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

City of Raleigh
Public Utilities Department Permit # S-5618

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

City of Raleigh
Public Utilities Department Permit # W-4214

AMERICAN Engineering
American Engineering Associates - Southeast, P.A.
4020 Westchase Boulevard, Suite 450
Raleigh, NC 27607
919-469-1101

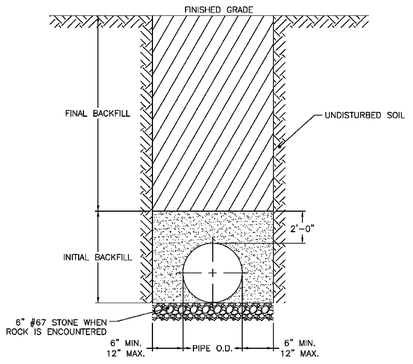
SEE TRANSPORTATION DETAIL
T–10.05.1 FOR ASPHALT REPAIR

SEE TRANSPORTATION DETAIL
T–10.05.2 FOR ASPHALT REPAIR EXTENTS

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 01/19/2025	NOT TO SCALE
	STANDARD ASPHALT PAVEMENT PATCH	

S-3

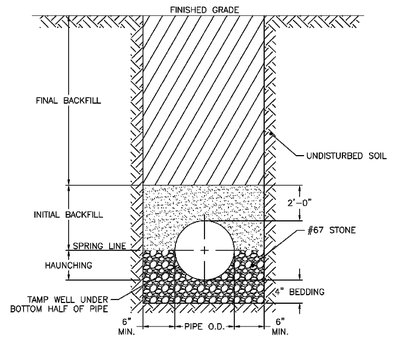


NOTES:
1. FOR TRENCHES REQUIRING SHORING AND BRACING, DIMENSIONS SHALL BE TAKEN FROM THE INSIDE FACE OF THE SHORING AND BRACING.
2. NO ROCKS OR BOULDERS 4" OR LARGER TO BE USED IN INITIAL BACKFILL.
3. ALL BACKFILL MATERIAL SHALL BE SUITABLE NATIVE MATERIAL.
4. BACKFILL SHALL BE TAMPED IN 6" LIFTS IN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

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 01/19/2025	NOT TO SCALE
	TRENCH BOTTOM DIMENSIONS & BACKFILLING REQUIREMENTS FOR DUCTILE IRON	

S-4



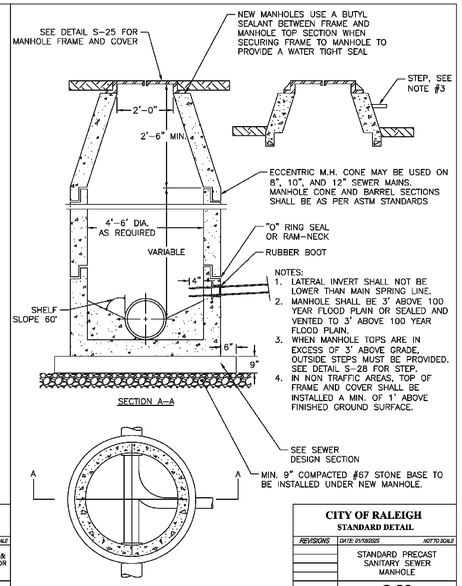
TYPICAL TRENCH BOTTOM DIMENSIONS FOR SDR 35 PVC GRAVITY PIPE

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
STANDARD DETAIL

REVISIONS	DATE: 01/19/2025	NOT TO SCALE
	TRENCH BOTTOM DIMENSIONS FOR PVC GRAVITY SEWER MAIN	

S-5



NOTES:
1. LATERAL INVERT SHALL NOT BE LOWER THAN MAIN SPRING LINE.
2. MANHOLE SHALL BE 3' ABOVE 100 YEAR FLOOD PLAIN OR SEALED AND VENTED TO 3' ABOVE 100 YEAR FLOOD PLAIN.
3. WHEN MANHOLE TOPS ARE IN EXCESS OF 3' ABOVE GRADE, OUTSIDE STEPS MUST BE PROVIDED. SEE DETAIL S–28 FOR STEP.
4. IN NON TRAFFIC AREAS, TOP OF FRAME AND COVER SHALL BE INSTALLED A MIN. OF 1' ABOVE FINISHED GROUND SURFACE.

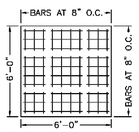
CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 01/19/2025	NOT TO SCALE
	STANDARD PRECAST SANITARY SEWER MANHOLE	

S-20

SSWR STRUCTURE TABLE

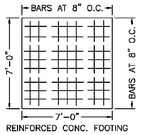
STRUCTURE NAME:	DESCRIPTION	PIPES IN:	PIPES OUT
EX. SSMH-267	SSWR MH 48 RIM = 363.98 INV IN = 352.05	8" PVC INV.=352.05	
EX. SSMH-268	SSWR MH 48 RIM = 365.25 INV IN = 354.41 INV IN = 353.11 INV OUT = 352.55	8" PVC INV.=354.41 8" PVC INV.=353.11	8" PVC INV.=352.55
SSMH-268A	SSWR MH 48 RIM = 361.61 INV OUT = 353.38		8" PVC INV.=353.38
SSMH-269	SSWR MH 48 RIM = 369.67 INV IN = 361.30 INV IN = 360.06 INV OUT = 359.86	8" PVC INV.=361.30 8" PVC INV.=360.06	8" PVC INV.=359.86
SSMH-270	SSWR MH 48 RIM = 371.88 INV IN = 362.88 INV OUT = 362.68	8" PVC INV.=362.88	8" PVC INV.=362.68
SSMH-271	SSWR MH 48 RIM = 374.42 INV IN = 365.46 INV OUT = 365.25	8" PVC INV.=365.46	8" PVC INV.=365.25
SSMH-272	SSWR MH 48 RIM = 381.06 INV IN = 372.50 INV OUT = 370.05	8" PVC INV.=372.50	8" PVC INV.=370.05
SSMH-273	SSWR MH 48 RIM = 382.28 INV IN = 374.56 INV OUT = 374.36	8" PVC INV.=374.56	8" PVC INV.=374.36
SSMH-274	SSWR MH 48 RIM = 382.81 INV OUT = 375.07		8" PVC INV.=375.07
SSMH-280A	SSWR MH 48 RIM = 370.62 INV IN = 361.86 INV OUT = 360.42	8" PVC INV.=361.86	8" PVC INV.=360.42
SSMH-280B	SSWR MH 48 RIM = 371.75 INV IN = 363.05 INV OUT = 362.85	8" PVC INV.=363.05	8" PVC INV.=362.85
SSMH-281	SSWR MH 48 RIM = 373.21 INV IN = 364.56 INV OUT = 364.36	8" PVC INV.=364.56	8" PVC INV.=364.36
SSMH-282	SSWR MH 48 RIM = 380.05 INV IN = 370.48 INV OUT = 370.28	8" PVC INV.=370.48	8" PVC INV.=370.28
SSMH-283	SSWR MH 48 RIM = 381.93 INV IN = 371.16 INV OUT = 370.96	8" PVC INV.=371.16	8" PVC INV.=370.96
SSMH-284	SSWR MH 48 RIM = 383.94 INV IN = 372.00 INV OUT = 371.80	8" PVC INV.=372.00	8" PVC INV.=371.80
SSMH-285A	SSWR MH 48 RIM = 383.20 INV IN = 372.77 INV IN = 373.70 INV OUT = 372.57	8" PVC INV.=372.77 8" PVC INV.=373.70	8" PVC INV.=372.57
SSMH-285B	SSWR MH 48 RIM = 383.99 INV OUT = 374.36		8" PVC INV.=374.36
SSMH-286	SSWR MH 48 RIM = 382.58 INV OUT = 373.14		8" PVC INV.=373.14



REINFORCED CONC. FOOTING FOR 4' PRECAST MANHOLE

BILL OF MATERIAL FOR 4' MANHOLE BASE

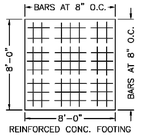
BAR SIZE	BAR LENGTH	NO. OF BARS	BAR WT. (LBS.)
#5	5'–6"	18	103
CL. "A" CONCRETE TOTAL CU. YDS.			1.0



REINFORCED CONC. FOOTING FOR 5' PRECAST MANHOLE

BILL OF MATERIAL FOR 5' MANHOLE BASE

BAR SIZE	BAR LENGTH	NO. OF BARS	BAR WT. (LBS.)
#5	6'–6"	20	136
CL. "A" CONCRETE TOTAL CU. YDS.			1.4



REINFORCED CONC. FOOTING FOR 6' PRECAST MANHOLE

BILL OF MATERIAL FOR 6' MANHOLE BASE

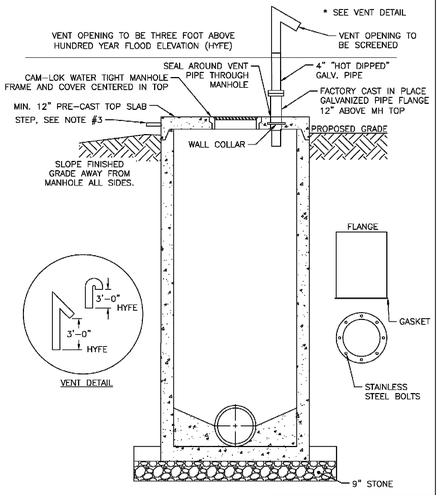
BAR SIZE	BAR LENGTH	NO. OF BARS	BAR WT. (LBS.)
#5	7'–6"	24	165
CL. "A" CONCRETE TOTAL CU. YDS.			1.8

* ALL BASES ARE MINIMUM 9" THICK

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 01/19/2025	NOT TO SCALE
	EXTENDED BASE OR CAST–IN–PLACE REINFORCED CONCRETE BASE	

S-21

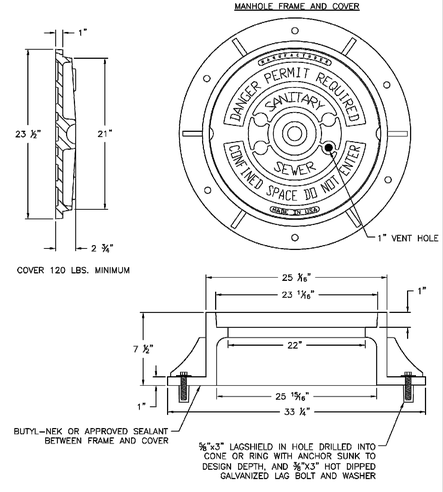


NOTES:
1. VENT MUST BE FACTORY WELDED, FABRICATED, AND "HOT DIPPED" GALVANIZED.
2. HYFE– HUNDRED YEAR FLOOD ELEVATION.
3. WHEN MANHOLE TOPS ARE IN EXCESS OF 3' ABOVE GRADE, OUTSIDE STEPS MUST BE PROVIDED. SEE DETAIL S–28 FOR STEP.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 01/19/2025	NOT TO SCALE
	STANDARD SEAL TIGHT MANHOLE WITH VENTED STACK	

S-24

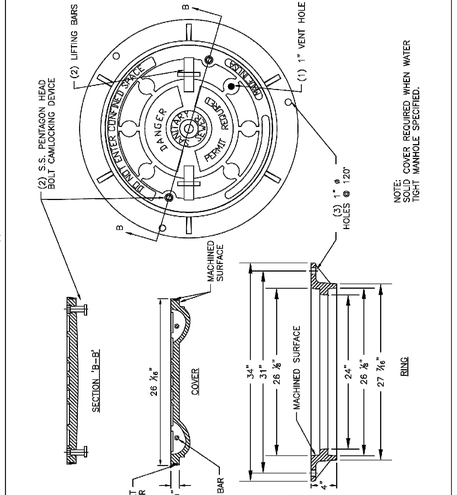


NOTES:
1. ALL MANHOLE FRAMES SHALL BE DOMESTICALLY CAST.
2. FRAME SHALL BE A MINIMUM WEIGHT OF 182 LBS. WITHIN PUBLIC ROW AND 160 LBS. WITHIN EASEMENTS.
3. COVER SHALL WEIGH A MIN. OF 120 LBS.
4. ALL MANHOLE FRAMES OUTSIDE OF PAVED SURFACES SHALL BE BOLTED TO THE CONE SECTION OR RING WITH A MINIMUM OF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

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 01/19/2025	NOT TO SCALE
	STANDARD MANHOLE COVER	

S-25



CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 01/19/2025	NOT TO SCALE
	FLAT MANHOLE COVER	

S-25A

NORTH CAROLINA
AMERICAN ENGINEERING ASSOCIATES SOUTHEAST
C-3881
CERTIFICATE OF AUTHORIZATION

Digitally signed by Jakob Klein
Date: 2025.05.01 08:04:04 -04'00'

PRELIMINARY
DO NOT USE FOR CONSTRUCTION
JAKOB P. KLEIN
26520
ENGINEER

FOR INFORMATION, ONLY

NO.	DATE	REVISION:
1	12/23/2024	CID SUBMITTAL #1

STIPULATION FOR REUSE

THIS DRAWING WAS PREPARED FOR USE ON THE SPECIFIC SITE, NAMED HEREON, CONTEMPORANEOUSLY WITH ITS ISSUE DATE AS LISTED, HEREON, AND IT IS NOT SUITABLE FOR USE ON A DIFFERENT PROJECT SITE OR AT A LATER TIME. USE OF THIS DRAWING FOR REFERENCE OR EXAMPLE ON ANOTHER PROJECT REQUIRES THE SERVICES OF PROPERLY LICENSED ARCHITECTS AND ENGINEERS. REPRODUCTION OF THIS DRAWING FOR REUSE ON ANOTHER PROJECT IS NOT AUTHORIZED AND MAY BE CONTRARY TO THE LAW.

KALAS FALLS
PHASE 5
CONSTRUCTION INFRASTRUCTURE DOCUMENTS
CID-25-01
TOWN OF ROLESVILLE, WAKE COUNTY, NC

JOB NUMBER:	R180115
CHECKED BY:	JK
DRAWN BY:	GE, RC
DATE:	05-01-2025

SHEET TITLE:

UTILITY DETAILS

SHEET NO.:

CU500

North Carolina 811
*** 3 Days Before Digging ***
North Carolina 811
811 or 1-800-632-4949
Remote Ticket Entry
http://nc811.org/remoteticketentry.htm

Public
Sewer Collection / Extension System

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City of Raleigh
Public Utilities Department Permit # S-5618

Public
Water Distribution / Extension System

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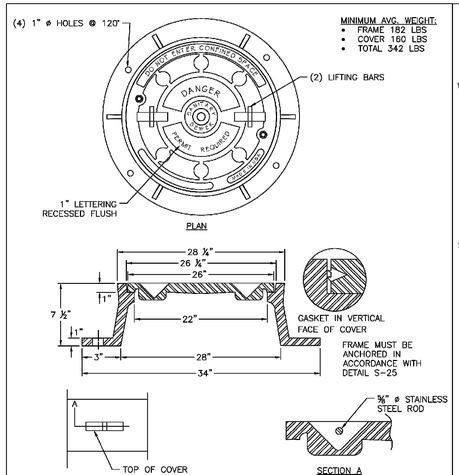
City of Raleigh
Public Utilities Department Permit # W-4214

AMERICAN Engineering
American Engineering Associates - Southeast, P.A.
4020 Westchase Boulevard, Suite 450
Raleigh, NC 27607
919-469-1101

NORTH CAROLINA ENGINEERING ASSOCIATES SOUTHEAST C-3881 CERTIFICATE OF AUTHORIZATION

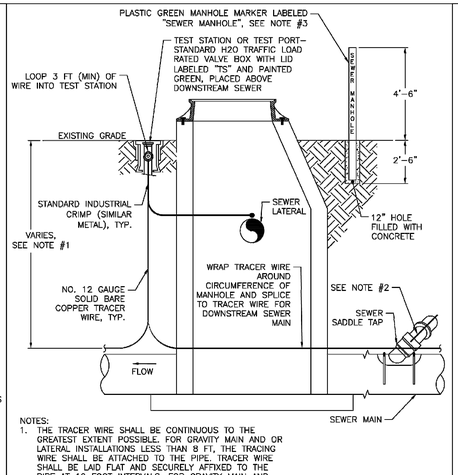
Digitally signed by Jakob Klein
Date: 2025.05.01 08:54:04-04'00'

PRELIMINARY NOT FOR CONSTRUCTION
JAKOB P. KLEIN 56528 NORTH CAROLINA PROFESSIONAL ENGINEER
DO NOT USE FOR CONSTRUCTION
FOR INFORMATION, ONLY



CITY OF RALEIGH
STANDARD DETAIL

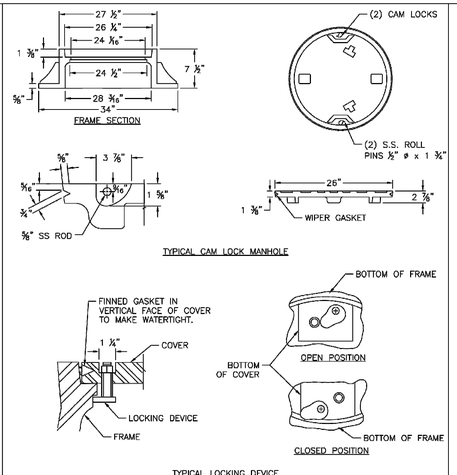
REVISIONS	DATE: 01/19/2025	NOT TO SCALE
	MANHOLE FRAME AND WATERTIGHT COVER	
	S-26	



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

CITY OF RALEIGH
STANDARD DETAIL

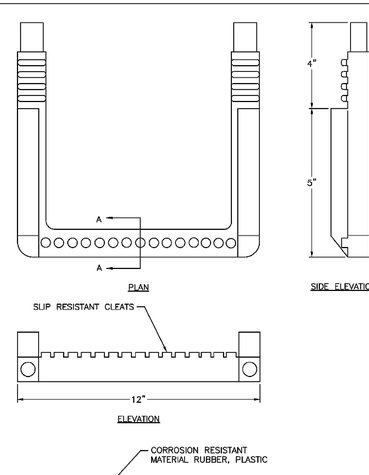
REVISIONS	DATE: 01/19/2025	NOT TO SCALE
	GRAVITY SEWER MAIN TRACER WIRE AND MANHOLE MARKER	
	S-20A	



NOTE:
1. WHEN WATERTIGHT NOT SPECIFIED, TOP SHALL HAVE ONE 1" VENT HOLE.
2. STANDARD: PENTAGON HEAD S.S. OPTIONAL: S.S. HEX HEAD BOLT.
3. RING MUST BE ANCHORED IN ACCORDANCE WITH DETAIL S–25.

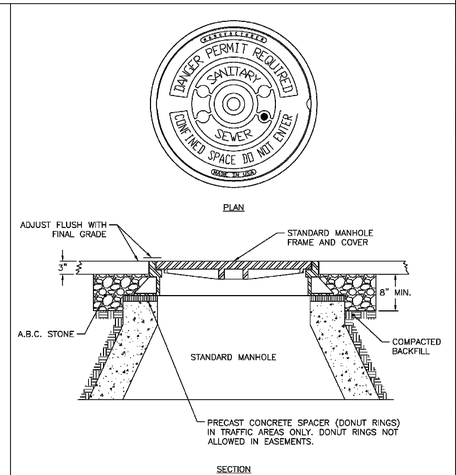
CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 01/19/2025	NOT TO SCALE
	WATERTIGHT MANHOLE FRAME WITH CAM LOCK COVER	
	S-27	



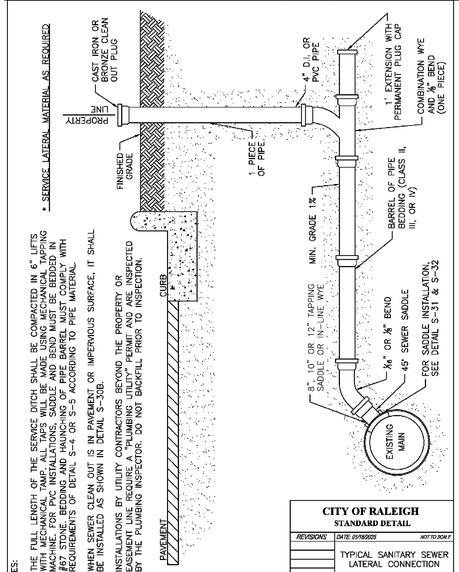
CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 01/19/2025	NOT TO SCALE
	STANDARD SLIP RESISTANT MANHOLE STEP DETAIL	
	S-28	



CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 01/19/2025	NOT TO SCALE
	STANDARD MANHOLE FRAME AND COVER DETAIL WITHIN FRAME SURFACE	
	S-29	



NOTES:
1. THE FULL LENGTH OF THE SERVICE DITCH SHALL BE COMPACTED IN 6" LIFTS WITH MECHANICAL TAMP. ALL TAPS WILL BE MADE USING MECHANICAL TAPPING MACHINE. FOR PVC INSTALLATIONS, SADDLE AND BEND MUST BE BEDDED IN CRUSHED STONE BEDDING AND BACKFILLED AS PER THE BEDDING AND BACKFILL REQUIREMENTS OF DETAIL S-4 OR S-5 ACCORDING TO PIPE MATERIAL.
2. WHEN SEWER CLEAN OUT IS IN PAVEMENT OR IMPERVIOUS SURFACE, IT SHALL BE INSTALLED AS SHOWN IN DETAIL S-33B.
3. INSTALLATIONS BY UTILITY CONTRACTORS BEYOND THE PROPERTY OR EASEMENT LINE REQUIRE A "PLUMBING UTILITY" PERMIT AND ARE INSPECTED BY THE PLUMBING INSPECTOR. DO NOT BACKFILL PRIOR TO INSPECTION.

CITY OF RALEIGH
STANDARD DETAIL

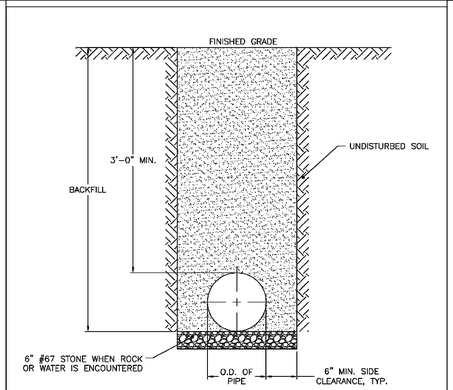
REVISIONS	DATE: 01/19/2025	NOT TO SCALE
	TYPICAL SANITARY SEWER LATERAL CONNECTION	
	S-30	

SEE TRANSPORTATION DETAIL
T–10.05.1 FOR ASPHALT REPAIR

SEE TRANSPORTATION DETAIL
T–10.05.2 FOR ASPHALT REPAIR EXTENTS

CITY OF RALEIGH
STANDARD DETAIL

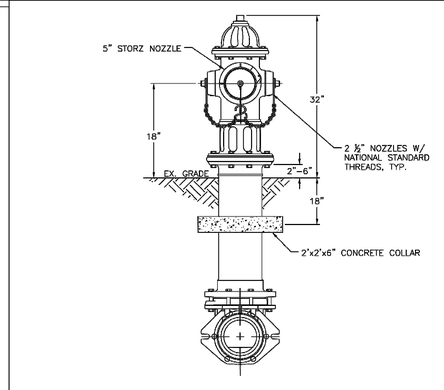
REVISIONS	DATE: 01/19/2025	NOT TO SCALE
	STANDARD ASPHALT PAVEMENT PATCH	
	W-2	



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
STANDARD DETAIL

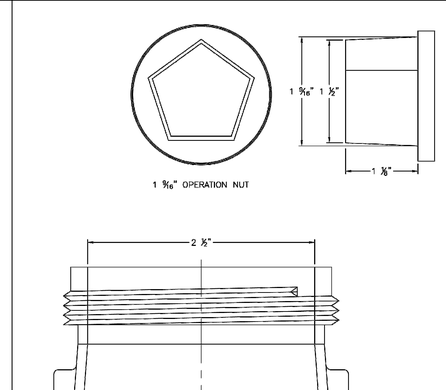
REVISIONS	DATE: 01/19/2025	NOT TO SCALE
	TRENCH BOTTOM DIMENSIONS AND BACKFILLING REQUIREMENTS FOR DUCTILE IRON	
	W-3	



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

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 01/19/2025	NOT TO SCALE
	STANDARD FIRE HYDRANT WITH 5" STORZ PUMPER NOZZLE	
	W-5	



CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 01/19/2025	NOT TO SCALE
	HYDRANT OPERATING NUT AND 2 ½" OUTLET THREADS	
	W-6	

NO.	DATE	REVISION:
1	12/23/2024	CID SUBMITTAL #1

STIPULATION FOR REUSE

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KALAS FALLS
PHASE 5
CONSTRUCTION INFRASTRUCTURE DOCUMENTS
CID-25-01
TOWN OF ROLESVILLE, WAKE COUNTY, NC

JOB NUMBER:	R180115
CHECKED BY:	JK
DRAWN BY:	GE, RC
DATE:	05-01-2025

SHEET TITLE:
UTILITY DETAILS

SHEET NO.:
CU501

North Carolina 811 Call Before You Dig
*** 3 Days Before Digging ***
North Carolina 811
811 or 1-800-632-4949
Remote Ticket Entry
http://nc811.org/remoteticketentry.htm

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2025-05-01

Public
Sewer Collection / Extension System

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

City of Raleigh
Public Utilities Department Permit # S-5618

Public
Water Distribution / Extension System

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City of Raleigh
Public Utilities Department Permit # W-4214

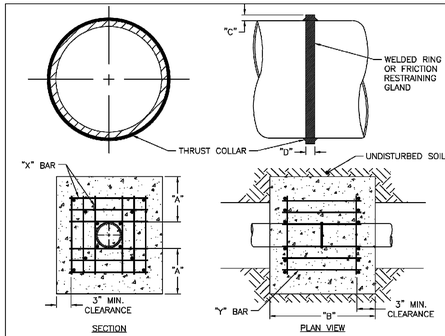
AMERICAN Engineering
American Engineering Associates - Southeast, P.A.
4020 Westchase Boulevard, Suite 450
Raleigh, NC 27607
919-469-1101

NORTH CAROLINA ENGINEERING CERTIFICATE OF AUTHORIZATION
AMERICAN ENGINEERING ASSOCIATES SOUTHEAST
C-3881

Digitally signed by Jakob Klein
Date: 2025.05.01 15:04:04 -04'00'

PRELIMINARY
NOT FOR CONSTRUCTION
JAKOB P. KLEIN
NORTH CAROLINA PROFESSIONAL ENGINEER
045528

FOR INFORMATION, ONLY



REINFORCING REQUIREMENTS

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

THRUST COLLAR AND THRUST SCHEDULE

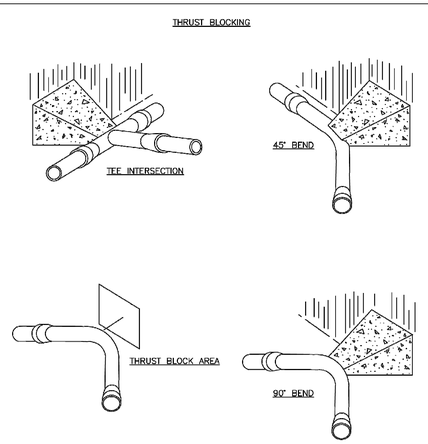
I.D. PIPE	"A"	"B"	"C"	"D"
6"–16"	1'–4"	1'–7"	2"	⅜"
20"–24"	1'–4"	1'–7"	3"	½"
30"–36"	1'–4"	1'–7"	4"	⅝"
≥48"	1'–8"	1'–9"	6"	⅞"

NOTES:
1. SEE DETAIL W–9 FOR THRUST BLOCK LOCATIONS.
2. CONCRETE SHALL BE 3,000 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 DETAIL W–3.
5. BACKFILL TAMPED IN 6" LIFTS, SEE DETAIL W–3.
6. THRUST COLLAR MUST BE FACTORY WELDED ON BOTH SIDES ALONG BOTH EDGES OF COLLAR AROUND CIRCUMFERENCE.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 01/19/2023	NOT TO SCALE
	THRUST BLOCKING DESIGN DATA FOR WATER MAINS	
		W-7

THRUST BLOCKING



NOTES:
1. CONCRETE SHALL BE 3,000 PSI.
2. CONCRETE SHALL NOT CONTACT BOLTS OR ENDS OF MECHANICAL JOINT FITTINGS.
3. TRENCHES SHALL CONFORM TO DETAIL W–3.
4. SEE DETAIL W–10 & W–11 (THRUST BLOCK TABLES) FOR AREA OF CONCRETE REQUIRED.
5. ALL BENDS AND INTERSECTIONS SHALL HAVE CONCRETE THRUST BLOCKING.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 01/19/2023	NOT TO SCALE
	THRUST BLOCKING VIEWS	
		W-9

REACTION BEARING AREAS FOR HORIZONTAL WATER PIPE BENDS BASED ON TEST PRESSURE OF 200 PSI

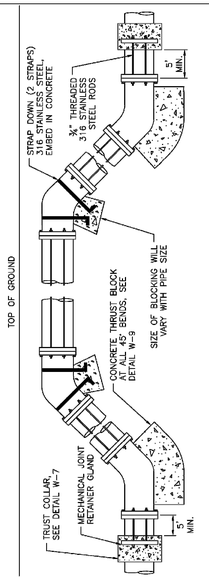
ALL AREAS GIVEN IN SQUARE FEET

SIZE OF BEND	DEGREE OF BEND	STATIC THRUST IN POUNDS	MODERATELY DRY CLAY 4,000 LBS/FT²	SOFT CLAY 2,000 LBS/FT²	1,600 LBS/FT³ GRAVEL/ COARSE SAND	8,000 LBS/FT³ DRY CLAY (ALWAYS DRY)	SAND, COMPACT FIRM 8,000 LBS/FT³	SAND— CLEAN DRY 4,000 LBS/FT³	SOIL 1,000 LBS/FT² QUICKSAND (VERY POOR)	ROCK— POOR 10,000 LBS/FT²
6"	11 ¼°	1,108	1	1	1	1	1	1	2	1
	22 ½°	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 ¼°	1,970	1	1	2	1	1	1	2	1
	22 ½°	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 ¼°	4,433	2	3	3	1	1	2	5	1
	22 ½°	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 ¼°	7,881	2	4	5	1	1	2	8	1
	22 ½°	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

NOTES:
1. 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.
2. USE 6" 90° BEND VALUE FOR HYDRANTS FOR ADDITIONAL SAFETY FACTOR.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 01/19/2023	NOT TO SCALE
	THRUST BLOCKING DESIGN QUANTITY TABLE	
		W-10



RESTRAINT REQUIREMENTS

PIPE DIA	RODDING	RJ GLANDS	THRUST COLLAR	THRUST BLOCKING
≤12"	X	X	X	X
≥12"	X	X	X	X

"X" DENOTES REQUIRED RESTRAINT.

