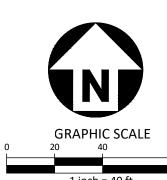


<b>→</b>	FIRE HYDRANT ASSEMBLY	>	SEWER FLOW DIRECTION ARROW
~	FIRE DEPARTMENT CONNECTION (FDC)	$\sim$	LINE BREAK SYMBOL
H	WATER VALVE		WATERLINE
lackbox	VALVE IN MANHOLE		WATER SERVICE LINE
	METER & VAULT		UTILITY SLEEVE
N	BACKFLOW PREVENTER		SANITARY SEWER
<b>→</b>	REDUCER		SEWER SERVICE LINE
ш	PLUG	_ FM FM	SEWER FORCE MAIN
<b>→</b>	BLOW-OFF ASSEMBLY	— G— G— G—	GAS LINE
	SANITARY SEWER MANHOLE	OUOU	OVERHEAD UTILITY
•	SEWER CLEAN-OUT	——— UE——— UE———	UNDERGROUND ELECTRIC
• •	GREASE TRAP	—T—T—T—	TELEPHONE
			EASEMENT LINE



SEE SHEET CO.00 FOR ALL PROJECT, SITE, GRADING, STORM DRAINAGE AND UTILITY NOTES

ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CURRENT TOWN OF CHAPEL HILL AND NCDOT ENGINEERING DESIGN AND CONSTRUCTION STANDARDS

PRELIMINARY DRAWING - NOT RELEASED FOR CONSTRUCTION



The John R. McAdams Company, Inc. 2905 Meridian Parkway Durham, NC 27713

fax 919. 361. 2269 license number: C-0293, C-187

phone 919. 361. 5000

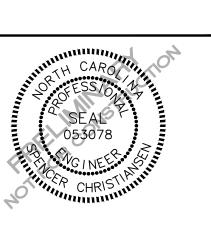
www.mcadamsco.com

# CLIENT

NORTHWOOD RAVIN 3015 CARRINGTON MILL BLVD, STE 460 MORRISVILLE, NORTH CAROLINA 27560 Adam Golden PHONE: 919. 354. 3680







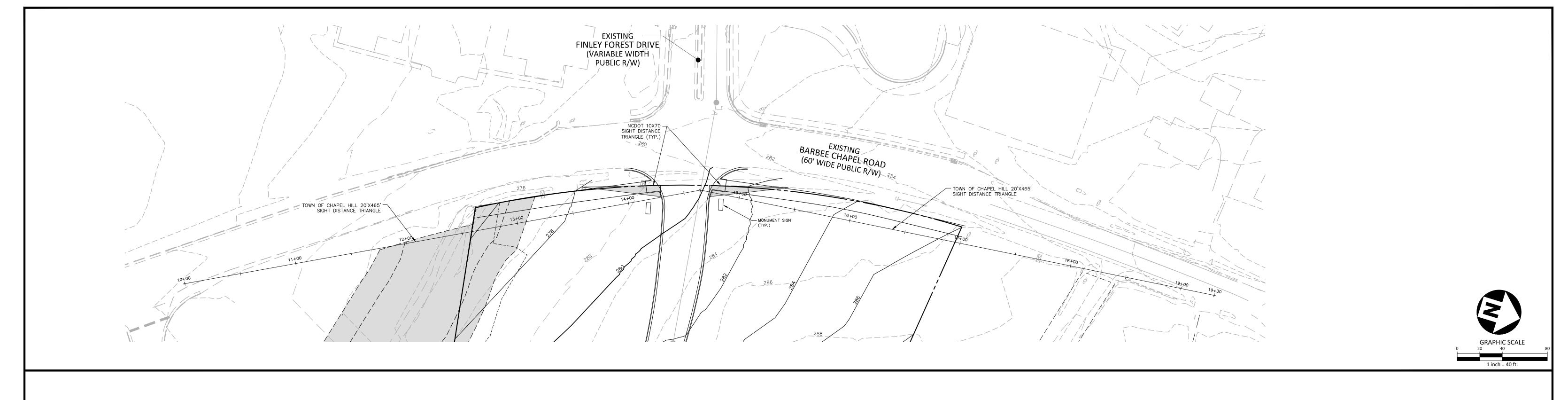
# **REVISIONS**

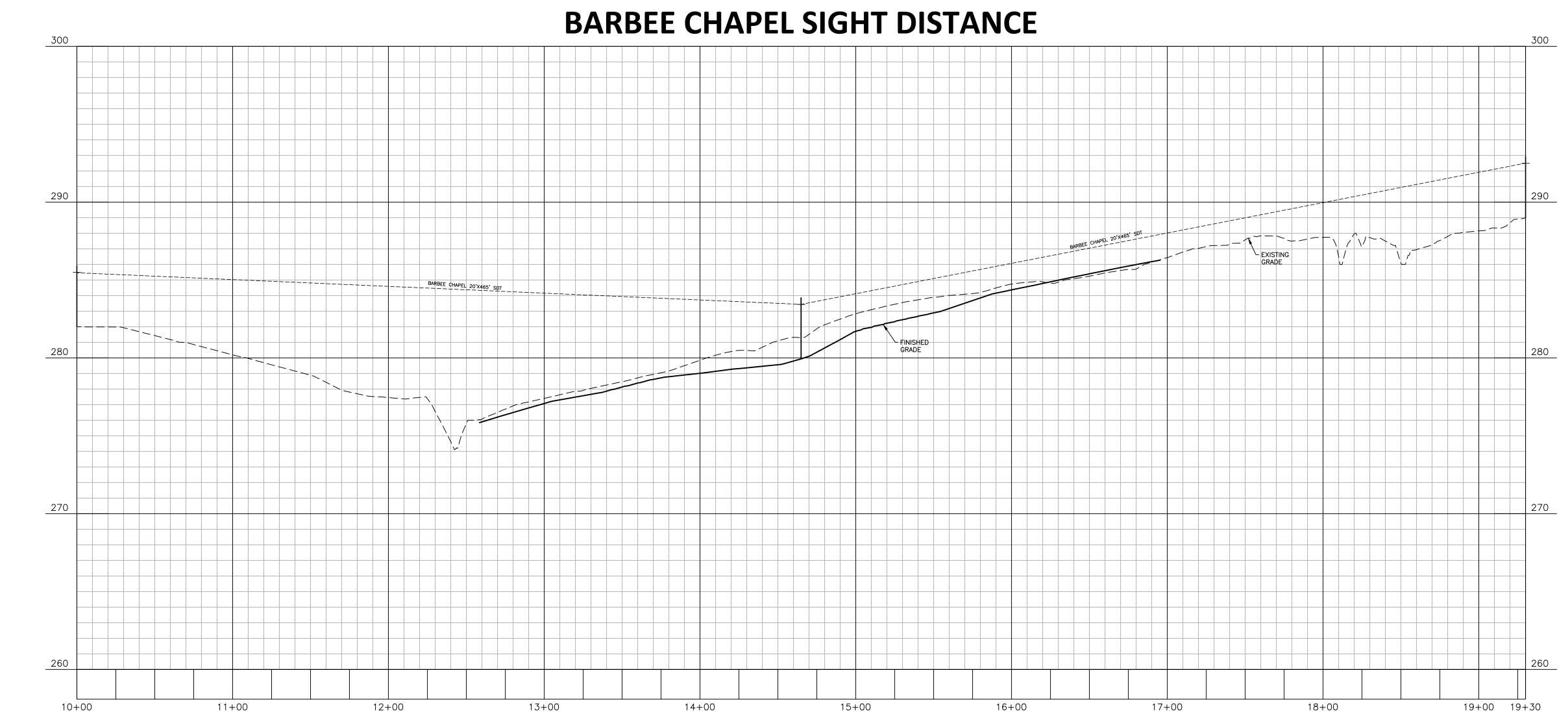
NO. DATE 1 06. 07. 2023 REVISED PER 1ST CZP COMMENTS

# PLAN INFORMATION

PROJECT NO. RAV-21002 RAV21002-U1 FILENAME CHECKED BY SJC DRAWN BY WHM/LJL SCALE 1" = 40' DATE 03. 23. 2023 SHEET

**UTILITY PLAN** 





MCADAMS

The John R. McAdams Company, Inc. 621 Hillsborough Street Suite 500 Raleigh, NC 27603 phone 919. 361. 5000

fax 919. 361. 2269

license number: C-0293, C-187

www.mcadamsco.com

**CLIENT** NORTHWOOD RAVIN 3015 CARRINGTON MILL BLVD, STE 460 MORRISVILLE, NORTH CAROLINA 27560 Adam Golden PHONE: 919. 354. 3680

**REVISIONS** 

1 06. 07. 2023 REVISED PER 1ST CZP COMMENTS



HILLMONT **CONDITIONAL ZONING PERMIT** STANCELL DRIVE

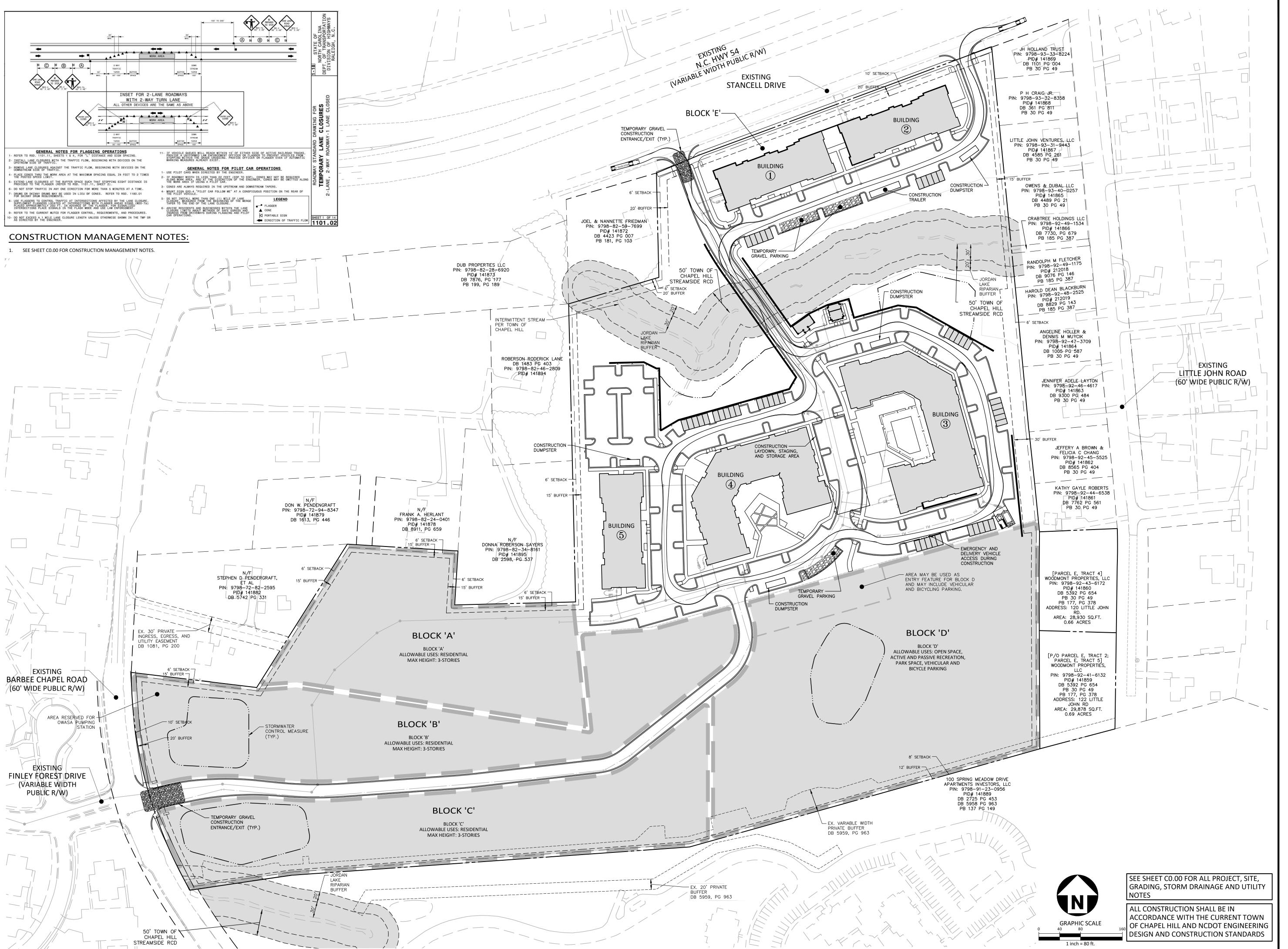
CHAPEL HILL, NORTH CAROLINA 27517

PLAN INFORMATION PROJECT NO. RAV-21002 RAV21002-P1 FILENAME CHECKED BY DRAWN BY SCALE 1" = 40'/1" = 4' DATE 03. 23. 2023

**PLAN AND PROFILE** 

- BARBEE CHAPEL SIGHT DISTANCE

PRELIMINARY DRAWING - NOT RELEASED FOR CONSTRUCTION





# McAdam

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phone 919. 361. 5000 fax 919. 361. 2269 license number: C-0293, C-187

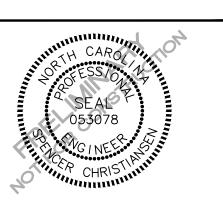
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# CLIENT

NORTHWOOD RAVIN 3015 CARRINGTON MILL BLVD, STE 460 MORRISVILLE, NORTH CAROLINA 27560 Adam Golden



# HILLIWION I IONAL ZONING PERMI STANCELL DRIVE L HILL, NORTH CAROLINA 27517



# REVISIONS

NO. DATE
1 06. 07. 2023 REVISED PER 1ST CZP COMMENTS
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# PLAN INFORMATION

PROJECT NO. RAV-21002

FILENAME RAV21002-CM1

CHECKED BY SJC

DRAWN BY LJL

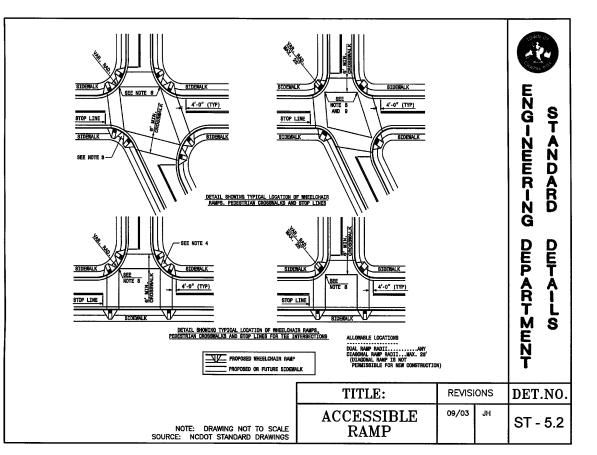
SCALE 1" = 80'

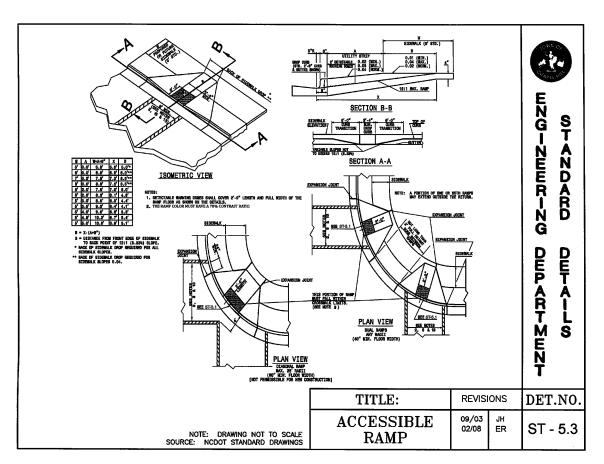
DATE 03. 23. 2023

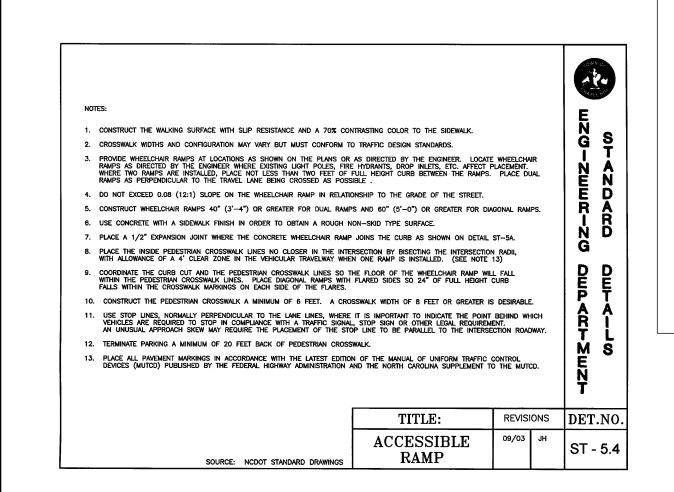
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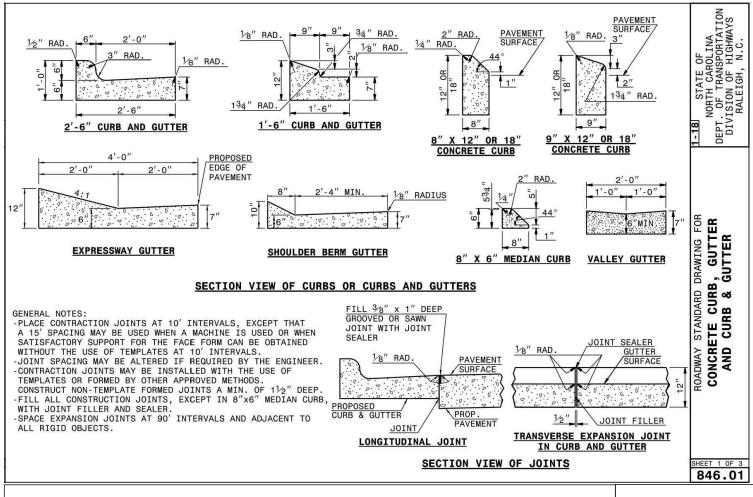
CONSTRUCTION MANAGEMENT PLAN

PRELIMINARY DRAWING - NOT RELEASED FOR CONSTRUCTION









NOTES:

1. TRANSITIONS NOT TO BE LOCATED IN A CURB RADIUS.

JOINTS IF MADE WITH SEPARATE POURS.

