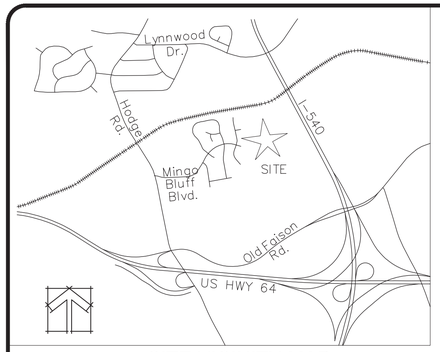


SITE VICINITY MAP

NOT TO SCALE

GENERAL PROJECT DATA

1. TOTAL NUMBER OF LOTS 48
2. TOTAL ACRES 8.91 AC
3. TOTAL DISTURBED AREA 5.19 AC
4. WATER (PUBLIC WATER)
5. SEWER (PUBLIC SEWER)
6. BUILDING SETBACKS:
   FRONT: 0 '- 25'
   SIDE: 10' BETWEEN BUIDLINGS
   REAR: NONE

PUBLIC IMPROVEMENT	
Mingo Creek Phase 7	
Number of Lots	48
Lot Numbers	700-747
Public Water Service Stubs	48
Public Sewer Service Stubs	48
Public Water (LF)	1,103
Public Sewer (LF)	956
Public Street (LF)	313
Private Street (LF)	938
Standard Transition to Valley Curb	100
30" Standard Curb (LF)	581
30" Valley Curb (LF)	1,443
Public Sidewalk (LF)	579
Private 5.5' Sidewalk (LF)	1,250
Private 6' Sidewalk (LF)	228
Public Storm Drainage (LF)	189
Private Storm Drainage (LF)	551
Public Greenway	0

Public
Water Distribution / Extension System

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

City of Raleigh
Public Utilities Department Permit # _____

Authorization to Construct _____

Date _____

Public
Sewer Collection / Extension System

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

City of Raleigh
Public Utilities Department Permit # _____

Authorization to Construct _____

Date _____

DEVELOPER/APPLICANT:

MINGO CREEK INVESTMENTS III, LLC
2102 PRITCHARD RD
Clayton, NC 27527

CONTACT/AGENT: DAVE DEYOUNG
919-901-3178

CALL 48 HOURS BEFORE YOU DIG
1-800-632-4949
NORTH CAROLINA ONE-CALL CENTER

CONSTRUCTION DRAWINGS

SU-2-01

MINGO CREEK PHASE 7

IN

KNIGHTDALE, WAKE COUNTY, NC

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.

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: _____

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

PLAT OF THE SUBDIVISION AND 20' CORWLE MUST BE SUBMITTED TO BOTH TOWN OF KNIGHTDALE AND CORPUD FOR REVIEW PRIOR TO RECORDING. THE PLAT MUST BE RECORDED PRIOR TO THE ISSUANCE OF UTILITY BUILDING PERMITS FROM THE TOWN

SHEET INDEX

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 25489 DONALD C. ADAMS, JR

REVISED
1/26/2022 5:10 PM

NOT RELEASED FOR CONSTRUCTION

Conditions to be met prior to approval of a Construction Improvements Permit:

1. That tree protection fencing be installed along the 50' Special Highway Overlay District as shown on the preliminary plat and that this fencing be Inspected and approved by the Planning Department prior to the issuance of a Construction Improvements Permit; and that a tree protection plan, including fence installation and Town approval, be approved for the Neuse River buffer areas to protect existing vegetation prior to the issuance of a Construction Improvements Permit;
2. That the sidewalk be included and shown on approved construction plans on both sides of Mingo Bluff Boulevard and the street identified as Street 1;
3. That the linear pattern of the townhome units along the Eastern Wake Expressway be redesigned to provide 'pods' of townhome units with a common open space more in keeping with the layouts as proposed for the rest of the proposed development;
4. That at least two canopy trees be shown on construction plans in front of each townhome building to better create a streetscape along these units;
5. That a note be added to the plans that all trashcans within the townhome units will be screened from view of the public and private streets, and that a detail be provided on construction plans on how screening is to be achieved;
6. That as recommended by the Parks & Recreation Advisory Board that specific recreation equipment and construction details of the recreation areas be reviewed and approved by the Parks & Recreation Advisory Board prior to issuance of a Construction Improvements Permit; that play equipment for the Tot Lots shall be IPEMA certified and include vendors such as Little Tykes, Recreation Creations and Landscape Structures; and that a bridge be provided over the stream (subject to Division of Water Quality approval) to connect the townhome pod to the sidewalk system in the southeast corner;
7. That a fencing system, including a split rail or similar fence (not just shrubbery) be installed between the active recreation area and Mingo Bluff Boulevard to provide a barrier to the road; and that the multi-purpose path be an asphalt at least 6 feet wide;
8. That the applicant be requested to voluntarily reserve an easement in the Northeast corner of the development to accommodate a future rail transit stop parking area;

Conditions to be met prior to Planning Department authorization to record lots:

9. That the recombination plat reflecting the 104.24 acres be approved by the Knightdale Planning Department, be recorded at the Wake County Register of Deeds and that 3 copies and 1 mylar be submitted to the town;
10. That homeowners documents incorporating this subdivision into the existing Mingo Creek homeowners association for all of Phase III are required to be approved by the Town Attorney and recorded at the Wake County Register of Deeds, and that a copy be submitted to the Town Planning Department within 14 days of authorization of map recording for any section of Phase III; and that the homeowners documents reflect responsibility for maintenance of recreation areas and open space;

Conditions that are to be met prior to issuance of Certificate of Occupancy:

11. That Mingo Bluff Boulevard be installed in its entirety prior to issuance of the first Certificate of Occupancy on any lot within the subdivision;
12. That the portion of the Type D buffer yard along the future Eastern Wake Expressway located within Phase 12 be completely installed prior to issuance of any building permit for Phase 12; that the portion of the Type D buffer yard along the future Eastern Wake Expressway located within Phase 7 be completely installed prior to the issuance of any building permit for Phase 7; that the portion of Type D buffer yard along the future Wake County Expressway located with Section 8 be completely installed prior to the issuance of any building permit for Section 8;
13. That the Type A buffer yard required along the southern portion of the property line be installed prior to the issuance of the first Certificate of Occupancy for Section 8 and the Type A buffer yard along the Northern property line be installed prior to the issuance of the first Certificate of Occupancy for Section 3;
14. That the active recreation area on Mingo Bluff Boulevard (containing the tot lots and gazebo areas) be constructed and completed prior to the issuance of the first Certificate of Occupancy of a house in Phase III; and that all other recreation areas, including all amenities (i.e. Multi-purpose path and basketball court), be constructed prior to the issuance of a Certificate of Occupancy for any house within the specific section that the recreation area is located within;
15. That the homes be built as follows: The minimum size of the townhomes with garages shall be a minimum of 1,400 square feet of heated floor space and townhomes without garages shall be a minimum of 1,000 square feet of heated floor space. The detached single family homes shall be a minimum of 1,300 square feet of heated floor space as agreed upon by Mr. Fred Smith.

ZMA-5-94

Approved by the Town Council, the request includes the following list of conditions and permitted uses;

R-12 CUD Uses; Streets, CP&L power line easement and Open Space
Use Number 6.24, Public Park

R-10 CUD Use Number 1.11, Single Family Detached
Use Number 6.24, Public Park
Minimum Lot Size; 10,000 square feet
Average Lot Size; 11,000 square feet
Total Acreage 108.9

R-7 CUD Use Number 1.11, Single Family Detached
Use Number 6.24, Public Park
Minimum Lot Size; 8,000 square feet
Average Lot Size; 9,000 square feet
Total Acreage 96.3

R-MT CUD Use Number 1.11, Single Family Detached
Use Number 6.24, Public Park
Use Number 1.13, Zero Lot Line
Use Number 1.21, Duplex
Use Number 1.31, Apartments
Use Number 1.32, Condominiums
Use Number 1.33, Townhouses
Maximum density will not exceed ten units per acre.
Total Acreage 55.0

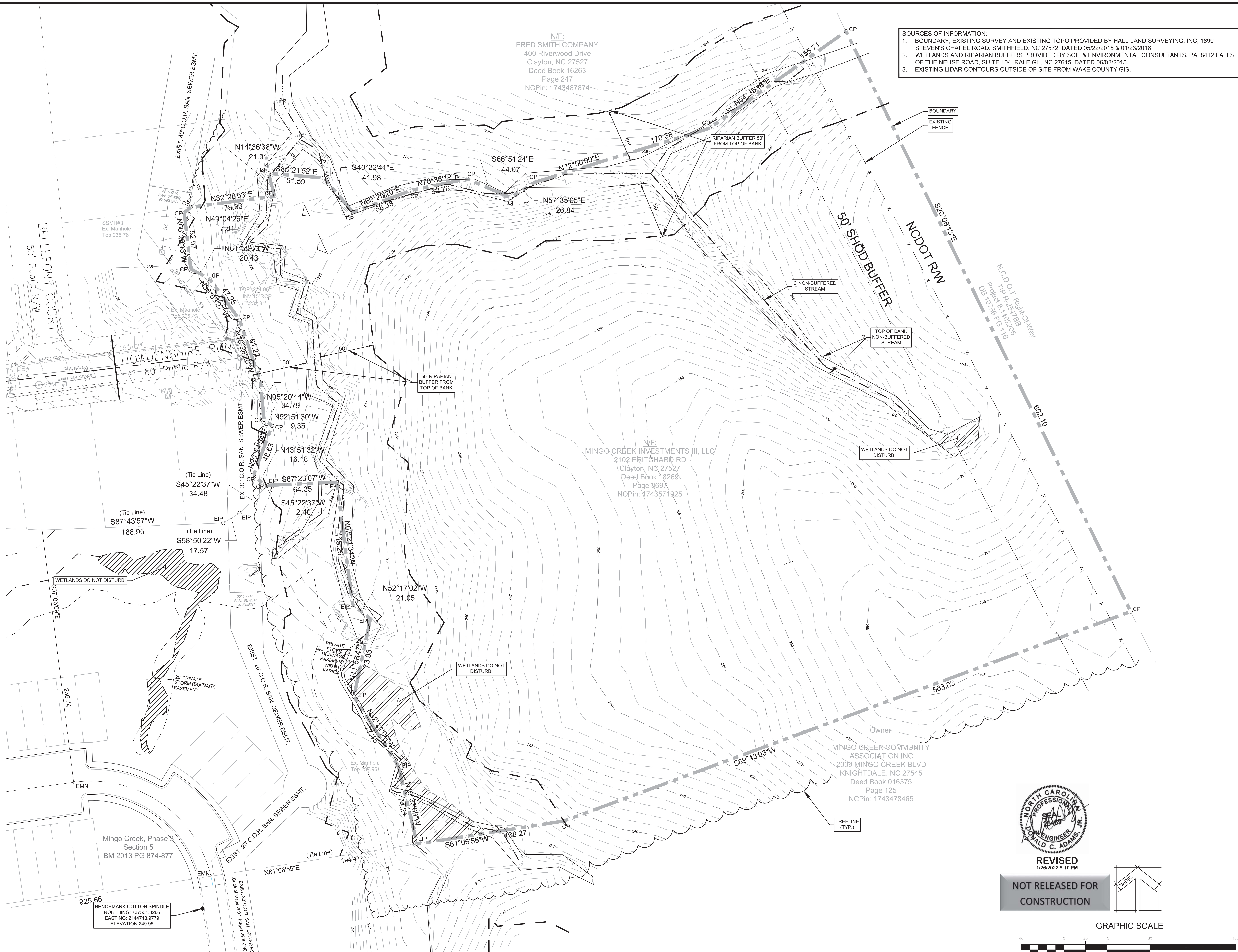
In the event that tracts shown as R-MT CUD develop as single family detached residential, such tracts will be permitted to develop at R-7 or R-10 standards including setbacks.

ADAMS & HODGE ENGINEERING, PC
314 EAST MAIN STREET
CLAYTON, NC 27520
919-243-1332 info@adamsandhodge.com
FIRM # C-4187

MINGO CREEK PHASE 7

KNIGHTDALE, WAKE COUNTY, NC

FEBRUARY 24, 2017
REVISED 06/14/2019 PER TOK COMMENTS
REVISED 08/26/2021 PER COR & TOK COMMENTS
REVISED 01/26/2022 PER CLIENT COMMENTS


N/F:
FRED SMITH COMPANY
400 Riverwood Drive
Clayton, NC 27527
Deed Book 16263
Page 247
NCPin: 1743487874
N/F:
MINGO CREEK INVESTMENTS III, LLC
2102 PRITCHARD RD
Clayton, NC 27527
Deed Book 18269
Page 8697
NCPin: 1743571925
Owner:
MINGO CREEK COMMUNITY
ASSOCIATION,INC
2009 MINGO CREEK BLVD
KNIGHTDALE, NC 27545
Deed Book 016375
Page 125
NCPin: 1743478465
N.C.D.O.T. Right-of-Way
TIP R-2547BB
Project 8.1402205
DB 10756 PG 116
BELLEFONT COURT
50' Public R/W
HOWDENSHIRE RD
60' Public R/W
Mingo Creek, Phase 3
Section 5
BM 2013 PG 874-877
NCDOT R/W
50' SHOD BUFFER
BOUNDARY
EXISTING FENCE
RIPARIAN BUFFER 50' FROM TOP OF BANK
℄ NON-BUFFERED STREAM
TOP OF BANK NON-BUFFERED STREAM
WETLANDS DO NOT DISTURB!
50' RIPARIAN BUFFER FROM TOP OF BANK
WETLANDS DO NOT DISTURB!
WETLANDS DO NOT DISTURB!
TREELINE (TYP.)
EXIST. 40' C.O.R. SAN. SEWER ESMT.
EX. 30' C.O.R. SAN. SEWER ESMT.
EXIST. 20' C.O.R. SAN. SEWER ESMT.
EXIST. 20' C.O.R. SAN. SEWER ESMT.
EXIST. 30' C.O.R. SAN. SEWER ESMT. (Book of Maps 2007, Pages 2906-2908)
20' PRIVATE STORM DRAINAGE EASEMENT
PRIVATE STORM DRAINAGE EASEMENT WIDTH VARIES
SSMH#3 Ex. Manhole Top 235.76
Ex. Manhole Top 235.48
Ex. Manhole Top 237.96
N14°36'38"W 21.91
S85°21'52"E 51.59
S40°22'41"E 41.98
S66°51'24"E 44.07
N72°50'00"E 170.38
N54°35'18"E 155.71
N82°28'53"E 78.83
N49°04'26"E 7.81
N69°25'20"E 56.38
N78°38'19"E 52.76
N57°35'05"E 26.84
N06°24'13"W 52.57
N61°50'53"W 20.43
N36°03'27"W 47.25
N18°28'26"W 61.27
N05°20'44"W 34.79
N52°51'30"W 9.35
N20°23'54"E 48.63
N43°51'32"W 16.18
S87°23'07"W 64.35
S45°22'37"W 2.40
(Tie Line) S45°22'37"W 34.48
(Tie Line) S87°43'57"W 168.95
(Tie Line) S58°50'22"W 17.57
N07°21'34"W 115.26
N52°17'02"W 21.05
N11°58'47"E 73.88
N32°21'06"W 77.45
N13°33'09"W 74.21
S81°06'55"W 138.27
(Tie Line) N81°06'55"E 194.47
S26°08'13"E 602.10
563.03
S69°43'03"W
S07°06'09"E 236.74
925.66
EMN
EMN
BENCHMARK COTTON SPINDLE NORTHING: 737531.3266 EASTING: 2144718.9779 ELEVATION 249.95
BENCHMARK IRON NAIL NORTHING: 737478.9595 EASTING: 2144727.1091 ELEVATION 252.40
GRAPHIC SCALE
(IN FEET)
1 inch = 40 ft.
NAD83

SOURCES OF INFORMATION:

1. BOUNDARY, EXISTING SURVEY AND EXISTING TOPO PROVIDED BY HALL LAND SURVEYING, INC, 1899 STEVEN'S CHAPEL ROAD, SMITHFIELD, NC 27572, DATED 05/22/2015 & 01/23/2016
2. WETLANDS AND RIPARIAN BUFFERS PROVIDED BY SOIL & ENVIRONMENTAL CONSULTANTS, PA, 8412 FALLS OF THE NEUSE ROAD, SUITE 104, RALEIGH, NC 27615, DATED 06/02/2015.
3. EXISTING LIDAR CONTOURS OUTSIDE OF SITE FROM WAKE COUNTY GIS.

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 25469 DONALD C. ADAMS, JR.

REVISED
1/26/2022 5:10 PM

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CALL 48 HOURS BEFORE YOU DIG
1-800-632-4949
NORTH CAROLINA ONE-CALL CENTER

REVISIONS:
1. 2019-06-14 PER TOK COMMENTS
2. 2021-08-26 PER ENGINEER, TOK AND COR COMMENTS
3. 2022-01-26 PER CLIENT COMMENTS

314 EAST MAIN STREET
CLAYTON, NC 27520
info@adamsandhodge.com
919-243-1332
FIRM # C-4187

ADAMS & HODGE ENGINEERING, PC

MINGO CREEK PHASE 7

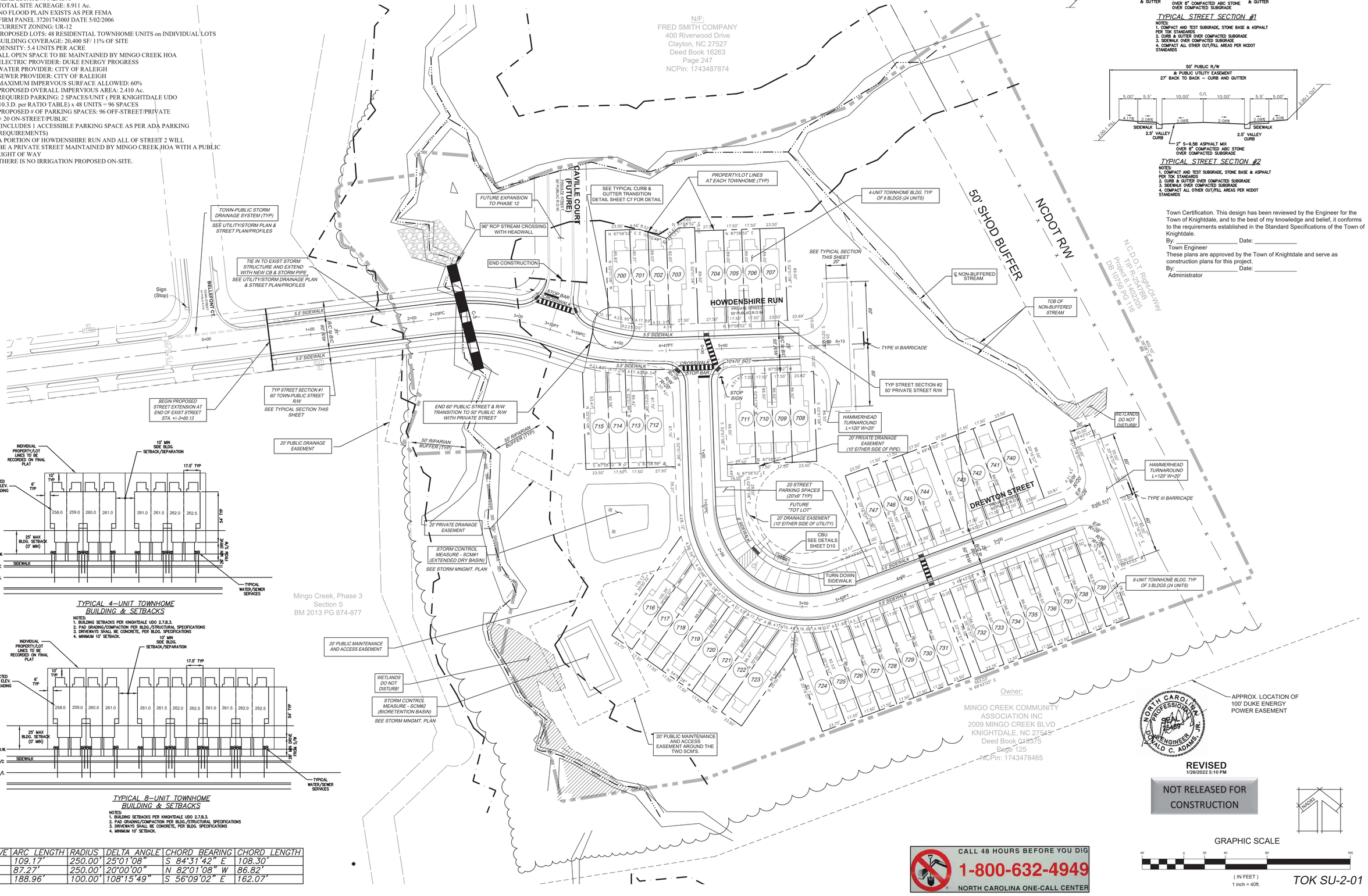
TOWN OF KNIGHTDALE, WAKE COUNTY, NORTH CAROLINA

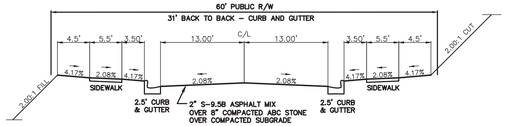
EXISTING CONDITIONS

DESIGN	DCA
DRAWN	ADS/BRL
CHECKED	DCA
HORIZONTAL SCALE	SEE GRAPHIC SCALE
VERTICAL SCALE	N/A
DATE	02/24/2017
JOB NO.	
SHEET	EX1

SITE INFORMATION

1. OWNER: JOYNER MINGO CREEK, LLC
   394 FLEMING ROAD,
   YOUNGSVILLE, NC 27596
2. SITE IS LOCATED WITHIN KNIGHTDALE TOWN LIMITS
3. PARCEL #: 1743571925
4. REAL ESTATE #: 04296578
5. TOTAL SITE ACREAGE: 8.911 Ac.
6. NO FLOOD PLAIN EXISTS AS PER FEMA
   FIRM PANEL 3720174300J DATE 5/02/2006
7. CURRENT ZONING: UR-12
8. PROPOSED LOTS: 48 RESIDENTIAL TOWNHOME UNITS on INDIVIDUAL LOTS
9. BUILDING COVERAGE: 20,400 SF/ 11% OF SITE
10. DENSITY: 5.4 UNITS PER ACRE
11. ALL OPEN SPACE TO BE MAINTAINED BY MINGO CREEK HOA
12. ELECTRIC PROVIDER: DUKE ENERGY PROGRESS
13. WATER PROVIDER: CITY OF RALEIGH
14. SEWER PROVIDER: CITY OF RALEIGH
15. MAXIMUM IMPERVOUS SURFACE ALLOWED: 60%
16. PROPOSED OVERALL IMPERVIOUS AREA: 2.410 Ac.
17. REQUIRED PARKING: 2 SPACES/UNIT (PER KNIGHTDALE UDO 10.3.D. per RATIO TABLE) x 48 UNITS = 96 SPACES
18. PROPOSED # OF PARKING SPACES: 96 OFF-STREET/PRIVATE
    + 20 ON-STREET/PUBLIC
    (INCLUDES 1 ACCESSIBLE PARKING SPACE AS PER ADA PARKING REQUIREMENTS)
19. A PORTION OF HOWDENSHIRE RUN AND ALL OF STREET 2 WILL BE A PRIVATE STREET MAINTAINED BY MINGO CREEK HOA WITH A PUBLIC RIGHT OF WAY
20. THERE IS NO IRRIGATION PROPOSED ON-SITE.





TYPICAL STREET SECTION #1

NOTES:
1. COMPACT AND TEST SUBGRADE, STONE BASE & ASPHALT PER TOK STANDARDS
2. CURB & GUTTER OVER COMPACTED SUBGRADE
3. SIDEWALK OVER COMPACTED SUBGRADE
4. COMPACT ALL OTHER CUT/FILL AREAS PER NCDOT STANDARDS

TYPICAL STREET SECTION #2

NOTES:
1. COMPACT AND TEST SUBGRADE, STONE BASE & ASPHALT PER TOK STANDARDS
2. CURB & GUTTER OVER COMPACTED SUBGRADE
3. SIDEWALK OVER COMPACTED SUBGRADE
4. COMPACT ALL OTHER CUT/FILL AREAS PER NCDOT STANDARDS

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

TYPICAL 4-UNIT TOWNHOME BUILDING & SETBACKS

NOTES:
1. BUILDING SETBACKS PER KNIGHTDALE UDO 2.7.B.3.
2. PAD GRADING/COMPACTION PER BLDG./STRUCTURAL SPECIFICATIONS
3. DRIVEWAYS SHALL BE CONCRETE, PER BLDG. SPECIFICATIONS
4. MINIMUM 10' SETBACK.

TYPICAL 8-UNIT TOWNHOME BUILDING & SETBACKS

NOTES:
1. BUILDING SETBACKS PER KNIGHTDALE UDO 2.7.B.3.
2. PAD GRADING/COMPACTION PER BLDG./STRUCTURAL SPECIFICATIONS
3. DRIVEWAYS SHALL BE CONCRETE, PER BLDG. SPECIFICATIONS
4. MINIMUM 10' SETBACK.

CURVE	ARC LENGTH	RADIUS	DELTA ANGLE	CHORD BEARING	CHORD LENGTH
C1	109.17'	250.00'	25°01'08"	S 84°31'42" E	108.30'
C2	87.27'	250.00'	20°00'00"	N 82°01'08" W	86.82'
C3	188.96'	100.00'	108°15'49"	S 56°09'02" E	162.07'

NORTH CAROLINA PROFESSIONAL SEAL 15459 ENGINEER DONALD C. ADAMS, JR.

REVISED
1/26/2022 5:10 PM

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NADAD

GRAPHIC SCALE
40 0 20 40 80 160
(IN FEET)
1 inch = 40ft.

TOK SU-2-01

REVISIONS:
1. 2021-05-14 PER TOK COMMENTS
2. 2021-06-29 PER ENGINEER
3. 2022-01-26 PER CLIENT COMMENTS

ADAMS & HODGE ENGINEERING, PC
314 EAST MAIN STREET
CLAYTON, NC 27520
info@adamsandhodge.com
919.243.2182
FIRM # C-4187

MINGO CREEK PHASE 7
TOWN OF KNIGHTDALE, WAKE COUNTY, NORTH CAROLINA

SITE PLAN

DESIGN: DCA
DRAWN: ADS/BRL
CHECKED: DCA
HORIZONTAL SCALE: SEE GRAPHIC SCALE
VERTICAL SCALE: N/A
DATE: 02/24/2017
JOB NO.
SHEET: C1

STANDARD UTILITY NOTES (as applicable):

1. All materials & construction methods shall be in accordance with City of Raleigh design standards, details & specifications (reference: CORPUD Handbook, current edition)
2. Utility separation requirements:
   a) A distance of 100' shall be maintained between sanitary sewer & any private or Public water supply source such as an impounded reservoir used as a source of drinking water. If adequate lateral separation cannot be achieved, ferrous sanitary sewer pipe shall be specified & installed to waterline specifications. However, the minimum separation shall not be less than 25' from a private well or 50' from a public well
   b) When installing water &/or sewer mains, the horizontal separation between utilities shall be 10'. If this separation cannot be maintained due to existing conditions, the variation allowed is the water main in a separate trench with the elevation of the water main at least 18" above the top of the sewer & must be approved by the Public Utilities Director. All distances are measured from outside diameter to outside diameter
   c) Where it is impossible to obtain proper separation, or anytime a sanitary sewer passes over a watermain, DIP materials or steel encasement extended 10' on each side of crossing must be specified & installed to waterline specifications
   d) 5.0' minimum horizontal separation is required between all sanitary sewer & storm sewer facilities, unless DIP material is specified for sanitary sewer
   e) Maintain 18" min. vertical separation at all watermain & RCP storm drain crossings; maintain 24" min. vertical separation at all sanitary sewer & RCP storm drain crossings. Where adequate separations cannot be achieved, specify DIP materials & a concrete cradle having 6" min. clearance (per CORPUD details W-41 & S-49)
   f) All other underground utilities shall cross water & sewer facilities with 18" min. vertical separation required
3. Any necessary field revisions are subject to review & approval of an amended plan &/or profile by the City of Raleigh Public Utilities Department prior to construction
4. Contractor shall maintain continuous water & sewer service to existing residences & businesses throughout construction of project. Any necessary service interruptions shall be preceded by a 24 hour advance notice to the City of Raleigh Public Utilities Department
5. 3.0' minimum cover is required on all water mains & sewer forcemains. 4.0' minimum cover is required on all reuse mains
6. It is the developer's responsibility to abandon or remove existing water & sewer services not being used in redevelopment of a site unless otherwise directed by the City of Raleigh Public Utilities Department. This includes abandoning tap at main & removal of service from ROW or easement per CORPUD Handbook procedure
7. Install ¾" copper water services with meters located at ROW or within a 2'x2' Waterline Easement immediately adjacent. NOTE: it is the applicant's responsibility to properly size the water service for each connection to provide adequate flow & pressure
8. Install 4" PVC sewer services @ 1.0% minimum grade with cleanouts located at ROW or easement line & spaced every 75 linear feet maximum
9. Pressure reducing valves are required on all water services exceeding 80 psi; backwater valves are required on all sanitary sewer services having building drains lower than 1.0' above the next upstream manhole
10. All environmental permits applicable to the project must be obtained from NCDWQ, USACE &/or FEMA for any riparian buffer, wetland &/or floodplain impacts (respectively) prior to construction.
11. NCDOT / Railroad Encroachment Agreements are required for any utility work (including main extensions & service taps) within state or railroad ROW prior to construction
12. Grease Interceptor / Oil Water Separator sizing calculations & installation specifications shall be approved by the CORPUD FOG Program Coordinator prior to issuance of a Building Permit. Contact Tim Beasley at (919) 996-2334 or timothy.beasley@raleighnc.gov for more information
13. Cross-connection control protection devices are required based on degree of health hazard involved as listed in Appendix-B of the Rules Governing Public Water Systems in North Carolina. These guidelines are the minimum requirements. The devices shall meet American Society of Sanitary Engineering (ASSE) standards or be on the University of Southern California approval list. The devices shall be installed and tested (both initial and periodic testing thereafter) in accordance with the manufacturer's recommendations or the local cross-connection control program, whichever is more stringent. Contact Joanie Hartley at (919) 996-5923 or joanie.hartley@raleighnc.gov for more information

PER CHANGE IN THE NORTH CAROLINA GERNERAL STATUTES (NCGS 87-121(g)), UNDERGROUND UTILITIES ARE TO BE LOCATED BY ELECTRONIC MEANS. SIMILAR TO OTHER DETAILS, GRAVITY SEWER MAINS NOW REQUIRE A #12 AWG INSULATED (GREEN) SOLID COPPER WIRE TO BE PLACED WITH THE GRAVITY SEWER MAIN. IF THE SEWER MAIN DEPTH IS GREATER THAN 8 FEET FROM FINAL SURFACE ELEVATION, PLACE THE WIRE AT A DEPTH BETWEEN 7 AND 8 FEET BELOW FINAL SURFACE ELEVATION. IN PAVED AREAS, PROVIDE ACCESS TO THE TRACER WIRE THROUGH A MINI-MANHOLE. IN AN OUTFALL CONDITION, PROVIDE ACCESS SIMILAR TO THE WATER LINE TRACER WIRE DETAIL. LOOP THE WIRE AROUND THE STANDARD MANHOLE. SEE DETAIL ON SHEET D2

NOTE:

1. *ALL STORM STRUCTURES SHOWN ARE NCDOT STD. CATCH BASIN WITH THE EXCEPTIONS OF SD10 WHICH IS A NCDOT STD. DROP INLET AND SD4, SD11 AND SD11A WHICH ARE VALLEY GRATES. PLEASE SEE DETAIL ON SHEET C3 FOR STANDARD CATCH BASIN CURB TRANSITION.*
2. *PIPE/MAIN CROSSINGS: STORMWATER OVER WATER MAIN; MIN. 18" CLEARANCE WITH ONE JOINT DIP WATERLINE CENTERED UNDER STORMDRAIN.*
3. *PIPE/MAIN CROSSINGS: STORMWATER OVER SANITARY SEWER MAIN; MIN. 24" CLEARANCE.*
4. *HORIZONTAL PIPE/MAIN SEPARATION; 10' MIN. CLEAR BETWEEN WATER/SEWER OR INSTALL WATER 18" OVER SEWER IN SEPARATE TRENCH OR USE DIP OR ENCASEMENT ON BOTH MAINS.*

LEGEND

EXISTING		PROPOSED
— W —	WATERLINE	— 6" WL —
	BLOWOFF	
	HYDRANT	
	VALVE	
	REDUCER	
	METER	
— SS —	SEWERLINE	— SS —
	MANHOLE	
	CLEANOUT	
	STORM DRAINAGE	
	CATCH BASIN	
	DROP INLET/YARD INLET	
	PROPOSED DITCH FLOW	

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

By: ____________ Date: ____________

Town Engineer

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

By: ____________ Date: ____________

Administrator

Public

Water Distribution / Extension System

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

City of Raleigh
Public Utilities Department Permit # ____________

Authorization to Construct ____________

Date ____________

Public

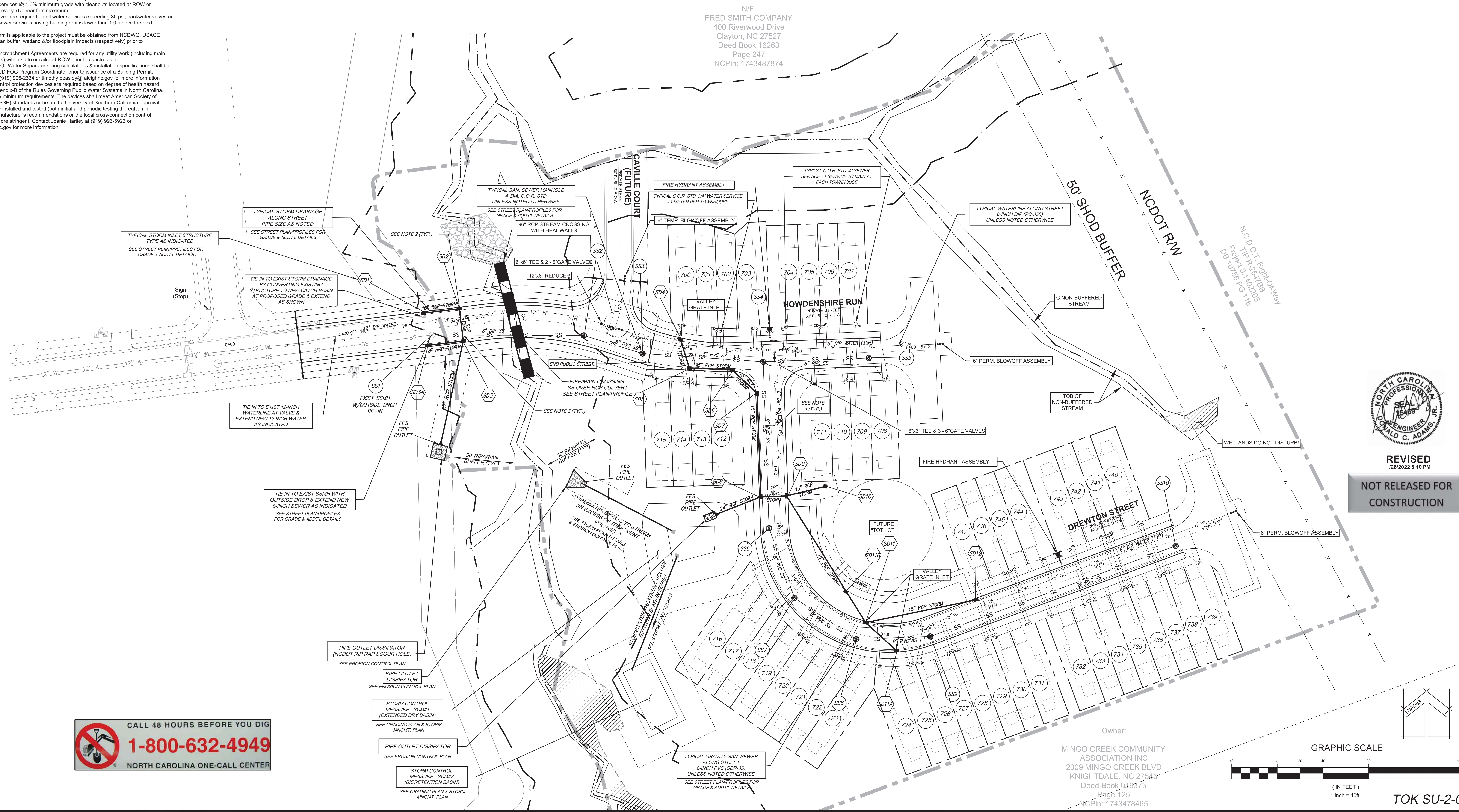
Sewer Collection / Extension System

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

City of Raleigh
Public Utilities Department Permit # ____________

Authorization to Construct ____________

Date ____________



REVISIONS:
1. 2019-06-14 PER TOK COMMENTS
2. 2021-08-26 PER ENGINEER, TOK AND COR COMMENTS
3. 2022-01-26 PER CLIENT COMMENTS

314 EAST MAIN STREET
CLAYTON, NC 27520
info@adamsandhodge.com
919-243-1332
FIRM # C-4187

ADAMS & HODGE
ENGINEERING, PC

MINGO CREEK
PHASE 7
TOWN OF KNIGHTDALE, WAKE COUNTY, NORTH CAROLINA

UTILITY & STORM
DRAINAGE PLAN

DESIGN DCA
DRAWN ADS/BRL
CHECKED DCA
HORIZONTAL SCALE SEE GRAPHIC SCALE
VERTICAL SCALE N/A
DATE 02/24/2017
JOB NO.
SHEET C2

TOK SU-2-01

N/F:
FRED SMITH COMPANY
400 Riverwood Drive
Clayton, NC 27527
Deed Book 16263
Page 247
NCPin: 1743487874

EROSION CONTROL SEQUENCE OF CONSTRUCTION

1. OBTAIN 401 & 404 PERMITS.
2. OBTAIN GRADING PERMIT AND CERTIFICATE OF COVERAGE.
3. THIS PROJECT IS DIVIDED INTO TWO (2) STAGES. STAGE 1 EROSION CONTROL - CONSTRUCTION PREPARATION.
   STAGE 2 EROSION CONTROL - SITE GRADING AND CONSTRUCTION.
4. BEFORE BEGINNING ANY LAND DISTURBING ACTIVITY THE CONTRACTOR SHALL CONTACT WAKE COUNTY ENVIRONMENTAL CONSULTANT, (919-418-3791) TO SET UP AND ATTEND A PRE-CONSTRUCTION MEETING.

BEGIN STAGE 1 EROSION CONTROL

6. INSTALL TEMPORARY GRAVEL CONSTRUCTION ENTRANCE.
7. INSTALL 96' RCP AT STREAM CROSSING.
8. INSTALL ALL SILT FENCING AND WIRE & WASHED STONE OUTLETS IN SILT FENCE AS SHOWN ON THE APPROVED PLAN. CLEAR ONLY AS NECESSARY TO INSTALL THESE DEVICES.
9. BUILD TEMPORARY SKIMMER BASIN AS SHOWN TO BE USED DURING CONSTRUCTION.
10. CLEAR AND INSTALL PERMANENT DIVERSION DITCH SHOWN ON EROSION CONTROL PLANS DISTURBING THE SMALLEST AREA POSSIBLE.
11. EROSION CONTROL MEASURES SHOWN ON PLANS ARE MINIMUM AND MIGHT NOT BE SUFFICIENT TO CONTROL EROSION AND SEDIMENTATION. CONTRACTOR TO INSTALL ADDITIONAL MEASURES AS GRADING CONDITIONS CHANGE TO ROUTE STORMWATER TOWARDS BASIN AND INLETS. CONTACT ENGINEER AS NEEDED FOR FURTHER DESIGN AND INSTRUCTION.
12. GROUNDCOVER MUST BE APPLIED TO DISTURBED AREAS ACCORDING TO THE "GROUND STABILIZATION" TABLE ON SHEET D7.1 03 (PER THE NEW STORMWATER RULES). STABILIZE SITE AS AREAS ARE BROUGHT UP TO GRADE WITH VEGETATION, PAVING, DITCH LININGS, ETC.
13. CALL WAKE COUNTY FOR ON SITE INSPECTION AND CERTIFICATE OF COMPLIANCE. (SEE NOTE #4 ABOVE.)

BEGIN STAGE 2 EROSION CONTROL

14. BEGIN TO CLEAR AND GRUB SITE. DURING THE INITIAL CLEARING AND ROUGH GRADING STAGE, ENSURE THAT STORMWATER IS ROUTED TO EXISTING BASIN UNTIL THE PROPOSED DRAINAGE PATTERNS ARE ESTABLISHED. MAINTAIN DEVICES AS NEEDED.
15. CALL WAKE COUNTY FOR ON SITE INSPECTION AND CERTIFICATE OF COMPLIANCE. (SEE NOTE #4 ABOVE.)
16. EROSION CONTROL MEASURES SHOWN ON PLANS ARE MINIMUM AND MIGHT NOT BE SUFFICIENT TO CONTROL EROSION AND SEDIMENTATION. CONTRACTOR TO INSTALL ADDITIONAL MEASURES AS GRADING CONDITIONS CHANGE TO ROUTE STORMWATER TOWARDS BASIN AND INLETS. CONTACT ENGINEER AS NEEDED FOR FURTHER DESIGN AND INSTRUCTION.
17. GROUNDCOVER MUST BE APPLIED TO DISTURBED AREAS ACCORDING TO THE "GROUND STABILIZATION" TABLE ON SHEET D7.1 03 (PER THE NEW STORMWATER RULES). STABILIZE SITE AS AREAS ARE BROUGHT UP TO GRADE WITH VEGETATION, PAVING, DITCH LININGS, ETC.
18. WHEN MATERIAL IN CONCRETE WASHOUT REACHES APPROXIMATE HEIGHT OF THE HAY BALES, CONTRACTOR SHALL REMOVE MATERIAL FROM CONCRETE WASHOUT AND DISPOSE OF IT AT AN APPROVED LANDFILL. CONCRETE WASHOUT SHALL THEN BE RESTORED TO CONDITIONS PER DETAIL.
19. CONTRACTOR SHALL USE THE SELF-INSPECTION PROGRAM AS DETAILED ON SHEET D1.04 ON A WEEKLY BASIS.
20. WHEN CONSTRUCTION IS COMPLETE AND ALL AREAS ARE PERMANENTLY STABILIZED COMPLETELY WITH THICK VEGETATION, CALL FOR INSPECTION (SEE NOTE #4 ABOVE).
21. IF SITE IS APPROVED, REMOVE SILT FENCING THEN SEED & MULCH OR PAVE ANY RESULTING BARE AREAS. REMOVE SILT, BAFFLES, SKIMMER THEN SHAPE & SIZE POND TO APPROVED DIMENSIONS. ALL REMAINING PERMANENT EROSION CONTROL DEVICES SUCH AS RIP-RAP ENERGY DISSIPATORS, SCM-1 AND SCM-2 SHOULD NOW BE INSTALLED.
22. WHEN THICK VEGETATION HAS BECOME PERMANENTLY ESTABLISHED, CALL FOR FINAL SITE INSPECTION (SEE NOTE #4 ABOVE).

NOTE:
1. ALL STORM STRUCTURES SHOWN ARE NCDOT STD. CATCH BASIN WITH THE EXCEPTIONS OF SD10 WHICH IS A NCDOT STD. DROP INLET AND SD4, SD11 AND SD11A WHICH ARE VALLEY GRATES. PLEASE SEE DETAIL THIS SHEET FOR STANDARD CATCH BASIN CURB TRANSITION.

RIPRAP APRON TO BE IMBEDDED AND FOLLOW STREAMS NATURAL CONTOURS
L = 51'
d = 2.5'
CLASS 1 STONE

96" RCP STREAM CROSSING WITH HEADWALLS

TEMPORARY RIP RAP CONSTRUCTION ENTRANCE
L = 50', W = 20'

TEMPORARY STORM INLET PROTECTION (TYP)
WIRE CLOTH & GRAVEL TYPE

GRADING/CONSTRUCTION LIMITS (TYP)

INSTALL TREE PROTECTION FENCING PER DETAIL ON SHEET D3 AT THE LIMITS OF DISTURBANCE. SILT FENCE AND TREE PROTECTION FENCING CAN BE COMBINED INTO ONE ENTITY PER THE DETAIL SHOWN.

TEMPORARY SILT FENCE (TYP)
AT BASE OF ALL FILL SLOPES AS INDICATED

TEMPORARY SILT FENCE OUTLET (TYP)

50' RIPARIAN BUFFER (TYP)

PERMANENT PIPE OUTLET DISSIPATOR - NCDOT STD. PREFORMED SCOUR HOLE
4.5' X 4.5' SQUARE BASE WIDTH
DEPTH = 2.0'
RIP RAP SIZE = CLASS 'B'
LIP LEVEL AT EXIST CONTOUR

PERMANENT OUTLET DITCH #1
SEE DETAIL THIS SHEET

PERMANENT WAKE CO. STD. RIP RAP PIPE OUTLET DISSIPATOR
L = 15'
W1 = 4.5' (AT PIPE OUTLET)
W2 = 16.5' (AT END)
SHAPE TO CONFORM WITH OUTLET DITCH
RIP RAP SIZE = CLASS 'I'
THICKNESS = 27"

PERMANENT WAKE CO. STD. RIP RAP PIPE OUTLET DISSIPATOR
L = 10'
W1 = 6.0' (AT PIPE OUTLET)
W2 = 6.0' (AT END)
RIP RAP SIZE = CLASS 'B'
THICKNESS = 18"

PERMANENT GRASS SLOPE PROTECTION MATTING FOR POND SPILLWAY & SLOPE
USE NORTH AMERICAN GREEN P550 PERM LINING, OR EQUAL

TEMPORARY WAKE CO. STD. SKIMMER BASIN (CONVERT TO PERM. STORMWATER POND "SCM-1" AFTER STABILIZATION)

MIN BASIN DIMENSIONS:
TOP L = 80'
TOP W = 40'
SLOPES = 2:1
DEPTH = 6'+
BOTTOM EL = 237.0+/-
WEIR LENGTH = 10'

SKIMMER OUTLET:
PIPE SIZE = 4"
ORIFICE SIZE = 1.25"
DEWATERING TIME = 2.73 DAYS

"NOTE" THE PERM STORMWATER POND VOLUME IS ADEQUATE, AND MAY BE USED FOR, THE TEMP. SKIMMER BASIN DURING CONSTRUCTION. CLEAN ALL SEDIMENT AND DEBRIS PRIOR TO CONVERTING TO FINAL STORMWATER POND. PERM POND DAM MAY REQUIRE RECONSTRUCTION AND/OR STRUCTURAL RECOMPACTION PRIOR TO PLACING IN SERVICE.

SEE STORM MANAGEMENT PLAN FOR PERM. POND DETAILS

"SCM-2" BIORENTION BASIN SEE STORM MNGMT PLAN FOR DETAILS

PROPOSED FINISH GRADE CONTOUR (TYP)

TEMPORARY SILT FENCE OUTLET (TYP)

LIMITS OF DISTURBANCE (TYP.)

TEMPORARY SILT FENCE (TYP)
AT BASE OF ALL FILL SLOPES AS INDICATED

CL NON-BUFFERED STREAM

TOB OF NON-BUFFERED STREAM

CAVILLE COURT (FUTURE)
50' PUBLIC R/W

HOWDENSHIRE RUN
PRIVATE STREET
50' PUBLIC R.O.W.

DREWTON STREET
PRIVATE STREET
50' PUBLIC R.O.W.

50' SHOD BUFFER

NCDOT R/W

N.C.D.O.T. Right-Of-Way
Project 8.1402205
TIP R-2547BB
DB 1056 PG 116

INSTALL TREE PROTECTION FENCING PER DETAIL ON SHEET D3 AT THE LIMITS OF DISTURBANCE. SILT FENCE AND TREE PROTECTION FENCING CAN BE COMBINED INTO ONE ENTITY PER THE DETAIL SHOWN.

WETLANDS DO NOT DISTURB!

PROPOSED FINISH GRADE SPOT EL (TYP)

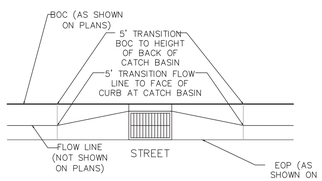
EXIST SSMH W/OUTSIDE DROP TIE-IN

FES PIPE OUTLET

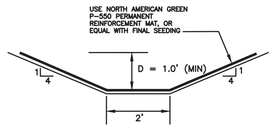
Sign (Stop)

BENCHMARK COTTON SPINDLE
NORTHING: 737531.3266
EASTING: 2144718.9779
ELEVATION 249.95

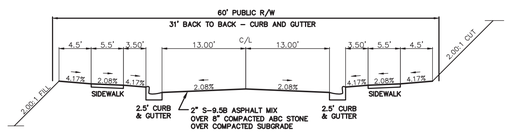
BENCHMARK IRON NAIL
NORTHING: 737478.9595
EASTING: 2144727.1091
ELEVATION 252.40



CURB TRANSITION DETAIL IN 30" VALLEY CURB FOR 30" STANDARD HOOD AND GRATE

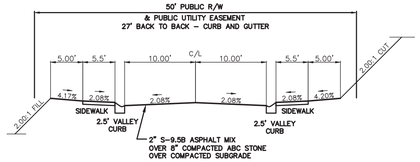


OUTLET DITCH #1
WHERE INDICATED IN PLAN VIEW



TYPICAL STREET SECTION #1

NOTES:
1. COMPACT AND TEST SUBGRADE, STONE BASE & ASPHALT PER TOK STANDARDS
2. CURB & GUTTER OVER COMPACTED SUBGRADE
3. SIDEWALK OVER COMPACTED SUBGRADE
4. COMPACT ALL OTHER CUT/FILL AREAS PER NCDOT STANDARDS



TYPICAL STREET SECTION #2

NOTES:
1. COMPACT AND TEST SUBGRADE, STONE BASE & ASPHALT PER TOK STANDARDS
2. CURB & GUTTER OVER COMPACTED SUBGRADE
3. SIDEWALK OVER COMPACTED SUBGRADE
4. COMPACT ALL OTHER CUT/FILL AREAS PER NCDOT STANDARDS

Owner:
MINGO CREEK COMMUNITY ASSOCIATION,INC
2009 MINGO CREEK BLVD
KNIGHTDALE, NC 27545
Deed Book 018375
Page 125
NCPin: 1743478465

EROSION LEGEND:

- -LIMITS OF DISTURBANCE
- -SILT FENCE
- TD -EXISTING TEMPORARY DIVERSION
- TD -TEMPORARY DIVERSION
- PD -PERMANENT DIVERSION
- -INTLET PROTECTION
- -OUTLET PROTECTION
- -CHECK DAM
- -WATTLE
- -CHECK DAM W/ WEIR & STORAGE
- -WATTLE W/ STORAGE
- -CONSTRUCTION ENTRANCE
- XXXX -DITCH LINER - NAG P300 OR EQUAL
- XXXX -DITCH LINER - NAG S150 OR EQUAL

NOTE ALL DITCHES LINED W/ NAG S150 UNLESS OTHERWISE NOTED.

