Memorandum

TO: Mayor and Town Board of Commissioners

FROM: Michael Elabarger, Senior Planner
Meredith Gruber, Planning Director

DATE: January 4, 2024

RE: Revision to SP 21-01, Cobblestone Crossing

Evidentiary (Quasi-Judicial) hearing on a Revision to the previously approved Site Plan SP 21-01, Cobblestone Village, a mixed-use development on 10.96 acres located at the intersection of Young Street and Main Street, zoned the Town Center (TC) District

Background
A request for approval of Revisions to the previously approved Site Plan (quasi-judicial) for a mixed-use development. The original approval was for a project detailed as the following:

- Building 1 – Residential with 40 units
- Building 2 – Mixed-Use with Retail 16,461 SF with 30 residential units
- Building 3 – Mixed-use with Retail 11,405 SF and 18 residential units
- Building 4 – Community Center 18,200 SF
- Building 5 – Mixed-use with Retail 3,816 SF and 4 residential units
- Building 6 – Mixed-use with Retail 18,416 SF and 36 residential units
- Building 7 – Residential with 40 units
- Building 8 – Residential with 12 units

Pursuant to a Mediated Settlement Conference Agreement between the Applicant and the Town, the following changes are represented in the Revised Site Plan plan set (see attached plan set).

- Building 4 [100% Non-residential] has been revised from a 12,000 sf community center building to a 10,420 sf commercial building (1 story).
- Building 5 [100% Non-residential] has been enlarged from a 3,647 sf building to a 5,970 sf building (remaining as 1 story), changed encased outdoor dining to exterior/rooftop bar/dining.
- Building 8 [100% Residential] – Increased residential dwelling unit (apartments) count from 12 to 24 (remaining at 3 stories).

- Building 3 [Mixed-use] – Reduced the commercial square footage from 10,299 sf to 8,612 sf and changed plaza/outdoor dining between Building and Main Street to a raised plaza/outdoor dining area.
- Added a mail kiosk in the center of site, between Bluestone Crossing Road and Rolesville Center Road.
- Plaza spaces between buildings 2 and 4, and between buildings 3 and 4, change in shape and features within them.
- Removal of Lease lines and a Veteran's Memorial feature.

The core elements of the project – residential dwelling units and non-residential square footage – compare as such:

	Residential Dwelling Units (multifamily/ apartments)	Non-Residential Square footage
SP 21-01 original approval	178	Retail/commercial: 49,830 SF Municipal Flex space: 15,900 SF Total: 65,730 SF
Revision to SP 21-01	188	Retail/flex/commercial: 53,384 SF

A Shared Parking Analysis document was part of the original approval; this document has been updated to reflect these changes. See the attached Parking Analysis, dated December 8, 2023.

Technical Review Committee and Planning Staff Recommendations

The Technical Review Committee has reviewed four (4) submittals of the Revised Site Plan. There are a few technical comments from Town Engineering remaining, and the Applicant must finalize any changes to Wake County stormwater related permits for the project that result from these changes. The Site Plan plan set will ultimately receive signature approval by the City of Raleigh Public Utility Department, Wake County Watershed Management, and Town Planning Director.

Findings of Fact
The required Findings of Fact include:

A. That the proposed development and/or use will not materially endanger the public health or safety;
B. That the proposed development and/or use will not substantially injure the value of adjoining property;
C. That the proposed development and/or use will be in harmony with the scale, bulk, coverage, density, and character of the neighborhood in which it is located;
D. That the proposed development and/or use will generally conform with the Comprehensive Plan and other official plans adopted by the Town;
E. That the proposed development and/or use is appropriately located with respect to transportation facilities, water and sewer supply, fire and police protection, and similar facilities;
F. That the proposed development and/or use will not cause undue traffic congestion or create a traffic hazard;
G. That the proposed development and use comply with all applicable requirements of this ordinance.

Attachments
SP 21-01 Revised Site Plan
Revised Shared Parking Analysis, dated December 8, 2023

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ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CURRENT TOWN OF ROLESVILLE STANDARDS AND SPECIFICATIONS

SYMBOLS AND ABBREVIATIONS

ABC	AGGREGATE BASE COURSE
ALUM	ALUMINUM
AST2	ALUMINIZED STEEL – TYPE 2
B–B	BACK TO BACK
BOA	BLOW–OFF ASSEMBLY
C&G	CURB AND GUTTER
CFS	CUBIC FEET PER SECOND
CI	CURB INLET
CL	CENTER LINE
CMP	CORRUGATED METAL PIPE
CO	CLEAN OUT
COM	COMMUNICATION
CONC	CONCRETE
DCV	DOUBLE CHECK VALVE
DDCV	DOUBLE DETECTOR CHECK VALVE
DI	DROP INLET
DIP	DUCTILE IRON PIPE
EASE	EASEMENT
ELEC	ELECTRIC
EX	EXISTING
FES	FLARED END SECTION
FH	FIRE HYDRANT
FM	FORCE MAIN
FT	FEET
FT/SEC	FEET PER SEC
GALV	GALVANIZED
GV	GATE VALVE
HDPE	HIGH DENSITY POLYETHYLENE
L	LENGTH
LF	LINEAR FEET
MH	MANHOLE
PAVE	PAVEMENT
PE	FINISHED PAD ELEVATION
PP	POWER POLE
PVC	POLYVINYL CHLORIDE
R	RADIUS
R/W	RIGHT–OF–WAY
RED	REDUCER
RCP	REINFORCED CONCRETE PIPE
RPZ	REDUCED PRESSURE ZONE
SS	SANITARY SEWER
STA	STATION
TDD	TEMPORARY DIVERSION DITCH
TELE	TELEPHONE
TSB	TEMPORARY SEDIMENT BASIN
UG	UNDERGROUND
WCR	WHEELCHAIR RAMP
W/L	WATER LINE
WM	WATER METER
YI	YARD INLET

	EXISTING CURB INLET
	EXISTING GRATE INLET/YARD INLET
	EXISTING FLARED END SECTION
	EXISTING FIRE HYDRANT
	EXISTING BLOW–OFF ASSEMBLY
	EXISTING GATE VALVE
	EXISTING REDUCER
	EXISTING WATER METER
S	*EXISTING SAN SEWER MANHOLE*
	EXISTING CLEAN OUT
	EXISTING POWER POLE
	EXISTING TELEPHONE PEDESTAL
	EXISTING AREA LIGHT
	EXISTING SIGN
	NEW CURB INLET
	NEW GRATE INLET/YARD INLET
	NEW FLARED END SECTION
	NEW FIRE HYDRANT
	NEW BLOW–OFF ASSEMBLY
	NEW GATE VALVE
	NEW REDUCER
	NEW WATER METER
	NEW TEE
	NEW PLUG
	NEW MANHOLE
	NEW CLEAN OUT
	NEW SIGN
	IRON PIPE
	BENCHMARK
	TEMP SILT FENCE
TPF	TEMP TREE PROTECTION FENCE
TPF	TEMP COMBINATION SILT/TREE PROTECTION FENCE
	TEMP DIVERSION DITCH
	DISTURBED LIMITS
	STREAM
G	*EXISTING GAS LINE*
COM	*EXISTING COMMUNICATIONS LINE*
T	*EXISTING UNDERGROUND TELEPHONE*
E	*EXISTING UNDERGROUND ELECTRIC*
OHE	*EXISTING OVERHEAD ELECTRIC*
W	*EXISTING WATER LINE*
FM	*EXISTING SANITARY SEWER FORCE MAIN*
SS	*EXISTING SANITARY SEWER*
	EXISTING STORM DRAINAGE
	NEW WATER LINE
	NEW SANITARY SEWER
FM	NEW SANITARY SEWER FORCE MAIN
G	NEW GAS MAIN
	HANDICAPPED ACCESSIBLE ROUTE

NOTE: ALL CONSTRUCTION ACTIVITY MUST BE IN ACCORDANCE WITH THE ACCEPTED POLICIES OF THE TOWN OF ROLESVILLE AND NCDOT

COBBLESTONE VILLAGE

MIXED USE DEVELOPMENT

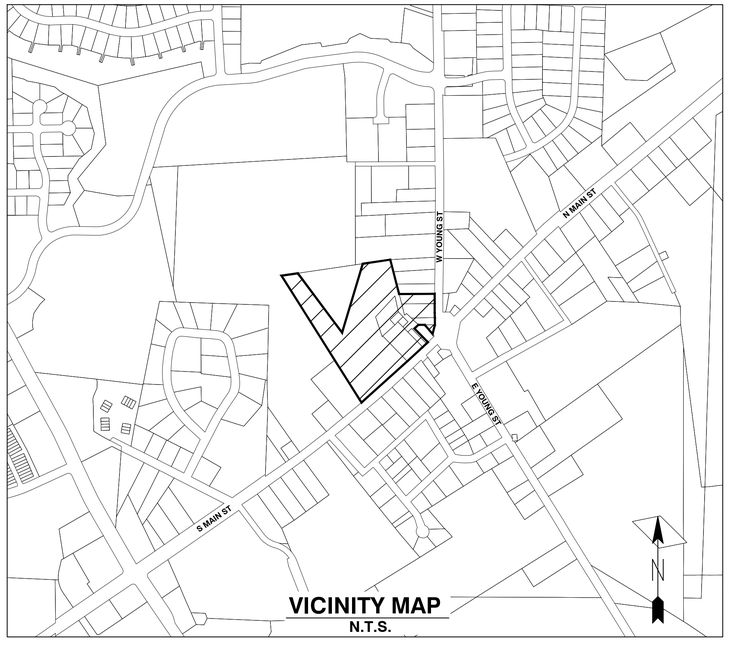
TOWN OF ROLESVILLE, WAKE COUNTY, NORTH CAROLINA

CONSTRUCTION DRAWINGS

TOWN OF ROLESVILLE PROJECT NO.

SITE PLAN APPLICATION NO. CUP-SB-21-01

CASE NO. SP21-01



VICINITY MAP
N.T.S.

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

City of Raleigh
Public Utilities Department Permit # W-3879

Authorization to Construct See digital signature

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

City of Raleigh
Public Utilities Department Permit # S-4962 (P)

Authorization to Construct See digital signature

SITE PERMITTING APPROVAL

Water and Sewer Permits (if applicable)

The City of Raleigh consents to the connection and extension of the City's **Public Sewer System** as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. **City of Raleigh Public Utilities Department Permit #** W-3879

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 #** S-4962 (P)

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

City of Raleigh Public Utilities Department Permit # _____

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

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

City of Raleigh Development Approval _____

Raleigh Water Review Officer

OWNER:

COBBLESTONE CROSSING SPE, LLC
8480 HONEYCUTT ROAD, STE 200
RALEIGH, NC 27615

DEVELOPER:

KDM DEVELOPMENT CORPORATION
1080 PITTSFORD VICTOR RD, STE 202
PITTSFORD NY 14534-3805

CONTACT: KENYON BURHNAM
PHONE: 585-465-0099
EMAIL: KENYON@KDMDEVELOPMENT.COM

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C1.2	OPEN SPACE PLAN
C2.1	UTILITY PLAN
C3.1	GRADING AND DRAINAGE PLAN
C3.2	BMP DETAILS
C3.3	EROSION CONTROL PLAN - STAGE 1
C3.4	EROSION CONTROL PLAN - STAGE 2
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C3.6	EROSION CONTROL DETAILS
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C3.8	STORM DRAINAGE PIPE & STRUCTURE TABLE
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A05	EXTERIOR ELEVATIONS - BUILDING 5
A08	EXTERIOR ELEVATIONS - BUILDING 8
A09	EXTERIOR ELEVATIONS - MAIL KIOSK

CONSTRUCTION NOTES

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH APPLICABLE MUNICIPALITY STANDARDS, SPECIFICATIONS, AND DETAILS. WORK IN THIS PROJECT SHALL ALSO CONFORM TO THESE PLANS, THE LATEST EDITIONS OF THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION (NCDOT) ROAD AND BRIDGE SPECIFICATIONS, THE ROAD AND BRIDGE STANDARDS, THE NORTH CAROLINA EROSION AND SEDIMENT CONTROL HANDBOOK, THE NORTH CAROLINA EROSION AND SEDIMENT CONTROL REGULATIONS, THE FINAL GEOTECHNICAL REPORT, AND GENERAL DESIGN STANDARDS. IN THE EVENT OF CONFLICT BETWEEN ANY OF THESE STANDARDS, SPECIFICATIONS, OR PLANS, THE MOST STRINGENT SHALL GOVERN.
2. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR TRENCH SAFETY DURING ALL PHASES OF CONSTRUCTION.
3. THE LOCATION AND SIZE OF EXISTING UTILITIES AS SHOWN IS APPROXIMATE ONLY. THE CONTRACTOR IS RESPONSIBLE FOR HORIZONTALLY AND VERTICALLY LOCATING AND PROTECTING ALL PUBLIC OR PRIVATE UTILITIES WHICH LIE IN OR ADJACENT TO THE CONSTRUCTION SITE. AT LEAST 48 HOURS PRIOR TO ANY DEMOLITION, GRADING, OR CONSTRUCTION ACTIVITY, THE CONTRACTOR SHALL NOTIFY THE NORTH CAROLINA ONE–CALL UTILITIES LOCATION SERVICE (ULOCO) AT 1–800–632–4949 FOR PROPER IDENTIFICATION OF EXISTING UTILITIES WITHIN THE SITE.
4. THE CONTRACTOR SHALL SALVAGE AND PROTECT ALL EXISTING POWER POLES, SIGNS, MANHOLES, TELEPHONE RISERS, WATER VALVES, ETC. DURING ALL CONSTRUCTION PHASES. THE CONTRACTOR SHALL REPAIR, AT HIS OWN EXPENSE, ANY EXISTING UTILITIES DAMAGED DURING CONSTRUCTION.
5. TRAFFIC CONTROL ON PUBLIC STREETS SHALL BE IN CONFORMANCE WITH THE TRAFFIC CONTROL PLAN, THE 'MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES,' AND AS FURTHER DIRECTED BY CITY AND STATE INSPECTORS.
6. ANY DISCREPANCIES FOUND BETWEEN THE DRAWINGS AND SPECIFICATIONS AND SITE CONDITIONS OR ANY INCONSISTENCIES OR AMBIGUITIES IN DRAWINGS OR SPECIFICATIONS SHALL BE IMMEDIATELY REPORTED TO THE ENGINEER, IN WRITING, WHO SHALL PROMPTLY ADDRESS SUCH INCONSISTENCIES OR AMBIGUITIES. WORK DONE BY THE CONTRACTOR AFTER HIS DISCOVERY OF SUCH DISCREPANCIES, INCONSISTENCIES, OR AMBIGUITIES SHALL BE DONE AT THE CONTRACTOR'S RISK.
7. A PRE–CONSTRUCTION CONFERENCE SHALL BE HELD PRIOR TO THE START OF CONSTRUCTION. THE CONTRACTOR SHALL ARRANGE THE MEETING WITH THE CITY ENGINEERING DIVISION.
8. CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL REQUIRED PERMITS AND APPROVALS PRIOR TO COMMENCING CONSTRUCTION.
9. ALL AREAS SHALL BE GRADED FOR POSITIVE DRAINAGE, AND AS SHOWN ON THESE PLANS. THE CONTRACTOR SHALL MAINTAIN ADEQUATE SITE DRAINAGE DURING ALL PHASES OF CONSTRUCTION. THE CONTRACTOR SHALL USE SILT FENCES (OR OTHER METHODS APPROVED BY THE ENGINEER AND APPLICABLE MUNICIPALITY) AS REQUIRED TO PREVENT SILT AND CONSTRUCTION DEBRIS FROM FLOWING ONTO ADJACENT PROPERTIES. CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE FEDERAL, STATE, OR LOCAL EROSION, CONSERVATION, AND SILTATION ORDINANCES. CONTRACTOR SHALL REMOVE ALL TEMPORARY EROSION CONTROL DEVICES UPON COMPLETION OF PERMANENT DRAINAGE FACILITIES AND THE ESTABLISHMENT OF A STAND OF GRASS OR OTHER GROWTH TO PREVENT EROSION.
10. THE CONTRACTOR SHALL CLEAR AND GRUB THE SITE AND PLACE, COMPACT, AND MOISTURE CONDITION ALL FILL PER THE PROJECT GEOTECHNICAL ENGINEER'S SPECIFICATIONS. THE FILL MATERIAL TO BE USED SHALL BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO PLACEMENT.
11. MATERIALS USED TO CONSTRUCT EMBANKMENTS FOR ANY PURPOSE, BACKFILL AROUND DRAINAGE STRUCTURES, OR IN UTILITY TRENCHES FOR ANY OTHER DEPRESSION REQUIRING FILL OR BACKFILL SHALL BE COMPACTED TO 95% OF MAXIMUM DENSITY AS DETERMINED BY THE STANDARD PROCTOR TEST AS SET OUT IN ASTM STANDARD D698. STONE BACKFILL SHALL BE COMPACTED TO 95% MAXIMUM DENSITY AS DETERMINED BY THE MODIFIED PROCTOR TEST AS SET OUT IN ASTM STANDARD D1557. THE CONTRACTOR SHALL PRIOR TO ANY OPERATIONS INVOLVING FILLING OR BACKFILLING, SUBMIT THE RESULTS OF THE PROCTOR TEST TOGETHER WITH A CERTIFICATION THAT THE SOIL TESTED IS REPRESENTATIVE OF THE MATERIALS TO BE USED ON THE PROJECT. TESTS SHALL BE CONDUCTED BY A CERTIFIED MATERIALS TESTING LABORATORY AND THE CERTIFICATIONS MADE BY A LICENSED PROFESSIONAL ENGINEER REPRESENTING THE LABORATORY.
12. PROPOSED CONTOURS AND GUTTER GRADIENTS ARE APPROXIMATE. PROPOSED SPOT ELEVATIONS AND ROADWAY PROFILES/SUPERELEVATIONS ARE TO BE USED IN CASE OF DISCREPANCY.
13. THE CONTRACTOR SHALL REVIEW, VERIFY AND COORDINATE ALL DIMENSIONS SHOWN ON PLANS, INCLUDING THE HORIZONTAL AND VERTICAL LOCATION OF CURB INLETS AND GRATE INLETS AND ALL UTILITIES CROSSING THE STORM SEWER PRIOR TO STARTING PROJECT.
14. ALL CURB JOINTS SHALL EXTEND THROUGH THE CURB. MINIMUM LENGTH OF OFFSET JOINTS AT RADIUS POINTS IS 1.5 FEET. ALL JOINTS SHALL BE SEALED WITH JOINT SEALANT.
15. ALL HANDICAP RAMPING, STRIPING, AND PAVEMENT MARKINGS SHALL CONFORM TO ADA REQUIREMENTS AND THE 'NORTH CAROLINA STATE BUILDING CODE, VOL. 1–C ACCESSIBILITY CODE.
16. OWNER SHALL PROVIDE FENCING AND OTHER SAFETY MEASURES NECESSARY IN AND AROUND ANY PROPOSED STORMWATER MANAGEMENT MEASURES (PONDS, WETLANDS, ETC.) OBTAINING PROPER PERMITS SHALL BE THE RESPONSIBILITY OF THE OWNER.
17. RETAINING WALLS EXCEEDING 30 INCHES IN HEIGHT SHALL INCLUDE FALL PROTECTION IN THE FORM OF A HANDRAIL OR FENCING ON THE HIGH SIDE OF THE RETAINING WALL.
18. PROPER COMPACTION OF ALL FILL SOILS PLACED ON SITE SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. COMPACTION SHALL BE ADEQUATE TO SUPPORT THE PROPOSED USE OF AREAS IN WHICH FILL SOILS ARE PLACED. THE CONTRACTOR SHALL HIRE A GEOTECHNICAL ENGINEER TO TEST AND VERIFY THAT COMPACTION IS ADEQUATE FOR THE PROPOSED USE OF IN THE AREA OF FILL PLACEMENT.
19. ALL ASPECTS OF THIS PROJECT SHALL BE IN FULL COMPLIANCE WITH CURRENT ADA STANDARDS. IF THE CONTRACTOR NOTES ANY ASPECTS OF THE PROJECT WHICH ARE NOT IN COMPLIANCE, THE ENGINEER SHALL BE NOTIFIED PRIOR TO ANY FURTHER WORK BEING PERFORMED. ANY WORK PERFORMED AFTER THE CONTRACTOR NOTES SUCH A NON COMPLIANCE IS SUBJECT TO REMOVAL AND REPAIR AT THE CONTRACTOR'S EXPENSE.
20. THE CONTRACTOR OR OWNER SHALL EMPLOY A GEOTECHNICAL ENGINEER TO TEST ALL EMBANKMENTS AND FILL PLACEMENT FOR PROPER COMPACTION. PROPER COMPACTION SHALL BE PER THE GEOTECHNICAL ENGINEER'S RECOMMENDATIONS OR THESE PLANS, WHICHEVER IS MORE STRINGENT. EMBANKMENTS FOR PONDS SHALL BE PLACED IN 6 INCH LOOSE LAYERS AND SHALL BE COMPACTED TO A DENSITY OF NO LESS THAN 95% OF THE STANDARD PROCTOR MAXIMUM DENSITY AT A MOISTURE CONTENT OF + OR – TWO PERCENTAGE POINTS OF THE OPTIMUM MOISTURE CONTENT IN ACCORDANCE WITH ASTM D698. THE CONTRACTOR SHALL TAKE PHOTOGRAPHS OF THE OUTLET STRUCTURE AT ALL AT ALL PHASES OF INSTALLATION AND SHALL RETAIN WITH GEOTECHNICAL TESTING DATA. THE CONTRACTOR SHALL ALSO RETAIN ALL SHIPPING RECORDS AND SPECIFICATIONS FOR THE OUTLET STRUCTURE MATERIALS AND STRUCTURES. ALL OF THE ABOVE DATA MAY BE REQUIRED AS PART OF THE MUNICIPALITY AS–BUILT PROCESS AND SHALL BE MADE AVAILABLE TO THE ENGINEER UPON REQUEST. THE CONTRACTOR AND OWNER SHALL HAVE DOCUMENTATION OF THESE TESTS AVAILABLE UPON REQUEST.
21. RETAINING WALLS SHOWN HEREIN SHALL BE DESIGNED BY A QUALIFIED PROFESSIONAL ENGINEER WITH EXPERIENCE DESIGNING RETAINING WALLS. AT LEAST 14 DAYS PRIOR TO BEGINNING CONSTRUCTION OF RETAINING WALLS, THE CONTRACTOR SHALL CONTACT THE OWNER'S GEOTECHNICAL ENGINEER TO SCHEDULE AND COORDINATE ALL APPROPRIATE INSPECTIONS, TESTING, AND VERIFICATION NECESSARY DURING RETAINING WALL CONSTRUCTION. THE GEOTECHNICAL ENGINEER SHALL PROVIDE CONTINUOUS INSPECTION, TESTING AND VERIFICATION FOR THE DURATION OF RETAINING WALL CONSTRUCTION. PROPER SCHEDULING, EXECUTION, AND RECORD KEEPING FOR ALL REQUIRED INSPECTIONS, TESTING, AND VERIFICATION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. SUCH RECORDS SHALL BE RETAINED AND SHALL BE PROVIDED TO THE OWNER AND BASS, NIXON & KENNEDY, INC. ALL MONITORING, TESTING, AND VERIFICATION SHALL CONFORM TO THE MOST RECENT VERSION OF THE NC BUILDING CODE CHAPTER 18, SECTION 1806 OR THE WALL DESIGN ENGINEER'S SPECIFICATIONS, WHICHEVER IS MORE STRINGENT.

ALL CONSTRUCTION MUST CONFORM TO THE UNDERGROUND UTILITY PROTECTION ACT
BEFORE YOU DIG! CONTACT ONE–CALL CENTER 1–800–632–4949

QUANTITY SUMMARY

PHASE NUMBER(S)	1
NUMBER OF LOT(S)	1
LOT NUMBER(S) BY PHASE	N/A
NUMBER OF UNITS	188
LIVABLE BUILDINGS	6
OPEN SPACE (AC)	1.92
NUMBER OF OPEN SPACE LOTS	N/A
PUBLIC WATER (LF)	875
PRIVATE SEWER (LF)	550
PUBLIC STREET (LF)	0
PUBLIC SIDEWALK (LF)	255

ENGINEER:

BASS, NIXON & KENNEDY, INC.
CONSULTING ENGINEERS
6310 CHAPEL HILL ROAD, SUITE 250
RALEIGH, NORTH CAROLINA 27607
TELEPHONE: (919) 851-4422
FAX: (919) 851-8968

CERTIFICATION NUMBERS: NCBELS (C-0110)
NCBOLA (C-0267)

CONTACT: MARTY D. BIZZELL, PE, CPESC
EMAIL: Marty.Bizzell@BNKinc.com

NORTH CAROLINA PROFESSIONAL SEAL 036808 ENGINEER MARTY D. BIZZELL
12/08/23

EROSION CONTROL, STORMWATER AND FLOODPLAIN MANAGEMENT

APPROVED
EROSION CONTROL ☐ S-_____
STORMWATER MGMT. ☐ S-_____
FLOOD STUDY ☐ S-_____
DATE_____

WAKE COUNTY NORTH CAROLINA

ENVIRONMENTAL CONSULTANT SIGNATURE

TOWN OF ROLESVILLE PROJECT NO.
BASS, NIXON & KENNEDY, INC.

03-19157 COBBLESTONE VILLAGE CONSTRUCTION SUBMITTAL

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City of Raleigh Development Approval _____

Raleigh Water Review Officer

1. POWERS, MARK R
POWERS, MARY K
PIN 1759-91-8091
REID 0055852
DB 9384 PG 2517
ZONING R-1
USE SINGLE FAMILY

2. TOWN OF ROLESVILLE
PIN 1759-92-2076
REID 0069979
DB 9754 PG 1416
ZONING R-1
USE ROLESVILLE TOWN PARK

3. TELECOM TOWERS LLC
PIN 1759-91-8780
REID 0060854
DB 12822 PG 1582
ZONING R-1
USE CELL TOWER

4. MAY, WILLIAM A
PIN 1769-02-3002
REID 0075102
DB 16-E PG 1544
ZONING R-1
USE SINGLE FAMILY

5. WILKINS, ROXEY MANGUM
WILKINS, WESLEY C SR
PIN 1769-01-4849
REID 0045890
DB 13684 PG 719
ZONING R-1
USE SINGLE FAMILY

6. WILKINS, ROXEY MANGUM
WILKINS, WESLEY C SR
PIN 1769-01-4840
REID 0002959
DB 16593 PG 1043
ZONING R-1
USE SINGLE FAMILY

7. SELF, LINDA ESTELLE MERRITT
WILKINS, ROXEY M
PIN 1769-01-4751
REID 0046996
DB 16423 PG 2434
ZONING R-1
USE MANUFACTURED HOME

8. HAMILTON, ELIZABETH
WILIAMS WILLIAMS, FRED J III
PIN 1769-01-7801
REID 0078003
DB 18-10 PG 63
ZONING R-1
USE SINGLE FAMILY

9. WILLIAMS, SUSIE H
PIN 1769-01-6663
REID 0078000
DB 012976 PG 01157
ZONING C
USE VACANT

10. TOWN OF ROLESVILLE
PIN 1769-01-7654
REID 0077362
DB 014567 PG 0741
ZONING C
USE SINGLE FAMILY

11. EDDINS FAMILY LLC
PIN 1769-01-5274
REID 0035722
DB 009971 PG 02251
ZONING C
USE COMMERCIAL

12. DRAGONFLY INVESTMENTS NC LLC
PIN 1769-01-5157
REID 0073627
DB 017752 PG 00806
ZONING C
USE COMMERCIAL

13. KET REAL ESTATE LLC
PIN 1769-01-5048
REID 0073596
DB 015925 PG 00965
ZONING R-1
USE TWOFAM

14. WIGGINS, BERTIE W
PIN 1769-01-4083
REID 0073786
DB 002265 PG 00405
ZONING R-1
USE SINGLE FAMILY

15. DIXON, BESSIE W
PIN 1769-00-4915
REID 0073787
DB 002265 PG 00087
ZONING R-1
USE SINGLE FAMILY

16. WELLS, ANGELA S
PIN 1769-00-3849
REID 0073785
DB 005317 PG 00189
ZONING R-1
USE SINGLE FAMILY

17. COOKE, WILLIS NANCY V
PIN 1769-00-2815
REID 0014688
DB 001810 PG 00563
ZONING R-1
USE SINGLE FAMILY

18. PRIVETTE PROPERTIES LLC
PIN 1769-00-5401
REID 0118309
DB 012763 PG 02560
ZONING C
USE COMMERCIAL

LINE TABLE		
LINE	BEARING	DISTANCE
L1	N 81°56'53" E	114.61'
L2	S 14°20'45" E	88.05'
L3	S 14°12'54" E	89.00'
L4	S 14°33'55" E	71.61'
L5	S 01°08'18" W	69.00'
L6	S 02°39'27" E	71.60'
L7	S 88°53'11" W	5.88'
L8	S 09°47'58" E	136.92'
L9	S 13°01'50" W	53.54'
L10	N 41°07'57" W	82.24'
L11	S 89°51'12" W	44.50'
L12	S 47°53'18" W	37.60'
L13	S 44°50'19" E	118.28'
L14	S 44°51'41" W	51.93'
L15	S 59°25'16" W	14.29'
L16	S 59°07'45" W	63.67'
L17	S 58°20'56" W	39.98'
L18	S 48°52'45" W	104.14'
L19	S 48°59'00" W	19.07'
L20	S 49°16'35" W	96.02'

NOTES:
1. EXISTING WATER MAIN TO REMAIN ACTIVE UNTIL THE PROPOSED WATER LINE IS INSTALLED, TESTED, AND READY TO BE ACTIVE.
2. SERVICES TO EXISTING BUILDINGS TO REMAIN IN PLACE THROUGHOUT CONSTRUCTION. CONTRACTOR TO VERIFY SERVICE LOCATIONS.
3. EXISTING WELLS AND SEPTIC SYSTEMS TO BE ABANDONED PER ALL WAKE COUNTY ENVIRONMENTAL SERVICES, STANDARDS & SPECIFICATIONS.

NO FLOODPLAINS EXIST ON-SITE

NOTE: ALL CONSTRUCTION ACTIVITY MUST BE IN ACCORDANCE WITH THE ACCEPTED POLICIES OF THE TOWN OF ROLESVILLE AND NCDOT

SCALE IN FEET
0 20 40 80 120 160

TOWN OF ROLESVILLE PROJECT NO.

NOT RELEASED FOR CONSTRUCTION OR BID SOLICITATION

BASS, NIXON & KENNEDY, INC.
CONSULTING ENGINEERS
6310 CHAPEL HILL ROAD, SUITE 250, RALEIGH, NC 27607
TELEPHONE: (919)851-4422 FAX: (919)851-8968
CERTIFICATION NUMBERS: NCBELS (C-0110); NCBOLA (C-0267)

NO.	DATE	DESCRIPTION	BY
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1	09-21-23	CHANGES FROM 06-02-22 CD'S	MRM
NO.	DATE	DESCRIPTION	BY

REVISIONS

JOB NO. 03-19157 | PROGRESS DATE | DRAWN BY MRM | CHK BY: MDB

EXISTING CONDITIONS & DEMOLITION PLAN

SCALE: 1" = 40'

COBBLESTONE VILLAGE
MIXED USE DEVELOPMENT
TOWN OF ROLESVILLE, WAKE COUNTY, NORTH CAROLINA

NORTH CAROLINA PROFESSIONAL SEAL 036908 ENGINEER MARTY D. BIZELL
12/08/23

SHEET C0.1

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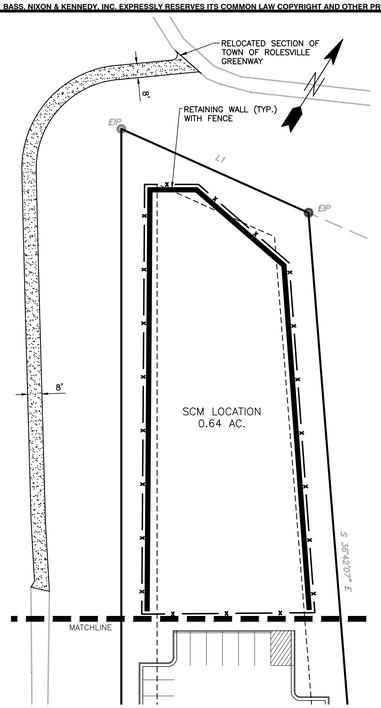

CONDITIONS OF APPROVAL:

1. TECHNICAL REVIEW COMMITTEE APPROVAL AND ISSUANCE OF REQUIRED PERMITS FROM ALL AGENCIES MUST BE ACHIEVED AND SUBMITTED FOR REVIEW AND RECORD RETENTION PRIOR TO FINAL SIGNATURE AND APPROVAL OF THE SITE PLAN.
2. CROSS-CONNECTION ACCESS TO ONE OF THE THREE ADJACENT PROPERTIES TO THE EAST ALONG W. YOUNG STREET (111, 113, AND 115 W. YOUNG STREET) FOR FUTURE DEVELOPMENT WILL BE PROVIDED.
3. BEST EFFORTS WILL BE MADE FOR GREENWAY ACCESS ACROSS THE TELECOM TOWNERS, LLC SITE FOR PEDESTRIAN TRAFFIC FROM OVERFLOW PARKING SITE LOCATED AT THE TERMINUS OF SCARBORO STREET IN MAIN STREET PARK.
4. BASED UPON TESTIMONY REGARDING SHARED PARKING IN A MIXED-USE DEVELOPMENT, A 15% PARKING REDUCTION IS GRANTED RESULTING IN 467 REQUIRED SPACES.
5. A MAXIMUM HEIGHT OF 60 FEET IS APPROVED PER THE BUILDING HEIGHT DESIGN ALTERNATIVE FOR THE SITE AS SHOWN ON THE SITE PLAN, PROVIDED ALL OTHER APPLICABLE STANDARDS ACCORDING TO THE LDO ARE MET.
6. FINAL STREET DESIGN SHALL INCORPORATE A ROUNDABOUT OR OTHER CUT-THROUGH FOR DROP-OFFS CONSISTENT WITH THE DESIGN REQUIREMENTS OF THE TOWN COMMUNITY BUILDING AS PROVIDED BY THE TOWN'S ARCHITECTURAL CONSULTANT.
7. SUP APPROVED BY BOARD OF COMMISSIONERS ON OCTOBER 5, 2021.

OVERALL SITE DATA

SITE AREA	10.96 AC (477,418 SF±)
P.I.N.	1769-01-1935
ZONING DISTRICT:	TOWN CENTER (TC)
USE:	RESIDENTIAL, MIXED USE
OPEN SPACE AREA:	1.92 AC PROVIDED (1.10 AC REQUIRED, 10%)
IMPERVIOUS AREA:	7.50 AC
IMPERVIOUS AREA (%):	68%
APARTMENT MIX	
1 BEDROOM	96 UNITS
2 BEDROOM	80 UNITS
3 BEDROOM	12 UNITS
TOTAL APARTMENTS	188 UNITS
RESIDENTIAL DENSITY:	17.15 UNITS/ACRE
TOTAL RETAIL/FLEX/COMMERCIAL: 3	53,384 SQUARE FEET
EVENT SPACE:	0.44 ACRES/ 18,976 SQUARE FEET

PARKING REQUIREMENTS PER TC DISTRICT DEVELOPMENT STANDARDS

MIXED USE RESDENTIAL: 2.0 SPACES PER UNIT	188 x 2 = 376 SPACES REQUIRED
MIXED USE NON-RESIDENTIAL: 3 SPACES PER 1000 GSF	53,384/1000 x 3 = 161 SPACES REQUIRED
TOTAL PARKING REQUIRED/PROVIDED:	537 SPACES REQUIRED/ 468 PROVIDED

5% OF ON STREET PARKING MAY BE COUNTED AS REQUIRED PARKING (27 ALLOWED/ 24 PROVIDED)
15% PARKING REDUCTION ALLOWED FOR SHARED PARKING: 537 x .85 = 457 REQUIRED/ 468 PROVIDED

BUILDING 1:	51,882 SF APARTMENTS
BUILDING 2:	11,678 SF RETAIL, 23,356 SF APARTMENTS
BUILDING 3:	8,612 SF RETAIL, 17,224 SF APARTMENTS
BUILDING 4:	10,420 SF RETAIL
BUILDING 5:	5,970 FLEX
BUILDING 6:	16,704 SF RETAIL, 33,408 SF APARTMENTS
BUILDING 7:	51,882 SF APARTMENTS
BUILDING 8:	31,710 SF APARTMENTS

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

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

City of Raleigh Development Approval _____

Raleigh Water Review Officer

ROADWAY MARKINGS TO BE IN ACCORDANCE WITH NCDOT ENCROAHMENT PERMIT E051-092-22-00547

CONTRACTOR AND DEVELOPER TO ENSURE POSITIVE DRAINAGE UNTIL IMPROVEMENTS ARE MADE BY U-6241

NO FLOODPLAINS EXIST ON-SITE

NOTE: ALL CONSTRUCTION ACTIVITY MUST BE IN ACCORDANCE WITH THE ACCEPTED POLICIES OF THE TOWN OF ROLESVILLE AND NCDOT

SCALE IN FEET
0 20 40 80 120 160

TOWN OF ROLESVILLE PROJECT NO.

