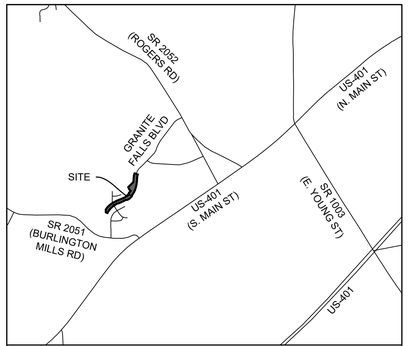


VICINITY MAP
1" = 2000'

CONSTRUCTION PLANS FOR

GRANITE FALLS BLVD. EXTENSION

ROLESVILLE, NORTH CAROLINA

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**.

PROPOSED INFRASTRUCTURE QUANTITIES

ITEM	OWNERSHIP	DIAMETER / MATERIAL	LENGTH
WATER	PUBLIC (CITY OF RALEIGH)	12"Ø CL350 DUCTILE IRON	1,412 LF
STORM DRAIN	PUBLIC (TOWN OF ROLESVILLE)	18"Ø CLASS III RCP	53 LF
STORM DRAIN	PUBLIC (TOWN OF ROLESVILLE)	18"Ø CLASS IV RCP	171 LF
STORM DRAIN	PUBLIC (TOWN OF ROLESVILLE)	24"Ø CLASS III RCP	394 LF
STORM DRAIN	PUBLIC (TOWN OF ROLESVILLE)	24"Ø CLASS IV RCP	44 LF
STORM DRAIN	PUBLIC (TOWN OF ROLESVILLE)	42"Ø CLASS III RCP	72 LF
ROADWAY	PUBLIC (TOWN OF ROLESVILLE)	41'-WIDE ROAD SECTION (B-B)	1,401 LF

EROSION CONTROL, STORMWATER AND FLOODPLAIN MANAGEMENT

APPROVED

EROSION CONTROL ☐ S-_____

STORMWATER MGMT. ☐ S-_____

FLOOD STUDY ☐ S-_____

DATE_____

WAKE COUNTY NC
EFFECTIVE: 08/23/17

ENVIRONMENTAL CONSULTANT SIGNATURE

DEVELOPER:

BARRINGTON DEVELOPMENT, LLC
CONTACT: JOHN WILLIAMS
1661 CASH RD
CREEDMOOR, NC 27525
919.215.3956
JPW@CAPITALCOMPANIES.GROUP

ENGINEER OF RECORD:

FLM ENGINEERING, INC
CONTACT: CHRISTOPHER A. LEWIS, PE
PO BOX 91727
RALEIGH, NC 27675
919.802.7146
CLEWIS@FLMENGINEERING.COM

CALL 48 HOURS BEFORE YOU DIG

North Carolina 811 www.nc811.org

NORTH CAROLINA
ONE-CALL CENTER
1-800-632-4949

ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH ALL TOWN OF ROLESVILLE, CITY OF RALEIGH AND WAKE COUNTY STANDARDS AND SPECIFICATIONS

WATER PERMITS

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 #** _____

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

FLM ENGINEERING

POST OFFICE BOX 91727
RALEIGH, NORTH CAROLINA 27675
PHONE: 919.610.1051
FIRM NC LICENSE NUMBER C-4222

NORTH CAROLINA PROFESSIONAL SEAL 041421 ENGINEER CHRISTOPHER A. LEWIS

REVISION HISTORY

REV #	DESCRIPTION	DATE	BY

ORIGINAL PLAN SIZE: 24" X 36"

ISSUED FOR PERMITTING
DO NOT USE FOR CONSTRUCTION

SCALE ADJUSTMENT

THIS BAR IS 1 INCH IN LENGTH ON ORIGINAL DRAWING

0 1"

IF IT IS NOT 1 INCH ON THIS SHEET, ADJUST YOUR SCALE ACCORDINGLY

CONSTRUCTION PLANS FOR GRANITE FALLS BLVD. EXTENSION

ROLESVILLE, NC

BARRINGTON DEVELOPMENT, LLC

DATE:	02-28-2020
SCALE:	AS SHOWN
DESIGNED BY:	FLM
APPROVED BY:	FLM
PROJECT NO.:	20012

COVER

C-1

SHEET 1 OF 18

STORM DRAINAGE CALCULATIONS

STORMWATER CONTROL MEASURE	STRUCTURE NUMBER FROM	STRUCTURE NUMBER TO	NUMBER OF STORM BOXES	Cc RUNOFF COEFFICIENT	I 25-YEAR INTENSITY*** (in/hr)	A DRAINAGE AREA (sf)	A DRAINAGE AREA (ac)	Tc TIME OF CONCENTRATION (min)	Q FLOW (cfs)	Q TOTAL FLOW (cfs)	SLOPE (ft/ft)	Dtheo (in)	SIZE (in)	Vfull (ft/sec)	PIPE LENGTH (ft)*	UPPER INVERT (ft)	LOWER INVERT (ft)	GRATE ELEVATION (ft)**	PIPE MATERIAL
GRANITE FALLS BLVD SCM	EX. EAST	EX. WEST	1	0.90	7.98	18303.00	0.42	5.0	3.02	3.02	0.0000	#DIV/0!		0.0	38.00			392.31	EX. RCP
	EX. WEST	CB-100	1	0.90	7.98	13917.00	0.32	5.0	2.29	5.31	0.0268	11.6	24	12.8	112.00	384.00	381.00	392.30	CLASS III RCP
	CB-1000	CB-1002	1	0.90	7.98	2833.00	0.07	5.0	0.47	5.78	0.0694	10.0	24	20.5	144.00	381.00	371.00	386.15	CLASS III RCP
	DI-001	CB-1001	1	0.50	7.98	95012.00	2.18	5.0	8.70	8.70	0.0667	11.7	18	16.6	15.00	373.00	372.00	379.00	CLASS III RCP
	CB-1001	CB-1002	1	0.90	7.98	9778.00	0.22	5.0	1.61	1.61	0.0132	8.5	18	7.4	38.00	372.50	372.00	376.73	CLASS III RCP
	CB-1002	CB-1006	1	0.90	7.98	3649.00	0.08	5.0	0.60	7.99	0.0145	15.1	24	9.4	138.00	371.00	369.00	376.80	CLASS III RCP
	CB-1003	CB-1004	1	0.90	7.98	19283.00	0.44	5.0	3.18	3.18	0.0125	11.0	18	7.2	8.00	369.60	369.50	372.81	CLASS IV RCP
	CB-1005	CB-1004	1	0.90	7.98	15454.00	0.35	5.0	2.55	2.55	0.0125	10.1	18	7.2	8.00	369.60	369.50	372.81	CLASS IV RCP
	CB-1004	CB-1006	1	0.90	7.98	2777.00	0.06	5.0	0.46	6.19	0.0132	14.0	18	7.4	38.00	369.50	369.00	372.77	CLASS IV RCP
	CB-1006	FES-POND	1	0.90	7.98	12690.00	0.29	5.0	2.09	16.27	0.0114	20.7	24	8.3	44.00	369.00	368.50	372.75	CLASS IV RCP
BARRINGTON PHASE 2 SCM	CB-1007	CB-108	1	0.90	7.98	10437.00	0.24	5.0	1.72	1.72	0.0132	8.7	18	7.4	38.00	381.75	381.25	385.74	CLASS IV RCP
	CB-1008	JB-002	1	0.90	7.98	6392.00	0.15	5.0	1.05	2.77	0.0132	10.4	18	7.4	95.00	381.25	380.00	385.72	CLASS IV RCP
GRANITE FALLS BLVD STREAM CROSSING	HW-1	HW-2	-	0.30	5.37	1785455.00	40.99	15.0	66.03	66.03	0.0278	29.6	42	18.9	72.00	367.30	365.30	-	CLASS III RCP

*LENGTHS ARE OF THE PIPE ONLY. DOES NOT INCLUDE FLARED END SECTIONS OR OTHER END TREATMENT. LENGTHS ARE CENTER OF STRUCTURE TO CENTER OF STRUCTURE.

**GRATE ELEVATIONS REFLECT ELEVATION AT GRATE. FOR CURB INLETS, ADD 0.5' TO GET THE HOOD ELEVATION.

***TIME OF CONCENTRATION FOR HW-1 TO HW-2 CALCULATED BY THE KIRPICH METHOD. L=2,520'; H=56'

SPREAD CALCULATIONS

CATCH BASINS CB #	UPSTREAM CB#	DOWNSTREAM CB#	INLET AREA (sf)	INLET AREA (ac)	Tc TIME OF CONCENTRATION (min)	2 YR - 5 MIN INTENSITY (in/hr)	Cc RUNOFF COEFFICIENT	Q FLOW (cfs)	Q BYPASS FROM UPSTREAM (cfs)	Q TOTAL (cfs)	Q BYPASS (cfs)	S SLOPE OF ROAD (%)	T SPREAD FROM HYDRAFLOW (ft)	ROAD WIDTH (FACE OF CURB TO FACE OF CURB)	HALF OF TRAVEL LANE (MINUS GUTTER)
EX. EAST	N/A		18229	0.42	5.0	5.62	0.90	2.117	0.000	2.117	0.620	3.60%	4.83	40	9.00
EX. WEST	N/A		13917	0.32	5.0	5.62	0.90	1.616	0.000	1.616	0.390	3.60%	4.08	40	9.00
CB-1000	EX. WEST		2833	0.07	5.0	5.62	0.90	0.329	0.390	0.719	0.040	6.10%	1.63	40	9.00
CB-1001	EX. EAST		9778	0.22	5.0	5.62	0.90	1.135	0.620	1.755	0.390	5.60%	3.72	40	9.00
CB-1002	CB-1000		3649	0.08	5.0	5.62	0.90	0.424	0.040	0.464	0.010	5.60%	0.89	40	9.00
CB-1003	CB-1001		19283	0.44	5.0	5.62	0.90	2.239	0.390	2.629	0.960	0.60%	8.76	40	9.00
CB-1005	CB-1007		15454	0.35	5.0	5.62	0.90	1.794	0.150	1.944	0.970	0.60%	8.79	40	9.00
CB-1004	CB-3000 & CB-3001	SAG	2777	0.06	5.0	5.62	0.90	0.322	1.930	2.252	0.000	SAG	8.75	40	9.00
CB-1006	CB-1002 & CB-1008	SAG	12690	0.29	5.0	5.62	0.90	1.474	0.010	1.484	0.000	SAG	6.14	40	9.00
CB-1007	N/A	CB-1005	10437	0.24	5.0	5.63	0.90	1.214	0.000	1.214	0.150	8.50%	2.37	40	9.00
CB-1008	N/A	CB-1006	6392	0.15	5.0	5.63	0.90	0.744	0.000	0.744	0.030	8.50%	1.38	40	9.00

RISER SEDIMENT BASIN DESIGN CALCULATIONS

SEDIMENT BASIN DESIGN: BASIN NUMBER	DRAINAGE AREA (ac)	DISTURBED AREA (ac)	REQUIRED VOLUME 1800 CF/AC (cf)	DEPTH* (ft)	WIDTH** (ft)	LENGTH** (ft)	VOLUME PROVIDED** (cf)	SEDIMENT BASIN EFFICIENCY: WEIGHTED RUNOFF COEFFICIENT	10-YEAR RAINFALL INTENSITY (in/hr)	FLOW, Q (cfs)	REQUIRED SURFACE AREA 435 SF/CFS (sf)	AREA PROVIDED** (sf)	SKIMMER***: SIZE (in)	ORIFICE RADIUS (in)	ORIFICE DIAMETER (in)
SB-1	4.80	1.20	2160	2	--	--	13981	0.51	7.20	17.63	7667	7729	2.5	1.1	2.2

*DEPTH FROM BOTTOM OF BASIN TO TOP OF RISER STRUCTURE

**DIMENSIONS ARE IRREGULAR AND THUS, NOT LISTED; VOLUME AND SURFACE AREA PER HYDROCAD MODEL

***SKIMMER SIZED PER SIZING CALCULATOR AT WWW.FAIRCLOTHSKIMMER.COM AT A DRAWDOWN RATE OF 72 HOURS BASED ON BASIN VOLUME PROVIDED

SEDIMENT BASIN SPILLWAY DESIGN

BASIN NUMBER	Q (cfs)	UPPER INVERT	LOWER INVERT	LENGTH (ft)	CHANNEL SECTION	BOTTOM WIDTH (ft)	TOP WIDTH (ft)	LEFT SIDE SLOPE, Z:1 (ft)	RIGHT SIDE SLOPE, Z:1 (ft)	CHANNEL DEPTH (ft)	CHANNEL SLOPE (ft/ft)	NORMAL DEPTH (ft)	FREEBOARD (ft)	SHEAR STRESS (lb/ft2)	VELOCITY (fps)	MANNING'S n VALUE	LINER
SB-1	17.63	371.00	370.00	2.50	TRAPEZOIDAL	25.00	31.00	3.00	3.00	1.00	0.400	0.13	0.87	3.24	5.34	0.040	NAG SC250

BOUYANCY CALCULATIONS
STORMWATER WETLAND

TOP OF OUTLET STRUCTURE =	371.00	ft
BOTTOM =	366.00	ft
HEIGHT OF RISER =	5.00	ft
ASSUME 6" WALL THICKNESS		

WEIGHT CALCULATIONS

Vbase =	0' x 0' x 0' =	0.00	cf
Wbase =	0 cf x 150 lb/cf =	0.00	lbs
Vsump =	4' x 4' x 2.5' =	40.00	cf
Wsump =	24 cf x 150 lb/cf =	6000.00	lbs
Wstruc =	[(5 x 5 x 5)-(4 x 4 x 4.5)] x 150 lb/cf =	7950.00	lbs
TOTAL WEIGHT =		13950.00	lbs

BOUYANCY CALCULATIONS

Bbase =	0 cf x 62.4 lb/cf =	0.00	lbs
Bstruc =	(5 x 5 x 5) x 62.4 lb/cf	7800.00	lbs
TOTAL BOUYANCY =		7800.00	lbs
FACTOR OF SAFETY =		**1.79**	

WATER PERMITS

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 #** _____

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

FLM ENGINEERING

POST OFFICE BOX 91727
RALEIGH, NORTH CAROLINA 27675
PHONE: 919.610.1051
FIRM NC LICENSE NUMBER C-4222

NORTH CAROLINA PROFESSIONAL SEAL 041421 ENGINEER CHRISTOPHER A. LEWIS

REVISION HISTORY

REV #	DESCRIPTION	DATE	BY

ORIGINAL PLAN SIZE: 24" X 36"

ISSUED FOR PERMITTING
DO NOT USE FOR CONSTRUCTION

SCALE ADJUSTMENT

THIS BAR IS 1 INCH IN LENGTH ON ORIGINAL DRAWING
0 1"

IF IT IS NOT 1 INCH ON THIS SHEET, ADJUST YOUR SCALE ACCORDINGLY

CONSTRUCTION PLANS FOR GRANITE FALLS BLVD. EXTENSION

ROLESVILLE, NC

BARRINGTON DEVELOPMENT, LLC

DATE:	02-28-2020
SCALE:	AS SHOWN
DESIGNED BY:	FLM
APPROVED BY:	FLM
PROJECT NO.:	20012

CALCULATIONS

C-2

LEGEND

- EX. PROPERTY LINE
- EX. RIGHT-OF-WAY
- EX. ADJACENT OWNERS
- EX. EASEMENT
- EX. ROAD CENTERLINE
- 325 EX. MAJOR CONTOUR (10')
- EX. MINOR CONTOUR (2')
- EX. CHANNEL/STREAM
- EX. STREAM BUFFER
- EX. SOIL LINE
- EX. FENCE
- OHW OHW EX. OVERHEAD ELECTRIC LINE
- W W EX. WATER LINE
- SS SS EX. SANITARY SEWER
- SD SD EX. STORM SEWER
- EX. TREE LINE
- EX. WETLAND

NOTES

1. SURVEY DATA PROVIDED BY CAWTHORNE, MOSS & PANCIERA, PC ON FEBRUARY 26, 2020.
2. THERE ARE NO FLOOD PRONE AREAS PRESENT PER FEMA FIRM PANEL NO. 3720175800J, EFFECTIVE MAY 2, 2006.
3. TREE LINES SHOWN PER AERIAL PHOTOGRAPHY.
4. THE UTILITIES SHOWN ARE NOT GUARANTEED TO BE A REPRESENTATION OF ALL UTILITIES WITHIN THE PROJECT EXTENT.
5. THE CONTRACTOR SHALL CALL THE NORTH CAROLINA ONE-CALL-CENTER AT LEAST 48 HOURS PRIOR TO BEGINNING WORK.
6. THE CONTRACTOR SHALL VERIFY DEPTHS AND LOCATIONS OF ALL UTILITIES PRIOR TO BEGINNING WORK AND SHALL USE CARE WHEN OPERATING AROUND EXISTING UTILITIES.
7. THE CONTRACTOR SHALL BE FINANCIALLY RESPONSIBLE FOR THE REPAIR OF ANY EXISTING UTILITIES DAMAGED DURING CONSTRUCTION.

SOIL TYPES

HeB - HELENA SANDY LOAM, 2 TO 6 PERCENT SLOPES

RgB - RAWLINGS-RION COMPLEX, 2 TO 6 PERCENT SLOPES

RgC - RAWLINGS-RION COMPLEX, 6 TO 10 PERCENT SLOPES

RgD - RAWLINGS-RION COMPLEX, 10 TO 15 PERCENT SLOPES

Ur - URBAN LAND

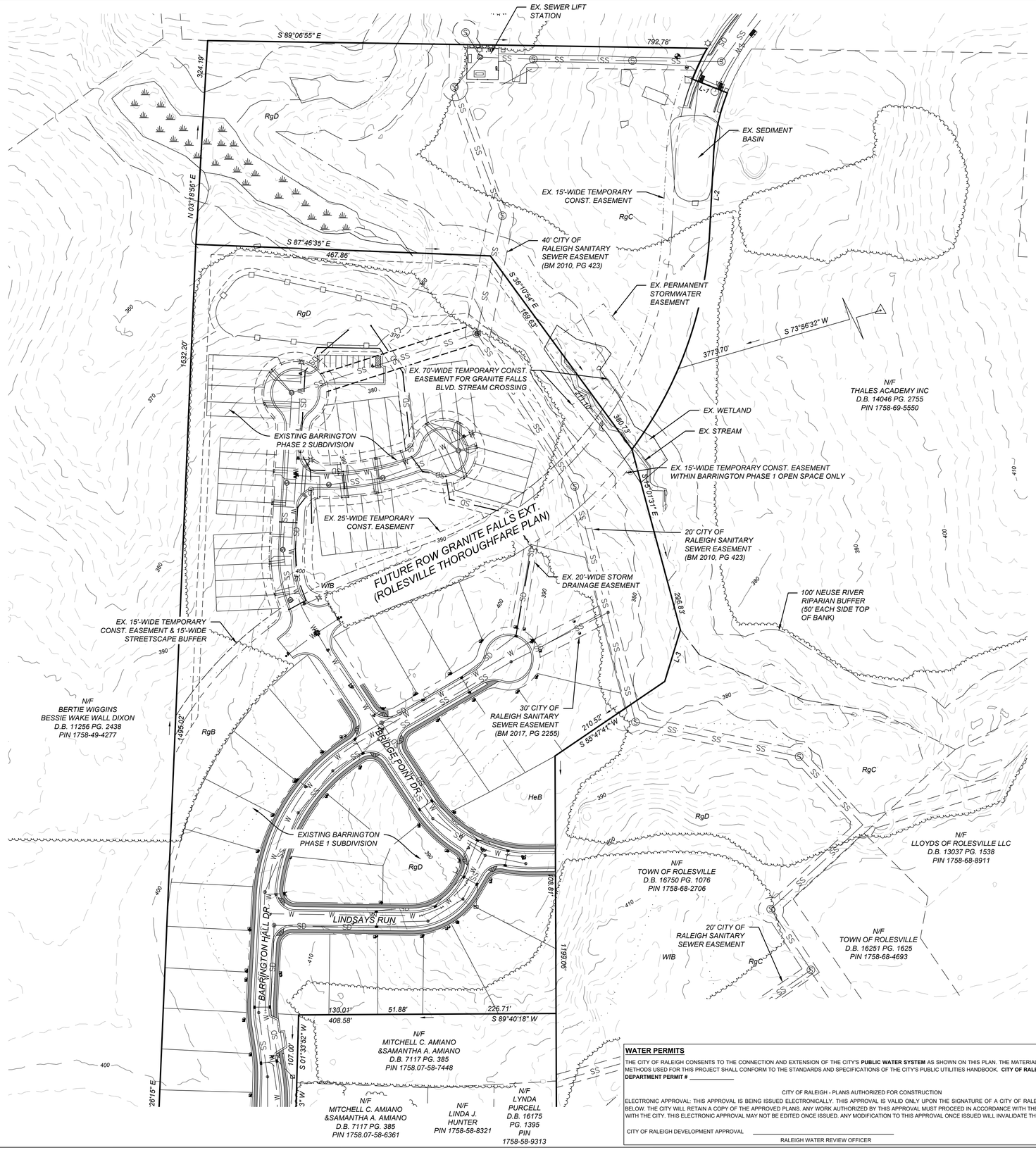
WfB - WEDOWEE-SAW COMPLEX, 2 TO 6 PERCENT SLOPES

LINE TABLE

LINE	LENGTH	BEARING
L-1	60.00'	S 68°25'15" E
L-2	122.59'	S 02°58'55" W
L-3	85.50'	S 16°57'45" W
L-4	24.50'	N 83°43'48" W
L-5	98.21'	N 85°48'34" W
L-6	97.16'	N 86°37'16" W
L-7	84.90'	S 86°59'05" E
L-8	91.17'	S 86°07'02" E
L-9	43.25'	S 84°15'53" E

CURVE TABLE

CURVE	LENGTH	RADIUS	CHORD	BEARING
C-1	54.14'	380.00'	54.10'	S 25°39'39" W
C-2	103.87'	320.00'	103.41'	S 12°16'50" W
C-3	221.22'	630.00'	220.08'	N 13°02'29" E
C-4	148.08'	630.00'	147.74'	N 29°50'04" E



CALL 48 HOURS BEFORE YOU DIG

NORTH CAROLINA ONE-CALL CENTER
1-800-632-4949

WATER PERMITS

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 #** _____

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

FLM ENGINEERING

POST OFFICE BOX 91727
RALEIGH, NORTH CAROLINA 27675
PHONE: 919.610.1051
FIRM NC LICENSE NUMBER C-4222

NORTH CAROLINA PROFESSIONAL SEAL 041421 ENGINEER CHRISTOPHER A. LEWIS

REVISION HISTORY

REV #	DESCRIPTION	DATE	BY

ORIGINAL PLAN SIZE: 24" X 36"

ISSUED FOR PERMITTING
DO NOT USE FOR CONSTRUCTION

80 40 0 80
SCALE: 1 INCH = 80 FEET

N

SCALE ADJUSTMENT
THIS BAR IS 1 INCH IN LENGTH ON ORIGINAL DRAWING
0 1"
IF IT IS NOT 1 INCH ON THIS SHEET, ADJUST YOUR SCALE ACCORDINGLY

CONSTRUCTION PLANS FOR GRANITE FALLS BLVD. EXTENSION

ROLESVILLE, NC

BARRINGTON DEVELOPMENT, LLC

DATE:	02-28-2020
SCALE:	AS SHOWN
DESIGNED BY:	FLM
APPROVED BY:	FLM
PROJECT NO.:	20012

EXISTING CONDITIONS

C-3

SHEET 3 OF 18

LEGEND

- EX. PROPERTY LINE
- EX. RIGHT-OF-WAY
- EX. SUBDIVISION LINE
- EX. ADJACENT OWNERS
- EX. EASEMENT
- EX. ROAD CENTERLINE
- EX. CHANNEL/STREAM
- EX. CHANNEL/STREAM BUFFER
- W — W — EX. WATER LINE
- SS — SS — EX. SANITARY SEWER
- SD — SD — EX. STORM SEWER
- OHW — OHW — EX. OVERHEAD ELECTRIC LINE
- PROP. PARCEL BOUNDARY
- PROP. RIGHT-OF-WAY
- PROP. SETBACK LINE
- PROP. EASEMENT
- W — W — PROP. WATER LINE
- SS — SS — PROP. SANITARY SEWER
- PROP. STORM SEWER
- PROP. WATER METER
- PROP. BLOW OFF ASSEMBLY
- PROP. GATE VALVE
- PROP. FIRE HYDRANT ASSEMBLY WITH GATE VALVE
- PROP. SEWER CLEANOUT

SUMMARY INFORMATION

DEVELOPMENT NAME: GRANITE FALLS BLVD EXTENSION

STREET ADDRESS: GRANITE FALLS BVLD.