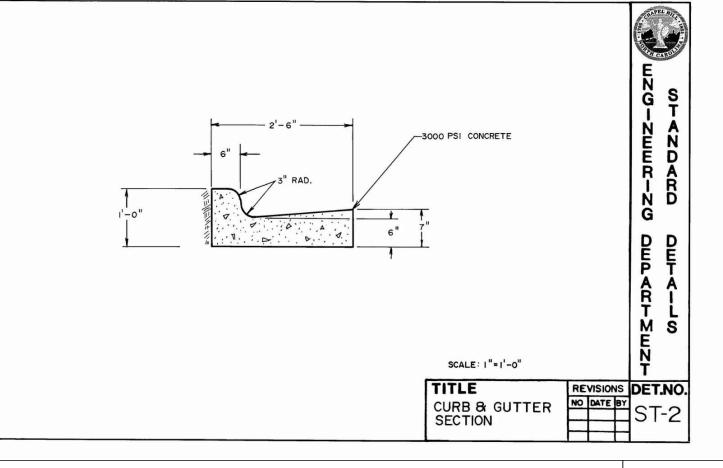
SITE REQUIREMENTS.

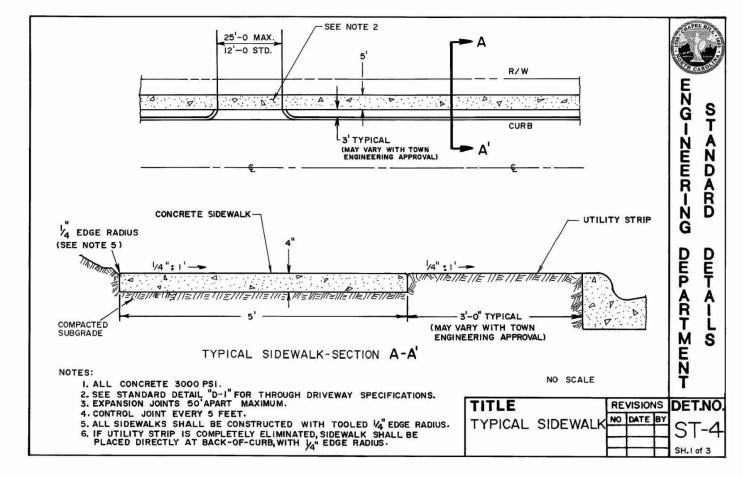
2. SEE TYPICAL CURB DETAILS FOR SPECIFIC DIMENSIONS AND INFORMATION.

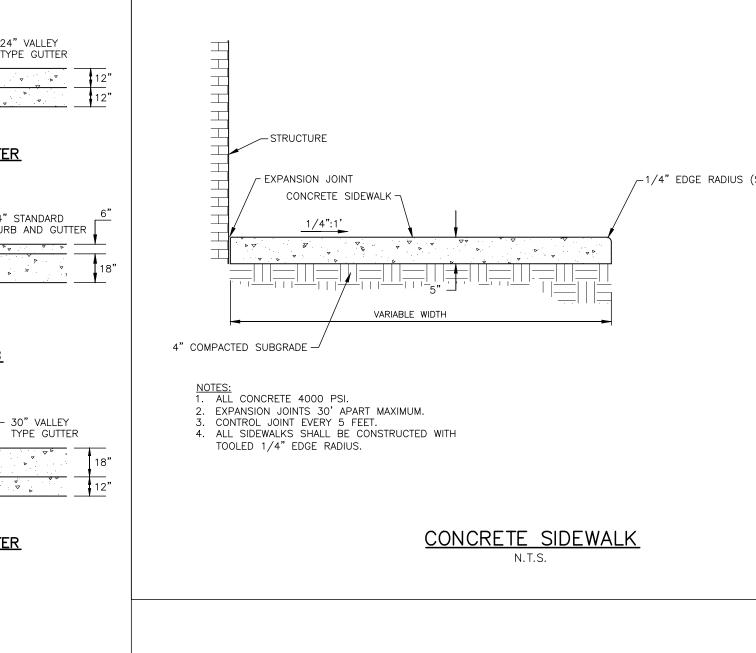
3. DUMMY JOINTS SHALL BE USED AT TRANSITION POINTS OR EXPANSION

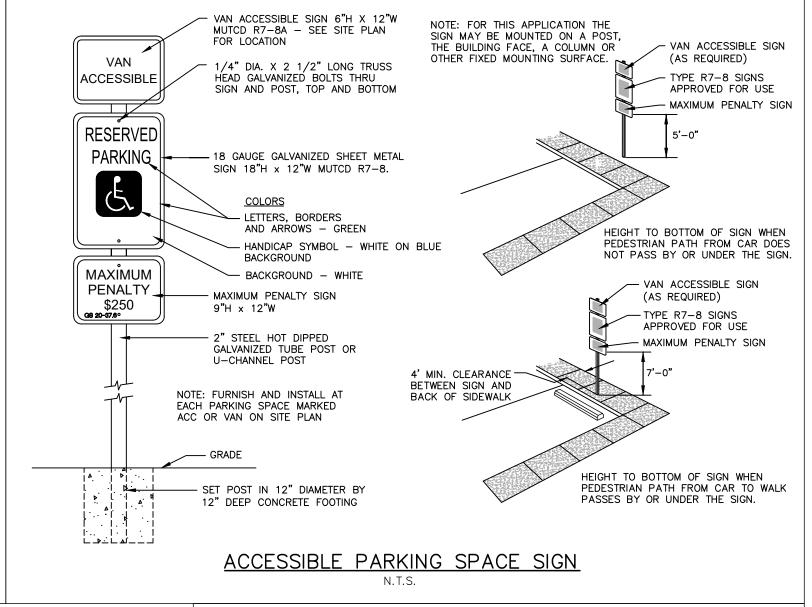
4. ROLL CURB MAY BE SUBSTITUTED FOR VALLEY TYPE GUTTER, BASED ON

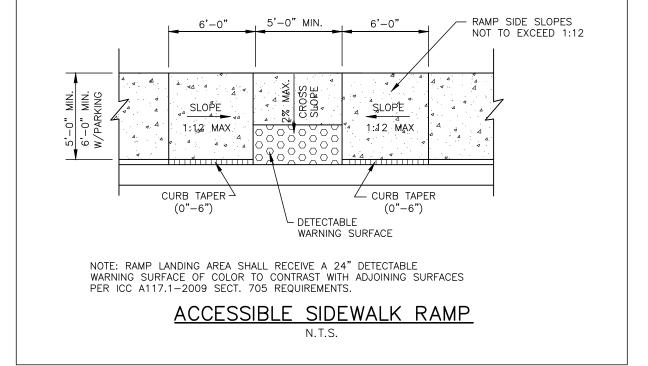
**CURB TRANSITION DETAILS** 













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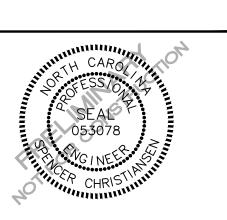
**CLIENT** 

NORTHWOOD RAVIN 3015 CARRINGTON MILL BLVD, STE 460 MORRISVILLE, NORTH CAROLINA 27560 Adam Golden

PHONE: 919. 354. 3680



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# **REVISIONS**

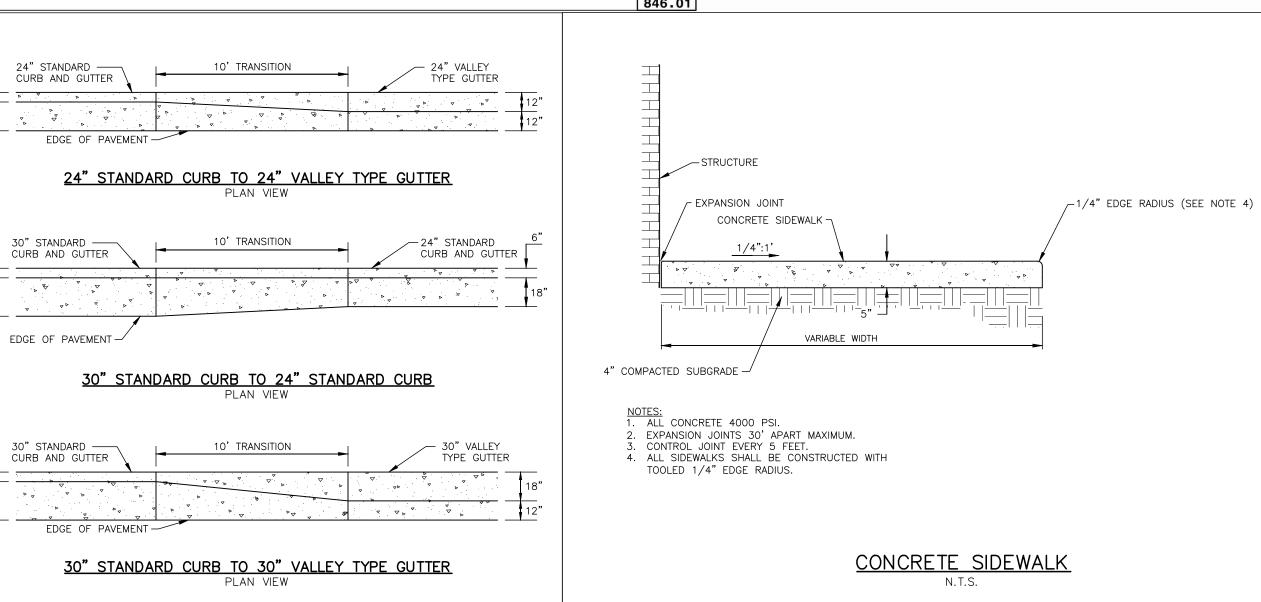
NO. DATE 1 06. 07. 2023 REVISED PER 1ST CZP COMMENTS

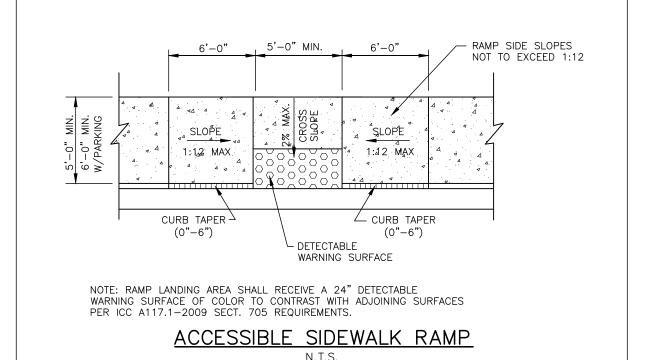
# PLAN INFORMATION

PROJECT NO. RAV-21002 FILENAME RAV21002-D1 CHECKED BY DRAWN BY SCALE NTS DATE 03. 23. 2023

SHEET

SITE DETAILS





# STORMWATER CONTROL MEASURE 'A' CONSTRUCTION SPECIFICATIONS

# **GENERAL NOTES**

- PRIOR TO CONSTRUCTION, ANY DISCREPANCIES IN THE PLANS AND NOTES SHALL BE BROUGHT TO THE ENGINEER'S ATTENTION.
- PRIOR TO ANY CONSTRUCTION OR PLACEMENT OF ANY BACKFILL, THE ONSITE GEOTECHNICAL ENGINEER SHALL INSPECT THE EXCAVATION AREA FOR THE UNDERGROUND SCM WITHIN THIS AREA TO ASSESS WHETHER SUITABLE SOILS EXIST AT THE SUBGRADE LEVEL. IF THE CONTRACTOR CONSTRUCTS AND COVERS UP THE UNDERGROUND SCM PRIOR TO INSPECTION, THEN THIS AREA SHALL BE UNCOVERED AND TESTED (TO THE ENGINEER'S AND OWNER'S APPROVAL) AT THE CONTRACTOR'S EXPENSE.
- THE FACILITY SHALL NOT BE USED AS A TEMPORARY EROSION CONTROL DEVICE (I.E. SEDIMENT TRAP OR SEDIMENT BASIN) DURING CONSTRUCTION.
- PRIOR TO PLACING STORMFILTER CARTRIDGES WITHIN THE UNDERGROUND SYSTEM, THE CONTRACTOR SHALL REQUEST AN ONSITE MEETING WITH THE DESIGN ENGINEER AND THE EROSION CONTROL INSPECTOR TO ENSURE THE UPSTREAM DRAINAGE AREA IS COMPLETELY STABILIZED (I.E. GOOD VEGETATIVE COVER). IF THE CONTRACTOR DECIDES TO PLACE THE STORMFILTER CARTRIDGES PRIOR TO APPROVAL FROM THE DESIGN ENGINEER AND THE EROSION CONTROL INSPECTOR, THEN THE CONTRACTOR SHALL EXCAVATE/REPLACE, AS NECESSARY, THE COMPONENTS NEEDED FOR THE SYSTEM TO FUNCTION PROPERLY AT HIS / HER EXPENSE SHOULD THE STORMFILTER CARTRIDGES NOT FUNCTION PROPERLY (I.E. WILL NOT DRAIN DUE TO SEDIMENT DEPOSITION) DUE TO AN UNSTABILIZED UPSTREAM DRAINAGE AREA.
- ONCE CONSTRUCTED, THE STORMFILTER CARTRIDGES SHALL NOT RECEIVE STORMWATER RUNOFF UNTIL THE ENTIRE CONTRIBUTING DRAINAGE AREA TO THE UNDERGROUND SYSTEM HAS BEEN COMPLETELY STABILIZED AND SITE CONSTRUCTION IS COMPLETE.
- ALL COMPONENTS OF THE UNDERGROUND SCM SYSTEM (STORMFILTER MANHOLE, CONCRETE VAULT, JOINT / RISER CONNECTIONS, ENDCAPS, ACCESS MANHOLES, ETC.) SHALL BE DESIGNED BY OTHERS. ANY VARIATIONS OR CHANGES MADE FROM THESE SPECIFICATIONS AND DRAWINGS DURING THE ORDERING AND/ OR INSTALLATION OF ALL COMPONENTS MUST BE APPROVED BY THE DESIGN ENGINEER. THE STRUCTURAL DESIGN OF THE UNDERGROUND SCM, ALONG WITH ITS ASSUMPTIONS, IS ALSO BY OTHERS. THE JOHN R. McADAMS COMPANY, INC. AND ITS EMPLOYEES ASSUME NO LIABILITY WITH RESPECT TO ANY ASPECT OF THE STRUCTURAL DESIGN FOR THE UNDERGROUND SCM SYSTEM.
- ALL PIPE / RISER CONNECTIONS AND JOINTS ASSOCIATED WITH THE UNDERGROUND SCM SYSTEM SHALL BE WATER TIGHT. THE MECHANISM FOR ACHIEVING THIS SHALL BE SUBMITTED TO THE DESIGN ENGINEER FOR REVIEW.
- THE CONTRACTOR SHALL FURNISH, INSTALL, OPERATE, AND MAINTAIN ANY PUMPING EQUIPMENT, ETC. NEEDED FOR REMOVAL OF WATER FROM VARIOUS PARTS OF THE UNDERGROUND SCM SYSTEM SITE. IT IS ANTICIPATED THAT PUMPING WILL BE NECESSARY IN THE EXCAVATION AREAS. DURING PLACEMENT OF FILL WITHIN THIS AREA (OR OTHER AREAS AS NECESSARY). THE CONTRACTOR SHALL KEEP THE WATER LEVEL BELOW THE BOTTOM OF THE EXCAVATION, THE MANNER IN WHICH THE WATER IS REMOVED SHALL BE SUCH THAT THE EXCAVATION BOTTOM AND SIDE SLOPES
- IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ADHERE TO ALL CURRENT OSHA REGULATIONS FOR CONFINED SPACE ENTRY AND PROVIDE SUCH DURING ENGINEER WALK-THROUGH/INSPECTION
- 0. ALL PIPE PENETRATIONS THROUGH A CONCRETE STRUCTURE (I.E. STORMFILTER CARTRIDGE / DETENTION SYSTEM, STORM DRAINAGE MANHOLES, ETC.) SHALL BE MADE WATERTIGHT USING NON-SHRINK CEMENTIOUS GROUT.
- . EXISTING UTILITIES AND STRUCTURES SHOWN, BOTH UNDERGROUND AND ABOVE GROUND, ARE BASED ON A FIELD SURVEY AND THE BEST AVAILABLE RECORD DRAWINGS. THE CONTRACTOR SHALL VERIFY FIELD CONDITIONS PRIOR TO BEGINNING RELATED CONSTRUCTION. ANY DISCREPANCIES SHALL BE REPORTED TO THE ENGINEER IMMEDIATELY.