- -SILT FENCE OUTLET
- 220 -EXISTING CONTOUR
- 220 -PROPOSED CONTOUR

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

NORTH CAROLINA PROFESSIONAL SEAL 25489 ENGINEER DONALD C. ADAMS, JR.

REVISED
1/26/2022 5:10 PM

NOT RELEASED FOR CONSTRUCTION

CALL 48 HOURS BEFORE YOU DIG
1-800-632-4949
NORTH CAROLINA ONE-CALL CENTER

NADAD

GRAPHIC SCALE
40 0 20 40 80 160
(IN FEET)
1 inch =40 ft.

TOK SU-2-01

REVISIONS:
1. 2021-06-04 PER TOK COMMENTS
2. 2021-06-29 PER ENGINEER
3. 2022-01-26 PER CLIENT COMMENTS

314 EAST MAIN STREET
CLAYTON, NC 27520
info@adamsandhodge.com
919-243-1182
FIRM # C-1187

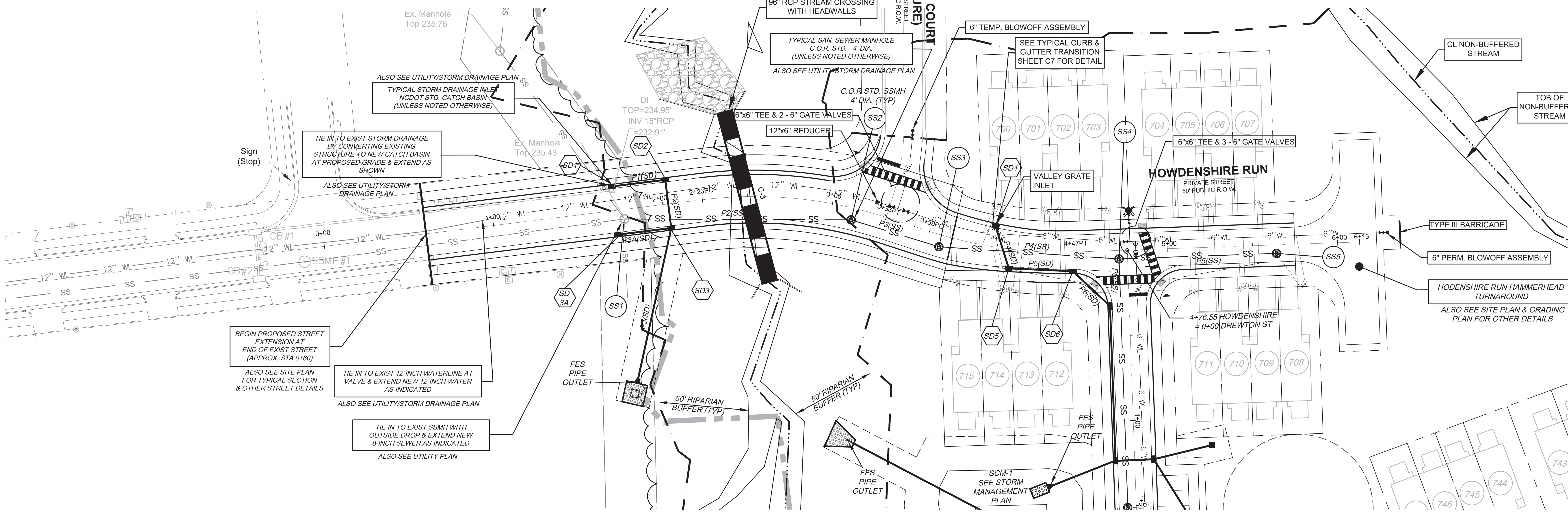
ADAMS & HODGE ENGINEERING, PC

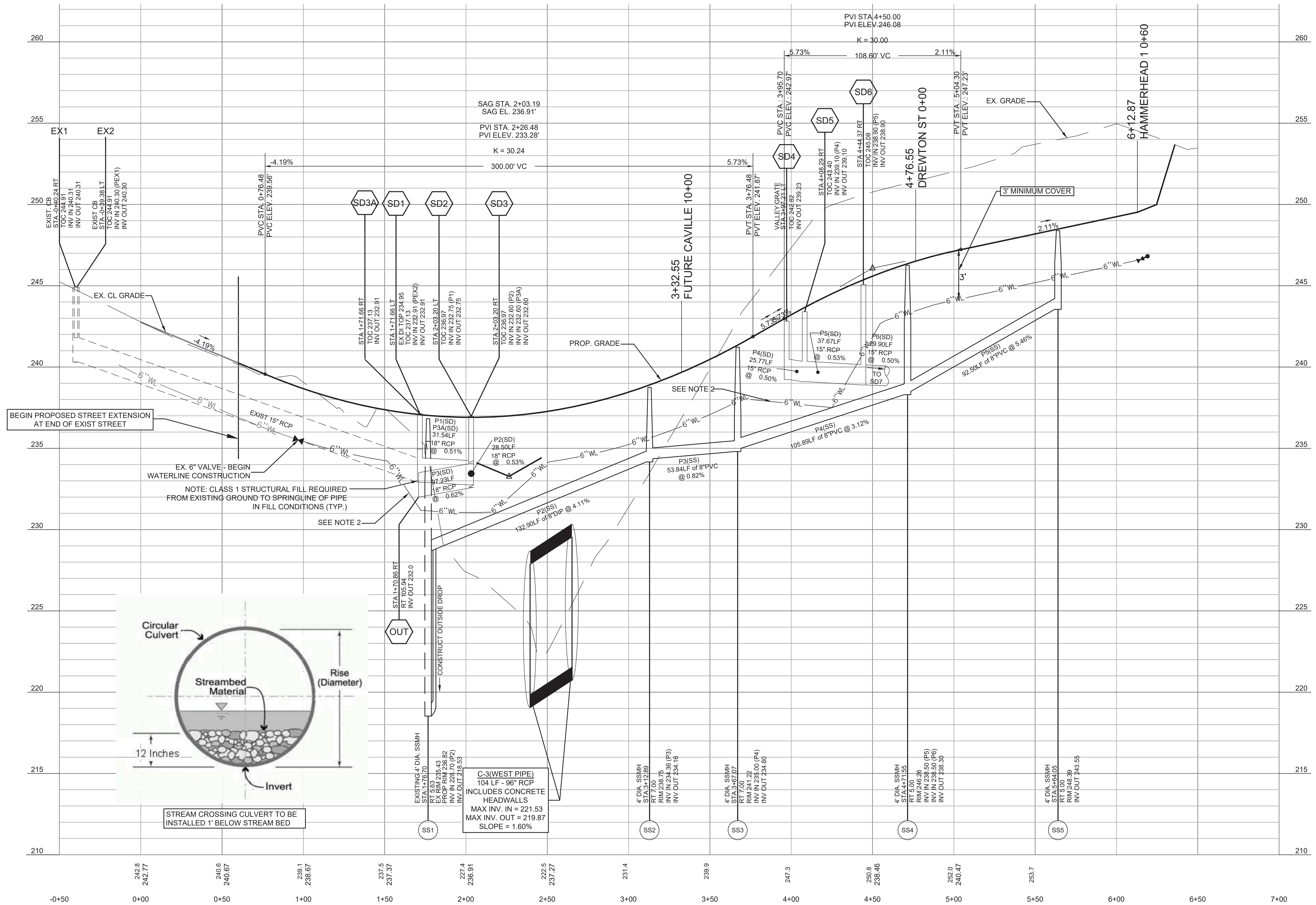
MINGO CREEK PHASE 7
TOWN OF KNIGHTDALE, WAKE COUNTY, NORTH CAROLINA

GRADING & EROSION CONTROL PLAN

DESIGN	DCA
DRAWN	ADS/BRL
CHECKED	DCA
HORIZONTAL SCALE	SEE GRAPHIC SCALE
VERTICAL SCALE	N/A
DATE	02/24/2017
JOB NO.	
SHEET	C3

CALL 48 HOURS BEFORE YOU DIG
1-800-632-4949
NORTH CAROLINA ONE-CALL CENTER

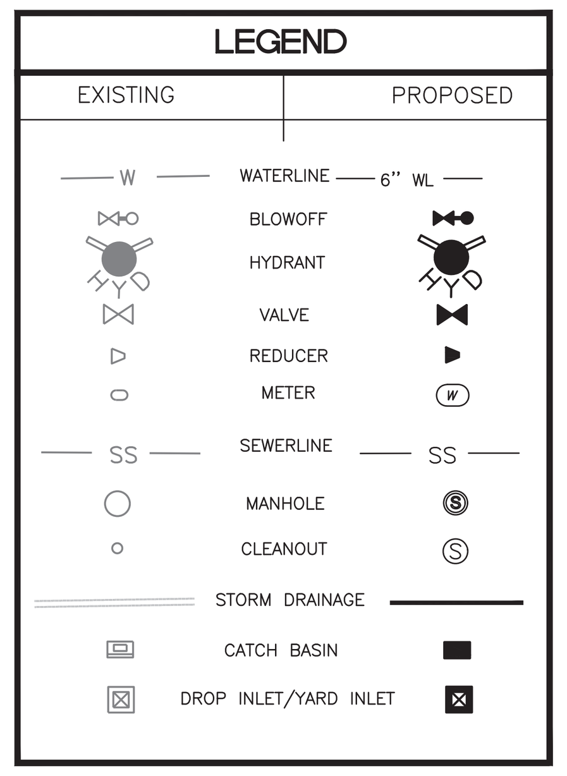




PER CHANGE IN THE NORTH CAROLINA GERNERAL STATUTES (NCGS 87-121(g)), UNDERGROUND UTILITIES ARE TO BE LOCATED BY ELECTRONIC MEANS. SIMILAR TO OTHER DETAILS, GRAVITY SEWER MAINS NOW REQUIRE A #12 AWG INSULATED (GREEN) SOLID COPPER WIRE TO BE PLACED WITH THE GRAVITY SEWER MAIN. IF THE SEWER MAIN DEPTH IS GREATER THAN 8 FEET FROM FINAL SURFACE ELEVATION, PLACE THE WIRE AT A DEPTH BETWEEN 7 AND 8 FEET BELOW FINAL SURFACE ELEVATION. IN PAVED AREAS, PROVIDE ACCESS TO THE TRACER WIRE THROUGH A MINI-MANHOLE. IN AN OUTFALL CONDITION, PROVIDE ACCESS SIMILAR TO THE WATER LINE TRACER WIRE DETAIL. LOOP THE WIRE AROUND THE STANDARD MANHOLE. SEE DETAIL ON SHEET D2

NOTE:
1. ALL STORM STRUCTURES SHOWN ARE NCDOT STD. CATCH BASIN WITH THE EXCEPTIONS OF SD10 WHICH IS A NCDOT STD. DROP INLET AND SD4, SD11 AND SD11A WHICH ARE VALLEY GRATES. PLEASE SEE DETAIL ON SHEET C3 FOR STANDARD CATCH BASIN CURB TRANSITION
2. PIPE/MAIN CROSSINGS: STORMWATER OVER WATER MAIN; MIN. 18" CLEARANCE WITH ONE JOINT DIP WATERLINE CENTERED UNDER STORMDRAIN.
3. PIPE/MAIN CROSSINGS: STORMWATER OVER SANITARY SEWER MAIN; MIN. 24" CLEARANCE.
4. HORIZONTAL PIPE/MAIN SEPARATION; 10' MIN. CLEAR BETWEEN WATER/SEWER OR INSTALL WATER 18" OVER SEWER IN SEPARATE TRENCH OR USE DIP OR ENCASEMENT ON BOTH MAINS.

LEGEND



Public
Water Distribution / Extension System
The City of Raleigh consents to the connection and extension of the City's public water system as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook.

City of Raleigh
Public Utilities Department Permit # ____________

Authorization to Construct ____________

Date ____________

Public
Sewer Collection / Extension System
The City of Raleigh consents to the connection and extension of the City's public sewer system as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook.

City of Raleigh
Public Utilities Department Permit # ____________

Authorization to Construct ____________

Date ____________

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

REVISED
1/26/2022 5:10 PM

NOT RELEASED FOR CONSTRUCTION

GRAPHIC SCALE
(IN FEET)
1 inch =40 ft.

TOK SU-2-01

REVISIONS:
1. 2019-06-14 PER TOK COMMENTS
2. 2021-08-26 PER ENGINEER, TOK AND COR COMMENTS
3. 2022-01-26 PER CLIENT COMMENTS

314 EAST MAIN STREET
CLAYTON, NC 27520
info@adamsandhodge.com
919-243-1332
FIRM # C-4187
ADAMS & HODGE ENGINEERING, PC

MINGO CREEK PHASE 7
TOWN OF KNIGHTDALE, WAKE COUNTY, NORTH CAROLINA

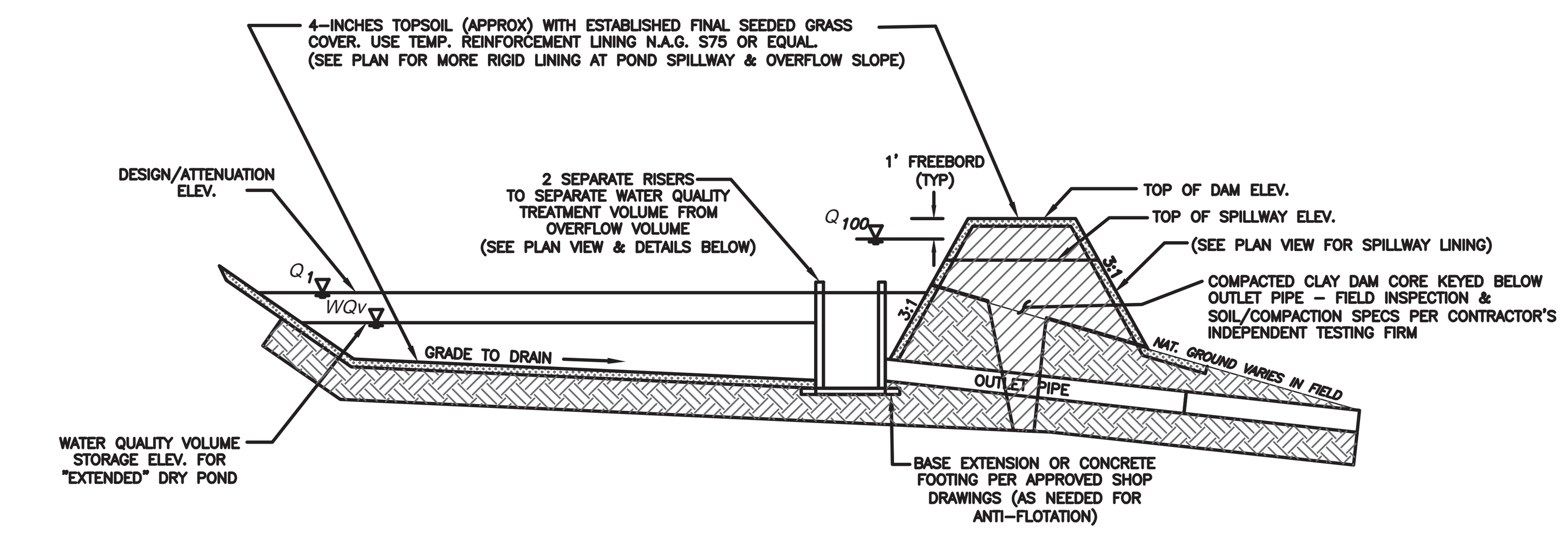
HOWDENSHIRE RUN PLAN & PROFILE

DESIGN	DCA
DRAWN	ADS/BRL
CHECKED	DCA
HORIZONTAL SCALE	SEE GRAPHIC SCALE
VERTICAL SCALE	N/A
DATE	02/24/2017
JOB NO.	
SHEET	C4

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

PER CHANGE IN THE NORTH CAROLINA GERNERAL STATUTES (NCGS 87-121(g)), UNDERGROUND UTILITIES ARE TO BE LOCATED BY ELECTRONIC MEANS. SIMILAR TO OTHER DETAILS, GRAVITY SEWER MAINS NOW REQUIRE A #12 AWG INSULATED (GREEN) SOLID COPPER WIRE TO BE PLACED WITH THE GRAVITY SEWER MAIN. IF THE SEWER MAIN DEPTH IS GREATER THAN 8 FEET FROM FINAL SURFACE ELEVATION, PLACE THE WIRE AT A DEPTH BETWEEN 7 AND 8 FEET BELOW FINAL SURFACE ELEVATION. IN PAVED AREAS, PROVIDE ACCESS TO THE TRACER WIRE THROUGH A MINI-MANHOLE. IN AN OUTFALL CONDITION, PROVIDE ACCESS SIMILAR TO THE WATER LINE TRACER WIRE DETAIL. LOOP THE WIRE AROUND THE STANDARD MANHOLE. SEE DETAIL ON SHEET D2

NOTE:
1. ALL STORM STRUCTURES SHOWN ARE NCDOT STD. CATCH BASIN WITH THE EXCEPTIONS OF SD10 WHICH IS A NCDOT STD. DROP INLET AND SD11 WHICH SHALL MATCH CURB SECTION.
2. PIPE/MAIN CROSSINGS: STORMWATER OVER WATER MAIN; MIN. 18" CLEARANCE WITH ONE JOINT DIP WATERLINE CENTERED UNDER STORMDRAIN.
3. PIPE/MAIN CROSSINGS: STORMWATER OVER SANITARY SEWER MAIN; MIN. 24" CLEARANCE.
4. HORIZONTAL PIPE/MAIN SEPARATION; 10' MIN. CLEAR BETWEEN WATER/SEWER OR INSTALL WATER 18" OVER SEWER IN SEPARATE TRENCH OR USE DIP OR ENCASEMENT ON BOTH MAINS.



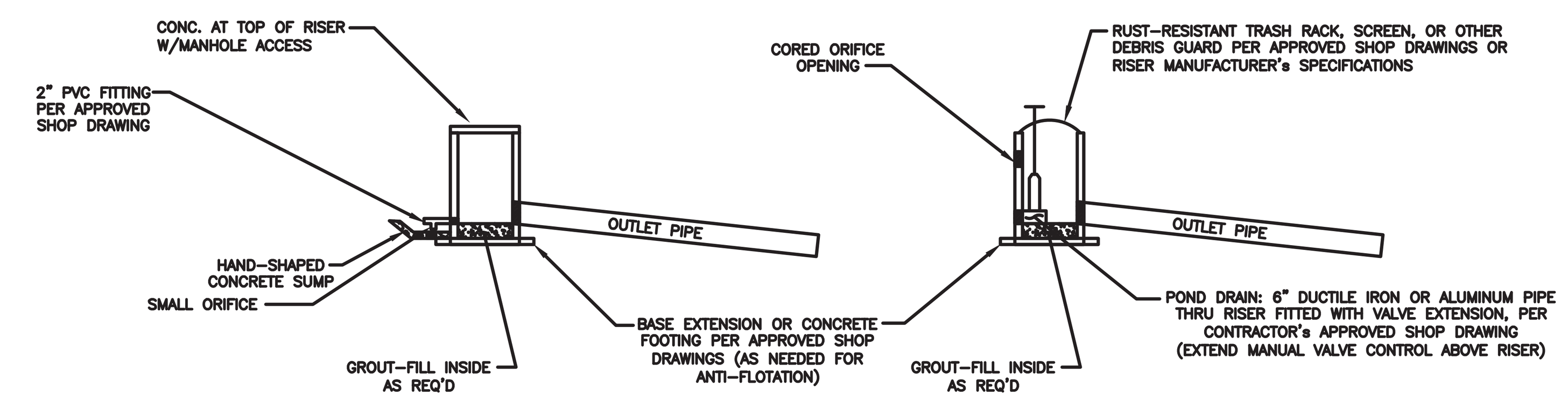
SCM #1 - EXTENDED DRY DETENTION SECTION DETAIL
NO SCALE

POND DATA CHART

DRY POND INFO	DIMENSION	ELEVATION
TOP OF DAM	10' WIDTH	245.00
SPILLWAY	30' LENGTH	243.75
RISER STRUCTURE #1:		
TOP OF CONCRETE BOX RISER	4'L X 4'W	244.50
CORED ORIFICE(S)	N/A	N/A
2" PVC FITTING W/SMALL ORIFICE (AT POND BOTTOM)	1.0" SM. ORIFICE DIA.	236.50
OUTLET PIPE(S) INVERT INLET	1-12" RCP	236.50
OUTET PIPE(S) INVERT OUTLET	1-12" RCP	236.00
RISER STRUCTURE #2:		
TOP OF CONCRETE BOX RISER	4'L X 4'W	243.00
CORED ORIFICE(S)	1-6" DIAMETER	242.25
2" PVC FITTING W/SMALL ORIFICE (AT POND BOTTOM)	N/A	N/A
OUTLET PIPE INVERT INLET	1-18" RCP	236.50
OUTET PIPE(S) INVERT OUTLET	1-18" RCP	223.00

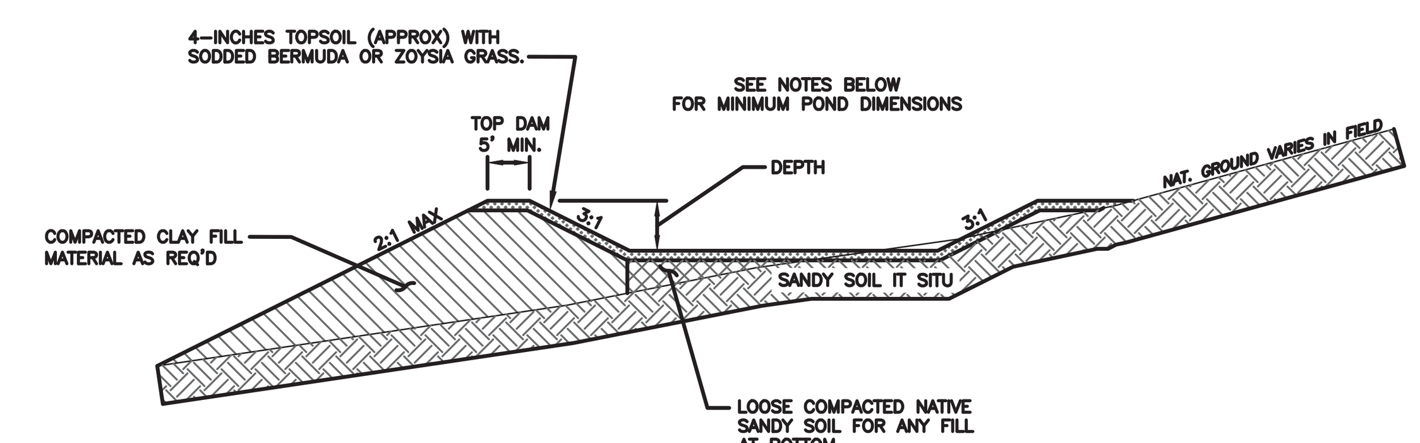
NOTES

1. Install all required erosion control measures prior to pond grading (ref: Erosion Control Plan) Use temporary seeding as required during grading operations. Use reinforcement matting with final seeding in accordance with this Plan and/or the Erosion Control Plan.
2. Pipe Outlets: See Plan View and/or Erosion Control Plan for Pipe Outlet Dissipator from Riser Structure #2. Pipe outlet from Riser Structure #1 discharges at slow velocity to SCM-2 (Bioretention) with no dissipator required.
3. Pond Overflow Spillway: See Plan View and/or Erosion Control Plan for Spillway Lining.
3. LOCATE & CONSTRUCT RISER STRUCTURES IN FIELD AS FAR AS PRACTICAL WITHIN INSIDE SLOPE OF POND DAM FOR MAXIMUM FLOTATION RESISTANCE.



RISER STRUCTURE #1
NO SCALE

RISER STRUCTURE #2
NO SCALE



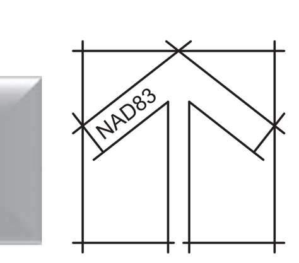
NOTES

1. Install all required erosion control measures prior to pond grading (ref: Erosion Control Plan) Use temporary seeding as required during grading operations. Use reinforcement matting with final seeding in accordance with this Plan and/or the Erosion Control Plan.
2. BASIN MINIMUM DIMENSIONS Depth = 12". L = 50; W = 20 (Measured at Pond Bottom). Minimum Volume = 1,080 cu.ft. Pond edges may be shaped and rounded in field for more aesthetic look as long as minimum depth and volume is obtained.

SCM #2 - BIORETENTION SECTION DETAIL (SANDY SOIL TYPES)
NO SCALE

REVISED
1/26/2022 8:02 AM

NOT RELEASED FOR CONSTRUCTION



GRAPHIC SCALE
40 0 20 40 80 160
(IN FEET)
1 inch =40 ft.

TOK SU-2-01

REVISIONS:
1. 2019-06-14 PER TOK COMMENTS
2. 2021-06-24 PER ENGINEER
TOK AND COR COMMENTS
3. 2022-01-26 PER CLIENT COMMENTS

314 EAST MAIN STREET
CLAYTON, NC 27520
info@adamsandhodge.com
919-243-1332
FIRM # C-4187

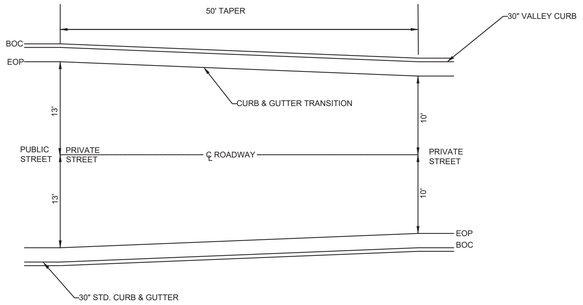
A&H ADAMS & HODGE ENGINEERING, PC

MINGO CREEK
PHASE 7
TOWN OF KNIGHTDALE, WAKE COUNTY, NORTH CAROLINA

STORMWATER MANAGEMENT PLAN

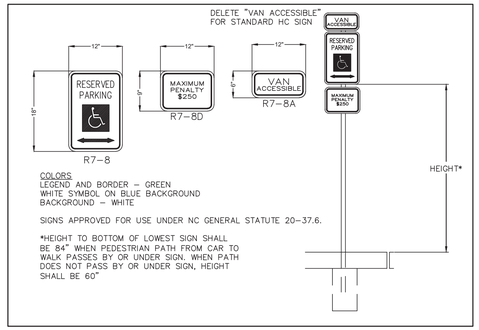
DESIGN	DCA
DRAWN	ADS/BRL
CHECKED	DCA
HORIZONTAL SCALE	SEE GRAPHIC SCALE
VERTICAL SCALE	N/A
DATE	02/24/2017
JOB NO.	
SHEET	C6

CALL 48 HOURS BEFORE YOU DIG
1-800-632-4949
NORTH CAROLINA ONE-CALL CENTER



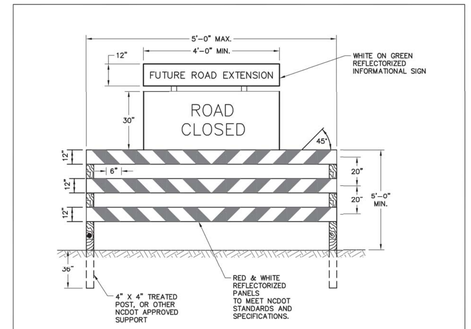
TYPICAL CURB & GUTTER TRANSITION

NOTES:
1. COMPACT AND TEST SUBGRADE, STONE BASE & ASPHALT PER TOK STANDARDS
2. CURB & GUTTER OVER COMPACTED SUBGRADE
3. SIDEWALK OVER COMPACTED SUBGRADE
4. COMPACT ALL OTHER CUT/FILL AREAS PER NCDOT STANDARDS



ADA PARKING SIGN DETAIL
NOT TO SCALE

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

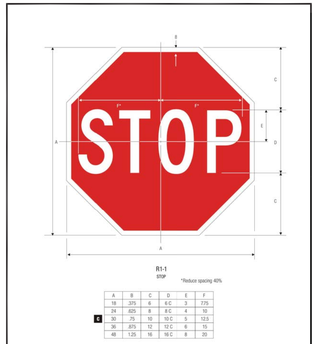


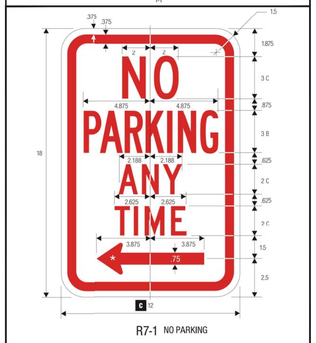
NOTES:
1. BARRICADE(S) TO BE ERECTED ACROSS ENTIRE ROADWAY INCLUDING CURB & GUTTER.
2. ADVANCE WARNING SIGN W14-1 (DEAD END) SHALL BE PLACED JUST AFTER LAST INTERSECTING STREET.
3. MARKINGS FOR BARRICADE RAILS SHALL BE REFLECTIVE AND ALTERNATE RED AND WHITE STRIPS.
4. "ROAD CLOSED" SIGN SHALL MEET SPECIFICATIONS OF M.U.T.C.D R11-2 AND BE REQUIRED ATOP EACH BARRICADE USED.

REVISIONS	
DATE	DESCRIPTION

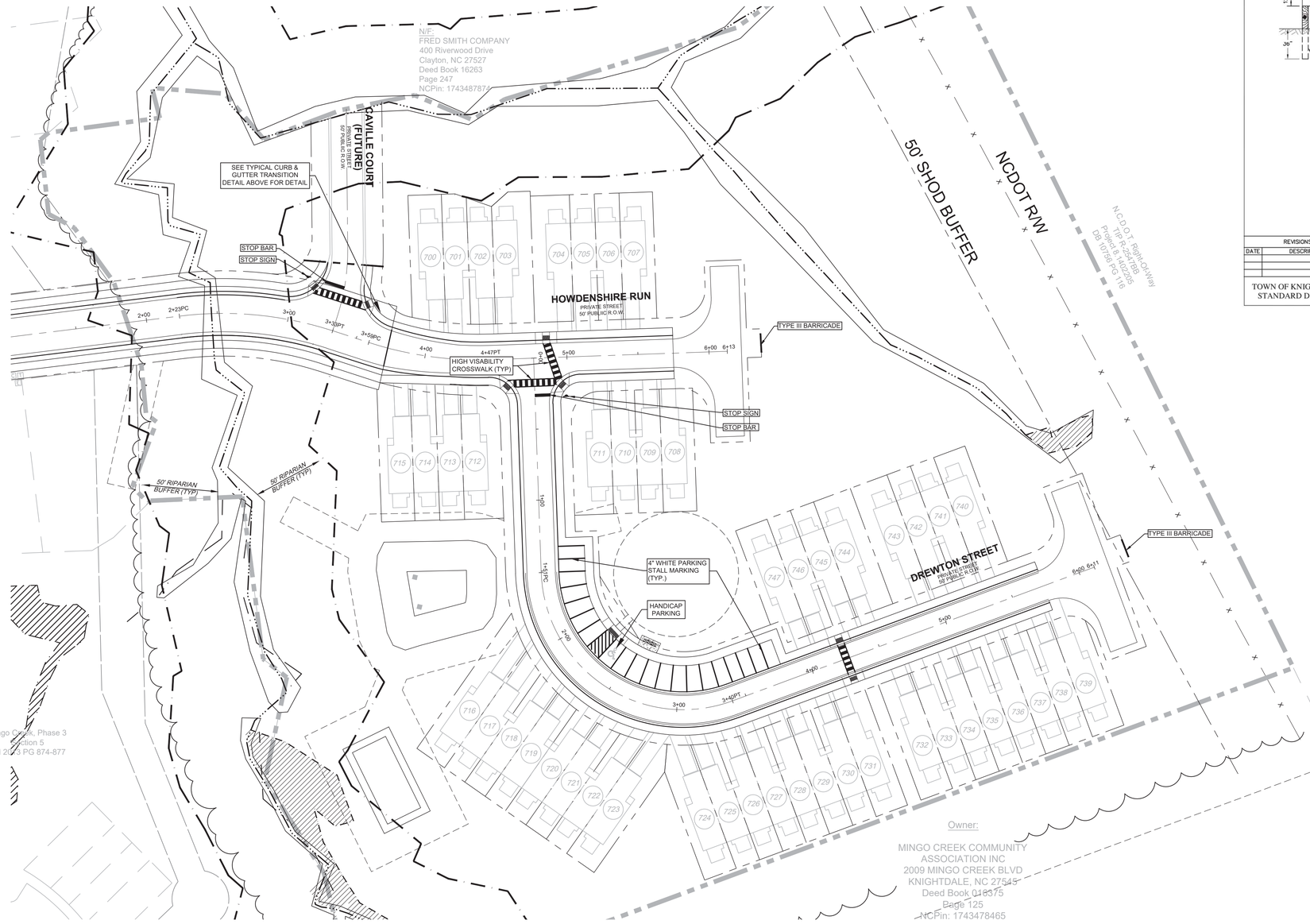
TOWN OF KNIGHTDALE STANDARD DETAILS	TEMPORARY BARRICADE FOR DEAD END ROADS	STD. NO. 3.18

**ALL TRAFIC CONTROL MARKINGS SHALL BE THERMOPLASTIC





NO STREET PARKING ALONG HOWDENSHIRE WAY OR DREWTON STREET



NORTH CAROLINA PROFESSIONAL SEAL 15469 ENGINEER DONALD C. ADAMS, JR.

REVISED
1/26/2022 9:28 AM

NOT RELEASED FOR CONSTRUCTION

GRAPHIC SCALE
40 0 20 40 80 160
(IN FEET)
1 inch =40 ft.

TOK SU-2-01

REVISIONS:
1. 2021-04-14 PER TOK COMMENTS
2. 2021-06-29 PER ENGINEER, PER TOK COMMENTS
3. 2022-01-26 PER CLIENT COMMENTS

314 EAST MAIN STREET
CLAYTON, NC 27520
info@adamsandhodge.com
919.247.1137
FIRM # C-4187

ADAMS & HODGE ENGINEERING, PC

MINGO CREEK PHASE 7
TOWN OF KNIGHTDALE, WAKE COUNTY, NORTH CAROLINA

SIGNAGE & MARKING PLAN

DESIGN DCA
DRAWN ADS/BRL
CHECKED DCA
HORIZONTAL SCALE SEE GRAPHIC SCALE
VERTICAL SCALE N/A
DATE 02/24/2017
JOB NO.
SHEET C7

Plant List

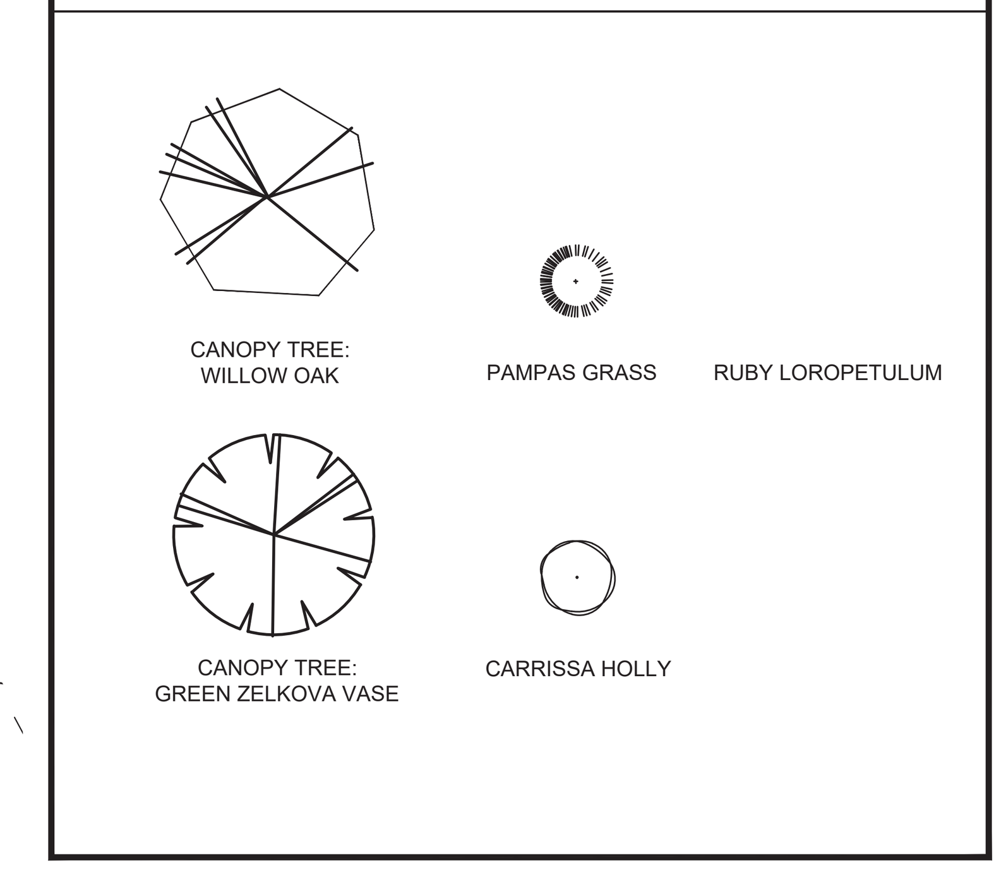
PLANT LIST

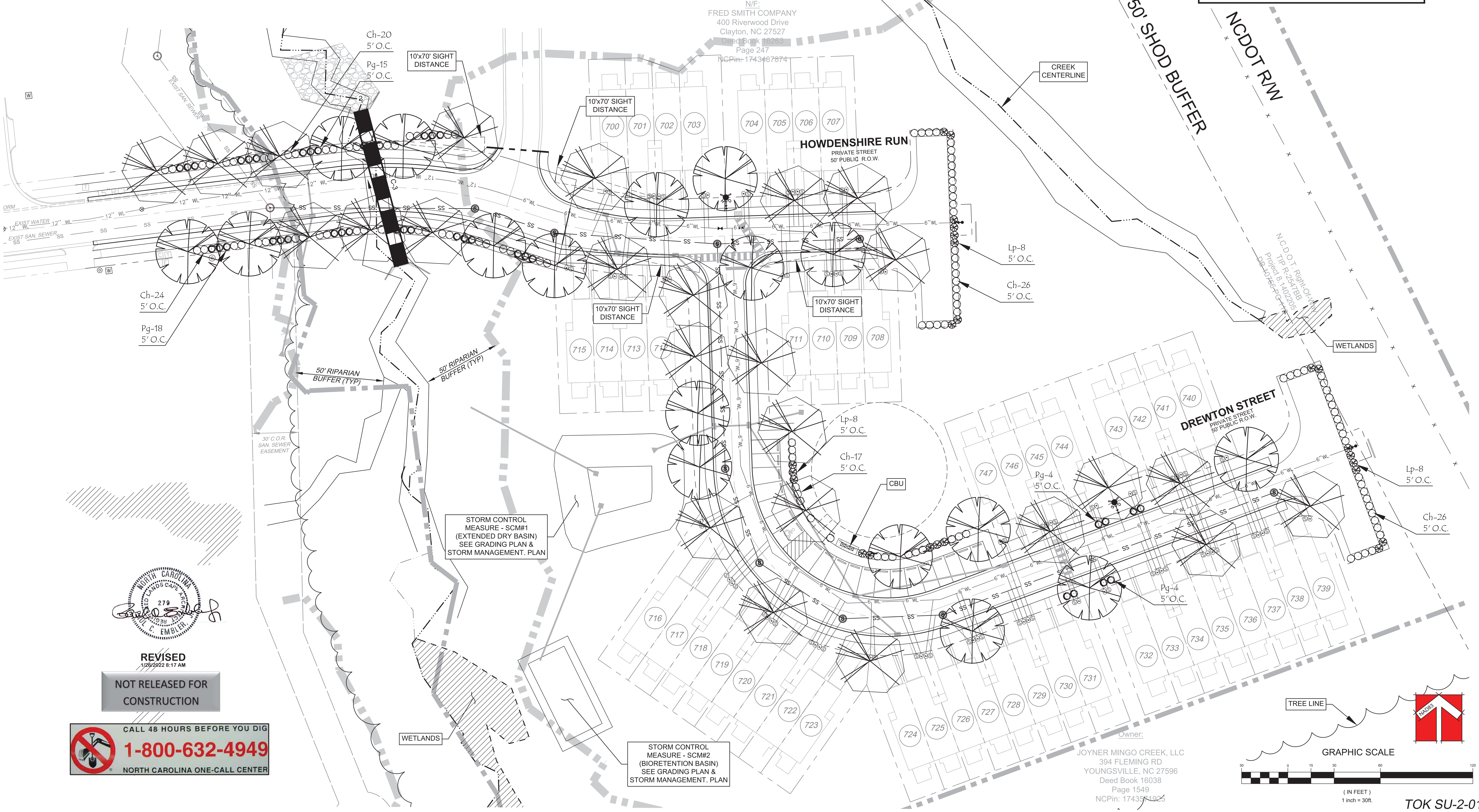
ALIAS	QTY.	BOTANICAL NAME	COMMON NAME	CALIPER	HEIGHT	WIDTH	ROOT
Wo	24	QUERCUS PHELLOS	WILLOW OAK	2"	8' MIN.	-	B&B
Gv	17	ZELKOVA SERRATA	"GREEN VASE" ZELKOVA	2"	8' MIN.	-	B&B
Ch	113	ILEX CORNUTA "CARRISSA"	CARRISSA HOLLY	-	18"-24" MIN	-	5GAL
Pg	41	CORTADERIA SELLOANA	PAMPAS GRASS	-	18"-24" MIN	-	5GAL
Lp	24	LOROPETALUM CHINESE "RUBY"	RUBY LORPETALUM	-	18"-24" MIN	-	5GAL

1. ALL PLANTS AND INSTALLATION SHALL BE IN ACCORDANCE WITH TOWN OF KNIGHTDALE RULES, REGULATIONS AND REQUIREMENTS AND, AT THE LEAST, MEET THE TOWN'S MINIMUM REQUIREMENTS FOR CODE COMPLIANCY
2. THE LANDSCAPE CONTRACTOR IS RESPONSIBLE FOR VERIFYING PLANT QUANTITIES AND IS TO NOTIFY THE CONTRACTOR ASAP OF ANY DISCREPANCIES BETWEEN THE PLANT LIST AND THE PLAN
3. THE LANDSCAPE CONTRACTOR SHALL ADJUST ANY BUFFER PLANTING AS NEEDED TO MAINTAIN REQUIRED CLEARANCES AROUND TRANSFORMERS, GENERATORS AND OTHER UTILITIES THAT REQUIRE CLEARANCES FOR ACCESS

NOTES:
1. ALL LANDSCAPED AREAS SHALL BE PROVIDED WITH AN AUTOMATICALLY OPERATED IRRIGATION SYSTEM THAT WILL ADEQUATELY COVER ALL LIVING PLANT MATERIAL, SUCH SYSTEM SHALL INCLUDE A RAIN SENSOR. (IF IRRIGATION WILL NOT BE UTILIZED, DROUGH-TOLERANT SPECIES MUST BE USED).
2. ALL LANDSCAPED AREA SHALL BE MAINTAINED IN AN ATTRACTIVE AND HEALTHY CONDITION. DEAD OR DISEASED PLANTINGS SHALL BE REMOVED AND REPLACED IN A TIMELY FASHION.
3. FOUNDATION PLANTINGS TO BE DESIGNED AND INSTALLED BY BUILDER.

Plant Symbol Key





NORTH CAROLINA LANDSCAPE ARCHITECT 279 SEAL — C. EMBLER

REVISED
1/26/2022 8:17 AM

NOT RELEASED FOR CONSTRUCTION

CALL 48 HOURS BEFORE YOU DIG
1-800-632-4949
NORTH CAROLINA ONE-CALL CENTER

TOK SU-2-01

REVISIONS:
1. 2019-06-14 PER TOK COMMENTS
2. 2021-08-26 PER ENGINEER, TOK AND COR COMMENTS

314 EAST MAIN STREET
CLAYTON, NC 27520
info@adamsandhodge.com
919-243-1332
FIRM # C-4187

ADAMS & HODGE ENGINEERING, PC

MINGO CREEK PHASE 7
TOWN OF KNIGHTDALE, WAKE COUNTY, NORTH CAROLINA

LANDSCAPE PLAN

DESIGN	DCA
DRAWN	ADS/BRL
CHECKED	DCA
HORIZONTAL SCALE	SEE GRAPHIC SCALE
VERTICAL SCALE	N/A
DATE	08/21/2019
JOB NO.	
SHEET	C8

FIXTURE: PEDESTRIAN LED
MOUNTING HEIGHT: 16 FT
LIGHT SOURCE: 50W LED'S, 4000K (EANB)
PATTERN: TYPE IV, B1-U0-G1(zero light at or above 90 degrees)

POLE ASSY # LPOLE-DB-FG-20FT-BLK-PVT-P
ASSY # LFIX-SBX-LED-50-BLK-IV-MULTIV-PVT-P

NOTE: THE FOOTCANDLE READINGS BELOW ARE MAINTAINED AND HAVE BEEN DEPRECIATED FOR LAMP LUMEN DEPRECIATION AND LUMINAIRE DIRT DEPRECIATION. FOR INITIAL FOOTCANDLES, DIVIDE THE READINGS BELOW BY .85.

LEGEND (OUTER to INNER): **0.100** , 0.200 , **0.300**

SINGLE BKT ASSY
LBKT-TOP-10IN-BLK-3T-SGL-PVT-P

TWIN BKT ASSY
LBKT-TOP-10IN-BLK-3T-DBL-180DEG-PVT-P

CALCULATION SUMMARY										
AREA NAME	DIMENSIONS	GRID / TYPE	# PTS	SPAC	GROUP	AVE	MAX	MIN	MAX/MIN	AVE/MIN
New Area	1070.50x761.69Ft	**Roadway**	**349**	**10.00**	**<+>**	**0.23**	**1.76**	**0.00**	**N/A**	**N/A**

Mingo Creek Phase 7 (19-0354) LUMINAIRE SCHEDULE							
TYP	SYMBOL	DESCRIPTION	LAMP	LUMENS	MOUNTING/BALLAST	LLF	QTY
PS5A		GE LIGHTING Style S Type III 4000K (1) EANB_A4740______	Ped. SB - Type III - 4000K	4313	16' MT HT Ped Shoebox	0.85	4

LIGHTING DESIGN TOLERANCE

The calculated footcandle light levels in this lighting design are predicted values and are based on specific information that has been supplied to Duke Energy Progress. Any inaccuracies in the supplied information, differences in luminaire installation, lighted area geometry including elevation differences, reflective properties of surrounding surfaces, obstructions (foliage or otherwise) in the lighted area, or lighting from sources other than listed in this design may produce different results from the predicted values. Normal tolerances of voltage, lamp output, and ballast and luminaire manufacture will also affect results.

Customer approval______________________________ Date__________

DISTANCE CALIBRATION (INCHES)

0 0.5 1.0 2.0 3.0 4.0

DUKE ENERGY PROGRESS

REVISED
1/26/2022 8:17 AM

NOT RELEASED FOR CONSTRUCTION

MINGO CREEK PHASE 7
KNIGHTDALE, NC
SITE LIGHTING PLAN

Designed by DEP LIGHTING SOLUTIONS
Reviewed by T. Ferguson Scale 1" = 30'
Date 12/11/2019 Size "Arch_D"
Description 50w Pedestrian Shoebox
Drawing No. 19-0354A Sht. 1 OF 1

REVISIONS:
1. 2019-06-14 PER TOK COMMENTS
2. 2021-08-26 PER ENGINEER, TOK AND COR COMMENTS
3. 2022-01-26 PER CLIENT COMMENTS

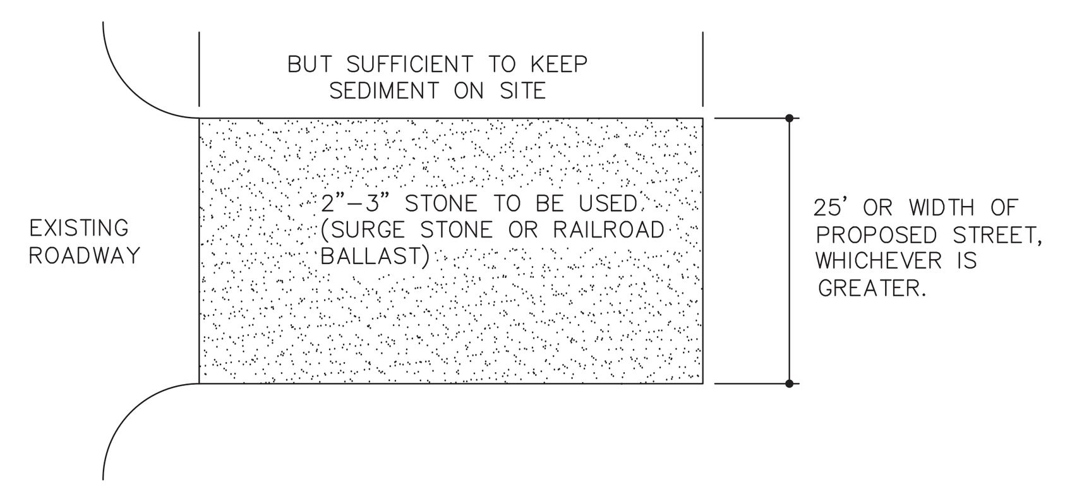
314 EAST MAIN STREET
CLAYTON, NC 27520
info@adamsandhodge.com
919-243-1332
FIRM # C-4187

ADAMS & HODGE ENGINEERING, PC

MINGO CREEK PHASE 7
TOWN OF KNIGHTDALE, WAKE COUNTY, NORTH CAROLINA

LIGHTING PLAN

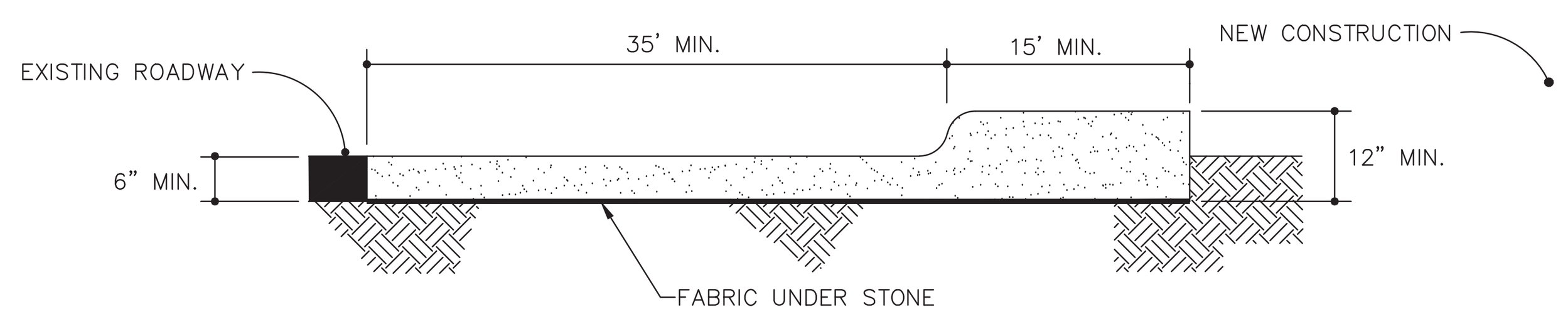
DESIGN DCA
DRAWN ADS/BRL
CHECKED DCA
HORIZONTAL SCALE SEE GRAPHIC SCALE
VERTICAL SCALE N/A
DATE 02/24/2017
JOB NO.
SHEET C9



PLAN VIEW

NOTES:

1. PUT SILT FENCE OR TREE PROTECTION FENCE UP TO ENSURE CONSTRUCTION ENTRANCE IS USED.
2. IF CONSTRUCTION ON THE SITES ARE SUCH THAT THE MUD IS NOT REMOVED BY THE VEHICLE TRAVELING OVER THE STONE, THEN THE TIRES OF THE VEHICLES MUST BE WASHED BEFORE ENTERING THE PUBLIC ROAD.
3. MAINTAIN GRAVEL PAD IN A CONDITION TO PREVENT MUD OR SEDIMENT FROM LEAVING CONSTRUCTION SITE. ENTRANCE WILL REQUIRE PERIODIC REMOVAL OF SEDIMENT–LADEN STONE AND REPLACEMENT WITH FRESH STONE.

