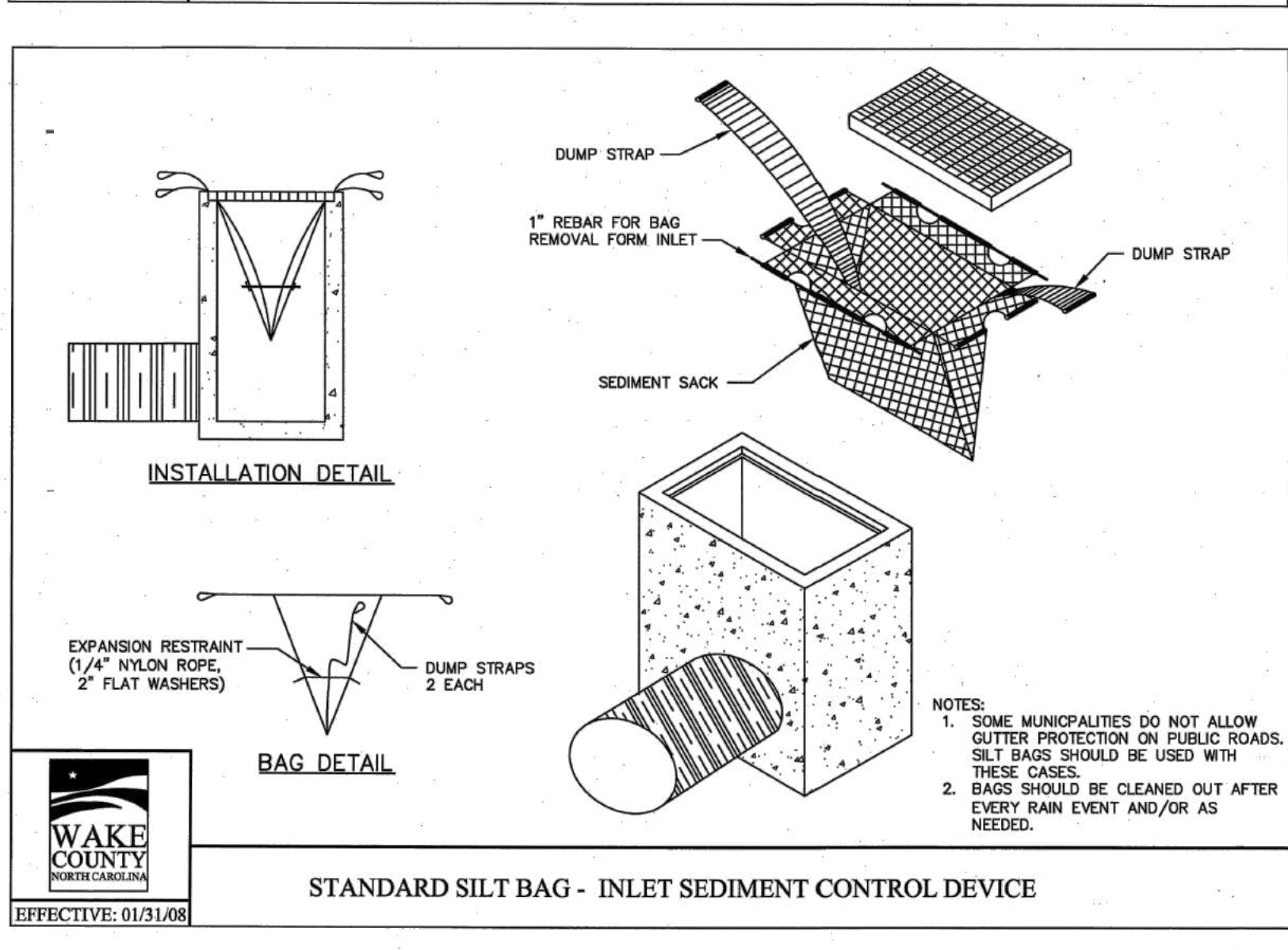
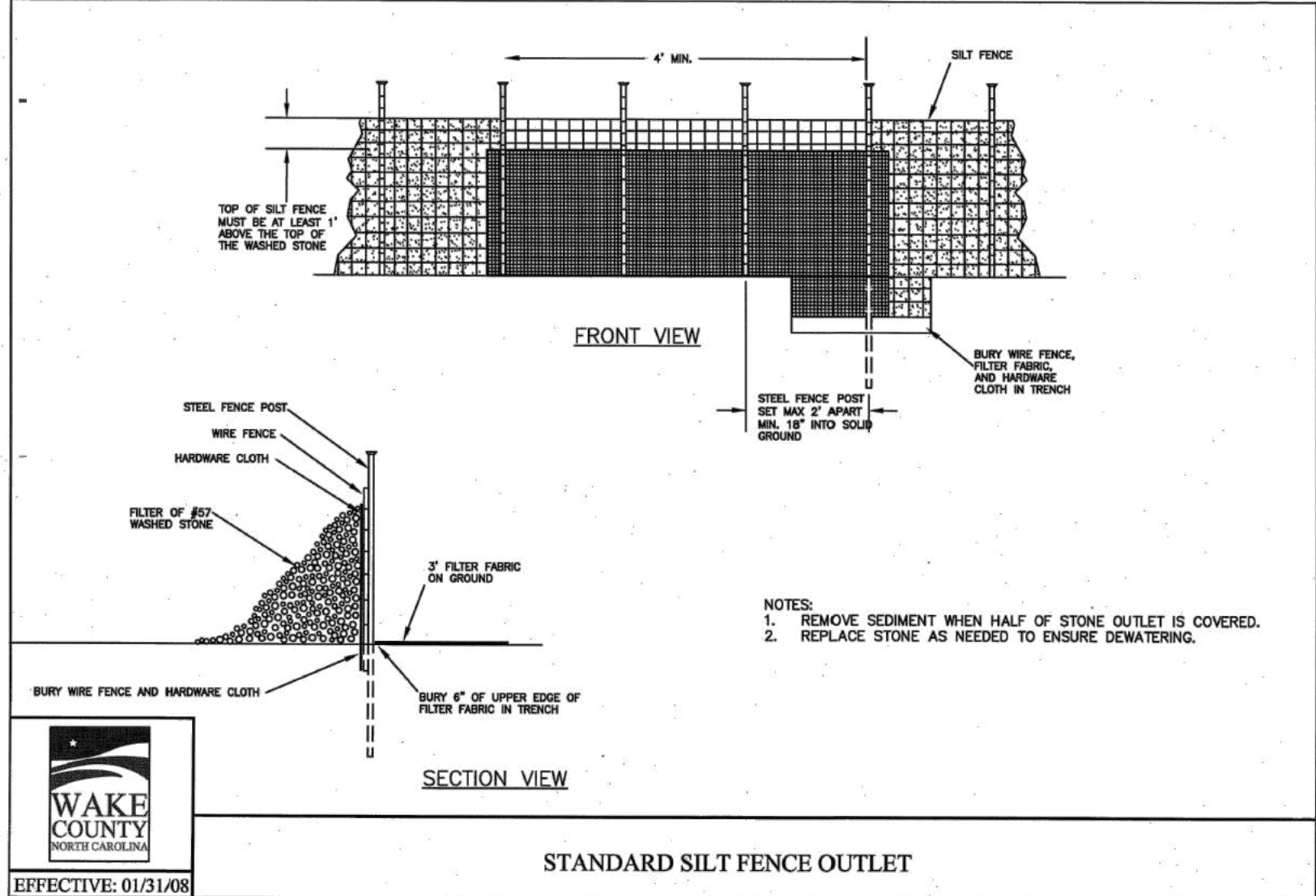
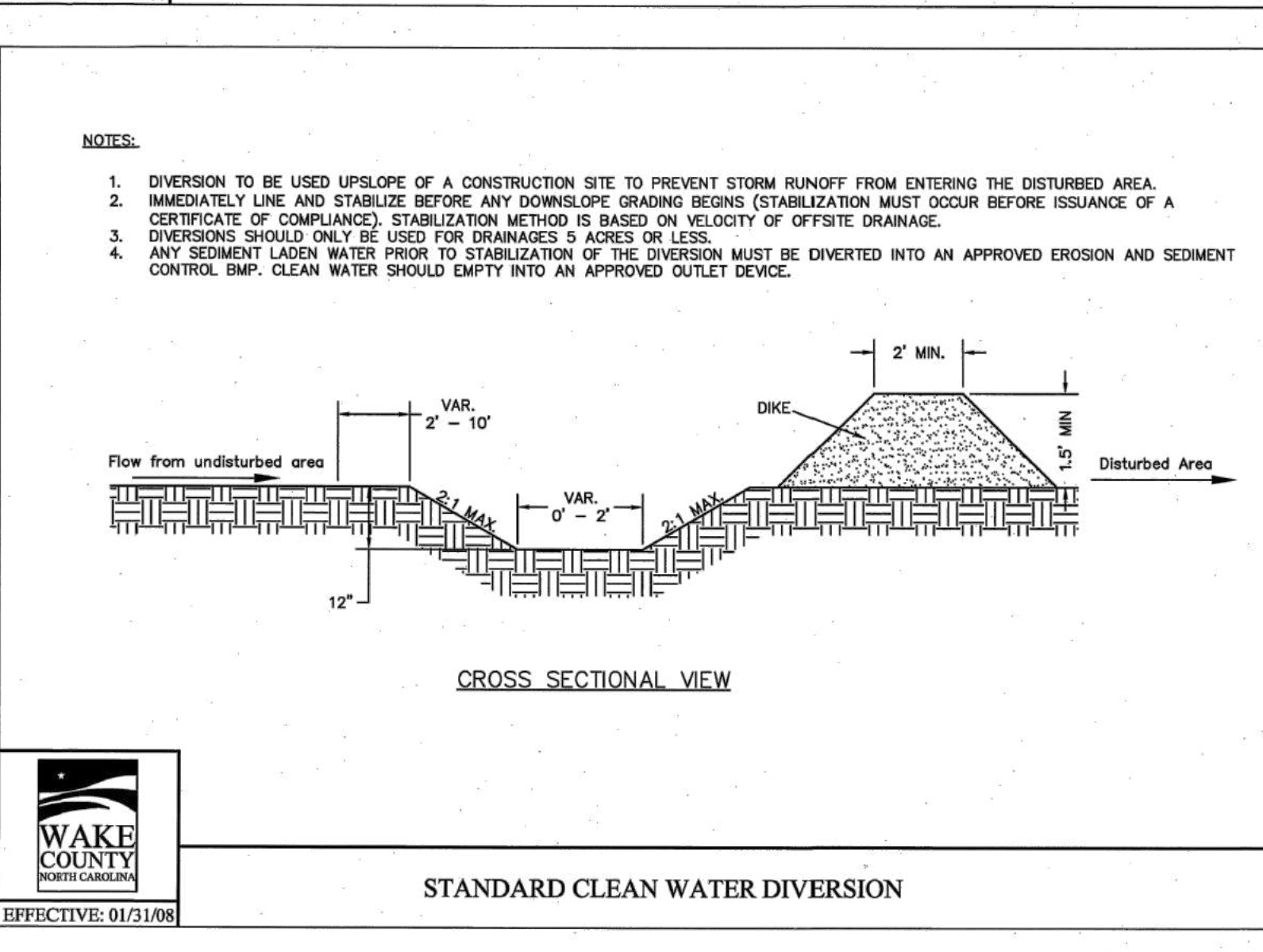
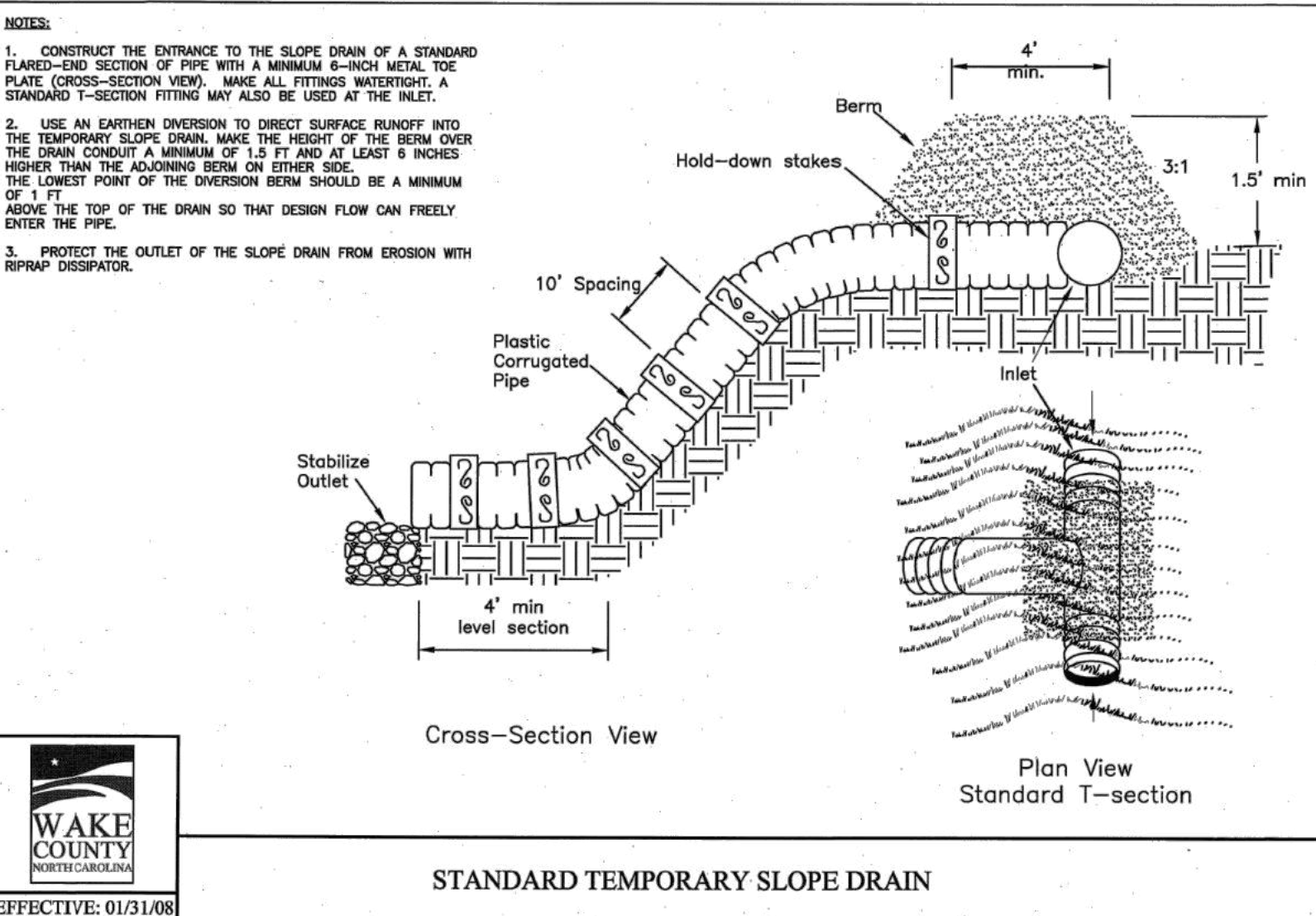
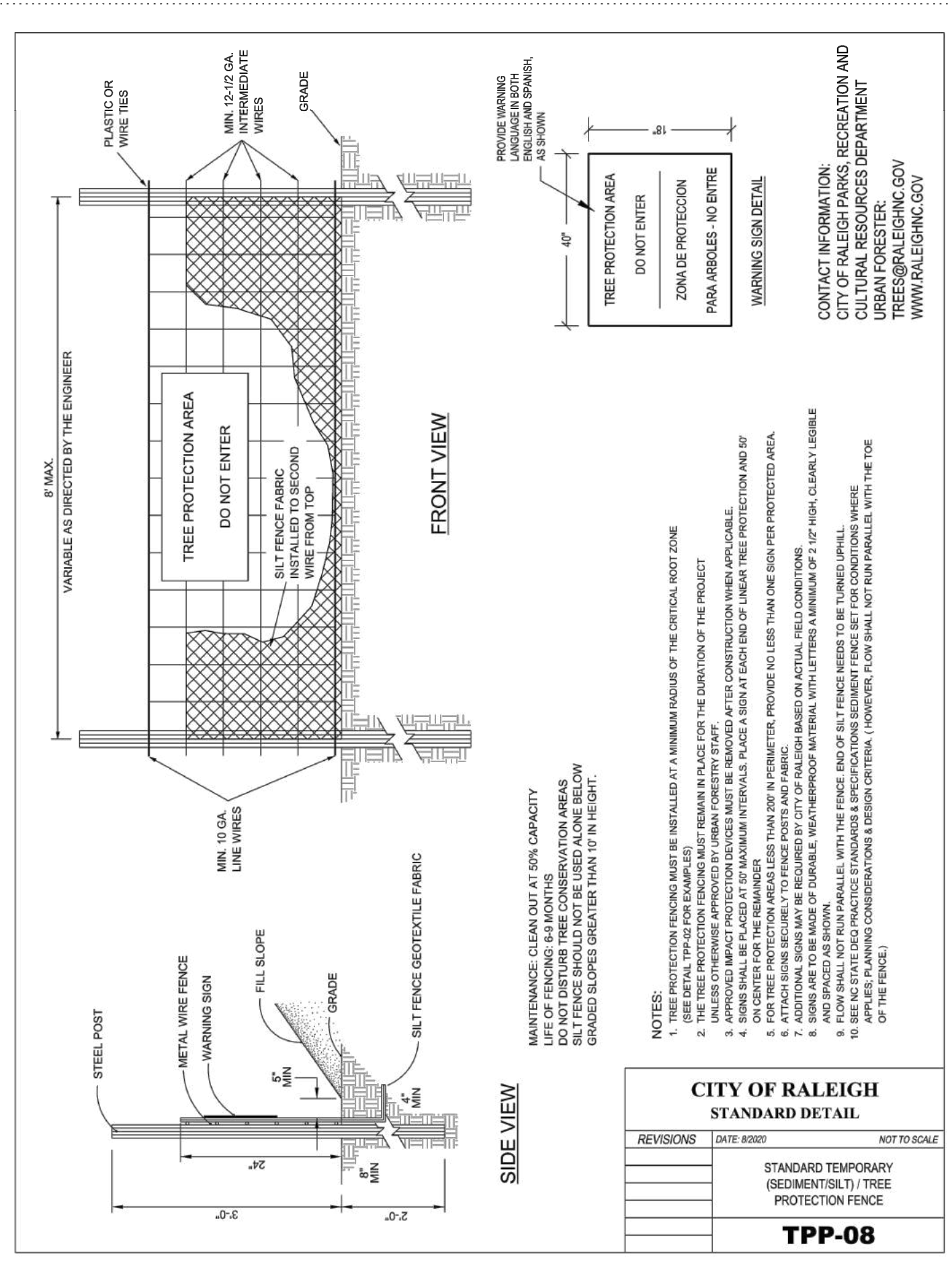
9	SIGNATURE SUBMITTAL	8/27/21
10	REVISION TO APPROVED PLANS	11/11/21