# STORMWATER MANAGEMENT SYSTEM MATERIAL SPECIFICATIONS

- THE UNDERGROUND STORMWATER MANAGEMENT SYSTEM IS TO BE DESIGNED BY OTHERS. ANY CHANGES TO THE PLANS SHALL BE PROVIDED TO THE DESIGN ENGINEER FOR REVIEW. PRIOR TO INSTALLATION, SHOP DRAWINGS OF THE STORMWATER MANAGEMENT SYSTEM SHALL BE PROVIDED TO THE DESIGN ENGINEER AND TO THE TOWN OF CHAPEL HILL FOR REVIEW.
- FILTER CARTRIDGES SHALL BE CONTECH STORMFILTERS WITH PHOSPHOSORB MEDIA. INSTALLATION OF THE STORMWATER DEVICE SHALL BE PER THE MANUFACTURER'S INSTALLATION GUIDELINES AND SPECIFICATIONS.
- ACCESS RISERS SHALL BE INSTALLED PER STRUCTURAL SPECIFICATIONS. ACCESS STEPS / LADDERS SHALL BE ATTACHED TO THE RISERS TO ALLOW FOR ACCESS INTO THE STORMWATER MANAGEMENT SYSTEM
- THE 24"Ø RCP OUTLET BARREL OF THE DETENTION SYSTEM SHALL BE CLASS III RCP, MODIFIED BELL AND SPIGOT, MEETING THE REQUIREMENTS OF ASTM C76-LATEST. THE PIPE JOINTS SHALL BE TYPE R-4.
- THE CONTRACTOR SHALL INSTALL THE STORMFILTER SYSTEM PER MANUFACTURERS' SPECIFICATIONS. CONTRACTOR TO PROVIDE A LETTER FROM MATERIAL SUPPLIER(S) STATING MATERIALS MEET THE SPECIFIED STANDARDS PRIOR TO INSTALLATION.
- COVER AND REVIEW OF SITE CONDITIONS TO MAINTAIN THE STRUCTURAL INTEGRITY OF THE SYSTEM TO BE THE RESPONSIBILITY OF THE

# STATEMENT OF RESPONSIBILITY

ALL REQUIRED MAINTENANCE AND INSPECTIONS OF THIS FACILITY SHALL BE THE RESPONSIBILITY OF THE PROPERTY OWNER, PER THE EXECUTED OPERATION AND MAINTENANCE AGREEMENT FOR THIS FACILITY.

# FOUNDATION NOTES

- ONCE THE EXCAVATION IS COMPLETE AND PRIOR TO INSTALLATION OF THE UNDERGROUND STORMWATER MANAGEMENT SYSTEM. THE ONSITE GEOTECHNICAL ENGINEER SHALL VERIFY THE BEARING CAPACITY OF THE UNDERLYING SOILS TO SERVE AS A FOUNDATION FOR THE UNDERGROUND STORMWATER MANAGEMENT SYSTEM. IF THE ONSITE GEOTECHNICAL ENGINEER DEEMS THE FOUNDATION SOILS AS UNSUITABLE, THEN THE UNSUITABLE MATERIAL SHOULD BE REMOVED DOWN TO A SUITABLE DEPTH AND THEN BUILT BACK UP TO THE CORRECT ELEVATION WITH A COMPACTED BACKFILL MATERIAL THAT IS APPROVED BY THE ONSITE GEOTECHNICAL ENGINEER. THE APPROVED BACKFILL MATERIAL SHOULD HAVE A GRADATION THAT WILL NOT ALLOW THE MIGRATION OF FINES, WHICH COULD CAUSE SETTLEMENT OF THE UNDERGROUND STORMWATER MANAGEMENT SYSTEM. IF NECESSARY, A GEOTEXTILE FABRIC CAN BE USED TO SEPARATE THE UNDERLYING SOILS AND THE BACKFILL MATERIAL. THIS GEOTEXTILE FABRIC (IF USED) IS TO BE SPECIFIED BY THE ON-SITE GEOTECHNICAL ENGINEER
- PLEASE NOTE THAT IF THE CONTRACTOR CONSTRUCTS AND COVERS UP THE EXCAVATION FOR THE UNDERGROUND STORMWATER MANAGEMENT SYSTEM PRIOR TO INSPECTION, THEN THIS AREA SHALL BE UNCOVERED AND TESTED (TO THE ENGINEER'S AND OWNER'S APPROVAL) AT THE CONTRACTOR'S EXPENSE.
- THE FOUNDATION SUBGRADE SHALL BE GRADED TO A UNIFORM OR SLIGHTLY SLOPING GRADE PRIOR TO PLACEMENT OF THE BEDDING MATERIAL. IF THE FOUNDATION SUBGRADE WILL BE EXPOSED FOR AN EXTENDED PERIOD OF TIME DURING CONSTRUCTION, THEN IT SHOULD BE GRADED TO A SLIGHT SLOPE SUCH THAT SATURATION OF THE SUBGRADE DOES NOT OCCUR.
- THE BEDDING MATERIAL FOR THE UNDERGROUND STORMWATER MANAGEMENT SYSTEM SHALL BE SPECIFIED BY THE ON-SITE GEOTECHNICAL ENGINEER. TYPICALLY, A WELL-GRADED GRANULAR MATERIAL WILL BE USED FOR THE BEDDING. PLEASE NOTE THAT IF CONSTRUCTION EQUIPMENT WILL BE OPERATING FOR AN EXTENDED PERIOD OF TIME ON THE BEDDING, THEN THE APPROPRIATE MEASURES (E.G. ENGINEERED FABRIC, STIFF GEOGRID, ETC.) SHALL BE TAKEN TO ENSURE THE INTEGRITY OF THE BEDDING IS NOT COMPROMISED.
- THE CONTRACTOR SHALL FURNISH, INSTALL, OPERATE, AND MAINTAIN ANY PUMPING EQUIPMENT, ETC. NEEDED FOR REMOVAL OF WATER FROM THE EXCAVATION. IT IS BEST TO BEGIN THE CONSTRUCTION OF THE DETENTION SYSTEMS AT THE DOWNSTREAM END WITH THE OUTLET ALREADY CONSTRUCTED TO ALLOW A ROUTE FOR WATER TO ESCAPE.
- THE CONTRACTOR SHALL PROVIDE A FOUNDATION DRAIN FOR THE UNDERGROUND DETENTION SYSTEM DESIGNED BY OTHERS. THE UNDERDRAIN SYSTEM SHALL BE INSTALLED PER MANUFACTURER'S SPECIFICATION AND SHALL POSITIVELY DRAIN TO DOWNSTREAM STRUCTURE. THE ONSITE GEOTECHNICAL ENGINEER SHALL DETERMINE IF FOUNDATION DRAINS ARE NOT REQUIRED FOR THE UNDERGROUND SCM SYSTEM. THE DESIGN ENGINEER SHALL BE NOTIFIED FOLLOWING THIS DETERMINATION.

# **BEDDING NOTES**

- THE EXCAVATION SUB GRADE MUST BE TRANSIT LEVEL.
- THE EXCAVATION PIT SHALL BE LINED (ON THE BOTTOM AND ALL FOUR SIDES) WITH A NON-WOVEN GEO-TEXTILE (GEOTEX 401 OR APPROVED EQUIVALENT). THE ONSITE GEOTECHNICAL ENGINEER SHALL APPROVE FABRIC FOR USE.
- THE SUBGRADE FOR THE DETENTION SYSTEM CAN BE A CONCRETE SLAB, OR CLEAN GRANULAR MATERIAL WITH A MAXIMUM AGGREGATE SIZE OF 3/4". THE BEDDING SHALL BE FREE FROM ROCK FORMATIONS, PROTRUDING STONES, FROZEN LUMPS, ROOTS, AND OTHER FOREIGN
- PREPARE THE SUBGRADE PER THE ONSITE GEOTECHNICAL ENGINEER'S DIRECTION (APPROXIMATELY 5-6" BELOW GRADE ON WHICH SLAB WILL SET). THE BEDDING MATERIAL SHOULD BE GRADED SUCH THAT A SMOOTH UNIFORM GRADE IS ESTABLISHED TO ALLOW FOR OPTIMUM PLACEMENT OF THE SAND FILTER.
- THE SUBGRADE MUST SUPPORT THE DETENTION SYSTEM WITHOUT DIFFERENTIAL SETTLEMENT BETWEEN PIECES.
- IF CONSTRUCTION EQUIPMENT WILL BE OPERATING FOR AN EXTENDED PERIOD OF TIME ON THE BEDDING, THEN THE APPROPRIATE MEASURES (E.G. STIFF GEOGRID, ETC.) SHALL BE TAKEN TO ENSURE THE INTEGRITY OF THE BEDDING IS NOT COMPROMISED.

# BACKFILL MATERIAL NOTES

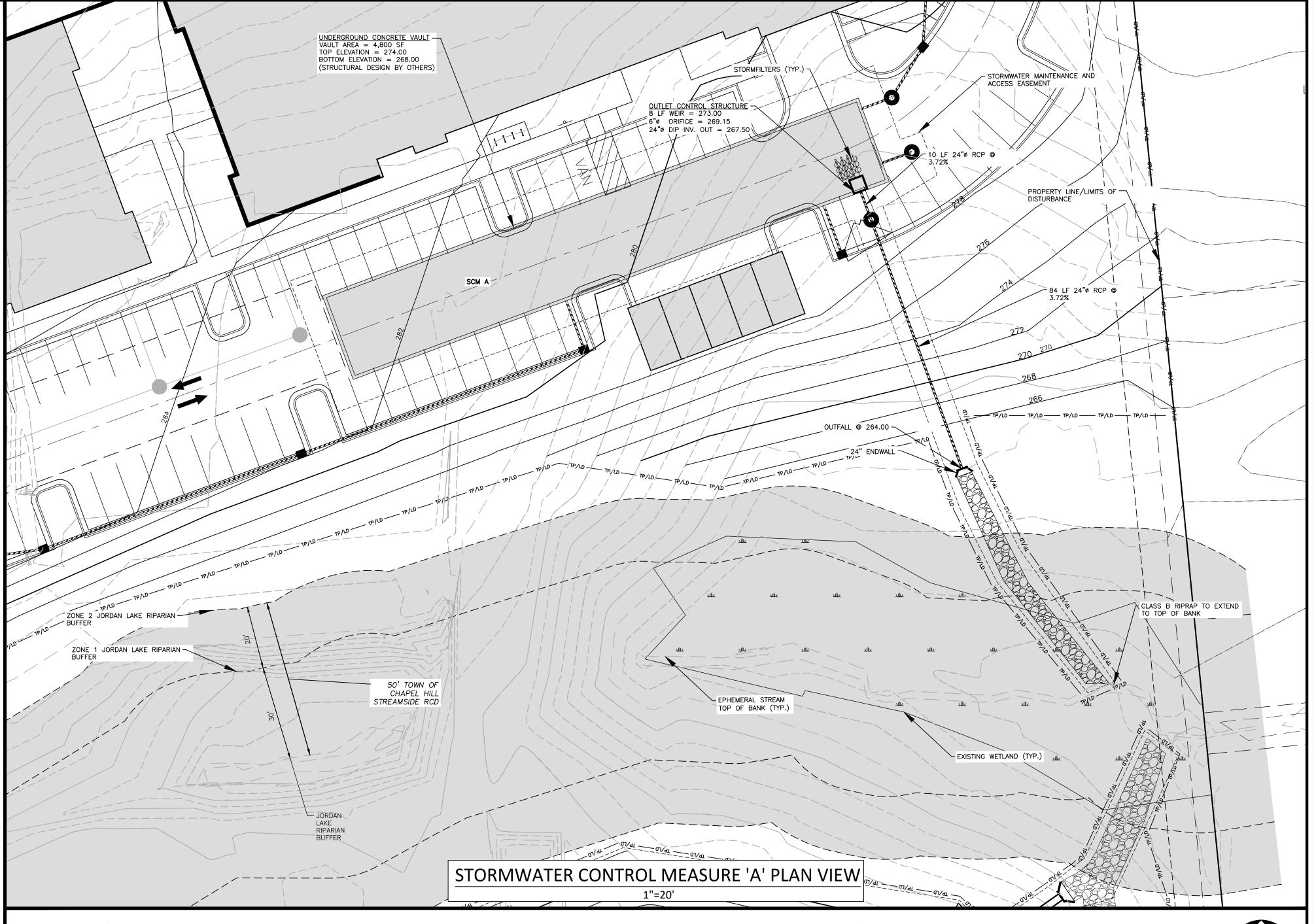
- THE ON-SITE GEOTECHNICAL ENGINEER SHALL SPECIFY THE BACKFILL MATERIAL FOR THE STORMWATER MANAGEMENT SYSTEM.
- THE BACKFILL MATERIAL SHOULD BE FREE OF ROCKS, FROZEN LUMPS, AND OTHER FOREIGN MATTER THAT COULD CAUSE HARD SPOTS WITHIN THE BACKFILL MATERIAL, OR THAT COULD DECOMPOSE AND CREATE VOIDS.
- HIGHLY PLASTIC SILTS, HIGHLY PLASTIC CLAYS, ORGANIC SILTS, ORGANIC CLAYS, AND PEATS SHOULD NOT BE USED AS A BACKFILL MATERIAL. THE BACKFILL MATERIAL SHOULD BE PLACED IN 6" LOOSE LIFTS AND COMPACTED TO 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY (ASTM-D698). THE FILL SOILS SHALL BE COMPACTED AT A MOISTURE CONTENT WITHIN +/- TWO PERCENT OF ITS OPTIMUM MOISTURE
- ANY MATERIAL STOCKPILING ON TOP OF THE STORMWATER MANAGEMENT SYSTEM SHALL BE APPROVED BY THE STRUCTURAL DESIGN ENGINEER OR DETENTION SYSTEM MANUFACTURER.