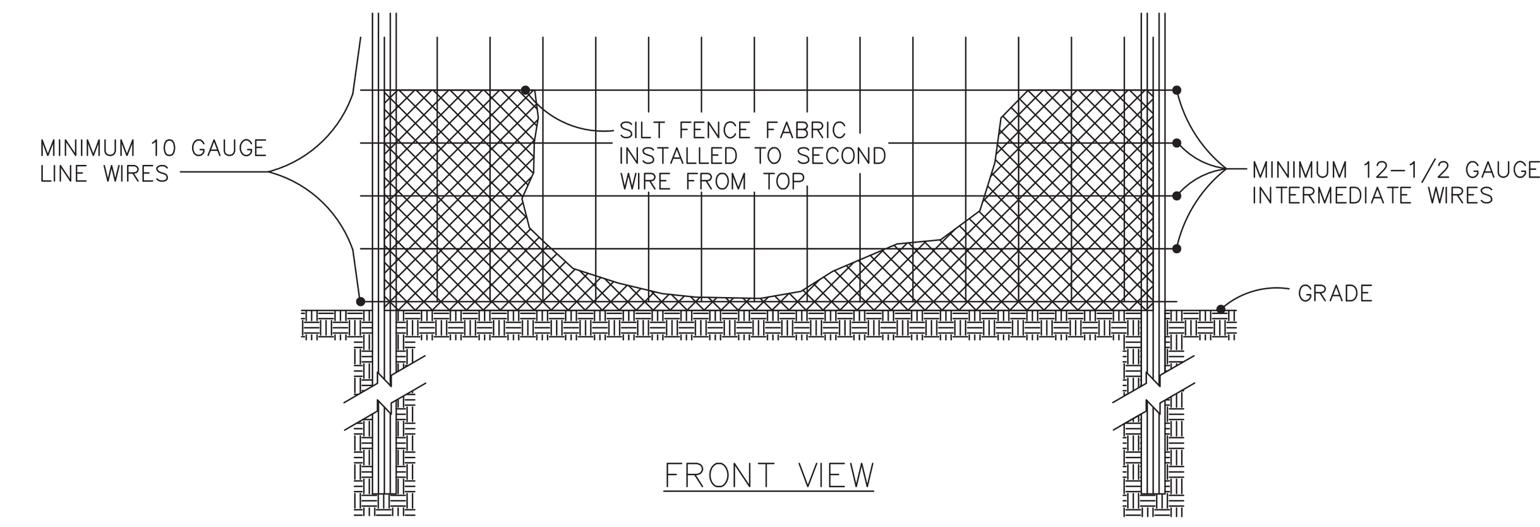


CROSS SECTION

WAKE COUNTY NORTH CAROLINA

EFFECTIVE: 01/31/08

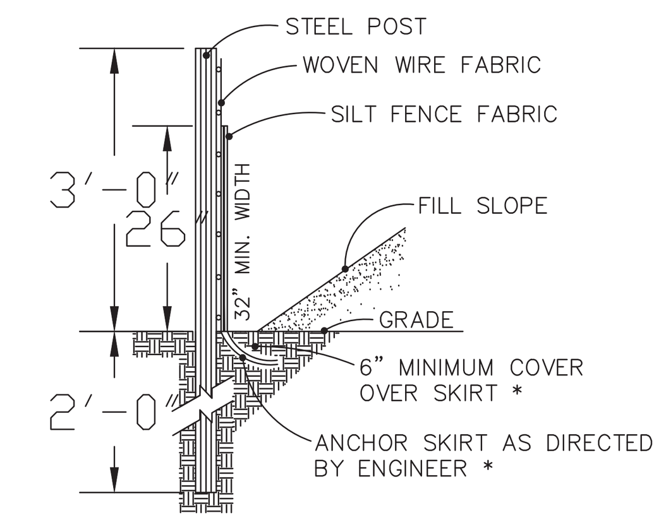
STANDARD CONSTRUCTION ENTRANCE



FRONT VIEW

NOTE:

1. USE SILT FENCE ONLY WHEN DRAINAGE AREA DOES NOT EXCEED 1/4 ACRE AND NEVER IN AREAS OF CONCENTRATED FLOW.
2. REMOVE SEDIMENT DEPOSITED AS NEEDED TO PROVIDE STORAGE VOLUME FOR THE NEXT RAIN AND TO REMOVE PRESSURE ON THE SILT FENCE.

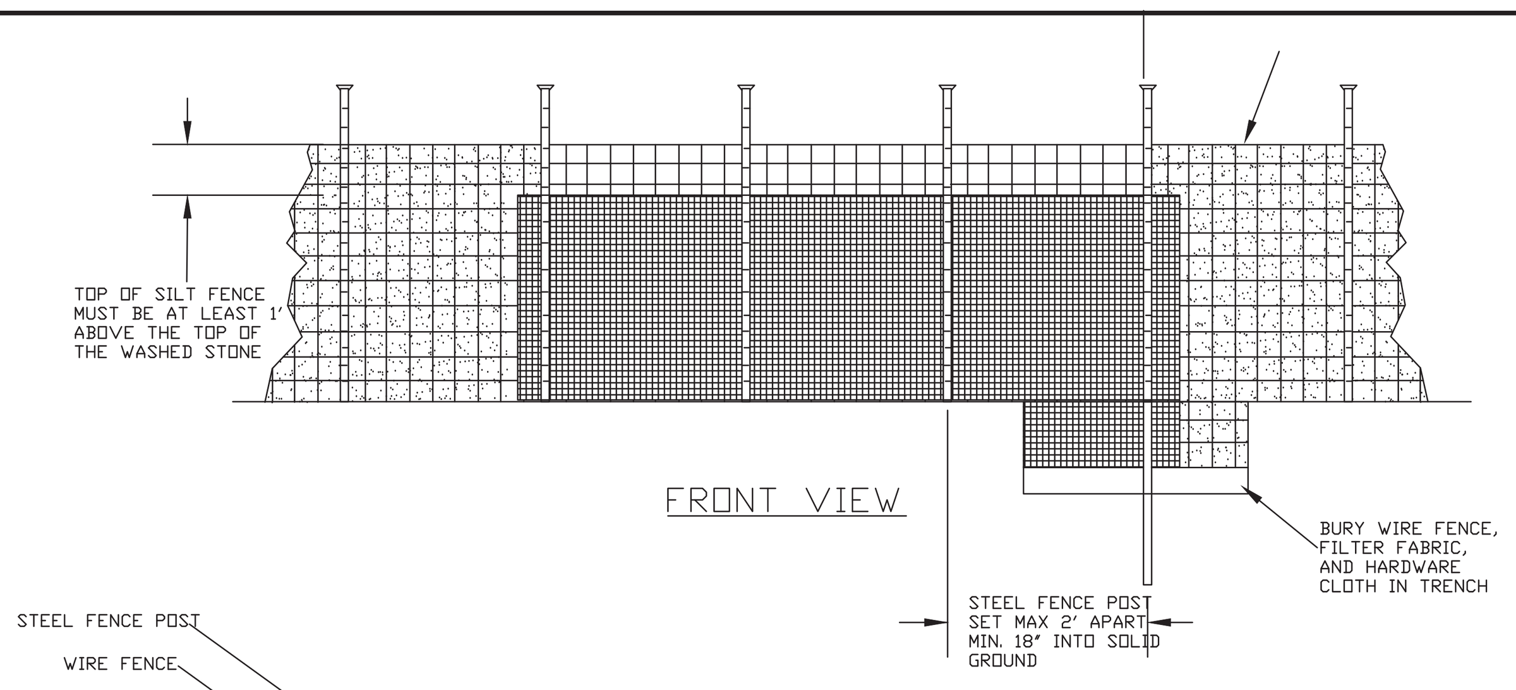


SIDE VIEW

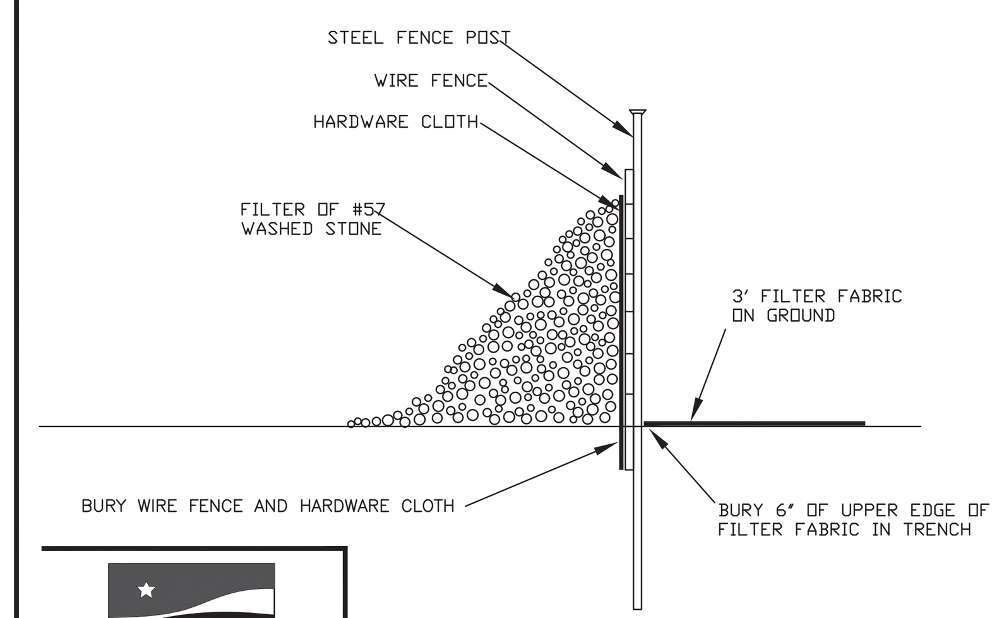
WAKE COUNTY NORTH CAROLINA

EFFECTIVE: 01/31/08

STANDARD TEMPORARY SILT FENCE



FRONT VIEW



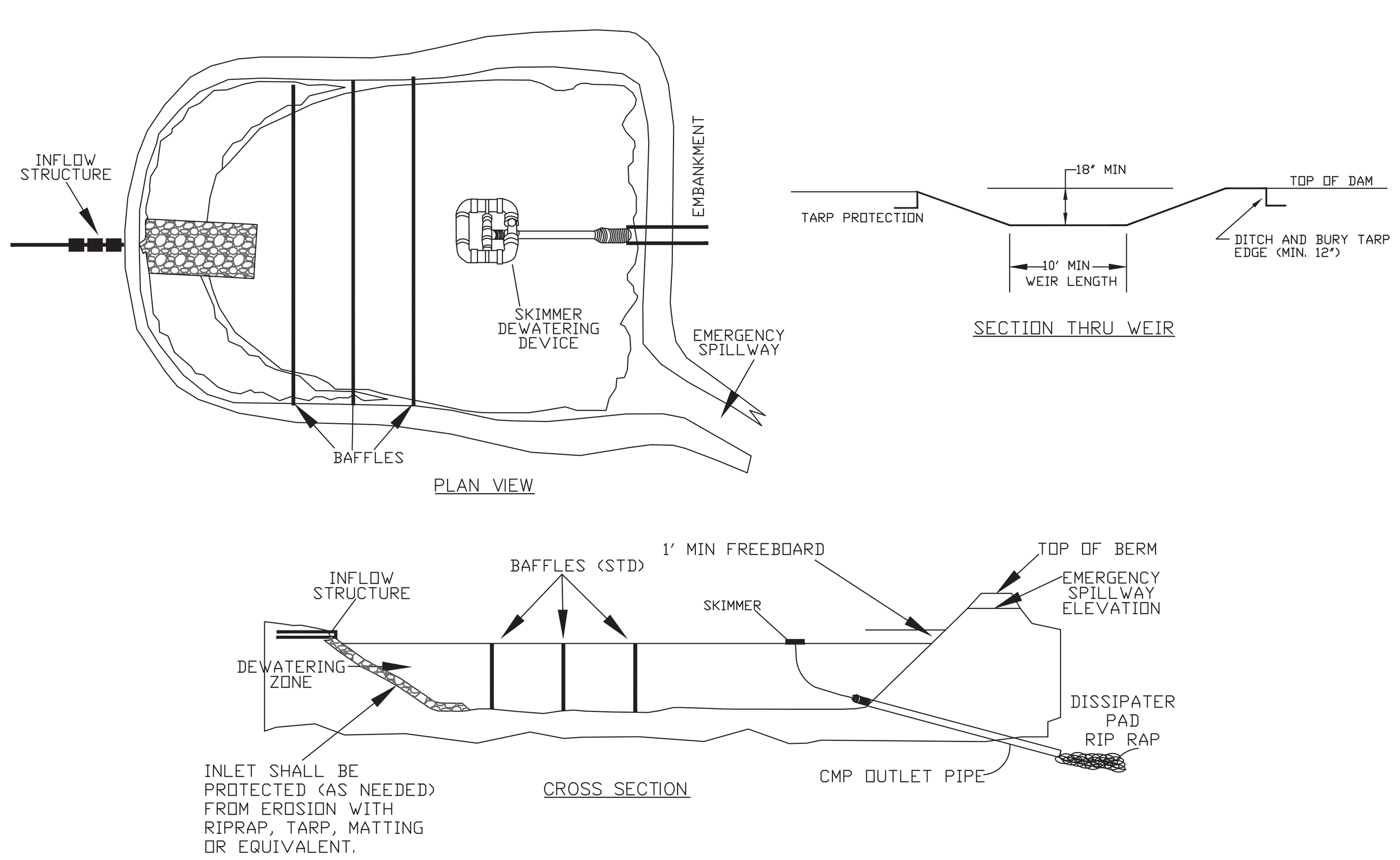
SECTION VIEW

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

WAKE COUNTY NORTH CAROLINA

EFFECTIVE: 01/31/08

STANDARD SILT FENCE OUTLET

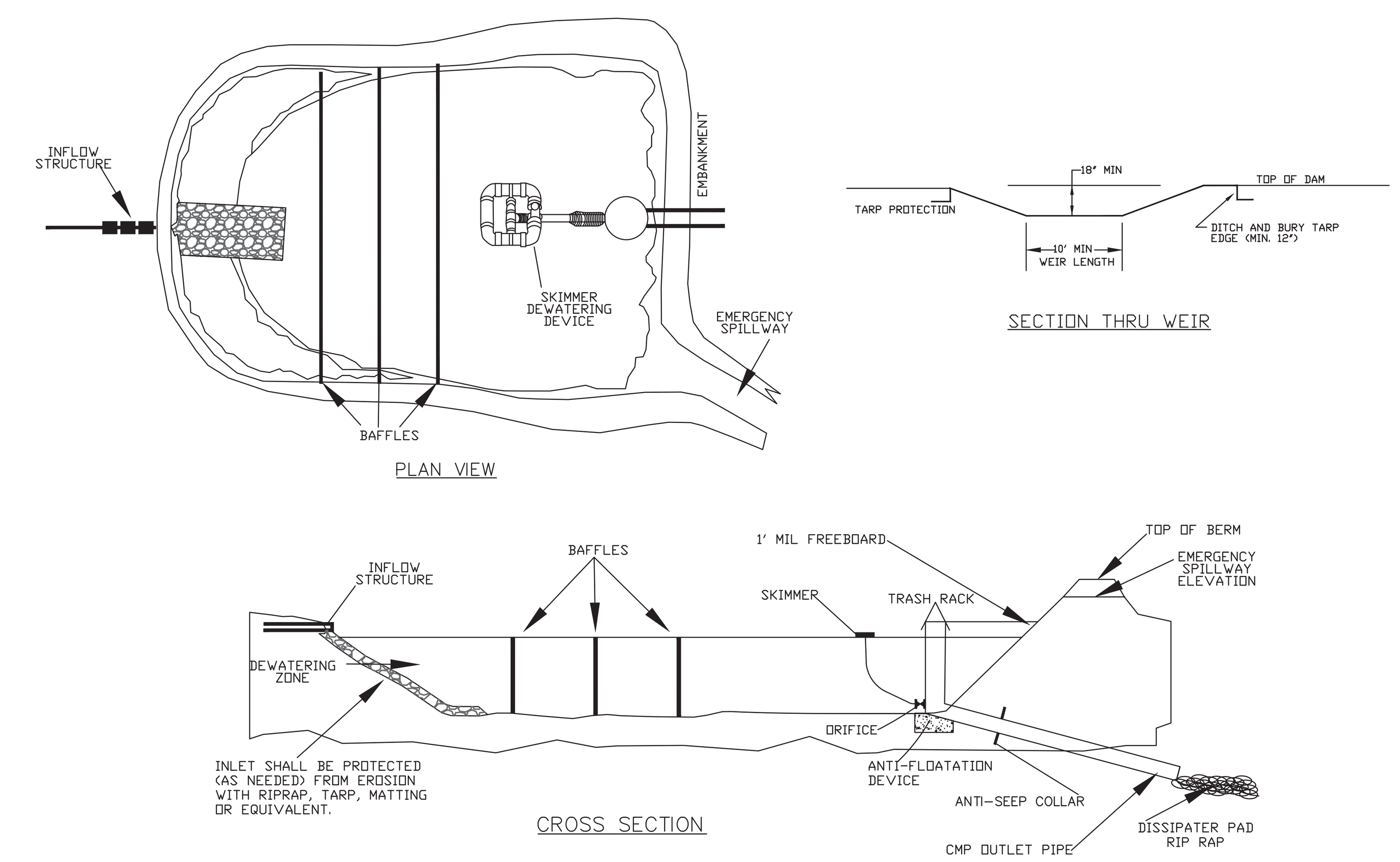


NOTES:
1) BASIN SHOULD BE CLEANED OUT WHEN CAPACITY REACHES AN ELEVATION REPRESENTING THAT THE BASIN IS HALF–FULL.
2) THE TARP USED TO PROTECT THE WEIR SHALL BE THE WIDTH SPECIFIED. THE LENGTH OF THE TARP SHALL BE ACCORDING TO AVAILABLE SUPPLY. IF MULTIPLE TARPS ARE TO BE USED, THEN TARPS SHALL BE OVERLAPPED AT LEAST 12". THE UPSTREAM 12" TARP SHALL OVERLAP THE DOWNSTREAM TARP. THE TARP SHALL BE 50 MIL. HEAVY DUTY SILVER TARPAULINS OR EQUIVALENT FOR U.V. RESISTANCE.
3) PROVIDE A MINIMUM OF THREE POROUS BAFFLES TO EVENLY DISTRIBUTE FLOW ACROSS THE BASIN, REDUCING TURBULENCE.
4) BAFFLE MATERIAL MUST BE SECURED AT THE BOTTOM AND SIDES USING STAPLES OR BY TRENCHING AS FOR A SILT FENCE.
5) MOST OF THE SEDIMENT WILL ACCUMULATE IN THE FIRST BAY, SO THIS SHOULD BE READILY AVAILABLE FOR MAINTENANCE.
6) DURING THE CONSTRUCTION PHASE OF THE PROJECT, PERMANENT STORMWATER RISER SHALL ONLY DEWATER FROM THE TOP OF PIPE.
7) POND SHALL NOT BE CONVERTED FOR STORMWATER USE UNTIL APPROVED BY ENVIRONMENTAL ENGINEER.

WAKE COUNTY NORTH CAROLINA

EFFECTIVE: 01/31/08

STANDARD SKIMMER BASIN



NOTES:
1) BASIN SHOULD BE CLEANED OUT WHEN CAPACITY REACHES AN ELEVATION REPRESENTING THAT THE BASIN IS HALF–FULL.
2) THE TARP USED TO PROTECT THE WEIR SHALL BE THE WIDTH SPECIFIED. THE LENGTH OF THE TARP SHALL BE ACCORDING TO AVAILABLE SUPPLY. IF MULTIPLE TARPS ARE TO BE USED, THEN TARPS SHALL BE OVERLAPPED AT LEAST 12". THE UPSTREAM 12" TARP SHALL OVERLAP THE DOWNSTREAM TARP. THE TARP SHALL BE 50 MIL. HEAVY DUTY SILVER TARPAULINS OR EQUIVALENT FOR U.V. RESISTANCE.
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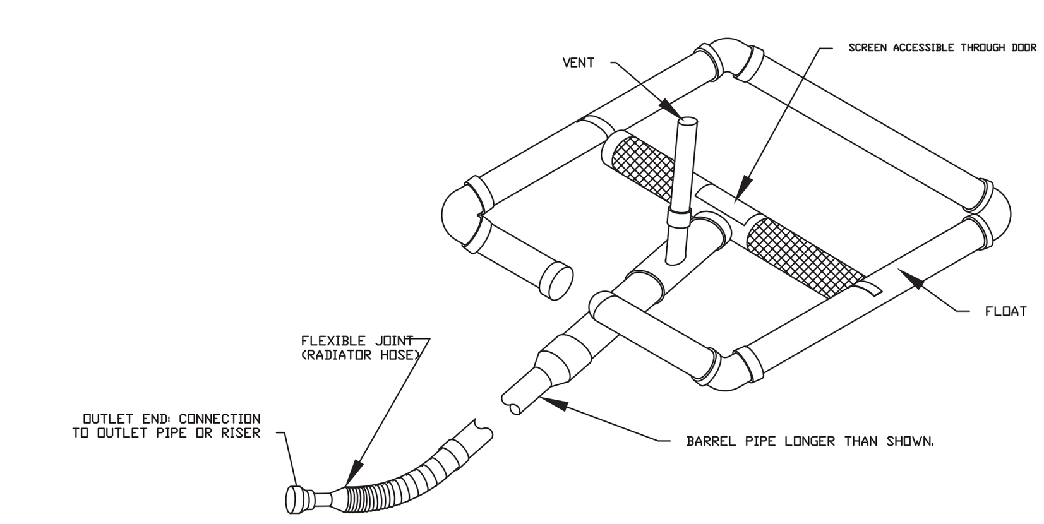
5) MOST OF THE SEDIMENT WILL ACCUMULATE IN THE FIRST BAY, SO THIS SHOULD BE READILY AVAILABLE FOR MAINTENANCE.
6) DURING THE CONSTRUCTION PHASE OF THE PROJECT, PERMANENT STORMWATER RISER SHALL ONLY DEWATER FROM THE TOP OF PIPE.
7) POND SHALL NOT BE CONVERTED FOR STORMWATER USE UNTIL APPROVED BY ENVIRONMENTAL ENGINEER.

WAKE COUNTY NORTH CAROLINA

EFFECTIVE: 01/31/08

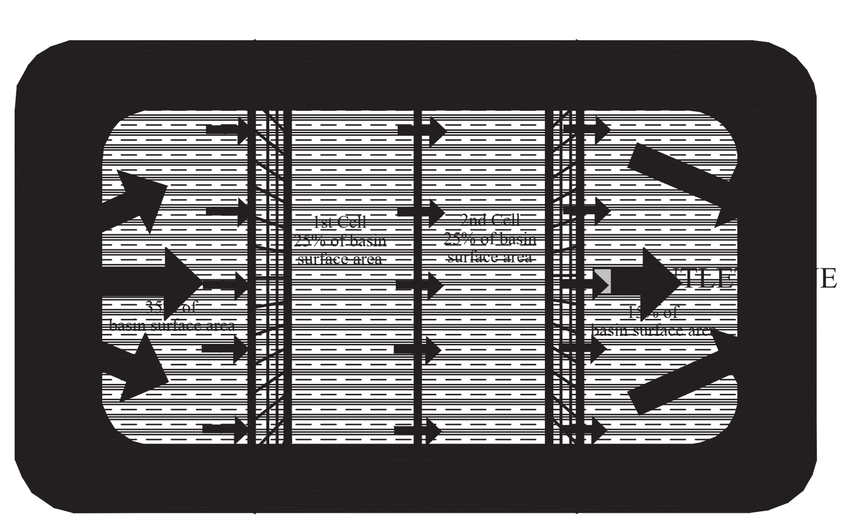
STANDARD SKIMMER ATTACHED TO PERMANENT RISER



WAKE COUNTY NORTH CAROLINA

EFFECTIVE: 01/31/08

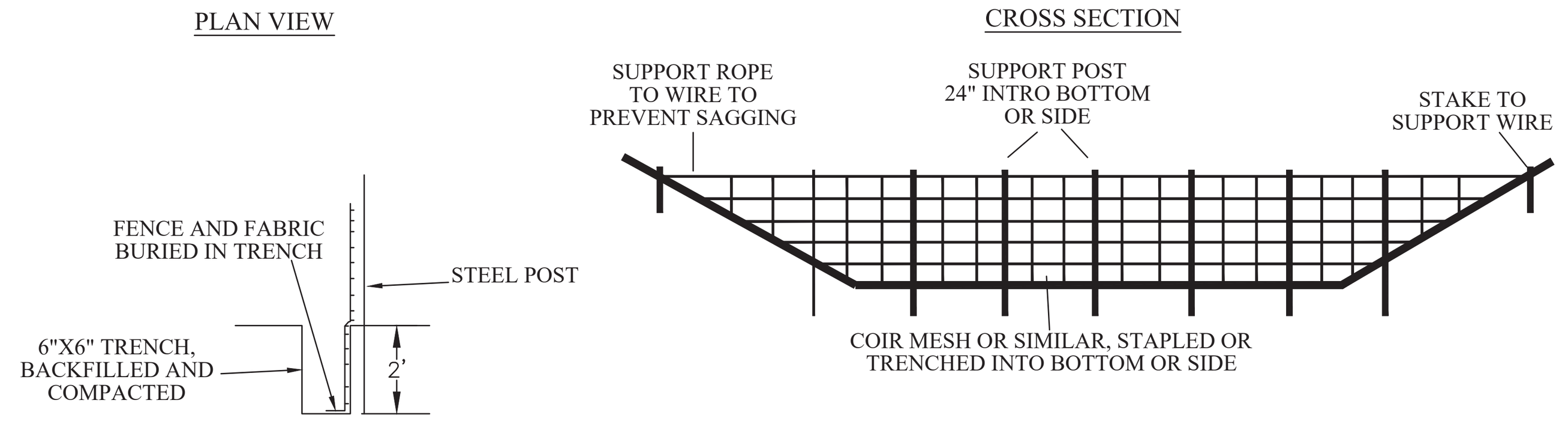
STANDARD SKIMMER DETAIL



PLAN VIEW

NOTES:
1. BAFFLE MATERIAL SHOULD BE SECURED AT THE BOTTOM AND SIDES USING STAPLES OR BY TRENCHING AS FOR SILT FENCE.
2. MOST OF THE SEDIMENT WILL ACCUMULATE IN THE 1ST BAY, WHICH SHOULD BE READILY ACCESSIBLE FOR MAINTENANCE.
3. PROVIDE 3 BAFFLES (USE TWO IF LESS THAN 20 FEET IN LENGTH). PROVIDE 5 BAFFLES FOR DRAINAGE AREAS GREATER THAN 10 ACRES.
4. BAFFLE SHALL BE 700 G/M2 COIR EROSION BLANKET.
5. TOPS OF BAFFLES SHOULD BE 2 INCHES LOWER THAN THE TOP OF THE BERMS
6. INSPECT BAFFLES FOR REPAIR ONCE A WEEK AND AFTER EACH RAINFALL

CROSS SECTION



SECTION VIEW AT OPENING

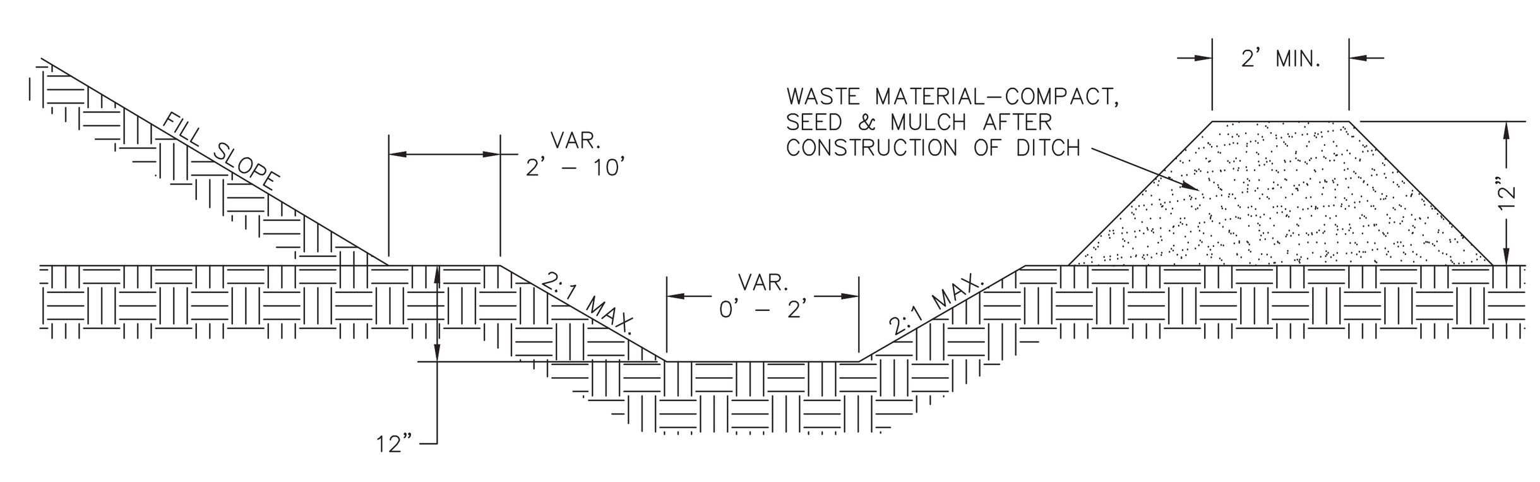
WAKE COUNTY NORTH CAROLINA

EFFECTIVE: 01/31/08

STANDARD BAFFLES DETAIL

NOTES:

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



CROSS SECTIONAL VIEW

WAKE COUNTY NORTH CAROLINA

EFFECTIVE: 01/31/08

STANDARD TEMPORARY DIVERSION DITCH

BASIN REMOVAL SEQUENCE

1. SCHEDULE A SITE MEETING WITH THE ENVIRONMENTAL ENGINEER/CONSULTANT TO DETERMINE IF BASIN CAN BE REMOVED. INSTALL SILT FENCING OR OTHER TEMPORARY EROSION CONTROL MEASURES AS NEEDED PRIOR TO REMOVAL OF THE BASIN.
2. REMOVE BASIN(S) AND ASSOCIATED TEMPORARY DIVERSION DITCHES. IF THE CULVERT PIPES NEED TO BE EXTENDED, PERFORM THIS OPERATION AT THIS TIME. FINE GRADE AREA IN PREPARATION FOR SEEDING.
3. PERFORM SEEDBED PREPARATION, SEED, MULCH AND ASPHALT TACK ANY RESULTING BARE AREAS IMMEDIATELY.
4. INSTALL VELOCITY DISSIPATORS AND/OR LEVEL SPREADERS AS REQUIRED ON THE EROSION CONTROL PLAN.
5. WHEN SITE IS FULLY ESTABLISHED, CALL ENVIRONMENTAL ENGINEER/CONSULTANT FOR APPROVAL OF REMOVING REMAINING TEMPORARY EROSION CONTROL MEASURES AND ADVICE ON WHEN SITE CAN BE ISSUED A CERTIFICATE OF COMPLETION.

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

REVISED
1/26/2022 8:21 AM

NOT RELEASED FOR CONSTRUCTION

TOK SU-2-01

REVISIONS:
1. 2019-06-14 PER TOK COMMENTS
2. 2021-08-26 PER ENGINEER, TOK AND COR COMMENTS
3. 2022-01-26 PER CLIENT COMMENTS

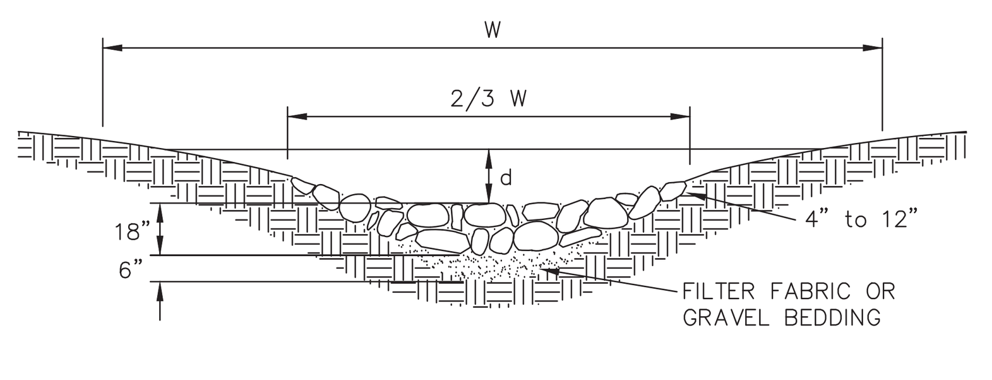
314 EAST MAIN STREET
CLAYTON, NC 27520
info@adamsandhodge.com
919-243-1332
FIRM # C-4187

ADAMS & HODGE ENGINEERING, PC

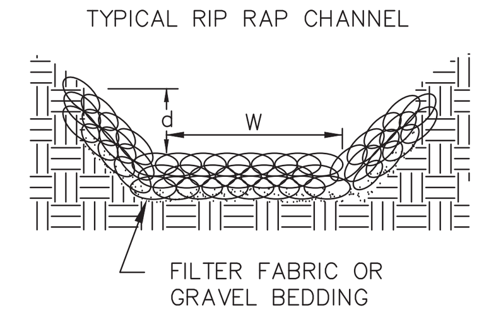
MINGO CREEK
PHASE 7
TOWN OF KNIGHTDALE, WAKE COUNTY, NORTH CAROLINA

DETAILS - EROSION
(WAKE COUNTY STD)

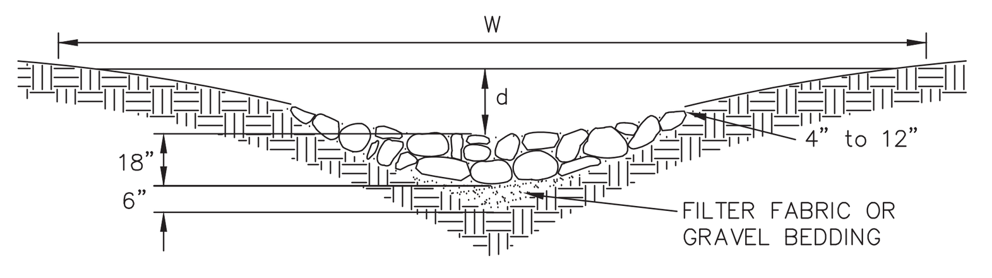
DESIGN	DCA
DRAWN	ADS/BRL
CHECKED	DCA
HORIZONTAL SCALE	SEE GRAPHIC SCALE
VERTICAL SCALE	N/A
DATE	02/24/2017
JOB NO.	
SHEET	D1



PARABOLIC-SHAPED WATERWAY WITH STONE CENTER DRAIN
(SHAPED BY BULLDOZER)



TRAPEZOIDAL



V-SHAPED WATERWAY WITH STONE CENTER DRAIN
(SHAPED BY MOTOR GRADER)

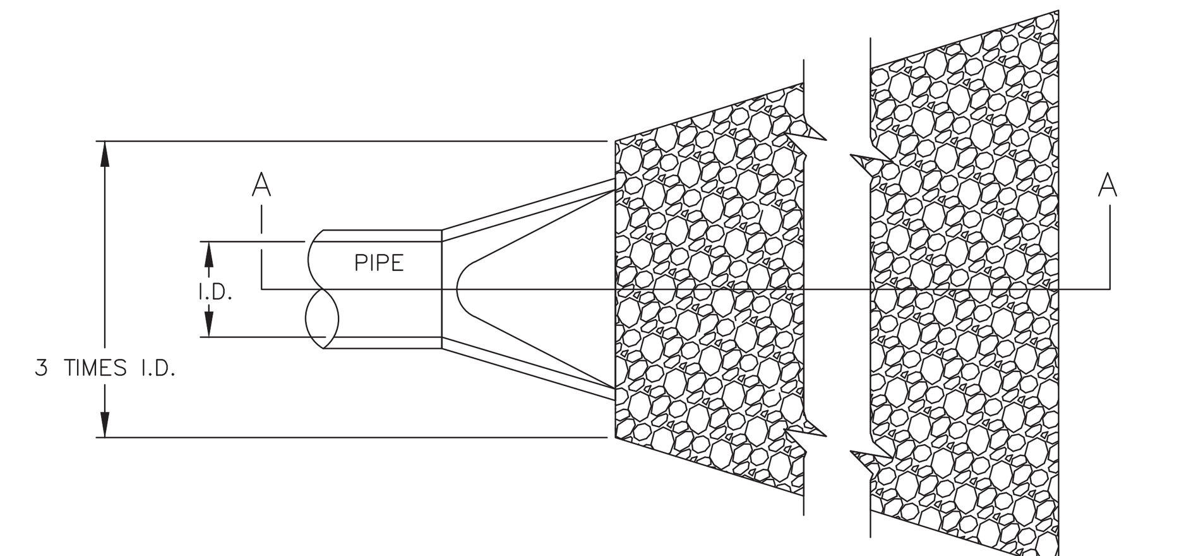
NOTES:

- TO BE USED WHERE EXCESSIVE STORMWATER VELOCITIES PROHIBIT VEGETATIVE LININGS.
- SIZE OF STONE MUST BE DETERMINED BY APPROPRIATE DESIGN PROCEDURE.
- DIMENSIONS FOR d & W VARIES ACCORDING TO DESIGN.

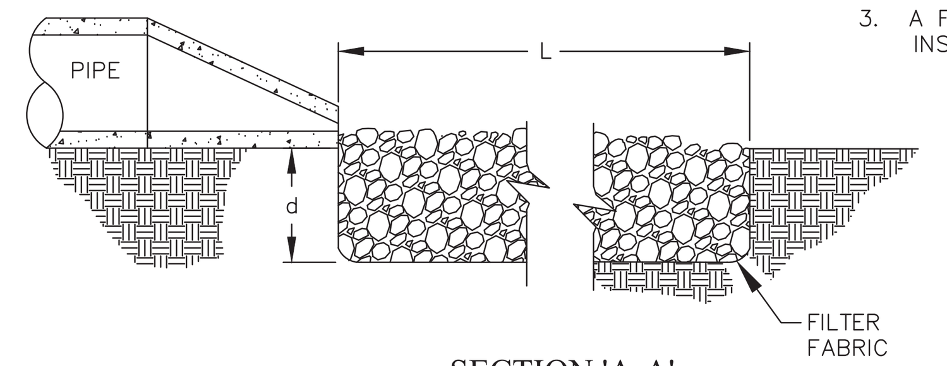
WAKE COUNTY NORTH CAROLINA

EFFECTIVE: 01/31/08

STANDARD RIP-RAP LINED CHANNELS



PLAN VIEW



SECTION 'A-A'

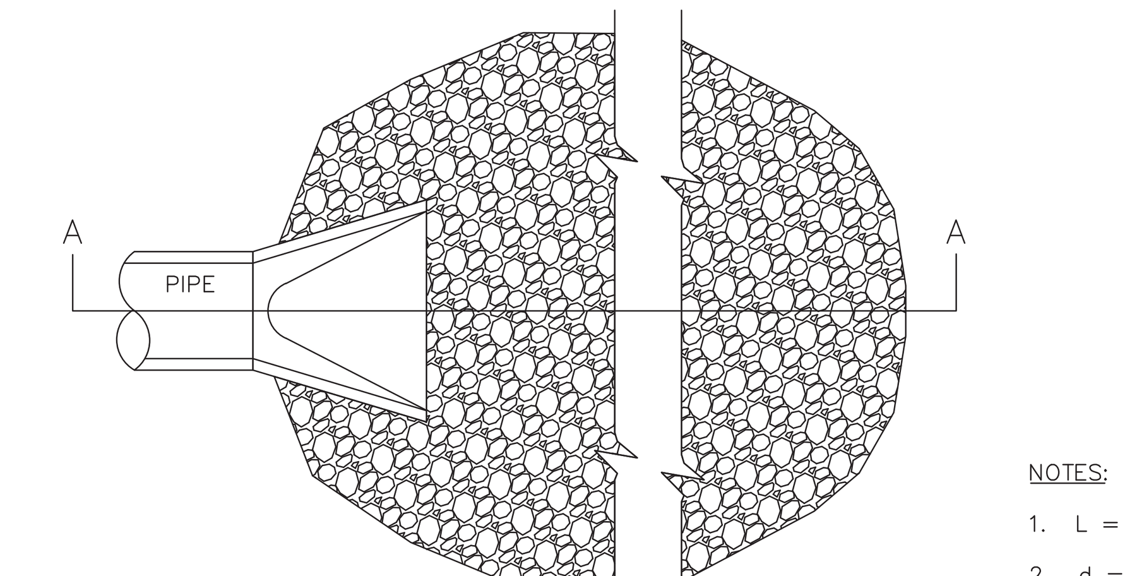
NOTES:

1. L = THE LENGTH OF THE RIPRAP APRON.
2. d = 1.5 TIMES THE MAXIMUM STONE DIAMETER BUT NOT LESS THAN 6" (INCHES).
3. A FILTER BLANKET OR FILTER FABRIC SHOULD BE INSTALLED BETWEEN THE RIPRAP AND SOIL FOUNDATION.

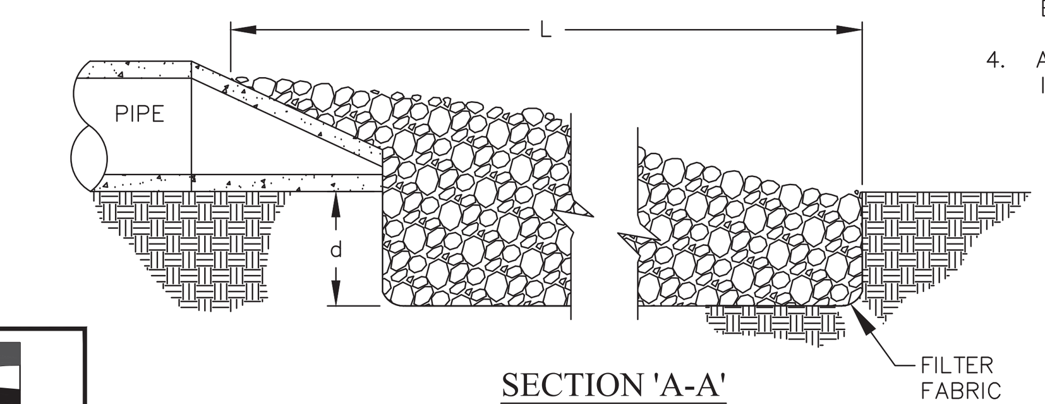
WAKE COUNTY NORTH CAROLINA

EFFECTIVE: 01/31/08

STANDARD PIPE OUTLET TO FLAT AREA
NO WELL-DEFINED CHANNEL



PLAN VIEW



SECTION 'A-A'

NOTES:

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

WAKE COUNTY NORTH CAROLINA

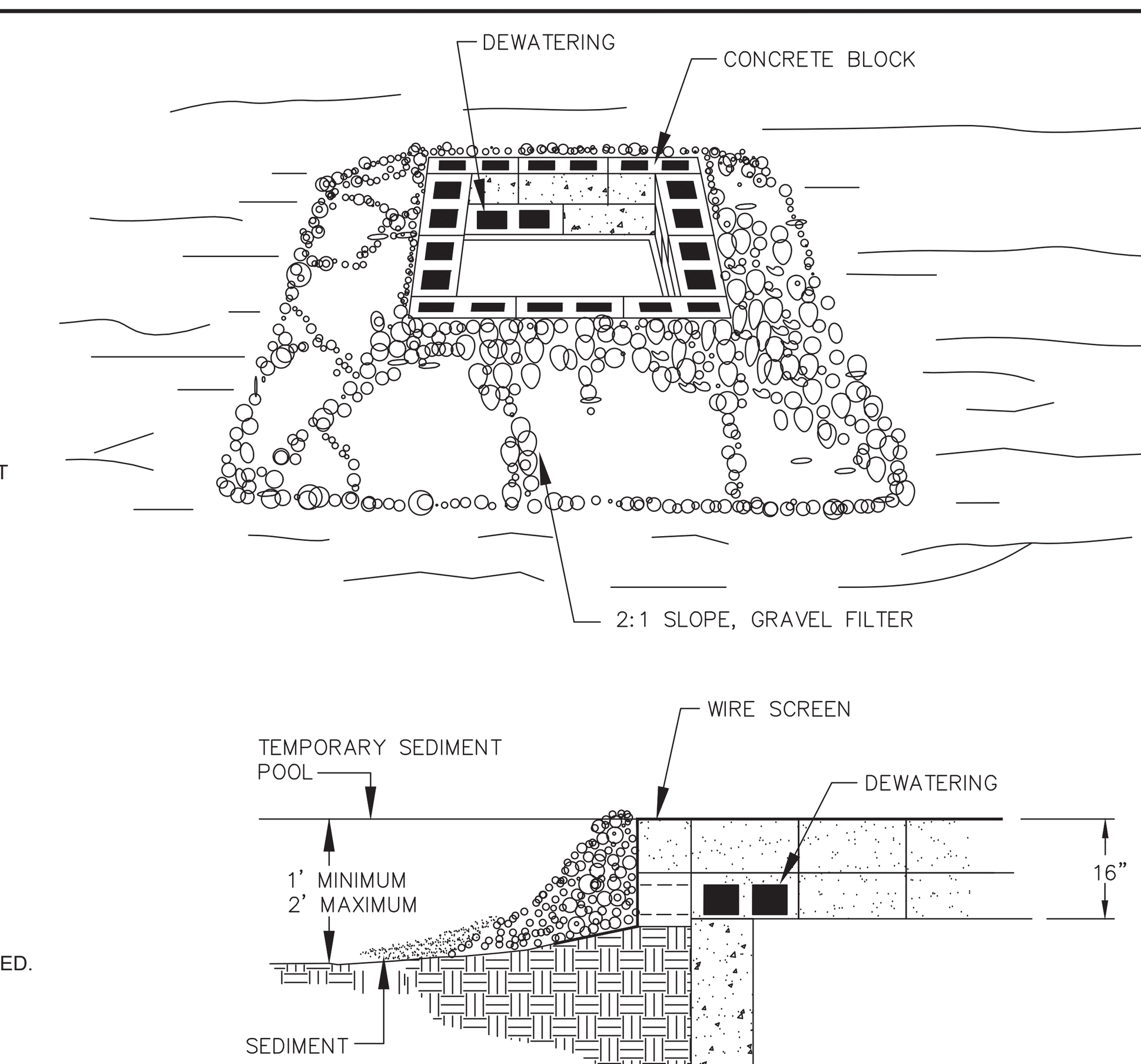
EFFECTIVE: 01/31/08

STANDARD PIPE OUTLET TO WELL-DEFINED CHANNEL

CONSTRUCTION SPECIFICATIONS

1. LAY ONE BLOCK ON EACH SIDE OF THE STRUCTURE ON ITS SIDE IN THE BOTTOM ROW TO ALLOW POOL DRAINAGE. THE FOUNDATION SHOULD BE EXCAVATED AT LEAST 2 INCHES BELOW THE CREST OF THE STORM DRAIN. PLACE THE BOTTOM ROW OF BLOCKS AGAINST THE EDGE OF THE STORM DRAIN FOR LATERAL SUPPORT AND TO AVOID WASHOUTS WHEN OVERFLOW OCCURS. IF NEEDED, GIVE LATERAL SUPPORT TO SUBSEQUENT ROWS BY PLACING 2x4 WOOD STUDS THROUGH BLOCK OPENINGS.
2. CAREFULLY FIT HARDWARE CLOTH OR COMPARABLE WIRE MESH WITH 1/2 INCH OPENINGS OVER ALL BLOCK OPENINGS TO HOLD GRAVEL IN PLACE.
3. USE CLEAN GRAVEL, 3/4 TO 1/2 INCH IN DIAMETER, PLACED 2 INCHES BELOW THE TOP OF THE BLOCK ON A 2:1 SLOPE OR FLATTER AND SMOOTH IT TO AN EVEN GRADE. DOT #57 WASHED STONE IS RECOMMENDED.