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 OUT SOU AND BE HELD IN PLACE WITH MINIMUM 12" LONG WIRE STAPLES.

REVISIONS: [Table with columns for REVISIONS, DATE, and BY]



**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 1.50 in. (1.27 x 1.27 cm) mesh. The blanket shall be sewn together on 1.50 inch (3.81 cm) centers with a colored thread. The blanket shall be manufactured with a colored thread stitched 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	30%
Mass/Unit Area	ASTM D6475	9.75 oz/sq yd (332 g/m²)
Swell	ECTC Guidelines	15%
Smolder Resistance	ECTC Guidelines	Yes
Stiffness	ASTM D1388	6.31 oz-in (1.17 kN/m)
Light Penetration	ASTM D5567	6.0%
Tensile Strength - MD	ASTM D6818	122.4 lbs/ft (1.81 kN/m)
Elongation - MD	ASTM D6818	36.1%
Tensile Strength - TD	ASTM D6818	79.2 lbs/ft (1.17 kN/m)
Elongation - TD	ASTM D6818	26.8%
Biomass Improvement	ASTM D7322	30%

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)	≤ 3:1 3:1 - 2:1 ≥ 2:1
≤ 20 ft (6 m)	0.029 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  
 4629 E. Booneville-New Harmony Rd.  
 Evansville, IN 47725  
 nageen.com  
 800-772-2040

**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 a colored thread. The blanket shall be manufactured with a colored thread stitched 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.

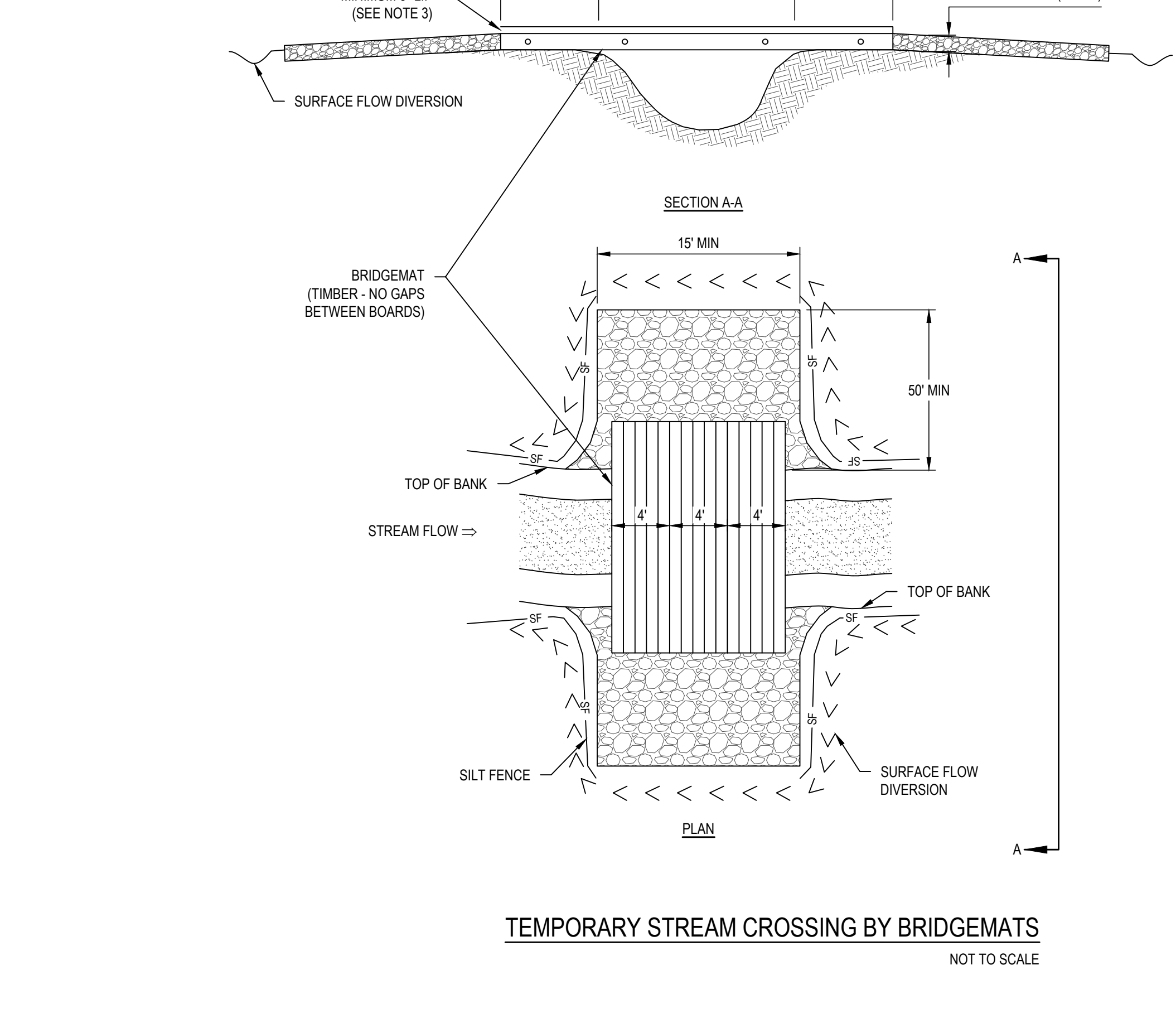
Index Property	Test Method	Typical
Thickness	ASTM D6525	0.32 in. (8.3 mm)
Resiliency	ECTC Guidelines	80.5%
Water Absorbency	ASTM D1117	370%
Mass/Unit Area	ASTM D6475	8.15 oz/sq yd (277.1 g/m²)
Swell	ECTC Guidelines	15%
Smolder Resistance	ECTC Guidelines	Yes
Stiffness	ASTM D1388	6.06 oz-in (1.07 kN/m)
Light Penetration	ASTM D5567	12.4%
Tensile Strength - MD	ASTM D6818	159.6 lbs/ft (2.37 kN/m)
Elongation - MD	ASTM D6818	31.7%
Tensile Strength - TD	ASTM D6818	93.6 lbs/ft (1.39 kN/m)
Elongation - TD	ASTM D6818	26.7%
Biomass Improvement	ASTM D7322	37%

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)	≤ 3:1 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

**NORTH AMERICAN GREEN**  
 Western Green  
 4629 E. Booneville-New Harmony Rd.  
 Evansville, IN 47725  
 nageen.com  
 800-772-2040



- 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 (SIDEBOARD) 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 RRAP OR OTHER SUITABLE MEANS IF DESIGN VELOCITY EXCEEDS THE ALLOWABLE FOR THE IN-PLACE SOIL.
  - USE A SKIDDER OR KNUCKLEBOOM TO INSTALL AND REMOVE MATS.
  - PLACE MATS BETWEEN "BUMPER TREES" OR USE DEADMAN ANCHORS TO ANCHOR ON BOTH BANKS.
  - ENSURE THAT AT LEAST (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

MERRITT HINTON  
OAKS BLVD  
Knightdale, NC

**EROSION CONTROL DETAILS**

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

**REVISIONS**

NO.	REVISION TO	DATE
9	SIGNATURE SUBMITTAL	8/27/21
10	REVISION TO APPROVED PLANS	11/11/21

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

SECTION E: GROUND STABILIZATION

Table with 3 columns: Site Area Description, Stabilize within this many calendar days after ceasing land disturbance, Timeframe variations

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.

GROUND STABILIZATION SPECIFICATION

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

Table comparing Temporary Stabilization and Permanent Stabilization methods.

POLYACRYLAMIDES (PAMS) AND FLOCCULANTS

- 1. Select flocculants that are appropriate for the soils being exposed during construction, selecting from the NC DWR List of Approved PAMS/Flocculants.

EQUIPMENT AND VEHICLE MAINTENANCE

- 1. Maintain vehicles and equipment to prevent discharge of fluids.
- 2. Provide drip pans under any stored equipment.

LITTER, BUILDING MATERIAL AND LAND CLEARING WASTE

- 1. Never bury or burn waste. Place litter and debris in approved waste containers.
- 2. Provide a sufficient number and size of waste containers (e.g. dumpster, trash receptacle) on site to contain construction and domestic wastes.

PAINT AND OTHER LIQUID WASTE

- 1. Do not dump paint and other liquid waste into storm drains, streams or wetlands.
- 2. Locate paint washouts at least 50 feet away from storm drain inlets and surface waters unless no other alternatives are reasonably available.

PORTABLE TOILETS

- 1. Install portable toilets on level ground, at least 50 feet away from storm drains, streams or wetlands unless there is no alternative reasonably available.
- 2. Provide staking or anchoring of portable toilets during periods of high winds or in high foot traffic areas.

EARTHEN STOCKPILE MANAGEMENT

- 1. Show stockpile locations on plans. Locate earthen-material stockpile areas at least 50 feet away from storm drain inlets, sediment basins, perimeter sediment controls and surface waters unless it can be shown no other alternatives are reasonably available.
- 2. Protect stockpile with silt fence installed along toe of slope with a minimum offset of five feet from the toe of stockpile.

CONCRETE WASHOUTS

- 1. Do not discharge concrete or cement slurry from the site.
- 2. Dispose of, or recycle settled, hardened concrete residue in accordance with local and state solid waste regulations and at an approved facility.
- 3. Manage washout from mortar mixers in accordance with the above item and in addition place the mixer and associated materials on impervious barrier and within lot perimeter silt fence.

HERBICIDES, PESTICIDES AND RODENTICIDES

- 1. Store and apply herbicides, pesticides and rodenticides in accordance with label restrictions.
- 2. Store herbicides, pesticides and rodenticides in their original containers with the label, which lists directions for use, ingredients and first aid steps in case of accidental poisoning.

HAZARDOUS AND TOXIC WASTE

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

NCG01-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.

Table with 3 columns: Inspect, Frequency (during normal business hours), Inspection records must include:

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

- (a) Visible sediment deposition in a stream or wetland.
- (b) Oil spills if: They are 25 gallons or more, They are less than 25 gallons but cannot be cleaned up within 24 hours, They cause sheen on surface waters (regardless of volume), or They are within 100 feet of surface waters (regardless of volume).

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.

Table with 2 columns: Occurrence, Reporting Timeframes (After Discovery) and Other Requirements

PART III SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION B: RECORDKEEPING

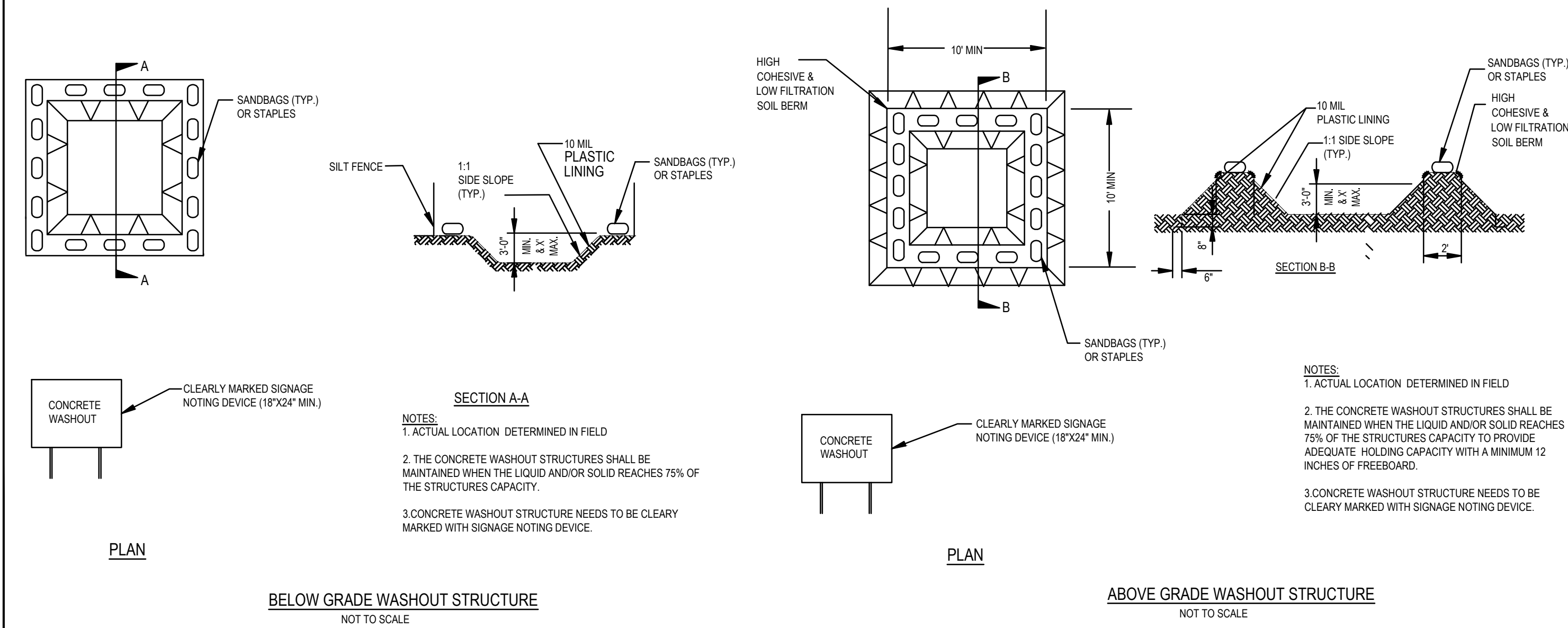
The approved E&SC plan as well as any approved deviation shall be kept on the site. The approved E&SC plan must be kept up-to-date throughout the coverage under this permit. The following items pertaining to the E&SC plan shall be documented in the manner described:

Table with 2 columns: Item to Document, Documentation Requirements

2. Additional Documentation

- (a) This general permit as well as the certificate of coverage, after it is received.
- (b) 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.