STRAP REQUIREMENTS

STRAP WIDTH	STRAP THICKNESS
1"	¾"
1.5"	¾"
2"	¾"
2"	½"
4"	½"

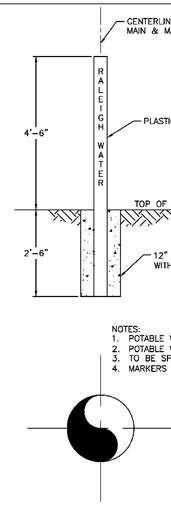
ROD REQUIREMENTS

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

NOTES:
1. STEEL RODS AND BOLTS SHALL BE ¾" 316 STAINLESS STEEL.
2. CONCRETE SHALL NOT CONTACT BOLTS OR ENDS OF MECHANICAL JOINT BENDS.
3. RESTRAINED MECHANICAL GLANDS TO BE USED AT ALL FITTINGS.
4. MUST USE DUCTILE IRON EYE BOLTS WHERE NECESSARY.
5. ALL SHALL BE FACTORY WELDED.
6. EXTERNAL RESTRAINT REQUIRED. INTEGRAL BELL RESTRAINT REQUIRES DIRECTOR'S APPROVAL.

CITY OF RALEIGH
STANDARD DETAIL

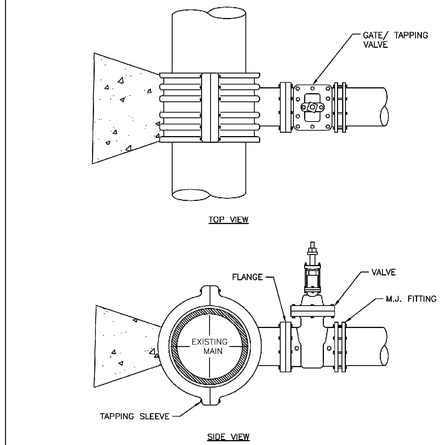
REVISIONS	DATE: 01/19/2023	NOT TO SCALE
	STANDARD VERTICAL BEND	
		W-12



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
STANDARD DETAIL

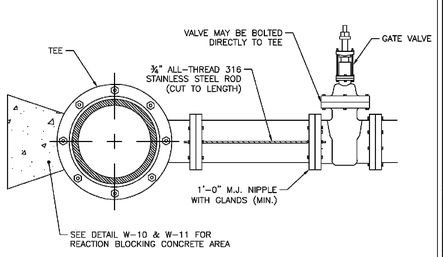
REVISIONS	DATE: 01/19/2023	NOT TO SCALE
	MAIN & VALVE MARKER FOR POTABLE WATER IN EASEMENTS	
		W-13



NOTES:
1. CONCRETE SHALL NOT CONTACT BOLTS OR ENDS OF MECHANICAL JOINT FITTINGS.
2. SEE DETAIL W–10 & W–11 (REACTION BLOCK TABLES) FOR AREA OF CONCRETE REQUIRED.
3. 3,000 PSI SOLID CONCRETE SHALL BE USED AS FOOTING FOR DUCTILE IRON PIPE.
4. FULL CIRCUMFERENCE SLEEVE, STAINLESS STEEL MATERIAL REQUIRED.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 01/19/2023	NOT TO SCALE
	4"–24" STANDARD TAPPING SLEEVE AND VALVE ASSEMBLY	
		W-14



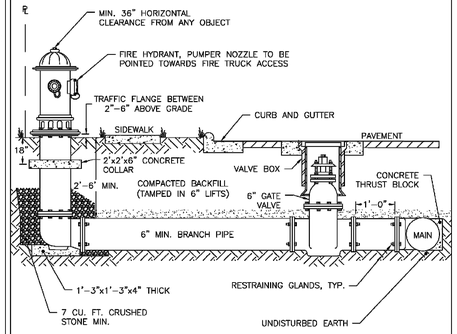
ROD REQUIREMENTS

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

NOTES:
1. STEEL RODS AND BOLTS SHALL BE ¾" 316 STAINLESS STEEL.
2. SEE DETAIL W–10 AND W–11 (THRUST BLOCK TABLES) FOR CONCRETE.
3. CONCRETE SHALL NOT CONTACT BOLTS OR ENDS OF MECHANICAL FITTINGS.
4. THIS RODDING REQUIREMENT DOES NOT APPLY TO FIRE HYDRANTS.

CITY OF RALEIGH
STANDARD DETAIL

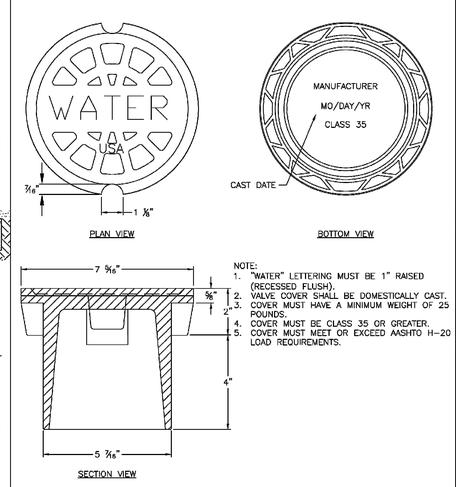
REVISIONS	DATE: 01/19/2023	NOT TO SCALE
	VALVE RESTRAINT AT TEES AND CROSSES FOR LINES (4"–24")	
		W-15



NOTES:
1. FIRE HYDRANT SHALL BE AS MANUFACTURED: MUELLER, AMERICAN DARLING, KENNEDY OR CLOW.
2. BRANCH PIPE SHALL BE DUCTILE IRON AWWA C150.
3. 6" GATE VALVE SHALL BE AWWA C500 OPEN LEFT.
4. RODS AND BOLTS SHALL BE ¾" 316 STAINLESS STEEL.
5. FIRE HYDRANTS WILL BE INSTALLED IN TRUE VERTICAL POSITION.
6. RODS SHALL NOT BE COUPLED MORE THAN ONCE. IF THE LENGTH FROM THE VALVE TO THE HYDRANT EXCEEDS 20' THEN A MECHANICAL RESTRAINING GLAND WITH A REBAR CAGE SHALL BE INSTALLED NO MORE THAN 10' FROM HYDRANT AND POURED IN CONCRETE.
7. FIRE HYDRANTS TO BE LOCATED IN ROW OR 2.5 FOOT EASEMENT (ON ALL SIDES OF HYDRANT) FOOT EASEMENT ADJACENT TO ROW.
8. ANYTIME SITE WORK, CONSTRUCTION, ROAD WORK, OR ANY OTHER WORK CHANGES THE GRADE OF THE FIRE HYDRANT, THE PERSON RESPONSIBLE FOR THE WORK IS RESPONSIBLE FOR ADJUSTING THE FIRE HYDRANT TO STAY WITHIN COMPLIANCE.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 01/19/2023	NOT TO SCALE
	STANDARD FIRE HYDRANT INSTALLATION (RESTRAINT GLANDS)	
		W-4



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

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 01/19/2023	NOT TO SCALE
	5 ¼" VALVE BOX DROP LID WITH 4" SKIRT	
		W-18

NO.	DATE	REVISION:
1	12/23/2024	CID SUBMITTAL #1

STIPULATION FOR REUSE

THIS DRAWING WAS PREPARED FOR USE ON THE SPECIFIC SITE, NAMED HEREON, CONTEMPORANEOUSLY WITH ITS ISSUE DATE AS LISTED, HEREON, AND IT IS NOT SUITABLE FOR USE ON A DIFFERENT PROJECT SITE OR AT A LATER TIME. USE OF THIS DRAWING FOR REFERENCE OR EXAMPLE ON ANOTHER PROJECT REQUIRES THE SERVICES OF PROPERLY LICENSED ARCHITECTS AND ENGINEERS. REPRODUCTION OF THIS DRAWING FOR REUSE ON ANOTHER PROJECT IS NOT AUTHORIZED AND MAY BE CONTRARY TO THE LAW.

KALAS FALLS
PHASE 5
CONSTRUCTION INFRASTRUCTURE DOCUMENTS
CID-25-01
TOWN OF ROLESVILLE, WAKE COUNTY, NC

JOB NUMBER:	R180115
CHECKED BY:	JK
DRAWN BY:	GE, RC
DATE:	05-01-2025

SHEET TITLE:

UTILITY DETAILS

SHEET NO.:

CU502

North Carolina 811 811.ncgov

*** 3 Days Before Digging ***
North Carolina 811
811 or 1-800-632-4949
Remote Ticket Entry
http://nc811.org/remoteticketentry.htm

J:\Jobs\0900\working projects\1111 phase 5 townhomes\CAD\Sheets\construction documents\CU500.dwg

2025-05-01

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

City of Raleigh
Public Utilities Department Permit # S-5618

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

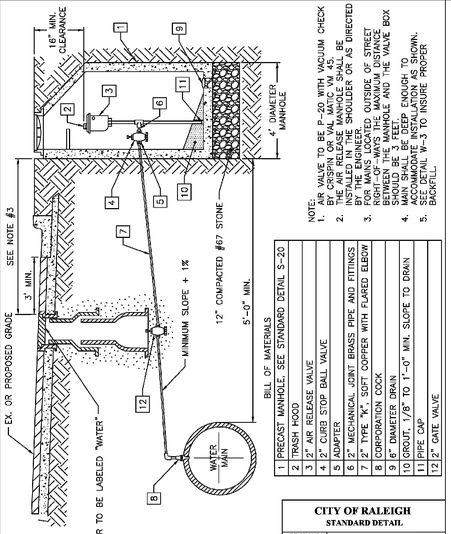
City of Raleigh
Public Utilities Department Permit # W-4214

AMERICAN Engineering
American Engineering Associates - Southeast, P.A.
4020 Westchase Boulevard, Suite 450
Raleigh, NC 27607
919-469-1101

NORTH CAROLINA ENGINEERING CERTIFICATE OF AUTHORIZATION
AMERICAN ENGINEERING ASSOCIATES SOUTHEAST
C-3881

Digitally signed by Jakob Klein
Date: 2025.05.01 15:04:04-04'00'

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION
JAKOB P. KLEIN
NORTH CAROLINA
65528
ENGINEER
FOR INFORMATION, ONLY



NOTE:
1. AIR VALVE TO BE P-20 WITH VACUUM CHECK BY CRISPIN OR VAL MATIC VM 45.
2. THE AIR VALVE ASSEMBLY SHALL BE INSTALLED IN THE SHOULDER OR AS DIRECTED BY THE ENGINEER.
3. PLACE MANHOLE OUTSIDE OF STREET RIGHT-OF-WAYS THE MAXIMUM DISTANCE BETWEEN THE MANHOLE AND THE VALVE BOX SHALL BE 15'.
4. MAIN SHALL BE DEEP ENOUGH TO ACCOMMODATE INSTALLATION AS SHOWN. SEE DETAIL W-3 TO INSURE PROPER BACKFILL.
5.

BILL OF MATERIALS

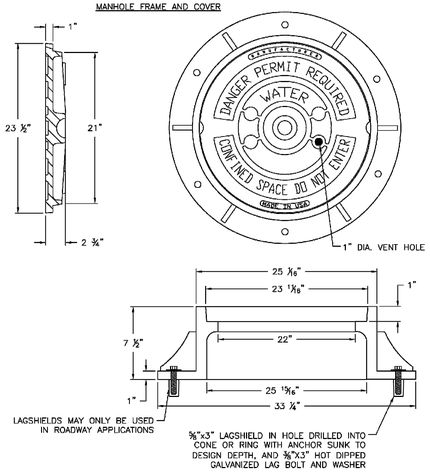
1	PRECAST MANHOLE, SEE STANDARD DETAIL S-20
2	TRASH HOOD
3	2" AIR RELEASE VALVE
4	2" CURB STOP BALL VALVE
5	ADAPTER
6	2" MECHANICAL JOINT BRASS PIPE AND FITTINGS
7	2" TYPE "K" SOFT COPPER WITH FLARED ELBOW
8	CORPORATION COCK
9	6" DIAMETER DRAIN
10	GROUT, 1/8" TO 1'-0" MIN. SLOPE TO DRAIN
11	PIPE CAP
12	2" GATE VALVE

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 05/18/2020	NOT TO SCALE
	WATER AIR RELEASE VALVE	

W-19

MANHOLE FRAME AND COVER

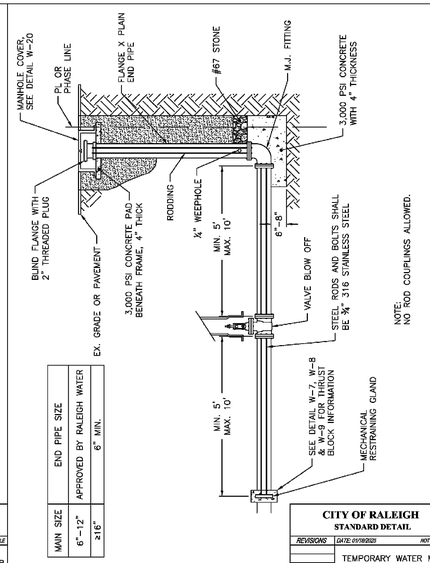


NOTES:
1. ALL MANHOLE FRAMES SHALL BE DOMESTICALLY CAST.
2. FRAME SHALL BE A MINIMUM WEIGHT OF 182 LBS.
3. COVER SHALL WEIGH A MIN. OF 120 LBS.
4. MANHOLES WITHIN PAVED SURFACES SHALL BE CONSTRUCTED ACCORDANCE WITH DETAIL S-29.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 05/18/2020	NOT TO SCALE
	STANDARD MANHOLE COVER	

W-20



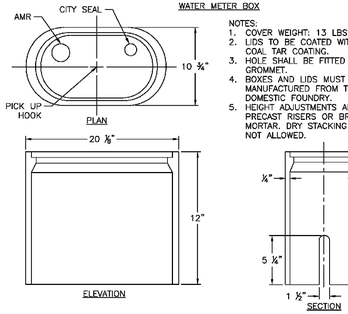
MAIN SIZE	END PIPE SIZE APPROVED BY RALEIGH WATER
6"-12"	6" MIN.
≥16"	

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 05/18/2020	NOT TO SCALE
	TEMPORARY WATER MAIN BLOW OFF ASSEMBLY	

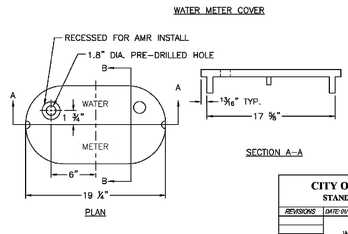
W-21

WATER METER BOX



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.
4. BOXES AND LIDS MUST BE MANUFACTURED FROM THE SAME DOMESTIC FOUNDRY.
5. HEIGHT ADJUSTMENTS ALLOWED BY PRECAST RISERS OR BRICK AND MORTAR. DRY STACKING OF BLOCK IS NOT ALLOWED.

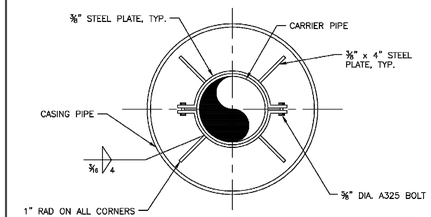
WATER METER COVER



CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 05/18/2020	NOT TO SCALE
	WATER METER BOX	

W-25

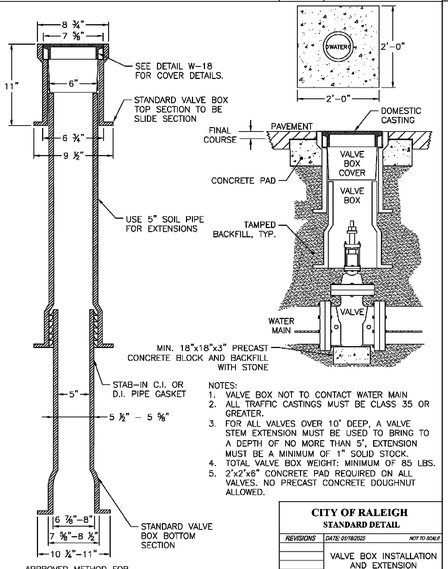


NOTE:
USE A MINIMUM OF TWO SPIDERS PER PIPE JOINT ONE FOURTH OF THE PIPE JOINT LENGTH IN FROM BOTH THE BELL AND SPIGOT ENDS.

CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 05/18/2020	NOT TO SCALE
	PIPE ALIGNMENT GUIDE	

W-40

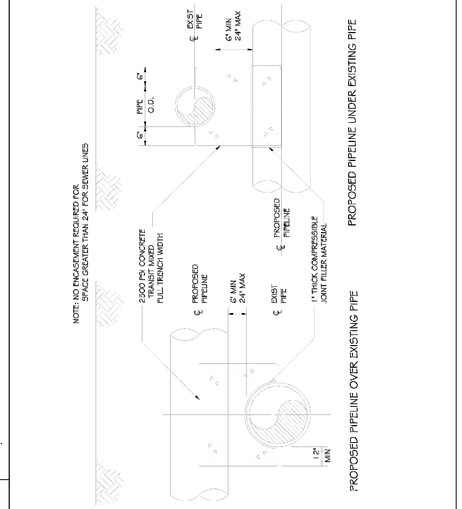


NOTES:
1. VALVE BOX NOT TO CONTACT WATER MAIN
2. ALL TRAFFIC CASTINGS MUST BE CLASS 35 OR GREATER.
3. FOR ALL VALVES OVER 10' DEEP, A VALVE STEM EXTENSION MUST BE USED TO BRING TO A DEPTH OF NO MORE THAN 5'. EXTENSION MUST BE A MINIMUM OF 1" SOLID STOCK.
4. TOTAL VALVE BOX WEIGHT: MINIMUM OF 85 LBS.
5. 2'x2'x6" CONCRETE PAD REQUIRED ON ALL VALVES. NO PRECAST CONCRETE DOUGHNUT ALLOWED.

CITY OF RALEIGH
STANDARD DETAIL

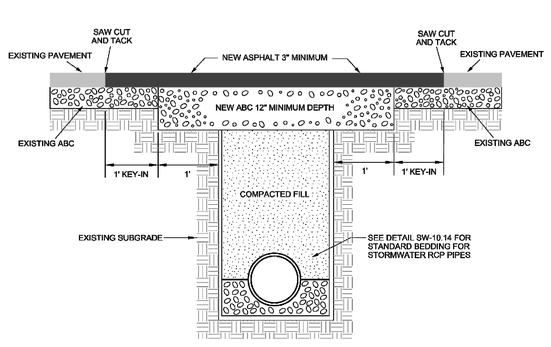
REVISIONS	DATE: 05/18/2020	NOT TO SCALE
	VALVE BOX INSTALLATION AND EXTENSION	

W-17



CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
CONCRETE CRADLE PROTECTION FOR SEWER LINE CROSSINGS

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
5-49	DHL	2-20-06		



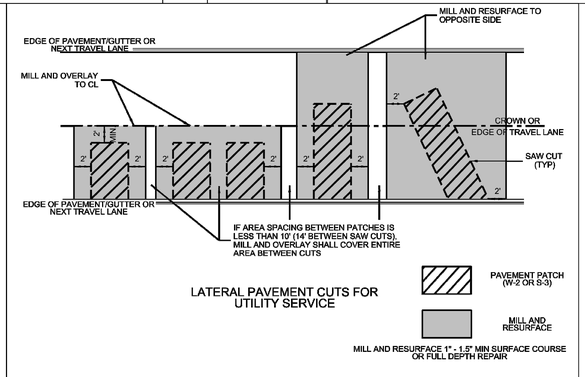
NOTES:
1. THE PAVEMENT EDGE SHALL BE DEFINED BY A STRAIGHT EDGE FORMED BY A MACHINED SAW CUT.
2. THE TRENCH SUBGRADE MATERIAL SHALL BE BACKFILLED WITH SUITABLE MATERIAL AND COMPACTED TO A DENSITY OF AT LEAST 95% OF THAT OBTAINED BY COMPACTING A SAMPLE OF THE MATERIAL IN ACCORDANCE WITH AASHTO T-99 AS MODIFIED BY NCDOT.
3. THE FINAL 1' OF FILL SHALL CONSIST OF ABC MATERIAL COMPACTED TO A DENSITY EQUAL TO 100% OF THAT OBTAINED BY COMPACTING A SAMPLE OF THE MATERIAL IN ACCORDANCE WITH AASHTO T-80 AS MODIFIED BY NCDOT. BITUMINOUS BASE OR BINDER MAY BE SUBSTITUTED IF APPROVED BY TRANSPORTATION DIRECTOR OR DESIGNEE.
4. THE ENTIRE THICKNESS/VERTICAL EDGE OF THE CUT SHALL BE TACKED.
5. THE SAME DEPTH OF PAVEMENT MATERIAL WHICH EXISTS SHALL BE REINSTALLED, BUT IN NO CASE SHALL THE ASPHALT BE LESS THAN 3" THICK.
6. THE ASPHALT PAVEMENT MATERIAL SHALL BE INSTALLED AND COMPACTED THOROUGHLY AND ROLLED WITH A SMOOTH DRUM ROLLER TO ACHIEVE A SMOOTH, LEVEL PATCH.

SHEET 1 OF 2

CITY OF RALEIGH
STANDARD DETAIL

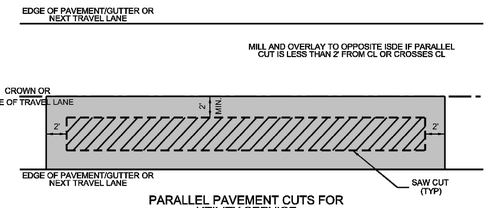
REVISIONS	DATE: 8/2020	NOT TO SCALE
DATE: 09/2021	ASPHALT PAVEMENT PATCH AND RCP PIPE BACKFILL	

T-10.05.1



LATERAL PAVEMENT CUTS FOR UTILITY SERVICE

PAVEMENT PATCH (W-2 OR S-3)
MILL AND RESURFACE
MILL AND RESURFACE 1" - 1.5" MIN SURFACE COURSE OR FULL DEPTH REPAIR



PARALLEL PAVEMENT CUTS FOR UTILITY SERVICE

NOTES:
1. THE PAVEMENT EDGES SHALL BE DEFINED BY A STRAIGHT EDGE FORMED BY A MACHINED SAW CUT OR MILLING MACHINE
2. THE TRENCH SUBGRADE MATERIAL SHALL BE BACKFILLED WITH SUITABLE MATERIAL AND COMPACTED TO A DENSITY OF AT LEAST 95% OF THAT OBTAINED BY COMPACTING A SAMPLE OF THE MATERIAL IN ACCORDANCE WITH AASHTO T-99 AS MODIFIED BY NCDOT
3. THE FINAL 1" OF FILL SHALL CONSIST OF ABC MATERIAL COMPACATED TO A DENSITY EQUAL TO 100% OF THAT OBTAINED BY COMPACTING A SAMPLE OF THE MATERIAL IN ACCORDANCE WITH AASHTO T-80 AS MODIFIED BY NCDOT
4. THE ENTIRE THICKNESS/VERTICAL EDGE OF THE CUT SHALL BE TACKED
5. THE SAME DEPTH OF PAVEMENT MATERIAL WHICH EXISTS SHALL BE REINSTALLED, BUT IN NO CASE SHALL THE ASPHALT BE LESS THAN 3" THICK
6. THE ASPHALT PAVEMENT MATERIAL SHALL BE INSTALLED, COMPACTED THOROUGHLY AND ROLLED WITH A SMOOTH DRUM ROLLER TO LEVEL PATCH

SHEET 2 OF 2

CITY OF RALEIGH
STANDARD DETAIL

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

T-10.05.2

NO.	DATE	REVISION:
1	12/23/2024	CID SUBMITTAL #1

STIPULATION FOR REUSE

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KALAS FALLS
PHASE 5
CONSTRUCTION INFRASTRUCTURE DOCUMENTS
CID-25-01
TOWN OF ROLESVILLE, WAKE COUNTY, NC

JOB NUMBER:	R180115
CHECKED BY:	JK
DRAWN BY:	GE, RC
DATE:	05-01-2025

SHEET TITLE:
UTILITY DETAILS

SHEET NO.:
CU503

North Carolina 811
811 Before You Dig
*** 3 Days Before Digging ***
North Carolina 811
811 or 1-800-632-4949
Remote Ticket Entry
http://nc811.org/remoteticketentry.htm

J:\Jobs\19900\working projects\1111 phase 5 townhomes\CAD\Sheets\construction documents\CU503.dwg
2025-05-01

EROSION CONTROL LEGEND		REFERENCE DETAIL
SF	SILT FENCE	01 / CE502
LOD	LIMITS OF DISTURBANCE	SEE PLANS
TF	TREE PROTECTION FENCE	02 / CE503
>>	TEMPORARY DIVERSION DITCH	CE500 & 06 / CE501
	COMPOST SOCK	06 / CE503
	SILT FENCE OUTLET	02 / CE502
	SEDIMENT SACK INLET PROTECTION	03 / CE502
	STANDARD PIPE INLET PROTECTION	08 / CE502
	GRAVEL INLET PROTECTION	04 / CE501
	ROCK DOUGHNUT INLET PROTECTION	04 / CE503
	GRAVEL CHECK DAM	03 / CE501
	MAINTENANCE PAD	03 / CE503
	RIPRAP DISSIPATOR	08 / CE501 & CE500
	DRAINAGE PIPE	09 / CE501
	WATTLE	05 / CE503
	SKIMMER	01 / CE503
	TEMPORARY SKIMMER BASIN	05 & 06 / CE502
	STAGING AND LAYDOWN AREA	CE500 NOTES
	CONSTRUCTION ENTRANCE	02 / CE501
	CONCRETE WASHOUT PIT	NCG01 / CE503
	EROSION CONTROL BLANKET	CE504

SITE LEGEND	
	100 YR FLOODLINE
	PROPERTY BOUNDARY/PHASE LINE
	2' BUILDING RESTRICTION LINE
	50' NEUSE RIVER BUFFER
∞	PROPOSED SURFACE WATER LEVEL
	RIGHT-OF-WAY
LOD	LIMITS OF DISTURBANCE
	WETLANDS

NOTES:

1. SEE SHEET CE500 FOR TEMPORARY DIVERSION DITCH CALCULATIONS.

GRAPHIC SCALE

60 0 30 60 120

(IN FEET)
1 inch = 60 ft.