PIN NUMBERS: RIGHT OF WAY ADJACENT TO PIN: 1758-59-7229

TOTAL R/W ACREAGE: 2.425 AC

EXISTING USE: VACANT PUBLIC RIGHT OF WAY
PROPOSED USE: PUBLIC STREET WITHIN PUBLIC RIGHT OF WAY

JURISDICTION: TOWN OF ROLESVILLE
ZONING DISTRICT: N/A

PROPOSED LINEAR FOOTAGE OF ROADS: 1,401 LF

PROPOSED IMPERVIOUS AREA:
NEW ROADWAYS & NEW SIDEWALKS = 1.523 ACRES (66,385 SQ. FT.)
TOTAL PROPOSED IMPERVIOUS AREA = 1.523 ACRES (66,385 SQ. FT.)

DEVELOPER:
BARRINGTON DEVELOPMENT, LLC
1661 CASH ROAD
CREEDMOOR, NC 27525
919.215.3956

ENGINEER:
FLM ENGINEERING, INC.
PO BOX 91727
RALEIGH, NC 27675
919.802.7146

CITY OF RALEIGH UTILITY NOTES

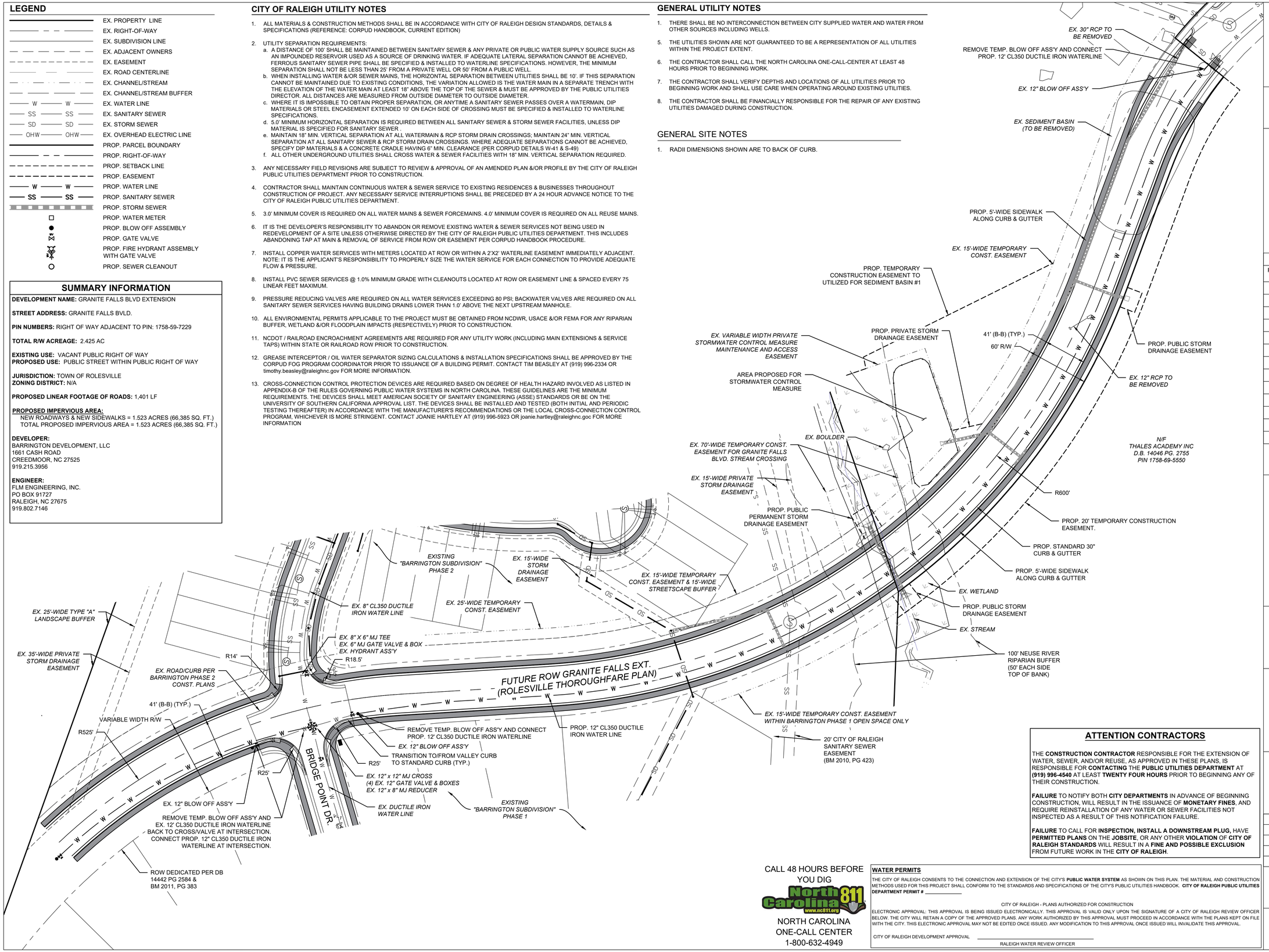
1. ALL MATERIALS & CONSTRUCTION METHODS SHALL BE IN ACCORDANCE WITH CITY OF RALEIGH DESIGN STANDARDS, DETAILS & SPECIFICATIONS (REFERENCE: CORPUD HANDBOOK, CURRENT EDITION)
2. UTILITY SEPARATION REQUIREMENTS:
   a. A DISTANCE OF 100' SHALL BE MAINTAINED BETWEEN SANITARY SEWER & ANY PRIVATE OR PUBLIC 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 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 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 NCDWR, 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.goc FOR MORE INFORMATION

GENERAL UTILITY NOTES

1. THERE SHALL BE NO INTERCONNECTION BETWEEN CITY SUPPLIED WATER AND WATER FROM OTHER SOURCES INCLUDING WELLS.
5. THE UTILITIES SHOWN ARE NOT GUARANTEED TO BE A REPRESENTATION OF ALL UTILITIES WITHIN THE PROJECT EXTENT.
6. THE CONTRACTOR SHALL CALL THE NORTH CAROLINA ONE-CALL-CENTER AT LEAST 48 HOURS PRIOR TO BEGINNING WORK.
7. THE CONTRACTOR SHALL VERIFY DEPTHS AND LOCATIONS OF ALL UTILITIES PRIOR TO BEGINNING WORK AND SHALL USE CARE WHEN OPERATING AROUND EXISTING UTILITIES.
8. THE CONTRACTOR SHALL BE FINANCIALLY RESPONSIBLE FOR THE REPAIR OF ANY EXISTING UTILITIES DAMAGED DURING CONSTRUCTION.

GENERAL SITE NOTES

1. RADII DIMENSIONS SHOWN ARE TO BACK OF CURB.



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**.

CALL 48 HOURS BEFORE YOU DIG

North Carolina 811 www.nc811.org

NORTH CAROLINA ONE-CALL CENTER
1-800-632-4949

WATER PERMITS

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 #** _____

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

FLM ENGINEERING

POST OFFICE BOX 91727
RALEIGH, NORTH CAROLINA 27675
PHONE: 919.610.1051
FIRM NC LICENSE NUMBER C-4222

NORTH CAROLINA PROFESSIONAL SEAL 041421 ENGINEER CHRISTOPHER A. LEWIS

REVISION HISTORY

REV #	DESCRIPTION	DATE	BY

ORIGINAL PLAN SIZE: 24" X 36"

ISSUED FOR PERMITTING
DO NOT USE FOR CONSTRUCTION

40 20 0 40
SCALE: 1 INCH = 40 FEET

SCALE ADJUSTMENT
THIS BAR IS 1 INCH IN LENGTH ON ORIGINAL DRAWING
0 1"
IF IT IS NOT 1 INCH ON THIS SHEET, ADJUST YOUR SCALE ACCORDINGLY

CONSTRUCTION PLANS FOR GRANITE FALLS BLVD. EXTENSION

ROLESVILLE, NC

BARRINGTON DEVELOPMENT, LLC

DATE:	02-28-2020
SCALE:	AS SHOWN
DESIGNED BY:	FLM
APPROVED BY:	FLM
PROJECT NO.:	20012

SITE & UTILITY PLAN

C-4

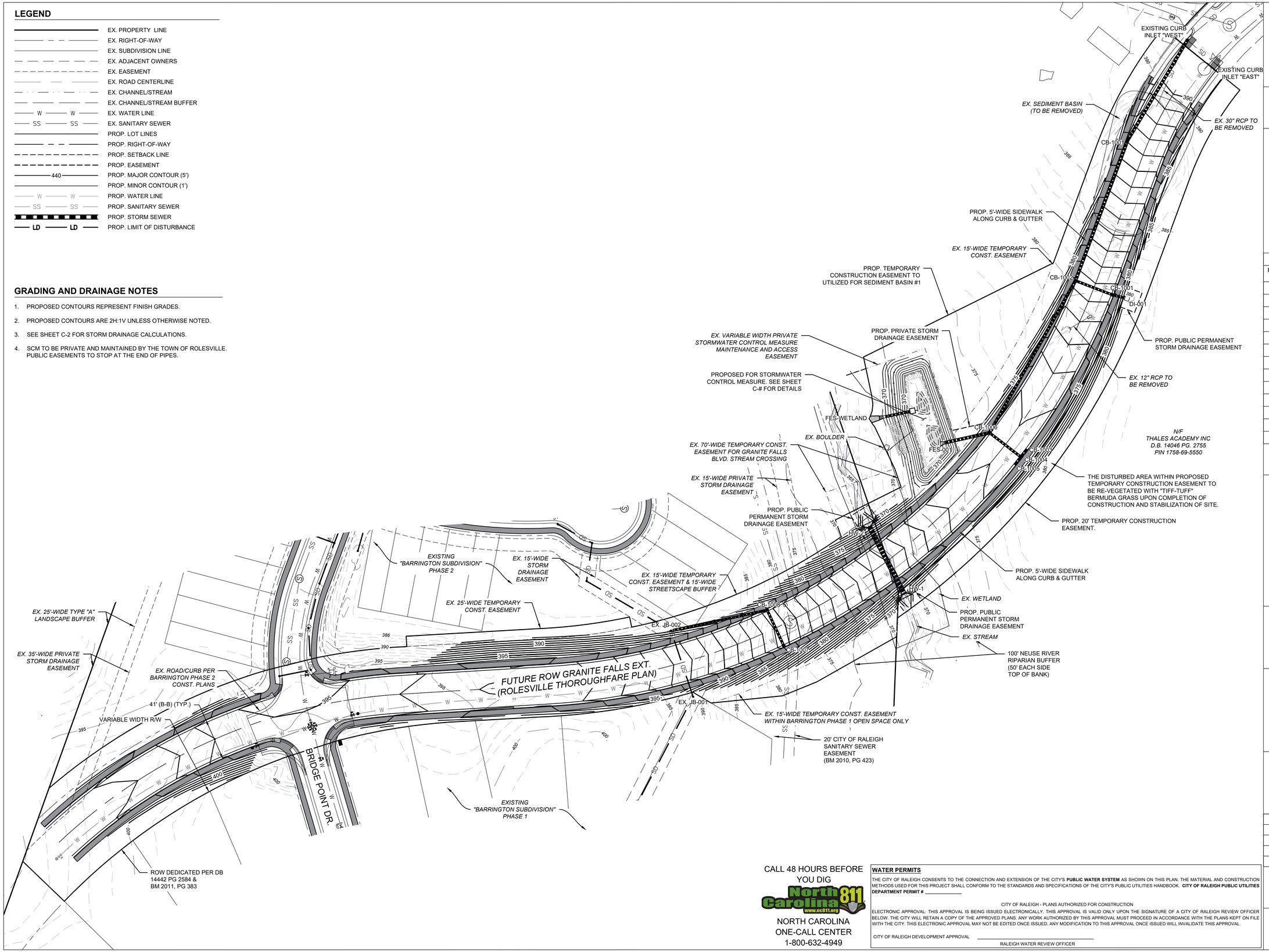
SHEET 4 OF 18

LEGEND

- EX. PROPERTY LINE
- EX. RIGHT-OF-WAY
- EX. SUBDIVISION LINE
- EX. ADJACENT OWNERS
- EX. EASEMENT
- EX. ROAD CENTERLINE
- EX. CHANNEL/STREAM
- EX. CHANNEL/STREAM BUFFER
- W — W — EX. WATER LINE
- SS — SS — EX. SANITARY SEWER
- PROP. LOT LINES
- PROP. RIGHT-OF-WAY
- PROP. SETBACK LINE
- PROP. EASEMENT
- 440 — PROP. MAJOR CONTOUR (5')
- PROP. MINOR CONTOUR (1')
- W — W — PROP. WATER LINE
- SS — SS — PROP. SANITARY SEWER
- PROP. STORM SEWER
- LD — LD — PROP. LIMIT OF DISTURBANCE

GRADING AND DRAINAGE NOTES

1. PROPOSED CONTOURS REPRESENT FINISH GRADES.
2. PROPOSED CONTOURS ARE 2H:1V UNLESS OTHERWISE NOTED.
3. SEE SHEET C-2 FOR STORM DRAINAGE CALCULATIONS.
4. SCM TO BE PRIVATE AND MAINTAINED BY THE TOWN OF ROLESVILLE. PUBLIC EASEMENTS TO STOP AT THE END OF PIPES.



CALL 48 HOURS BEFORE YOU DIG

NORTH CAROLINA ONE-CALL CENTER
1-800-632-4949

WATER PERMITS

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 #** _____

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

FLM ENGINEERING

POST OFFICE BOX 91727
RALEIGH, NORTH CAROLINA 27675
PHONE: 919.610.1051
FIRM NC LICENSE NUMBER C-4222

NORTH CAROLINA PROFESSIONAL SEAL 041421 ENGINEER CHRISTOPHER A. LEWIS

REVISION HISTORY

REV #	DESCRIPTION	DATE	BY

ORIGINAL PLAN SIZE: 24" X 36"

ISSUED FOR PERMITTING
DO NOT USE FOR CONSTRUCTION

40 80 0 40
SCALE: 1 INCH = 40 FEET

SCALE ADJUSTMENT

THIS BAR IS 1 INCH IN LENGTH ON ORIGINAL DRAWING
0 1"
IF IT IS NOT 1 INCH ON THIS SHEET, ADJUST YOUR SCALE ACCORDINGLY

CONSTRUCTION PLANS FOR GRANITE FALLS BLVD. EXTENSION

ROLESVILLE, NC

BARRINGTON DEVELOPMENT, LLC

DATE:	02-28-2020
SCALE:	AS SHOWN
DESIGNED BY:	FLM
APPROVED BY:	FLM
PROJECT NO.:	20012

GRADING & DRAINAGE PLAN

C-5

SHEET 5 OF 18

LEGEND

- EX. PROPERTY LINE
- EX. RIGHT-OF-WAY
- EX. SUBDIVISION LINE
- EX. ADJACENT OWNERS
- EX. EASEMENT
- EX. ROAD CENTERLINE
- EX. CHANNEL/STREAM
- EX. CHANNEL/STREAM BUFFER
- W — W — EX. WATER LINE
- SS — SS — EX. SANITARY SEWER
- PROP. LOT LINES
- PROP. RIGHT-OF-WAY
- PROP. SETBACK LINE
- PROP. EASEMENT
- 440 — PROP. MAJOR CONTOUR (5')
- PROP. MINOR CONTOUR (1')
- W — W — PROP. WATER LINE
- SS — SS — PROP. SANITARY SEWER
- PROP. STORM SEWER
- LD — LD — PROP. LIMIT OF DISTURBANCE
- ADDITIONAL LIMIT OF DISTURBANCE
- >> TD >> — PROP. TEMP. DIVERSION DITCH
- SF — SF — PROP. SILT FENCE
- —X—X—X—X— PROP. BAFFLE
- PROP. FAIRCLOTH SKIMMER
- PROP. NAG S75, OR EQUIVALENT, SLOPE PROTECTION
- PROP. CONSTRUCTION ENTRANCE
- PROP. SILT FENCE OUTLET
- PROP. ROCK CHECK DAM
- PROP. INLET PROTECTION

BASIN REMOVAL SEQUENCE

1. SCHEDULE A SITE MEETING WITH THE ENVIRONMENTAL ENGINEER/CONSULTANT TO DETERMINE IF A BASIN CAN BE CONVERTED.
2. DEWATER BASIN VIA SILT BAG. FINE GRADE STORMWATER WETLAND IN PREPARATION FOR PLANTING AND PERFORM AS-BUILT SURVEY TO VERIFY THAT GRADES MEET DESIGN.
3. PERFORM PLANTING PREPARATION, PLANT, SEED, MULCH AND ASPHALT TACK ANY RESULTING BARE AREAS IMMEDIATELY.
4. WHEN BASIN CONVERSION IS COMPLETE, CALL ENVIRONMENTAL ENGINEER/CONSULTANT FOR APPROVAL OF REMOVING REMAINING TEMPORARY EROSION CONTROL MEASURES AND ADVICE ON WHEN SITE CAN BE ISSUED A CERTIFICATE OF COMPLETION.

WAKE COUNTY STOCKPILE REQUIREMENTS

EFFECTIVE SEPTEMBER 1, 2008 - SOIL STOCKPILES SHALL BE LOCATED ON THE APPROVED PLAN AND SHALL ADHERE TO THE FOLLOWING REQUIREMENTS:

DESIGN CRITERIA

A. A 25-FOOT TEMPORARY MAINTENANCE AND ACCESS EASEMENT SHALL BE SHOWN AROUND ALL PROPOSED STOCKPILES (EROSION CONTROL MEASURES SURROUNDING THE STOCKPILE SHALL BE SHOWN AT THE OUTER LIMIT OF THIS EASEMENT).

B. STOCKPILE FOOTPRINTS SHALL BE SETBACK A MINIMUM OF 25' FROM ADJACENT PROPERTY LINES.

C. A NOTE SHALL BE PROVIDED ON THE APPROVED PLAN THAT STOCKPILE HEIGHT SHALL NOT EXCEED 35 FEET.

D. STOCKPILE SLOPES SHALL BE 2:1 OR FLATTER.

E. APPROVED BMPS SHALL BE SHOWN ON A PLAN TO CONTROL ANY POTENTIAL SEDIMENT LOSS FROM A STOCKPILE.

F. STOCKPILING MATERIALS ADJACENT TO A DITCH, DRAINAGEWAY, WATERCOURSE, WETLAND, STREAM BUFFER, OR OTHER BODY OF WATER SHALL BE AVOIDED UNLESS AN ALTERNATIVE LOCATION IS DEMONSTRATED TO BE UNAVAILABLE.

G. ANY CONCENTRATED FLOW LIKELY TO AFFECT THE STOCKPILE SHALL BE DIVERTED TO AN APPROVED BMP.

H. OFF-SITE SPOIL OR BORROW AREAS MUST BE IN COMPLIANCE WITH WAKE COUNTY UDO AND STATE REGULATIONS. ALL SPOIL AREAS OVER AN ACRE ARE REQUIRED TO HAVE AN APPROVED SEDIMENT CONTROL PLAN. DEVELOPER/CONTRACTOR SHALL NOTIFY WAKE COUNTY OF ANY OFFSITE DISPOSAL OF SOIL, PRIOR TO DISPOSAL. FILL OF FEMA FLOODWAYS AND NON-ENCROACHMENT AREAS ARE PROHIBITED EXCEPT AS OTHERWISE PROVIDED BY SUBSECTION 14-19-2 OF THE WAKE COUNTY UNIFIED DEVELOPMENT ORDINANCE (CERTIFICATIONS AND PERMITS REQUIRED).

MAINTENANCE REQUIREMENTS TO BE NOTED ON THE PLAN

I. SEEDING OR COVERING STOCKPILES WITH TARPS OR MULCH IS REQUIRED AND WILL REDUCE EROSION PROBLEMS. TARPS SHOULD BE KEYED IN AT THE TOP OF THE SLOPE TO KEEP WATER FROM RUNNING UNDERNEATH THE PLASTIC.

J. IF A STOCKPILE IS TO REMAIN FOR FUTURE USE AFTER THE PROJECT IS COMPLETE (BUILDERS, ETC.), THE FINANCIAL RESPONSIBLE PARTY MUST NOTIFY WAKE COUNTY OF A NEW RESPONSIBLE PARTY FOR THAT STOCKPILE.

K. THE APPROVED PLAN SHALL PROVIDE FOR THE USE OF STAGED SEEDING AND MULCHING ON A CONTINUAL BASIS WHILE THE STOCKPILE IS IN USE.

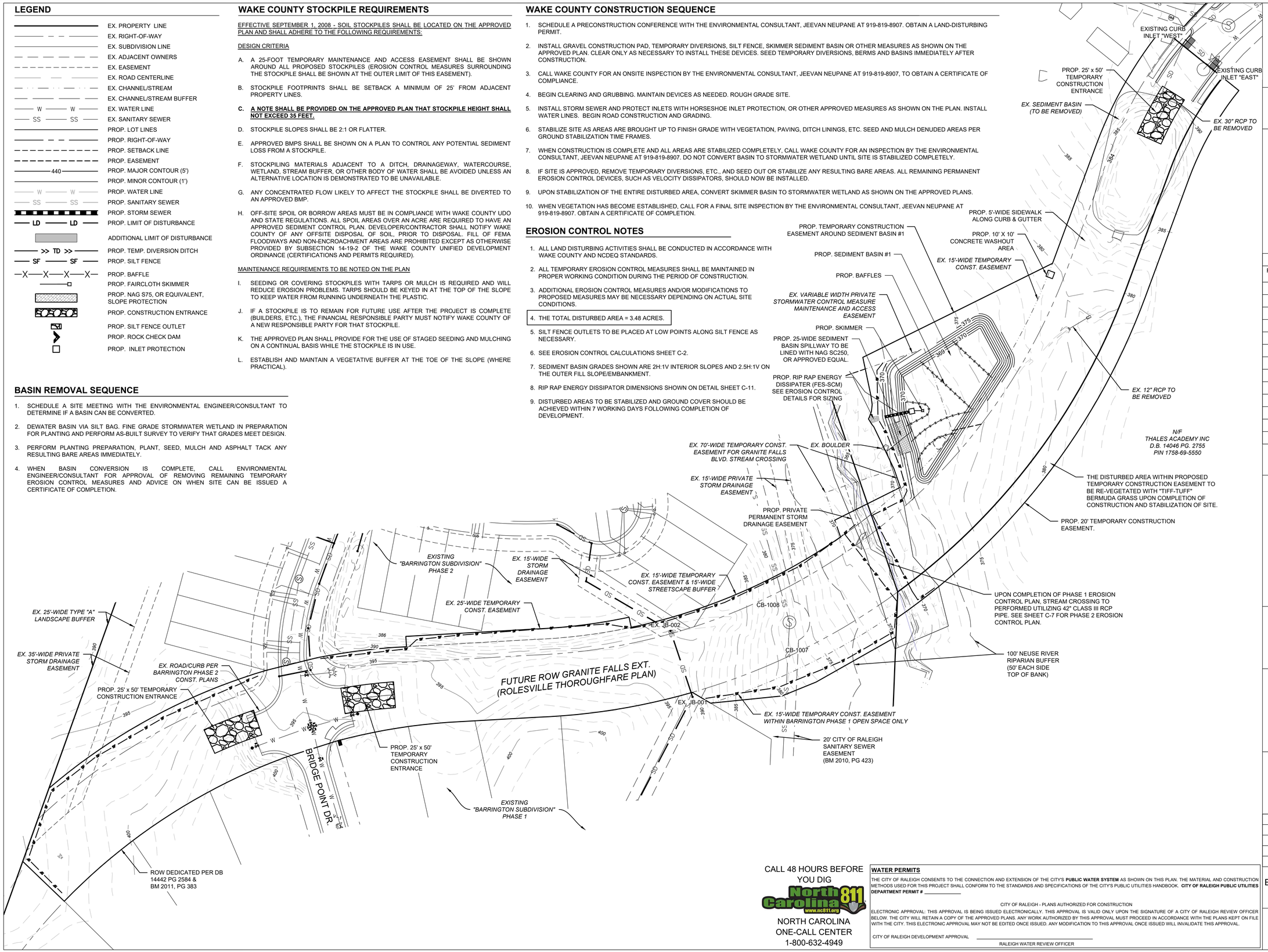
L. ESTABLISH AND MAINTAIN A VEGETATIVE BUFFER AT THE TOE OF THE SLOPE (WHERE PRACTICAL).