# UNDERGROUND VAULT CONSTRUCTION NOTES

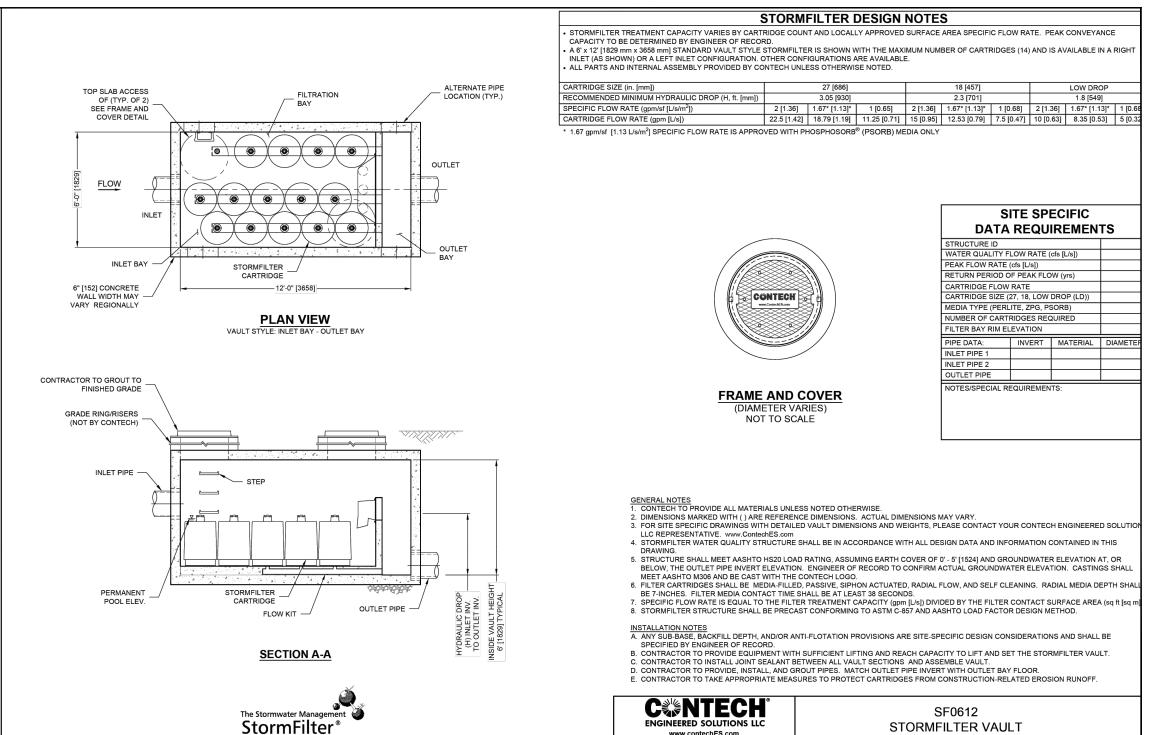
- UNDERGROUND VAULT CONFIGURATION IS TO BE DESIGNED AND PROVIDED BY OTHERS.
- ABSOLUTELY NO RUNOFF SHALL ENTER THE UNDERGROUND VAULT UNTIL ALL CONTRIBUTING DRAINAGE AREAS HAVE BEEN STABILIZED.
- MANHOLE ACCESS SHALL BE PROVIDED FOR THE UNDERGROUND VAULT. MANHOLES SHALL BE IN COMPLIANCE WITH TOWN OF CHAPEL HILL STANDARD DETAILS BUT SHALL BE A MINIMUM OF 24 INCHES IN DIAMETER TO COMPLY WITH OSHA CONFINED SPACE REQUIREMENTS (OR MINIMUM OSHA REQUIREMENTS APPLICABLE AT TIME OF CONSTRUCTION). CONTRACTOR SHALL PROVIDE ACCESS LADDERS FOR ACCESS BELOW ALL MANHOLES. MANHOLE COVERS SHALL ALLOW FOR PROPER VENTILATION.

# SYSTEM TESTING NOTES

PRIOR TO PLACEMENT OF THE BACKFILL MATERIAL AND STORM FILTER CARTRIDGES, CONTRACTOR SHALL TEST FOR WATER TIGHTNESS. ENTRANCES AND EXITS SHALL BE PLUGGED AND THE SYSTEM COMPLETELY FILLED WITH WATER TO DEMONSTRATE WATER TIGHTNESS. WATER TIGHTNESS MEANS NO SIGNIFICANT FOR A PERIOD OF 24 HOURS, SIGNIFICANT LEAKAGE TO BE DETERMINED BY THE CERTIFYING ENGINEER. CONTRACTOR SHALL CALL AND SCHEDULE THE FIELD TESTING OF THE SYSTEM (WATER-TIGHTNESS) WITH THE ENGINEER AT LEAST 2 WORKING DAYS PRIOR TO THE TEST. THE CONTRACTOR SHALL PROVIDE WRITTEN REPORTS TO THE ENGINEER VERIFYING THE WATER TIGHTNESS OF THE STORMWATER VAULT.

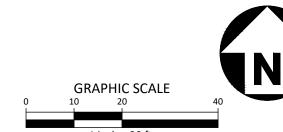


STANDARD DETAIL



STORMFILTER MANHOLE

N.T.S.





**REVISIONS** 

NO. DATE 1 06. 07. 2023 REVISED PER 1ST CZP COMMENTS

PROJECT NO. RAV-21002

**SHEET** 

PLAN INFORMATION

FILENAME RAV21002-SCM A CHECKED BY DRAWN BY SCALE 1" = 20' 03. 23. 2023

**SCM A PLAN VIEW** 

PRELIMINARY DRAWING - NOT RELEASED FOR CONSTRUCTION

SEE SHEET CO.00 FOR ALL PROJECT, SITE,

ALL CONSTRUCTION SHALL BE IN

GRADING, STORM DRAINAGE AND UTILITY

ACCORDANCE WITH THE CURRENT TOWN

OF CHAPEL HILL AND NCDOT ENGINEERING

DESIGN AND CONSTRUCTION STANDARDS

license number: C-0293, C-187 www.mcadamsco.com NORTHWOOD RAVIN 3015 CARRINGTON MILL BLVD, STE 460 MORRISVILLE, NORTH CAROLINA 27560

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phone 919, 361, 5000

fax 919. 361. 2269

**CLIENT** 

Adam Golden





# STORMWATER CONTROL MEASURE 'B' CONSTRUCTION SPECIFICATIONS

PRIOR TO CONSTRUCTION, ANY DISCREPANCIES IN THE PLANS AND NOTES SHALL BE BROUGHT TO THE DESIGN ENGINEER'S ATTENTION

- THE PROJECT WILL MEET ALL OF THE REQUIREMENTS RELATIVE TO BEST MANAGEMENT PRACTICES AND ENGINEERED STORMWATER CONTROL STRUCTURES AS OUTLINED IN THE TOWN OF CHAPEL HILL LAND USE MANAGEMENT ORDINANCE. (ARTICLE 5, SECTION 5.4,
- THE FINAL CERTIFICATION FOR THIS FACILITY WILL INCLUDE A CERTIFICATION BY THE ON-SITE GEOTECHNICAL ENGINEER THAT THE PROJECT WAS CONSTRUCTED PER THE APPROVED PLANS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE WITH THE ON-SITE GEOTECHNICAL ENGINEER FOR OBSERVATION AND TESTING SUCH THAT THE ON-SITE GEOTECHNICAL ENGINEER CAN CERTIFY THE CONSTRUCTION OF THE DAM EMBANKMENT AND SPILLWAY. THIS CERTIFICATION MUST ADDRESS THE TESTING FOR MATERIALS AND COMPACTION OF THE DAM EMBANKMENT AND SPILLWAY.
- ALL CONSTRUCTION ACTIVITY RELATED TO THE PROPOSED STORMWATER CONTROL MEASURE SHALL BE PER THE DETAILS AND SPECIFICATIONS SHOWN IN THESE DRAWINGS. SOILS, COMPACTION, AND OTHER MISCELLANEOUS DETAILS AND SPECIFICATIONS MAY BE MODIFIED PER THE RECOMMENDATIONS OF THE ON-SITE GEOTECHNICAL ENGINEER, HOWEVER, PRIOR TO IMPLEMENTATION, THE DESIGN ENGINEER SHALL BE NOTIFIED OF ANY DEVIATION FROM THESE DESIGN DRAWINGS, INCLUDING SHOP DRAWINGS FOR ANY PROPOSED
- DURING THE INITIAL STAGES OF CONSTRUCTION, THE STORMWATER CONTROL MEASURE MAY BE USED AS A SEDIMENT BASIN FOR EROSION CONTROL PURPOSES. IF SO. THE CONTRACTOR SHALL FOLLOW THE GENERAL CONSTRUCTION SEQUENCE BELOW: THE CONTRACTOR SHALL CONSTRUCT THE ENTIRE FACILITY (PERMANENT OUTLET STRUCTURE, DAM, ETC.) WITH THE EXCEPTION OF THE INTERIOR FINE GRADING FOR THE FACILITY. THE INTERIOR FINE GRADING WILL BE CONSTRUCTED ONCE THE EROSION CONTROL
- PHASE IS COMPLETE THE TEMPORARY DRAW DOWN RISER (OR SKIMMER) SHALL BE CONNECTED TO THE PERMANENT 6"Ø DIP DRAIN PIPE. ONCE THE UPSTREAM DRAINAGE AREA IS STABILIZED AND THE EROSION CONTROL INSPECTOR APPROVES THE REMOVAL OF THE SEDIMENT BASIN. THE CONTRACTOR SHALL REMOVE THE TEMPORARY DRAW DOWN RISER (OR SKIMMER) AND CLEAN OUT THE
- WHERE WATER QUALITY COULD BE ADVERSELY AFFECTED. ONCE THE BASIN IS CLEANED OUT, AND ALL EROSION CONTROL DEVICES REMOVED, THE CONTRACTOR SHALL CONSTRUCT THE
- INTERIOR GRADING SHOWN ON THIS SHEET ONCE THE GRADING IS COMPLETE. THE CONTRACTOR SHALL REQUEST AN ON-SITE INSPECTION AND AN AS-BUILT SURVEY PRIOR TO INSTALLATION OF THE STORMWATER CONTROL MEASURE PLANTS. IF THE CONTRACTOR PLANTS THE PROPOSED VEGETATION PRIOR TO AN AS-BUILT SURVEY (AND SUBSEQUENT APPROVAL), ANY CHANGES TO THE GRADING / RE-PLANTING OF PLANTS WILL BE AT THE CONTRACTOR'S EXPENSE

BASIN. ALL SEDIMENT, TRASH, ETC. SHALL BE DISPOSED OF PROPERLY (I.E. - PLACED IN A LANDFILL) AND NOT STOCKPILED IN AN AREA

- ONCE THE ENGINEER HAS APPROVED THE AS-BUILT GRADING, THE CONTRACTOR SHALL PLANT THE PROPOSED STORMWATER CONTROL MEASURE PLANTS SHOWN ON THE LANDSCAPE PLAN FOR THE FACILITY. AFTER COMPLETION OF THE PLANTING, THE LANDSCAPE CONTRACTOR SHALL PROVIDE A LETTER TO THE ENGINEER CERTIFYING THAT THE PLANTS HAVE BEEN INSTALLED PER THE APPROVED STORMWATER CONTROL MEASURE PLANTING PLAN
- ALL OSHA REQUIREMENTS FOR EXCAVATIONS (SHORING, DEPTH, ETC.) ARE THE RESPONSIBILITY OF THE CONTRACTOR. IF REQUIRED, THE CONTRACTOR SHALL PROVIDE AN EXCAVATION PLAN TO BE SEALED BY A NC P.E. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE IF AN EXCAVATION PLAN IS REQUIRED. THE IOHN R. MCADAMS COMPANY ASSUMES NO RESPONSIBILITY FOR ANY EXCAVATION DESIGN RELATED TO SAFETY OR OSHA REQUIREMENTS.
- ON-SITE GEOTECHNICAL ENGINEER TO DETERMINE IF IN-SITU SOILS ENCOUNTERED WOULD MAINTAIN A STORMWATER CONTROL MEASURE PERMANENT POOL AT DESIGN ELEVATION. IF HIGHLY PERMEABLE SOILS ARE ENCOUNTERED THAT WOULD NOT MAINTAIN THE PERMANENT POOL ELEVATION AS DESIGNED. A CLAY LINER MAY BE REQUIRED TO MAINTAIN A PERMANENT POOL OF WATER IN THE STORMWATER CONTROL MEASURE. FINAL DETERMINATION IF A CLAY LINER IS NEEDED SHALL BE THE RESPONSIBILITY OF THE ON-SITE GEOTECHNICAL ENGINEER. UPON DETERMINATION OF HIGHLY PERMEABLE SOIL CONDITIONS, ON-SITE GEOTECHNICAL ENGINEER WILL INFORM THE DESIGN ENGINEER AND RECOMMEND LINER SPECIFICATIONS.
- . IT IS ANTICIPATED THAT DEWATERING WILL BE NECESSARY IN THE EXCAVATION AREAS (E.G. EMBANKMENT SUB GRADE, INTERIOR PORTIONS OF THE STORMWATER CONTROL MEASURE, KEY TRENCH, ETC.). THEREFORE, THE CONTRACTOR SHALL FURNISH, INSTALL, OPERATE, AND MAINTAIN ANY PUMPING EQUIPMENT, ETC. NEEDED FOR REMOVAL OF WATER FROM VARIOUS PARTS OF THE STORMWATER CONTROL MEASURE SITE, DURING PLACEMENT OF FILL WITHIN THESE AREAS, THE CONTRACTOR SHALL KEEP THE WATER LEVEL BELOW THE BOTTOM OF THE EXCAVATION / CONSTRUCTION AREAS. THE MANNER IN WHICH THE WATER IS REMOVED SHALL BE SUCH THAT THE EXCAVATION BOTTOM AND SIDE SLOPES ARE STABLE. WITH NO SEDIMENT DISCHARGED FROM THE SITE (I.E. PUMPED WATER MAY NEED TO BE DIRECTED TO AN APPROVED EROSION CONTROL DEVICE SUCH AS A DIRT BAG (ACF ENVIRONMENTAL), OR ENGINEER APPROVED EQUIVALENT, PRIOR TO DISCHARGE).
- 9. RETAINING WALL ALIGNMENT SHOWN ON THESE PLANS DEPICTS THE LOCATION OF THE FRONT FACE OF THE RETAINING WALL AT THE
- 10. RETAINING WALL IS TO BE A DESIGN-BUILD PROJECT(S) BY THE CONTRACTOR. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN FINAL CONSTRUCTION DRAWINGS FROM A REGISTERED PROFESSIONAL ENGINEER AND GAIN ALL REQUIRED PERMITS NECESSARY FOR THE CONSTRUCTION OF THE RETAINING WALL.
- 11. RETAINING WALL SHALL BE ASSUMED TO BE BACKFILLED WITH OFF-SITE BORROW MATERIAL OR PROCESSED FILL UNLESS CONTRACTOR CAN PROVIDE OWNER WITH CONFIRMATION FROM THE GEOTECHNICAL ENGINEER AND THE RETAINING WALL DESIGNER THAT READILY AVAILABLE ON-SITE SOILS CAN BE USED.
- 12. TOP AND BOTTOM OF WALL ELEVATIONS REFERENCED ON THESE PLANS IDENTIFY FINISHED GRADE ELEVATIONS ONLY. THE EXTENT THAT THE RETAINING WALL WILL BE EXTENDED BELOW GRADE TO THE FOOTING SHALL BE IDENTIFIED ON THE RETAINING WALL CONSTRUCTION
- 13. ON-SITE GEOTECHNICAL ENGINEER SHOULD BE GIVEN AN OPPORTUNITY TO REVIEW ALL RETAINING WALL PLANS AND DESIGNS RELEVANT TO GEOTECHNICAL CONSIDERATIONS PRIOR TO FINAL DESIGN OF THE WALLS.