BASS, NIXON & KENNEDY, INC.
CONSULTING ENGINEERS
6310 CHAPEL HILL ROAD, SUITE 250, RALEIGH, NC 27607
TELEPHONE: (919)851-4422 FAX: (919)851-8968
CERTIFICATION NUMBERS: NCBELS (C-0110); NCBOLA (C-0267)

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1	09-21-23	CHANGES FROM 06-02-22 CD'S

REVISIONS BY: MRM MRM MRM

PROGRESS
DRAWN BY: MRM
DATE
JOB NO. 05191S7

SITE PLAN

SCALE: 1" = 40'
CHK BY: MDB

COBBLESTONE VILLAGE
MIXED USE DEVELOPMENT
TOWN OF ROLESVILLE, WAKE COUNTY, NORTH CAROLINA

SHEET C1.1

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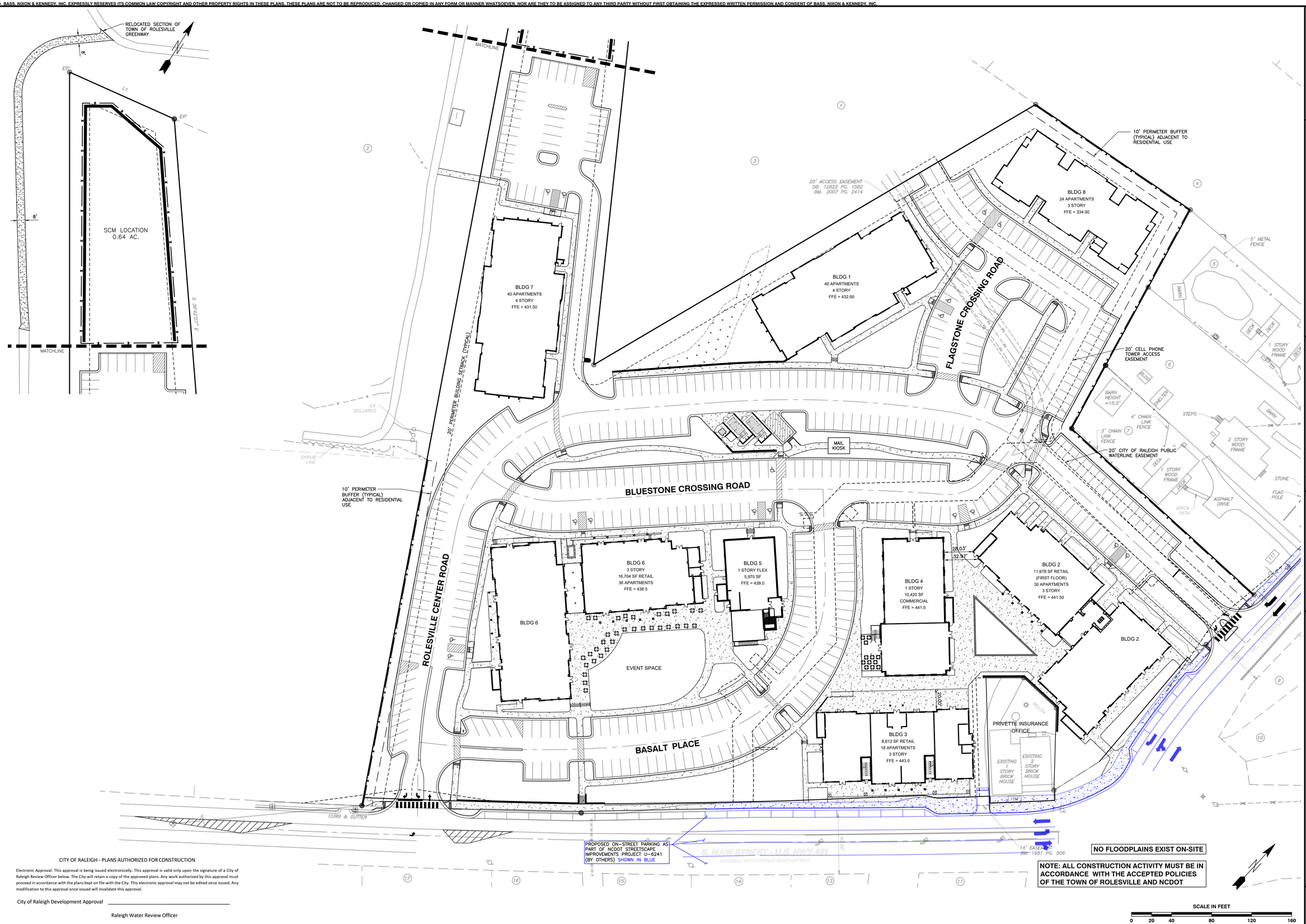

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City of Raleigh Development Approval _____

Raleigh Water Review Officer

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		REVISIONS

JOB NO.	03-19157
DATE	
PROGRESS	
DRAWN BY	MRM
CHK BY:	MDB

OPEN SPACE PLAN

SCALE: 1" = 40'

COBBLESTONE VILLAGE
MIXED USE DEVELOPMENT
TOWN OF ROLESVILLE, WAKE COUNTY, NORTH CAROLINA

SHEET C1.2

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City of Raleigh Development Approval _____

Raleigh Water Review Officer

Public
Water Distribution / Extension System

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

City of Raleigh Public Utilities Department Permit # W-3879

Authorization to Construct See digital signature

Private
Sewer Collection / Extension System

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

City of Raleigh Public Utilities Department Permit # S-4962 (P)

Authorization to Construct See digital signature

ATTENTION CONTRACTORS

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

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

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

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

NOTES:
1. FOR BUILDING SEWER PLUMBING THE FURTHEST MAIN UNDER SLAB UPSET 1.5' BELOW FFE.
2. BACKFLOW PREVENTERS TO BE LOCATED INSIDE OF BUILDINGS 2 & 4.

NO FLOODPLAINS EXIST ON-SITE

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SCALE IN FEET
0 20 40 80 120 160

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		REVISIONS	

PROGRESS DRAWN BY: MRM
DATE CHK BY: MDB
JOB NO. 03-19157
SCALE: 1" = 40'

UTILITY PLAN

COBBLESTONE VILLAGE
MIXED USE DEVELOPMENT
TOWN OF ROLESVILLE, WAKE COUNTY, NORTH CAROLINA

NORTH CAROLINA PROFESSIONAL SEAL 036905 ENGINEER MARTY D. BIZZELL
12/08/23

SHEET C2.1

TOWN OF ROLESVILLE PROJECT NO.

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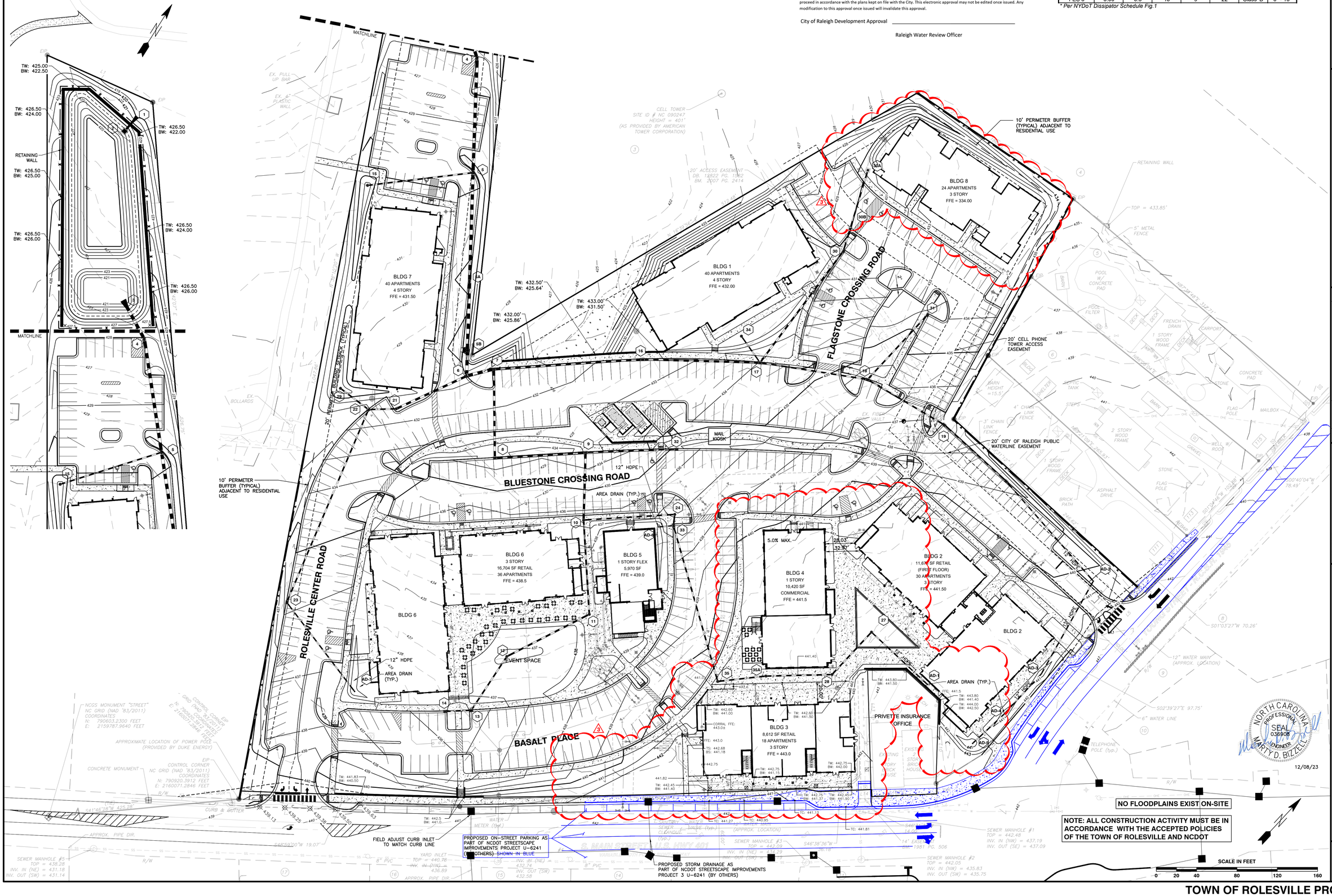
City of Raleigh Development Approval _____

Raleigh Water Review Officer

Structure	d_o (ft)	Velocity (fps)	Length (ft)	Width (ft)	Depth (in)	Type	d_{50}
FES 1	2.00	7.4	12	6	22	Class 'B'	6" - 13"
FES 3	3.00	6.5	18	9	22	Class 'B'	6" - 13"

** Per NYDoT Dissipator Schedule Fig.1*



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		REVISIONS	

JOB NO. 03-19157 PROGRESS DATE
DRAWN BY MRM
CHK BY: MDB
SCALE: 1" = 40'

GRADING PLAN

COBBLESTONE VILLAGE
MIXED USE DEVELOPMENT
TOWN OF ROLESVILLE, WAKE COUNTY, NORTH CAROLINA

NORTH CAROLINA PROFESSIONAL SEAL 036908 ENGINEER MARTY D. BIZZELL
12/08/23

SHEET C3.1

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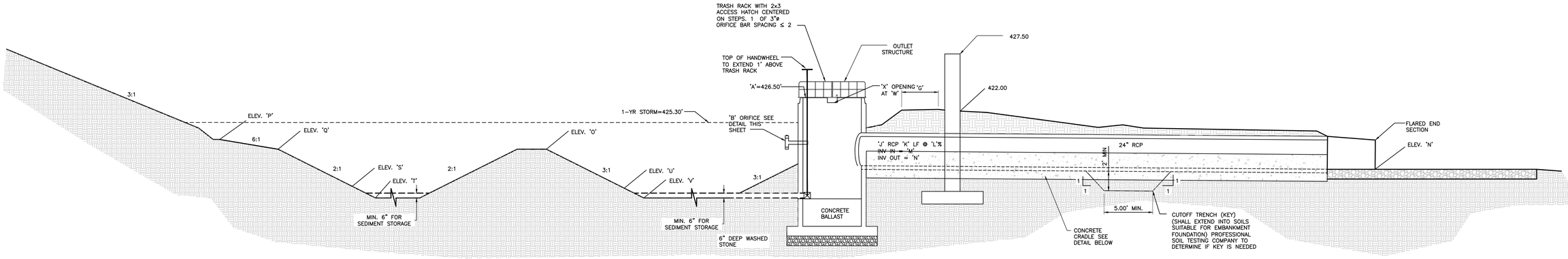
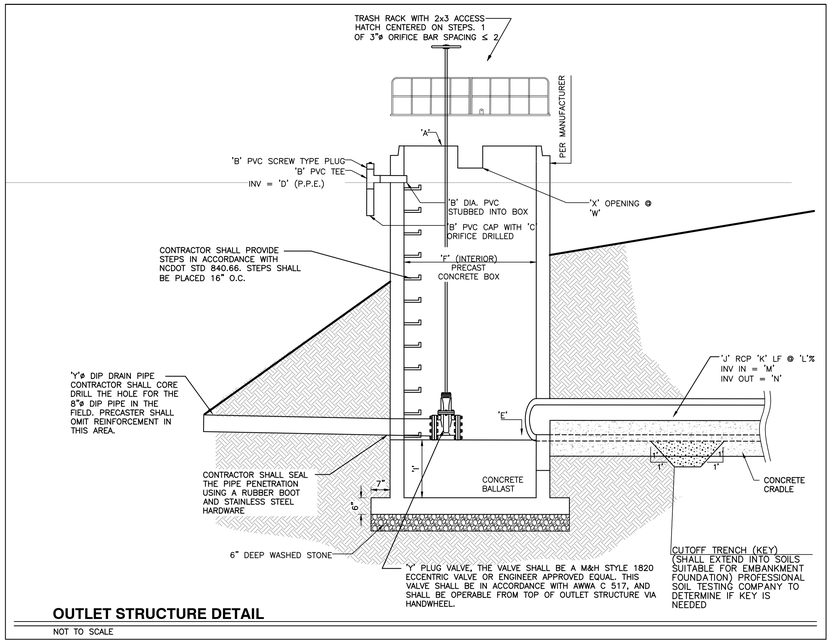


CROSS-SECTION OF WET POND A-A

NTS



OUTLET STRUCTURE DETAIL

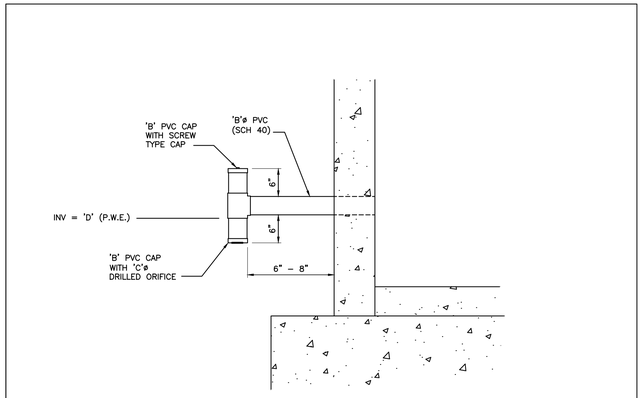
NOT TO SCALE

BOUYANCY CALCULATIONS FOR RISER/BARREL
COBBLESTONE VILLAGE
WET POND - SCM

Square Riser Inside Length (ft):	4.0
Riser Wall Thickness (in):	6
Pond Bottom Elevation (ft):	420.00
Riser Crest Elevation (ft):	426.50
Density of Riser Matl (lb/cf):	150.00
Pipe Inside Diameter (in):	24
Pipe Wall Thickness (in):	3
Length of Pipe Exposed (ft):	1.00
Density H2O (lb/cf):	62.40
Volume H2O Displaced by Riser (cf):	131.63
Weight H2O Displaced by Riser (lb):	8213.40
Volume H2O Displaced by Pipe (cf):	4.91
Weight H2O Displaced by Pipe (lb):	306.31
Total Uplift Force (lb):	8519.71
Weight of Riser (lb):	4,144
Weight of Pipe (lb):	265.07
Pipe/Riser Downward Force (lb):	4408.82

Ballast Concrete:

Minimum Factor of Safety:	1.2
Required ballast thickness (in):	37.02
Provided Ballast Thickness (in):	40
Total Downward Force (lb):	10,692
Provided Factor of Safety:	1.25



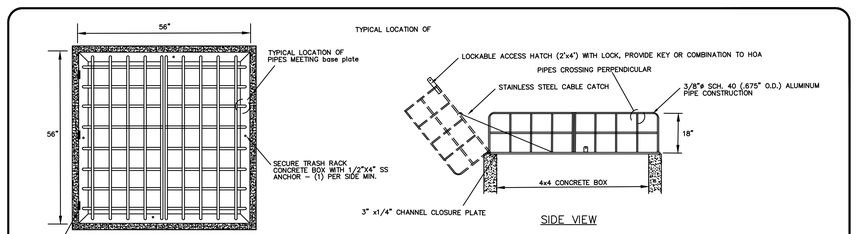
INVERTED INTAKE DETAIL (RISER)

NTS

POND LEGEND - SCM			
	Description	Design	As-Built
A	Top of Riser	426.50 ft	
B	Diameter of PVC Drawdown Pipe	4 in	
C	Drawdown Orifice Opening	2.5 in	
D	Drawdown Pipe Elevation / Permanent Pool	424.50 ft	
E	Inside Bottom Riser Elevation	420.00 ft	
F	Outlet Structure Size	4ft x 4ft	
G	Top of Berm Width	10 ft	
H	Top of Dam	428.00 ft	
I	Ballast Thickness	40 in	
J	Size of Outlet Pipe	24 in	
K	Length of Outlet Pipe	18 ft	
L	Slope of Outlet Pipe	2.78 %	
M	Invert in Outlet Pipe	420.00 ft	
N	Invert Out Outlet Pipe	419.80 ft	
O	Top Elevation Forebay Berm	424.00 ft	
P	Elevation Top of Litoral Shelf	425.00 ft	
Q	Elevation Bottom of Litoral Shelf	424.00 ft	
R	Slope of Litoral Shelf	6:1	
S	Sediment Cleanout Elevation Forbay	422.00 ft	
T	Bottom Elevation Forebay	421.00 ft	
U	Sediment Cleanout Elevation Permanent Pool	421.00 ft	
V	Bottom Elevation Permanent Pool	420.00 ft	
W	Elevation Secondary Weir	426.20 ft	
X	Width Secondary Weir	12 in	

Special Instructions

Place Drawdown pipe opposite of outlet pipe and ensure a minimum of 12" clearance between drawdown pipe opening and ground elevation to allow for proper drainage. Place secondary weir above drawdown pipe on same side of outlet structure.



TRASH RACK SUBMITTAL - Aluminum Trashrack for 4x4 Box

ALUMINUM TRASH RACK MATERIALS AND WELDING SPECIFICATIONS

ALUMINUM MATERIALS USED IN TRASH RACK FABRICATION:
6061-T6

GENERAL CHARACTERISTICS:
6061-T6 HEAVY DUTY STRUCTURAL CORROSION RESISTANCE (B) STRESS, CRACKING (B)

ALUMINUM MILL PRODUCT SPECIFICATIONS
6061 PIPE MILITARY (MIL-P-25995) ASTM B241) ANSI (H38.7)

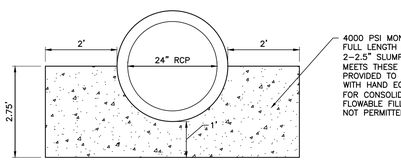
TYPICAL MECHANICAL PROPERTIES:
TENSILE STRENGTH (ksi)
6061-T6 ULTIMATE (45) YIELD (40) ULTIMATE SHEARING STRENGTH ksi (30)

TYPICAL MECHANICAL PROPERTIES OF TIG WELDED JOINT ON ALUMINUM ALLOYS:
WELD DUCTILITY
BASE METAL 6061
FILLER 5356 ULTIMATE STRENGTH (29,000#) YIELD STRENGTH (17,000 #)

NOTE: WELDING OF ALUMINUM HAS LITTLE, IF ANY, ROOT PENETRATION INTO BASE METAL. TO ACHIEVE PROPER JOINT ATTACHMENT BEVELING OF BASE METAL IS NECESSARY AND GENEROUS AMOUNT OF WELD ROD IS REQ'D. WE USE BOTH 4043 AND 5356 FILLER RODS TO ACHIEVE THE BEST STRENGTH AND CORROSION RESISTANCE FOR THE APPLICATION. ALL PIPES THAT CROSS PERPENDICULAR TO ONE ANOTHER ARE WELDED TOP AND BOTTOM WITH A 1/4" TO 3/8" WIDE FILLET. PIPES THAT MEET THE BASE PLATES ARE WELDED COMPLETELY AROUND WITH A 1/4" TO 3/8" WELD FILLET. ALL WELDS ARE DONE IN A MANNER TO ACHIEVE MAXIMUM STRENGTH AND IN AN EFFORT TO MINIMIZE ANNEALING OF THE BASE METAL IN ORDER TO AVOID CRACKING.

TRASH RACK DETAIL

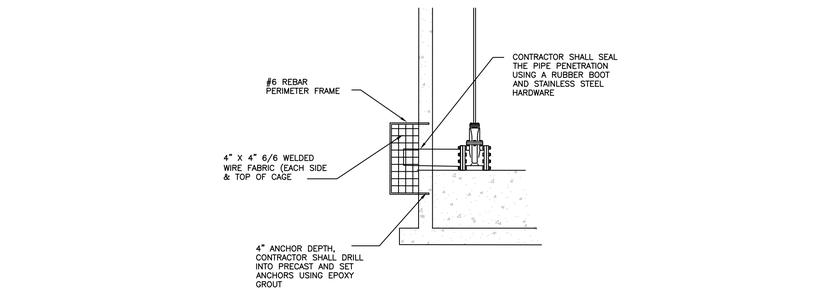
NTS



4000 PSI MONOLITHIC CONCRETE CRADLE UNDER FULL LENGTH OF PIPE. CONCRETE SHALL BE 2–2.5" SLUMP. CERTIFICATION THAT CONCRETE MEETS THESE SPECIFICATION'S SHALL BE PROVIDED TO THE OWNER. PLACE UNDER PIPE WITH HAND EQUIPMENT AND VIBRATE INTERNALLY FOR CONSOLIDATION, FINISH SHALL BE "ROUGH". FLOWABLE FILLS, SLURRIES, OR OR GELS ARE NOT PERMITTED.

CONCRETE CRADLE DETAIL

NOT TO SCALE



(IF APPLICABLE) EMERGENCY DRIP DRAIN TRASH RACK DETAIL

NOT TO SCALE

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

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City of Raleigh Development Approval _____

Raleigh Water Review Officer

NORTH CAROLINA PROFESSIONAL SEAL 036908 ENGINEER MARY D. BIZZELL

12/08/23

NO FLOODPLAINS EXIST ON-SITE

NOTE: ALL CONSTRUCTION ACTIVITY MUST BE IN ACCORDANCE WITH THE ACCEPTED POLICIES OF THE TOWN OF ROLESVILLE AND NCDOT

BASS, NIXON & KENNEDY, INC.
CONSULTING ENGINEERS
6310 CHAPEL HILL ROAD, SUITE 250, RALEIGH, NC 27607
TELEPHONE: (919)851-4422 FAX: (919)851-8968
CERTIFICATION NUMBERS: NCBELS (C-0110); NCBOLA (C-0267)

NO.	DATE	DESCRIPTION	BY
		REVISIONS	
3	12-08-23	TOWN OF ROLESVILLE COMMENTS	MRM
2	10-16-23	T.O.R. COMMENTS	MRM
1	09-21-23	CHANGES FROM 06-02-22 CD'S	MRM

PROGRESS MRM
DRAWN BY
DATE
JOB NO. 03-19157
SCALE: N.T.S.
CHK BY: MDB

BMP DETAILS

COBBLESTONE VILLAGE
MIXED USE DEVELOPMENT
TOWN OF ROLESVILLE, WAKE COUNTY, NORTH CAROLINA

SHEET C3.2

NOT RELEASED FOR CONSTRUCTION OR BID SOLICITATION

TOWN OF ROLESVILLE PROJECT NO.

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CONSTRUCTION SEQUENCE - STAGE 1

1. ONCE THE EROSION AND SEDIMENT CONTROL PLAN APPROVAL AND NCG01 CERTIFICATE OF COVERAGE ARE OBTAINED, SCHEDULE A PRECONSTRUCTION CONFERENCE WITH THE ENVIRONMENTAL CONSULTANT. OBTAIN A LAND-DISTURBING PERMIT.
2. INSTALL GRAVEL CONSTRUCTION PAD, TEMPORARY DIVERSIONS, SILT FENCE, SKIMMER SEDIMENT BASINS AND OTHER MEASURES AS SHOWN ON THE APPROVED PLAN. CLEAR ONLY AS NECESSARY TO INSTALL THESE DEVICES. SEED TEMPORARY DIVERSIONS, BERMS AND BASINS IMMEDIATELY AFTER CONSTRUCTION.
3. CALL ENVIRONMENTAL CONSULTANT FOR AN ONSITE INSPECTION BY THE ENVIRONMENTAL CONSULTANT TO OBTAIN A CERTIFICATE OF COMPLIANCE.
4. BEGIN CLEARING AND GRUBBING. MAINTAIN DEVICES AS NEEDED. ROUGH GRADE SITE.
5. STABILIZE SITE AS AREAS ARE BROUGHT UP TO FINISH GRADE WITH VEGETATION, PAVING, DITCH LININGS, ETC. SEED AND MULCH DENUDED AREAS PER GROUND STABILIZATION TIME FRAMES.
6. STABILIZE SITE AS AREAS ARE BROUGHT UP TO FINISH GRADE WITH VEGETATION, ALLEY PAVING, DITCH LININGS, ETC. SEED AND MULCH DENUDED AREAS PER GROUND STABILIZATION TIME FRAMES.
7. CALL ENVIRONMENTAL CONSULTANT FOR AN ONSITE INSPECTION BY THE ENVIRONMENTAL CONSULTANT PRIOR TO THE REMOVAL OF SKIMMER SEDIMENT BASIN #1.
8. CONTINUE TO SOIL EROSION PLAN STAGE 2 ONCE SKIMMER BASIN #1 HAS BEEN REMOVED.

NOTE: WAKE COUNTY MUST GRANT PERMISSION TO CONVERT THE SEDIMENT BASIN OVER TO THE STORMWATER USE PRIOR TO COMPLETING ANY RELATED WORK.

TOTAL DISTURBED AREA = 11.0 AC

DENUDED AREA = 10.96 AC

REQUIRED WAKE COUNTY BASIN REMOVAL AND/OR CONVERSION SEQUENCE

1. SCHEDULE A SITE MEETING WITH THE ENVIRONMENTAL CONSULTANT TO DETERMINE IF A BASIN CAN BE REMOVED OR CONVERTED TO A PERMANENT STORMWATER POND. INSTALL SILT FENCING OR OTHER TEMPORARY EROSION CONTROL MEASURES AS NEEDED PRIOR TO REMOVAL OF THE BASIN.
2. UTILIZE OUTLET STRUCTURES THAT WITHDRAW WATER FROM THE SEDIMENT BASIN SURFACE FOR DRAW DOWN OF WATER IN BASIN FOR MAINTENANCE OR CLOSE OUT UNLESS INFEASIBLE. SEE REQUIREMENTS OF NCG01 PERMIT PART II, SECTION G, ITEM (4) ENTITLED "DRAW DOWN OF SEDIMENT BASINS FOR MAINTENANCE OR CLOSE OUT" AND REFER TO WAKE COUNTY "FILTER BAG FOR DEWATERING ACTIVITIES" CONSTRUCTION DETAIL.
3. REMOVE BASIN(S) AND ASSOCIATED TEMPORARY DIVERSION DITCHES. IF CULVERT PIPES NEED TO BE EXTENDED, PERFORM THIS OPERATION AT THIS TIME. FINE GRADE AREA IN PREPARATION FOR SEEDING.
4. PERFORM SEEDBED PREPARATION, SEED, MULCH AND ASPHALT TACK ANY RESULTING BARE AREAS IMMEDIATELY.
5. INSTALL VELOCITY DISSIPATORS AND/OR LEVEL SPREADERS AS REQUIRED ON THE EROSION CONTROL PLAN.
6. WHEN SITE IS FULLY STABILIZED, CALL ENVIRONMENTAL CONSULTANT FOR APPROVAL OF REMOVING REMAINING TEMPORARY EROSION CONTROL MEASURES AND ADVICE ON WHEN SITE CAN BE ISSUED A CERTIFICATE OF COMPLETION. NOTE: A MEETING SHOULD ALSO BE SCHEDULED WITH THE ENVIRONMENTAL CONSULTANT TO DETERMINE WHEN A BASIN MAY BE CONVERTED FOR STORMWATER USE. SOME MUNICIPALITIES MAY ALSO REQUIRE THIS.

SEDIMENT BASIN SUMMARY CHART

Sediment Basin Number	1	2	3
Drainage Area (acres)	3.42	4.61	0.6
Q10(cfs)	(0.5)(7.22)(3.42)=12.35	(0.5)(7.22)(4.61)=16.64	(0.5)(7.22)(0.60)=2.17
Weir Size (ft)	10 x 1.5	10 x 1.5	10 x 1.5
Surface Area Required (SF)	(435)(12.35)=5,372	(435)(16.64)=7,238	(435)(2.17)=944
Volume Required (CF)	(1800)(3.42)= 6,156	(1800)(4.61)= 8,298	(1800)(0.60)= 1,080
Dimensions (ft)	see plans	see plans	see plans
Surface Area Provided (SF)	5,400	10,640	1,584
Volume Provided (CF)	13,572	27,636	2,563
Skimmer Size	4"	4"	3
Orifice Radius	0.5"	0.63"	0.25
Orifice Diameter	1.0"	1.25"	0.5
Drawdown Time (Days)	4.62	3.98	3.74
Number of Baffles	3	3	3

Structure	d_c (ft)	Velocity (fps)	Length (ft)	Width (ft)	Depth (in)	Type	d_{90}
FES 1	2.00	7.4	12	6	22	Class 'B'	6" - 13"
FES 3	3.00	6.5	18	9	22	Class 'B'	6" - 13"
DV DITCH 1*	1.25	5.3	5	4	9	Class 'A'	3" - 6"
DV DITCH 2*	1.25	5.3	5	4	9	Class 'A'	3" - 6"
DV DITCH 3*	1.25	5.3	5	4	9	Class 'A'	3" - 6"
DV DITCH 4*	1.25	5.3	5	4	9	Class 'A'	3" - 6"
PIPE 1**	1.25	5.3	5	4	9	Class 'A'	3" - 6"
PIPE 2**	1.25	5.3	5	4	9	Class 'A'	3" - 6"

*Per NYDoT Dissipator Schedule Fig.1

DITCH/CHANNEL CALCULATIONS

DIVERSION DITCH ID	LENGTH (LF)	DA (Ac)	Q10 (CFS)	SLOPE (%)	V10 (FPS)	LINER *	PERMISSIBLE SHEAR STRESS (PSF)	CALCULATED SHEAR STRESS (PSF)
DV-1	296	1.02	2.34	2.00	2.01	SC150	2.00	0.78
DV-2	495	1.00	2.30	2.60	2.29	SC150	2.00	0.94
DV-3	442	0.52	1.19	1.80	0.92	SC150	1.80	0.29
DV-4	167	0.06	0.13	2.90	0.98	SC150	1.80	0.38

* NAG = NORTH AMERICAN GREEN OR EQUIVALENT

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

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City of Raleigh Development Approval _____

Raleigh Water Review Officer

Skimmer Basin #1

Okay

3.42	Drainage Area (Acres)
12.35	Peak Flow from 10-year Storm (cfs)
6156	Required Volume (ft³)
5372	Required Surface Area (ft²)
51.8	Suggested Width (ft)
103.7	Suggested Length (ft)
54	Trial Top Width at Spillway Invert (ft)
100	Trial Top Length at Spillway Invert (ft)
2	Trial Side Slope Ratio Z:1
3	Trial Depth (ft) (2 to 3.5 feet above grade)
42	Bottom Width (ft)
88	Bottom Length (ft)
3696	Bottom Area (ft²)
13572	Actual Volume (ft³) Okay
5400	Actual Surface Area (ft²) Okay
10	Trial Weir Length (ft)
1	Suggested Trial Depth of Flow (ft)
30.0	Spillway Capacity (cfs) Okay
4	Skimmer Size (inches)
0.333	Head on Skimmer (feet)
1	Orifice Size (1/4 inch increments)
4.62	Dewatering Time (days) Required 3 to 5 days for Wake County

Skimmer Size (inches): 1, 2, 2.5, 3, 4, 5, 6, 8

Skimmer Basin #2

Okay

4.61	Drainage Area (Acres)
16.64	Peak Flow from 10-year Storm (cfs)
8298	Required Volume (ft³)
7238	Required Surface Area (ft²)
69.2	Suggested Width (ft)
120.3	Suggested Length (ft)
56	Trial Top Width at Spillway Invert (ft)
190	Trial Top Length at Spillway Invert (ft)
2	Trial Side Slope Ratio Z:1
3	Trial Depth (ft) (2 to 3.5 feet above grade)
44	Bottom Width (ft)
178	Bottom Length (ft)
7832	Bottom Area (ft²)
27636	Actual Volume (ft³) Okay
10640	Actual Surface Area (ft²) Okay
20	Trial Weir Length (ft)
0.75	Suggested Trial Depth of Flow (ft)
39.0	Spillway Capacity (cfs) Okay
4	Skimmer Size (inches)
0.333	Head on Skimmer (feet)
1.25	Orifice Size (1/4 inch increments)
3.98	Dewatering Time (days) Required 3 to 5 days for Wake County

Skimmer Size (inches): 1, 1.25, 2, 2.5, 3, 4, 5, 6, 8

Skimmer Basin #3

Okay

0.6	Drainage Area (Acres)
2.17	Peak Flow from 10-year Storm (cfs)
1080	Required Volume (ft³)
944	Required Surface Area (ft²)
21.7	Suggested Width (ft)
43.4	Suggested Length (ft)
33	Trial Top Width at Spillway Invert (ft)
48	Trial Top Length at Spillway Invert (ft)
2	Trial Side Slope Ratio Z:1
2	Trial Depth (ft) (2 to 3.5 feet above grade)
25	Bottom Width (ft)
40	Bottom Length (ft)
1000	Bottom Area (ft²)
2563	Actual Volume (ft³) Okay
1584	Actual Surface Area (ft²) Okay
10	Trial Weir Length (ft)
0.75	Suggested Trial Depth of Flow (ft)
19.5	Spillway Capacity (cfs) Okay
3	Skimmer Size (inches)
0.25	Head on Skimmer (feet)
0.5	Orifice Size (1/4 inch increments)
3.74	Dewatering Time (days) Required 3 to 5 days for Wake County

Skimmer Size (inches): 1.5, 2, 2.5, 3, 4, 5, 6, 8

LEGEND

- TEMP CONCRETE WASHOUT
- TEMP LOW SPOT SILT FENCE OUTLET
- ROCK CHECK DAM
- TEMP CONSTRUCTION ENTRANCE
- RIP-RAP DISSAPTOR
- TEMP DIVERSION DITCH (LINED-SEE DETAIL)
- TEMP SILT FENCE
- TPF — TEMP TREE PROTECTION FENCE
- LIMITS OF DISTURBANCE
- x — SEDIMENT BASIN BAFFLE
- TPF — TEMP TREE PROTECTION & SILT FENCE COMBO

NO FLOODPLAINS EXIST ON-SITE

NOTE: ALL CONSTRUCTION ACTIVITY MUST BE IN ACCORDANCE WITH THE ACCEPTED POLICIES OF THE TOWN OF ROLESVILLE AND NCDOT

SCALE IN FEET: 0 20 40 80 120 160

NORTH CAROLINA PROFESSIONAL SEAL 036908 ENGINEER MARTY D. BIZZELL

12/08/23

BASS, NIXON & KENNEDY, INC.
CONSULTING ENGINEERS
6310 CHAPEL HILL ROAD, SUITE 250, RALEIGH, NC 27607
TELEPHONE: (919)851-4422 FAX: (919)851-8968
CERTIFICATION NUMBERS: NCBELS (C-0110); NCBOLA (C-0267)

NO.	DATE	DESCRIPTION
3	12-08-23	TOWN OF ROLESVILLE COMMENTS
2	10-16-23	T.O.R. COMMENTS
1	09-21-23	CHANGES FROM 06-02-22 CD'S
		REVISIONS

BY: MRM MRM MRM

JOB NO. 03-19157 | DATE | PROGRESS | DRAWN BY: MRM | CHK BY: MDB

EROSION CONTROL PLAN - STAGE 1

SCALE: 1" = 40'

SHEET C3.3

COBBLESTONE VILLAGE
MIXED USE DEVELOPMENT
TOWN OF ROLESVILLE, WAKE COUNTY, NORTH CAROLINA

TOWN OF ROLESVILLE PROJECT NO.