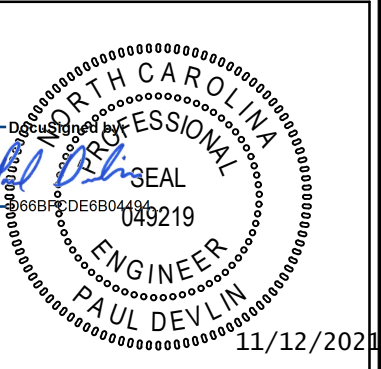
ONSITE CONCRETE WASHOUT STRUCTURE WITH LINER



MERRITT HINTON OAKS BLVD Knightdale, NC

NCG01 DETAILS

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

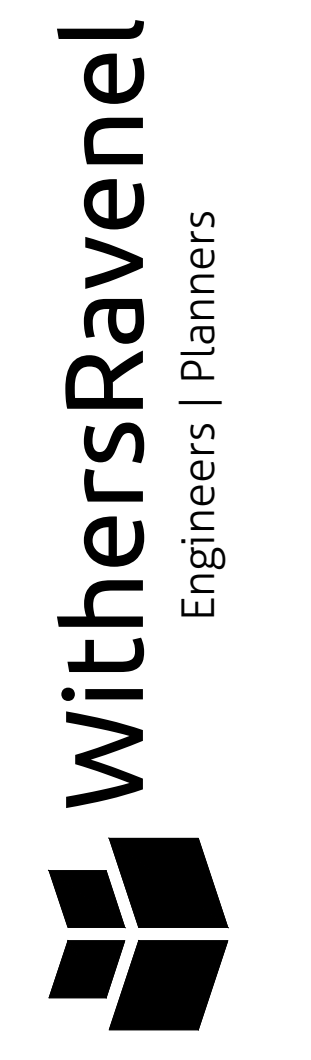


Revisions table with 2 columns: Revision number, Description, Date

9 SIGNATURE SUBMITTAL 8/27/21 10 REVISION TO APPROVED PLANS 11/11/21

Sheet No. C9.7

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.

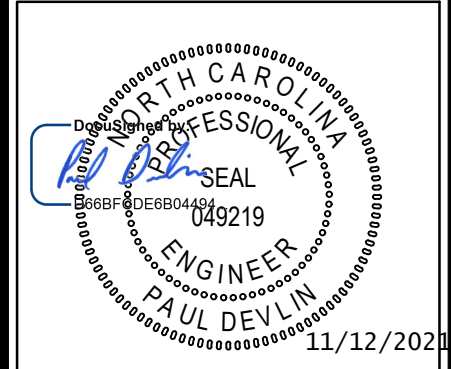


1375 Wilmington Street | Suite 200 | Raleigh, NC 27601 | T: 919-469-3300 | License #: C-0822 | www.withersravenel.com

MERRITT HINTON  
OAKS BLVD  
Knightdale, NC

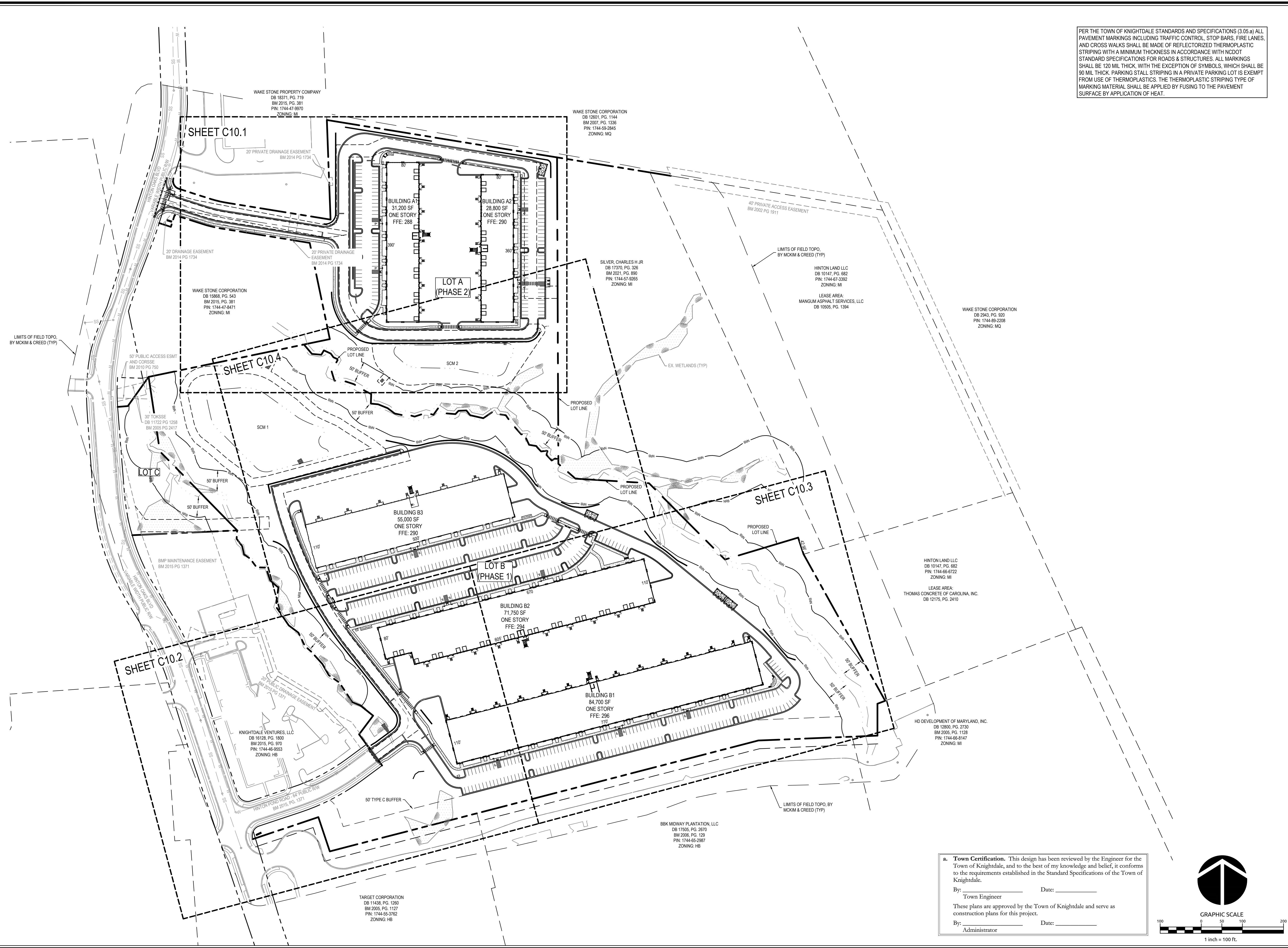
OVERALL TRAFFIC AND  
MARKINGS PLAN

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



Revisions		
9	SIGNATURE SUBMITTAL	8/27/21
10	REVISION TO APPROVED PLANS	11/11/21

Sheet No.  
**C10.0**

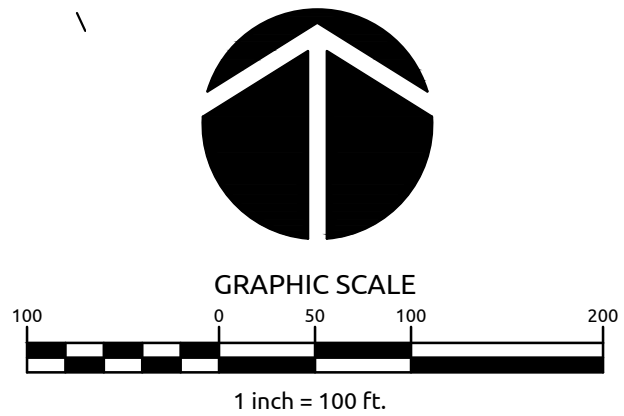


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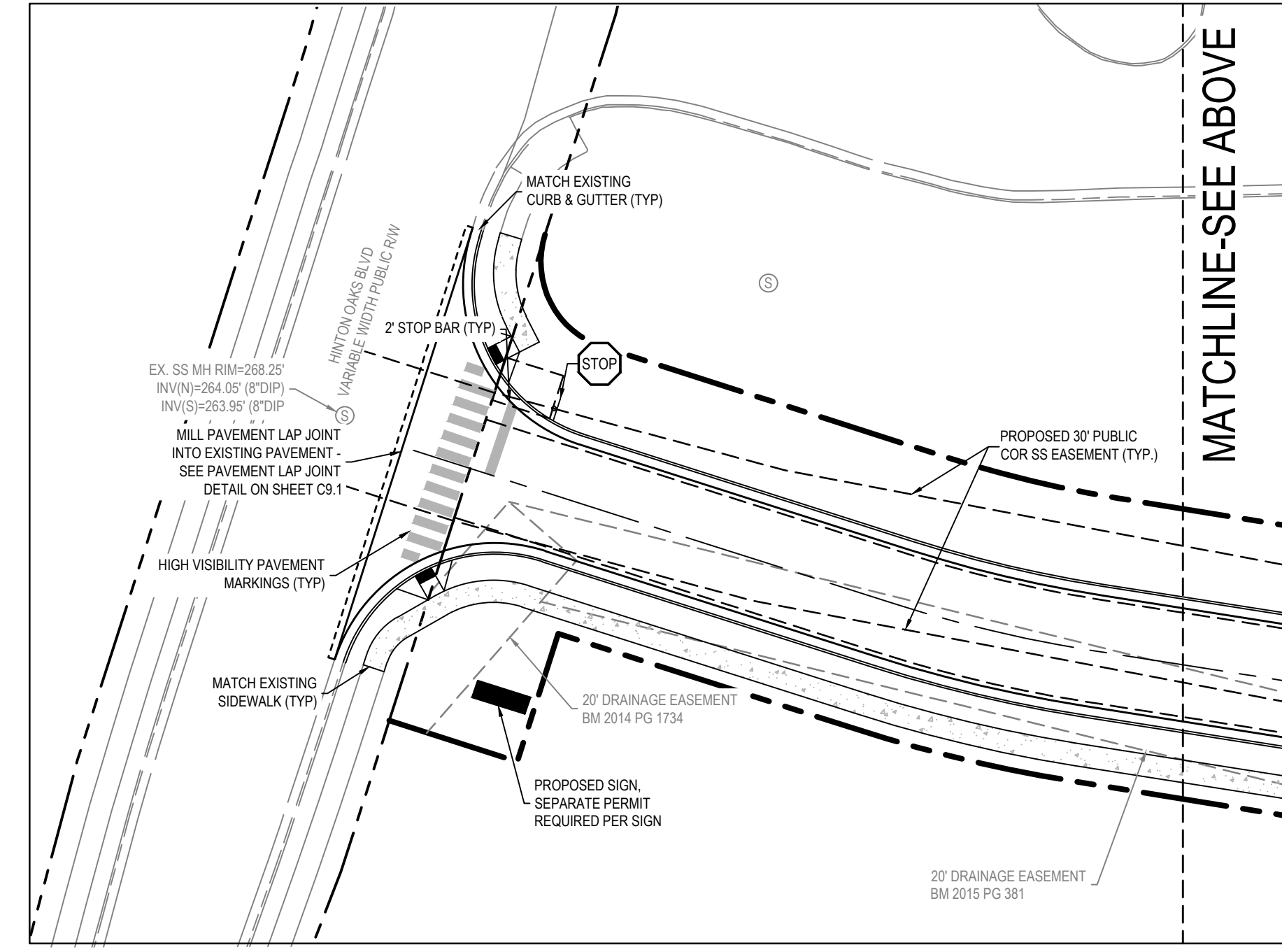
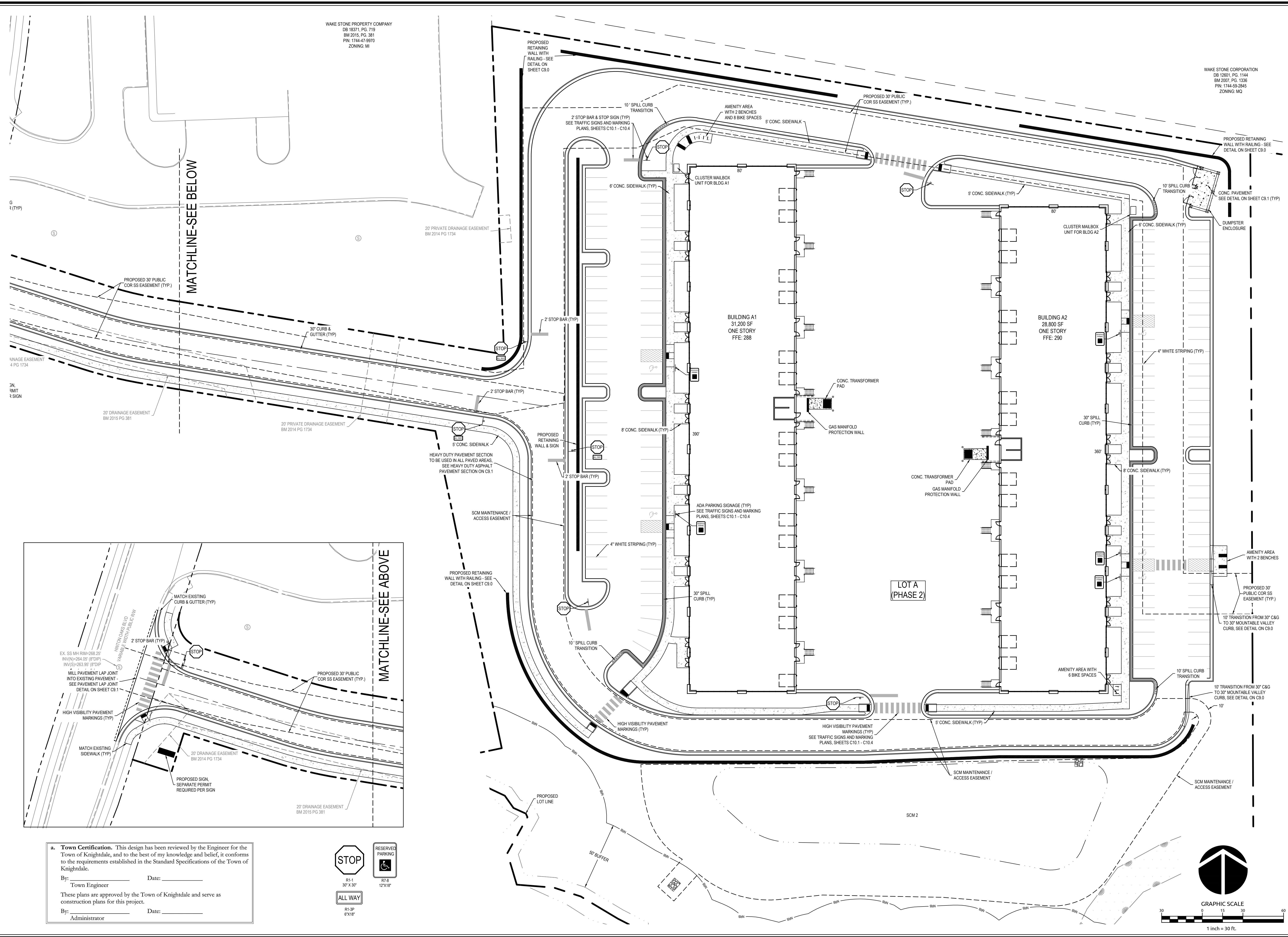
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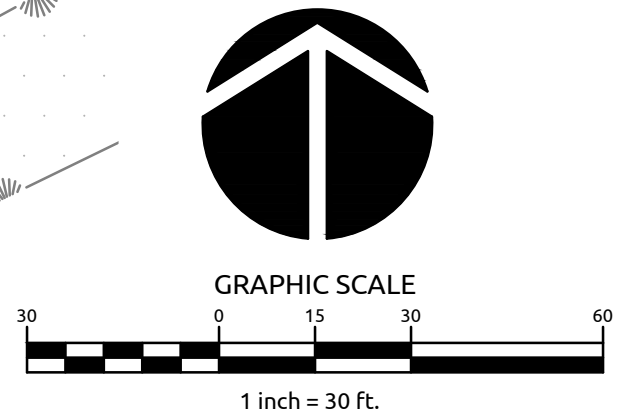
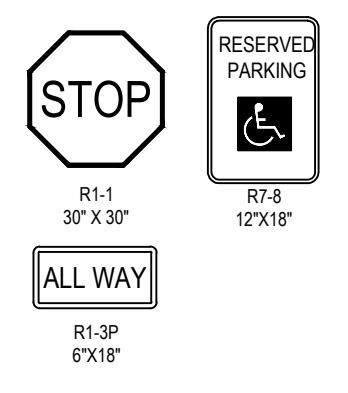


