Darlington County Watershed Study
Final Report
Darlington County, South Carolina

Prepared for:

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PLEASE NOTE: Contact SCOR Mitgiation at mitigation@scor.sc.gov
for questions regarding redacted information.

SECTION 1. INTRODUCTION

A. Overview

Darlington County, South Carolina was awarded a U. S. Housing and Urban Development (HUD) Community Development Block Grant – Mitigation (CDBG-MIT) Program through the South Carolina Office of Resilience (SCOR). The grant was to fund a watershed study throughout the county that identifies and addresses the existing and future flooding concerns and issues and develops an implementation strategy for these individual, flood mitigating projects. These conceptual, proposed projects will be considered as part of a grant to develop plans and specifications for construction.

The study also included the municipalities of Darlington, Hartsville, Lamar and Society Hill and as well as the unincorporated areas. The projects areas that were selected for conceptual design were determined from several factors including: Low-and-Moderate Income (LMI), the number of affected residents, and socio-economic variables and potential benefits derived from the conceptual design when compared to estimated construction costs. A benefit-cost analysis will be used as the means to determine the feasibility of the projects, as well as comparison to competing projects in other counties of the state to obtain construction grants.

For Darlington County, four project areas were selected. These included:

- Moses Drive area south of the City of Darlington
- Chestnut Street area inside the City of Darlington
- M L King Drive south of the City of Hartsville
- Sampit Drive area southwest of Lake Robinson

The Sampit Drive area project will be completed after the submission deadline for 2023 of this round of construction projects.

This report documents the findings of the alternative analysis design phase of the project. The alternative analysis consisted of an existing conditions hydrologic/hydraulic (H&H) model and subsequent alternative conceptual designs and associate H&H models to alleviate the flooding problems. Levels of service of each drainage system will be determined for existing conditions and conceptual designs. A level of service is the capacity of the drainage system to drain the stormwater without flooding out of the system.

South Carolina has experienced three disasters that were presidential declarations. Hurricanes Joaquin, Matthew and Florence in 2015, 2016, and 2018, respectively. Most of the damages were a result of extreme rainfall over the area. Many of the communities affected were designated Low to Moderate Income (LMI) areas. Homes that were destroyed by flooding resulted in the homeowners moving out of the area and affecting nearby businesses and the local economy. These impacted

communities needed federal assistance in rebuilding and a stable future from extreme flooding events.

In 2018, HUD notified the State of South Carolina that it would receive an allocation of CDBG-MIT funds, for the specific purpose of mitigation activities in the Most Impacted and Distressed (MID) counties from the 2015 Severe Storm disaster and the Most Impacted and Distressed counties from the 2016 Hurricane Matthew disaster. The study included the inherent academic Social Vulnerability Index (SoVI) considerations associated with Low and - Moderate Income (LMI) communities.

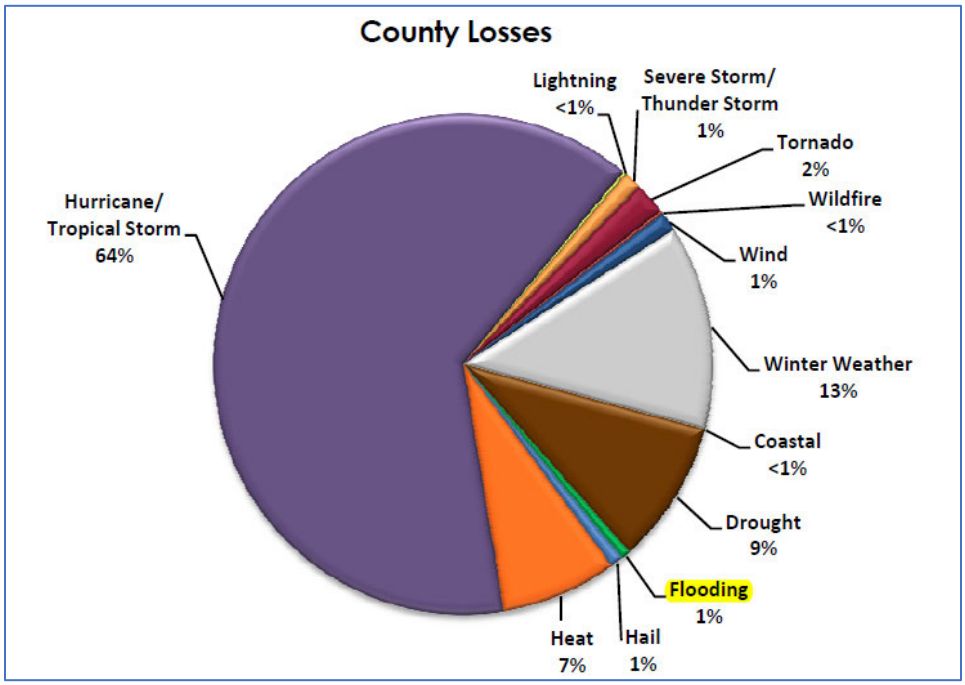
The MID counties included Berkeley, Calhoun, Charleston, Chesterfield, Clarendon, Darlington, Dillon, Dorchester, Florence, Georgetown, Horry, Lee, Darlington, Orangeburg, Sumter, and Williamsburg.

Governor McMaster has by executive order established the South Carolina Floodwater Commission to identify a comprehensive solution and coordinate mitigation efforts because of flooding. The Commission will work to provide solution-based discussions and to identify and implement short-term and long-term recommendations to alleviate and mitigate flood impacts to this State, with emphasis on the coastal and river-based communities.

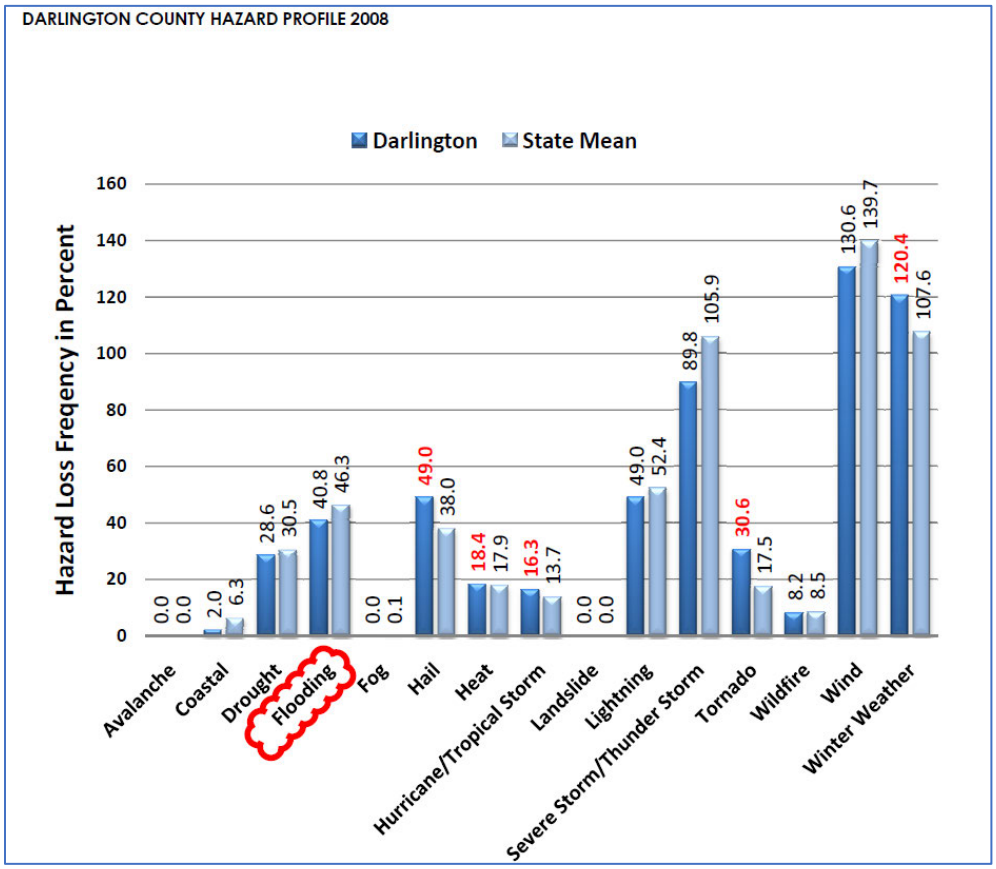
The SC General Assembly in Bill S.259 created the Office of Resilience in 2020. The legislation was enacted as the "Disaster Relief and Resilience Act" and created the S.C. Office of Resilience. The Office is tasked with developing, implementing, and maintaining the Statewide Resilience Plan with a goal of coordinating statewide resilience and disaster recovery efforts with the federal, state, local and non-governmental entities. The legislation also establishes the South Carolina Disaster Relief and Resilience Reserve Fund that will be used to maintain the Statewide Resilience Plan and for disaster relief assistance, hazard mitigation, and infrastructure improvements.

B. **Known Historic Flooding Issues Within the County**

Darlington County has had flooding throughout the county over many years. Once a mostly rural, farm-oriented area with ditches draining the agricultural fields, has now increased urbanization in many of the towns. These ditches were originally an irrigation system for low-lying agricultural fields. However, as the County developed and transitioned from agricultural to dense urban uses, the County no longer relied on agricultural lands and the irrigation systems were rendered obsolete but the many of the ditches were repurposed and used for stormwater management.



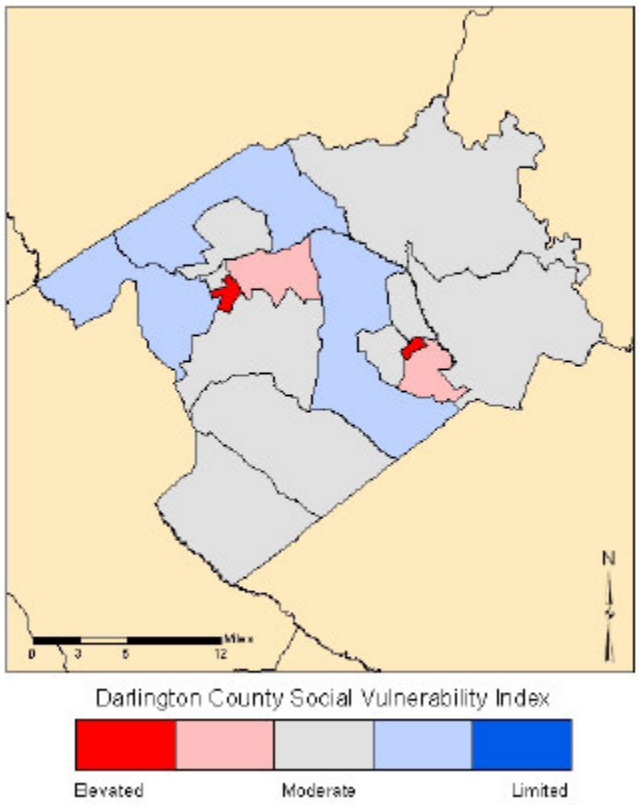
The main conveyance systems in many of the towns within the County were comprised of these ditches. These are still used today with ancillary stormwater systems connecting to these ditches. Most of the significant flooding areas are located within urban settings. These include the Cities of Darlington and Hartsville. These systems were created without using significant engineering principles. This has created a system that does not convey stormwater during less frequency flooding events.



Social Vulnerability

Social vulnerability examines the socioeconomic and demographic character of places and helps to explain the variation in the population's ability to prepare for and respond to hazards. The Social Vulnerability Index (SoVI) is a statistical measure that compares social vulnerability to environmental hazards among places, and then visually displays these comparisons on a map. SoVI thus illustrates where there is uneven capacity for preparedness and response and where additional planning and response resources might be used most effectively to help residents. The variables used in determining the Social Vulnerability (SoVI) score along with how SoVI is calculated are available on the Hazards and Vulnerability Research Institute.

Within Darlington County, most of the census tracts exhibit moderate levels of social vulnerability. *The exceptions are Census tracts in Darlington (city) and in Hartsville, which have high SoVI scores and elevated levels of social vulnerability (see figure below).*



SECTION 2. STUDY BACKGROUND

A. Project Goals and Objectives

The overall project goals and objectives were to provide a comprehensive study that includes conceptual plans, provides levels of service for proposed stormwater conveyance system, and determines the benefit/costs of potential projects. of the county to include input from residents for

B. Coordination with Stakeholders, Regulatory Agencies and Organizations

Coordination with stakeholders included meeting with residents and any affected businesses from flooding events based on questionnaires and field visits. The agencies contacted included SCDOT, SCDHEC, US Corps of Engineers. The City of Darlington's and City of Hartsville's public works and other city departments were contacted. Based on the

C. Design Criteria

The design criteria were taken from SCDOT Requirements of Hydraulic Design Studies Manual, May 2009. In general, the area appears to have local drainage issues. The proposed project will improve conditions but will not fix all the existing drainage issues. The Level of Service relates the classification of the passage of stormwater through the system to a particular flood frequency. In our case, the Level of Service target was the 10-year 24-hour storm event.

Travel lane widths may be 9 feet to 11 feet depending upon the road group type.
For rural roads, provide a minimum 4-foot shoulder or a 6-foot shoulder for Group 4 roads. The shoulder width includes a minimum paved width of 2 feet. Where bicycles are to be accommodated on the shoulder, the designer should provide a minimum paved shoulder width of 4 feet.

In constrained urban areas with low speeds, the shoulder width may be just the 3-foot valley gutter width. The use of curb and gutter and valley gutter sections are common on urban streets to reduce right-of-way requirements.

For specific lane and shoulder width criteria for local roads and streets, see the geometric design tables in Section 14.3.

Freeboard for Road Subgrades - To protect the pavement, it is recommended that road subgrades be 1.0 foot above the design high-water level.

Crossline Pipes - The design discharge for all crossline pipes for primary roads (SC or US designation) and interstate routes is the 50-year peak discharge. For secondary roads, the design discharge for crossline pipes is the 25-year peak discharge. The designer should analyze the 100-year or overtopping flood, whichever is less. This analysis does not change the design criteria.

Storm Drains and Roadside Ditches - The design storm for storm drain systems and roadside ditches is the 10-year storm for drainage areas from 0 to 40 acres, the 25-year storm for drainage areas from 40 to 500 acres, and the 50-year storm for drainage areas greater than 500 acres.

Inlet Spacing - Inlet spacing will be based on the spread criteria in the AASHTO Model Drainage Manual as modified below. For Type 16, 17, and 18 inlets, refer to the Department's website for spacing charts. Recommended maximum spacing is 900 feet and recommended minimum spacing is 150 feet unless specified by the hydraulic design engineer. A 100-foot spacing will be used at sag points to flank the low point in the roadway.

Inlets in grassed medians will be spaced so that the 10-year stormwater level in the median will be below the edge of the shoulder. The maximum inlet spacing will be 750 feet.

Minimum Ditch and Pipe Grades - Minimum grade on ditches, gutters, and pipes in a storm drainage system is recommended to be 0.3 percent where possible. The recommended minimum velocity for the design discharge in a pipe should be 3.0 feet per second. This will promote self-cleaning of the pipe. The controlling factor is velocity rather than grade.

Minimum Pipe Size - Minimum pipe size in storm drainage systems and for crosslines is 18 inches. A 15-inch pipe may be used to connect yard drains to a storm drainage system and for driveway pipes.

Minimum Cover for Pipes - Consideration should be given to the type of inlet or manhole into which the pipe is connecting. For minimum cover requirements refer to SCDOT's Standard Drawings for Road Construction.

The ditch sections and cross pipes could not meet the SCDOT design standards so a waiver may be required from the SCDOT.

Hydrological Criteria

Rainfall and Design Storm Events

Twenty four-hour point rainfall values from the NOAA Atlas 14 (Appendix B) were used in each analysis. This data is available on the web and is an interactive site. The rainfall values are summarized below. The Moses Drive Area and Chestnut St Area used the City of Darlington values. The M. L. King St area used the values from City of Hartsville.

	Average Recurrence Interval, years (24-hr Duration)						
Location	**2-yr**	**10-yr**	**25-yr**	**50-yr**	**100-yr**	**500-yr**	**1000-yr**
City of Darlington	3.54	5.39	6.72	7.89	9.23	13.1	15.1
City of Hartsville	3.52	5.35	6.67	7.84	9.17	13.0	15.1

D. Level of Service

I. Purpose

Most of the stormwater conveyance systems within Darlington County are owned and operated by the S.C. Department of Transportation (SCDOT). The general class of roadways is primary and secondary with primary status given to the larger more traveled routes, i.e., interstates and US highways.

Darlington County only owns, operates, and maintains stormwater conveyance systems (e.g., pipes, ditches, and inlets) on local roads. The level of service for no surge in systems is the 10-year event. However, the designed systems keep flooding out of the drainage systems from the 25-year and beyond in some instances.

In general, the County only owns, operates, and maintains the stormwater system within County right-of-way, properly dedicated easements, or on County-owned property. The County desires to operate and maintain these systems in as efficient a manner as possible.

A Level of Service is a measure of service quality for a particular activity that defines the frequency and type of action desired to maintain operation of the stormwater conveyance system at an acceptable level. The physical assets owned, operated, and maintained by the County for the purpose of storing, conveying, or treating stormwater runoff include pipes, culverts, ditches, inlets and junction boxes, and stormwater control measures.

It should be noted that regardless of the established goals, there will always be circumstances that impact the County's ability to achieve the stated goal. Large storm events, economic downturns, loss of critical County staff, etc. all play a part in the County's ability to achieve a particular goal. The intent of each LOS is to provide direction for the program, assist in budgeting and business planning, and to create a common understanding of program expectations for staff, County leadership, and citizens.

E. OTHER GRANT OPPORTUNITIES

1. FEDERAL GRANT FUNDING SOURCES

US ENVIRONMENTAL PROTECTION AGENCY - Funding is available through the agency's Water Infrastructure Finance and Innovation Act (WIFIA) program and the State Infrastructure Financing Authority (SWIFIA) program. Letters of interest may be submitted and received by EPA any time.

US DEPARTMENT OF INTERIOR – FY23 WaterSMART Environmental Water Resources Projects. Water conservation & efficiency projects that result in quantifiable & sustained water savings & benefit ecological values; water management or infrastructure improvements to mitigate drought-related impacts to ecological values; & watershed management.

EPA Clean Water Act Nonpoint Source Grant (Section 319 Grants)—Congress amended the Clean Water Act in 1987 to establish EPA's Section 319 Nonpoint Source Management Program to provide greater federal leadership in focusing state and local nonpoint source efforts. Under Section 319, states, territories, and Indian tribes receive grant money to support a wide variety of activities, including:

- technical and financial assistance,
- education and training,
- technology transfer,
- demonstration projects, and

- monitoring to assess the success of projects implemented under the grant.

EPA Clean Water State Revolving Fund (CWSRF)—The CWSRF program is a federal-state partnership that provides communities a permanent, independent source of low-cost financing for a wide range of water quality infrastructure projects, including stormwater and green infrastructure.

EPA Environmental Justice Small Grants Program—The Environmental Justice Small Grants Program supports and empowers communities working on solutions to local environmental and public health issues. The program is designed to help communities understand and address exposure to multiple environmental harms and risks. Environmental Justice Small Grants fund projects up to $30,000, depending on the availability of funds in a given year.

EPA Office of Sustainable Communities Greening America's Communities Program—Greening America's Communities is an EPA program to help cities and towns develop an implementable vision of environmentally friendly neighborhoods that incorporate innovative green infrastructure and other sustainable design strategies. EPA provides design assistance to help support sustainable communities that protect the environment, economy, and public health and to inspire local and state leaders to expand this work elsewhere.

EPA Office of Sustainable Communities Building Blocks Program—Building Blocks for Sustainable Communities provides quick, targeted technical assistance to selected communities using a variety of tools that have demonstrated results and widespread application. The purpose of delivering these tools is to stimulate a discussion about growth and development and strengthen local capacity to implement sustainable approaches.

FEMA Building Resilient Infrastructure and Communities (BRIC) program—This program supports states, local communities, tribes and territories as they undertake hazard mitigation projects, reducing the risks they face from disasters and natural hazards.

US Department of Agriculture - Rural Development Water and Environmental Programs (drainage, water, sewer, solid waste). The Rural Utilities Service, through its Water and Environmental Programs, provides financial assistance to eligible public bodies, Indian Tribes and non-profit organizations to construct, enlarge, or improve water, wastewater and solid waste disposal systems in rural areas.

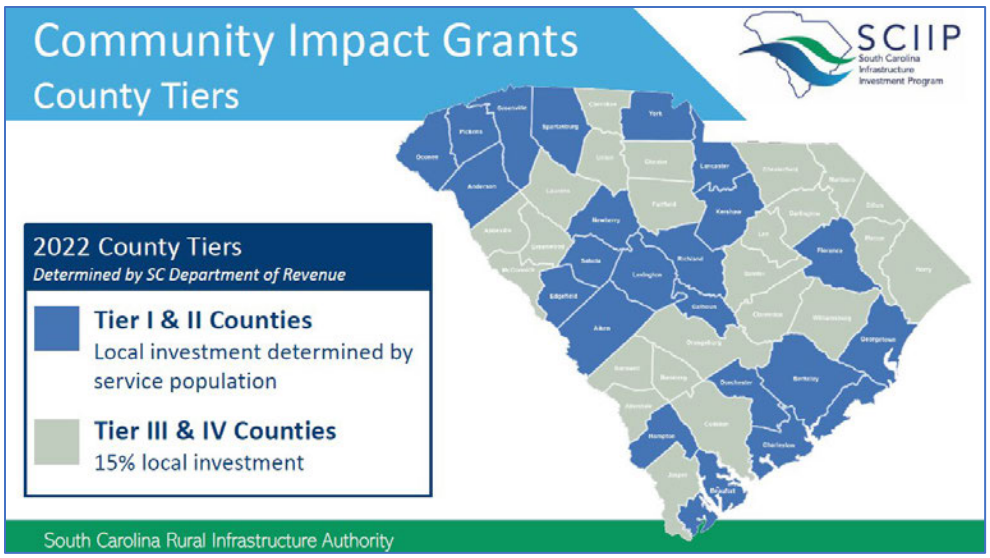
US Department of Commerce - Economic Development Administration - Public Works (publicly owned infrastructure and facilities). Empowers distressed communities to revitalize, expand and upgrade their physical infrastructure to attract new industry, encourage business expansion, diversify local economies, and generate or retain long-term, private sector jobs and investment. All projects are evaluated to determine the extent to which they align with EDA's investment priorities, create or retain high-quality jobs, leverage public and private resources, demonstrate the ability to start the proposed project promptly and use funds quickly and effectively, and provide a clear scope of work and specific, measurable outcomes.

S0UTH CAROLINA INFRASTRUCTURE FUNDING SOURCES

South Carolina Rural Infrastructure Authority (SCRIA)

Grants are offered to assist in the development of reliable infrastructure statewide and increase capacity for economic growth. Financial assistance is made available during two competitive funding rounds annually. Applications are reviewed on a comparative basis with consideration of the relative need, feasibility and impact of each project. Funding decisions are made by the SCRIA's Board of Directors. RIA staff can provide technical assistance to help communities apply for funding to address critical infrastructure needs.

For FY 23 SCRIA will make its state grant dollars primarily available to assist with the SCIIP local investment requirement. Utilities that serve 10,000 people or less may request up to $500,000 of SCRIA state grant funds to be used towards their SCIIP local investment requirement. Such a request may be made using the SCIIP application form.



If available state funds are not fully obligated for SC Infrastructure Investment Program (SCIIP) projects, RIA may consider applications for Emergency or Economic Infrastructure Jobs projects or Regional Feasibility Planning Grants. You may use the FY22 Fall round application for any FY23 Emergencies or Economic/Jobs projects. See below.

Basic Infrastructure/Emergencies Grants

The Basic Infrastructure program is designed to assist communities in complying with environmental quality standards, protecting public health from other environmental concerns or *improving the capacity of existing infrastructure*. Funds may also be used to address infrastructure that has exceeded its useful life and no longer provides quality services.

Projects that require an urgent response to resolve a documented emergency may be submitted at any time for Tier 3 & 4 counties. Consider the following when trying to determine if the project meets the definition of an emergency need: the situation is an imminent threat to the health or environment, urgent or immediate action is required, and finally, no other resources are available to address the situation.

Economic Infrastructure/Jobs Grants

Through the Economic Infrastructure program, funding will help build or enhance local infrastructure to support economic development that will create and retain jobs as well as boost opportunities for future economic impact. Reliable infrastructure benefits both new and existing businesses and puts

1. Regional Solutions - Projects that implement solutions that impact multiple systems
2. Water Quality - Projects that address consent orders, violations or other public health or environmental impacts
3. Resilience and storm protection - Projects that help utilities prepare for emergencies
4. Other aging infrastructure - Projects that upgrade or replace infrastructure that has exceeded its useful life
5. Capacity - Projects that improve service for existing residents while preparing for future opportunities

communities in a position to attract additional investment that will contribute to long-term community sustainability.