WAKE COUNTY CONSTRUCTION SEQUENCE

1. SCHEDULE A PRECONSTRUCTION CONFERENCE WITH THE ENVIRONMENTAL CONSULTANT, JEEVAN NEUPANE AT 919-819-8907. OBTAIN A LAND-DISTURBING PERMIT.
2. INSTALL GRAVEL CONSTRUCTION PAD, TEMPORARY DIVERSIONS, SILT FENCE, SKIMMER SEDIMENT BASIN OR OTHER MEASURES AS SHOWN ON THE APPROVED PLAN. CLEAR ONLY AS NECESSARY TO INSTALL THESE DEVICES. SEED TEMPORARY DIVERSIONS, BERMS AND BASINS IMMEDIATELY AFTER CONSTRUCTION.
3. CALL WAKE COUNTY FOR AN ONSITE INSPECTION BY THE ENVIRONMENTAL CONSULTANT, JEEVAN NEUPANE AT 919-819-8907, TO OBTAIN A CERTIFICATE OF COMPLIANCE.
4. BEGIN CLEARING AND GRUBBING. MAINTAIN DEVICES AS NEEDED. ROUGH GRADE SITE.
5. INSTALL STORM SEWER AND PROTECT INLETS WITH HORSESHOE INLET PROTECTION, OR OTHER APPROVED MEASURES AS SHOWN ON THE PLAN. INSTALL WATER LINES. BEGIN ROAD CONSTRUCTION AND GRADING.
6. 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.
7. WHEN CONSTRUCTION IS COMPLETE AND ALL AREAS ARE STABILIZED COMPLETELY, CALL WAKE COUNTY FOR AN INSPECTION BY THE ENVIRONMENTAL CONSULTANT, JEEVAN NEUPANE AT 919-819-8907. DO NOT CONVERT BASIN TO STORMWATER WETLAND UNTIL SITE IS STABILIZED COMPLETELY.
8. IF SITE IS APPROVED, REMOVE TEMPORARY DIVERSIONS, ETC., AND SEED OUT OR STABILIZE ANY RESULTING BARE AREAS. ALL REMAINING PERMANENT EROSION CONTROL DEVICES, SUCH AS VELOCITY DISSIPATORS, SHOULD NOW BE INSTALLED.
9. UPON STABILIZATION OF THE ENTIRE DISTURBED AREA, CONVERT SKIMMER BASIN TO STORMWATER WETLAND AS SHOWN ON THE APPROVED PLANS.
10. WHEN VEGETATION HAS BECOME ESTABLISHED, CALL FOR A FINAL SITE INSPECTION BY THE ENVIRONMENTAL CONSULTANT, JEEVAN NEUPANE AT 919-819-8907. OBTAIN A CERTIFICATE OF COMPLETION.

EROSION CONTROL NOTES

1. ALL LAND DISTURBING ACTIVITIES SHALL BE CONDUCTED IN ACCORDANCE WITH WAKE COUNTY AND NCDEQ STANDARDS.
2. ALL TEMPORARY EROSION CONTROL MEASURES SHALL BE MAINTAINED IN PROPER WORKING CONDITION DURING THE PERIOD OF CONSTRUCTION.
3. ADDITIONAL EROSION CONTROL MEASURES AND/OR MODIFICATIONS TO PROPOSED MEASURES MAY BE NECESSARY DEPENDING ON ACTUAL SITE CONDITIONS.
4. THE TOTAL DISTURBED AREA = 3.48 ACRES.
5. SILT FENCE OUTLETS TO BE PLACED AT LOW POINTS ALONG SILT FENCE AS NECESSARY.
6. SEE EROSION CONTROL CALCULATIONS SHEET C-2.
7. SEDIMENT BASIN GRADES SHOWN ARE 2H:1V INTERIOR SLOPES AND 2.5H:1V ON THE OUTER FILL SLOPE/EMBANKMENT.
8. RIP RAP ENERGY DISSIPATOR DIMENSIONS SHOWN ON DETAIL SHEET C-11.
9. DISTURBED AREAS TO BE STABILIZED AND GROUND COVER SHOULD BE ACHIEVED WITHIN 7 WORKING DAYS FOLLOWING COMPLETION OF DEVELOPMENT.



CALL 48 HOURS BEFORE YOU DIG

NORTH CAROLINA ONE-CALL CENTER
1-800-632-4949

WATER PERMITS

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 #** _____

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

FLM ENGINEERING

POST OFFICE BOX 91727
RALEIGH, NORTH CAROLINA 27675
PHONE: 919.610.1051
FIRM NC LICENSE NUMBER C-4222

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 041421 CHRISTOPHER A. LEWIS

REVISION HISTORY

REV #	DESCRIPTION	DATE	BY

ORIGINAL PLAN SIZE: 24" X 36"

ISSUED FOR PERMITTING
DO NOT USE FOR CONSTRUCTION

40 20 0 40
SCALE: 1 INCH = 40 FEET

SCALE ADJUSTMENT
THIS BAR IS 1 INCH IN LENGTH ON ORIGINAL DRAWING
0 1"
IF IT IS NOT 1 INCH ON THIS SHEET, ADJUST YOUR SCALE ACCORDINGLY

CONSTRUCTION PLANS FOR GRANITE FALLS BLVD. EXTENSION

ROLESVILLE, NC

BARRINGTON DEVELOPMENT, LLC

DATE:	02-28-2020
SCALE:	AS SHOWN
DESIGNED BY:	FLM
APPROVED BY:	FLM
PROJECT NO.:	20012

EROSION & SEDIMENT CONTROL PLAN - PHASE 1

C-6

SHEET 6 OF 18

LEGEND

- EX. PROPERTY LINE
- EX. RIGHT-OF-WAY
- EX. SUBDIVISION LINE
- EX. ADJACENT OWNERS
- EX. EASEMENT
- EX. ROAD CENTERLINE
- EX. CHANNEL/STREAM
- EX. CHANNEL/STREAM BUFFER
- W — W EX. WATER LINE
- SS — SS EX. SANITARY SEWER
- PROP. LOT LINES
- PROP. RIGHT-OF-WAY
- PROP. SETBACK LINE
- PROP. EASEMENT
- 440 PROP. MAJOR CONTOUR (5')
- PROP. MINOR CONTOUR (1')
- W — W PROP. WATER LINE
- SS — SS PROP. SANITARY SEWER
- PROP. STORM SEWER
- LD — LD PROP. LIMIT OF DISTURBANCE
- ADDITIONAL LIMIT OF DISTURBANCE
- >> TD >> PROP. TEMP. DIVERSION DITCH
- SF — SF PROP. SILT FENCE
- —X—X—X—X— PROP. BAFFLE
- PROP. FAIRCLOTH SKIMMER
- PROP. NAG S75, OR EQUIVALENT, SLOPE PROTECTION
- PROP. CONSTRUCTION ENTRANCE
- PROP. SILT FENCE OUTLET
- PROP. ROCK CHECK DAM
- PROP. INLET PROTECTION

BASIN REMOVAL SEQUENCE

1. SCHEDULE A SITE MEETING WITH THE ENVIRONMENTAL ENGINEER/CONSULTANT TO DETERMINE IF A BASIN CAN BE CONVERTED.
2. DEWATER BASIN VIA SILT BAG. FINE GRADE STORMWATER WETLAND IN PREPARATION FOR PLANTING AND PERFORM AS-BUILT SURVEY TO VERIFY THAT GRADES MEET DESIGN.
3. PERFORM PLANTING PREPARATION, PLANT, SEED, MULCH AND ASPHALT TACK ANY RESULTING BARE AREAS IMMEDIATELY.
4. WHEN BASIN CONVERSION IS COMPLETE, CALL ENVIRONMENTAL ENGINEER/CONSULTANT FOR APPROVAL OF REMOVING REMAINING TEMPORARY EROSION CONTROL MEASURES AND ADVICE ON WHEN SITE CAN BE ISSUED A CERTIFICATE OF COMPLETION.

WAKE COUNTY STOCKPILE REQUIREMENTS

EFFECTIVE SEPTEMBER 1, 2008 - SOIL STOCKPILES SHALL BE LOCATED ON THE APPROVED PLAN AND SHALL ADHERE TO THE FOLLOWING REQUIREMENTS:

DESIGN CRITERIA

A. A 25-FOOT TEMPORARY MAINTENANCE AND ACCESS EASEMENT SHALL BE SHOWN AROUND ALL PROPOSED STOCKPILES (EROSION CONTROL MEASURES SURROUNDING THE STOCKPILE SHALL BE SHOWN AT THE OUTER LIMIT OF THIS EASEMENT).

B. STOCKPILE FOOTPRINTS SHALL BE SETBACK A MINIMUM OF 25' FROM ADJACENT PROPERTY LINES.

C. A NOTE SHALL BE PROVIDED ON THE APPROVED PLAN THAT STOCKPILE HEIGHT SHALL NOT EXCEED 35 FEET.

D. STOCKPILE SLOPES SHALL BE 2:1 OR FLATTER.

E. APPROVED BMPS SHALL BE SHOWN ON A PLAN TO CONTROL ANY POTENTIAL SEDIMENT LOSS FROM A STOCKPILE.

F. STOCKPILING MATERIALS ADJACENT TO A DITCH, DRAINAGEWAY, WATERCOURSE, WETLAND, STREAM BUFFER, OR OTHER BODY OF WATER SHALL BE AVOIDED UNLESS AN ALTERNATIVE LOCATION IS DEMONSTRATED TO BE UNAVAILABLE.

G. ANY CONCENTRATED FLOW LIKELY TO AFFECT THE STOCKPILE SHALL BE DIVERTED TO AN APPROVED BMP.

H. OFF-SITE SPOIL OR BORROW AREAS MUST BE IN COMPLIANCE WITH WAKE COUNTY UDO AND STATE REGULATIONS. ALL SPOIL AREAS OVER AN ACRE ARE REQUIRED TO HAVE AN APPROVED SEDIMENT CONTROL PLAN. DEVELOPER/CONTRACTOR SHALL NOTIFY WAKE COUNTY OF ANY OFFSITE DISPOSAL OF SOIL, PRIOR TO DISPOSAL. FILL OF FEMA FLOODWAYS AND NON-ENCROACHMENT AREAS ARE PROHIBITED EXCEPT AS OTHERWISE PROVIDED BY SUBSECTION 14-19-2 OF THE WAKE COUNTY UNIFIED DEVELOPMENT ORDINANCE (CERTIFICATIONS AND PERMITS REQUIRED).

MAINTENANCE REQUIREMENTS TO BE NOTED ON THE PLAN

I. SEEDING OR COVERING STOCKPILES WITH TARPS OR MULCH IS REQUIRED AND WILL REDUCE EROSION PROBLEMS. TARPS SHOULD BE KEYED IN AT THE TOP OF THE SLOPE TO KEEP WATER FROM RUNNING UNDERNEATH THE PLASTIC.

J. IF A STOCKPILE IS TO REMAIN FOR FUTURE USE AFTER THE PROJECT IS COMPLETE (BUILDERS, ETC.), THE FINANCIAL RESPONSIBLE PARTY MUST NOTIFY WAKE COUNTY OF A NEW RESPONSIBLE PARTY FOR THAT STOCKPILE.

K. THE APPROVED PLAN SHALL PROVIDE FOR THE USE OF STAGED SEEDING AND MULCHING ON A CONTINUAL BASIS WHILE THE STOCKPILE IS IN USE.

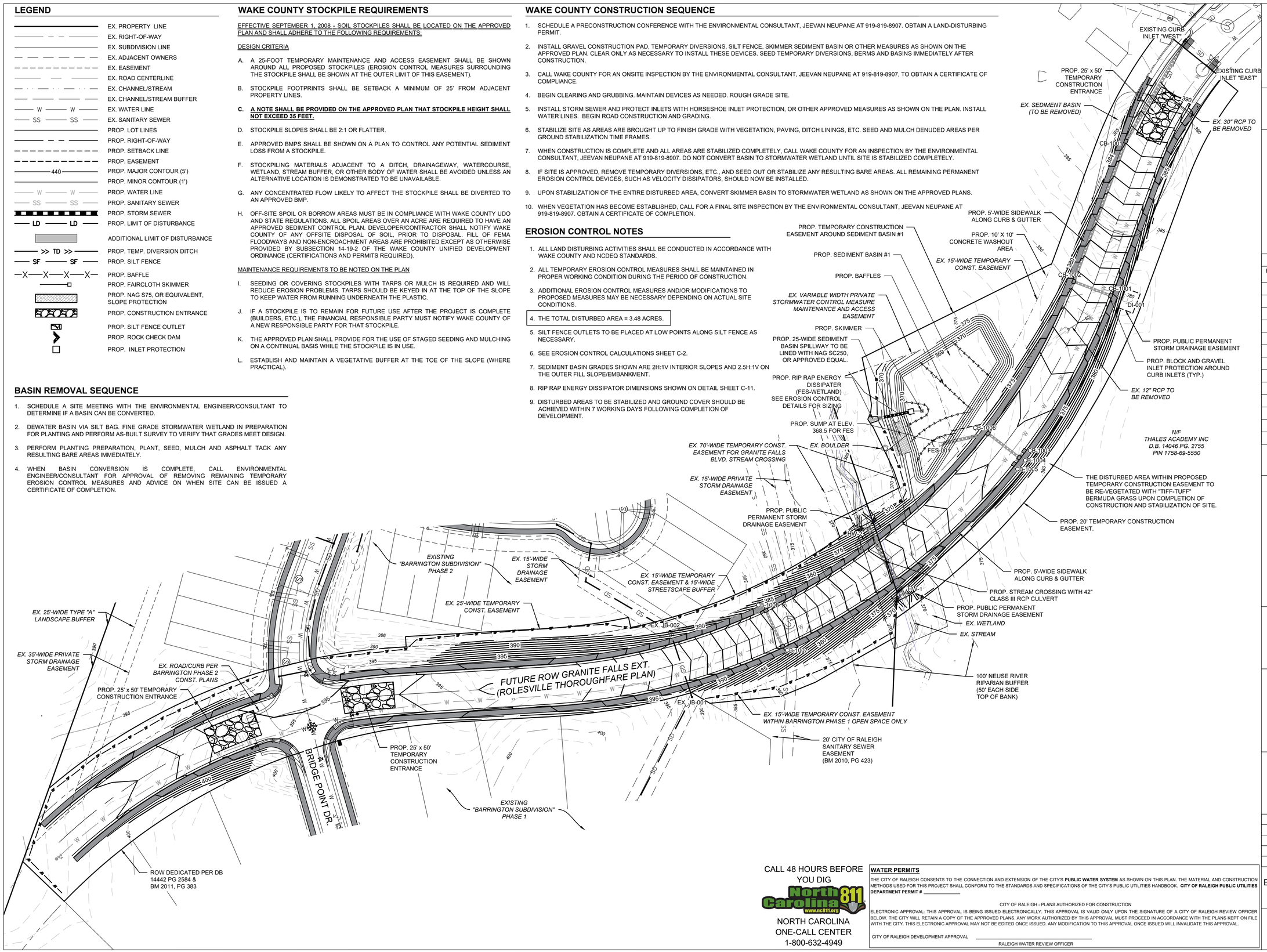
L. ESTABLISH AND MAINTAIN A VEGETATIVE BUFFER AT THE TOE OF THE SLOPE (WHERE PRACTICAL).

WAKE COUNTY CONSTRUCTION SEQUENCE

1. SCHEDULE A PRECONSTRUCTION CONFERENCE WITH THE ENVIRONMENTAL CONSULTANT, JEEVAN NEUPANE AT 919-819-8907. OBTAIN A LAND-DISTURBING PERMIT.
2. INSTALL GRAVEL CONSTRUCTION PAD, TEMPORARY DIVERSIONS, SILT FENCE, SKIMMER SEDIMENT BASIN OR OTHER MEASURES AS SHOWN ON THE APPROVED PLAN. CLEAR ONLY AS NECESSARY TO INSTALL THESE DEVICES. SEED TEMPORARY DIVERSIONS, BERMS AND BASINS IMMEDIATELY AFTER CONSTRUCTION.
3. CALL WAKE COUNTY FOR AN ONSITE INSPECTION BY THE ENVIRONMENTAL CONSULTANT, JEEVAN NEUPANE AT 919-819-8907, TO OBTAIN A CERTIFICATE OF COMPLIANCE.
4. BEGIN CLEARING AND GRUBBING. MAINTAIN DEVICES AS NEEDED. ROUGH GRADE SITE.
5. INSTALL STORM SEWER AND PROTECT INLETS WITH HORSESHOE INLET PROTECTION, OR OTHER APPROVED MEASURES AS SHOWN ON THE PLAN. INSTALL WATER LINES. BEGIN ROAD CONSTRUCTION AND GRADING.
6. 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.
7. WHEN CONSTRUCTION IS COMPLETE AND ALL AREAS ARE STABILIZED COMPLETELY, CALL WAKE COUNTY FOR AN INSPECTION BY THE ENVIRONMENTAL CONSULTANT, JEEVAN NEUPANE AT 919-819-8907. DO NOT CONVERT BASIN TO STORMWATER WETLAND UNTIL SITE IS STABILIZED COMPLETELY.
8. IF SITE IS APPROVED, REMOVE TEMPORARY DIVERSIONS, ETC., AND SEED OUT OR STABILIZE ANY RESULTING BARE AREAS. ALL REMAINING PERMANENT EROSION CONTROL DEVICES, SUCH AS VELOCITY DISSIPATORS, SHOULD NOW BE INSTALLED.
9. UPON STABILIZATION OF THE ENTIRE DISTURBED AREA, CONVERT SKIMMER BASIN TO STORMWATER WETLAND AS SHOWN ON THE APPROVED PLANS.
10. WHEN VEGETATION HAS BECOME ESTABLISHED, CALL FOR A FINAL SITE INSPECTION BY THE ENVIRONMENTAL CONSULTANT, JEEVAN NEUPANE AT 919-819-8907. OBTAIN A CERTIFICATE OF COMPLETION.

EROSION CONTROL NOTES

1. ALL LAND DISTURBING ACTIVITIES SHALL BE CONDUCTED IN ACCORDANCE WITH WAKE COUNTY AND NCDEQ STANDARDS.
2. ALL TEMPORARY EROSION CONTROL MEASURES SHALL BE MAINTAINED IN PROPER WORKING CONDITION DURING THE PERIOD OF CONSTRUCTION.
3. ADDITIONAL EROSION CONTROL MEASURES AND/OR MODIFICATIONS TO PROPOSED MEASURES MAY BE NECESSARY DEPENDING ON ACTUAL SITE CONDITIONS.
4. THE TOTAL DISTURBED AREA = 3.48 ACRES.
5. SILT FENCE OUTLETS TO BE PLACED AT LOW POINTS ALONG SILT FENCE AS NECESSARY.
6. SEE EROSION CONTROL CALCULATIONS SHEET C-2.
7. SEDIMENT BASIN GRADES SHOWN ARE 2H:1V INTERIOR SLOPES AND 2.5H:1V ON THE OUTER FILL SLOPE/EMBANKMENT.
8. RIP RAP ENERGY DISSIPATOR DIMENSIONS SHOWN ON DETAIL SHEET C-11.
9. DISTURBED AREAS TO BE STABILIZED AND GROUND COVER SHOULD BE ACHIEVED WITHIN 7 WORKING DAYS FOLLOWING COMPLETION OF DEVELOPMENT.



CALL 48 HOURS BEFORE YOU DIG

NORTH CAROLINA ONE-CALL CENTER
1-800-632-4949

WATER PERMITS

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 #** _____

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

FLM ENGINEERING

POST OFFICE BOX 91727
RALEIGH, NORTH CAROLINA 27675
PHONE: 919.610.1051
FIRM NC LICENSE NUMBER C-4222

NORTH CAROLINA PROFESSIONAL SEAL 041421 ENGINEER CHRISTOPHER A. LEWIS

REVISION HISTORY

REV #	DESCRIPTION	DATE	BY

ORIGINAL PLAN SIZE: 24" X 36"

ISSUED FOR PERMITTING
DO NOT USE FOR CONSTRUCTION

40 20 0 40
SCALE: 1 INCH = 40 FEET

SCALE ADJUSTMENT
THIS BAR IS 1 INCH IN LENGTH ON ORIGINAL DRAWING
0 1"
IF IT IS NOT 1 INCH ON THIS SHEET, ADJUST YOUR SCALE ACCORDINGLY