AMERICAN Engineering
American Engineering Associates - Southeast, P.A.
4020 Westchase Boulevard, Suite 450
Raleigh, NC 27607
919-469-1101

NORTH CAROLINA ENGINEERING CERTIFICATE OF AUTHORIZATION
AMERICAN ENGINEERING ASSOCIATES SOUTHEAST
C-3881

Digitally signed by Jakob Klein
Date: 2025.05.01 08:57:04-04'00'

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 56528 JAKOB P. KLEIN

PRELIMINARY
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NO.	DATE	REVISION:
1	12/23/2024	CID SUBMITTAL #1

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KALAS FALLS
PHASE 5
CONSTRUCTION INFRASTRUCTURE
DOCUMENTS
CID-25-01
TOWN OF ROLESVILLE,
WAKE COUNTY, NC

JOB NUMBER:	R180115
CHECKED BY:	JK
DRAWN BY:	GE, RC
DATE:	05-01-2025

SHEET TITLE:

ESC PHASE 1 OVERALL

SHEET NO.:

CE100

North Carolina 811 811.com
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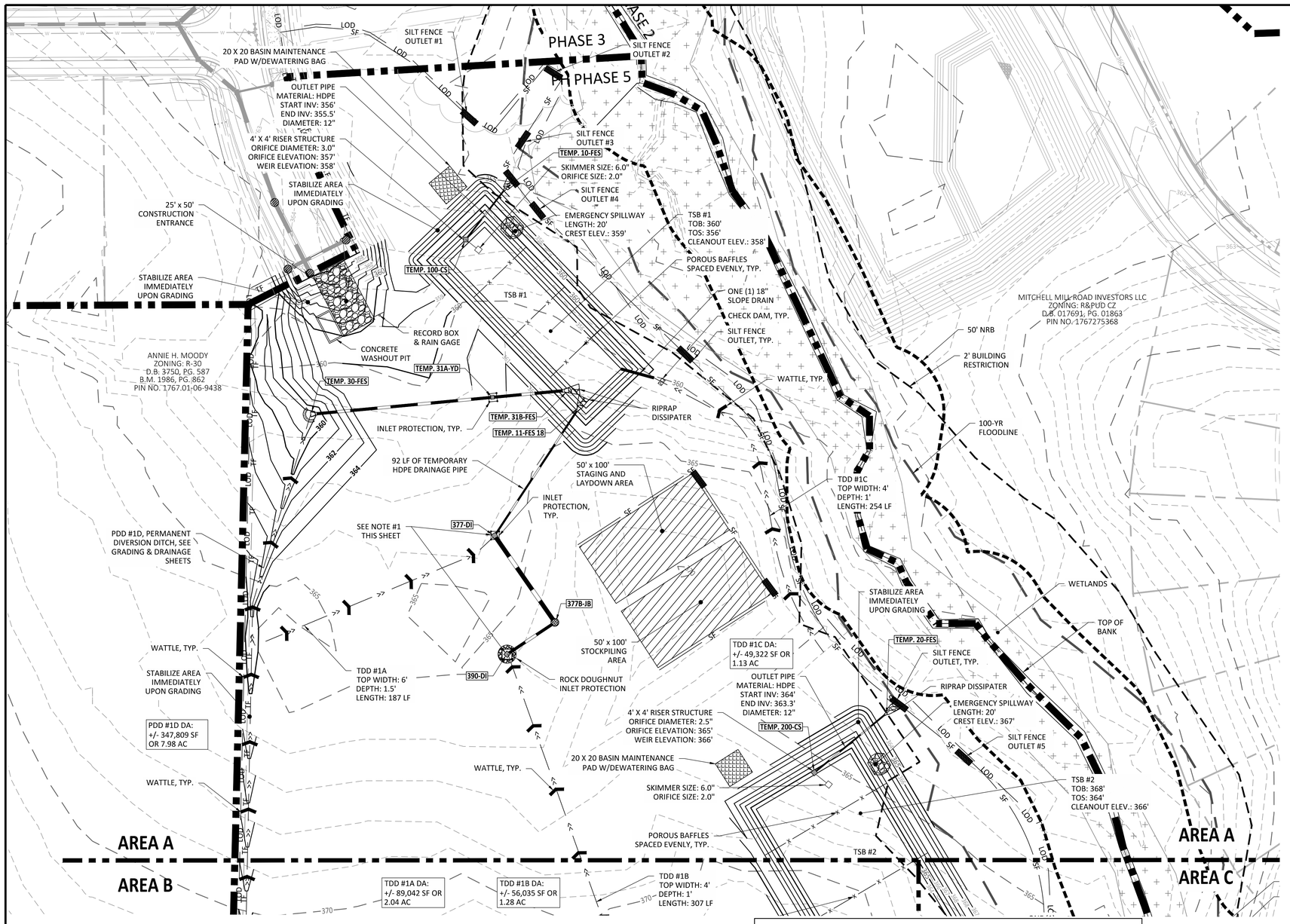
North Carolina 811
811 or 1-800-632-4949
Remote Ticket Entry
http://nc811.org/remoteticketentry.htm

J:\Jobs\9000\walden property\!!!! phase 5 townhomes\CAD\Sheets\construction documents\CE100-400.dwg

2025-05-01



EROSION CONTROL LEGEND		REFERENCE DETAIL
SF	SILT FENCE	01 / CE502
LOD	LIMITS OF DISTURBANCE	SEE PLANS
TF	TREE PROTECTION FENCE	02 / CE503
>>	TEMPORARY DIVERSION DITCH	CE500 & 06 / CE501
	COMPOST SOCK	06 / CE503
	SILT FENCE OUTLET	02 / CE502
	SEDIMENT SACK INLET PROTECTION	03 / CE502
	STANDARD PIPE INLET PROTECTION	08 / CE502
	GRAVEL INLET PROTECTION	04 / CE501
	ROCK DOUGHNUT INLET PROTECTION	04 / CE503
	GRAVEL CHECK DAM	03 / CE501
	MAINTENANCE PAD	03 / CE503
	RIPRAP DISSIPATOR	08 / CE501 & CE500
	DRAINAGE PIPE	09 / CE501
	WATTLE	05 / CE503
	SKIMMER	01 / CE503
	TEMPORARY SKIMMER BASIN	05 & 06 / CE502
	STAGING AND LAYDOWN AREA	CE500 NOTES
	CONSTRUCTION ENTRANCE	02 / CE501
	CONCRETE WASHOUT PIT	NCG01 / CE503
	EROSION CONTROL BLANKET	CE504

SITE LEGEND	
	100 YR FLOODLINE
	PROPERTY BOUNDARY/PHASE LINE
	2' BUILDING RESTRICTION LINE
	50' NEUSE RIVER BUFFER
	PROPOSED SURFACE WATER LEVEL
	RIGHT-OF-WAY
LOD	LIMITS OF DISTURBANCE
	WETLANDS

GRAPHIC SCALE

40 0 20 40 80

(IN FEET)
1 inch = 40 ft.

E&SC STAGE 1 STRUCTURE TABLE	
Structure Name	Details
TEMP. 10	RIM = 366.50 INV IN = 355.50
390	RIM = 367.43 INV OUT = 364.35
377	RIM = 368.55 INV IN = 362.27 INV OUT = 362.17
TEMP. 11	RIM = 368.42 INV IN = 358.00
TEMP. 100	RIM = 358.50 INV OUT = 356.00

E&SC STAGE 1 STRUCTURE TABLE	
Structure Name	Details
TEMP. 200	RIM = 366.50 INV OUT = 364.00
TEMP. 20	RIM = 367.43 INV IN = 363.30
377B	RIM = 366.75 INV IN = 364.00 INV OUT = 363.50
TEMP. 300	RIM = 382.42 INV IN = 372.56 INV OUT = 372.46
395	RIM = 382.18 INV IN = 375.48 INV OUT = 375.38

E&SC STAGE 1 STRUCTURE TABLE	
Structure Name	Details
382A	RIM = 381.95 INV IN = 375.26 INV OUT = 374.00
382	RIM = 381.39 INV IN = 373.70 INV OUT = 373.60
381C	RIM = 379.90 INV IN = 373.07 INV OUT = 373.07
396B	RIM = 378.98 INV OUT = 376.23
TEMP. 299	INV IN = 367.25

E&SC STAGE 1 STRUCTURE TABLE	
Structure Name	Details
TEMP. 31A	RIM = 361.50 INV IN = 357.82 INV OUT = 357.82
TEMP. 30	INV OUT = 358.50
TEMP. 31B	INV IN = 357.54
396A	RIM = 382.84 INV IN = 376.09 INV OUT = 375.99
396	RIM = 382.59 INV IN = 375.83 INV OUT = 375.73

E&SC STAGE 1 PIPE SUMMARY

DOWNSTREAM STRUCTURE	UPSTREAM STRUCTURE	PIPE SIZE	LENGTH	SLOPE	DOWNSTREAM INVERT (FT)	UPSTREAM INVERT (FT)
TEMP. 31B	TEMP. 31A	24"	56.65	0.50%	357.54	357.82
TEMP. 31A	TEMP. 30	24"	135.38	0.50%	357.82	358.50
TEMP. 299	TEMP. 300	24"	226.06	2.30%	367.25	372.46
TEMP. 300	381C	24"	50.90	1.00%	372.56	373.07
TEMP. 20	TEMP. 200	12"	69.41	1.01%	363.30	364.00
TEMP. 10	TEMP. 100	12"	48.20	1.04%	355.50	356.00
TEMP. 11	377	15"	114.10	3.65%	358.00	362.17
377B	390	24"	42.60	0.82%	364.00	364.35
377	377B	36"	78.38	1.57%	362.27	363.50
381C	382	30"	86.18	0.61%	373.07	373.60
382	382A	30"	40.12	0.75%	373.70	374.00
382A	395	24"	23.27	0.50%	375.26	375.38
395	396	24"	49.91	0.50%	375.48	375.73
396	396A	24"	31.35	0.51%	375.83	375.99
396A	396B	24"	28.11	0.50%	376.09	376.23

NOTES:

1. PERMANENT DRAINAGE INFRASTRUCTURE TO BE INSTALLED TO CONVEY STORM DRAINAGE DURING STAGE 1 OF THE EROSION AND SEDIMENT CONTROL PLAN, ALLOWING FOR ROAD CONSTRUCTION. STRUCTURES TO BE RETROFITTED, IF NECESSARY, FOLLOWING THE COMPLETION OF INITIAL ROAD WORK. SEE GRADING AND DRAINAGE SHEETS FOR CONSTRUCTION OF THIS INFRASTRUCTURE.
2. TSB IS TEMPORARY SEDIMENT BASIN.
3. TDD IS TEMPORARY DIVERSION DITCH.
4. PDD IS PERMANENT DIVERSION DITCH.
5. SEE SHEET CE500 FOR TEMPORARY DIVERSION DITCH CALCULATIONS.
6. SEE SHEET CE500 FOR RIP RAP DISSIPATER CALCULATIONS.
7. SILT FENCE OUTLET CONTRIBUTING AREAS ARE LIMITED TO 0.25 ACRES. SEE SHEET PROJECT E&SC REPORT AND/OR SHEET CE500 FOR CALCULATIONS.
8. THE PIPE AND STRUCTURE SUMMARY ON THIS SHEET CONTAIN PERMANENT AND TEMPORARY INFRASTRUCTURE THAT ARE TO BE INSTALLED DURING EROSION & SEDIMENT CONTROL STAGE 1. THIS INFRASTRUCTURE WILL ALLOW FOR ROAD CONSTRUCTION AND DISCHARGING OF TEMPORARY SEDIMENT CONTROL MEASURES. NOTE THAT SELECT INFRASTRUCTURE IS TO BE MODIFIED, AT RESPECTIVE STAGE OF EROSION CONTROL, TO FINAL GRADE ELEVATIONS AND STRUCTURE STYLE. STORM DRAINAGE INFRASTRUCTURE DESIGN AND SCHEDULES CAN BE SEEN WITHIN THE "CD & CG" SERIES OF THIS PLAN SET AND THE INFORMATION FOUND IN THE "CD & CG" SERIES SHOULD GOVERN ANY DISCREPANCIES BETWEEN EROSION CONTROL PLAN SHEETS AND GRADING AND DRAINAGE PLAN SHEETS.
9. ALL PERMANENT PIPES ARE TO BE RCP FOLLOWING THE PROJECT GRADING AND DRAINAGE SHEET DESIGN. CORRUGATED METAL OR HDPE PIPE MAY BE UTILIZED FOR TEMPORARY PIPES.
10. DRAINAGE PIPES UTILIZED TO CONVEY SEDIMENT LADEN WATER TO TEMPORARY SEDIMENT TRAPS ARE PRONE TO SEDIMENT BUILD UP. PIPES SHOULD BE INSPECTED AFTER RAIN EVENTS OF 1" OR GREATER WITHIN A 24-HOUR PERIOD. ENSURE NO DAMMING OF DEBRIS OR SEDIMENT IS PRESENT WITHIN THE PIPES. FLUSHING OF PIPES WILL BE REQUIRED PERIODICALLY TO MAINTAIN PERFORMANCE.

North Carolina 811 Dig Safely
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811 or 1-800-632-4949
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4020 Westchase Boulevard, Suite 450
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919-469-1101

NORTH CAROLINA
AMERICAN ENGINEERING ASSOCIATES SOUTHEAST
C-3881
CERTIFICATE OF AUTHORIZATION

Digitally signed by Jakob Klein
Date: 2025.05.01 16:08:04-04'00'

PRELIMINARY
DO NOT USE FOR CONSTRUCTION
NORTH CAROLINA PROFESSIONAL ENGINEER 56528 JAKOB P. KLEIN

FOR INFORMATION, ONLY

NO.	DATE	REVISION:
1	12/23/2024	CID SUBMITTAL #1

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KALAS FALLS
PHASE 5
CONSTRUCTION INFRASTRUCTURE
DOCUMENTS
CID-25-01
TOWN OF ROLESVILLE,
WAKE COUNTY, NC

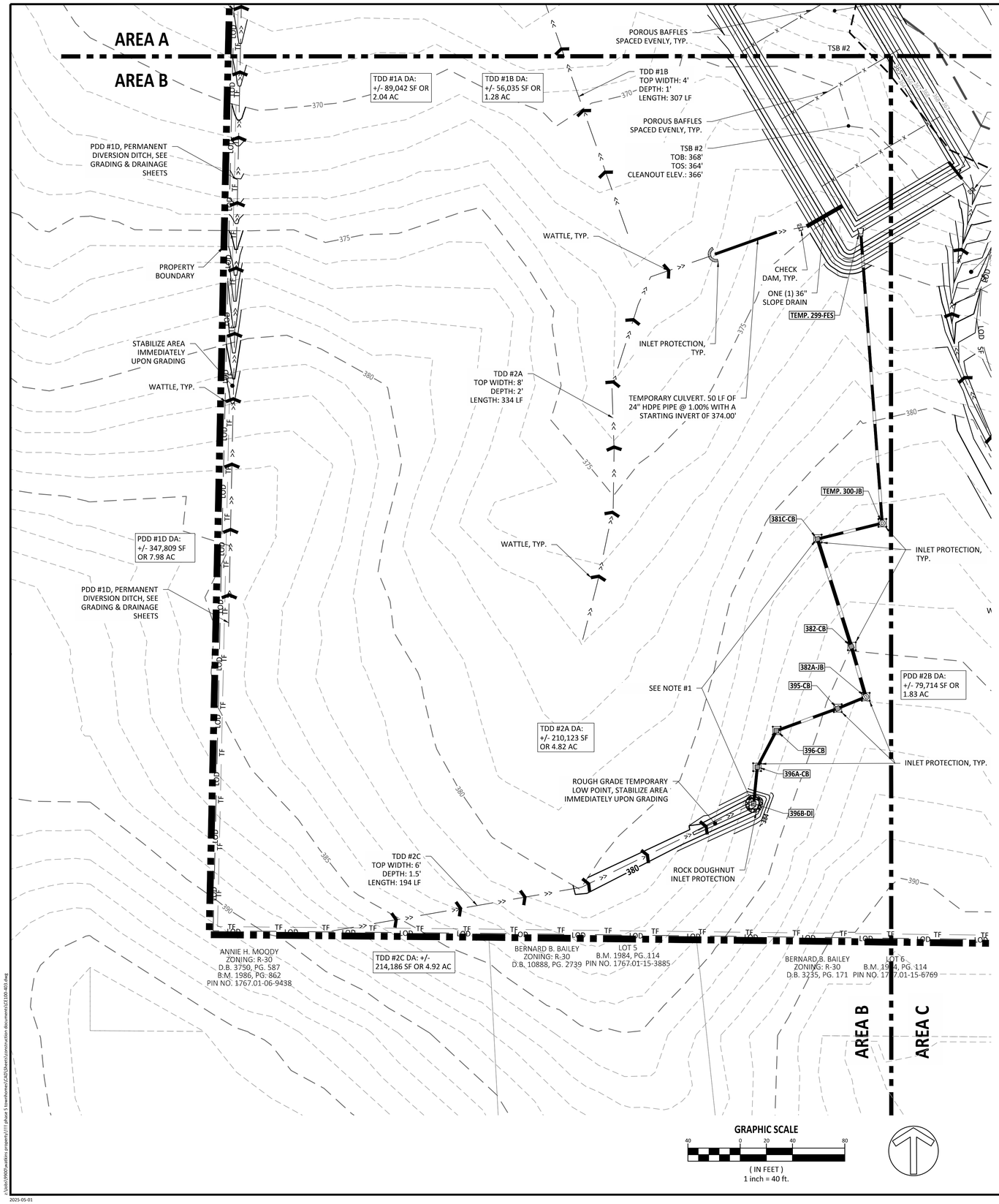
JOB NUMBER:	R180115
CHECKED BY:	JK
DRAWN BY:	GE, RC
DATE:	05-01-2025

SHEET TITLE:

ESC PHASE 1 AREA A

SHEET NO.:

CE400



EROSION CONTROL LEGEND		REFERENCE DETAIL
SF	SILT FENCE	01 / CE502
LOD	LIMITS OF DISTURBANCE	SEE PLANS
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	GRAVEL INLET PROTECTION	04 / CE501
	ROCK DOUGHNUT INLET PROTECTION	04 / CE503
	GRAVEL CHECK DAM	03 / CE501
	MAINTENANCE PAD	03 / CE503
	RIPRAP DISSIPATOR	08 / CE501 & CE500
	DRAINAGE PIPE	09 / CE501
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	TEMPORARY SKIMMER BASIN	05 & 06 / CE502
	STAGING AND LAYDOWN AREA	CE500 NOTES
	CONSTRUCTION ENTRANCE	02 / CE501
	CONCRETE WASHOUT PIT	NCG01 / CE503
	EROSION CONTROL BLANKET	CE504

SITE LEGEND	
	100 YR FLOODLINE
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	2' BUILDING RESTRICTION LINE
	50' NEUSE RIVER BUFFER
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NOTES:

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2. TEMPORARY STORM DRAINAGE CULVERT SPANNING PROPOSED RIGHT-OF-WAY TO ALLOW CONSTRUCTION OF ROAD INFRASTRUCTURE. CULVERT TO BE REMOVED FOLLOWING INITIAL ROAD CONSTRUCTION.
3. TSB IS TEMPORARY SEDIMENT BASIN.
4. TDD IS TEMPORARY DIVERSION DITCH.
5. PDD IS PERMANENT DIVERSION DITCH.
6. SEE SHEET CE500 FOR TEMPORARY DIVERSION DITCH CALCULATIONS.
7. SEE SHEET CE500 FOR RIP RAP DISSIPATER CALCULATIONS.
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AMERICAN Engineering
American Engineering Associates - Southeast, P.A.
4020 Westchase Boulevard, Suite 450
Raleigh, NC 27607
919-469-1101

NORTH CAROLINA CERTIFICATE OF AUTHORIZATION
AMERICAN ENGINEERING ASSOCIATES SOUTHEAST
C-3881

Digitally signed by Jakob Klein
Date: 2025.05.01 [illegible]-04'00'

PRELIMINARY
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NORTH CAROLINA PROFESSIONAL ENGINEER 56528 JAKOB P. KLEIN

FOR INFORMATION, ONLY

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1	12/23/2024	CID SUBMITTAL #1

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KALAS FALLS
PHASE 5
CONSTRUCTION INFRASTRUCTURE DOCUMENTS
CID-25-01
TOWN OF ROLESVILLE, WAKE COUNTY, NC

JOB NUMBER:	R180115
CHECKED BY:	JK
DRAWN BY:	GE, RC
DATE:	05-01-2025

SHEET TITLE:

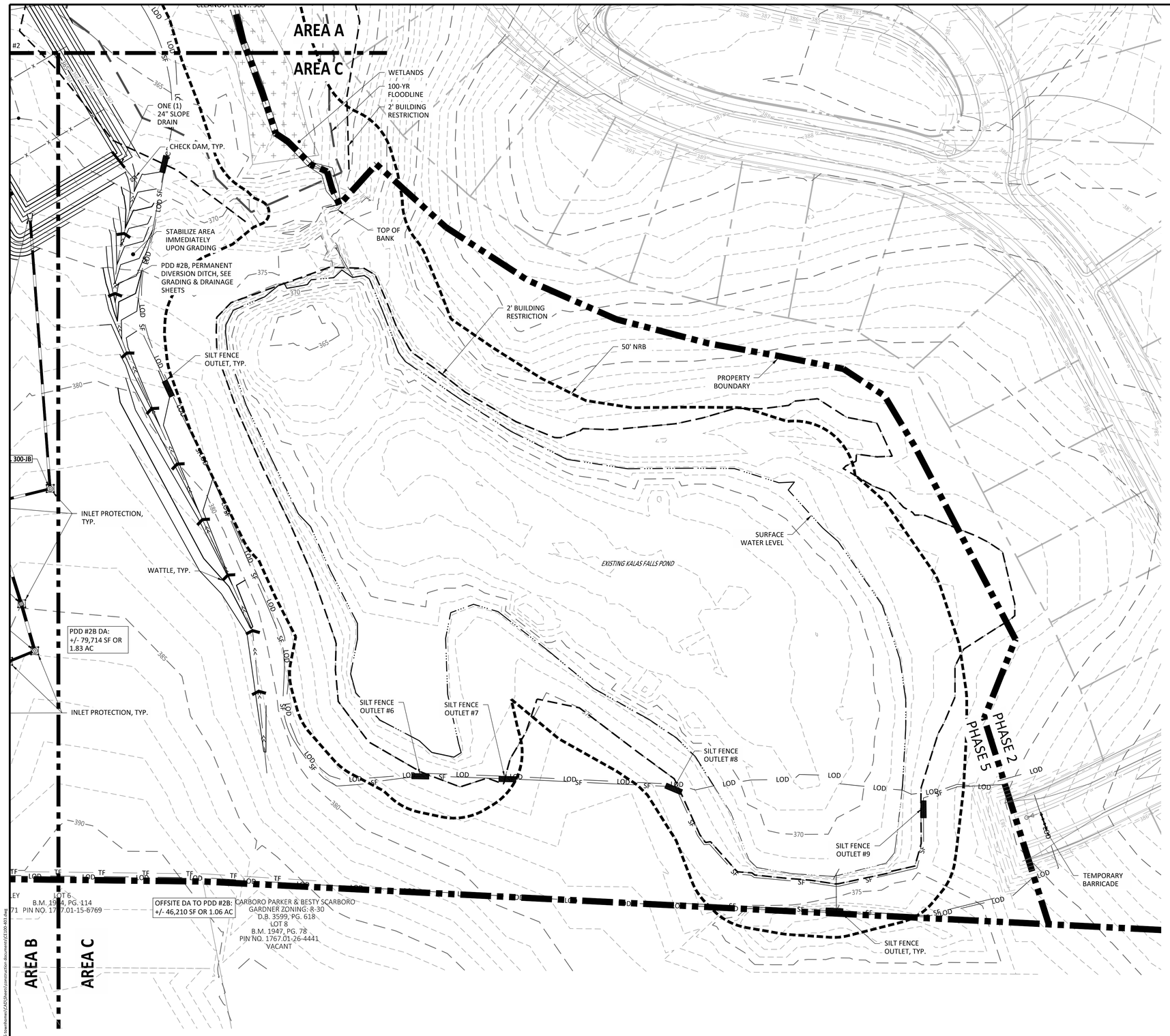
ESC PHASE 1 AREA B

SHEET NO.:

CE401

North Carolina 811 811.com
*** 3 Days Before Digging ***
North Carolina 811
811 or 1-800-632-4949
Remote Ticket Entry
http://nc811.org/remoteticketentry.htm

J:\Jobs\9900\working\working\working\111 phase 5 townhomes\CAD\Sheets\construction documents\CE104-401.dwg
2025-05-01



EROSION CONTROL LEGEND		REFERENCE DETAIL
SF	SILT FENCE	01 / CE502
LOD	LIMITS OF DISTURBANCE	SEE PLANS
TF	TREE PROTECTION FENCE	02 / CE503
>>	TEMPORARY DIVERSION DITCH	CE500 & 06 / CE501
	COMPOST SOCK	06 / CE503
	SILT FENCE OUTLET	02 / CE502
	SEDIMENT SACK INLET PROTECTION	03 / CE502
	STANDARD PIPE INLET PROTECTION	08 / CE502
	GRAVEL INLET PROTECTION	04 / CE501
	ROCK DOUGHNUT INLET PROTECTION	04 / CE503
	GRAVEL CHECK DAM	03 / CE501
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	RIPRAP DISSIPATOR	08 / CE501 & CE500
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	TEMPORARY SKIMMER BASIN	05 & 06 / CE502
	STAGING AND LAYDOWN AREA	CE500 NOTES
	CONSTRUCTION ENTRANCE	02 / CE501
	CONCRETE WASHOUT PIT	NCG01 / CE503
	EROSION CONTROL BLANKET	CE504

SITE LEGEND	
	100 YR FLOODLINE
	PROPERTY BOUNDARY/PHASE LINE
	2' BUILDING RESTRICTION LINE
	50' NEUSE RIVER BUFFER
	PROPOSED SURFACE WATER LEVEL
	RIGHT-OF-WAY
LOD	LIMITS OF DISTURBANCE
	WETLANDS

NOTES:

1. TSB IS TEMPORARY SEDIMENT BASIN.
2. TDD IS TEMPORARY DIVERSION DITCH.
3. PDD IS PERMANENT DIVERSION DITCH.
4. SEE SHEET CE500 FOR TEMPORARY DIVERSION DITCH CALCULATIONS.
5. SEE SHEET CE500 FOR RIP RAP DISSIPATER CALCULATIONS.
9. DRAINAGE PIPES UTILIZED TO CONVEY SEDIMENT LADEN WATER TO TEMPORARY SEDIMENT TRAPS ARE PRONE TO SEDIMENT BUILD UP. PIPES SHOULD BE INSPECTED AFTER RAIN EVENTS OF 1" OR GREATER WITHIN A 24-HOUR PERIOD. ENSURE NO DAMMING OF DEBRIS OR SEDIMENT IS PRESENT WITHIN THE PIPES. FLUSHING OF PIPES WILL BE REQUIRED PERIODICALLY TO MAINTAIN PERFORMANCE.

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

AMERICAN Engineering
American Engineering Associates - Southeast, P.A.
4020 Westchase Boulevard, Suite 450
Raleigh, NC 27607
919-469-1101

NORTH CAROLINA ENGINEERING ASSOCIATES SOUTHEAST C-3881 CERTIFICATE OF AUTHORIZATION

Digitally signed by Jakob Klein
Date: 2025.05.01 08:59:04'00'

NORTH CAROLINA PROFESSIONAL 56528 ENGINEER JAKOB P. KLEIN

PRELIMINARY
DO NOT USE FOR CONSTRUCTION

FOR INFORMATION, ONLY

NO.	DATE	REVISION:
1	12/23/2024	CID SUBMITTAL #1

STIPULATION FOR REUSE

THIS DRAWING WAS PREPARED FOR USE ON THE SPECIFIC SITE, NAMED HEREON, CONTEMPORANEOUSLY WITH ITS ISSUE DATE AS LISTED, HEREON. AND IT IS NOT SUITABLE FOR USE ON A DIFFERENT PROJECT SITE OR AT A LATER TIME. USE OF THIS DRAWING FOR REFERENCE OR EXAMPLE ON ANOTHER PROJECT REQUIRES THE SERVICES OF PROPERLY LICENSED ARCHITECTS AND ENGINEERS. REPRODUCTION OF THIS DRAWING FOR REUSE ON ANOTHER PROJECT IS NOT AUTHORIZED AND MAY BE CONTRARY TO THE LAW.

KALAS FALLS
PHASE 5
CONSTRUCTION INFRASTRUCTURE DOCUMENTS
CID-25-01
TOWN OF ROLESVILLE, WAKE COUNTY, NC

JOB NUMBER:	R180115
CHECKED BY:	JK
DRAWN BY:	GE, RC
DATE:	05-01-2025

SHEET TITLE:

ESC PHASE 1 AREA C

SHEET NO.:

CE402

North Carolina 811 811 or 1-800-632-4949
*** 3 Days Before Digging ***
North Carolina 811
811 or 1-800-632-4949
Remote Ticket Entry
http://nc811.org/remoteticketentry.htm

EROSION CONTROL LEGEND		REFERENCE DETAIL
SF	SILT FENCE	01 / CE502
LOD	LIMITS OF DISTURBANCE	SEE PLANS
TF	TREE PROTECTION FENCE	02 / CE503
>>	TEMPORARY DIVERSION DITCH	CE500 & 06 / CE501
	COMPOST SOCK	06 / CE503
	SILT FENCE OUTLET	02 / CE502
	SEDIMENT SACK INLET PROTECTION	03 / CE502
	STANDARD PIPE INLET PROTECTION	08 / CE502
	GRAVEL INLET PROTECTION	04 / CE501
	ROCK DOUGHNUT INLET PROTECTION	04 / CE503
	GRAVEL CHECK DAM	03 / CE501
	MAINTENANCE PAD	03 / CE503
	RIPRAP DISSIPATOR	08 / CE501 & CE500
	DRAINAGE PIPE	09 / CE501
	WATTLE	05 / CE503
	SKIMMER	01 / CE503
	TEMPORARY SKIMMER BASIN	05 & 06 / CE502
	STAGING AND LAYDOWN AREA	CE500 NOTES
	CONSTRUCTION ENTRANCE	02 / CE501
	CONCRETE WASHOUT PIT	NCG01 / CE503
	EROSION CONTROL BLANKET	CE504

SITE LEGEND	
	100 YR FLOODLINE
	PROPERTY BOUNDARY/PHASE LINE
	2' BUILDING RESTRICTION LINE
	50' NEUSE RIVER BUFFER
∞	PROPOSED SURFACE WATER LEVEL
	RIGHT-OF-WAY
LOD	LIMITS OF DISTURBANCE
	WETLANDS

NOTES:

1. SEE SHEET CE500 FOR TEMPORARY DIVERSION DITCH CALCULATIONS.

GRAPHIC SCALE

60 0 30 60 120

(IN FEET)
1 inch = 60 ft.