# **OUTLET STRUCTURE MATERIAL SPECIFICATIONS**

- THE 24"Ø RCP OUTLET BARREL SHALL BE CLASS III RCP, MODIFIED BELL AND SPIGOT, MEETING THE REQUIREMENTS OF ASTM C76-LATES THE PIPES SHALL HAVE CONFINED O-RING RUBBER GASKET JOINTS MEETING ASTM C-443-LATEST. THE PIPE JOINTS SHALL BE TYPE R-4.
- THE STRUCTURAL DESIGN FOR THE 4' X 4' (INTERNAL DIMENSIONS) RISER BOX WITH EXTENDED BASE SHALL BE BY OTHERS. PRIOR TO ORDERING THE STRUCTURES, THE CONTRACTOR SHALL PROVIDE, TO THE DESIGN ENGINEER FOR REVIEW, SHOP DRAWINGS AND SUPPORTING STRUCTURAL CALCULATIONS SEALED BY A P.E. REGISTERED IN NORTH CAROLINA DEMONSTRATING THE PERTINENT VERTICAL LOADS ARE SUPPORTED BY THE CONCRETE RISER STRUCTURE.
- B. THE RISER BOX OUTLET STRUCTURE SHALL BE PROVIDED WITH STEPS 16" ON CENTER. STEPS SHALL BE PROVIDED ON THE INNER WALL OF THE RISER BOX. STEPS SHALL BE IN ACCORDANCE WITH NCDOT STD. 840.66. PLEASE REFER TO SHEET C9.XX FOR LOCATION OF THE RISER STEPS. NOTE THE STEPS SHALL LINE UP WITH THE ACCESS HATCH OF THE TRASH RACK.
- 4. THE CONCRETE ANTI-FLOTATION BLOCK SHALL BE CAST-IN-PLACE. STEEL REINFORCEMENT AND CONNECTION TO THE RISER SHALL BE PROVIDED IN ACCORDANCE WITH THE DETAIL ON SHEET C9.XX. THE CONTRACTOR SHALL ENSURE THE WEIGHT OF THE ENTIRE RISER STRUCTURE IS GREATER THAN OR EQUAL TO XX,XXX LBS. IN LIEU OF CAST-IN-PLACE, THE CONTRACTOR MAY OPT FOR A PRECAST ANTI-FLOTATION BLOCK. SHOP DRAWINGS FOR THE PRECAST BLOCK SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW. THE PRECAST ANTI-FLOTATION BLOCK SHALL HAVE A SHIPPING WEIGHT OF XX,XXX LBS.
- 5. THE RISER BOX JOINTS SHALL BE SEALED USING BUTYL RUBBER SEALANT CONFORMING TO ASTM-C990-LATEST. IF NECESSARY, THE CONTRACTOR SHALL INCORPORATE A WATERSTOP INTO THE RISER BOX JOINT TO ENSURE A WATERTIGHT CONNECTION. THE CONTRACTOR SHALL PARGE JOINTS ON BOTH THE INSIDE AND OUTSIDE WITH NON-SHRINK GROUT AND INSTALL GALVANIZED STEEL STRAPS PER DETAIL ON SHEET C9.XX.
- 6. PRIOR TO ORDERING, THE CONTRACTOR SHALL SUBMIT TRASH RACK SHOP DRAWINGS TO THE ENGINEER FOR REVIEW. CONTRACTOR SHALL ENSURE THAT AN ACCESS HATCH IS PROVIDED WITHIN THE TRASH RACK (SEE DETAIL FOR LOCATION) THAT WILL ALLOW FOR FUTURE MAINTENANCE ACCESS. CONTRACTOR SHALL ALSO PROVIDE A CHAIN AND LOCK FOR SECURING THE ACCESS HATCH. NOTE THE ACCESS HATCH SHALL LINE UP WITH THE ACCESS STEPS AFTER INSTALLATION.
- 7. ALL POURED CONCRETE SHALL MEET THE FOLLOWING SPECIFICATIONS UNLESS OTHERWISE NOTED:

-MINIMUM 3000 PSI (28 DAY) -SLUMP = 3" - 5" -ENTRAINED AIR = 5% - 7%

PLEASE NOTE NO CONCRETE SHALL BE POURED WHEN THE AMBIENT AIR TEMPERATURES ARE EXPECTED TO BE ABOVE 85°F OR BELOW 40°F. CAST-IN-PLACE CONCRETE SHALL BE "WET CURED" AFTER FINISHING FOR A MINIMUM OF 48 HOURS.

- ON-SITE GEOTECHNICAL ENGINEER TO ENSURE AND CERTIFY ALL POURED CONCRETE MEETS THE ABOVE SPECIFICATIONS.
- 8. GEOTEXTILE FABRIC FOR THE 24" Ø RCP OUTLET BARREL JOINTS SHALL BE MIRAFI 180N OR ENGINEER APPROVED EQUAL (NON-WOVEN
- 9. STORMWATER CONTROL MEASURE EMERGENCY DRAW DOWN IS VIA AN 6"Ø PLUG VALVE. THE VALVE SHALL BE A M&H STYLE 1820 ECCENTRIC VALVE OR APPROVED EQUAL. THIS VALVE IS IN ACCORDANCE WITH AWWA C-517, AND SHALL BE OPERABLE FROM TOP OF OUTLET STRUCTURE VIA A HAND WHEEL (SEE DETAIL SHEET C9.XX). THE CONTRACTOR SHALL PROVIDE A REMOVABLE VALVE WRENCH WITH A HAND WHEEL ON TOP FOR OPERATION OF THE 6"Ø PLUG VALVE.

- PRIOR TO CONSTRUCTION, THE OWNER SHALL OBTAIN A LAND DISTURBING (GRADING) PERMIT AND AN "APPROVAL TO CONSTRUCT FROM THE TOWN OF CHAPEL HILL AND ALL OTHER NECESSARY PERMITS FROM APPLICABLE AGENCIES (E.G. 404 / 401 PERMITS)
- 2. INSTALL ALL SEDIMENT AND EROSION CONTROL MEASURES PER THE APPROVED SEDIMENT AND EROSION CONTROL PLAN. THE CONTRACTOR SHALL MAINTAIN ALL APPROVED SEDIMENT AND EROSION CONTROL MEASURES THROUGHOUT THE ENTIRE PROJECT, AS REQUIRED. THE CONTRACTOR SHALL RECEIVE APPROVAL FROM THE EROSION CONTROL INSPECTOR, AS REQUIRED BY GOVERNING AGENCIES, PRIOR TO ANY CLEARING
- 3. CLEAR AND GRUB AREA WITHIN THE LIMITS OF THE PROPOSED DAM CONSTRUCTION. ALL TREES AND THEIR ENTIRE ROOT SYSTEMS MUST BE REMOVED FROM THE DAM FOOTPRINT AREA AND BACKFILLED WITH SUITABLE SOIL MATERIAL. THE BACKFILLED AREAS SHALL BE COMPACTED TO THE SAME STANDARDS AS THE DAM EMBANKMENT. THE REMAINING AREA OF THE EMBANKMENT SHALL BE STRIPPED TO A SUITABLE DEPTH AS DIRECTED BY THE ON-SITE GEOTECHNICAL ENGINEER. ANY RESIDUAL SOILS TO BE LEFT IN PLACE MUST BE WELL SCARIFIED TO PROMOTE BONDING OF THE NEW EMBANKMENT FILL. NO EMBANKMENT MATERIAL SHALL BE PLACED FOR THE DAM OR KEY TRENCH UNTIL APPROVAL OF THE DAM SUBGRADE IS OBTAINED FROM THE ON-SITE GEOTECHNICAL ENGINEER.
- 4 EXCAVATE FOR THE NEW KEY TRENCH ALONG THE CENTERLINE OF THE PROPOSED DAM EMBANKMENT. THE TRENCH SHALL EXTEND A MINIMUM OF 5 FT BELOW EXISTING GRADE OR 2 FT BELOW THE 24"Ø RCP OUTLET BARREL AND SHALL HAVE A MINIMUM BOTTOM WIDTH OF 5 FEET. THE KEY TRENCH SIDESLOPES SHALL BE A MINIMUM OF 1:1 (H:V). WHEN EXCAVATING THE KEY TRENCH, IF ANY DEBRIS IS ENCOUNTERED TO AN EXTENT THAT SUCH DEBRIS MAY EXIST IN OTHER INSITU PORTIONS OF THE DAM EMBANKMENT, IT SHOULD ALSO BE REMOVED. THE KEY TRENCH SHALL BE COMPACTED TO THE SAME SPECIFICATION LISTED IN ITEM 4 OF THE SECTION TITLED "BERM AND SOIL COMPACTION SPECIFICATIONS." DEPENDING UPON ON-SITE SOIL CONDITIONS ENCOUNTERED DURING EXCAVATION, THE ON-SITE GEOTECHNICAL ENGINEER MAY VARY THE DEPTH AND DIMENSIONS OF THE KEY TRENCH AS DEEMED NECESSARY. THE ON-SITE GEOTECHNICAL ENGINEER SHALL RETAIN DOCUMENTATION OF ANY VARIATION FOR FUTURE AS-BUILT SUBMITTALS TO THE TOWN OF **CHAPEL HILL**
- 5. BEGIN PLACEMENT OF BACKFILL WITHIN THE KEY TRENCH. THE KEY TRENCH SHALL BE COMPACTED TO THE SPECIFICATIONS LISTED ITEM 4 OF THE SECTION TITLED "BERM AND SOIL COMPACTION SPECIFICATIONS." THE KEY TRENCH SHALL BE TESTED PER THE SPECIFICATIONS LISTED IN THAT SECTION.
- 5. PRIOR TO INSTALLATION, SUBGRADE CONDITIONS ALONG THE SPILLWAY PIPES SHOULD BE EVALUATED BY THE ON-SITE GEOTECHNICAL ENGINEER TO ASSESS WHETHER SUITABLE BEARING CONDITIONS EXIST AT THE SUBGRADE LEVEL. SHOULD SOFT OR OTHERWISE UNSUITABLE CONDITIONS BE ENCOUNTERED ALONG THE PIPE ALIGNMENTS, THESE MATERIALS SHOULD BE UNDERCUT AS DIRECTED BY THE GEOTECHNICAL ENGINEER. THE UNDERCUT MATERIALS SHALL BE REPLACED WITH ADEQUATELY COMPACTED STRUCTURAL FILL, LEAN CONCRETE OR FLOWABLE FILL AS DIRECTED BY THE ON-SITE GEOTECHNICAL ENGINEER
- 7. IN ORDER TO HELP PROTECT THE SOIL SUBGRADE FROM DETERIORATION (DUE TO EXPOSURE, RAINFALL, SEEPAGE, AND RUNOFF) BEFORE THE CRADIE CAN BE POLIFIED IT IS STRONGLY RECOMMENDED THAT A 3" TO 4" THICK CONCRETE MUD MAT BE POLIFIED OVER THE SUBGRADE ONCE IT IS APPROVED BY THE ON-SITE GEOTECHNICAL ENGINEER. THE MUD MAT WILL ALSO PROVIDE BEARING FOR THE BLOCKS THAT TEMPORARILY SUPPORT THE SPILLWAY PIPE UNTIL THE CRADLE CAN BE POURED. THE METHOD OF BLOCK SUPPORT FOR THE PIPE PROPOSED BY THE CONTRACTOR SHOULD BE SUBMITTED TO THE JOHN R. McADAMS COMPANY FOR REVIEW.
- 8. BEGIN CONSTRUCTION OF THE NEW EMBANKMENT. FILL MATERIALS SHALL BE PLACED IN MAXIMUM 8" THICK LIFTS PRIOR TO COMPACTION, UNLESS DIRECTED OTHERWISE BY THE ON-SITE GEOTECHNICAL ENGINEER. FILL LIFTS SHALL BE CONTINUOUS OVER THE ENTIRE LENGTH OF FILL. IF IT IS NECESSARY, THE EMBANKMENT FILL MATERIAL WILL BE OVERBUILT IN HORIZONTAL LIFTS AND CUT BACK TO FINAL GRADE IN ORDER TO ACHIEVE PROPER COMPACTION.
- 9. AS CONSTRUCTION OF THE EMBANKMENT MOVES FORWARD, IT WILL BE NECESSARY TO INSTALL THE CONCRETE CRADLE. SEE NOTE ON CRADLE DETAIL (SHEET C9.XX). THIS MAY BE CONSTRUCTED USING ONE OF THE FOLLOWING METHODS:
- A. IF THE PROPOSED STRUCTURAL FILL MATERIAL IS UTILIZED AS THE FORMWORK FOR THE CONCRETE CRADIF. THEN THE STRUCTURAL FILL SHOULD BE INSTALLED AND COMPACTED UP TO THE TOP OF CONCRETE CRADLE ELEVATION. ONCE THE STRUCTURAL FILL REACHES THE NEXT DOWNSTREAM JUNCTION BOX OR HEADWALL AND IS COMPACTED TO THE ELEVATION OF THE TOP OF THE CONCRETE CRADLE, EXCAVATE THE CONCRETE CRADLE TRENCH PER THE PROVIDED DETAILS AND CONSTRUCT THE CONCRETE CRADLE AS PER THE PROVIDED CONCRETE CRADLE DETAIL
- B. IF THE PROPOSED STRUCTURAL FILL IS NOT UTILIZED AS THE FORMWORK FOR THE CONCRETE CRADLE, THEN PRIOR TO CONSTRUCTING THE STRUCTURAL FILL EMBANKMENT, THE FORMWORK FOR THE CONCRETE CRADLE SHOULD BE INSTALLED ON EXISTING GROUND AND/OR THE MUD MAT. THE CONCRETE CRADLE SHALL BE CONSTRUCTED PER THE PROVIDED DETAILS
- 10. INSTALL RISER / BARREL ASSEMBLY, ALONG WITH THE EMERGENCY DRAIN SYSTEM. INSTALL 24" RCP OUTLET BARREL SPILLWAY FILTER FROM THE DETAILS SHOWN ON SHEET C9.XX.
- 11. CONSTRUCT EMBANKMENT PER SPECIFICATIONS LISTED IN THE SECTION TITLED "BERM AND SOIL COMPACTION SPECIFICATIONS" AND REQUIREMENTS OF THE ON-SITE GEOTECHNICAL ENGINEER. ALL CHARACTERISTICS OF THE EMBANKMENT FILL MATERIAL SHALL MEET THE STANDARDS SET FORTH IN "BERM AND SOIL COMPACTION SPECIFICATIONS", INCLUDING COMPACTION AND MOISTURE REQUIREMENTS. IF NECESSARY TO ACHIEVE PROPER COMPACTION. THE EMBANKMENT FILL MATERIAL WILL BE OVERBUILT IN HORIZONTAL LIFTS AND CUT BACK TO PROPER FINAL GRADE. ANY HAND COMPACTION ACTIVITIES AROUND SPILLWAY OR DRAIN STRUCTURES SHALL BE CONDUCTED IN 4-INCH LOOSE LIFTS AND BE TO THE SAME COMPACTION AND MOISTURE REQUIREMENTS AS THE ENTIRE EMBANKMENT. ALL COMPACTION AND MOISTURE TESTING SHALL BE CARRIED OUT AS DIRECTED BY THE ON-SITE GEOTECHNICAL ENGINEER AND AS LISTED IN THE SECTION TITLED "BERM AND SOIL COMPACTION SPECIFICATIONS".
- 12. UPON COMPLETION OF DAM EMBANKMENT, PROMPTLY STABILIZE AND SEED DAM EMBANKMENT PER SEEDING SCHEDULE. PERMANENT GROUND COVER SHALL BE ESTABLISHED PER THE PERMANENT SEEDING SCHEDULE FOUND ON SHEET C9.XX.
- 13. SCHEDULE A FINAL AS-BUILT INSPECTION AND AS-BUILT SURVEY WITH THE ENGINEER AND SURVEYOR. AN AS-BUILT INSPECTION AND SURVEY SHALL BE SCHEDULED BEFORE IMPOUNDING WATER IN THE FACILITY AND A MINIMUM OF 60 DAYS PRIOR TO THE ANTICIPATED DATE OF CERTIFICATION APPROVAL. ANY COMMENTS OR DEFICIENCIES IN THE SCM CONSTRUCTION MUST BE CORRECTED TO THE SATISFACTION OF THE ENGINEER AND OWNER BEFORE CERTIFICATION SHALL BE GRANTED.