SC Infrastructure Investment Program (SCIIP)

The SCIIP is funded by the American Rescue Plan and administered by SCRIA.
The federal American Rescue Plan Act of 2021 (ARPA) directed Coronavirus Fiscal Recovery Funds to both state and local governments as part of a larger effort to combat the effects of the COVID-19 pandemic, including public health and economic impacts. ARPA identifies investments in water, wastewater and stormwater infrastructure as eligible uses of the fiscal recovery funds. In May 2022, the SC General Assembly allocated $900M of these funds to the SC Rural Infrastructure Authority (RIA) for distribution primarily through a competitive grant process.
This funding offers a unique opportunity to make long-term capital improvements that will strengthen critical services to residents and businesses across the state, create more resilient communities and build the capacity to support economic and growth opportunities for the future.

Priority consideration will be given to projects based on a comparative analysis in the following relative order of need:

The deadline to submit a SCIIP grant application is now closed.
The federal expenditure deadline is December 31, 2026.

SC Department of Commerce - Community Development Block Grant Program (CDBG) (water, sewer, drainage, public facilities)- The CDBG Program provides grants for a wide variety of projects from revitalizing neighborhoods to improving community infrastructure, providing public facilities and creating or retaining jobs. The program targets low-to-moderate income areas.

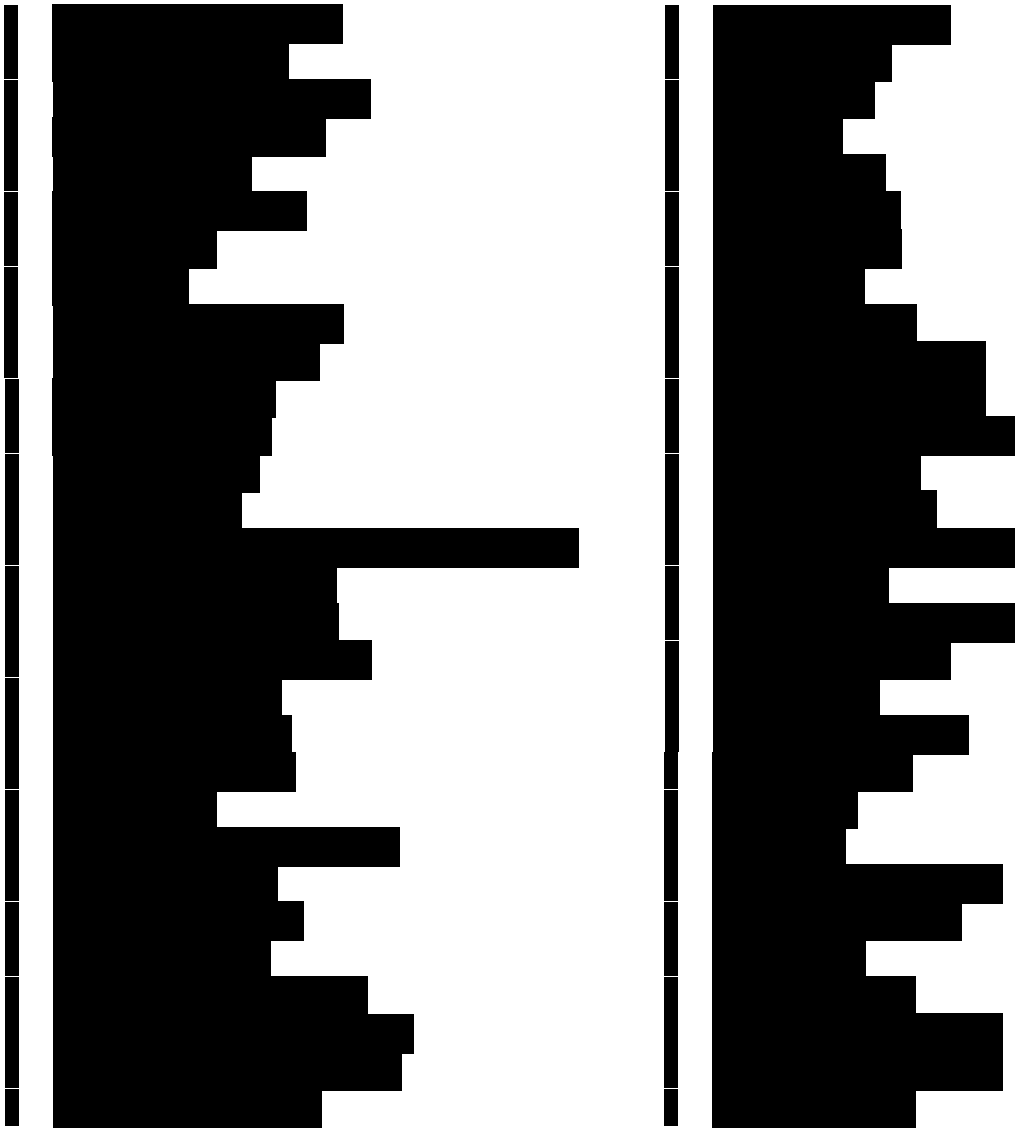
SC Department of Health and Environmental Control (DHEC) - State Revolving Funds (SRF)
Clean Water SRF(sewer, stormwater) Drinking Water SRF. Both SRF programs provide long-term, low-interest loans. The Clean Water SRF finances all types of sewer facilities including treatment plants, collection systems, stormwater improvements for environmental and growth needs, and line relocation for road widening up to 30 years at 1.0% to 2.2%.

SECTION 3. INDIVIDUAL PROJECT AREAS

A comprehensive list of all projects considered was developed based on a matrix scoring criteria using the Low-to-Moderate Income area and/or Urgent Need criteria.

A. Comprehensive List of All Projects Considered

Flooding Locations with City of Darlington address.



Flooding Locations with City of Florence address.

B. Project Prioritization and Matrix and Scoring

Darlington County/City projects considered based on LMI and/Urgent Need.

Flooding Locations	Field Visit Assessment	Type of Solution	LMI or Urgent	Darlington Priority Ranking (L-Low, M-Mod., H-High)	Detailed Map No.	Census Tract and Block Group	LMI%
[redacted]	SCDOT maintenance issue. Roadside ditches and culverts need cleaning. Resident says flooding occurs east of his home along S. Center Rd. Driveway and cross culvert need to be cleaned.	Maintenance	LMI	L	77	115 / 2	55
[redacted]	Flooding in the rear section of a subdivision. Homes are on a slab. Floods from resident's home to and along Lullwater Drive. Approx. 10+ homes. Photos texted. Need further investigation. Flood could be from design.	Design	LMI	M	76	109/4	51
	SCDOT maintenance issue. Roadside ditches and driveway culverts and cross culvert need cleaning. Resident says flooding occurs because of clogged d/s ditch . Resident says cleaning needed.	Maintenance	LMI	M	71	114/3	76
[redacted]	SCDOT maintenance issue. Roadside ditches and driveway culverts and cross culvert need cleaning. Resident says flooding occurs because of clogged d/s ditch . Resident says cleaning needed.	Maintenance	LMI	M	71	114/3	76
[redacted]	SCDOT maintenance issue. Roadside ditches and driveway culverts and cross culvert need cleaning. Resident says flooding occurs because of clogged d/s ditch . Resident says cleaning needed.	Maintenance	LMI	M	71	114/3	76
[redacted]	This area is known as "Black Bottom" per the resident. There has been widespread flooding in the subdivision with water lasting for days before receding. This area might qualify for assistance.	**Buyout / Design**	LMI	H	66	114/3	76
[redacted]	The yard is low and acts as a bowl. There is a litlle ditch in the wooded area in front yard but doesn't appear to have any flow, maybe a field ditch from a long time ago. No contributing water observed, just a low area with no outlet.	Maintenance	LMI	L	68	114/3	76
[redacted]	Icoe Lane acts as a ditch itself draining all the surrounding farmland. There are no field ditches along the road so water has to run down the road to the cross pipe at washout. Large ditch in front of 525 is heavily vegetated and adding to the flooding situation. At a minimum there should be a ditch cut along the field to keep the road from washing out, then maintenance of the ditches. However, this is privately owned land and roads.	Design / Maintenance	LMI	M	42	112/1	53
[redacted]	Same as above	Design / Maintenance	LMI	M	42	112/1	53
[redacted]	Yard is very low and acts as a bowl with the edges of the yard higher than the interior. No way for water to drain off until it ponds high enough. Lot slopes from roadway towards the house. 24" rcp underneath the road at property line is 50% silted in and has standing water in the ditch. Was told neighbors have same issues.	Maintenance	LMI	M	77	115 / 2	55

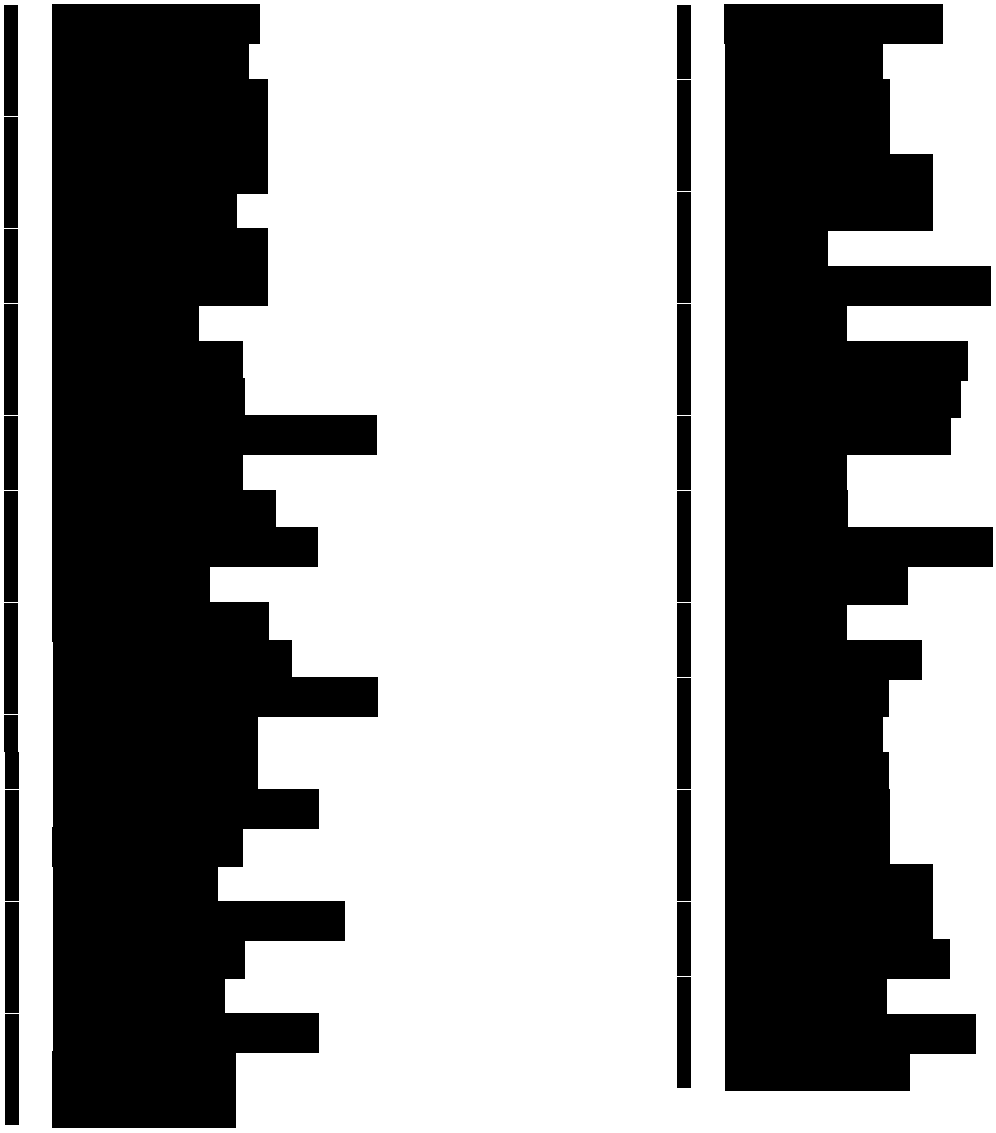
Flooding Locations	Field Visit Assessment	Type of Solution	LMI or Urgent	Darlington Priority Ranking (L-Low, M-Mod., H-High)	Detailed Map No.	Census Tract and Block Group	LMI%
[redacted]	Area is low all around her house, woods line, across the street and at the end of the street. Water appears to run down Flynn and fan out at the end of the road in her yard and across the street. No ditching is present. Area at woods line drops off into the woods so it seems the water wouild drain into the woods, unless the woods are flooded in these rain events preventing runoff into them. Maybe adding gutter or ditches.	Design	LMI	L to M	60	112/2	53
Chestnut Street between South Main Street and Dargan Street	Road is flat and has a low point near his house. There is a drainage system at the low point with inlets on both side in asphalt curbing. Drainage system may be clogged and/or undersized. Water noticed standing in one inlet at corner of Chestnut and Dargan with the outlet pipe submerged and 50% sitled in.	Design/Maintenance	LMI	L to M	54	114/2	74
Chestnut Street between South Main Street and Dargan Street	Information in spreadsheet alluded to same conern as Winfred Herrington.	Maintenance	LMI	M	54	114/2	74
[redacted]	875 Indian Branch - yard is low and bowl shaped. Evidence of ponding water seen in multiple places in yard, especially front right area. No roadway ditches present. Appears to collect water from 1074 West McIver and maybe other properties. Low area with nowhere to go.	Design/Maintenance	LMI	L	59	112/4	54
[redacted]	Investigated site. Large ditch behind trucking company appeared to have been recently cleaned out. Banks were mowed and no observed debris was in the ditch the entire length. Piles of debris were seen on the land adjacent to the ditch that could have possibly been removed from the ditch. Auction Ave was used to investigate the ditch.	Maintenance	LMI	L	62	114/3	76
[redacted]	The home is located at the end of the street. The yard is low and low around the shed as well. Road ditch was observed flowing towrds his house in the field. The road ditch has no outlet at the end and appears should be flowing to the large ditch in the oppostie direction. A regrade towards the large ditch would be recommended. There is a smaller ditch in the tree line along the prperty line but does not appear to carry any water, yard is lower than top of bank.	Design/Maintenance	LMI	M	64	114/3	76
[redacted]	Yard is flat and drians towards the back of the house. Ditch and pipe was found in the woods but pipe was underneath lots of debris and was not uncovered. Ditch seemed to be functioning, pipe should be cleaned out.	Maintenance	LMI	L	57	114/2	74
[redacted]	Yard is low and flat. No ditching along the road, drainage system is very deep and doesn't appear to capture much roadway runoff. The house has a pronounced drip line from the roof which is causing water to accumulate around the house due to no gutter system. Does not appear any offsite area is contributing to the flooding.	Design/Maintenance	LMI	L / M	56	111/2	68

Flooding Locations	Field Visit Assessment	Type of Solution	LMI or Urgent	Darlington Priority Ranking (L-Low, M-Mod., H-High)	Detailed Map No.	Census Tract and Block Group	LMI%
[redacted]	36" rcp underneath the road has flowing water in the channel and evidence of roadway overtopping. Top of plastic pipe was found in outlet ditch, could not uncover but could be homemade pipe. Very silted in at the outlet ditch and soft sand. Water flowing into system must be traveling underground somewhere. Original ditch should be put back or at least homemade pipe dug up and sized correctly. SIte appears to have a large DA and flooding a major issue for adjacent owners.	Design / Maintenance	Urgent Need	H	40	110/2	39
[redacted]	Ditch along roadway relatively clean, drive pipes half silted in but not too bad. Rental house yards and vacant lot next to them are low and appear to trap water. Land from the ditch and woodsline slope to yard where it ponds. Area is low.	Maintenance	LMI	L	67	114/3	76
[redacted]	Yard is low and appears lower than the ditches along the roadway. Ditch along road looks to have a high point/blockage before it ties to the large ditch towards 401 which could be causing water to back up. The rolled ashpalt curb is supposed to drain to a DI on a cross pipe in a ditch behind his house. There is a low spot near his driveway where the water runs instead of flowing down. Local resident told property owner the road has sunken since it was built causing the low spot. Ditch running behind his house is silted in and DI's on both side of the road are blocked and need to be cleaned out.	Design / Maintenance	LMI	L /M	39	112/1	53
S. Main St@ E. Broad St	Area floods routinely with low area at Russell St and E. Broad St. and S. Main and E. Broad St. Drainage system needs redesign.	Design	LMI	H	53	111/1	51
Race Track Rd at bridge	Visited bridge. Water level was very high with possibly a beaver dam approximately 100' from upstream face. Water was close to low chord, bridge probably overtops regularly.	None	LMI	- -	58	112/4	54
[redacted]	The pipe underneath the road is a 24" rcp that ties to a broken DI in valley ditch area. Pipe leaving the DI is a 15" terra cota pipe in very poor shape. The pipe has been dug up in two places and has a round hole cut into the top to act as an inlet to help with the standing water. At the outlet of the 15" the channel in very incised and had flowig water at the time of the visit. the outlet pipe has broken off and is very deteriorated. Sink holes are present in the back yard probably due to seperated pipe underground. Drainage system is undersized and in extremely poor condition. Area stays wet and exposed pipe and broken/damaged inlets are a hazard.	Design / Maintenance	Urgent Need	H	47	114/4	29
[redacted]	There is a drainage system coming down road but no ditching to channel water into system. Her house is at the end of the line where all the water runs. Pipe in ditch at back property line is clogged. Water runs into her yard instead of down ditches. Entire area floods regularly. Top of DI beside driveway is broken and open and hazardous..	Buyout / Design / Maintenance. Widespread issue	LMI	H	55	114/2	74

Flooding Locations	Field Visit Assessment	Type of Solution	LMI or Urgent	Darlington Priority Ranking (L-Low, M-Mod., H-High)	Detailed Map No.	Census Tract and Block Group	LMI%
[redacted]	Yard is flat and at an intersection. There are 2 DI's in the street in front of her house that have standing water in them. They connect to a drainage system in front of the school across the street from her. All the DI's have standing water in them and appear to be clogged. Could be blind JB's in this system that are clogged and a few DI's are damaged as well.	Maintenance	LMI	M	57	114/2	74
[redacted]	Yard is very low and acts as a bowl with the edges of the yard higher than the interior. Lot slopes from roadway towards the house and loop driveway acts like a dam holding water in the front yard and around the house. Roadway ditches look ok and drive pipes mostly clean. Septic system was being repaired during visit. Water has nowhere to go during heavy rains and sits around house and yard. Unsure if ditching would help.	Design / Maintenance	LMI	M	28	109/2	54
[redacted]	Her home is the last property before the ditch goes under Pineforest. Yard is very low on the right side and middle of property. 36" rcp under the road is 50% silted in and outlet ditch not very defined and is heavily wooded. Water appears to pond on upstream side and back up into her yard. Pipe needs to be cleaned out and outlet channel regraded to promote positive flow.	Buyout / Design / Maintenance	Urgent Need	H	32	113/1	27
[redacted]	Roadway ditches along both roads look ok, some growth but still functioning. Issue appears to be the outfall ditch adjacent to James Gibson's house and beyond. The ditch is heavliy overgrown and looks to have a large drainage area. Resident claims a property owner downstream filled in the ditch to make a driveway which has backed up the water at these locations. An attempt was made to locate the blockage but could not pinpoint the actual location of the homeowner. Water has been in residents homes and garages multiple times and does not flow.	Design / Maintenance	LMI	H		109/2	54
[redacted]	Site had no apparent flooding issues. Back of house is used for car storage and was a little muddy, no grass established. Land fell off behind house in wooded area, no surrounding properties appeared to have flooding issues.	Maintenance	LMI	L	100	112/1	53
[redacted]	Yard is flat and slopes from road towards home. Evidence of standing water in places around home. Could not assess condition underneath the house or settling. Road ditches are somewhat clean but should be cleaned out, dirve pipes are 80% sitled in.	Maintenance	LMI	M	99	109/2	54
[redacted]	Area around home and back yard is low and appears to have a bowl shape with the sides of the lot being higher than interior causing water to pond in heavy rains. Unable to determine where roadway ditches flow but do need cleaning out as well as dirve pipes and cross culverts.	Maintenance	LMI	L / M	71	114/3	76
[redacted]	Home looks deserted. Area is low with a ditch across the street with standing water in it. Another resident very close by reported flooding issues across the road from this site.	Maintenance	LMI	M	106	114/2	74

Flooding Locations	Field Visit Assessment	Type of Solution	LMI or Urgent	Darlington Priority Ranking (L-Low, M-Mod., H-High)	Detailed Map No.	Census Tract and Block Group	LMI%
[redacted]	Streets do not have ditching or pipe networks, yard slopes towards house and house is lower than surrounding yard.	Maintenance	LMI	L / M	55	114/2	74
[redacted]	Wooded area across the road was very wet, ditches full and stagnat water. The ditches should flow somewhere but do not. All neighbors in this area have similar complaints. Outlet should be identified where water should be draining, it could be along 52 near the Ford dealership but hard to determine. No existing ditches or pipes around this area.	Design / Maintenance	LMI	M / H	106	114/2	74
[redacted]	Yard is low and house is lower than perimeter of the yard. Very large ditch in the back is overgrown and is the main outfall channel for what appears to be a large drainage area. Field and surrounding yards flood in major storm events.	Maintenance	LMI	M	104	112/4	54

Flooding Locations with a City of Hartsville Address.

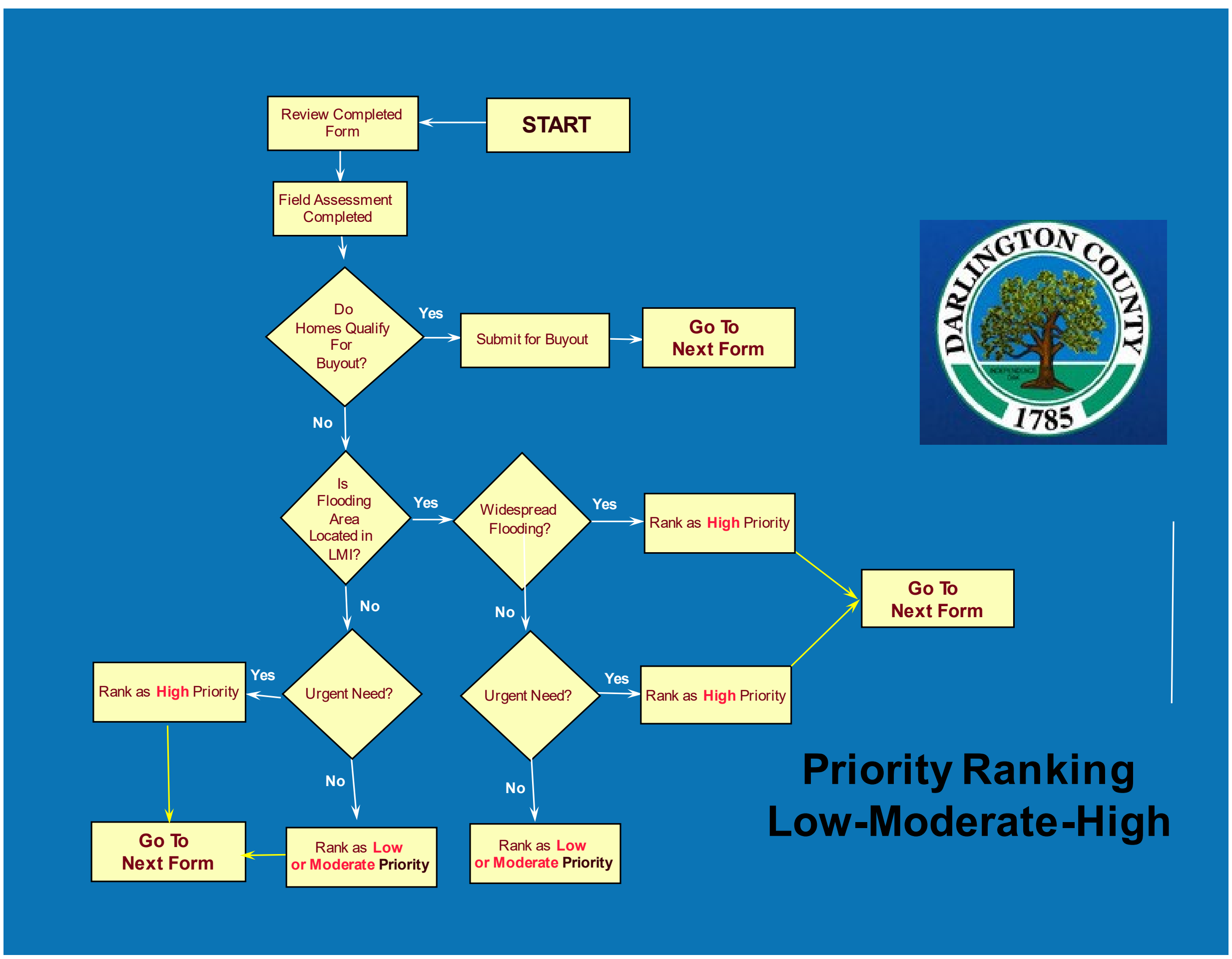


Flooding locations with a Town of McBee address.