AMERICAN Engineering
American Engineering Associates - Southeast, P.A.
4020 Westchase Boulevard, Suite 450
Raleigh, NC 27607
919-469-1101

NORTH CAROLINA ENGINEERING CERTIFICATE OF AUTHORIZATION
AMERICAN ENGINEERING ASSOCIATES SOUTHEAST
C-3881

Digitally signed by Jakob Klein
Date: 2025.05.01 08:04:04-04'00'

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 055226 JAKOB P. KLEIN

PRELIMINARY
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1	12/23/2024	CID SUBMITTAL #1

STIPULATION FOR REUSE

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KALAS FALLS
PHASE 5
CONSTRUCTION INFRASTRUCTURE DOCUMENTS
CID-25-01
TOWN OF ROLESVILLE, WAKE COUNTY, NC

JOB NUMBER:	R180115
CHECKED BY:	JK
DRAWN BY:	GE, RC
DATE:	05-01-2025

SHEET TITLE:

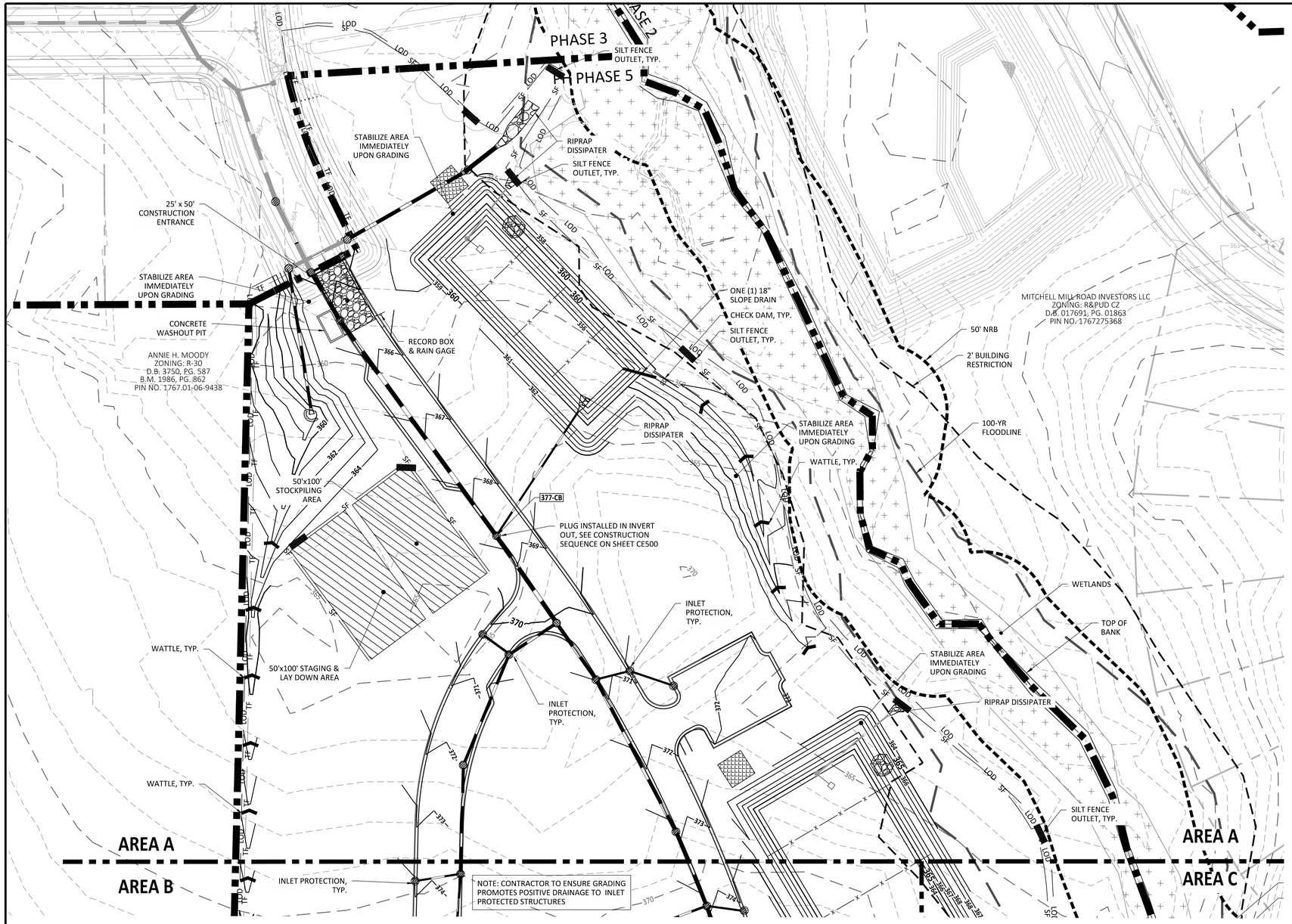
ESC PHASE 2 OVERALL

SHEET NO.:

CE110

North Carolina 811
*** 3 Days Before Digging ***
North Carolina 811
811 or 1-800-632-4949
Remote Ticket Entry
http://nc811.org/remoteticketentry.htm

J:\Jobs\9000\walkton property\!!! phase 5 townhomes\CAD\Sheets\construction documents\CE110-E43.dwg
2025-05-01



EROSION CONTROL LEGEND		REFERENCE DETAIL
SF	SILT FENCE	01 / CE502
LOD	LIMITS OF DISTURBANCE	SEE PLANS
TF	TREE PROTECTION FENCE	02 / CE503
>>	TEMPORARY DIVERSION DITCH	CE500 & 06 / CE501
	COMPOST SOCK	06 / CE503
	SILT FENCE OUTLET	02 / CE502
	SEDIMENT SACK INLET PROTECTION	03 / CE502
	STANDARD PIPE INLET PROTECTION	08 / CE502
	GRAVEL INLET PROTECTION	04 / CE501
	ROCK DOUGHNUT INLET PROTECTION	04 / CE503
	GRAVEL CHECK DAM	03 / CE501
	MAINTENANCE PAD	03 / CE503
	RIPRAP DISSIPATOR	08 / CE501 & CE500
	DRAINAGE PIPE	09 / CE501
	WATTLE	05 / CE503
	SKIMMER	01 / CE503
	TEMPORARY SKIMMER BASIN	05 & 06 / CE502
	STAGING AND LAYDOWN AREA	CE500 NOTES
	CONSTRUCTION ENTRANCE	02 / CE501
	CONCRETE WASHOUT PIT	NCG01 / CE503
	EROSION CONTROL BLANKET	CE504

SITE LEGEND	
	100 YR FLOODLINE
	PROPERTY BOUNDARY/PHASE LINE
	2' BUILDING RESTRICTION LINE
	50' NEUSE RIVER BUFFER
	PROPOSED SURFACE WATER LEVEL
	RIGHT-OF-WAY
LOD	LIMITS OF DISTURBANCE
	WETLANDS

NOTES:

1. CONTRACTOR TO ENSURE GRADING PROMOTES POSITIVE DRAINAGE TO INLET PROTECTED STRUCTURES.
2. TSB IS TEMPORARY SEDIMENT BASIN.
3. SEE SHEET CE500 FOR RIP RAP DISSIPATER CALCULATIONS.
4. SEE SHEET CD110 FOR STORM DRAINAGE INFRASTRUCTURE SCHEDULES.

AMERICAN Engineering
American Engineering Associates - Southeast, P.A.
4020 Westchase Boulevard, Suite 450
Raleigh, NC 27607
919-469-1101

NORTH CAROLINA ENGINEERING CERTIFICATE OF AUTHORIZATION
AMERICAN ENGINEERING ASSOCIATES SOUTHEAST
C-3881

Digitally signed by Jakob Klein
Date: 2025.05.01 08:56:04-04'00'

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 56528 JAKOB P. KLEIN

PRELIMINARY
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KALAS FALLS
PHASE 5
CONSTRUCTION INFRASTRUCTURE DOCUMENTS
CID-25-01
TOWN OF ROLESVILLE, WAKE COUNTY, NC

JOB NUMBER:	R180115
CHECKED BY:	JK
DRAWN BY:	GE, RC
DATE:	05-01-2025

SHEET TITLE:

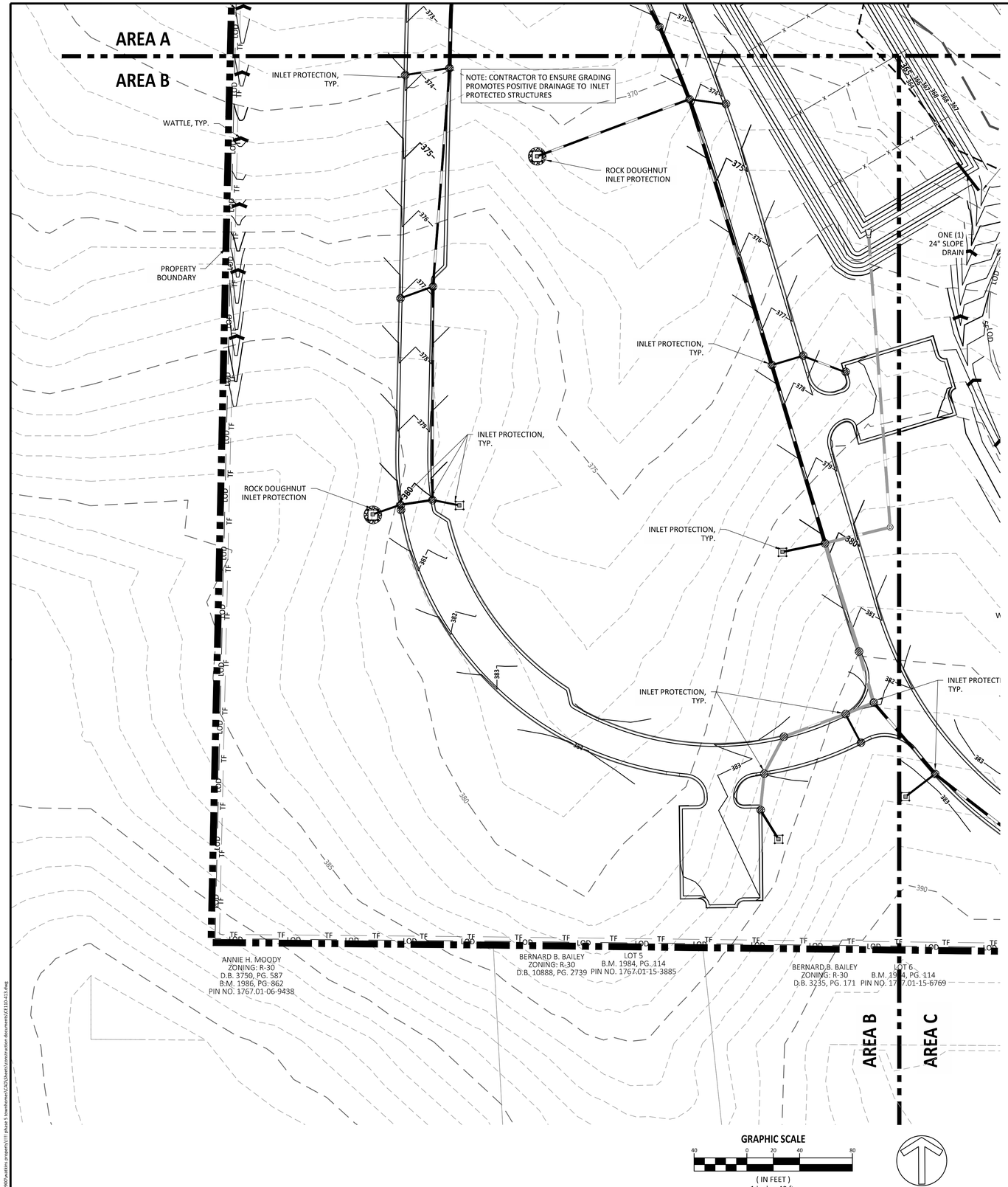
ESC PHASE 2 AREA A

SHEET NO.:

CE410

North Carolina 811 811 or 1-800-632-4949
*** 3 Days Before Digging ***
North Carolina 811
811 or 1-800-632-4949
Remote Ticket Entry
http://nc811.org/remoteticketentry.htm

z:\jobs\0900\watkins property\!!!! phase 5 townhomes\CAD\Sheet\construction documents\CE110-413.dwg
2025-05-01



EROSION CONTROL LEGEND		REFERENCE DETAIL
SF	SILT FENCE	01 / CE502
LOD	LIMITS OF DISTURBANCE	SEE PLANS
TF	TREE PROTECTION FENCE	02 / CE503
>>	TEMPORARY DIVERSION DITCH	CE500 & 06 / CE501
	COMPOST SOCK	06 / CE503
	SILT FENCE OUTLET	02 / CE502
	SEDIMENT SACK INLET PROTECTION	03 / CE502
	STANDARD PIPE INLET PROTECTION	08 / CE502
	GRAVEL INLET PROTECTION	04 / CE501
	ROCK DOUGHNUT INLET PROTECTION	04 / CE503
	GRAVEL CHECK DAM	03 / CE501
	MAINTENANCE PAD	03 / CE503
	RIPRAP DISSIPATOR	08 / CE501 & CE500
	DRAINAGE PIPE	09 / CE501
	WATTLE	05 / CE503
	SKIMMER	01 / CE503
	TEMPORARY SKIMMER BASIN	05 & 06 / CE502
	STAGING AND LAYDOWN AREA	CE500 NOTES
	CONSTRUCTION ENTRANCE	02 / CE501
	CONCRETE WASHOUT PIT	NCG01 / CE503
	EROSION CONTROL BLANKET	CE504

SITE LEGEND	
	100 YR FLOODLINE
	PROPERTY BOUNDARY/PHASE LINE
	2' BUILDING RESTRICTION LINE
	50' NEUSE RIVER BUFFER
000	PROPOSED SURFACE WATER LEVEL
	RIGHT-OF-WAY
LOD	LIMITS OF DISTURBANCE
	WETLANDS

NOTES:

1. CONTRACTOR TO ENSURE GRADING PROMOTES POSITIVE DRAINAGE TO INLET PROTECTED STRUCTURES.
2. TSB IS TEMPORARY SEDIMENT BASIN.
3. SEE SHEET CE500 FOR RIP RAP DISSIPATER CALCULATIONS.
4. SEE SHEET CD110 FOR STORM DRAINAGE INFRASTRUCTURE SCHEDULES.

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

AMERICAN Engineering
American Engineering Associates - Southeast, P.A.
4020 Westchase Boulevard, Suite 450
Raleigh, NC 27607
919-469-1101

NORTH CAROLINA CERTIFICATE OF AUTHORIZATION
AMERICAN ENGINEERING ASSOCIATES SOUTHEAST
C-3881

Digitally signed by Jakob Klein
Date: 2025.05.01 08:03:04-04'00'

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 055328 JAKOB P. KLEIN

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KALAS FALLS
PHASE 5
CONSTRUCTION INFRASTRUCTURE DOCUMENTS
CID-25-01
TOWN OF ROLESVILLE, WAKE COUNTY, NC

JOB NUMBER:	R180115
CHECKED BY:	JK
DRAWN BY:	GE, RC
DATE:	05-01-2025

SHEET TITLE:

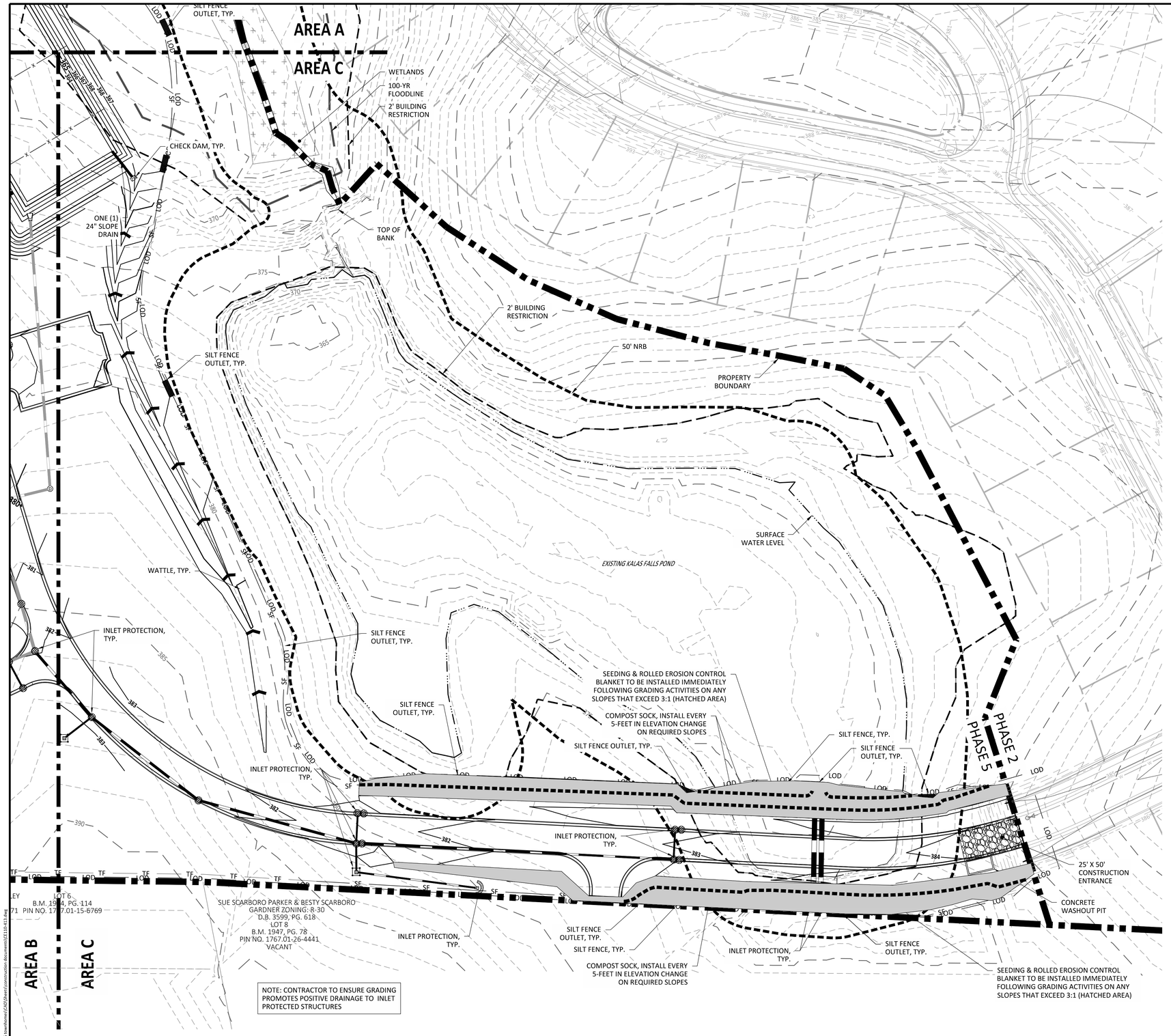
ESC PHASE 2 AREA B

SHEET NO.:

CE411

North Carolina 811
*** 3 Days Before Digging ***
North Carolina 811
811 or 1-800-632-4949
Remote Ticket Entry
http://nc811.org/remoteticketentry.htm

J:\Jobs\0900\parkton property\!!!! phase 5 townhomes\!CAD\Sheets\construction documents\CE1110-413.dwg
2025-05-01



EROSION CONTROL LEGEND		REFERENCE DETAIL
SF	SILT FENCE	01 / CE502
LOD	LIMITS OF DISTURBANCE	SEE PLANS
TF	TREE PROTECTION FENCE	02 / CE503
>>	TEMPORARY DIVERSION DITCH	CE500 & 06 / CE501
	COMPOST SOCK	06 / CE503
	SILT FENCE OUTLET	02 / CE502
	SEDIMENT SACK INLET PROTECTION	03 / CE502
	STANDARD PIPE INLET PROTECTION	08 / CE502
	GRAVEL INLET PROTECTION	04 / CE501
	ROCK DOUGHNUT INLET PROTECTION	04 / CE503
	GRAVEL CHECK DAM	03 / CE501
	MAINTENANCE PAD	03 / CE503
	RIPRAP DISSIPATOR	08 / CE501 & CE500
	DRAINAGE PIPE	09 / CE501
	WATTLE	05 / CE503
	SKIMMER	01 / CE503
	TEMPORARY SKIMMER BASIN	05 & 06 / CE502
	STAGING AND LAYDOWN AREA	CE500 NOTES
	CONSTRUCTION ENTRANCE	02 / CE501
	CONCRETE WASHOUT PIT	NCG01 / CE503
	EROSION CONTROL BLANKET	CE504

SITE LEGEND	
	100 YR FLOODLINE
	PROPERTY BOUNDARY/PHASE LINE
	2' BUILDING RESTRICTION LINE
	50' NEUSE RIVER BUFFER
∞	PROPOSED SURFACE WATER LEVEL
	RIGHT-OF-WAY
LOD	LIMITS OF DISTURBANCE
	WETLANDS

NOTES:

1. CONTRACTOR TO ENSURE GRADING PROMOTES POSITIVE DRAINAGE TO INLET PROTECTED STRUCTURES.
2. TSB IS TEMPORARY SEDIMENT BASIN.
3. SEE SHEET CE500 FOR RIP RAP DISSIPATER CALCULATIONS.
4. SEE SHEET CD110 FOR STORM DRAINAGE INFRASTRUCTURE SCHEDULES.

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

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American Engineering Associates - Southeast, P.A.
4020 Westchase Boulevard, Suite 450
Raleigh, NC 27607
919-469-1101

NORTH CAROLINA
AMERICAN ENGINEERING ASSOCIATES SOUTHEAST
C-3881
CERTIFICATE OF AUTHORIZATION

Digitally signed by Jakob Klein
Date: 2025.05.01 09:40:04 -04'00'

NORTH CAROLINA
PROFESSIONAL
65528
ENGINEER
JAKOB P. KLEIN

PRELIMINARY
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KALAS FALLS
PHASE 5
CONSTRUCTION INFRASTRUCTURE DOCUMENTS
CID-25-01
TOWN OF ROLESVILLE, WAKE COUNTY, NC

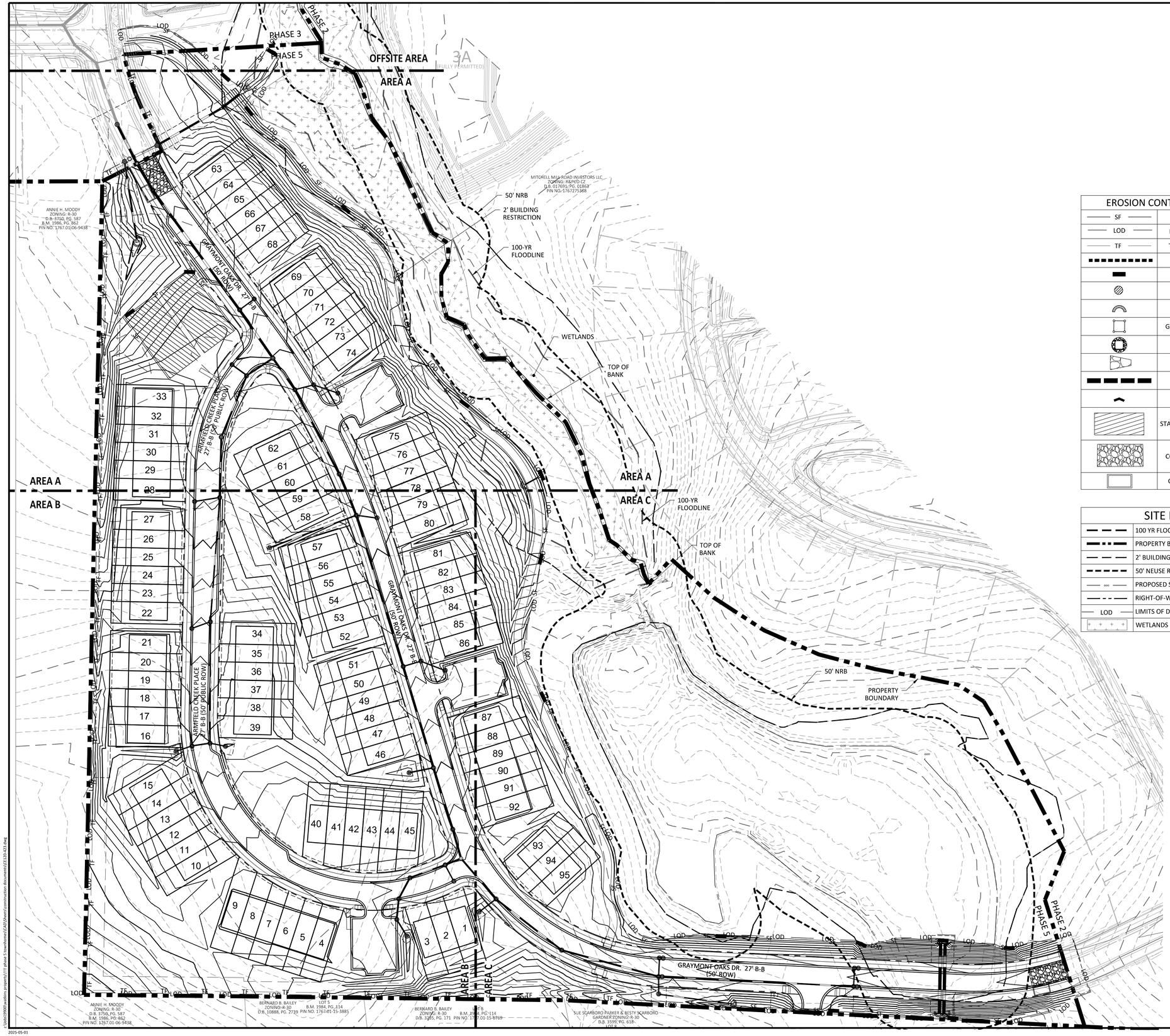
JOB NUMBER:	R180115
CHECKED BY:	JK
DRAWN BY:	GE, RC
DATE:	05-01-2025

SHEET TITLE:
ESC PHASE 2 AREA C

SHEET NO.:
CE412

North Carolina 811
*** 3 Days Before Digging ***
North Carolina 811
811 or 1-800-632-4949
Remote Ticket Entry
http://nc811.org/remoteticketentry.htm

J:\Jobs\0900\walden property\!!!! phase 5 townhomes\CAD\Sheets\construction documents\CE118-413.dwg
2025-05-01



EROSION CONTROL LEGEND		REFERENCE DETAIL
SF	SILT FENCE	01 / CE502
LOD	LIMITS OF DISTURBANCE	SEE PLANS
TF	TREE PROTECTION FENCE	02 / CE503
	COMPOST SOCK	06 / CE503
	SILT FENCE OUTLET	02 / CE502
	SEDIMENT SACK INLET PROTECTION	03 / CE502
	STANDARD PIPE INLET PROTECTION	08 / CE502
	GRAVEL INLET PROTECTION	04 / CE501
	ROCK DOUGHNUT INLET PROTECTION	04 / CE503
	RIPRAP DISSIPATOR	08 / CE501 & CE500
	DRAINAGE PIPE	09 / CE501
	WATTLE	05 / CE503
	STAGING AND LAYDOWN AREA	CE500 NOTES
	CONSTRUCTION ENTRANCE	02 / CE501
	CONCRETE WASHOUT PIT	NCG01 / CE503

SITE LEGEND	
	100 YR FLOODLINE
	PROPERTY BOUNDARY/PHASE LINE
	2' BUILDING RESTRICTION LINE
	50' NEUSE RIVER BUFFER
	PROPOSED SURFACE WATER LEVEL
	RIGHT-OF-WAY
LOD	LIMITS OF DISTURBANCE
	WETLANDS

GRAPHIC SCALE

60 0 30 60 120

(IN FEET)
1 inch = 60 ft.