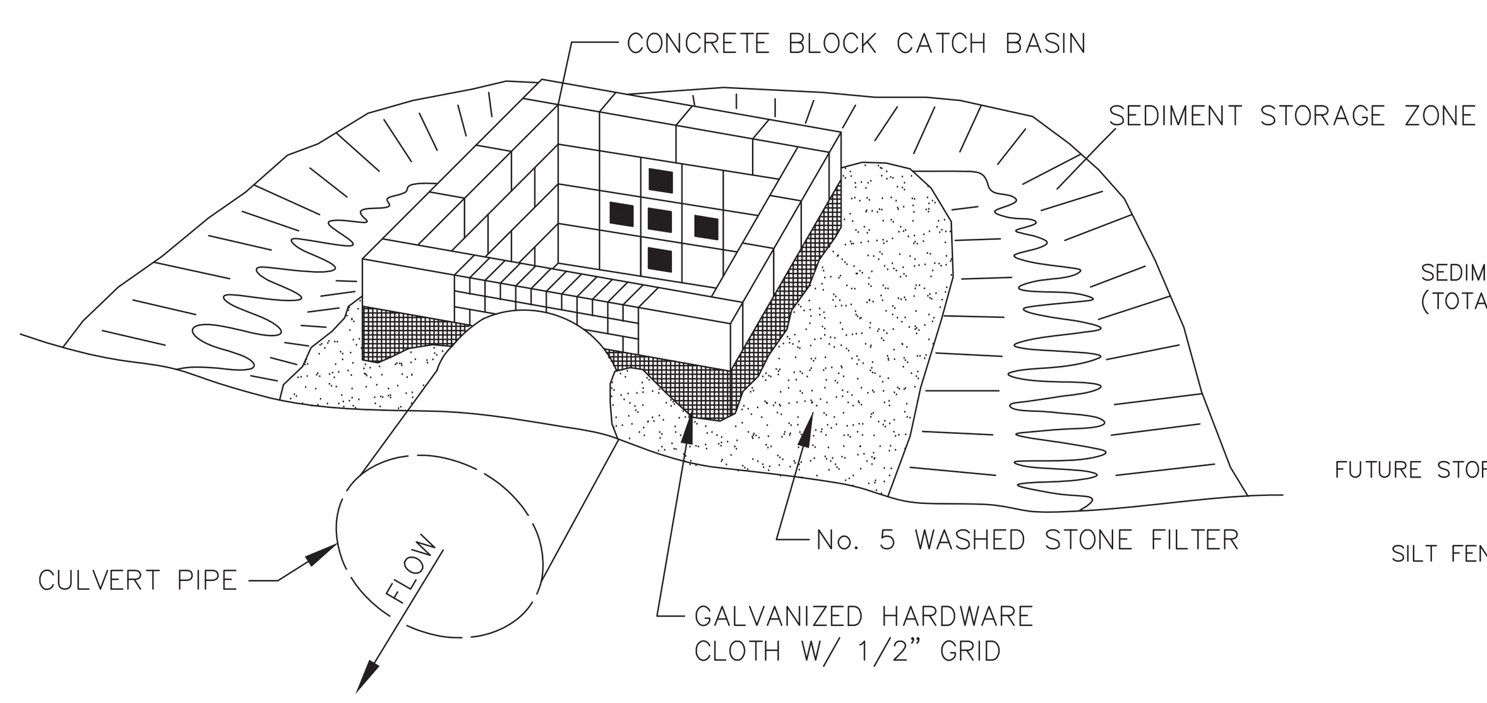
MAINTENANCE: INSPECT INLET PROTECTION AND REMOVE SEDIMENT AFTER EACH RAIN EVENT. GRAVEL SHOULD BE REPLACED AND REPAIRS MADE AS NEEDED.



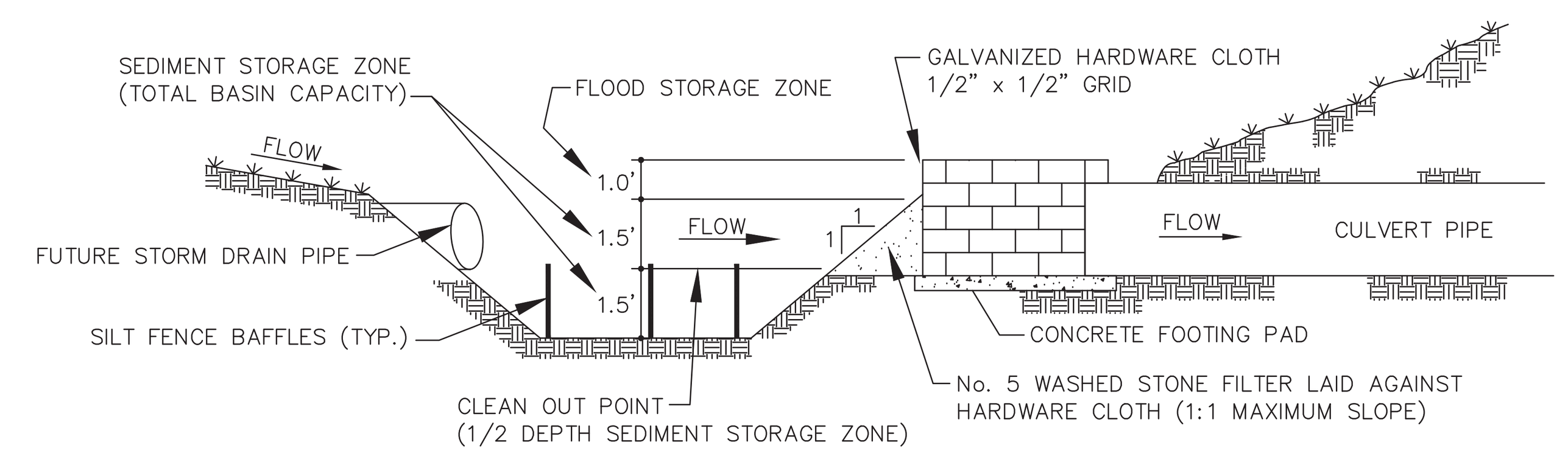
WAKE COUNTY NORTH CAROLINA

EFFECTIVE: 01/31/08

STANDARD BLOCK & GRAVEL DROP INLET PROTECTION

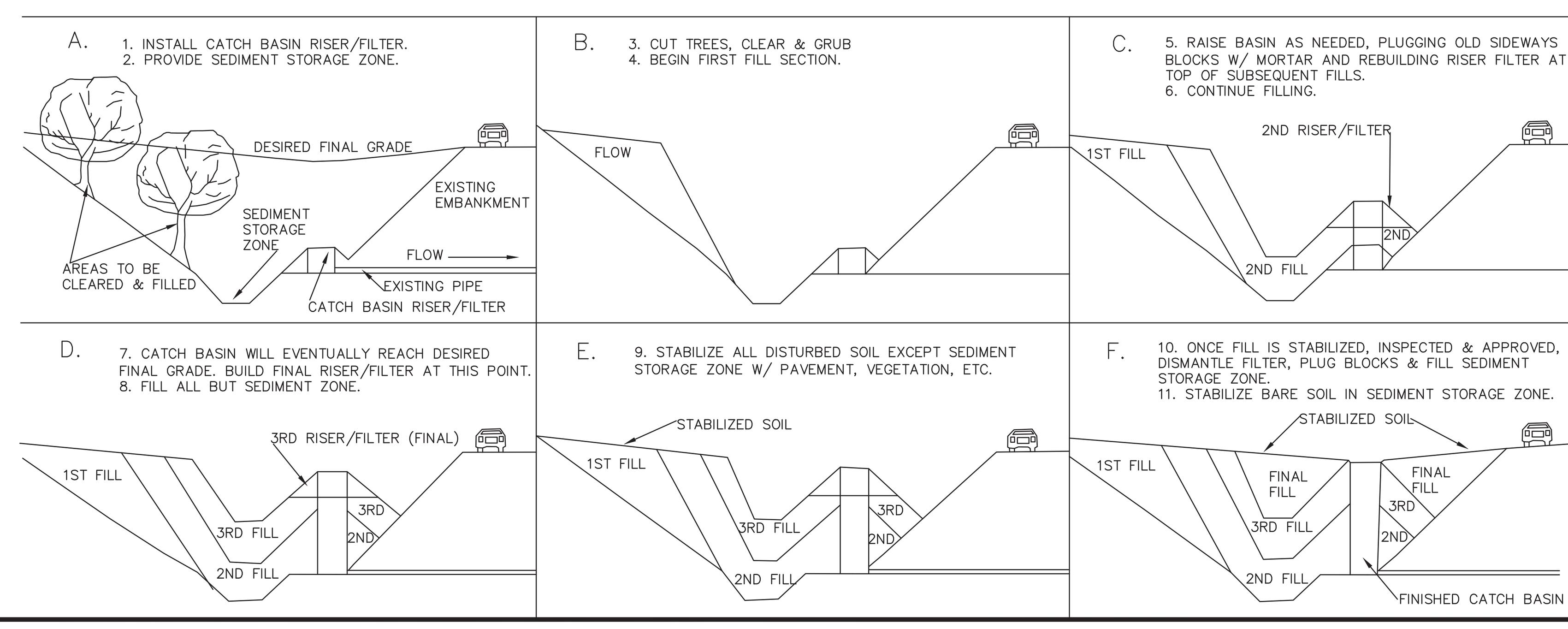


PERSPECTIVE VIEW



SECTION VIEW

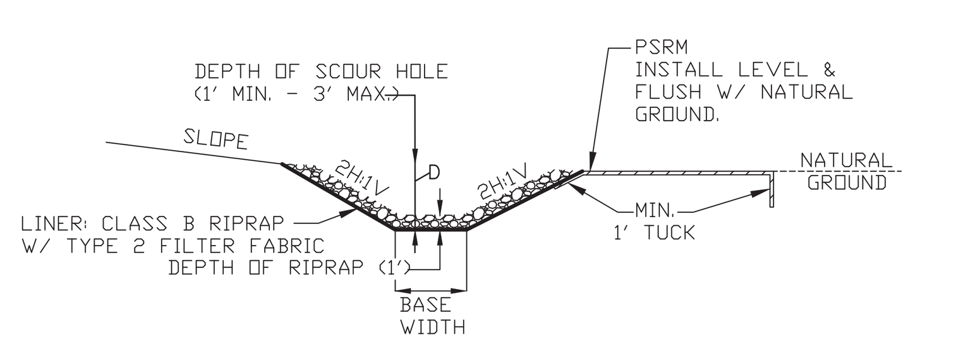
USE OF CATCH BASIN RISER/FILTER ON FILL SITES



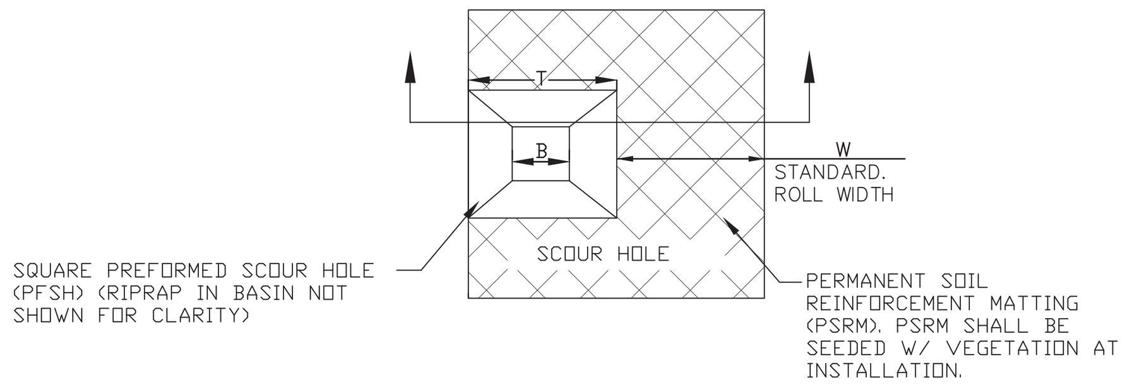
WAKE COUNTY NORTH CAROLINA

EFFECTIVE: 01/31/08

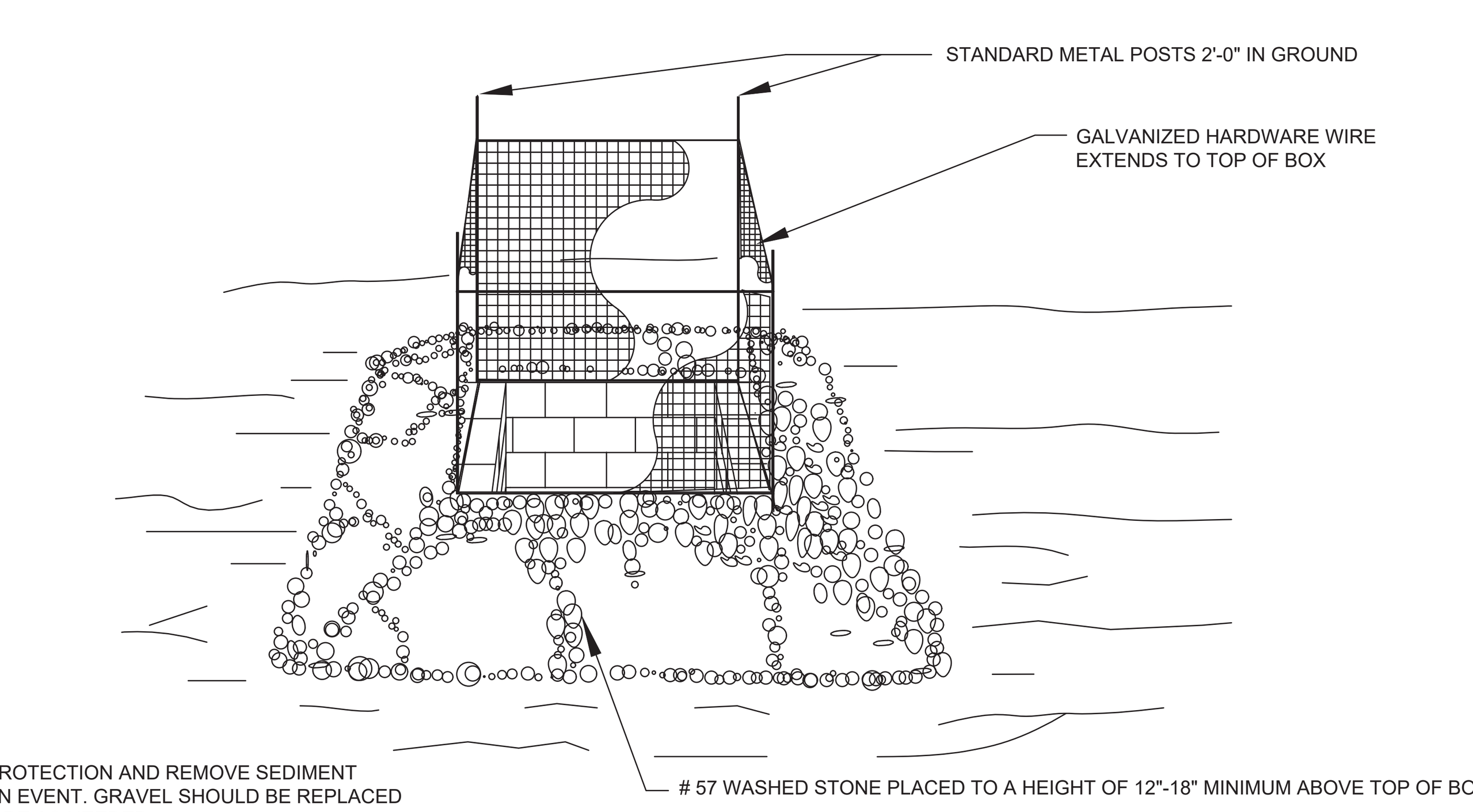
STANDARD CATCH BASIN RISER/FILTER



CROSS-SECTION B-B



NCDOT RIP RAP PRE-FORMED SCOUR HOLE
NO SCALE



NOTE:

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

57 WASHED STONE PLACED TO A HEIGHT OF 12"-18" MINIMUM ABOVE TOP OF BOX

WAKE COUNTY NORTH CAROLINA

EFFECTIVE: 01/31/08

STANDARD GRAVEL YARD INLET PROTECTION

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

NORTH CAROLINA PROFESSIONAL SEAL 35485 ENGINEER DONALD C. ADAMS, JR.

REVISED
1/26/2022 8:21 AM

NOT RELEASED FOR CONSTRUCTION

TOK SU-2-01

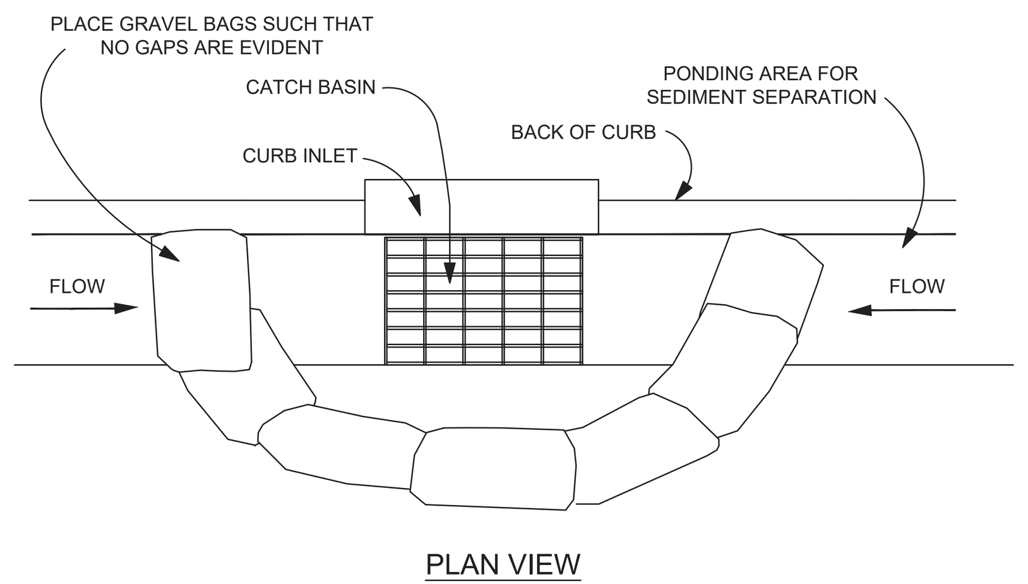
ADAMS & HODGE ENGINEERING, PC
314 EAST MAIN STREET
CLAYTON, NC 27520
info@adamsandhodge.com
919-243-1332
FIRM # C-4187

REVISIONS:
1. 2019-06-14 PER TOK COMMENTS
2. 2021-06-30 PER ENGINEER TOK AND COR COMMENTS
3. 2022-01-26 PER CLIENT COMMENTS

MINGO CREEK
PHASE 7
TOWN OF KNIGHTDALE, WAKE COUNTY, NORTH CAROLINA

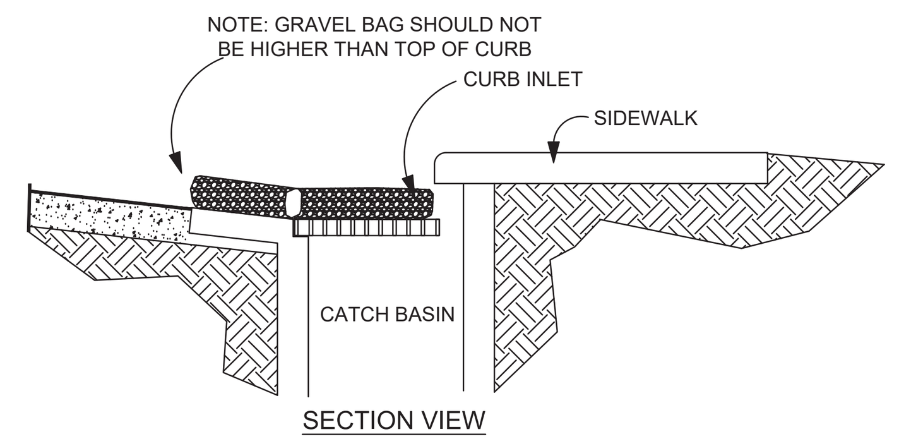
DETAILS - EROSION
(WAKE COUNTY STD)

DESIGN DCA
DRAWN ADS/BRL
CHECKED DCA
HORIZONTAL SCALE SEE GRAPHIC SCALE
VERTICAL SCALE N/A
DATE 02/24/2017
JOB NO.
SHEET D2



NOTES:

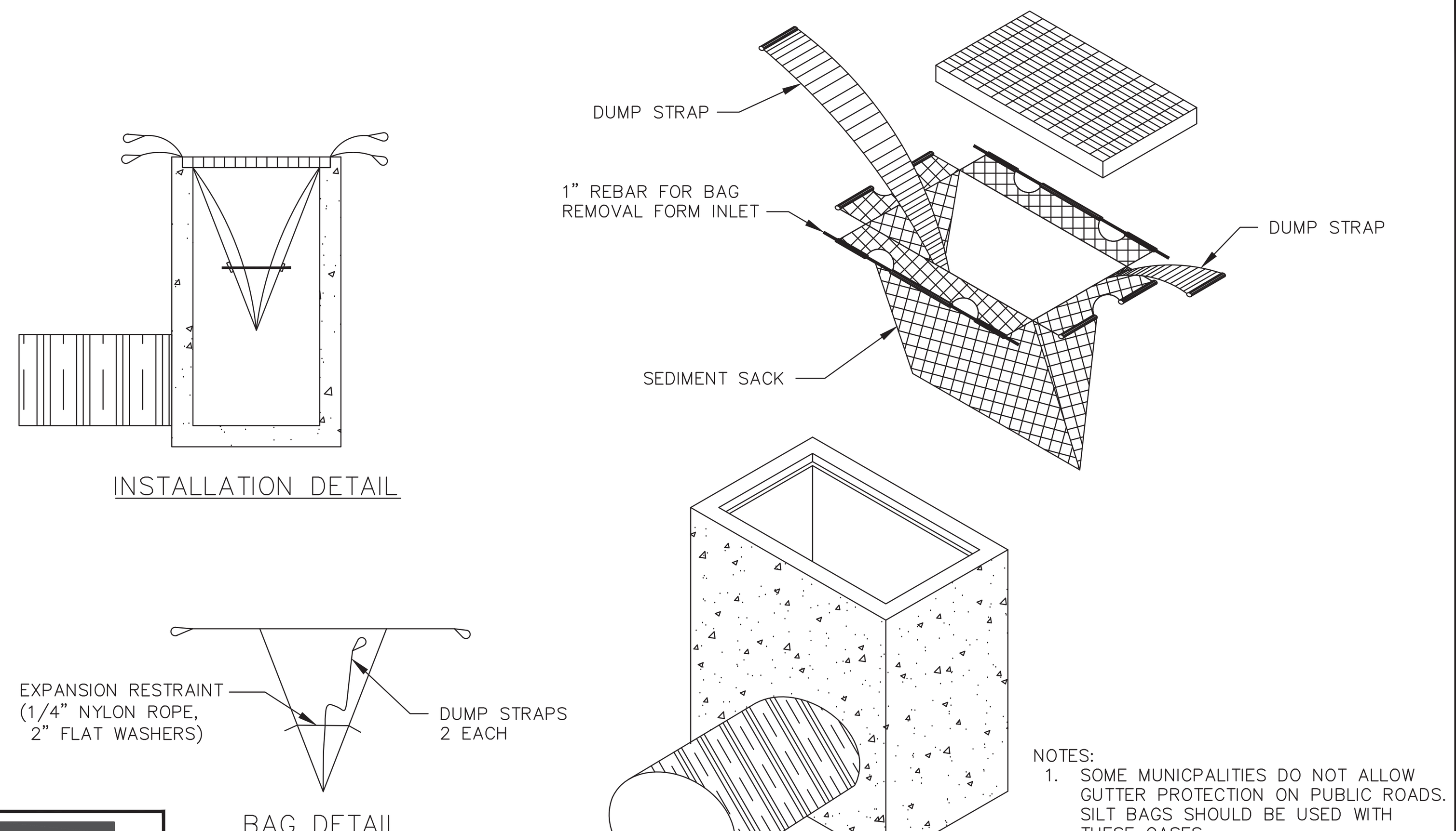
1. PLACE GRAVEL BAG BARRIER ON GENTLY SLOPING STREET, WHERE WATER CAN POND AND ALLOW SEDIMENT TO SEPARATE FROM RUNOFF.
2. USE SAND BAGS OF WOVEN GEOTEXTILE FABRIC (NOT BURLAP) AND FILL WITH ¾ INCH (OR SMALLER) GRAVEL. BAGS MUST BE LAYERED SUCH THAT NO GAPS ARE EVIDENT.
3. INSPECT BARRIERS AND REMOVE SEDIMENT AFTER EACH STORM EVENT. SEDIMENT AND GRAVEL MUST BE REMOVED FROM THE TRAVELED WAY IMMEDIATELY.
4. WHEN INSTALLING CURB INLET PROTECTION DEVICES, **NEVER** BLOCK THE CURB INLET.



WAKE COUNTY NORTH CAROLINA

STANDARD GRAVEL BAG CURB INLET PROTECTION

EFFECTIVE: 01/31/08

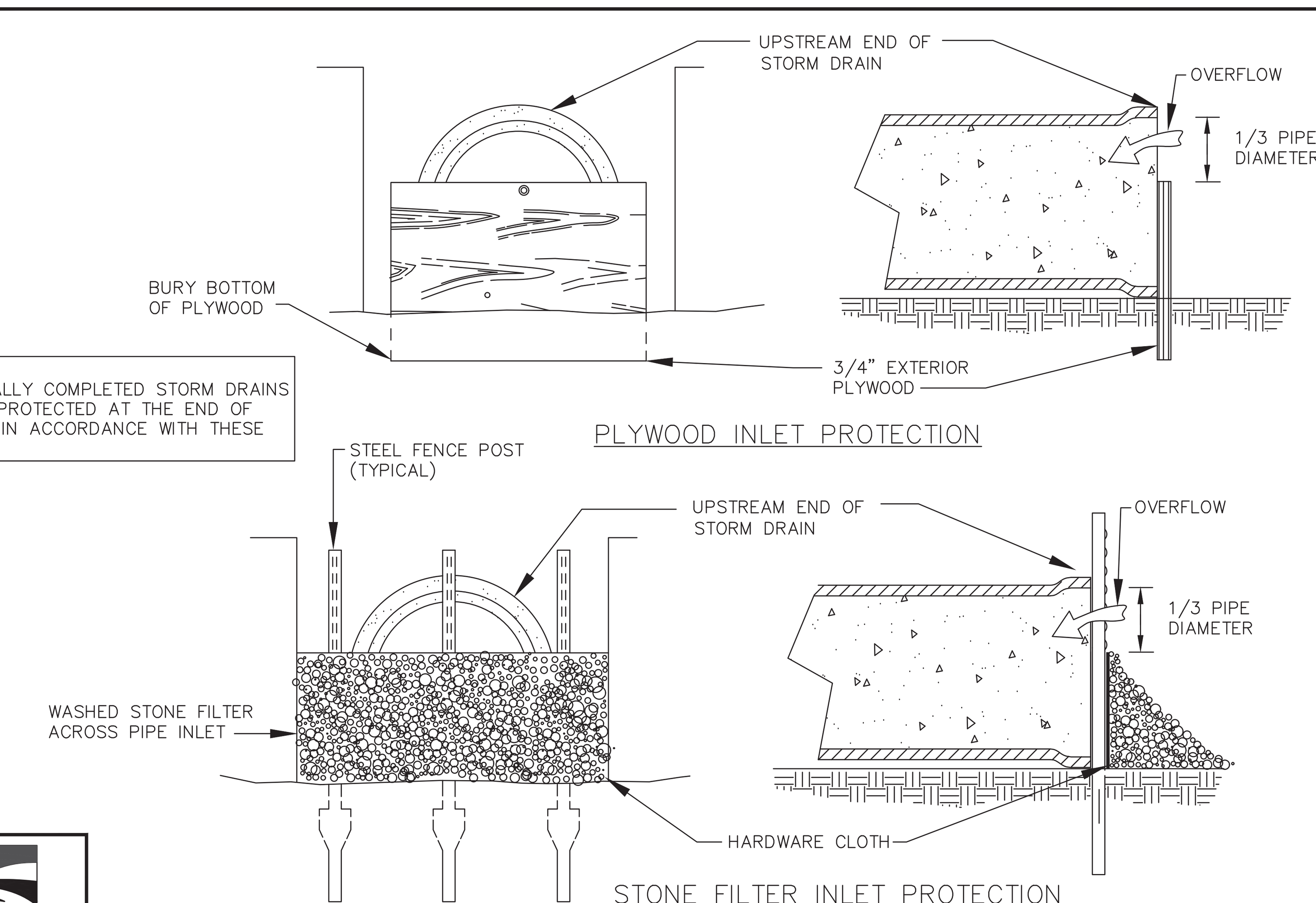


NOTES:
1. SOME MUNICIPALITIES DO NOT ALLOW GUTTER PROTECTION ON PUBLIC ROADS. SILT BAGS SHOULD BE USED WITH THESE CASES.
2. BAGS SHOULD BE CLEANED OUT AFTER EVERY RAIN EVENT AND/OR AS NEEDED.

WAKE COUNTY NORTH CAROLINA

STANDARD SILT BAG - INLET SEDIMENT CONTROL DEVICE

EFFECTIVE: 01/31/08


UPSTREAM END OF STORM DRAIN
OVERFLOW
1/3 PIPE DIAMETER
BURY BOTTOM OF PLYWOOD
3/4" EXTERIOR PLYWOOD
PLYWOOD INLET PROTECTION
STEEL FENCE POST (TYPICAL)
UPSTREAM END OF STORM DRAIN
OVERFLOW
1/3 PIPE DIAMETER
WASHED STONE FILTER ACROSS PIPE INLET
HARDWARE CLOTH
STONE FILTER INLET PROTECTION

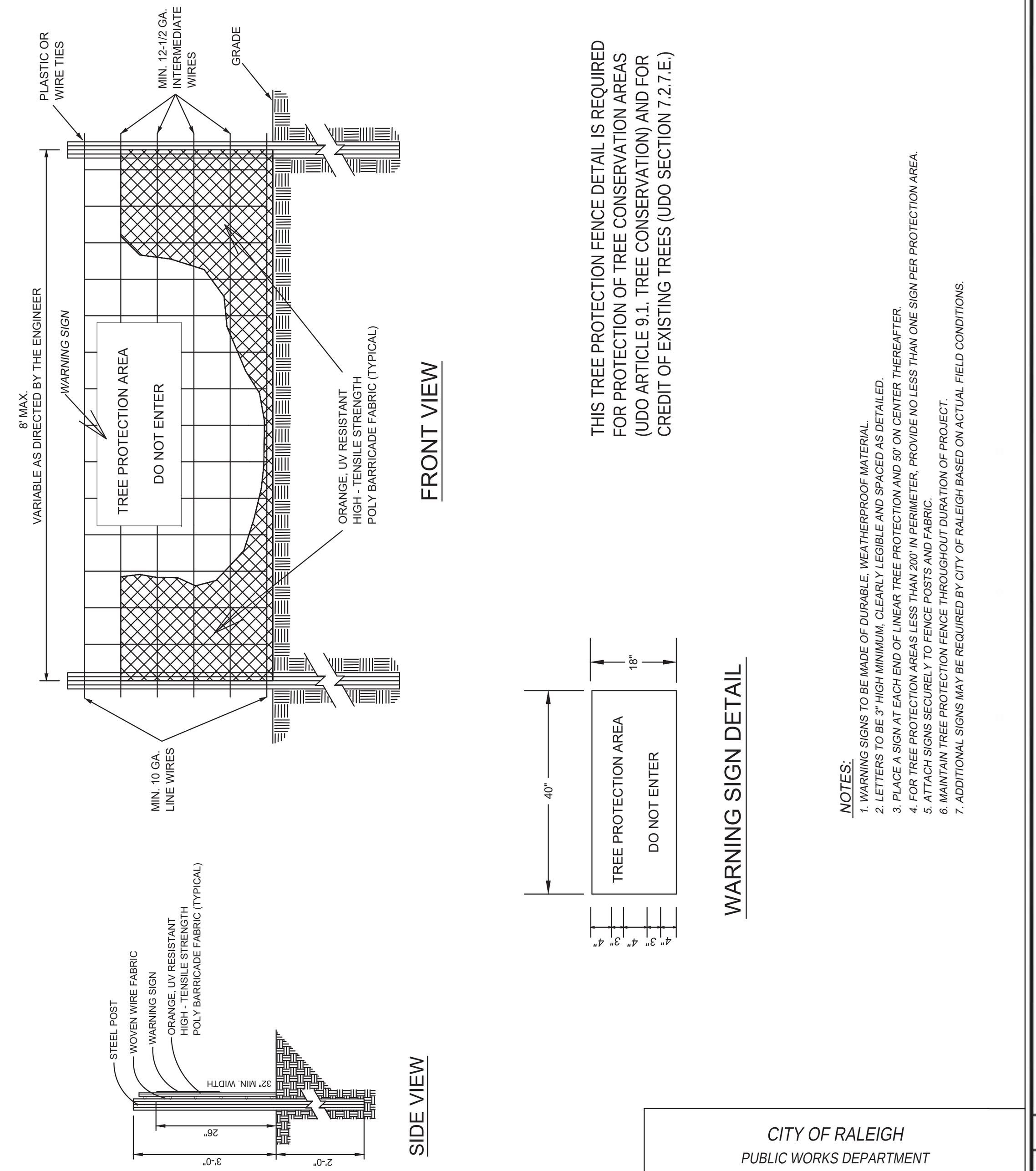
NOTE:
ALL PARTIALLY COMPLETED STORM DRAINS SHALL BE PROTECTED AT THE END OF EACH DAY IN ACCORDANCE WITH THESE DETAILS.

WAKE COUNTY NORTH CAROLINA

STANDARD PIPE INLET PROTECTION (PLYWOOD & STONE)

EFFECTIVE: 01/31/08

UDO NOTE ADDED AND RENUMBERED "002" 11-1-2013, WDP



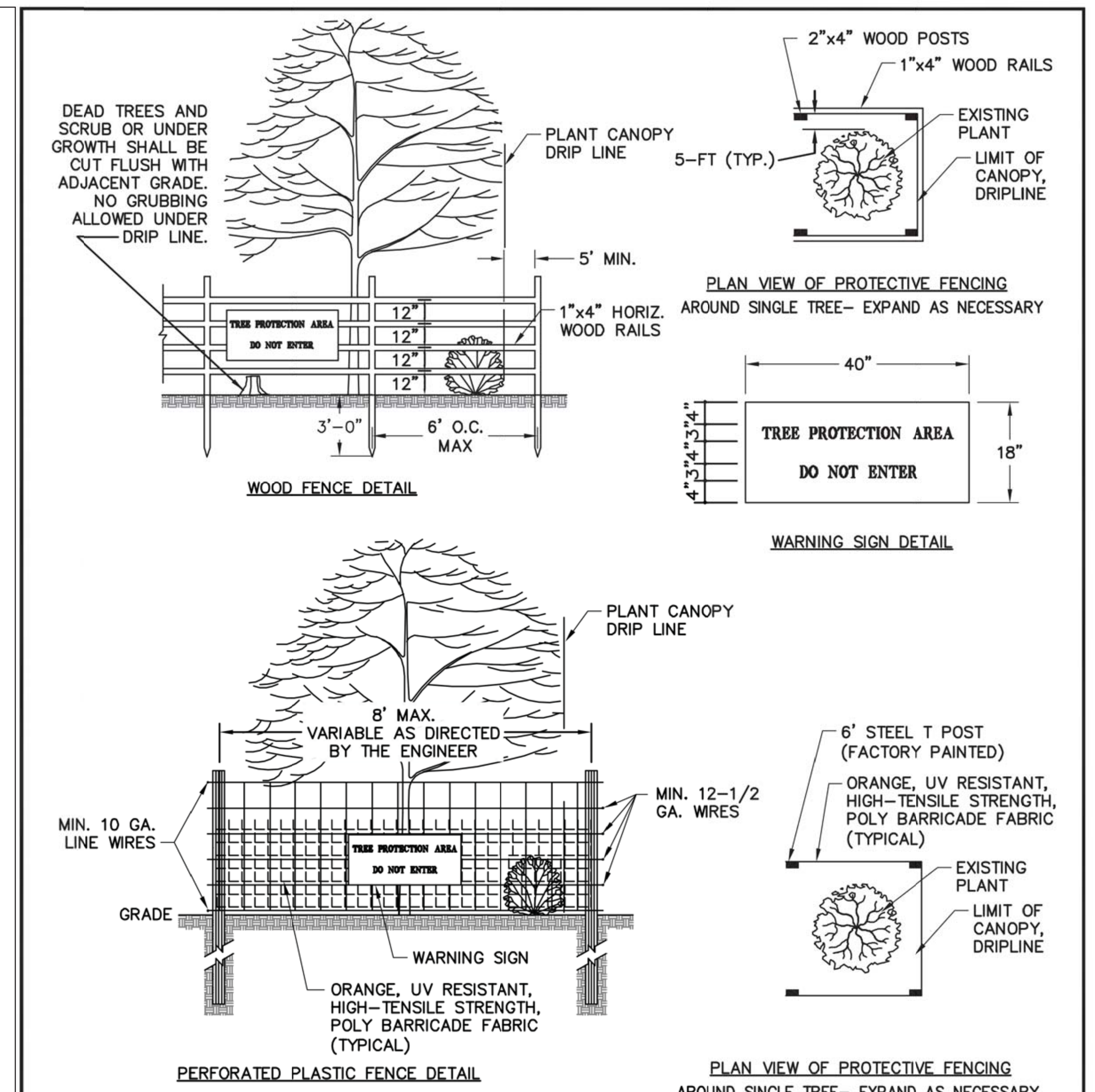
THIS TREE PROTECTION FENCE DETAIL IS REQUIRED FOR PROTECTION OF TREE CONSERVATION AREAS (UDO ARTICLE 9.1. TREE CONSERVATION) AND FOR CREDIT OF EXISTING TREES (UDO SECTION 7.2.7.E.)

CITY OF RALEIGH
PUBLIC WORKS DEPARTMENT

REVISIONS | DATE: 9/1/13 | NOT TO SCALE

STANDARD TREE CONSERVATION AREA FENCE DETAIL

TC-02

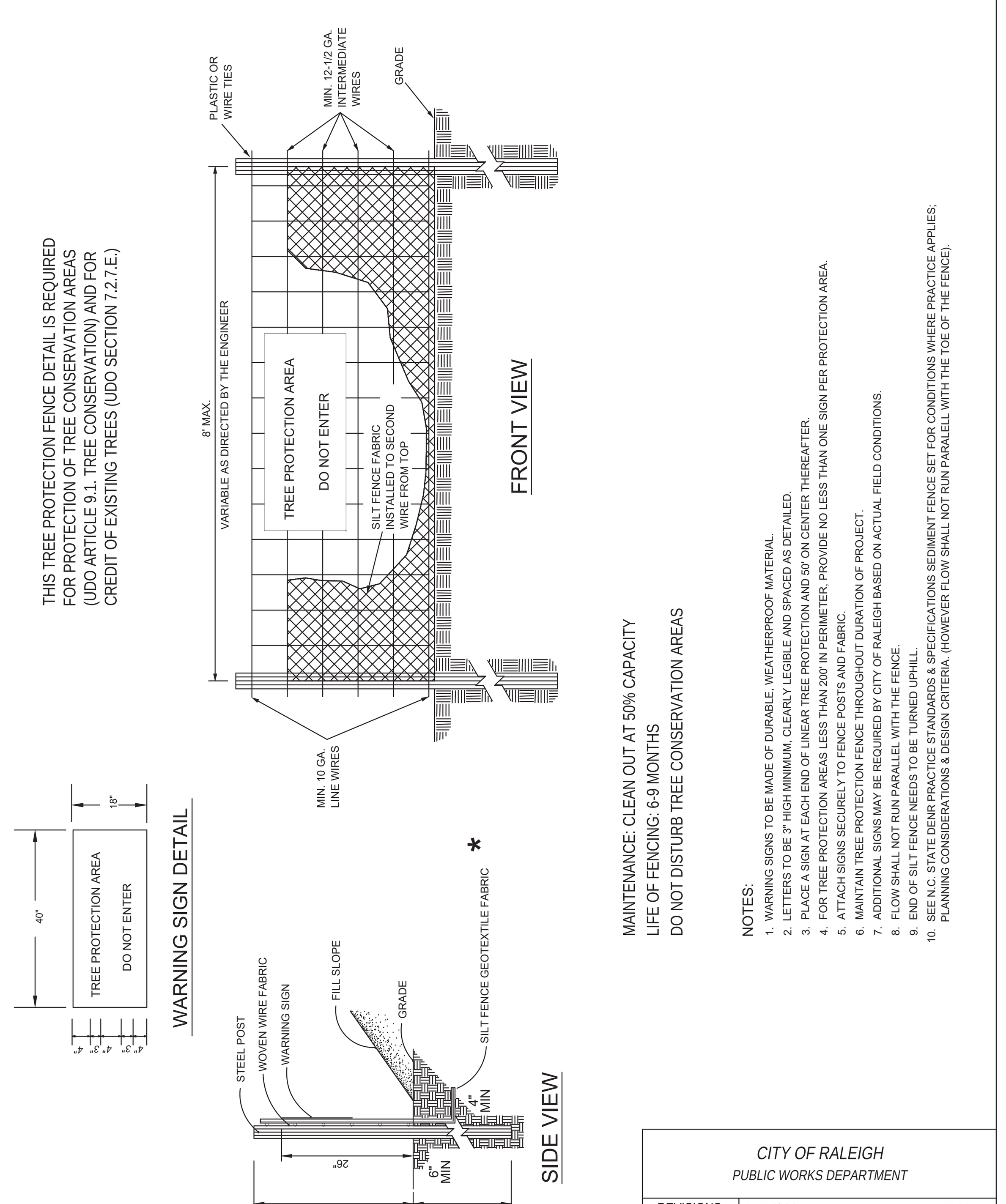

2"x4" WOOD POSTS
1"x4" WOOD RAILS
DEAD TREES AND SCRUB OR UNDER GROWTH SHALL BE CUT FLUSH WITH ADJACENT GRADE. NO GRUBBING ALLOWED UNDER DRIP LINE.
PLANT CANOPY DRIP LINE
5-FT (TYP.)
EXISTING PLANT
LIMIT OF CANOPY, DRIPLINE
5' MIN.
1"x4" HORIZ. WOOD RAILS
3'-0"
6' O.C. MAX
WOOD FENCE DETAIL
PLAN VIEW OF PROTECTIVE FENCING
AROUND SINGLE TREE- EXPAND AS NECESSARY
TREE PROTECTION AREA
DO NOT ENTER
40"
18"
WARNING SIGN DETAIL
PLANT CANOPY DRIP LINE
8' MAX. VARIABLE AS DIRECTED BY THE ENGINEER
6' STEEL T POST (FACTORY PAINTED)
MIN. 10 GA. LINE WIRES
MIN. 12-1/2 GA. WIRES
ORANGE, UV RESISTANT, HIGH-TENSILE STRENGTH, POLY BARRICADE FABRIC (TYPICAL)
EXISTING PLANT
LIMIT OF CANOPY, DRIPLINE
GRADE
WARNING SIGN
ORANGE, UV RESISTANT, HIGH-TENSILE STRENGTH, POLY BARRICADE FABRIC (TYPICAL)
PERFORATED PLASTIC FENCE DETAIL
PLAN VIEW OF PROTECTIVE FENCING
AROUND SINGLE TREE- EXPAND AS NECESSARY

NOTES:
1. REMOVE ALL BARRIERS UPON COMPLETION OF PROJECT.
2. LANDSCAPING PLANS SHALL SHOW LOCATIONS OF ALL TREE PROTECTION FENCES.
3. ALL PLANTS TO BE SAVED SHALL BE PROTECTED BY FENCING AS SHOWN IN THIS DETAIL.
4. CONTRACTOR SHALL INSTALL FENCING PRIOR TO BEGINNING ANY CONSTRUCTION OR GRADING ACTIVITY.
5. CONTRACTOR SHALL CALL FOR INSPECTION AND APPROVAL OF PROTECTIVE FENCING PRIOR TO BEGINNING ANY CONSTRUCTION OR GRADING.
6. PROTECTIVE FENCING SHALL BE LOCATED 5' OUTSIDE DRIPLINE OF TREES AND 1' MINIMUM OUTSIDE SHRUBS OR OTHER PLANTS.

REVISIONS	
DATE	DESCRIPTION

TOWN OF KNIGHTDALE STANDARD DETAILS | PLANT PROTECTIVE FENCING | STD. NO. 2.10

UDO NOTE ADDED AND RENUMBERED "001" 11-1-2013, WDP



THIS TREE PROTECTION FENCE DETAIL IS REQUIRED FOR PROTECTION OF TREE CONSERVATION AREAS (UDO ARTICLE 9.1. TREE CONSERVATION) AND FOR CREDIT OF EXISTING TREES (UDO SECTION 7.2.7.E.)

MAINTENANCE: CLEAN OUT AT 50% CAPACITY
LIFE OF FENCING: 6-9 MONTHS
DO NOT DISTURB TREE CONSERVATION AREAS

CITY OF RALEIGH
PUBLIC WORKS DEPARTMENT

REVISIONS | DATE: 9/1/13 | NOT TO SCALE

STANDARD TEMPORARY (SEDIMENT/SILT) / TREE CONSERVATION AREA FENCE DETAIL

TC-01

SEEDBED PREPARATION

1. CHISEL COMPACTED AREAS AND SPREAD TOPSOIL 3 INCHES DEEP OVER ADVERSE SOIL CONDITIONS, IF AVAILABLE.
2. RIP THE ENTIRE AREA TO 6 INCH DEPTH.
3. REMOVE ALL LOOSE ROCK, ROOTS, AND OTHER OBSTRUCTIONS LEAVING SURFACE REASONABLY SMOOTH AND UNIFORM.
4. APPLY AGRICULTURAL LIME, FERTILIZER, AND SUPERPHOSPHATE UNIFORMLY AND MIX WITH SOIL (SEE BELOW).
5. CONTINUE TILLAGE UNTIL A WELL-PULVERIZED, FIRM, REASONABLY UNIFORM SEEDBED IS PREPARED 4 TO 6 INCHES DEEP.
6. SEED (150 IBS/ACRE) ON A FRESHLY PREPARED SEEDBED AND COVER SEED LIGHTLY WITH SEEDING EQUIPMENT OR CULTIPACK AFTER SEEDING.
7. MULCH IMMEDIATELY AFTER SEEDING AND ANCHOR MULCH.
8. INSPECT ALL SEEDED AREAS AND MAKE NECESSARY REPAIRS OR RESEEDINGS WITHIN THE PLANTING SEASON, IF POSSIBLE. IF STAND IS OVER 60% DAMAGED, RE-ESTABLISH FOLLOWING ORIGINAL LIME, FERTILIZER AND SEEDING RATES.
9. CONSULT CONSERVATION INSPECTOR ON MAINTENANCE TREATMENT AND FERTILIZATION AFTER PERMANENT COVER IS ESTABLISHED.

SOIL PREPARATION

* AGRICULTURAL LIMESTONE – 2 TONS/ACRE (3 TONS IN CLAY SOIL)
* FERTILIZER – 1,000 LBS/ACRE – 10/10/10
* SUPERPHOSPHATE – 500 LBS/ACRE – 20% ANALYSIS
* MULCH – 2 TONS/ACRE – SMALL GRAIN STRAW
* ANCHOR – ASPHALT EMULSION @ 300 GALS/ACRE

SEEDING SPECIFICATIONS

1. TEMPORARY SEEDING
   * SEE TABLES BELOW:
2. PERMANENT SEEDING
   * TALL FESCUE, 100 LB/ACRE
   * SERICEA LESPEDEZA, 15 LB/ACRE

Table 6.10a
Temporary Seeding Recommendations for Late Winter and Early Spring

Seeding mixture

Species	Rate (lb/acre)
Rye (grain)	120
Annual lespedeza (Kobe in Piedmont and Coastal Plain, Korean in Mountains)	50

Omit annual lespedeza when duration of temporary cover is not to extend beyond June.

Seeding dates
Mountains—Above 2500 feet: Feb. 15 - May 15
Below 2500 feet: Feb. 1- May 1
Piedmont—Jan. 1 - May 1
Coastal Plain—Dec. 1 - Apr. 15

Soil amendments
Follow recommendations of soil tests or apply 2,000 lb/acre ground agricultural limestone and 750 lb/acre 10-10-10 fertilizer.

Mulch
Apply 4,000 lb/acre straw. Anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.

Maintenance
Refertilize if growth is not fully adequate. Reseed, refertilize and mulch immediately following erosion or other damage.

Table 6.10b
Temporary Seeding Recommendations for Summer

Seeding mixture

Species	Rate (lb/acre)
German millet	40

In the Piedmont and Mountains, a small-stemmed Sudangrass may be substituted at a rate of 50 lb/acre.

Seeding dates
Mountains—May 15 - Aug. 15
Piedmont—May 1 - Aug. 15
Coastal Plain—Apr. 15 - Aug. 15

Soil amendments
Follow recommendations of soil tests or apply 2,000 lb/acre ground agricultural limestone and 750 lb/acre 10-10-10 fertilizer.

Mulch
Apply 4,000 lb/acre straw. Anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.

Maintenance
Refertilize if growth is not fully adequate. Reseed, refertilize and mulch immediately following erosion or other damage.

Table 6.10c
Temporary Seeding Recommendations for Fall

Seeding mixture

Species	Rate (lb/acre)
Rye (grain)	120

Seeding dates
Mountains—Aug. 15 - Dec. 15
Coastal Plain and Piedmont—Aug. 15 - Dec. 30

Soil amendments
Follow soil tests or apply 2,000 lb/acre ground agricultural limestone and 1,000 lb/acre 10-10-10 fertilizer.

Mulch
Apply 4,000 lb/acre straw. Anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.

Maintenance
Repair and refertilize damaged areas immediately. Topdress with 50 lb/acre of nitrogen in March. If it is necessary to extent temporary cover beyond June 15, overseed with 50 lb/acre Kobe (Piedmont and Coastal Plain) or Korean (Mountains) lespedeza in late February or early March.

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 25469 DONALD C. ADAMS, JR.