Flooding Locations	Field Visit Assessment	Type of Solution	LMI or Urgent Need	Hartsville Priority Ranking (L-Low, M-Med, H-High)	Detailed Map No.	Census Tract and Block Group	LMI %
[redacted]	No visible outlet below (south) of John St. Ditch located north of John Street that flows eastward under Patrick Hwy was recently widened. This widened ditch ultimately flows under Antioch Rd and N. 5th St (US 15) into Black Creek. Property has flooded many times in the past prior to recent ditch widening.	Buyout / Design	Urgent Need	H	9	103 BG4	46.1
[redacted]	These locations are the same investigate for 1240 Patrick Hwy.	See 1240 Patrick Hwy	Urgent Need	H	--	103 BG4	46.1
[redacted]	Drainage system needs replacing. Ditch behind residents along Kenwoods flood during heavy rainfall. Also, runoff from west side of Kenwood enters area also. Outfall of ditch to Sonoco Rd needs investigation to determine capacity. Resident's crawl space & HVAC gets damaged.	Buyout / Design	Urgent Need	H	11	106 BG1	42.7
[redacted]	Drainage system needs replacing. Ditch behind residents along Kenwoods flood during heavy rainfall. Also, runoff from west side of Kenwood enters area also. Outfall of ditch to Sonoco Rd needs investigation to determine capacity.	Design	Urgent Need	H	11	106 BG1	42.7
In front of Hartsville High School, Marlboro Ave, and Carolina Elementary School	Large Ditch system along Lewellen Ave needs cleaning and maintenance. Water backs up at clogged culvert at entrance to cemetary at sharp corner of road.	Maintenance	--	H	15	105 BG1	38.4
[redacted]	Valley gutter section along roadway need to be larger and more inlets needed to intercept drainage flowing to low point at 626 6th St.	Design	LMI	M	22	107 BG1	65.1
Butler St	Drainage system needs to be designed and contructed on the east side of 8th Ave. for this entire area.	Design	LMI	H	16	107 BG1	65.1
[redacted]		Maintenance	LMI	M	16	107 BG2	76.3
Carter Dr		--	LMI	M		107 BG2	76.3
E. Chaplin Circle		--	LMI	M		107 BG1	65.1
[redacted]	Side ditches needs trees removed and cleaned.	Maintenance	LMI	M	20	107 BG2	76.3

Flooding Locations	Field Visit Assessment	Type of Solution	LMI or Urgent Need	Hartsville Priority Ranking (L-Low, M-Med, H-High)	Detailed Map No.	Census Tract and Block Group	LMI %
MLK Drive and Russell Road Properties	Ditches behind residents on MLK Blvd need to be cleaned and drainage system designed. Ditch that runs parallel to MLK Blvd needs to be graded to have positive flow toward Marion Ave.	Design	LMI	H	21	107 BG2	76.3
[redacted]	Ditches behind residents on MLK Blvd need to be cleaned and drainage system designed. Ditch that runs parallel to MLK Blvd needs to be graded to have positive flow toward Marion Ave.	Design	LMI	H	21	107 BG2	76.3
[redacted]	Ditches behind residents on MLK Blvd need to be cleaned and drainage system designed. Ditch that runs parallel to MLK Blvd needs to be graded to have positive flow toward Marion Ave.	Design	LMI	H	21	107 BG2	76.3
1415 Martin Luther King Dr	Ditches behind residents on MLK Blvd need to be cleaned and drainage system designed. Ditch that runs parallel to MLK Blvd needs to be graded to have positive flow toward Marion Ave.	Design	LMI	H	21	107 BG2	76.3
[redacted]	Water flows from airport and floods across road during moderate rainall. This is a safety hazard that needs immediate attention. Cross culvert under Whippoorwill Rd is too small. Downstream extention of culvert has collapsed or separated in several areas. This extention goes to back of parcel and discharges into woods and travels to Oak Hill Ct. Airport detention area may not be operating properly.	Design	Urgent Need	H	4	102 BG2	25.5
[redacted]	Ditches and culverts need to be cleaned. There could be an obstruction downstream causing the flooding. Home gets water underneath.	Design / Maintenance	LMI	H		106 BG2	60.9
[redacted]	Large amount of runoff flows into this area. Much of it comes from Hwy 151 and the storage units. There does not appear to be an outlet and water ponds in homes and yards. Recommend Buyouts for those home that flood.	Design	Urgent Need	H	--	104 BG3	17.6
[redacted]	Large amount of runoff flows into this area. Much of it comes from Hwy 151 and the storage units. There does not appear to be an outlet and water ponds in homes and yards. Recommend Buyouts for those home that flood.	Buyout / Design	Urgent Need	H	--	104 BG3	17.6
[redacted]	No drainage system in neighborhood. Water ponds in yard during heavy rains and stays for hours. Residents are trapped because of flood waters.	Design	Urgent Need	H	114a	102 BG1	34.1
[redacted]	No drainage system in neighborhood. Water ponds in yard during heavy rains and stays for hours. Residents are trapped because of flood waters.	Design	Urgent Need	H	114a	102 BG1	34.1
[redacted]	No drainage system in neighborhood. Water ponds in yard during heavy rains and stays for hours. Residents are trapped because of flood waters.	Design	Urgent Need	H	114a	102 BG1	34.1

Flooding Locations	Field Visit Assessment	Type of Solution	LMI or Urgent Need	Hartsville Priority Ranking (L-Low, M-Med, H-High)	Detailed Map No.	Census Tract and Block Group	LMI %
[redacted]	No visible outlet below (south) of John St. Ditch located north of John Street that flows eastward under Patrick Hwy was recently widened. This widened ditch ultimately flows under Antioch Rd and N. 5th St (US 15) into Black Creek.	Design	Urgent Need	H		103 BG4	46.1
[redacted]	No visible outlet below (south) of John St. Ditch located north of John Street that flows eastward under Patrick Hwy was recently widened. This widened ditch ultimately flows under Antioch Rd and N. 5th St (US 15) into Black Creek.	Design	Urgent Need	H		103 BG4	46.1
[redacted]	No visible outlet below (south) of John St. Ditch located north of John Street that flows eastward under Patrick Hwy was recently widened. This widened ditch ultimately flows under Antioch Rd and N. 5th St (US 15) into Black Creek.	Design	Urgent Need	H		103 BG4	46.1
[redacted]	No visible outlet below (south) of John St. Ditch located north of John Street that flows eastward under Patrick Hwy was recently widened. This widened ditch ultimately flows under Antioch Rd and N. 5th St (US 15) into Black Creek.	Buyout / Design	Urgent Need	H		103 BG4	46.1



C. ALTERNATIVE ANALYSES

The alternative analysis was carried out by creating several scenarios for each study area: Moses Drive, Chestnut Street and M. L. King Drive. Since these areas are nearly at buildout conditions, no future analysis was conducted. There were several ditches in each of the areas that could be converted to pipes but every effort was taken to keep as many ditches open to achieve "green" infrastructure improvements and water quality benefits. The ditches can be lined with a geo-fabric for long-term stabilization (resilient) and ease of maintenance. Pipes with limited slopes tend to clog if velocity is under 3 fps.

The alternative selection criteria were set by using the SCDOT criteria for secondary roads since many if not most roads in the County are owned and operated by the SCDOT. The ditches and culverts were sized to attempt to convey the 10-year storm event. The SCDOT criteria requires roadway cross pipes to convey the 25-year storm event. However, it would not be feasible to meet that criteria for MLK and Moses Drive areas. The storm-drain pipes and ditches were sized to try to keep the 10-year hydraulic grade line below the crown of the pipe or top of bank; however, this criteria were not met for each case. The system did not flood but was under surcharge effect. The storm drain system does not have capacity for storm events greater than the 10-year event. Designing system beyond the 10-year event would be too costly and require much more right-of-way.

The storm drain system was evaluated using the PCSWMM computer model updated in 2022. Structure losses were calculated using the HEC-22 Second Edition method. The storm drain system will convey both the runoff from the ditches as well as sheet flow from the proposed roadway.

The rain gardens and infiltration pond capacity were designed to hold and infiltrate the runoff from the 10-year proposed conditions so that the improvements would not adversely impact the downstream area.

The 2-, 10-, 25-, 50- and 100-year 24-hour storm events were used in the PCSWMM model to determine the effects of flooding. In all cases in each area, the existing systems could not pass the two event without flooding out of the system. Various scenarios were considered using engineering judgement, constructability and potential permitting requirements. For example, several sites within each study area had an existing ditch along a home or roadway to alleviate the concentrated flow in one pipe. The situation was reviewed to see if piping the ditch was a better method of conveying stormwater. While the piped system may operate sufficiently, it would be more expensive and provide less water quality. However, it could be more aesthetically pleasing to have the system piped between homes and provide a level of safety if small children are present.

Procedure

Each project area was divided into separate subcatchment to account for multiple discharge points into the drainage model. Subcatchment parameters were obtained from various sources that included the soil data captured from the NRCS Websoil Survey and Subcatchments were delineated within the

PCSWMM model using the contour elevations from the most recent LIDAR data. A contour layer was developed within PCSWMM to draw the subcatchments for each discharge point in the model. Using the export feature in the model, subcatchments were exported to shapefiles and then imported into Websoil survey website to obtain the exact area for each subcatchment. Composite curve numbers were developed for each subcatchment based on approximate percentages of each soil type and land use.

The time of concentration, Tc was measured from each subcatchment from the farthest point to the discharge point in the model. The slope was measured and used as part of the calculation of the Tc.

The SCS lag equation was used to compute Tc in the model for each subcatchment.

Lag (hrs) = L^0.8((1000/CN-10)+1)^0.7/1900Y^0.5
Tc (min) = Lag * 1.67 *60

The PCSWMM model has an option to allows the user to compute Tc by the SCS method. A spreadsheet was developed to calculate the composite CN, slope and Tc (as a check) for each subcatchment and is included in the appendix.

Two of the study areas (Moses and MLK) included only ditches and secondary road cross pipes for the drainage system. The Chestnut area was in an urban setting and had a closed drainage system. Nesbitt Surveying provided the data for pipes and ditches along with ELR surveyors. The inlets tops required assistance from the City of Darlington for the Chestnut Street Area. This was to lift off the tops because of the difficult access to get invert, size and type of the pipes.

The ditches and culverts were sized to attempt to convey the 10-year storm event. The SCDOT criteria requires roadway cross pipes to convey the 25-year storm event. However, it would not be feasible to meet that criteria for MLK and Moses Drive areas. The storm-drain pipes and ditches were sized to try to keep the 10-year hydraulic grade line below the crown of the pipe or top of bank; however, this criteria were not met for each case. The storm drain system does not have capacity for storm events greater than the 10-year event. It should be noted that the baseline design criteria were the 10-year event, lower frequency storm events (25-, 50-, and 100-year) safely passed through the proposed drainage system without significant flooding in all project areas.

The storm drain system was evaluated using the PCSWMM computer model updated in 2022. Structure losses were calculated using the HEC-22 Second Edition method. The storm drain system will convey both the runoff from the ditches as well as sheet flow from the proposed roadway.

The rain gardens and infiltration pond capacity were designed to hold and infiltrate the runoff from the 10-year proposed conditions so that the improvements would not adversely impact the downstream area.

D. Recommended Project List

The recommended project list was developed with the input from SCOR and the County. These were selected from the total list previously shown above. They were selected for conceptual design for submittal to FEMA for a follow-up construction grant.

They include:

- Moses Drive Area – Located just south of the City of Darlington
- Chestnut Street Area – Located within City Limits of Darlington
- ML King Drive Area – Located just south of the City of Hartsville
- Sampit Drive Area – (This study will be included in the next rounds of construction grant submittals next year (2024)

Level of Service

The results of the proposed conditions show a markedly improved drainage system. The proposed conceptual design safely passes a 10-yr design frequency storm for the achieved Level of Service. The conceptual design also reduces the peak flows and flooding for the less frequent storm events (25-,100-year design storms). PCSWMM output for the 10-year proposed scenario is shown in Appendix D.

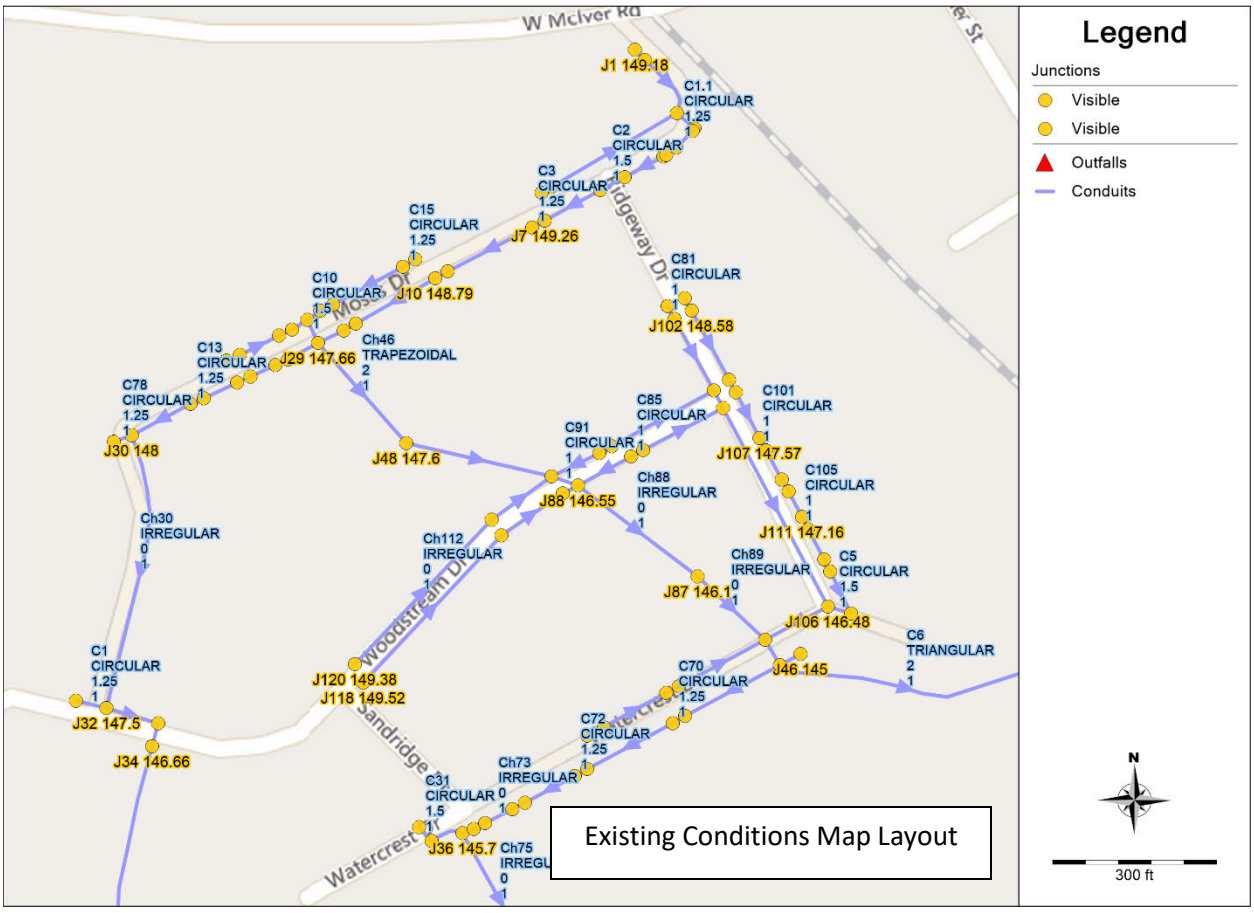
The PCSWMM models are included in a separate zipped file along with other input data.

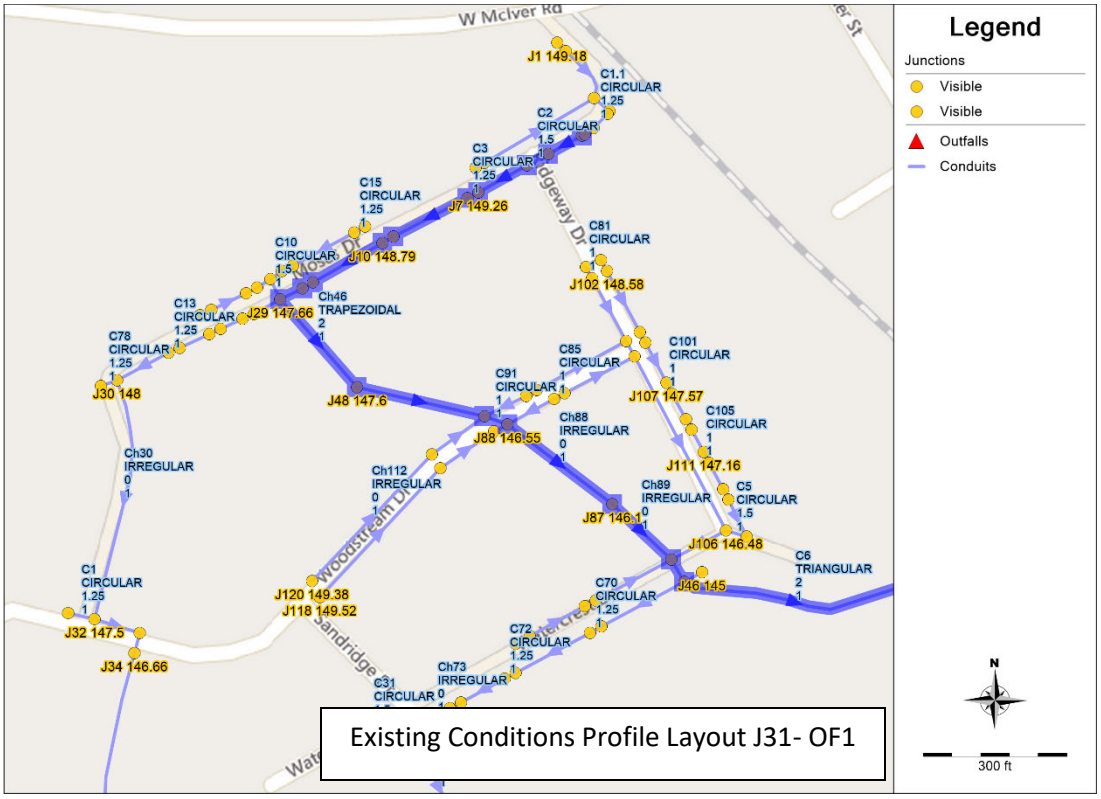
Moses Drive Area

Existing and Proposed Conditions

The Moses Drive Area consists of Moses, Ridgeway, Sandridge, Watercrest and Woodstream Drives. Major flooding was reported in this area. Woodstream Drive extends further south and dead ends near the creek. There is only one entrance to the Moses Drive area which adds to the emergency during a flood. There is no other evacuation route and emergency vehicles are hampered by the floodwaters. The existing conditions for the drainage system show that it floods even at the 2-year storm event.

Ditches sections are located on each side of the roads and receive sheet flow from property and the roadways. The existing system has inverted slopes though pipes and some ditches are perched. The field survey and PCSWMM model confirmed the two resident locations that were noted in the questionnaire forms as flooding had driveway culverts that were below the other inverts in the drainage system. This condition not only flooded those residents but also backed up the drainage system and flooded surrounding areas. There are two outfalls for the Moses Drive Chestnut Street Area. The east outfall discharges near the railroad tracks. The south outfall discharged toward the stream.