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4020 Westchase Boulevard, Suite 450
Raleigh, NC 27607
919-469-1101

NORTH CAROLINA
AMERICAN ENGINEERING ASSOCIATES SOUTHEAST
C-3881
CERTIFICATE OF AUTHORIZATION

Digitally signed by Jakob Klein
Date: 2025.05.01 16:04:04-04'00'

PRELIMINARY
NORTH CAROLINA PROFESSIONAL 56528 ENGINEER JAKOB P. KLEIN
DO NOT USE FOR CONSTRUCTION

FOR INFORMATION, ONLY

NO.	DATE	REVISION:
1	12/23/2024	CID SUBMITTAL #1

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KALAS FALLS
PHASE 5
CONSTRUCTION INFRASTRUCTURE DOCUMENTS
CID-25-01
TOWN OF ROLESVILLE, WAKE COUNTY, NC

JOB NUMBER:	R180115
CHECKED BY:	JK
DRAWN BY:	GE, RC
DATE:	05-01-2025

SHEET TITLE:

ESC PHASE 3 OVERALL

SHEET NO.:

CE120

North Carolina 811 811 or 1-800-632-4949
*** 3 Days Before Digging ***
North Carolina 811
811 or 1-800-632-4949
Remote Ticket Entry
http://nc811.org/remoteticketentry.htm

J:\Jobs\R900\master projects\!!!! phase 5 townhomes\CAD\Sheets\construction documents\CE120-A3.dwg

2025-05-01

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

EROSION CONTROL LEGEND		REFERENCE DETAIL
SF	SILT FENCE	01 / CE502
LOD	LIMITS OF DISTURBANCE	SEE PLANS
TF	TREE PROTECTION FENCE	02 / CE503
	COMPOST SOCK	06 / CE503
	SILT FENCE OUTLET	02 / CE502
	SEDIMENT SACK INLET PROTECTION	03 / CE502
	STANDARD PIPE INLET PROTECTION	08 / CE502
	GRAVEL INLET PROTECTION	04 / CE501
	ROCK DOUGHNUT INLET PROTECTION	04 / CE503
	RIPRAP DISSIPATOR	08 / CE501 & CE500
	DRAINAGE PIPE	09 / CE501
	WATTLE	05 / CE503
	STAGING AND LAYDOWN AREA	CE500 NOTES
	CONSTRUCTION ENTRANCE	02 / CE501
	CONCRETE WASHOUT PIT	NCG01 / CE503

SITE LEGEND	
	100 YR FLOODLINE
	PROPERTY BOUNDARY/PHASE LINE
	2' BUILDING RESTRICTION LINE
	50' NEUSE RIVER BUFFER
	PROPOSED SURFACE WATER LEVEL
	RIGHT-OF-WAY
LOD	LIMITS OF DISTURBANCE
	WETLANDS

AMERICAN Engineering
American Engineering Associates - Southeast, P.A.
4020 Westchase Boulevard, Suite 450
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919-469-1101

NORTH CAROLINA ENGINEERING
AMERICAN ENGINEERING ASSOCIATES SOUTHEAST
C-3881
CERTIFICATE OF AUTHORIZATION

Digitally signed by Jakob Klein
Date: 2025.05.01 16:04:04-04'00'

NORTH CAROLINA PROFESSIONAL ENGINEER
056528
JAKOB P. KLEIN

PRELIMINARY
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KALAS FALLS
PHASE 5
CONSTRUCTION INFRASTRUCTURE DOCUMENTS
CID-25-01
TOWN OF ROLESVILLE, WAKE COUNTY, NC

JOB NUMBER:	R180115
CHECKED BY:	JK
DRAWN BY:	GE, RC
DATE:	05-01-2025

SHEET TITLE:
ESC PHASE 3 AREA A

SHEET NO.:
CE420

North Carolina 811
*** 3 Days Before Digging ***
North Carolina 811
811 or 1-800-632-4949
Remote Ticket Entry
http://nc811.org/remoteticketentry.htm

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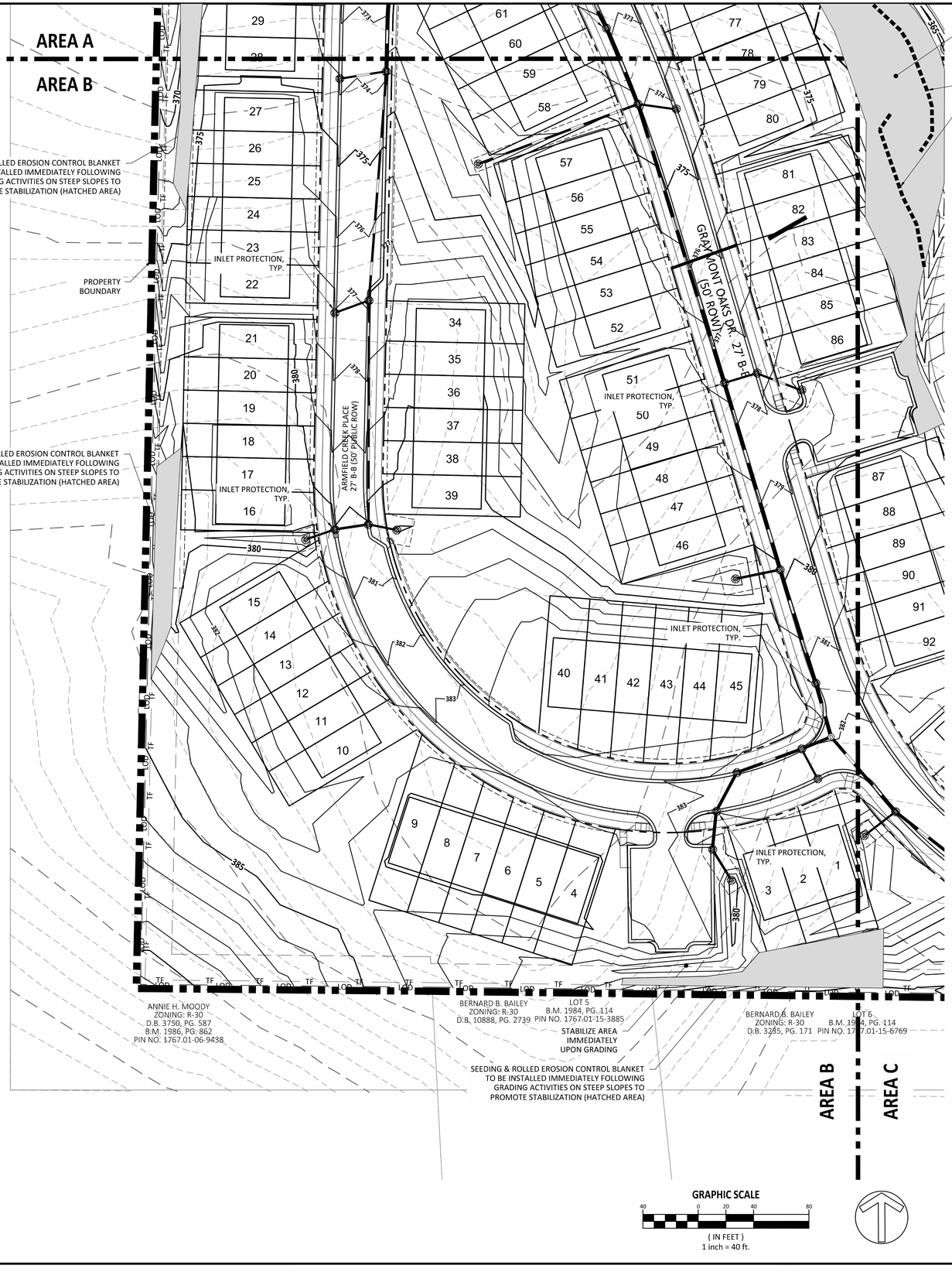
2025-05-01



EROSION CONTROL LEGEND		REFERENCE DETAIL
SF	SILT FENCE	01 / CE502
LOD	LIMITS OF DISTURBANCE	SEE PLANS
TF	TREE PROTECTION FENCE	02 / CE503
	COMPOST SOCK	06 / CE503
	SILT FENCE OUTLET	02 / CE502
	SEDIMENT SACK INLET PROTECTION	03 / CE502
	STANDARD PIPE INLET PROTECTION	08 / CE502
	GRAVEL INLET PROTECTION	04 / CE501
	ROCK DOUGHNUT INLET PROTECTION	04 / CE503
	RIPRAP DISSIPATOR	08 / CE501 & CE500
	DRAINAGE PIPE	09 / CE501
	WATTLE	05 / CE503
	STAGING AND LAYDOWN AREA	CE500 NOTES
	CONSTRUCTION ENTRANCE	02 / CE501
	CONCRETE WASHOUT PIT	NCG01 / CE503

SITE LEGEND	
	100 YR FLOODLINE
	PROPERTY BOUNDARY/PHASE LINE
	2' BUILDING RESTRICTION LINE
	50' NEUSE RIVER BUFFER
	PROPOSED SURFACE WATER LEVEL
	RIGHT-OF-WAY
LOD	LIMITS OF DISTURBANCE
	WETLANDS

AMERICAN Engineering
American Engineering Associates - Southeast, P.A.
4020 Westchase Boulevard. Suite 450
Raleigh, NC 27607
919-469-1101

NORTH CAROLINA
AMERICAN ENGINEERING ASSOCIATES SOUTHEAST
C-3881
CERTIFICATE OF AUTHORIZATION

Digitally signed by Jakob Klein
Date: 2025.05.01 07:04:00 -04'00'

NORTH CAROLINA PROFESSIONAL ENGINEER
SEAL 56526
JAKOB P. KLEIN

PRELIMINARY
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NO.	DATE	REVISION:
1	12/23/2024	CID SUBMITTAL #1

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KALAS FALLS
PHASE 5
CONSTRUCTION INFRASTRUCTURE DOCUMENTS
CID-25-01
TOWN OF ROLESVILLE, WAKE COUNTY, NC

JOB NUMBER:	R180115
CHECKED BY:	JK
DRAWN BY:	GE, RC
DATE:	05-01-2025

SHEET TITLE:
ESC PHASE 3 AREA B

SHEET NO.:
CE421

North Carolina 811
*** 3 Days Before Digging ***
North Carolina 811
811 or 1-800-632-4949
Remote Ticket Entry
http://nc811.org/remoteticketentry.htm

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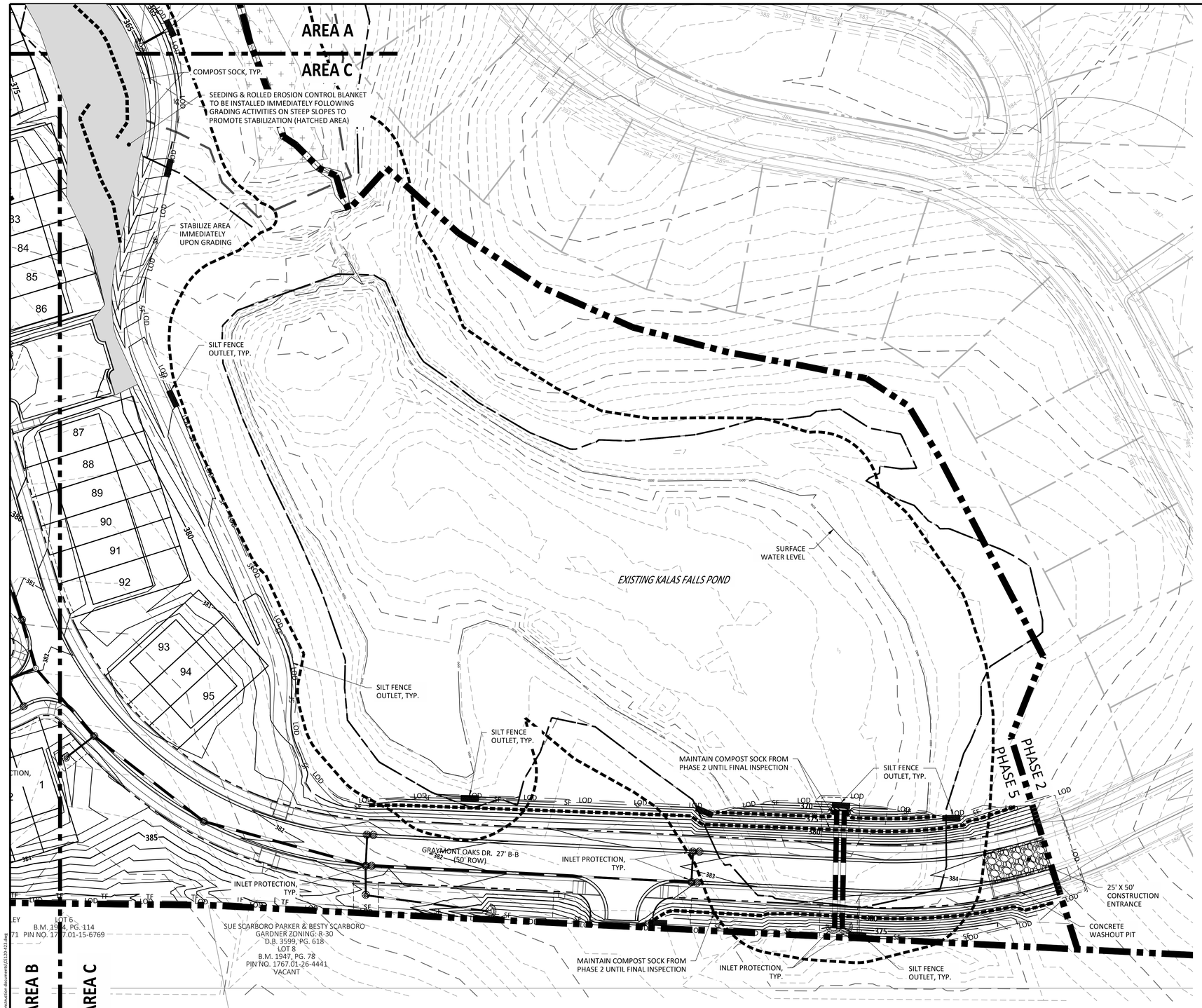
2025-05-01



EROSION CONTROL LEGEND		REFERENCE DETAIL
SF	SILT FENCE	01 / CE502
LOD	LIMITS OF DISTURBANCE	SEE PLANS
TF	TREE PROTECTION FENCE	02 / CE503
	COMPOST SOCK	06 / CE503
	SILT FENCE OUTLET	02 / CE502
	SEDIMENT SACK INLET PROTECTION	03 / CE502
	STANDARD PIPE INLET PROTECTION	08 / CE502
	GRAVEL INLET PROTECTION	04 / CE501
	ROCK DOUGHNUT INLET PROTECTION	04 / CE503
	RIPRAP DISSIPATOR	08 / CE501 & CE500
	DRAINAGE PIPE	09 / CE501
	WATTLE	05 / CE503
	STAGING AND LAYDOWN AREA	CE500 NOTES
	CONSTRUCTION ENTRANCE	02 / CE501
	CONCRETE WASHOUT PIT	NCG01 / CE503

SITE LEGEND	
	100 YR FLOODLINE
	PROPERTY BOUNDARY/PHASE LINE
	2' BUILDING RESTRICTION LINE
	50' NEUSE RIVER BUFFER
	PROPOSED SURFACE WATER LEVEL
	RIGHT-OF-WAY
LOD	LIMITS OF DISTURBANCE
	WETLANDS

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

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Raleigh, NC 27607
919-469-1101

NORTH CAROLINA ENGINEERING CERTIFICATE OF AUTHORIZATION
AMERICAN ENGINEERING ASSOCIATES SOUTHEAST
C-3881

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NORTH CAROLINA PROFESSIONAL ENGINEER
56528
JAKOB P. KLEIN

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KALAS FALLS
PHASE 5
CONSTRUCTION INFRASTRUCTURE DOCUMENTS
CID-25-01
TOWN OF ROLESVILLE, WAKE COUNTY, NC

JOB NUMBER:	R180115
CHECKED BY:	JK
DRAWN BY:	GE, RC
DATE:	05-01-2025

SHEET TITLE:
ESC PHASE 3 AREA C

SHEET NO.:
CE422

North Carolina 811 811
*** 3 Days Before Digging ***
North Carolina 811
811 or 1-800-632-4949
Remote Ticket Entry
http://nc811.org/remoteticketentry.htm

z:\jobs\0900\walkins property\!!!! phase 5 townhomes\CAD\Sheet\construction documents\CE120-423.dwg
2025-05-01

PHILLIP L. MOODY
ZONING: R-30
D.B. 3750, PG. 589
B.M. 1986, PG. 968
B.M. 1928, PG. 142
P.I.N. 1767.01-28-3460
REAL ESTATE ID: 0048422 AGRICULTURAL

KALAS PHASE 5 DISCHARGE POINT INTO SCM 3B, SEE NOTE BELOW

SCM 3B

SEE KALAS PHASE 3 CD PLAN SET FOR STORM DRAINAGE INFRASTRUCTURE

SILT FENCE OUTLET, TYP.

PHASE 3

PHASE 2

PHASE 5

OFFSITE AREA

AREA A

SCM 3A
(FULLY PERMITTED)

RIPRAP DISSIPATER

SILT FENCE OUTLET, TYP.

65'x80' TEMPORARY CONSTRUCTION EASEMENT

INLET PROTECTION, TYP.

25' x 50' CONSTRUCTION ENTRANCE

COMPOST SOCK, TYP.

MITCHELL MILL ROAD INVESTORS LLC
ZONING: R&PUD CZ
D.B. 017691, PG. 01863

EROSION CONTROL LEGEND		REFERENCE DETAIL
SF	SILT FENCE	01 / CE502
LOD	LIMITS OF DISTURBANCE	SEE PLANS
TF	TREE PROTECTION FENCE	02 / CE503
	COMPOST SOCK	06 / CE503
	SILT FENCE OUTLET	02 / CE502
	SEDIMENT SACK INLET PROTECTION	03 / CE502
	STANDARD PIPE INLET PROTECTION	08 / CE502
	GRAVEL INLET PROTECTION	04 / CE501
	ROCK DOUGHNUT INLET PROTECTION	04 / CE503
	RIPRAP DISSIPATOR	08 / CE501 & CE500
	DRAINAGE PIPE	09 / CE501
	WATTLE	05 / CE503
	STAGING AND LAYDOWN AREA	CE500 NOTES
	CONSTRUCTION ENTRANCE	02 / CE501
	CONCRETE WASHOUT PIT	NCG01 / CE503

SITE LEGEND	
	100 YR FLOODLINE
	PROPERTY BOUNDARY/PHASE LINE
	2' BUILDING RESTRICTION LINE
	50' NEUSE RIVER BUFFER
	PROPOSED SURFACE WATER LEVEL
	RIGHT-OF-WAY
LOD	LIMITS OF DISTURBANCE
	WETLANDS

NOTE: PLEASE SEE KALAS PHASE 3 CD PLAN SET FOR STORM DRAINAGE INFRASTRUCTURE WITHIN THAT PROJECT SCOPE. KALAS PHASE 5 UTILIZES SCM 3B LOCATED ON THE KALAS PHASE 3 PARCEL. A DETAILED CONSTRUCTION SEQUENCE FOR SEDIMENT CONTROL, SITE STABILAZATION, AND OUTLETTING TO SCM 3B CAN BE FOUND ON SHEET CE500 WITHIN THIS PLAN SET. THE KALAS PHASE 5 PROJECT WILL REPORT FINAL IMPERVIOUS DATA TO WAKE COUNTY TO ENSURE THE PROJECT TOTALS REMAIN AT/OR BELOW THE DESIGN FOR SCM 3B.

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

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4020 Westchase Boulevard, Suite 450
Raleigh, NC 27607
919-469-1101

NORTH CAROLINA CERTIFICATE OF AUTHORIZATION
AMERICAN ENGINEERING ASSOCIATES SOUTHEAST
C-3881

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Date: 2025.05.01 08:21:04-04'00'

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 56528 JAKOB P. KLEIN

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KALAS FALLS
PHASE 5
CONSTRUCTION INFRASTRUCTURE
DOCUMENTS
CID-25-01
TOWN OF ROLESVILLE,
WAKE COUNTY, NC

JOB NUMBER:	R180115
CHECKED BY:	JK
DRAWN BY:	GE, RC
DATE:	05-01-2025

SHEET TITLE:

ESC PHASE 3 OFFSITE AREA

SHEET NO.:

CE423

North Carolina 811
*** 3 Days Before Digging ***
North Carolina 811
811 or 1-800-632-4949
Remote Ticket Entry
http://nc811.org/remoteticketentry.htm

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2025-05-01

Date:

Page:

NON-INVASIVE PERMANENT SEEDING RECOMMENDATIONS FOR LATE WINTER AND EARLY SPRING

SEEDING MIXTURE

Species	Rate
Centipede	5 lbs/acre
Indian Woodoats	1.5-2.5 lbs/acre*
Virginia Wild Rye	4-6 lbs/acre*

*Depending upon mix with other species. See table 6.11.d from Chapter 6 of the NC Erosion and Sediment Control Planning and Design Manual.

Seeding Dates
Coastal or Eastern Piedmont for Centipede- Sept. 1 - May 1
Coastal and Piedmont for Indian Woodoats and Virginia Wild Rye- Feb 15 - April 1
Mountains for Indian Woodoats and Virginia Wild Rye- March 1 - May 15

Maintenance:
Significant maintenance may be required to obtain desired cover once centipede is planted. Acceptable for sodding.

NON-INVASIVE PERMANENT SEEDING RECOMMENDATIONS FOR SUMMER

SEEDING MIXTURE

Species	Rate
Indian Woodoats	1.5-2.5 lbs/acre*
Virginia Wild Rye	4-6 lbs/acre*

*Depending upon mix with other species. See table 6.11.d from Chapter 6 of the NC Erosion and Sediment Control Planning and Design Manual.

Seeding Dates
Mountains - July 15- Aug 15
Piedmont - Aug 15 - Oct 15

Maintenance:
Indian Woodoats and Virginia Wild Rye are both sun and shade tolerant.

NON-INVASIVE PERMANENT SEEDING RECOMMENDATIONS FOR FALL

SEEDING MIXTURE

Species	Rate
Hard Fescue	15 lbs/acre
Switchgrass	2.5-3.5 lbs/acre*
Indian Grass	5-7 lbs/acre*
Big Bluestem	5-7 lbs/acre*
Indian Woodoats	1.5-2.5 lbs/acre*
Virginia Wild Rye	4-6 lbs/acre*

*Depending upon mix with other species. See table 6.11.d from Chapter 6 of the NC Erosion and Sediment Control Planning and Design Manual.

Seeding Dates
Mountains - Hard Fescue- Aug 1 - June 1
Mountains- Switchgrass, Indian Grass, Big Bluestem- Dec 1 - April 15
Piedmont and Coastal- Switchgrass, Indian Grass, Big Bluestem- Dec 1 - April 1
Coastal- Indian Woodoats and Virginia Wild Rye- Sept 1 - Nov 1

Maintenance:
Hard Fescue is not recommended for slopes > 5%. Prefers shade.

SEED BED 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 rate of 1 to 1 ½ tons/acre on coarse-textured soils and 2-3 tons/acre on fine-textured 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 raking, harrowing, or other suitable methods for fine grading. The finished grade shall be a smooth even soil surface with a loosen uniformly fine texture. All ridges and depressions shall be removed and filled to provide the approved surface drainage. Planting is to be done immediately after finished grades are obtained and seedbed preparation is completed.

NOTES:
1. Permanent seeding, sodding or other means of stabilization are required when all construction work is completed according to the NPDES timeframe's table.
2. A North Carolina Department of Agriculture soils test (or equal) is highly recommended to be obtained for all areas to be seeded, sprigged, sodded or planted.
3. Use a seeding mix that will produce fast growing nurse crops and includes non-invasive species that will eventually provide a permanent groundcover. Soil blankets may be used in lieu of nurse crops. Mat, tack or crimp mulch, as needed to stabilize seeded areas until root establishment. Mulch must be applied uniformly over the soil with a cover density of at least 80%.
4. Ground cover shall be maintained until permanent vegetation is established and stable against accelerated erosion.

NORTH CAROLINA Environmental Quality
EFFECTIVE DATE: 11/15/2022

PERMANENT SEEDING RECOMMENDATIONS

REQUIRED GROUND STABILIZATION TIMEFRAMES

STABILIZATION AREA	SITE AREA DESCRIPTION	STABILIZE WITHIN THIS MANY CALENDAR DAYS AFTER CEASING LAND DISTURBANCE	TIMEFRAME VARIATIONS
1	(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
2	(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
3	(e) Areas with slopes flatter than 4:1	14	- 7 days for perimeter dikes, swales, ditches, perimeter slopes with HQW Zones

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.

NPDES STABILIZATION LEGEND

	NPDES STABILIZATION AREA 1
	NPDES STABILIZATION AREA 2
	NPDES STABILIZATION AREA 3

NDPES DOCUMENTATION NOTES

1. THIS PAGE IS SUBMITTED TO COMPLY WITH THE NPDES GENERAL STORMWATER PERMIT NCG010000.
2. THIS PAGE CAN BE APPROVED BY THE CITY PURSUANT TO NPDES GENERAL STORMWATER PERMIT NCG010000 ONLY.
3. THIS PAGE OF THE APPROVED PLANS IS ENFORCEABLE EXCLUSIVELY PURSUANT TO NPDES GENERAL STORMWATER PERMIT NCG010000.
4. THE CITY IS NOT AUTHORIZED TO ENFORCE THIS PAGE OF THE PLANS AND IT IS NOT A PART OF THE APPROVED PLANS FOR PURPOSES OF ENFORCEMENT ACTION UNDER THE CITY CODE.

SEEDING NOTES

1. REFERENCE PERMANENT SEEDING RECOMMENDATIONS FOR SEEDBED PREPARATION.
2. ROLESVILLE IS LOCATED IN PIEDMONT REGION OF NORTH CAROLINA.

TEMPORARY SEEDING SCHEDULE

DATE	TYPE	RATE (lb/acre)
FEB 15 - APRIL 1	VIRGINIA WILD RYE	4-6 LBS/ACRE
AUG 15 - OCT 15	INDIAN WOODOATS	1.5-2.5 LBS/ACRE
DEC 1 - APRIL 1	SWITCHGRASS	2.5-3.5 LBS/ACRE

GRAPHIC SCALE
60 0 30 60 120
(IN FEET)
1 inch = 60 ft.

North Carolina 811
*** 3 Days Before Digging ***
North Carolina 811
811 or 1-800-632-4949
Remote Ticket Entry
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NORTH CAROLINA AMERICAN ENGINEERING ASSOCIATES SOUTHEAST C-3881 CERTIFICATE OF AUTHORIZATION

Digitally signed by Jakob Klein
Date: 2025.05.01 08:43:04-04'00'

PRELIMINARY
NORTH CAROLINA REGISTERED 56528 PROFESSIONAL ENGINEER JAKOB P. KLEIN
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KALAS FALLS
PHASE 5
CONSTRUCTION INFRASTRUCTURE DOCUMENTS
CID-25-01
TOWN OF ROLESVILLE, WAKE COUNTY, NC

JOB NUMBER:	R180115
CHECKED BY:	JK
DRAWN BY:	GE, RC
DATE:	05-01-2025

SHEET TITLE:

NPDES PLAN

SHEET NO.:

CE130

J:\Jobs\0900\walden property\!!! phase 5 townhome\!CAD\Sheets\construction documents\CE130-433.dwg
2025-05-01

MAINTENANCE OF EROSION CONTROL MEASURES:

SILT FENCE MAINTENANCE - INSPECT SEDIMENT FENCES AT LEAST ONCE A WEEK AND AFTER EACH RAINFALL. MAKE ANY REQUIRED REPAIRS IMMEDIATELY.

SHOULD THE FABRIC OF A SEDIMENT FENCE COLLAPSE, TEAR, DECOMPOSE OR BECOME INEFFECTIVE, REPLACE IT PROMPTLY.

REMOVE SEDIMENT DEPOSITS AS NECESSARY TO PROVIDE ADEQUATE STORAGE VOLUME FOR THE NEXT RAIN AND TO REDUCE PRESSURE ON THE FENCE. TAKE CARE TO AVOID UNDERMINING THE FENCE DURING CLEANOUT.

REMOVE ALL FENCING MATERIALS AND UNSTABLE SEDIMENT DEPOSITS AND BRING THE AREA TO GRADE AND STABILIZE IT AFTER THE CONTRIBUTING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.

SILT FENCE OUTLETS - SHALL BE INSPECTED AT LEAST WEEKLY AND AFTER EVERY SIGNIFICANT RAINFALL. IF DAMAGED, THEY SHALL HAVE FABRIC, POSTS OR WIRE BACKING REPLACED TO RESTORE TO ORIGINAL CONDITION.

TREE PROTECTION FENCE MAINTENANCE:

CONTINUE TO CARE FOR THE SITE UNTIL THE NEW OWNER TAKES POSSESSION. TAKE THESE STEPS AFTER ALL MATERIALS AND EQUIPMENT HAVE BEEN REMOVED FROM THE SITE:

- REMOVE TREE PROTECTION ZONE FENCES.
- PRUNE ANY DAMAGED TREES. IN SPITE OF PRECAUTIONS, SOME DAMAGE TO PROTECTED TREES MAY OCCUR. IN SUCH CASES, REPAIR ANY DAMAGE TO THE CROWN, TRUNK, OR ROOT SYSTEM IMMEDIATELY.
- REPAIR ROOTS BY CUTTING OFF THE DAMAGED AREAS AND PAINTING THEM WITH TREE PAINT. SPREAD PEAT MOSS OR MOIST TOPSOIL OVER EXPOSED ROOTS.
- REPAIR DAMAGE TO BARK BY TRIMMING AROUND THE DAMAGED AREA AS SHOWN IN FIGURE 6.05D, TAPER THE CUT TO PROVIDE DRAINAGE, AND PAINT WITH TREE PAINT.
- CUT OFF ALL DAMAGED TREE LIMBS ABOVE THE TREE COLLAR AT THE TRUNK OR MAIN BRANCH. USE THREE SEPARATE CUTS AS SHOWN IN FIGURE 6.05D TO AVOID PEELING BARK FROM HEALTHY AREAS OF THE TREE.
- CONTINUE MAINTENANCE CARE. PAY SPECIAL ATTENTION TO ANY STRESSED, DISEASED, OR INSECT-INFESTED TREES. REDUCE TREE STRESS CAUSED BY UNINTENDED CONSTRUCTION DAMAGE BY OPTIMIZING PLANT CARE WITH WATER, MULCH, AND FERTILIZER WHERE APPROPRIATE. CONSULT YOUR TREE EXPERT IF NEEDED.
- INFORM THE PROPERTY OWNER ABOUT THE MEASURES EMPLOYED DURING CONSTRUCTION, WHY THOSE MEASURES WERE TAKEN, AND HOW THE EFFORT CAN BE CONTINUED.