CONSTRUCTION PLANS FOR GRANITE FALLS BLVD. EXTENSION

ROLESVILLE, NC

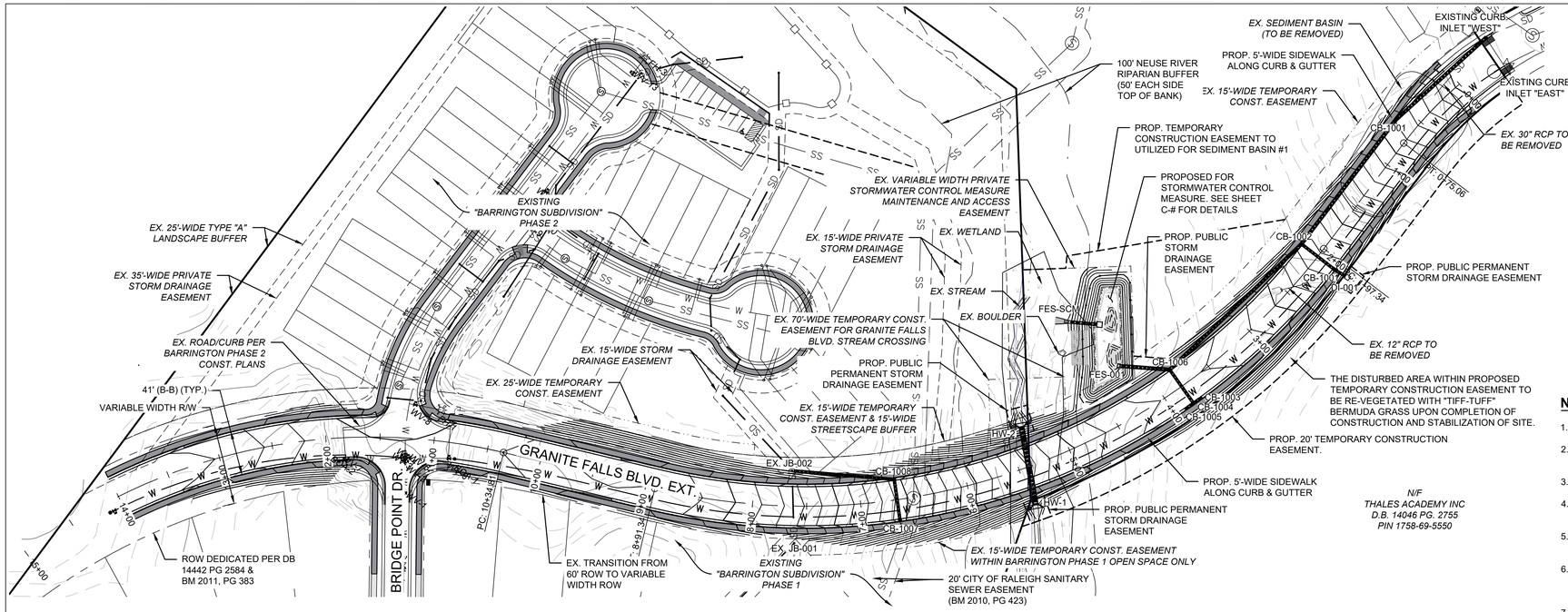
BARRINGTON DEVELOPMENT, LLC

DATE:	02-28-2020
SCALE:	AS SHOWN
DESIGNED BY:	FLM
APPROVED BY:	FLM
PROJECT NO.:	20012

EROSION & SEDIMENT CONTROL PLAN - PHASE 2

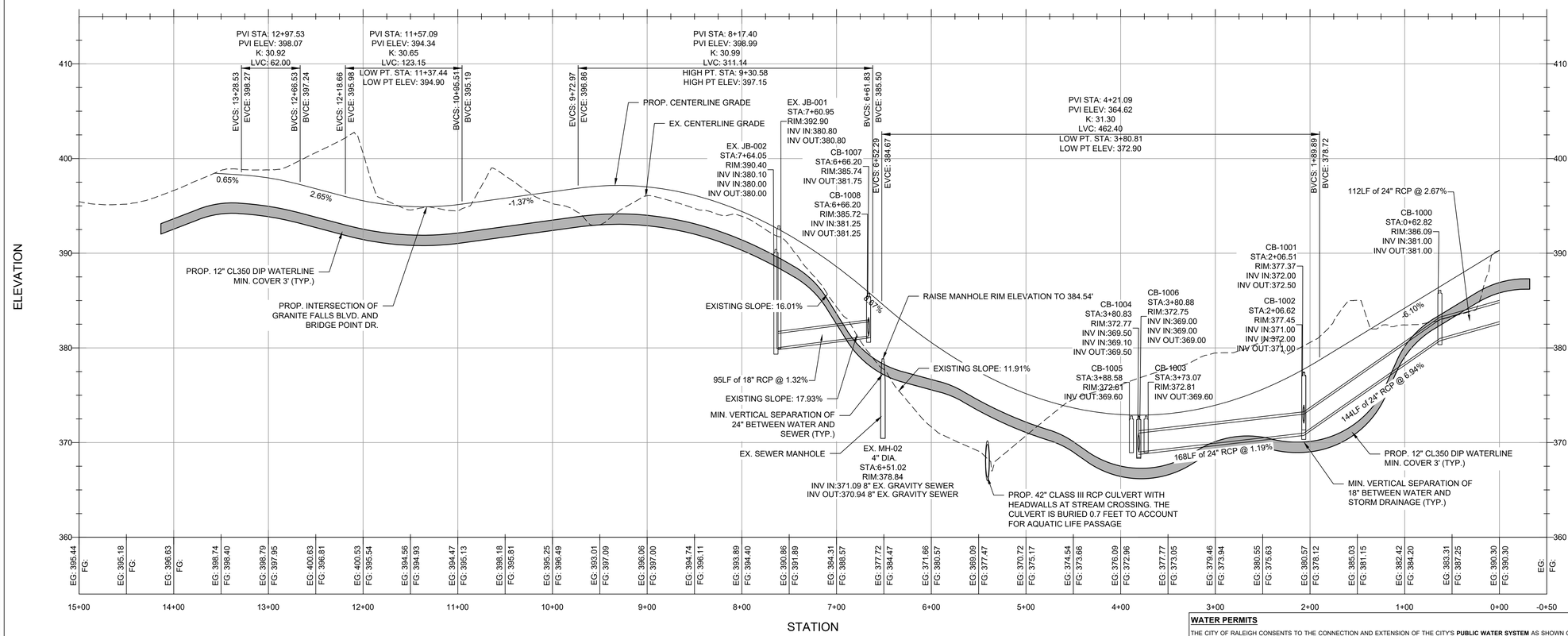
C-7

SHEET 7 OF 18



GRANITE FALLS BLVD. EXT. PLAN VIEW

STA 0+00 - STA 15+00



SCALE: 1 INCH = 60 FEET
HORIZONTAL SCALE

GRANITE FALLS BLVD. EXT. PROFILE VIEW

STA 0+00 - STA 15+00

SCALE: 1 INCH = 6 FEET
VERTICAL SCALE

LEGEND

	EX. PROPERTY LINE
	EX. RIGHT-OF-WAY
	EX. ADJACENT OWNERS
	EX. EASEMENT
	EX. ROAD CENTERLINE
325	EX. MAJOR CONTOUR (5')
324	EX. MINOR CONTOUR (1')
OHW	EX. OVERHEAD ELECTRIC LINE
W	EX. WATER LINE
SS	EX. SANITARY SEWER
SD	EX. STORM SEWER
	PROP. PARCEL BOUNDARY
	PROP. RIGHT-OF-WAY
	PROP. LOT LINES
	PROP. SETBACK LINE
	PROP. EASEMENT
325	PROP. MAJOR TOWNHOME PROJECT CONTOUR (5')
324	PROP. MINOR TOWNHOME PROJECT CONTOUR (1')
W	PROP. WATER LINE
SS	PROP. SANITARY SEWER
	PROP. STORM SEWER

NOTES

1. MINIMUM SEPARATION BETWEEN WATER AND STORM DRAINAGE IS 18 INCHES.
2. MINIMUM SEPARATION BETWEEN WATER AND SEWER IS 18 INCHES, WITH WATER BEING ABOVE THE SEWER.
3. MINIMUM SEPARATION BETWEEN SEWER AND STORM DRAINAGE IS 24 INCHES.
4. THE UTILITIES SHOWN ARE NOT GUARANTEED TO BE A REPRESENTATION OF ALL UTILITIES WITHIN THE PROJECT EXTENT.
5. THE CONTRACTOR SHALL CALL THE NORTH CAROLINA ONE-CALL-CENTER AT LEAST 48 HOURS PRIOR TO BEGINNING WORK.
6. THE CONTRACTOR SHALL VERIFY DEPTHS AND LOCATIONS OF ALL UTILITIES PRIOR TO BEGINNING WORK AND SHALL USE CARE WHEN OPERATING AROUND EXISTING UTILITIES.
7. THE CONTRACTOR SHALL BE FINANCIALLY RESPONSIBLE FOR THE REPAIR OF ANY EXISTING UTILITIES DAMAGED DURING CONSTRUCTION.

WATER PERMITS

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 #** _____

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

FLM ENGINEERING

POST OFFICE BOX 91727
RALEIGH, NORTH CAROLINA 27675
PHONE: 919.610.1051
FIRM NC LICENSE NUMBER C-4222

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 041421 CHRISTOPHER A. LEWIS

REVISION HISTORY

REV #	DESCRIPTION	DATE	BY

ORIGINAL PLAN SIZE: 24" X 36"

ISSUED FOR PERMITTING
DO NOT USE FOR CONSTRUCTION

SCALE: 1 INCH = 60 FEET

SCALE ADJUSTMENT
THIS BAR IS 1 INCH IN LENGTH ON ORIGINAL DRAWING
IF IT IS NOT 1 INCH ON THIS SHEET, ADJUST YOUR SCALE ACCORDINGLY

CONSTRUCTION PLANS FOR GRANITE FALLS BLVD. EXTENSION

ROLESVILLE, NC

BARRINGTON DEVELOPMENT, LLC

DATE:	02-28-2020
SCALE:	AS SHOWN
DESIGNED BY:	FLM
APPROVED BY:	FLM
PROJECT NO.:	20012

GRANITE FALLS BLVD. EXT. PLAN & PROFILE

C-8

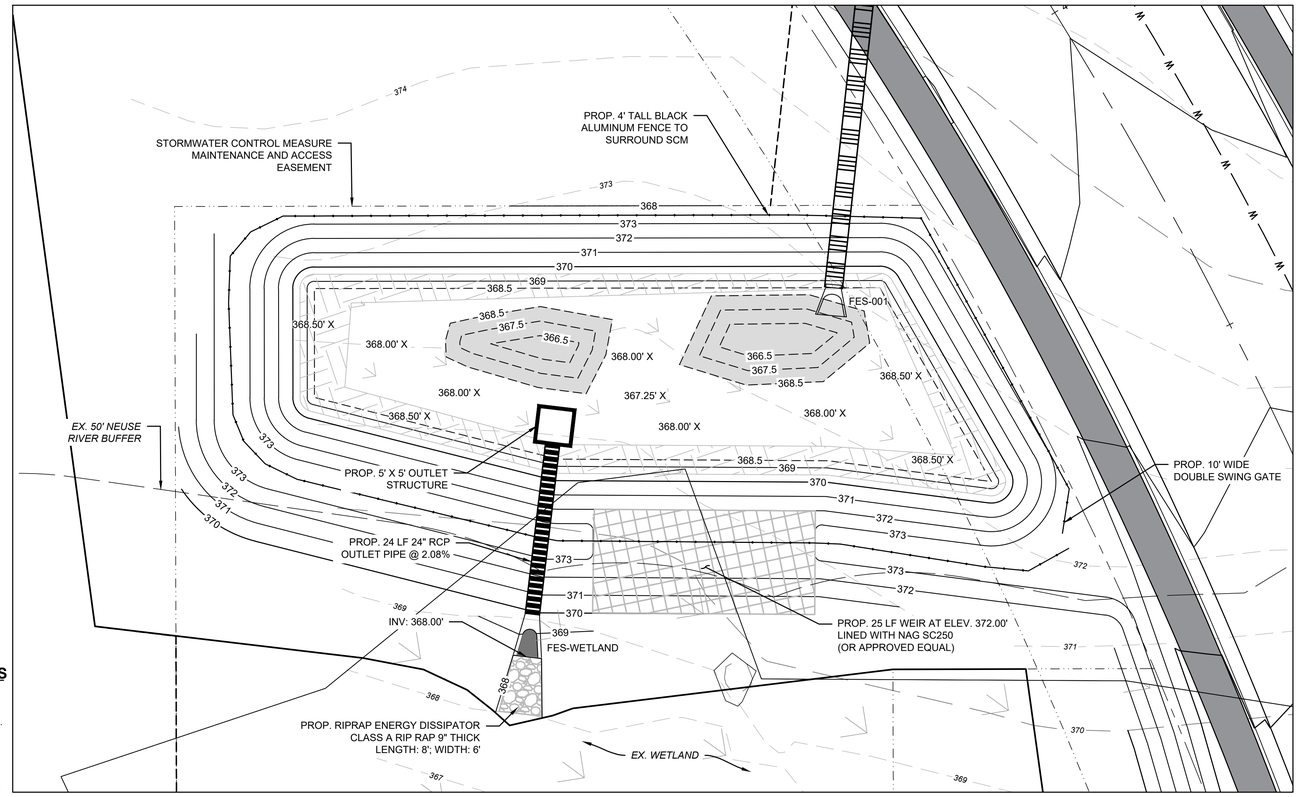
SHEET 1 OF 18

LEGEND

- EX. PROPERTY LINE
- EX. RIGHT-OF-WAY
- EX. ADJACENT OWNERS
- EX. EASEMENT
- EX. ROAD CENTERLINE
- 325 — EX. MAJOR CONTOUR (5')
- EX. MINOR CONTOUR (1')
- EX. CHANNEL/STREAM
- EX. STREAM BUFFER
- EX. BARBED FENCE
- OHW — OHW — EX. OVERHEAD ELECTRIC LINE
- SD — SD — EX. STORM SEWER
- EX. WETLAND
- PROP. RIGHT-OF-WAY
- PROP. LOT LINES
- PROP. SETBACK LINE
- PROP. EASEMENT
- SS — SS — PROP. SANITARY SEWER
- PROP. STORM DITCH
- 300 — PROP. MAJOR CONTOUR (5')
- PROP. MINOR CONTOUR (1')
- PROP. STORM SEWER
- PROP.FLARED END SECTION (FES)
- PROP. RIPRAP DISSIPATOR
- SHALLOW LAND AREA
- SHALLOW WATER AREA
- DEEP POOL AREA

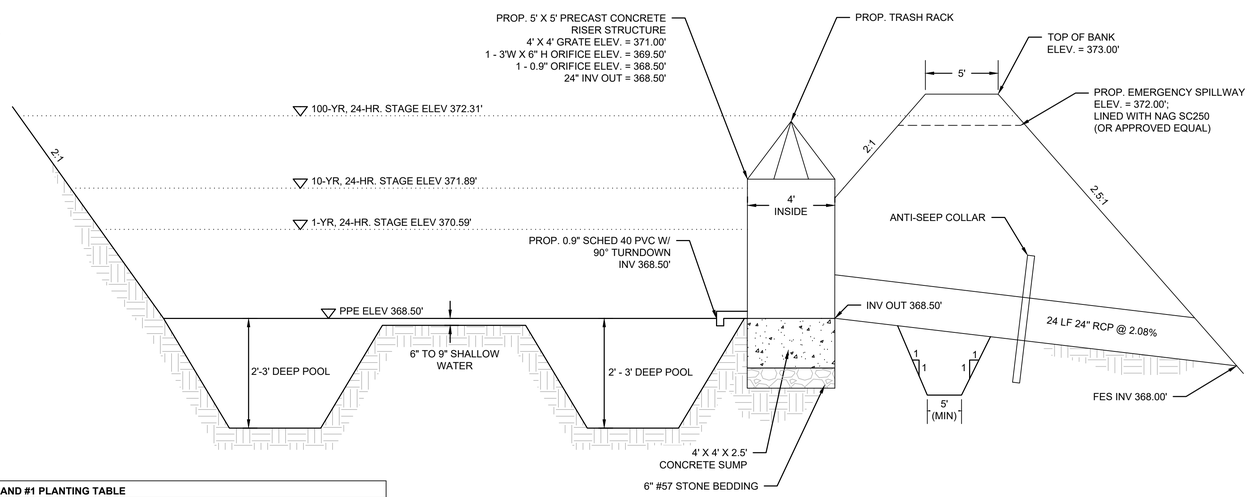
STORMWATER WETLAND MAINTENANCE NOTES

1. THE LANDSCAPE PROFESSIONAL MANAGING THE WETLAND MUST UNDERSTAND THE BIOLOGICAL REQUIREMENTS OF THE PLANTS AND MANAGE WATER LEVELS APPROPRIATELY TO PROVIDE FOR THEIR NEEDS.
2. ALTHOUGH WETLAND PLANTS REQUIRE WATER FOR GROWTH AND REPRODUCTION, THEY CAN BE KILLED BY DROWNING IN EXCESSIVELY DEEP WATER. USUALLY, INITIAL GROWTH IS BEST WITH TRANSPLANTED PLANTS IN WET, WELL-AERATED SOIL. OCCASIONAL INUNDATION FOLLOWED BY EXPOSURE TO AIR OF THE MAJORITY OF THE VEGETATION ENABLES THE PLANTS TO OBTAIN OXYGEN AND GROW OPTIMALLY. CONVERSELY, FREQUENT SOIL SATURATION IS IMPORTANT FOR WETLAND PLANT SURVIVAL.
3. DRAMATIC SHIFTS CAN OCCUR AS PLANT SUCCESSION PROCEEDS. THE PLANT COMMUNITY REFLECTS MANAGEMENT AND CAN INDICATE PROBLEMS OR THE RESULTS OF IMPROVEMENTS. FOR EXAMPLE, A REQUIREMENT OF SUBMERGED AQUATIC PLANTS, SUCH AS PONDWEED (POTAMOGETON SPP.), IS LIGHT PENETRATION INTO THE WATER COLUMN. THE DISAPPEARANCE OF THESE PLANTS MAY INDICATE INADEQUATE WATER CLARITY. THE APPEARANCE OF INVASIVE SPECIES OR DEVELOPMENT OF A MONOCULTURE IS ALSO A SIGN OF A PROBLEM WITH THE AQUATIC/SOIL/VEGETATIVE REQUIREMENTS. FOR INSTANCE, MANY INVASIVE SPECIES CAN QUICKLY SPREAD AND TAKE OVER A WETLAND. IF CATTAILS BECOME INVASIVE, THEY CAN BE REMOVED BY A LICENSED AQUATIC PESTICIDE APPLICATOR BY WIPING AQUATIC GLYPHOSATE, A SYSTEMIC HERBICIDE, ON THE CATTAILS.
4. UNLIKE MAINTENANCE REQUIREMENTS FOR WET OR DRY STORMWATER PONDS, SEDIMENT SHOULD ONLY BE SELECTIVELY REMOVED FROM STORMWATER WETLANDS, PRIMARILY FROM THE FOREBAY.SEDIMENT REMOVAL DISTURBS STABLE VEGETATION COVER AND DISRUPTS FLOWPATHS THROUGH THE WETLAND. THE TOP FEW INCHES OF SEDIMENT SHOULD BE STOCKPILED SO THAT IT CAN BE REPLACED OVER THE SURFACE OF THE WETLAND AFTER THE COMPLETION OF SEDIMENT REMOVAL TO RE-ESTABLISH THE VEGETATIVE COVER USING ITS OWN SEED BANK. ACCUMULATED SEDIMENT SHOULD BE REMOVED FROM AROUND INLET AND OUTLET STRUCTURES.
5. THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION (NCDOT) SHALL NOT BE RESPONSIBLE FOR ANY MAINTENANCE TO THE BEST MANAGEMENT PRACTICES (BMPS).



STORMWATER WETLAND PLAN VIEW

SCALE: 1" = 10'



STORMWATER WETLAND CROSS-SECTION

NOT TO SCALE

STORMWATER WETLAND #1 PLANTING TABLE				
QUANTITY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING
SHALLOW WATER PLANTINGS (AREA = 1,092 SQ. FT.; 50 HERBACEOUS PLANTS PER 200 SQ. FT.; 273 TOTAL PLANTS REQ.)				
54	ACORUS SUBCORDATUM	SWEETFLAG	4 CU. IN.	2' O.C.
54	HYDROLEA QUADRIVALVIS	WATERPOD	4 CU. IN.	2' O.C.
55	IRIS VIRGINICA	BLUE FLAG IRIS	4 CU. IN.	2' O.C.
55	SAGITTARIA LATIFOLIA	DUCK POTATO	4 CU. IN.	2' O.C.
55	SAURURUS CERNUUS	LIZARD'S TAIL	4 CU. IN.	2' O.C.
SHALLOW LAND PLANTINGS (AREA = 841 SQ. FT.; 50 HERBACEOUS PLANTS PER 200 SQ. FT.; 210 TOTAL PLANTS REQ.)				
70	CAREX TENERA	QUILL SEDGE	4 CU. IN.	2' O.C.
70	HIBISCUS COCCINEUS	SCARLET ROSE MALLOW	4 CU. IN.	2' O.C.
70	LOBELIA ELONGATA	LONGLEAF LOBELIA	4 CU. IN.	2' O.C.
DEEP POOL				
20	ELEOCHARIS ACICULARIS	NEEDLE SPIKERUSH	BARE ROOT	N/A
20	NUPHAR LUTEA SSP. ADVENA	YELLOW POND-LILY	BARE ROOT	N/A

NOTES

1. THE WETLAND MUST BE STABILIZED WITHIN 14 DAYS OF CONSTRUCTION. CONSTRUCTION SHALL BE SEQUENCED SO THAT VEGETATION CAN BE PLANTED AND THE WETLAND BROUGHT ONLINE WITHIN 14 DAYS. PLANTS MAY NEED TO BE WATERED DURING THIS TIME IF THE DEVICE IS NOT BROUGHT ONLINE THE SAME DAY. STABILIZATION MAY BE IN THE FORM OF FINAL VEGETATION PLANTINGS OR A TEMPORARY MEANS UNTIL THE VEGETATION BECOMES ESTABLISHED. IF USING A TEMPORARY MEANS, CONTRACTOR SHALL PROVIDE A WET HYDROSEED MIX. CONTRACTOR SHALL SCARIFY THE SOIL TO A HALF-INCH PRIOR TO HYDROSEEDING.
2. INLET AND OUTLET CHANNELS SHALL BE PROTECTED FROM SCOUR THAT MAY OCCUR DURING PERIODS OF HIGH FLOW. STANDARD EROSION CONTROL MEASURES SHOULD BE USED.
3. THE STORMWATER WETLAND SHOULD BE STAKED AT THE ONSET OF THE PLANTING SEASON. WATER DEPTHS IN THE WETLAND SHOULD BE MEASURED TO CONFIRM THE ORIGINAL PLANTING ZONES. AT THIS TIME, IT MAY BE NECESSARY TO MODIFY THE PLANTING PLAN TO REFLECT ALTERED DEPTHS OR THE AVAILABILITY OF WETLAND PLANT STOCK. CONTRACTOR SHALL COORDINATE PLANTINGS, PLANTING ZONES AND WATER DEPTHS WITH THE ENGINEER. SURVEYED PLANTING ZONES SHOULD BE MARKED ON AN "AS-BUILT" OR RECORD DESIGN PLAN AND LOCATED IN THE FIELD USING STAKES OR FLAGS.
4. THE WETLAND DRAIN SHOULD BE FULLY OPENED FOR NO MORE THAN 3 DAYS PRIOR TO THE PLANTING DATE (WHICH SHOULD COINCIDE WITH THE DELIVERY DATE FOR THE WETLAND PLANT STOCK) TO PRESERVE SOIL MOISTURE AND WORKABILITY.
5. NURSERY STOCK SHALL BE TRANSPLANTED FROM LOCAL AQUATIC PLANT NURSERIES. THE OPTIMAL PERIOD FOR TRANSPLANTING EXTENDS FROM EARLY APRIL TO MID-JUNE SO THAT THE WETLAND PLANTS WILL HAVE A FULL GROWING SEASON TO BUILD THE ROOT RESERVES NEEDED TO SURVIVE THE WINTER. HOWEVER, SOME SPECIES MAY BE PLANTED SUCCESSFULLY IN EARLY FALL. CONTRACTOR SHALL CONTACT NURSERY WELL IN ADVANCE OF CONSTRUCTION TO ENSURE THAT THEY WILL HAVE THE DESIRED SPECIES AVAILABLE.
6. POST-NURSERY CARE OF WETLAND PLANTS IS VERY IMPORTANT IN THE INTERVAL BETWEEN DELIVERY OF THE PLANTS AND THEIR SUBSEQUENT INSTALLATION BECAUSE THEY ARE PRONE TO DESICCATION. STOCK SHOULD BE FREQUENTLY WATERED AND SHADED.
7. SHWT TO BE EVALUATED PRIOR TO CONSTRUCTION. IF SHWT IS WITHIN 6" OF PPE ELEVATION, A CLAY LINER WILL NOT BE REQUIRED. OTHERWISE, INSTALLATION OF A 6" CLAY LINER WILL BE REQUIRED. CLAY LINER SHALL HAVE A MINIMUM 15% PASSING THE #200 SIEVE AND A MAX PERMEABILITY OF 1 X 10^{-5} CM/SEC. ACCEPTABLE ALTERNATIVES INCLUDE A 30 MIL POLY-LINER OR A BENTONITE LINER.
8. GRADES SHOWN REPRESENT FINISH GRADE ELEVATIONS. TO ACHIEVE FINISH GRADE ELEVATIONS, INSTALL 4" OF TOPSOIL.
9. PROVIDE PLANTS PER TABLE ON THIS SHEET. DAM STRUCTURE AND PERIMETER FILL SLOPES SHALL BE PLANTED WITH NON-CLUMPING TURF GRASS. TREES AND WOODY SHRUBS NOT ALLOWED.
10. CATTAILS SHALL NOT BE PLANTED IN WETLAND.