NOT RELEASED FOR CONSTRUCTION OR BID SOLICITATION

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CONSTRUCTION SEQUENCE - STAGE 2

1. BEGIN CONSTRUCTION OF ALL BUILDINGS.
2. STABILIZE SITE AS NEW DISTURBED AREAS ARE BROUGHT UP TO FINISH GRADE WITH VEGETATION, PAVING, DITCH LININGS, ETC. SEED AND MULCH DENUDED AREAS PER GROUND STABILIZATION TIME FRAMES.
3. WHEN CONSTRUCTION OF PARKING LOTS ARE COMPLETE AND ALL AREAS ARE STABILIZED COMPLETELY, CALL ENVIRONMENTAL CONSULTANT FOR AN INSPECTION.
4. IF THE SITE IS APPROVED, REMOVE TEMPORARY DIVERSIONS, SILT FENCE, SEDIMENT BASINS, ETC., AND SEED OUT OR STABILIZE ANY RESULTING BARE AREAS. ALL REMAINING PERMANENT EROSION CONTROL DEVICES, SUCH AS VELOCITY DISSIPATORS, SHOULD NOW BE INSTALLED.
5. WHEN VEGETATION HAS BECOME ESTABLISHED, CALL FOR A FINAL SITE INSPECTION BY THE ENVIRONMENTAL CONSULTANT. OBTAIN A CERTIFICATE OF COMPLETION.

NOTE: WAKE COUNTY MUST GRANT PERMISSION TO CONVERT THE SEDIMENT BASIN OVER TO THE STORMWATER USE PRIOR TO COMPLETING ANY RELATED WORK.

TOTAL DISTURBED AREA = 10.96 AC

ENVIRONMENTAL CONSULTANT: JEEVAN NEUPANE (919-819-8907)

REQUIRED WAKE COUNTY BASIN REMOVAL AND/OR CONVERSION SEQUENCE

1. SCHEDULE A SITE MEETING WITH THE ENVIRONMENTAL CONSULTANT TO DETERMINE IF A BASIN CAN BE REMOVED OR CONVERTED TO A PERMANENT STORMWATER POND. INSTALL SILT FENCING OR OTHER TEMPORARY EROSION CONTROL MEASURES AS NEEDED PRIOR TO REMOVAL OF THE BASIN.
2. UTILIZE OUTLET STRUCTURES THAT WITHDRAW WATER FROM THE SEDIMENT BASIN SURFACE FOR DRAW DOWN OF WATER IN BASIN FOR MAINTENANCE OR CLOSE OUT UNLESS INFEASIBLE. SEE REQUIREMENTS OF NCG01 PERMIT PART II, SECTION Q, ITEM (4) ENTITLED "DRAW DOWN OF SEDIMENT BASINS FOR MAINTENANCE OR CLOSE OUT" AND REFER TO WAKE COUNTY "FILTER BAG FOR DEWATERING ACTIVITIES" CONSTRUCTION DETAIL.
3. REMOVE BASIN(S) AND ASSOCIATED TEMPORARY DIVERSION DITCHES. IF CULVERT PIPES NEED TO BE EXTENDED, PERFORM THIS OPERATION AT THIS TIME. FINE GRADE AREA IN PREPARATION FOR SEEDING.
4. PERFORM SEEDBED PREPARATION, SEED, MULCH AND ASPHALT TACK ANY RESULTING BARE AREAS IMMEDIATELY.
5. INSTALL VELOCITY DISSIPATORS AND/OR LEVEL SPREADERS AS REQUIRED ON THE EROSION CONTROL PLAN.
6. WHEN SITE IS FULLY STABILIZED, CALL ENVIRONMENTAL CONSULTANT FOR APPROVAL OF REMOVING REMAINING TEMPORARY EROSION CONTROL MEASURES AND ADVICE ON WHEN SITE CAN BE ISSUED A CERTIFICATE OF COMPLETION. NOTE: A MEETING SHOULD ALSO BE SCHEDULED WITH THE ENVIRONMENTAL CONSULTANT TO DETERMINE WHEN A BASIN MAY BE CONVERTED FOR STORMWATER USE. SOME MUNICIPALITIES MAY ALSO REQUIRE THIS.

Skimmer Basin #2

Okay

6.99	Drainage Area (Acres)
25.23	Peak Flow from 10-year Storm (cfs)
12582	Required Volume (ft³)
10975	Required Surface Area (ft²)
74.1	Suggested Width (ft)
148.2	Suggested Length (ft)
58	Trial Top Width at Spillway Invert (ft)
190	Trial Top Length at Spillway Invert (ft)
2	Trial Side Slope Ratio Z:1
3	Trial Depth (ft) (2 to 3.5 feet above grade)
46	Bottom Width (ft)
178	Bottom Length (ft)
8188	Bottom Area (ft²)
28740	Actual Volume (ft³) Okay
11020	Actual Surface Area (ft²) Okay
20	Trial Weir Length (ft)
0.75	Suggested Trial Depth of Flow (ft)
39.0	Spillway Capacity (cfs) Okay
4	Skimmer Size (inches)
0.333	Head on Skimmer (feet)
1.5	Orifice Size (1/4 inch increments)
4.20	Dewatering Time (days) Okay

Required 3 to 5 days for Wake County

Skimmer Size (inches)
1.5
2
2.5
3
4
5
6
8

SEDIMENT BASIN SUMMARY CHART

Sediment Basin Number	1	2
Drainage Area (acres)	1.74	6.99
Q10(cfs)	(0.5)(7.22)(1.74)=6.28	(0.5)(7.22)(6.99)=25.23
Weir Size (ft)	10 x 1.5	10 x 1.5
Surface Area Required (SF)	(435)(6.28)=2,732	(435)(25.23)=10,975
Volume Required (CF)	(1800)(1.74)= 3,132	(1800)(6.99)= 12,582
Dimensions (ft)	see plans	see plans
Surface Area Provided (SF)	2,800	11,000
Volume Provided (CF)	5,646	27,500
Skimmer Size	4"	4
Orifice Radius	0.4"	0.75
Orifice Diameter	0.75"	1.5
Drawdown Time (Days)	4.18	4.2
Number of Baffles	3	3

DITCH/CHANNEL CALCULATIONS

DIVERSION DITCH ID	LENGTH (LF)	DA (Ac)	Q10 (CFS)	SLOPE (%)	V10 (FPS)	LINER *	PERMISSIBLE SHEAR STRESS (PSF)	CALCULATED SHEAR STRESS (PSF)
DV-1	296	1.02	2.34	2.00	2.01	SC150	2.00	0.78
DV-2	495	1.00	2.30	2.60	2.29	SC150	2.00	0.94
DV-3	442	0.52	1.19	1.80	0.92	SC150	1.80	0.29
DV-4	167	0.06	0.13	2.90	0.96	SC150	1.80	0.38

* NAG = NORTH AMERICAN GREEN OR EQUIVALENT

LEGEND

- TEMP CONSTRUCTION ENTRANCE
- TEMP LOW SPOT SILT FENCE OUTLET
- TEMP INLET PROTECTION
- RIP-RAP DISSAPTOR
- TEMP SILT FENCE
- TEMP TREE PROTECTION FENCE
- LIMITS OF DISTURBANCE
- SEDIMENT BASIN BAFFLE
- TEMP TREE PROTECTION & SILT FENCE COMBO

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City of Raleigh Development Approval _____

Raleigh Water Review Officer

CELL TOWER SITE ID # NC 090247 HEIGHT = 401' (AS PROVIDED BY AMERICAN TOWER CORPORATION)

BLDG 7 — 40 APARTMENTS, 4 STORY, FFE = 431.50

BLDG 1 — 40 APARTMENTS, 4 STORY, FFE = 432.00

BLDG 8 — 24 APARTMENTS, 3 STORY, FFE = 334.00

BLDG 6 — 3 STORY, 16,704 SF RETAIL, 36 APARTMENTS, FFE = 438.5

BLDG 5 — 1 STORY FLEX, 5,970 SF, FFE = 439.0

BLDG 4 — 1 STORY, 10,420 SF COMMERCIAL, FFE = 441.5

BLDG 2 — 11,678 SF RETAIL (FIRST FLOOR), 30 APARTMENTS, 3 STORY, FFE = 441.50

BLDG 3 — 8,612 SF RETAIL, 18 APARTMENTS, 3 STORY, FFE = 443.0

PRIVETTE INSURANCE OFFICE

BARN HEIGHT = 15.5'

FLAGSTONE CROSSING ROAD

BLUESTONE CROSSING ROAD

ROLESVILLE CENTER ROAD

BASALT PLACE

W. YOUNG STREET - N.C.S.H. 1945

S. MAIN STREET - U.S. HWY 401 (VARIABLE WIDTH RIGHT OF WAY)

20' ACCESS EASEMENT DB. 12822 PG. 1562 BM. 2007 PG. 2414

20' CELL PHONE TOWER ACCESS EASEMENT

20' CITY OF RALEIGH PUBLIC WATERLINE EASEMENT

14' EASEMENT BM. 1981 PG. 506

TEMPORARY LOW SPOT SILT FENCE OUTLET TYP.

TEMP. 25'x50'x6" GRAVEL CONSTRUCTION ENTRANCE

TEMP. 25'x50'x6" GRAVEL CONSTRUCTION ENTRANCE

LIMITS OF DISTURBANCE

SCM LOCATION 0.64 AC.

SKIMMER SEDIMENT BASIN #2 (TO BE CONVERTED TO A WET POND)

BAFFLES TYP.

ROCK CHECK DAM (TYP.)

SEE RIP RAP SCHEDULE FOR DISSIPATER INFORMATION

TEMP. 12" HDPE

MATCHLINE

MAIL KIOSK

12" HDPE

AREA DRAIN (TYP.)

SEDIMENT SPACE

AD-1 AD-2 AD-3 AD-4 AD-5 AD-6 AD-7 AD-8

EX. FIBER OPTIC VAULT

EX. 12" HDPE

EX. 24" RCP

EX. 18" RCP

EX. 15" RCP

EX. 12" RCP

EX. 6" WATER LINE

12" WATER MAIN (APPROX. LOCATION)

6" WATER LINE

PROPOSED ON-STREET PARKING AS PART OF NCDOT STREETSCAPE IMPROVEMENTS PROJECT U-6241 (BY OTHERS) SHOWN IN BLUE

PROPOSED STORM DRAINAGE AS PART OF NCDOT STREETSCAPE IMPROVEMENTS PROJECT 3 U-6241 (BY OTHERS)

FIELD ADJUST CURB INLET TO MATCH CURB LINE

SANITARY SEWER CLEANOUT (typ.)

WATER VALVE (typ.)

WATER METER (typ.)

SEWER MANHOLE #1 TOP = 442.48 INV. IN (NW) = 437.19 INV. OUT (SE) = 437.09

SEWER MANHOLE #2 TOP = 442.05 INV. IN (NW) = 435.83 INV. OUT (SW) = 435.75

SEWER MANHOLE #3 TOP = 442.09 INV. IN (NE) = 434.29 INV. OUT (SW) = 434.19

SEWER MANHOLE #4 INV. IN (NE) = 432.74 INV. OUT (SW) = 432.58

SEWER MANHOLE #5 TOP = 438.28 INV. IN (NE) = 431.18 INV. OUT (SW) = 431.14

NCGS MONUMENT "STREET" NC GRID (NAD '83/2011) COORDINATES N: 790603.2300 FEET E: 2159787.9640 FEET

CONTROL CORNER EIP NC GRID (NAD '83/2011) COORDINATES N: 790920.3912 FEET E: 2160071.2846 FEET

APPROXIMATE LOCATION OF POWER POLE (PROVIDED BY DUKE ENERGY)

EIP CONTROL CORNER NC GRID (NAD '83/2011) COORDINATES N: 790920.3912 FEET E: 2160071.2846 FEET

CONCRETE MONUMENT

(TIE) S41°46'28"W 425.28' (CORP)

S48°59'00"W 19.07'

S46°59'00"W 241.21'

S46°38'36"W 14.00'

S46°38'36"W 36.18'

N87°39'48"E 312.71'

N87°22'00"E 265.93'

S01°03'27"W 70.26'

S00°40'04"W 78.49'

S01°04'46"W 102.88'

N87°08'04"E 280.37'

S02°39'27"E 97.75'

N 32°10'29" W 526.75'

N 16°39'56" E 512.48'

N 81°17'23" E 186.91'

246.62'

NO FLOODPLAINS EXIST ON-SITE

NOTE: ALL CONSTRUCTION ACTIVITY MUST BE IN ACCORDANCE WITH THE ACCEPTED POLICIES OF THE TOWN OF ROLESVILLE AND NCDOT

SCALE IN FEET 0 20 40 80 120 160

NORTH CAROLINA PROFESSIONAL SEAL 036908 ENGINEER MARTY D. BIZZELL

12/08/23

BASS, NIXON & KENNEDY, INC.
CONSULTING ENGINEERS
6310 CHAPEL HILL ROAD, SUITE 250, RALEIGH, NC 27607
TELEPHONE: (919)851-4422 FAX: (919)851-8968
CERTIFICATION NUMBERS: NCBELS (C-0110); NCBOLA (C-0267)

NO.	DATE	DESCRIPTION	BY
		REVISIONS	
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2	10-16-23	T.O.R. COMMENTS	MRM
1	09-21-23	CHANGES FROM 06-02-22 CD'S	MRM

JOB NO. 03-19157 DATE PROGRESS DRAWN BY MRM

EROSION CONTROL PLAN - STAGE 2

SCALE: 1" = 40' CHK BY: MDB

SHEET C3.4

COBBLESTONE VILLAGE
MIXED USE DEVELOPMENT
TOWN OF ROLESVILLE, WAKE COUNTY, NORTH CAROLINA

TOWN OF ROLESVILLE PROJECT NO.

NOT RELEASED FOR CONSTRUCTION OR BID SOLICITATION

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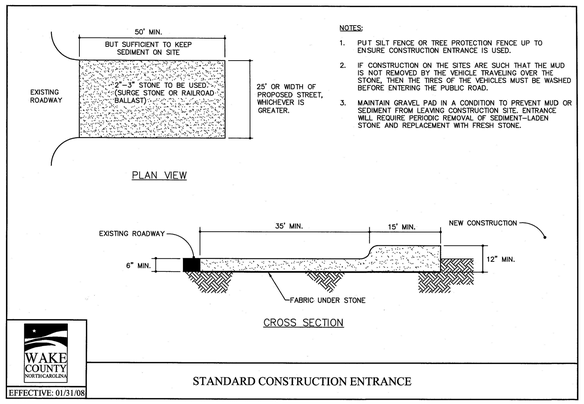


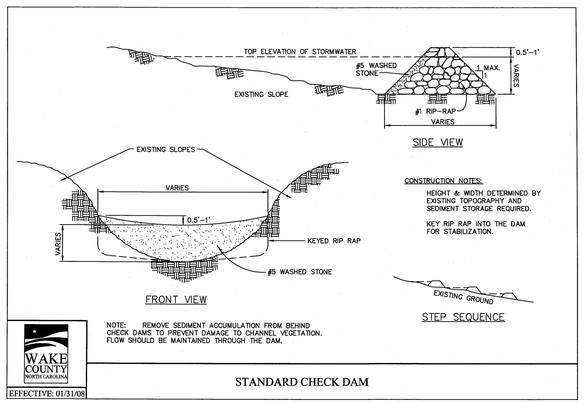
NOTES:

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

WAKE COUNTY NORTH CAROLINA

EFFECTIVE: 01/31/08

STANDARD CONSTRUCTION ENTRANCE



CONSTRUCTION NOTES:

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

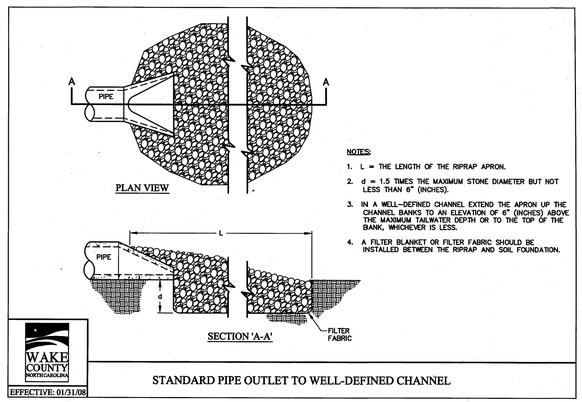
KEY RIP RAP INTO THE DAM FOR STABILIZATION.

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

WAKE COUNTY NORTH CAROLINA

EFFECTIVE: 01/31/08

STANDARD CHECK DAM



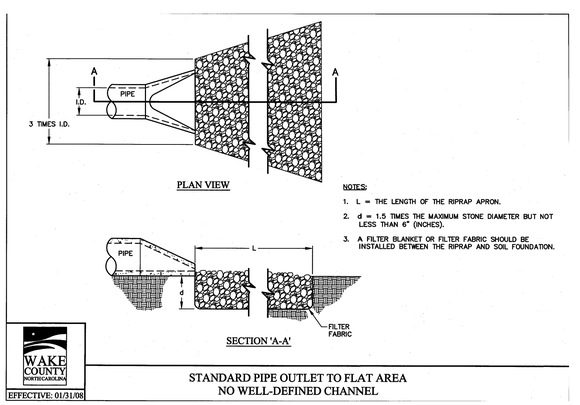
NOTES:

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



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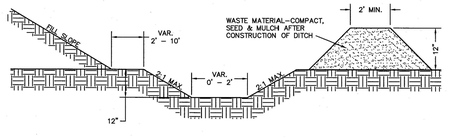
WAKE COUNTY NORTH CAROLINA

EFFECTIVE: 01/31/08

STANDARD PIPE OUTLET TO FLAT AREA NO WELL-DEFINED CHANNEL

NOTES:

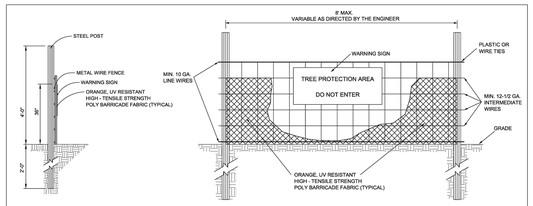
1. TEMPORARY DIVERSION DITCH TO BE USED TO INTERCEPT FLOW AND/OR DIVERT TO A SEDIMENT CONTROL MEASURE OR BMP.
2. SILT SHALL BE REMOVED WHEN DITCH IS ONE-HALF FULL.
3. DITCH SHALL BE RECONSTRUCTED WHEN DAMAGED BY EQUIPMENT OR COVERED BY FILL.
4. STABILIZE DIVERSION DITCH BERM WITH TEMPORARY SEEDING, MULCH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



WAKE COUNTY NORTH CAROLINA

EFFECTIVE: 01/31/08

STANDARD TEMPORARY DIVERSION DITCH

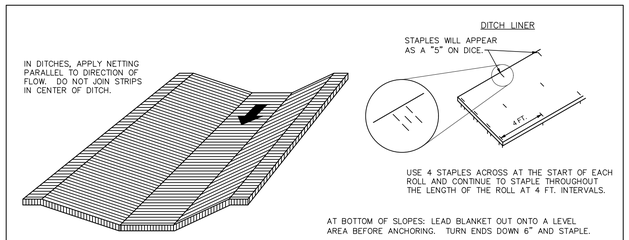


NOTES:

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

TPP-01	CITY OF RALEIGH STANDARD DETAIL	STANDARD TREE PROTECTION DETAIL	REVISION	DATE

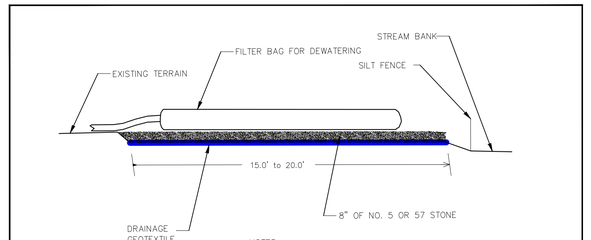
CONTACT INFORMATION:
CITY OF RALEIGH PARKS, RECREATION AND CULTURAL RESOURCES DEPARTMENT
URBAN FORESTER
TREES@RALEIGHNC.GOV
WWW.RALEIGHNC.GOV



MAINTENANCE: ALL BLANKETS SHOULD BE INSPECTED PERIODICALLY, ESPECIALLY AFTER RAINSTORMS, TO CHECK FOR RILL EROSION. WHERE EROSION IS OBSERVED, ADDITIONAL BLANKETS SHOULD BE APPLIED. BLANKETS SHOULD BE INSPECTED AFTER RAINSTORMS FOR DISLOCATION OR FAILURE IF WASHOUTS OR BREAKAGE OCCUR, RE-INSTALL BLANKETS AS NECESSARY AFTER REPAIRING DAMAGE TO THE SLOPE. INSPECTIONS SHOULD TAKE PLACE UNTIL GRASSES ARE FIRMLY ESTABLISHED. WHERE MULCH IS USED IN CONJUNCTION WITH ORNAMENTAL PLANTINGS, INSPECT PERIODICALLY THROUGHOUT THE YEAR TO DETERMINE IF MULCH IS MAINTAINING COVERAGE OF THE SOIL SURFACE. REPAIR AS NEEDED.

STABILIZING CHANNEL WITH EXCELSIOR BLANKET

SCALE: NTS



NOTES

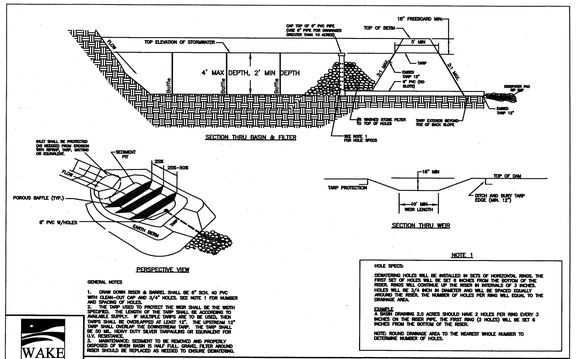
PROVIDE STABILIZED OUTLET TO STREAM BANK. WOOD PALLETS MAY BE USED IN LIEU OF STONE AND GEOTEXTILE AS DIRECTED. A SUFFICIENT NUMBER OF PALLETS MUST BE PROVIDED TO ELEVATE THE ENTIRE FILTER BAG FOR DEWATERING ABOVE NATURAL GROUND.

NOT TO SCALE

WAKE COUNTY NORTH CAROLINA

EFFECTIVE: 01/31/08

STANDARD FILTER BAG FOR DEWATERING ACTIVITIES



GENERAL NOTES

1. GRADE DOWN RISER & BARREL SHALL BE 6" SCH. 40 PVC WITH CLEAN-OUT CAP AND 3/4" HOLES. SEE NOTE 1 FOR NUMBER AND SPACING OF HOLES.
2. THE TARP USED TO PROTECT THE WEIR SHALL BE SUE WITH SPAULDS. THE LENGTH AND WIDTH OF THE TARP SHALL BE SUFFICIENT TO COVER ALL OF THE EARTH AREA TO BE EXPOSED. TARPS SHALL BE OVERLAPPED AT LEAST 12". THE UPSTREAM 12" TARP SHALL CROSS OVER THE DOWNSTREAM TARP. THE TARP SHALL BE A HEAVY DUTY SILVER TARPAULINE OR EQUIVALENT FOR D.V. RESERVOIR.
3. SEDIMENT-LADEN SEDIMENT TO BE REMOVED AND PROPERLY DISPOSED OF WHEN IT REACHES A DEPTH OF 1/2 THE ORIFICE BOARD WIDTH SHOULD BE REPLACED AS NEEDED TO ENSURE DEWATERING.

NOTE 1

HOLE SPACES:

DEWATERING HOLES WILL BE INSTALLED IN SETS OF HORIZONTAL RANKS. THE FIRST SET OF HOLES WILL BE 3FT. 6 INCHES FROM THE BOTTOM OF THE RISER. EACH SET WILL CONSIST OF FIVE HOLES IN SUBSEQUENT RANKS OF 3 INCHES. THE FIRST HOLE WILL BE LOCATED AT THE UPSTREAM SIDE OF THE RISER EQUALLY AROUND THE RISER. THE NUMBER OF HOLES PER RANK WILL EQUAL TO THE DRAINAGE AREA.

EXAMPLE

A RISER DRAINING 2.0 ACRES SHOULD HAVE 2 HOLES PER RANK EVERY 3 INCHES FROM 3 FEET 6 INCHES TO THE TOP OF THE RISER.

NOTE: ROUND DRAINAGE AREA TO THE NEAREST WHOLE NUMBER TO DETERMINE NUMBER OF HOLES.

WAKE COUNTY NORTH CAROLINA

EFFECTIVE: 01/31/08

STANDARD CUSTOM BASIN

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

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City of Raleigh Development Approval _____

Raleigh Water Review Officer

12/08/23

NORTH CAROLINA PROFESSIONAL SEAL 036908 ENGINEER MARTY D. BIZZELL

BASS, NIXON & KENNEDY, INC.
CONSULTING ENGINEERS
6310 CHAPEL HILL ROAD, SUITE 250, RALEIGH, NC 27607
TELEPHONE: (919)851-4422 FAX: (919)851-8968
CERTIFICATION NUMBERS: NCBELS (C-0110); NCBOLA (C-0267)

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		REVISIONS

JOB NO.	03-19157
PROGRESS	
DATE	
DRAWN BY	MRM
CHK BY:	MDB
SCALE:	N.T.S.

EROSION CONTROL DETAILS

COBBLESTONE VILLAGE
MIXED USE DEVELOPMENT
TOWN OF ROLESVILLE, WAKE COUNTY, NORTH CAROLINA

SHEET C3.5

TOWN OF ROLESVILLE PROJECT NO.

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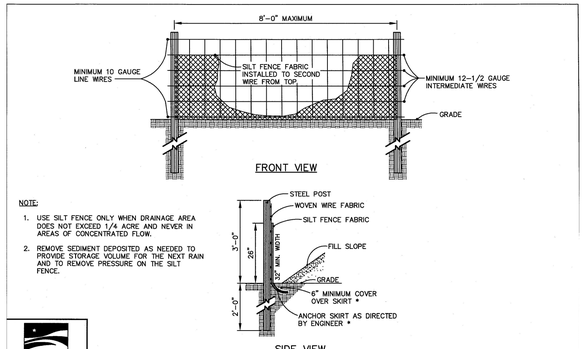
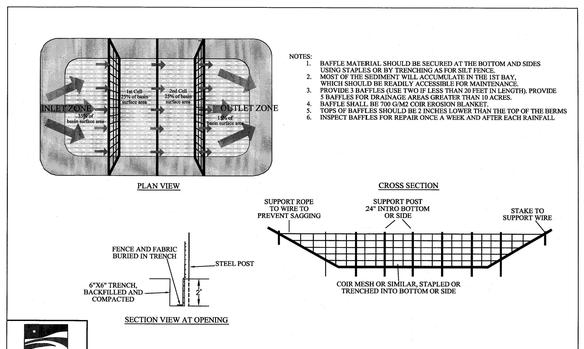


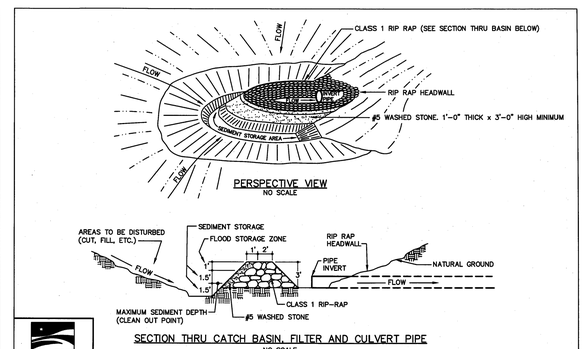
EFFECTIVE: 01/31/08

STANDARD TEMPORARY SILT FENCE



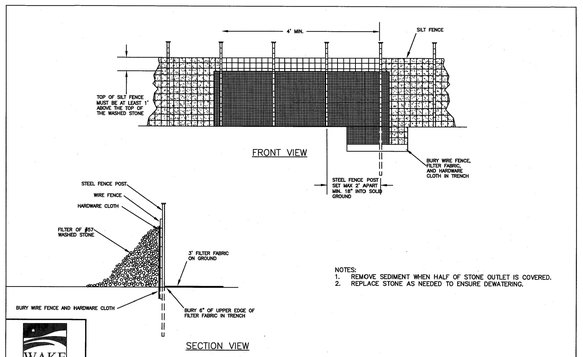
EFFECTIVE: 01/31/08

STANDARD BAFFLES DETAIL



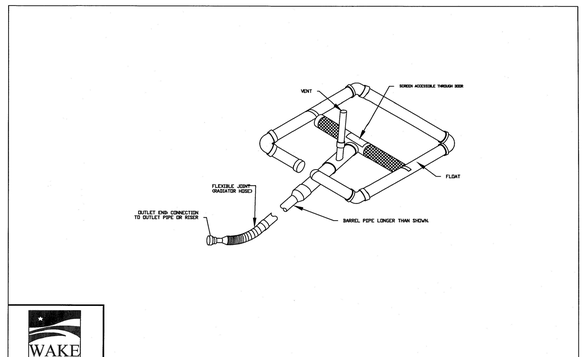
EFFECTIVE: 01/31/08

STANDARD HORSESHOE INLET PROTECTION



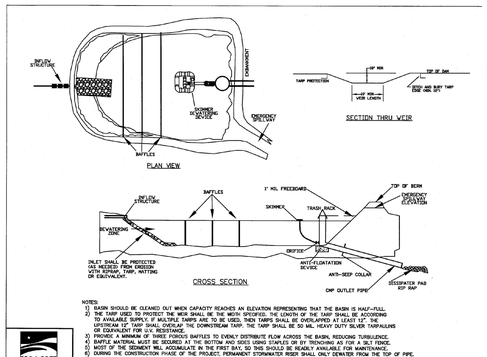
EFFECTIVE: 01/31/08

STANDARD SILT FENCE OUTLET



EFFECTIVE: 01/31/08

STANDARD SKIMMER DETAIL



EFFECTIVE: 01/31/08

STANDARD SKIMMER ATTACHED TO PERMANENT RISER

SEEDING INFORMATION:

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 INCHES DEPTH.
3. REMOVE ALL LOOSE ROCK, ROOTS, AND OTHER OBSTRUCTIONS LEAVING SURFACE REASONABLY SMOOTH AND UNIFORM.
4. APPLY AGRICULTURAL LIME, FERTILIZER, AND SUPER PHOSPHATE 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 ON A FRESHLY PREPARED SEEDBED AND COVER LIGHTLY WITH SEEDING EQUIPMENT OR CULTIPACK AFTER SEEDING.
7. MULCH IMMEDIATELY AFTER SEEDING AND ANCHOR MULCH.
8. INSPECT ALL SEEDED AREAS AND MAKE NECESSARY REPAIRS OR RESEEDINGS WITHIN THE PLANTING SEASON, IF POSSIBLE. IF STAND SHOULD BE OVER 60% DAMAGED, REESTABLISH FOLLOWING ORIGINAL LIME, FERTILIZER AND SEEDING RATES.
9. CONSULT CONSERVATION INSPECTOR ON MAINTENANCE TREATMENT AND FERTILIZATION AFTER PERMANENT COVER IS ESTABLISHED.

* APPLY: AGRICULTURAL LIMESTONE – 2 TONS/ACRE
FERTILIZER – 10–10–10 ANALYSIS AT 800–1,000 LBS./ACRE
SUPER PHOSPHATE – 500 LBS.ORE OF 20% ANALYSIS SUPER PHOSPHATE
MULCH – 2 TONS (APPROX. 80 BALES) SMALL SMALL GRAIN STRAW/ACRE
ANCHOR –TACK WITH LIQUID ASPHALT AT 400 GAL./ACRE OR EMULSIFIED ASPHALT AT 300 GALLONS/ACRE

SEEDING SCHEDULE

PERMANENT SEEDING – SHOULDERS, SIDE DITCHES, SLOPES (MAX. 3:1)

DATE	TYPE	PLANTING RATE
AUG. 15 – NOV. 1	TALL FESCUE	200 LBS./ACRE
NOV. 1 – MAR.1	TALL FESCUE AND ABRUZZI RYE *(NURSE CROP)	200 LBS./ACRE 25 LBS./ACRE
MAR. 1 – APR. 15	TALL FESCUE	200 LBS./ACRE
APR. 15 – JUN. 30	HULLED COMMON BERMUDAGRASS	15 LBS./ACRE

PERMANENT SEEDING – SLOPES (3:1 TO 2:1)

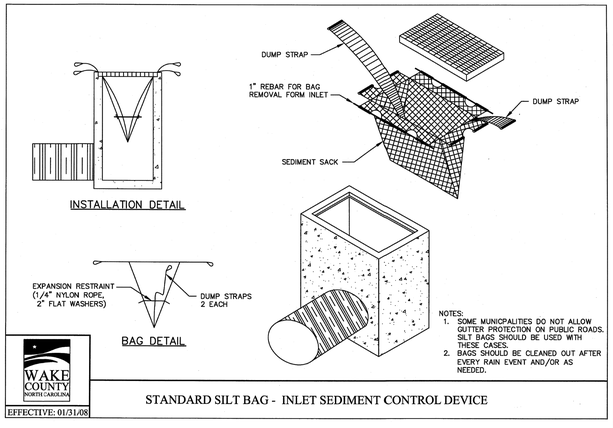
AUG. 15–NOV.1	TALL FESCUE AND SERICEA LESPEDEZA (UNHULLED, UNSCARIFIED)	200 LBS/ACRE 60 TO 70 LBS/ACRE
NOV. 1–MAR.1	TALL FESCUE AND SERICEA LESPEDEZA (UNHULLED, UNSCARIFIED) AND ABRUZZI RYE	200 LBS/ACRE 60 TO 70 LBS/ACRE 25 LBS/ACRE
MAR. 1–JUNE 1	TALL FESCUE AND SERICEA LESPEDEZA (SCARIFIED)	200 LBS/ACRE 40 TO 50 LBS/ACRE
MAR. 15–JUNE 30	WEEPING LOVEGRASS AND SERICEA LESPEDEZA (SCARIFIED)	10 LBS/ACRE 40 TO 50 LBS/ACRE
MAR. 15–JUNE 30	HULLED COMMON BERMUDAGRASS AND SERICEA LESPEDEZA (SCARIFIED)	15 LBS/ACRE 40 TO 50 LBS/ACRE

TEMPORARY SEEDING

JUNE 1–SEPT. 1	TALL FESCUE AND BROWNTOP MILLET *(NURSE CROP) OR SORGHUM–SUDAN HYBRIDS *(NURSE CROP)	200 LBS/ACRE 35 LBS/ACRE 30 LBS/ACRE

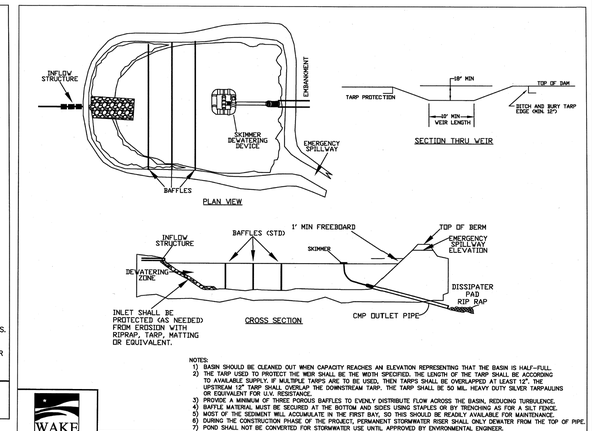
CONSULT CONSERVATION ENGINEER OR SOIL CONSERVATION SERVICE FOR ADDITIONAL INFORMATION CONCERNING OTHER ALTERNATIVES FOR VEGETATION OF DENUDED AREAS. THE ABOVE VEGETATION RATES ARE THOSE WHICH DO WELL UNDER LOCAL CONDITIONS; OTHER SEEDING RATE COMBINATIONS ARE POSSIBLE.