Legend
Junctions
Visible
Visible
Outfalls
Conduits
W McIver Rd
Ridgeway Dr
Woodstream Dr
Sandridge
J1 149.18
C1.1 CIRCULAR 1.25
C2 CIRCULAR 1.5
C3 CIRCULAR 1.25
C15 CIRCULAR 1.25
J7 149.26
C10 CIRCULAR 1.5
J10 148.79
C81 CIRCULAR
J102 148.58
C13 CIRCULAR 1.25
J29 147.66
Ch46 TRAPEZOIDAL
C78 CIRCULAR 1.25
J30 148
J48 147.6
C85 CIRCULAR
C101 CIRCULAR
J107 147.57
C91 CIRCULAR
Ch88 IRREGULAR
J88 146.55
C105 CIRCULAR
J111 147.16
Ch30 IRREGULAR
Ch112 IRREGULAR
Ch89 IRREGULAR
C5 CIRCULAR 1.5
J87 146.1
J106 146.48
C6 TRIANGULAR
J46 145
C1 CIRCULAR 1.25
J120 149.38
J118 149.52
C70 CIRCULAR 1.25
J32 147.5
J34 146.66
C72 CIRCULAR 1.25
Ch73 IRREGULAR
C31 CIRCULAR
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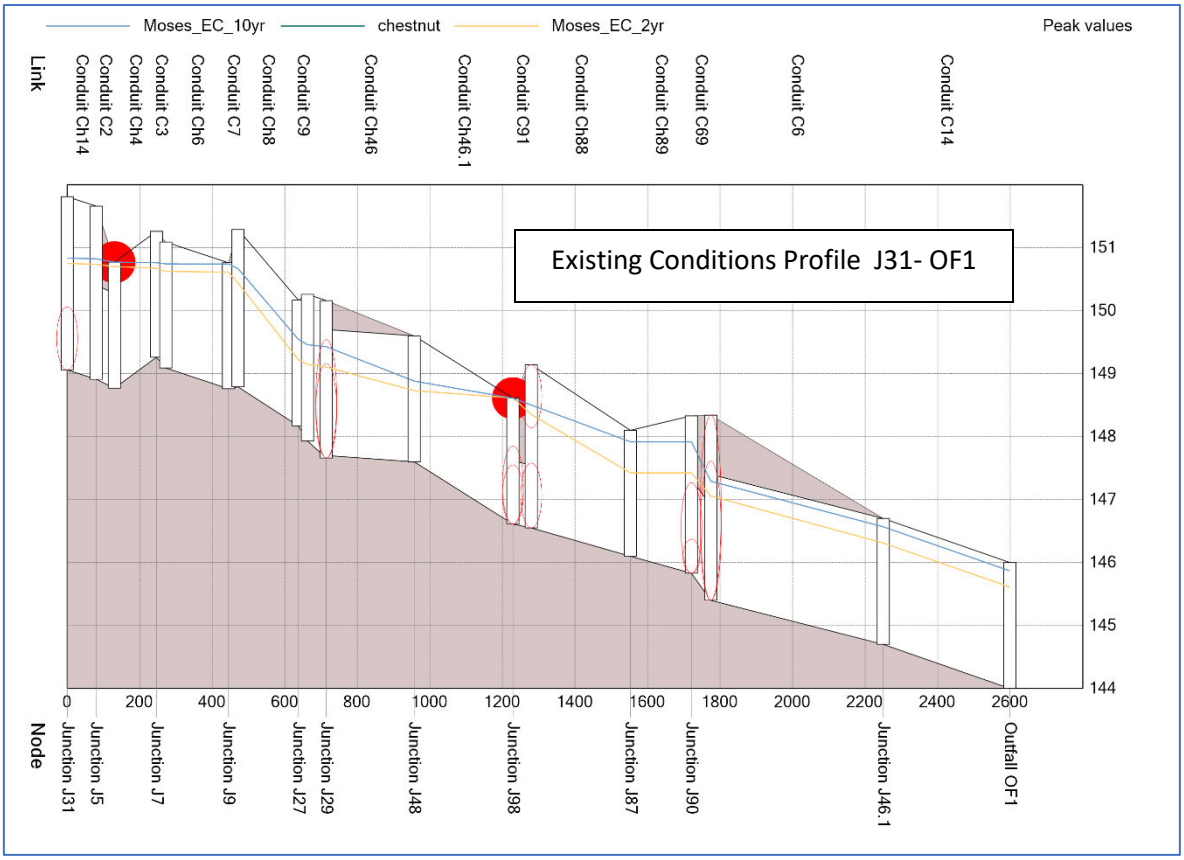
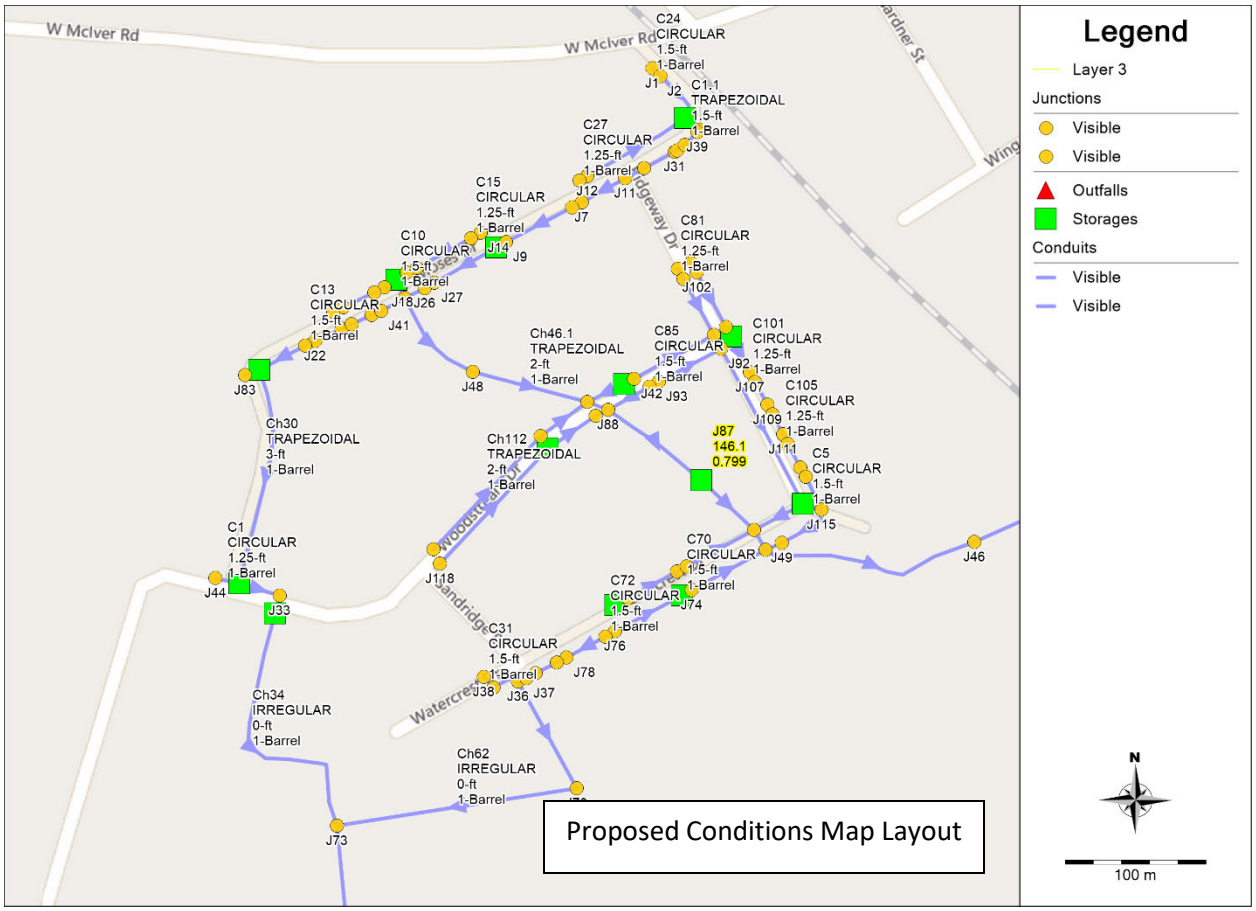
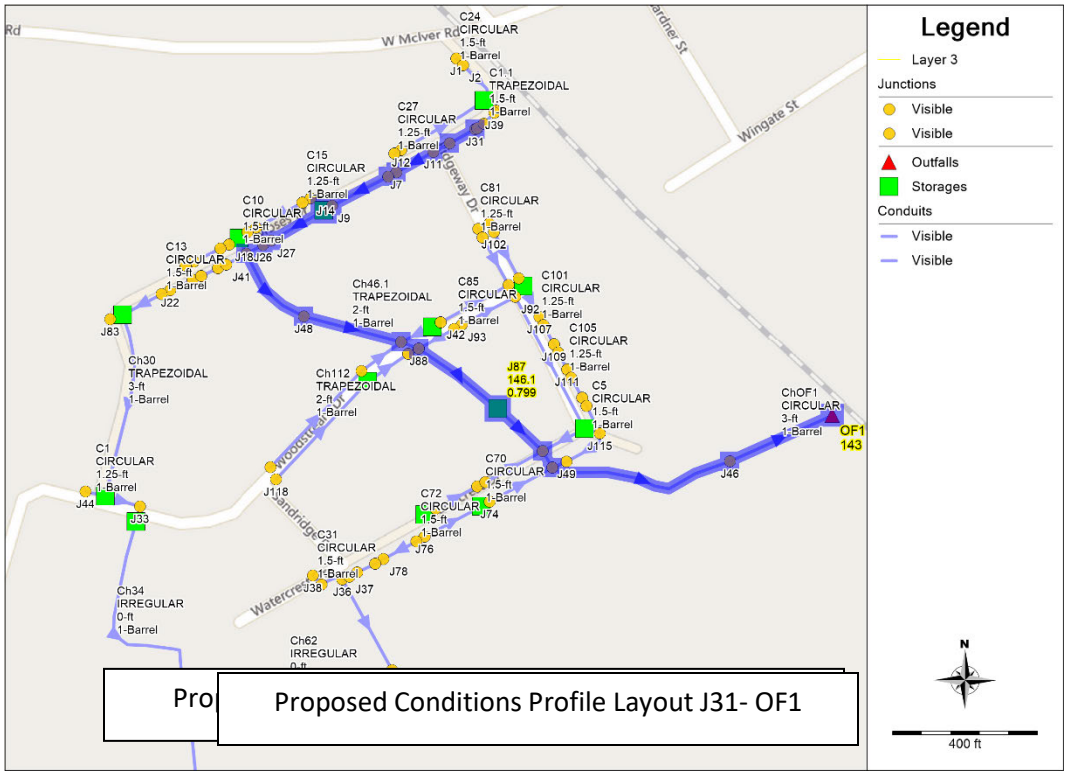
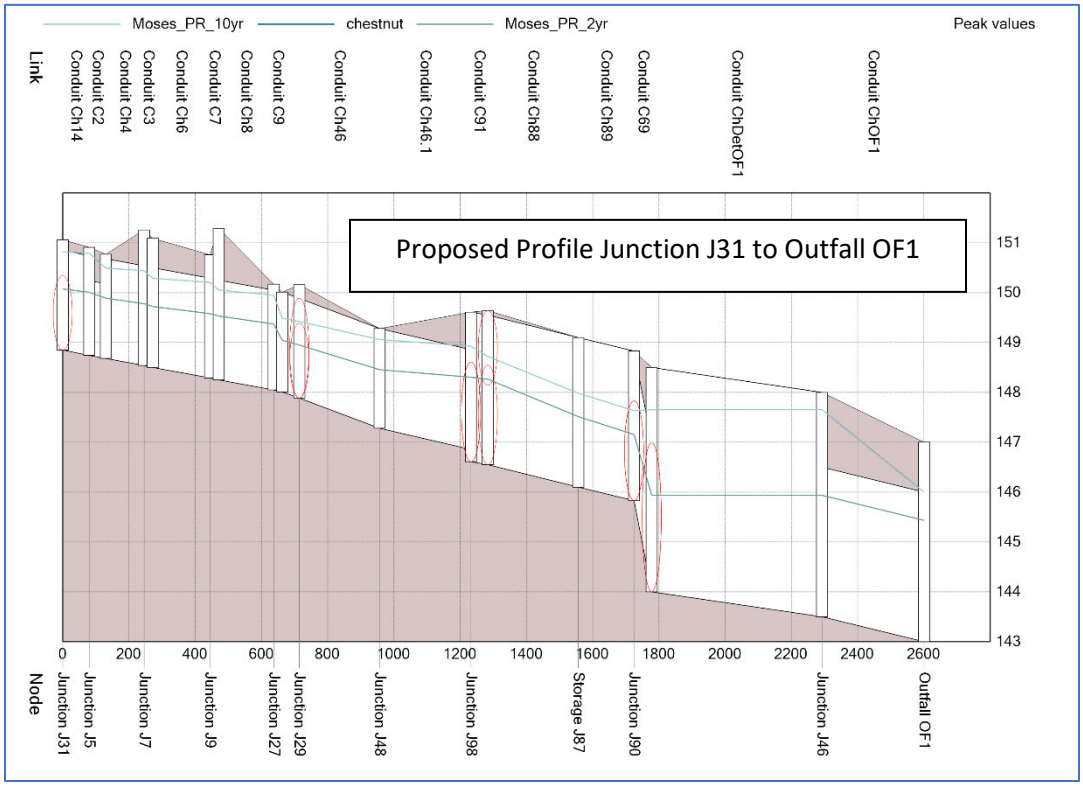
300 ft


Moses_EC_10yr
chestnut
Moses_EC_2yr
Peak values
Link
Conduit Ch14
Conduit C2
Conduit Ch4
Conduit C3
Conduit Ch6
Conduit C7
Conduit Ch8
Conduit C9
Conduit Ch46
Conduit Ch46.1
Conduit C91
Conduit Ch88
Conduit Ch89
Conduit C69
Conduit C6
Conduit C14
Existing Conditions Profile J31- OF1
151
150
149
148
147
146
145
144
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600
Node
Junction J31
Junction J5
Junction J7
Junction J9
Junction J27
Junction J29
Junction J48
Junction J98
Junction J87
Junction J90
Junction J46.1
Outfall OF1



Proposed Conditions Map Layout

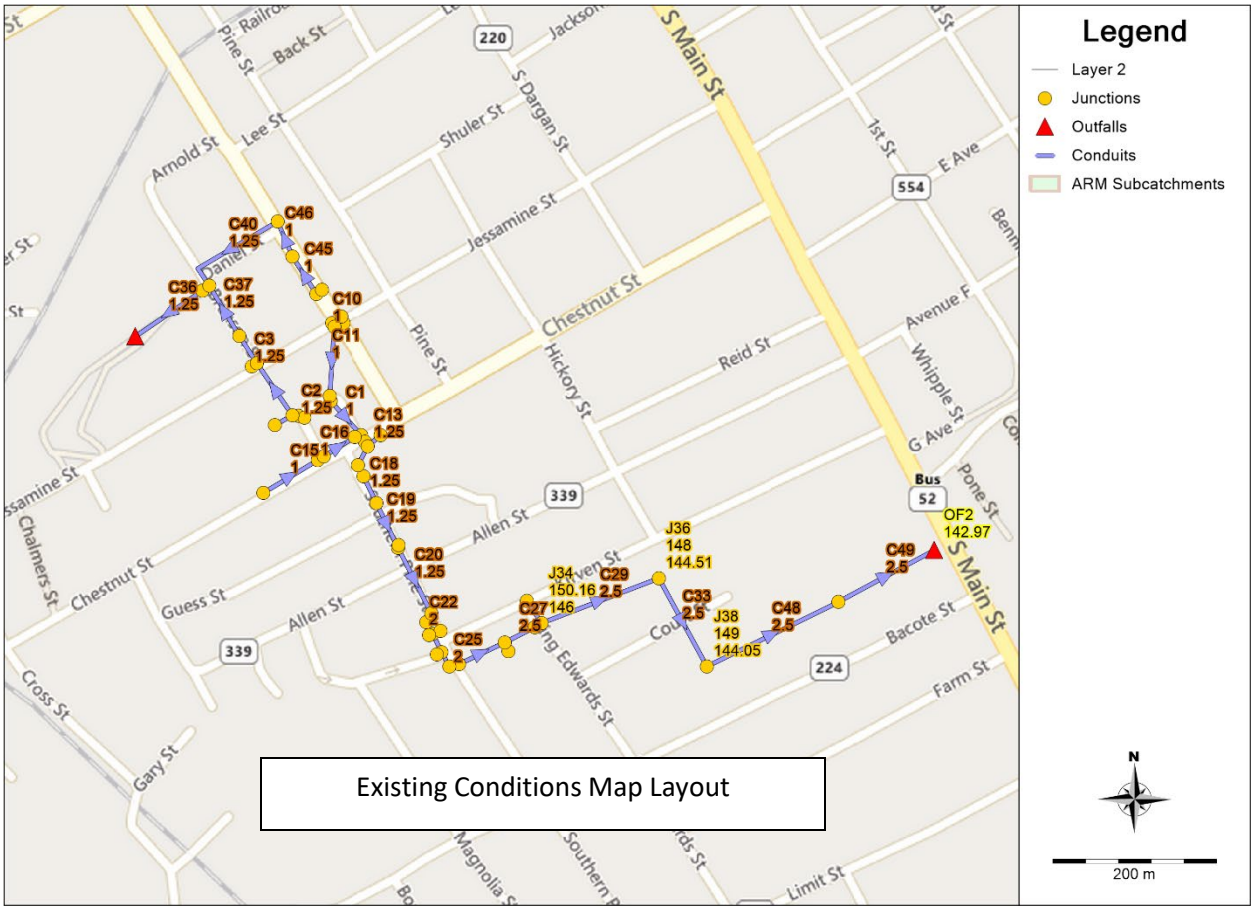

Legend
Layer 3
Junctions
Visible
Visible
Outfalls
Storages
Conduits
Visible
Visible
W McIver Rd
Wingate St
Ridgeway Dr
Woodbine Dr
Sandridge Dr
Watercress Dr
C24 CIRCULAR 1.5-ft 1-Barrel
C1.1 TRAPEZOIDAL 1.5-ft 1-Barrel
C27 CIRCULAR 1.25-ft 1-Barrel
C15 CIRCULAR 1.25-ft 1-Barrel
C10 CIRCULAR 1.5-ft 1-Barrel
C13 CIRCULAR 1.5-ft 1-Barrel
C81 CIRCULAR 1.25-ft 1-Barrel
Ch46.1 TRAPEZOIDAL 2-ft 1-Barrel
C85 CIRCULAR 1.5-ft 1-Barrel
C101 CIRCULAR 1.25-ft 1-Barrel
C105 CIRCULAR 1.25-ft 1-Barrel
Ch30 TRAPEZOIDAL 3-ft 1-Barrel
Ch112 TRAPEZOIDAL 2-ft 1-Barrel
J87 146.1 0.799
C5 CIRCULAR 1.5-ft 1-Barrel
ChOF1 CIRCULAR 3-ft 1-Barrel
OF1 143
C1 CIRCULAR 1.25-ft 1-Barrel
C70 CIRCULAR 1.5-ft 1-Barrel
C72 CIRCULAR 1.5-ft 1-Barrel
C31 CIRCULAR 1.5-ft 1-Barrel
Ch34 IRREGULAR 0-ft 1-Barrel
Ch62 IRREGULAR
Pro
Proposed Conditions Profile Layout J31- OF1
N
400 ft


Moses_PR_10yr
chestnut
Moses_PR_2yr
Peak values
Link
Conduit Ch14
Conduit C2
Conduit C4
Conduit C3
Conduit Ch6
Conduit C7
Conduit Ch8
Conduit C9
Conduit Ch46
Conduit Ch46.1
Conduit C91
Conduit Ch88
Conduit Ch89
Conduit C69
Conduit ChDetOF1
Conduit ChOF1
Proposed Profile Junction J31 to Outfall OF1
151
150
149
148
147
146
145
144
143
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600
Node
Junction J31
Junction J5
Junction J7
Junction J9
Junction J27
Junction J29
Junction J48
Junction J98
Storage J87
Junction J90
Junction J46
Outfall OF1

Chestnut Street Area

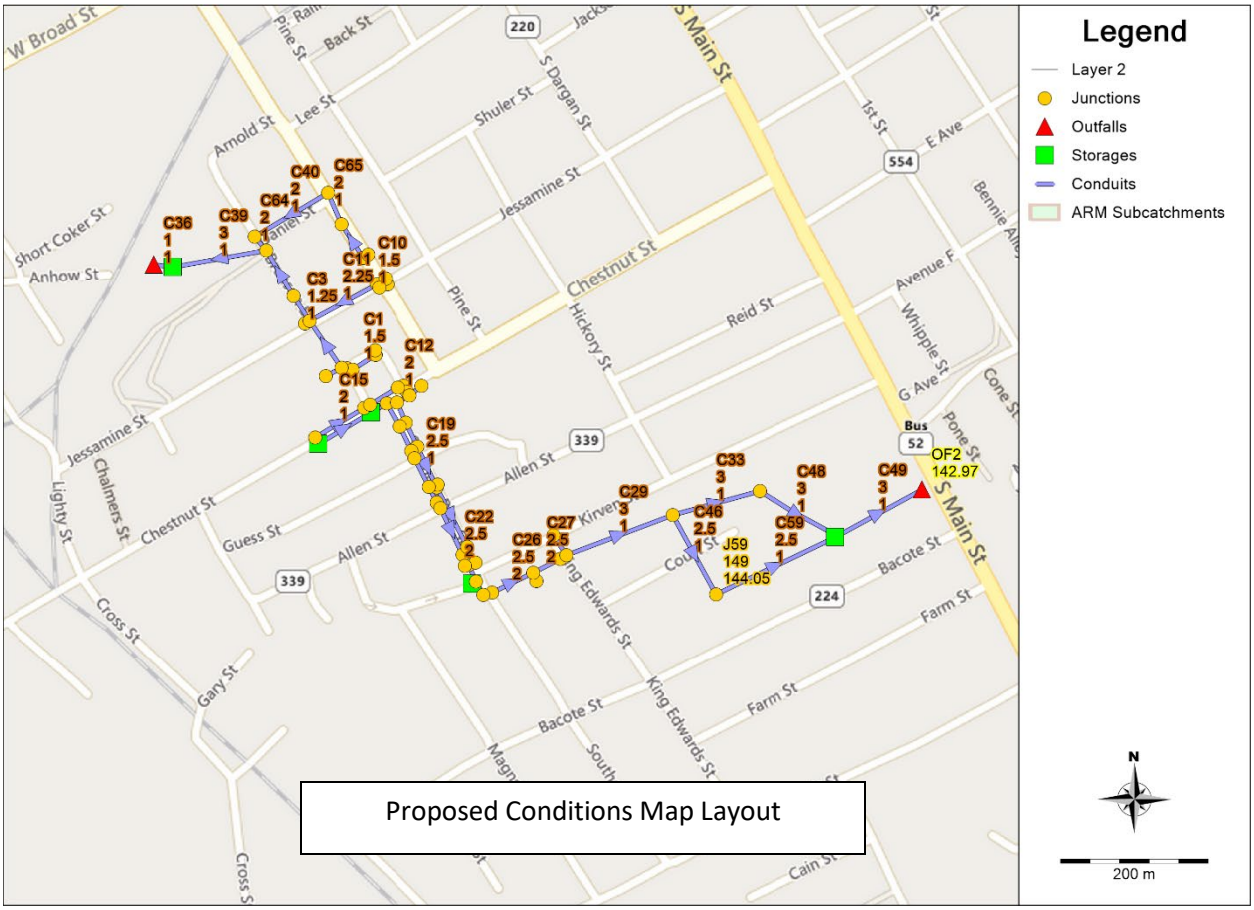
The Chestnut Street Area is an urban area in downtown Darlington. The drainage system is antiquated and consists of 12-inch to 30-inch RCPs in poor condition. Much of the drainage infrastructure is buried and several could not be located, particularly, just south of Chestnut street at the intersection with Southern Pines Street. This system had many inlets that were inaccessible and required the help of the City of Darlington Public Works Staff to assist in lifting the inlet grates and tops.

Drainage system layout is shown below for the Existing Conditions. PCSWMM output is in the Appendix for the 2-, and 10-year existing and proposed conditions.



Existing Conditions Map Layout

The proposed conditions consisted of additional inlets and correcting inverted slopes for each drainage line. Pipe sizes were increased to pass the 2- and 10-year events. The results of these improvements can be seen in the Appendix. The 2- and 10-year profiles for the existing and conditions profiles are shown to see improvements in the hydraulic grade lines.



Proposed Conditions Map Layout

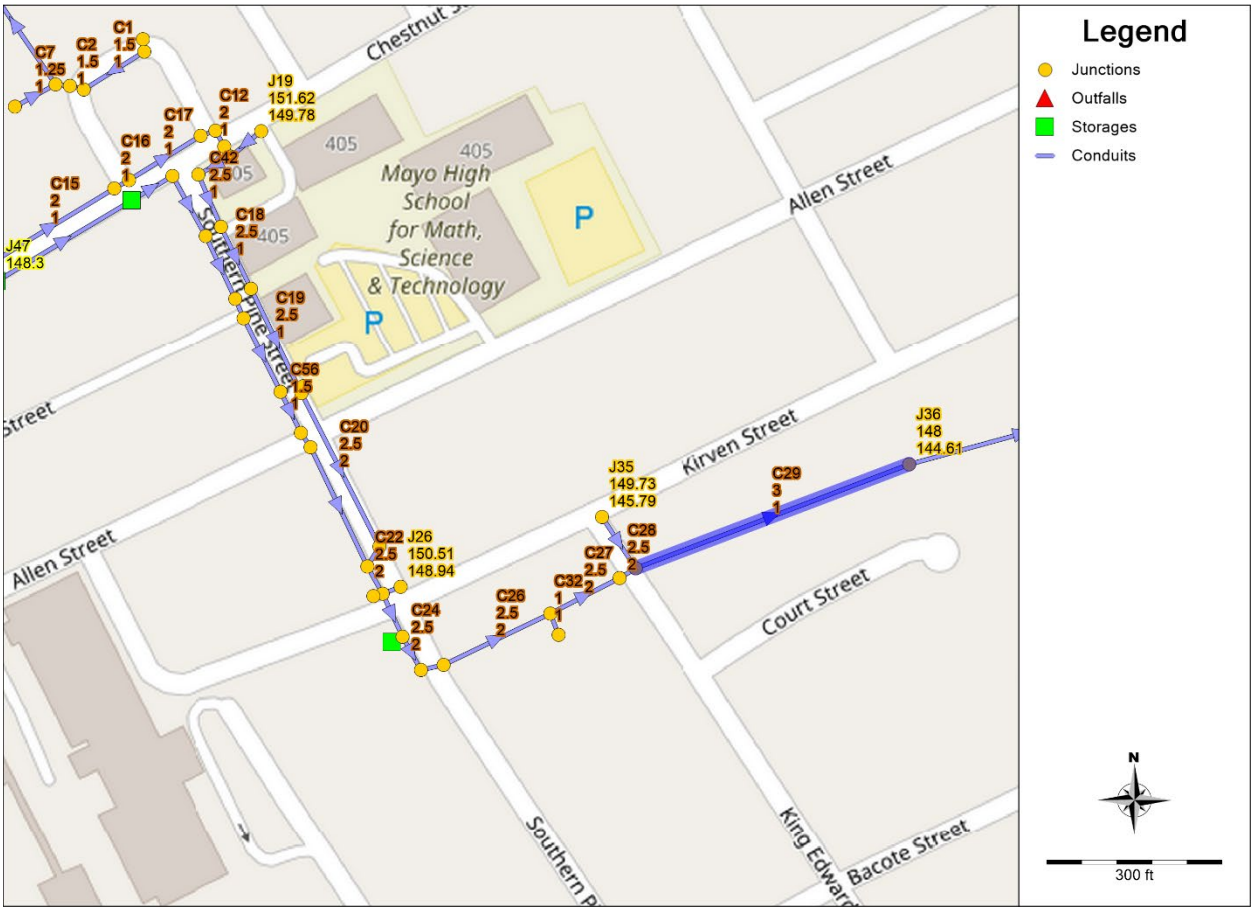
Bio-retention areas were developed along Chestnut Street to reduce flooding and allow stormwater to pond and infiltrate. Detention areas were also used to reduce peak flows downstream. These facilities were located near the outfalls.