OUTLET STRUCTURE NOTES & SPECIFICATIONS

1. RCP OUTLET SHALL BE CLASS III RCP MEETING REQUIREMENTS OF ASTM C76. THE PIPE JOINTS SHALL BE MORTAR OR FLEXIBLE PLASTIC TYPE JOINT.
2. THE MANHOLE OUTLET RISER SHALL MEET ASTM C-913. THE MANHOLE JOINTS SHALL BE ASTM C-443 RUBBER GASKET JOINTS. MANHOLE JOINTS SHALL BE SECURELY ANCHORED TO PREVENT SEPARATION. CONTRACTOR IS RESPONSIBLE FOR DESIGN OF THE MANHOLE SECTION ANCHORING SYSTEM.
3. WATERTIGHT SEAL SHALL BE PROVIDED AT RISER/BARREL INTERFACE. PERVIOUS MATERIAL SUCH AS SAND, GRAVEL, OR CRUSHED STONE SHALL NOT BE USED AS BACKFILL AROUND THE PIPE OR ANTI-SEEP COLLAR. FILL MATERIAL AROUND THE RISER/BARREL STRUCTURE SHALL BE PLACED IN 4" LAYERS AND COMPACTED TO THE SAME DENSITY AS THE ADJACENT EMBANKMENT.
4. OUTLET STRUCTURE SHALL BE PROVIDED WITH STEPS 1'-2" ON CENTER. STEPS SHALL BE IN ACCORDANCE WITH NCDOT STD. 840.66.
5. CONCRETE ANTI-FLOATATION BLOCK SHALL BE PRECAST DURING FABRICATION. IF THE CONCRETE ANTI-FLOATATION BLOCK IS CAST SEPARATE FROM THE MANHOLE ASSEMBLY THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANCHORING THE ANTI-FLOATATION BLOCK TO THE MANHOLE RISER ASSEMBLY.
6. ALL POURED CONCRETE SHALL BE A MINIMUM 3,000 PSI (28 DAY) UNLESS OTHERWISE NOTED.
7. NON-WOVEN GEOTEXTILE FABRIC SHALL BE PLACED AROUND EACH JOINT OF THE RCP OUTLET BARREL IN 2' WIDE STRIPS CENTERED ON JOINT. FABRIC SHALL BE AMOCO STYLE 4553 POLYPROPYLENE NON-WOVEN NEEDLE PUNCHED OR APPROVED EQUAL (NON-WOVEN FABRIC).

BERM SPECIFICATIONS

1. ALL FILL SOILS FOR BERM SECTION SHALL BE CLEAN, IMPERMEABLE MATERIAL AND COMPACTED TO AT LEAST 98% STANDARD PROCTOR MAXIMUM DRY DENSITY, AT OPTIMUM MOISTURE CONTENT. NO BLASTED MATERIALS SHALL BE USED IN THE EMBANKMENT CONSTRUCTION. SOILS SHALL NOT EXHIBIT SIGNIFICANT SHRINK/SWELL OR DISPERSIVE CHARACTERISTICS. THE ON-SITE GEOTECHNICAL ENGINEER SHALL APPROVE THE SOILS FOR PLACEMENT WITHIN THE BERM SECTION. THE GEOTECHNICAL ENGINEER SHALL ALSO SPECIFY THE METHODS TO BE USED FOR PLACEMENT OF FILL.
2. IN ALL FILL AREAS OF THE BERM, A SOILS COMPACTION TEST SHALL BE CONDUCTED EACH 2,500 SQUARE FEET PER VERTICAL CUT OF FILL.
3. A KEY TRENCH IS TO BE PROVIDED IN ALL FILL AREAS. TRENCH TO EXTEND A MINIMUM OF TWO FEET BELOW EXISTING GRADE. THE MINIMUM BOTTOM WIDTH SHALL BE WIDE ENOUGH TO PERMIT OPERATION OF EXCAVATION AND COMPACTION EQUIPMENT, BUT IN NO CASE SHALL BE LESS THAN 2' WIDE. CONTRACTOR SHALL CONFIRM KEY TRENCH DEPTH AND WIDTH WITH THE ON-SITE GEOTECHNICAL ENGINEER. SOILS AND COMPACTION FOR KEY TRENCH SHALL MEET ALL REQUIREMENTS OF #1 ABOVE.
4. FILL PLACEMENT SHALL NOT EXCEED A MAXIMUM OF 8" LIFTS. EACH LIFT SHALL BE CONTINUOUS FOR THE ENTIRE LENGTH OF EMBANKMENT. BEFORE PLACEMENT OF FILL FOR THE BERM SECTION, ALL UNSUITABLE MATERIAL SHALL BE REMOVED AND THE SURFACE PROPERLY PREPARED FOR FILL PLACEMENT.
5. NO TREES OF ANY TYPE MAY BE LOCATED ON THE BERM SECTION.
6. WEIR SHALL BE LINED WITH NORTH AMERICAN GREEN SC250 MATTING, OR APPROVED EQUAL.
7. SIDE SLOPES SHALL BE LINED WITH NAG S75, OR APPROVED EQUAL.
8. INSTALL ANTI-SEEP COLLAR AT MIDPOINT OF OUTLET PIPE. CONCRETE SHALL BE 3,000 PSI (28 DAYS) AND REINFORCED WITH #4 REBAR 12" O.C. EACH WAY. MINIMUM BEARING CAPACITY BENEATH COLLAR SHALL BE 2,000 PSF.

WATER PERMITS

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 #** _____

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

FLM ENGINEERING

POST OFFICE BOX 91727
RALEIGH, NORTH CAROLINA 27675
PHONE: 919.610.1051
FIRM NC LICENSE NUMBER C-4222

NORTH CAROLINA PROFESSIONAL SEAL 041421 ENGINEER CHRISTOPHER A. LEWIS

REVISION HISTORY

REV #	DESCRIPTION	DATE	BY

ORIGINAL PLAN SIZE: 24" X 36"

ISSUED FOR PERMITTING
DO NOT USE FOR CONSTRUCTION

10 5 0 10
SCALE: 1 INCH = 10 FEET

SCALE ADJUSTMENT

THIS BAR IS 1 INCH IN LENGTH ON ORIGINAL DRAWING
0 1"
IF IT IS NOT 1 INCH ON THIS SHEET, ADJUST YOUR SCALE ACCORDINGLY

CONSTRUCTION PLANS FOR GRANITE FALLS BLVD. EXTENSION

ROLESVILLE, NC

BARRINGTON DEVELOPMENT, LLC

DATE:	02-28-2020
SCALE:	AS SHOWN
DESIGNED BY:	FLM
APPROVED BY:	FLM
PROJECT NO.:	20012

STORMWATER DETAILS

C-9

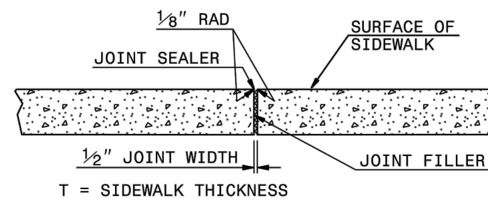
SHEET 9 OF 18

NOTES:

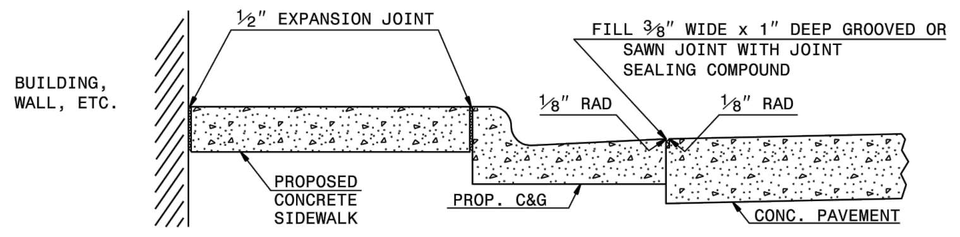
CONSTRUCT STANDARD SIDEWALK 5′ WIDE AND 4″ THICK UNLESS OTHERWISE DENOTED ON PLANS.

PLACE A GROOVE JOINT 1″ DEEP WITH 1/8″ RADII IN THE CONCRETE SIDEWALK AT 5′ INTERVALS. ONE 1/2″ EXPANSION JOINT WILL BE REQUIRED AT 50′ INTERVALS. A 1/2″ 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

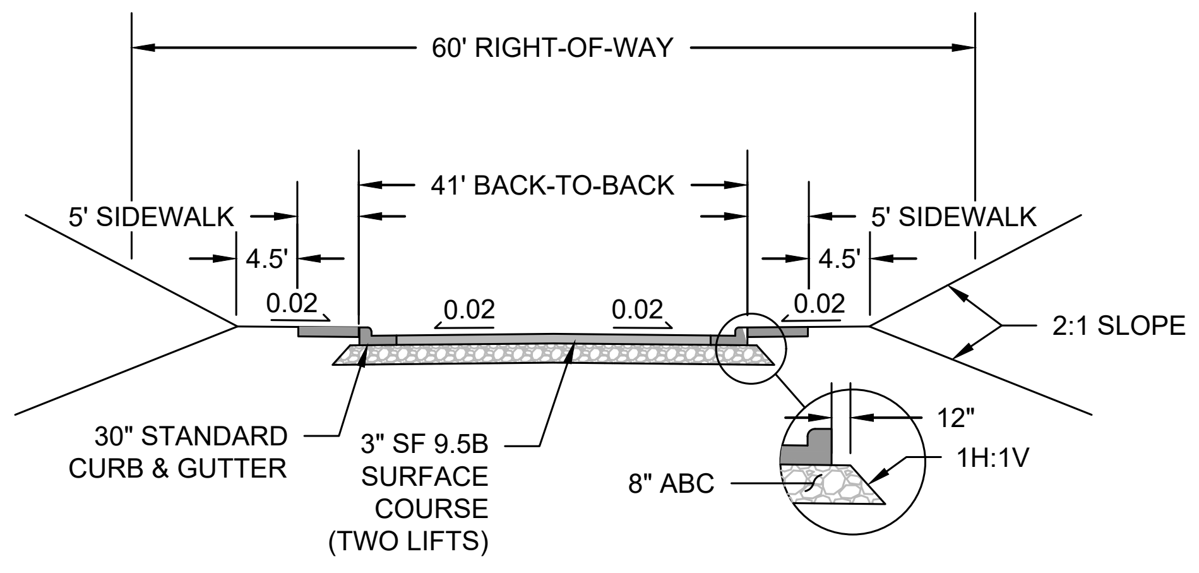


DETAILS SHOWING JOINTS IN CONCRETE SIDEWALK

1-18
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

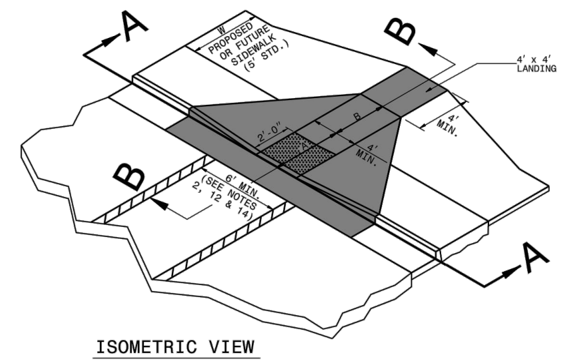
ROADWAY STANDARD DRAWING FOR
CONCRETE SIDEWALK

SHEET 1 OF 1
848.01



TYPICAL ROADWAY CROSS-SECTION

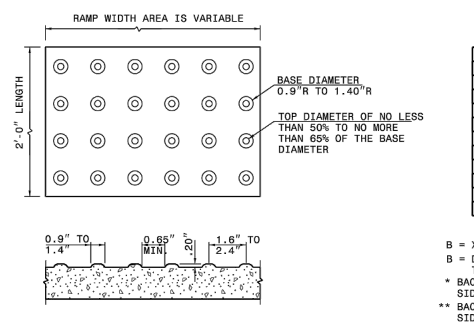
NO SCALE



ISOMETRIC VIEW

▨ PAY LIMITS FOR CURB RAMP

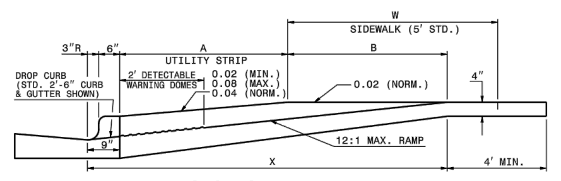
NOTES:
1. DETECTABLE WARNING DOMES WILL COVER 2′-0″ LENGTH AND FULL WIDTH OF THE RAMP FLOOR AS SHOWN ON THE DETAILS.
2. DETECTABLE WARNING DOMES WILL CONTRAST VISIBILITY WITH ADJOINING SURFACE, EITHER LIGHT-ON-DARK, OR DARK-ON-LIGHT SEQUENCE COVERING THE ENTIRE RAMP.



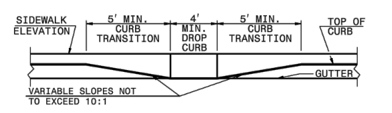
DETECTABLE WARNING DOMES

W	A	W+A+9″	X	B
5′	0.0′	5.8′	5.8′	5.0′*
6′	0.0′	6.8′	6.8′	6.0′**
7′	0.0′	7.8′	7.3′	6.5′**
8′	0.0′	8.8′	7.3′	6.5′**
5′	2.0′	7.8′	7.8′	5.0′
5′	2.5′	8.3′	8.1′	4.8′
5′	3.0′	8.8′	8.3′	4.4′
5′	3.5′	9.3′	8.4′	4.1′
5′	4.0′	9.8′	8.6′	3.8′
5′	4.5′	10.3′	8.7′	3.4′
5′	5.0′	10.8′	8.9′	3.1′

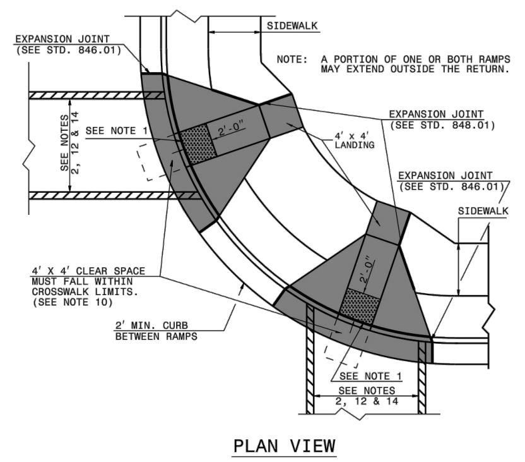
B = X-(A+9″)
B = DISTANCE FROM FRONT EDGE OF SIDEWALK TO BACK POINT OF 12:1 (8.33%) SLOPE.
* BACK OF SIDEWALK DROP REQUIRED FOR ALL SIDEWALK SLOPES.
** BACK OF SIDEWALK DROP REQUIRED FOR SIDEWALK SLOPES 0.04.



SECTION B-B



SECTION A-A

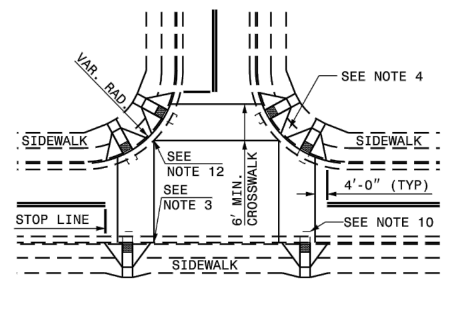


PLAN VIEW
DUAL RAMPS
ANY RADII
(4′ MIN. FLOOR WIDTH)

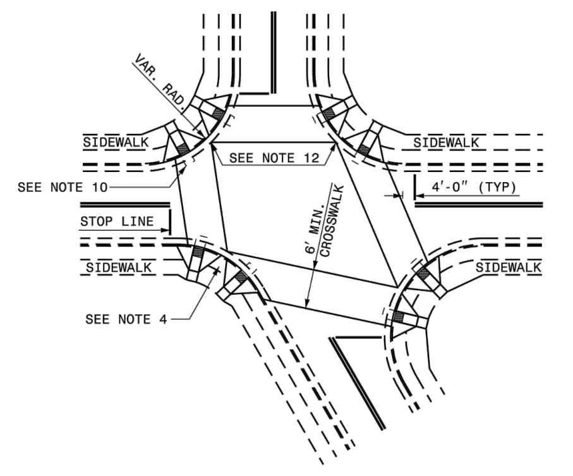
1-18
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY STANDARD DRAWING FOR
CURB RAMP
PROPOSED CURB AND GUTTER

SHEET 1 OF 3
848.05



DETAIL SHOWING TYPICAL LOCATION OF CURB RAMPS, PEDESTRIAN CROSSWALKS AND STOP LINES FOR TEE INTERSECTIONS



DETAIL SHOWING TYPICAL LOCATION OF CURB RAMPS, PEDESTRIAN CROSSWALKS AND STOP LINES

ROADWAY PLAN SYMBOL
CR
FOR PROPOSED CURB RAMP

PROPOSED CURB RAMP W/ LANDING
PROPOSED OR FUTURE SIDEWALK

ALLOWABLE LOCATIONS
DUAL RAMP RADII..........ANY

1-18
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY STANDARD DRAWING FOR
CURB RAMP
PROPOSED CURB AND GUTTER

SHEET 2 OF 3
848.05

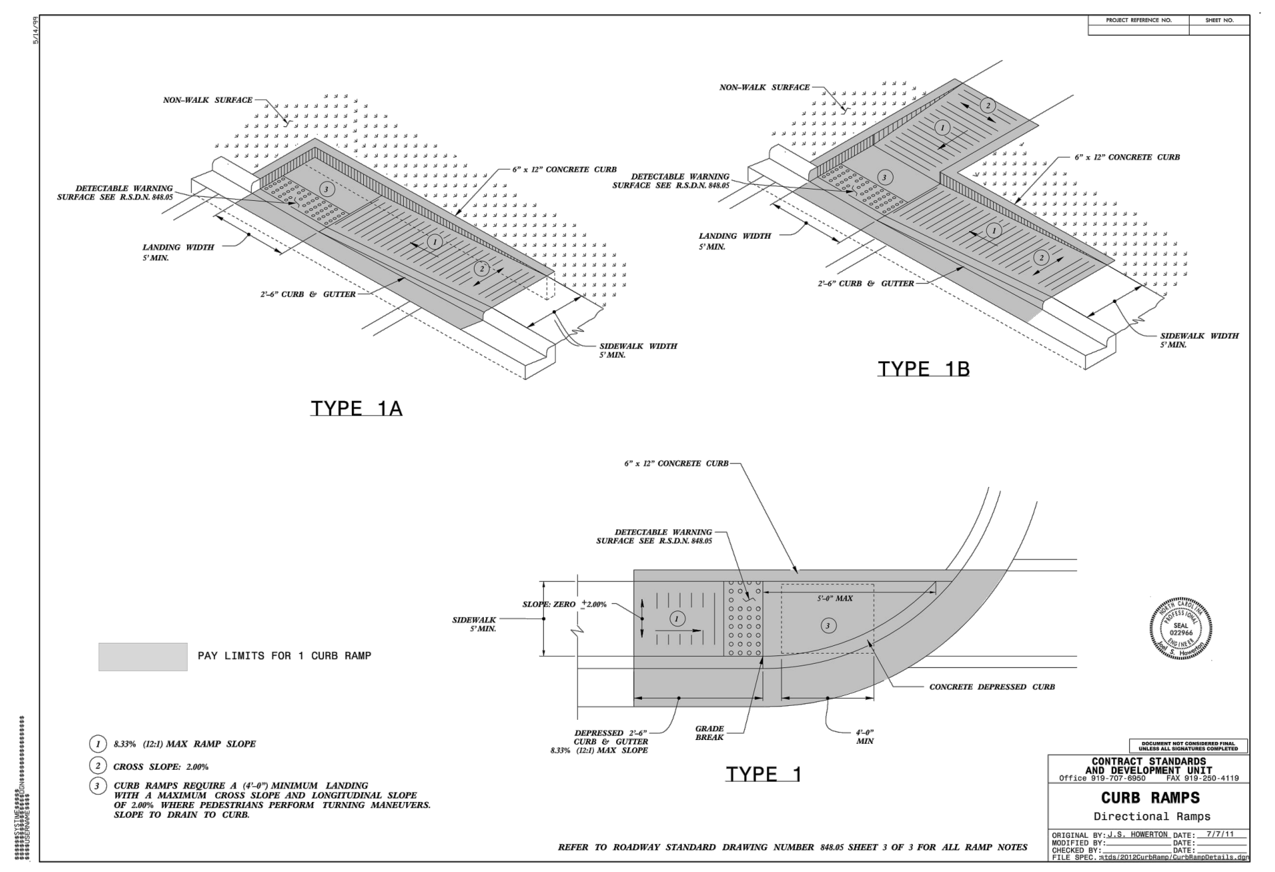
NOTES:

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 1/2″ 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.

1-18
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY STANDARD DRAWING FOR
CURB RAMPS
NOTES

SHEET 3 OF 3
848.05



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.

REFER TO ROADWAY STANDARD DRAWING NUMBER 848.05 SHEET 3 OF 3 FOR ALL RAMP NOTES

WATER PERMITS

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 # ______________**

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

FLM
ENGINEERING

POST OFFICE BOX 91727
RALEIGH, NORTH CAROLINA 27675
PHONE: 919.610.1051
FIRM NC LICENSE NUMBER C-4222

SEAL 041421
CHRISTOPHER A. LEWIS
1/27/21

REVISION HISTORY

REV #	DESCRIPTION	DATE	BY

ORIGINAL PLAN SIZE: 24" X 36"

ISSUED FOR PERMITTING
DO NOT USE FOR CONSTRUCTION

SCALE ADJUSTMENT
THIS BAR IS 1 INCH IN LENGTH ON ORIGINAL DRAWING
0 1"
IF IT IS NOT 1 INCH ON THIS SHEET, ADJUST YOUR SCALE ACCORDINGLY

CONSTRUCTION PLANS
FOR
GRANITE FALLS BLVD.
EXTENSION

ROLESVILLE, NC

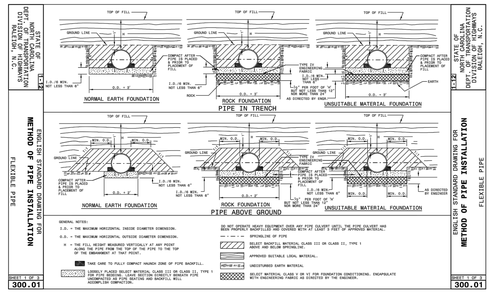
BARRINGTON
DEVELOPMENT, LLC

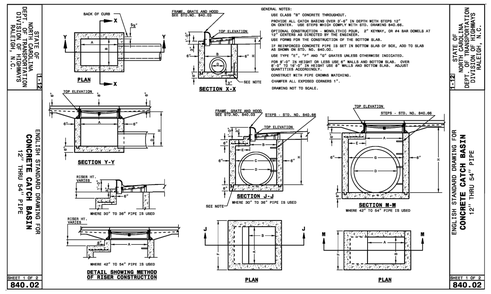
DATE:	02-28-2020
SCALE:	AS SHOWN
DESIGNED BY:	FLM
APPROVED BY:	FLM
PROJECT NO.:	20012

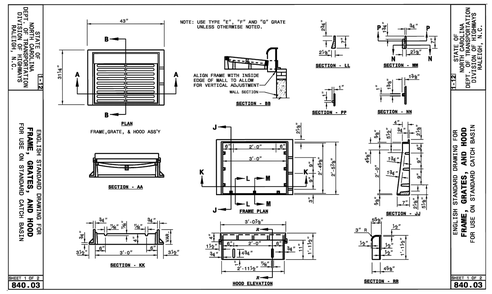
SITE DETAILS

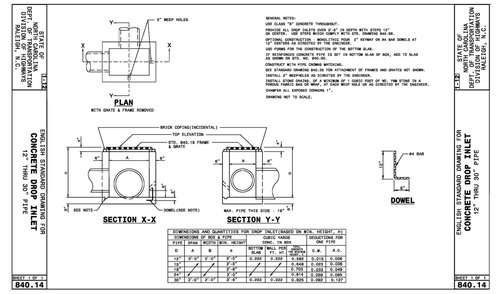
C-10

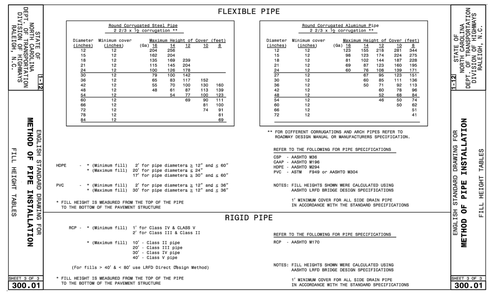
SHEET 10 OF 18

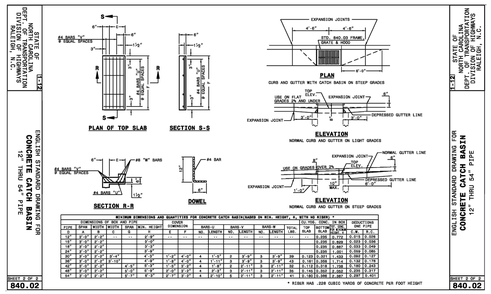


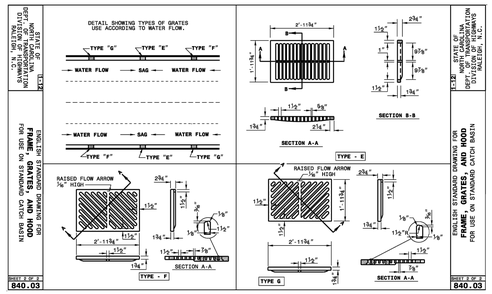


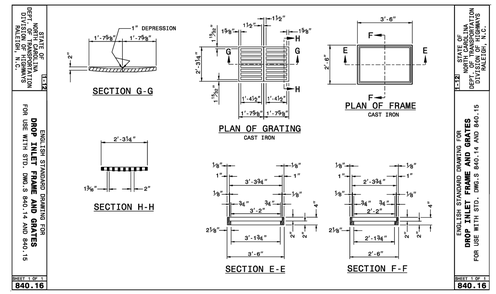






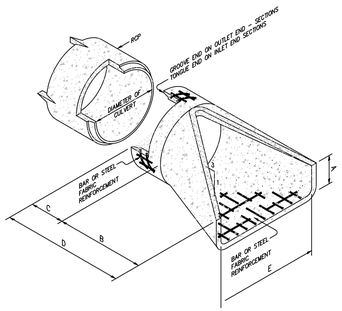




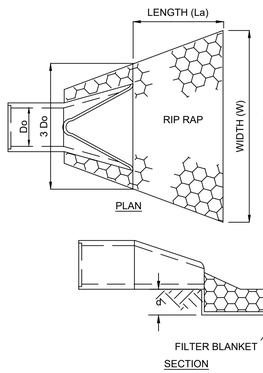


END SECTION DIMENSIONS					
DIA.	A	B	C	D	E
15"	7"	2'-3 1/4"	3'-11 1/2"	6'-2 3/4"	2'-6"
18"	9"	2'-3"	3'-11 3/4"	6'-2 3/4"	3'-0"
24"	9"	3'-7"	3'-1"	6'-8"	3'-11 3/4"
30"	1'-0"	4'-6 1/2"	1'-10 1/2"	6'-5"	5'-0"
36"	1'-4"	5'-0"	3'-1 1/2"	8'-1 1/2"	5'-11"
42"	1'-10 1/4"	5'-1 3/8"	3'-1"	8'-2 3/8"	6'-5 1/4"

NOTES:
1. DESIGN OF END-SECTION SHALL CONFORM TO STANDARD REINFORCED SECTIONAL CONCRETE CULVERT PIPE.
2. ANY TWIN BARREL SYSTEM GREATER THAN 42" RCP REQUIRES A HEADWALL.
3. ANY SYSTEM OF MORE THAN 2 PIPES REQUIRES A HEADWALL.
4. SEE NCDOT "ROADWAY STANDARD DRAWINGS" FOR HEADWALL CONSTRUCTION DETAILS.