# BERM AND SOIL COMPACTION SPECIFICATIONS

- INSTRUCTION, THE ON-SITE GEOTECHNICAL ENGINEER SHALL IDENTIFY BORROW / FILL AREAS AND VERIFY THEIR SUITABILIT FOR USE WITHIN THE DAM EMBANKMENT. ALSO, THE ON-SITE GEOTECHNICAL ENGINEER SHALL PERFORM STANDARD PROCTORS ON THE PROPOSED BORROW MATERIAL TO ENSURE THAT OPTIMUM MOISTURE CONTENT AND COMPACTION CAN BE ACHIEVED / CONTROLLED DURING CONSTRUCTION.
- GEOTECHNICAL ENGINEER. THE FILL MATERIAL SHALL BE FREE FROM ROOTS, STUMPS. WOOD. STONES GREATER THAN 6". AND FROZEN OR OTHER OBJECTIONABLE MATERIAL. THE FOLLOWING SOIL TYPES ARE SUITABLE FOR USE AS FILL WITHIN THE DAM EMBANKMENT AND KEY TRENCH: ML AND CL. ALL FILL MATERIALS SHALL BE APPROVED BY THE ONSITE GEOTECHNICAL ENGINEER FOR THE INTENDED USE.

2. ALL FILL MATERIALS TO BE USED FOR THE DAM EMBANKMENT SHALL BE TAKEN FROM BORROW AREAS APPROVED BY THE ON-SITE

- FILL PLACEMENT FOR THE EMBANKMENT SHALL NOT EXCEED A MAXIMUM 8" LIFT (UNCOMPACTED). EACH LIFT SHALL BE CONTINUOUS FOR THE ENTIRE LENGTH OF EMBANKMENT. BEFORE PLACEMENT OF FILL FOR THE BERM SECTION, ALL UNSUITABLE MATERIAL SHALL BE REMOVED AND THE SURFACE PROPERLY PREPARED FOR FILL PLACEMENT. FILL MATERIAL ADJACENT TO ALL SPILLWAY AND DRAINAGE STRUCTURES SHALL BE PLACED IN 4-INCH (UNCOMPACTED) LIFTS AND HAND-COMPACTED TO THE SAME COMPACTION AND MOISTURE REQUIREMENTS AS THE ENTIRE EMBANKMENT
- MAXIMUM DRY DENSITY (ASTM D-698). THE FILL SOILS SHALL BE COMPACTED AT A MOISTURE CONTENT WITHIN -1 TO +3 PERCENT OF ITS OPTIMUM MOISTURE CONTENT. COMPACTION TESTS SHALL BE PERFORMED BY THE ON-SITE GEOTECHNICAL ENGINEER DURING CONSTRUCTION TO VERIFY THAT THE PROPER COMPACTION LEVEL HAS BEEN REACHED. THE FILL SHOULD BE COMPACTED USING A SHEEPSFOOT TYPE COMPACTOR. IN ORDER TO PREVENT DAMAGE TO THE PIPE, NO COMPACTION EQUIPMENT SHALL CROSS ANY PIPE UNTIL MINIMUM COVER IS ESTABLISHED ALONG THE PIPE.

4. ALL FILL SOILS USED IN THE EMBANKMENT CONSTRUCTION SHALL BE COMPACTED TO AT LEAST 95% OF THE STANDARD PROCTOR

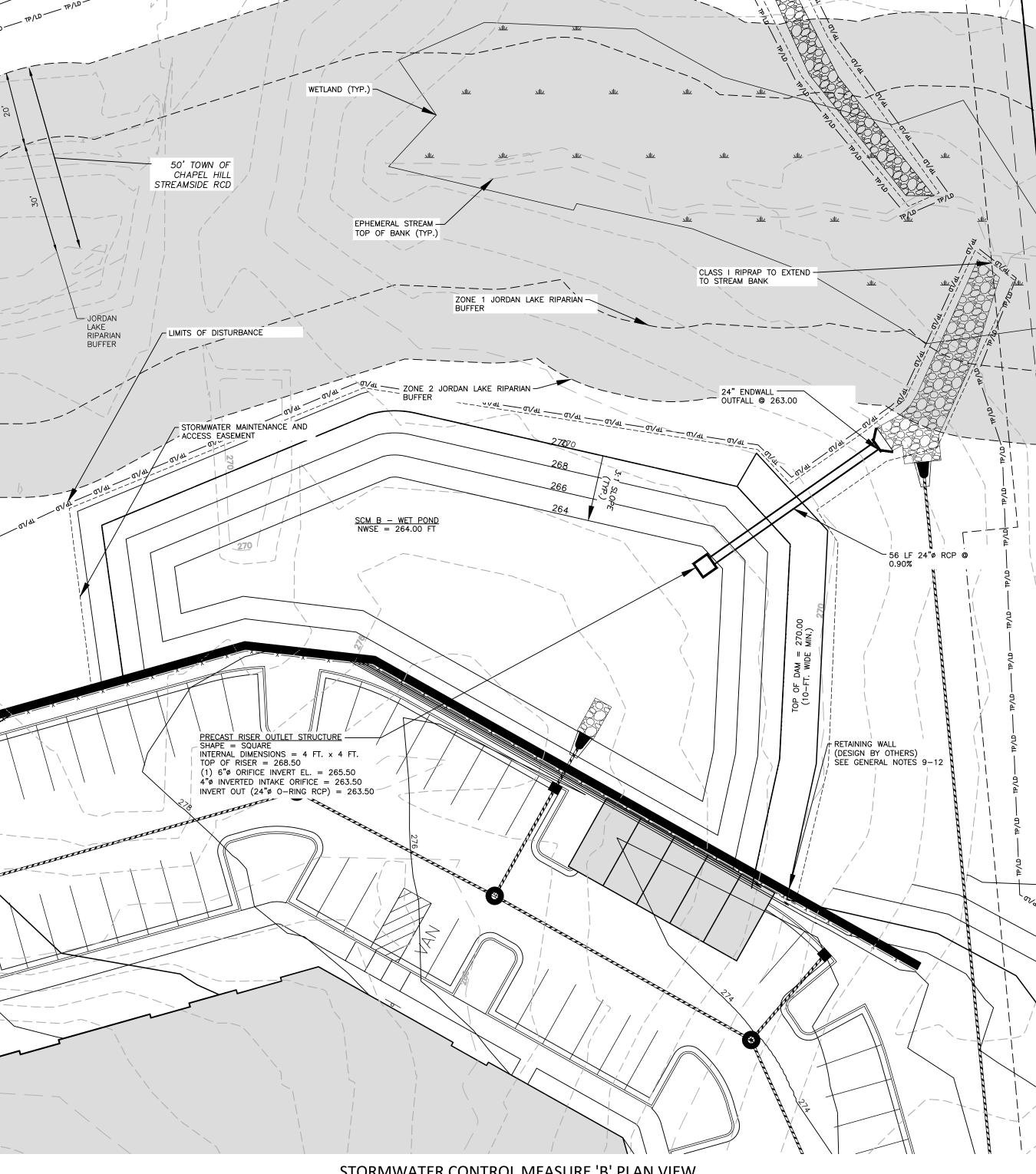
GEOTECHNICAL ASPECTS OF THE FACILITY HAVE BEEN CONSTRUCTED PER PLAN. THIS CERTIFICATION MUST ADDRESS THE TESTING FOR MATERIALS AND COMPACTION OF THE DAM EMBANKMENT AND SPILLWAY. THESE REPORTS AND CERTIFICATION WILL BE NEEDED DURING THE AS-BUILT CERTIFICATION PROCESS FOR THIS STORMWATER CONTROL MEASURE. THEREFORE, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE TESTING AND OBSERVATION WITH THE ON-SITE GEOTECHNICAL ENGINEER.

THE DESIGN ENGINEER SHALL BE PROVIDED WITH REPORTS AND CERTIFICATION. BY THE ON-SITE GEOTECHNICAL ENGINEER. THAT THE

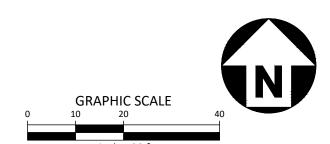
- TESTING OF THE NEW FILL MATERIALS SHALL BE PERFORMED TO VERIFY THAT THE RECOMMENDED LEVEL OF COMPACTION IS ACHIEVED DURING CONSTRUCTION. THEREFORE, ONE DENSITY TEST SHALL BE PERFORMED FOR EVERY 2,500 SQUARE FEET OF AREA FOR EVERY LIFT OF FILL OR AS RECOMMENDED BY THE ON-SITE GEOTECHNICAL ENGINEER.
- 7. TESTING WILL BE REQUIRED ALONG THE 36"Ø RCP OUTLET BARREL AT A FREQUENCY OF ONE TEST PER 25 LF OF PIPE PER VERTICAL FOOT OF FILL OR AS DIRECTED BY THE ON-SITE GEOTECHNICAL ENGINEER.

# STATEMENT OF RESPONSIBILITY

1. ALL REQUIRED MAINTENANCE AND INSPECTIONS OF THE STORMWATER CONTROL MEASURE SHALL BE THE RESPONSIBILITY OF THE OWNER, PER THE EXECUTED OPERATION AND MAINTENANCE AGREEMENT FOR THIS FACILITY.



STORMWATER CONTROL MEASURE 'B' PLAN VIEW



SEE SHEET CO.00 FOR ALL PROJECT, SITE, GRADING, STORM DRAINAGE AND UTILITY

ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CURRENT TOWN OF CHAPEL HILL AND NCDOT ENGINEERING DESIGN AND CONSTRUCTION STANDARDS

PRELIMINARY DRAWING - NOT RELEASED FOR CONSTRUCTION



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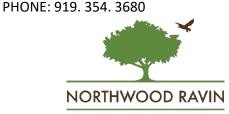
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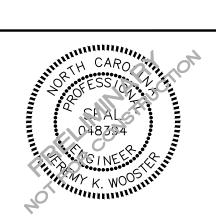
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# CLIENT

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Adam Golden





# **REVISIONS**

NO. DATE

1 06. 07. 2023 REVISED PER 1ST CZP COMMENTS

# PLAN INFORMATION

PROJECT NO. RAV-21002 FILENAME RAV21002-SCM B CHECKED BY DRAWN BY

03. 23. 2023 SHEET

SCALE

**SCM B PLAN VIEW** 

# STORMWATER CONTROL MEASURE 'C' CONSTRUCTION SPECIFICATIONS

# GENERAL NOTES

1. PRIOR TO CONSTRUCTION, ANY DISCREPANCIES IN THE PLANS AND NOTES SHALL BE BROUGHT TO THE DESIGN ENGINEER'S ATTENTION

- THE PROJECT WILL MEET ALL OF THE REQUIREMENTS RELATIVE TO BEST MANAGEMENT PRACTICES AND ENGINEERED STORMWATER
  CONTROL STRUCTURES AS OUTLINED IN THE TOWN OF CHAPEL HILL LAND DEVELOPMENT ORDINANCE. (CHAPTER 4. PART 4.6. LDO)
- 3. THE FINAL CERTIFICATION FOR THIS FACILITY WILL INCLUDE A CERTIFICATION BY THE ON-SITE GEOTECHNICAL ENGINEER THAT THE PROJECT WAS CONSTRUCTED PER THE APPROVED PLANS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE WITH THE ON-SITE GEOTECHNICAL ENGINEER FOR OBSERVATION AND TESTING SUCH THAT THE ON-SITE GEOTECHNICAL ENGINEER CAN CERTIFY THE CONSTRUCTION OF THE DAM EMBANKMENT AND SPILLWAY. THIS CERTIFICATION MUST ADDRESS THE TESTING FOR MATERIALS AND COMPACTION OF THE DAM EMBANKMENT AND SPILLWAY.
- 4. ALL CONSTRUCTION ACTIVITY RELATED TO THE PROPOSED STORMWATER CONTROL MEASURE SHALL BE PER THE DETAILS AND SPECIFICATIONS SHOWN IN THESE DRAWINGS. SOILS, COMPACTION, AND OTHER MISCELLANEOUS DETAILS AND SPECIFICATIONS MAY BE MODIFIED PER THE RECOMMENDATIONS OF THE ON-SITE GEOTECHNICAL ENGINEER. HOWEVER, PRIOR TO IMPLEMENTATION, THE DESIGN ENGINEER SHALL BE NOTIFIED OF ANY DEVIATION FROM THESE DESIGN DRAWINGS, INCLUDING SHOP DRAWINGS FOR ANY PROPOSED
- 5. DURING THE INITIAL STAGES OF CONSTRUCTION, THE STORMWATER CONTROL MEASURE MAY BE USED AS A SEDIMENT BASIN FOR EROSION CONTROL PURPOSES. IF SO, THE CONTRACTOR SHALL FOLLOW THE GENERAL CONSTRUCTION SEQUENCE BELOW:
- A. THE CONTRACTOR SHALL CONSTRUCT THE ENTIRE FACILITY (PERMANENT OUTLET STRUCTURE, DAM, ETC.) WITH THE EXCEPTION OF THE INTERIOR FINE GRADING FOR THE FACILITY. THE INTERIOR FINE GRADING WILL BE CONSTRUCTED ONCE THE EROSION CONTROL PHASE IS COMPLETE.
- PHASE IS COMPLETE.

  B. THE TEMPORARY DRAW DOWN RISER (OR SKIMMER) SHALL BE CONNECTED TO THE PERMANENT 6"Ø DIP DRAIN PIPE.

  C. ONCE THE UPSTREAM DRAINAGE AREA IS STABILIZED AND THE EROSION CONTROL INSPECTOR APPROVES THE REMOVAL OF THE
- BASIN. ALL SEDIMENT, TRASH, ETC. SHALL BE DISPOSED OF PROPERLY (I.E. PLACED IN A LANDFILL) AND NOT STOCKPILED IN AN AREA WHERE WATER QUALITY COULD BE ADVERSELY AFFECTED.

SEDIMENT BASIN, THE CONTRACTOR SHALL REMOVE THE TEMPORARY DRAW DOWN RISER (OR SKIMMER) AND CLEAN OUT THE

- D. ONCE THE BASIN IS CLEANED OUT, AND ALL EROSION CONTROL DEVICES REMOVED, THE CONTRACTOR SHALL CONSTRUCT THE INTERIOR GRADING SHOWN ON THIS SHEET.
   E. ONCE THE GRADING IS COMPLETE, THE CONTRACTOR SHALL REQUEST AN ON-SITE INSPECTION AND AN AS-BUILT SURVEY PRIOR TO
- INSTALLATION OF THE STORMWATER CONTROL MEASURE PLANTS. IF THE CONTRACTOR PLANTS THE PROPOSED VEGETATION PRIOR TO AN AS-BUILT SURVEY (AND SUBSEQUENT APPROVAL), ANY CHANGES TO THE GRADING / RE-PLANTING OF PLANTS WILL BE AT THE CONTRACTOR'S EXPENSE.

  F. ONCE THE ENGINEER HAS APPROVED THE AS-BUILT GRADING, THE CONTRACTOR SHALL PLANT THE PROPOSED STORMWATER
- CONTROL MEASURE PLANTS SHOWN ON THE LANDSCAPE PLAN FOR THE FACILITY. AFTER COMPLETION OF THE PLANTING, THE LANDSCAPE CONTRACTOR SHALL PROVIDE A LETTER TO THE ENGINEER CERTIFYING THAT THE PLANTS HAVE BEEN INSTALLED PER THE APPROVED STORMWATER CONTROL MEASURE PLANTING PLAN.