*NURSE CROP/TEMPORARY–RESEED ACCORDING TO OPTIMUM SEASON FOR DESIRED PERMANENT VEGETATION. DO NOT ALLOW TEMPORARY COVER TO GROW OVER 12" IN HEIGHT BEFORE MOWING, OTHERWISE FESCUE MAY BE SHADED OUT.



EFFECTIVE: 01/31/08

STANDARD SILT BAG - INLET SEDIMENT CONTROL DEVICE



EFFECTIVE: 01/31/08

STANDARD SKIMMER BASIN

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NORTH CAROLINA PROFESSIONAL SEAL 036908 ENGINEER MARTY D. BIZZELL

12/08/23

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CONSULTING ENGINEERS
6310 CHAPEL HILL ROAD, SUITE 250, RALEIGH, NC 27607
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CERTIFICATION NUMBERS: NCBELS (C-0110); NCBOLA (C-0267)

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		REVISIONS	

PROGRESS DRAWN BY: MRM
DATE CHK BY: MDB
JOB NO. 03-19157
SCALE: N.T.S.

EROSION CONTROL DETAILS

COBBLESTONE VILLAGE
MIXED USE DEVELOPMENT
TOWN OF ROLESVILLE, WAKE COUNTY, NORTH CAROLINA

SHEET C3.6

NOT RELEASED FOR CONSTRUCTION OR BID SOLICITATION

TOWN OF ROLESVILLE PROJECT NO.

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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.

Temporary and Permanent Groundcover*

STABILIZATION TIMEFRAMES
(Effective Aug. 3, 2011)

Site Area Description	Stabilization	Timeframe Exceptions
Perimeter dikes, swales, ditches, slopes	7 days	None
High Quality Water (HQW) Zones	7 days	None
Slopes steeper than 3:1	7 days	If slopes are 10' or less in length and are not steeper than 2:1, 14 days are allowed.
Slopes 3:1 or flatter	14 days	7 days for slopes greater than 50' in length.
All other areas with slopes flatter than 4:1	14 days	None, except for perimeters and HQW Zones.

*-For Falls Lake watershed, in disturbed areas where grading activities are incomplete, provide temporary groundcover no later than seven (7) days for slopes steeper than 3:1; ten (10) days for slopes equal to or flatter than 3:1; fourteen (14) days for areas with no slope.

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

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.

NORTH CAROLINA *Environmental Quality*

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 of waste containers on site to manage the quantity of waste produced.
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. 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.
8. Dispose waste off-site at an approved disposal facility.

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.

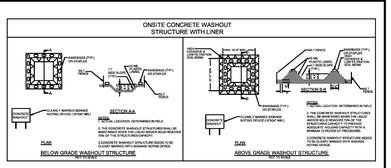
PORTABLE TOILETS

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.

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: 03/01/19

PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION A: SELF-INSPECTION

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

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

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

PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION B: RECORDKEEPING

1. E&SC Plan Documentation

The approved E&SC plan as well as any approved deviation shall be kept on the site. The approved E&SC plan must be kept up-to-date throughout the coverage under this permit. The following items pertaining to the E&SC plan shall be kept on site and available for inspection at all times during normal business hours.

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

2. Additional Documentation to be Kept on Site

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

(a) This General Permit as well as the Certificate of Coverage, after it is received.

(b) Records of inspections made during the previous twelve months. The permittee shall record the required observations on the Inspection Record Form provided by the Division or a similar inspection form that includes all the required elements. Use of electronically-available records in lieu of the required paper copies will be allowed if shown to provide equal access and utility as the hard-copy records.

3. Documentation to be Retained for Three Years

All data used to complete the e-NOI and all inspection records shall be maintained for a period of three years after project completion and made available upon request. [40 CFR 122.41]

PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION C: REPORTING

1. Occurrences that Must be Reported

Permittees shall report the following occurrences:

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

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

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

(d) Anticipated bypasses and unanticipated bypasses.

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

2. Reporting Timeframes and Other Requirements

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

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

NORTH CAROLINA *Environmental Quality*

PART II, SECTION G, ITEM (4)
DRAW DOWN OF SEDIMENT BASINS FOR MAINTENANCE OR CLOSE OUT

Sediment basins and traps that receive runoff from drainage areas of one acre or more shall use outlet structures that withdraw water from the surface when these devices need to be drawn down for maintenance or close out unless this is infeasible. The circumstances in which it is not feasible to withdraw water from the surface shall be rare (for example, times with extended cold weather). Non-surface withdrawals from sediment basins shall be allowed only when all of the following criteria have been met:

(a) The E&SC plan authority has been provided with documentation of the non-surface withdrawal and the specific time periods or conditions in which it will occur. The non-surface withdrawal shall not commence until the E&SC plan authority has approved these items,
(b) The non-surface withdrawal has been reported as an anticipated bypass in accordance with Part III, Section C, Item (2)(c) and (d) of this permit,
(c) Dewatering discharges are treated with controls to minimize discharges of pollutants from stormwater that is removed from the sediment basin. Examples of appropriate controls include properly sited, designed and maintained dewatering tanks, weir tanks, and filtration systems,
(d) Vegetated, upland areas of the sites or a properly designed stone pad is used to the extent feasible at the outlet of the dewatering treatment devices described in Item (c) above,
(e) Velocity dissipation devices such as check dams, sediment traps, and riprap are provided at the discharge points of all dewatering devices, and
(f) Sediment removed from the dewatering treatment devices described in Item (c) above is disposed of in a manner that does not cause deposition of sediment into waters of the United States.

NCG01 SELF-INSPECTION, RECORDKEEPING AND REPORTING

EFFECTIVE: 04/01/19

BASS, NIXON & KENNEDY, INC.
CONSULTING ENGINEERS
6310 CHAPEL HILL ROAD, SUITE 250, RALEIGH, NC 27607
TELEPHONE: (919)851-4422 FAX: (919)851-8968
CERTIFICATION NUMBERS: NCBELS (C-0110); NCBOLA (C-0267)

NO.	DATE	REVISIONS	BY
3	12-08-23	TOWN OF ROLESVILLE COMMENTS	MRM
2	10-16-23	T.O.R. COMMENTS	MRM
1	09-21-23	CHANGES FROM 06-02-22 CD'S	MRM

JOB NO. 03-19157 | DATE | PROGRESS | DRAWN BY: MRM | CHK BY: MDB | SCALE: N.T.S.

NCG01 PLAN

COBBLESTONE VILLAGE
MIXED USE DEVELOPMENT
TOWN OF ROLESVILLE, WAKE COUNTY, NORTH CAROLINA

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

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

City of Raleigh Development Approval _____

Raleigh Water Review Officer

NORTH CAROLINA PROFESSIONAL SEAL 036908 ENGINEER MARTY D. BIZZELL

12/08/23

SHEET **C3.7**

NOT RELEASED FOR CONSTRUCTION OR BID SOLICITATION

TOWN OF ROLESVILLE PROJECT NO.

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Raleigh Water Review Officer

STORMDRAINAGE PIPE TABLE

U.S. STRUCTURE	D.S. STRUCTURE	U.S. INVERT	D.S. INVERT	LENGTH	DIAMETER	MATERIAL	SLOPE
2	1	420.00	419.80	18.80	24	HDPE	1.06%
4	3	421.26	421.00	43.91	36	HDPE	0.60%
5	4	422.04	421.36	113.45	36	HDPE	0.60%
5A	5	422.79	422.14	107.85	36	HDPE	0.60%
5B	5A	423.20	422.79	68.66	36	HDPE	0.60%
6	5B	423.35	423.20	25.31	36	HDPE	0.60%
7	6	423.62	423.45	28.04	36	HDPE	0.60%
8	7	425.82	424.94	88.24	24	HDPE	1.00%
9	8	426.82	425.92	90.21	24	HDPE	1.00%
10	9	427.59	426.92	67.14	24	HDPE	1.00%
11	10	428.63	427.69	93.66	18	HDPE	1.00%
12	11	429.65	428.73	91.93	18	HDPE	1.00%

STORMDRAINAGE PIPE TABLE

U.S. STRUCTURE	D.S. STRUCTURE	U.S. INVERT	D.S. INVERT	LENGTH	DIAMETER	MATERIAL	SLOPE
13	12	430.39	429.75	63.96	15	HDPE	1.00%
14	13	430.75	430.49	25.95	15	HDPE	1.00%
15	5	424.10	423.05	105.41	15	HDPE	1.00%
16	7	424.61	423.72	147.77	24	HDPE	0.60%
17	16	425.41	424.71	116.44	24	HDPE	0.60%
18	17	428.85	427.77	107.92	15	HDPE	1.00%
19	18	431.57	430.69	88.39	15	HDPE	1.00%
20	19	432.50	431.67	83.01	15	HDPE	1.00%
21	6	424.22	423.45	76.89	24	HDPE	1.00%
22	21	424.60	424.32	27.60	15	HDPE	1.00%
23	22	426.78	424.70	207.76	15	HDPE	1.00%
24	10	432.22	430.86	90.55	15	HDPE	1.50%

STORMDRAINAGE PIPE TABLE

U.S. STRUCTURE	D.S. STRUCTURE	U.S. INVERT	D.S. INVERT	LENGTH	DIAMETER	MATERIAL	SLOPE
27	28	436.27	435.41	57.44	15	HDPE	1.50%
28	35A	435.31	434.76	65.53	15	HDPE	0.84%
29	22	425.05	424.70	34.83	15	HDPE	1.00%
30	17	426.34	425.51	137.91	18	HDPE	0.60%
30A	30B	426.96	426.66	60.86	15	HDPE	0.50%
30B	30	426.46	426.34	23.19	15	HDPE	0.50%
31	18	429.82	428.95	87.08	15	HDPE	1.00%
32	9	429.50	428.60	90.23	15	HDPE	1.00%
33	24	432.43	432.32	11.23	15	HDPE	1.00%
34	17	428.09	427.77	32.09	12	HDPE	1.00%
35	33	434.14	432.53	160.60	15	HDPE	1.00%
35A	35	434.76	434.24	48.13	15	HDPE	1.07%

STORMDRAINAGE PIPE TABLE

U.S. STRUCTURE	D.S. STRUCTURE	U.S. INVERT	D.S. INVERT	LENGTH	DIAMETER	MATERIAL	SLOPE
AD-1	27	438.35	437.59	75.93	12	HDPE	1.00%
AD-2	20	434.02	432.70	131.56	12	HDPE	1.00%
AD-3	AD-2	433.18	432.13	105.35	12	HDPE	1.00%
AD-4	AD-3	433.92	433.38	54.03	12	HDPE	1.00%
AD-5	AD-4	435.05	434.62	43.08	12	HDPE	1.00%
AD-6	33	432.68	432.53	14.61	12	HDPE	1.00%
AD-7	23	428.09	426.98	111.06	12	HDPE	1.00%

STORMDRAINAGE STRUCTURE TABLE

STRUCTURE NAME	INSERTION RIM ELEVATION (FLOWLINE)	STRUCTURE TYPE
1	422.45 INV. IN= 419.80 (2)	24" FES
2	426.50 INV. OUT= 420.00 (1)	RISER
3	424.83 INV. IN= 421.00 (4)	36" FES
4	428.06 INV. IN= 421.36 (5) INV. OUT= 421.26 (3)	NCDOT CURB INLET
5	429.40 INV. IN= 422.14 (5A) INV. IN= 423.05 (15) INV. OUT= 422.04 (4)	NCDOT CURB INLET
5A	429.50 INV. IN= 422.79 (5B) INV. OUT= 422.79 (5)	NCDOT CURB INLET
5B	429.00 INV. IN= 423.20 (6) INV. OUT= 423.20 (5A)	HDPE YARD INLET
6	430.50 INV. IN= 423.45 (7) INV. IN= 423.45 (21) INV. OUT= 423.35 (5B)	NCDOT CURB INLET
7	430.65 INV. IN= 424.94 (8) INV. IN= 423.72 (16) INV. OUT= 423.62 (6)	NCDOT CURB INLET

STORMDRAINAGE STRUCTURE TABLE

STRUCTURE NAME	INSERTION RIM ELEVATION (FLOWLINE)	STRUCTURE TYPE
8	433.45 INV. IN= 425.92 (9) INV. OUT= 425.82 (7)	NCDOT CURB INLET
9	433.25 INV. IN= 426.92 (10) INV. IN= 428.80 (32) INV. OUT= 426.82 (8)	NCDOT CURB INLET
10	436.67 INV. IN= 427.69 (11) INV. IN= 430.86 (24) INV. OUT= 427.59 (9)	HDPE YARD INLET
11	437.44 INV. IN= 428.73 (12) INV. OUT= 428.63 (10)	HDPE YARD INLET
12	436.50 INV. IN= 429.75 (13) INV. OUT= 429.65 (11)	HDPE YARD INLET
13	435.50 INV. IN= 430.49 (14) INV. OUT= 430.39 (12)	NCDOT CURB INLET
14	435.50 INV. OUT= 430.75 (13)	NCDOT CURB INLET
15	428.50 INV. OUT= 424.10 (5)	HDPE YARD INLET
16	432.50 INV. IN= 424.71 (17) INV. OUT= 424.61 (7)	NCDOT CURB INLET

STORMDRAINAGE STRUCTURE TABLE

STRUCTURE NAME	INSERTION RIM ELEVATION (FLOWLINE)	STRUCTURE TYPE
17	434.01 INV. IN= 427.77 (18) INV. IN= 425.51 (30) INV. IN= 427.77 (34) INV. OUT= 425.41 (16)	NCDOT CURB INLET
18	435.60 INV. IN= 430.69 (19) INV. IN= 428.95 (31) INV. OUT= 428.85 (17)	NCDOT CURB INLET
19	437.52 INV. IN= 431.67 (20) INV. OUT= 431.57 (18)	NCDOT CURB INLET
20	438.60 INV. IN= 432.70 (AD-2) INV. OUT= 432.50 (19)	NCDOT CURB INLET
21	431.60 INV. IN= 424.32 (22) INV. OUT= 424.22 (6)	HDPE YARD INLET
22	431.50 INV. IN= 424.70 (23) INV. IN= 424.70 (29) INV. OUT= 424.60 (21)	NCDOT CURB INLET
23	435.80 INV. IN= 426.98 (AD-7) INV. OUT= 426.78 (22)	NCDOT CURB INLET
24	437.18 INV. IN= 432.32 (33) INV. OUT= 432.22 (10)	HDPE YARD INLET
27	440.00 INV. IN= 437.59 (AD-1) INV. OUT= 436.27 (28)	HDPE YARD INLET

STORMDRAINAGE STRUCTURE TABLE

STRUCTURE NAME	INSERTION RIM ELEVATION (FLOWLINE)	STRUCTURE TYPE
28	441.00 INV. IN= 435.41 (27) INV. OUT= 435.31 (35A)	HDPE YARD INLET
29	428.50 INV. OUT= 425.05 (22)	HDPE YARD INLET
30	430.50 INV. IN= 426.34 (30B) INV. OUT= 426.34 (17)	NCDOT CURB INLET
30A	430.50 INV. OUT= 426.96 (30B)	HDPE YARD INLET
30B	430.00 INV. IN= 426.66 (30A) INV. OUT= 426.46 (30)	YARD INLET
31	434.10 INV. OUT= 429.82 (18)	NCDOT CURB INLET
32	435.52 INV. OUT= 429.50 (9)	NCDOT CURB INLET
33	437.50 INV. IN= 432.53 (35) INV. IN= 432.53 (AD-6) INV. OUT= 432.43 (24)	NCDOT CURB INLET
34	431.00 INV. OUT= 428.09 (17)	HDPE YARD INLET

STORMDRAINAGE STRUCTURE TABLE

STRUCTURE NAME	INSERTION RIM ELEVATION (FLOWLINE)	STRUCTURE TYPE
35	441.00 INV. IN= 434.24 (35A) INV. OUT= 434.14 (33)	HDPE YARD INLET
35A	441.00 INV. IN= 434.76 (28) INV. OUT= 434.76 (35)	HDPE YARD INLET
AD-1	441.40 INV. OUT= 438.35 (27)	HDPE YARD INLET
AD-2	441.05 INV. IN= 432.13 (AD-3) INV. OUT= 434.02 (20)	HDPE YARD INLET
AD-3	440.50 INV. IN= 433.38 (AD-4) INV. OUT= 433.18 (AD-2)	HDPE YARD INLET
AD-4	440.50 INV. IN= 434.62 (AD-5) INV. OUT= 433.92 (AD-3)	HDPE YARD INLET
AD-5	440.50 INV. OUT= 435.05 (AD-4)	HDPE YARD INLET
AD-6	438.00 INV. OUT= 432.68 (33)	HDPE YARD INLET
AD-7	435.50 INV. OUT= 428.09 (23)	HDPE YARD INLET

NOTE: ALL STORM ITEMS SHALL BE AS-BUILT PER THE TOWN UDO SECTION 7.5.5, WHICH SPECIFIES REQUIREMENTS AS-BUILTS FOR STORM.

BASS, NIXON & KENNEDY, INC.
CONSULTING ENGINEERS
6310 CHAPEL HILL ROAD, SUITE 250, RALEIGH, NC 27607
TELEPHONE: (919)851-4422 FAX: (919)851-8968
CERTIFICATION NUMBERS: NCBELS (C-0110); NCBOLA (C-0267)

NO.	DATE	DESCRIPTION	BY
		REVISIONS	
3	12-08-23	TOWN OF ROLESVILLE COMMENTS	MRM
2	10-16-23	T.O.R. COMMENTS	MRM
1	09-21-23	CHANGES FROM 06-02-22 CD'S	MRM

JOB NO. 03-19157 | DATE: PROGRESS | DRAWN BY: MRM | CHK BY: MDB | SCALE:

STORM DRAINAGE PIPE & STRUCTURE TABLE

COBBLESTONE VILLAGE
MIXED USE DEVELOPMENT
TOWN OF ROLESVILLE, WAKE COUNTY, NORTH CAROLINA

NORTH CAROLINA PROFESSIONAL SEAL 038908 ENGINEER MARTY D. BIZZELL

12/08/23

SHEET C3.8

TOWN OF ROLESVILLE PROJECT NO.

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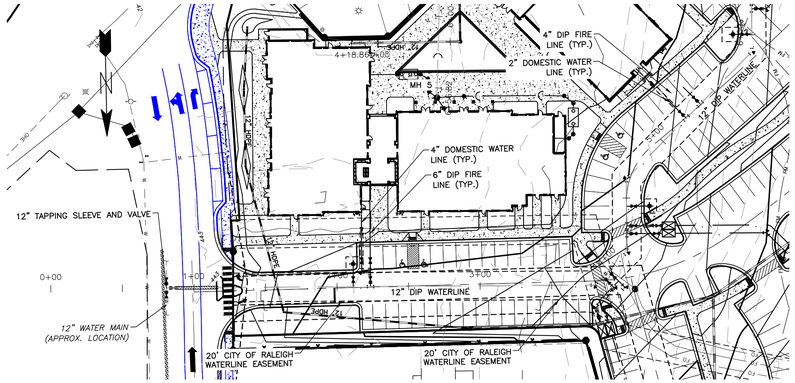
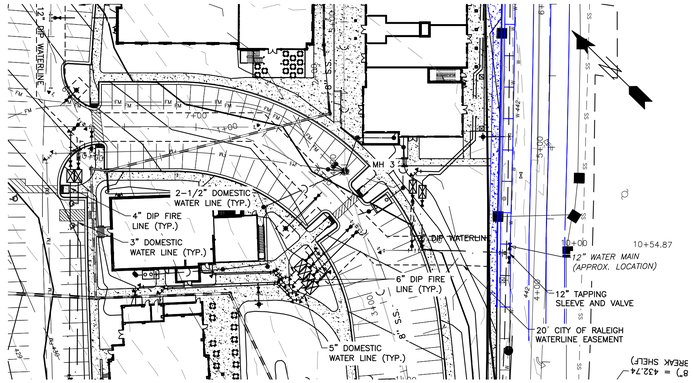




Public
Water Distribution / Extension System

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

City of Raleigh
Public Utilities Department Permit # W-3879

Authorization to Construct See digital signature

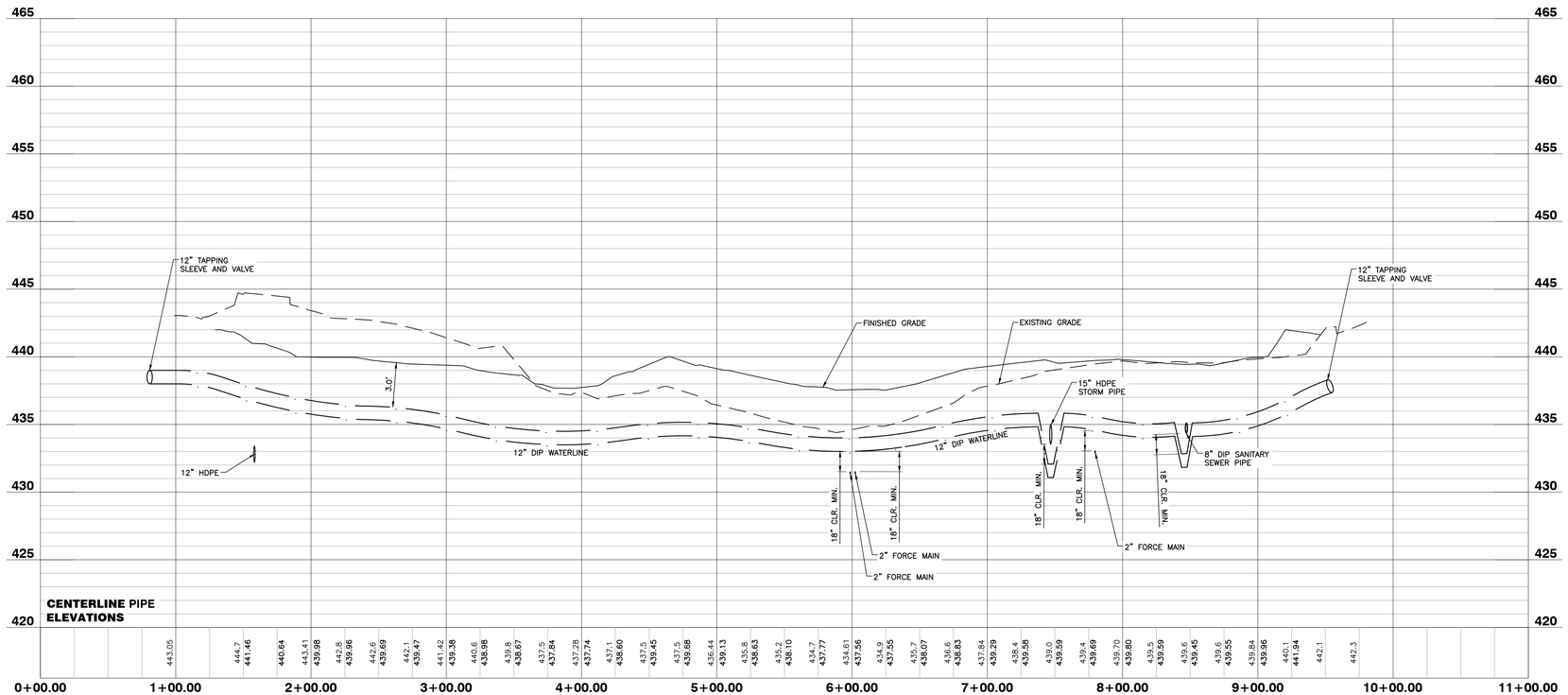
CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

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

City of Raleigh Development Approval _____

Raleigh Water Review Officer

PUBLIC WATERLINE PROFILE



12/08/23

NO FLOODPLAINS EXIST ON-SITE

NOTE: ALL CONSTRUCTION ACTIVITY MUST BE IN ACCORDANCE WITH THE ACCEPTED POLICIES OF THE TOWN OF ROLESVILLE AND NCDOT

BASS, NIXON & KENNEDY, INC.
CONSULTING ENGINEERS
6310 CHAPEL HILL ROAD, SUITE 250, RALEIGH, NC 27607
TELEPHONE: (919)851-4422 FAX: (919)851-8968
CERTIFICATION NUMBERS: NCBELS (C-0110); NCBOLA (C-0267)

NO.	DATE	DESCRIPTION	BY
		REVISIONS	
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2	10-16-23	T.O.R. COMMENTS	MRM
3	12-08-23	TOWN OF ROLESVILLE COMMENTS	MRM

JOB NO. 03-19157 DATE PROGRESS DRAWN BY MRM

PUBLIC WATERLINE PROFILE

SCALE: 1" = 50' H./ 1"= 5' V CHK BY: MDB

COBBLESTONE VILLAGE
MIXED USE DEVELOPMENT
TOWN OF ROLESVILLE, WAKE COUNTY, NORTH CAROLINA

SHEET C4.1

TOWN OF ROLESVILLE PROJECT NO.

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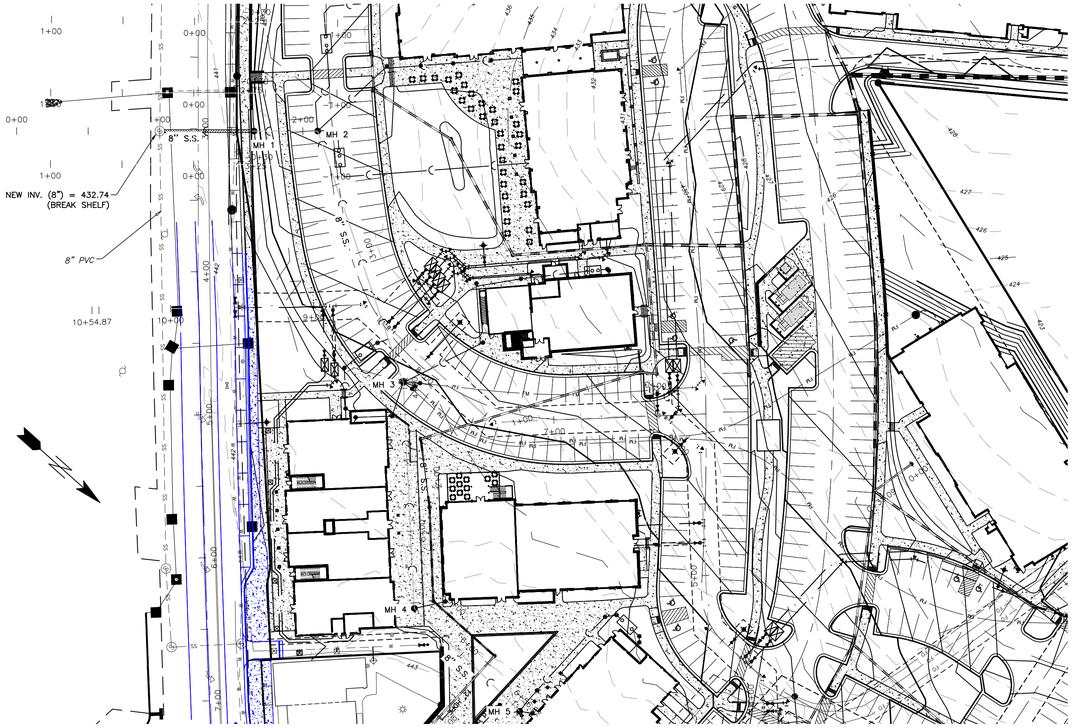
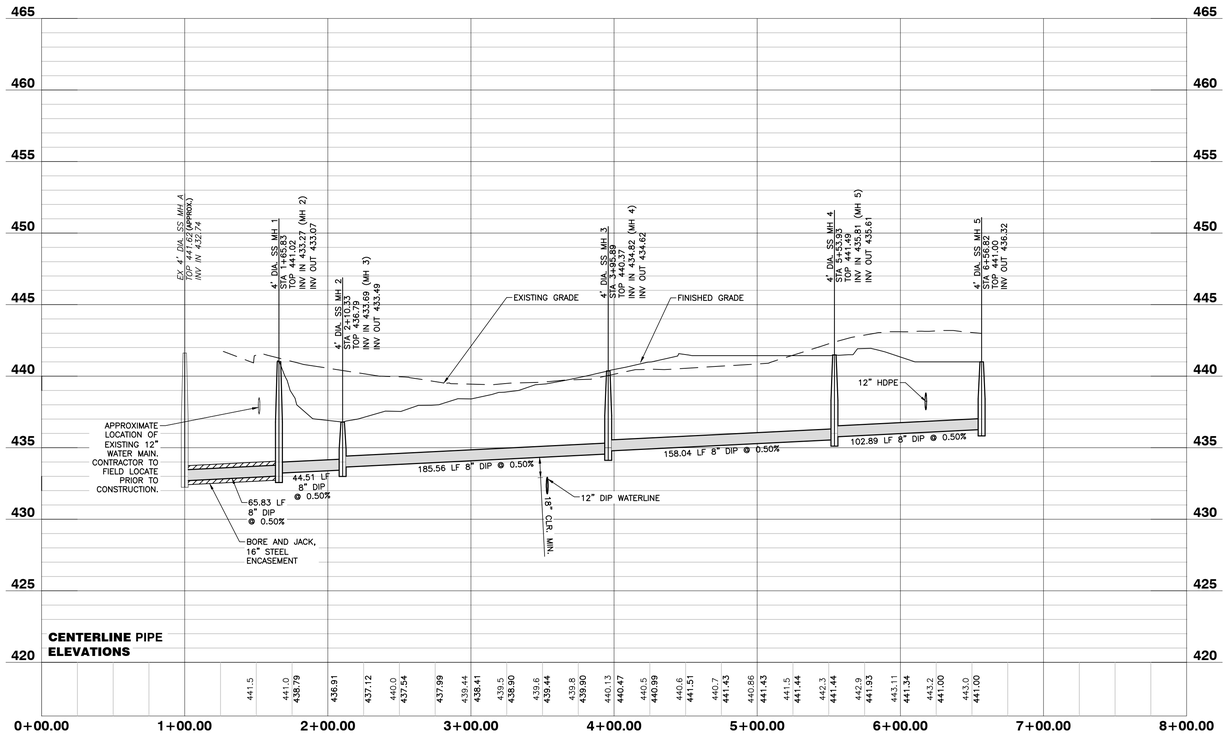


SANITARY SEWER PROFILE



Private
Sewer Collection / Extension System

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

City of Raleigh
Public Utilities Department Permit # S-4962 (P)

Authorization to Construct See digital signature

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City of Raleigh Development Approval _____

Raleigh Water Review Officer

NORTH CAROLINA PROFESSIONAL SEAL 036908 ENGINEER MARTY D. BIZZELL

12/08/23

NO FLOODPLAINS EXIST ON-SITE

NOTE: ALL CONSTRUCTION ACTIVITY MUST BE IN ACCORDANCE WITH THE ACCEPTED POLICIES OF THE TOWN OF ROLESVILLE AND NCDOT

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1	09-21-23	CHANGES FROM 06-02-22 CD'S
		REVISIONS BY

JOB NO. 03-19157 PROGRESS MRM
DATE DRAWN BY

SANITARY SEWER PROFILE

SCALE: 1" = 50' H/ 1"= 5' V CHK BY: MDB

COBBLESTONE VILLAGE
MIXED USE DEVELOPMENT
TOWN OF ROLESVILLE, WAKE COUNTY, NORTH CAROLINA

SHEET C4.2

TOWN OF ROLESVILLE PROJECT NO.

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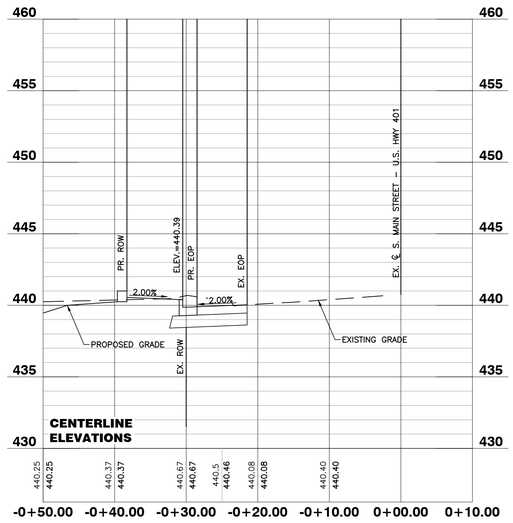
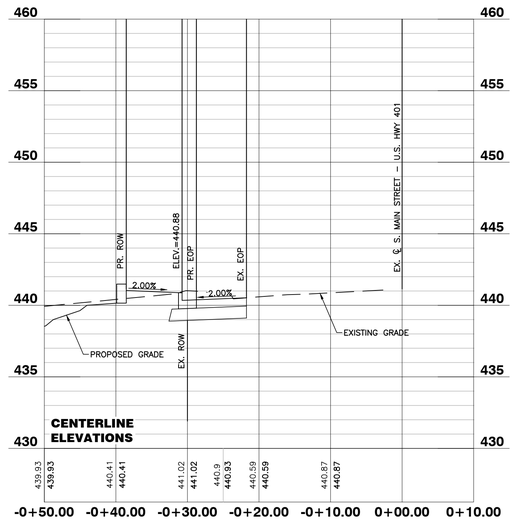
1+75



2+25



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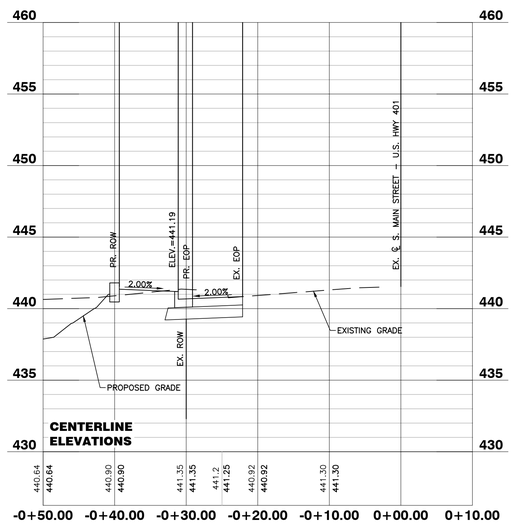

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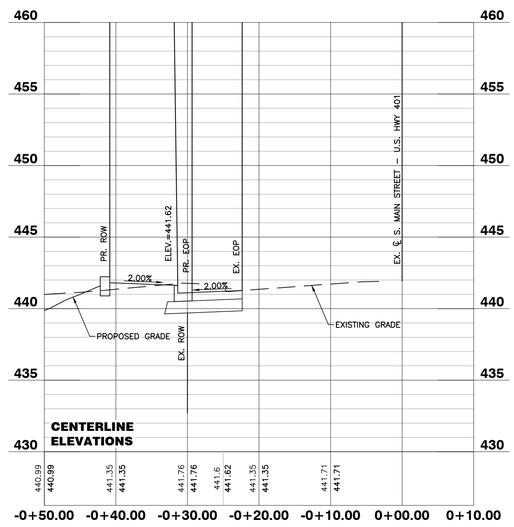

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Raleigh Water Review Officer

NORTH CAROLINA PROFESSIONAL SEAL 036908 ENGINEER MARTY D. BIZZELL

12/08/23

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1	09-21-23	CHANGES FROM 06-02-22 CD'S

REVISIONS BY: MRM | MRM | MRM

JOB NO. 03-19157 | PROGRESS | DRAWN BY: MRM | CHK BY: MDB

S. MAIN ST. - U.S. 401
WIDENING CROSS SECTIONS

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

COBBLESTONE VILLAGE
MIXED USE DEVELOPMENT
TOWN OF ROLESVILLE, WAKE COUNTY, NORTH CAROLINA

SHEET C4.3

TOWN OF ROLESVILLE PROJECT NO.