REVISED
1/26/2022 8:22 AM

NOT RELEASED FOR CONSTRUCTION

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

TOK SU-2-01

ADAMS & HODGE ENGINEERING, PC
314 EAST MAIN STREET
CLAYTON, NC 27520
info@adamsandhodge.com
919-243-1332
FIRM # C-4187

REVISIONS:
1. 2019-06-14 PER TOK COMMENTS
2. 2021-08-16 PER ENGINEER, TOK AND COR COMMENTS
3. 2022-01-26 PER CLIENT COMMENTS

MINGO CREEK PHASE 7
TOWN OF KNIGHTDALE, WAKE COUNTY, NORTH CAROLINA

DETAILS - EROSION (WAKE COUNTY STD)

DESIGN	DCA
DRAWN	ADS/BRL
CHECKED	DCA
HORIZONTAL SCALE	SEE GRAPHIC SCALE
VERTICAL SCALE	N/A
DATE	02/24/2017
JOB NO.	
SHEET	D3

GROUND STABILIZATION AND MATERIALS HANDLING PRACTICES FOR COMPLIANCE WITH THE NCG01 CONSTRUCTION GENERAL PERMIT

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

SECTION E: GROUND STABILIZATION

Required Ground Stabilization Timeframes

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

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

GROUND STABILIZATION SPECIFICATION

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

Temporary Stabilization	Permanent Stabilization
• Temporary grass seed covered with straw or other mulches and tackifiers • Hydroseeding • Rolled erosion control products with or without temporary grass seed • Appropriately applied straw or other mulch • Plastic sheeting	• Permanent grass seed covered with straw or other mulches and tackifiers • Geotextile fabrics such as permanent soil reinforcement matting • Hydroseeding • Shrubs or other permanent plantings covered with mulch • Uniform and evenly distributed ground cover sufficient to restrain erosion • Structural methods such as concrete, asphalt or retaining walls • Rolled erosion control products with grass seed

POLYACRYLAMIDES (PAMS) AND FLOCCULANTS

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

EQUIPMENT AND VEHICLE MAINTENANCE

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

LITTER, BUILDING MATERIAL AND LAND CLEARING WASTE

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

PAINT AND OTHER LIQUID WASTE

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

PORTABLE TOILETS

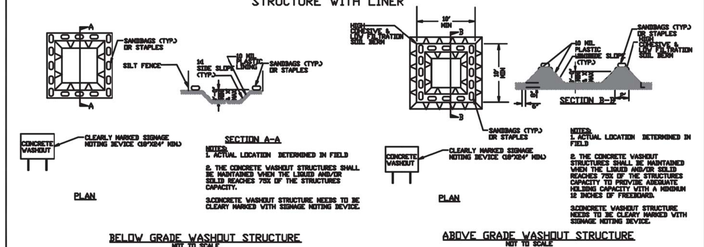
1. Install portable toilets on level ground, at least 50 feet away from storm drains, streams or wetlands unless there is no alternative reasonably available. If 50 foot offset is not attainable, provide relocation of portable toilet behind silt fence or place on a gravel pad and surround with sand bags.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

EARTHEN STOCKPILE MANAGEMENT

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

NORTH CAROLINA *Environmental Quality*

ONSITE CONCRETE WASHOUT STRUCTURE WITH LINER



CONCRETE WASHOUTS

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

HERBICIDES, PESTICIDES AND RODENTICIDES

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

HAZARDOUS AND TOXIC WASTE

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

NCG01 GROUND STABILIZATION AND MATERIALS HANDLING

EFFECTIVE: 04/01/19

ADAMS & HODGE ENGINEERING, PC
314 EAST MAIN STREET
CLAYTON, NC 27520
info@adamsandhodge.com
(919) 247-1332
FIRM # C-4187

REVISIONS:
1. 2021-04-14 PER TOC COMMENTS
2. 2021-06-29 PER ENGINEER, PER CLIENT COMMENTS
3. 2022-01-26 PER CLIENT COMMENTS

MINGO CREEK PHASE 7
TOWN OF KNIGHTDALE, WAKE COUNTY, NORTH CAROLINA

DETAILS - EROSION

DESIGN: DCA
DRAWN: ADS/BRL
CHECKED: DCA
HORIZONTAL SCALE: SEE GRAPHIC SCALE
VERTICAL SCALE: N/A
DATE: 02/24/2017
JOB NO.
SHEET: D3.01

PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION A: SELF-INSPECTION

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

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

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

PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION B: RECORDKEEPING

1. E&SC Plan Documentation

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

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

2. Additional Documentation

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

(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. Use of electronically-available records in lieu of the required paper copies will be allowed if shown to provide equal access and utility as the hard-copy records.

(c) All data used to complete the Notice of Intent and older inspection records shall be maintained for a period of three years after project completion and made available upon request. [40 CFR 122.41]

PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION C: REPORTING

1. Occurrences that must be reported

Permittees shall report the following occurrences:

(a) Visible sediment deposition in a stream or wetland.

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

(a) Releases of hazardous substances in excess of reportable quantities under Section 311 of the Clean Water Act (Ref: 40 CFR 110.3 and 40 CFR 117.3) or Section 102 of CERCLA (Ref: 40 CFR 302.4) or G.S. 143-215.85.

(b) Anticipated bypasses and unanticipated bypasses.

(c) Noncompliance with the conditions of this permit that may endanger health or the environment.

2. Reporting Timeframes and Other Requirements

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

Occurrence	Reporting Timeframes (After Discovery) and Other Requirements
(a) Visible sediment deposition in a stream or wetland	• ***Within 24 hours***, an oral or electronic notification. • ***Within 7 calendar days***, a report that contains a description of the sediment and actions taken to address the cause of the deposition. Division staff may waive the requirement for a written report on a case-by-case basis. • If the stream is named on the NC 303(d) list as impaired for sediment-related causes, the permittee may be required to perform additional monitoring, inspections or apply more stringent practices if staff determine that additional requirements are needed to assure compliance with the federal or state impaired-waters conditions.
(b) Oil spills and release of hazardous substances per Item 1(b)-(c) above	• ***Within 24 hours***, an oral or electronic notification. The notification shall include information about the date, time, nature, volume and location of the spill or release.
(c) Anticipated bypasses [40 CFR 122.41(m)(3)]	• ***A report at least ten days before the date of the bypass, if possible***. The report shall include an evaluation of the anticipated quality and effect of the bypass.
(d) Unanticipated bypasses [40 CFR 122.41(m)(3)]	• ***Within 24 hours***, an oral or electronic notification. • ***Within 7 calendar days,*** a report that includes an evaluation of the quality and effect of the bypass.
(e) Noncompliance with the conditions of this permit that may endanger health or the environment[40 CFR 122.41(l)(7)]	• ***Within 24 hours***, an oral or electronic notification. • ***Within 7 calendar days***, a report that contains a description of the noncompliance, and its causes; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time noncompliance is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6). • Division staff may waive the requirement for a written report on a case-by-case basis.

NORTH CAROLINA
Environmental Quality

NCG01 SELF-INSPECTION, RECORDKEEPING AND REPORTING

EFFECTIVE: 04/01/19

REVISIONS:
1. 2019-06-14 PER TOK COMMENTS
2. 2021-08-26 PER ENGINEER, TOK AND COR COMMENTS
3. 2022-01-26 PER CLIENT COMMENTS

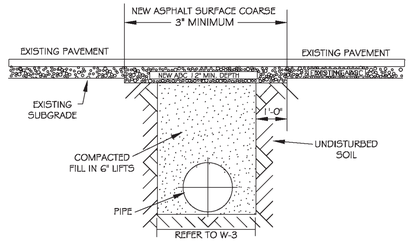
314 EAST MAIN STREET
CLAYTON, NC 27520
info@adamsandhodge.com
919-243-1332
FIRM # C-4187

ADAMS & HODGE
ENGINEERING, PC

MINGO CREEK
PHASE 7
TOWN OF KNIGHTDALE, WAKE COUNTY, NORTH CAROLINA

DETAILS - EROSION

DESIGN	DCA
DRAWN	ADS/BRL
CHECKED	DCA
HORIZONTAL SCALE	SEE GRAPHIC SCALE
VERTICAL SCALE	N/A
DATE	02/24/2017
JOB NO.	
SHEET	D3.02



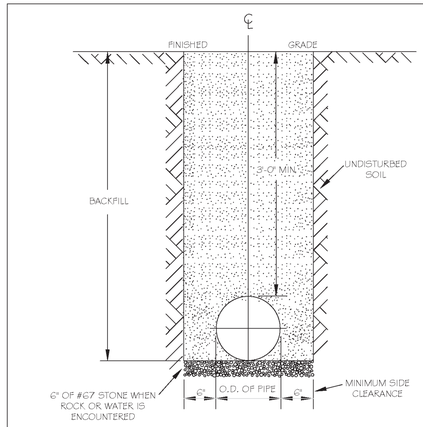
NOTES:

1. THE PAVEMENT CUT SHALL BE DEFINED BY A STRAIGHT EDGE AND CUT WITH AN APPROPRIATE SAW CUT MACHINE.
2. THE TRENCH SUBGRADE MATERIAL SHALL BE BACKFILLED WITH SUITABLE MATERIAL AND COMPACTED TO A DENSITY OF AT LEAST 95% OF THAT OBTAINED BY COMPACTING A SAMPLE OF THE MATERIAL IN ACCORDANCE WITH AASHTO T-99 AS MODIFIED BY NCDOT.
3. THE FINAL 1' OF FILL SHALL CONSIST OF ABC MATERIAL COMPACTED TO A DENSITY EQUAL TO 100% OF THAT OBTAINED BY COMPACTING A SAMPLE OF THE MATERIAL IN ACCORDANCE WITH AASHTO T-80 AS MODIFIED BY NCDOT.
4. THE ENTIRE THICKNESS/ VERTICAL EDGE OF CUT SHALL BE TACKED.
5. THE SAME DEPTH OF PAVEMENT MATERIAL WHICH EXISTS SHALL BE REINSTALLED, BUT IN NO CASE SHALL THE ASPHALT BE LESS THAN 3" THICK.
6. THE ASPHALT PAVEMENT MATERIAL SHALL BE INSTALLED AND COMPACTED THOROUGHLY WITH A SMOOTH DRUM ROLLER TO ACHIEVE A SMOOTH LEVEL PATCH.
7. REFER TO CITY OF RALEIGH STANDARDS FOR TRENCHES AND PIPE BEDDING, W-3. FOR ADDITIONAL DETAILS.
8. NO HAND PATCHING ALLOWED.
9. PAVEMENT CUTS WITHIN NCDOT ROW SHALL CONFORM TO THE APPROVED ON SITE ENCROACHMENT PERMIT.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES

STANDARD ASPHALT PAVEMENT PATCH DETAIL

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-2	RRH	3-31-00	A.B.B.	4-16-04
	D.W.C.	11-1-99	J.P.S.	10-29-10

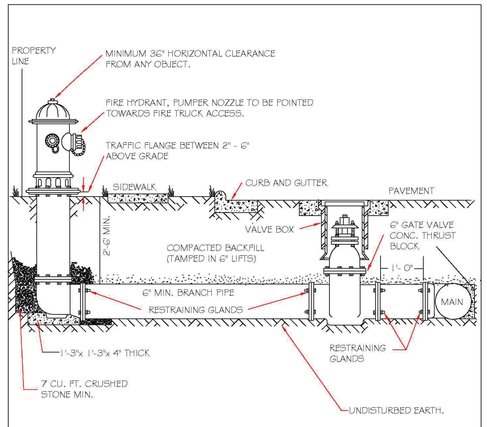


NOTES:

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

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
TRENCH BOTTOM DIMENSIONS & BACKFILLING REQUIREMENTS FOR DUCTILE IRON

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-3	D.W.C.	9-3-93	ABB	2-15-05
	RRH	3-31-00	J.P.S.	10-29-10



NOTES:

1. FIRE HYDRANT SHALL BE AS MANUFACTURED: MUELLER, AMERICAN DARLING, KENNEDY, M&H, WATEROUS, CLOW, EAST JORDAN IRON WORKS, OR US PIPE.
2. BRANCH PIPE SHALL BE DUCTILE IRON AWWA C150-96
3. 6" GATE VALVE SHALL BE AWWA C500-86 OPEN LEFT
4. STEEL RODS AND BOLTS SHALL BE ¾" HOT DIPPED GALVANIZED
5. FIRE HYDRANTS WILL BE INSTALLED IN TRUE VERTICAL POSITION
   RODS SHALL NOT BE COUPLED MORE THAN ONCE. IF THE LENGTH FROM THE VALVE TO THE HYDRANT EXCEEDS 20' THEN A MECHANICAL RESTRAINING GLAND WITH A REBAR CAGE SHALL BE INSTALLED NO MORE THAN 10' FROM HYDRANT AND POURED IN CONCRETE.
   FIRE HYDRANTS TO BE LOCATED IN ROW OR 2 FOOT EASEMENT ADJACENT TO ROW

ANYTIME SITE WORK, CONSTRUCTION, ROAD WORK, OR ANY OTHER WORK CHANGES THE GRADE OF THE FIRE HYDRANT, THE PERSON RESPONSIBLE FOR THE WORK IS RESPONSIBLE FOR ADJUSTING THE FIRE HYDRANT TO STAY WITHIN COMPLIANCE.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES

STANDARD FIRE HYDRANT INSTALLATION DETAIL

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-4	ABB	4-6-04	PAP	2/17/09
	DHL	2/14/08		

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

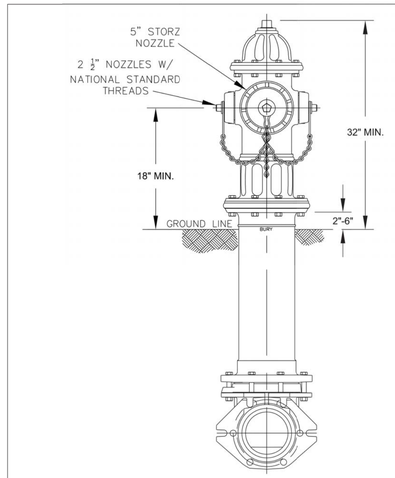
Public
Water Distribution / Extension System
The City of Raleigh consents to the connection and extension of the City's public water system as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook.

City of Raleigh
Public Utilities Department Permit # _____
Authorization to Construct _____
Date _____

NORTH CAROLINA PROFESSIONAL SEAL 25405 ENGINEER DONALD C. ADAMS JR.

REVISED
1/26/2022 8:22 AM

NOT RELEASED FOR CONSTRUCTION



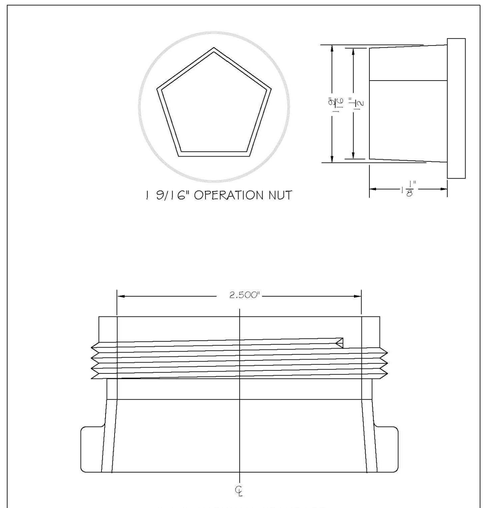
NOTES:

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

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
RALEIGH, GARNER, KNIGHTDALE, ROLESVILLE, WAKE FOREST, WENDELL & ZEBULON

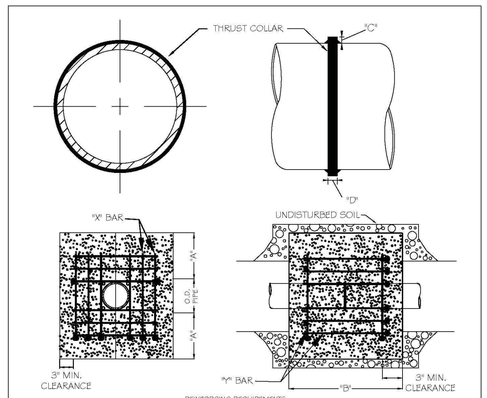
STANDARD FIRE HYDRANT WITH 5" STORZ PUMPER NOZZLE

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-5	MAB	6-30-16		
	KAT	9-15-17		



CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
HYDRANT OPERATING NUT AND 2 1/2" OUTLET THREADS

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-6	RRH	3-31-00	DHL	2-18-08
	A.B.B.	4-13-04	J.P.S.	11-1-10



REINFORCING REQUIREMENTS

I.D. PIPE	REBAR SIZE	"X" BAR LENGTH	"X" BAR WEIGHT	"A" BAR LENGTH	"A" BAR WEIGHT	NO. REQUIRED
6" - 36"	#5	2'-2"+ O.D. PIPE	1.043 LBS/FT	1'-1"	1.1 LBS. EACH	x-24, Y-12
48" & greater	#6	3'-0"+ O.D. PIPE	1.502 LBS/FT	1'-3"	1.9 LBS. EACH	x-24, Y-12

THRUST COLLAR, AND THRUST SCHEDULE

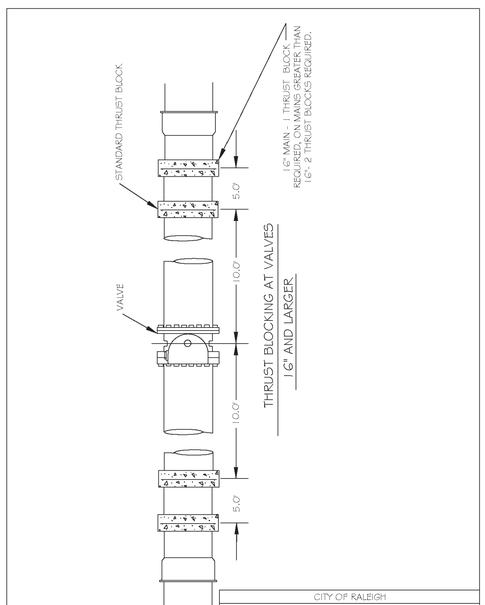
I.D. PIPE	"A"	"B"	"C"	"D"
6" - 16"	1'-4"	1'-7"	2"	3/8"
20" - 24"	1'-4"	1'-7"	3"	1/2"
30" - 36"	1'-4"	1'-7"	4"	5/8"
48" & greater	1'-5"	1'-9"	6"	7/8"

NOTES:

1. SEE STANDARD DETAIL W-9 FOR THRUST BLOCK LOCATIONS.
2. CONCRETE SHALL BE 3000 PSI AND TRANSIT MIXED.
3. REINFORCING BARS SHALL BE DEFORMED AND TIED TOGETHER.
4. TRENCH BOTTOM WIDTH IN VICINITY OF THRUST BLOCK INSTALLATION SHALL BE THE MINIMUM WIDTH AS SHOWN ON STANDARD DETAIL W-3.
5. BACKFILL TAMPED IN 6" LIFTS PER STANDARD DETAIL W-3.
6. THRUST COLLAR MUST BE FACTORY WELDED ON BOTH SIDES ALONG BOTH EDGES OF COLLAR AROUND CIRCUMPERENCE.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
THRUST BLOCKING DESIGN DATA FOR WATER MAINS

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-7	RRH	1-21-00	J.P.S.	11-1-10
	D.H.L.	6-18-08		



CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
STANDARD THRUST BLOCK INSTALLATION FOR 16" AND LARGER VALVES AND DEAD END MAINS

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-8	Y.C.A.	4-12-90	D.W.C.	9-7-93
		6-92	RRH	3-31-00

ADAMS & HODGE ENGINEERING, PC
314 EAST MAIN STREET
CLAYTON, NC 27520
info@adamsandhodge.com
(919) 243-1187
FIRM # C-4187

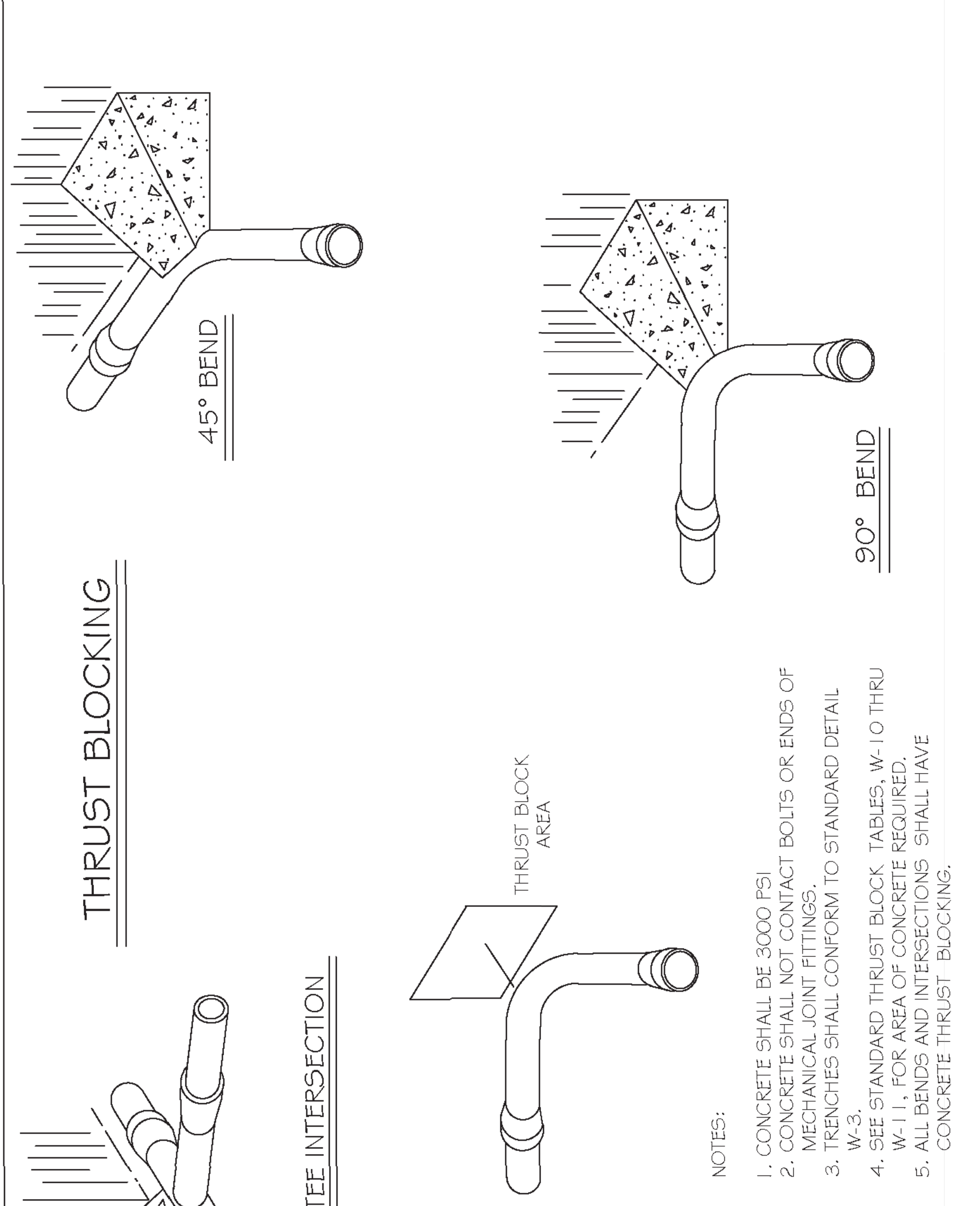
REVISIONS:
1. 2020-08-14 PER TDC COMMENTS
2. 2021-06-29 PER ENGINEER
3. 2022-01-26 PER CLIENT COMMENTS

MINGO CREEK PHASE 7
TOWN OF KNIGHTDALE, WAKE COUNTY, NORTH CAROLINA

DETAILS - WATER (C.O.R. STD)

DESIGN DCA
DRAWN ADS/BRL
CHECKED DCA
HORIZONTAL SCALE SEE GRAPHIC SCALE
VERTICAL SCALE N/A
DATE 02/24/2017
JOB NO.
SHEET D4

TOK SU-2-01



NOTES:
1. CONCRETE SHALL BE 3000 PSI
2. CONCRETE SHALL NOT CONTACT BOLTS OR ENDS OF MECHANICAL JOINT FITTINGS.
3. TRENCHES SHALL CONFORM TO STANDARD DETAIL W-3.
4. SEE STANDARD THRUST BLOCK TABLES, W-10 THRU W-11, FOR AREA OF CONCRETE REQUIRED.
5. ALL BENDS AND INTERSECTIONS SHALL HAVE CONCRETE THRUST BLOCKING.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
STANDARD THRUST BLOCKING VIEWS

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-9	D.W.C.	3-1-87	RRH	3-31-00
		9-7-99	D.H.L.	6-18-08

REACTION BEARING AREAS FOR HORIZONTAL WATER PIPE BENDS

BASED ON TEST PRESSURE OF 200 P.S.I.

ALL AREAS GIVEN IN SQUARE FEET.

SIZE AND DEGREE OF BEND	STATIC THRUST IN POUNDS	MODERATELY DRY CLAY 4000 LBS/FT²	SOFT CLAY 2000 LBS/FT²	1600 LBS/FT² GRAVEL / COARSE SAND	8000 LBS/FT² DRY CLAY, ALWAYS DRY	SAND, COMPACT FIRM 8000 LBS/FT²	SAND - CLEAN DRY 4000 LBS/FT²	SOIL 1000 LBS/FT² QUICKSAND - VERY POOR	ROCK - POOR 10,000 LBS/FT²
6"									
11 1/4°	1,108	1	1	1	1	1	1	2	1
22 1/2°	2,207	1	2	2	1	1	1	3	1
45°	4,328	2	3	3	1	1	2	5	1
90°	7,996	2	4	5	1	1	2	8	1
PLUG	5,655	2	3	4	1	1	2	6	1
8"									
11 1/4°	1,970	1	1	2	1	1	1	2	1
22 1/2°	3,922	1	2	3	1	1	1	4	1
45°	7,694	2	4	5	1	1	2	8	1
90°	14,215	4	8	9	2	2	4	15	2
PLUG	10,053	3	5	6	2	2	3	10	1
12"									
11 1/4°	4,433	2	3	3	1	1	2	5	1
22 1/2°	8,826	3	5	6	2	2	3	9	1
45°	17,312	5	9	11	3	3	5	18	2
90°	31,983	8	16	19	4	4	8	32	4
PLUG	22,619	6	12	14	3	3	6	23	3
16"									
11 1/4°	7,881	2	4	5	1	1	2	8	1
22 1/2°	15,691	4	8	10	2	2	4	16	2
45°	30,779	8	16	19	4	4	8	31	4
90°	56,861	15	29	35	8	8	15	57	6
PLUG	40,213	10	21	25	5	5	10	41	5

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

USE 6" - 90 BEND VALUE FOR HYDRANTS FOR ADDITIONAL SAFETY FACTOR.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
THRUST BLOCKING DESIGN QUANTITY TABLE

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-10	D.W.C.	6-23-99		

REACTION BEARING AREAS FOR HORIZONTAL WATER PIPE BENDS

BASED ON TEST PRESSURE OF 200 P.S.I.

ALL AREAS GIVEN IN SQUARE FEET.

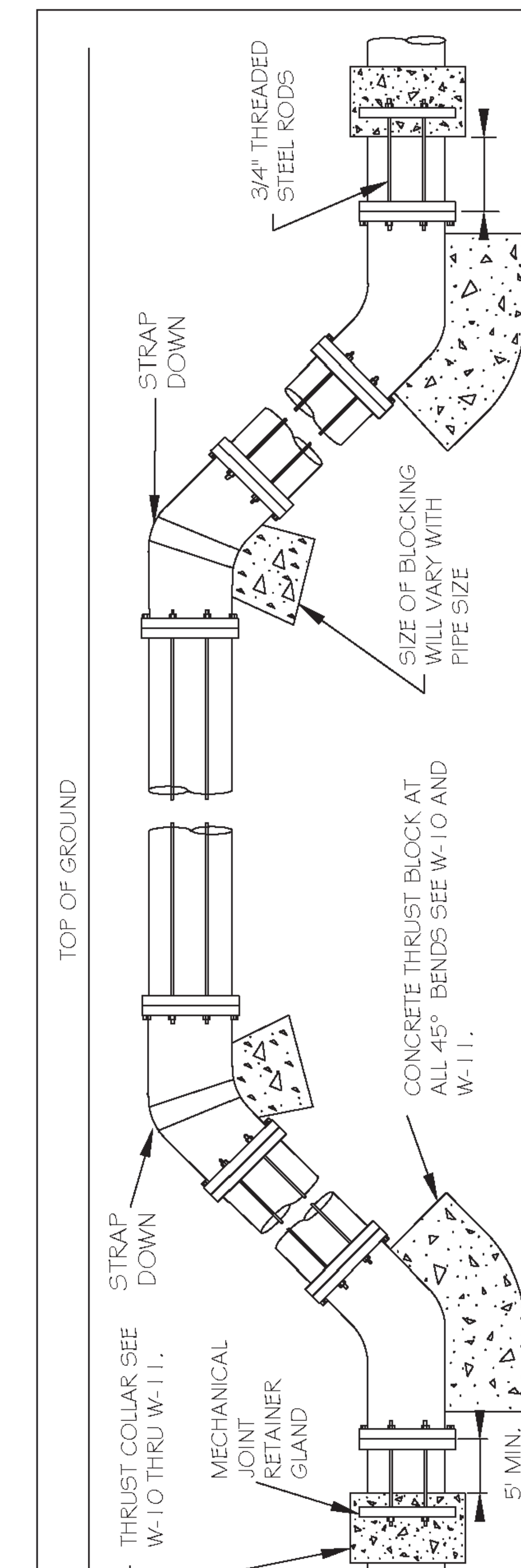
SIZE AND DEGREE OF BEND	STATIC THRUST IN POUNDS	MODERATELY DRY CLAY 4000 LBS/FT²	SOFT CLAY 2000 LBS/FT²	GRAVEL/COARSE SAND 1600LBS/FT²	8000 LBS/FT² DRY CLAY - ALWAYS DRY	SAND, COMPACT FIRM 8000 LBS/FT²	SAND - CLEAN DRY 4000 LBS/FT²	SOIL 1000 LBS/FT² QUICKSAND - VERY POOR	ROCK - POOR 10,000 LBS/FT²
24"									
11 1/4°	17,734	5	9	11	3	3	5	18	2
22 1/2°	35,305	9	18	22	5	5	9	36	4
45°	69,252	18	35	42	9	9	18	70	7
90°	127,936	32	64	77	16	16	32	128	13
PLUG	90,478	23	46	55	12	12	23	91	10
30"									
11 1/4°	27,709	7	14	17	4	4	7	2	3
22 1/2°	55,163	14	28	34	7	7	14	56	6
45°	108,206	28	55	65	14	14	28	109	11
90°	199,900	50	100	120	25	25	50	200	20
PLUG	141,372	36	71	85	18	18	36	142	15
36"									
11 1/4°	39,901	10	20	24	5	5	10	40	4
22 1/2°	79,439	20	40	48	10	10	20	30	8
45°	155,816	39	78	94	20	20	39	156	16
90°	287,855	72	144	172	36	36	72	288	29
PLUG	203,575	51	102	122	26	26	51	204	21
48"									
11 1/4°	70,935	18	36	43	9	9	18	71	8
22 1/2°	141,218	36	71	85	18	18	36	142	15
45°	277,007	70	139	166	35	35	70	277	28
90°	511,742	128	256	320	64	64	128	512	52
PLUG	361,911	91	181	217	46	46	91	362	37

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

USE 6" - 90° BEND VALUE FOR HYDRANTS FOR ADDITIONAL SAFETY FACTOR.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
THRUST BLOCKING DESIGN QUANTITY TABLE

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-11	D.W.C.	6-23-99		



ADD MECHANICAL JOINT RETAINER GLANDS THROUGHOUT ASSEMBLY.

ROD REQUIREMENTS

SIZE OF 45 BEND	STATIC THRUST IN POUNDS	NO. OF RODS REQUIRED
6"	4,328	2
8"	7,694	4
12"	17,312	4
16"	30,779	8
24"	69,252	8

GENERAL NOTES:
1. STEEL RODS AND BOLTS SHALL BE 3/4" HOT DIPPED GALVANIZED.
2. CONCRETE SHALL NOT CONTACT BOLTS OR ENDS OF MECHANICAL JOINT BENDS.
3. RESTRAINED MECHANICAL GLANDS TO BE USED AT ALL FITTINGS.
4. MUST USE DUCTILE IRON EYE BOLTS WHERE NECESSARY.
5. 3' MINIMUM COVER MUST BE MAINTAINED ON ALL WATER MAINS

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
STANDARD VERTICAL BEND

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

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

Public

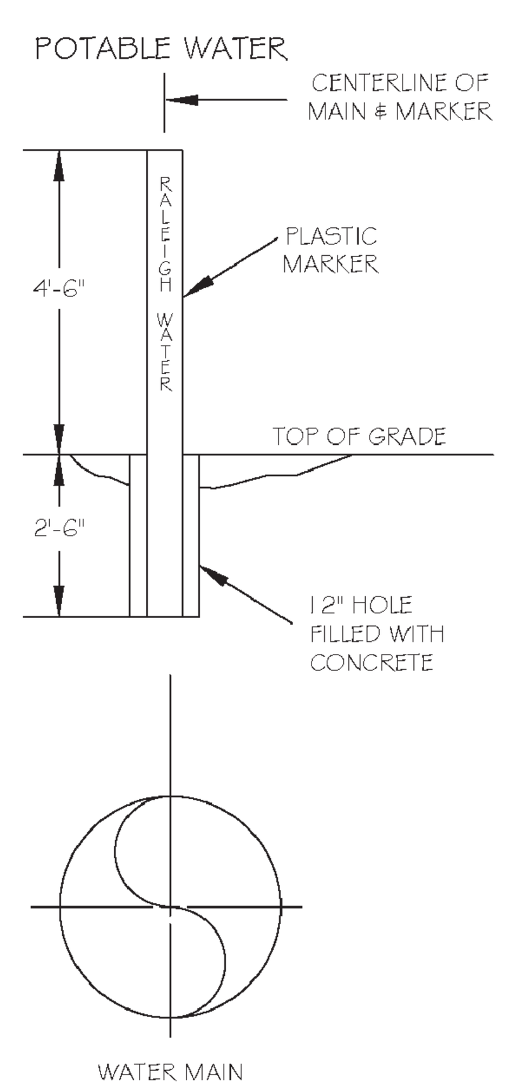
Water Distribution / Extension System

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

City of Raleigh
Public Utilities Department Permit # ____________________

Authorization to Construct ____________________

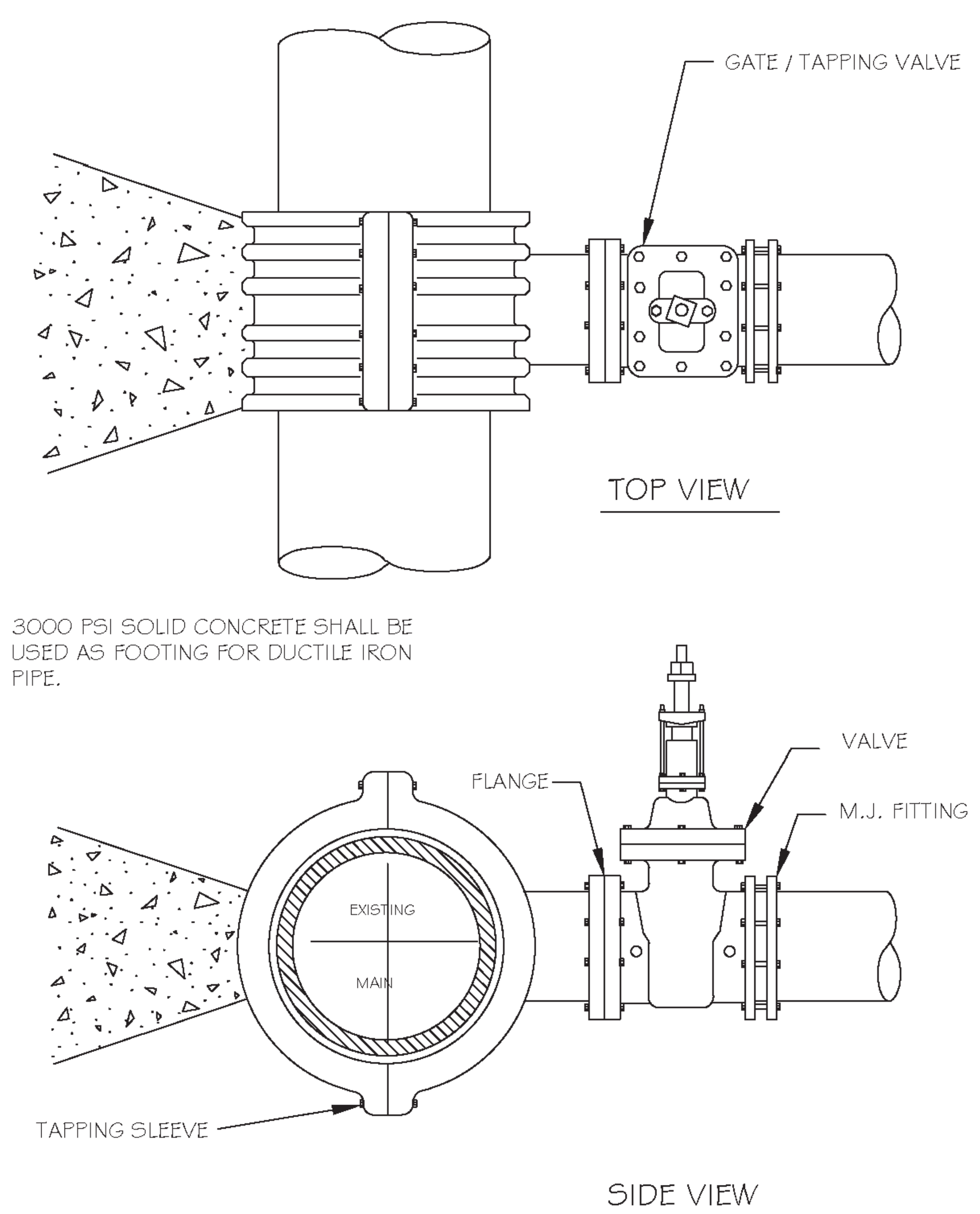
Date ____________________



NOTES
1. POTABLE WATER MARKER TO BE BLUE IN COLOR.
2. POTABLE WATER MARKER TO BE LABELED "RALEIGH WATER".
3. TO BE SPACED ALONG CENTERLINE OF MAIN EVERY 300 FEET.
4. MARKERS TO BE ROUND AND 4" IN DIAMETER.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
STANDARD MAIN & VALVE MARKERS FOR POTABLE & REUSE WATER IN EASEMENTS

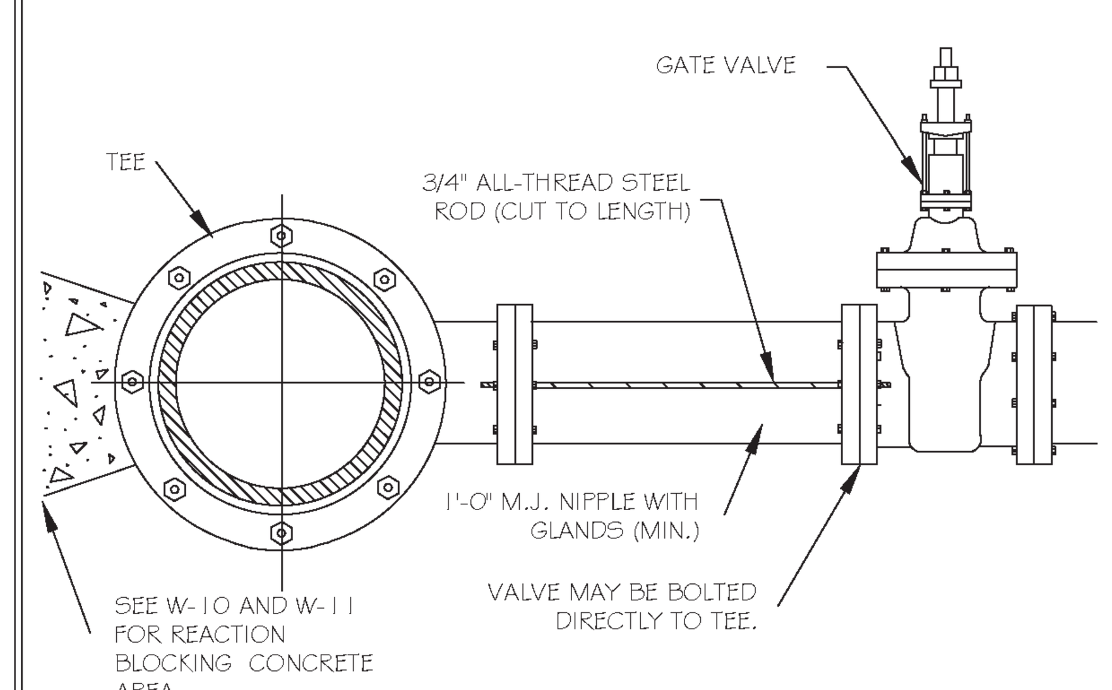
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-13	D.W.C.	9-7-99	DHL	8-16-07
	RRH	3-31-00	J.P.S.	11-1-10



NOTES:
1. CONCRETE SHALL NOT CONTACT BOLTS OR ENDS OF MECHANICAL JOINT FITTINGS.
2. SEE STANDARD REACTION BLOCK TABLES, W-10 AND W-11 FOR AREA OF CONCRETE REQUIRED.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
4" - 24" STANDARD TAPPING SLEEVE AND VALVE ASSEMBLY

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-14	Y.C.A.	2-31-8	RRH	3-31-00
	D.W.C.	9-7-99	J.P.S.	11-1-10



ROD REQUIREMENTS

NO. OF RODS	BRANCH SIZE
4"	2
6"	2
8"	4
12"	4
16"	6
24"	6
30"	8
36"	8

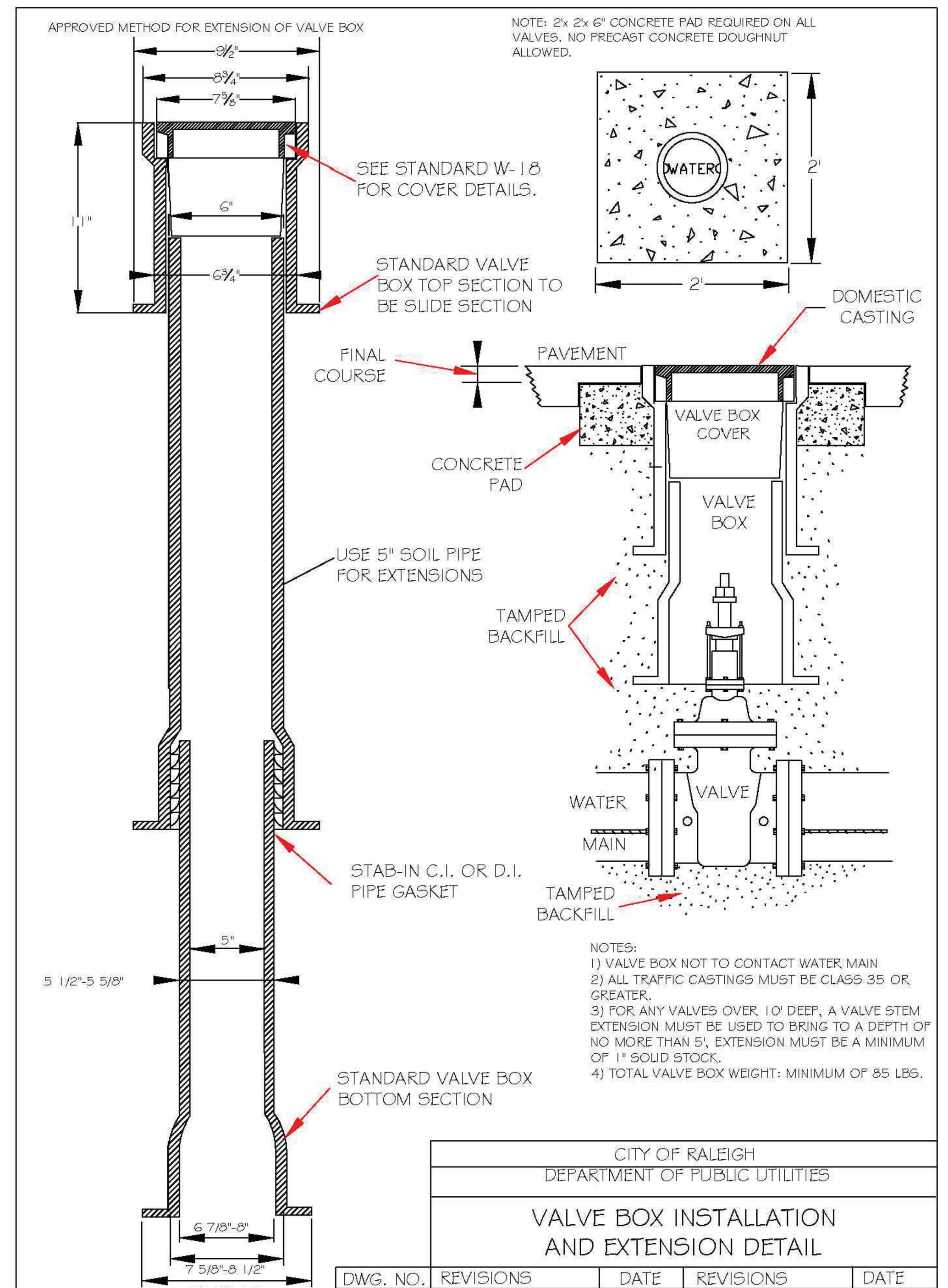
NOTES:
1. STEEL RODS AND BOLTS SHALL BE 3/4" HOT DIPPED GALVANIZED.
2. SEE STANDARD THRUST BLOCK. TABLES W-10 AND W-11 FOR CONCRETE.
3. CONCRETE SHALL NOT CONTACT BOLTS OR ENDS OF MECHANICAL FITTINGS.
4. THIS RODDING REQUIREMENT DOES NOT APPLY TO FIRE HYDRANTS.

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

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-15	RRH	3-31-00	D.H.L.	6-16-08
	A.B.B.	4-19-04	J.P.S.	11-1-10

REVISED
1/26/2022 8:22 AM

NOT RELEASED FOR CONSTRUCTION



NOTES:
1) VALVE BOX NOT TO CONTACT WATER MAIN
2) ALL TRAFFIC CASTINGS MUST BE CLASS 35 OR GREATER.
3) FOR ANY VALVES OVER 10' DEEP, A VALVE STEM EXTENSION MUST BE USED TO BRING TO A DEPTH OF NO MORE THAN 5', EXTENSION MUST BE A MINIMUM OF 1" SOLID STOCK.
4) TOTAL VALVE BOX WEIGHT: MINIMUM OF 85 LBS.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
VALVE BOX INSTALLATION AND EXTENSION DETAIL

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-17	D.W.C.	9-7-99	A.B.B.	4-15-04
	RRH	3-31-00	DHL	8-16-07

REVISIONS:
1. 2019-06-14 PER TOK COMMENTS
2. 2021-08-26 PER ENGINEER, TOK AND COR COMMENTS
3. 2022-01-26 PER CLIENT COMMENTS

314 EAST MAIN STREET
CLAYTON, NC 27520
info@adamsandhodge.com
919-243-1332
FIRM # C-4187

ADAMS & HODGE ENGINEERING, PC

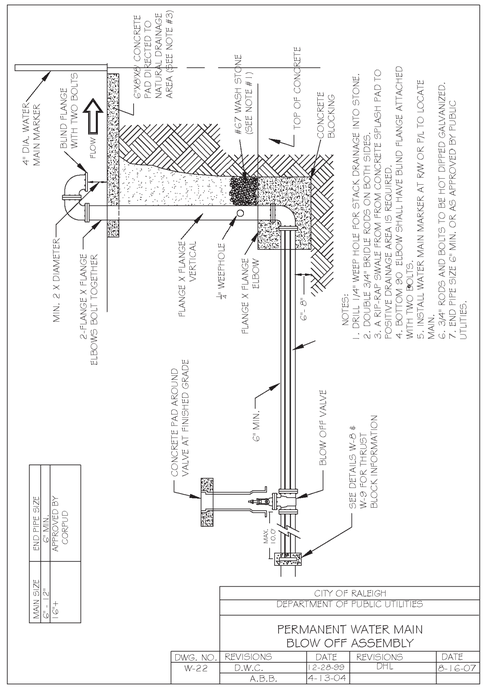
MINGO CREEK PHASE 7

TOWN OF KNIGHTDALE, WAKE COUNTY, NORTH CAROLINA

DETAILS - WATER (C.O.R. STD)

DESIGN DCA
DRAWN ADS/BRL
CHECKED DCA
HORIZONTAL SCALE SEE GRAPHIC SCALE
VERTICAL SCALE N/A
DATE 02/24/2017
JOB NO.
SHEET D5

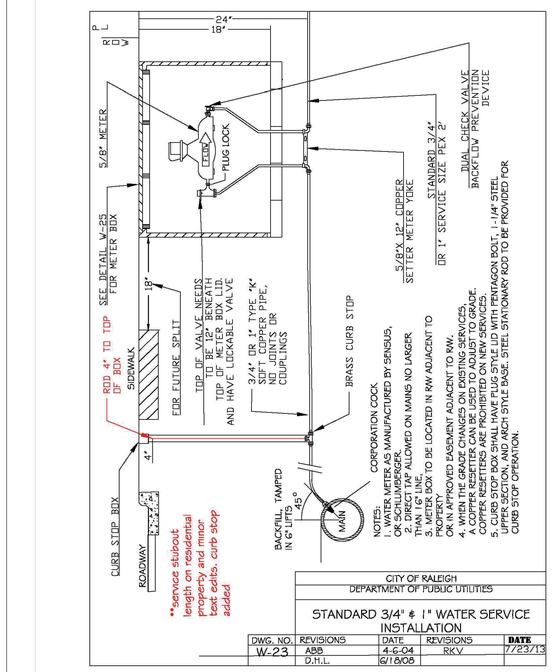
TOK SU-2-01



CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES

PERMANENT WATER MAIN
BLOW OFF ASSEMBLY

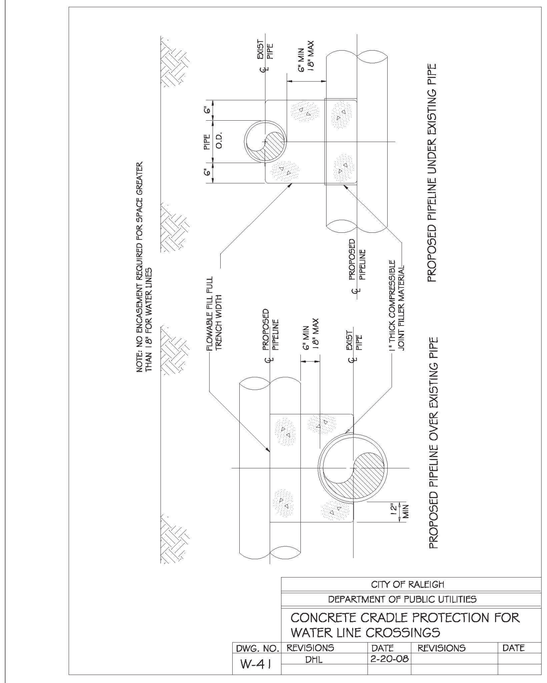
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-22	D.W.C.	12-28-99	DHL	8-16-07
	A,B,B.	4-13-04		



CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES

STANDARD 3/4" & 1" WATER SERVICE INSTALLATION

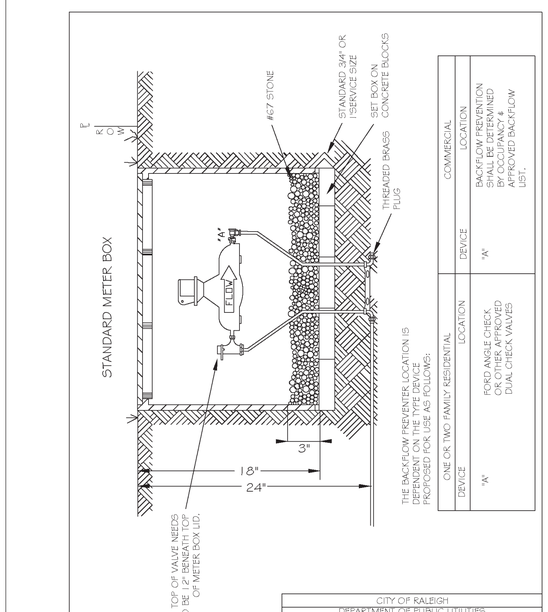
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-23	ABB	4-6-04	RKV	7/23/13
	D.H.L.	6/18/08		



CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES

CONCRETE CRADLE PROTECTION FOR WATER LINE CROSSINGS

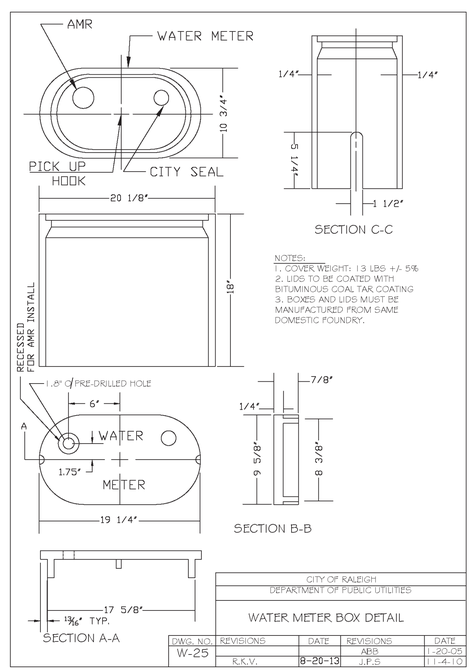
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-41	DHL	2-20-08		



CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES

ONE OR TWO FAMILY DWELLINGS BACKFLOW PREVENTION/ METER ASSEMBLY INSTALLATION

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



CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES

WATER METER BOX DETAIL

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-25			ABB	1-20-05
	R.K.V.	8-26-13	J.P.S	11-4-10

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

Public
Water Distribution / Extension System
The City of Raleigh consents to the connection and extension of the City's public water system as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook.