  ALL OSHA REQUIREMENTS FOR EXCAVATIONS (SHORING, DEPTH, ETC.) ARE THE RESPONSIBILITY OF THE CONTRACTOR. IF REQUIRED, THE
- 6. ALL OSHA REQUIREMENTS FOR EXCAVATIONS (SHORING, DEPTH, ETC.) ARE THE RESPONSIBILITY OF THE CONTRACTOR. IF REQUIRED, THE CONTRACTOR SHALL PROVIDE AN EXCAVATION PLAN TO BE SEALED BY A NC P.E. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE IF AN EXCAVATION PLAN IS REQUIRED. THE JOHN R. MCADAMS COMPANY ASSUMES NO RESPONSIBILITY FOR ANY EXCAVATION DESIGN RELATED TO SAFETY OR OSHA REQUIREMENTS.
- 7. ON-SITE GEOTECHNICAL ENGINEER TO DETERMINE IF IN-SITU SOILS ENCOUNTERED WOULD MAINTAIN A STORMWATER CONTROL MEASURE PERMANENT POOL AT DESIGN ELEVATION. IF HIGHLY PERMEABLE SOILS ARE ENCOUNTERED THAT WOULD NOT MAINTAIN THE PERMANENT POOL ELEVATION AS DESIGNED, A CLAY LINER MAY BE REQUIRED TO MAINTAIN A PERMANENT POOL OF WATER IN THE STORMWATER CONTROL MEASURE. FINAL DETERMINATION IF A CLAY LINER IS NEEDED SHALL BE THE RESPONSIBILITY OF THE ON-SITE GEOTECHNICAL ENGINEER. UPON DETERMINATION OF HIGHLY PERMEABLE SOIL CONDITIONS, ON-SITE GEOTECHNICAL ENGINEER WILL INFORM THE DESIGN ENGINEER AND RECOMMEND LINER SPECIFICATIONS.
- 8. IT IS ANTICIPATED THAT DEWATERING WILL BE NECESSARY IN THE EXCAVATION AREAS (E.G. EMBANKMENT SUB GRADE, INTERIOR PORTIONS OF THE STORMWATER CONTROL MEASURE, KEY TRENCH, ETC.). THEREFORE, THE CONTRACTOR SHALL FURNISH, INSTALL, OPERATE, AND MAINTAIN ANY PUMPING EQUIPMENT, ETC. NEEDED FOR REMOVAL OF WATER FROM VARIOUS PARTS OF THE STORMWATER CONTROL MEASURE SITE. DURING PLACEMENT OF FILL WITHIN THESE AREAS, THE CONTRACTOR SHALL KEEP THE WATER LEVEL BELOW THE BOTTOM OF THE EXCAVATION / CONSTRUCTION AREAS. THE MANNER IN WHICH THE WATER IS REMOVED SHALL BE SUCH THAT THE EXCAVATION BOTTOM AND SIDE SLOPES ARE STABLE, WITH NO SEDIMENT DISCHARGED FROM THE SITE (I.E. PUMPED WATER MAY NEED TO BE DIRECTED TO AN APPROVED EROSION CONTROL DEVICE SUCH AS A DIRT BAG (ACF ENVIRONMENTAL), OR ENGINEER APPROVED EQUIVALENT. PRIOR TO DISCHARGE).
- 9. THE RETAINING WALL ALIGNMENT SHOWN ON THESE PLANS DEPICTS THE LOCATION OF THE FRONT FACE OF THE RETAINING WALL AT THE BOTTOM.
- 10. THE RETAINING WALL IS TO BE A DESIGN-BUILD PROJECT(S) BY THE CONTRACTOR. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN FINAL CONSTRUCTION DRAWINGS FROM A REGISTERED PROFESSIONAL ENGINEER AND GAIN ALL REQUIRED PERMITS NECESSARY FOR THE CONSTRUCTION OF THE RETAINING WALL.
- 11. THE RETAINING WALL SHALL BE ASSUMED TO BE BACKFILLED WITH OFF-SITE BORROW MATERIAL OR PROCESSED FILL UNLESS CONTRACTOR CAN PROVIDE OWNER WITH CONFIRMATION FROM THE GEOTECHNICAL ENGINEER AND THE RETAINING WALL DESIGNER THAT READILY AVAILABLE ON-SITE SOILS CAN BE USED.
- 12. THE TOP AND BOTTOM OF WALL ELEVATIONS SHOWN ON THESE PLANS IDENTIFY FINISHED GRADE ELEVATIONS ONLY. THE EXTENT THAT THE RETAINING WALL WILL BE EXTENDED BELOW GRADE TO THE FOOTING SHALL BE IDENTIFIED ON THE RETAINING WALL CONSTRUCTION DRAWINGS.
- 13. THE ON-SITE GEOTECHNICAL ENGINEER SHOULD BE GIVEN AN OPPORTUNITY TO REVIEW ALL RETAINING WALL PLANS AND DESIGNS RELEVANT TO GEOTECHNICAL CONSIDERATIONS PRIOR TO FINAL DESIGN OF THE WALLS.

# **OUTLET STRUCTURE MATERIAL SPECIFICATIONS**

- THE 24"Ø RCP OUTLET BARREL SHALL BE CLASS III RCP, MODIFIED BELL AND SPIGOT, MEETING THE REQUIREMENTS OF ASTM C76-LATEST. THE PIPES SHALL HAVE CONFINED O-RING RUBBER GASKET JOINTS MEETING ASTM C-443-LATEST. THE PIPE JOINTS SHALL BE TYPE R-4.
- . THE STRUCTURAL DESIGN FOR THE 5 X 5'(INTERNAL DIMENSIONS) RISER BOX WITH EXTENDED BASE SHALL BE BY OTHERS. PRIOR TO ORDERING THE STRUCTURES, THE CONTRACTOR SHALL PROVIDE, TO THE DESIGN ENGINEER FOR REVIEW, SHOP DRAWINGS AND SUPPORTING STRUCTURAL CALCULATIONS SEALED BY A P.E. REGISTERED IN NORTH CAROLINA DEMONSTRATING THE PERTINENT VERTICAL LOADS ARE SUPPORTED BY THE CONCRETE RISER STRUCTURE.
- 3. THE RISER BOX OUTLET STRUCTURE SHALL BE PROVIDED WITH STEPS 16" ON CENTER. STEPS SHALL BE PROVIDED ON THE INNER WALL OF THE RISER BOX. STEPS SHALL BE IN ACCORDANCE WITH NCDOT STD. 840.66. PLEASE REFER TO SHEET CX.XX FOR LOCATION OF THE RISER STEPS. NOTE THE STEPS SHALL LINE UP WITH THE ACCESS HATCH OF THE TRASH RACK.
- 4. THE CONCRETE ANTI-FLOTATION BLOCK SHALL BE CAST-IN-PLACE. STEEL REINFORCEMENT AND CONNECTION TO THE RISER SHALL BE PROVIDED IN ACCORDANCE WITH THE DETAIL ON SHEET C9.XX. THE CONTRACTOR SHALL ENSURE THE WEIGHT OF THE ENTIRE RISER STRUCTURE IS GREATER THAN OR EQUAL TO XX,XXX LBS. IN LIEU OF CAST-IN-PLACE, THE CONTRACTOR MAY OPT FOR A PRECAST ANTI-FLOTATION BLOCK. SHOP DRAWINGS FOR THE PRECAST BLOCK SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW. THE PRECAST ANTI-FLOTATION BLOCK SHALL HAVE A SHIPPING WEIGHT OF XX,XXX LBS.
- 5. THE RISER BOX JOINTS SHALL BE SEALED USING BUTYL RUBBER SEALANT CONFORMING TO ASTM-C990-LATEST. IF NECESSARY, THE CONTRACTOR SHALL INCORPORATE A WATERSTOP INTO THE RISER BOX JOINT TO ENSURE A WATERTIGHT CONNECTION. THE CONTRACTOR SHALL PARGE JOINTS ON BOTH THE INSIDE AND OUTSIDE WITH NON-SHRINK GROUT AND INSTALL GALVANIZED STEEL STRAPS PER DETAIL ON SHEET C9.XX.
- 6. PRIOR TO ORDERING, THE CONTRACTOR SHALL SUBMIT TRASH RACK SHOP DRAWINGS TO THE ENGINEER FOR REVIEW. CONTRACTOR SHALL ENSURE THAT AN ACCESS HATCH IS PROVIDED WITHIN THE TRASH RACK (SEE DETAIL FOR LOCATION) THAT WILL ALLOW FOR FUTURE MAINTENANCE ACCESS. CONTRACTOR SHALL ALSO PROVIDE A CHAIN AND LOCK FOR SECURING THE ACCESS HATCH. NOTE THE ACCESS HATCH SHALL LINE UP WITH THE ACCESS STEPS AFTER INSTALLATION.
- 7. ALL POURED CONCRETE SHALL MEET THE FOLLOWING SPECIFICATIONS UNLESS OTHERWISE NOTED:

-MINIMUM 3000 PSI (28 DAY)

-SLUMP = 3" - 5" -ENTRAINED AIR = 5% - 7%

PLEASE NOTE NO CONCRETE SHALL BE POURED WHEN THE AMBIENT AIR TEMPERATURES ARE EXPECTED TO BE ABOVE 85°F OR BELOW 40°F. CAST-IN-PLACE CONCRETE SHALL BE "WET CURED" AFTER FINISHING FOR A MINIMUM OF 48 HOURS.

ON-SITE GEOTECHNICAL ENGINEER TO ENSURE AND CERTIFY ALL POURED CONCRETE MEETS THE ABOVE SPECIFICATIONS.

- 8. GEOTEXTILE FABRIC FOR THE 24"Ø RCP OUTLET BARREL JOINTS SHALL BE MIRAFI 180N OR ENGINEER APPROVED EQUAL (NON-WOVEN
- 9. STORMWATER CONTROL MEASURE EMERGENCY DRAW DOWN IS VIA AN 6"Ø PLUG VALVE. THE VALVE SHALL BE A M&H STYLE 1820 ECCENTRIC VALVE OR APPROVED EQUAL. THIS VALVE IS IN ACCORDANCE WITH AWWA C-517, AND SHALL BE OPERABLE FROM TOP OF OUTLET STRUCTURE VIA A HAND WHEEL (SEE DETAIL SHEET C9.XX). THE CONTRACTOR SHALL PROVIDE A REMOVABLE VALVE WRENCH WITH A HAND WHEEL ON TOP FOR OPERATION OF THE 6"Ø PLUG VALVE.