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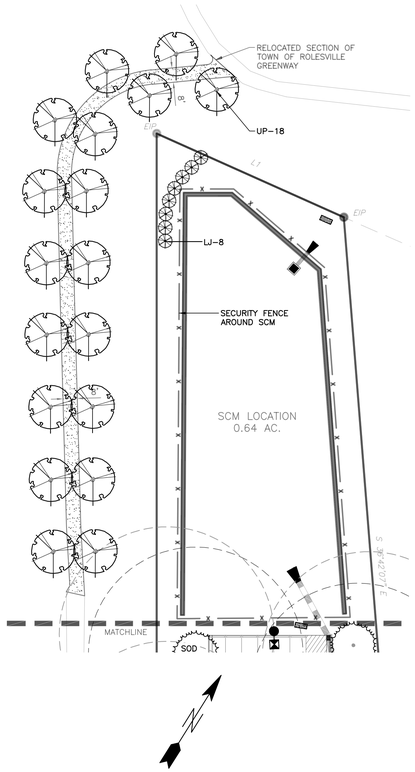

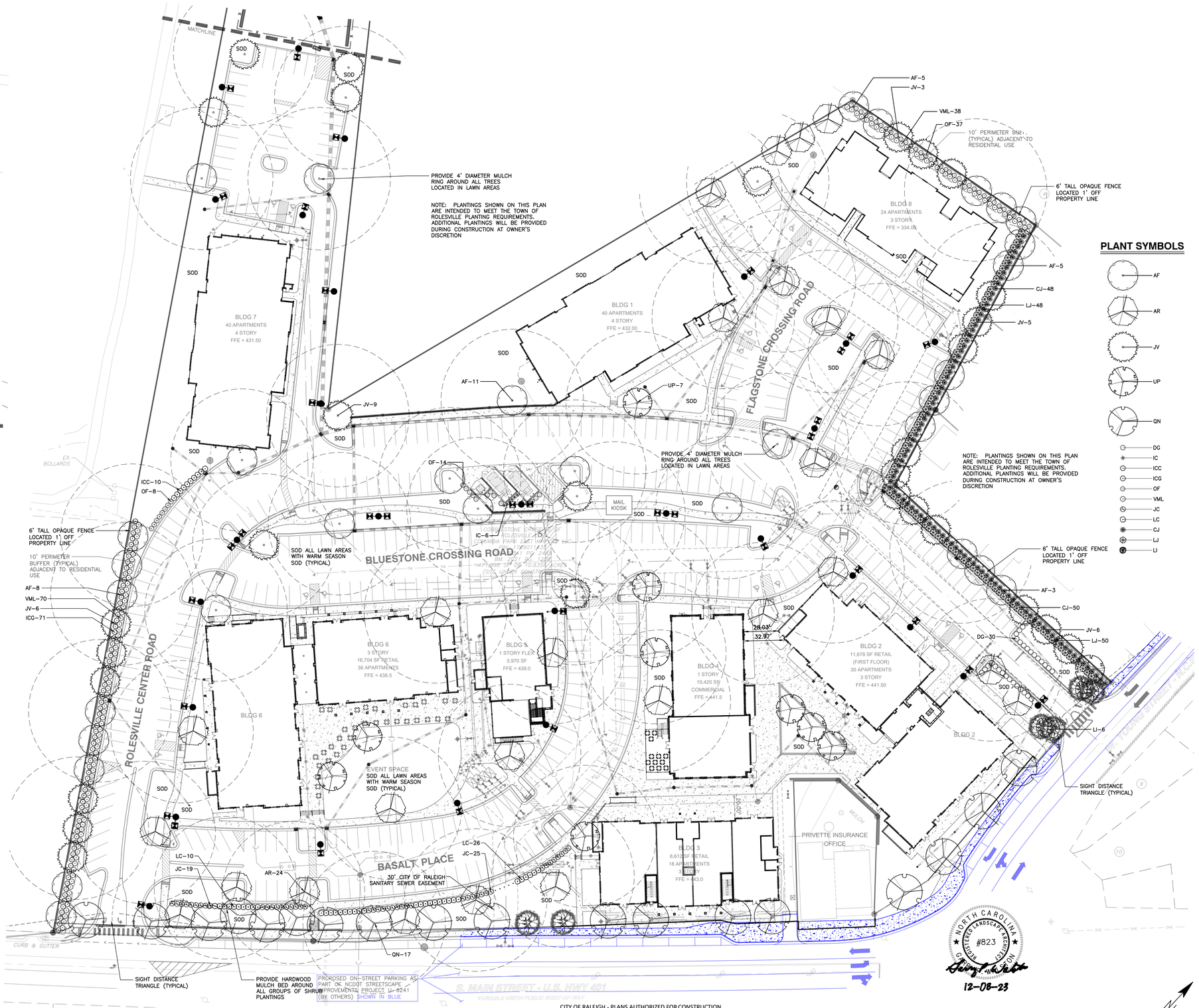

PLANT SYMBOLS

AF, AR, JV, UP, QN, DG, IC, ICC, ICG, OF, VML, JC, LC, CJ, LJ, LI

PLANT LIST

KEY	SCIENTIFIC NAME	COMMON NAME	QUAN.	CAL	HT	ROOT	USE
	CANOPY TREES						
AF	Acer freemanii	Freeman Maple	32	2.5"	8'	B&B	Buffer/VUA
AR	Acer rubrum 'Brandywine'	Brandywine Red Maple	26	2.5"	8'	B&B	VUA
JV	Juniperus virginiana	Eastern Red Cedar	29	2.5"	8'	B&B	Buffer/VUA
QN	Quercus nutallii	Nuttall Oak	18	2.5"	8'	B&B	Street Tree
UP	Ulmus parvifolia 'Allee'	Allee Elm	28	2.5"	8'	B&B	VUA
	UNDERSTORY TREES						
LI	Lagerstroemia Indica 'Tonto'	Crepe Myrtle	6	1.5"	6'	B&B	Street
	SHRUBS						
CJ	Cleyera japonica	Japanese Cleyera	98		24"	CONT.	Buffer
DG	Distylium 'Green Wave'	Green Wave Distylium	30		24"	CONT.	VUA
IC	Ilex crenata 'Sky Pencil'	Sky Pencil Holly	6		36"	CONT.	Dumpster
ICC	Ilex crenata 'Chesapeake'	Chesapeake Holly	10		24"	CONT.	VUA Screen
ICG	Ilex crenata 'Green Lustre'	Green Lustre Japanese Holl	71		24"	CONT.	Buffer
JC	Juniperus chinensis 'Saybrook Gol	Saybrook Gold Juniper	44		24"	CONT.	VUA Screen
LC	Loropetalum chinense 'Daruma'	Daruma Loropetalum	36		24"	CONT.	VUA Screen
LJ	Ligustrum japonicum	Wax Ligustrum	106		24"	CONT.	Buffer
OF	Osmanthus fragrans	Fragrant Tea Olive	59		24"	CONT.	Buffer/Screen
VML	Viburnum x 'Moonlit Lace'	Moonlit Lace Viburnum	108		24"	CONT.	Buffer

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Raleigh Water Review Officer

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NORTH CAROLINA REGISTERED LANDSCAPE ARCHITECT #823

12-08-23

SCALE IN FEET: 0 20 40 80 120 160

BASS, NIXON & KENNEDY, INC.
CONSULTING ENGINEERS
6310 CHAPEL HILL ROAD, SUITE 250, RALEIGH, NC 27607
TELEPHONE: (919)851-4422 FAX: (919)851-8968
CERTIFICATION NUMBERS: NCBELS (C-0110); NCBOLA (C-0267)

NO.	DATE	DESCRIPTION	BY
		REVISIONS	
4	12-08-23	PER TOR COMMENTS	GW
3	05-12-22	PER TOR COMMENTS	GW
2	04-20-22	PER TOR COMMENTS	GW
1	5-25-21	PER TOR COMMENTS	GW

JOB NO. 03-19157 | DATE | PROGRESS | DRAWN BY: GW | CHK BY: GPW

LANDSCAPE PLAN

SCALE: 1" = 40'

COBBLESTONE VILLAGE
MIXED USE DEVELOPMENT
TOWN OF ROLESVILLE, WAKE COUNTY, NORTH CAROLINA

SHEET L1.1

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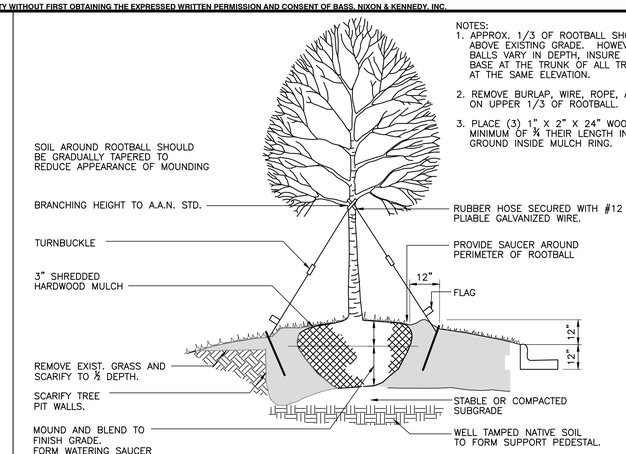
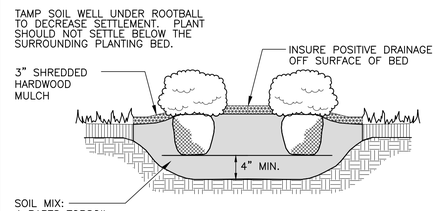


TYPICAL TREE PLANTING

NOT TO SCALE



CONTINUOUS SHRUB PLANTING

NOT TO SCALE

GENERAL NOTES

1. A/C UNITS, TRANSFORMERS AND OTHER MECHANICAL OR UTILITY EQUIPMENT, NOT SHOWN ON THE PLAN, SHALL BE SCREENED FROM VIEW EITHER BY ADJUSTING PLANTINGS SHOWN IN CLOSE PROXIMITY TO EQUIPMENT OR BY THE ADDITION OF WAX MYRTLES @ 24" HT, 5' OC (SEE GENERAL NOTES FOR EQUIPMENT ACCESSIBILITY AND PLANTING PROXIMITY, ETC.). DUMPSTER IS SCREENED FROM OFF-SITE VIEWS.
2. CONTRACTOR SHALL VERIFY LOCATION OF ALL UTILITIES PRIOR TO PLANTING.
3. MULCH SHALL BE 3" DEEP SHREDDED HARDWOOD MULCH UNLESS OTHERWISE NOTED.
4. VERIFICATION OF TOTAL QUANTITIES AS SHOWN IN THE PLANT LIST AND ON THE PLAN SHALL BE THE RESPONSIBILITY OF THE LANDSCAPE CONTRACTOR. ANY DISCREPANCIES BETWEEN PLANT LIST AND PLANTING PLAN SHALL BE BROUGHT TO THE ATTENTION OF THE LANDSCAPE ARCHITECT FOR CLARIFICATION.
5. ALL TREES, SHRUBS, GROUNDCOVER, ETC. SHALL CONFORM TO ACCEPTED STANDARDS ESTABLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN.
6. ALL ROOTBALLS REMOVED FROM CONTAINERS SHALL BE SCARIFIED PRIOR TO PLANTING.
7. B&B AS LISTED UNDER "ROOT" IN THE PLANT LIST INDICATES BALLED & BURLAPPED.
8. ALL PLANTS/PLANTINGS SHALL BE MULCHED IMMEDIATELY AFTER PLANTING AND WATERED.
9. ALL PLANTS SHALL BEAR THE SAME RELATIONSHIP TO FINISHED GRADE AS THEY BORE TO PREVIOUS EXISTING GRADE (UNLESS OTHERWISE NOTED).
10. ALL TREES AND SHRUBS SHALL REQUIRE MULCH RINGS AT THEIR BASE IF LEFT WITHIN LAWN AREAS.
11. MULCH EDGES AND PROPOSED PLANTINGS SHALL NOT DISTURB ANY EXISTING GROUPS OF TREES TO REMAIN. EDGES ARE SHOWN FOR APPROXIMATION ONLY, BUT ARE TO INDICATE SMOOTH, CLEAN CURVES.
12. CULVERTS, RIP-RAP STRUCTURES, AND OTHER STORMWATER DEVICES SHALL BE SCREENED WITH EVERGREEN SHRUBS. IF STRUCTURES ARE NOT SHOWN ON THE PLAN, INSTALL WAX MYRTLES @ 24" HT. - 5' OC.
13. A 2' BUMPER OVERHANG, FROM THE BACK OF CURB, SHALL BE ALLOTTED FOR MATURE SHRUBS.
14. TREE PROTECTION FENCING SHALL BE MAINTAINED UNTIL ALL SITE WORK IS COMPLETED. THE FENCING SHALL BE REMOVED PRIOR TO THE FINAL SITE INSPECTION FOR THE CERTIFICATE OF OCCUPANCY (C.O.). THE SITE SHALL BE STABILIZED AND SEEDED PRIOR TO THE ISSUANCE OF A (C.O.).
15. UNLESS OTHERWISE NOTED ON THE PLAN, ALL DISTURBED AREAS ARE TO BE SEEDED WITH WARM SEASON GRASS, INCLUDING PARKING LOT PERIMETERS AND PARKING LOT ISLANDS..
16. PERIMETER BUFFER AREAS ARE TO BE MULCHED TO A DEPTH OF THREE INCHES.

LANDSCAPE CALCULATIONS

PERIMETER BUFFERS (10' TYPICAL):

WEST (1) - 352 LF = 4 TREES / 100 LF = 14 TREES REQUIRED/PROVIDED
= 40 SHRUBS / 100 LF = 141 SHRUBS REQUIRED/PROVIDED
= 352 LF MIN. 6' TALL FENCE REQUIRED

NORTH (2) - 187 LF = 4 TREES / 100 LF = 8 TREES REQUIRED/PROVIDED
= 40 SHRUBS / 100 LF = 75 SHRUBS REQUIRED/PROVIDED
= 187 LF MIN. 6' TALL FENCE REQUIRED

NORTHEAST (3) - 240 LF = 4 TREES / 100 LF = 10 TREES REQUIRED/PROVIDED
= 40 SHRUBS / 100 LF = 96 SHRUBS REQUIRED/PROVIDED
= 240 LF MIN. 6' TALL FENCE REQUIRED

EAST (4) - 247 LF = 4 TREES / 100 LF = 10 TREES REQUIRED/PROVIDED
= 40 SHRUBS / 100 LF = 100 SHRUBS REQUIRED/PROVIDED
= 247 LF MIN. 6' TALL FENCE REQUIRED

STREET YARDS:

MAIN ST - 595 LF = 1 TREE / 50 LF = 12 TREES REQUIRED/PROVIDED

WEST YOUNG ST - 242 LF = 1 TREE / 50 LF = 5 TREES REQUIRED/PROVIDED

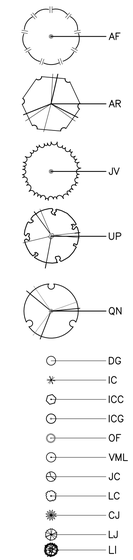
VEHICULAR USE AREA COVERAGE: 1 TREE WITHIN 60' OF EACH PARKING SPACE

PLANTING NOTES:

LOCATE PLANTS AND PLANTING BEDS BY USING SCALED DIMENSIONS FROM STREET, PROPERTY LINES, BACK OF CURB, BUILDINGS, WALLS, ETC. ALL PLANTS SHALL MEET OR EXCEED THE MINIMUM STANDARDS SET BY THE U.S.D.A. FOR NURSERY STOCK SPONSORED BY THE AMERICAN ASSOCIATION OF NURSERYMEN, INC., WASHINGTON, D.C. NO SUBSTITUTIONS SHALL BE PERMITTED WITHOUT WRITTEN APPROVAL FROM THE OWNER AND/OR THE LANDSCAPE ARCHITECT. SYMBOLS: B&B = BALLED & BURLAPPED; B.R. = BARE ROOT; CONT. = CONTAINER, O.C. = ON-CENTER

STREET TREE PLANTINGS TO BE COORDINATED IN CONCURRENCE WITH NCDOT STREETSCAPE IMPROVEMENT PROJECT ALONG S. MAIN AND YOUNG STREET(S).

PLANT SYMBOLS



CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

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

City of Raleigh Development Approval _____

Raleigh Water Review Officer

NO FLOODPLAINS EXIST ON-SITE

NOTE: ALL CONSTRUCTION ACTIVITY MUST BE IN ACCORDANCE WITH THE ACCEPTED POLICIES OF THE TOWN OF ROLESVILLE AND NCDOT

REGISTERED LANDSCAPE ARCHITECT NORTH CAROLINA #823

12-08-23

BNK

BASS, NIXON & KENNEDY, INC.
CONSULTING ENGINEERS
6310 CHAPEL HILL ROAD, SUITE 250, RALEIGH, NC 27607
TELEPHONE: (919)851-4422 FAX: (919)851-8968
CERTIFICATION NUMBERS: NCBELS (C-0110); NCBOLA (C-0267)

NO.	DATE	DESCRIPTION	BY
4	12-08-23	PER TOR COMMENTS	GW
3	05-12-22	PER TOR COMMENTS	GW
2	04-20-22	PER TOR COMMENTS	GW
1	5-25-21	PER TOR COMMENTS	GW
	DATE	REVISIONS	

JOB NO. 03-19157 | DATE | DRAWN BY GW | PROGRESS

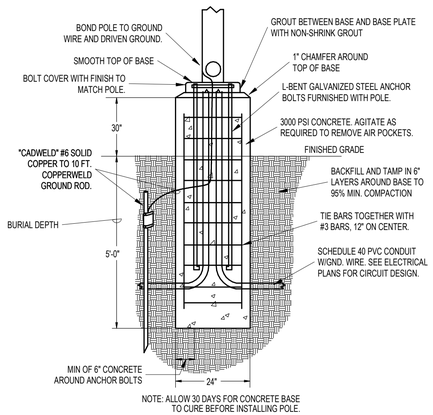
LANDSCAPE DETAILS

SCALE: N.T.S. | CHK BY: GPW

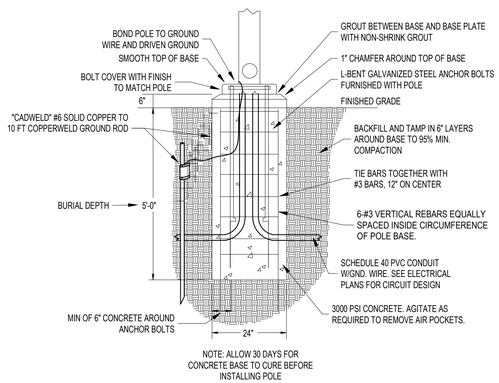
COBBLESTONE VILLAGE
MIXED USE DEVELOPMENT
TOWN OF ROLESVILLE, WAKE COUNTY, NORTH CAROLINA

SHEET L1.2

NOT RELEASED FOR CONSTRUCTION OR BID SOLICITATION



1 LIGHTING POLE BASE DETAIL
SCALE: NONE



2 SITE LIGHTING POLE BASE DETAIL - 5'(6" AFG)
SCALE: NONE

3 FIXTURE "A" & "A2" DETAIL
SCALE: NONE

4 FIRST FLOOR SITE LIGHTING
SCALE: 1" = 50'-0"

STATISTICS	
AVERAGE	1.8 fc
MAXIMUM	5.6 fc
MINIMUM	0.4 fc
MAX/MIN	14.0:1
AVG/MIN	4.5:1

NOTE:
1. BUILDING LIGHTING SHALL BE PROVIDED TO ILLUMINATE ENTRANCES AND EXITS TO MEET IES STANDARDS AS PART OF THE BUILDING ELECTRICAL DESIGN AND IS NOT INCLUDED IN THE SCOPE OF THIS SITE LIGHTING LAYOUT.
2. ALL SITE LIGHTING SHALL BE SHEILDED FROM ADJACENT PUBLIC STREETS USING HOUSE SIDE SHEILDS IF GREATER THAN 2.0 FC AT PROPERTY LINE.
3. THE INTENT OF THIS DRAWING IS TO SHOW FOOTCANDLE LEVELS BASED ON FIXTURES SHOWN. ACTUAL LEVELS MAY VARY BASED ON ACTUAL FIXTURE INSTALLED.
4. THIS DRAWING IS INTENDED FOR PRELIMINARY SITE PLAN APPROVAL OF DESIGNED LIGHTING LEVELS AND IS NOT INTENDED TO BE USED FOR CONSTRUCTION.

ELECTRICAL CONNECTION NOTE:
THIS IS A SITE LIGHTING CALCULATION PLAN ONLY AND DOES NOT PROVIDE ELECTRICAL CONNECTIONS FOR FIXTURES SHOWN. SITE DEVELOPERS (OWNERS, BUILDERS AND GENERAL CONTRACTORS) ARE RESPONSIBLE FOR COORDINATING WITH BUILDING ELECTRICAL CONTRACTOR OR POWER COMPANY FOR POWER CONNECTIONS FOR ALL FIXTURES.

Lighting Fixture Schedule

Type Mark	Description	Manufacturer	Model	Voltage	Wattage	Mounting Height
A	NEW LED POLE MOUNTED PARKING LOT LIGHTING	EATON-STREETWORKS	LED 50W SHOEBOX - TYPE IV -3000K	277 V	59.0 W	25'
B	NEW LED POLE MOUNTED PARKING LOT LIGHTING	EATON-STREETWORKS	LED 150W SHOEBOX - TYPE IV -4000K	277 V	166.0 W	25'
B1	NEW LED POLE MOUNTED PARKING LOT LIGHTING	EATON-STREETWORKS	LED 150W SHOEBOX - TYPE IV -4000K	277 V	332.0 W	25'
B2	NEW LED POLE MOUNTED PARKING LOT LIGHTING	EATON-STREETWORKS	LED 150W SHOEBOX - TYPE IV -4000K	277 V	332.0 W	25'

BNK
BASS | NIXON | KENNEDY
CONSULTING ENGINEERS
ENGINEERING FIRM NUMBER: C-0110
6310 CHAPEL HILL ROAD, SUITE 250
RALEIGH, NC 27607
PHONE: 919.851.4422

SEALS

PRELIMINARY
NOT FOR CONSTRUCTION

COBBLESTONE VILLAGE
ROLESVILLE, NC

REVISION SCHEDULE		
NO.	DESCRIPTION	DATE

SHEET
DRAWN BY: IB
CHECKED BY: PLC
DATE ISSUED: 12/08/2023
SHEET NAME: SITE LIGHTING PLAN
SHEET NUMBER: SL-001

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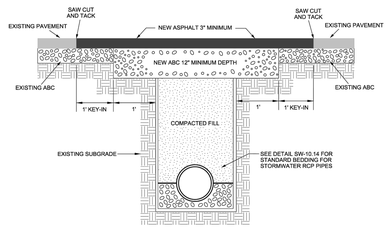


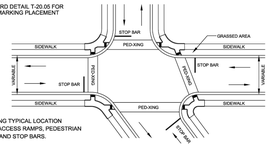
NOTES:
1. THE PAVEMENT EDGE SHALL BE DEFINED BY A STRAIGHT EDGE FORMED BY A MACHINED SAW CUT.
2. THE TRENCH SUBGRADE MATERIAL SHALL BE BACKFILLED WITH SUITABLE MATERIAL AND COMPACTED TO A DENSITY OF AT LEAST 95% OF THAT OBTAINED BY COMPACTING A SAMPLE OF THE MATERIAL IN ACCORDANCE WITH AASHTO T-99 AS 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. BITUMINOUS BASE OR BINDER MAY BE SUBSTITUTED IF APPROVED BY TRANSPORTATION DIRECTOR OR DESIGNEE.
4. THE ENTIRE THICKNESS/VERTICAL EDGE OF THE 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 AND ROLLED WITH A SMOOTH DRUM ROLLER TO ACHIEVE A SMOOTH, LEVEL PATCH.

CITY OF RALEIGH
STANDARD DETAIL

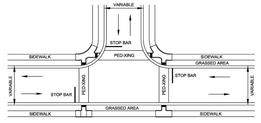
REVISIONS	DATE: 8/2020	NOT TO SCALE
	ASPHALT PAVEMENT PATCH AND RCP PIPE BACKFILL	

T-10.05

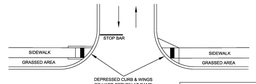
NOTE: SEE STANDARD DETAIL T-20.05 FOR PAVEMENT MARKING PLACEMENT



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



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



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

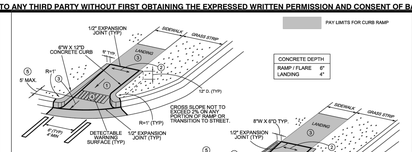
SHEET 1 OF 8

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 8/2020	NOT TO SCALE
	CURB RAMPS	

T-20.01.1

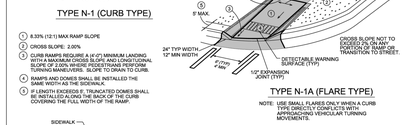
PAY LIMITS FOR CURB RAMP



TYPE N-1 (CURB TYPE)

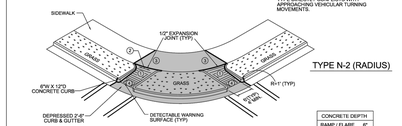
CONCRETE DEPTH
RAMP / FLARE 6"
LANDING 4"

1. 8.33% (12:1) MAX RAMP SLOPE
2. CROSS SLOPE: 2.00%
3. CURB RAMPS REQUIRE A (4'-0") MINIMUM LANDING WITH A MAXIMUM CROSS SLOPE AND LONGITUDINAL SLOPE OF 2.00% WHERE PEDESTRIANS PERFORM TURNING MANEUVERS. SLOPE TO DRAIN TO CURB.
4. RAMPS AND DOMES SHALL BE INSTALLED THE SAME WIDTH AS THE SIDEWALK.
5. 8' LENGTH EXCEEDS 6'. TRUNCATED DOMES SHALL BE INSTALLED ALONG THE BACK OF THE CURB COVERING THE FULL WIDTH OF THE RAMP.



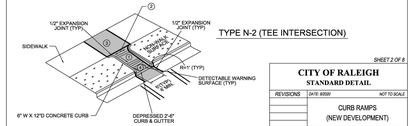
TYPE N-1A (FLARE TYPE)

NOTE: USE SMALL FLARES ONLY WHEN A CURB RAMP IS NOT EXPECTED TO BE USED BY APPROACHING VEHICULAR TURNING MOVEMENTS.



TYPE N-2 (RADIUS)

CONCRETE DEPTH
RAMP / FLARE 6"
LANDING 4"



TYPE N-2 (TEE INTERSECTION)

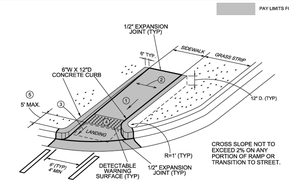
SHEET 2 OF 8

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 8/2020	NOT TO SCALE
	CURB RAMPS (NEW DEVELOPMENT)	

T-20.01.2

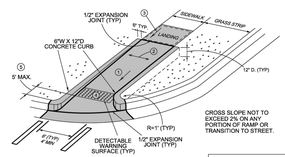
PAY LIMITS FOR CURB RAMP



TYPE N-4

1. SLOPE TO MEET GRADE, 15' MAXIMUM.
2. CROSS SLOPE: 2.00%
3. CURB RAMPS REQUIRE A (4'-0") MINIMUM LANDING WITH A MAXIMUM CROSS SLOPE AND LONGITUDINAL SLOPE OF 2.00% WHERE PEDESTRIANS PERFORM TURNING MANEUVERS. SLOPE TO DRAIN TO CURB.
4. RAMPS AND DOMES SHALL BE INSTALLED THE SAME WIDTH AS THE SIDEWALK.
5. 8' LENGTH EXCEEDS 6'. TRUNCATED DOMES SHALL BE INSTALLED ALONG THE BACK OF THE CURB COVERING THE FULL WIDTH OF THE RAMP.

CONCRETE DEPTH
RAMP 6"
LANDING 4"



TYPE N-4A

SHEET 4 OF 8

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 8/2020	NOT TO SCALE
	CURB RAMPS (NEW DEVELOPMENT)	

T-20.01.4

CITY OF RALEIGH
CURB RAMPS
GENERAL NOTES

1. CITY OF RALEIGH STANDARD CURB RAMPS HAVE BEEN DEVELOPED IN ACCORDANCE WITH THE AMERICANS WITH DISABILITIES ACT (ADA) AND PUBLIC RIGHT OF WAY ACCESS GUIDELINES (PROWAG).
2. CURB RAMPS SHALL BE PROVIDED AT LOCATIONS AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. SIDEWALK ACCESS RAMPS SHALL BE LOCATED AS INDICATED IN THE DETAIL, HOWEVER, THE LOCATION MAY BE ADJUSTED IN COORDINATION WITH THE CITY OF RALEIGH WHERE EXISTING LIGHT POLES, FIRE HYDRANTS, DROP INLETS, ETC. AFFECT PLACEMENT.
3. DOUBLE WHEELCHAIR RAMPS ARE TO BE INSTALLED AT ALL PUBLIC STREET INTERSECTIONS WHERE SIDEWALK IS REQUIRED.
4. THE WALKING SURFACE SHALL BE SLIP RESISTANT, THE COLOR FOR THE DETECTABLE WARNING AREA SHALL BE YELLOW FOR CONTRAST.
5. NO SLOPE ON THE SIDEWALK ACCESS RAMP SHALL EXCEED 1"/FT (12:1) IN RELATIONSHIP TO THE GRADE OF THE STREET.
6. IN NO CASE SHALL THE WIDTH OF THE SIDEWALK ACCESS RAMP BE LESS THAN 48" ALL RAMPS SHALL BE INSTALLED THE SAME WIDTH AS THE SIDEWALK.
7. USE CLASS A (3000 PSI) CONCRETE WITH A SIDEWALK FINISH IN ORDER TO OBTAIN A ROUGH NONSKID SURFACE.
8. A 1/2" EXPANSION JOINT INSTALLED FULL DEPTH WILL BE REQUIRED WHERE THE CONCRETE SIDEWALK ACCESS RAMP JOINS THE CURB AND ALSO WHERE NEW CONCRETE ABUTS EXISTING CONCRETE.
9. CURB RAMPS SHOULD BE PLACED PARALLEL TO THE DIRECTION OF TRAVEL.

SHEET 5 OF 8

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 8/2020	NOT TO SCALE
	CURB RAMP NOTES	

T-20.01.8

POLYGRATE
3401 CHIEF DRIVE
HOLLY, MI 48442-9333
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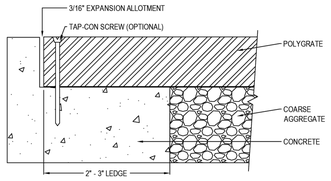

SECTION

PRODUCT AND MATERIAL TEST DATA			
RESIN PROPERTIES	**ASTM TEST**	**UNITS**	**TYPICAL VALUES**
DENSITY	D-1505	G / CC	0.957
MELT INDEX	D-1238	G / 10 MIN	7
MOLDED PROPERTIES	**ASTM TEST**	**UNITS**	**TYPICAL VALUES**
MODULUS	D-638	PSI	166 000
TENSILE AT YIELD	D-638	PSI	430
ELONGATION AT BREAK	D-638	%	1 400
FLEXURAL MODULUS	D-790	PSI	194 000

NOTES:
1. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
2. DO NOT SCALE DRAWING.
3. THIS DRAWING IS INTENDED FOR USE BY ARCHITECTS, ENGINEERS, CONTRACTORS, CONSULTANTS AND DESIGN PROFESSIONALS FOR PLANNING PURPOSES ONLY. THIS DRAWING MAY NOT BE USED FOR CONSTRUCTION.
4. ALL INFORMATION CONTAINED HEREIN WAS CURRENT AT THE TIME OF DEVELOPMENT BUT MUST BE REVIEWED AND APPROVED BY THE PRODUCT MANUFACTURER TO BE CONSIDERED ACCURATE.
5. CONTRACTOR'S NOTE: FOR PRODUCT AND COMPANY INFORMATION VISIT www.CADdetails.com/info AND ENTER REFERENCE NUMBER 1063-016

POLYGRATE™

POLYGRATE™ INSTALLATION WITH CONCRETE SURROUND

1063-016 REVISION DATE 01/26/2018

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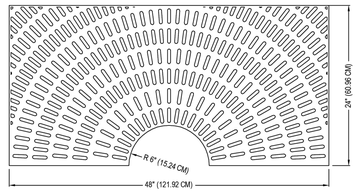

TOP VIEW - HALF GRATE

PRODUCT AND MATERIAL TEST DATA			
RESIN PROPERTIES	**ASTM TEST**	**UNITS**	**TYPICAL VALUES**
DENSITY	D-1505	G / CC	0.957
MELT INDEX	D-1238	G / 10 MIN	7
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MODULUS	D-638	PSI	166 000
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4. ALL INFORMATION CONTAINED HEREIN WAS CURRENT AT THE TIME OF DEVELOPMENT BUT MUST BE REVIEWED AND APPROVED BY THE PRODUCT MANUFACTURER TO BE CONSIDERED ACCURATE.
5. CONTRACTOR'S NOTE: FOR PRODUCT AND COMPANY INFORMATION VISIT www.CADdetails.com/info AND ENTER REFERENCE NUMBER 1063-006

POLYGRATE™ SQUARE TREE GRATES

4' X 4' SQUARE POLYGRATE™ TREE GRATE (TSB44)

1063-006 REVISION DATE 01/26/2018

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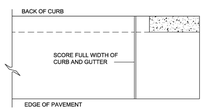
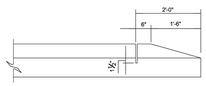
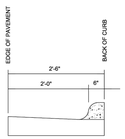


PLAN



FRONT

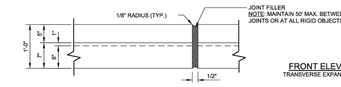


END

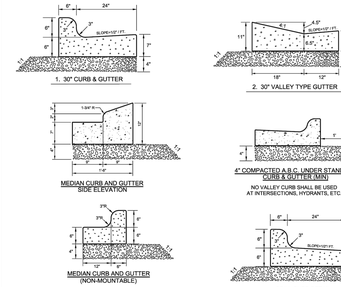
CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 8/2020	NOT TO SCALE
	STANDARD METHOD OF ENDING CURB AND GUTTER	

T-10.25



FRONT ELEVATION
TRANSVERSE EXPANSION JOINT



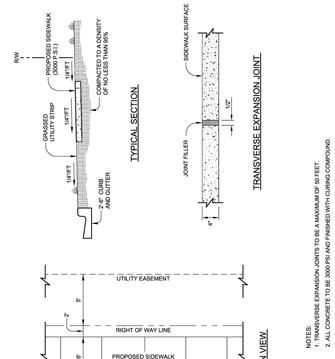
NOTES:
1. 10' MAXIMUM BETWEEN DUMMY JOINTS. 10' MAXIMUM BETWEEN DUMMY JOINTS ON MACHINE POURS.
2. 1/2" EXPANSION JOINT EVERY 50'.
3. 3000 PSI CONCRETE MINIMUM, 4" SLUMP MAXIMUM.
4. LIQUID MEMBRANE CURING COMPOUND SHALL MEET THE REQUIREMENTS OF SECTION 1026.2 OF NCDOT STANDARDS & SPECIFICATIONS FOR ROADS AND STRUCTURES.
5. ALL CONSTRUCTION JOINTS SHALL BE FILLED WITH JOINT FILLER AND SEALER IN ACCORDANCE WITH NCDOT ROADWAY STANDARD DETAIL 846.01 THE JOINT MATERIAL SHALL CONFORM TO SECTION 1028-2 OF NCDOT STANDARD & SPECIFICATIONS FOR ROADS AND STRUCTURES.
6. REFER TO NCDOT DETAIL 846.01 FOR CURB AND GUTTER SUPERELEVATION RATES.

SHEET 1 OF 2

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 8/2020	NOT TO SCALE
	CURB AND GUTTER	

T-10.26.1

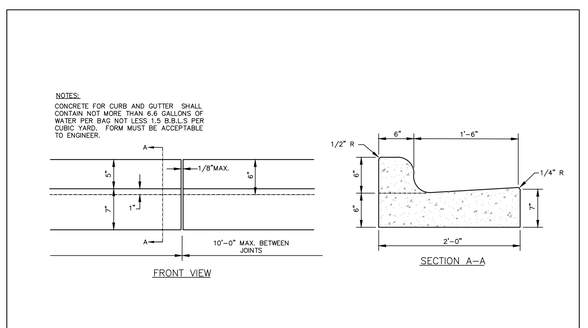


NOTES:
1. TRANSVERSE EXPANSION JOINTS TO BE A MAXIMUM OF 50 FEET.
2. ALL JOINTS TO BE SEALED WITH A SILICONE SEALANT COMPOUND.
3. A 1/4 INCH DEPTH IS REQUIRED AT LOCATIONS OF DRIVEWAY CROSSINGS, AT STREET INTERSECTIONS (ALONG THE LENGTH OF RADIUS CURB RETURNS), AND AT THE HANDICAP RAMPS.