City of Raleigh
Public Utilities Department Permit # _____

Authorization to Construct _____

Date _____

NORTH CAROLINA PROFESSIONAL SEAL 25405 ENGINEER DONALD C. ADAMS, JR.

REVISED
1/26/2022 8:22 AM

NOT RELEASED FOR CONSTRUCTION

TOK SU-2-01

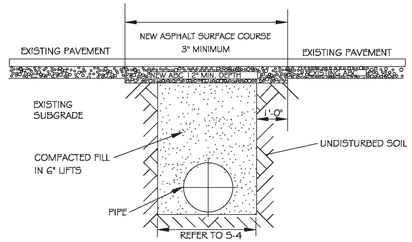
ADAMS & HODGE ENGINEERING, PC
314 EAST MAIN STREET
CLAYTON, NC 27520
info@adamsandhodge.com
919-241-1332
FIRM # C-4187

REVISIONS:
1. 2020-06-24 PER TOK COMMENTS
2. 2021-06-29 PER ENGINEER, 2021-08-04 PER COMMENTS
3. 2022-01-26 PER CLIENT COMMENTS

MINGO CREEK PHASE 7
TOWN OF KNIGHTDALE, WAKE COUNTY, NORTH CAROLINA

DETAILS - WATER (C.O.R. STD)

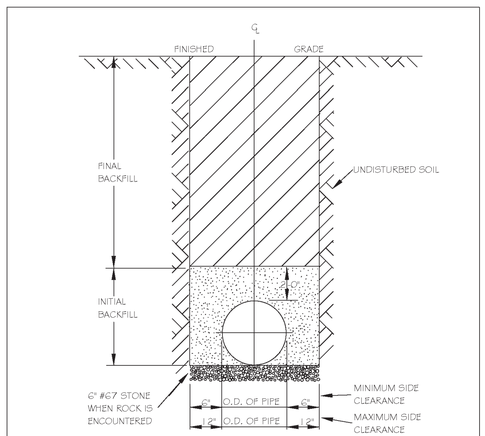
DESIGN DCA
DRAWN ADS/BRL
CHECKED DCA
HORIZONTAL SCALE SEE GRAPHIC SCALE
VERTICAL SCALE N/A
DATE 02/24/2017
JOB NO.
SHEET D6



NOTES:
1. IN NCDOT MAINTAINED ROADWAYS ENCROACHMENT PAVEMENT PATCH REQUIREMENTS SHALL TAKE PRECEDENCE.
2. THE PAVEMENT CUT SHALL BE DEFINED BY A STRAIGHT EDGE AND CUT WITH AN APPROPRIATE SAWCUT MACHINE.
3. THE TRENCH SUBGRADE MATERIAL SHALL BE BACKFILLED WITH SUITABLE MATERIAL AND COMPACTED TO A DENSITY OF AT LEAST 95% OF THAT OBTAINED BY COMPACTING A SAMPLE OF THE MATERIAL IN ACCORDANCE WITH AASHTO T-99 AS MODIFIED BY NCDOT.
4. THE FINAL 1' OF FILL SHALL CONSIST OF ABC MATERIAL COMPACTED TO A DENSITY EQUAL TO 100% OF THAT OBTAINED BY COMPACTING A SAMPLE OF THE MATERIAL IN ACCORDANCE WITH AASHTO T-80 AS MODIFIED BY NCDOT.
5. THE ENTIRE THICKNESS AND VERTICAL EDGE OF CUT SHALL BE TACKED.
6. THE SAME DEPTH OF PAVEMENT MATERIAL WHICH EXISTS SHALL BE REINSTALLED, BUT IN NO CASE SHALL THE ASPHALT BE LESS THAN 3" THICK.
7. THE ASPHALT PAVEMENT MATERIAL SHALL BE INSTALLED AND COMPACTED THOROUGHLY WITH A SMOOTH DRUM ROLLER TO ACHIEVE A SMOOTH LEVEL PATCH.
8. REFER TO CITY OF RALEIGH STANDARDS FOR TRENCHES AND PIPE BEDDING (S-4 & S-5) FOR ADDITIONAL DETAILS.
9. NO HAND PATCHING ALLOWED.
10. PAVEMENT CUTS WITHIN NCDOT ROW SHALL CONFORM TO THE APPROVED ON SITE ENCROACHMENT PERMIT.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
STANDARD ASPHALT PAVEMENT PATCH DETAIL

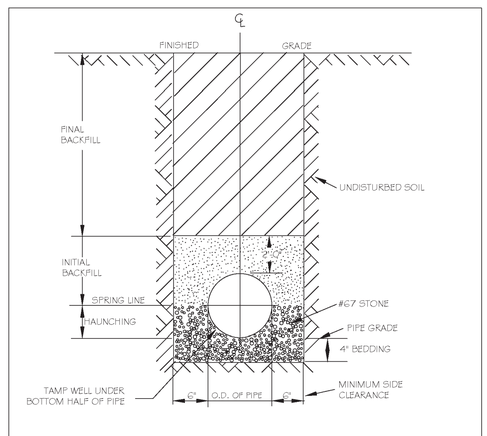
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-3	D.W.C.	11-1-99	A.B.B.	4-19-04
	RRH	3-30-00	J.P.S.	10-8-10



NOTES:
1. TRENCHES REQUIRING SHORING AND BRACING, DIMENSIONS SHALL BE TAKEN FROM THE INSIDE FACE OF THE SHORING AND BRACING.
2. NO ROCKS OR BOULDERS 4" OR LARGER TO BE USED IN INITIAL BACKFILL.
3. ALL BACKFILL MATERIAL SHALL BE SUITABLE NATIVE MATERIAL.
4. BACKFILL SHALL BE TAMPED IN 6" LIFTS IN TRAFFIC AREAS, 12" IN NON-TRAFFIC AREAS.
5. ACHIEVE 80% COMPACTION IN NON-TRAFFIC AREAS, AND 95% COMPACTION IN TRAFFIC AREAS.
6. IF IN EASEMENT 4" TOPSOIL, AND 12" CLEAN SELECT FILL MAY BE REQUIRED.
7. NO BOULDERS 8" IN DIAMETER OR GREATER ALLOWED IN FINAL BACKFILL.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
TRENCH BOTTOM DIMENSIONS & BACKFILLING REQUIREMENTS FOR DUCTILE IRON

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-4	D.W.C.	3-3-99		
	RRH	3-30-00		

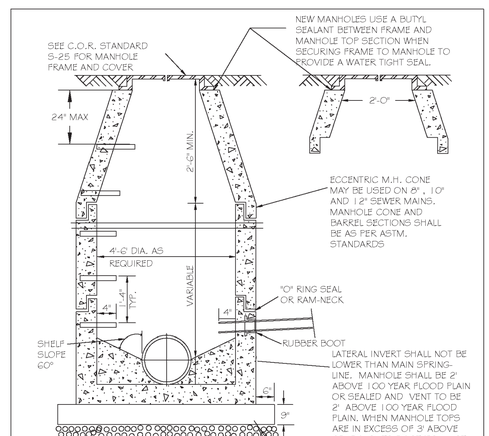


TYPICAL TRENCH BOTTOM DIMENSIONS FOR SDR 35 PVC GRAVITY PIPE

NOTES:
1. FOR TRENCHES REQUIRING SHORING AND BRACING, DIMENSIONS SHALL BE TAKEN FROM THE INSIDE FACE OF THE SHORING AND BRACING.
2. NO ROCKS OR BOULDERS 4" OR LARGER TO BE USED IN INITIAL BACKFILL.
3. ALL BACKFILL MATERIAL SHALL BE SUITABLE NATIVE MATERIAL.
4. BACKFILL SHALL BE TAMPED IN 6" LIFTS IN TRAFFIC AREAS, 12" IN NON-TRAFFIC AREAS.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
TRENCH BOTTOM DIMENSIONS AND BACKFILLING REQUIREMENTS FOR PVC GRAVITY SEWER MAIN

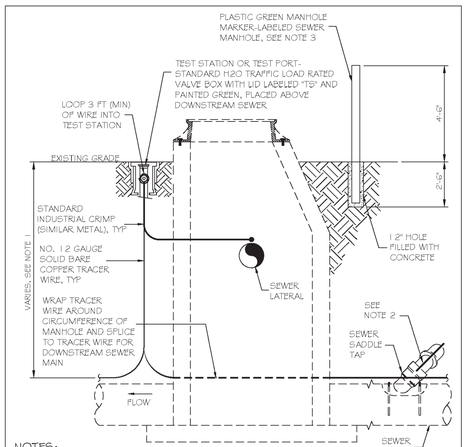
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-5	TO NOTES	3-1-87	D.W.C.	9-3-99
		7-2-82	RRH	3-30-00



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

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-20	Y.C.A.	12-31-92	ABB	2-21-05
	RRH	3-30-00	D.H.L.	6-16-05

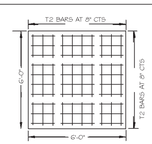
Town Certification. This design has been reviewed by the Engineer for the Town of Knightdale, and to the best of my knowledge and belief, it conforms to the requirements established in the Standard Specifications of the Town of Knightdale.
By: _____ Date: _____
Town Engineer
These plans are approved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



NOTES:
1. THE TRACER WIRE SHALL BE CONTINUOUS TO THE GREATEST EXTENT POSSIBLE. FOR GRAVITY MAIN AND OR LATERAL INSTALLATIONS LESS THAN 8 FT, THE TRACING WIRE SHALL BE ATTACHED TO THE PIPE. TRACER WIRE SHALL BE LAID FLAT AND SECURELY AFFIXED TO THE PIPE AT 10 FOOT INTERVALS. FOR GRAVITY MAIN AND OR LATERAL INSTALLATION DEEPER THAN 8 FT, THE TRACING WIRE SHALL BE INSTALLED AT A DEPTH OF 7-8 FT. THE WIRE SHALL BE PROTECTED FROM DAMAGE DURING THE EXECUTION OF THE WORK. NO BREAKS OR CUTS IN THE TRACER WIRE SHALL BE PERMITTED.
2. WHERE LATERAL TAPS ARE MADE BY SERVICE SADDLES, THE TRACER WIRE SHALL NOT BE ALLOWED TO TO BE PLACED BETWEEN THE SADDLE AND MAIN.
3. MANHOLE MARKERS SHALL BE PLACED ADJACENT TO MANHOLES AT THE DISCRETION OF OWNER OR OWNERS REPRESENTATIVE.

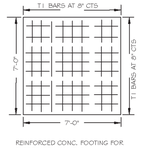
CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
GRAVITY SEWER MAIN TRACER WIRE AND MANHOLE MARKER

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-20A	WKD	09-14		



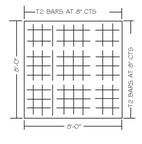
REINFORCED CONC. FOOTING FOR 4' PRECAST MANHOLE

BILL OF MATERIAL FOR 4' MANHOLE				
BAR	SIZE	LENGTH	NO.	WT. LBS.
T2	#5	5'-0"	18	103
CL. "A" CONCRETE TOTAL CU. YDS.				.000



REINFORCED CONC. FOOTING FOR 5' PRECAST MANHOLE

BILL OF MATERIAL FOR 4' MANHOLE				
BAR	SIZE	LENGTH	NO.	WT. LBS.
T1	#5	6'-0"	20	126
CL. "A" CONCRETE TOTAL CU. YDS.				.361



REINFORCED CONC. FOOTING FOR 6' PRECAST MANHOLE

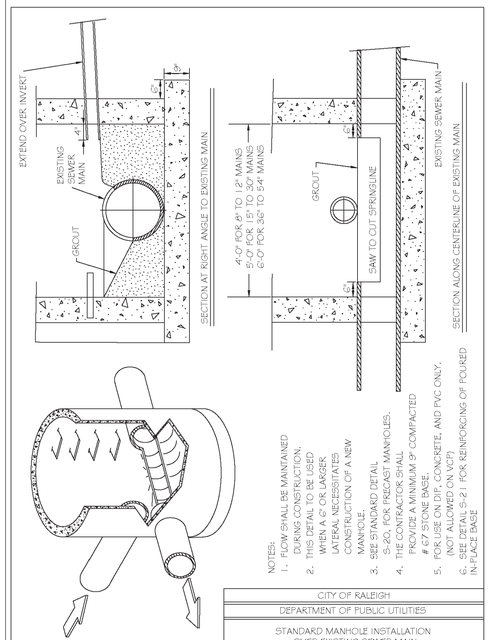
BILL OF MATERIAL FOR 4' MANHOLE				
BAR	SIZE	LENGTH	NO.	WT. LBS.
T2	#5	7'-0"	24	165
CL. "A" CONCRETE TOTAL CU. YDS.				1.778

* ALL BASES ARE MINIMUM 9" THICK

T1 OR T2 BAR
STRAIGHT BAR

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
EXTENDED BASE OR CAST-IN-PLACE REINFORCED CONCRETE BASE

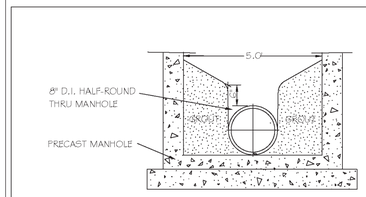
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-21		3-1-87	ABB	2-9-05
	RRH	3-30-00		



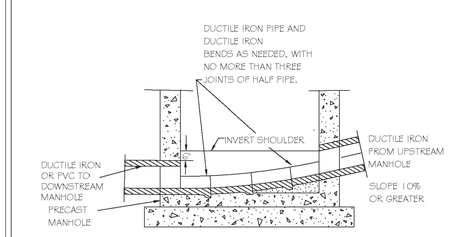
NOTES:
1. FLOW SHALL BE MAINTAINED DURING CONSTRUCTION.
2. THIS DETAIL TO BE USED WHEN A 6" OR LARGER LATERAL NECESSITATES CONSTRUCTION OF A NEW MANHOLE.
3. SEE STANDARD DETAIL S-20, FOR PRECAST MANHOLES.
4. THE CONTRACTOR SHALL PROVIDE A MINIMUM 9" COMPACTED #67 STONE BASE.
5. FOR USE ON DIP, CONCRETE, AND PVC ONLY. (NOT ALLOWED ON VCP)
6. SEE DETAIL S-21 FOR REINFORCING OF POURED IN-PLACE BASE

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
STANDARD MANHOLE INSTALLATION OVER EXISTING SEWER MAIN

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-22	Y.C.A.	12-31-91	A.B.B.	1-19-05
	RRH	3-30-00	D.H.L.	6/16/05



SECTION AT RIGHT ANGLE TO CENTER LINE OF PIPE



SECTION ALONG CENTER LINE OF PIPE

NOTE:
NO HORIZONTAL ALIGNMENT CHANGE CAN BE MADE WITH IN THIS MANHOLE TYPE. USE ON GRADES 10% OR GREATER.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
STANDARD HIGH VELOCITY MANHOLE INVERT

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-23		3-1-87	RRH	3-30-00
	Y.C.A.	12-31-91		

Public
Sewer Collection / Extension System
The City of Raleigh consents to the connection and extension of the City's public sewer system as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook.

City of Raleigh
Public Utilities Department Permit # _____
Authorization to Construct _____
Date _____

REVISED
1/26/2022 8:22 AM

NOT RELEASED FOR CONSTRUCTION

TOK SU-2-01

REVISIONS:
1. 2021-06-04 PER TOK COMMENTS
2. 2021-06-29 PER ENGINEER, PER TOK COMMENTS
3. 2022-01-26 PER CLIENT COMMENTS

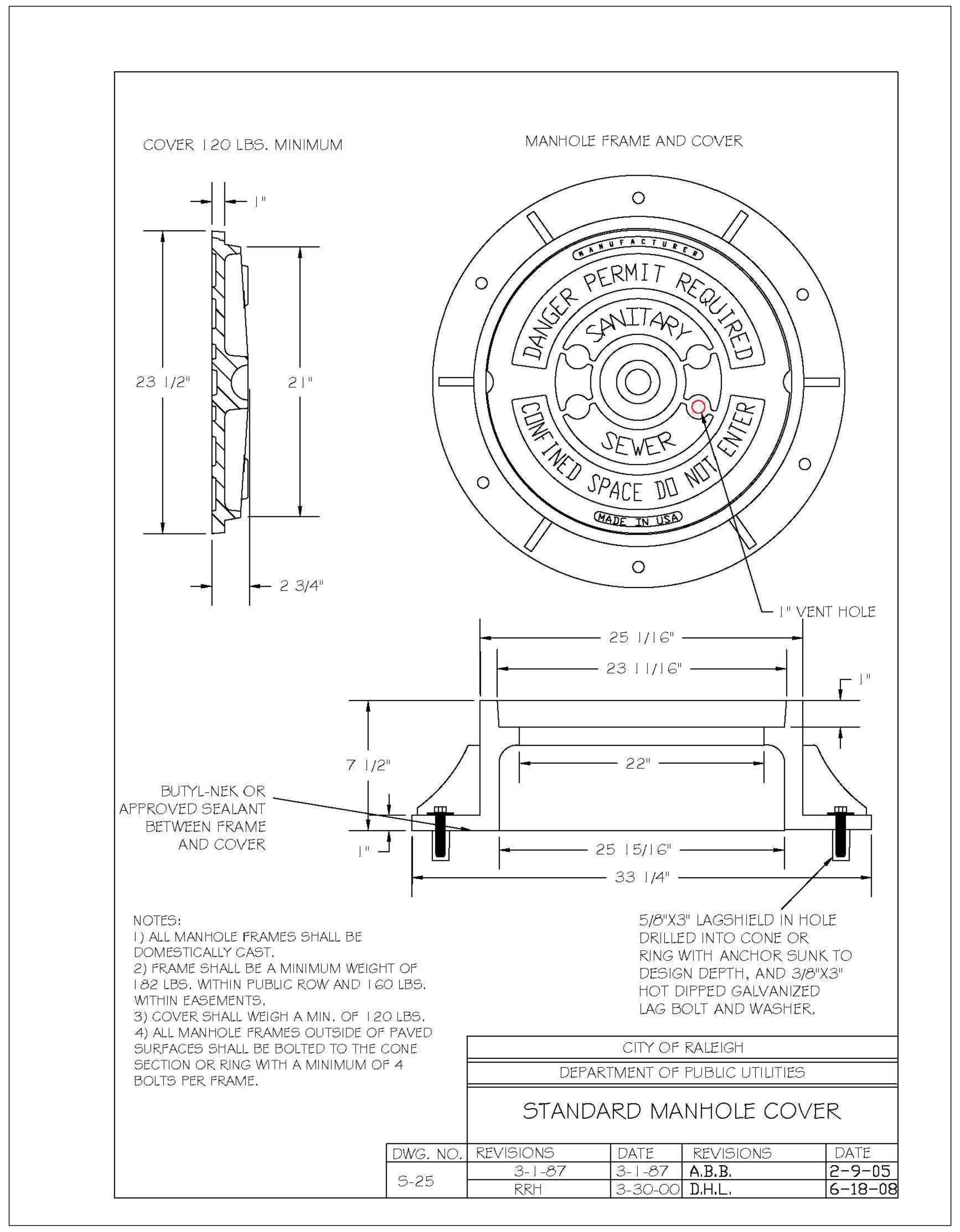
314 EAST MAIN STREET
CLAYTON, NC 27520
info@adamsandhodge.com
919.243.1332
FIRM # C-4187

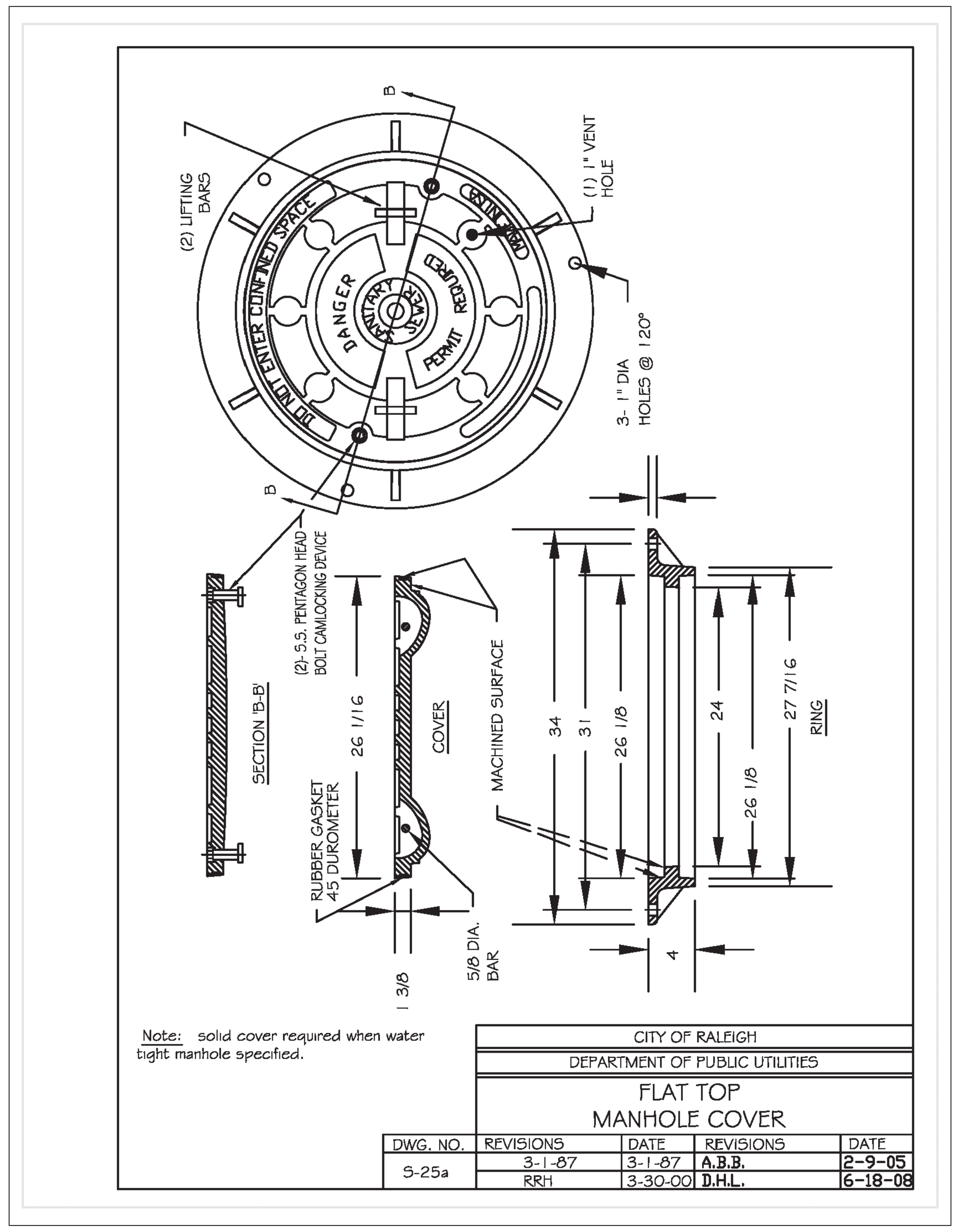
ADAMS & HODGE ENGINEERING, PC

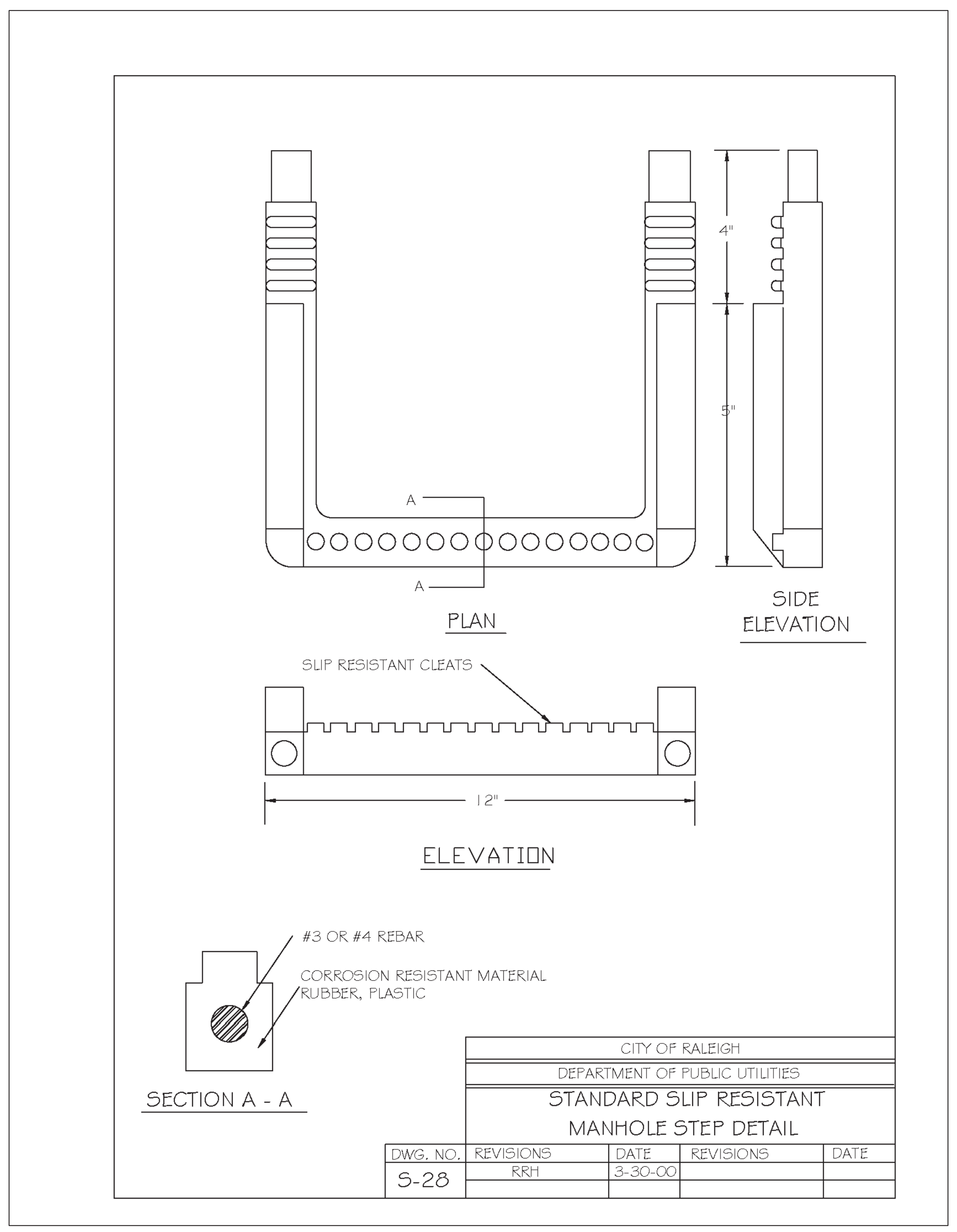
MINGO CREEK PHASE 7
TOWN OF KNIGHTDALE, WAKE COUNTY, NORTH CAROLINA

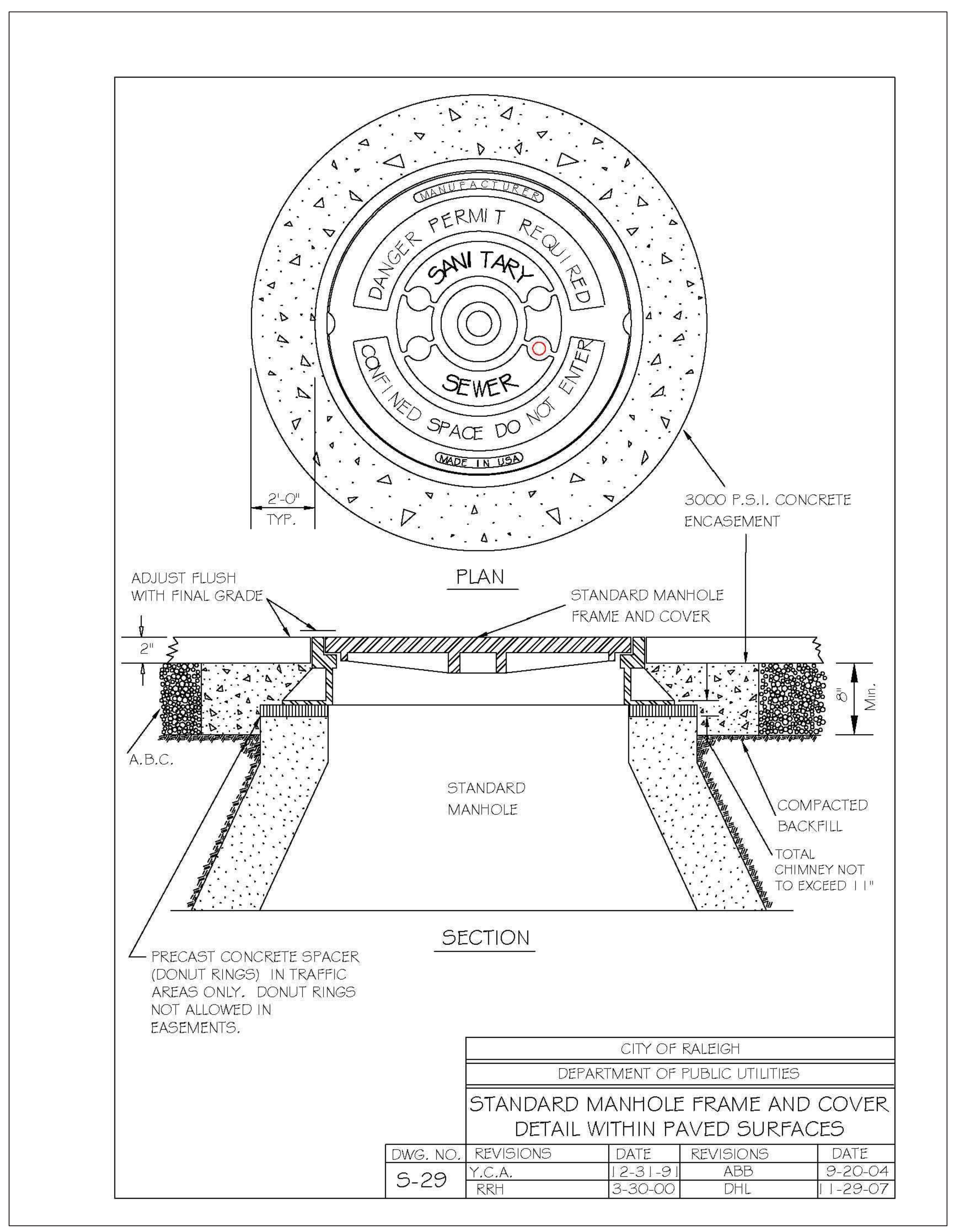
DETAILS - WATER (C.O.R. STD)

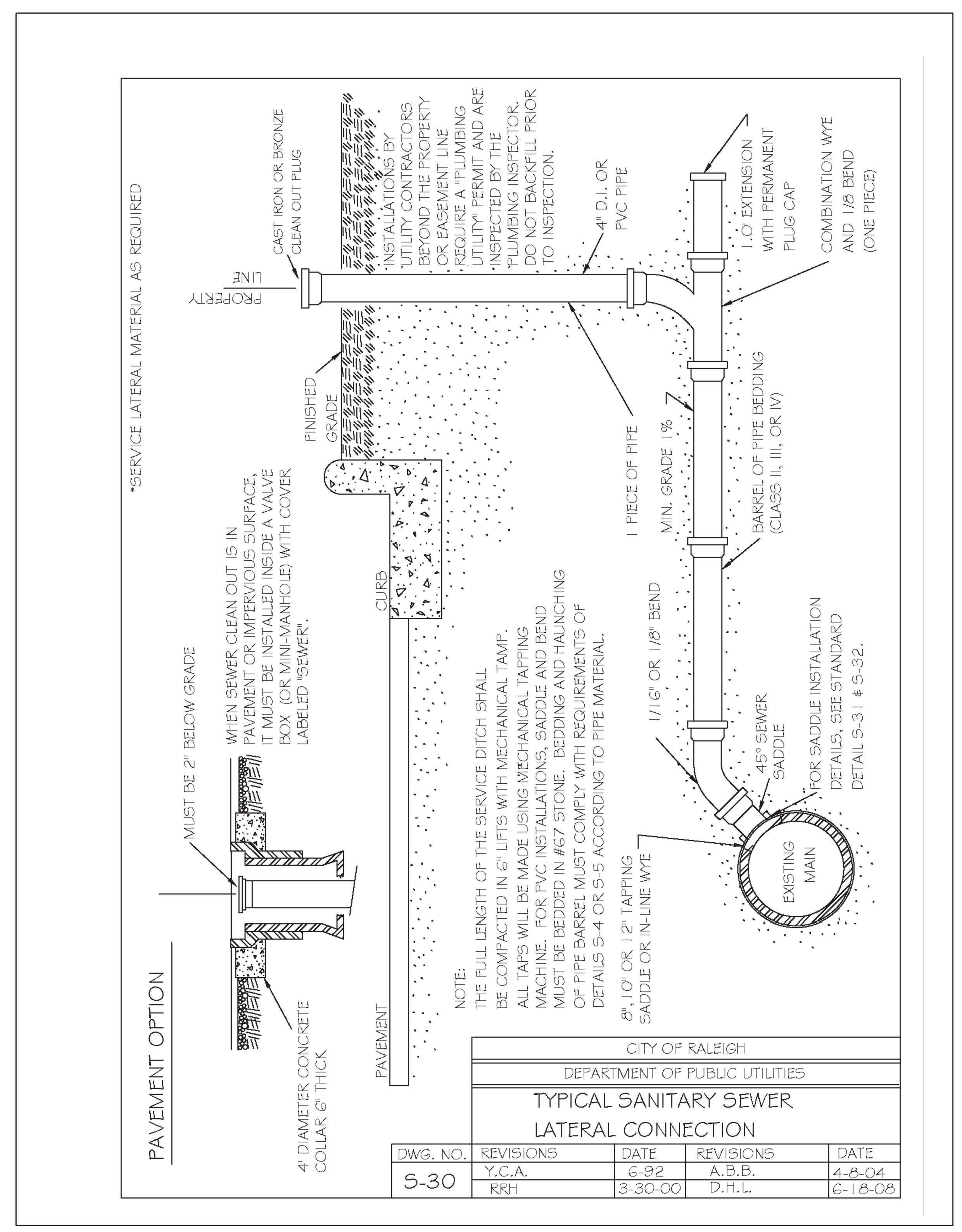
DESIGN	DCA
DRAWN	ADS/BRL
CHECKED	DCA
HORIZONTAL SCALE	SEE GRAPHIC SCALE
VERTICAL SCALE	N/A
DATE	02/24/2017
JOB NO.	
SHEET	D7

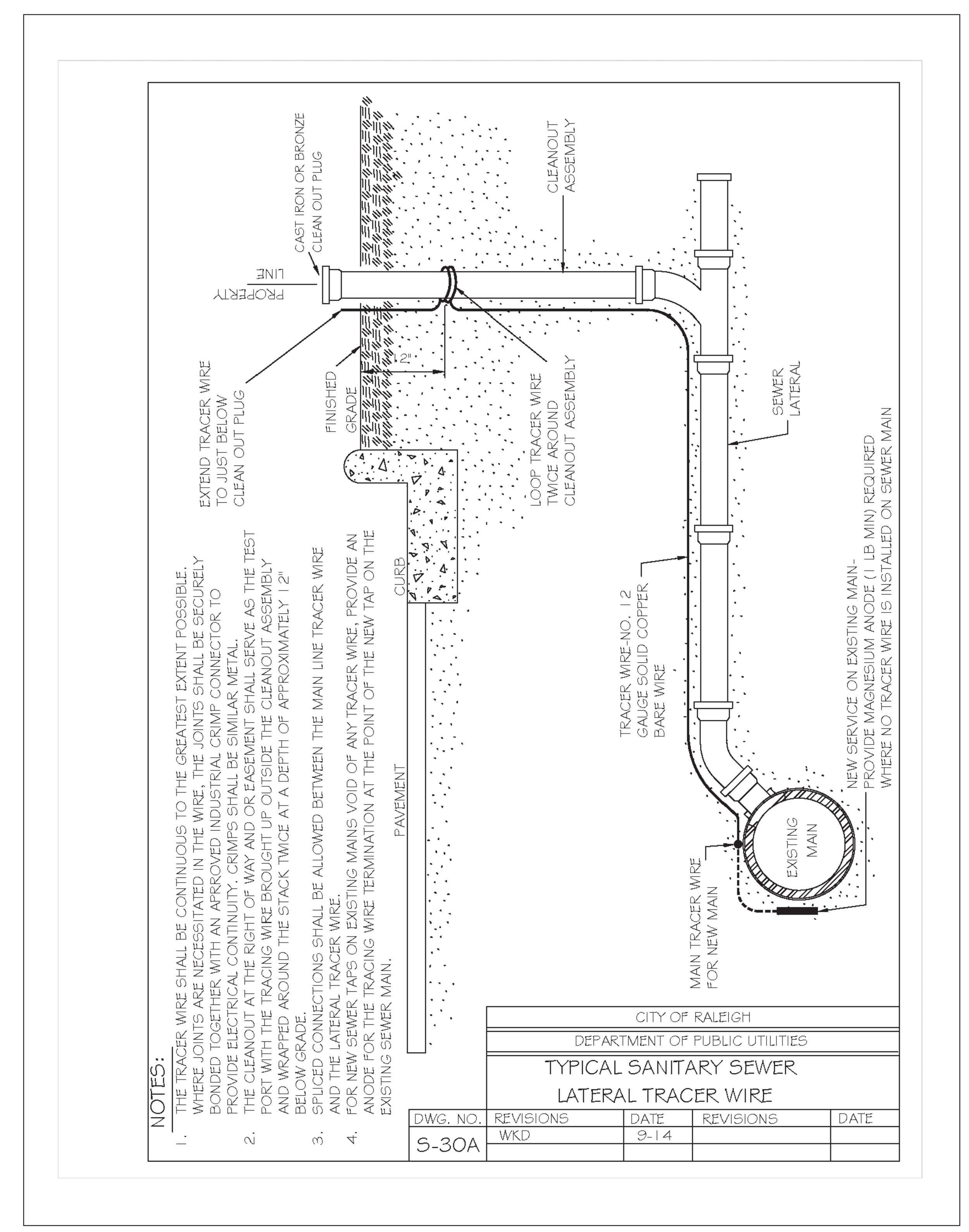












Town Certification. This design has been reviewed by the Engineer for the Town of Knightdale, and to the best of my knowledge and belief, it conforms to the requirements established in the Standard Specifications of the Town of Knightdale.

By: ____________________ Date: ____________

Town Engineer

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

By: ____________________ Date: ____________

Administrator

Public

Water Distribution / Extension System

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

City of Raleigh
Public Utilities Department Permit # ____________

Authorization to Construct ____________

Date ____________

REVISED
1/26/2022 8:22 AM

NOT RELEASED FOR CONSTRUCTION

ADAMS & HODGE ENGINEERING, PC

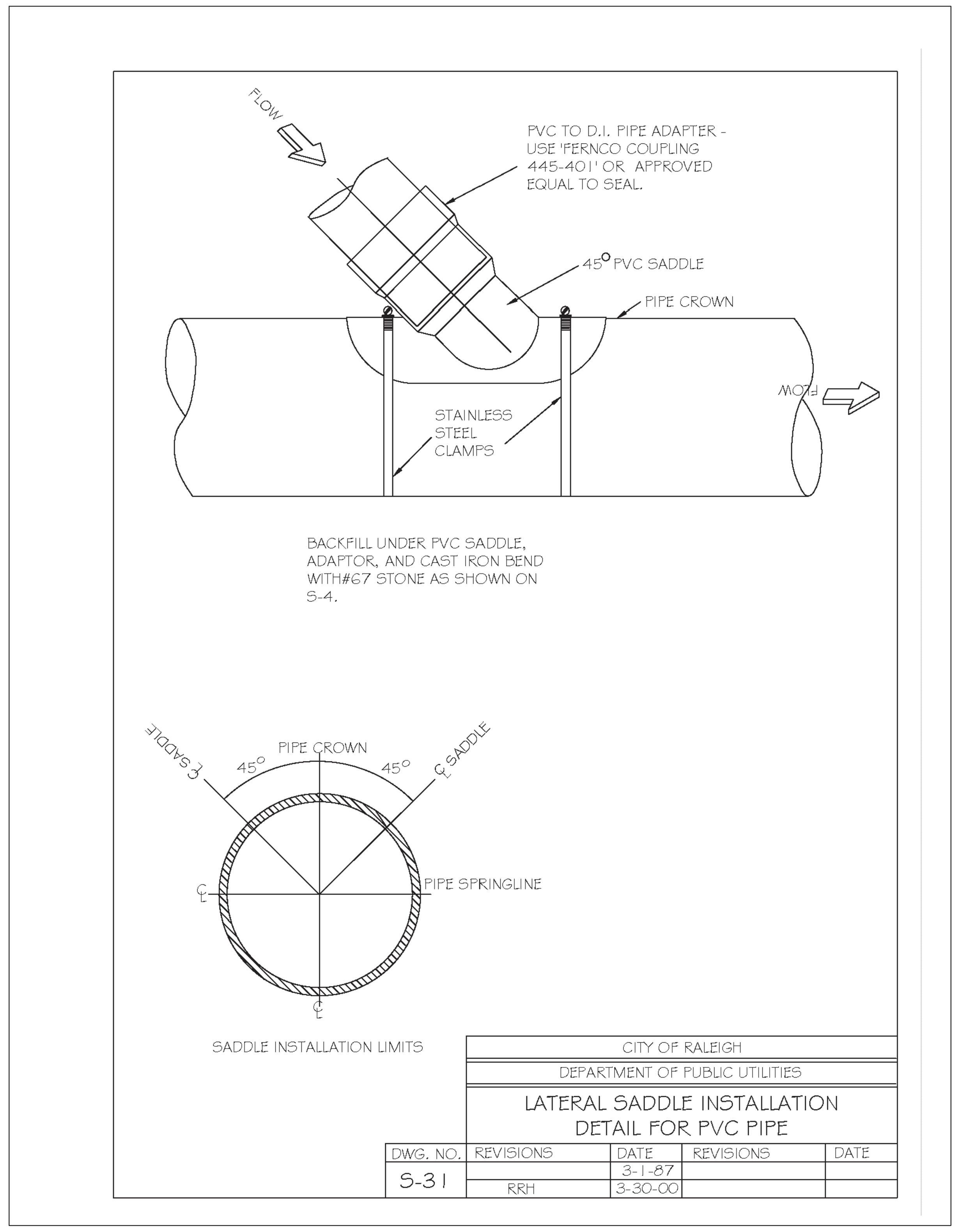
314 EAST MAIN STREET
CLAYTON, NC 27520
info@adamsandhodge.com
919-243-1332
FIRM # C-4187

MINGO CREEK PHASE 7
TOWN OF KNIGHTDALE, WAKE COUNTY, NORTH CAROLINA

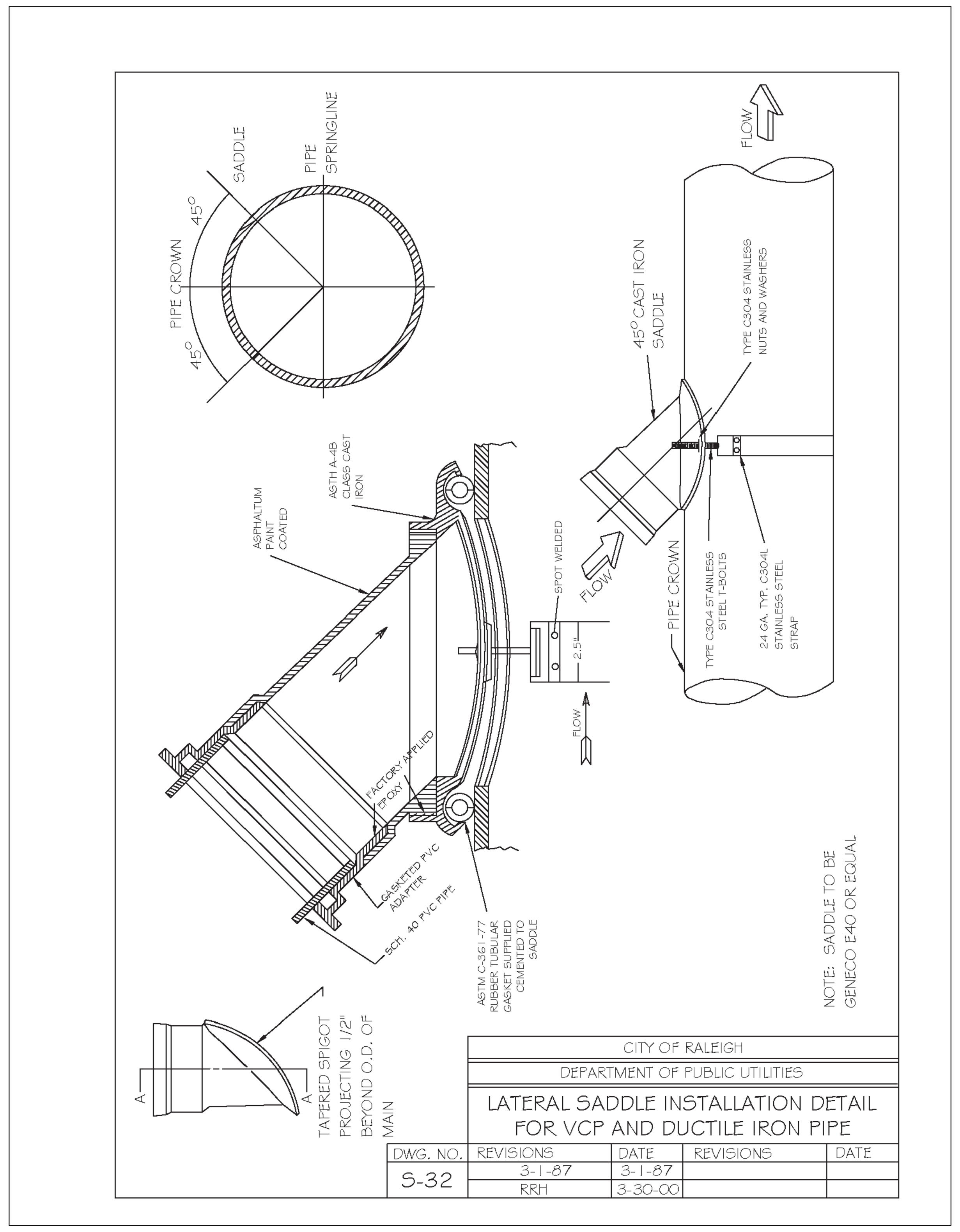
DETAILS - SEWER (C.O.R. STD)

DESIGN DCA
DRAWN ADS/BRL
CHECKED DCA
HORIZONTAL SCALE SEE GRAPHIC SCALE
VERTICAL SCALE N/A
DATE 02/24/2017
JOB NO.
SHEET D8