CONSTRUCTION ENTRANCE - MAINTAIN THE GRAVEL PAD IN A CONDITION TO PREVENT MUD OR SEDIMENT FROM LEAVING THE CONSTRUCTION SITE. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH 2-INCH STONE. AFTER EACH RAINFALL, INSPECT ANY STRUCTURE USED TO TRAP SEDIMENT AND CLEAN IT OUT AS NECESSARY. IMMEDIATELY REMOVE ALL OBJECTIONABLE MATERIALS SPILLED, WASHED, OR TRACKED ONTO PUBLIC ROADWAYS.

SOIL STOCKPILE AREAS/OTHER GRASSED AREAS MAINTENANCE - GRASS AREAS SHALL BE RESEEDED AS NECESSARY. SOIL STOCKPILE AREAS SHALL BE SEEDED WHEN THEIR USE IS COMPLETE.

TEMPORARY SEDIMENT TRAP - INSPECT TEMPORARY SEDIMENT TRAPS AT LEAST WEEKLY AND AFTER EACH SIGNIFICANT (½ INCH OR GREATER) RAINFALL EVENT AND REPAIR IMMEDIATELY. REMOVE SEDIMENT, AND RESTORE THE TRAP TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO ONE-HALF THE DESIGN DEPTH OF THE TRAP. PLACE THE SEDIMENT THAT IS REMOVED IN THE DESIGNATED DISPOSAL AREA AND REPLACE THE PART OF THE GRAVEL FACING THAT IS IMPAIRED BY SEDIMENT.

CHECK THE STRUCTURE FOR DAMAGE FROM EROSION OR PIPING. PERIODICALLY CHECK THE DEPTH OF THE SPILLWAY TO ENSURE IT IS A MINIMUM OF 1.5 FEET BELOW THE LOW POINT OF THE EMBANKMENT. IMMEDIATELY FILL ANY SETTLEMENT OF THE EMBANKMENT TO SLIGHTLY ABOVE DESIGN GRADE. ANY RIPRAP DISPLACED FROM THE SPILLWAY MUST BE REPLACED IMMEDIATELY.

AFTER ALL SEDIMENT-PRODUCING AREAS HAVE BEEN PERMANENTLY STABILIZED, REMOVE THE STRUCTURE AND ALL UNSTABLE SEDIMENT. SMOOTH THE AREA TO BLEND WITH THE ADJOINING AREAS AND STABILIZE PROPERLY (*REFERENCES: SURFACE STABILIZATION*).

SEDIMENT BASINS - INSPECT TEMPORARY SEDIMENT BASINS AT LEAST WEEKLY AND AFTER EACH SIGNIFICANT (1/2 INCH OR GREATER) RAINFALL EVENT AND REPAIR IMMEDIATELY. REMOVE SEDIMENT AND RESTORE THE BASIN TO ITS ORIGINAL DIMENSIONS WHEN IT ACCUMULATES TO ONE-HALF THE DESIGN DEPTH. PLACE REMOVED SEDIMENT IN AN AREA WITH SEDIMENT CONTROLS.

CHECK THE EMBANKMENT, SPILLWAYS, AND OUTLET FOR EROSION DAMAGE, AND INSPECT THE EMBANKMENT FOR PIPING AND SETTLEMENT. MAKE ALL NECESSARY REPAIRS IMMEDIATELY. REMOVE ALL TRASH AND OTHER DEBRIS FROM THE RISER AND POOL AREA.

CONCRETE WASHOUT - IT SHALL BE CLEANED PERIODICALLY AS NEEDED. IF THE PLASTIC LINER IS DAMAGED, IT SHALL BE REPLACED.

BAFFLES - INSPECT BAFFLES AT LEAST ONCE A WEEK AND AFTER EACH RAINFALL. MAKE ANY REQUIRED REPAIRS IMMEDIATELY.

BE SURE TO MAINTAIN ACCESS TO THE BAFFLES. SHOULD THE FABRIC OF A BAFFLE COLLAPSE, TEAR, DECOMPOSE, OR BECOME INEFFECTIVE, REPLACE IT PROMPTLY.

REMOVE SEDIMENT DEPOSITS WHEN IT REACHES HALF FULL, TO PROVIDE ADEQUATE STORAGE VOLUME FOR THE NEXT RAIN AND TO REDUCE PRESSURE ON THE BAFFLES.TAKE CARE TO AVOID DAMAGING THE BAFFLES DURING CLEANOUT AND REPLACE IF DAMAGED DURING CLEANOUT OPERATIONS. SEDIMENT DEPTH SHOULD NEVER EXCEED HALF THE DESIGNED STORAGE DEPTH.

AFTER THE CONTRIBUTING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED, REMOVE ALL BAFFLE MATERIALS AND UNSTABLE SEDIMENT DEPOSITS, BRING THE AREA TO GRADE, AND STABILIZE IT.

ROLLED EROSION CONTROL PRODUCTS:

1. INSPECT ROLLED EROSION CONTROL PRODUCTS AT LEAST WEEKLY AND AFTER EACH SIGNIFICANT (1/2 INCH OR GREATER) RAIN FALL EVENT REPAIR IMMEDIATELY.
2. GOOD CONTACT WITH THE GROUND MUST BE MAINTAINED, AND EROSION MUST NOT OCCUR BENEATH THE RECP.
3. ANY AREAS OF THE RECP 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 RECP AS NECESSARY UNTIL GROUND COVER IS ESTABLISHED.

SKIMMERS - INSPECT SKIMMER SEDIMENT BASINS AT LEAST WEEKLY AND AFTER EACH SIGNIFICANT (ONE-HALF INCH OR GREATER) RAINFALL EVENT AND REPAIR IMMEDIATELY. REMOVE SEDIMENT AND RESTORE THE BASIN TO ITS ORIGINAL DIMENSIONS WHEN SEDIMENT ACCUMULATES TO ONE-HALF THE HEIGHT OF THE FIRST BAFFLE. PULL THE SKIMMER TO ONE SIDE SO THAT THE SEDIMENT UNDERNEATH IT CAN BE EXCAVATED. EXCAVATE THE SEDIMENT FROM THE ENTIRE BASIN, NOT JUST AROUND THE SKIMMER OR THE FIRST CELL. MAKE SURE VEGETATION GROWING IN THE BOTTOM OF THE BASIN DOES NOT HOLD DOWN THE SKIMMER.

REPAIR THE BAFFLES IF THEY ARE DAMAGED. RE-ANCHOR THE BAFFLES IF WATER IS FLOWING UNDERNEATH OR AROUND THEM.

IF THE SKIMMER IS CLOGGED WITH TRASH AND THERE IS WATER IN THE BASIN, USUALLY JERKING ON THE ROPE WILL MAKE THE SKIMMER BOB UP AND DOWN AND DISLODGE THE DEBRIS AND RESTORE FLOW. IF THIS DOES NOT WORK, PULL THE SKIMMER OVER TO THE SIDE OF THE BASIN AND REMOVE THE DEBRIS.ALSO CHECK THE ORIFICE INSIDE THE SKIMMER TO SEE IF IT IS CLOGGED; IF SO, REMOVE THE DEBRIS.

IF THE SKIMMER AND/OR BARREL PIPE IS CLOGGED, THE ORIFICE CAN BE REMOVED AND THE OBSTRUCTION CLEARED WITH A PLUMBER'S SNAKE OR BY FLUSHING WITH WATER. BE SURE AND REPLACE THE ORIFICE BEFORE REPOSITIONING THE SKIMMER.

CHECK THE FABRIC LINED SPILLWAY FOR DAMAGE AND MAKE ANY REQUIRED REPAIRS WITH FABRIC THAT SPANS THE FULL WIDTH OF THE SPILLWAY. CHECK THE EMBANKMENT, SPILLWAYS, AND OUTLET FOR EROSION DAMAGE, AND INSPECT THE EMBANKMENT FOR PIPING AND SETTLEMENT. MAKE ALL NECESSARY REPAIRS IMMEDIATELY. REMOVE ALL TRASH AND OTHER DEBRIS FROM THE SKIMMER AND POOL AREAS.

FREEZING WEATHER CAN RESULT IN ICE FORMING IN THE BASIN. SOME SPECIAL PRECAUTIONS SHOULD BE TAKEN IN THE WINTER TO PREVENT THE SKIMMER FROM PLUGGING WITH ICE.

GRASSED LINED CHANNEL- DURING THE ESTABLISHMENT PERIOD, CHECK GRASS-LINED CHANNELS AFTER EVERY RAINFALL.AFTER GRASS IS ESTABLISHED, PERIODICALLY CHECK THE CHANNEL; CHECK IT AFTER EVERY HEAVY RAINFALL EVENT. IMMEDIATELY MAKE REPAIRS. IT IS PARTICULARLY IMPORTANT TO CHECK THE CHANNEL OUTLET AND ALL ROAD CROSSINGS FOR BANK STABILITY AND EVIDENCE OF PIPING OR SCOUR HOLES. REMOVE ALL SIGNIFICANT SEDIMENT ACCUMULATIONS TO MAINTAIN THE DESIGNED CARRYING CAPACITY. KEEP THE GRASS IN A HEALTHY, VIGOROUS CONDITION AT ALL TIMES, SINCE IT IS THE PRIMARY EROSION PROTECTION FOR THE CHANNEL (PRACTICE 6.11, *PERMANENT SEEDING*).

RIP-RAP CHANNEL - INSPECT CHANNELS AT REGULAR INTERVALS AS WELL AS AFTER MAJOR RAINS, AND MAKE REPAIRS PROMPTLY. GIVE SPECIAL ATTENTION TO THE OUTLET AND INLET SECTIONS AND OTHER POINTS WHERE CONCENTRATED FLOW ENTERS. CAREFULLY CHECK STABILITY AT ROAD CROSSINGS, AND LOOK FOR INDICATIONS OF PIPING, SCOUR HOLES, OR BANK FAILURES. MAKE REPAIRS IMMEDIATELY. MAINTAIN ALL VEGETATION ADJACENT TO THE CHANNEL IN A HEALTHY, VIGOROUS CONDITION TO PROTECT THE AREA FROM EROSION AND SCOUR DURING OUT-OF-BANK FLOW.

OUTLET STABILIZATION STRUCTURE - INSPECT RIPRAP OUTLET STRUCTURES WEEKLY AND AFTER SIGNIFICANT (1/2 INCH OR GREATER) RAINFALL EVENTS TO SEE IF ANY EROSION AROUND OR BELOW THE RIPRAP HAS TAKEN PLACE, OR IF STONES HAVE BEEN DISLODGED. IMMEDIATELY MAKE ALL NEEDED REPAIRS TO PREVENT FURTHER DAMAGE

TEMPORARY SILT DITCH -- SHALL BE INSPECTED AT LEAST WEEKLY AND AFTER EVERY SIGNIFICANT RAINFALL. IF SIGNIFICANT EROSION OF THE DITCH IS HAPPENING IT SHALL BE REGRADED. ANY BREACH OF THE DOWNHILL SIDE BERM SHALL BE FIXED IMMEDIATELY.

WATTLES/COMPOST SOCK - INSPECT COMPOST SOCKS WEEKLY AND AFTER EACH SIGNIFICANT RAINFALL EVENT (1/2 INCH OR GREATER). REMOVE ACCUMULATED SEDIMENT AND ANY DEBRIS. THE COMPOST SOCK MUST BE REPLACED IF CLOGGED OR TORN. IF PONDING BECOMES EXCESSIVE, THE SOCK MAY NEED TO BE REPLACED WITH A LARGER DIAMETER OR A DIFFERENT MEASURE. THE SOCK NEEDS TO BE REINSTALLED IF UNDERMINED OR DISLODGED. THE COMPOST SOCK SHALL BE INSPECTED UNTIL LAND DISTURBANCE IS COMPLETE AND THE AREA ABOVE THE MEASURE HAS BEEN PERMANENTLY STABILIZED

ROCK PIPE INLET PROTECTION - INSPECT ROCK PIPE INLET PROTECTION AT LEAST WEEKLY AND AFTER EACH SIGNIFICANT (½ INCH OR GREATER) RAINFALL EVENT AND REPAIR IMMEDIATELY. REMOVE SEDIMENT AND RESTORE THE SEDIMENT STORAGE AREA TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO ONE-HALF THE DESIGN DEPTH OF THE TRAP. PLACE THE SEDIMENT THAT IS REMOVED IN THE DESIGNATED DISPOSAL AREA AND REPLACE THE CONTAMINATED PART OF THE GRAVEL FACING.

CHECK THE STRUCTURE FOR DAMAGE. ANY RIPRAP DISPLACED FROM THE STONE HORSESHOE MUST BE REPLACED IMMEDIATELY.

AFTER ALL THE SEDIMENT-PRODUCING AREAS HAVE BEEN PERMANENTLY STABILIZED, REMOVE THE STRUCTURE AND ALL THE UNSTABLE SEDIMENT. SMOOTH THE AREA TO BLEND WITH THE ADJOINING AREAS AND PROVIDE PERMANENT GROUND COVER (*SURFACE STABILIZATION*).

STOCKPILE 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).

STAGE 1 E&SC CONSTRUCTION SEQUENCE:

1. THE OWNER SHALL OBTAIN NCG01 PERMIT AND PAY ANY FEE THAT MAYBE ASSOCIATED WITH THIS PERMIT.
2. SCHEDULE A PRE-CONSTRUCTION CONFERENCE WITH THE WAKE COUNTY WATERSHED MANAGER.
3. ENSURE THAT ALL LIMITS OF DISTURBANCE, SURFACE WATERS, AND RIPARIAN BUFFERS ARE FLAGGED PRIOR TO INSTALLATION OF EROSION CONTROL MEASURES.
4. TREE PROTECTION FENCES, SILT FENCES, AND CONSTRUCTION ENTRANCES SHALL BE INSTALLED AS SHOWN ON THE APPROVED EROSION CONTROL PLANS.
5. CLEAR ONLY AS NECESSARY TO INSTALL THESE DEVICES INCLUDING STOCKPILE LOCATIONS. STOCKPILE LOCATIONS SHOULD BE ENCLOSED BY SILT FENCE AS SHOWN ON THE PLANS. SEED TEMPORARY DIVERSIONS, BERMS, AND SEDIMENT BASINS IMMEDIATELY AFTER CONSTRUCTION.
6. THE TEMPORARY SEDIMENT BASINS ARE TO BE FULLY CONSTRUCTED PRIOR TO THE INSTALLATION OF ANY TEMPORARY DIVERSION DITCHES (TDD) OR PERMANENT DIVERSION DITCHES (PDD). CONSTRUCT TSBS #1-#2 AS TEMPORARY SEDIMENT BASINS FOLLOWING THE PROJECT CD PLAN SET.
7. INSTALL TDD AND PDD'S PER DESIGN IN THE CD PLAN SET TO CONVEY RUNOFF TO TSB #1 AND TSB#2.
8. INSTALL STORMWATER INFRASTRUCTURE DI-390 THROUGH TEMPORARY 11 FES, DI-396B THROUGH TEMPORARY FES 299, AND TEMPORARY 30 FES THROUGH TEMPORARY 31 FES. INSTALL ANY ADDITIONAL STORMWATER INFRASTRUCTURE NOTED IN THE STAGE 1 CD PLAN SET. NOTE THAT IN THE CONSTRUCTION DRAWINGS, PERMANENT STORMWATER PIPES AND STRUCTURES INSTALLED WITHIN STAGE 1 OF EROSION CONTROL ARE TO BE UTILIZED AND MAINTAINED THROUGH FINAL BUILD OUT OF THIS PROJECT. THESE PERMANENT PIPES AND STRUCTURES WILL SERVE THE TEMPORARY SEDIMENT BASINS AND ACT AS INLETS/OUTLETS FOR THE TDD'S AND PDD'S UNTIL THEY ARE EVENTUALLY MODIFIED TO FINAL SITE DESIGN IN STAGE 3 (FOLLOWING FINAL SITE STABILIZATION). SEE EROSION AND SEDIMENT CONTROL PLANS FOR MORE DETAIL.
9. NOTE THAT DRAINAGE PIPES UTILIZED TO CONVEY SEDIMENT LADEN WATER TO TEMPORARY SEDIMENT TRAPS ARE PRONE TO SEDIMENT BUILD UP. PIPES SHOULD BE INSPECTED AFTER RAIN EVENTS OF 1" OR GREATER WITHIN A 24-HOUR PERIOD. CONTRACTORS ARE TO ENSURE NO DAMMING OR SIGNIFICANT SEDIMENT BUILD UP ARE PRESENT WITHIN THE PIPES. FLUSHING OF PIPES WILL BE REQUIRED PERIODICALLY TO MAINTAIN PERFORMANCE.
10. ALL TEMPORARY RIP RAP IS TO BE INSTALLED AS SEEN IN THE CD PLAN SET.
11. ANY STORMWATER INFRASTRUCTURE INSTALLED SHOULD HAVE INLETS PROTECTED WITH BLOCK AND GRAVEL INLET CONTROL, SEDIMENT TRAPS, OR OTHER APPROVED MEASURES AS SHOWN IN THE PLANS. NOTE THAT INLETS WITH A DRAINAGE AREA OVER 1 ACRE ARE TO HAVE ROCK DOUGHNUT INLET PROTECTION.
12. CALL FOR AN ONSITE INSPECTION BY THE WAKE COUNTY WATERSHED MANAGER TO OBTAIN A CERTIFICATE OF COMPLIANCE. ADDITIONAL MEASURES OR DITCH EXTENSIONS MAY BE REQUIRED BY THE NCDEQ/TOWN OF ROLESVILLE EROSION CONTROL FIELD INSPECTOR TO ROUTE RUNOFF TO SEDIMENT BASINS BASED ON FIELD CONDITIONS AND THESE MEASURES SHALL BE INSTALLED UPON THE INSPECTOR'S DETERMINATION.
13. STABILIZE SITE AREAS AS THAT ARE BROUGHT UP TO FINISH GRADE WITH VEGETATION, PAVING, DITCH-LININGS, ETC. SEED AND MULCH DENUDED AREAS PER GROUND STABILIZATION TIME FRAMES.
14. CALL FOR INSPECTION BY WAKE COUNTY WATERSHED MANAGER FOR APPROVAL BEFORE PROCEEDING TO STAGE 2 CONSTRUCTION.

STAGE 2 E&SC CONSTRUCTION SEQUENCE:

1. GENERAL SITE GRADING MAY BEGIN.
2. INSTALL STORM DRAINAGE INFRASTRUCTURE AS SEEN IN THE APPROVED CONSTRUCTION DRAWINGS. THE 400A TO 400B GREENWAY CULVERTS ARE NOT TO BE INSTALLED UNTIL STAGE 3. EXCAVATE TRENCH, INSTALL SECTION(S) OF PIPE, BACKFILL AND STABILIZE GROUND DISTURBANCE WITHIN A WORKDAY. MODIFICATIONS TO STORM DRAINAGE INFRASTRUCTURE INSTALLED IN STAGE 1 MAY BE REQUIRED AS FINISH GRADE IS ESTABLISHED ON SITE.
3. NOTE THAT TEMPORARY STORMWATER INFRASTRUCTURE FES 11 AND FES 299 ARE TO REMAIN IN PLACE DURING STAGE 2 TO CONVEY STORMWATER TO TSB #1 AND TSB #2.
4. ALL PERMANENT RIP RAP IS TO BE INSTALLED AS SEEN IN THE CD PLAN SET.
5. ANY STORMWATER INFRASTRUCTURE INSTALLED SHOULD HAVE INLETS PROTECTED WITH BLOCK AND GRAVEL INLET CONTROL, SEDIMENT TRAPS, OR OTHER APPROVED MEASURES AS SHOWN IN THE PLANS. NOTE THAT INLETS WITH A DRAINAGE AREA OVER 1 ACRE ARE TO HAVE ROCK DOUGHNUT INLET PROTECTION.
6. FOLLOWING CONNECTION TO KALAS FALLS PHASE 3 STORM DRAINAGE INFRASTRUCTURE, A PLUG SHALL BE INSTALLED AT THE INVERT OUT OF STRUCTURE 377-CB. THIS IS TO ELIMINATE SEDIMENT BEING CONVEYED TO SCM 3B (REGIONAL SCM) LOCATED ON KALAS PHASE 3. THE PLUG WILL REMAIN IN PLACE UNTIL FINAL SITE STABILIZATION HAS BEEN ACHIEVED, AND THE CONTRACTOR HAS APPROVAL TO CONVEY STORMWATER RUNOFF ON SITE TO SCM 3B BY THE WAKE COUNTY INSPECTOR (SEE STAGE 3: STEP 1).
7. CULVERT CROSSING BENEATH GRAYMONT OAKS DRIVE ARE TO BE INSTALLED FOLLOWING CD PLAN SET DESIGN. IDEALLY, THE CULVERT INSTALLATION IS TO BE COORDINATED WITH THE DAM REHABILITATION PROJECT (SEPARATE COVER/PERMIT) FOR THE KALAS FALLS POND.
8. ROAD CONSTRUCTION SHALL TAKE PLACE.
9. ANY 3:1 SLOPE OR GREATER ADJACENT TO THE GRAYMONT OAKS DRIVE ARE TO HAVE ROLLED EROSION CONTROL BLANKETS INSTALLED AS GRADES ARE BROUGHT TO FINISHED ELEVATIONS. COMPOST SOCKS ARE TO BE UTILIZED PERPENDICULAR TO THE FLOW OF WATER TO PREVENT RILL/GULLY, SEE CD PLAN SET.
10. CONSTRUCTION ENTRANCE #2 TO THE EAST OF THE SITE MAY BE INSTALLED.
11. CLEAN SEDIMENT BASINS WHEN ONE-HALF FULL.
12. SEED AND MULCH DENUDED AREA INCLUDING ANY CUT/FILL SLOPES WITHIN FOURTEEN (14) DAYS AFTER FINISHED GRADES ARE ESTABLISHED.
13. MAINTAIN SOIL EROSION CONTROL MEASURES.
14. UTILITIES (WATER, ELECTRIC, GAS, CABLE TV, TELEPHONE, ETC.) WILL BE INSTALLED DURING THIS PHASE.
15. CALL FOR INSPECTION BY WAKE COUNTY WATERSHED MANAGER FOR APPROVAL BEFORE PROCEEDING TO STAGE 3 CONSTRUCTION.

STAGE 3 E&SC CONSTRUCTION SEQUENCE:

1. CALL FOR AN ONSITE INSPECTION BY THE WAKE COUNTY WATERSHED MANAGER FOR APPROVAL TO REMOVE/BACKFILL TSB #1 AND TSB #2 AND REMOVE PLUG IN STRUCTURE CB-377, ALLOWING FOR SITE STORMWATER RUNOFF TO BE CONVEYED TO SCM #3B.
2. ONCE PROJECT IS APPROVED TO OUTLET TO SCM #3B, ANY TEMPORARY STORMWATER PIPES REMAINING CAN BE REMOVED OR ABANDONED IN PLACE AND FILLED WITH FLOWABLE FILL.
3. AS SURROUNDING PROJECT AREAS ARE BROUGHT TO FINAL GRADE ELEVATIONS, ROLLED EROSION CONTROL BLANKETS SHOULD BE IMPLEMENTED ON SLOPES OF 3:1 OR GREATER TO PROMOTE PROMPT GROUND SURFACE STABILIZATION. THESE AREAS SHOULD BE SEEDED FOLLOWING THE NPDES SEEDING SCHEDULE WITHIN THE CD PLAN SET. UTILIZE COMPOST SOCKS ON SLOPES TO MINIMIZE/ATTENUATE RUNOFF AS SEEN IN CD PLAN SET.
4. AS SITE IS BROUGHT TO FINAL ELEVATIONS, PERMANENT DIVERSION DITCHES SHOULD BE INSTALLED WITH RECOMMENDED LINER AS SEEN IN THE CD PLAN SET TO CONVEY STORMWATER RUNOFF.
5. THE 400A TO 400B GREENWAY CULVERT AND RIP RAP CAN BE INSTALLED AS SEEN IN THE CD PLAN SET.
6. VERTICAL CONSTRUCTION MAY BEGIN.
7. CLEAN/INSPECT INLET PROTECTION FOLLOWING ANY STORM EVENTS OF 1" OR EVERY FOURTEEN (14) DAYS.
8. SEED AND MULCH DENUDED AREA INCLUDING ANY CUT/FILL SLOPES WITHIN FOURTEEN (14) DAYS AFTER FINISHED GRADES ARE ESTABLISHED.
9. MAINTAIN SOIL EROSION CONTROL MEASURES UNTIL PERMANENT GROUND IS ESTABLISHED.
10. REQUEST INSPECTION BY WAKE COUNTY WATERSHED MANAGER AFTER VEGETATION IS ESTABLISHED TO REMOVE REMAINING EROSION CONTROL MEASURES.
11. REMOVE REMAINING SOIL EROSION CONTROL MEASURES AND STABILIZE THE RESULTING BARE AREAS. CONTACT WAKE COUNTY WATERSHED MANAGER TO REQUEST A FINAL INSPECTION FOR APPROVAL TO CLOSE THE LAND DISTURBANCE PERMIT.
12. THE OWNER IS TO FINALIZE THE NCG01 PERMIT.

NOTES FOR CONSTRUCTION:

1. PLANS FOR INFRASTRUCTURE ONLY.
2. ALL CONSTRUCTION MUST BE PERFORMED IN ACCORDANCE WITH CURRENT TOWN OF ROLESVILLE, WAKE COUNTY, AND CITY OF RALEIGH STANDARD SPECS AND DETAILS, AND SPECIFICATIONS.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION OF EXISTING CONDITIONS. CONTRACTOR SHALL NOTIFY ENGINEER OF DISCREPANCIES BETWEEN FIELD CONDITIONS AND THESE DRAWINGS.
4. CONTRACTOR WILL KEEP STREETS CLEAN AT ALL TIMES, OR A WASH STATION WILL BE REQUIRED.
5. ALL CATCH BASINS SHALL HAVE INLET PROTECTION.
6. ALL CUT AND FILL SLOPES MUST BE STABALIZED WITHIN 7 DAYS AS SHOWN ON CHART TO THE LEFT AND ON THE EC SHEETS.
7. TREE PROTECTION FENCING ON THIS PROJECT WILL BE INSTALLED AND INSPECTED BEFORE THE GRADING PERMIT IS ISSUED.
8. PERMANENT GROUND COVER WILL BE ESTABLISHED IN 15 WORKING DAYS OR 90 CALENDAR DAYS WHICHEVER IS SHORTER.
9. THE AREA DESIGNATED SHALL BE USED FOR TOPSOIL STOCKPILE.
10. MINIMUM CORNER CLEARANCE FROM THE CURB LINE OF INTERSECTING STREETS SHALL BE AT LEAST 20 FEET FROM THE POINT OF TANGENCY.

REQUIRED WAKE COUNTY CONSTRUCTION SEQUENCE*

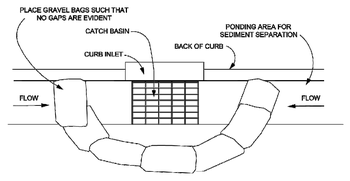
1. SCHEDULE A PRECONSTRUCTION CONFERENCE WITH THE WATERSHED MANGER. OBTAIN A LAND-DISTURBING PERMIT.
2. INSTALL GRAVEL CONSTRUCTION PAD, TEMPORARY DIVERSIONS, SILT FENCE, SEDIMENT BASINS OR
   OTHER MEASURES AS SHOWN ON THE APPROVED PLAN. CLEAR ONLY AS NECESSARY TO INSTALL
   THESE DEVICES. SEED TEMPORARY DIVERSIONS, BERMS AND BASINS IMMEDIATELY AFTER
   CONSTRUCTION.
3. CALL FOR AN ONSITE INSPECTION BY THE WATERSHED MANAGER TO OBTAIN A CERTIFICATE OF COMPLIANCE.
4. BEGIN CLEARING AND GRUBBING. MAINTAIN DEVICES AS NEEDED. ROUGH GRADE SITE.
5. INSTALL STORM SEWER, IF SHOWN, AND PROTECT INLETS WITH BLOCK AND GRAVEL INLET CONTROLS,
   SEDIMENT TRAPS OR OTHER APPROVED MEASURES AS SHOWN ON THE PLAN. BEGIN CONSTRUCTION, BUILDING, ETC.
6. 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 FOR AN INSPECTION BY THE WATERSHED MANAGER.
8. IF SITE IS APPROVED, REMOVE TEMPORARY DIVERSIONS, SILT FENCE, SEDIMENT BASINS, ETC.,
   AND SEED OUT OR STABILIZE ANY RESULTING BARE AREAS. ALL REMAINING PERMANENT EROSION
   CONTROL DEVICES, SUCH AS VELOCITY DISSIPATORS, SHOULD NOW BE INSTALLED.
9. WHEN VEGETATION HAS BECOME ESTABLISHED, CALL FOR A FINAL SITE INSPECTION BY THE
   WATERSHED MANAGER. OBTAIN A CERTIFICATE OF COMPLETION.