CITY OF RALEIGH
STANDARD DETAIL

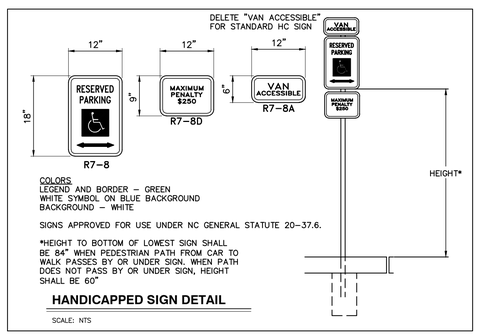
REVISIONS	DATE: 8/2020	NOT TO SCALE
	CONCRETE SIDEWALK	

T-30.01



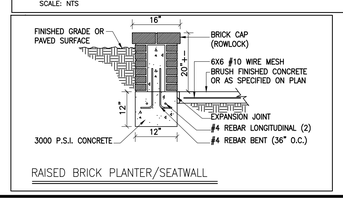
TYPICAL CURB AND GUTTER SECTION 24" FOR PRIVATE STREETS AND DRIVES ONLY

SCALE: NTS



HANDICAPPED SIGN DETAIL

SCALE: NTS



RAISED BRICK PLANTER/SEATWALL

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

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

City of Raleigh Development Approval _____

Raleigh Water Review Officer

NORTH CAROLINA PROFESSIONAL SEAL 036905 ENGINEER MARTY D. BIZZELL

12/08/23

BASS, NIXON & KENNEDY, INC.
CONSULTING ENGINEERS
6310 CHAPEL HILL ROAD, SUITE 250, RALEIGH, NC 27607
TELEPHONE: (919)851-4422 FAX: (919)851-8968
CERTIFICATION NUMBERS: NCBELS (C-0110); NCBOLA (C-0267)

NO.	DATE	DESCRIPTION	BY
		REVISIONS	
3	12-08-23	TOWN OF ROLESVILLE COMMENTS	MRM
2	10-16-23	T.O.R. COMMENTS	MRM
1	09-21-23	CHANGES FROM 06-02-22 CD'S	MRM

PROGRESS MRM
DATE DRAWN BY
JOB NO. 03-19157
DETAILS
SCALE: N.T.S. CHK BY:MDB

COBBLESTONE VILLAGE
MIXED USE DEVELOPMENT
TOWN OF ROLESVILLE, WAKE COUNTY, NORTH CAROLINA

SHEET C5.1

NOT RELEASED FOR CONSTRUCTION OR BID SOLICITATION

TOWN OF ROLESVILLE PROJECT NO.

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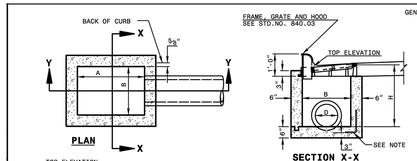
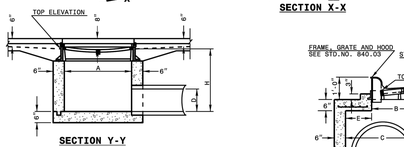
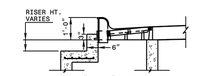
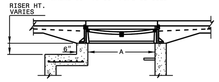
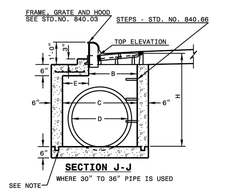


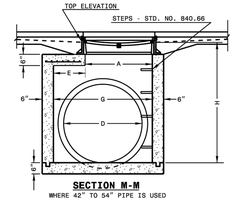


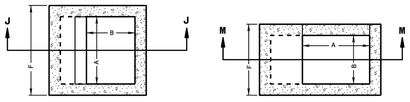




DETAIL SHOWING METHOD OF RISER CONSTRUCTION







GENERAL NOTES:

USE CLASS "B" CONCRETE THROUGHOUT.

PROVIDE ALL CATCH BASINS OVER 3'-6" IN DEPTH WITH STEPS 12" ON CENTER. USE STEPS WHICH COMPLY WITH STD. DRAWING 840.66.

OPTIONAL CONSTRUCTION - MONOLITHIC POUR, 2" KEYWAY, OR #4 BAR DOWELS AT 12" CENTERS AS DIRECTED BY THE ENGINEER.

USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.

IF REINFORCED CONCRETE PIPE IS SET IN BOTTOM SLAB OF BOX, ADD TO SLAB AS SHOWN ON STD. NO. 840.00.

USE TYPE "E", "F" AND "G" GRATES UNLESS OTHERWISE INDICATED.

FOR 8'-0" IN HEIGHT OR LESS USE 6" WALLS AND BOTTOM SLAB. OVER 8'-0" TO 16'-0" IN HEIGHT USE 8" WALLS AND BOTTOM SLAB. ADJUST QUANTITIES ACCORDINGLY.

CONSTRUCT WITH PIPE CROWNS MATCHING.

CHAMFER ALL EXPOSED CORNERS 1".

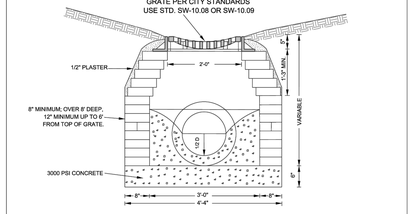
DRAWING NOT TO SCALE.

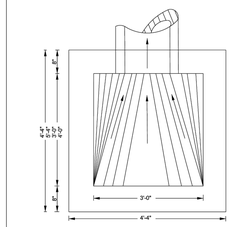
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

1-18

ROADWAY STANDARD DRAWING FOR
CONCRETE CATCH BASIN
12" THRU 54" PIPE

SHEET 1 OF 2
840.02





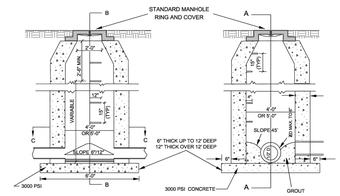
NOTES:
1. FOR 24" RCP & LARGER USE PIPE DIAMETER PLUS 12" FOR MINIMUM INSIDE DIMENSION.
2. 24" X 24" CASTING WITH 12", 15" & 18" PIPE, 24" X 36" CASTING USED WITH 24" PIPE OR LARGER. IF PLACED WITHIN PUBLIC R/W CASTING MUST BE TRAFFIC BEARING TYPE PER NCDOT STANDARDS.
3. USE 4" X 4" X 8" OR 4" X 8" X 16" SOLID CONCRETE BLOCK, CAST IN PLACE OR PRECAST CONCRETE TO MEET N.C.D.O.T. STANDARDS ACCEPTABLE.
4. STEPS SHALL BE INSTALLED IN ALL DROP INLETS OVER 3' IN DEPTH. DEPTH SHALL BE MEASURED FROM THE TOP OF GRATE TO THE INVERT OF THE DROP INLET.

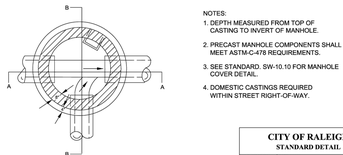
CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 8/2020	NOT TO SCALE
	STANDARD DROP INLET	
	SW-10.03	

TYPICAL MH FOR STORM SEWER

PIPE SIZE	MH DIAMETER
12-24"	4'-0"
30-42"	5'-0"
48"	6'-0"
54"	8'-0"

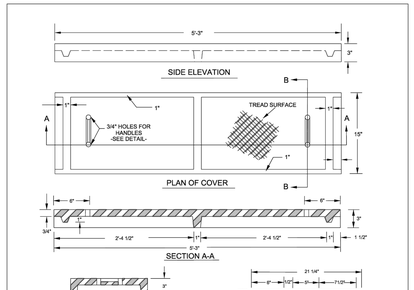


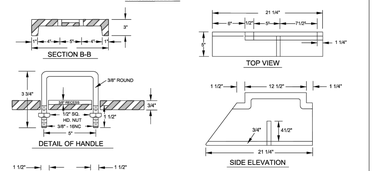


NOTES:
1. DEPTH MEASURED FROM TOP OF CASTING TO INVERT OF MANHOLE.
2. PRECAST MANHOLE COMPONENTS SHALL MEET ASTM-C-478 REQUIREMENTS.
3. SEE STANDARD. SW-10.10 FOR MANHOLE COVER DETAIL.
4. DOMESTIC CASTINGS REQUIRED WITHIN STREET RIGHT-OF-WAY.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 8/2020	NOT TO SCALE
	STANDARD CLASS "A" MANHOLE	
	SW-10.05	

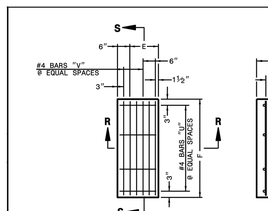


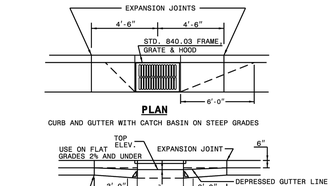


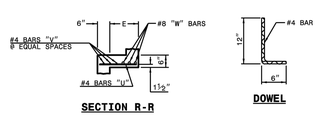
SHEET 1 OF 2

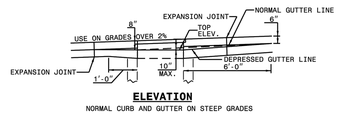
CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 8/2020	NOT TO SCALE
	CATCH BASIN CASTINGS	
	SW-10.06.1	









MINIMUM DIMENSIONS AND QUANTITIES FOR CONCRETE CATCH BASIN(BASED ON MIN. HEIGHT, H, WITH NO RISER) *

DIMENSIONS OF BOX AND PIPE						COVER DIMENSION		BARS-U		BARS-V		BARS-W		TOTAL LBS.	CU.YDS. CONC. IN BOX TOP SLAB		DEDUCTIONS ONE PIPE	
PIPE D	SPAN A	WIDTH B	WIDTH C	SPAN G	MIN. HEIGHT H	E	F	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH		TOP SLAB	BOTTOM SLAB	C.M.	R.C.
12"	3'-0"	2'-2"	---	---	2'-9"	---	---	---	---	---	---	---	---	---	---	0.235	0.772	0.015
15"	3'-0"	2'-2"	---	---	3'-0"	---	---	---	---	---	---	---	---	---	---	0.235	0.829	0.023
18"	3'-0"	2'-2"	---	---	3'-3"	---	---	---	---	---	---	---	---	---	---	0.235	0.887	0.033
24"	3'-0"	2'-2"	---	---	3'-9"	---	---	---	---	---	---	---	---	---	---	0.235	1.001	0.059
30"	3'-0"	2'-2"	3'-4"		4'-3"	1'-2"	4'-0"	4	1'-5"	2	3'-9"	3	3'-9"	39	0.123	0.321	1.433	0.092
36"	3'-0"	2'-2"	3'-10"		4'-9"	1'-8"	4'-0"	4	1'-11"	3	3'-9"	3	3'-9"	43	0.181	0.358	1.714	0.132
42"	3'-0"	2'-2"		4'-5"	5'-3"	1'-5"	3'-2"	4	1'-8"	2	2'-11"	3	2'-11"	32	0.112	0.318	1.738	0.180
48"	3'-0"	2'-2"		5'-0"	5'-9"	2'-0"	3'-2"	4	2'-3"	3	2'-11"	3	2'-11"	35	0.145	0.352	2.052	0.235
54"	3'-0"	2'-2"		5'-7"	6'-3"	2'-7"	3'-2"	4	2'-10"	5	2'-11"	3	2'-11"	41	0.180	0.358	2.387	0.297

DEDUCTIONS ONE PIPE
C.M.	R.C.
0.015	0.026
0.023	0.036
0.033	0.049
0.059	0.085
0.092	0.127
0.132	0.178
0.180	0.243
0.235	0.317
0.297	0.401

* RISER HAS .228 CUBIC YARDS OF CONCRETE PER FOOT HEIGHT

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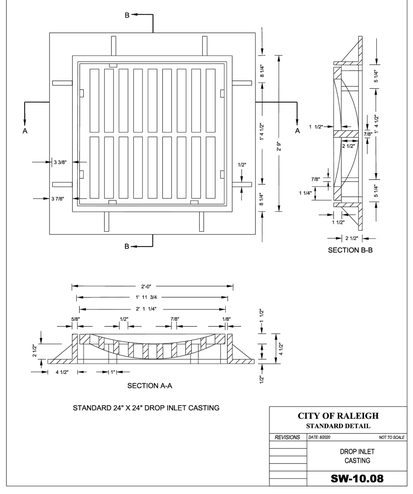
DIVISION OF HIGHWAYS
RALEIGH, N.C.

1-18

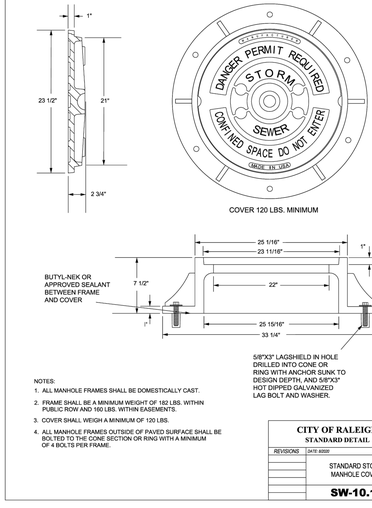
ROADWAY STANDARD DRAWING FOR
CONCRETE CATCH BASIN
12" THRU 54" PIPE

SHEET 2 OF 2
840.02



CITY OF RALEIGH
STANDARD DETAIL

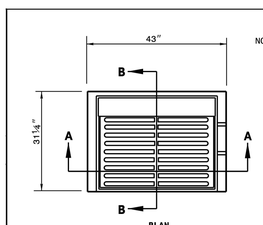
REVISIONS	DATE: 8/2020	NOT TO SCALE
	DROP INLET CASTING	
	SW-10.08	



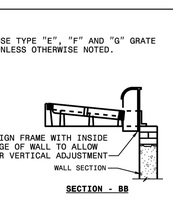
NOTES:
1. ALL MANHOLE FRAMES SHALL BE DOMESTICALLY CAST.
2. FRAME SHALL BE A MINIMUM WEIGHT OF 182 LBS. WITHIN PUBLIC ROW AND 160 LBS. WITHIN EASEMENTS.
3. COVER SHALL WEIGH A MINIMUM OF 120 LBS.
4. ALL MANHOLE FRAMES OUTSIDE OF PAVED SURFACE SHALL BE BOLTED TO THE CONE SECTION OR RING WITH A MINIMUM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

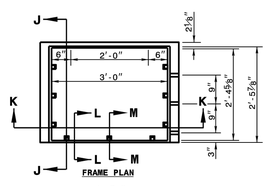
CITY OF RALEIGH
STANDARD DETAIL

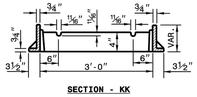
REVISIONS	DATE: 8/2020	NOT TO SCALE
	STANDARD STORM MANHOLE COVER	
	SW-10.10	

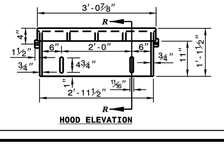


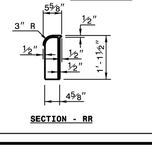
NOTE: USE TYPE "E", "F" AND "G" GRATE UNLESS OTHERWISE NOTED.









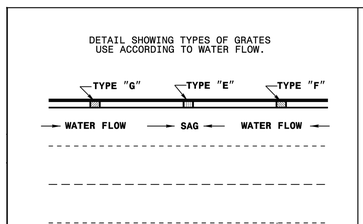


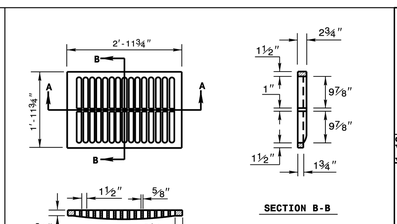
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

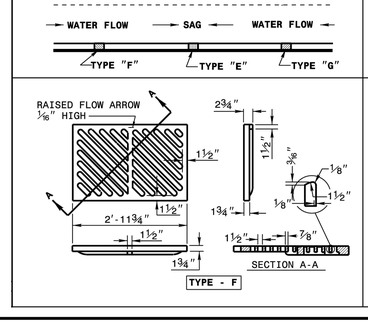
1-18

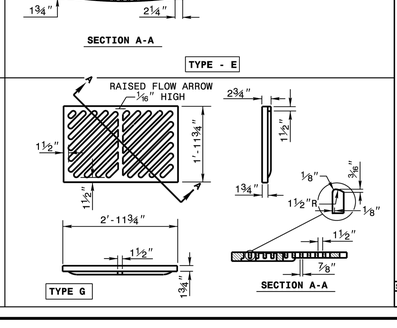
ROADWAY STANDARD DRAWING FOR
FRAME, GRATES, AND HOOD
FOR USE ON STANDARD CATCH BASIN

SHEET 1 OF 2
840.03









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

1-18

ROADWAY STANDARD DRAWING FOR
FRAME, GRATES, AND HOOD
FOR USE ON STANDARD CATCH BASIN

SHEET 2 OF 2
840.03

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

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City of Raleigh Development Approval _____

Raleigh Water Review Officer

NORTH CAROLINA PROFESSIONAL SEAL 036808 ENGINEER MARTY D. BIZZELL

12/08/23

BNK

BASS, NIXON & KENNEDY, INC.
CONSULTING ENGINEERS
6310 CHAPEL HILL ROAD, SUITE 250, RALEIGH, NC 27607
TELEPHONE: (919)851-4422 FAX: (919)851-8968
CERTIFICATION NUMBERS: NCBELS (C-0110); NCBOLA (C-0267)

NO.	DATE	DESCRIPTION
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3	12-08-23	TOWN OF ROLESVILLE COMMENTS
2	10-16-23	T.O.R. COMMENTS
1	09-21-23	CHANGES FROM 06-02-22 CD'S

BY
MRM
MRM
MRM

03-19157 JOB NO. | PROGRESS | DATE | DRAWN BY: MRM

DETAILS

SCALE: N.T.S. | CHK BY: MDB

COBBLESTONE VILLAGE
MIXED USE DEVELOPMENT
TOWN OF ROLESVILLE, WAKE COUNTY, NORTH CAROLINA

SHEET **C5.2**

NOT RELEASED FOR CONSTRUCTION OR BID SOLICITATION

TOWN OF ROLESVILLE PROJECT NO.

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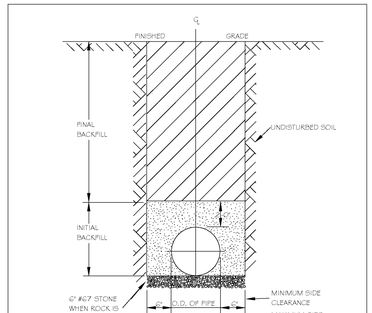
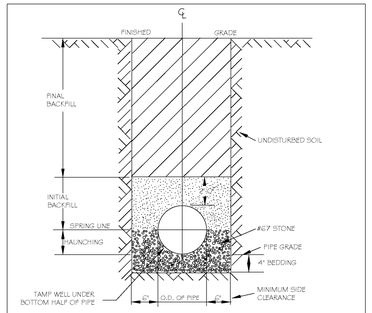


NOTES:
1. TRENCHES REQUIRING SHORING AND BRACING, DIMENSIONS SHALL BE TAKEN FROM THE INSIDE FACE OF THE SHORING AND BRACING.
2. NO ROCKS OR BOULDERS 4" OR LARGER TO BE USED IN INITIAL BACKFILL.
3. ALL BACKFILL MATERIAL SHALL BE SUITABLE NATIVE MATERIAL.
4. BACKFILL SHALL BE TAMPED IN 6" LIFTS IN TRAFFIC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

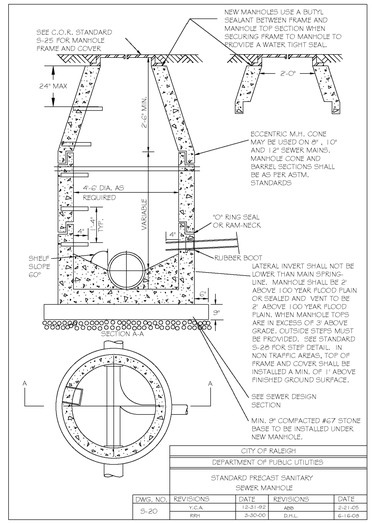
CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
TRENCH BOTTOM DIMENSIONS & BACKFILLING REQUIREMENTS FOR DUCTILE IRON				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-4	D.W.C.	9-3-99		
	KKH	3-30-00		



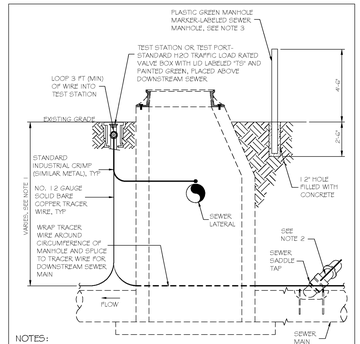
TYPICAL TRENCH BOTTOM DIMENSIONS FOR SDR 35 PVC GRAVITY PIPE

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	3-1-97	D.W.C.	9-3-99
		7-2-02	KKH	3-30-00

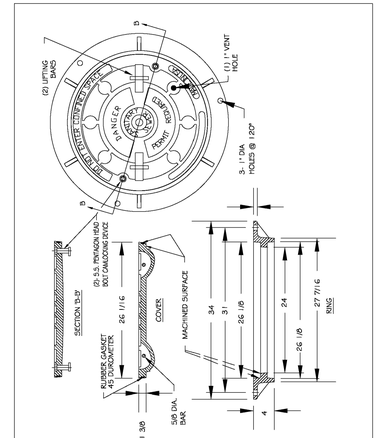


CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
STANDARD PRECAST SANITARY SEWER MANHOLE				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-20	Y.C.A.	12-21-92	ABS	2-21-05
	KKH	3-30-00	D.H.L.	6-16-08



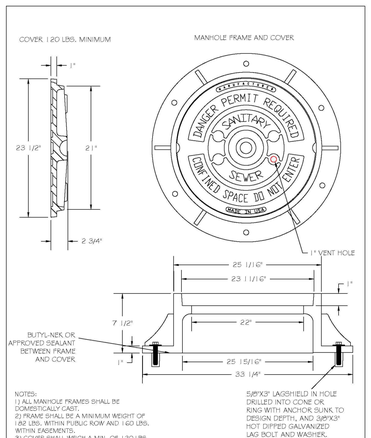
NOTES:
1. THE TRACER WIRE SHALL BE CONTINUOUS TO THE GREATEST EXTENT POSSIBLE. FOR GRAVITY MAIN AND OR LATERAL INSTALLATIONS LESS THAN 6 FT, THE TRACING WIRE SHALL BE ATTACHED TO THE PIPE. TRACER WIRE SHALL BE LAID FLAT AND SECURELY AFFIXED TO THE PIPE AT 10 FOOT INTERVALS. FOR GRAVITY MAIN AND OR LATERAL INSTALLATION DEEPER THAN 6 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 OF 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				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-30A	WKD	09-14		



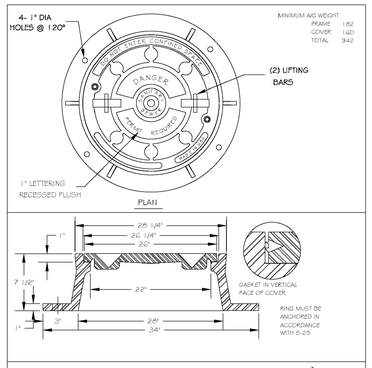
Note: solid cover required when water tight manhole specified.

CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
FLAT TOP MANHOLE COVER				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-25.01	3-1-97	3-1-97	A.B.B.	2-9-05
	KKH	3-30-00	D.H.L.	6-18-08



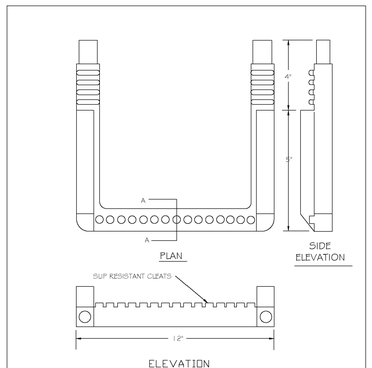
NOTES:
1) ALL MANHOLE FRAMES SHALL BE DOMESTICALLY CAST.
2) FRAME SHALL BE A MINIMUM WEIGHT OF 182 LBS. WITHIN PUBLIC R/W AND 160 LBS. WITHIN EASEMENTS.
3) COVER SHALL WEIGH A MIN. OF 120 LBS.
4) ALL MANHOLE FRAMES OUTSIDE OF PAVED SURFACES SHALL BE BOLTED TO THE CONE SECTION OR RING WITH A MINIMUM OF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

CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
STANDARD MANHOLE COVER				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-25		3-1-97	A.B.B.	2-9-05
	KKH	3-30-00	D.H.L.	6-18-08



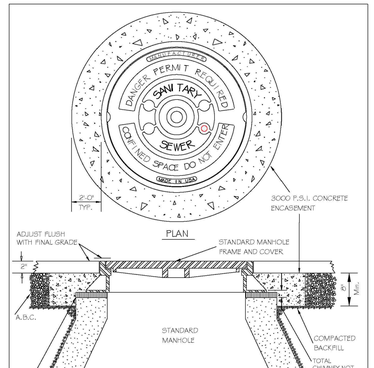
TYPICAL LIFTING DEVICE

CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
MANHOLE FRAME AND WATERTIGHT COVER				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-26	3-1-97	3-1-97	ABS	8-29-05
	KKH	3-30-00	D.H.L.	6/16/08

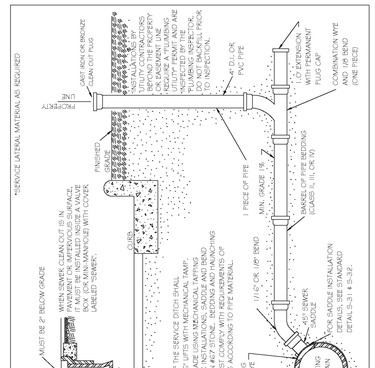


SECTION A - A

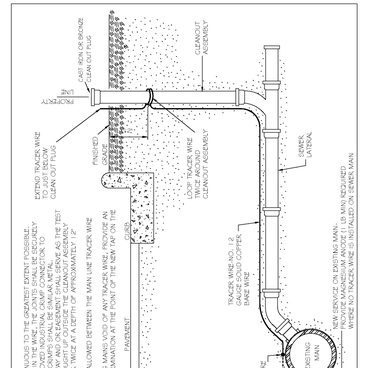
CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
STANDARD SLIP RESISTANT MANHOLE STEP DETAIL				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-28	KKH	3-30-00		



CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
STANDARD MANHOLE FRAME AND COVER DETAIL WITHIN PAVED SURFACES				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-29	Y.C.A.	12-21-92	ABS	9-20-04
	KKH	3-30-00	DHL	1-23-07



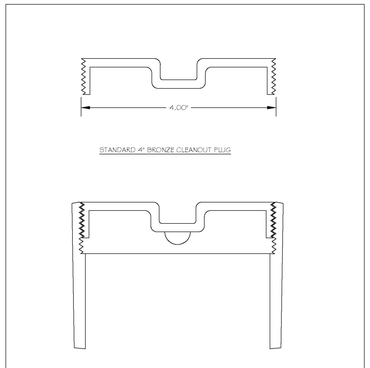
CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
TYPICAL SANITARY SEWER LATERAL CONNECTION				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-30	Y.C.A.	6-92	A.B.B.	4-4-04
	KKH	3-30-00	D.H.L.	6-16-08



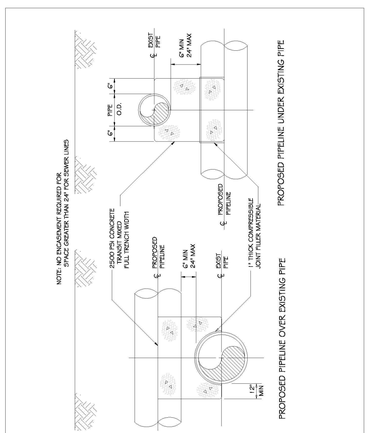
NOTES:
1. THE TRACER WIRE SHALL BE CONTINUOUS TO THE GREATEST EXTENT POSSIBLE. WHERE JOINTS ARE INCIDENTATED IN THE WAY, THE JOINTS SHALL BE SECURELY BONDED TO PROVIDE ELECTRICAL CONTINUITY. COMPO SHALL BE SIMILAR METAL.
2. PROVIDE ELECTRICAL CONTINUITY ACROSS ALL VALVES AND FITTINGS. TEST WIRE AT THE TEST PORT WITH THE TRACING WIRE BROUGHT UP OUTSIDE THE CLEANOUT ASSEMBLY.
3. INSTALL WIRE AROUND THE STACK TWICE AT A DEPTH OF APPROXIMATELY 12" BELOW GRADE.
4. PROVIDE SLACK OF 3' AT EACH END OF THE MAIN LINE TRACER WIRE.
5. AVOID OF ANY TRACER WIRE. PROVIDE AN ADEQUATE LENGTH OF WIRE FROM THE TOP OF THE NEW MAIN TO THE TOP OF THE NEW MANHOLE COVER.
6. FOR NEW SEWER, TAPS ON EXISTING MAINS SHALL BE MADE BY SERVICE SADDLES, THE TRACER WIRE SHALL NOT BE ALLOWED TO BE PLACED BETWEEN THE SADDLE AND MAIN.
7. MANHOLE MARKERS SHALL BE PLACED ADJACENT TO MANHOLES AT THE DISCRETION OF OWNER OR OWNERS REPRESENTATIVE.

NEW SERVICE ON EXISTING MAIN-PROVIDE MAGNESIUM ANODE (1 LB MIN) INSTALLED TO TRACER WIRE (INSTALLED ON EXISTING MAIN.

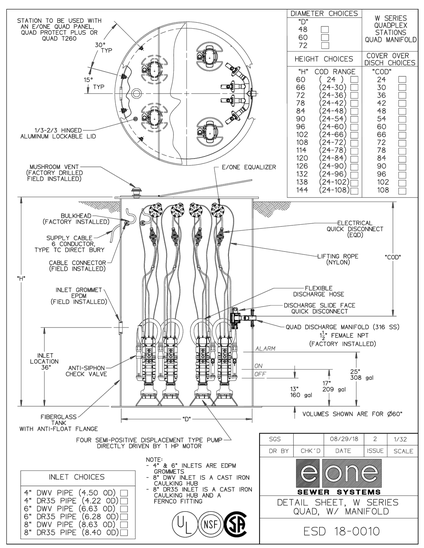
CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
TYPICAL SANITARY SEWER LATERAL TRACER WIRE				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-30A	WKD	9-14		



CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
4" CLEANOUT PLUG				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-34	D.W.C.	2-27-95	KKH	3-30-00



CITY OF RALEIGH				
DEPARTMENT OF PUBLIC UTILITIES				
CONCRETE CRADLE PROTECTION FOR SEWER LINE CROSSINGS				
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-49	DHL	2-20-08		



DIAMETER CHOICES "D"	W SERIES QUADPLEX STATIONS QUAD MANIFOLD
48 ☐	
60 ☐	
72 ☐	

HEIGHT CHOICES "H"	COD RANGE	COVER OVER DISCH CHOICES "COD"
60	(24-) ☐	24 ☐
66	(24-30) ☐	30 ☐
72	(24-36) ☐	36 ☐
78	(24-42) ☐	42 ☐
84	(24-48) ☐	48 ☐
90	(24-54) ☐	54 ☐
96	(24-60) ☐	60 ☐
102	(24-66) ☐	66 ☐
108	(24-72) ☐	72 ☐
114	(24-78) ☐	78 ☐
120	(24-84) ☐	84 ☐
126	(24-90) ☐	90 ☐
132	(24-96) ☐	96 ☐
138	(24-102) ☐	102 ☐
144	(24-108) ☐	108 ☐

INLET CHOICES
4" DWV PIPE (4.50 OD) ☐
4" DR35 PIPE (4.22 OD) ☐
6" DWV PIPE (6.63 OD) ☐
6" DR35 PIPE (6.28 OD) ☐
8" DWV PIPE (8.63 OD) ☐
8" DR35 PIPE (8.40 OD) ☐

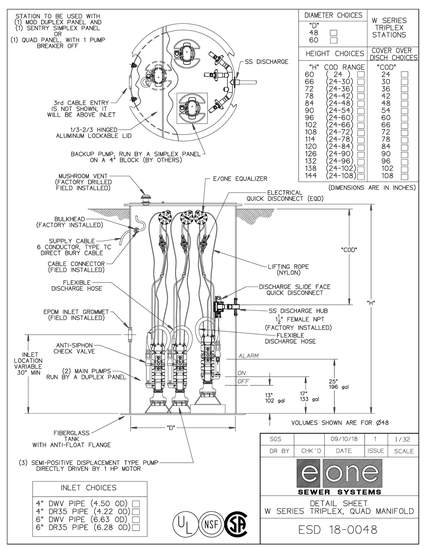
NOTE:
- 4 & 6" INLETS ARE EDPM GROMMETS
- 6" DWV INLET IS A CAST IRON CALKING HUB
- 8" DR35 INLET IS A CAST IRON CALKING HUB AND A FERNCO FITTING

SGS		08/29/18	2	1/32
DR BY	CHK'D	DATE	ISSUE	SCALE

e/one SEWER SYSTEMS

DETAIL SHEET, W SERIES QUAD, W/ MANIFOLD

ESD 18-0010



(DIMENSIONS ARE IN INCHES)

DIAMETER CHOICES "D"	W SERIES TRIPLEX STATIONS
60 ☐	
72 ☐	

HEIGHT CHOICES "H"	COD RANGE	COVER OVER DISCH CHOICES "COD"
60	(24-) ☐	24 ☐
66	(24-30) ☐	30 ☐
72	(24-36) ☐	36 ☐
78	(24-42) ☐	42 ☐
84	(24-48) ☐	48 ☐
90	(24-54) ☐	54 ☐
96	(24-60) ☐	60 ☐
102	(24-66) ☐	66 ☐
108	(24-72) ☐	72 ☐
114	(24-78) ☐	78 ☐
120	(24-84) ☐	84 ☐
126	(24-90) ☐	90 ☐
132	(24-96) ☐	96 ☐
138	(24-102) ☐	102 ☐
144	(24-108) ☐	108 ☐

INLET CHOICES
4" DWV PIPE (4.50 OD) ☐
4" DR35 PIPE (4.22 OD) ☐
6" DWV PIPE (6.63 OD) ☐
6" DR35 PIPE (6.28 OD) ☐

SGS		09/10/18	1	1/32
DR BY	CHK'D	DATE	ISSUE	SCALE

e/one SEWER SYSTEMS

DETAIL SHEET W SERIES TRIPLEX, QUAD MANIFOLD

ESD 18-0048

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

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

City of Raleigh Development Approval _____

Raleigh Water Review Officer

NORTH CAROLINA PROFESSIONAL SEAL 036808 ENGINEER MARTY D. BIZZELL

12/08/23

BNK

BASS, NIXON & KENNEDY, INC.
CONSULTING ENGINEERS
6310 CHAPEL HILL ROAD, SUITE 250, RALEIGH, NC 27607
TELEPHONE: (919)851-4422 FAX: (919)851-8968
CERTIFICATION NUMBERS: NCBELS (C-0110); NCBOLA (C-0267)

NO.	DATE	DESCRIPTION	BY
3	12-08-23	TOWN OF ROLESVILLE COMMENTS	MRM
2	10-16-23	T.O.R. COMMENTS	MRM
1	09-21-23	CHANGES FROM 06-02-22 CD'S	MRM
		REVISIONS	

03-19157 JOB NO. | PROGRESS DATE | MRM DRAWN BY

DETAILS

SCALE: N.T.S. | CHK BY: MDB

COBBLESTONE VILLAGE
MIXED USE DEVELOPMENT
TOWN OF ROLESVILLE, WAKE COUNTY, NORTH CAROLINA

SHEET C5.3

NOT RELEASED FOR CONSTRUCTION OR BID SOLICITATION

TOWN OF ROLESVILLE PROJECT NO.