FLARED END SECTION
NO SCALE

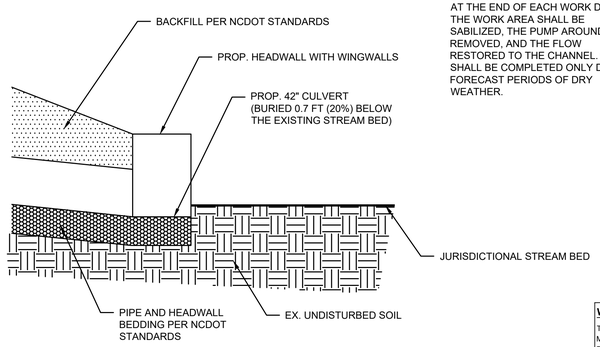


MAINTENANCE:

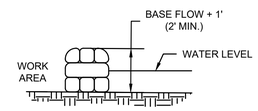
INSPECT PIPE INLET PROTECTION AT LEAST WEEKLY AND AFTER EACH SIGNIFICANT (1/2 INCH OR GREATER) RAINFALL EVENT TO SEE IF ANY EROSION AROUND OR BELOW THE RIPRAP HAS TAKEN PLACE, OR IF THE STONES HAVE BEEN DISLODGED. IMMEDIATELY MAKE ALL NEEDED REPAIRS TO PREVENT FURTHER DAMAGE.

OUTLET	Do	3Do	La	W	RIP RAP	d
FES-001	24"	6'	8'	6'	CLASS A RIPRAP	9"
FES-WETLAND	24"	6'	8'	6'	CLASS A RIPRAP	9"

RIPRAP ENERGY DISSIPATOR
NO SCALE



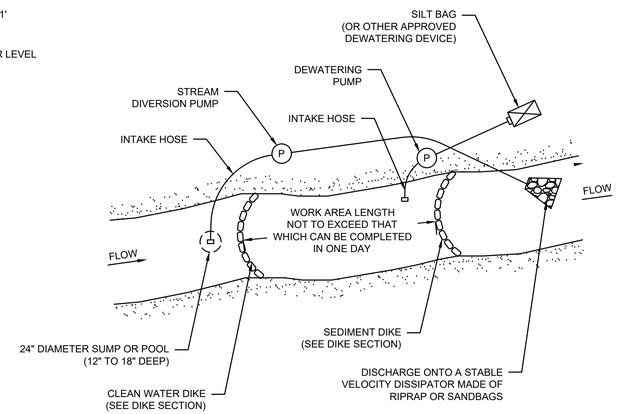
HW 1 TO HW 2
CROSSING DETAIL
NO SCALE



DIKE SECTION

NOTES:

1. PUMP AROUND DIKES SHALL NOT BE SET OUTSIDE THE LIMITS OF DISTURBANCE/IMPACT LIMITS SHOWN ON THE PLANS.
2. INSTALL PUMP AROUND DIVERSION AND DEWATER THE CONSTRUCTION ZONE THROUGH THE DEWATERING DEVICE. THE CONTRACTOR SHALL STAGE THE LIMITS OF THE PUMP AROUND FLOW DIVERSION TO DEWATER ONLY THAT SECTION SCHEDULED FOR THAT DAY'S WORK. AT THE END OF EACH WORK DAY, THE WORK AREA SHALL BE SABILIZED, THE PUMP AROUND REMOVED, AND THE FLOW RESTORED TO THE CHANNEL. WORK SHALL BE COMPLETED ONLY DURING FORECAST PERIODS OF DRY WEATHER.



PUMP AROUND DETAIL
NO SCALE

WATER PERMITS

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 #** _____

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

FLM ENGINEERING

POST OFFICE BOX 91727
RALEIGH, NORTH CAROLINA 27675
PHONE: 919.610.1051
FIRM NC LICENSE NUMBER C-4222

NORTH CAROLINA PROFESSIONAL SEAL 041421 ENGINEER CHRISTOPHER A. LEWIS

REVISION HISTORY

REV #	DESCRIPTION	DATE	BY

ORIGINAL PLAN SIZE: 24" X 36"

ISSUED FOR PERMITTING
DO NOT USE FOR CONSTRUCTION

SCALE ADJUSTMENT

THIS BAR IS 1 INCH IN LENGTH ON ORIGINAL DRAWING
0 — 1"
IF IT IS NOT 1 INCH ON THIS SHEET, ADJUST YOUR SCALE ACCORDINGLY

CONSTRUCTION PLANS FOR GRANITE FALLS BLVD. EXTENSION

ROLESVILLE, NC

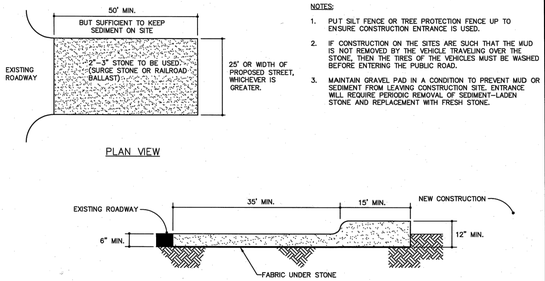
BARRINGTON DEVELOPMENT, LLC

DATE:	02-28-2020
SCALE:	AS SHOWN
DESIGNED BY:	FLM
APPROVED BY:	FLM
PROJECT NO.:	20012

STORM DRAINAGE DETAILS

C-11

SHEET 11 OF 18



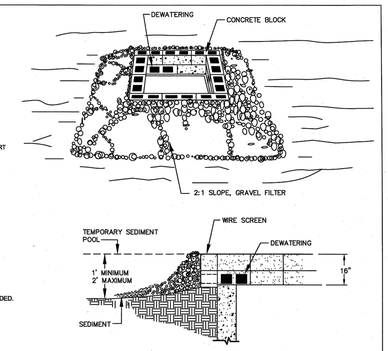
NOTES:

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 SPECIFICATIONS

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

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

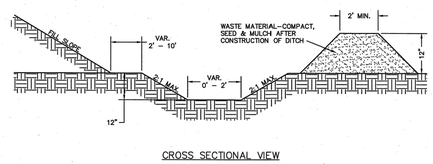
WAKE COUNTY NORTH CAROLINA

EFFECTIVE: 01/31/08

STANDARD BLOCK & GRAVEL DROP INLET PROTECTION

NOTES:

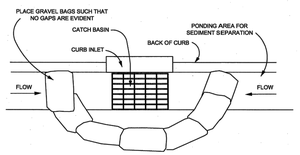
1. TEMPORARY DIVERSION DITCH TO BE USED TO INTERCEPT FLOW AND/OR DIVERT TO A SEDIMENT CONTROL MEASURE OR BMP.
2. SILT SHALL BE REMOVED WHEN DITCH IS ONE-HALF FULL.
3. DITCH SHALL BE RECONSTRUCTED WHEN DAMAGED BY EQUIPMENT OR COVERED BY FILL.
4. STABILIZE DIVERSION DITCH BERM WITH TEMPORARY SEEDING, MULCH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



WAKE COUNTY NORTH CAROLINA

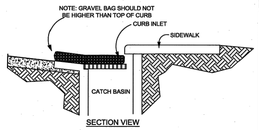
EFFECTIVE: 01/31/08

STANDARD TEMPORARY DIVERSION DITCH



NOTES:

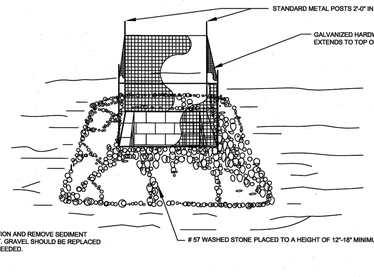
1. PLACE GRAVEL BAG BARRIER ON GENTLY SLOPING STREET, WHERE WATER CAN POND AND ALLOW SEDIMENT TO SEPARATE FROM RUNNOFF.
2. USE SAND BAGS OF WOVEN GEOTEXTILE FABRIC (NOT BURLAP) AND FILL WITH ¾ INCH (OR SMALLER) GRAVEL. BAGS MUST BE LAYERED SUCH THAT NO GAPS ARE EVIDENT.
3. INSPECT BARRIERS AND REMOVE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



WAKE COUNTY NORTH CAROLINA

EFFECTIVE: 01/31/08

STANDARD GRAVEL BAG CURB INLET PROTECTION



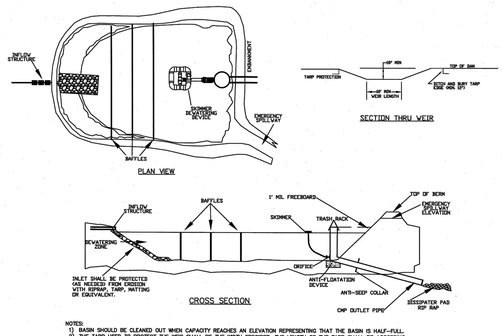
NOTE:

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

WAKE COUNTY NORTH CAROLINA

EFFECTIVE: 01/31/08

STANDARD GRAVEL YARD INLET PROTECTION



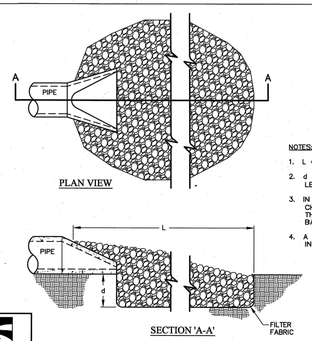
INLET SHALL BE PROTECTED WITH WIRE MESH, FILTER FABRIC, TARP, MATTING OR EQUIVALENT.

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

WAKE COUNTY NORTH CAROLINA

EFFECTIVE: 01/31/08

STANDARD SKIMMER ATTACHED TO PERMANENT RISER



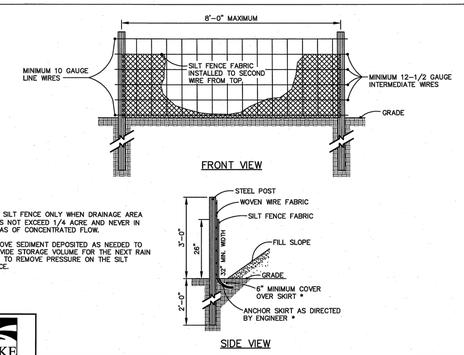
NOTES:

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



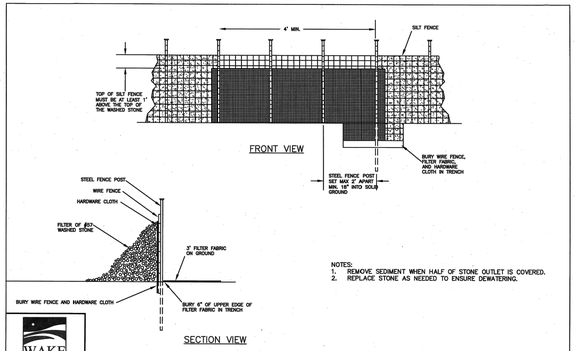
NOTE:

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

WAKE COUNTY NORTH CAROLINA

EFFECTIVE: 01/31/08

STANDARD TEMPORARY SILT FENCE



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

WAKE COUNTY NORTH CAROLINA

EFFECTIVE: 01/31/08

STANDARD SILT FENCE OUTLET

WATER PERMITS

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 #** _____

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

FLM ENGINEERING

POST OFFICE BOX 91727
RALEIGH, NORTH CAROLINA 27675
PHONE: 919.610.1051
FIRM NC LICENSE NUMBER C-4222

NORTH CAROLINA PROFESSIONAL SEAL 041421 ENGINEER CHRISTOPHER A. LEWIS

REVISION HISTORY

REV #	DESCRIPTION	DATE	BY

ORIGINAL PLAN SIZE: 24" X 36"

ISSUED FOR PERMITTING
DO NOT USE FOR CONSTRUCTION

SCALE ADJUSTMENT

THIS BAR IS 1 INCH IN LENGTH ON ORIGINAL DRAWING

0 1"

IF IT IS NOT 1 INCH ON THIS SHEET, ADJUST YOUR SCALE ACCORDINGLY

CONSTRUCTION PLANS FOR GRANITE FALLS BLVD. EXTENSION

ROLESVILLE, NC

BARRINGTON DEVELOPMENT, LLC

DATE:	02-28-2020
SCALE:	AS SHOWN
DESIGNED BY:	FLM
APPROVED BY:	FLM
PROJECT NO.:	20012

EROSION & SEDIMENT CONTROL DETAILS

C-12

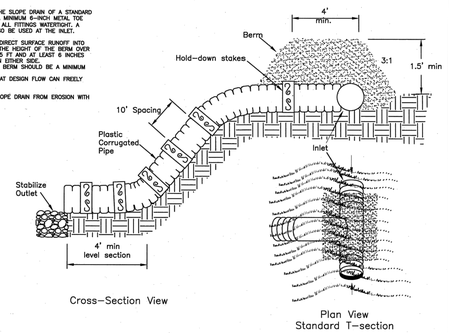
SHEET 12 OF 18

NOTES:

1. CONSTRUCT THE ENTRANCE TO THE SLOPE DRAIN OF A STANDARD FLARED-END SECTION OF PIPE WITH A MINIMUM 6-INCH METAL TOE PLATE (CROSS-SECTION VIEW). MAKE ALL FITTINGS WATERTIGHT. A STANDARD T-SECTION FITTING MAY ALSO BE USED AT THE INLET.

2. USE AN EARTHEN DIVERSION TO DIRECT SURFACE RUNOFF INTO THE TEMPORARY SLOPE DRAIN. MAKE THE HEIGHT OF THE BERM OVER THE DRAIN CONDUIT A MINIMUM OF 1.5 FT AND AT LEAST 6 INCHES ABOVE THE TOP OF THE DRAIN AT THE INLET POINT. THE LOWEST POINT OF THE DIVERSION BERM SHOULD BE A MINIMUM OF 1 FT ABOVE THE TOP OF THE DRAIN SO THAT DESIGN FLOW CAN FREELY ENTER THE PIPE.

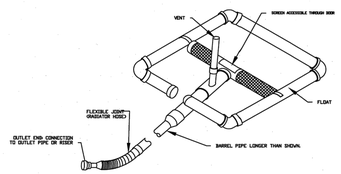
3. PROTECT THE OUTLET OF THE SLOPE DRAIN FROM EROSION WITH RIPRAP DISSIPATOR.



WAKE COUNTY NORTH CAROLINA

EFFECTIVE: 01/31/08

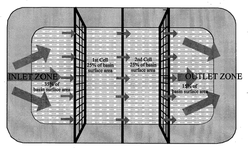
STANDARD TEMPORARY SLOPE DRAIN



WAKE COUNTY NORTH CAROLINA

EFFECTIVE: 01/31/08

STANDARD SKIMMER DETAIL

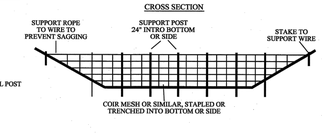


PLAN VIEW

NOTES:

1. BAFFLE MATERIAL SHOULD BE SECURED AT THE BOTTOM AND SIDES USING STAPLES OR BY TRENCHING AS FOR SILT FENCE.
2. MOST OF THE SEDIMENT WILL ACCUMULATE IN THE 1ST BAY, WHICH SHOULD BE READILY ACCESSIBLE FOR MAINTENANCE.
3. PROVIDE ONE BAFFLE PER ACRE OF DRAINAGE (LESS THAN 1 ACRE IN LENGTH). PROVIDE 5 BAFFLES FOR DRAINAGE AREAS OF 5 ACRES OR MORE THAN 1 ACRES.
4. BAFFLE SHALL BE 700 GM2 COIR EROSION BLANKET.
5. TOPS OF BAFFLES SHOULD BE 2 INCHES LOWER THAN THE TOP OF THE BERMS
6. INSPECT BAFFLES FOR REPAIR ONCE A WEEK AND AFTER EACH RAINFALL

CROSS SECTION

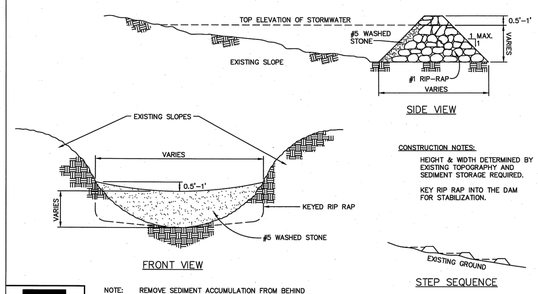


SECTION VIEW AT OPENING

WAKE COUNTY NORTH CAROLINA

EFFECTIVE: 01/31/08

STANDARD BAFFLES DETAIL



CONSTRUCTION NOTES:

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

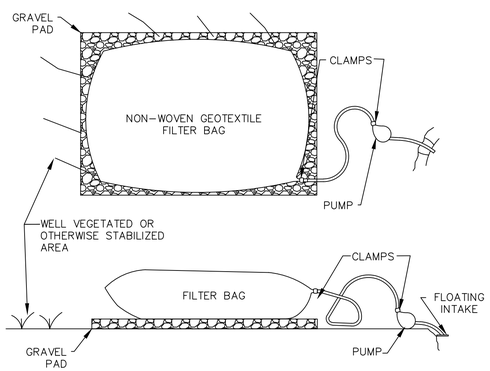
KEY RIP RAP INTO THE DAM FOR STABILIZATION.

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



FILTER BAGS MAY BE USED TO FILTER WATER PUMPED FROM EXCAVATIONS PRIOR TO DISCHARGING.

FILTER BAGS SHALL BE MADE FROM NON-WOVEN GEOTEXTILE MATERIAL SEWN WITH HIGH STRENGTH, DOUBLE STITCHED "J" TYPE SEAMS. THEY SHALL BE CAPABLE OF TRAPPING PARTICLES LARGER THAN 150 MICRONS.

THE PUMPING RATE SHALL BE NO GREATER THAN 750 GPM OR ½ THE MAXIMUM SPECIFIED BY THE MANUFACTURER, WHICHEVER IS LESS. PUMP INTAKES SHOULD BE FLOATING AND SCREENED.

FILTER BAGS SHALL BE LOCATED IN WELL-VEGETATED (GRASSY) AREAS AND DISCHARGED ONTO STABLE, EROSION RESISTANT AREAS. WHERE THIS IS NOT POSSIBLE, A GEOTEXTILE FLOW PATH SHALL BE PROVIDED. BAGS SHALL NOT BE PLACED ON SLOPES GREATER THAN 5%.

THE PUMP DISCHARGE HOSE SHALL BE INSERTED INTO THE FILTER BAG IN THE MANNER SPECIFIED BY THE MANUFACTURER AND SECURELY CLAMPED.

A SUITABLE MEANS OF ACCESSING THE BAG WITH MACHINERY REQUIRED FOR DISPOSAL PURPOSES MUST BE PROVIDED. FILTER BAGS SHALL BE REPLACED WHEN THEY BECOME ½ FULL. SPARE REPLACEMENT BAGS SHALL BE KEPT AVAILABLE FOR REPLACEMENT OF THOSE THAT HAVE FAILED OR ARE ½ FULL.

FILTER BAGS SHALL BE INSPECTED DAILY. IF ANY PROBLEM IS DETECTED, PUMPING SHALL CEASE IMMEDIATELY AND NOT RESUME UNTIL THE PROBLEM IS CORRECTED.

SILT BAG

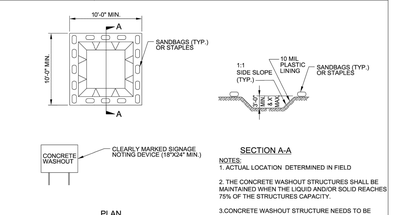
NO SCALE

NPDES Stormwater Discharge Permit for Construction Activities (NCGO1) — NCDENR/Division of Energy, Mineral and Land Resources

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.