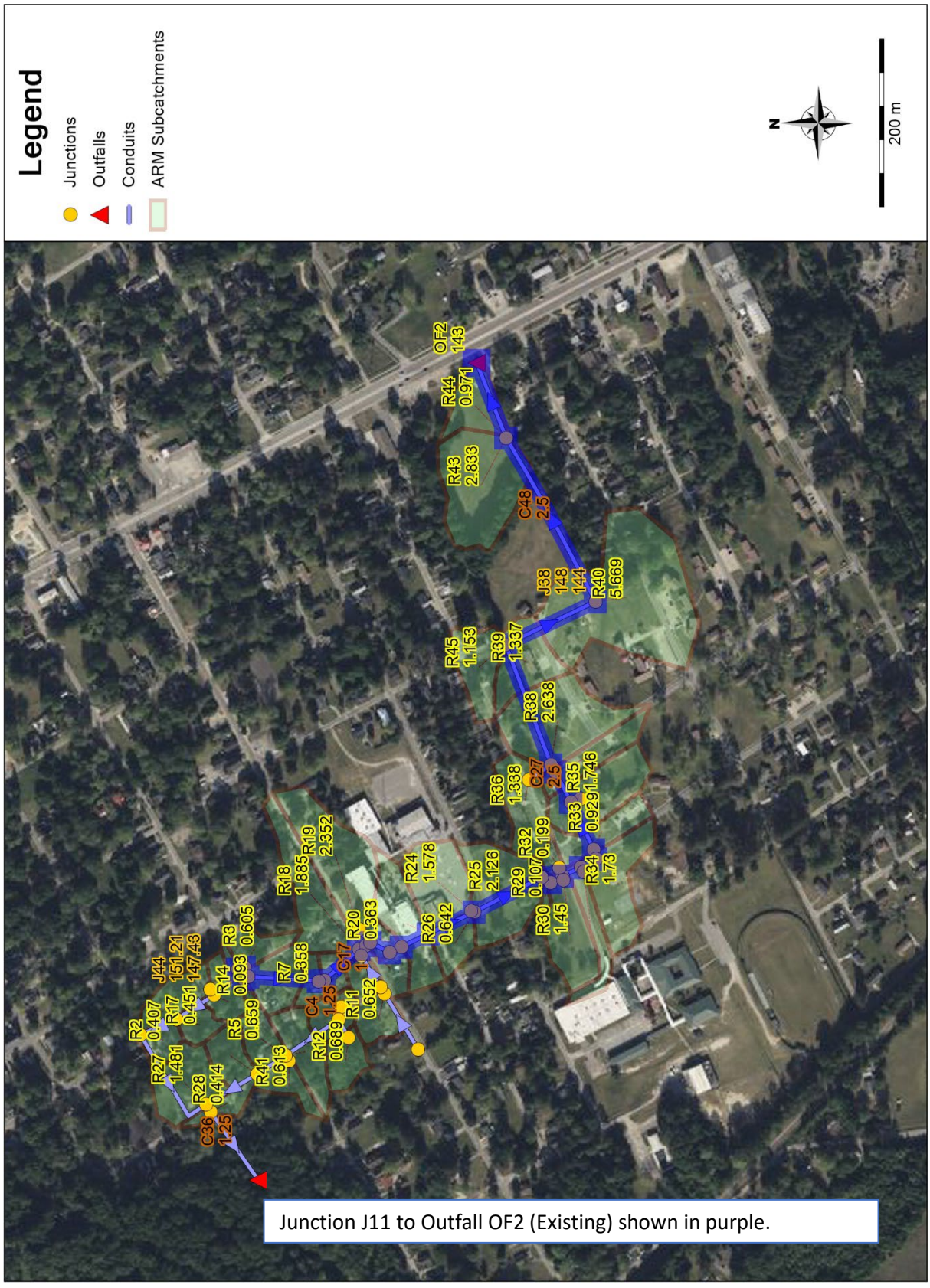
The following figures show an example of the existing conditions from Node 20 to the Outfall (Node OF2) at South Main Street. Note this existing line cannot pass the 2-year storm event. The proposed condition nearly passes the 10-year events and allows stormwater to flow to the outfall more freely. The existing and proposed discharges for Outfall OF1 and OF2 were 6.74 cfs vs 2.7 cfs and 19.7 cfs vs. 10.1 cfs.

The downstream drainage segment was relocated behind the apartments on South Pine Road. The existing drainage system in that location is a 30-inch RCP that drains under the cul-de-sac (Court St) to the south and joins other pipes at the tree line at a junction box J38. The drainage line to the north of Court Street was rerouted to the east and toward S. Main Street where it joins a box (Outfall OF1) at S.

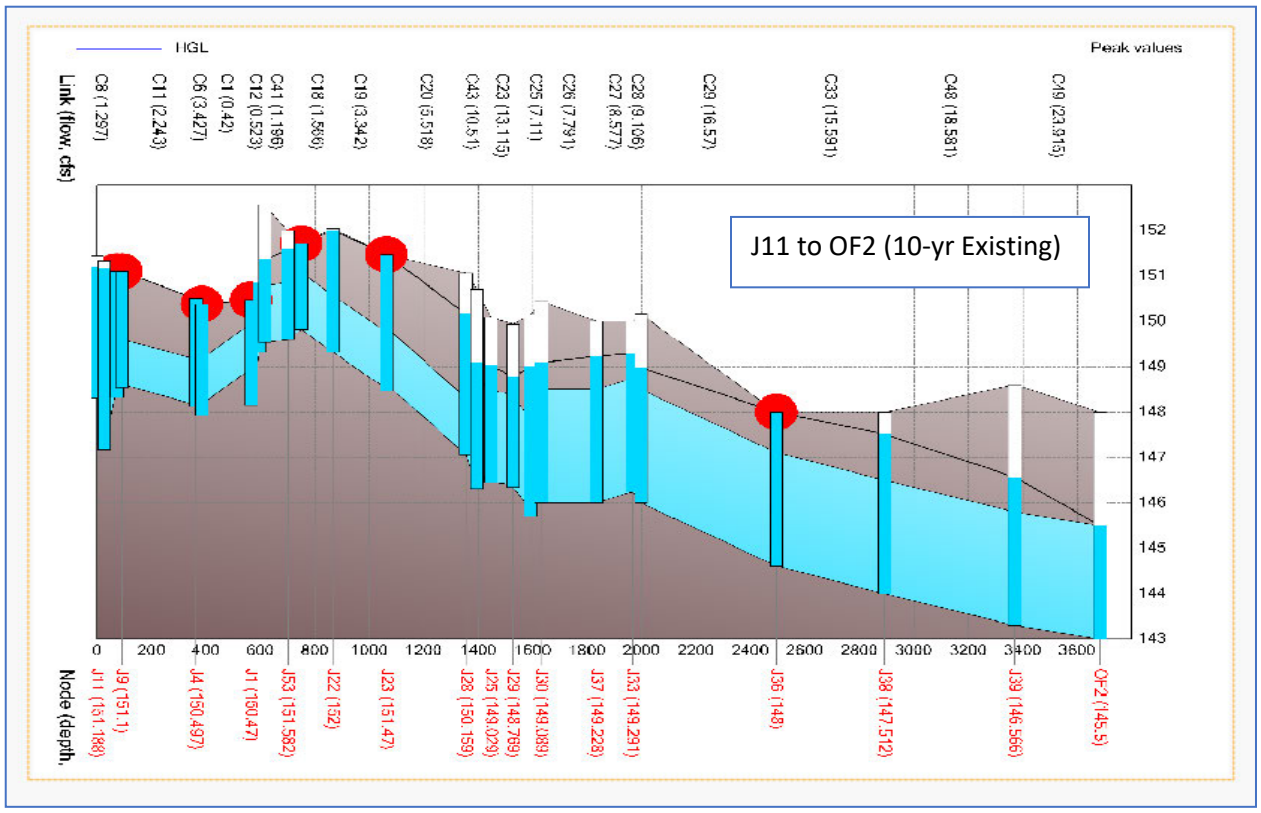
Main Street. The 30-inch line was opened as a channel to provide water quality and provide ease of maintenance. It also reduced the cost of material for construction. The pipes tend to clog over time due to the flat slope. Also, dual pipes were proposed from King Edwards Street to Allen Street along Southern Pines Street. The pipes are shown below in purple with the pipe name, size (in feet), and number of barrels shown in red. The northern outfall OF1 receives stormwater from the north part of Virgil Wells Circle. The system was disconnected from OF2 to provide relief for the southern segment.

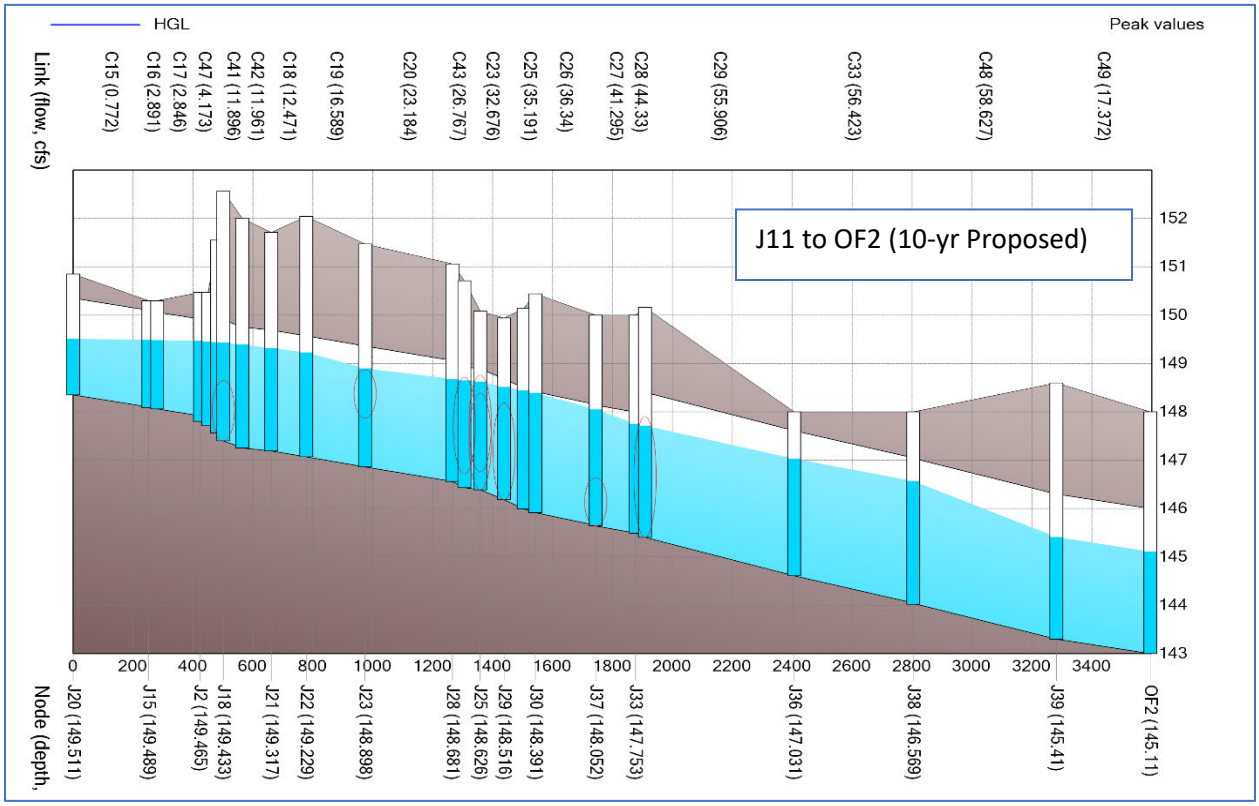
Reduction in flooding can be seen in the profile figures below for Junction J11 to Outfall OF2. Street flooding is eliminated at Virgil Wells Circle, Chestnut Street and Southern Pines Street.

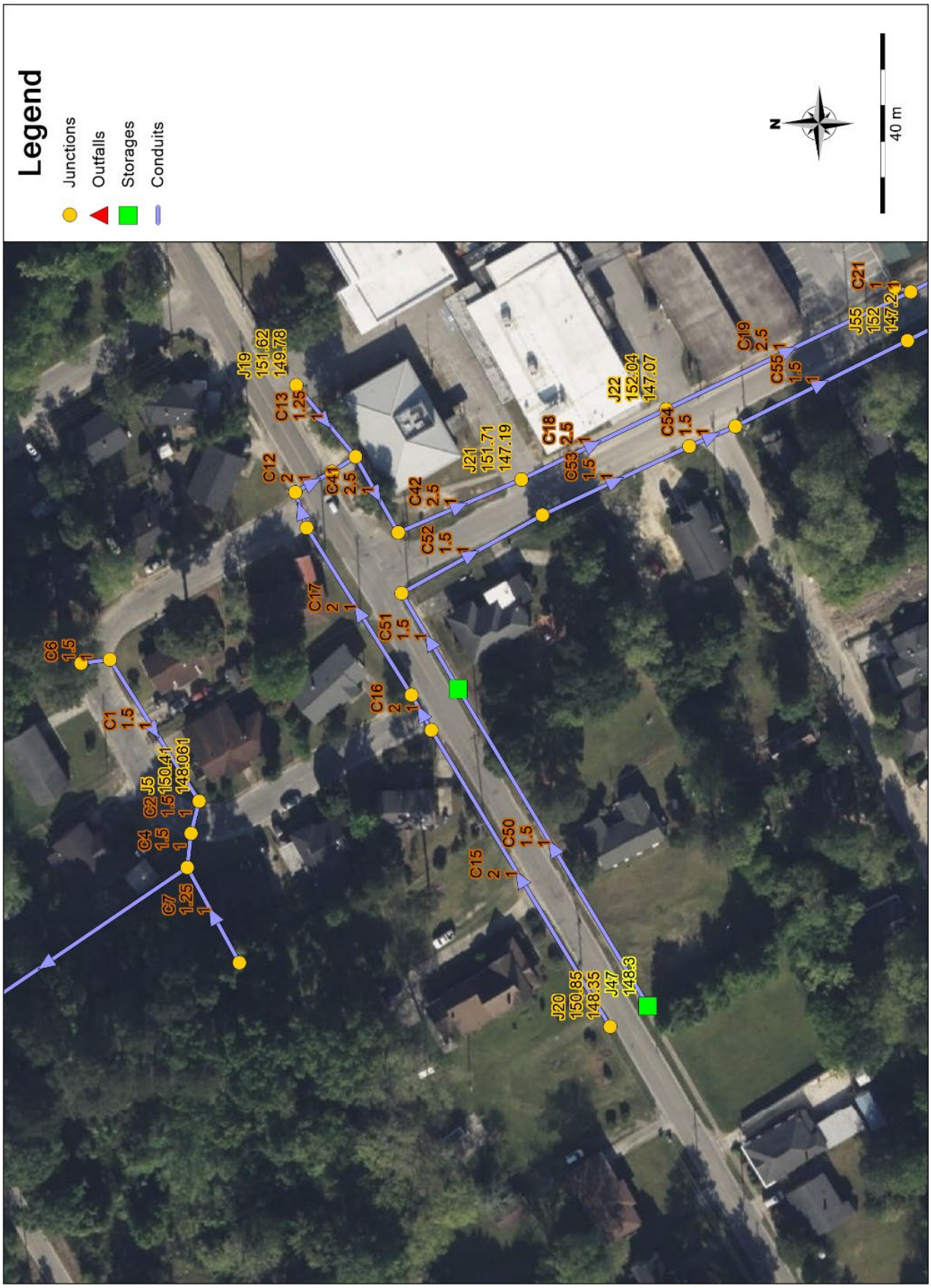


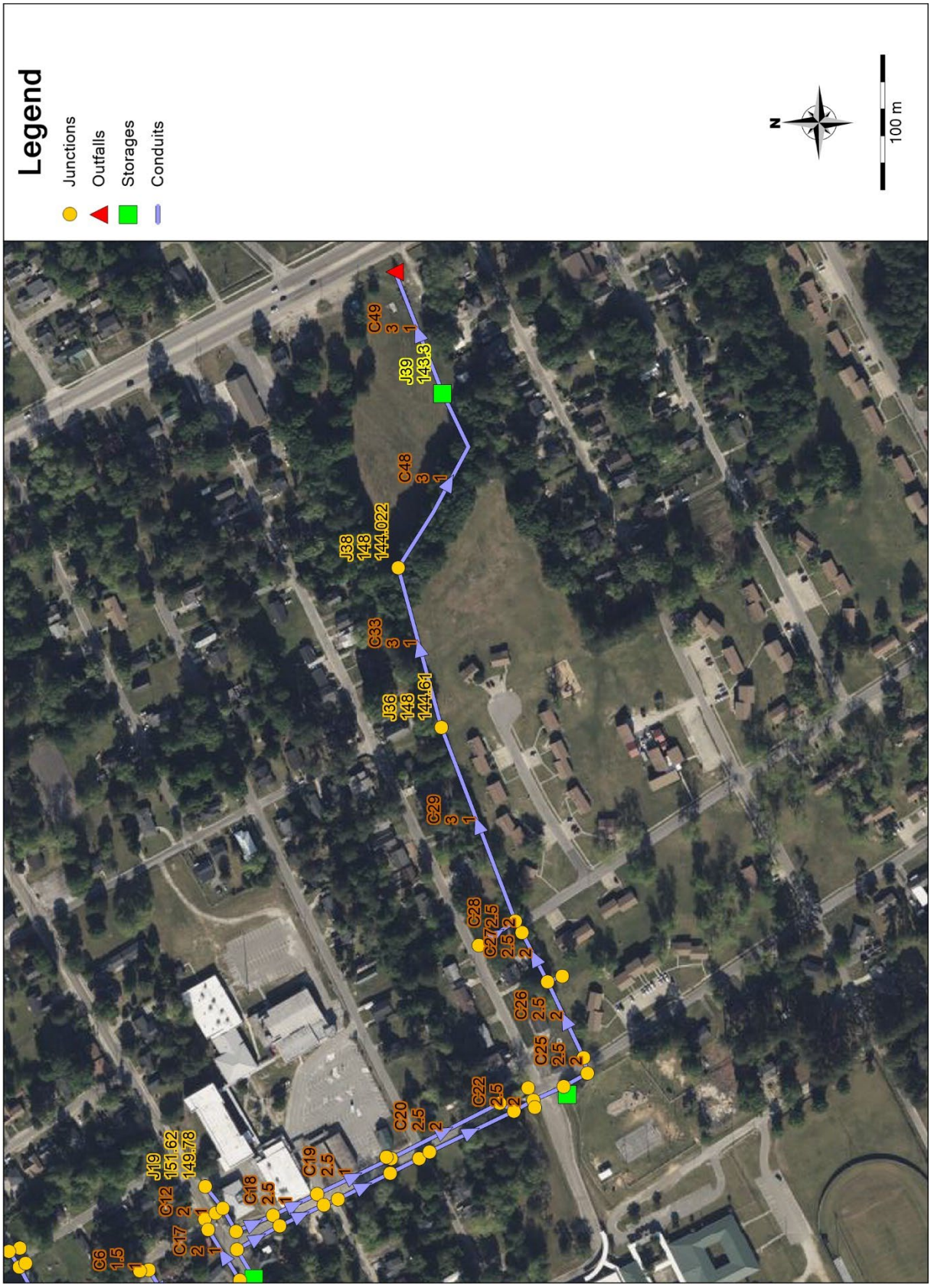


Junction J11 to Outfall OF2 (Existing) shown in purple.


HGL
Peak values
Link (flow, cfs)
C8 (1.297)
C11 (2.243)
C6 (3.427)
C1 (0.42)
C12 (0.523)
C41 (1.186)
C18 (1.566)
C19 (3.342)
C20 (5.518)
C43 (10.51)
C23 (13.115)
C25 (7.11)
C26 (7.791)
C27 (8.577)
C28 (9.106)
C29 (16.57)
C33 (15.591)
C48 (18.581)
C49 (23.915)
J11 to OF2 (10-yr Existing)
152
151
150
149
148
147
146
145
144
143
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600
2800
3000
3200
3400
3600
Node (depth,
J11 (151.188)
J9 (151.1)
J4 (150.497)
J1 (150.47)
J53 (151.582)
J22 (152)
J23 (151.47)
J28 (150.159)
J25 (149.029)
J29 (148.769)
J30 (149.089)
J37 (149.228)
J33 (149.291)
J36 (148)
J38 (147.512)
J39 (146.566)
OF2 (145.5)


HGL
Peak values
Link (flow, cfs)
C15 (0.772)
C16 (2.891)
C17 (2.846)
C47 (4.173)
C41 (11.896)
C42 (11.961)
C18 (12.471)
C19 (16.589)
C20 (23.184)
C43 (26.767)
C23 (32.676)
C25 (35.191)
C26 (36.34)
C27 (41.295)
C28 (44.33)
C29 (55.906)
C33 (56.423)
C48 (58.627)
C49 (17.372)
J11 to OF2 (10-yr Proposed)
152
151
150
149
148
147
146
145
144
143
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600
2800
3000
3200
3400
Node (depth,
J20 (149.511)
J15 (149.489)
J2 (149.465)
J18 (149.433)
J21 (149.317)
J22 (149.229)
J23 (148.898)
J28 (148.681)
J25 (148.626)
J29 (148.516)
J30 (148.391)
J37 (148.052)
J33 (147.753)
J36 (147.031)
J38 (146.569)
J39 (145.41)
OF2 (145.11)


Legend
Junctions
Outfalls
Storages
Conduits
N
40 m
J19
151.62
149.78
C13
1.25
1
C12
2
1
C41
2.5
1
C42
2.5
1
J21
151.71
147.19
C18
2.5
1
C53
1.5
1
J22
152.04
147.07
C54
1.5
1
C19
2.5
C55
1.5
1
J55
152
147.21
C21
1
C17
2
1
C52
1.5
1
C51
1.5
1
C6
1.5
1
C1
1.5
1
C16
2
1
J5
150.41
148.061
C2
1.5
1
C4
1.5
1
C7
1.25
1
C15
2
1
C50
1.5
1
J20
150.65
148.35
J47
148.3


Legend
Junctions
Outfalls
Storages
Conduits
N
100 m
C49
3
1
J39
143.3
C48
3
1
J38
148
144.022
C33
3
1
J36
148
144.61
C29
3
1
C28
C27 2.5
2.5
2
C26
2.5
2
C25
2.5
2
C22
2.5
2
C20
2.5
2
C19
2.5
1
C18
2.5
1
J19
151.62
149.78
C12
2
1
C17
2
1
C6
1.5
1

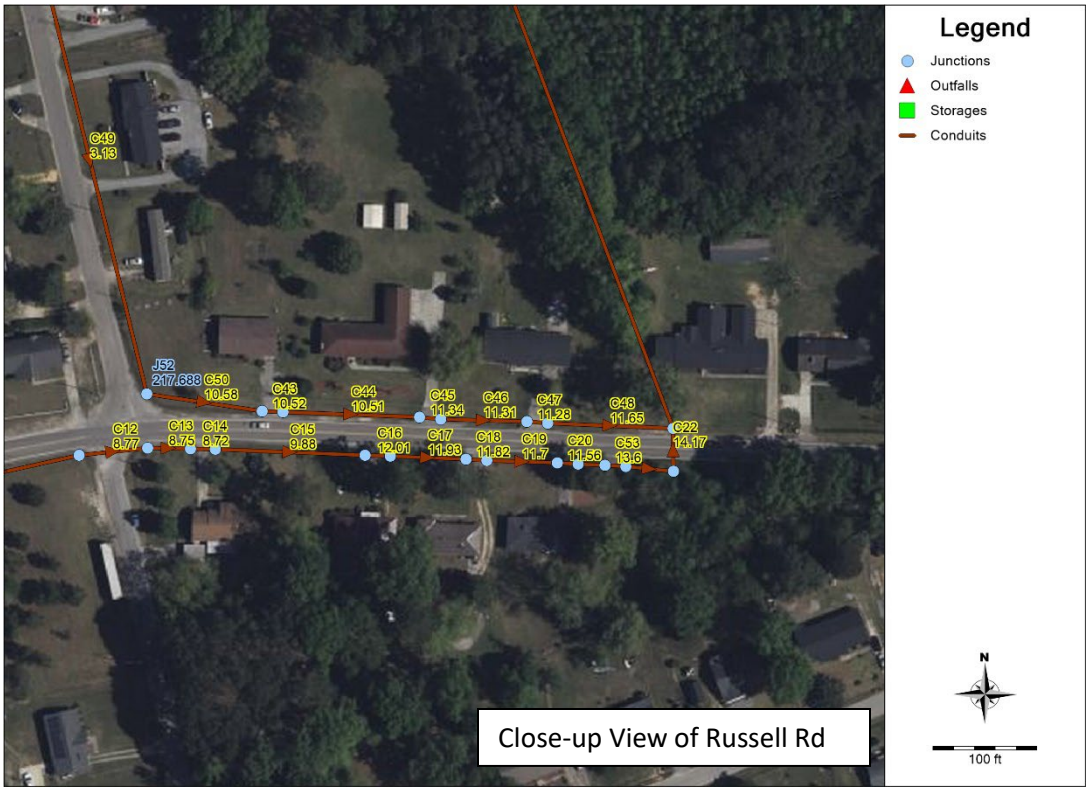
M. L. King Drive

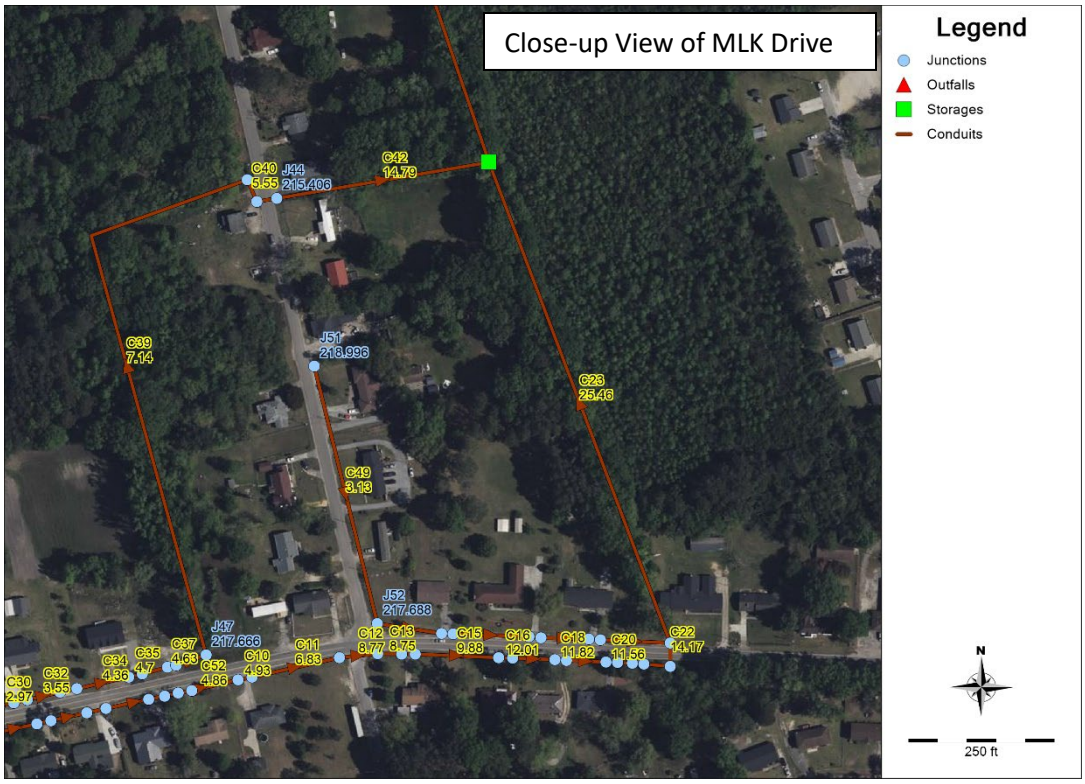
M. L. King Drive area has experienced severe flooding over time without any major assistance. This area has had a history of flooding. The main ditch that runs parallel to the MLK Drive and is the outfall for the system for the area at Russell Road and MLK Drive. Most of the flooding occurs nearer the intersection of Russell Road and MLK.