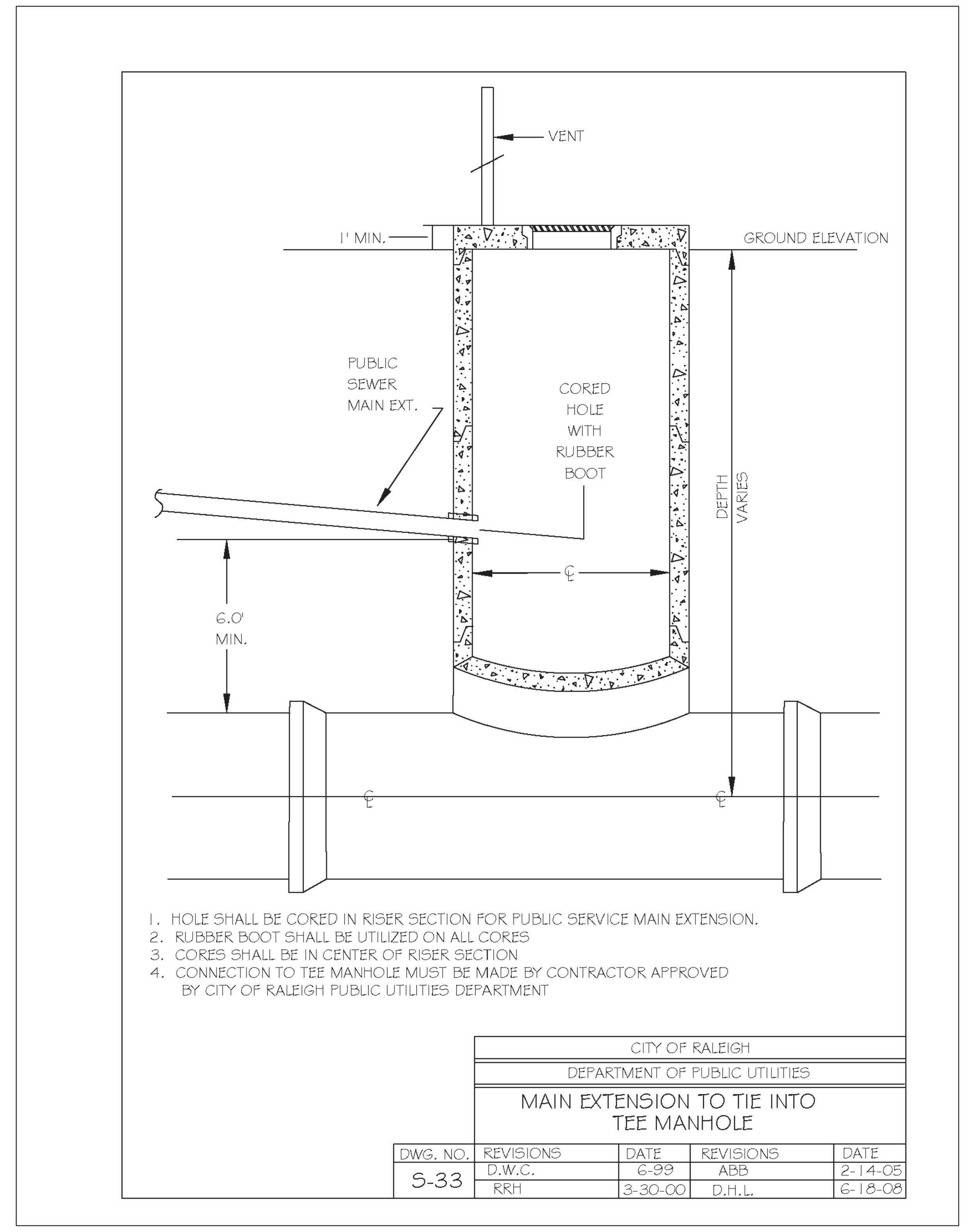
TOK SU-2-01



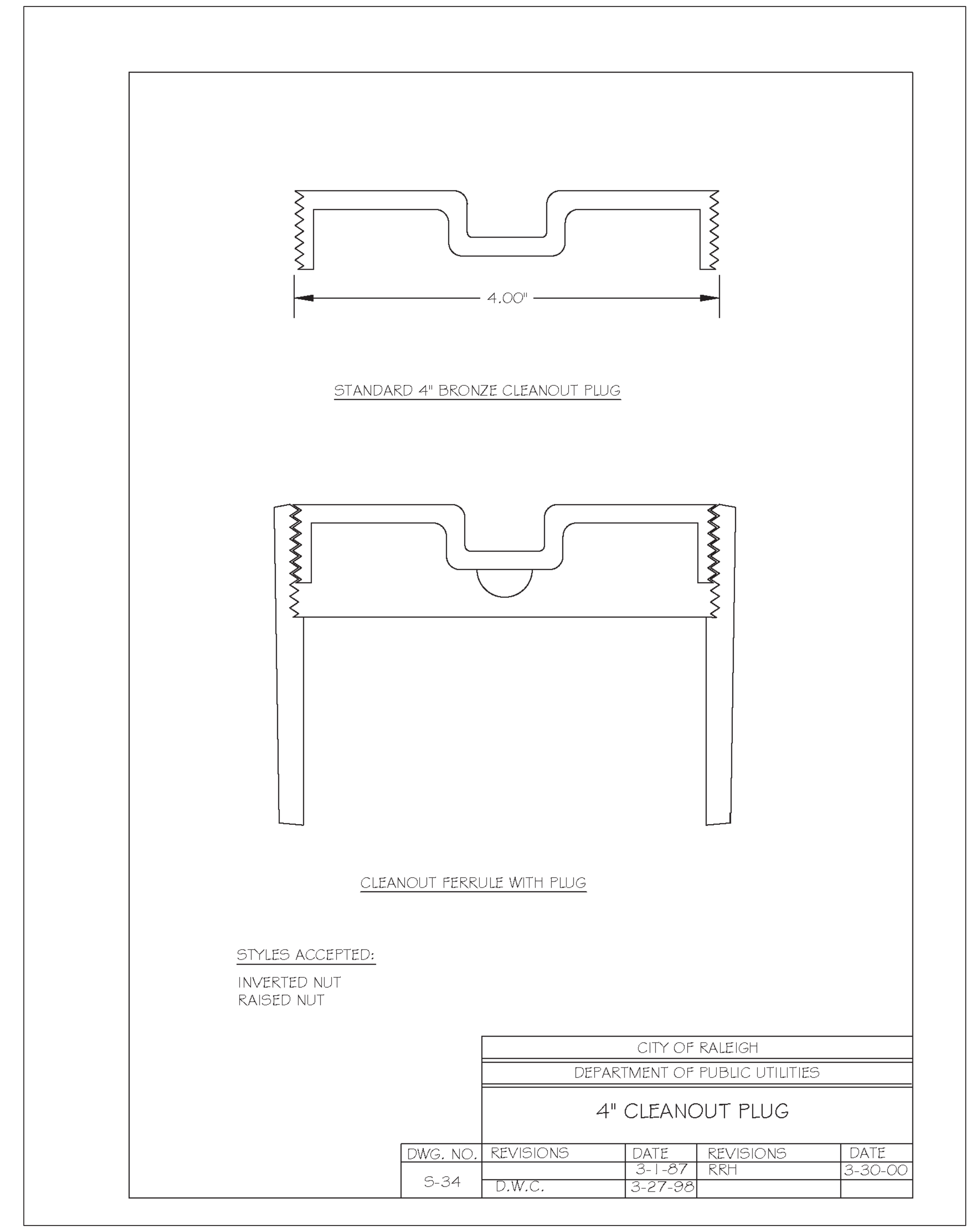
FLOW
PVC TO D.I. PIPE ADAPTER - USE 'FERNCO COUPLING 445-401' OR APPROVED EQUAL TO SEAL.
45° PVC SADDLE
PIPE CROWN
FLOW
STAINLESS STEEL CLAMPS
BACKFILL UNDER PVC SADDLE, ADAPTOR, AND CAST IRON BEND WITH#67 STONE AS SHOWN ON S-4.
PIPE CROWN
45°
45°
PIPE SPRINGLINE
SADDLE INSTALLATION LIMITS
CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
LATERAL SADDLE INSTALLATION DETAIL FOR PVC PIPE
DWG. NO. S-31
REVISIONS RRH
DATE 3-1-87 3-30-00

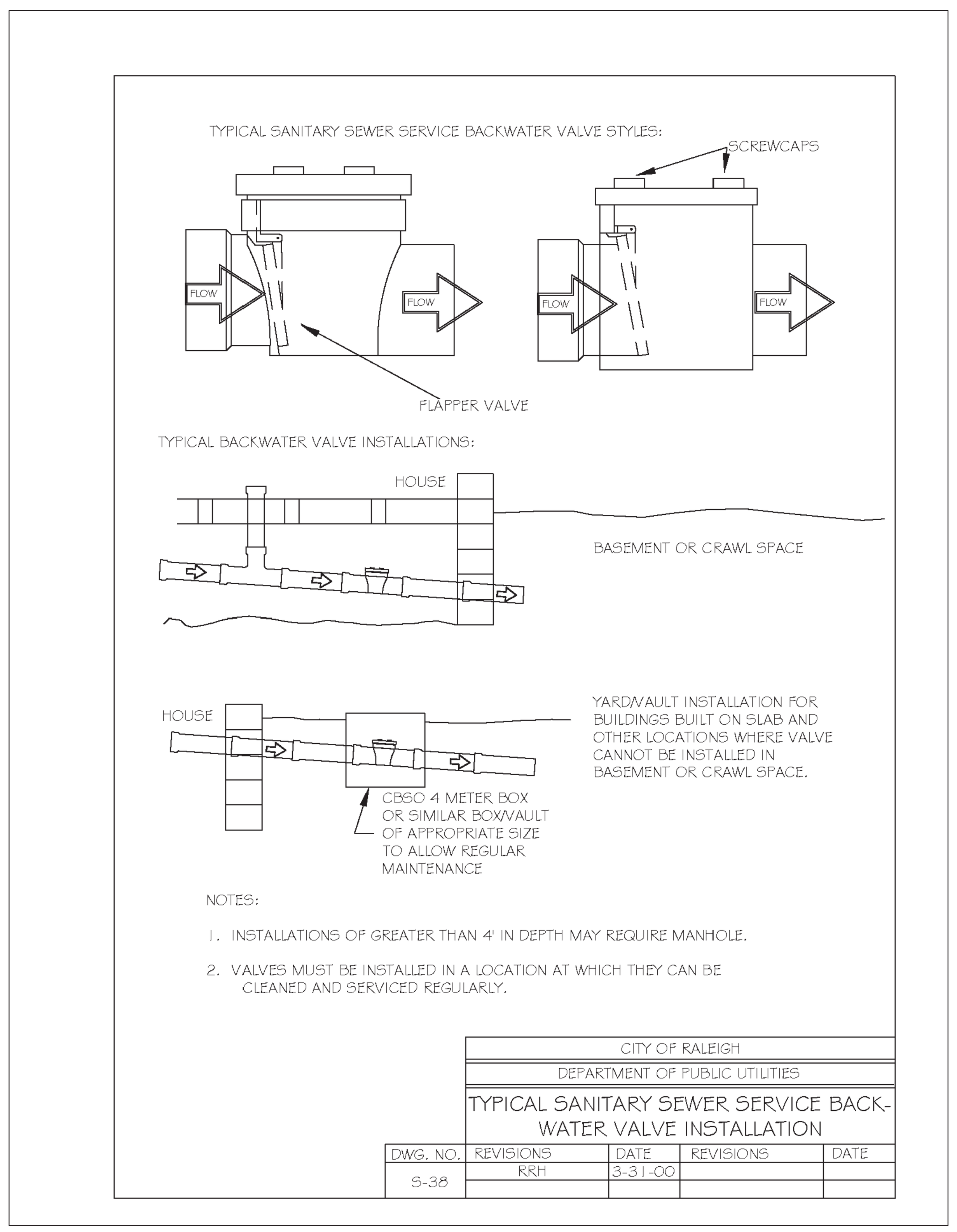


SADDLE
PIPE SPRINGLINE
PIPE CROWN
45°
FLOW
45° CAST IRON SADDLE
PIPE CROWN
FLOW
NOTE: SADDLE TO BE GENECO E40 OR EQUAL
CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
LATERAL SADDLE INSTALLATION DETAIL FOR VCP AND DUCTILE IRON PIPE
DWG. NO. S-32
REVISIONS RRH
DATE 3-1-87 3-30-00

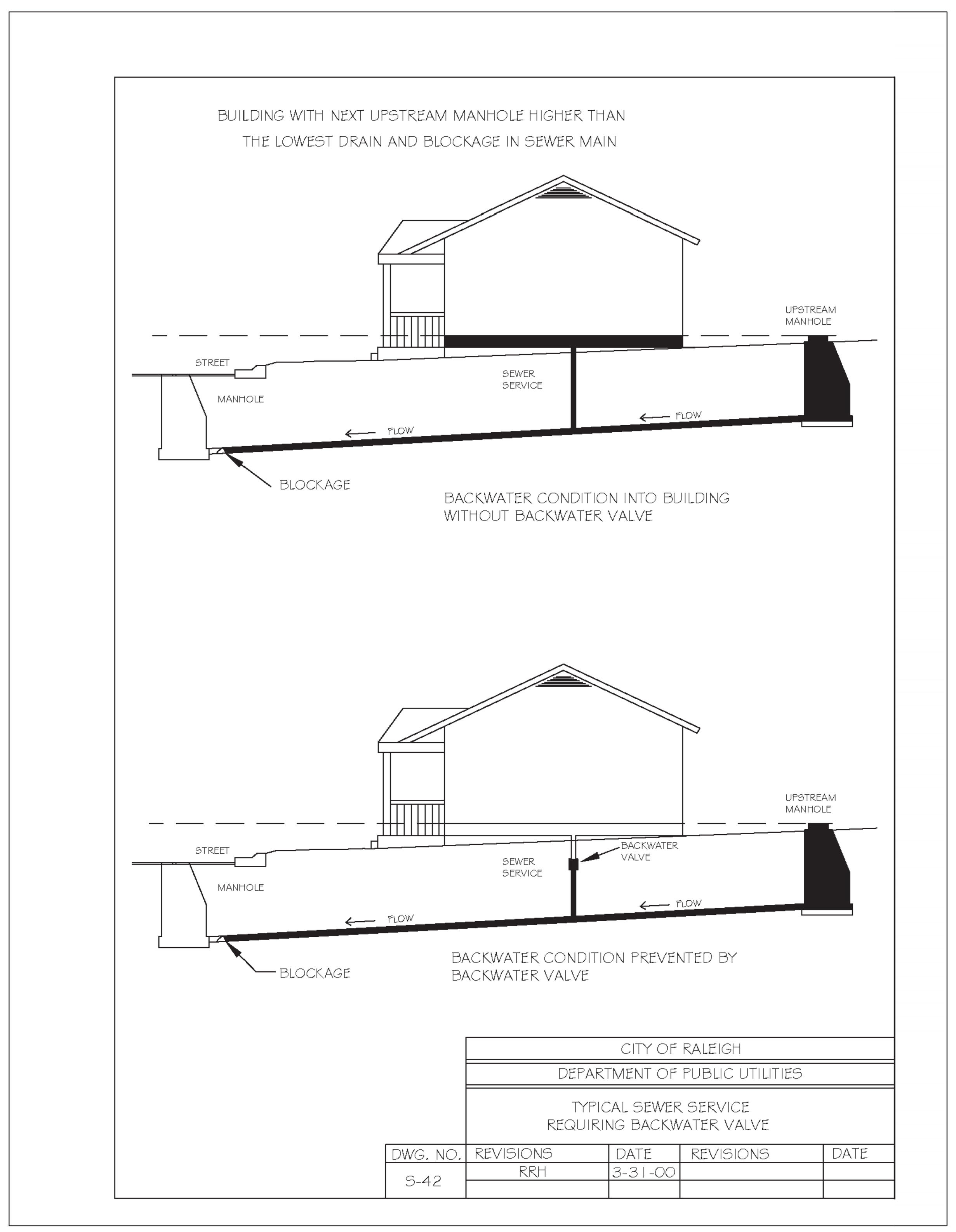


VENT
1' MIN.
GROUND ELEVATION
PUBLIC SEWER MAIN EXT.
CORED HOLE WITH RUBBER BOOT
DEPTH VARIES
6.0' MIN.
1. HOLE SHALL BE CORED IN RISER SECTION FOR PUBLIC SERVICE MAIN EXTENSION.
2. RUBBER BOOT SHALL BE UTILIZED ON ALL CORES
3. CORES SHALL BE IN CENTER OF RISER SECTION
4. CONNECTION TO TEE MANHOLE MUST BE MADE BY CONTRACTOR APPROVED BY CITY OF RALEIGH PUBLIC UTILITIES DEPARTMENT
CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
MAIN EXTENSION TO TIE INTO TEE MANHOLE
DWG. NO. S-33

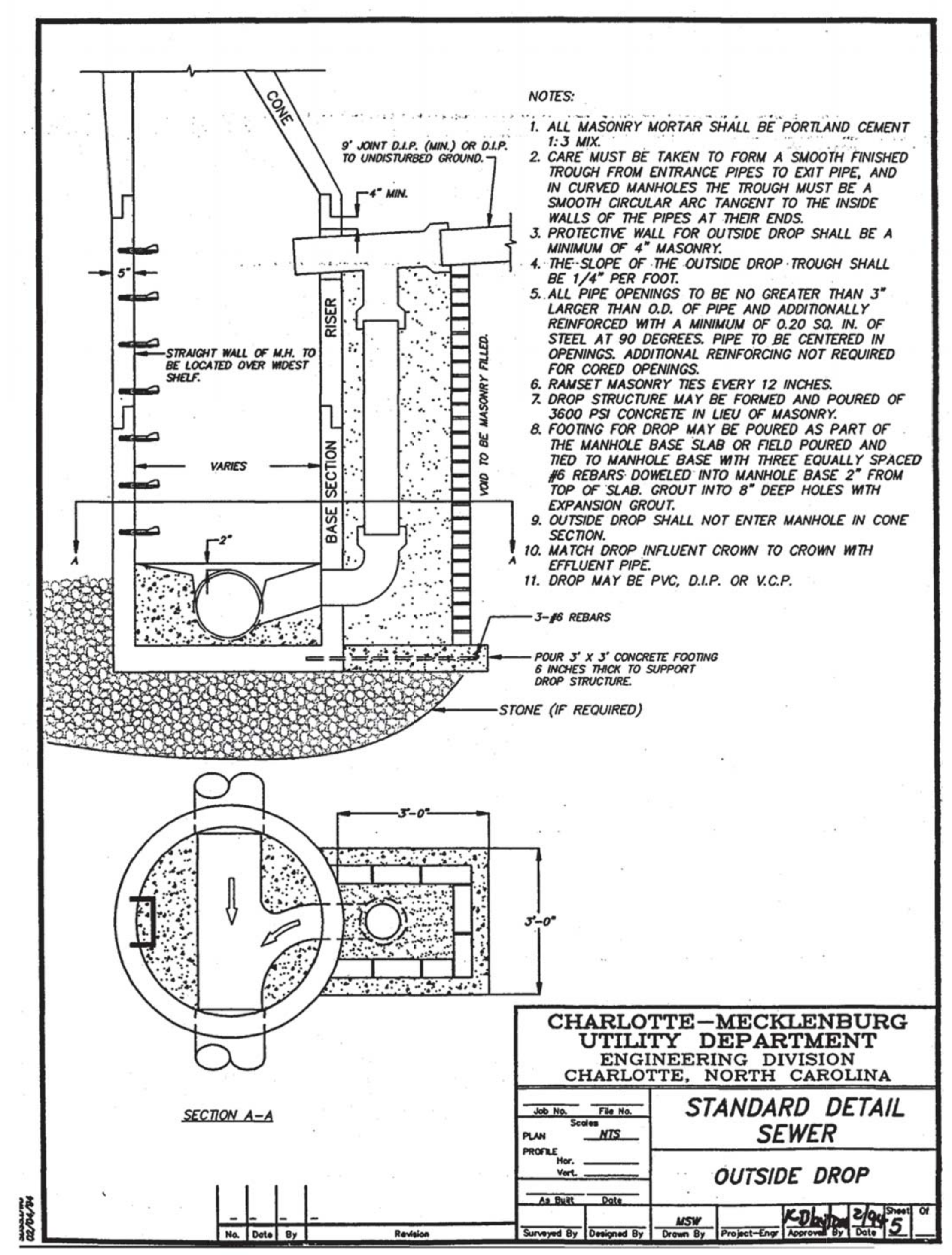




TYPICAL SANITARY SEWER SERVICE BACKWATER VALVE STYLES:
SCREWCAPS
FLOW
FLAPPER VALVE
TYPICAL BACKWATER VALVE INSTALLATIONS:
HOUSE
BASEMENT OR CRAWL SPACE
HOUSE
YARD/VAULT INSTALLATION FOR BUILDINGS BUILT ON SLAB AND OTHER LOCATIONS WHERE VALVE CANNOT BE INSTALLED IN BASEMENT OR CRAWL SPACE.
CBSO 4 METER BOX OR SIMILAR BOX/VAULT OF APPROPRIATE SIZE TO ALLOW REGULAR MAINTENANCE
NOTES:
1. INSTALLATIONS OF GREATER THAN 4' IN DEPTH MAY REQUIRE MANHOLE.
2. VALVES MUST BE INSTALLED IN A LOCATION AT WHICH THEY CAN BE CLEANED AND SERVICED REGULARLY.
CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
TYPICAL SANITARY SEWER SERVICE BACK-WATER VALVE INSTALLATION
DWG. NO. S-38
REVISIONS RRH
DATE 3-31-00



BUILDING WITH NEXT UPSTREAM MANHOLE HIGHER THAN THE LOWEST DRAIN AND BLOCKAGE IN SEWER MAIN
STREET
MANHOLE
SEWER SERVICE
UPSTREAM MANHOLE
FLOW
BLOCKAGE
BACKWATER CONDITION INTO BUILDING WITHOUT BACKWATER VALVE
BACKWATER VALVE
BACKWATER CONDITION PREVENTED BY BACKWATER VALVE
CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
TYPICAL SEWER SERVICE REQUIRING BACKWATER VALVE
DWG. NO. S-42
REVISIONS RRH
DATE 3-31-00



NOTES:
1. ALL MASONRY MORTAR SHALL BE PORTLAND CEMENT 1:3 MIX.
2. CARE MUST BE TAKEN TO FORM A SMOOTH FINISHED TROUGH FROM ENTRANCE PIPES TO EXIT PIPE, AND IN CURVED MANHOLES THE TROUGH MUST BE A SMOOTH CIRCULAR ARC TANGENT TO THE INSIDE WALLS OF THE PIPES AT THEIR ENDS.
3. PROTECTIVE WALL FOR OUTSIDE DROP SHALL BE A MINIMUM OF 4" MASONRY.
4. THE SLOPE OF THE OUTSIDE DROP TROUGH SHALL BE 1/4" PER FOOT.
5. ALL PIPE OPENINGS TO BE NO GREATER THAN 3" LARGER THAN O.D. OF PIPE AND ADDITIONALLY REINFORCED WITH A MINIMUM OF 0.20 SQ. IN. OF STEEL AT 90 DEGREES. PIPE TO BE CENTERED IN OPENINGS. ADDITIONAL REINFORCING NOT REQUIRED FOR CORED OPENINGS.
6. RAMSET MASONRY TIES EVERY 12 INCHES.
7. DROP STRUCTURE MAY BE FORMED AND POURED OF 3600 PSI CONCRETE IN LIEU OF MASONRY.
8. FOOTING FOR DROP MAY BE POURED AS PART OF THE MANHOLE BASE SLAB OR FIELD POURED AND TIED TO MANHOLE BASE WITH THREE EQUALLY SPACED #6 REBARS DOWELED INTO MANHOLE BASE 2" FROM TOP OF SLAB. GROUT INTO 8" DEEP HOLES WITH EXPANSION GROUT.
9. OUTSIDE DROP SHALL NOT ENTER MANHOLE IN CONE SECTION.
10. MATCH DROP INFLUENT CROWN TO CROWN WITH EFFLUENT PIPE.
11. DROP MAY BE PVC, D.I.P. OR V.C.P.
CONE
RISER
BASE SECTION
VOID TO BE MASONRY FILLED.
VARIES
3-#6 REBARS
POUR 3' X 3' CONCRETE FOOTING 6 INCHES THICK TO SUPPORT DROP STRUCTURE.
STONE (IF REQUIRED)
SECTION A-A
CHARLOTTE-MECKLENBURG UTILITY DEPARTMENT
ENGINEERING DIVISION
CHARLOTTE, NORTH CAROLINA
STANDARD DETAIL SEWER
OUTSIDE DROP

July 27, 1995 XV-61 Sewer Specifications/Details (SD)

REVISED
1/26/2022 8:22 AM

NOT RELEASED FOR CONSTRUCTION

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

Public
Water Distribution / Extension System
The City of Raleigh consents to the connection and extension of the City's public water system as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook.
City of Raleigh
Public Utilities Department Permit # ____________________
Authorization to Construct ____________________
Date ____________________

TOK SU-2-01

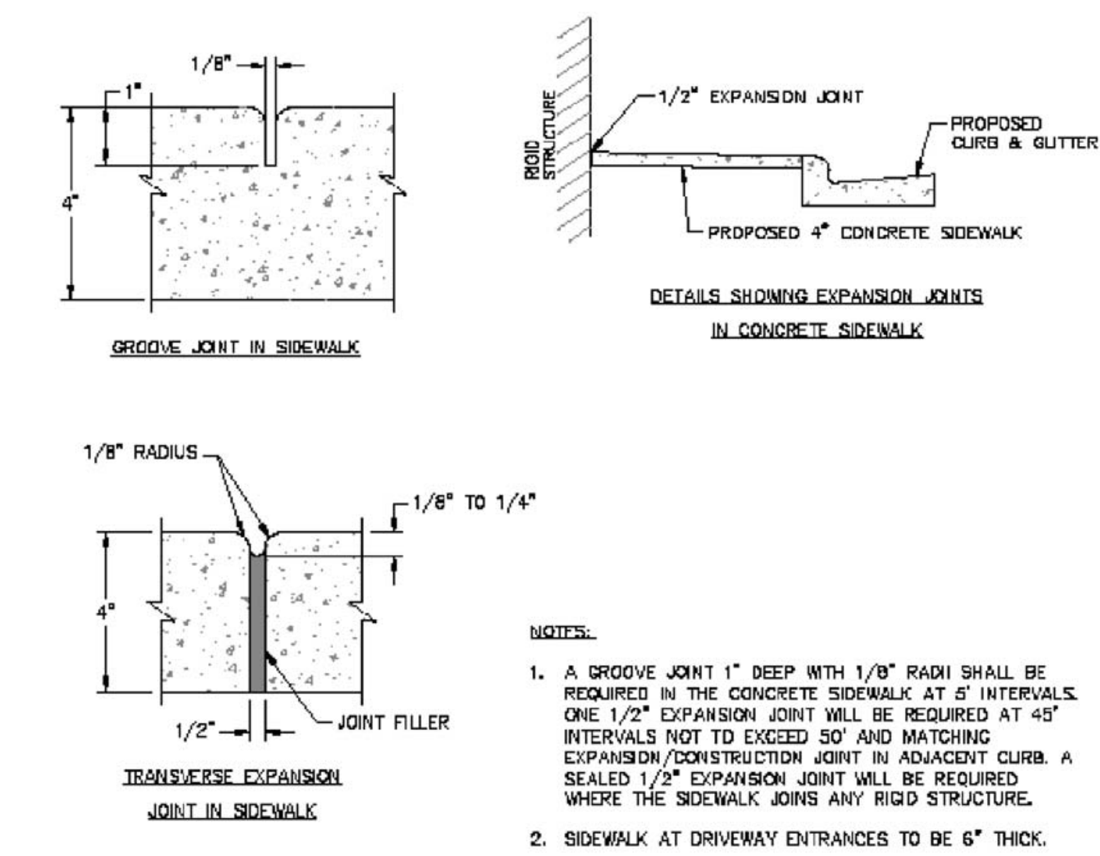
REVISIONS:
1. 2019-06-14 PER TOK COMMENTS
2. 2021-08-26 PER ENGINEER, TOK AND COR COMMENTS
3. 2022-01-26 PER CLIENT COMMENTS

314 EAST MAIN STREET
CLAYTON, NC 27520
info@adamsandhodge.com
919-243-1332
FIRM # C-4187
ADAMS & HODGE ENGINEERING, PC

MINGO CREEK PHASE 7
TOWN OF KNIGHTDALE, WAKE COUNTY, NORTH CAROLINA

DETAILS - SEWER (C.O.R. STD)

DESIGN	DCA
DRAWN	ADS/BRL
CHECKED	DCA
HORIZONTAL SCALE	SEE GRAPHIC SCALE
VERTICAL SCALE	N/A
DATE	02/24/2017
JOB NO.	
SHEET	D9



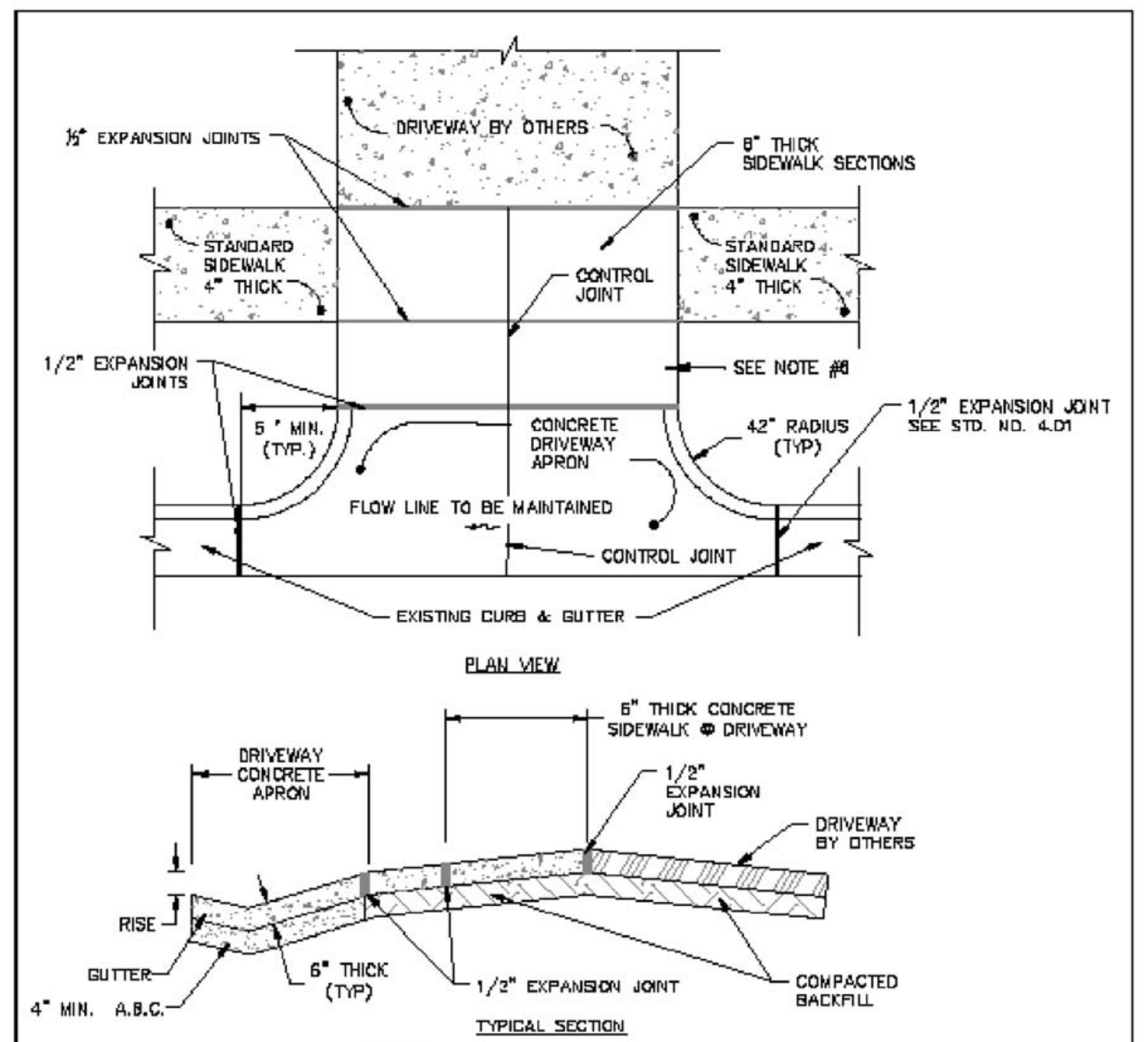
NOTES:

1. A GROOVE JOINT 1" DEEP WITH 1/8" RADII SHALL BE REQUIRED IN THE CONCRETE SIDEWALK AT 5' INTERVALS. ONE 1/2" EXPANSION JOINT WILL BE REQUIRED AT 45' INTERVALS NOT TO EXCEED 50' AND MATCHING EXPANSION/CONSTRUCTION JOINT IN ADJACENT CURB. A SEALED 1/2" EXPANSION JOINT WILL BE REQUIRED WHERE THE SIDEWALK JOINS ANY RIGID STRUCTURE.
2. SIDEWALK AT DRIVEWAY ENTRANCES TO BE 6" THICK.
3. WIDTH OF SIDEWALK ON THOROUGHFARE STREETS SHALL BE A MINIMUM OF 5'. WIDTH OF SIDEWALKS IN THE CENTRAL BUSINESS DISTRICT WILL BE DETERMINED BY THE TOWN ENGINEER.
4. WIDTH OF SIDEWALKS ON NON-THOROUGHFARE STREETS SHALL BE A MINIMUM OF 5' UNLESS OTHERWISE SPECIFIED BY THE TOWN'S UNIFIED DEVELOPMENT ORDINANCE.
5. SIDEWALK TO BE POURED TO END OF RADIUS AT INTERSECTING STREETS.
6. CONCRETE COMPRESSIVE STRENGTH SHALL BE 3600 PSI IN 28 DAYS.

2 of 2

REVISIONS	
DATE	DESCRIPTION

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

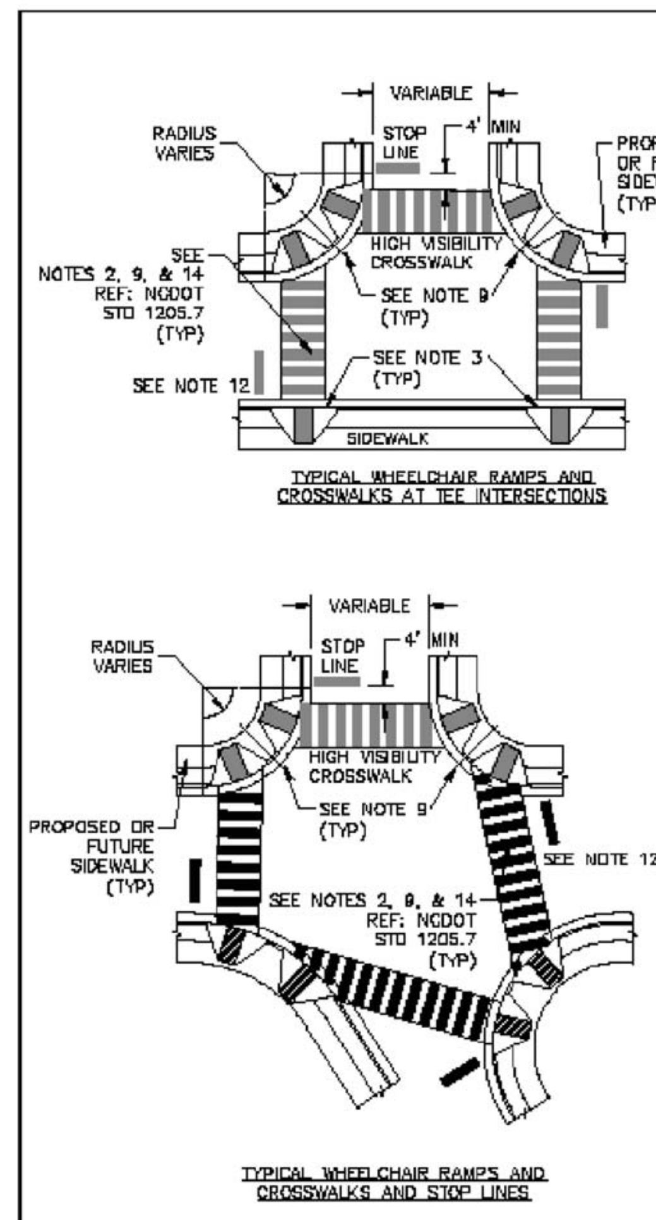


NOTES:

1. RESIDENTIAL DRIVEWAYS TO BE 12' TO 18'.
2. COMMERCIAL DRIVEWAYS TO BE A MAXIMUM OF 36' WIDE.
3. CONCRETE SHALL BE 3000 P.S.I.
4. CONTROL JOINTS NOT TO EXCEED 10' ON CENTER.
5. CURB RADIUS SHALL NOT RISE MORE THAN 1 (ONE) INCH.
6. IF THE DRIVEWAY SECTION BETWEEN THE SIDEWALK AND THE DRIVEWAY APRON IS 18" OR LESS THE SIDEWALK WILL BE WIDENED TO THE APRON AND AN EXPANSION JOINT ELIMINATED.
7. DRIVEWAY SHALL BE A MINIMUM OF 5 FEET FROM PROPERTY LINE.

REVISIONS	
DATE	DESCRIPTION

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



NOTES:

3. NC GEN. ST. 136-44.14 REQUIRES THAT ALL STREET CURBS BEING CONSTRUCTED OR RECONSTRUCTED SHALL INCLUDE WHEELCHAIR RAMPS AT ALL INTERSECTIONS AND OTHER POINTS OF PEDESTRIAN TRAFFIC.

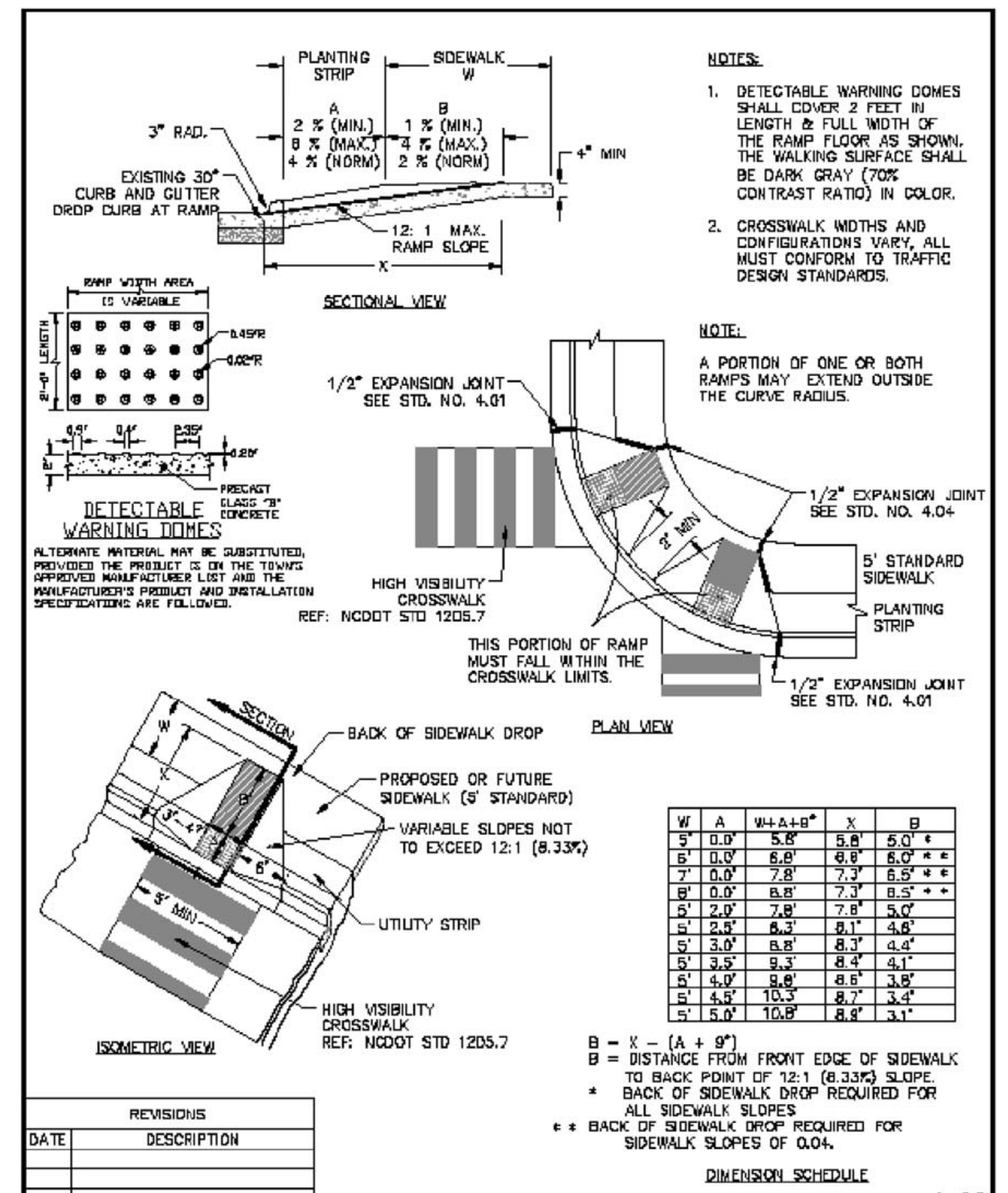
WHEELCHAIR RAMPS SHALL BE PROVIDED AT LOCATIONS AS SHOWN ON THE PLANS OR AS DIRECTED BY THE TOWN. LOCATIONS MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE TOWN TO AVOID POWER POLES, FIRE HYDRANTS, STORM INLETS, ETC. NO LESS THAN TWO (2) FEET OF FULL HEIGHT CURB SHALL BE PLACED BETWEEN THE RAMPS.

5. NO SLOPE ON THE WHEELCHAIR RAMP SHALL EXCEED 1" PER FOOT (12:1 OR 8.33%) IN RELATIONSHIP TO THE GRADE OF THE STREET.
6. THE WHEELCHAIR RAMP SHALL BE A MINIMUM OF 40" (3'-4") WIDE.
7. CONCRETE SHALL BE A MINIMUM OF 3000 P.S.I. AND FINISHED WITH A NON-SKID SURFACE.
8. AN EXPANSION JOINT OF 1/2" SHALL BE PLACED AT THE JOINT BETWEEN THE WHEELCHAIR RAMP AND THE CURB OR SIDEWALK.
9. THE INSIDE PEDESTRIAN CROSSWALK LINES SHALL BE SET NO CLOSER INTO THE INTERSECTION THAN WOULD BE ESTABLISHED BY BISECTING THE CURB RADII.
10. THE CURB CUTS AND THE PEDESTRIAN CROSSWALK LINES SHALL BE COORDINATED SO THAT THE BEGINNING OF THE WHEELCHAIR RAMP WILL FALL COMPLETELY WITHIN THE CROSSWALK LINES.
11. THE MINIMUM WIDTH OF THE PEDESTRIAN CROSSWALKS SHALL BE 5'-0".
12. STOP LINES SHALL BE PLACED AS SHOWN TO INDICATE THE POINT AT WHICH VEHICLES MUST COME TO A STOP. THIS POINT SHALL BE A MINIMUM OF 4'-0" FROM THE PEDESTRIAN CROSSWALK.
13. PARKING SHALL NOT BE ALLOWED WITHIN 20' OF PEDESTRIAN CROSSWALKS.
14. ALL PAVEMENT MARKINGS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AND THE NORTH CAROLINA SUPPLEMENT TO THE MUTCD. ALL PAVEMENT MARKINGS SHALL CONFORM WITH NC DOT SPECIFICATIONS SECTIONS 920 AND 1087.
15. ALL STOP BARS SHALL BE 4 FEET BEHIND EDGE OF CROSSWALK.

2 of 2

REVISIONS	
DATE	DESCRIPTION

TOWN OF KNIGHTDALE STANDARD DETAILS — WHEELCHAIR RAMP CURB CUT — STD. NO. 4.06



NOTES:

1. DETECTABLE WARNING DOMES SHALL COVER 2 FEET IN LENGTH & FULL WIDTH OF THE RAMP FLOOR AS SHOWN. THE WALKING SURFACE SHALL BE DARK GRAY (70% CONTRAST RATIO) IN COLOR.
2. CROSSWALK WIDTHS AND CONFIGURATIONS VARY, ALL MUST CONFORM TO TRAFFIC DESIGN STANDARDS.

NOTE:

A PORTION OF ONE OR BOTH RAMPS MAY EXTEND OUTSIDE THE CURVE RADIUS.

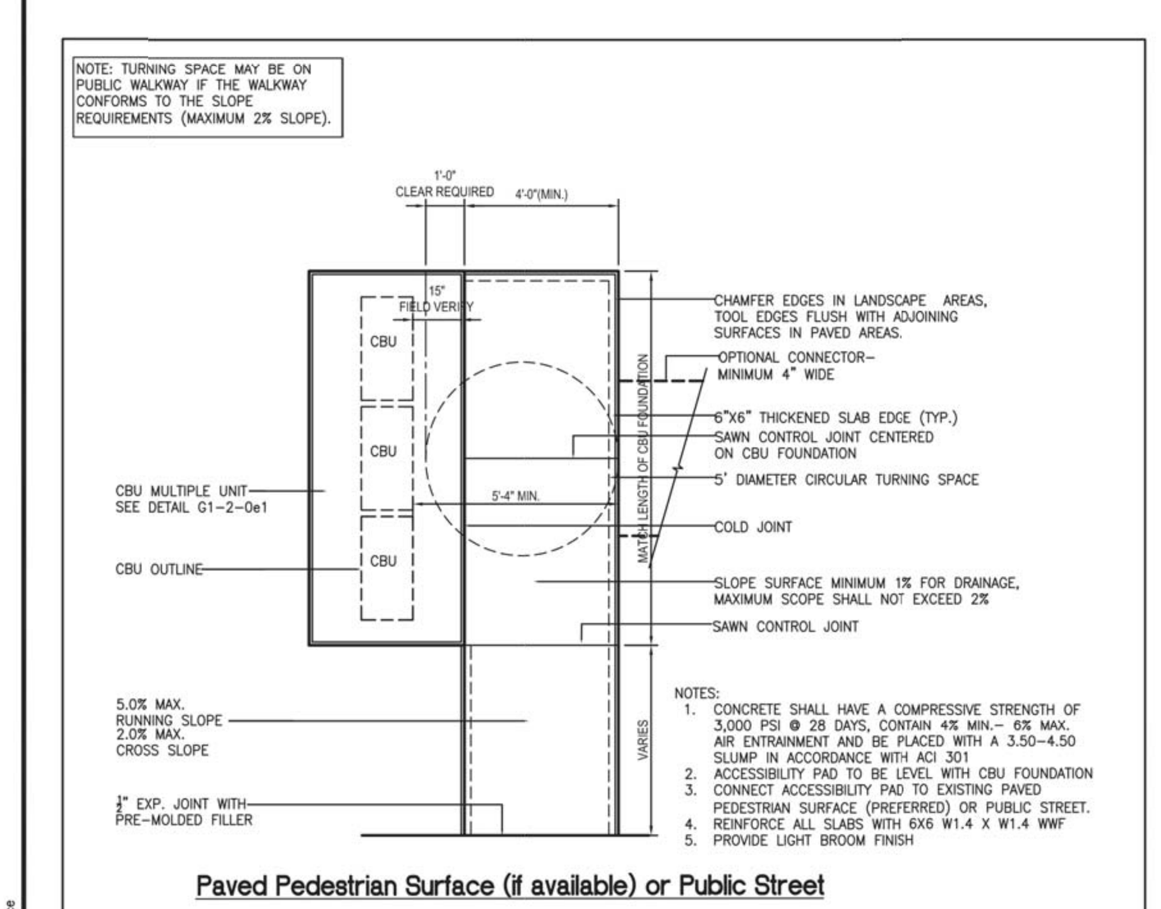
1 of 2

REVISIONS	
DATE	DESCRIPTION

TOWN OF KNIGHTDALE STANDARD DETAILS — WHEELCHAIR RAMP CURB CUT — STD. NO. 4.06

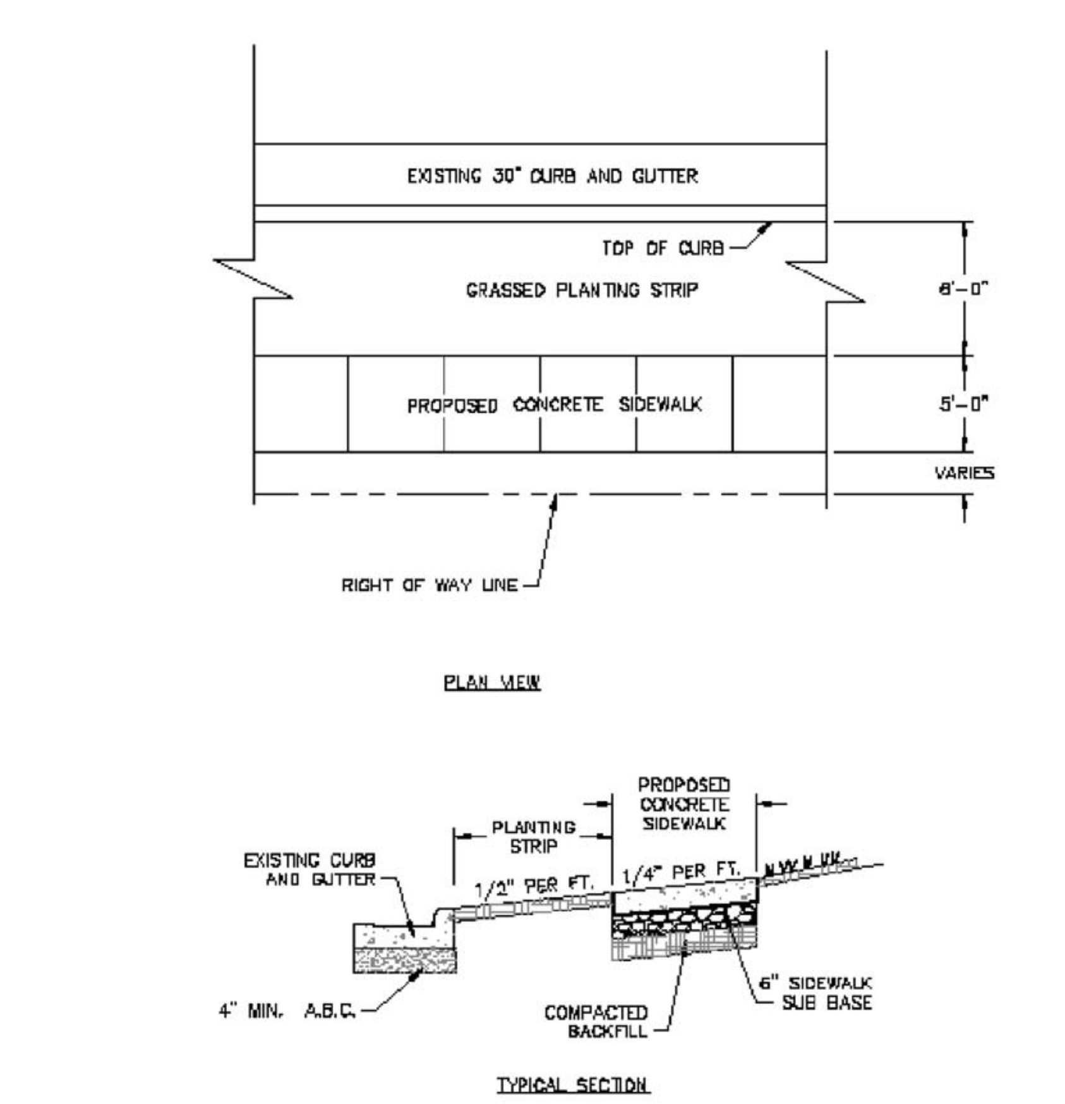
NOTES TO A/E:

1. IF THE ACCESSIBLE ROUTE FROM THE CBU(s) CONNECTS WITH A STREET OR OTHER PAVED SURFACE AT A VERTICAL CURB, A CURB RAMP SHOULD BE INSTALLED IN ACCORDANCE WITH RE-4 REQUIREMENTS.