WAKE STONE PROPERTY COMPANY  
DB 18371, PG. 719  
BM 2015, PG. 381  
PIN: 1744-41-9270  
ZONING: MI

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



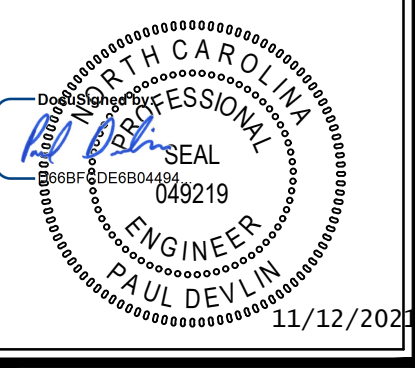
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**WithersRavenel**  
Engineers | Planners  
MERRITT HINTON  
OAKS BLVD  
Knightdale, NC

**TRAFFIC SIGNS AND  
MARKING PLAN**

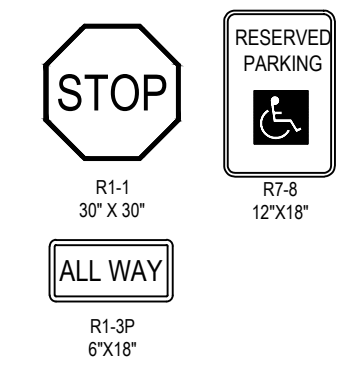
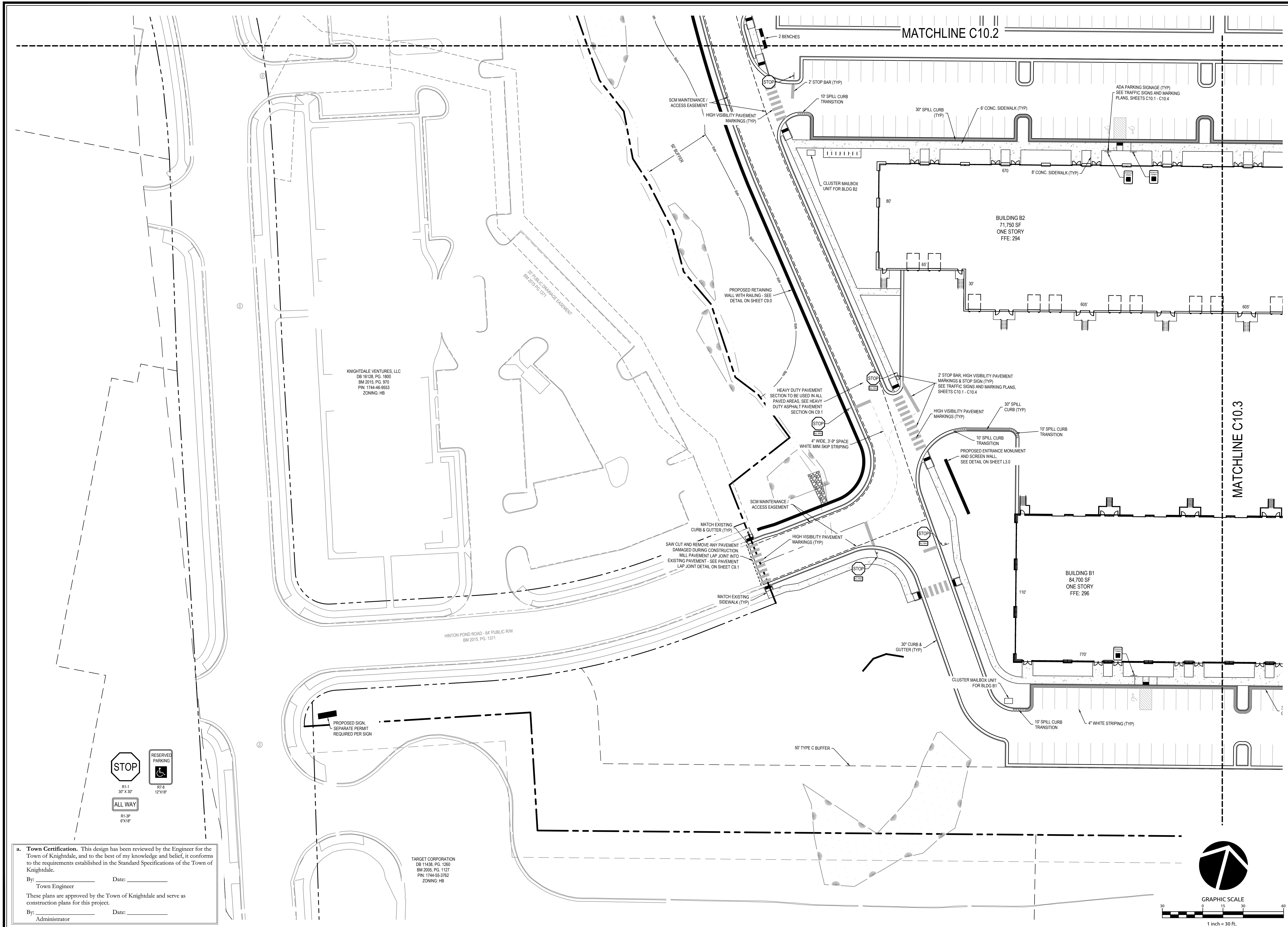
Job No. 09190080.00 Drawn By WR  
Date 09/15/2020 Designer WR



Revisions

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Sheet No.  
**C10.1**

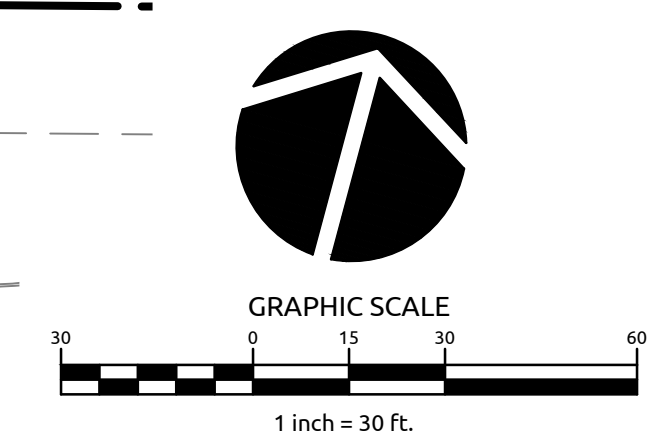


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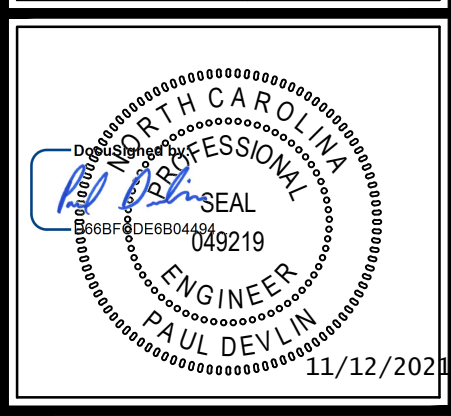
**WithersRavenel**  
Engineers | Planners

137 S Wilmington Street | Suite 200 | Raleigh, NC 27601 | T: 919.469.3300 | License #: C-0832 | www.withersravenel.com

**MERRITT HINTON OAKS BLVD**  
Knightdale, NC

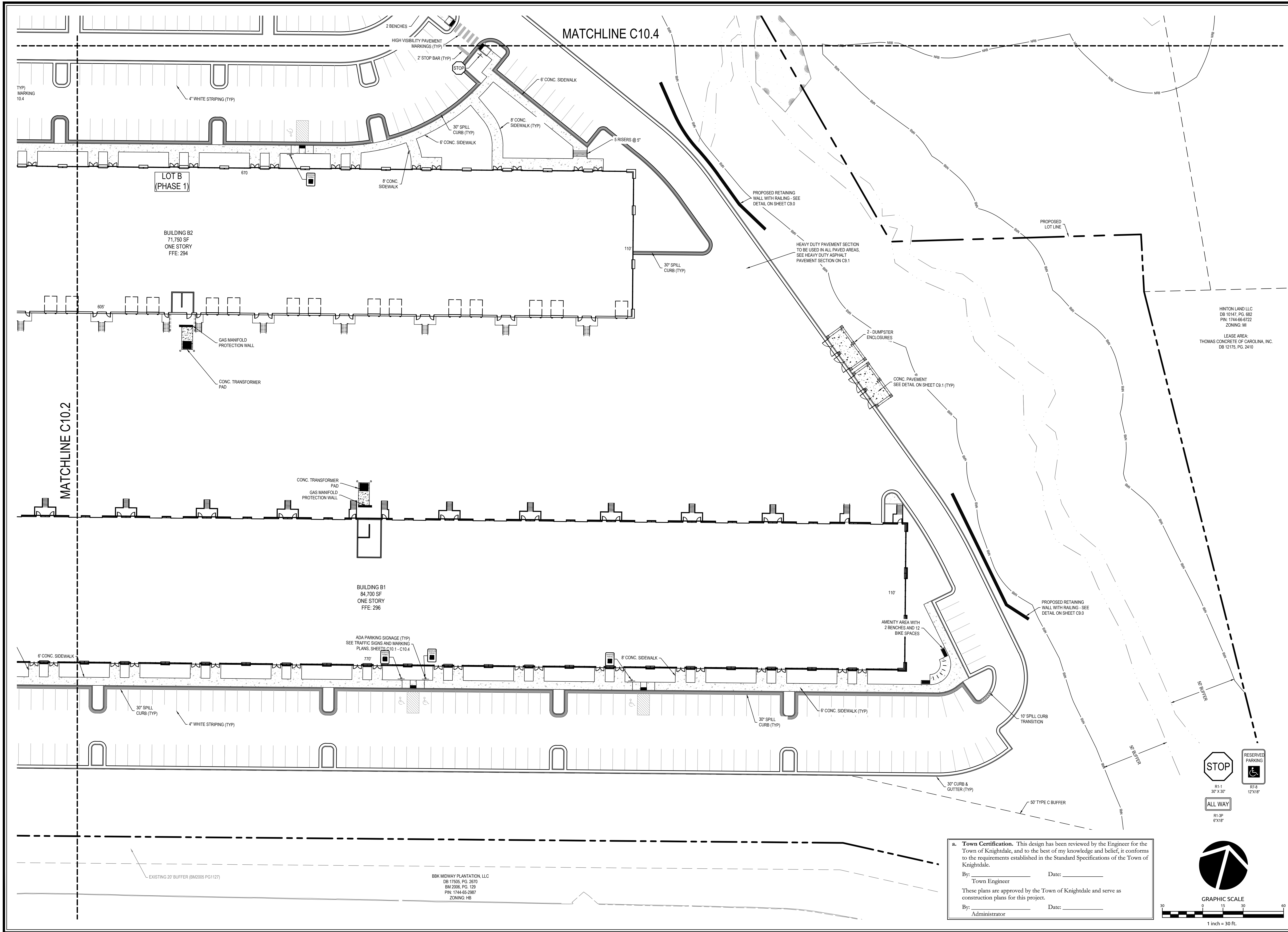
**TRAFFIC SIGNS AND MARKING PLAN**

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Date	09/15/2020	Designer	WR

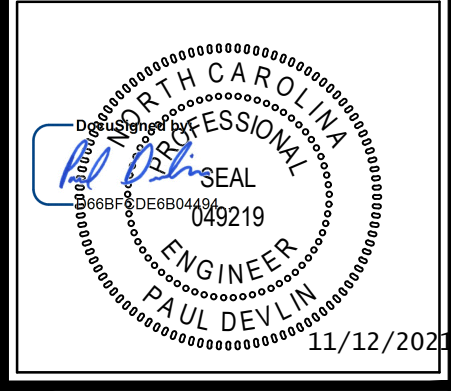


Revisions		
9	SIGNATURE SUBMITTAL	8/27/21
10	REVISION TO APPROVED PLANS	11/11/21

Sheet No.  
**C10.2**



Job No.	09190080.00	Drawn By	WR
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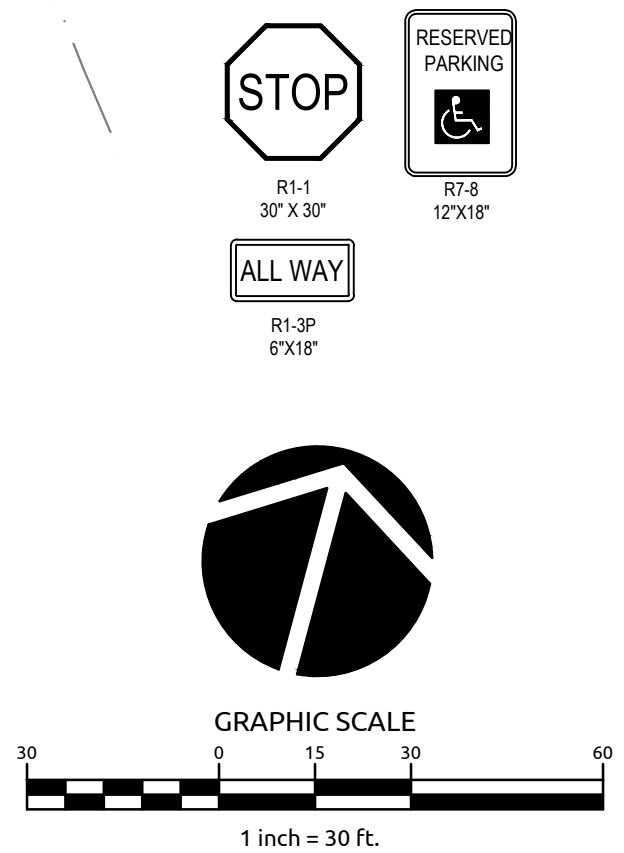
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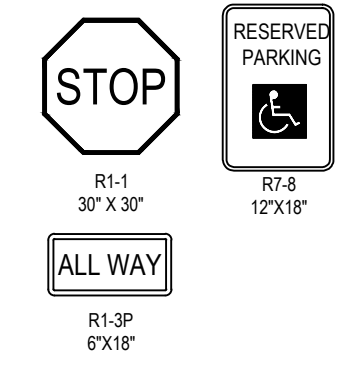
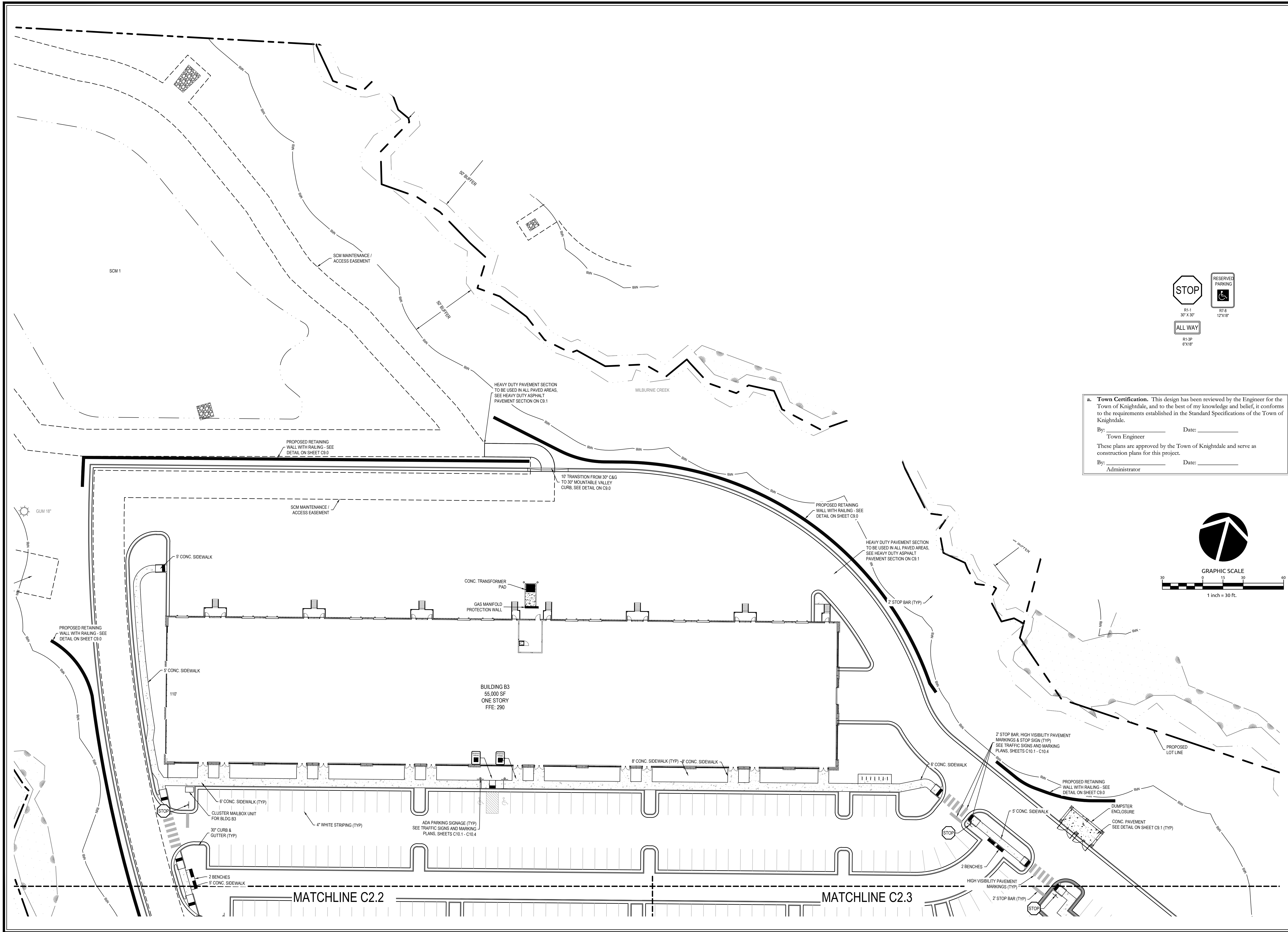
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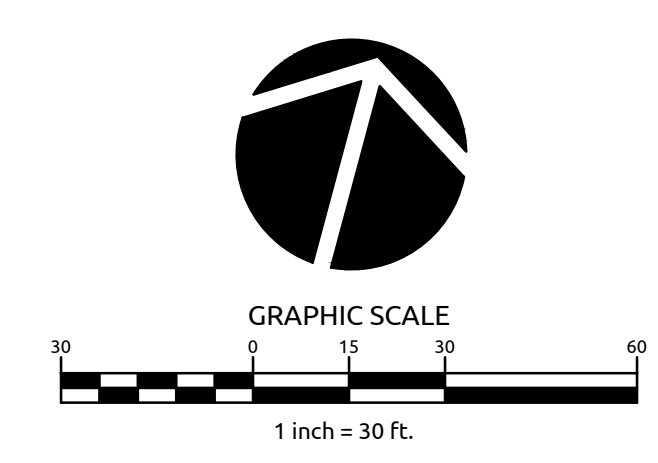