ONSITE CONCRETE WASHOUT STRUCTURE WITH LINER

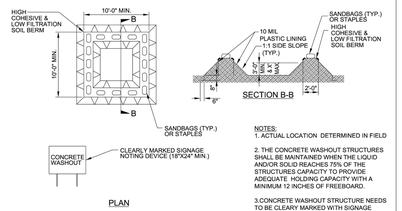


NOTES:
1. ACTUAL LOCATION DETERMINED IN FIELD

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

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

BELOW GRADE WASHOUT STRUCTURE
NOT TO SCALE



NOTES:
1. ACTUAL LOCATION DETERMINED IN FIELD

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

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

ABOVE GRADE WASHOUT STRUCTURE
NOT TO SCALE

PROJECT REFERENCE NO.	SHEET NO.
R-5721A	C-13 (SHEET 13)
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

FOR DISTURBED AREAS, DITCHES, SHOULDERS, SLOPES (MAX 3:1):

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

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

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

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

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

MIXTURE

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

SEEDBED PREPARATION:

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

*APPLY: AGRICULTURAL LIMESTONE- 2 TONS/ACRE MINIMUM OR PER SOIL TEST

FERTILIZER - 10-10-10 ANALYSIS @ 1,000 LBS/ACRE
SUPERPHOSPHATE - 500 LBS/ACRE OF 20% ANALYSIS
MULCH - 2 TONS (+/- 80 BALES) STRAW/ACRE
ANCHOR - USE LIQUID ASPHALT @ 400 GALS/ACRE
OR EMULSIFIED ASPHALT @ 300 GALS/ACRE

PERMANENT SEEDING SCHEDULE

NO SCALE

FOR LATE WINTER AND EARLY SPRING:

SEEDING MIXTURE:
RYE (GRAIN) - 120 LB/ACRE
ANNUAL LESPEDEZA* (KOBE IN PIEDMONT AND COASTAL PLAIN, KOREAN IN MOUNTAINS) - 50 LB/ACRE

*OMIT ANNUAL LESPEDEZA WHEN DURATION OF TEMPORARY COVER IS NOT TO EXTEND BEYOND JUNE

SEEDING DATES:
MOUNTAINS: ABOVE 2500 FEET: FEB. 15 - MAY 15
BELOW 2500 FEET: FEB. 1 - MAY 1
PIEDMONT: JAN. 1 - MAY 1
COASTAL PLAIN: DEC. 1 - APR. 15

SOIL AMENDMENTS:

FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 2,000 LB/ACRE GROUND AGRICULTURAL LIMESTONE AND 750 LB/ACRE 10-10-10 FERTILIZER

MULCH:

APPLY 4,000 LB/ACRE STRAW. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING, OR A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL

MAINTENANCE:

REFERTILIZE IF GROWTH IS NOT FULLY ADEQUATE. RESEED, REFERTILIZE, AND MULCH IMMEDIATELY FOLLOWING EROSION OR OTHER DAMAGE

FOR SUMMER:

SEEDING MIXTURE:
GERMAN MILLET* - 40 LB/ACRE

*IN THE PIEDMONT AND MOUNTAINS, A SMALL-STEMMED SUDANGRASS MAY BE SUBSTITUTED AT A RATE OF 50 LB/ACRE

SEEDING DATES:
MOUNTAINS: MAY 15 - AUG. 15
PIEDMONT: MAY 1 - AUG. 15
COASTAL PLAIN: APR. 15 - AUG. 15

SOIL AMENDMENTS:

FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 2,000 LB/ACRE GROUND AGRICULTURAL LIMESTONE AND 750 LB/ACRE 10-10-10 FERTILIZER

MULCH:

APPLY 4,000 LB/ACRE STRAW. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING, OR A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL

MAINTENANCE:

REFERTILIZE IF GROWTH IS NOT FULLY ADEQUATE. RESEED, REFERTILIZE, AND MULCH IMMEDIATELY FOLLOWING EROSION OR OTHER DAMAGE

FOR FALL:

SEEDING MIXTURE:
RYE (GRAIN) - 120 LB/ACRE

SEEDING DATES:
MOUNTAINS: AUG. 15 - DEC. 15
COASTAL PLAIN AND PIEDMONT: AUG. 15 - DEC. 30

SOIL AMENDMENTS:

FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 2,000 LB/ACRE GROUND AGRICULTURAL LIMESTONE AND 1,000 LB/ACRE 10-10-10 FERTILIZER

MULCH:

APPLY 4,000 LB/ACRE STRAW. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING, OR A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL

MAINTENANCE:

REPAIR AND REFERTILIZE DAMAGED AREAS IMMEDIATELY. TOPDRESS WITH 50 LB/ACRE OF NITROGEN IN MARCH. IF IT IS NECESSARY TO EXTEND TEMPORARY COVER BEYOND JUNE 15, OVERSEED WITH 50 LB/ACRE KOBE (PIEDMONT AND COASTAL PLAIN) OR KOREAN (MOUNTAINS) LESPEDEZA IN LATE FEBRUARY OR EARLY MARCH.

SEEDBED PREPARATION:

LIMING - APPLY LIME ACCORDING TO SOIL TEST RECOMMENDATIONS. IF THE PH (ACIDITY) OF THE SOIL IS NOT KNOWN, AN APPLICATION OF GROUND AGRICULTURAL LIMESTONE AT THE 6 106 RATE OF 1 TO 1 1/2 TONS/ACRE ON COARSE-TEXTURED SOILS AND 2-3 TONS/ACRE ON FINETEXTURED SOILS IS USUALLY SUFFICIENT. APPLY LIMESTONE UNIFORMLY AND INCORPORATE INTO THE TOP 4-6 INCHES OF SOIL. SOILS WITH A PH OF 6 OR HIGHER NEED NOT BE LIMED.

FERTILIZER - BASE APPLICATION RATES ON SOIL TESTS. WHEN THESE ARE NOT POSSIBLE, APPLY A 10-10-10 GRADE FERTILIZER AT 700-1,000 LB/ACRE. BOTH FERTILIZER AND LIME SHOULD BE INCORPORATED INTO THE TOP 4-6 INCHES OF SOIL. IF A HYDRAULIC SEEDER IS USED, DO NOT MIX SEED AND FERTILIZER MORE THAN 30 MINUTES BEFORE APPLICATION.

SURFACE ROUGHENING - IF RECENT TILLAGE OPERATIONS HAVE RESULTED IN A LOOSE SURFACE, ADDITIONAL ROUGHENING MAY NOT BE REQUIRED. EXCEPT TO BREAK UP LARGE CLODS. IF RAINFALL CAUSES THE SURFACE TO BECOME SEALED OR CRUSTED, LOOSEN IT JUST PRIOR TO SEEDING BY DISKING, RAKING, HARROWING, OR OTHER SUITABLE METHODS. GROOVE OR FURROW SLOPES STEEPER THAN 3:1 ON THE CONTOUR BEFORE SEEDING (PRACTICE 6.03, SURFACE ROUGHENING).

TEMPORARY SEEDING SCHEDULE

NO SCALE

WATER PERMITS

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 #** _____

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

FLM ENGINEERING
POST OFFICE BOX 91727
RALEIGH, NORTH CAROLINA 27675
PHONE: 919.610.1051
FIRM NC LICENSE NUMBER C-4222

NORTH CAROLINA PROFESSIONAL SEAL 041421 ENGINEER CHRISTOPHER A. LEWIS

REVISION HISTORY

REV #	DESCRIPTION	DATE	BY

ORIGINAL PLAN SIZE: 24" X 36"

ISSUED FOR PERMITTING
DO NOT USE FOR CONSTRUCTION

SCALE ADJUSTMENT
THIS BAR IS 1 INCH IN LENGTH ON ORIGINAL DRAWING
0 1"
IF IT IS NOT 1 INCH ON THIS SHEET, ADJUST YOUR SCALE ACCORDINGLY

CONSTRUCTION PLANS FOR GRANITE FALLS BLVD. EXTENSION

ROLESVILLE, NC

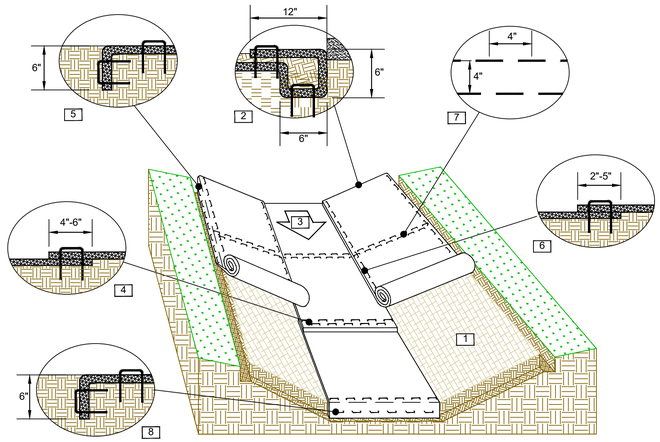
BARRINGTON DEVELOPMENT, LLC

DATE:	02-28-2020
SCALE:	AS SHOWN
DESIGNED BY:	FLM
APPROVED BY:	FLM
PROJECT NO.:	20012

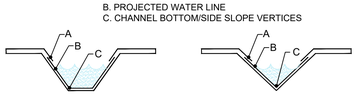
EROSION & SEDIMENT CONTROL DETAILS

C-13

SHEET 13 OF 18



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



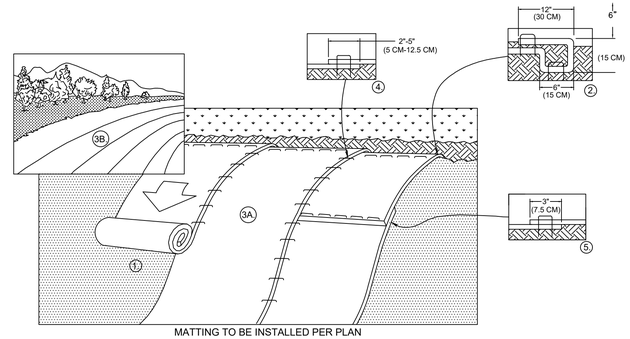
NOTES:
*HORIZONTAL STAPLE SPACING SHOULD BE ALTERED IF NECESSARY TO ALLOW STAPLES TO SECURE THE CRITICAL POINTS ALONG THE CHANNEL SURFACE.

**IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" MAY BE NECESSARY TO PROPERLY SECURE THE RECP'S.

NOTES:

1. PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECPS), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.
2. BEGIN AT THE TOP OF THE CHANNEL BY ANCHORING THE RECPS IN A 6" DEEP X 6" WIDE TRENCH WITH APPROXIMATELY 12" OF RECPS EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. USE SHOREMAX MAT AT THE CHANNEL/CULVERT OUTLET AS SUPPLEMENTAL SCOUR PROTECTION AS NEEDED. ANCHOR THE RECPS WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO THE COMPACTED SOIL AND FOLD THE REMAINING 12" PORTION OF RECPS BACK OVER THE SEED AND COMPACTED SOIL. SECURE RECPS OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE RECPS.
3. ROLL CENTER RECPS IN DIRECTION OF WATER FLOW IN BOTTOM OF CHANNEL. RECPS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL RECPS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE.
4. PLACE CONSECUTIVE RECPS END-OVER-END (SHINGLE STYLE) WITH A 4"-6" OVERLAP. USE A DOUBLE ROW OF STAPLES STAGGERED 4" APART AND 4" ON CENTER TO SECURE RECPS.
5. FULL LENGTH EDGE OF RECPS AT TOP OF SIDE SLOPES MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN A 6" DEEP X 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
6. ADJACENT RECPS MUST BE OVERLAPPED APPROXIMATELY 2"-5" (DEPENDING ON RECPS TYPE) AND STAPLED.
7. IN HIGH FLOW CHANNEL APPLICATIONS A STAPLE CHECK SLOT IS RECOMMENDED AT 30 TO 40 FOOT INTERVALS. USE A DOUBLE ROW OF STAPLES STAGGERED 4" APART AND 4" ON CENTER OVER ENTIRE WIDTH OF THE CHANNEL.
8. THE TERMINAL END OF THE RECPS MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN A 6" DEEP X 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.

CHANNEL MATTING INSTALLATION
NO SCALE



MATTING TO BE INSTALLED PER PLAN

NOTES:

1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED. NOTE: WHEN USING CELL-O-SEED DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A 6" (15 CM) DEEP X 6" (15 CM) WIDE TRENCH WITH APPROXIMATELY 12" (30cm) OF BLANKET EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30 CM) APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" (30 CM) PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" (30 CM) APART ACROSS THE WIDTH OF THE BLANKET.
3. ROLL THE BLANKETS (A.) DOWN OR (B.) HORIZONTALLY ACROSS THE SLOPE. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING THE DOT SYSTEM , STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
4. THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY 2" - 5" (5 CM - 12.5 CM) OVERLAP DEPENDING ON BLANKET TYPE.
5. CONSECUTIVE BLANKETS SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" (7.5 CM) OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" (30 CM) APART ACROSS ENTIRE BLANKET WIDTH. NOTE: *IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" (15 CM) MAY BE NECESSARY TO PROPERLY SECURE THE BLANKETS.

DETAIL AND LANGUAGE PROVIDED BY NORTH AMERICAN GREEN REV. 1/2004

MAINTENANCE:

1. INSPECT SLOPE MATTING AT LEAST WEEKLY AND AFTER EACH SIGNIFICANT (¼ INCH OR GREATER) RAIN FALL EVENT. REPAIR IMMEDIATELY.
2. GOOD CONTACT WITH THE GROUND MUST BE MAINTAINED, AND EROSION MUST NOT OCCUR BENEATH THE SLOPE MATTING.
3. ANY AREAS OF THE SLOPE MATTING THAT ARE DAMAGED OR NOT IN CLOSE CONTACT WITH THE GROUND SHALL BE REPAIRED AND STAPLED.
4. IF EROSION OCCURS DUE TO POORLY CONTROLLED DRAINAGE, THE PROBLEM SHALL BE FIXED AND THE ERODED AREA PROTECTED.
5. MONITOR AND REPAIR THE SLOPE MATTING AS NECESSARY UNTIL GROUND COVER IS ESTABLISHED.

SLOPE INSTALLATION
NO SCALE

ROLLMAX™ ROLLED EROSION CONTROL

Specification Sheet – VMax® SC250® Turf Reinforcement Mat

DESCRIPTION
The composite turf reinforcement mat (C-TRM) shall be a machine-produced mat of 70% straw and 30% coconut fiber matrix incorporated into permanent three-dimensional turf reinforcement matting. The matrix shall be evenly distributed across the entire width of the matting and stitch bonded between a heavy duty UV stabilized nettings with 0.50 x 0.50 inch (1.27 x 1.27 cm) openings, an ultra heavy UV stabilized, dramatically corrugated (crimped) intermediate netting with 0.5 x 0.5 inch (1.27 x 1.27 cm) openings, and covered by an heavy duty UV stabilized nettings with 0.50 x 0.50 inch (1.27 x 1.27 cm) openings. The middle corrugated netting shall form prominent closely spaced ridges across the entire width of the mat. The three nettings shall be stitched together on 1.50 inch (3.81cm) centers with UV stabilized polypropylene thread to form permanent three-dimensional turf reinforcement matting. All mats shall be manufactured with a colored thread stitched along both outer edges as an overlap guide for adjacent mats.

The SC250 shall meet Type 5A, 5B, and 5C specification requirements established by the Erosion Control Technology Council (ECTC) and Federal Highway Administration's (FHWA) FP-03 Section 713.18

Material Content		
Matrix	70% Straw Fiber	0.35 lb/sq yd (0.19 kg/sm)
	30% Coconut Fiber	0.15 lbs/sq yd (0.08 kg/sm)
Netting	Top and Bottom, UV-Stabilized Polypropylene	5 lb/7000 sq ft (2.44 kg/100 sm)
	Middle, Corrugated UV-Stabilized Polypropylene	24 lb/1000 sf (11.7 kg/100 sm)
Thread	Polypropylene, UV Stable	

Standard Roll Sizes	
Width	6.5 ft (2.0 m)
Length	55.5 ft (16.9 m)
Weight ± 10%	34 lbs (15.42 kg)
Area	40 sq yd (33.4 sm)

Index Property	Test Method	Typical
Thickness	ASTM D6525	0.62 in. (15.75 mm)
Resiliency	ASTM 6524	95.2%
Density	ASTM D792	0.891 g/cm³
Mass/Unit Area	ASTM 6566	16.13 oz/sy (548 g/sm)
UV Stability	ASTM D4355/ 1000 HR	100%
Porosity	ECTC Guidelines	99%
Stiffness	ASTM D1388	222.65 oz-in.
Light Penetration	ASTM D6567	4.1%
Tensile Strength – MD	ASTM D6818	709 lbs/ft (10.31 kN/m)
Elongation – MD	ASTM D6818	23.9%
Tensile Strength – TD	ASTM D6818	712 lbs/ft (10.36 kN/m)
Elongation – TD	ASTM D6818	36.9%
Biomass Improvement	ASTM D7322	441%

Design Permissible Shear Stress	Short Duration	Long Duration
Phase 1: Unvegetated	3.0 psf (144 Pa)	2.5 psf (120 Pa)
Phase 2: Partially Veg.	8.0 psf (383 Pa)	8.0 psf (383 Pa)
Phase 3: Fully Veg.	10.0 psf (480 Pa)	8.0 psf (383 Pa)
Unvegetated Velocity	9.5 fps (2.9 m/s)	
Vegetated Velocity	15 fps (4.6 m/s)	

NORTH AMERICAN GREEN SC250 EROSION CONTROL BLANKET
NO SCALE

ROLLMAX™ ROLLED EROSION CONTROL

Specification Sheet – EroNet™ S75® Erosion Control Blanket

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

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

Material Content		
Matrix	100% Straw Fiber	0.5 lbs/sq yd (0.27 kg/sm)
Netting	Top side only, lightweight photodegradable	1.5 lb/7000 sq ft (0.73 kg/100 sm)
Thread	Degradable	

Standard Roll Sizes			
Width	6.67 ft (2.03 m)	8.0 ft (2.4 m)	16 ft (4.87 m)
Length	108 ft (32.92 m)	112 ft (34.14 m)	108 ft (32.92 m)
Weight ± 10%	40 lbs (18.14 kg)	50 lbs (22.68 kg)	96 lbs (43.54 kg)
Area	80 sq yd (66.9 sm)	100 sq yd (83.61 sm)	192 sq yd (165.5 sm)

Index Property	Test Method	Typical
Thickness	ASTM D6525	0.50 in. (12.7 mm)
Resiliency	ECTC Guidelines	78.8%
Water Absorbency	ASTM D1117	301%
Mass/Unit Area	ASTM D6475	9.76 oz/sy (332 g/sm)
Swell	ECTC Guidelines	15%
Smolder Resistance	ECTC Guidelines	Yes
Stiffness	ASTM D1388	6.31 oz-in
Light Penetration	ASTM D6567	6.0%
Tensile Strength – MD	ASTM D6818	122.4 lbs/ft (1.81 kN/m)
Elongation – MD	ASTM D6818	36.7%
Tensile Strength – TD	ASTM D6818	79.2 lbs/ft (1.17 kN/m)
Elongation – TD	ASTM D6818	26.8%
Biomass Improvement	ASTM D7322	301%

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

Slope Design Data: C Factors			
Slope Gradients (S)			
Slope Length (L)	≤ 3:1	3:1 – 2:1	≥ 2:1
≤ 20 ft (6 m)	0.029	N/A	N/A
20-50 ft	0.11	N/A	N/A
≥ 50 ft (15.2 m)	0.19	N/A	N/A

NTPEP Large-Scale Slope Testing
ASTM D6459 - C-factor = 0.012

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

Tensar. NORTH AMERICAN GREEN®

Tensar International Corporation
2500 Northwinds Parkway
Suite 500
ALPHARETTA, GA 30009
800-TENSAR-1
tensarcorp.com

Tensar International Corporation warrants that at the time of delivery the product furnished hereunder shall conform to the specification stated herein. Any other warranty including merchantability and fitness for a particular purpose, are hereby excluded. If the product does not meet specifications on this page and Tensar has been notified in writing within **30 days of shipment, Tensar's liability shall be limited to the perfect specification materials or all prior specifications for the product described above and is not applicable to any products shipped prior to January 1, 2012.**

EC_RMX_MPDS_E575_6.15

NORTH AMERICAN GREEN S75 EROSION CONTROL BLANKET
NO SCALE

WATER PERMITS

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 #** _____

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

FLM ENGINEERING
POST OFFICE BOX 91727
RALEIGH, NORTH CAROLINA 27675
PHONE: 919.610.1051
FIRM NC LICENSE NUMBER C-4222

NORTH CAROLINA PROFESSIONAL SEAL 041421 ENGINEER CHRISTOPHER A. LEWIS

REVISION HISTORY

REV #	DESCRIPTION	DATE	BY

ORIGINAL PLAN SIZE: 24" X 36"

ISSUED FOR PERMITTING
DO NOT USE FOR CONSTRUCTION

SCALE ADJUSTMENT
THIS BAR IS 1 INCH IN LENGTH ON ORIGINAL DRAWING
0 1"
IF IT IS NOT 1 INCH ON THIS SHEET, ADJUST YOUR SCALE ACCORDINGLY

CONSTRUCTION PLANS FOR GRANITE FALLS BLVD. EXTENSION

ROLESVILLE, NC

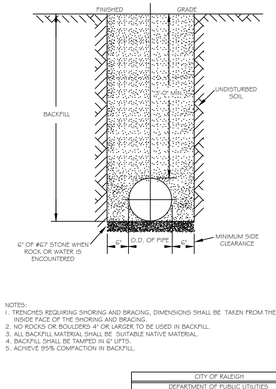
BARRINGTON DEVELOPMENT, LLC

DATE:	02-28-2020
SCALE:	AS SHOWN
DESIGNED BY:	FLM
APPROVED BY:	FLM
PROJECT NO.:	20012

EROSION & SEDIMENT CONTROL DETAILS

C-14

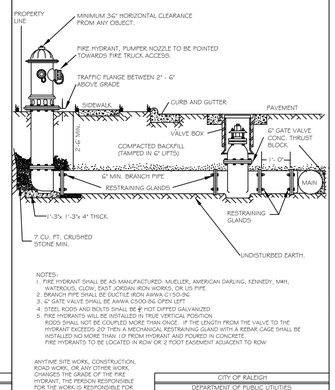
SHEET 14 OF 18



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

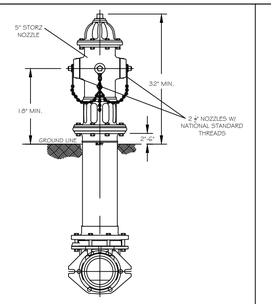
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-3	D.W.C.	9-3-99	ARB	2-15-00
	RRH	3-31-00	J.P.S.	10-29-10



ANYTIME SITE WORK, CONSTRUCTION, ROAD WORK, OR ANY OTHER WORK, CHANGES THE GRADE OF THE FIRE HYDRANT, IT SHALL BE THE RESPONSIBILE 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

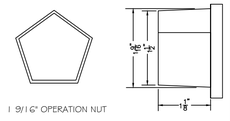
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-4	ARB	4-6-04	FKF	2/17/09
	DHL	2/14/08		

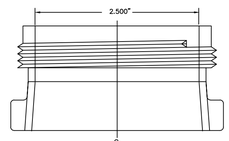


NOTES:
1. ALL PUBLIC FIRE HYDRANTS IN THE CITY OF RALEIGH AND THE MERGER TOWNS OF GARNER, ROLESVILLE, WAKE FOREST, KNIGHTDALE, WENDELL AND ZEBULON SHALL BE PAINTED CHROME YELLOW WITH HIGH REFLECTIVE ALUMINUM SILVER CAPS, BONNETS AND OPERATING NUTS.

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

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-5	MAB	8-16-16		

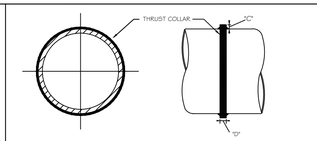




2 1/2" NATIONAL STANDARD OUTLET THREADS

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

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



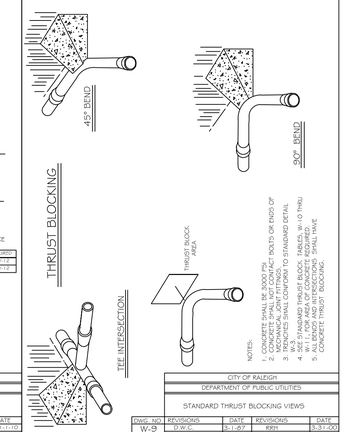
REINFORCING REQUIREMENTS					
I.D. PIPE	REBAR SIZE	"Y" BAR LENGTH	"Y" BAR WEIGHT	"X" BAR LENGTH	"X" BAR WEIGHT	NO. REQUIRED
6" - 36"	#5	2'-0" + O.D. PIPE	1.043 LB/FT	1'-2"	1.043 LB/FT	4-24, 1-12
48" & greater	#6	3'-0" + O.D. PIPE	1.502 LB/FT	1'-3"	1.502 LB/FT	4-24, 1-12

THRUST COLLAR ASSTRUCTURE SCHEDULE				
I.D. PIPE	"A"	"B"	"C"	"D"
6" - 16"	1'-4"	1'-7"	3"	3.05'
20" - 24"	1'-4"	1'-7"	3"	1.62'
30" - 36"	1'-4"	1'-7"	4"	5.85'
48" & greater	1'-5"	1'-9"	6"	7.85'

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	D.W.C.	9-3-99	DHL	2-15-00
	D.H.L.	6-18-08	J.P.S.	11-1-10



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 THRUST BLOCKING.
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.	9-1-87	RRH	3-31-00
		9-7-99	D.H.L.	6-18-08

REACTION BEARING AREAS FOR HORIZONTAL WATER PIPE BENDS
BASED ON TEST PRESSURE OF 200 P.S.I.