CLUSTER BOX UNIT (CBU) ACCESS MANUVERING SPACE - MULTIPLE UNIT — G1-2-0 e3 — ../usps/library/details/G1-2-0e3.dwg — 1/4"=1'-0"

UNITED STATES POSTAL SERVICE — STANDARD DETAIL LIBRARY



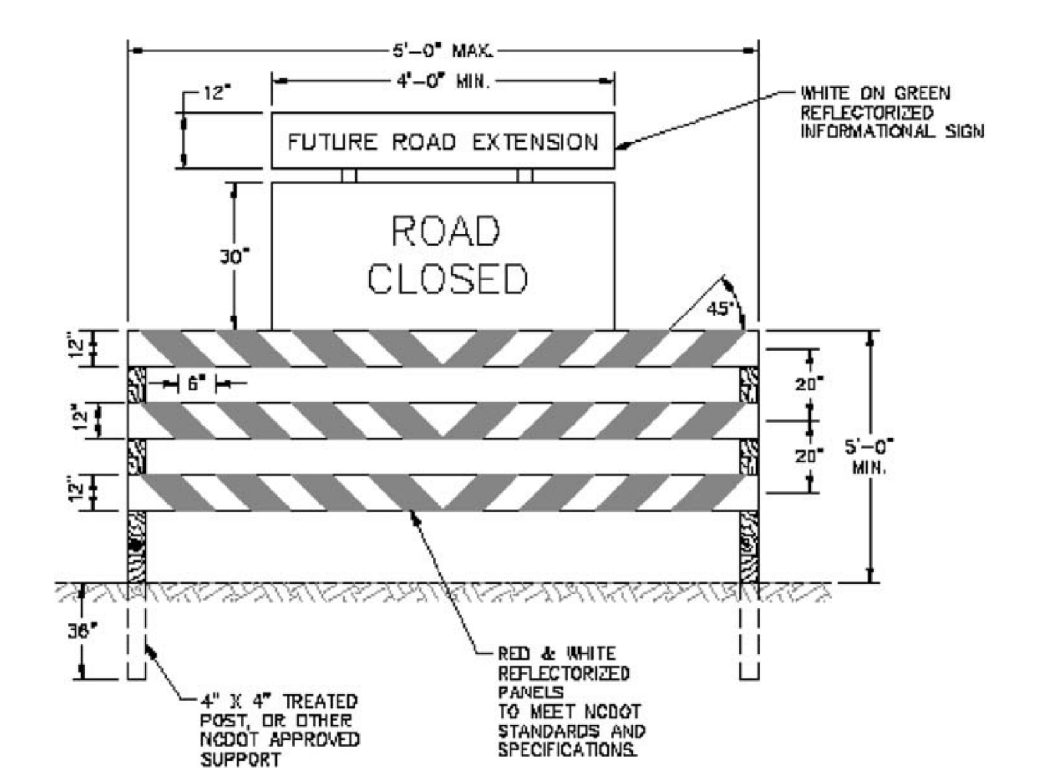
NOTES:

1. TRANSVERSE EXPANSION JOINTS TO BE A MAXIMUM OF 50 FEET APART.
2. CONTROL JOINTS TO BE AT 5 FEET O.C.
3. ALL CONCRETE TO BE FINISHED WITH CURING COMPOUND.
4. SIDEWALK SUB BASE TO BE A MIXTURE OF 70 PERCENT #57 STONE AND ASTM C33 SAND OR EQUAL.

1 of 2

REVISIONS	
DATE	DESCRIPTION

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

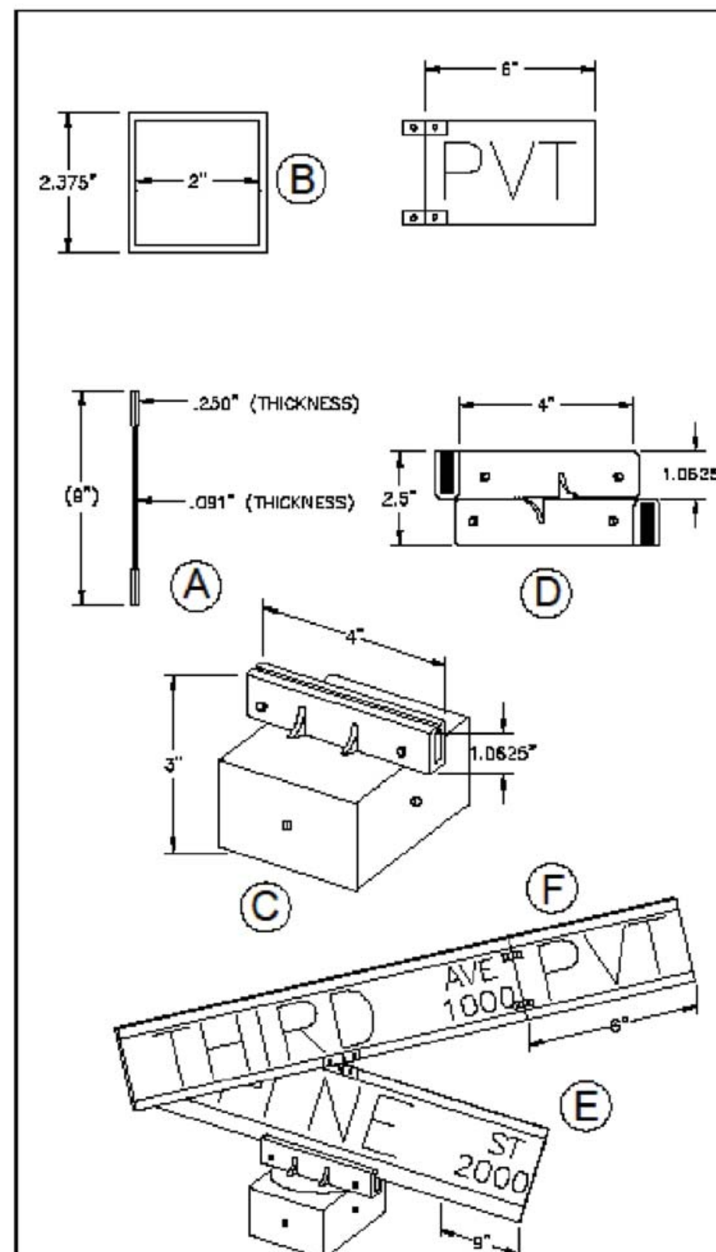


NOTES:

1. BARRICADE(S) TO BE ERECTED ACROSS ENTIRE ROADWAY INCLUDING CURB & GUTTER.
2. ADVANCE WARNING SIGN W14-1 (DEAD END) SHALL BE PLACED JUST AFTER LAST INTERSECTING STREET.
3. MARKINGS FOR BARRICADE RAILS SHALL BE REFLECTIVE AND ALTERNATE RED AND WHITE STRIPS.
4. "ROAD CLOSED" SIGN SHALL MEET SPECIFICATIONS OF M.U.T.C.D R11-2 AND BE REQUIRED ATOP EACH BARRICADE USED.

REVISIONS	
DATE	DESCRIPTION

TOWN OF KNIGHTDALE STANDARD DETAILS — TEMPORARY BARRICADE FOR DEAD END ROADS — STD. NO. 3.18

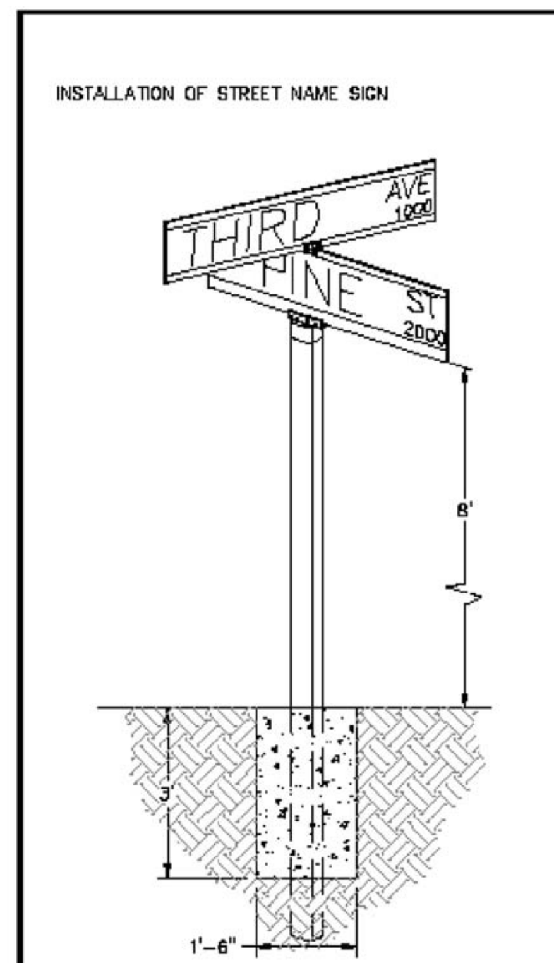


NOTES:

1. BLADES SHALL BE EXTRUDED ALUMINUM 6063T5 OR 6063T6 ALLOY .080" THICK. POST SHALL BE 10'-0" IN LENGTH, GLOSS GALVANIZED STEEL CONTINUOUS MILL DIPPED, WITH NO RAW ENDS; OR 40, 1540 WALL ALUMINUM (SEE DETAIL B).
2. CAP TO BE ALUMINUM #380 ALLOY OR EQUAL SLOTTED FOR .25" EXTRUDED BLADE; 2.375" I.D. BASE, DIE CAST AND POLISHED. CAP SHALL BE TAPPED TO RECEIVE AND INCLUDE 3 STAINLESS STEEL SET SCREWS FOR POST MOUNTING AND 2 STAINLESS STEEL SET SCREWS FOR BLADE MOUNTING. SET SCREWS TO HAVE ALLEN HEADS (SEE DETAIL C).
3. BLADE SPACER BRACKET SHALL MEET SAME SPECIFICATIONS AS THE CAP WITH 2 SCREWS TO EACH BLADE MOUNTING (SEE DETAIL D).
4. THE FACE OF ALL BLADES SHALL MEET COVERED WITH ENGINEERING GRADE SHEETING WITH #2290 WHITE DIE CUT LETTERS WITH REVERSED SCREENED #708 TRANSPARENT GREEN. THE PRIMARY LETTERS SHALL BE 5" HIGH UPPER CASE. FHWA SERIES B AND PREFIX/SUFFIX LETTERS SHALL BE 2-1/2" HIGH, UPPER CASE, FHWA SERIES C. BLOCK NUMBERS SHALL BE PLACED IN THE LOWER RIGHT CORNER AND SHALL BE 2-1/2" HIGH, FHWA SERIES C. ALL MATERIALS TO BE VACUUM AND HEAT APPLIED TO A PREPARED ALUMINUM BLADE, WHICH HAS BEEN CLEANED AND ALL FOREIGN MATERIAL REMOVED (SEE DETAIL E).
5. LETTERS, NUMBERS AND SPACING SHALL CONFORM TO THE STANDARD ALPHABETS FOR HIGHWAY SIGNS, 1966 EDITION, REPRINT MAY, 1972 BY THE U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAY ADMINISTRATION, OFFICE OF TRAFFIC OPERATION.
6. ALL STREET NAME SIGNS ARE SUBJECT TO APPROVAL BY THE TOWN. BLOCK NUMBERS SHALL BE PROVIDED ON SIGNS AND CORRESPOND TO OFFICIALLY APPROVED ADDRESSES.
7. IF THE STREET IS INTENDED TO BE PRIVATE, A SUPPLEMENTAL PLATE IS REQUIRED. THE SUPPLEMENTAL PLATE MAY BE ATTACHED TO THE SIGN OR AN EXTENDED BLADE WITH BLACK ON YELLOW SHEETING MAY BE USED. THE SIGN SHALL HAVE BLACK LETTERS THAT SHOW PVT TO STAND FOR PRIVATE. THE LETTERS SHALL BE 2-1\2" HIGH, UPPER CASE, FHWA SERIES C, ON A BACKGROUND OF YELLOW ENGINEERING GRADE SHEETING. (SEE DETAIL F).

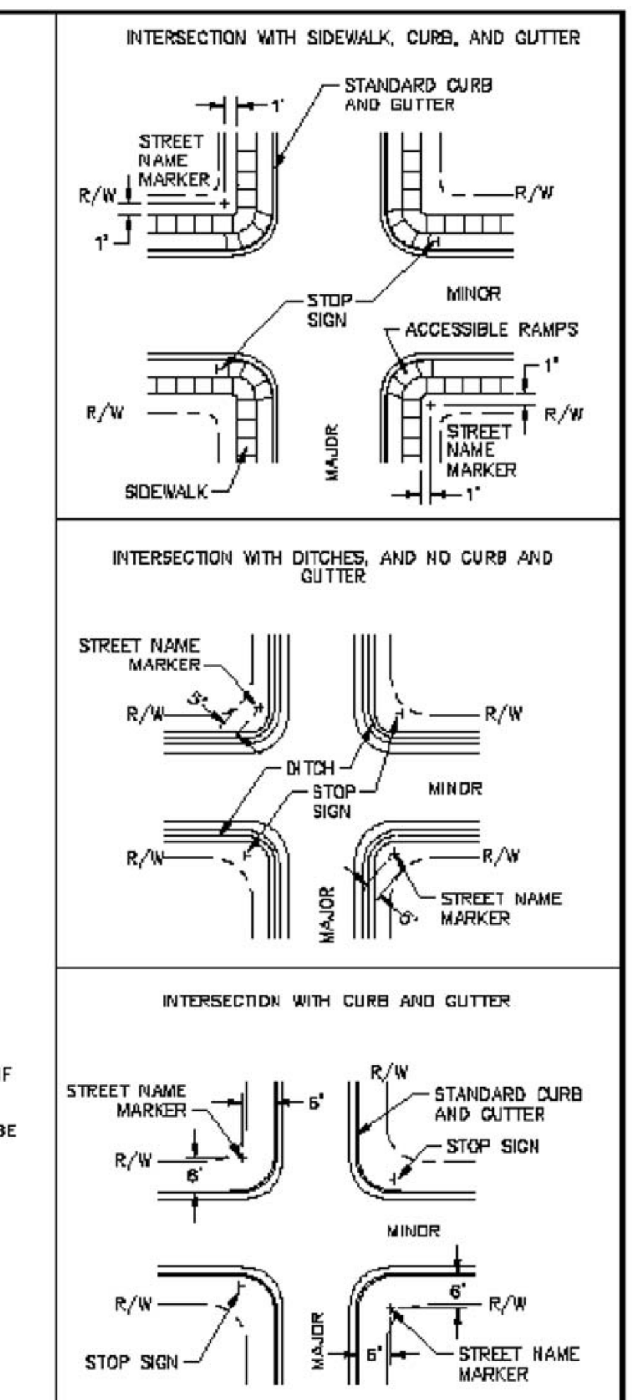
REVISIONS	
DATE	DESCRIPTION

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



NOTES:

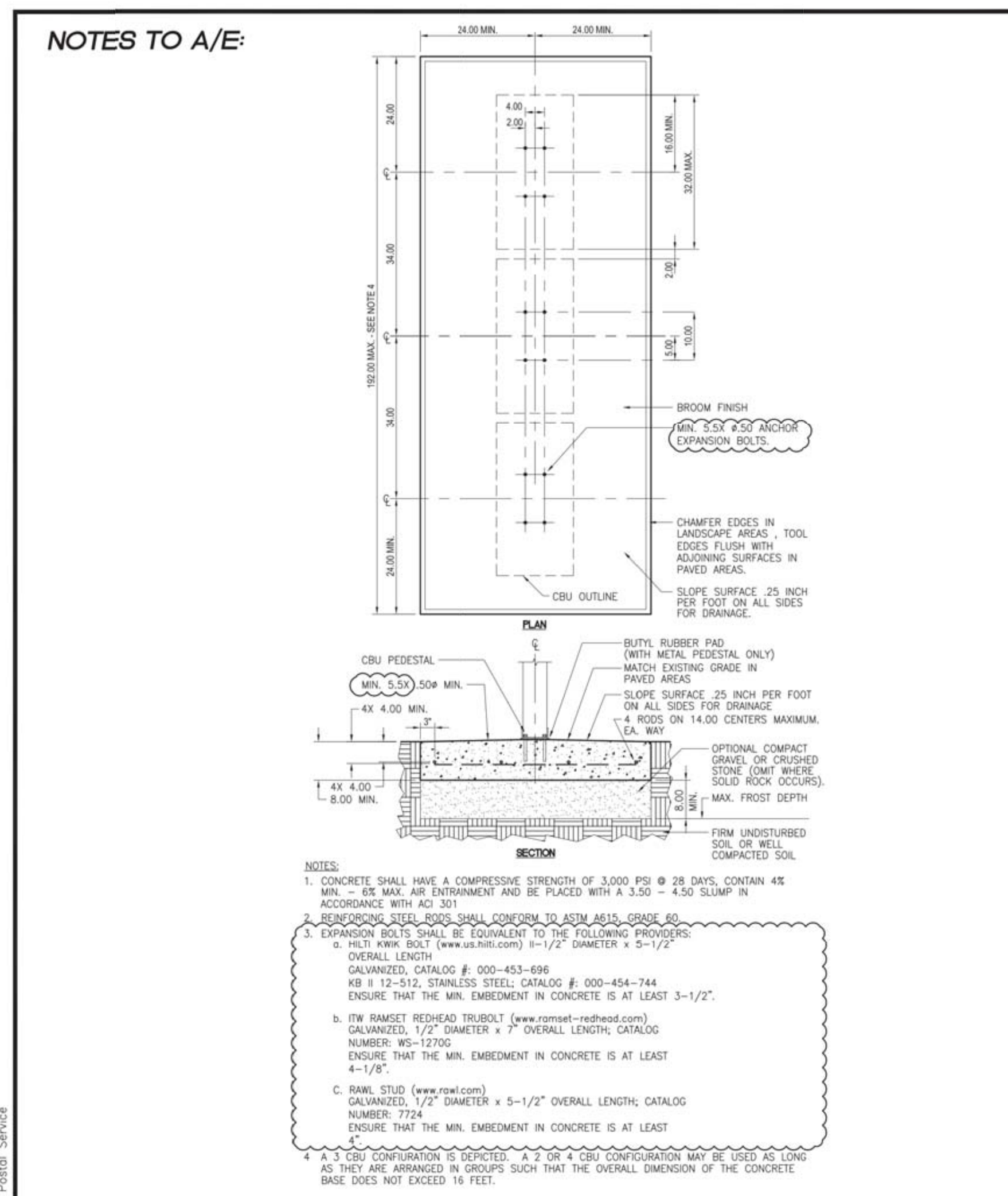
1. TWO STREET NAME MARKERS ARE REQUIRED IF THE MAJOR STREET HAS 3 OR MORE LANES.
2. ANY VARIANCE FROM THIS STANDARD MUST BE APPROVED BY THE TOWN OF KNIGHTDALE.



REVISIONS	
DATE	DESCRIPTION

TOWN OF KNIGHTDALE STANDARD DETAILS — STREET NAME SIGN INSTALLATION LOCATIONS — STD. NO. 3.16

NOTES TO A/E:



CLUSTER BOX UNIT (CBU) INSTALLATION - MULTIPLE UNIT — G1-2-0 e1 — ../usps/library/details/G1-2-0e1 — 1/2" = 1'-0"

UNITED STATES POSTAL SERVICE — STANDARD DETAIL LIBRARY

REVISED
1/26/2022 8:23 AM

NOT RELEASED FOR CONSTRUCTION

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

TOK SU-2-01

REVISIONS:
1. 2019-06-14 PER TOK COMMENTS
2. 2021-08-26 PER ENGINEER, TOK AND COR COMMENTS
3. 2022-01-26 PER CLIENT COMMENTS

314 EAST MAIN STREET
CLAYTON, NC 27520
info@adamsandhodge.com
919-243-1332
FIRM # C-4187

ADAMS & HODGE ENGINEERING, PC

MINGO CREEK PHASE 7
TOWN OF KNIGHTDALE, WAKE COUNTY, NORTH CAROLINA

DETAILS - SIGNAGE & MARKINGS

DESIGN	DCA
DRAWN	ADS/BRL
CHECKED	DCA
HORIZONTAL SCALE	SEE GRAPHIC SCALE
VERTICAL SCALE	N/A
DATE	02/24/2017
JOB NO.	
SHEET	D10

LANDSCAPE WORK SPECIFICATIONS

SCOPE OF WORK: FURNISH ALL LABOR, MATERIALS, AND EQUIPMENT REQUIRED OR INDICATED BY THE DRAWINGS AND SPECIFICATIONS TO COMPLETE THE WORK OF THIS SECTION INCLUDING INSTALLATION OF TREES, SHRUBS, GROUND COVERS, PERENNIALS, SOD, SEEDING, MULCH, AND APPURTENANCES.

JOB CONDITIONS: ATTENTION SHALL BE DIRECTED TO THE LOCATION OF ACTIVE UTILITIES WITHIN THE LIMITS OF WORK. BEFORE COMMENCING ANY WORK REQUIRED BY THE CONTRACT, THE CONTRACTOR SHALL LOCATE ALL UTILITIES, SUBSURFACE DRAINAGE, AND UNDERGROUND CONSTRUCTION SO THAT PROPER PRECAUTIONS MAY BE TAKEN NOT TO DISTURB OR DAMAGE ANY SUBSURFACE IMPROVEMENTS. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR MAKING, AT HIS OWN EXPENSE, ALL REPAIRS TO DAMAGED UTILITIES RESULTING FROM THE WORK COVERED BY THE CONTRACT.

MATERIALS AND WORK: THE SELECTION OF ALL MATERIALS AND THE EXECUTION OF ALL WORK REQUIRED UNDER THE CONTRACT SHALL BE SUBJECT TO APPROVAL BY THE OWNER OR HIS AGENT. THE OWNER SHALL HAVE THE RIGHT TO REJECT ANY AND ALL MATERIALS AND ANY AND ALL WORK WHICH, IN HIS OPINION, DOES NOT MEET THE REQUIREMENTS OF THE CONTRACT DOCUMENTS AT ANY STAGE OF THE OPERATIONS. ALL REJECTED MATERIALS SHALL BE REMOVED FROM THE SITE BY THE CONTRACTOR.

PLANT MATERIALS: ALL MATERIALS SHALL BE NURSERY GROWN, FRESHLY DUG IF FIELD GROWN, NATURALLY SHAPED, AND WELL-BRANCHED; FULL FOLIAGED WHEN IN LEAF WITH HEALTHY, WELL-DEVELOPED ROOT SYSTEMS. TREES MUST BE SELF-SUPPORTING, WITH STRAIGHT TRUNKS AND LEADERS INTACT. ALL PLANTS FURNISHED SHALL BE FREE OF ANY INSECT INFESTATIONS OR THEIR EGGS, AND SHALL HAVE BEEN GROWN UNDER CLIMATIC CONDITIONS SIMILAR TO THOSE OF THE PROJECT LOCALE. ALL PLANTS SHALL BE TRUE TO SPECIES AND VARIETY.

PLANT SIZE: SPECIFIED SIZES INDICATE MINIMUM ALLOWABLE SIZES AT PLANTING. WHERE CONTAINER AND SIZE ARE INDICATED FOR A SINGLE SPECIES, BOTH REQUIREMENTS MUST BE MET.

PLANT HANDLING & STORAGE: PLANTS AND THEIR ROOT SYSTEMS SHALL BE ADEQUATELY PROTECTED FROM DRYING OUT AT ALL TIMES. PLANT MATERIALS SHALL BE WATERED PRIOR TO TRANSPORT AND KEPT MOIST PRIOR TO PLANTING. PLANTS THAT CANNOT BE PLANTED IMMEDIATELY UPON DELIVERY SHALL BE KEPT IN THE SHADE AND WELL-WATERED. PLANTS SHALL NOT REMAIN UNPLANTED FOR LONGER THAN THREE DAYS AFTER DELIVERY.

BALLED & BURLAPPED PLANTS SHALL BE LIFTED FROM THE BOTTOM ONLY, NOT BY STEMS OR TRUNKS.

CARE SHALL BE TAKEN WHEN REMOVING THE CONTAINER FROM CONTAINER-GROWN PLANTS SO AS NOT TO INJURE THE PLANT'S ROOTS.

SUBSTITUTIONS: IF PROOF IS SUBMITTED THAT ANY PLANT SPECIFIED IS NOT AVAILABLE, A WRITTEN PROPOSAL FOR USE OF A SIMILARLY-SIZED AND TYPE OF PLANT AND CORRESPONDING COST ADJUSTMENT WILL BE CONSIDERED. ALL SUBSTITUTIONS MUST BE APPROVED BY THE LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.

BACKFILL MATERIAL: NATIVE SOIL SHALL NOT BE USED FOR BACKFILL BUT IS ACCEPTABLE FOR CONSTRUCTION OF REQUIRED SAUCERS AROUND PLANTS. THE REMAINDER OF UNUSED NATIVE SOIL SHALL BE HAULED AWAY FROM THE SITE. BACKFILL MATERIAL SHALL BE A BLENDED SOIL MATERIAL AND SHALL BE CONSIST OF 40% COMPOST, 35% SAND, AND 25% CLAY. THE COMPOST SHALL A TURKEY COMPOST BEARING THE U.S. COUNCIL SEAL OF ASSURANCE. THE SAND SHALL BE OBTAINED FROM A SAND QUARRY AND FREE OF ALL VIABLE WEED SEED. OTHER CONDITIONS OF THE BACKFILL SHALL BE AS FOLLOWS:

MAXIMUM SOLUBLE SALTS:	**350 PPM**
RELATIVE DENSITY:	**25%-50%, LOOSE**
RELATIVE PERMEABILITY:	**2.5-10 IN./HR.**
PLASTIC INDEX:	**4-10**
PH RANGE:	**6.0-6.8**

BACKFILL MATERIAL SHALL BE TESTED AND TEST RESULTS SHALL BE FURNISHED TO THE LANDSCAPE ARCHITECT FOR APPROVAL PRIOR TO USE.

PLANT FERTILIZER: SHALL BE A COMPLETE FERTILIZER, OF WHICH 50% OF THE NITROGEN IS DERIVED FROM NATURAL ORGANIC SOURCES OR UREAFORM. IT SHALL CONTAIN BY PERCENTAGE THE FOLLOWING: 10% NITROGEN, 10% PHOSPHORIC ACID, AND 10% POTASH. IT SHALL BE DELIVERED IN UNOPENED, LABELED CONTAINERS AND STORED IN A WEATHERPROOF PLACE.

WATER: SHALL BE FURNISHED BY THE OWNER.

PLANT MATERIAL INSTALLATION: MATERIALS SHALL ONLY BE PLANTED DURING PERIODS OF SUITABLE WEATHER CONDITIONS.

THE OWNER SHALL BE NOTIFIED OF SUBSURFACE CONDITIONS THAT WOULD PROVE DETRIMENTAL TO PLANT SURVIVAL OR GROWTH. ALTERNATE LOCATIONS FOR MATERIAL SHALL BE DETERMINED BY THE CONTRACTOR AND LANDSCAPE ARCHITECT.

ALL TREES AND SHRUBS SHALL BE PLANTED IN INDIVIDUAL HOLES. THE SIDES AND BOTTOM OF HOLES SHALL BE SCARIFIED PRIOR TO PLANTING. BACKFILL WITH THE SOIL MIXTURE SPECIFIED ON THE DRAWINGS. BACKFILLING SHALL BE ACCOMPLISHED IN LIFTS TO ENSURE ELIMINATION OF ALL AIR POCKETS. ALL PLANTS SHALL BE POSITIONED TO PLACE MOST ATTRACTIVE SIDE TO VIEW AND IN A PLUMB POSITION.

INSTALL 6 FT. DIAMETER SAUCERS MADE OF SOIL AROUND LARGE TREES AND 4 FT. DIAMETER SAUCERS AROUND SMALL TREES.

IMMEDIATELY FOLLOWING PLANTING, PLANTS SHALL BE MULCHED. WHERE PLANTS ARE PLANTED IN GROUPS, THE AREA ABOUT THE PLANT AS WELL AS THE AREA BETWEEN PLANTS SHALL BE COVERED WITH MULCH. PLANTS SHALL BE THOROUGHLY WATERED FOLLOWING MULCHING.

STAKE ALL TREES IN ACCORDANCE WITH THE DRAWINGS.

PRUNING SHALL BE LIMITED TO THE REMOVAL OF INJURED BRANCHES AND TWIGS. USE CLEAN AND SHARP PRUNING TOOLS.

SIDEWALKS AND PAVEMENTS SHALL BE KEPT CLEAN DURING PROGRESS OF INSTALLATION WORK.

PLANTING BEHIND SEGMENTAL RETAINING WALLS: CONTRACTOR SHALL EXERCISE EXTREME CARE IN THE INSTALLATION OF PROPOSED TREES AND SHRUBS BEHIND SEGMENTAL RETAINING WALLS. CONTRACTOR SHALL PROCEED WITH CAUTION WHEN EXCAVATING SO AS NOT TO TEAR OR REMOVE SECTIONS OF THE GEOGRID FABRIC THAT IS TYPICALLY LOCATED 18 TO 24 INCHES BELOW FINISHED GRADE. PENETRATION OF THE GEOGRID IS PERMITTED TO PLANT INDIVIDUAL TREES OR LARGE SHRUBS AS NECESSARY; HOWEVER, EXCAVATION OF THE PLANTING HOLE AND PERFORATION OF THE GEOGRID FABRIC SHALL BE ACCOMPLISHED USING AN AUGER OR BY HAND-CUTTING THE FABRIC FOLLOWING EXCAVATION BY A BACKHOE WITH A SMOOTH-EDGE BUCKET.

MAINTENANCE OF PLANT MATERIALS: PLANT MATERIALS SHALL BE MAINTAINED FOLLOWING PLANTING AND UNTIL FINAL ACCEPTANCE IS GRANTED BY THE OWNER. MAINTENANCE SHALL CONSIST OF WATERING, WEEDING, PRUNING, MULCHING, ADJUSTMENT OF GUYING, RESTORATION OF PLANT POSITION OR SAUCERS, AND SPRAYING IF NECESSARY. FINAL ACCEPTANCE FOR SEGMENTS OF THE CONTRACT WORK MAY BE GRANTED BY THE OWNER.

THE CONTRACTOR SHALL PROTECT PLANTED AREAS WITH STAKES AND FLAGGING TO LIMIT DAMAGE.

SIDEWALKS AND PAVEMENTS SHALL BE KEPT CLEAN WHEN MAINTENANCE OPERATIONS ARE IN PROGRESS.

ALL INSTALLED MATERIALS SHALL BE IN ACCEPTABLE CONDITION WHEN CONTRACTOR APPLIES FOR PAYMENT.

INSPECTION AND ACCEPTANCE OF WORK: UPON 48 HOURS ADVANCE NOTICE, THE LANDSCAPE ARCHITECT SHALL INSPECT ALL WORK FOR ACCEPTANCE. THE CONTRACTOR'S RESPONSIBILITY FOR MAINTENANCE SHALL TERMINATE AT THE DATE OF ACCEPTANCE OF EACH SEGMENT OF WORK. UPON THE DATE OF ACCEPTANCE, THE GUARANTEE PERIOD SHALL COMMENCE.

GUARANTEE: THE CONTRACTOR SHALL GUARANTEE TO PROVIDE TO THE OWNER THRIVING PLANT MATERIALS TO INCLUDE TREES, SHRUBS, AND GROUND COVERS FOR A PERIOD OF ONE YEAR FOLLOWING FINAL ACCEPTANCE. ADDITIONALLY, THE CONTRACTOR SHALL GUARANTEE TO THE OWNER THRIVING PERENNIALS, ANNUALS, WELL-ESTABLISHED SEEDED AREAS, AND WELL-ROOTED SODDED AREAS FOR A PERIOD OF 90 DAYS FOLLOWING FINAL ACCEPTANCE. THE GUARANTEES ARE SUBJECT TO THE FOLLOWING CONDITIONS:

THE OWNER IS RESPONSIBLE FOR PROPER WATERING OF PLANT MATERIALS, SEEDED AREAS, AND SODDED AREAS FOLLOWING FINAL ACCEPTANCE. THE CONTRACTOR SHALL PROVIDE TO THE OWNER WRITTEN INSTRUCTIONS SPECIFYING THE RATES AND EXTENT OF WATERING REQUIRED. THE CONTRACTOR SHALL MAKE MONTHLY INSPECTIONS FOR A PERIOD, OF (1) YEAR AT NO EXTRA COST TO THE OWNER, TO DETERMINE WHAT CHANGES, IF ANY, SHOULD BE MADE TO THE WATERING PROGRAM. ANY RECOMMENDATIONS SHALL BE SUBMITTED TO THE OWNER IN WRITING.

DAMAGE CAUSED TO PLANT MATERIALS FROM ACTS OF NATURE, VANDALISM, EROSION, OR MALICIOUS ACTS WILL VOID THE GUARANTEE FOR ANY EFFECTED MATERIALS.

DAMAGE TO PLANT MATERIALS CAUSED BY DISEASE INCLUDING BROWN PATCH IN TURF GRASSES EXCLUDE ANY EFFECTED MATERIALS FROM THE GUARANTEE.

PLANT MATERIAL REPLACEMENT: THE CONTRACTOR SHALL REPLACE WITHOUT COST TO THE OWNER, AND AS SOON AS WEATHER CONDITIONS PERMIT, ALL PLANTS NOT IN THRIVING CONDITION AS DETERMINED BY THE OWNER DURING AND AT THE END OF THE GUARANTEE PERIOD. THE GUARANTEE OF ALL REPLACED PLANTS SHALL EXTEND FOR AN ADDITIONAL 30 CALENDAR DAYS.

TURF MATERIALS: MATERIALS REQUIRED FOR SEEDING AND OR SODDING SHALL CONFORM TO THE FOLLOWING:

FERTILIZER: SHALL BE A TURFGRADE, HIGH PHOSPHORUS FERTILIZER, IN WHICH 1/2 TO 3/4 OF THE NITROGEN IS SLOWLY AVAILABLE. IT SHALL CONTAIN BY PERCENTAGE THE FOLLOWING: 18% NITROGEN, 24% PHOSPHORIC ACID, AND 10% POTASH. IT SHALL BE DELIVERED IN UNOPENED, LABELED CONTAINERS AND STORED IN A WEATHERPROOF PLACE.

LIME: SHALL BE NATURAL DOLOMITIC LIMESTONE CONTAINING NOT LESS THAN 85% OF TOTAL CARBONATES WITH A MINIMUM OF 30% MAGNESIUM CARBONATES IN A PELLETIZED FORM.

ANTI-EROSION MULCH: SHALL BE CLEAN, SEED-FREE SALT HAY OR THRESHED STRAW OF WHEAT, RYE, OATS, OR BARLEY.

GRASS SEED: SHALL BE FRESH, CLEAN, NEW-CROP SEED COMPLYING WITH TOLERANCE FOR PURITY AND GERMINATION ESTABLISHED BY "OFFICIAL SEED ANALYSTS OF NORTH AMERICA". PROVIDE TYPE OR MIXTURE COMPOSED OF SPECIES AS SPECIFIED ON THE CONSTRUCTION DRAWINGS.

SOD: SHALL BE FRESHLY CUT, DROUGHT-RESISTANT SOD, FREE OF OBJECTIONABLE BROADLEAF OR GRASSY WEEDS. PROVIDE TYPE AS SPECIFIED BELOW.

PREPARATION OF TURF AREAS: PRIOR TO SEEDING OR SOD INSTALLATION, VERIFY THAT ALL TRENCHING AND OTHER LAND DISTURBING ACTIVITIES HAVE BEEN COMPLETED.

ALL DISTURBED AREAS SHALL BE DRESSED TO TYPICAL SECTIONS AND GRADES SHOWN ON THE CONSTRUCTION DRAWINGS. REMOVE FROM THE SITE ALL TEMPORARY SEEDING OR STABILIZATION MEASURES.

ALL AREAS TO RECEIVE SEED OR SOD SHALL BE PREPARED ACCORDING TO THE FOLLOWING PROCEDURE:

REMOVE ANY UNDESIRABLE VEGETATION OR DEBRIS.

APPLY LIMESTONE ACCORDING TO SOIL TEST RECOMMENDATION OR AT A RATE OF 4000 LBS. PER ACRE.

RIP THE AREA TO A MINIMUM DEPTH OF 4 TO 6 INCHES.

REMOVE ALL LOOSE ROCKS, ROOTS, AND OTHER DEBRIS AND PULVERIZE THE TOP 2 INCHES OF LOOSENED SOIL TO PROVIDE A SMOOTH AND UNIFORM SURFACE.

APPLY TURFGRADE FERTILIZER IN A MANNER THAT ENSURES UNIFORM DISTRIBUTION. FERTILIZER SHALL BE APPLIED AT A RATE THAT PROVIDES 5 LBS. OF PHOSPHORUS PER 1000 S.F. LIGHTLY MIX WITH SOIL AND SMOOTH SURFACE.

SODDING: APPLY DROUGHT-RESISTANT, TURF-TYPE FESCUE SOD (E.G. "REBEL III", "BONANZA", "CONFEDERATE", ETC.) IN THE FOLLOWING MANNER:

SOD SHALL BE PLACED ON A SMOOTH, EVEN SURFACE CONFORMING TO FINISH GRADE REQUIREMENTS. FINISH GRADE SHALL BE 1 INCH BELOW SURFACES OF ADJACENT SIDEWALKS AND CURBING. SOIL SHALL BE WATERED BEFORE SOD IS LAID. ALL SOD SHALL BE CUT BY AN APPROVED MECHANICAL SOD CUTTER. UNDER NO CIRCUMSTANCES SHALL ANY SODDING WORK BE DONE UNLESS WEATHER AND SOIL CONDITIONS ARE SUITABLE.

HANDLING OF SOD SHALL BE DONE IN A MANNER AS TO PREVENT TEARING, BREAKING, DRYING, OR OTHER DAMAGE.

SOD SHALL BE INSTALLED ON-SITE IN NOT MORE THAN 72 HOURS AFTER CUTTING. IF THE SOD IS NOT INSTALLED WITHIN 48 HOURS AFTER CUTTING, IT SHALL BE UNSTACKED OR UNROLLED, PLACED IN SHADE, AND KEPT MOIST UNTIL INSTALLATION.

LAY SOD PARALLEL TO THE DIRECTION OF THE SLOPE AND IN A MANNER WHICH WILL PERMIT JOINTS TO ALTERNATE.

FIT SOD PIECES TOGETHER TIGHTLY SO THAT NO JOINT IS VISIBLE, AND TAMP SOD FIRMLY AND EVENLY BY HAND.

AFTER SODDING IS COMPLETE AND APPROVED BY LANDSCAPE ARCHITECT, SODDED AREAS SHALL BE ROLLED WITH A 200 LB. ROLLER.

WATER SODDED AREAS IMMEDIATELY AFTER FINAL ROLLING WITH A FINE SPRAY TO A DEPTH OF 4 INCHES. KEEP ALL SODDED AREAS CONTINUOUSLY MOIST THEREAFTER UNTIL 30 CALENDAR DAYS FOLLOWING INSTALLATION. USE FINE SPRAY NOZZLES ONLY.

INSPECT AND MAINTAIN SODDED AREAS AND MAKE NECESSARY REPAIRS DURING THE SPECIFIED GUARANTEE PERIOD. IF 60% OR MORE OF SODDED AREAS FAIL TO BECOME ROOTED, THE CONTRACTOR, AT NO ADDITIONAL EXPENSE TO THE OWNER, WILL REPEAT THE ENTIRE PROCESS WITH NEW SOD MATERIALS.

SEEDING: APPLY TURF-TYPE SEED MIXTURE (E.G. "CONFEDERATE" FESCUE MIXTURE, "TRI-BLEND", ETC.) AT A RATE OF 6 LBS. PER 1000 S.F. KENTUCKY 31 TALL FESCUE IS UNACCEPTABLE.

CULTIPACK SEEDED AREAS AND APPLY ANTI-EROSION MULCH AT A RATE OF 2 TONS PER ACRE.

INSPECT AND MAINTAIN SEEDED AREAS AND MAKE NECESSARY REPAIRS DURING THE SPECIFIED GUARANTEE PERIOD. IF 60% OR MORE OF SEEDED AREAS FAIL TO BECOME ESTABLISHED, THE CONTRACTOR, AT NO ADDITIONAL EXPENSE TO THE OWNER, WILL REPEAT THE ENTIRE PROCESS FOR ESTABLISHMENT OF A SUITABLE TURFGRASS.

LANDSCAPE WORK SPECIFICATIONS
SCALE: NTS — 6

IRRIGATION DIRECTIVES

A. THE GENERAL CONTRACTOR SHALL SUBCONTRACT THE IRRIGATION WORK TO A FIRM OF HIS CHOICE, OR HAVE THE PLANTING CONTRACTOR SUB-CONTRACT THE IRRIGATION WORK TO A LICENSED IRRIGATION CONTRACTOR FIRM OF THEIR CHOICE.

B. THE IRRIGATION SYSTEM SHALL BE DESIGNED TO SPRAY THE LAWNS AND PLANT BEDS SEPARATELY AS SHOWN ON THE PLAN IN OUTLYING AREAS ISLANDS OF SHRUBS SHALL BE OVERSPRAYED WITH THE LAWN HEADS OR, PER PLAN, MAY HAVE SHRUB HEADS ON THE ADJACENT LAWN ZONE

C. PROVIDE ADEQUATE ZONES TO INDIVIDUALLY CONTROL IRRIGATION FOR ALL THE DIFFERENT EXPOSURES AND SLOPES AT LEAST AS INDICATED ON THE PLANS AS WELL AS TO BE ABLE TO BEST MATCH THE WATER AVAILABLE TO THE SYSTEM

D. SUBMIT HEAD LAYOUT AND ROUTING PLAN TO THE LANDSCAPE ARCHITECT FOR APPROVAL OF THE LAYOUT AND ZONE DESIGN

E. IN MUNICIPAL AREAS PROVIDE THE OWNER A (DOLLAR) CHOICE TO SET A SEPARATE METER FOR THE IRRIGATION, OR TO USE THE EXISTING METERED SOURCE FOR THE IRRIGATION

F. METERS ARE PROVIDED FOR IRRIGATIONS; CONTRACTOR TO PROVIDE BACK-FLOW PREVENTION

G. PROVIDE THE OWNER A PLASTIC COVERED COLOR CODED PLAN TO PLACE NEAR THE CONTROLLER

H. PROVIDE (3) THREE COPIES OF "AS-BUILT" LAYOUT AND OPERATING INSTRUCTIONS TO THE OWNER.

IRRIGATION NOTES

NOTICE TO IRRIGATION CONTRACTOR: MANY GOVERNMENTAL UNITS ARE CURRENTLY REVISING THEIR ORDINANCES AND REGULATIONS REGARDING IRRIGATION SYSTEMS. BEFORE THIS PROJECT IS BID OR INSTALLED, THE CONTRACTOR SHALL VERIFY WITH THE RULING GOVERNMENTAL UNIT THAT THE PROPOSED SYSTEM MEETS ALL LOCAL REGULATIONS. AREAS OF SPECIAL CONCERN INCLUDE:
1. RIGHT-OF-WAY EASEMENT AGREEMENTS FOR PLACEMENT OF IRRIGATION WITHIN STREET/ROAD RIGHT-OF-WAYS.
2. BACKFLOW PREVENTION DEVICES, WHETHER THESE ARE REQUIRED AND IF SO, WHAT TYPES ARE APPROVED.
3. CERTIFICATION/LICENSE TO INSTALL BACKFLOW PREVENTER DEVICES AND METERS.
4. "WINTER SERVICE" REQUIREMENTS FOR BACKFLOW PREVENTER DEVICES.
5. USE OF A SECOND METER FOR IRRIGATION USE ONLY.
6. WATER RATION DAYS IN WHICH IRRIGATION SYSTEM CANNOT BE USED.
7. ALL OTHER REGULATIONS NOT MENTIONED HEREIN.

SHOULD THE BID/CONSTRUCTION DOCUMENTS BE INCONSISTANT WITH CURRENT LOCAL REGULATIONS, THE CONTRACTOR SHALL PRESENT THE OWNER WITH A QUOTE/CONTRACT THAT INCLUDES MODIFICATIONS TO MAKE THE SYSTEM COMPLIANT WITH ALL THE LOCAL CODES.

PERMITS, FEES: THE IRRIGATION CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS NECESSARY TO INSTALL THE SYSTEM AND HE SHALL PAY ANY ASSOCIATED FEES. COST FOR THESE ITEMS SHALL BE INCLUDED IN THE QUOTE/CONTRACT FOR THE IRRIGATION SYSTEM.

IRRIGATION DIRECTIVES AND NOTES
SCALE: NTS — 5

NOTES

1. THE PLANTING PROCESS IS SIMILAR FOR DECIDUOUS AND EVERGREEN TREES.

2. FOR SINGLE STEM TREES, DO NOT SUPPLY TREES WITH MULTIPLE LEADERS, ONLY PROVIDE TREES WITH A SINGLE LEADER. DO NOT PRUNE TREE AT PLANTING EXCEPT FOR SPECIFIC STRUCTURAL CORRECTIONS AND TO INSURE COMPLIANCE WITH SIGHT DISTANCE STANDARDS.

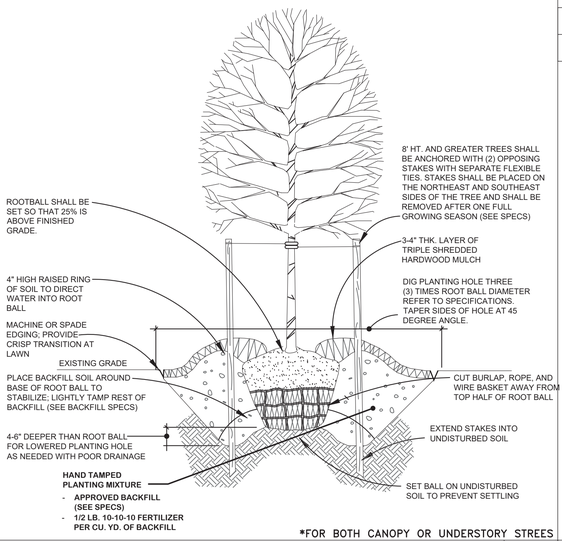
3. MARK THE NORTH SIDE OF THE TREE AT THE NURSERY AND LOCATE TO THE NORTH IN THE FIELD.

4. WHERE SEVERAL TREES WILL BE PLANTED CLOSE TOGETHER SUCH THAT THEY WILL LIKELY SHARE ROOT SPACE, TILL IN SOIL AMENDMENTS TO A DEPTH OF 6" TO 8" OVER THE ENTIRE BED AREA.

5. FOR CONTAINER-GROWN TREES, SET THE ROOTS OUT OF THE OUTER LAYER OF POTTING SOIL, THEN CUT OR PULL APART ANY ROOTS CIRCLING THE PERIMETER OF THE CONTAINER.

6. THOROUGHLY SOAK THE TREE ROOT BALL AND ADJACENT PREPARED SOIL SEVERAL TIMES DURING THE FIRST MONTH AFTER PLANTING AND REGULARLY THROUGHOUT THE FOLLOWING TWO SUMMERS.

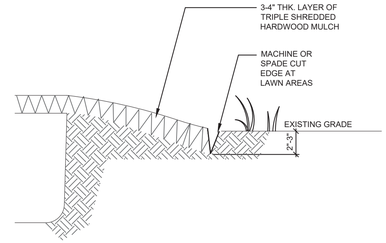
7. IF PLANTING HOLES ARE DUG WITH A LARGE AUGER, BREAKING DOWN THE SIDES WITH A SHOVEL TO ELIMINATE GLAZING AND CREATE THE SLOPING SIDE PROFILE SHOWN ON THE DETAIL.



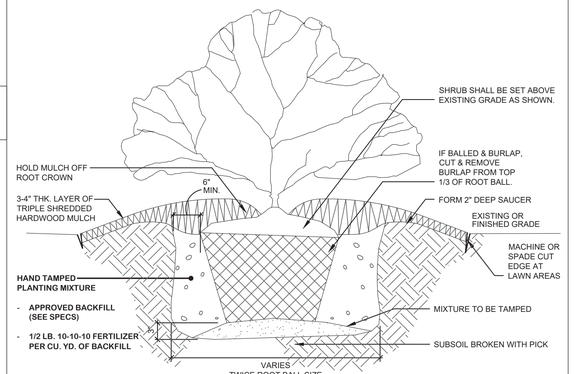
*FOR BOTH CANOPY OR UNDERSTORY STREES

* TYPICAL TREE INSTALLATION
SCALE: NTS — 4

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

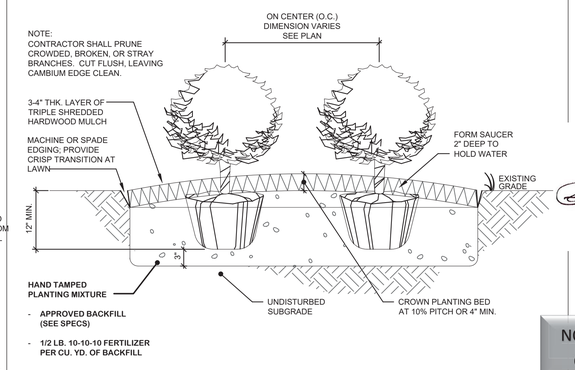


BED EDGING
SCALE: NTS — 1



*FOR BOTH CONTAINER OR B&B SHRUBS

*TYPICAL SHRUB INSTALLATION
SCALE: NTS — 2



MASSING PLANT INSTALLATION
SCALE: NTS — 3

NORTH CAROLINA REGISTERED LANDSCAPE ARCHITECT 279 PAUL C. EMBLER

REVISED
9:36 am, Jan 26, 2022

NOT RELEASED FOR CONSTRUCTION

REVISIONS:
1. 2021-06-14 PER TOK COMMENTS
2. 2021-06-29 PER ENGINEER
3. 2022-01-26 PER CLIENT COMMENTS

314 EAST MAIN STREET
CLAYTON, NC 27520
info@adamsandhodge.com
919-243-4187
FIRM # C-4187

ADAMS & HODGE ENGINEERING, PC

MINGO CREEK PHASE 7
TOWN OF KNIGHTDALE, WAKE COUNTY, NORTH CAROLINA

DETAILS - LANDSCAPE

DESIGN: DCA
DRAWN: ADS/BRL
CHECKED: DCA
HORIZONTAL SCALE: SEE GRAPHIC SCALE
VERTICAL SCALE: N/A
DATE: 02/24/2017
JOB NO.
SHEET: D11

TOK SU-2-01