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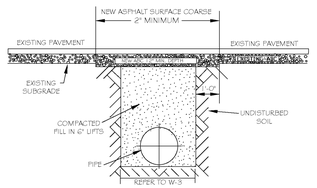
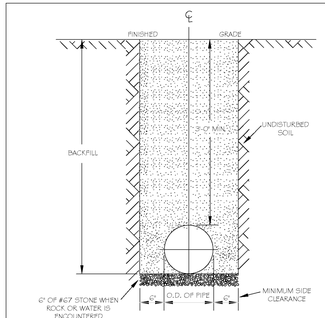


NOTES:
1. THE PAVEMENT CUT SHALL BE DEFINED BY A STRAIGHT EDGE AND CUT WITH AN APPROPRIATE SAW CUT MACHINE.
2. THE TRENCH SUBGRADE MATERIAL SHALL BE BACKFILLED WITH SUITABLE MATERIAL AND COMPACTED TO A DENSITY OF AT LEAST 95% OF THAT OBTAINED BY COMPACTING A SAMPLE OF THE MATERIAL IN ACCORDANCE WITH AASHTO T-99 AS MODIFIED BY NCDOT.
3. THE FINAL 1'-0" 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 2" 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

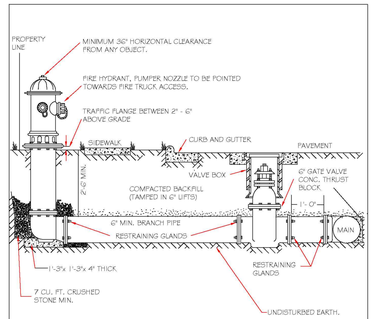
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-2	KKH	5-31-00	A.B.B.	4-16-04
	D.W.C.	11-1-99	J.P.S.	10-29-10



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.	9-3-99	A.B.B.	2-15-05
	KKH	5-31-00	J.P.S.	10-29-10

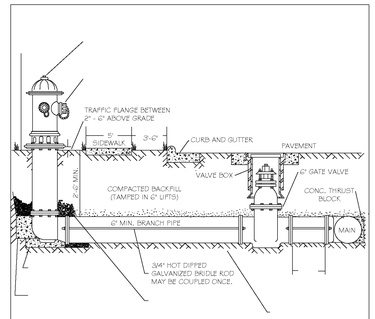


NOTES:
1. FIRE HYDRANT SHALL BE AS MANUFACTURED: MUELLER, AMERICAN DARLING, KENNEDY, MIH, WATEROUS, CLOW, EAST JORDAN IRON WORKS, OR US PIPE.
2. BRANCH PIPE SHALL BE DUCTILE IRON AWWA C150-96
3. 6" GATE VALVE SHALL BE AWWA C500-96 OPEN LEFT
4. STEEL RODS AND BOLTS SHALL BE ¾" HOT DIPPED GALVANIZED
5. 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	ADS	4-6-04	7/8"	8/17/09
	DHL	2/14/08		

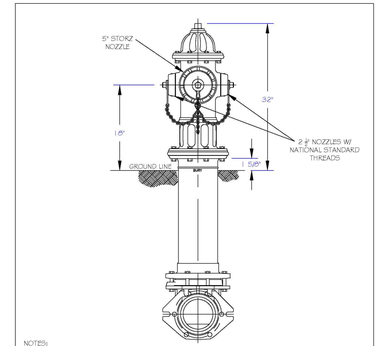


NOTES:
1. FIRE HYDRANT SHALL BE AS MANUFACTURED: MUELLER, AMERICAN DARLING, KENNEDY, MIH, WATEROUS, CLOW, EAST JORDAN IRON WORKS, OR US PIPE.
2. BRANCH PIPE SHALL BE DUCTILE IRON AWWA C150-96
3. 6" GATE VALVE SHALL BE AWWA C500-96 OPEN LEFT
4. STEEL RODS AND BOLTS SHALL BE ¾" HOT DIPPED GALVANIZED
5. 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

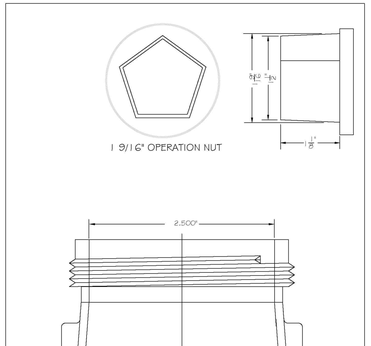
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-4a	ADS	4-6-04		



NOTES:
1. RALEIGH PUBLIC HYDRANTS SHALL BE PAINTED SOLID RED.
2. KNIGHTDALE, 4 ROLESVILLE PUBLIC HYDRANTS SHALL BE PAINTED RED W/SILVER OPERATING NUTS.
3. ZEBULON PUBLIC HYDRANTS SHALL BE PAINTED RED W/ SILVER BONNETS AND OPERATING NUTS.
4. WAKE FOREST AND GARNER, AND WENDELL PUBLIC AND PRIVATE HYDRANTS TO BE PAINTED SAFETY YELLOW W/SILVER CAPS AND OPERATING NUTS.
5. OPERATING NUTS ON HYDRANTS CONNECTED TO PUBLIC MAINS LARGER THAN 12" SHALL BE PAINTED BLACK.

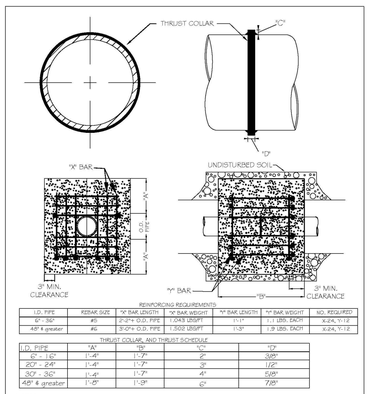
CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
RALEIGH, GARNER, KNIGHTDALE, ROLESVILLE, WAKE FOREST, WENDELL & ZEBULON
STANDARD FIRE HYDRANT WITH 5" STORZ PUMPER NOZZLE

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-5	KKH	5-31-00	ANB	7-21-06
		3-31-00	DHL	2-18-08



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

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-6	KKH	5-31-00	DHL	2-15-08
	A.B.B.	4-13-04	J.P.S.	11-1-10



REINFORCING REQUIREMENTS

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

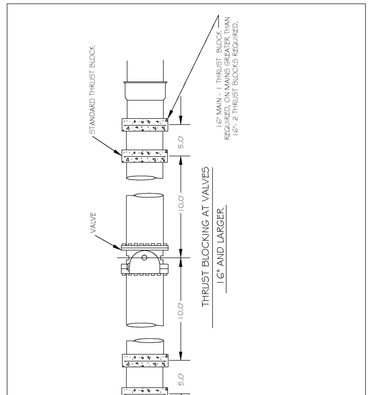
THRUST COLLAR, AND THRUST SCHEDULE

I.D. PIPE	"A"	"B"	"C"	"D"
6" - 12"	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 CIRCUMFERENCE.

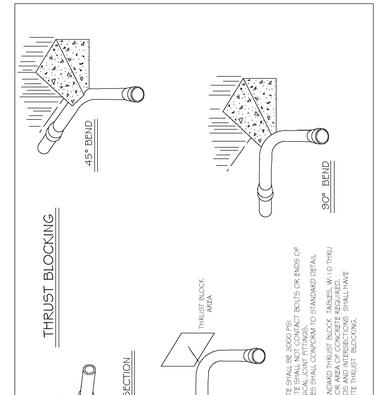
CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
THRUST BLOCKING DESIGN DATA FOR WATER MAINS

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-7	KKH	2-1-00	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.	4-16-04	D.W.C.	9-7-99
		5-31	KKH	5-31-00
		6-32	KKH	3-31-00



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.	9-7-99	D.H.L.	5-31-00
				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	MOCHANITE PER CUM. 4000 LBS/SFT	SOFT CLAY 1000 LBS/SFT	ORGANIC/CHANNEL SAND 1500 LBS/SFT	ROCK/FIRM CLAY 2000 LBS/SFT	SAND, COMPACT FIRM 3000 LBS/SFT	SAND, CLEAN DRY 3000 LBS/SFT	SOFT CLAY, DEEP 3000 LBS/SFT	ROCK, FIRM 4000 LBS/SFT
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°	4,326	2	3	3	1	1	2	5	1
90°	7,995	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°	7,684	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°	30,773	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.

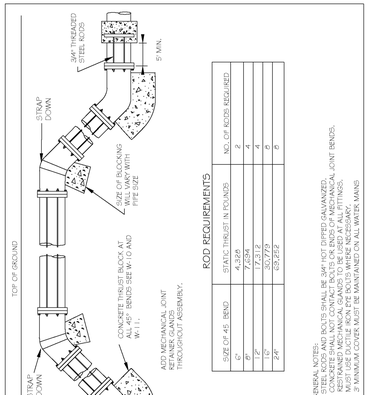
SIZE AND DEGREE OF BEND	STATIC THRUST IN POUNDS	MOCHANITE PER CUM. 4000 LBS/SFT	SOFT CLAY 1000 LBS/SFT	ORGANIC/CHANNEL SAND 1500 LBS/SFT	ROCK/FIRM CLAY 2000 LBS/SFT	SAND, COMPACT FIRM 3000 LBS/SFT	SAND, CLEAN DRY 3000 LBS/SFT	SOFT CLAY, DEEP 3000 LBS/SFT	ROCK, FIRM 4000 LBS/SFT
24"									
11 1/4°	17,734	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°	287,865	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°	277,107	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	45	45	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		



ROD REQUIREMENTS

STATIC THRUST IN POUNDS	NO. OF RODS REQUIRED
4,326	2
7,684	4
17,312	4
31,983	6
69,252	6

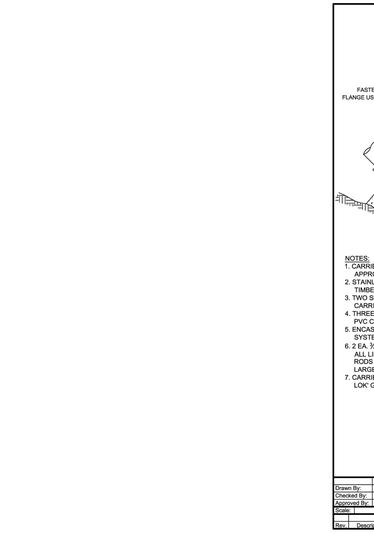
SIZE OF 45 BEND

6"	¾"	24"
8"	¾"	24"
12"	¾"	24"
16"	¾"	24"
24"	¾"	24"

GENERAL NOTES:
1. ALL RODS AND NUTS AND BOLTS SHALL BE 304 HOT DIPPED GALVANIZED.
2. CONCRETE SHALL NOT CONTACT BOLTS OR ENDS OF MECHANICAL JOINT FITTINGS.
3. SEE STANDARD THRUST BLOCK TABLES, W-10 AND W-11 FOR AREA OF CONCRETE REQUIRED.
4. MUST USE DUCTILE IRON PIPE BOLTS WHERE NSC250 MAY BE USED.
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	ANB	4-6-04	J.P.S.	11-1-10
	D.H.L.	6-18-08		



NOTES:
1. CARRIER PIPE SHALL BE D.I.P. UNLESS EXPRESSLY APPROVED BY THE COUNTY.
2. STAINLESS STEEL SPACERS SHALL BE USED. NO TIMBER SKIDS ARE ALLOWED.
3. TWO SPACERS PER JOINT SHALL BE USED FOR D.I.P. CARRIER PIPE.
4. THREE SPACERS PER JOINT SHALL BE USED FOR PVC CARRIER PIPE.
5. ENCASED BORES ALONG GRAVITY COLLECTION SYSTEMS SHALL NOT REQUIRE BRIDLE RODS.
6. 2 EA. ¾" S.S. BRIDLE RODS SHALL BE REQUIRED ON ALL LINES 8"Ø AND SMALLER. 4 EA. ¾" S.S. BRIDLE RODS SHALL BE REQUIRED ON ALL LINES 10"Ø AND LARGER.
7. CARRIER PIPE SHALL BE INSTALLED USING 'FIELD LOK' GASKETS OR APPROVED EQUAL.

STANDARD BORE ENCASEMENT
NOT TO SCALE

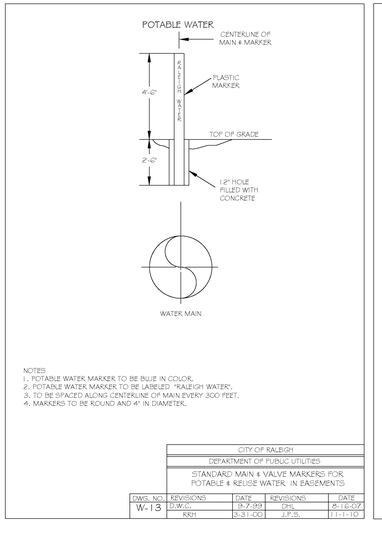
	Name	Date
Drawn By:		
Checked By:		
Approved By:		
Scale:		

Rev.	Description	Date	Init.

JOHNSTON COUNTY
Department of Public Utilities
P.O. Box 2263
Smithfield, NC 27577

WATER
STANDARD DETAIL
Standard Bore Encasement

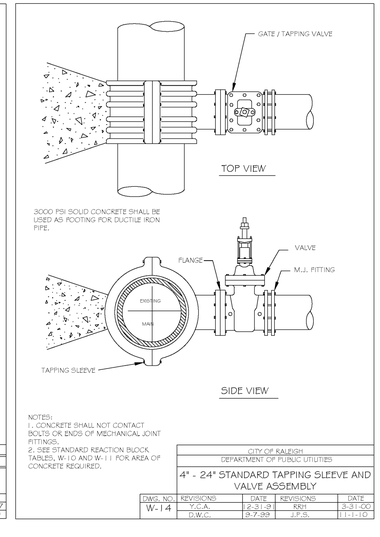
PAGE 6



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

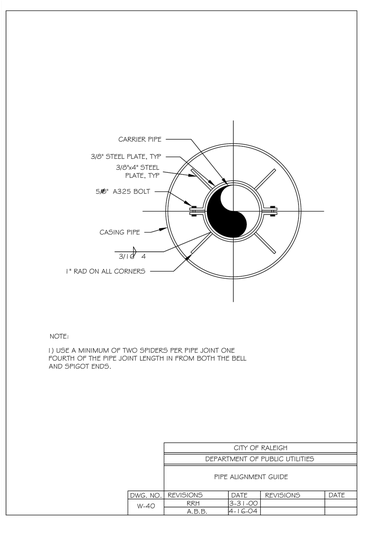
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-13	D.W.C.	9-7-99	DHL	6-16-07
	KKH	5-31-00	J.P.S.	11-1-10



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.	2-21-01	KKH	5-31-00
	D.W.C.	9-7-99	J.P.S.	11-1-10



NOTE:
1) USE A MINIMUM OF TWO SPIDERS PER PIPE JOINT ONE FOURTH OF THE PIPE JOINT LENGTH IN FROM BOTH THE BELL AND SPIGOT ENDS.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
PIPE ALIGNMENT GUIDE

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-40	KKH	5-31-00		
	A.B.B.	4-16-04		

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

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

City of Raleigh Development Approval _____

Raleigh Water Review Officer

NORTH CAROLINA PROFESSIONAL SEAL 036808 ENGINEER MARTY D. BIZZELL

12/08/23

BASS, NIXON & KENNEDY, INC.
CONSULTING ENGINEERS
6310 CHAPEL HILL ROAD, SUITE 250, RALEIGH, NC 27607
TELEPHONE: (919)851-4422 FAX: (919)851-8968
CERTIFICATION NUMBERS: NCBELS (C-0110); NCBOLA (C-0267)

NO.	DATE	DESCRIPTION	BY
3	12-08-23	TOWN OF ROLESVILLE COMMENTS	MRM
2	10-16-23	T.O.R. COMMENTS	MRM
1	09-21-23	CHANGES FROM 06-02-22 CD'S	MRM
		REVISIONS	

JOB NO. 03-19157 | DATE | PROGRESS | DRAWN BY: MRM | CHK BY: MDB

DETAILS

SCALE: N.T.S.

COBBLESTONE VILLAGE
MIXED USE DEVELOPMENT
TOWN OF ROLESVILLE, WAKE COUNTY, NORTH CAROLINA

SHEET C5.4

NOT RELEASED FOR CONSTRUCTION OR BID SOLICITATION

TOWN OF ROLESVILLE PROJECT NO.

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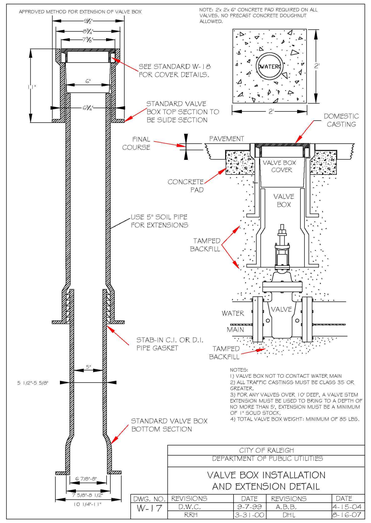

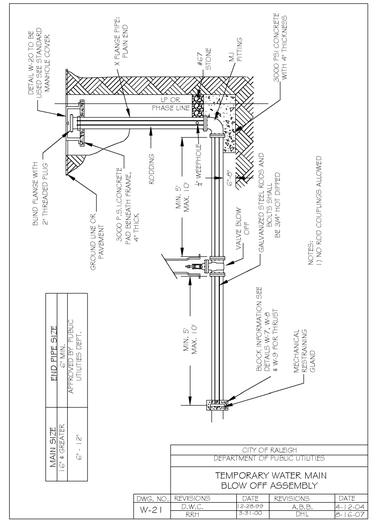

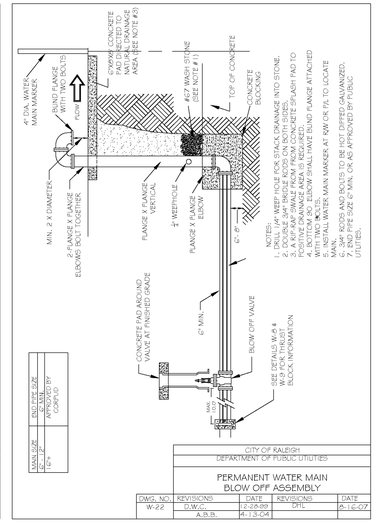

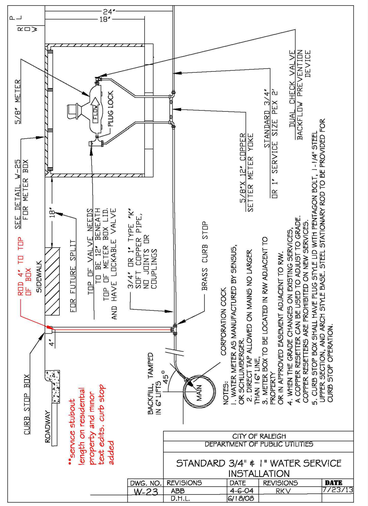

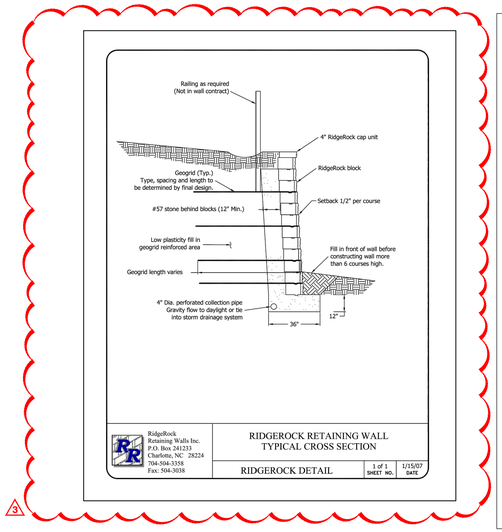

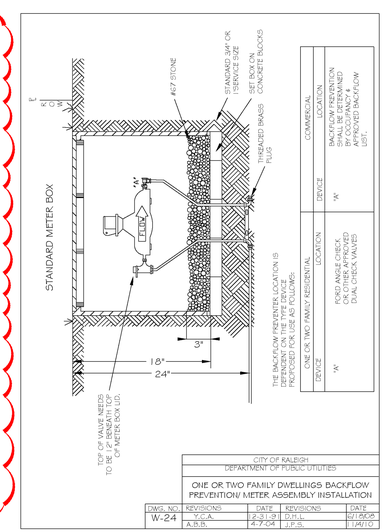

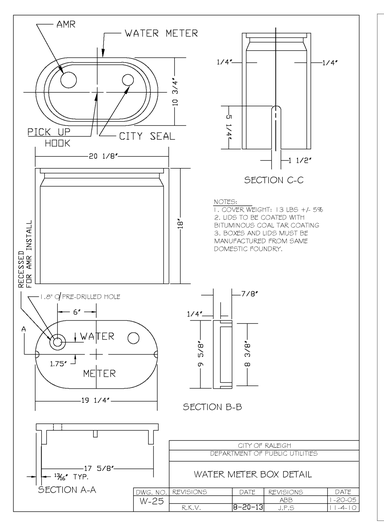

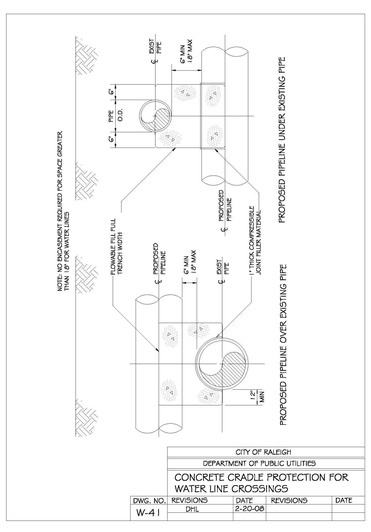

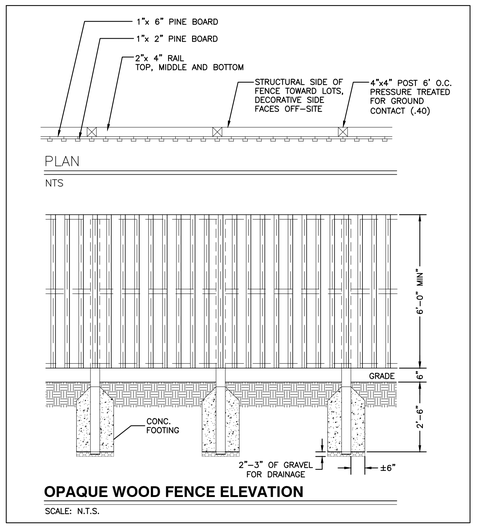

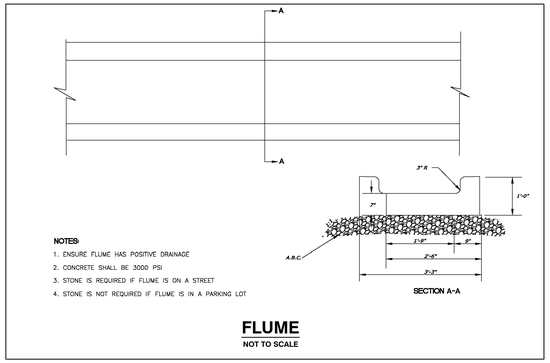

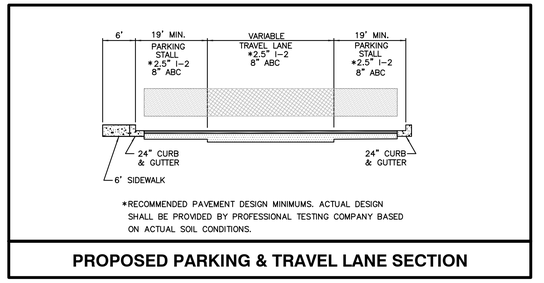

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

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City of Raleigh Development Approval _____

Raleigh Water Review Officer

NORTH CAROLINA PROFESSIONAL SEAL 036908 ENGINEER MARTY D. BIZZELL

12/08/23

BASS, NIXON & KENNEDY, INC.
CONSULTING ENGINEERS
6310 CHAPEL HILL ROAD, SUITE 250, RALEIGH, NC 27607
TELEPHONE: (919)851-4422 FAX: (919)851-8968
CERTIFICATION NUMBERS: NCBELS (C-0110); NCBOLA (C-0267)

NO.	DATE	DESCRIPTION	BY
3	12-08-23	TOWN OF ROLESVILLE COMMENTS	MRM
2	10-16-23	T.O.R. COMMENTS	MRM
1	09-21-23	CHANGES FROM 06-02-22 CD'S	MRM

REVISIONS

PROGRESS | DRAWN BY: MRM
DATE | CHK BY: MDB
JOB NO. 03-19157
SCALE: N.T.S.

DETAILS

COBBLESTONE VILLAGE
MIXED USE DEVELOPMENT
TOWN OF ROLESVILLE, WAKE COUNTY, NORTH CAROLINA

SHEET C5.5

TOWN OF ROLESVILLE PROJECT NO.

NOT RELEASED FOR CONSTRUCTION OR BID SOLICITATION

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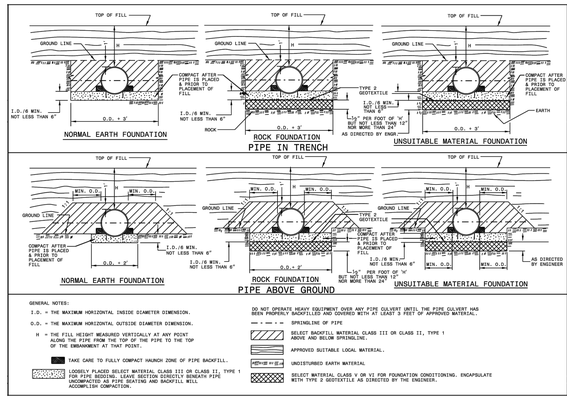
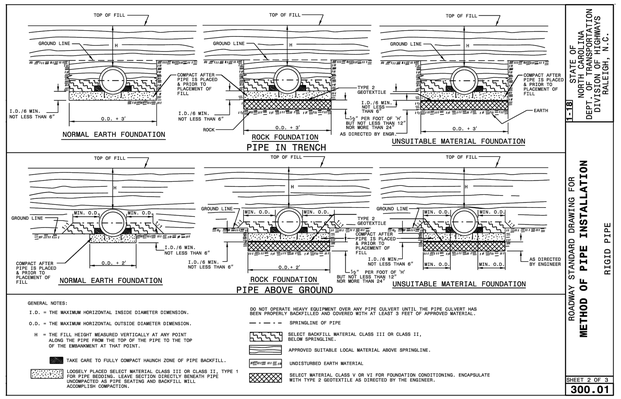


STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

1-1B

ROADWAY STANDARD DRAWING FOR
METHOD OF PIPE INSTALLATION
FLEXIBLE PIPE

SHEET 1 OF 3
300.01



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

1-1B

ROADWAY STANDARD DRAWING FOR
METHOD OF PIPE INSTALLATION
RIGID PIPE

SHEET 2 OF 3
300.01

FLEXIBLE PIPE

Round Corrugated Steel Pipe
2 2/3 x ½ corrugation **

Diameter (Inches)	Minimum cover (Inches)	(Ga)	Maximum Height of Cover (feet) 16	14	12	10	8
12	12		204	256			
15	12		162	204			
18	12		135	169	239		
21	12		115	145	204		
24	12		100	126	178		
30	12		79	100	142		
36	12		65	83	117	152	
42	12		55	70	100	130	160
48	12		48	61	87	113	139
54	12			54	77	100	123
60	12				69	90	111
66	12					81	100
72	12					74	91
78	12						81
84	12						69

Round Corrugated Aluminum Pipe
2 2/3 x ½ corrugation **

Diameter (Inches)	Minimum cover (Inches)	(Ga)	Maximum Height of Cover (feet) 16	14	12	10	8
12	12		123	155	218	281	344
15	12		98	123	174	224	275
18	12		81	102	144	187	229
21	12		69	87	123	160	195
24	12		60	76	108	139	171
27	12		67	95	123	151	
30	12		60	85	111	136	
36	12		50	71	92	113	
42	12			60	78	96	
48	12			52	68	84	
54	12			46	60	74	
60	12				50	62	
66	12					51	
72	12					41	

** FOR DIFFERENT CORRUGATIONS AND ARCH PIPES REFER TO ROADWAY DESIGN MANUAL OR MANUFACTURERS SPECIFICATION.

HDPE - * (Minimum fill) 2' for pipe diameters ≥ 12" and ≤ 60"
* (Maximum fill) 20' for pipe diameters ≤ 24"
17' for pipe diameters ≥ 30" and ≤ 60"

PVC - * (Minimum fill) 2' for pipe diameters ≥ 12" and ≤ 36"
* (Maximum fill) 30' for pipe diameters ≥ 12" and ≤ 36"

* FILL HEIGHT IS MEASURED FROM THE TOP OF THE PIPE TO THE BOTTOM OF THE PAVEMENT STRUCTURE

REFER TO THE FOLLOWING FOR PIPE SPECIFICATIONS

CSP - AASHTO M36
CAAP - AASHTO M196
HDPE - AASHTO M294
PVC - ASTM - F949 or AASHTO M304

NOTES: FILL HEIGHTS SHOWN WERE CALCULATED USING AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

1' MINIMUM COVER FOR ALL SIDE DRAIN PIPE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS

RIGID PIPE

RCP - * (Minimum fill) 1' for Class IV & CLASS V
2' for Class III & Class II

* (Maximum fill) 10' - Class II pipe
20' - Class III pipe
30' - Class IV pipe
40' - Class V pipe

(For fills > 40' & < 80' use LRFD Direct Design Method)

* FILL HEIGHT IS MEASURED FROM THE TOP OF THE PIPE TO THE BOTTOM OF THE PAVEMENT STRUCTURE

REFER TO THE FOLLOWING FOR PIPE SPECIFICATIONS

RCP - AASHTO M170

NOTES: FILL HEIGHTS SHOWN WERE CALCULATED USING AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

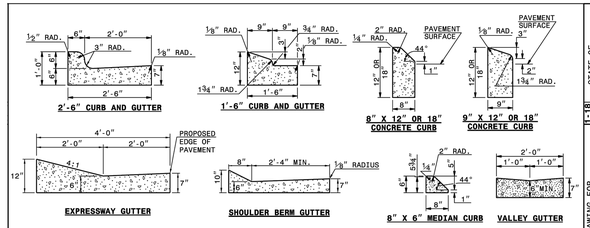
1' MINIMUM COVER FOR ALL SIDE DRAIN PIPE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS

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

1-1B

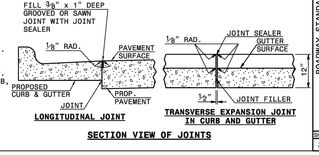
ROADWAY STANDARD DRAWING FOR
METHOD OF PIPE INSTALLATION
FILL HEIGHT TABLES

SHEET 3 OF 3
300.01



SECTION VIEW OF CURBS OR CURBS AND GUTTERS

GENERAL NOTES:
-PLACE CONTRACTION JOINTS AT 10' INTERVALS, EXCEPT THAT A 15' SPACING MAY BE USED WHEN A MACHINE IS USED OR WHEN SATISFACTORY SUPPORT FOR THE FACE FORM CAN BE OBTAINED WITHOUT THE USE OF TEMPLATES AT 10' INTERVALS.
-JOINT SPACING MAY BE ALTERED IF REQUIRED BY THE ENGINEER.
-CONTRACTION JOINTS MAY BE INSTALLED WITH THE USE OF TEMPLATES OR FORMED BY OTHER APPROVED METHODS.
CONSTRUCT NON-TEMPLATE FORMED JOINTS A MIN. OF 1½" DEEP.
-FILL ALL CONSTRUCTION JOINTS, EXCEPT IN 8"x6" MEDIAN CURB, WITH JOINT FILLER AND SEALER;
-SPACE EXPANSION JOINTS AT 90' INTERVALS AND ADJACENT TO ALL RIGID OBJECTS.



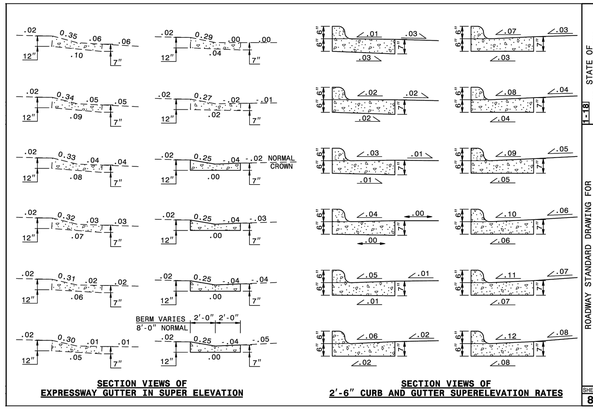
SECTION VIEW OF JOINTS

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

1-1B

ROADWAY STANDARD DRAWING FOR
CONCRETE CURB, GUTTER AND CURB & GUTTER

SHEET 1 OF 3
846.01

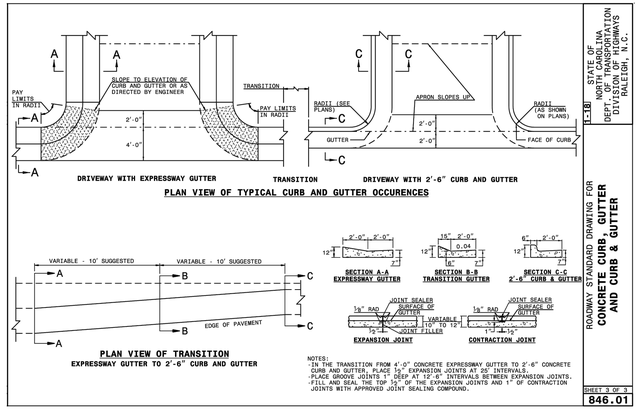


STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

1-1B

ROADWAY STANDARD DRAWING FOR
CONCRETE CURB, GUTTER AND CURB & GUTTER

SHEET 2 OF 3
846.01



NOTES:
-IN THE TRANSITION FROM 4'-0" CONCRETE EXPRESSWAY GUTTER TO 2'-6" CONCRETE CURB AND GUTTER, PLACE ½" EXPANSION JOINTS AT 20' INTERVALS.
-PLACE GROOVE JOINTS 1" DEEP AT 12'-6" INTERVALS BETWEEN EXPANSION JOINTS.
-FILL AND SEAL THE TOP ½" OF THE EXPANSION JOINTS AND 1" OF CONTRACTION JOINTS WITH APPROVED JOINT SEALING COMPOUND.

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

1-1B

ROADWAY STANDARD DRAWING FOR
CONCRETE CURB, GUTTER AND CURB & GUTTER

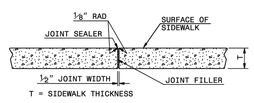
SHEET 3 OF 3
846.01

NOTES:

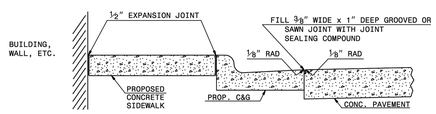
CONSTRUCT STANDARD SIDEWALK 5' WIDE AND 4" THICK UNLESS OTHERWISE DENOTED ON PLANS.

PLACE A GROOVE JOINT 1" DEEP WITH ⅛" RADII IN THE CONCRETE SIDEWALK AT 5' INTERVALS. ONE ½" EXPANSION JOINT WILL BE REQUIRED AT 50' INTERVALS. A ½" EXPANSION JOINT WILL BE REQUIRED WHERE THE SIDEWALK JOINS ANY RIGID STRUCTURE.

SEE STD. DWG. 848.05 FOR CURB RAMP LOCATION REQUIREMENTS AND CONSTRUCTION GUIDELINES.