ALL AREAS GIVEN IN SQUARE FEET

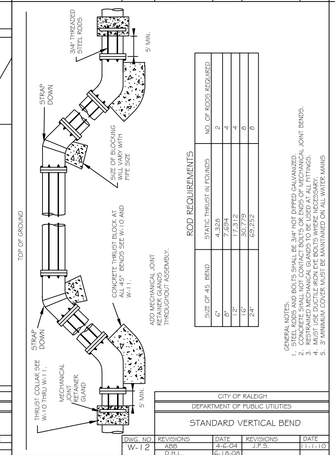
SIZE AND DEGREE OF BEND	STATIC THRUST IN POUNDS	TYPE OF FITTING CLAY AND SOILS TIGHT	TYPE OF FITTING SANDY SOILS	TYPE OF FITTING SATURATED SOILS	TYPE OF FITTING "FIRM CLAY" CONDITIONS	TYPE OF FITTING MED. COARSE FIRM SOILS	TYPE OF FITTING MED. COARSE WET SOILS	TYPE OF FITTING VERY COARSE SOILS	TYPE OF FITTING FINE SILTY SOILS
6"									
11 1/4°	1,108	1	1	1	1	1	1	2	1
22 1/2°	2,207	1	2	2	1	1	1	3	1
45°	4,328	2	3	3	1	1	2	5	1
90°	7,996	2	4	5	1	1	2	8	1
PLUG	5,655	2	3	4	1	1	2	6	1
8"									
11 1/4°	1,970	1	1	2	1	1	1	2	1
22 1/2°	3,922	1	2	3	1	1	1	4	1
45°	7,694	2	4	5	1	1	2	8	1
90°	14,215	4	8	9	2	2	4	15	2
PLUG	10,053	3	5	6	2	2	3	10	1
12"									
11 1/4°	4,433	2	3	3	1	1	2	5	1
22 1/2°	8,826	3	5	6	2	2	3	9	1
45°	17,312	5	9	11	3	3	5	18	2
90°	31,983	8	16	19	4	4	8	32	4
PLUG	22,619	6	12	14	3	3	6	23	3
16"									
11 1/4°	7,861	2	4	5	1	1	2	8	1
22 1/2°	15,691	4	8	10	2	2	4	16	2
45°	30,779	8	16	19	4	4	8	31	4
90°	56,861	15	29	35	8	8	15	57	6
PLUG	40,213	10	21	25	5	5	10	41	5

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

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

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

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



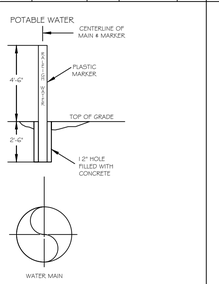
SIZE OF 45 BEND	STATIC THRUST IN POUNDS	NO. OF RODS REQUIRED
6"	4,328	2
8"	7,694	2
12"	17,312	4
16"	30,779	4
24"	69,252	6

ROD REQUIREMENTS

GENERAL NOTES:
1. ALL RODS AND BOLTS SHALL BE 3/4" HOT DIPPED GALVANIZED.
2. CONCRETE SHALL NOT CONTACT BOLTS OR ENDS OF MECHANICAL JOINT BENDS.
3. SEE STANDARD THRUST BLOCK TABLES W-10 AND W-11 FOR AREA OF THRUST BLOCKING.
4. MUST USE DUCTILE IRON DIE BOLTS WHERE NECESSARY.
5. 3" MINIMUM COVER MUST BE MAINTAINED ON ALL WATER MAINS

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
STANDARD VERTICAL BEND

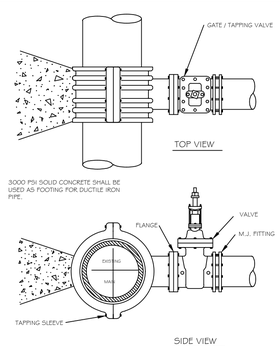
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-12	ARB	4-6-04	J.P.S.	11-1-10
	D.H.L.	6-18-08		



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 4 VALVE MARKERS FOR POTABLE & REUSE WATER IN EASEMENTS

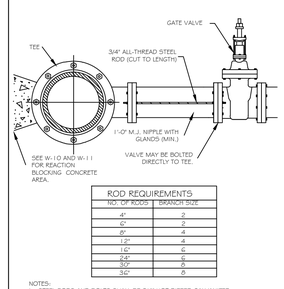
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-13	D.W.C.	9-7-99	DHL	5-16-07
	RRH	3-31-00	J.P.S.	11-1-10



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

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

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-14	Y.C.A.	2-31-81	RRH	3-31-00
	D.W.C.	9-7-99	J.P.S.	11-1-10

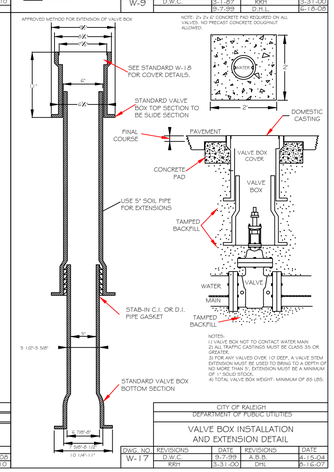


ROD REQUIREMENTS	
NO. OF RODS	BRANCH SIZE
4"	2
6"	2
8"	4
12"	4
16"	6
24"	6
30"	8
36"	8

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

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

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-15	RRH	3-31-00	D.H.L.	6-16-08
	A.B.B.	4-13-04	J.P.S.	11-1-10

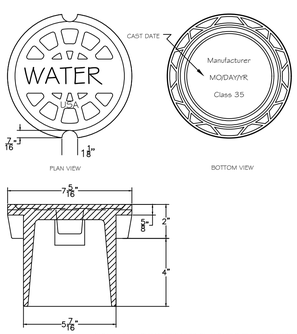


NOTE: 2'x 2'x 6" CONCRETE PAD REQUIRED ON ALL VALVES. NO PRECAST CONCRETE DOUGHNUT ALLOWED.

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

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

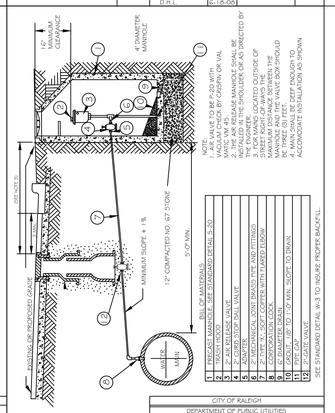
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-17	D.W.C.	9-7-99	A.B.B.	4-15-04
	RRH	3-31-00	DHL	5-16-07



NOTE 1 - "WATER" LETTERING MUST BE 1" RAISED (RECESSED FLUSH)
NOTE 2 - VALVE COVER SHALL BE DOMESTICALLY CAST.
NOTE 3 - COVER MUST HAVE A MINIMUM WEIGHT OF 25 POUNDS.
NOTE 4 - COVER MUST BE CLASS 35 OR GREATER.
NOTE 5 - COVER MUST MEET OR EXCEED AASHTO H-20 LOAD REQUIREMENTS.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
5 1/4" VALVE BOX DROP LID WITH 4" SKIRT

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-18				



NOTE
1. AIR VALVE TO BE P-20 WITH 1" AIR VENT, 2" AIR RELEASE, 2" AUTOMATIC VALVE.
2. ALL VALVE BOX COVERS SHALL BE PLITTSBURG WITH "AIR" STAMPED ON THE SHOULDER OR AS DIRECTED BY ENGINEER.
3. ITEMS MARKED (*) LOCATED OUTSIDE OF THE RIGHT OF WAY SHALL BE MAXIMUM DISTANCE BETWEEN THE MAINLINE AND THE VALVE BOX SHOULD BE 5' OR LESS.
4. MAIN SHALL BE DEEP ENOUGH TO ACCOMODATE INSTALLATION AS SHOWN

BILL OF MATERIALS

1	PRECAST MANHOLE - SEE STANDARD DETAIL S-20	
2	1" WATER SERVICE	
3	2" AIR RELEASE VALVE	
4	2" CORPO STOP BALL VALVE	
5	2" AUTOMATIC VALVE	
6	2" MECHANICAL JOINT CROSS HYD AND FITTINGS	
7	4" MECHANICAL JOINT GATE VALVE WITH 2 LARGER LUGS	
8	4" CORPORATION COCK	
9	4" QUARTER BENDS	
10	4" PVC SDR 35 - 12" MIN. SLOPE TO DRAIN	
11	PIPE CAP	
12	2" GATE VALVE	

SEE STANDARD DETAIL W-19 TO HOUSE PROPER BACKFILL

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
STANDARD WATER AIR RELEASE VALVE

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-19	ARB	10-8-04		2-31-81
	J.P.S.	11-1-10	RRH	6-7-00

WATER PERMITS

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 #** _____

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

FLM ENGINEERING
POST OFFICE BOX 91727
RALEIGH, NORTH CAROLINA 27675
PHONE: 919.610.1051
FIRM NC LICENSE NUMBER C-4222

NORTH CAROLINA PROFESSIONAL SEAL 041421 ENGINEER CHRISTOPHER A. LEWIS

REVISION HISTORY

REV #	DESCRIPTION	DATE	BY

ORIGINAL PLAN SIZE: 24" X 36"

ISSUED FOR PERMITTING
DO NOT USE FOR CONSTRUCTION

SCALE ADJUSTMENT
THIS BAR IS 1 INCH IN LENGTH ON ORIGINAL DRAWING
0 — 1"
IF IT IS NOT 1 INCH ON THIS SHEET, ADJUST YOUR SCALE ACCORDINGLY

CONSTRUCTION PLANS FOR GRANITE FALLS BLVD. EXTENSION

ROLESVILLE, NC

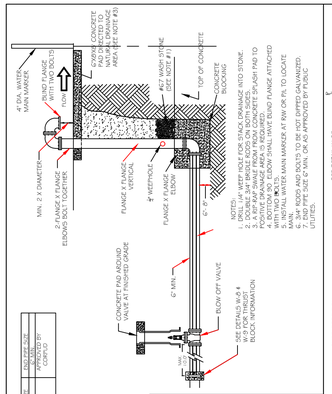
BARRINGTON DEVELOPMENT, LLC

DATE:	02-28-2020
SCALE:	AS SHOWN
DESIGNED BY:	FLM
APPROVED BY:	FLM
PROJECT NO.:	20012

WATER DETAILS

C-15

SHEET 15 OF 18

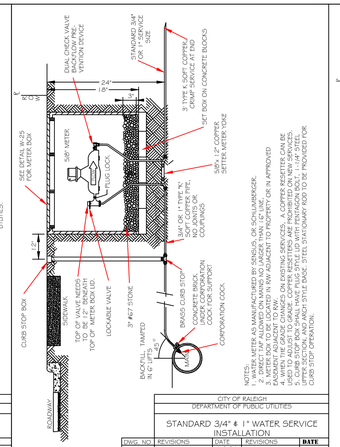


REVISIONS	DATE	REVISIONS	DATE

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES

PERMANENT WATER MAIN BLOW OFF ASSEMBLY

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-22	D.W.C.	2-05-97	DRL	8/16/07
	A.B.B.	4-13-04		

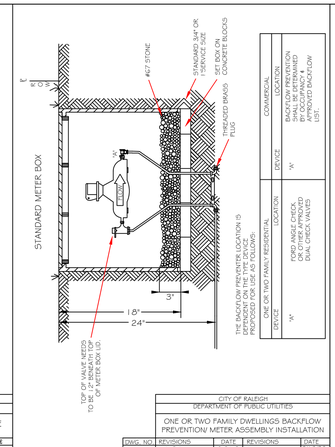


NOTES:
1. METER AS MANUFACTURED BY SENSUS, OR SCHULUMBERGER.
2. DIRECT TAP ALLOWED ON HAND AS LARGER THAN 12" LINE.
3. METER BOX TO BE LOCATED IN RW ADJACENT TO PROPERTY OR IN APPROVED EASEMENT AS CLOSE TO PROPERTY LINE AS POSSIBLE.
4. WHEN THE GRADE CHANGES ON EXISTING SERVICES, A COPPER REGETTER LINE SHALL BE INSTALLED TO ALLOW FOR PROPER INSTALLATION OF THE METER BOX.
5. CURB STOP BOX SHALL HAVE PLUG STYLE LID WITH PENTAGON BOLT. 1-1/4" STEEL.
6. CURB STOP BOX SHALL BE SET PLUMB AND TO GRADE. SHALL HAVE PROPER DRAINAGE. SHALL BE PROPERLY OPERABLE CURB STOP OPERATION.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES

STANDARD 3/4" & 1" WATER SERVICE INSTALLATION

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	REVISIONS	DATE
W-23	D.W.C.	4-6-04	ABB	4-6-04		
	D.H.L.	5/18/05				

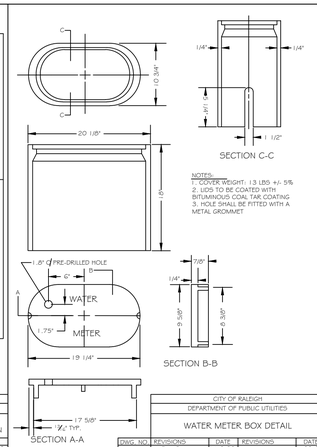


	COMMERCIAL	
	LOCATION	BACKFLOW PREVENTER SHALL BE INTERNALLY MOUNTED IN THE BUILDING (EXCEPT DOUBLE CHECK DETECTOR ASSEMBLY USE).
ONE OR TWO FAMILY RESIDENTIAL	DEVICE	"A"
LOCATION		
DEVICE	FORD ANGLE CHECK DETECTOR ASSEMBLY DUAL CHECK VALVES	
"A"		

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES

ONE OR TWO FAMILY DWELLINGS BACKFLOW PREVENTION/ METER ASSEMBLY INSTALLATION

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE	REVISIONS	DATE
W-24	A.B.B.	4-7-04	J.P.S.	1/4/10		
	Y.C.A.	2-21-08	D.H.L.	6/18/08		

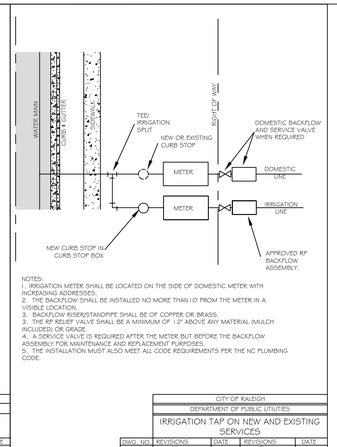


NOTES:
1. COVER WEIGHT: 13 LBS +/- 5%
2. LIDS TO BE COATED WITH BITUMINOUS COAL TAR COATING
3. HOLE SHALL BE FITTED WITH A METAL GROMMET

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES

WATER METER BOX DETAIL

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-25	D.W.C.	1-3-95	ABB	1-20-05
	RRH	3-31-00	J.P.S.	1-4-10

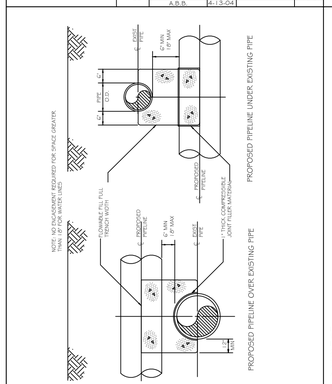


NOTES:
1. IRRIGATION METER SHALL BE LOCATED ON THE SIDE OF DOMESTIC METER WITH INCREASING ADDRESSES.
2. THE BACKFLOW SHALL BE INSTALLED NO MORE THAN 10' FROM THE METER IN A VISIBLE LOCATION.
3. BACKFLOW RISER/STANDPIPE SHALL BE OF COPPER OR BRASS.
3. THE RP RELIEF VALVE SHALL BE A MINIMUM OF 12" ABOVE ANY MATERIAL (MULCH INCLUDED) OR GRADE.
4. A SERVICE VALVE IS REQUIRED AFTER THE METER BUT BEFORE THE BACKFLOW ASSEMBLY FOR MAINTENANCE AND REPLACEMENT PURPOSES.
5. THE INSTALLATION MUST ALSO MEET ALL CODE REQUIREMENTS PER THE NC PLUMBING CODE.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES

IRRIGATION TAP ON NEW AND EXISTING SERVICES

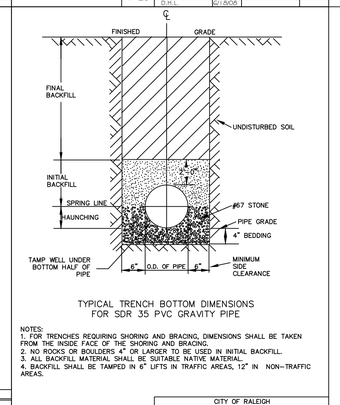
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-35	RRH	3-31-00	D.H.L.	6-18-08
	ABB	2-10-04	J.P.S.	10/25/10



CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES

CONCRETE CRADLE PROTECTION FOR WATER LINE CROSSINGS

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



TYPICAL TRENCH BOTTOM DIMENSIONS FOR SDR 35 PVC GRAVITY PIPE

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

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES

TRENCH BOTTOM DIMENSIONS AND BACKFILLING REQUIREMENTS FOR PVC GRAVITY SEWER MAIN

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

WATER PERMITS

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 #** _____

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

FLM ENGINEERING

POST OFFICE BOX 91727
RALEIGH, NORTH CAROLINA 27675
PHONE: 919.610.1051
FIRM NC LICENSE NUMBER C-4222

NORTH CAROLINA PROFESSIONAL SEAL 041421 ENGINEER CHRISTOPHER A. LEWIS

REVISION HISTORY

REV #	DESCRIPTION	DATE	BY

ORIGINAL PLAN SIZE: 24" X 36"

ISSUED FOR PERMITTING
DO NOT USE FOR CONSTRUCTION

SCALE ADJUSTMENT

THIS BAR IS 1 INCH IN LENGTH ON ORIGINAL DRAWING
0 1"

IF IT IS NOT 1 INCH ON THIS SHEET, ADJUST YOUR SCALE ACCORDINGLY

CONSTRUCTION PLANS FOR GRANITE FALLS BLVD. EXTENSION

ROLESVILLE, NC

BARRINGTON DEVELOPMENT, LLC

DATE:	02-28-2020
SCALE:	AS SHOWN
DESIGNED BY:	FLM
APPROVED BY:	FLM
PROJECT NO.:	20012

WATER DETAILS

C-16

SHEET 16 OF 18

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

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

SECTION E: GROUND STABILIZATION

Required Ground Stabilization Timeframes

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

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

GROUND STABILIZATION SPECIFICATION

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

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

POLYACRYLAMIDES (PAMS) AND FLOCCULANTS

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

EQUIPMENT AND VEHICLE MAINTENANCE

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

LITTER, BUILDING MATERIAL AND LAND CLEARING WASTE

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

PAINT AND OTHER LIQUID WASTE

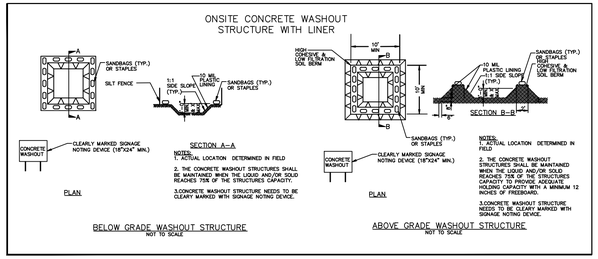
1. Do not dump paint and other liquid waste into storm drains, streams or wetlands.
2. Locate paint washouts at least 50 feet away from storm drain inlets and surface waters unless no other alternatives are reasonably available.
3. Contain liquid wastes in a controlled area.
4. Containment must be labeled,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

PORTABLE TOILETS

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

EARTHEN STOCKPILE MANAGEMENT

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



CONCRETE WASHOUTS

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

HERBICIDES, PESTICIDES AND RODENTICIDES

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

HAZARDOUS AND TOXIC WASTE

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

NCG01 GROUND STABILIZATION AND MATERIALS HANDLING

EFFECTIVE: 04/01/19

WATER PERMITS

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 #** _____

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

FLM ENGINEERING
POST OFFICE BOX 91727
RALEIGH, NORTH CAROLINA 27675
PHONE: 919.610.1051
FIRM NC LICENSE NUMBER C-4222

NORTH CAROLINA PROFESSIONAL SEAL 041421 ENGINEER CHRISTOPHER A. LEWIS

REVISION HISTORY

REV #	DESCRIPTION	DATE	BY

ORIGINAL PLAN SIZE: 24" X 36"

ISSUED FOR PERMITTING
DO NOT USE FOR CONSTRUCTION

SCALE ADJUSTMENT
THIS BAR IS 1 INCH IN LENGTH ON ORIGINAL DRAWING
0 1"
IF IT IS NOT 1 INCH ON THIS SHEET, ADJUST YOUR SCALE ACCORDINGLY

CONSTRUCTION PLANS FOR GRANITE FALLS BLVD. EXTENSION

ROLESVILLE, NC

BARRINGTON DEVELOPMENT, LLC

DATE:	02-28-2020
SCALE:	AS SHOWN
DESIGNED BY:	FLM
APPROVED BY:	FLM
PROJECT NO.:	20012

NCDEQ NCG01 GROUND STABILIZATION AND MATERIALS HANDLING

C-17

SHEET 17 OF 18

PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION A: SELF-INSPECTION

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

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

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

PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION B: RECORDKEEPING

1. E&SC Plan Documentation

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

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

2. Additional Documentation to be Kept on Site

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

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

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

3. Documentation to be Retained for Three Years

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

PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION C: REPORTING

1. Occurrences that Must be Reported

Permittees shall report the following occurrences:

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

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

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

(d) Anticipated bypasses and unanticipated bypasses.

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

2. Reporting Timeframes and Other Requirements

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

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

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

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

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

NCG01 SELF-INSPECTION, RECORDKEEPING AND REPORTING

EFFECTIVE: 04/01/19

WATER PERMITS

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 #** _____

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

FLM ENGINEERING

POST OFFICE BOX 91727
RALEIGH, NORTH CAROLINA 27675
PHONE: 919.610.1051
FIRM NC LICENSE NUMBER C-4222

NORTH CAROLINA PROFESSIONAL SEAL 041421 ENGINEER CHRISTOPHER A. LEWIS

REVISION HISTORY

REV #	DESCRIPTION	DATE	BY

ORIGINAL PLAN SIZE: 24" X 36"

ISSUED FOR PERMITTING
DO NOT USE FOR CONSTRUCTION

SCALE ADJUSTMENT
THIS BAR IS 1 INCH IN LENGTH ON ORIGINAL DRAWING
0 1"
IF IT IS NOT 1 INCH ON THIS SHEET, ADJUST YOUR SCALE ACCORDINGLY

CONSTRUCTION PLANS FOR GRANITE FALLS BLVD. EXTENSION

ROLESVILLE, NC

BARRINGTON DEVELOPMENT, LLC

DATE:	02-28-2020
SCALE:	AS SHOWN
DESIGNED BY:	FLM
APPROVED BY:	FLM
PROJECT NO.:	20012

NCDEQ NCG01 INSPECTION RECORDKEEPING AND REPORTING

C-18

SHEET 18 OF 18