CONTRIBUTING AREAS TO SFO	
SFO IDENTIFICATION	AREA (SF)
#1	4,082
#2	10,677
#3	10,045
#4	4,193
#5	10,477
#6	10,185
#7	10,236
#8	10,044
#9	10,100

NOTE: EACH SILT FENCE OUTLET CONTRIBUTING AREA IS LIMITED TO 0.25 ACRES OR 10,890 SF. ONLY THE SILT FENCE OUTLETS WITH LARGE CONTRIBUTING AREAS WERE DELINEATED FOR CALCULATIONS TO ENSURE MAXIMUM AREAS WERE MAINTAINED. IT IS RECOMMENDED FOR THE CONTRACTOR TO INSTALL SILT FENCE OUTLETS AT EACH LOCATION SHOWN IN THE CONSTRUCTION DRAWINGS PLAN SET TO ENSURE PROPER SEDIMENT CONTROL.

10-YEAR EROSION & SEDIMENT CONTROL DIVERSION DITCH CALCULATIONS (VARAIBLE SIDE SLOPES)

#	DRAINAGE AREA (AC)	AVERAGE SLOPE (%)	WIDTH (FT)	DEPTH (FT)	V_{10} (FT/S)	CALCULATED τ (LBS/FT^2)	RECOMMENDED LINER	LINER ALLOWABLE τ (LBS/FT^2)
TDD 1A	2.04	0.81	6	1.5	2.53	0.76	AM. EXCELISIOR CO.; CURLEX NET FREE	1.00
TDD 1B	1.29	2.28	6	1.5	3.28	2.13	AM. EXCELSIOR CO.; CURLEX III; 2 NETS	2.30
TDD 1C	1.13	3.46	6	1.5	3.89	3.24	GEOCOIR/DEKOWE;



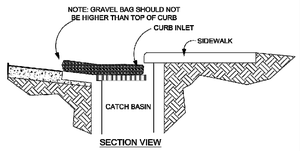
PLAN VIEW

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. WHEN INSTALLING CURB INLET PROTECTION DEVICES, NEVER BLOCK THE CURB INLET.

MAINTENANCE NOTES:

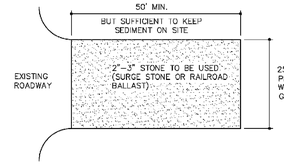
1. INSPECT BARRIERS AND REMOVE SEDIMENT AFTER EACH STORM EVENT (1 INCH OR GREATER). SEDIMENT AND GRAVEL MUST BE REMOVED FROM THE TRAVELED WAY IMMEDIATELY.



SECTION VIEW

WAKE COUNTY NORTH CAROLINA
EFFECTIVE: 01/31/08

STANDARD GRAVEL BAG CURB INLET PROTECTION | 01



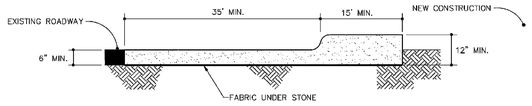
PLAN VIEW

NOTES:

1. INSTALL SILT FENCE OR TREE PROTECTION FENCE TO ENSURE CONSTRUCTION ENTRANCE IS USED BY VEHICLES.
2. IF MUD IS NOT REMOVED FROM TIRES AFTER VEHICLE TRAVELS OVER STONE, THE TIRES OF THE VEHICLE MUST BE WASHED BEFORE ENTERING PUBLIC ROADS.

MAINTENANCE NOTES:

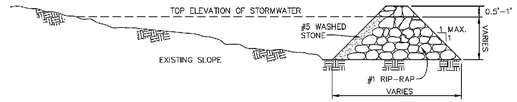
1. THE GRAVEL CONSTRUCTION ENTRANCE MUST BE MAINTAINED IN A CONDITION TO PREVENT TRACKING OR DIRECT FLOW OF MUD ONTO ADJACENT ROADWAYS.
2. REPLACEMENT OF STONE MAY BE NECESSARY TO ENSURE THE GRAVEL ENTRANCE FUNCTIONS PROPERLY.
3. REPLENISHMENT OF STONE MAY BE NECESSARY.
4. FREQUENT CHECKS OF THE DEVICE AND TIMELY MAINTENANCE SHOULD BE COMPLETED.
5. ANY MATERIAL TRACKED ONTO THE ROADWAY SHALL BE CLEANED UP IMMEDIATELY.



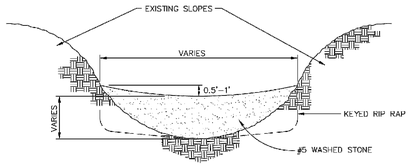
CROSS SECTION

WAKE COUNTY NORTH CAROLINA
EFFECTIVE: 01/31/08

STANDARD CONSTRUCTION ENTRANCE | 02



SIDE VIEW



FRONT VIEW

CONSTRUCTION NOTES:

1. HEIGHT & WIDTH DETERMINED BY EXISTING TOPOGRAPHY AND SEDIMENT STORAGE REQUIRED.
2. KEY RIP RAP INTO THE DAM FOR STABILIZATION.

MAINTENANCE NOTES:

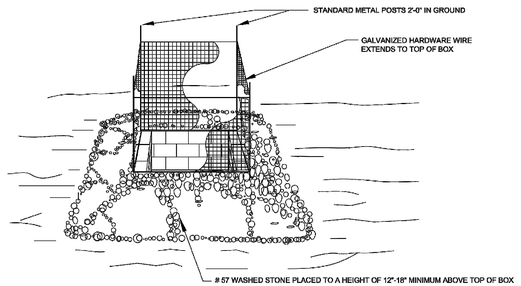
1. INSPECT CHECK DAMS WEEKLY AND AFTER EVERY RAINFALL EVENT OF 1" OR MORE.
2. REMOVE SEDIMENT AND DEBRIS AS NEEDED.
3. MAINTAIN FLOW THROUGH THE CHECK DAM.

STEP SEQUENCE

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 | 03

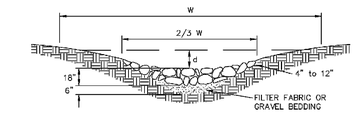


MAINTENANCE NOTES:

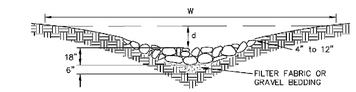
1. REMOVE SEDIMENT WHEN HALF HEIGHT OF STONE AND CLEAR HARDWARE OF DEBRIS TO PROVIDE ADEQUATE FLOW FOR SUBSEQUENT RAINS, TAKING CARE NOT TO DAMAGE OR UNDERCUT HARDWARE DURING SEDIMENT REMOVAL.
2. REPLACE STONE AS NEEDED.

WAKE COUNTY NORTH CAROLINA
EFFECTIVE: 01/31/08

STANDARD GRAVEL YARD INLET PROTECTION | 04



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



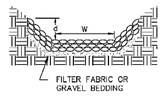
V–SHAPED WATERWAY WITH STONE CENTER DRAIN
(SHAPED BY MOTOR GRADER)

NOTES:

–TO BE USED WHERE EXCESSIVE STORMWATER VELOCITIES PROHIBIT VEGETATIVE LININGS.

–SIZE OF STONE MUST BE DETERMINED BY APPROPRIATE DESIGN PROCEDURE.

–DIMENSIONS FOR d & W VARIES ACCORDING TO DESIGN.



TRAPEZOIDAL

MAINTENANCE NOTES:
–INSPECT RIPRAP DITCH WEEKLY AND AFTER SIGNIFICANT RAIN EVENTS TO SEE IF ANY EROSION AROUND OR BELOW THE RIP RAP HAS TAKEN PLACE. IMMEDIATELY MAKE ALL NEEDED REPAIRS TO PREVENT FURTHER DAMAGE.
–IF EROSION IS EVIDENT PAST END OF RIPRAP DITCH DUE TO RUNOFF DISCHARGING FROM DITCH, INCREASE DIMENSIONS OF RIPRAP PAD PROVIDED SPACE IS AVAILABLE WITHIN THE APPROVED LIMITS OF DISTURBANCE.
–MAINTAIN ALL VEGETATION ADJACENT TO CHANNEL IN A HEALTHY, VIGOROUS CONDITION TO PROTECT DITCH FROM EROSION AND SCOUR DURING OUT–OF–BANK FLOW.

WAKE COUNTY NORTH CAROLINA
EFFECTIVE: 01/31/08

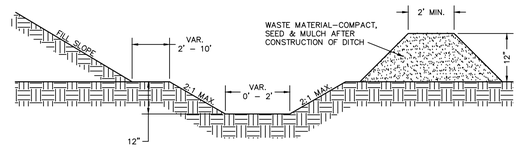
STANDARD RIP-RAP LINED CHANNELS | 05

NOTES:

1. TEMPORARY DIVERSION DITCH TO BE USED TO INTERCEPT FLOW AND/OR DIVERT TO A SEDIMENT CONTROL MEASURE OR BMP.
2. STABILIZE DIVERSION DITCH BERM WITH TEMPORARY SEEDING, MULCH WITH TAC, AND/OR EROSION CONTROL NETTING.

MAINTENANCE NOTES:

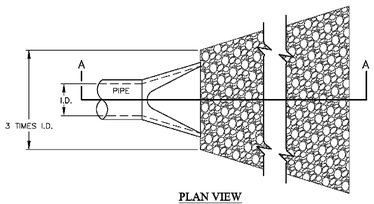
1. INSPECT ONCE A WEEK AND AFTER EVERY 1" RAINFALL.
2. SILT SHALL BE REMOVED WHEN DITCH IS ONE–HALF FULL.
3. DITCH SHALL BE RECONSTRUCTED WHEN DAMAGED BY EQUIPMENT OR COVERED BY FILL.
4. CHECK OUTLETS AND MAKE TIMELY REPAIRS AS NEEDED.
5. AFTER DRAINAGE AREA IS PERMANENTLY STABILIZED, PLACE WASTE MATERIAL IN DITCH TO BLEND WITH NATURAL GROUND AND STABILIZE.



CROSS SECTIONAL VIEW

WAKE COUNTY NORTH CAROLINA
EFFECTIVE: 01/31/08

STANDARD TEMPORARY DIVERSION DITCH | 06



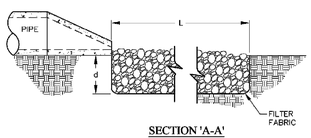
PLAN VIEW

NOTES:

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

MAINTENANCE NOTES:

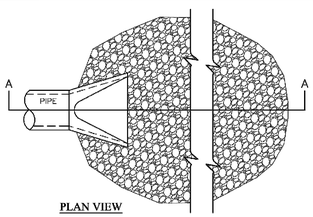
1. INSPECT RIPRAP OUTLET STRUCTURES WEEKLY AND AFTER SIGNIFICANT (1 INCH OR GREATER) RAINFALL EVENTS TO SEE IF ANY EROSION AROUND OR BELOW THE RIPRAP HAS TAKEN PLACE, OR IF STONES HAVE BEEN DISLODGED. IMMEDIATELY MAKE ALL NEEDED REPAIRS TO PREVENT FURTHER DAMAGE.



SECTION 'A-A'

WAKE COUNTY NORTH CAROLINA
EFFECTIVE: 01/31/08

STANDARD PIPE OUTLET TO FLAT AREA
NO WELL-DEFINED CHANNEL | 07



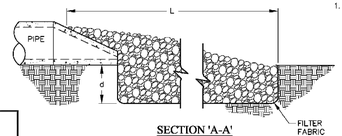
PLAN VIEW

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.

MAINTENANCE NOTES:

1. INSPECT RIPRAP OUTLET STRUCTURES WEEKLY AND AFTER SIGNIFICANT (1 INCH OR GREATER) RAINFALL EVENTS TO SEE IF ANY EROSION AROUND OR BELOW THE RIPRAP HAS TAKEN PLACE, OR IF STONES HAVE BEEN DISLODGED. IMMEDIATELY MAKE ALL NEEDED REPAIRS TO PREVENT FURTHER DAMAGE.



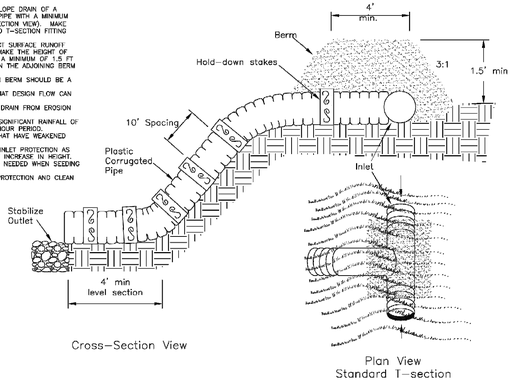
SECTION 'A-A'

WAKE COUNTY NORTH CAROLINA
EFFECTIVE: 01/31/08

STANDARD PIPE OUTLET TO WELL-DEFINED CHANNEL | 08

MAINTENANCE 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 HIGHER THAN THE ADJOINING BERM ON EITHER SIDE.
3. THE LOWEST POINT OF THE DIVERSION BERM SHOULD BE A MINIMUM OF 1 FT.
4. ABOVE THE TOP OF THE DRAIN SO THAT DESIGN FLOW CAN FREELY ENTER THE PIPE.
5. PROTECT THE OUTLET OF THE SLOPE DRAIN FROM EROSION WITH RIPRAP DISSIPATOR.
6. INSPECT SLOPE DRAINS AFTER EACH SIGNIFICANT RAINFALL OF 1 INCHES OR GREATER, OVER A 24–HOUR PERIOD.
7. REBUILD EARTH BERMS AND INLETS THAT HAVE WEAKENED DUE TO SCOURING.
8. EXTEND SLOPE DRAINS AND REBUILD INLET PROTECTION AS SLOPE IS BUILT, AFTER EACH 2–FOOT INCREASE IN HEIGHT.
9. REBUILD OR REPAIR SLOPE DRAINS IF NEEDED WHEN SEEDING AND MULCHING IS PERFORMED.
10. REFURBISH CLASS B STONE OUTLET PROTECTION AND CLEAN AS NEEDED.



WAKE COUNTY NORTH CAROLINA
EFFECTIVE: 01/31/08

STANDARD TEMPORARY SLOPE DRAIN | 09

AMERICAN Engineering
American Engineering Associates - Southeast, P.A.
4020 Westchase Boulevard, Suite 450
Raleigh, NC 27607
919-469-1101

NORTH CAROLINA ENGINEERING ASSOCIATES SOUTHEAST C-3881 CERTIFICATE OF AUTHORIZATION

Digitally signed by Jakob Klein
Date: 2025.05.01 10:57:04-04'00'

PRELIMINARY
NORTH CAROLINA 50528 PROFESSIONAL ENGINEER JAKOB P. KLEIN
DO NOT USE FOR CONSTRUCTION
FOR INFORMATION, ONLY

NO.	DATE	REVISION:
1	12/23/2024	CID SUBMITTAL #1

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KALAS FALLS
PHASE 5
CONSTRUCTION INFRASTRUCTURE DOCUMENTS
CID-25-01
TOWN OF ROLESVILLE, WAKE COUNTY, NC

JOB NUMBER:	R180115
CHECKED BY:	JK
DRAWN BY:	GE, RC
DATE:	05-01-2025

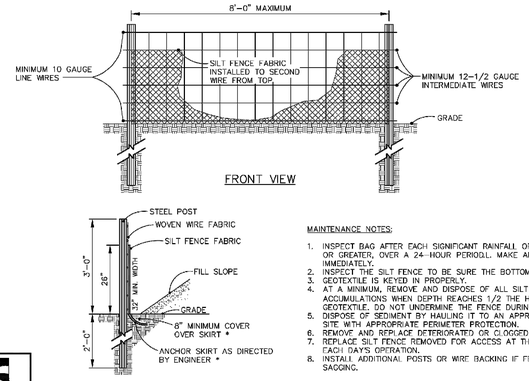
SHEET TITLE:

ESC DETAILS

SHEET NO.:

CE501

North Carolina 811
*** 3 Days Before Digging ***
North Carolina 811
811 or 1-800-632-4949
Remote Ticket Entry
http://nc811.org/remoteticketentry.htm



MAINTENANCE NOTES:

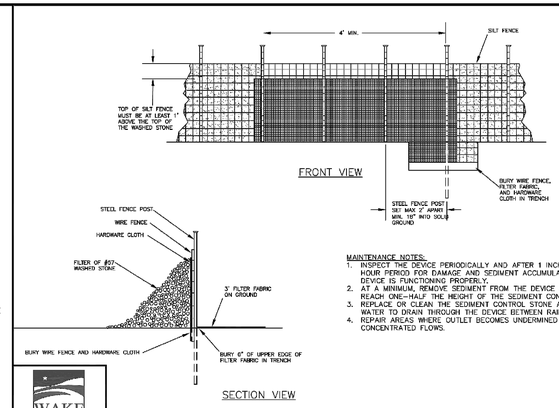
1. INSPECT BAG AFTER EACH SIGNIFICANT RAINFALL OF 1 INCHES OR GREATER, OVER A 24-HOUR PERIOD. MAKE ANY REPAIRS IMMEDIATELY.
2. INSPECT THE SILT FENCE TO BE SURE THE BOTTOM OF THE GEOTEXTILE IS KEYED IN PROPERLY.
3. GEOTEXTILE IS KEYED IN PROPERLY.
4. AT A MINIMUM, REMOVE AND DISPOSE OF ALL SILT ACCUMULATIONS WHEN DEPTH REACHES 1/2 THE HEIGHT OF THE GEOTEXTILE. DO NOT UNDERMINE THE FENCE DURING CLEANOUT.
5. DISPOSE OF SEDIMENT BY HAULING IT TO AN APPROVED WASTE SITE WITH APPROPRIATE PERIMETER PROTECTION.
6. REMOVE AND REPLACE DETERIORATED OR CLOGGED SILT FENCE.
7. REPLACE SILT FENCE REMOVED FOR ACCESS AT THE END OF EACH DAYS OPERATION.
8. INSTALL ADDITIONAL POSTS OR WIRE BACKING IF FENCE IS SAGGING.

WAKE COUNTY NORTH CAROLINA

EFFECTIVE: 01/31/08

STANDARD TEMPORARY SILT FENCE

01



MAINTENANCE NOTES:

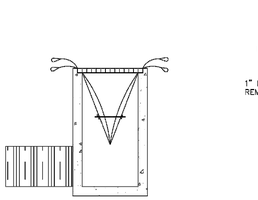
1. INSPECT THE DEVICE PERIODICALLY AND AFTER 1 INCH RAINFALL OVER 24 HOUR PERIOD FOR DAMAGE AND SEDIMENT ACCUMULATION TO CONFIRM THE DEVICE IS FUNCTIONING PROPERLY.
2. AT A MINIMUM, REMOVE SEDIMENT FROM THE DEVICE WHEN ACCUMULATIONS REACH ONE-HALF THE HEIGHT OF THE SEDIMENT CONTROL STONE.
3. REPLACE OR CLEAN THE SEDIMENT CONTROL STONE AS NEEDED TO ALLOW WATER TO DRAIN THROUGH THE DEVICE BETWEEN RAINFALL EVENTS.
4. REPAIR AREAS WHERE OUTLET BECOMES UNDERMINED DUE TO CONCENTRATED FLOWS.

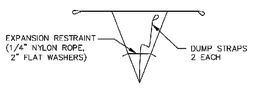
WAKE COUNTY NORTH CAROLINA

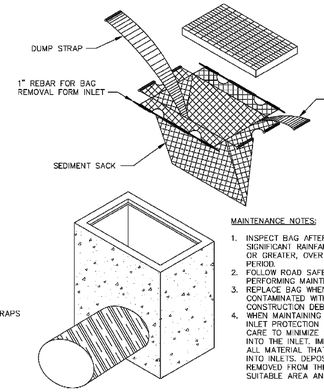
EFFECTIVE: 01/31/08

STANDARD SILT FENCE OUTLET

02







MAINTENANCE NOTES:

1. INSPECT BAG AFTER EACH SIGNIFICANT RAINFALL OF 1 INCHES OR GREATER, OVER A 24-HOUR PERIOD.
2. FOLLOW ROAD SAFETY WHILE PERFORMING MAINTENANCE.
3. REPLACE BAG WHEN THEY BECOME CONTAMINATED WITH SEDIMENT AND CONSTRUCTION DEBRIS.
4. WHEN MAINTAINING AND REMOVING INLET PROTECTION DEVICES, EXERCISE CARE TO MINIMIZE SEDIMENT FALLING INTO THE INLET. IMMEDIATELY REMOVE ALL MATERIAL THAT HAS FALLEN INTO INLETS. DEPOSIT SEDIMENT REMOVED FROM THE DEVICE IN A SUITABLE AREA AND STABILIZE.

WAKE COUNTY NORTH CAROLINA

EFFECTIVE: 01/31/08

STANDARD SILT BAG - INLET SEDIMENT CONTROL DEVICE

03

NOTES:

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

MAINTENANCE NOTES:

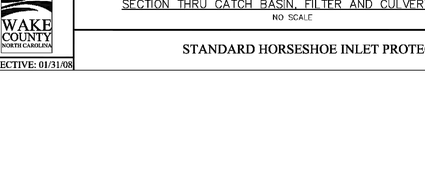
1. INSPECT AFTER EVERY RAINFALL DURING THE CONSTRUCTION OPERATION.
2. IMMEDIATELY REMOVE ANY OBSTRUCTIONS FROM THE FLOW AREA, AND REPAIR DIVERSION RIDGE.
3. CHECK OUTLETS AND MAKE TIMELY REPAIRS AS NEEDED.
4. MAINTAIN THE VEGETATION IN A VIGOROUS, HEALTHY CONDITION AT ALL TIMES.

WAKE COUNTY NORTH CAROLINA

EFFECTIVE: 01/31/08

STANDARD CLEAN WATER DIVERSION

04



NOTES:

1. BAFFLE MATERIAL SHOULD BE SECURED AT THE BOTTOM AND SIDES USING STAPLES OR BY TRENCHING AS FOR SILT FENCE.
2. MOST OF THE SEDIMENT WILL ACCUMULATE IN THE 1ST BAY, WHICH SHOULD BE READILY ACCESSIBLE FOR MAINTENANCE.
3. PROVIDE 3 BAFFLES (USE TWO IF LESS THAN 20 FEET IN LENGTH). PROVIDE 5 BAFFLES FOR DRAINAGE AREAS GREATER THAN 10 ACRES.
4. BAFFLE SHALL BE 200 G/M2 COIR EROSION BLANKET.
5. TOPS OF BAFFLES SHOULD BE 2 INCHES LOWER THAN THE TOP OF THE BERMS.

MAINTENANCE NOTES:

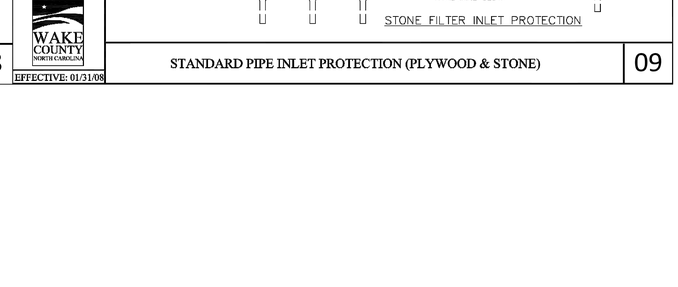
1. INSPECT BAFFLES FOR REPAIR ONCE A WEEK AND AFTER EACH 1" RAINFALL.
2. MAINTAIN ACCESS TO BAFFLES AND MAKE ANY REPAIRS IMMEDIATELY.
3. REMOVE SEDIMENT DEPOSITS WHEN IT REACHES HALF FULL.
4. AVOID DAMAGING BAFFLES DURING CLEANOUT AND REPLACE IF DAMAGED.
5. REMOVE BAFFLES AND SEDIMENT DEPOSITS AFTER CONTRIBUTING DRAINAGE AREA HAS BEEN PERMANENTLY STABILIZED.

WAKE COUNTY NORTH CAROLINA

EFFECTIVE: 01/31/08

STANDARD BAFFLES DETAIL

05



GENERAL NOTES

1. CROWN DOWN RISER & BARREL SHALL BE 6" SCH. 40 PVC WITH CLEAN-OUT CAP AND 3/4" HOLES. SEE NOTE 1 FOR NUMBER AND SPACING OF HOLES.
2. SET TOP OF RISER AT ELEVATION THE WSE SHALL BE THE SHOWN SPECIFIC. 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 30 MIL. HEAVY DUTY SILVER TARPAULINS OR EQUIVALENT FOR U.V. RESISTANCE.

MAINTENANCE NOTES

1. INSPECT WEEKLY AND AFTER EVERY 1" OR GREATER RAINFALL.
2. REMOVE SEDIMENT AND PROPERLY DISPOSED OF WHEN BASIN IS HALF FULL.
3. GRAVEL FILTER AROUND RISER SHOULD BE REPLACED AS NEEDED TO ENSURE DEWATERING.
4. CHECK THE STRUCTURE FOR DAMAGE FROM EROSION OR PIPING.
5. ANY RIP RAP DISPLACED FROM DISSIPATER PAD MUST BE REPLACED IMMEDIATELY.

HOLE SPECS:

DEWATERING HOLES WILL BE INSTALLED IN SETS OF HORIZONTAL RINGS, THE FIRST SET OF HOLES WILL BE SET 6 INCHES FROM THE BOTTOM OF THE RISER. RINGS WILL CONTINUE UP THE RISER IN INTERVALS OF 3 INCHES. HOLES WILL BE 3/4 INCH IN DIAMETER AND WILL BE SPACED EQUALLY AROUND THE RISER. THE NUMBER OF HOLES PER RING WILL EQUAL TO THE DRAINAGE AREA.

EXAMPLE

A BASIN DRAINING 2.0 ACRES SHOULD HAVE 2 HOLES PER RING EVERY 3 INCHES ON THE RISER PIPE. (1ST RING (2 HOLES) WILL BE SET 6 INCHES FROM THE BOTTOM OF THE RISER.

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

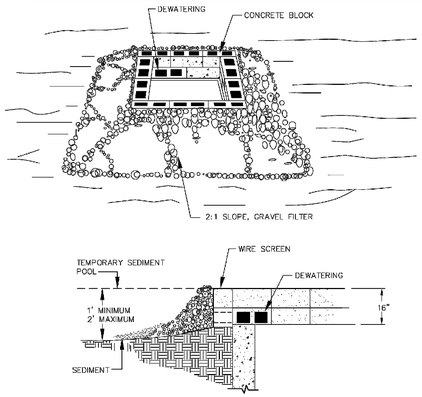
NOTE 1

WAKE COUNTY NORTH CAROLINA

EFFECTIVE: 01/31/08

STANDARD CUSTOM BASIN

06



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 NOTES:

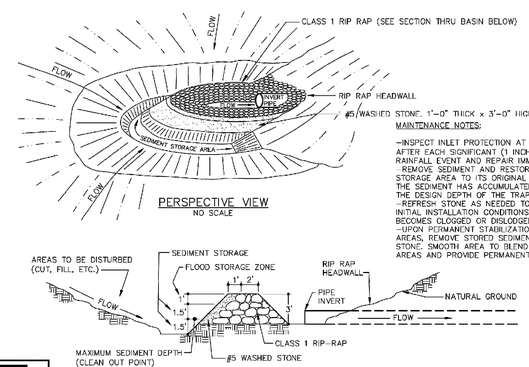
1. INSPECT INLET PROTECTION AND REMOVE SEDIMENT AFTER EACH 1" RAIN EVENT.
2. REMOVE SEDIMENT WHEN VOLUME OF THE BASIN IS REDUCED BY ONE-HALF.
3. GRAVEL SHOULD BE REPLACED AND REPAIRS MADE AS NEEDED.