TRANSVERSE EXPANSION JOINT IN SIDEWALK



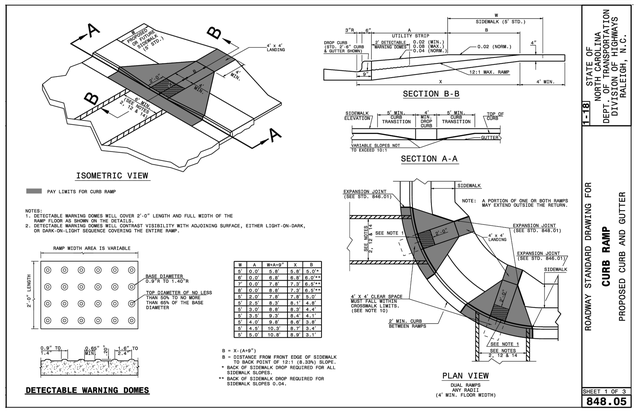
DETAILS SHOWING JOINTS IN CONCRETE SIDEWALK

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

1-1B

ROADWAY STANDARD DRAWING FOR
CONCRETE SIDEWALK

SHEET 1 OF 1
848.01



NOTES:
1. DETECTABLE WARNING DOMES WILL COVER 2'-0" LENGTH AND FULL WIDTH OF THE RAMP FLOOR AS SHOWN ON THE DETAILS.
2. DETECTABLE WARNING DOMES CONTRAST VISIBILITY WITH ADJOINING SURFACE, EITHER LIGHT-ON-DARK, OR DARK-ON-LIGHT SEQUENCE COVERING THE ENTIRE RAMP.

W	A	W+A+9"	X	B
4'-0"	6.0'	6.8'	6.8'	0.57
4'-0"	8.0'	8.8'	8.8'	0.57
4'-0"	10.0'	10.8'	10.8'	0.57
4'-0"	12.0'	12.8'	12.8'	0.57
5'-0"	6.0'	6.8'	7.3'	0.57
5'-0"	8.0'	8.8'	9.3'	0.57
5'-0"	10.0'	10.8'	11.3'	0.57
5'-0"	12.0'	12.8'	13.3'	0.57
6'-0"	6.0'	6.8'	7.8'	0.57
6'-0"	8.0'	8.8'	9.3'	0.57
6'-0"	10.0'	10.8'	11.3'	0.57
6'-0"	12.0'	12.8'	13.3'	0.57

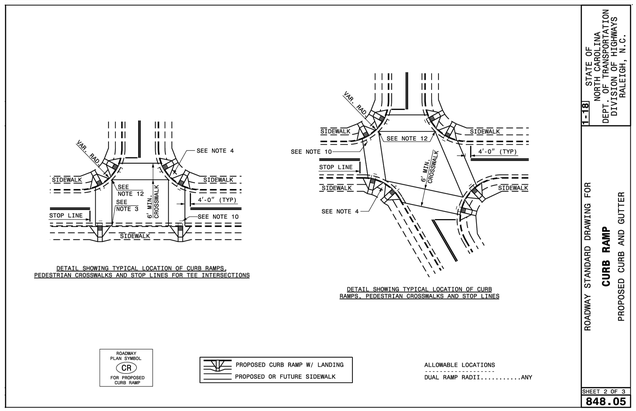
B = X-(A+9")
B = DISTANCE FROM FRONT EDGE OF SIDEWALK TO BACK POINT OF 12:1 (8.33%) SLOPE.
* BACK OF SIDEWALK DROP REQUIRED FOR ALL SIDEWALK SLOPES.
** BACK OF SIDEWALK DROP REQUIRED FOR SIDEWALK SLOPED 0.04.

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

1-1B

ROADWAY STANDARD DRAWING FOR
CURB RAMP
PROPOSED CURB AND GUTTER

SHEET 1 OF 3
848.05



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

1-1B

ROADWAY STANDARD DRAWING FOR
CURB RAMP
PROPOSED CURB AND GUTTER

SHEET 2 OF 3
848.05

NOTES:

1. CONSTRUCT THE RAMP SURFACE TO BE STABLE, FIRM, AND SLIP RESISTANT. CONSTRUCT THE CURB RAMP TYPE AS SHOWN IN THE PAVEMENT MARKING PLANS OR AS DIRECTED BY THE ENGINEER.
2. LOCATE CURB RAMPS AND PLACE PEDESTRIAN CROSSWALK MARKINGS AS SHOWN IN THE PAVEMENT MARKING PLANS. WHEN FIELD ADJUSTMENTS REQUIRE MOVING CURB RAMPS OR MARKINGS AS SHOWN, CONTACT THE SIGNING AND DELINEATION UNIT OR LOCATE AS DIRECTED BY THE ENGINEER.
3. COORDINATE THE CURB RAMP AND THE PEDESTRIAN CROSSWALK MARKINGS SO A 4'x4' CLEAR SPACE AT THE BASE OF THE CURB RAMP WILL FALL WITHIN THE PEDESTRIAN CROSSWALK LINES.
4. SET BACK DISTANCE FROM INSIDE CROSSWALK MARKING TO NEAREST EDGE OF TRAVEL LANE IS 4' MINIMUM.
5. REFER TO THE PAVEMENT MARKING PLANS FOR STOP BAR LOCATIONS AT SIGNALIZED INTERSECTIONS. IF A PAVEMENT MARKING PLAN IS NOT PROVIDED, CONTACT THE SIGNAL DESIGN SECTION FOR THE STOP BAR LOCATIONS OR LOCATE AS DIRECTED BY THE ENGINEER.
6. TERMINATE PARKING A MINIMUM OF 20' BACK OF A PEDESTRIAN CROSSWALK.
7. CONSTRUCT CURB RAMPS A MINIMUM OF 4' WIDE.
8. CONSTRUCT THE RUNNING SLOPE OF THE RAMP 8.33% MAXIMUM.
9. ALLOWABLE CROSS SLOPE ON SIDEWALKS AND CURB RAMPS WILL BE 2% MAXIMUM.
10. CONSTRUCT THE SIDE FLARE SLOPE A MAXIMUM OF 10% MEASURED ALONG THE CURB LINE.
11. CONSTRUCT THE COUNTER SLOPE OF THE GUTTER OR STREET AT THE BASE OF THE CURB RAMP A MAXIMUM OF 5% AND MAINTAIN A SMOOTH TRANSITION.
12. CONSTRUCT LANDINGS FOR SIDEWALK A MINIMUM OF 4'x4' WITH A MAXIMUM SLOPE OF 2% IN ANY DIRECTION. CONSTRUCT LANDINGS FOR MEDIAN ISLANDS A MINIMUM OF 5'x5' WITH A MAXIMUM SLOPE OF 2% IN ANY DIRECTION.
13. TO USE A MEDIAN ISLAND AS A PEDESTRIAN REFUGE AREA, MEDIAN ISLANDS WILL BE A MINIMUM OF 6' WIDE. CONSTRUCT MEDIAN ISLANDS TO PROVIDE PASSAGE OVER OR THROUGHT THE ISLAND.
14. SMALL CHANNELIZATION ISLANDS THAT CAN NOT PROVIDE A 5'X5' LANDING AT THE TOP OF A RAMPS, WILL BE CUT THROUGH LEVEL WITH THE SURFACE STREET.
15. CURB RAMPS WITH RETURNED CURBS MAY BE USED ONLY WHERE PEDESTRIANS WOULD NOT NORMALLY WALK ACROSS THE RAMP. THE ADJACENT SURFACE IS PLANTING OR OTHER NON-WALKING SURFACE OR THE SIDE APPROACH IS SUBSTANTIALLY OBSTRUCTED.
16. PLACE A ½" EXPANSION JOINT WHERE THE CONCRETE CURB RAMP JOINS THE CURB AS SHOWN IN ROADWAY STANDARD DRAWING 848.01
17. PLACE ALL PEDESTRIAN PUSH BUTTON ACTUATORS AND CROSSING SIGNALS AS SHOWN IN THE PLANS OR AS SHOWN IN THE MUTCD.
18. CURB RAMPS THROUGH MEDIAN ISLANDS, SINGLE RAMPS AT DUAL CROSSWALKS OR LIMITED R/W SITUATIONS, WILL BE HANDLED BY SPECIAL DETAILS. CONTACT THE CONTRACT STANDARDS AND DEVELOPMENT UNIT FOR THE DETAILS OR FOR A SPECIAL DESIGN.

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

1-1B

ROADWAY STANDARD DRAWING FOR
CURB RAMPS
NOTES

SHEET 3 OF 3
848.05

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

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City of Raleigh Development Approval _____

Raleigh Water Review Officer

NORTH CAROLINA PROFESSIONAL SEAL 036908 ENGINEER MARTY D. BIZZELL

12/08/23

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CONSULTING ENGINEERS
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REVISIONS BY: MRM MRM MRM

03-19157 JOB NO. | PROGRESS | DRAWN BY: MRM | DATE

DETAILS

SCALE: N.T.S. | CHK BY: MDB

COBBLESTONE VILLAGE
MIXED USE DEVELOPMENT
TOWN OF ROLESVILLE, WAKE COUNTY, NORTH CAROLINA

SHEET **C5.6**

NOT RELEASED FOR CONSTRUCTION OR BID SOLICITATION

TOWN OF ROLESVILLE PROJECT NO.

EIFS FINISH
SW6203 - SPARE WHITE

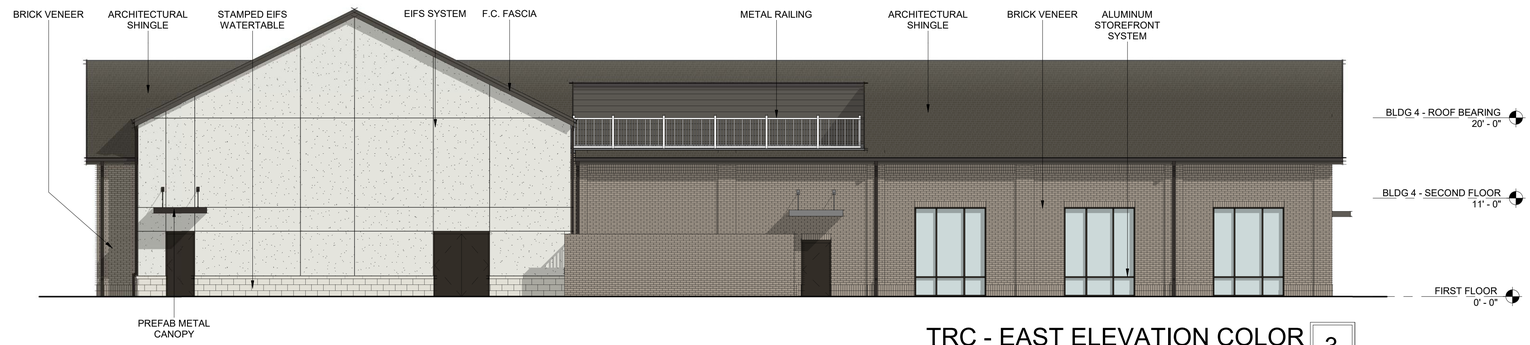
FIBER CEMENT SIDING
SW7048 - URBANE BRONZE

STAMPED EIFS WATERTABLE

BRICK VENEER
TRIANGLE - BESSEMER GREY

MATERIAL SWATCHES - BUILDING 4

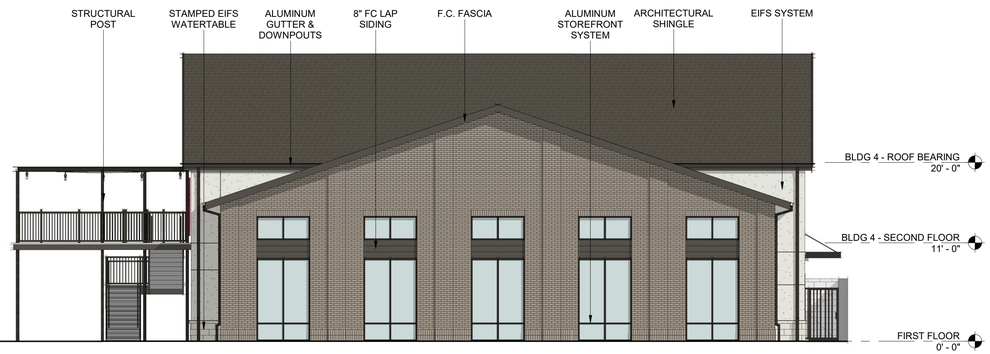
1" = 1'-0"



TRC - EAST ELEVATION COLOR

1/8" = 1'-0"

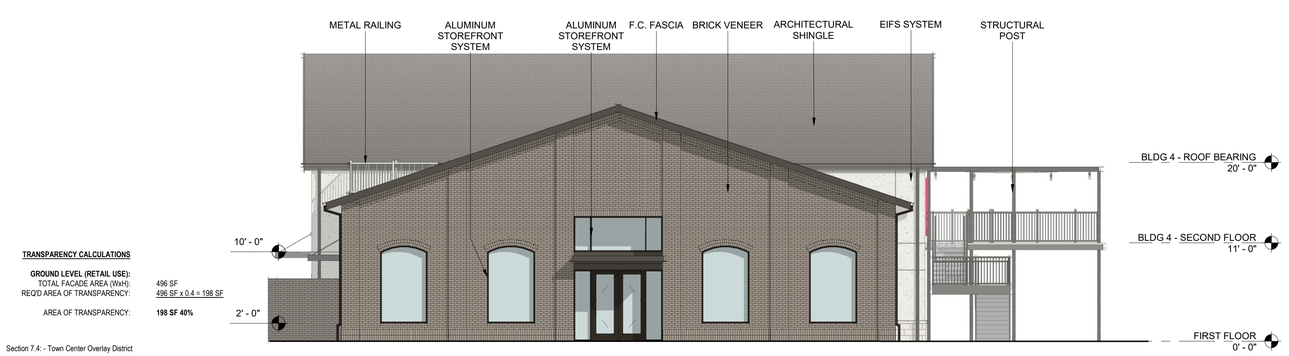
3



TRC - SOUTH ELEVATION COLOR

1/8" = 1'-0"

4



TRANSPARENCY CALCULATIONS

GROUND LEVEL (RETAIL USE):
TOTAL FACADE AREA (WxH): 496 SF
REQ'D AREA OF TRANSPARENCY: 496 SF x 0.4 = 198 SF

AREA OF TRANSPARENCY: **198 SF 40%**

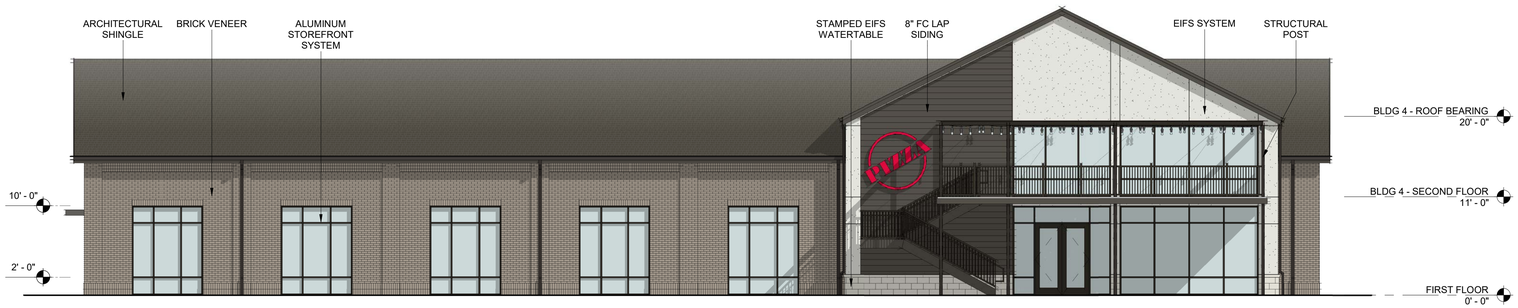
Section 7.4: - Town Center Overlay District

7.4.18 Windows, doors, display windows and/or arcades shall make up at least 40 percent of the street façade on the first story as measured from two feet above grade to ten feet above grade.
Blank walls are not permitted adjacent to streets.

TRC - NORTH ELEVATION COLOR

1/8" = 1'-0"

2



TRANSPARENCY CALCULATIONS

GROUND LEVEL (RETAIL USE):
TOTAL FACADE AREA (WxH): 1,105 SF
REQ'D AREA OF TRANSPARENCY: 1,105 SF x 0.4 = 442 SF

AREA OF TRANSPARENCY: **442 SF 40%**

Section 7.4: - Town Center Overlay District

7.4.18 Windows, doors, display windows and/or arcades shall make up at least 40 percent of the street façade on the first story as measured from two feet above grade to ten feet above grade.
Blank walls are not permitted adjacent to streets.

TRC - WEST ELEVATION COLOR

1/8" = 1'-0"

1

CLINE DESIGN

COBBLESTONE VILLAGE

ROLESVILLE, NORTH CAROLINA

EXTERIOR ELEVATIONS - BUILDING 4

A04

As indicated | 019032 | 09.01.23

FIBER CEMENT SIDING
SW7048 - URBANE BRONZE

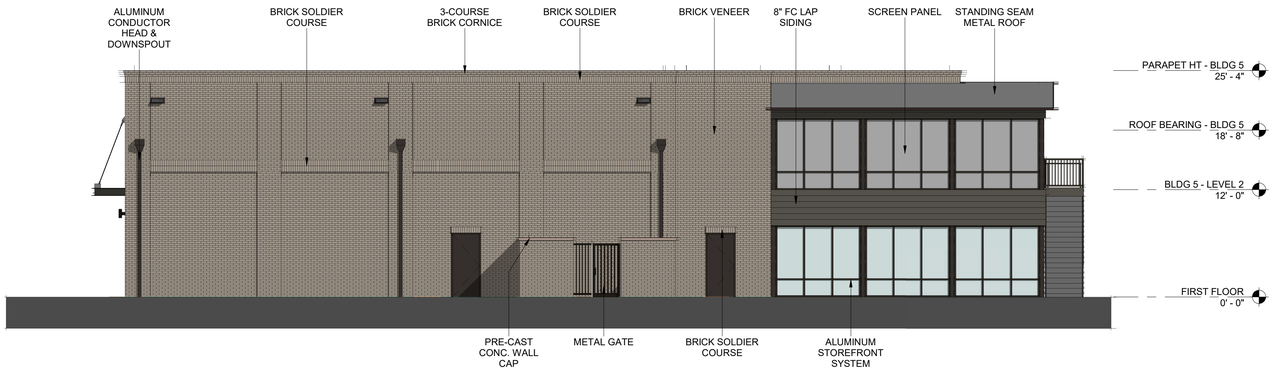
BRICK VENEER
TRIANGLE - BESSEMER GREY

MAT. SWATCHES - BLDG 5

1" = 1'-0"

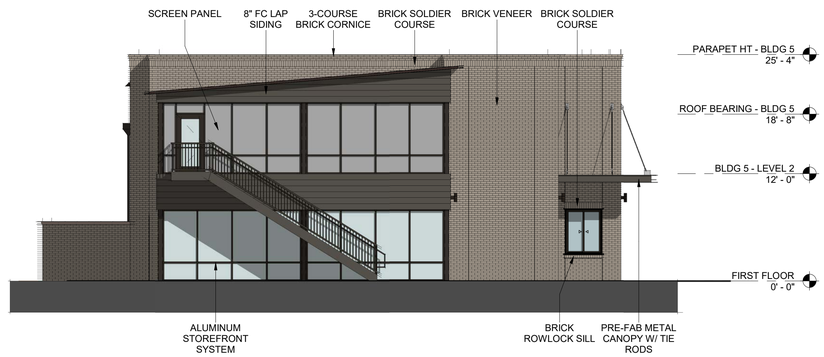
3D View_BLDG 5 - SE 6

3D View_BLDG 5 - NE 5



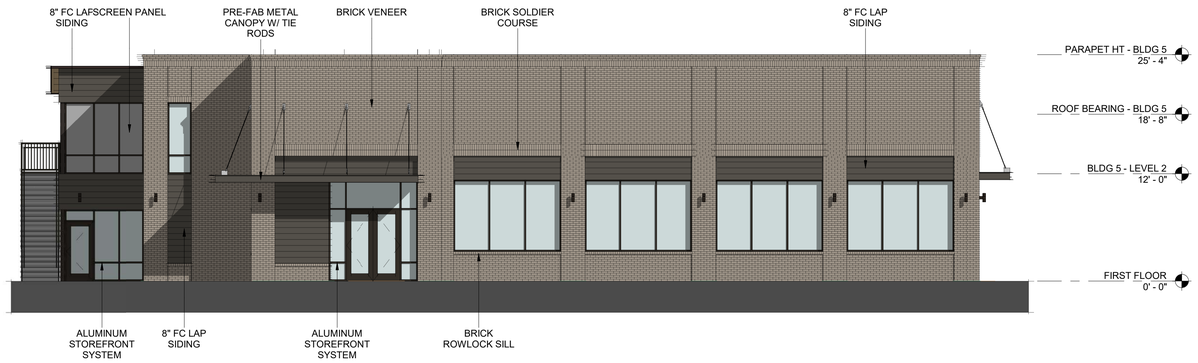
BLDG 5 - WEST ELEVATION 4

1/8" = 1'-0"



BLDG 5 - SOUTH ELEVATION 2

1/8" = 1'-0"



TRANSPARENCY CALCULATIONS

GROUND LEVEL (RETAIL USE):
TOTAL FACADE AREA (WxH): 824 SF
REQ'D AREA OF TRANSPARENCY: 824 SF x 0.4 = 330 SF

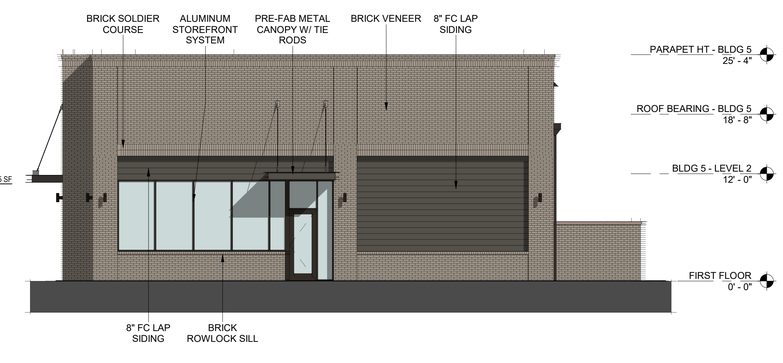
AREA OF TRANSPARENCY: **453 SF 55%**

Section 7.4: - Town Center Overlay District

7.4.18 Windows, doors, display windows and/or arcades shall make up at least 40 percent of the street façade on the first story as measured from two feet above grade to ten feet above grade.
Blank walls are not permitted adjacent to streets.

BLDG 5 - EAST ELEVATION 3

1/8" = 1'-0"



TRANSPARENCY CALCULATIONS

GROUND LEVEL (RETAIL USE):
TOTAL FACADE AREA (WxH): 412 SF
REQ'D AREA OF TRANSPARENCY: 412 SF x 0.4 = 165 SF

AREA OF TRANSPARENCY: **165 SF 40%**

Section 7.4: - Town Center Overlay District

7.4.18 Windows, doors, display windows and/or arcades shall make up at least 40 percent of the street façade on the first story as measured from two feet above grade to ten feet above grade.
Blank walls are not permitted adjacent to streets.

BLDG 5 - NORTH ELEVATION 1

1/8" = 1'-0"

CLINE DESIGN

COBBLESTONE VILLAGE

ROLESVILLE, NORTH CAROLINA

EXTERIOR ELEVATIONS - BUILDING 5 A05

As indicated | 019032 | 09.01.23

BLDG 8 - 03 RIGHT SIDE ELEVATION 4

1/8" = 1'-0"

BLDG 8 - 02 REAR ELEVATION 2

1/8" = 1'-0"

BLDG 8 - 04 LEFT SIDE ELEVATION 3

1/8" = 1'-0"

BLDG 8 - 01 FRONT ELEVATION 1

1/8" = 1'-0"

SW 7048
Urbane Bronze

LAP SIDING -
8" EXPOSURE
PANEL & TRIM BOARD

SW 2803
Rookwood
Terra Cotta

LAP SIDING -
8" EXPOSURE

SW 6187
Rosemary

BOARD & BATTON
SIDING

SW 9164
Illusive Green

LAP SIDING -
6" EXPOSURE
PANEL & TRIM BOARD

SW 7042
Shoji White

LAP SIDING -
6" EXPOSURE

SW 7006
Extra White

PANEL & TRIM BOARD

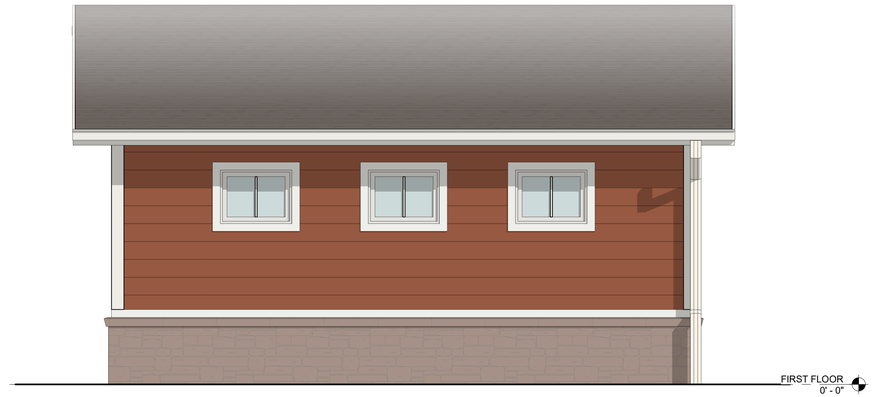
CLINE DESIGN

COBBLESTONE VILLAGE

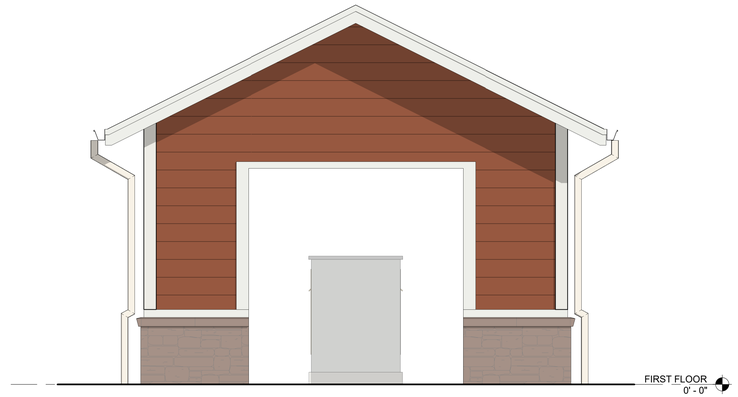
ROLESVILLE, NORTH CAROLINA

EXTERIOR ELEVATIONS - BUILDING 8 A08

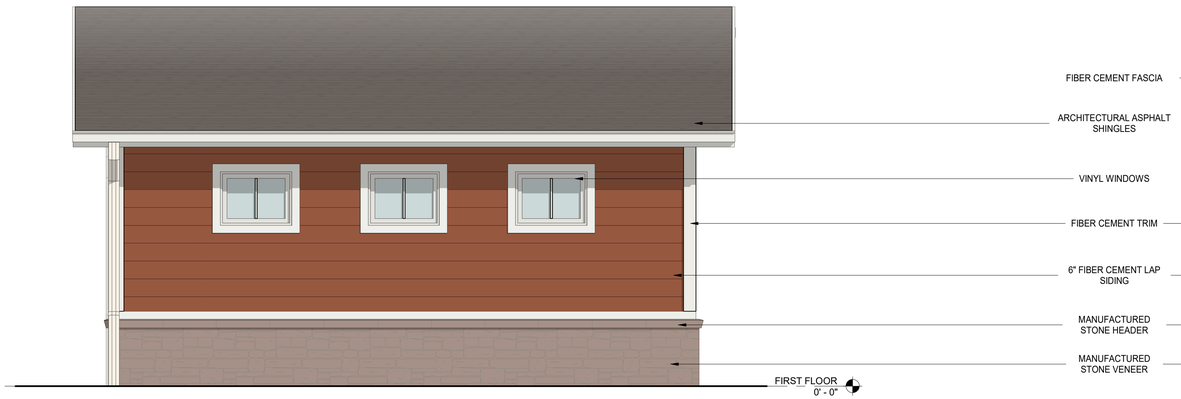
1/8" = 1'-0" | 019032 | 09.01.23



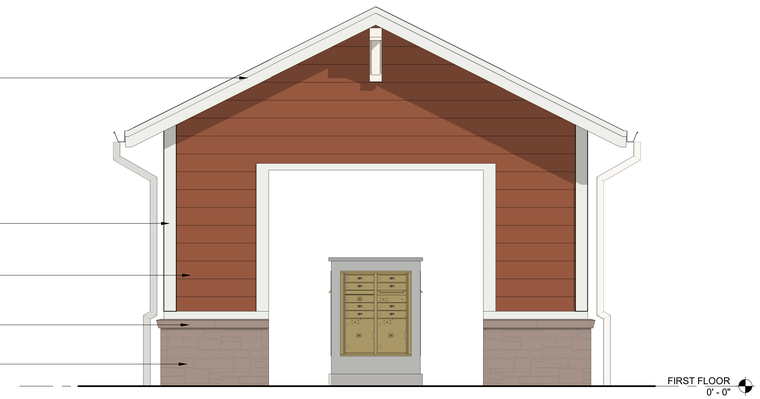
RIGHT SIDE ELEVATION 4
3/8" = 1'-0"



REAR ELEVATION 2
3/8" = 1'-0"



LEFT SIDE ELEVATION 3
3/8" = 1'-0"



FRONT ELEVATION 1
3/8" = 1'-0"

SW 2803
Rookwood Terra Cotta
LAP SIDING - 8" EXPOSURE

SW 7006
Extra White
PANEL & TRIM BOARD

CLINE DESIGN

COBBLESTONE VILLAGE
ROLESVILLE, NORTH CAROLINA

EXTERIOR ELEVATIONS - MAIL KIOSK **A09**
3/8" = 1'-0" | 019032 | 09.01.23

BNK BASS | NIXON | KENNEDY
CONSULTING ENGINEERS

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Raleigh, NC 27607
919.851.4422 | bnkinc.com

COBBLESTONE VILLAGE
ROLESVILLE, NC

SHARED PARKING ANALYSIS

12/08/23

PREPARED BY
MARTY D. BIZZELL, PE, CPESC
BASS, NIXON & KENNEDY, INC.
CONSULTING ENGINEERS
DECEMBER 2023

BASS | NIXON | KENNEDY
CONSULTING ENGINEERS

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Cobblestone Village Mixed-Use Development

Shared Parking Analysis

The proposed Cobblestone Village Mixed Use Development is to be located in Rolesville, NC at the intersection of S. Main Street and W. Young Street. A number of uses including residential apartments, restaurants, retail and community center are proposed for the mixed-use development. The mixed-use development proposes to include 180 residential apartments, 53,384 square feet of retail/flex/commercial space.

A shared parking study has been performed to determine the parking demand for the development. A number of items were considered when determining the parking demand for the development including land use and hours of operation.

The parking requirements were taken from the Town of Rolesville's Town Center ordinance. The ordinance breaks parking requirements into two land uses, mixed-use residential and mixed-use nonresidential. The mixed-use residential requires two parking spaces per dwelling unit. The mixed-use nonresidential requires three spaces for each 1,000 square feet of gross floor area.

Based upon 188 mixed-use residential units and 53,384 square feet of mixed-use nonresidential mixed-use space, the parking requirement are as follows:

188 mixed use residential units x 2 spaces per unit	= 376 spaces
53,384 sf mixed-use nonresidential @ 3 spaces per 1,000 sf	= 161 spaces
Total Single-Use Parking Requirement	= 537 spaces

Once the parking requirement was established, a shared parking analysis was performed. Shared Parking is defined as *the concept of parking which recognizes that uses in proximity to one another may have parking demands which permit such uses to share the same marginal parking spaces provided to accommodate peak parking conditions in a common parking facility.*

An optimized parking analysis was performed using parking demand and parking distribution data from the Institute of Transportation Engineers "Parking Generation Manual" 5th Edition. Parking distribution data expressed in percent of peak parking demand given hourly was performed for each use. This analysis was performed for weekday and on Saturday. A peak hour parking demand was determined from each of the analysis.

Conclusion

The shared parking analysis shows that during weekdays, the peak parking demand for the development occurs at 7:00 p.m. with a total parking demand of 404 parking spaces needed. The Saturday analysis also shows that the peak parking demand occurred at 7:00 p.m. with a parking demand of 417 parking spaces.

The site plan proposes a total of 444 on-site spaces and 24 on-street parking spaces for a total of 468 parking spaces proposed. Therefore, based on the results of the shared parking analysis performed for Cobblestone Village, the peak hour parking demand of 417 parking spaces will be met.

For events that may be held at Cobblestone Village, it is difficult to quantify a parking demand due to a number of factors such as what the event may be, type of event, time of event, etc. The developer of Cobblestone Village is committed to working with the Town of Rolesville to identify overflow parking locations/facilities that can be utilized in during an event where additional parking is needed.

Cobblestone Village Shared Parking Analysis

December 7, 2023

Total Square Footage and Unit Tabulation

	Restaurant SF	Community Center SF	Retail/Flex/Commercial SF	Residential Units
Building 1	.			40
Building 2			11,678	30
Building 3			8,612	18
Building 4			10,420	
Building 5			5,970	
Building 6			16,704	36
Building 7				40
Building 8				24
Total:	-	-	53,384	188

NON-OPTIMIZED Single-Use Parking Requirements

Parking Coefficient:	3/1,000 SF	3/1,000 SF	3/1,000 SF	2 per unit	
Parking Count:	**0**	**-**	**161.00**	**376**	**Total:**
				Single-Use Required:	**537**

OPTIMIZED Peak Hour Percentage Factors WEEKDAY

TIME	% of peak	demand	% of peak	demand	% of peak	demand	% of peak	demand	Total Hourly Sums
6:00 AM	10%	0	0%	0	0%	0	90%	338	339
7:00 AM	25%	0	58%	0	0%	0	77%	290	290
8:00 AM	68%	0	72%	0	15%	25	56%	211	236
9:00 AM	72%	0	95%	0	32%	52	45%	169	222
10:00 AM	77%	0	94%	0	54%	87	40%	150	238
11:00 AM	83%	0	95%	0	71%	115	37%	139	255
12:00 PM	100%	0	83%	0	99%	160	36%	135	296
1:00 PM	91%	0	65%	0	100%	161	36%	135	297
2:00 PM	56%	0	56%	0	90%	145	37%	139	285
3:00 PM	42%	0	64%	0	83%	134	43%	162	296
4:00 PM	42%	0	75%	0	81%	131	45%	169	301
5:00 PM	64%	0	84%	0	84%	136	55%	207	343
6:00 PM	87%	0	100%	0	86%	139	66%	248	388
7:00 PM	79%	0	99%	0	80%	129	73%	274	404
8:00 PM	65%	0	0%	0	63%	102	77%	290	392
9:00 PM	42%	0	0%	0	42%	68	86%	323	392
10:00 PM	21%	0	0%	0	15%	25	92%	346	371
11:00 PM	0%	0	0%	0	0%	0	97%	365	365
12:00 AM	0%	0	0%	0	0%	0	100%	376	376

WEEKDAY Peak Demand Required: **404**

OPTIMIZED Peak Hour Percentage Factors SATURDAY

TIME	% of peak	demand	% of peak	demand	% of peak	demand	% of peak	demand	Total Hourly Sums
6:00 AM	15%	0	0%	0	0%	0	98%	368	369
7:00 AM	28%	0	50%	0	0%	0	96%	361	361
8:00 AM	52%	0	75%	0	27%	44	92%	346	390
9:00 AM	75%	0	100%	0	46%	75	80%	301	376
10:00 AM	91%	0	89%	0	67%	108	78%	293	402
11:00 AM	100%	0	80%	0	85%	137	71%	267	404
12:00 PM	90%	0	68%	0	95%	153	68%	256	409
1:00 PM	80%	0	60%	0	100%	161	66%	248	410
2:00 PM	67%	0	60%	0	98%	158	65%	244	403
3:00 PM	45%	0	53%	0	92%	149	68%	256	405
4:00 PM	39%	0	52%	0	86%	139	70%	263	403
5:00 PM	40%	0	49%	0	79%	128	73%	274	403
6:00 PM	40%	0	50%	0	71%	115	77%	290	405
7:00 PM	58%	0	50%	0	69%	112	81%	305	417
8:00 PM	40%	0	0%	0	60%	97	82%	308	406
9:00 PM	35%	0	0%	0	51%	83	86%	323	407
10:00 PM	33%	0	0%	0	38%	62	87%	327	390
11:00 PM	0%	0	0%	0	0%	0	92%	346	346
12:00 AM	0%	0	0%	0	0%	0	93%	350	350

SATURDAY Peak Demand Required: **417**

Parking Provided:	
On-Site	444
On-Street	24
Total Parking Provided	**468**

Assumptions:

Parking requirements based on current Town of Rolesville Town Center District parking requirements.
Accessible Spaces: 11 Required / 25 Provided
40 Bicycle Spaces are provided.