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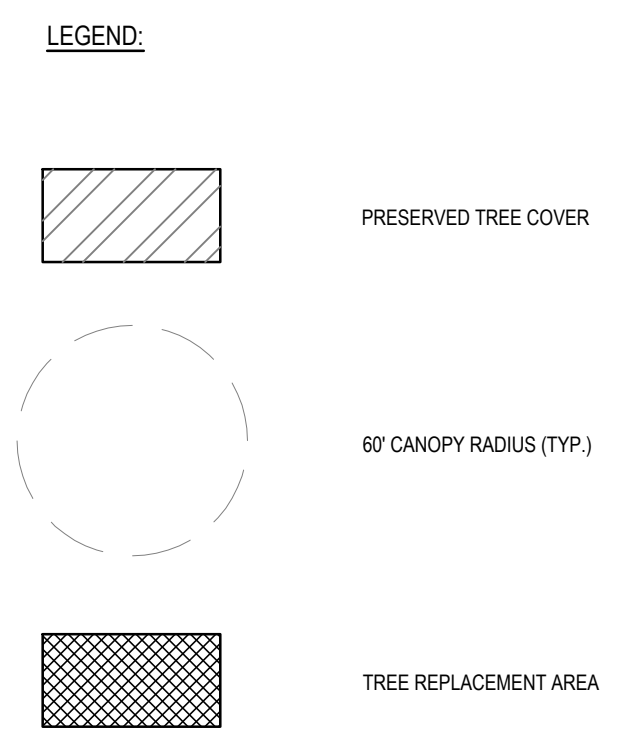
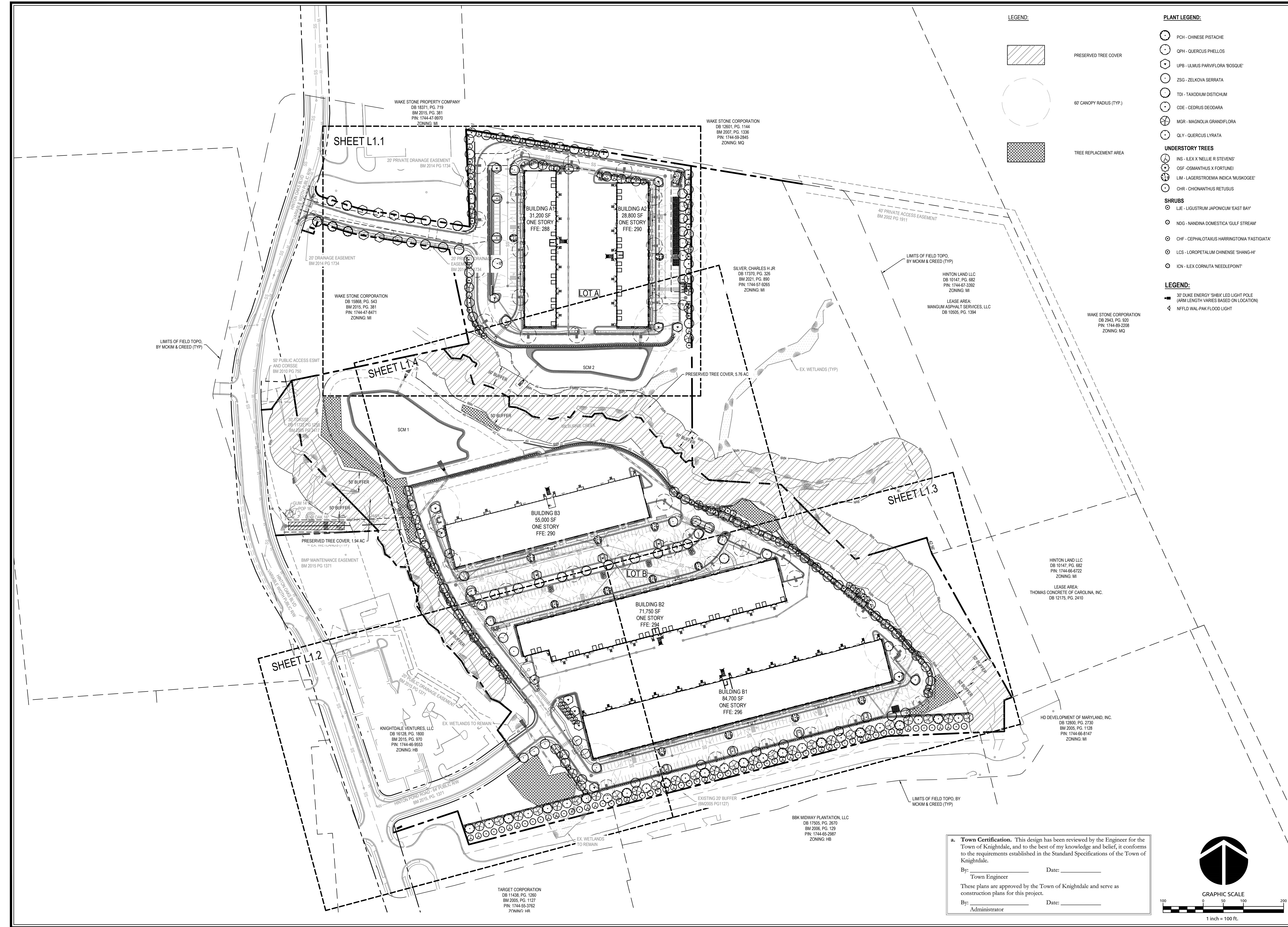
By: \_\_\_\_\_ Date: \_\_\_\_\_  
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Date	09/15/2020	Designer	WR



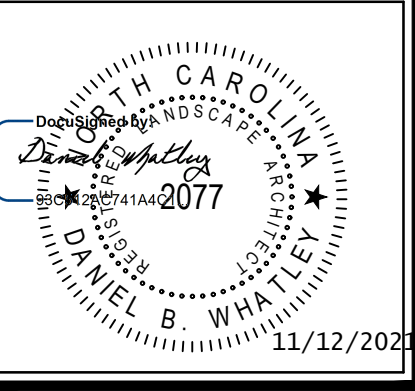
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- PLANT LEGEND:**
- PCH - CHINESE PISTACHE
  - QPH - QUERCUS PHELLOS
  - UPB - ULMUS PARVIFLORA 'BOSSUE'
  - ZSG - ZELKOVA SERRATA
  - TDI - TAXODIUM DISTICHUM
  - CDE - CEDRUS DEODARA
  - MGR - MAGNOLIA GRANDIFLORA
  - QLY - QUERCUS LYRATA
- UNDERSTORY 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



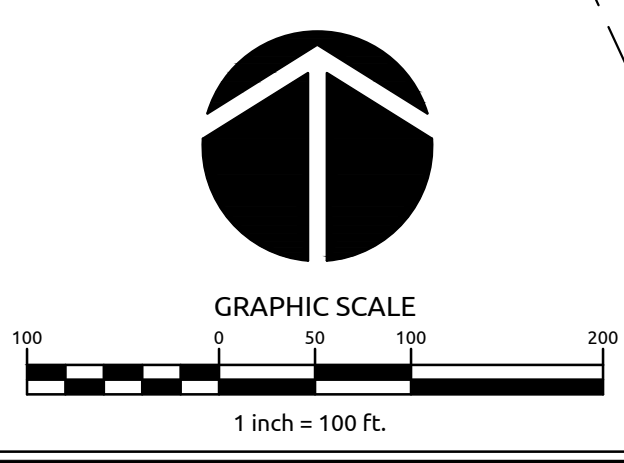
Revisions		
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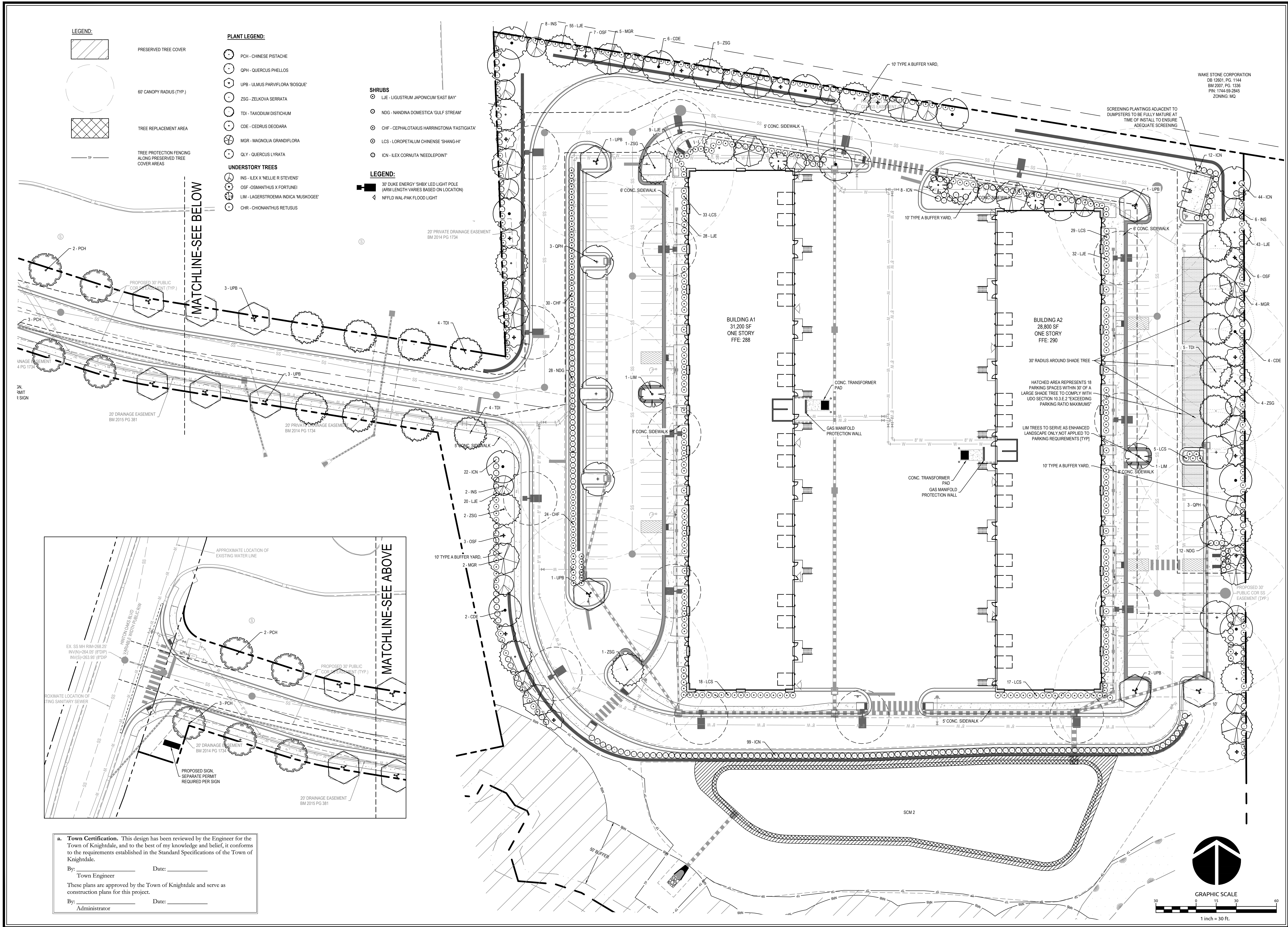
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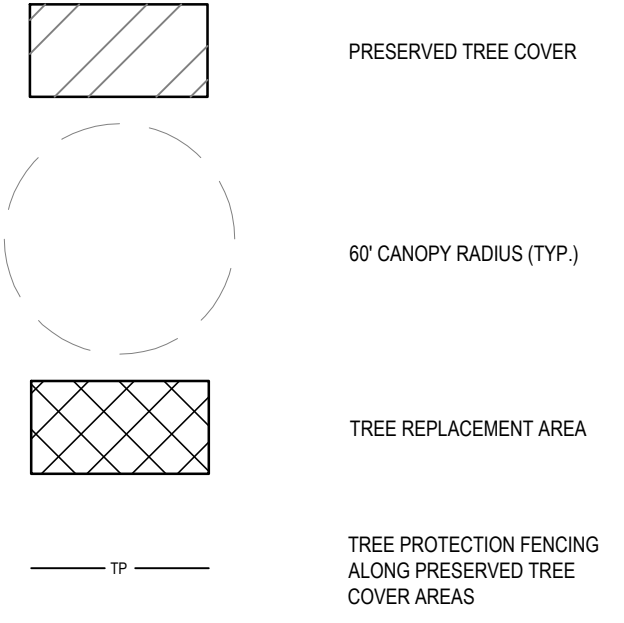
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Administrator