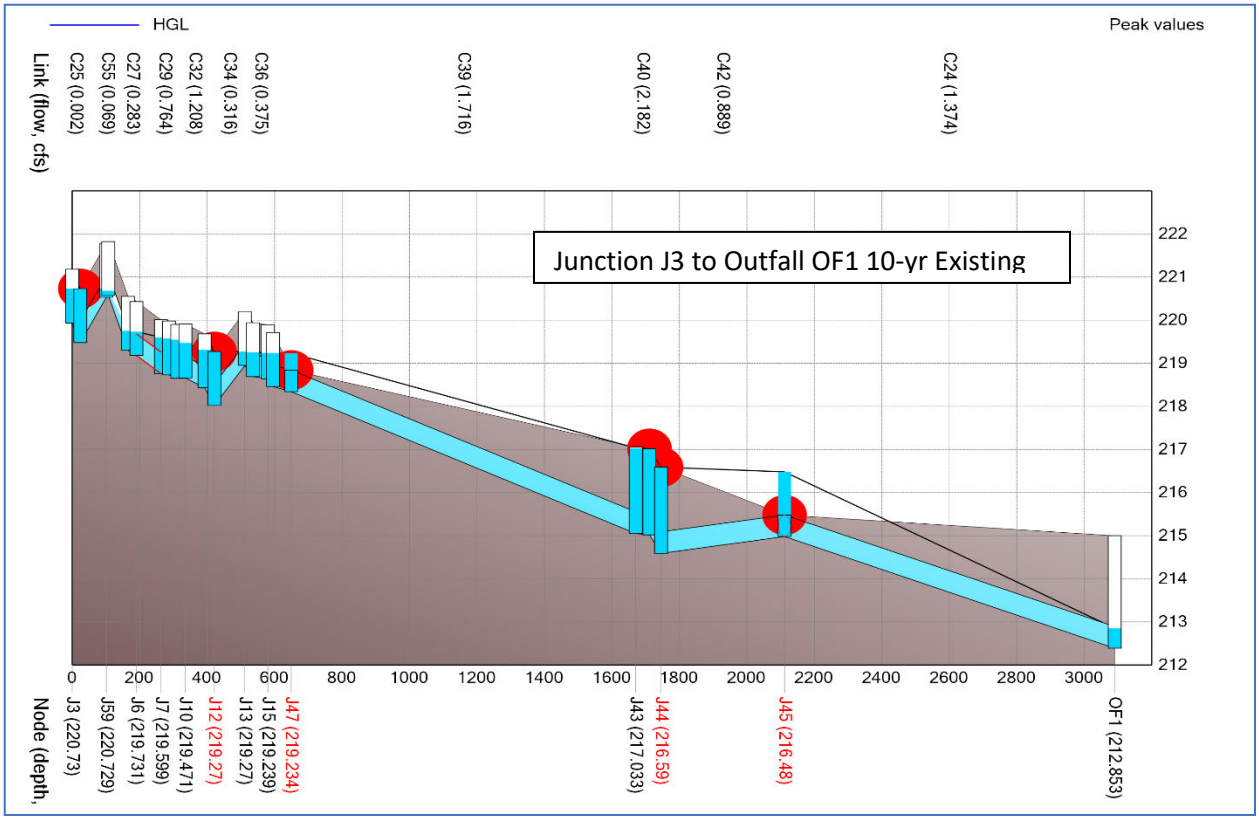
The existing conditions consist of very shallow ditches along the roads, especially along ML King Drive. During rainfall events, runoff sheet flows across the roadway and enter residents' yards and around homes. Residents that reported flooding during the public meeting phase of the project lived predominately on ML King Drive. ELR personnel met with residents to discuss their flooding issue and is documented in the Existing Conditions Report.

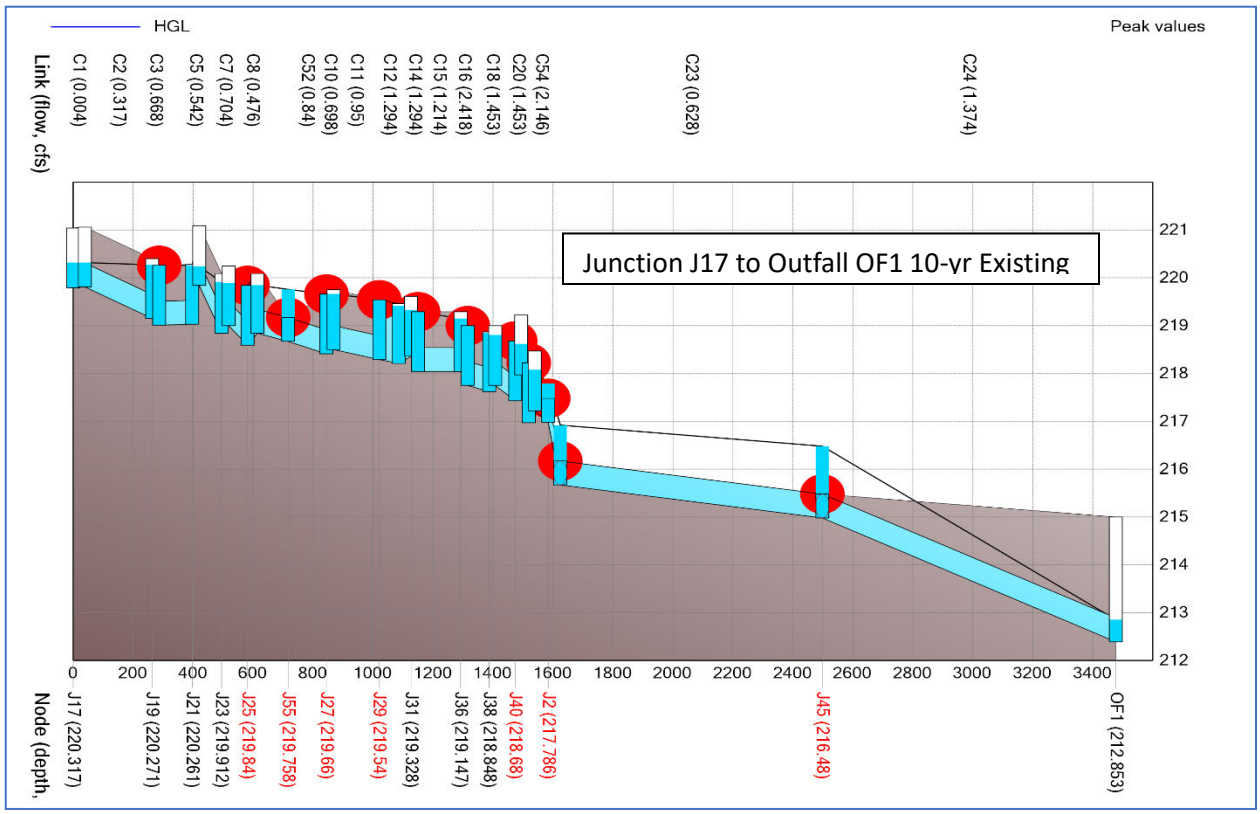
Flooding for existing conditions shows major street flooding along Russell Road and ML King Drive. Discharge to the outfall is very limited due to the flood storage in the roads and residents' lots. The figure below shows the proposed layout with improvements to all the ditches and many driveway and cross culverts. The bright green node shown represents 1.5 acres of detention storage that reduces to peak discharge for proposed conditions to the outfall. The intent of the design was to move water out of the roadway ditches as quickly as possible toward the outfall and detain the runoff in the detention area.

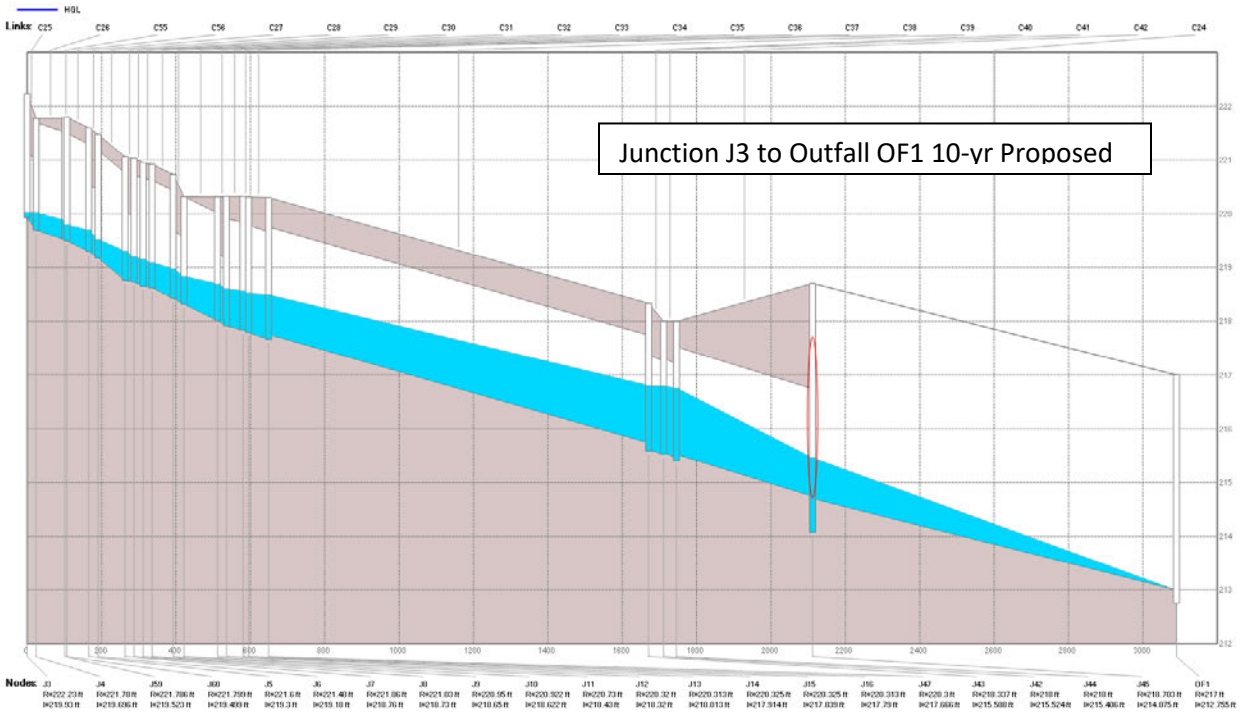
E.L. ROBINSON ENGINEERING

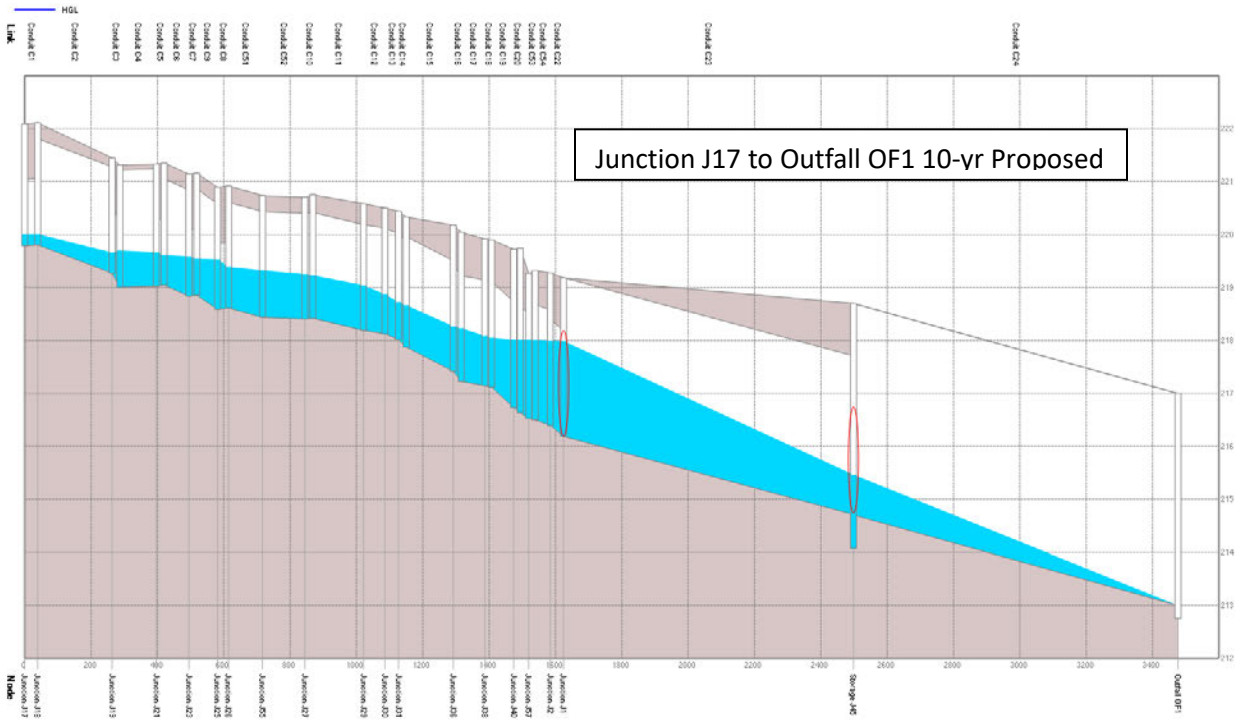

Legend
Junctions
Outfalls
Storages
Conduits
C49 3.13
J52 217.688
C50 10.58
C43 10.52
C44 10.51
C45 11.34
C46 11.31
C47 11.28
C48 11.65
C22 14.17
C12 8.77
C13 8.75
C14 8.72
C15 9.88
C16 12.01
C17 11.93
C18 11.82
C19 11.7
C20 11.56
C53 13.6
Close-up View of Russell Rd
N
100 ft


Close-up View of MLK Drive
Legend
Junctions
Outfalls
Storages
Conduits
C40 5.55
J44 215.406
C42 14.79
C39 7.14
J51 218.996
C23 25.46
C49 3.13
J52 217.688
J47 217.666
C37 4.63
C35 4.7
C34 4.36
C32 3.55
C30 2.97
C52 4.86
C10 4.93
C11 6.83
C12 8.77
C13 8.75
C15 9.88
C16 12.01
C18 11.82
C20 11.56
C22 14.17
N
250 ft


HGL
Peak values
Link (flow, cfs)
C25 (0.002)
C55 (0.069)
C27 (0.283)
C29 (0.764)
C32 (1.208)
C34 (0.316)
C36 (0.375)
C39 (1.716)
C40 (2.182)
C42 (0.889)
C24 (1.374)
Junction J3 to Outfall OF1 10-yr Existing
222
221
220
219
218
217
216
215
214
213
212
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600
2800
3000
Node (depth,
J3 (220.73)
J59 (220.729)
J6 (219.731)
J7 (219.599)
J10 (219.471)
J12 (219.27)
J13 (219.27)
J15 (219.239)
J47 (219.234)
J43 (217.033)
J44 (216.59)
J45 (216.48)
OF1 (212.853)


HGL
Peak values
Link (flow, cfs)
C1 (0.004)
C2 (0.317)
C3 (0.668)
C5 (0.542)
C7 (0.704)
C8 (0.476)
C52 (0.84)
C10 (0.698)
C11 (0.95)
C12 (1.294)
C14 (1.294)
C15 (1.214)
C16 (2.418)
C18 (1.453)
C20 (1.453)
C54 (2.146)
C23 (0.628)
C24 (1.374)
Junction J17 to Outfall OF1 10-yr Existing
221
220
219
218
217
216
215
214
213
212
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600
2800
3000
3200
3400
Node (depth,
J17 (220.317)
J19 (220.271)
J21 (220.261)
J23 (219.912)
J25 (219.84)
J55 (219.758)
J27 (219.66)
J29 (219.54)
J31 (219.328)
J36 (219.147)
J38 (218.848)
J40 (218.68)
J2 (217.786)
J45 (216.48)
OF1 (212.853)


Junction J3 to Outfall OF1 10-yr Proposed


Junction J17 to Outfall OF1 10-yr Proposed

E. Anticipated Permitting Requirements

The potential permitting requirements for the project will include those for several state and federal entities.

- *SC Department of Transportation (SCDOT)* – An encroachment permit that addresses ingress/egress into properties may be required.
- *SC Department of Health and Environmental Control (SCDHEC)*
    - NPDES - Sediment and Erosion Control
- *US Army Corps of Engineers (USACE)* - Section 401 (water quality) & Section 404 (Wetlands) will be needed.

US Fish & Wildlife Service– An Endangered Species Act (ESA) may be required.

SECTION 4. BENEFIT/COST ANALYSIS AND LMI ASSESSMENT

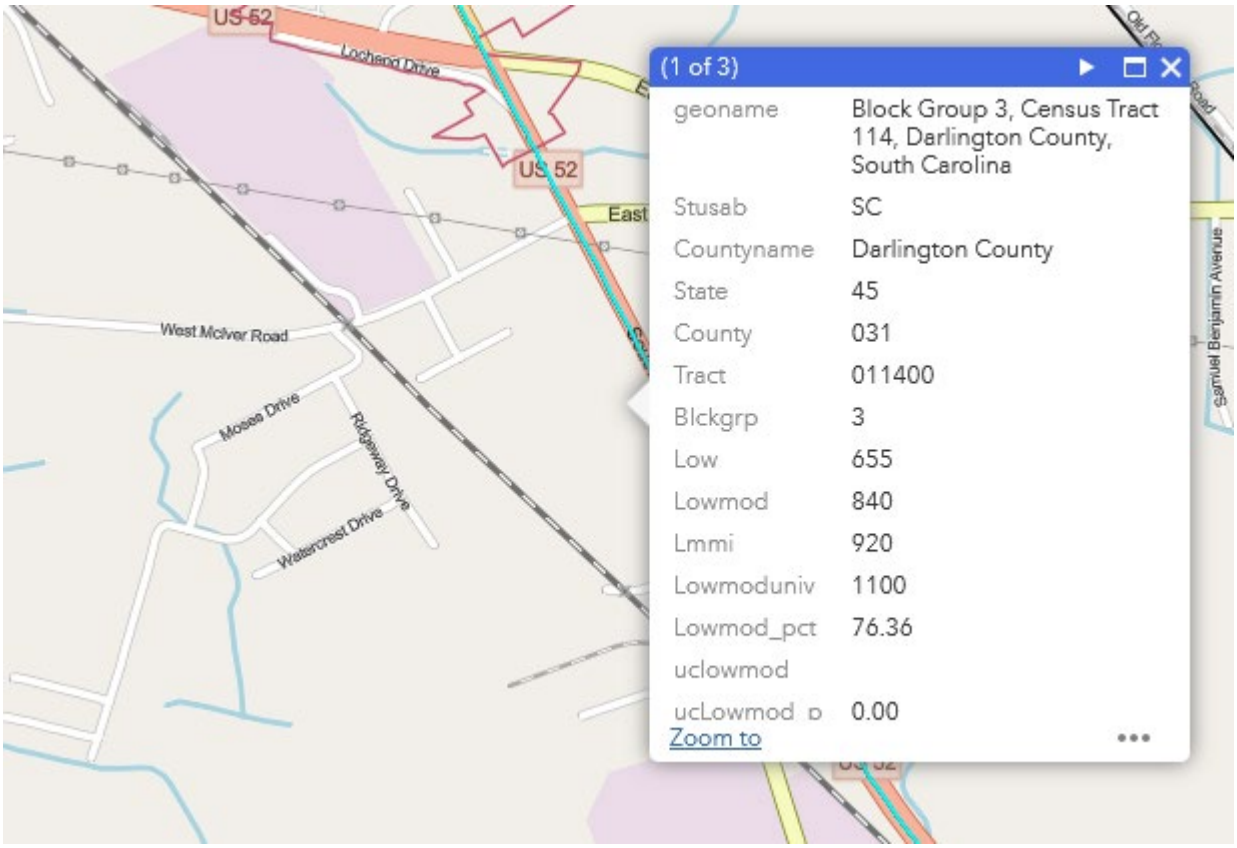
A. Qualitative and Quantitative Impact Statement Upon Low-and-Moderate Income Areas

Low-to-Moderate Income (LMI) Areas

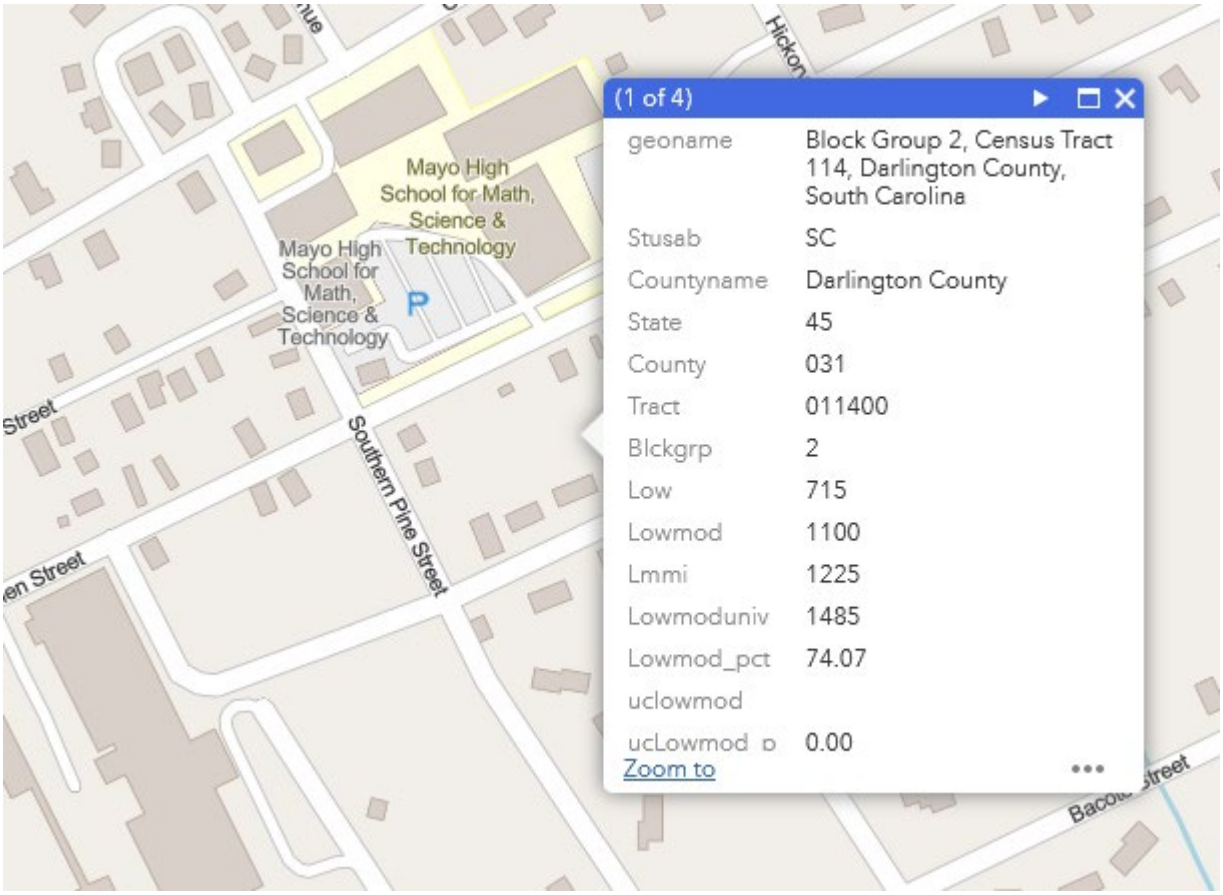
The Moses Drive, Chestnut Street and ML King Drive Areas had LMI percentages of 76.36, 74.07 and 76.29, respectively.