WAKE COUNTY NORTH CAROLINA

EFFECTIVE: 01/31/08

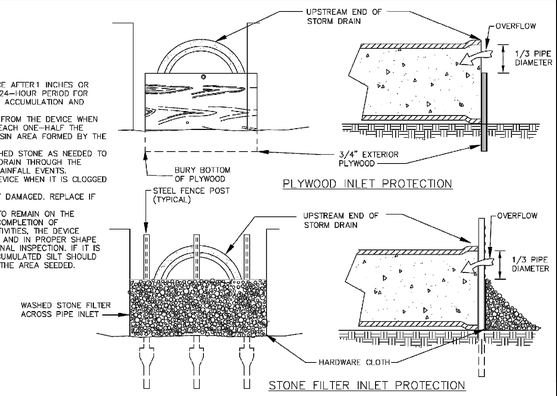
STANDARD BLOCK & GRAVEL DROP INLET PROTECTION

07



MAINTENANCE NOTES:

1. INSPECT THE DEVICE AFTER 1 INCHES OR GREATER, OVER A 24-HOUR PERIOD FOR DAMAGE, SEDIMENT ACCUMULATION AND PROPER FUNCTION.
2. REMOVE SEDIMENT FROM THE DEVICE WHEN ACCUMULATIONS REACH ONE-HALF THE HEIGHT OF THE BASIN AREA FORMED BY THE DEVICE.
3. REPLACE THE WASHED STONE AS NEEDED TO ALLOW WATER TO DRAIN THROUGH THE DEVICE BETWEEN RAINFALL EVENTS.
4. CLEAN OUT THE DEVICE WHEN IT IS CLOGGED WITH DEBRIS.
5. CHECK PLYWOOD IF DAMAGED. REPLACE IF NEEDED.
6. IF THE DEVICE IS TO REMAIN ON THE PROJECT AT THE COMPLETION OF CONSTRUCTION ACTIVITIES, THE DEVICE SHOULD BE CLEAN AND IN PROPER SHAPE AT THE TIME OF FINAL INSPECTION. IF IT IS REMOVED, ALL ACCUMULATED SILT SHOULD BE REMOVED AND THE AREA SEEDED.



WAKE COUNTY NORTH CAROLINA

EFFECTIVE: 01/31/08

STANDARD HORSESHOE INLET PROTECTION

08

WAKE COUNTY NORTH CAROLINA

EFFECTIVE: 01/31/08

STANDARD PIPE INLET PROTECTION (PLYWOOD & STONE)

09

AMERICAN Engineering
American Engineering Associates - Southeast, P.A.
4020 Westchase Boulevard, Suite 450
Raleigh, NC 27607
919-469-1101

NORTH CAROLINA ENGINEERING ASSOCIATES SOUTHEAST C-3881 CERTIFICATE OF AUTHORIZATION

Digitally signed by Jakob Klein
Date: 2025.05.01 08:53:04-04'00'

PRELIMINARY
NORTH CAROLINA PROFESSIONAL ENGINEER 045529 JAKOB P. KLEIN
DO NOT USE FOR CONSTRUCTION

FOR INFORMATION, ONLY

NO.	DATE	REVISION:
1	12/23/2024	CID SUBMITTAL #1

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KALAS FALLS
PHASE 5
CONSTRUCTION INFRASTRUCTURE DOCUMENTS
CID-25-01
TOWN OF ROLESVILLE, WAKE COUNTY, NC

JOB NUMBER:	R180115
CHECKED BY:	JK
DRAWN BY:	GE, RC
DATE:	05-01-2025

SHEET TITLE:

ESC DETAILS

SHEET NO.:

CE502

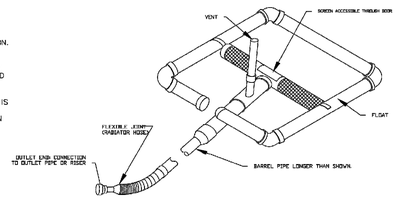
North Carolina 811 Call Before You Dig

*** 3 Days Before Digging ***
North Carolina 811
811 or 1-800-632-4949
Remote Ticket Entry
http://nc811.org/remoteticketentry.htm

L:\Jobs\1990Workkins projects\1111 phase 5 townhomes\CAD\Sheets\construction documents\CE500-509.dwg

2025-05-01

MAINTENANCE NOTES:
1. INSTALL A PAD FOR SKIMMER TO REST ON STONE OR WOOD PALLETS OR I=-BEAM SECTION.
2. INSTALL SKIMMER AND PAD AWAY FROM BAFFLES.
3. ATTACH ROPE TO SKIMMER FOR MAINTENANCE
4. INSPECT THE BASIN ON A REGULAR BASIS AND AFTER EVERY SIGNIFICANT RAINFALL EVENT (1 INCH OR GREATER).
5. CHECK THE SKIMMER TO MAKE SURE THAT IT IS NOT CLOGGED WITH SEDIMENT.
6. REMOVE SEDIMENT THAT MAY ACCUMULATE ON THE STONE PAD UNDERNEATH THE SKIMMER DEVICE.

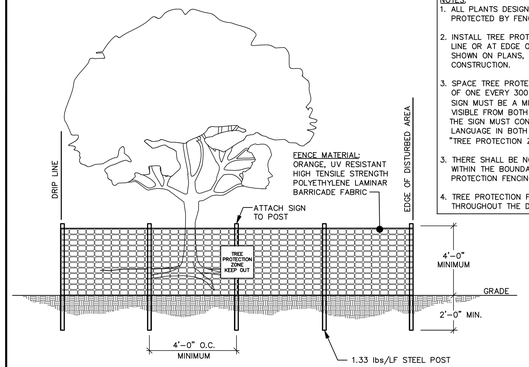


WAKE COUNTY NORTH CAROLINA

STANDARD SKIMMER DETAIL

01

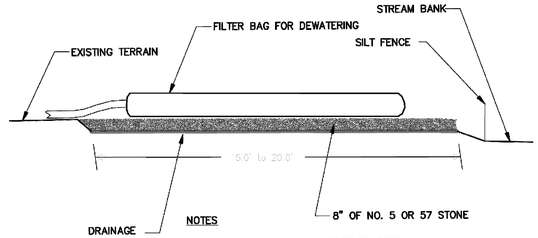
EFFECTIVE: 01/31/08



NOTES:
1. ALL PLANTS DESIGNATED TO BE SAVED SHALL BE PROTECTED BY FENCING, AS ILLUSTRATED.
2. INSTALL TREE PROTECTION FENCE AT TREE DRIP LINE OR AT EDGE OF DISTURBED AREA, AS SHOWN ON PLANS, PRIOR TO COMMENCEMENT OF CONSTRUCTION.
3. SPACE TREE PROTECTION ZONE SIGNS A MINIMUM OF ONE EVERY 300 FEET. THE SIZE OF EACH SIGN MUST BE A MINIMUM OF 2' x 2' AND BE VISIBLE FROM BOTH SIDES OF THE FENCE. THE SIGN MUST CONTAIN THE FOLLOWING LANGUAGE IN BOTH ENGLISH & SPANISH: "TREE PROTECTION ZONE, KEEP OUT".
3. THERE SHALL BE NO STORAGE OF MATERIAL WITHIN THE BOUNDARIES OF THE TREE PROTECTION FENCING.
4. TREE PROTECTION FENCING SHALL BE MAINTAINED THROUGHOUT THE DURATION OF THE PROJECT.

TREE PROTECTION FENCE

02



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

MAINTENANCE NOTES

1. REPLACE AND DISPOSE OF FILTER BAG(S) WHEN IT IS ⅔ FULL OF SEDIMENT OR WHEN IT IS IMPRCTICAL FOR BAG TO FILTER SEDIMENT.
2. PROVIDE A SUFFICEINT QUANTITY OF FILTER BAGS TO CONTAIN SILT FROM PUMPED EFFLUENT.

NOT TO SCALE

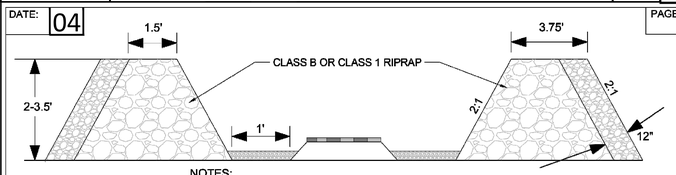
WAKE COUNTY NORTH CAROLINA

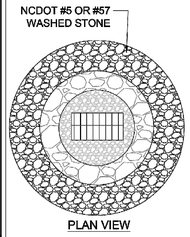
EFFECTIVE: 01/31/08

STANDARD FILTER BAG FOR DEWATERING ACTIVITIES

03

DATE: 04 PAGE:





PLAN VIEW

NOTES:
1. Clear the area of all debris that might hinder excavation and disposal of spoil.
2. Grade shallow depression uniformly towards the inlet with side slopes no greater than 2:1. Grade a 1-foot wide level area set 4 inches below the area adjacent to the inlet.
3. Install the Class B or Class 1 riprap in a circle around the inlet. The minimum crest width of the riprap should be 18 inches, with a minimum bottom width of 7.5 feet. The minimum height of the stone is 2 feet.
4. The outside face of the riprap is then lined with 12 inches of NC DOT #5 or #57 washed stone.

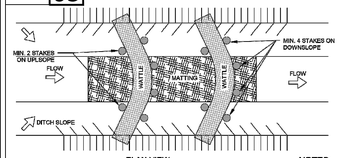
MAINTENANCE:
1. Inspect all measures at least weekly and after each rainfall of 1.0 inch or greater; make any repairs immediately.
2. Remove sediment form the sediment pool area when the volume is decreased by half. Stabilize excavated material appropriately.
3. Do not damage or undercut the structure during sediment removal. Remove debris and replace stone as needed. If inlet is covered with wire mesh, clean wire mesh free of debris.

DEQ

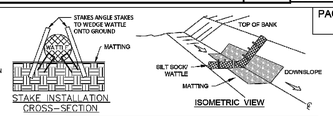
ROCK DOUGHNUT INLET PROTECTION

Effective Date: 9/1/2023 In accordance with the 2013 Design Manual Updates

DATE: 05 PAGE:



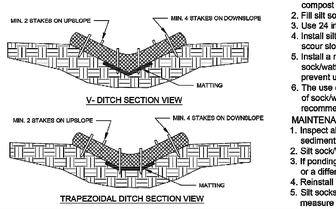
PLAN VIEW



Spacing Between Socks / Wattles (Feet)		
Channel Slope (%)	8-Inch Diameter Sock	12-Inch Diameter Sock
1	67	100
2	33	66
3	22	33
4	17	25
5	13	20

NOTES:
1. Other materials providing equivalent protection against erosive velocities may be substituted for compost use in silt socks or wattles.
2. Fill silt sock/wattle netting uniformly to the desired length such that logs do not deform.
3. Use 24 inch long wooden stakes with a 2 inch x 2 inch nominal cross section.
4. Install silt sock/wattle(s) to a height on slope so flow will not wash around silt sock/wattle and scour slopes, or as directed.
5. Install a minimum of two up-slope stakes and four down-slope stakes at an angle to wedge silt sock/wattle to ground at bottom ditch. Use staples to secure silt sock/wattle to the ground to prevent undermining.
6. The use of flocculants such as Polyacrylamide (PAM) is recommended. Apply flocculants on top of sock/wattle and to matting on either side of sock/wattle according to manufacturer recommended rates. Reapply after each 1.0 inch rainfall.

MAINTENANCE:
1. Inspect all measures weekly and after each rainfall of 1.0 inch or greater. Remove accumulated sediment and any debris.
2. Silt sock/Wattle(s) must be replaced if clogged or torn.
3. If ponding becomes excessive, the silt sock/wattle may need to be replaced with a larger diameter or a different measure.
4. Reinstall if damaged or dislodged.
5. Silt socks/Wattles shall be inspected until land disturbance is compete and the area above the measure is permanently stabilized.

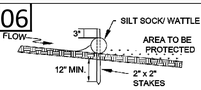


DEQ

SILT SOCK / WATTLE FOR CHECK DAM

Effective Date: 9/1/2023 In accordance with the 2013 Design Manual Updates

DATE: 06 PAGE:



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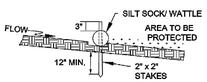

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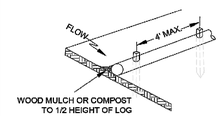
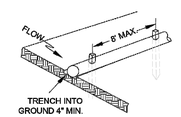


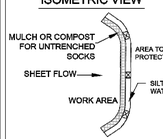
UNTRENCHED INSTALLATION



ENTRENCHED INSTALLATION*

"THIS APPLICATION MAY NOT BE USED WITH COMPOST SOCKS SMALLER THAN 12".

ISOMETRIC VIEW



COMPOST SOCK INITIAL FLOW RATES					
Compost Sock Design Diameter	8 Inch (200 mm)	12 Inch (300 mm)	18 Inch (450 mm)	24 Inch (600 mm)	32 Inch (750 mm)
Maximum Slope Length (<2%)	600 Feet (183 m)	750 Feet (229 m)	1,000 Feet (305 m)	1,300 Feet (396 m)	1,650 Feet (500 m)
Hydraulic Flow Through Rate	7.5 gpm/ft (94 l/min)	11.3 gpm/ft (141 l/min)	15.0 gpm/ft (188 l/min)	22.5 gpm/ft (281 l/min)	30.0 gpm/ft (374 l/min)

NOTE:
1. Other materials providing equivalent protection against erosive velocities may be substituted for compost use in silt socks or wattles.
2. Fill silt sock/wattle netting uniformly to the desired length such that logs do not deform.
3. Silt sock/Wattle(s) should be installed parallel to and a minimum of 10 feet beyond the toe of a graded slope. Silt Sock/Wattle(s) located below flat areas should be located at the edge of the land disturbance. The ends of the silt sock/wattle(s) should be turned slightly upslope to prevent runoff from going around the end of the silt sock/wattle(s).
4. Oak or other durable hardwood stakes with a 2 inch x 2 inch cross section should be driven vertically plumb, through the center of the silt sock/wattle. Stakes should be placed at a maximum interval of 4 feet or a maximum interval of 8 feet if the silt sock/wattle is placed in a 4 inch trench.
5. In the event staking is not possible (ie. when socks/wattles are used on pavement) heavy concrete blocks shall be used behind the silt sock/wattle to hold it in place during runoff events.

MAINTENANCE:
1. Inspect all measures at least weekly and after each rainfall of 1.0 inch or greater.
2. Remove accumulated sediment and any debris as needed to allow for adequate flow.
3. Silt sock/Wattle must be replaced if clogged or torn.
4. If ponding becomes excessive, the silt sock/wattle may need to be replaced with a larger diameter or a different measure.
5. Reinstall if damaged or dislodged.
6. Silt socks/wattles shall be inspected until land disturbance is compete and the area above the measure has been permanently stabilized.

DEQ

SILT SOCK / WATTLE FOR PERIMETER AND INLET PROTECTION

Effective Date: 9/1/2023 In accordance with the 2013 Design Manual Updates

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

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

SECTION E: GROUND STABILIZATION

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

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

GROUND STABILIZATION SPECIFICATION

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

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

POLYACRYLAMIDES (PAMS) AND FLOCCULANTS

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

EQUIPMENT AND VEHICLE MAINTENANCE

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

LITTER, BUILDING MATERIAL AND LAND CLEARING WASTE

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

PAINT AND OTHER LIQUID WASTE

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

PORTABLE TOILETS

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

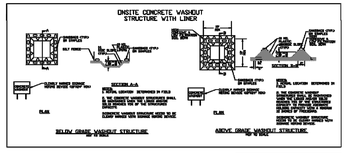
EARTHEN STOCKPILE MANAGEMENT

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

NORTH CAROLINA *Environmental Quality*

NCG01 GROUND STABILIZATION AND MATERIALS HANDLING

EFFECTIVE: 04/01/19



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 hardened 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.

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 precipitation is available, record the cumulative rain measurement for those un-attended days (use 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 (when 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, 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.

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 1Bh (c) above	• ***Within 24 hours,*** an oral or electronic notification. The notification shall include information about the date, time, nature, volume and location of the spill or release.
(c) Anticipated bypasses [40 CFR 122.41(m)(3)]	• ***A report at least ten days before the date of the bypass, if possible.*** The report shall include an evaluation of the anticipated quality and effect of the bypass.
(d) Unanticipated bypasses [40 CFR 122.41(m)(3)]	• ***Within 24 hours,*** an oral or electronic notification. • ***Within 7 calendar days,*** a report that includes an evaluation of the quality and effect of the bypass.
(e) Noncompliance with the conditions of this permit that may endanger health or the environment[40 CFR 122.41(l)(7)]	• ***Within 24 hours,*** an oral or electronic notification. • ***Within 7 calendar days,*** a report that contains a description of the noncompliance, and its causes; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time noncompliance is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6). • Division staff may waive the requirement for a written report on a case-by-case basis.

NORTH CAROLINA *Environmental Quality*

NCG01 SELF-INSPECTION, RECORDKEEPING AND REPORTING

EFFECTIVE: 04/01/19

AMERICAN Engineering
American Engineering Associates - Southeast, P.A.
4020 Westchase Boulevard, Suite 450
Raleigh, NC 27607
919-469-1101

NORTH CAROLINA ENGINEERING ASSOCIATES SOUTHEAST C-3881 CERTIFICATE OF AUTHORIZATION

Digitally signed by Jakob Klein
Date: 2025.05.01 08:31:04-04'00'

PRELIMINARY
NORTH CAROLINA PROFESSIONAL ENGINEER 56528 JAKOB P. KLEIN
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1	12/23/2024	CID SUBMITTAL #1

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KALAS FALLS
PHASE 5
CONSTRUCTION INFRASTRUCTURE DOCUMENTS
CID-25-01
TOWN OF ROLESVILLE, WAKE COUNTY, NC

JOB NUMBER: R180115
CHECKED BY: JK
DRAWN BY: GE, RC
DATE: 05-01-2025

SHEET TITLE:

ESC DETAILS

SHEET NO.:

CE503

North Carolina 811

*** 3 Days Before Digging ***
North Carolina 811
811 or 1-800-632-4949
Remote Ticket Entry
http://nc811.org/remoteticketentry.htm

J:\Jobs\R000\roadsign property\!!!! phase 5 townhomes\CAD\Sheets\construction documents\CE503.503.dwg

2025-05-01

Figure 1. Minimum Anchor Pattern

Maximum Design Conditions			Anchor Pattern
Shear Stress	Velocity	Wave Heigth	
<= 6 lbs/ft2	<= 14 ft/s	6 in.	F
> 6-8 lbs/ft2	> 14-18 ft/s	12 in.	G
> 8 lbs/ft2	> 18 ft/s	18 in.	H

Figure 2. Minimum Anchor Type

Soil Type	Anchor Type
Clay-Clay Loam	10 in Wire Staple
Silt Loam - Loam	10 in Wire Staple
Sandy Loam	12 in Wire Staple
Sand / Muck <= 6 in	12in Rebar Staple
Sand / Muck 6-12 in	18 in Rebar Staple
Sand / Muck 12-18 in	24 in Earth Anchor + 12 in Rebar Staple
Sand / Muck > 18 in	36 in Earth Anchor + 18 in Rebar Staple

Figure 3. Anchor Patterns for use with Wire/Rebar Staples

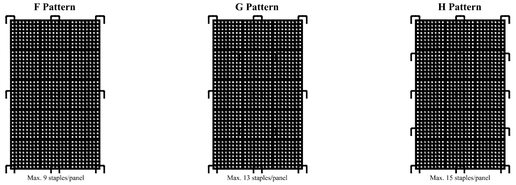
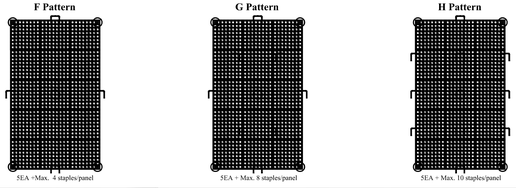


Figure 4. Anchor Patterns for use with Combination of Earth Anchors and Staples



NORTH AMERICAN GREEN
5401 St. Wendel - Cynthiana Rd. PH: 800-772-2040
Poseyville, IN 47633 www.nagreen.com

Disclaimer:
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Drawn on: 5-4-17

ShoreMax™

ANCHORING GUIDE

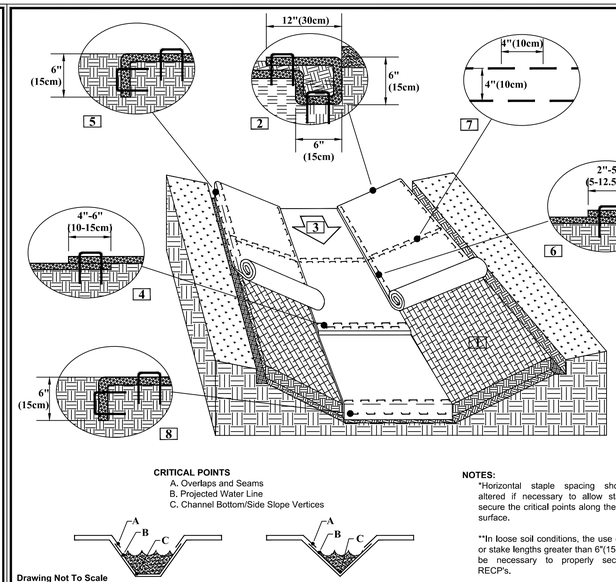
1. When installing ShoreMax mat, the anchor pattern (figure 3 or 4) should be selected based on the expected maximum design conditions (shear stress, velocity, or wave impact) (figure 1).
2. Anchor selection should be based on the soil type and pull-out strength required (figure 2). In soft, highly erodible soils percussion earth anchors may be necessary. Earth anchors can be installed in conjunction with rebar staples (figure 4).
3. When using percussion earth anchors, position anchors in each corner and the center of the panel. Place staples in the appropriate pattern through remainder of mat. Staples can be shared between two adjacent panels.

***Note:**
Number of staples used per panel can be reduced by 30-40% when sharing staples between panels.

⊓ - Wire/Rebar Staple

⊕ - Percussion Earth Anchor

Drawing Not To Scale



Drawing Not To Scale

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"(15cm) may be necessary to properly secure the RECP's.

CHANNEL INSTALLATION DETAIL

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"(15cm) deep X 6"(15cm) wide trench with approximately 12"(30cm) 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"(30cm) 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"(30cm) 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"(30cm) apart in a 6"(15cm) deep X 6"(15cm) wide trench. Backfill and compact the trench after stapling.
6. Adjacent RECPs must be overlapped approximately 2"-5" (5-12.5cm) (Depending on RECPs type) and stapled.
7. In high flow channel applications a staple check slot is recommended at 30 to 40 foot (9 -12m) intervals. Use a double row of staples staggered 4"(10cm) apart and 4"(10cm) 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" (30cm) apart in a 6"(15cm) deep X 6"(15cm) wide trench. Backfill and compact the trench after stapling.

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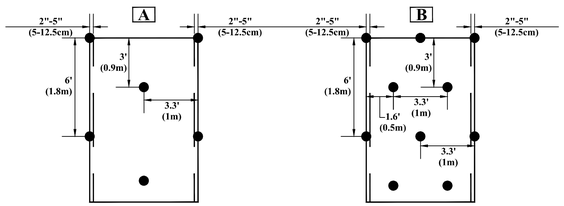

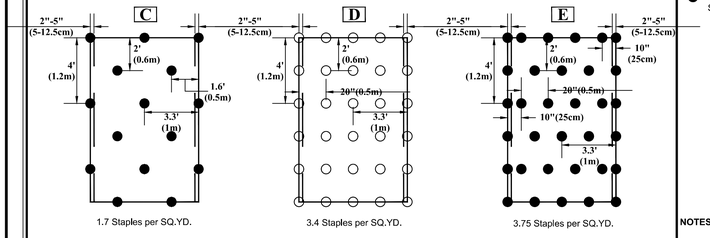

STAPLE PATTERN GUIDE

- 4:1 Slopes (A)
- 3:1 Slopes (B)
- 2:1 Slopes (C)
- 1:1 & Steeper Slopes (D)
- Medium/High Flow Channel (D)
- High Flow Channel And Shoreline (E)

NOTES:

* Use ECMDS® for more accurate staple pattern selection.

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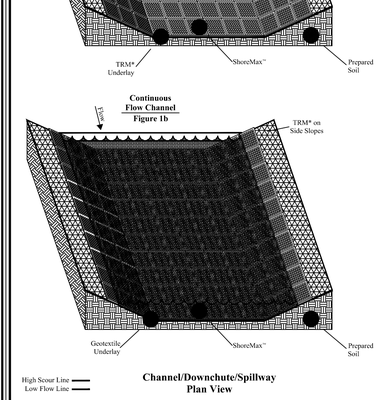

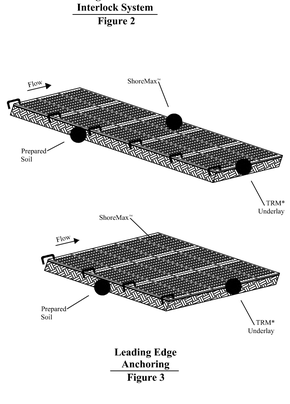

Drawing Not To Scale

ShoreMax™

STEEP CHANNEL/ CHUTE/SPILLWAY DETAIL

* ShoreMax mats can be installed over a variety of underlayments including: sod, turf reinforcement mats (TRMs), geotextiles, and in some cases erosion control blankets (ECBs).

1. Prepare soil before installing erosion control products, including any necessary application of lime, fertilizer, and seed (when installing TRM or ECB underlayment).
2. Install turf reinforcement mat (TRM) over prepared soils according to manufacturer's recommendations.
3. Place ShoreMax mat in the bottom of the channel over the installed TRM (figure 1). The ShoreMax mat should be installed up to the appropriate elevation on the side slope as determined by the engineer. When using multiple panels, connect the panels using the Integrated Panel Interlock System (figure 2). ShoreMax mat can be laid in either direction.
4. For channels carrying continuous water flows, an appropriate geotextile should be placed under the ShoreMax mat for submerged applications (figure 1b).
5. Place staples/anchors in the appropriate pattern. Perimeter staples can be shared between two adjacent panels. In soft or highly erodible soils, percussion earth anchors may be required. View ShoreMax Anchoring Guide, for additional details.
6. At beginning of channel and areas where significant concentrated flows are directed onto the ShoreMax mat, place 1 staple/pin per linear foot along the leading edge of the ShoreMax system, resulting in 1 staple/pin on each corner and gridline (figure 3).

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AMERICAN Engineering
American Engineering Associates - Southeast, P.A.
4020 Westchase Boulevard, Suite 450
Raleigh, NC 27607
919-469-1101

NORTH CAROLINA ENGINEERING CERTIFICATE OF AUTHORIZATION
AMERICAN ENGINEERING ASSOCIATES SOUTHEAST
C-3881

Digitally signed by Jakob Klein
Date: 2025.05.01 08:04:04'00'

PRELIMINARY
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NORTH CAROLINA REGISTERED PROFESSIONAL ENGINEER
65328
JAKOB P. KLEIN

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CID-25-01
TOWN OF ROLESVILLE, WAKE COUNTY, NC

JOB NUMBER:	R180115
CHECKED BY:	JK
DRAWN BY:	GE, RC
DATE:	05-01-2025

SHEET TITLE:

ESC DETAILS

SHEET NO.:

CE504

North Carolina 811
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North Carolina 811
811 or 1-800-632-4949
Remote Ticket Entry
http://nc811.org/remoteticketentry.htm

Public
Sewer Collection / Extension System

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

City of Raleigh
Public Utilities Department Permit # S-5618

Public
Water Distribution / Extension System

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

City of Raleigh
Public Utilities Department Permit # W-4214

SITE LEGEND	
	100 YR FLOODLINE
	PROPERTY BOUNDARY/PHASE LINE
	2' BUILDING RESTRICTION LINE
	50' NEUSE RIVER BUFFER
000	PROPOSED SURFACE WATER LEVEL
	RIGHT-OF-WAY
LOD	LIMITS OF DISTURBANCE
	LOT LINE
	WETLANDS
	AMENITY AREA
	CONCRETE
	10' CURB TRANSITION

PHASE 3
PHASE 5
PHASE 2
3A
(FULLY PERMITTED)
GRAYMONT OAKS DR (50' ROW)
ANNIE H. MOODY
ZONING: R-30
D.B. 3750, PG. 587
B.M. 1986, PG. 862
PIN NO. 1767.01-06-9438
MITCHELL MILL ROAD INVESTORS LLC
ZONING: R&PUD CZ
D.B. 017691, PG. 01868
PIN NO. 1767.01-75-3368
GRAYMONT OAKS DR
27' B-B (50' ROW)
ARMFIELD CREEK PLACE
27' B-B (50' ROW)
AREA A
AREA B
AREA A
AREA C
THE DAM REHABILITATION, AN INDEPENDENT PROJECT, IS IN PROGRESS HAVING APPROVED PERMIT UPDATED THROUGH WAKE COUNTY BY WITHERS RAVENEL.
GRAYMONT OAKS DR.
27' B-B (50' ROW)
PHASE 2
PHASE 5
BERNARD B. BAILEY
ZONING: R-30
D.B. 10888, PG. 2739
LOT 5
B.M. 1984, PG. 114
PIN NO. 1767.01-15-3885
BERNARD B. BAILEY
ZONING: R-30
D.B. 3365, PG. 171
B.M. 1984, PG. 114
PIN NO. 1767.01-15-8769
SUE SCARBORO PARKER & BESTY SCARBORO
GARDNER ZONING: R-30
D.B. 3599, PG. 618
LOT 4

GRAPHIC SCALE
60 0 30 60 120
(IN FEET)
1 inch = 60 ft.

AMERICAN Engineering
American Engineering Associates - Southeast, P.A.
4020 Westchase Boulevard. Suite 450
Raleigh, NC 27607
919-469-1101

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL
56528
JAKOB P. KLEIN

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GRADING & DRAINAGE OVERALL

SHEET NO.:
CG100

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