**LEGEND:**



**PLANT LEGEND:**

- PCH - CHINESE PISTACHE
- OPH - QUERCUS PHELLOS
- UPB - ULMUS PARVIFLORA 'BOSQUE'
- ZSG - ZELKOVA SERRATA
- TDI - TAXODIUM DISTICHUM
- CDE - CEDRUS DEODARA
- MGR - MAGNOLIA GRANDIFLORA
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- CHR - CHIONANTHUS RETUSUS

**SHRUBS**

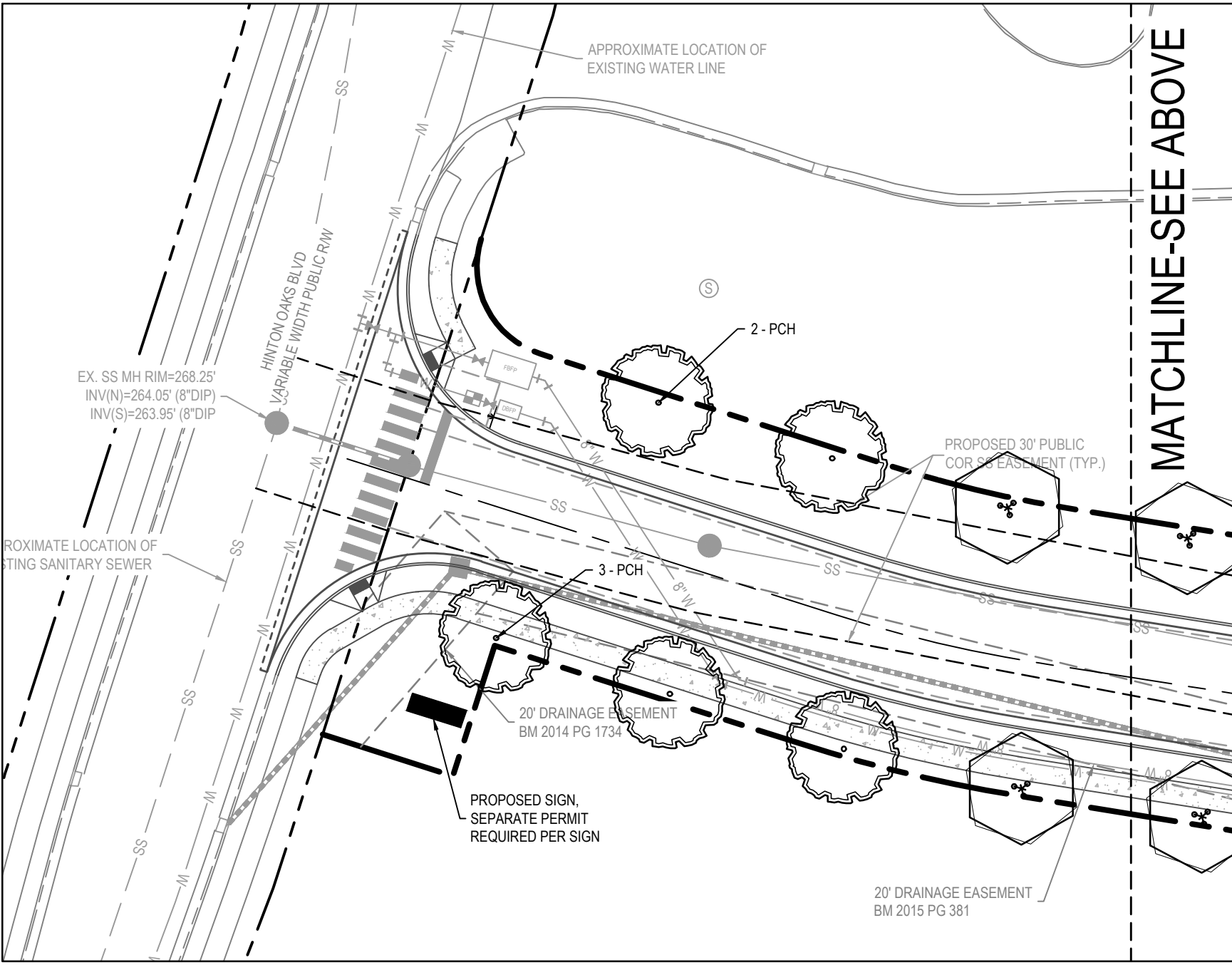
- LJE - LIGUSTRUM JAPONICUM 'EAST BAY'
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- CHF - CEPHALOTAXUS HARRINGTONIA 'FASTIGIATA'
- LCS - LOROPETALUM CHINENSE 'SHANG-HI'
- ICN - ILEX CORNUTA 'NEEDLEPOINT'

**LEGEND:**

- 30' DUKE ENERGY 'SHBY' LED LIGHT POLE (ARM LENGTH VARIES BASED ON LOCATION)
- NFLD WAL-PAK FLOOD LIGHT

MATCHLINE-SEE BELOW

MATCHLINE-SEE ABOVE



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

SCREENING PLANTINGS ADJACENT TO DUMPSTERS TO BE FULLY MATURE AT TIME OF INSTALL TO ENSURE ADEQUATE SCREENING

BUILDING A2  
28,800 SF  
ONE STORY  
FFE: 290

BUILDING A1  
31,200 SF  
ONE STORY  
FFE: 288

**WithersRavenel**  
Engineers | Planners

MERRITT HINTON  
OAKS BLVD  
Knightdale, NC

LANDSCAPE PLAN

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

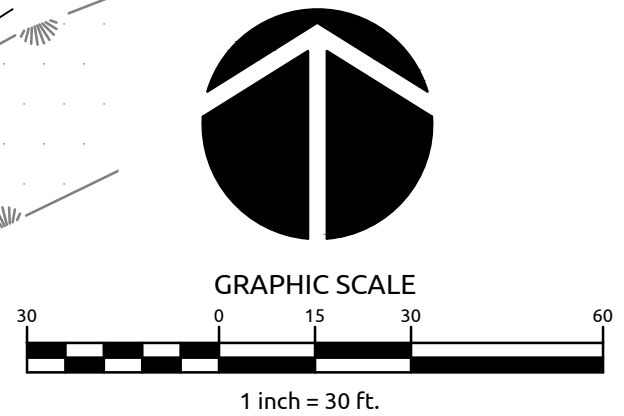
Revisions	Signature	Submittal	Date
9	SIGNATURE	SUBMITTAL	8/27/21
10	REVISION TO	APPROVED PLANS	11/11/21

**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

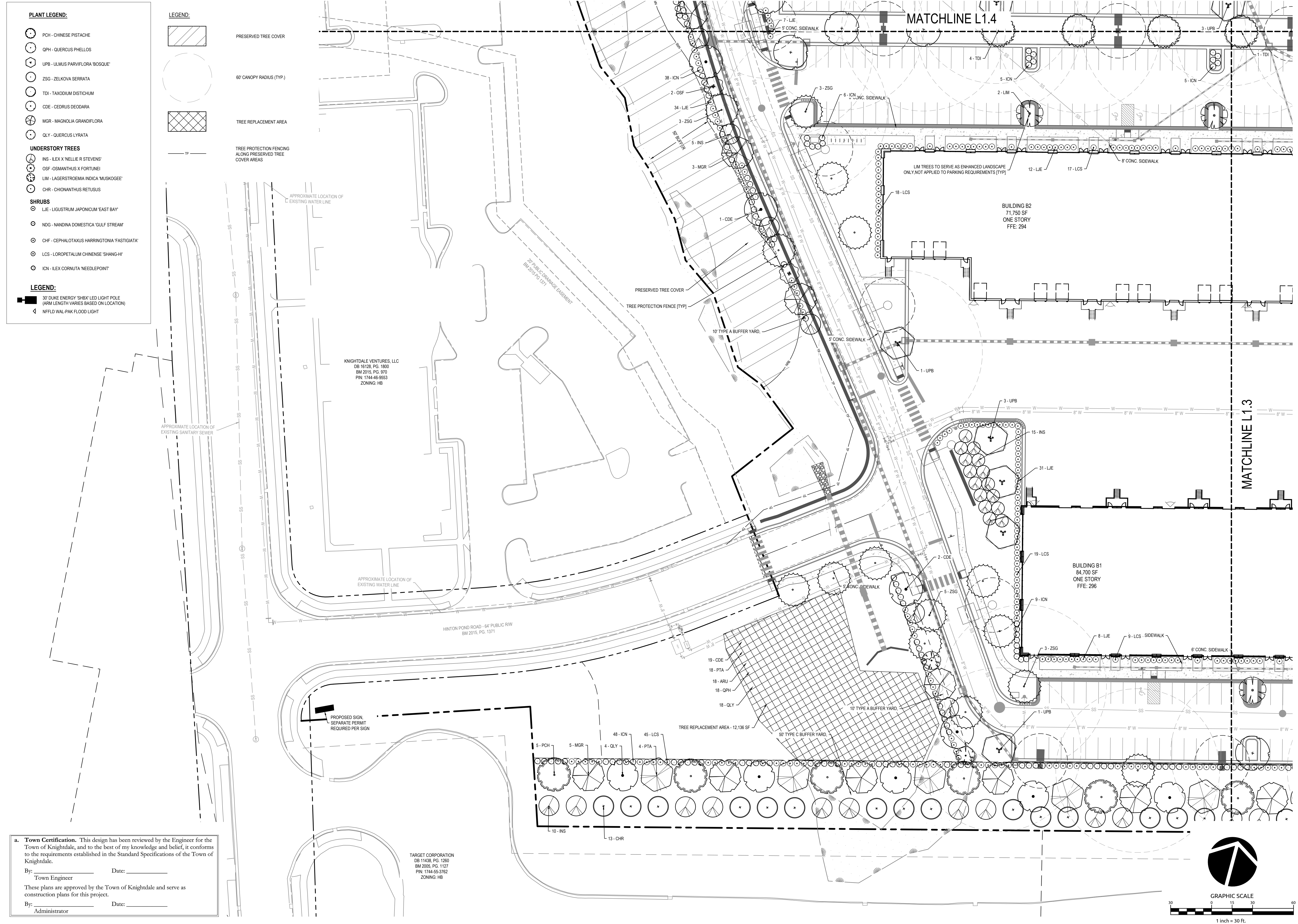
These plans are approved by the Town of Knightdale and serve as construction plans for this project.

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



Sheet No.  
**L1.1**





- PLANT LEGEND:**
- PCH - CHINESE PISTACHE
  - OPH - QUERCUS PHELLOS
  - UPB - ULMIUS PARVIFLORA 'BOSQUE'
  - 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**
- LIE - 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 'SHX' LED LIGHT POLE (ARM LENGTH VARIES BASED ON LOCATION)
  - NFLD WAL-PAK FLOOD LIGHT

- LEGEND:**
- PRESERVED TREE COVER
  - 60' CANOPY RADIUS (TYP)
  - TREE REPLACEMENT AREA
  - TREE PROTECTION FENCING ALONG PRESERVED TREE COVER AREAS
  - TP

APPROXIMATE LOCATION OF EXISTING WATER LINE

APPROXIMATE LOCATION OF EXISTING SANITARY SEWER

KNIGHTDALE VENTURES, LLC  
DB 18128, PG. 1800  
BM 2015, PG. 970  
PIN: 1744-46-5553  
ZONING: HB

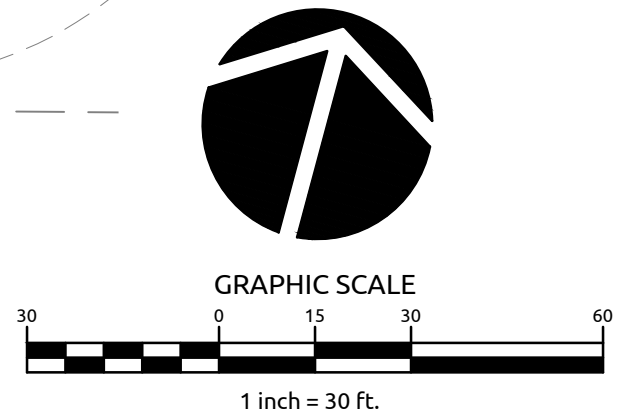
TARGET CORPORATION  
DB 11438, PG. 1260  
BM 2005, PG. 1127  
PIN: 1744-55-3782  
ZONING: HB

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Town Engineer

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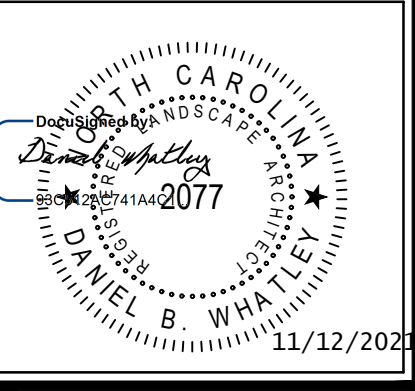
**WithersRavenel**  
Engineers | Planners

137 S Wilmington Street | Suite 200 | Raleigh, NC 27601 | T: 919.469.3300 | License #: C-0821 | www.withersravenel.com

MERRITT HINTON  
OAKS BLVD  
Knightdale, NC

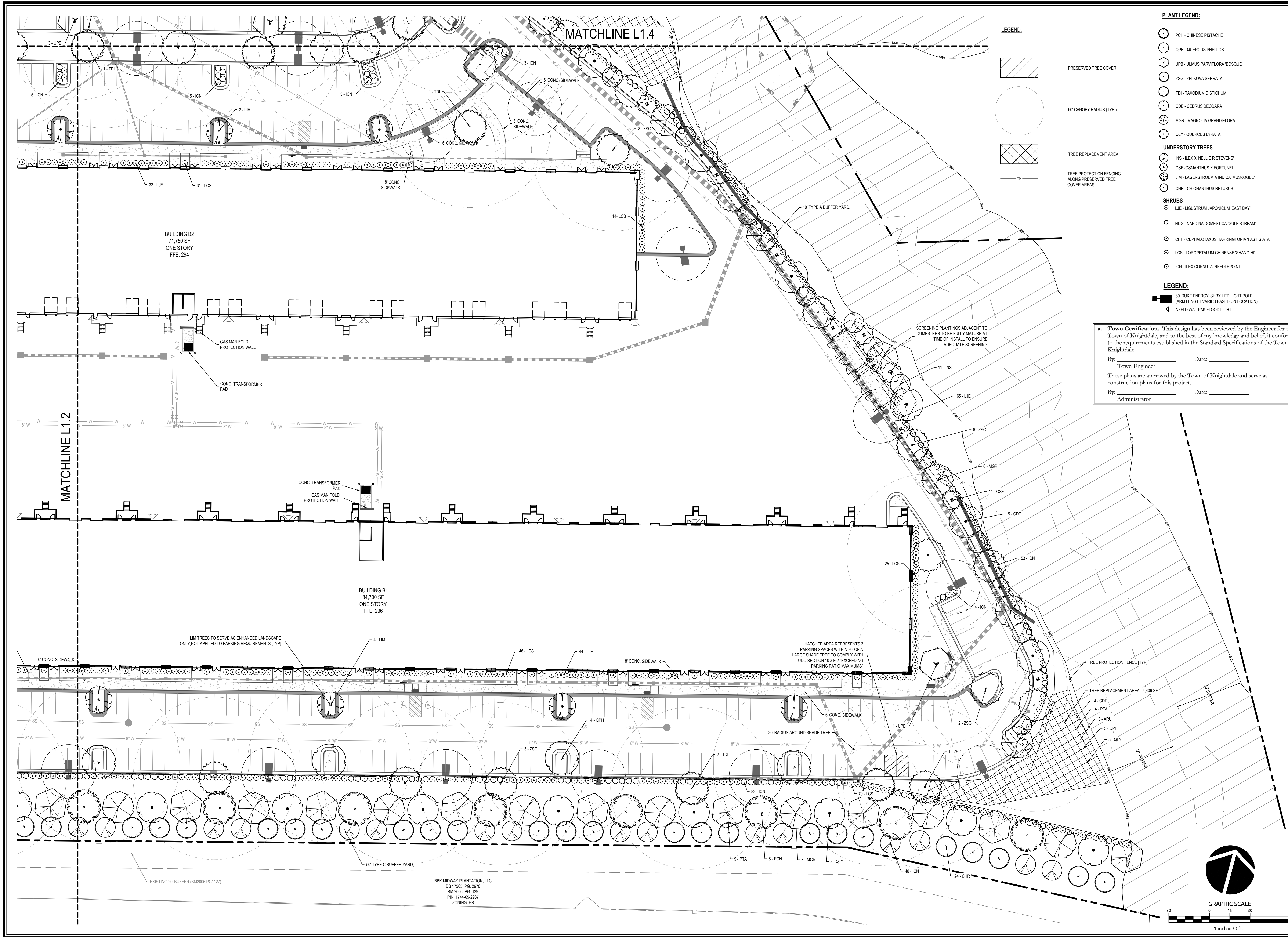
**LANDSCAPE PLAN**

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

Sheet No.  
**L1.2**



LEGEND:

- PRESERVED TREE COVER
- 60' CANOPY RADIUS (TYP.)
- TREE REPLACEMENT AREA
- TREE PROTECTION FENCING ALONG PRESERVED TREE COVER AREAS

PLANT LEGEND:

- PCH - CHINESE PISTACHE
  - QPH - QUERCUS PHELLOS
  - UPB - ULMUS PARVIFLORA 'BOSQUE'
  - ZSG - ZELKOVA SERRATA
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  - CDE - CEDRUS DEODARA
  - MGR - MAGNOLIA GRANDIFLORA
  - QLY - QUERCUS LYRATA
  - INS - ILEX X NELLIE R STEVENS'
  - OSF - OSMANTHUS X FORTUNEI
  - LIM - LAGERSTROEMIA INDICA 'MUSKOGEE'
  - CHR - CHONANTHUS RETUSUS
- SHRUBS**
- LIE - 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 'SHBK' LED LIGHT POLE (ARM LENGTH VARIES BASED ON LOCATION)
- NFLD WAL-PAK FLOOD LIGHT

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

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

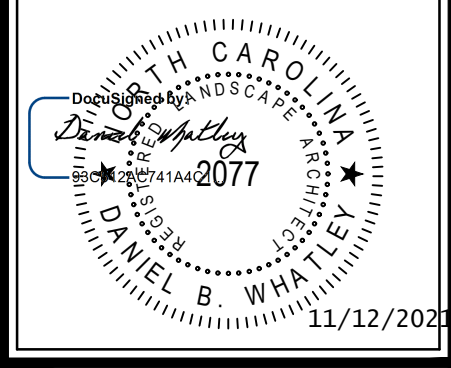
**WithersRavenel**  
Engineers | Planners

137 S Wilmington Street | Suite 200 | Raleigh, NC 27601 | T: 919.469.3340 | License #: C-0832 | www.withersravenel.com

MERRITT HINTON  
OAKS BLVD  
Knightdale, NC

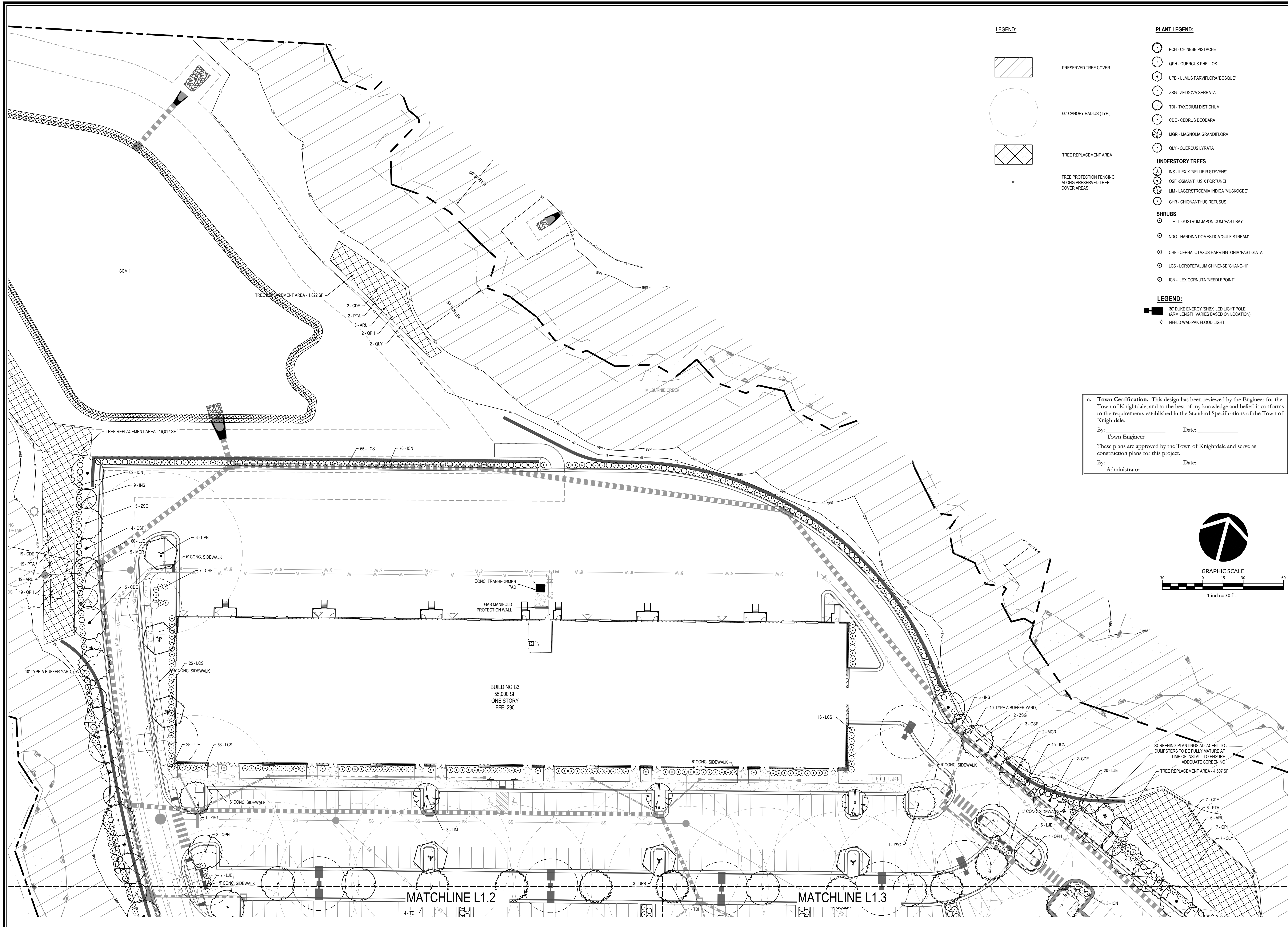
LANDSCAPE PLAN

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

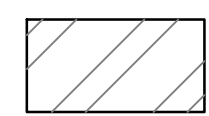


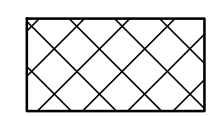
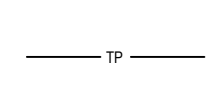


Revisions	Signature	Date
9 SIGNATURE SUBMITTAL		8/27/21
10 REVISION TO APPROVED PLANS		11/11/21














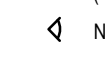


Sheet No.  
**L1.3**





**LEGEND:**

-  PRESERVED TREE COVER
-  60' CANOPY RADIUS (TYP.)
-  TREE REPLACEMENT AREA
-  TREE PROTECTION FENCING ALONG PRESERVED TREE COVER AREAS
-  TP

**PLANT LEGEND:**

-  PCH - CHINESE PISTACHE
-  QPH - QUERCUS PHELLOS
-  UPB - ULMUS PARVIFLORA 'BOSQUE'
-  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:**

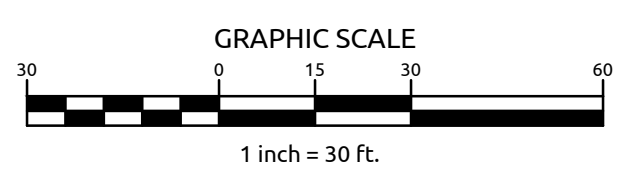
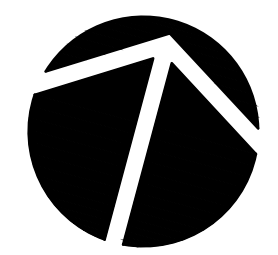
-  30' DUKE ENERGY 'SHBY' LED LIGHT POLE (ARM LENGTH VARIES BASED ON LOCATION)
-  NFLD WAL-PAK FLOOD LIGHT

**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.

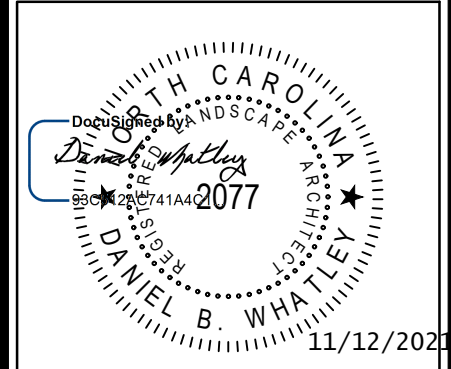
By: \_\_\_\_\_ Date: \_\_\_\_\_  
Town Engineer

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

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

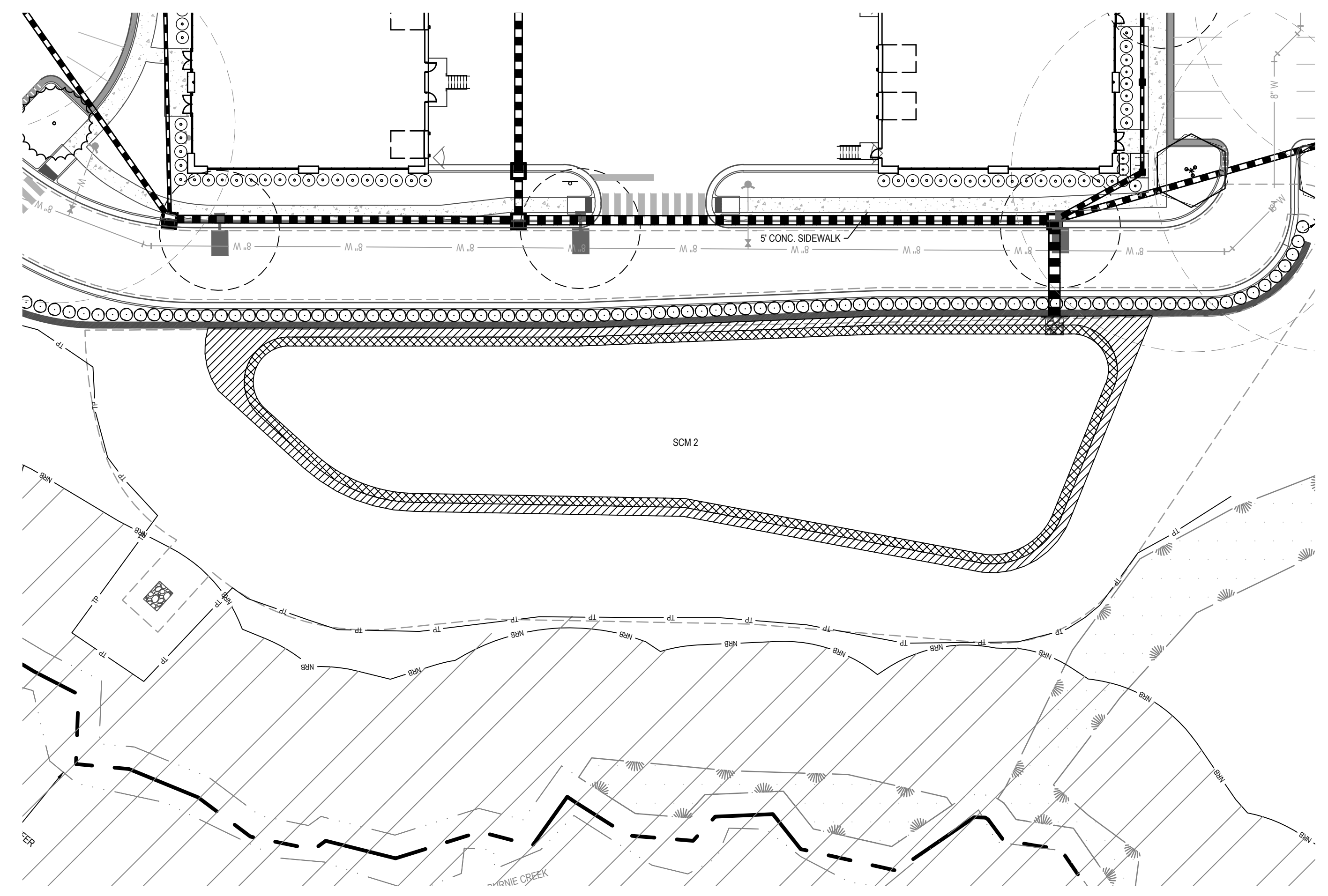
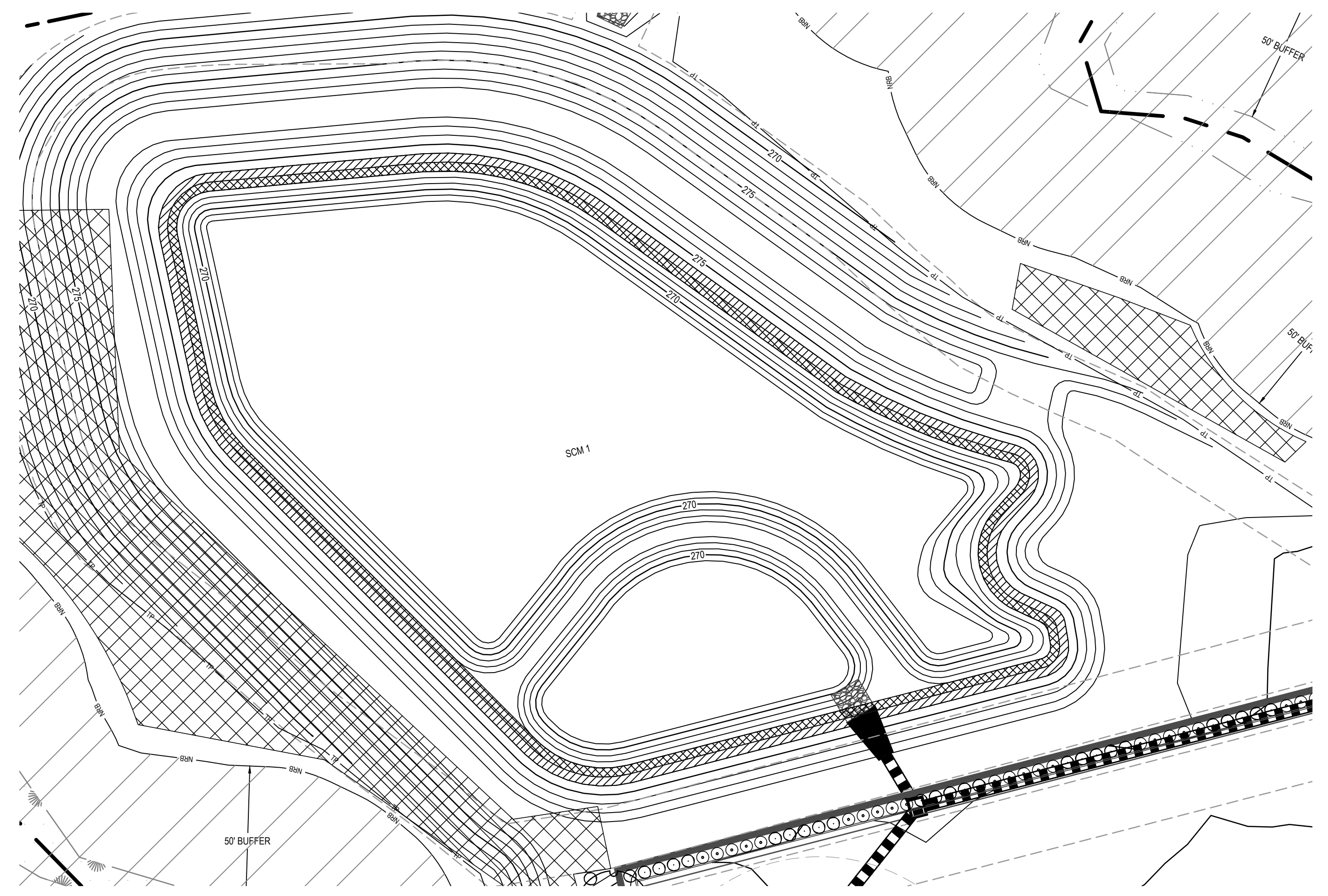