# ONSTRUCTION SEQUENCE

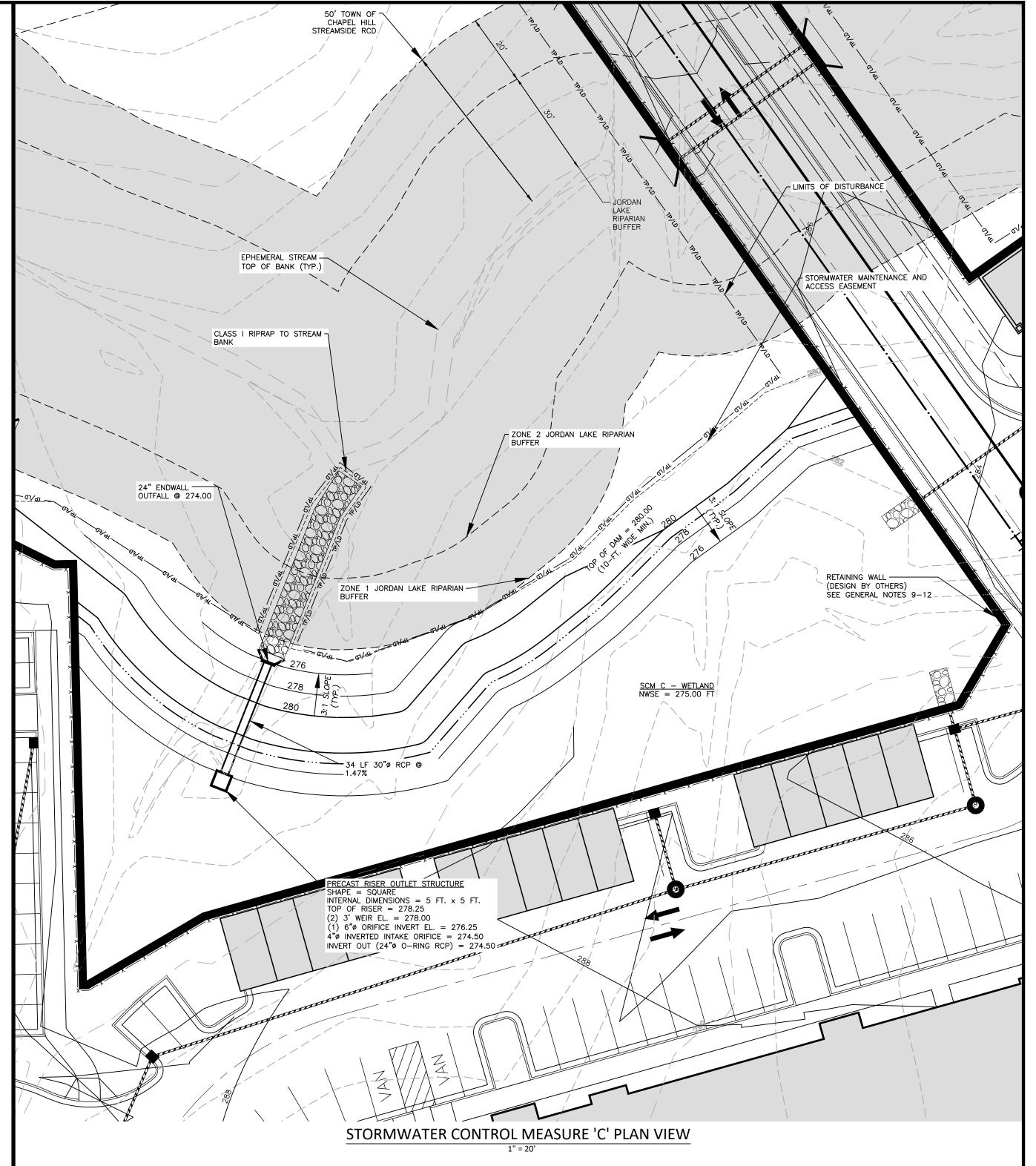
- 1. PRIOR TO CONSTRUCTION, THE OWNER SHALL OBTAIN A LAND DISTURBING (GRADING) PERMIT AND AN "APPROVAL TO CONSTRUCT" FROM THE TOWN OF CHAPEL HILL AND ALL OTHER NECESSARY PERMITS FROM APPLICABLE AGENCIES (E.G. 404 / 401 PERMITS)
- 2. INSTALL ALL SEDIMENT AND EROSION CONTROL MEASURES PER THE APPROVED SEDIMENT AND EROSION CONTROL PLAN. THE CONTRACTOR SHALL MAINTAIN ALL APPROVED SEDIMENT AND EROSION CONTROL MEASURES THROUGHOUT THE ENTIRE PROJECT, AS REQUIRED. THE CONTRACTOR SHALL RECEIVE APPROVAL FROM THE EROSION CONTROL INSPECTOR, AS REQUIRED BY GOVERNING AGENCIES. PRIOR TO ANY CLEARING.
- 3. CLEAR AND GRUB AREA WITHIN THE LIMITS OF THE PROPOSED DAM CONSTRUCTION. ALL TREES AND THEIR ENTIRE ROOT SYSTEMS MUST BE REMOVED FROM THE DAM FOOTPRINT AREA AND BACKFILLED WITH SUITABLE SOIL MATERIAL. THE BACKFILLED AREAS SHALL BE COMPACTED TO THE SAME STANDARDS AS THE DAM EMBANKMENT. THE REMAINING AREA OF THE EMBANKMENT SHALL BE STRIPPED TO A SUITABLE DEPTH AS DIRECTED BY THE ON-SITE GEOTECHNICAL ENGINEER. ANY RESIDUAL SOILS TO BE LEFT IN PLACE MUST BE WELL SCARIFIED TO PROMOTE BONDING OF THE NEW EMBANKMENT FILL. NO EMBANKMENT MATERIAL SHALL BE PLACED FOR THE DAM OR KEY TRENCH UNTIL APPROVAL OF THE DAM SUBGRADE IS OBTAINED FROM THE ON-SITE GEOTECHNICAL ENGINEER.
- 4. EXCAVATE FOR THE NEW KEY TRENCH ALONG THE CENTERLINE OF THE PROPOSED DAM EMBANKMENT. THE TRENCH SHALL EXTEND A MINIMUM OF 5 FT BELOW EXISTING GRADE OR 2 FT BELOW THE 24"Ø RCP OUTLET BARREL AND SHALL HAVE A MINIMUM BOTTOM WIDTH OF 5 FEET. THE KEY TRENCH SIDESLOPES SHALL BE A MINIMUM OF 1:1 (H:V). WHEN EXCAVATING THE KEY TRENCH, IF ANY DEBRIS IS ENCOUNTERED TO AN EXTENT THAT SUCH DEBRIS MAY EXIST IN OTHER INSITU PORTIONS OF THE DAM EMBANKMENT, IT SHOULD ALSO BE REMOVED. THE KEY TRENCH SHALL BE COMPACTED TO THE SAME SPECIFICATION LISTED IN ITEM 4 OF THE SECTION TITLED "BERM AND SOIL COMPACTION SPECIFICATIONS." DEPENDING UPON ON-SITE SOIL CONDITIONS ENCOUNTERED DURING EXCAVATION, THE ON-SITE GEOTECHNICAL ENGINEER MAY VARY THE DEPTH AND DIMENSIONS OF THE KEY TRENCH AS DEEMED NECESSARY. THE ON-SITE GEOTECHNICAL ENGINEER SHALL RETAIN DOCUMENTATION OF ANY VARIATION FOR FUTURE AS-BUILT SUBMITTALS TO THE TOWN OF CHAPEL HILL.
- 5. BEGIN PLACEMENT OF BACKFILL WITHIN THE KEY TRENCH. THE KEY TRENCH SHALL BE COMPACTED TO THE SPECIFICATIONS LISTED ITEM 4 OF THE SECTION TITLED "BERM AND SOIL COMPACTION SPECIFICATIONS." THE KEY TRENCH SHALL BE TESTED PER THE SPECIFICATIONS LISTED IN THAT SECTION.
- 6. PRIOR TO INSTALLATION, SUBGRADE CONDITIONS ALONG THE SPILLWAY PIPES SHOULD BE EVALUATED BY THE ON-SITE GEOTECHNICAL ENGINEER TO ASSESS WHETHER SUITABLE BEARING CONDITIONS EXIST AT THE SUBGRADE LEVEL. SHOULD SOFT OR OTHERWISE UNSUITABLE CONDITIONS BE ENCOUNTERED ALONG THE PIPE ALIGNMENTS, THESE MATERIALS SHOULD BE UNDERCUT AS DIRECTED BY THE GEOTECHNICAL ENGINEER. THE UNDERCUT MATERIALS SHALL BE REPLACED WITH ADEQUATELY COMPACTED STRUCTURAL FILL, LEAN CONCRETE OR FLOWABLE FILL AS DIRECTED BY THE ON-SITE GEOTECHNICAL ENGINEER.
- 7. IN ORDER TO HELP PROTECT THE SOIL SUBGRADE FROM DETERIORATION (DUE TO EXPOSURE, RAINFALL, SEEPAGE, AND RUNOFF) BEFORE THE CRADLE CAN BE POURED, IT IS STRONGLY RECOMMENDED THAT A 3" TO 4" THICK CONCRETE MUD MAT BE POURED OVER THE SUBGRADE ONCE IT IS APPROVED BY THE ON-SITE GEOTECHNICAL ENGINEER. THE MUD MAT WILL ALSO PROVIDE BEARING FOR THE BLOCKS THAT TEMPORARILY SUPPORT THE SPILLWAY PIPE UNTIL THE CRADLE CAN BE POURED. THE METHOD OF BLOCK SUPPORT FOR THE PIPE PROPOSED BY THE CONTRACTOR SHOULD BE SUBMITTED TO THE JOHN R. McADAMS COMPANY FOR REVIEW.
- 8. BEGIN CONSTRUCTION OF THE NEW EMBANKMENT. FILL MATERIALS SHALL BE PLACED IN MAXIMUM 8" THICK LIFTS PRIOR TO COMPACTION, UNLESS DIRECTED OTHERWISE BY THE ON-SITE GEOTECHNICAL ENGINEER. FILL LIFTS SHALL BE CONTINUOUS OVER THE ENTIRE LENGTH OF FILL. IF IT IS NECESSARY, THE EMBANKMENT FILL MATERIAL WILL BE OVERBUILT IN HORIZONTAL LIFTS AND CUT BACK TO FINAL GRADE IN ORDER TO ACHIEVE PROPER COMPACTION.
- AS CONSTRUCTION OF THE EMBANKMENT MOVES FORWARD, IT WILL BE NECESSARY TO INSTALL THE CONCRETE CRADLE. SEE NOTE ON CRADLE DETAIL (SHEET C9.XX). THIS MAY BE CONSTRUCTED USING ONE OF THE FOLLOWING METHODS:
  - A. IF THE PROPOSED STRUCTURAL FILL MATERIAL IS UTILIZED AS THE FORMWORK FOR THE CONCRETE CRADLE, THEN THE STRUCTURAL FILL SHOULD BE INSTALLED AND COMPACTED UP TO THE TOP OF CONCRETE CRADLE ELEVATION. ONCE THE STRUCTURAL FILL REACHES THE NEXT DOWNSTREAM JUNCTION BOX OR HEADWALL AND IS COMPACTED TO THE ELEVATION OF THE TOP OF THE CONCRETE CRADLE, EXCAVATE THE CONCRETE CRADLE TRENCH PER THE PROVIDED DETAILS AND CONSTRUCT THE CONCRETE CRADLE AS PER THE PROVIDED CONCRETE CRADLE DETAIL.
- B. IF THE PROPOSED STRUCTURAL FILL IS NOT UTILIZED AS THE FORMWORK FOR THE CONCRETE CRADLE, THEN PRIOR TO CONSTRUCTING THE STRUCTURAL FILL EMBANKMENT, THE FORMWORK FOR THE CONCRETE CRADLE SHOULD BE INSTALLED ON EXISTING GROUND AND/OR THE MUD MAT. THE CONCRETE CRADLE SHALL BE CONSTRUCTED PER THE PROVIDED DETAILS
- 10. AS AN ALTERNATE TO A CONCRETE CRADLE UNDER THE BARREL PIPE (SEE SHEET C9.XX), THE CONTRACTOR MAY CHOOSE TO ELIMINATE THE CONCRETE CRADLE AND USE COMPACTED BACKFILL IF THE ON-SITE GEOTECHNICAL ENGINEER WILL PROVIDE A NC PE SEALED LETTER CERTIFYING THAT THE COMPACTION UNDER, AROUND, AND ABOVE THE BARREL MEETS THE SPECIFICATIONS OF THE EMBANKMENT COMPACTION REQUIREMENTS AND MOISTURE CONTENT. THIS CERTIFICATION LETTER MUST BE SUBMITTED TO THE DESIGN ENGINEER PRIOR TO BACKFILL. THIS SEPARATE CERTIFICATION MUST BE SPECIFIC TO THE BARREL PIPE FOR THE FACILITY, AND MUST CLEARLY STATE THAT ALL SOIL MATERIAL UNDER, AROUND, AND ABOVE THE BARREL PIPE MEETS THE BERM AND SOIL COMPACTION SPECIFICATIONS ON THIS SHEET. THIS CERTIFICATION IS TO INCLUDE REFERENCE TO BOTH MATERIAL AND COMPACTION, AND MUST STATE THAT ALL MATERIALS UNDER, AROUND, AND ABOVE THE BARREL HAVE BEEN COMPACTED PER THE BERM MATERIAL SPECIFICATIONS (AT LEAST 95% OF MAXIMUM DRY DENSITY USING ASTM D698 STANDARD PROCTOR) WITH NO VOID SPACES PRESENT. THE CONTRACTORS INTENT TO UTILIZE THIS ALTERNATIVE MUST BE STATED PRIOR TO CONSTRUCTION TAKING PLACE. THIS CONTRACTORS CERTIFICATION MUST BE PRESENTED TO THE DESIGN ENGINEER BEFORE AN AS-BUILT CERTIFICATION CAN BE ISSUED FOR THIS FACILITY.
- 11. INSTALL RISER / BARREL ASSEMBLY, ALONG WITH THE EMERGENCY DRAIN SYSTEM. INSTALL 24" RCP OUTLET BARREL SPILLWAY FILTER FROM THE DETAILS SHOWN ON SHEET C9.XX.
- 12. CONSTRUCT EMBANKMENT PER SPECIFICATIONS LISTED IN THE SECTION TITLED "BERM AND SOIL COMPACTION SPECIFICATIONS" AND REQUIREMENTS OF THE ON-SITE GEOTECHNICAL ENGINEER. ALL CHARACTERISTICS OF THE EMBANKMENT FILL MATERIAL SHALL MEET THE STANDARDS SET FORTH IN "BERM AND SOIL COMPACTION SPECIFICATIONS", INCLUDING COMPACTION AND MOISTURE REQUIREMENTS. IF NECESSARY TO ACHIEVE PROPER COMPACTION, THE EMBANKMENT FILL MATERIAL WILL BE OVERBUILT IN HORIZONTAL LIFTS AND CUT BACK TO PROPER FINAL GRADE. ANY HAND COMPACTION ACTIVITIES AROUND SPILLWAY OR DRAIN STRUCTURES SHALL BE CONDUCTED IN 4-INCH LOOSE LIFTS AND BE TO THE SAME COMPACTION AND MOISTURE REQUIREMENTS AS THE ENTIRE EMBANKMENT. ALL COMPACTION AND MOISTURE TESTING SHALL BE CARRIED OUT AS DIRECTED BY THE ON-SITE GEOTECHNICAL ENGINEER AND AS LISTED IN THE SECTION TITLED "BERM AND SOIL COMPACTION SPECIFICATIONS".
- 13. UPON COMPLETION OF DAM EMBANKMENT, PROMPTLY STABILIZE AND SEED DAM EMBANKMENT PER SEEDING SCHEDULE. PERMANENT GROUND COVER SHALL BE ESTABLISHED PER THE PERMANENT SEEDING SCHEDULE FOUND ON SHEET C9.XX.
- 14. SCHEDULE A FINAL AS-BUILT INSPECTION AND AS-BUILT SURVEY WITH THE ENGINEER AND SURVEYOR. AN AS-BUILT INSPECTION AND SURVEY SHALL BE SCHEDULED BEFORE IMPOUNDING WATER IN THE FACILITY AND A MINIMUM OF 60 DAYS PRIOR TO THE ANTICIPATED DATE OF CERTIFICATION APPROVAL. ANY COMMENTS OR DEFICIENCIES IN THE SCM CONSTRUCTION MUST BE CORRECTED TO THE SATISFACTION OF THE ENGINEER AND OWNER BEFORE CERTIFICATION SHALL BE GRANTED.

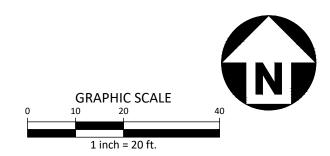
# BERM AND SOIL COMPACTION SPECIFICATIONS

- PRIOR TO CONSTRUCTION, THE ON-SITE GEOTECHNICAL ENGINEER SHALL IDENTIFY BORROW / FILL AREAS AND VERIFY THEIR SUITABILITY FOR USE WITHIN THE DAM EMBANKMENT. ALSO, THE ON-SITE GEOTECHNICAL ENGINEER SHALL PERFORM STANDARD PROCTORS ON THE PROPOSED BORROW MATERIAL TO ENSURE THAT OPTIMUM MOISTURE CONTENT AND COMPACTION CAN BE ACHIEVED / CONTROLLED DURING CONSTRUCTION.
- 2. ALL FILL MATERIALS TO BE USED FOR THE DAM EMBANKMENT SHALL BE TAKEN FROM BORROW AREAS APPROVED BY THE ON-SITE GEOTECHNICAL ENGINEER. THE FILL MATERIAL SHALL BE FREE FROM ROOTS, STUMPS, WOOD, STONES GREATER THAN 6", AND FROZEN OR OTHER OBJECTIONABLE MATERIAL. THE FOLLOWING SOIL TYPES ARE SUITABLE FOR USE AS FILL WITHIN THE DAM EMBANKMENT AND KEY TRENCH: ML AND CL. ALL FILL MATERIALS SHALL BE APPROVED BY THE ONSITE GEOTECHNICAL ENGINEER FOR THE INTENDED USE.
- 3. FILL PLACEMENT FOR THE EMBANKMENT SHALL NOT EXCEED A MAXIMUM 8" LIFT (UNCOMPACTED). EACH LIFT SHALL BE CONTINUOUS FOR THE ENTIRE LENGTH OF EMBANKMENT. BEFORE PLACEMENT OF FILL FOR THE BERM SECTION, ALL UNSUITABLE MATERIAL SHALL BE REMOVED AND THE SURFACE PROPERLY PREPARED FOR FILL PLACEMENT. FILL MATERIAL ADJACENT TO ALL SPILLWAY AND DRAINAGE STRUCTURES SHALL BE PLACED IN 4-INCH (UNCOMPACTED) LIFTS AND HAND-COMPACTED TO THE SAME COMPACTION AND MOISTURE REQUIREMENTS AS THE ENTIRE EMBANKMENT.
- 4. ALL FILL SOILS USED IN THE EMBANKMENT CONSTRUCTION SHALL BE COMPACTED TO AT LEAST 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY (ASTM D-698). THE FILL SOILS SHALL BE COMPACTED AT A MOISTURE CONTENT WITHIN -1 TO +3 PERCENT OF ITS OPTIMUM MOISTURE CONTENT. COMPACTION TESTS SHALL BE PERFORMED BY THE ON-SITE GEOTECHNICAL ENGINEER DURING CONSTRUCTION TO VERIFY THAT THE PROPER COMPACTION LEVEL HAS BEEN REACHED. THE FILL SHOULD BE COMPACTED USING A SHEEPSFOOT TYPE COMPACTOR. IN ORDER TO PREVENT DAMAGE TO THE PIPE, NO COMPACTION EQUIPMENT SHALL CROSS ANY PIPE UNTIL MINIMUM COVER IS ESTABLISHED ALONG THE PIPE.
- 5. THE DESIGN ENGINEER SHALL BE PROVIDED WITH REPORTS AND CERTIFICATION, BY THE ON-SITE GEOTECHNICAL ENGINEER, THAT THE GEOTECHNICAL ASPECTS OF THE FACILITY HAVE BEEN CONSTRUCTED PER PLAN. THIS CERTIFICATION MUST ADDRESS THE TESTING FOR MATERIALS AND COMPACTION OF THE DAM EMBANKMENT AND SPILLWAY. THESE REPORTS AND CERTIFICATION WILL BE NEEDED DURING THE AS-BUILT CERTIFICATION PROCESS FOR THIS STORMWATER CONTROL MEASURE. THEREFORE, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE TESTING AND OBSERVATION WITH THE ON-SITE GEOTECHNICAL ENGINEER.
- TESTING OF THE NEW FILL MATERIALS SHALL BE PERFORMED TO VERIFY THAT THE RECOMMENDED LEVEL OF COMPACTION IS ACHIEVED DURING CONSTRUCTION. THEREFORE, ONE DENSITY TEST SHALL BE PERFORMED FOR EVERY 2,500 SQUARE FEET OF AREA FOR EVERY LIFT OF FILL OR AS RECOMMENDED BY THE ON-SITE GEOTECHNICAL ENGINEER.
- 7. TESTING WILL BE REQUIRED ALONG THE 24"Ø RCP OUTLET BARREL AT A FREQUENCY OF ONE TEST PER 25 LF OF PIPE PER VERTICAL FOOT OF FILL OR AS DIRECTED BY THE ON-SITE GEOTECHNICAL ENGINEER.

# STATEMENT OF RESPONSIBILITY

1. ALL REQUIRED MAINTENANCE AND INSPECTIONS OF THE STORMWATER CONTROL MEASURE SHALL BE THE RESPONSIBILITY OF THE OWNER, PER THE EXECUTED OPERATION AND MAINTENANCE AGREEMENT FOR THIS FACILITY.





SEE SHEET CO.00 FOR ALL PROJECT, SITE, GRADING, STORM DRAINAGE AND UTILITY NOTES

ALL CONSTRUCTION SHALL BE IN
ACCORDANCE WITH THE CURRENT TOWN
OF CHAPEL HILL AND NCDOT ENGINEERING
DESIGN AND CONSTRUCTION STANDARDS

PRELIMINARY DRAWING - NOT RELEASED FOR CONSTRUCTION



McAdams

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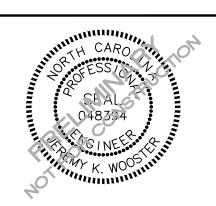
# CLIENT

NORTHWOOD RAVIN 3015 CARRINGTON MILL BLVD, STE 460 MORRISVILLE, NORTH CAROLINA 27560

Adam Golden PHONE: 919. 354. 3680



# HILLMONT NDITIONAL ZONING PERN STANCELL DRIVE



# REVISIONS

NO. DATE

1 06. 07. 2023 REVISED PER 1ST CZP COMMENTS
2

3 4 5

PLAN INFORMATION

PROJECT NO. RAV-21002

FILENAME RAV21002-SCM

CHECKED BY JKW

DRAWN BY ABT

SCALE 1" = 20'

DATE 03. 23. 2023

SHEET

SCM C PLAN VIEW

C9.20