This information was taken from the US Housing and Urban Development (USHUD) website and is based on the 2011-2015 American Community Survey. These data are to be used to qualify all new area-benefit activities as of April 1, 2019. *To qualify, the LMI area must have a value of 51% or greater with no rounding.*

Moses Drive Area LMI



Chestnut Street Area LMI

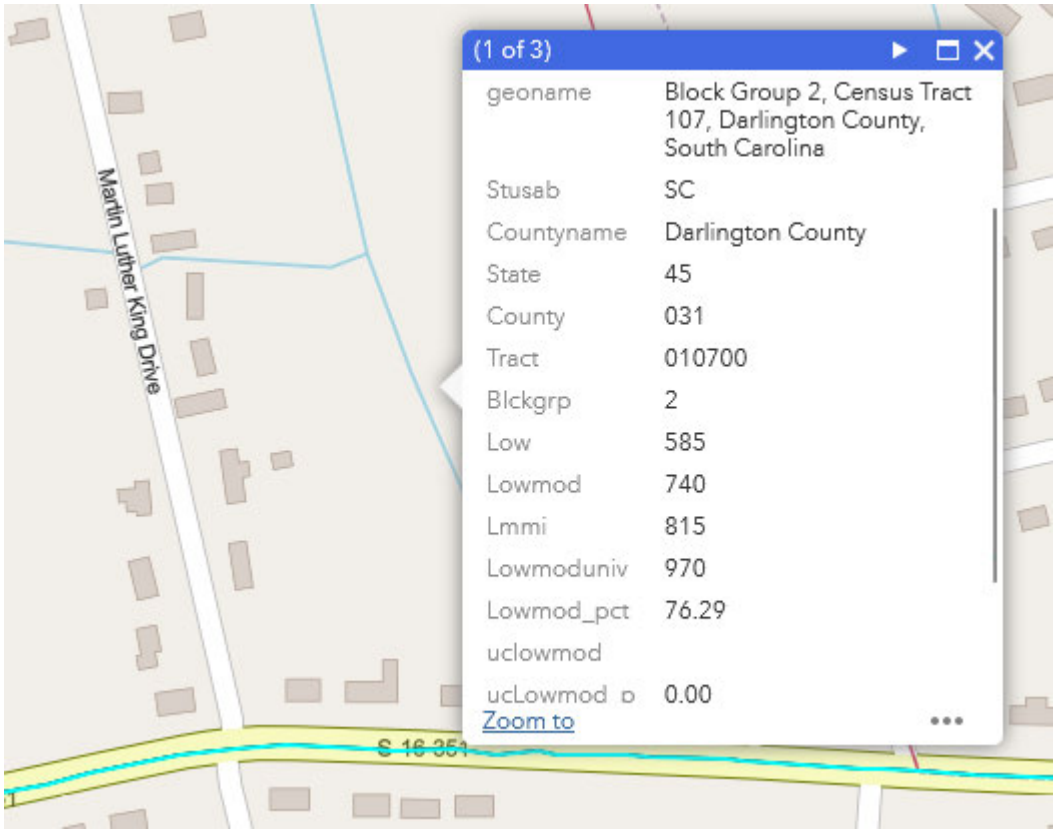


The Community Development Block Grant (CDBG) program requires that each CDBG funded activity must either principally benefit low- and moderate-income (LMI) persons, aid in the prevention or elimination of slums or blight or meet a community development need having a particular urgency. Most activities funded by the Community Development Block Grant (CDBG) program are designed to benefit low- and moderate-income (LMI) persons. This benefit may take the form of housing, jobs, and services.

The impacts the current condition of the drainage system has on the town is severe with moderate to heavy rainfall. Extreme rainfall events have impacted a high percentage of residents in these areas. The proposed conditions give relieve to these residents through the 25-year event. The system is designed to primarily convey stormwater through the system without surcharging most of the pipes and channels.

Flooding also impacts health and the environment. Much of the sewer system is impacted during flooding, whether a septic system or manhole overflows from a sewer system. Also treatment plants are affected by wet weather inflows into the system via infiltration.

ML King Drive LMI Area



B. Benefit – Cost Analysis

A Benefit – Cost Analysis (BCA) was developed for each project as part of the study to determine cost effectiveness. The results also are used to rank each project according to the BCA.

A Benefit – Cost Analysis (BCA) was developed for each project as part of the study to determine cost effectiveness. The results also are used to rank each project according to the BCA.

Damage data from taken from the Arizona State University's Center for Emergency Management and Homeland Security - Spatial Hazard Events and Losses Database for the United States. The SHELDUS database was used to determine county-level hazard data. SHELDUS Version 21.0 was launched on February 15, 2023. The database covers the period from January 1960 to December 2021. SHELDUS covers natural hazards such thunderstorms, hurricanes, floods, wildfires, and tornados as well as perils such as flash floods, heavy rainfall, etc.

The database contains information on the date of an event, affected location (county and state) and the direct losses caused by the event (property and crop losses, injuries, and fatalities) as well as insured crop losses (indemnity payments by the U.S. Department of Agriculture). Insured crop losses cover the period from January 1989 to December 2021. The database contains loss information for Puerto Rico, Guam, and other U.S. territories from 2000 through 2021. SHELDUS is updated annually.

There are a number of hazards listed in the SHELDUS program. The hazard type used on our analyses was flooding.

Contact information:
Center for Emergency Management and Homeland Security
Arizona State University
411 N Central Ave
Mail Code 4020
Phoenix, AZ 85004

The BCA Analyses were computed using the FEMA BCA Toolkit Version 6.0.0 (01-02-23).

Benefit-Cost Ratio
The benefit-cost ratio (benefits divided by cost) is defined as the benefit divided by the estimated cost. This ratio is an expression of the money saved by implementing a project as opposed to the costs occurred by not implementing the project. A ratio less than one means the project will cost more to implement than it will save. Any ratio equal to 1 or higher justifies the project from a pure financial viewpoint.

The ratios are then sorted by quartile to award points when compared to competing projects. This will weaken the cost-benefit ratio defined by a single value to account for the larger picture of the project, account for error from assumptions and methodologies and be appropriate for the stage of most projects.

Benefit-Cost Ratio Quartile	***Points***
0-25%	0
25-50%	7
50-75%	13
75-100%	20

The analyses yielded values show below.

Moses Drive Area – BCR = 5.84

Chestnut Street Area – BCR = 2.52

ML King Drive Area – BCR = 3.27

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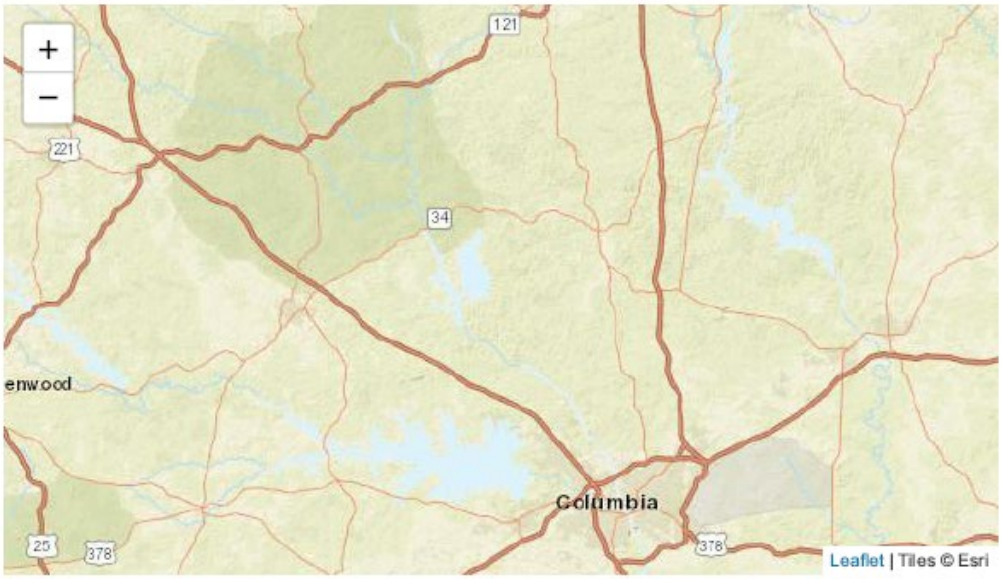
FEMA Benefit-Cost Calculator

V.6.0 (Build 20230103.1822 | Release Notes)

Benefit-Cost Analysis

Project Name: Moses Drive Area - Drainage Improvements



				Using 7% Discount Rate			Using 3% Discount Rate (For FY22 BRIC and FMA only)			
Map Marker ▲	Mitigation Title	Property Type	Hazard	Benefits (B)	Costs (C)	BCR (B/C)	Benefits (B)	Costs (C)	BCR (B/C)	
1	Drainage Improvement @ 34.3322968; -79.9576503	•••	DFA - Riverine Flood	$ 8,301,345	$ 1,420,841	5.84	$ 15,476,817	$ 1,778,712	8.70	
TOTAL (SELECTED)				$ 8,301,345	$ 1,420,841	5.84	$ 15,476,817	$ 1,778,712	8.70	
TOTAL				$ 8,301,345	$ 1,420,841	5.84	$ 15,476,817	$ 1,778,712	8.70	

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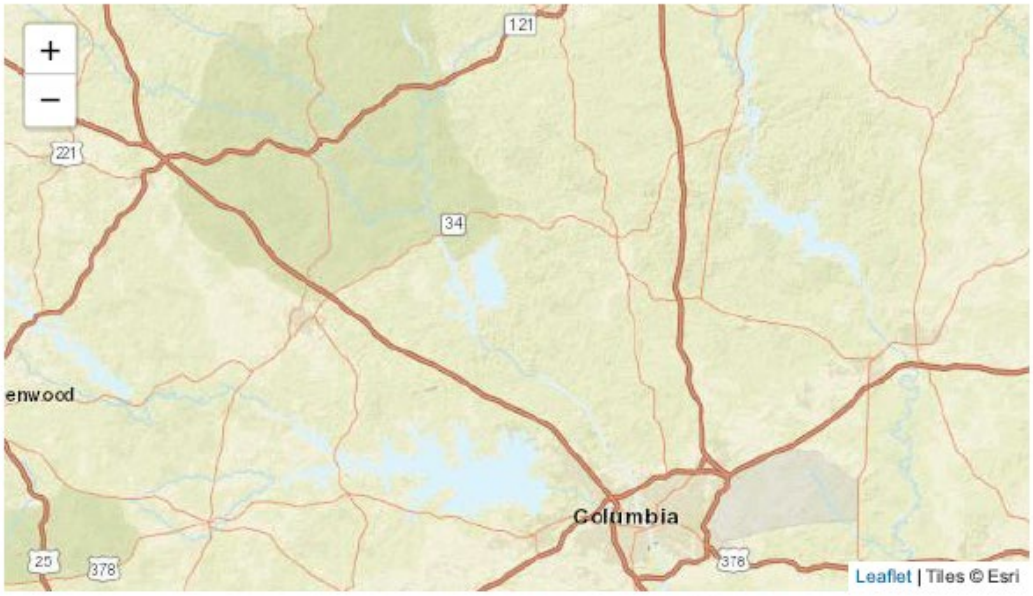
FEMA Benefit-Cost Calculator

V.6.0 (Build 20230103.1822 | Release Notes)

Benefit-Cost Analysis

Project Name: Chestnut Area - Drainage Improvement



				Using 7% Discount Rate			Using 3% Discount Rate (For FY22 BRIC and FMA only)			
Map Marker ▲	Mitigation Title	Property Type	Hazard	Benefits (B)	Costs (C)	BCR (B/C)	Benefits (B)	Costs (C)	BCR (B/C)	
1	Drainage Improvement @ Darlington, South Carolina		DFA - Riverine Flood	$ 6,576,718	$ 2,607,878	2.52	$ 12,261,466	$ 3,252,045	3.77	
TOTAL (SELECTED)				$ 6,576,718	$ 2,607,878	2.52	$ 12,261,466	$ 3,252,045	3.77	
TOTAL				$ 6,576,718	$ 2,607,878	2.52	$ 12,261,466	$ 3,252,045	3.77	

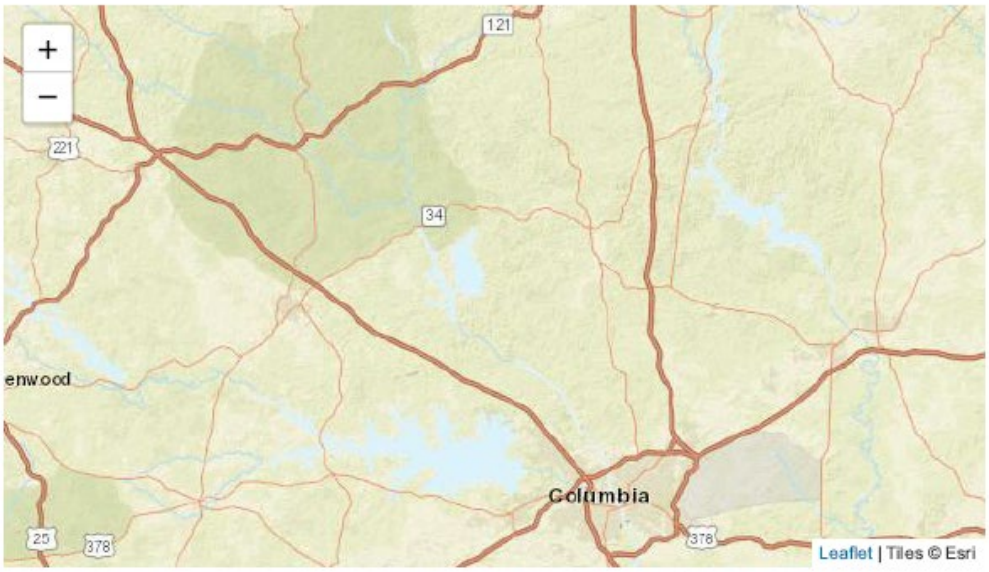
3/23/23, 3:00 PM Version 6.0.0. Build 20230103.1822

FEMA Benefit-Cost Calculator

V.6.0 (Build 20230103.1822 | Release Notes)

Benefit-Cost Analysis

Project Name: MLK Area Drainage Improvements

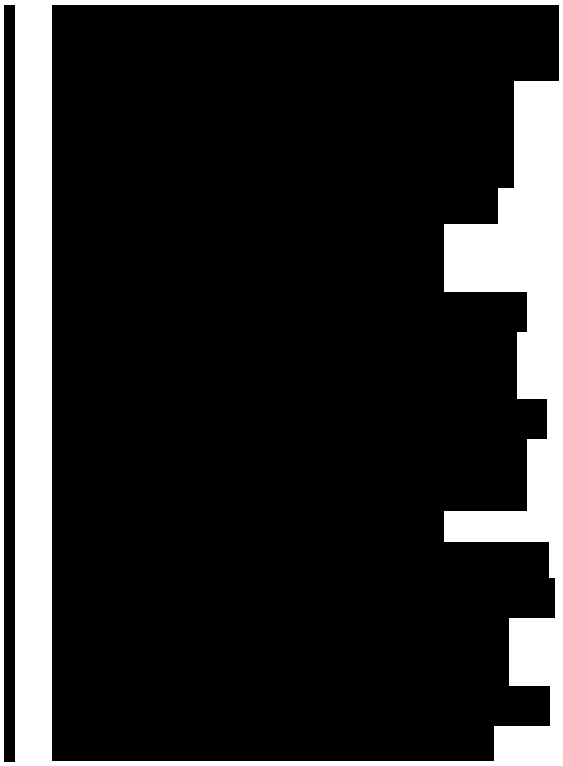


				Using 7% Discount Rate			Using 3% Discount Rate (For FY22 BRIC and FMA only)			
Map Marker ▲	Mitigation Title	Property Type	Hazard	Benefits (B)	Costs (C)	BCR (B/C)	Benefits (B)	Costs (C)	BCR (B/C)	
1	Drainage Improvement @ Darlington County, South Carolina	•••	DFA - Riverine Flood	$ 4,509,484	$ 1,380,370	3.27	$ 8,407,368	$ 1,753,152	4.80	
TOTAL (SELECTED)				$ 4,509,484	$ 1,380,370	3.27	$ 8,407,368	$ 1,753,152	4.80	
TOTAL				$ 4,509,484	$ 1,380,370	3.27	$ 8,407,368	$ 1,753,152	4.80	

SECTION 5. PROJECT ASSESSMENTS AND CONCEPT PLAN

Potential Property Buyout Locations

Based on these onsite assessments and investigations, the following properties are recommended for potential buyout locations.



Risk Assessment for Each Project

Flood impacts are the specific types of damage that could occur because of flooding. The flood impacts identified are the specific consequence that could result from the flood water. Not all impacts are directly related to property damage but have equally devastating consequences, such as the closing of a flooded street or the inability of a homeowner to leave a house surrounded by flood water.

Examples of flood impacts include flooding in the living space of a house, flooding of an outdoor heating or air conditioning unit, or damage to personal property such as a car. Flooding above the lowest floor of a building can cause varying levels of damage to a structure. Even a small amount of flood water inside a house for example can damage flooring and cabinets. Higher levels of flooding can cause serious damage to sheet rock, doors, and the building's electrical systems. Long-term flooding can also result in mold and mildew that can lead to serious health issues.

Assessment of the risk must consider the likelihood that a particular impact would occur. Storm event recurrence interval flood data will be used to estimate the frequency of occurrence of a flood impact. The estimated flood elevations are founded on a statistical analysis of the likelihood that a watershed

will receive enough rain over a certain period (24 hours) to produce storm water runoff sufficient to reach a flood level equal to or exceeding a certain elevation in any given year. An example of this concept is the "100-year storm event." The 100-year storm event predicts in any given year there is a 1 percent chance that a watershed will receive enough rain to produce flood levels equal to or exceeding a specified level during a 24-hour time period. This concept is a useful tool in estimating the likelihood that a flood impact will occur. The recurrence interval is an annualized probability. There is a 1 percent chance that a 100-year storm will occur during 2023 and a 1 percent chance that a 100-year storm will occur in 2024 and so on. The storm event recurrence intervals that will be used to quantify the probability of flood impacts are listed below.

Storm Event	Annual Exceedance Probability	Flood Risk
2-year	50%	High
10-year	10%	Elevated
25-year	4%	Medium
50-year	2%	Low
100-year	1%	Extremely Low

For our four (4) projects, the proposed Level of Service (LOS) was the 10-year storm event. This meant that the stormwater flowed freely within pipes, culverts and ditches without surcharging (pressurizing the pipes or culverts) or ditches overflowing. The proposed systems *did* pass the 25-year and occasionally, the 50-year event without flooding out of the system. All the existing projects could not pass the 2-year storm event. The risks for the existing conditions were considered high. Physical contact with flooding and other social vulnerability considerations can impact risk.

References

1. E. L. Robinson Engineering, *Hartsville Drainage Study*, 2021
2. E. L. Robinson Engineering, Darlington County Watershed Study, Existing Conditions Report, 2022
3. E. L. Robinson Engineering, Darlington County Watershed Study, Alternative Analysis Report, 2023
4. South Hartsville – Housing Affordability & Marketability Study, December 2016.
5. South Carolina Department of Transportation*, South Carolina Roadway Design Manual, 2021.*
6. USDA, NRCS, TR-55, Peak Flow Determination, 1986.
7. City of Greenville, Stormwater Levels of Service Policy, 2018.
8. Darlington County GIS data
9. South Carolina Floodwater Commission, *South Carolina Floodwater Commission Report*, November 2018
10. National Hurricane Center, Tropical Cyclone Report – *Hurricane Florence, 31 August to 17 September 2018*, September 2019
11. National Hurricane Center, Tropical Cyclone Report – *Hurricane Matthew, 28 September to 9 October 2016*, April 2017
12. US Department of Commerce, *The Historic South Carolina Floods of October 1-5, 2015*, July 2016.
13. National Hurricane Center, Tropical Cyclone Report – *Hurricane Joaquin, 28 September to 7 October 2015*, January 2016
14. US Geological Survey, *Flood Inundation Maps of Selected Areas Affected by the Flood of October 2015 in Central and Coastal South Carolina*, 2016
15. *USGS, Monitoring storm tide and flooding from Hurricane Matthew along the Atlantic coast of the United States*, October 2016
16. Federal Emergency Management Agency, *Flood Insurance Study for Darlington County, SC*, 2013
17. NOAA National Hurricane Center, *Hurricanes in History*, Webpage
18. Federal Emergency Management Agency, *Flood Insurance Study for Darlington County, SC*, 1991
19. Wilbur Smith Associates, *Analysis of the Flood of October 1990 – Black Creek Watershed, Chesterfield and Darlington Counties*, 1992
20. USGS, Preliminary peak stage and streamflow data selected Stream gaging Stations South Carolina
21. Darlington County webpage for questionnaire and flood mapping, GIS-based, OnPoint! Media
22. Flood Risk Assessment and Reduction Community Guidebook, U.S. Department of Homeland Security
23. Arizona State University's Center for Emergency Management and Homeland Security - *Spatial Hazard Events and Losses Database for the United States.* February 2023.