Job No.	09190080.00	Drawn By	WR
Date	09/15/2020	Designer	WR



Revisions		
9	SIGNATURE SUBMITTAL	8/27/21
10	REVISION TO APPROVED PLANS	11/11/21

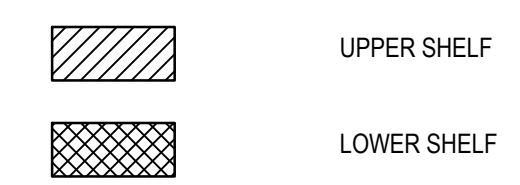
Sheet No.	L1.4
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**SCM #1: WETPOND**

SCALE: 1" = 30'

**LEGEND:**



**NOTES:**

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

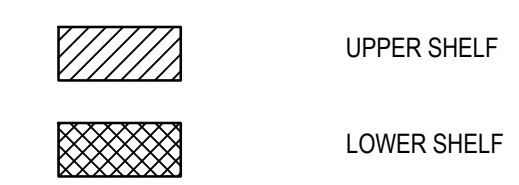
WET POND - SCM #1						
KEY	QTY	BOTANICAL NAME	COMMON NAME	ROOT	SIZE	NOTES
<b>UPPER SHELF# = 2447 SF W/ 50 HERB. PLANTS/200 SF = 612</b>						
AAM	153	<i>Aconis americanus</i>	Sweetflag	CONT.	2.25" PLUG (32'S)	MIN. 24" O.C. 25% SHARED COVERAGE
AIN	153	<i>Asclepias incarnata</i>	Butterfly Milkweed	CONT.	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 SF W/ 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>	Pickersweed	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:**



**NOTES:**

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

WET POND - SCM #2						
KEY	QTY	BOTANICAL NAME	COMMON NAME	ROOT	SIZE	NOTES
<b>UPPER SHELF# = 2446 SF W/ 50 HERB. PLANTS/200 SF = 612</b>						
AAM	153	<i>Aconis 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# = 1947 SF W/ 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>	Pickersweed	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

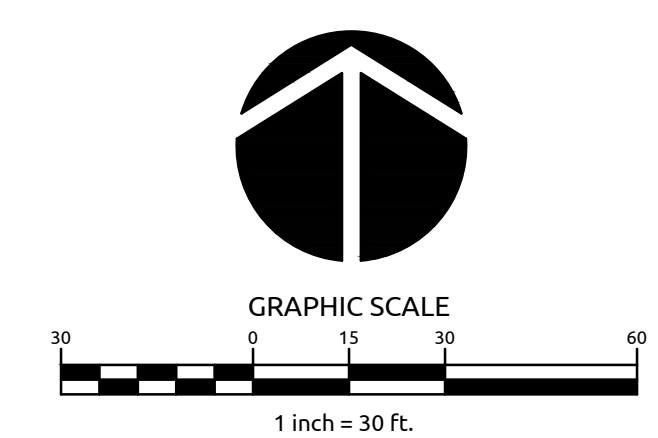
Note: 'Shared coverage' means that the species will be evenly interspersed on their designated shelf across a single 24" OC square grid.

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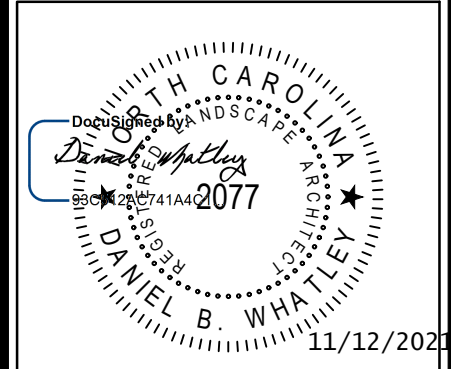
By: \_\_\_\_\_ Date: \_\_\_\_\_  
Town Engineer

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



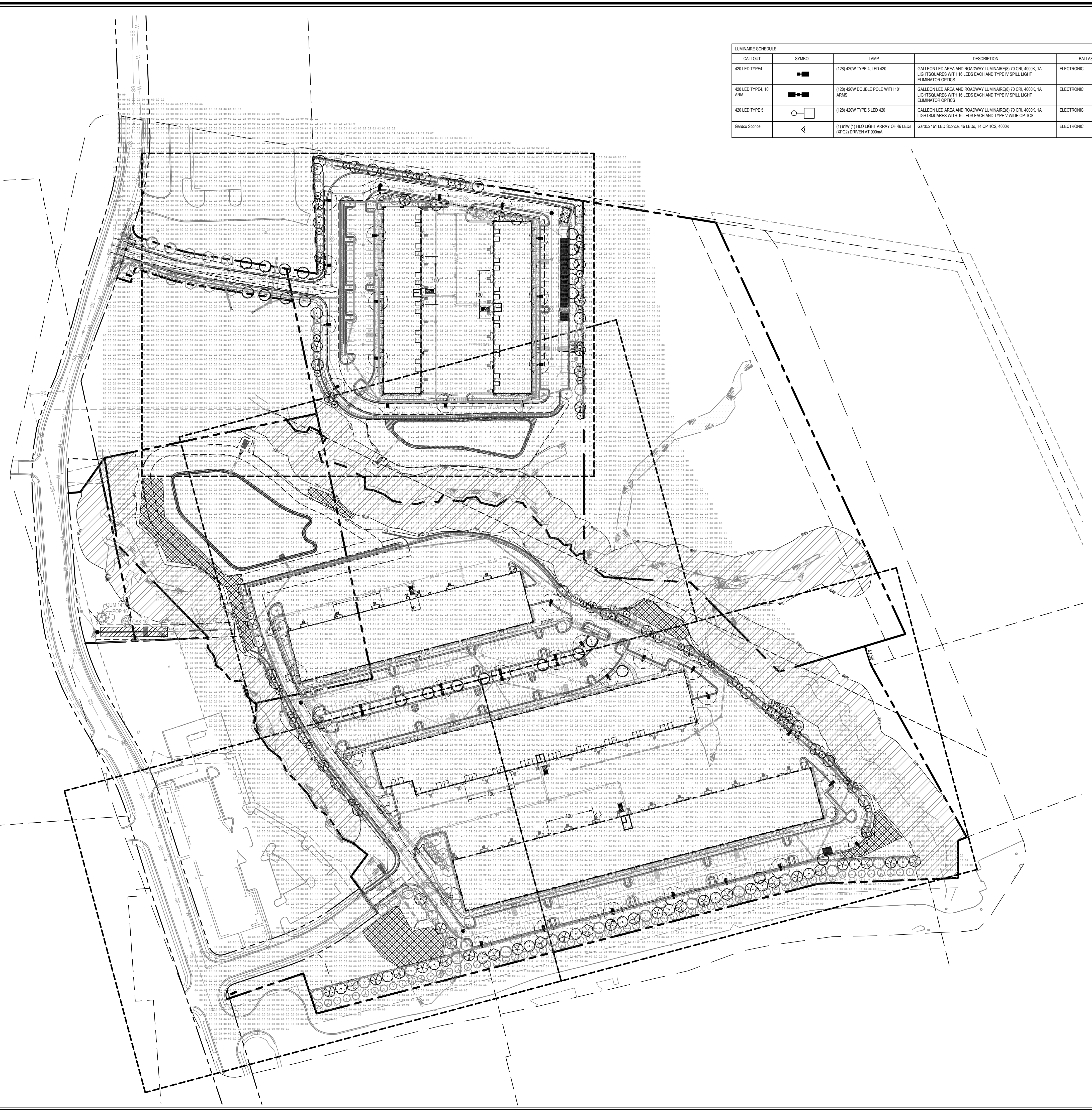
Job No. 09190080.00 Drawn By WR  
Date 09/15/2020 Designer WR



Revisions		
9	SIGNATURE SUBMITTAL	8/27/21
10	REVISION TO APPROVED PLANS	11/11/21







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, 400K, 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	31
420 LED TYPE 4, 10' ARM		(128) 420W DOUBLE POLE WITH 10' ARMS	GALILEON LED AREA AND ROADWAY LUMINAIRE(B) 70 CRI, 400K, 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, 400K, 1A LIGHTSQUARES WITH 16 LEADS EACH AND TYPE V WIDE OPTICS	ELECTRONIC	POLE, 35, 2 ARM	COOPER LIGHTING - STREETWORKS, GANAE-08-LED-U-SW2	120V 1P 2W	7
Garbox Scooter		(1) 91W (1) H.O. LIGHT ARRAY OF 46 LEDS (XPZ2) DRIVEN AT 900mA	Garbox 161 LED Scooter, 46 LEDS, 14 OPTICS, 400K	ELECTRONIC	WALL MOUNT, 18 HT	PHILIPS GARDCO, 161-46L-900-9W-Q2-4	120V 1P 2W	31

NORTH PARKING LOT PHOTOMETRIC SCHEDULE	
AVERAGE FOOT-CANDELS	3.87
MAXIMUM FOOT-CANDELS	5.7
MINIMUM FOOT-CANDELS	1.4
MINIMUM TO MAXIMUM FC RATIO	0.25
MAXIMUM TO MINIMUM FC RATIO	4.03
AVERAGE TO MINIMUM FC RATIO	2.72

SOUTH PARKING LOT PHOTOMETRIC SCHEDULE	
AVERAGE FOOT-CANDELS	3.11
MAXIMUM FOOT-CANDELS	7.4
MINIMUM FOOT-CANDELS	0.9
MINIMUM TO MAXIMUM FC RATIO	0.12
MAXIMUM TO MINIMUM FC RATIO	8.67
AVERAGE TO MINIMUM FC RATIO	3.65

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) \_\_\_\_\_.

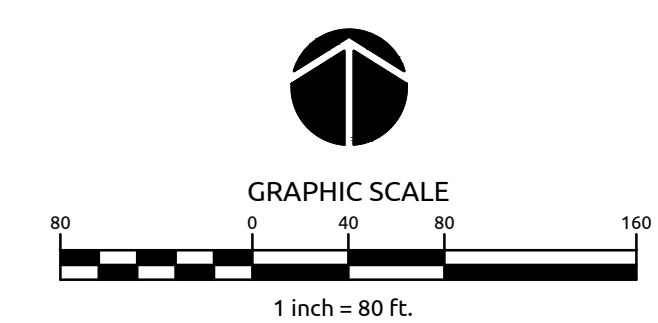
Official Seal: \_\_\_\_\_ Notary: \_\_\_\_\_  
 Commission Expires: \_\_\_\_\_

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

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



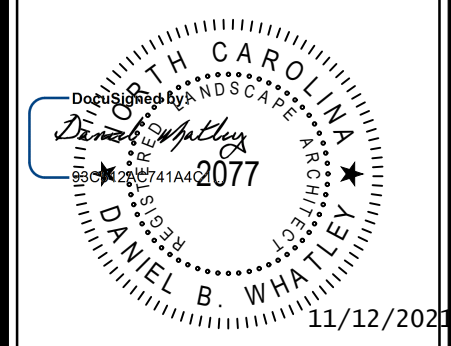
**WithersRavenel**  
 Engineers | Planners

1375 Wilmington Street | Suite 200 | Raleigh, NC 27601 | T: 919-669-3300 | License #: C-0821 | www.withersravenel.com

MERRITT HINTON  
 OAKS BLVD  
 Knightdale, NC

LIGHTING 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

Sheet No.  
**SL1.0**

by @ignify

Wall Sconce

LED Wall Sconce

Project: \_\_\_\_\_  
Location: \_\_\_\_\_  
Cat.No: \_\_\_\_\_  
Type: \_\_\_\_\_  
Lamp: \_\_\_\_\_  
Notes: \_\_\_\_\_

Gardco LED wall sconce 161 offers distinction through its styling, powerful optical design, array of distributions, and impressive selection of control possibilities. Designed to compliment 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.

Ordering guide

Order No.	Part No.	Part Name	Quantity	Notes
161	46L	400W LED wall sconce	4	

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 400W. 5. Must specify specific input voltage.

Accessories (order separately)

Part No.	Description
F318-100	IMR hand held programmer (for use with IMR2 motion response when hand programming is required). If needed, only one is needed per job.

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### 161 LED wall sconce

Wall Sconce

LED Wattage and Lumen Values

Rated White Output Color	Total Watts	Module Count	Color Temp. (K)	Regrange System	Type 2 Lumens	Type 2 BPS	Type 2 Efficacy (lm/w)	Type 3 Lumens	Type 3 BPS	Type 3 Efficacy (lm/w)	Type 4 Lumens	Type 4 BPS	Type 4 Efficacy (lm/w)
161-46L-400-WW-G2	46	1	600	4000	18	15,000	82-U0-G2	10,883	82-U0-G2	87	10,245	82-U0-G2	92
161-46L-400-WW-G2	46	1	800	4000	18	16,000	83-U0-G2	10,918	83-U0-G2	100	10,322	83-U0-G2	92
161-46L-400-WW-G2	46	2	600	4000	18	21,000	83-U0-G2	10,918	83-U0-G2	87	20,918	83-U0-G2	92
161-53L-400-WW-G2	53	2	800	4000	34	37,500	83-U0-G2	15,360	83-U0-G2	109	21,477	83-U0-G2	105

1. Wattage and lumen output may vary by +/- 8% due to LED manufacturer forward voltage specification and ambient temperature. 2. Lumens values based on photometric tests performed in compliance with IESNA LM-79. 3. Warm White color temperatures will result in decreased lumen output. Contact our lighting applications@ignify.com for details or additional information.

Distributions: Type 2, Type 3, Type 4

Dimensions: 161mm (6.34") x 102mm (4.02") x 82mm (3.23")

Luminaire options

DD-D: Non-dimming driver with leads supplied through back of luminaire (for secondary dimming controls by others).

Dynaformer Automatic Profile Dimming: Automatic dimming profiles (CSGO/CM50) offer safety or median settings. For shorter or longer duration. Dimming profiles provide flexibility towards energy savings goals while optimizing light levels during specific dark hours. 50% dimming is standard. 75% and 25% dimming is also available if different light levels are required (contact Technical Support for details).

IMR2: Infrared Motion Response Integral. IMR2 module is mounted integral to luminaire. Motion response for IMR2 is set (operates 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 to factory set to 50% with 5 minute default "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. IMR2 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.

Passive Infrared (PIR) motion sensor. WattStopper P3P-211, equipped with lens. Available in 120V through 277V input only. The P3P-211 can also be reprogrammed with WattStopper's F3P-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, 277 or 347VAC)

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

Wall Sconce

Specifications

Housing: Main body castings made of a low copper die cast Aluminum alloy (A360) for a high resistance to corrosion, 0.007" (2.5mm) minimum thickness.

Driver: High power factor of 90% min. Electronic driver, operating range 50/60Hz. Auto adjusting universal voltage input from 120 to 277VAC or 147 to 480 VAC rated for both application line to line or line to neutral. Class 1, THD of 20% max. Output is protected from short circuits, voltage overload and current overload. Automatic recovery after connection. Standard built-in driver surge protection of 4kV (rms).

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 paint (3.5 mil minimum). The thermosetting resins provides a discoloration 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.

Light Engine: Electrical components are RoHS compliant. IP68 sealed light engines. LEDs tested by ISO 17025:2005 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.

Optical System: The advanced LED optical systems provide IES Types 2, 3 and 4 distributions. Composed of high performance UV stabilized optical grade polymer refractor lenses to achieve desired distribution optimized to get maximum spacing, target lumens and a superior lighting uniformity. System is rated IP68. Performance shall be tested per LM-63, LM-79 and TM-18 (IESNA) certifying its photometric performance. Dark sky compliant with 0% spill-out and 0.5% per IESNA TM-15. Designed and tested to rating IP68 in accordance with European Standard EN 60529 (equivalent of international standard IEC 60529:2002).

UL Listed: 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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WithersRavenel Engineers | Planners

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MERRITT HINTON OAKS BLVD Knightdale, NC

### 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.

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.

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

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

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

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**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

LIGHTING DETAILS

Job No. 09190080 Drawn By WR  
Date 09/15/2020 Designer WR

Revisions

9	SIGNATURE SUBMITTAL	8/27/21
10	REVISION TO APPROVED PLANS	11/11/21

Sheet No. SL1.1