Appendix A – Field Surveys

Moses Drive Area

Chestnut Street Area

ML King Drive Area

Appendix B – Precipitation Data

NOAA Atlas 14, Volume 2, Version 3
Location name: Darlington, South Carolina, USA*
Latitude: 34.2749°, Longitude: -79.8612°
Elevation: 149.71 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M.Yekta, and D. Riley

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.435 (0.400-0.472)	0.507 (0.468-0.550)	0.588 (0.541-0.638)	0.659 (0.605-0.714)	0.741 (0.677-0.802)	0.807 (0.734-0.872)	0.869 (0.787-0.939)	0.929 (0.836-1.00)	1.00 (0.896-1.09)	1.07 (0.945-1.16)
10-min	0.694 (0.639-0.753)	0.811 (0.748-0.880)	0.942 (0.866-1.02)	1.05 (0.967-1.14)	1.18 (1.08-1.28)	1.28 (1.17-1.39)	1.38 (1.25-1.49)	1.47 (1.33-1.59)	1.59 (1.42-1.72)	1.68 (1.49-1.82)
15-min	0.868 (0.799-0.942)	1.02 (0.941-1.11)	1.19 (1.10-1.29)	1.33 (1.22-1.44)	1.50 (1.37-1.62)	1.63 (1.48-1.76)	1.75 (1.58-1.89)	1.86 (1.67-2.01)	2.00 (1.78-2.17)	2.11 (1.87-2.29)
30-min	1.19 (1.10-1.29)	1.41 (1.30-1.53)	1.69 (1.56-1.84)	1.93 (1.77-2.09)	2.22 (2.03-2.40)	2.45 (2.23-2.65)	2.67 (2.42-2.89)	2.89 (2.60-3.13)	3.18 (2.84-3.45)	3.41 (3.02-3.71)
60-min	1.48 (1.37-1.61)	1.77 (1.63-1.92)	2.17 (2.00-2.36)	2.52 (2.31-2.73)	2.95 (2.70-3.20)	3.32 (3.02-3.59)	3.68 (3.33-3.98)	4.06 (3.65-4.39)	4.56 (4.07-4.94)	4.98 (4.41-5.41)
2-hr	1.68 (1.54-1.83)	2.01 (1.85-2.19)	2.50 (2.30-2.72)	2.94 (2.70-3.20)	3.52 (3.21-3.81)	4.00 (3.64-4.34)	4.50 (4.07-4.88)	5.03 (4.50-5.44)	5.74 (5.09-6.21)	6.34 (5.58-6.88)
3-hr	1.77 (1.62-1.95)	2.12 (1.94-2.33)	2.65 (2.42-2.91)	3.14 (2.86-3.44)	3.79 (3.43-4.15)	4.36 (3.93-4.76)	4.95 (4.43-5.40)	5.59 (4.96-6.09)	6.49 (5.68-7.08)	7.27 (6.30-7.94)
6-hr	2.09 (1.91-2.32)	2.51 (2.29-2.77)	3.14 (2.86-3.46)	3.72 (3.38-4.09)	4.51 (4.08-4.95)	5.21 (4.67-5.70)	5.93 (5.29-6.48)	6.72 (5.93-7.33)	7.84 (6.83-8.55)	8.81 (7.59-9.62)
12-hr	2.45 (2.23-2.72)	2.93 (2.67-3.25)	3.68 (3.35-4.07)	4.39 (3.98-4.84)	5.36 (4.83-5.89)	6.22 (5.57-6.82)	7.13 (6.32-7.81)	8.13 (7.14-8.89)	9.56 (8.27-10.4)	10.8 (9.24-11.8)
24-hr	2.93 (2.73-3.18)	3.54 (3.29-3.84)	4.52 (4.19-4.90)	5.39 (4.98-5.83)	6.72 (6.16-7.28)	7.89 (7.17-8.57)	9.23 (8.27-10.0)	10.7 (9.49-11.8)	13.1 (11.3-14.4)	15.1 (12.8-16.8)
2-day	3.42 (3.19-3.71)	4.12 (3.84-4.46)	5.23 (4.86-5.67)	6.21 (5.75-6.74)	7.72 (7.08-8.38)	9.07 (8.22-9.86)	10.6 (9.48-11.6)	12.3 (10.9-13.6)	15.0 (12.9-16.7)	17.3 (14.6-19.5)
3-day	3.66 (3.41-3.95)	4.39 (4.10-4.74)	5.54 (5.15-5.97)	6.54 (6.06-7.05)	8.06 (7.40-8.70)	9.39 (8.54-10.2)	10.9 (9.79-11.9)	12.6 (11.2-13.8)	15.1 (13.2-16.8)	17.4 (14.9-19.5)
4-day	3.89 (3.63-4.19)	4.66 (4.36-5.02)	5.84 (5.44-6.28)	6.86 (6.37-7.37)	8.39 (7.72-9.03)	9.71 (8.87-10.5)	11.2 (10.1-12.1)	12.8 (11.4-14.0)	15.3 (13.4-16.9)	17.6 (15.1-19.6)
7-day	4.55 (4.27-4.86)	5.44 (5.10-5.82)	6.72 (6.28-7.18)	7.79 (7.27-8.32)	9.34 (8.65-9.99)	10.6 (9.79-11.4)	12.0 (11.0-13.0)	13.5 (12.2-14.7)	15.8 (14.0-17.3)	18.0 (15.8-19.9)
10-day	5.27 (4.96-5.59)	6.28 (5.92-6.68)	7.65 (7.19-8.12)	8.76 (8.22-9.31)	10.3 (9.65-11.0)	11.6 (10.8-12.4)	13.0 (12.0-13.9)	14.4 (13.2-15.5)	16.5 (14.9-17.9)	18.4 (16.4-20.1)
20-day	7.05 (6.68-7.45)	8.34 (7.91-8.82)	9.96 (9.43-10.5)	11.3 (10.7-12.0)	13.2 (12.4-13.9)	14.7 (13.7-15.6)	16.2 (15.1-17.3)	17.9 (16.5-19.2)	20.2 (18.4-21.8)	22.0 (19.8-23.9)
30-day	8.69 (8.28-9.13)	10.2 (9.76-10.8)	12.0 (11.5-12.7)	13.5 (12.8-14.2)	15.3 (14.5-16.2)	16.8 (15.8-17.8)	18.3 (17.1-19.4)	19.8 (18.4-21.0)	21.7 (20.1-23.3)	23.3 (21.3-25.1)
45-day	10.9 (10.4-11.4)	12.8 (12.2-13.3)	14.8 (14.1-15.5)	16.4 (15.6-17.1)	18.5 (17.6-19.4)	20.2 (19.1-21.2)	21.8 (20.5-22.9)	23.4 (22.0-24.7)	25.5 (23.7-27.1)	27.1 (25.1-29.0)
60-day	13.0 (12.4-13.5)	15.2 (14.5-15.9)	17.4 (16.7-18.2)	19.2 (18.3-20.1)	21.5 (20.5-22.5)	23.2 (22.1-24.3)	24.9 (23.6-26.2)	26.5 (25.0-28.0)	28.6 (26.8-30.4)	30.2 (28.1-32.2)

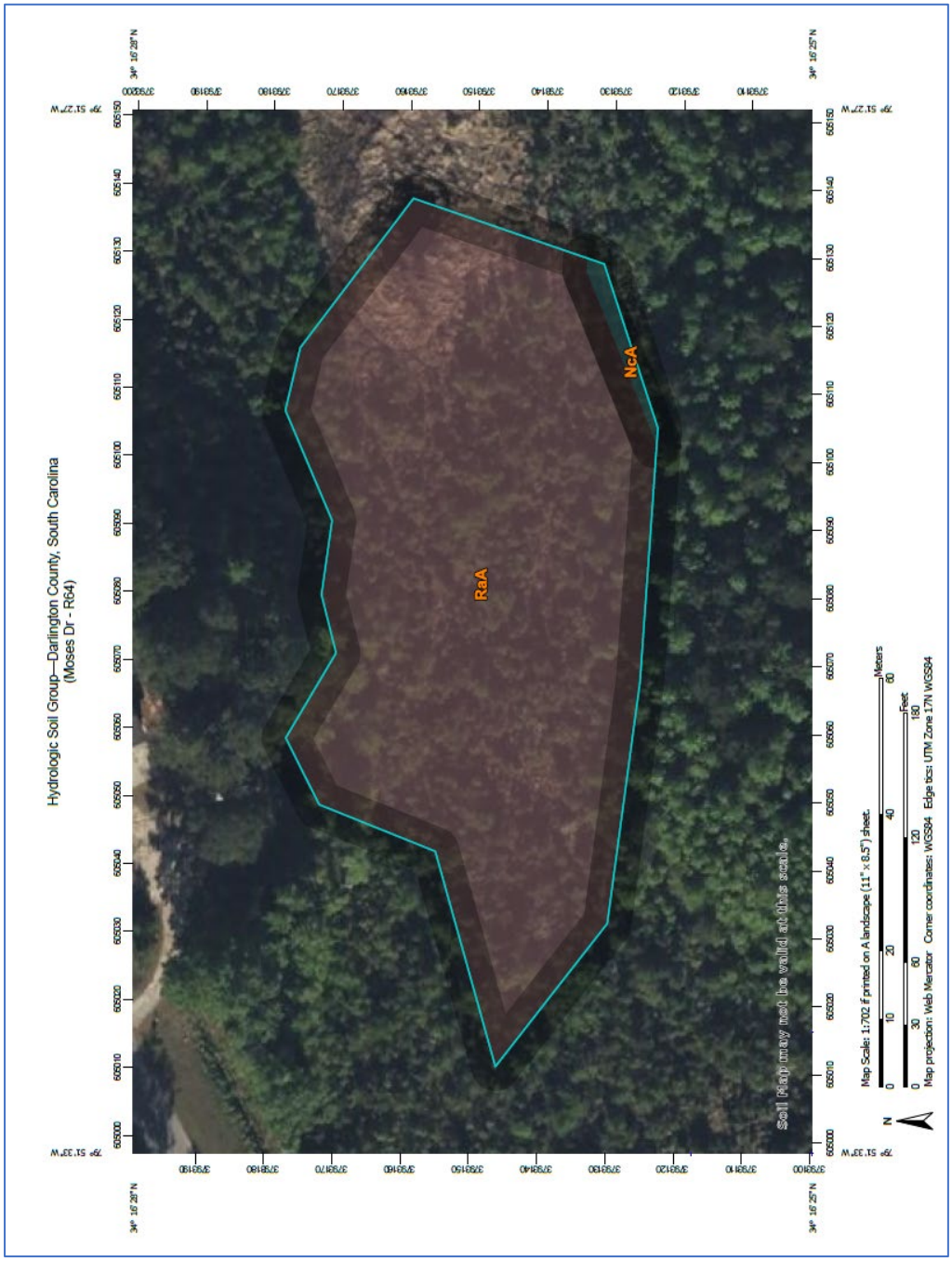
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

Appendix C – Hydrologic Parameters Example for Subcatchments (All Subcatchments Data Provided in Zipped File)

Moses Drive Area – Subcatchment R64



Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
NcA	Noboco loamy sand, 0 to 2 percent slopes	C	0.0	1.1%
RaA	Rains sandy loam, 0 to 2 percent slopes	B/D	1.2	98.9%
Totals for Area of Interest			**1.2**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

RUNOFF CURVE NUMBER & Tc

Client:	SC Office of Resilience	**SCS Eqn.**	**Lag** (hrs) = L^0.8((1000/CN-10)+1)^0.7/1900Y^0
Proj Name:	Darlington Co. Watershed Study - Moses Dr		**Tc** (min) = Lag * 1.67 *60
Basin Name:	R64		
COMMENTS:	Existing Conditions		

Cover Type Treatment		Curve Numbers for Hydrologic Soil Type							
		hydrologic condition	A		B		C	D	
CULTIVATED AGRICULTURAL LANDS									
Fallow	Bare soil	----		77		86	91		94
	Crop residue (CR)	poor		76		85	90		93
	Crop residue (CR)	good		74		83	88		90
Row Crops	Straight row (SR)	poor		72		81	88		91
	Straight row (SR)	good		67		78	85		89
Other Agricultural Land	Pasture, grassland or range	fair		49		69	79		84
	Meadow -cont. grass (non grazed)	----		30		58	71		78
	Brush - brush, weed, grass mix	fair		35		56	70		77
	Woods - grass combination	fair		43		65	76		82
	Woods	fair		36		60	73	1.2	79
	Farmsteads	----		59		74	82		86
FULLY DEVELOPED URBAN AREAS (Veg Established)			A		B		C	D	
Open space (Lawns,parks etc.)	Fair condition; grass cover 50% to 75 %			49		69	79		84
Impervious Areas	Paved parking lots, roofs, driveways			98		98	98		98
	Streets and roads								
	Paved; curbs and storm sewers			98		98	98		98
	Paved; open ditches (w/right-of-way)			83		89	92		93
	Gravel (w/ right-of-way)			76		85	89		91
	Dirt (w/ right-of-way)			72		82	87		89
Urban Districts		Avg % imperv							
	Commercial & business	85		89		92	94		95
	Industrial	72		81		88	91		93
Residential districts by average lot size		Avg % imperv							
	1/8 acre (town houses)	65		77		85	90		92
	1/4 acre	38		61		75	83		87
	1/3 acre	30		57		72	81		86
	1/2 acre	25		54		70	80		85
	1 acre	20		51		68	79		84
	2 acre	12		46		65	77		82
	User defined urban			**		**	**		**
DEVELOPING URBAN AREA (No Vegetation)									
	Newly graded area (pervious only)			77		86	91		94
				0		0	0	1.2	
			Total Acres				**1.2**		
	Weighted Runoff Curve Number (RCN)						**79**		

Basin Name	R64
Outlet Name	J46
DA, ac	1.2
Length, ft	419
Slope, %	0.191
CN	79
Lag, hr	0.37
Tc,min	**37.5**
Min. Tc, min	**37.5**
us elev	147.6
ds elev	146.8
S %	**0.191**

Appendix D – PCSWMM Output (10-year Storm Event)

(All PCSWMM Models Data Provided in Zipped File)

a. – Moses PCSWMM Output

Junction Name	Invert Elev. (ft)	Rim Elev. (ft)	Max. HGL (ft)
J1	149.18	151.18	150.89
J101	148.77	150.77	149.52
J102	148.68	150.58	149.23
J103	146.81	148.81	148.05
J107	147.5	149.57	148.57
J108	147.3	149.43	148.55
J109	147.1	149.51	148.52
J11	148.68	150.77	150.46
J110	147	149.36	148.47
J111	146.98	149.16	148.45
J112	146.95	149.23	148.32
J113	146.92	149.27	148.25
J114	146.9	149.31	147.91
J115	146.6	149.38	147.65
J117	148.1	150.58	149.14
J118	149.52	151.52	149.99
J12	149.28	151.28	150.88
J120	149.38	150.18	150.23
J121	147.77	149.77	149
J125	146.5	148.09	148.01
J126	146.45	148.45	147.85
J13	149.39	151.39	150.91
J14	148.99	150.99	149.7
J15	148.91	150.91	149.68
J16	148.17	150.17	149.68
J17	147.92	149.92	149.64
J18	147.87	149.87	149.64
J19	147.81	149.81	149.74
J2	149.15	151.05	150.88
J20	147.77	149.77	149.75
J21	147.88	149.88	149.79
J22	147.66	149.75	149.26

J23	147.63	149.65	149.21
J24	147.74	150	149.3
J25	147.78	150	149.34
J26	148.01	149.93	149.47
J27	148.05	150.17	149.92
J29	147.886	150.16	149.41
J3	148.94	151.14	150.82
J31	148.85	151.06	150.77
J33	146.71	149.64	148.97
J35	148.85	150.85	150.8
J36	144.3	148.7	146.58
J37	144.5	144.95	146.58
J38	146.42	148.92	147.46
J39	148.93	150.93	150.82
J4	148.88	150.86	150.81
J40	147.84	149.88	149.35
J41	147.87	150.02	149.39
J42	149.96	151.96	150.57
J44	149.79	151.79	150.3
J45	144.6	146	146.58
J46	143.5	147	147.65
J48	147.28	149.28	149.05
J49	145.5	148.5	147.67
J5	148.74	150.91	150.75
J50	143.1	150	146.46
J66	146	149.17	147.15
J7	148.54	151.26	150.4
J70	143.54	148.54	146.53
J73	143.26	148.26	146.46
J74	144.52	146.52	146.6
J76	145	146.79	146.59
J77	144.92	146.75	146.59
J78	144.8	146.72	146.59
J79	144.78	146.87	146.58
J8	148.5	151.09	150.26
J83	149.28	151.28	150.35
J88	146.55	149.6	148.72
J89	148.08	149.58	148.76
J9	148.29	150.76	150.17
J90	145.83	148.33	147.63
J91	144	147.9	147.65

J92	147.22	150.22	148.36
J93	147.99	149.99	148.43
J94	148.16	150.16	148.7
J95	148.69	150.69	149.3
J96	148.84	150.84	149.13
J97	147.74	149.74	149.06
J98	146.61	149.5	148.92

Conduit Name	Length (ft)	Cross-Section	Diameter/Bottom Width, ft	No. of Pipes	Slope (ft/ft)	Max. Flow (cfs)	Max. Velocity (ft/s)
C1	56.799	CIRCULAR	1.25	1	0.05201	1.32	2.34
C1.1	41.713	TRAPEZOIDAL	1.5	1	0.0012	7.9	1.36
C10	45.407	CIRCULAR	1.5	1	-0.00211	8.44	4.82
C101	25.363	CIRCULAR	1.25	1	0.00789	3.05	2.78
C103	25.259	CIRCULAR	1.25	1	0.00396	2.88	2.35
C105	24.946	CIRCULAR	1.25	1	0.0012	4.66	3.8
C107	25.032	CIRCULAR	1.25	1	0.0008	4.65	3.98
C109	25.792	CIRCULAR	1.25	1	0.00969	3.18	3.43
C11	26.412	CIRCULAR	1.5	1	0.00151	4.55	2.6
C12	5.71	CIRCULAR	1.5	1	0	7.84	4.44
C13	25.889	CIRCULAR	1.5	1	0.00116	5.47	3.11
C14	70.436	IRREGULAR	0		0.00142	13.32	0.94
C15	26.009	CIRCULAR	1.25	1	0.00308	1.65	3.39
C17	26.119	CIRCULAR	1.25	1	0.00957	2.83	2.31
C19	25.938	CIRCULAR	1.25	1	0.00424	2.84	2.31
C2	50.149	CIRCULAR	1.5	1	0.0012	8.08	4.57
C21	26.109	CIRCULAR	1.25	1	-0.0023	4.55	3.71
C24	25.443	CIRCULAR	1.5	1	0.00118	2.56	1.46
C26	41.679	CIRCULAR	1.5	2	0.0012	7.39	2.09
C27	21.67	CIRCULAR	1.25	1	0.00508	3.23	2.7
C3	25.927	CIRCULAR	1.5	1	0.00154	7.95	4.5
C31	33.868	CIRCULAR	1.5	1	0.0124	5.17	5.72
C33	42.783	CIRCULAR	1.5	1	0.00117	10.59	5.99
C4	25.128	CIRCULAR	1.5	1	0.00119	4.7	2.72
C44	36.48	CIRCULAR	1.5	1	0.01426	5.53	3.78
C5	44.159	CIRCULAR	1.5	1	0.00906	4.15	3.06
C69	53.317	CIRCULAR	3	2	0.03434	40.06	5.07
C7	26.267	CIRCULAR	1.5	1	0.00152	7.89	4.46
C70	26.195	CIRCULAR	1.5	1	0.00267	6.44	3.81
C72	25.792	CIRCULAR	1.5	1	0.0031	4.23	2.9
C74	25.671	CIRCULAR	1.5	1	0.00078	4.52	2.61
C78	35.802	CIRCULAR	1.25	1	0.03242	3.36	4.19
C8	24.132	CIRCULAR	1.5	1	0.00414	4.72	2.67
C81	27.096	CIRCULAR	1.25	1	-0.00554	0.97	2.46
C85	24.538	CIRCULAR	1.5	1	0.00693	1.57	3.24

C87	31.683	CIRCULAR	1.5	1	-0.00189	1.67	2.63
C9	25.68	CIRCULAR	1.5	1	0.00156	9.06	5.19
C90.1	26.087	CIRCULAR	1	1	0.07573	1.27	4.06
C91	50.967	CIRCULAR	3	1	0.00118	24.48	4.33
C94	33.553	CIRCULAR	1.5	1	0.00566	3.55	2.74
C96	26.306	CIRCULAR	1.25	1	0.00342	1.81	3.38
C97	25.75	CIRCULAR	1.5	1	0.00194	6.81	3.9
Ch1	6.534	TRAPEZOIDAL	2		0.00153	7.93	1.14
Ch100	129.46	TRAPEZOIDAL	2		0.00286	3.77	0.73
Ch102	60.519	TRAPEZOIDAL	2		0.0033	2.95	0.71
Ch104	51.671	TRAPEZOIDAL	2		0.00039	2.87	0.49
Ch106	62.556	TRAPEZOIDAL	2		0.00048	4.65	0.9
Ch108	83.693	TRAPEZOIDAL	2		0.00358	4.65	1.47
Ch111	93.496	TRAPEZOIDAL	2		0.00374	3.08	1.04
Ch112	361.93	TRAPEZOIDAL	2		0.00445	3.58	1.27
Ch113	134.96	TRAPEZOIDAL	2		0.0086	5.42	0.88
Ch114	367.07	TRAPEZOIDAL	2		0.00346	1.07	0.82
Ch115	134.67	TRAPEZOIDAL	2		0.00126	0.69	0.5
Ch119	178.34	TRAPEZOIDAL	2		0.00348	6.79	1.01
Ch12	67.436	TRAPEZOIDAL	2		0.00119	4.46	0.79
Ch14	80.077	TRAPEZOIDAL	2		0.00137	7.78	0.96
Ch15	23.012	TRAPEZOIDAL	2		0.0013	7.86	1.03
Ch16	144.12	TRAPEZOIDAL	2		0.00513	1.39	0.62
Ch18	28.937	TRAPEZOIDAL	2		0.00449	2.79	0.42
Ch20	80.128	TRAPEZOIDAL	2		-0.0005	2.78	0.3
Ch22	32.729	TRAPEZOIDAL	2		0.00244	4.48	0.64
Ch23	51.495	TRAPEZOIDAL	2		0.00241	9.09	1.82
Ch25	126.08	TRAPEZOIDAL	2		0.00127	2.49	0.4
Ch26	264.87	TRAPEZOIDAL	2		0.00109	2.67	0.57
Ch29	120.85	TRAPEZOIDAL	2		0.00132	5.3	0.89
Ch30	508.42	TRAPEZOIDAL	3		0.00124	7.97	1.16
Ch32	98.677	TRAPEZOIDAL	3		0.00132	9.88	1.04
Ch34	650.75	IRREGULAR	0		0.00522	13.61	1.22
Ch4	115.61	TRAPEZOIDAL	2		0.00121	8.01	1.16
Ch46	242.48	TRAPEZOIDAL	2		0.0025	11.49	1.76
Ch46.1	275.81	TRAPEZOIDAL	2		0.00154	10.98	1.08
Ch5.1	62.461	TRAPEZOIDAL	2		0.00026	4.79	0.92
Ch5.2	49.994	TRAPEZOIDAL	2		0.0012	4.62	0.86
Ch6	172.97	TRAPEZOIDAL	2		0.00121	7.9	1.11
Ch62	566.03	IRREGULAR	0		0.00049	6.51	0.67
Ch71	176.38	TRAPEZOIDAL	3		0.00232	6.76	1.24
Ch73	55.792	TRAPEZOIDAL	3		0.00323	4.62	0.62
Ch74	61.706	TRAPEZOIDAL	3		0.02756	7.8	1.49
Ch74.1	20.863	TRAPEZOIDAL	3		0.00959	4.76	0.48
Ch75	283.13	IRREGULAR	0		0.00268	5.81	0.45
Ch78	102.6	TRAPEZOIDAL	3		0.00117	4.37	0.72
Ch8	166.1	TRAPEZOIDAL	2		0.0012	9.08	1.19
Ch82	147.79	TRAPEZOIDAL	2		0.00744	0.95	0.47

Ch83	142.97	TRAPEZOIDAL	2		0.00406	1.81	0.76
Ch84	164.8	TRAPEZOIDAL	2		0.00467	1.57	0.68
Ch86	110.38	TRAPEZOIDAL	2		0.01459	1.58	0.33
Ch88	272.92	TRAPEZOIDAL	3		0.00165	24.67	2.3
Ch89	168.43	TRAPEZOIDAL	3		0.0016	27.48	2.13
Ch90	211.85	TRAPEZOIDAL	2		0.01048	4.34	1.34
Ch90.2	95.646	TRAPEZOIDAL	2		0.01443	1.14	0.28
Ch92	195.92	TRAPEZOIDAL	3		0.00265	5.37	0.78
Ch93	129.09	TRAPEZOIDAL	3		0.00852	10.63	3.34
Ch93.1	41.41	TRAPEZOIDAL	3		0.03625	34.34	2.89
Ch95	129.69	TRAPEZOIDAL	1.66		0.00239	3.55	0.69
Ch99	407.14	TRAPEZOIDAL	2		0.00251	6.76	1.36
ChDetOF1	514.34	IRREGULAR	0		0.00097	33	0.52
ChO37Det	559.28	IRREGULAR	0		0.00029	24.96	0.61
ChOF1	307.94	CIRCULAR	3	1	0.00162	18.11	2.56

Storage Junction	Invert Elev. (ft)	Rim Elev. (ft)	Storage Name	Max. Volume (1000 ft^3)
J10	148.25	151.29	BioRetention	0.741
J100	147	149	BioRetention	0.393
J106	146.2	148.98	BioRetention	0.58
J116	147.85	150.58	BioRetention	0.313
J119	148.25	148.75	BioRetention	0.166
J28	147.79	149.79	BioRetention	0.78
J30	147.47	151.14	BioRetention	0.702
J32	146.84	151.58	BioRetention	0.963
J34	146.66	149.16	BioRetention	0.803
J43	147.99	149.99	BioRetention	0.334
J6	148.99	151.03	BioRetention	1.884
J75	144.59	146.59	BioRetention	0.867
J87	146.1	148.1	BioRetention	0.799

b. – Chestnut Street PCSWMM Output

Junction Name	Rim Elev. (ft)	Max. HGL (ft)	Invert Elev. (ft)
J1	150.47	149.37	147.711
J10	151.1	148.57	146.926
J11	151.45	148.59	147.86
J12	151.33	148.59	147.733
J13	150.5	148.51	146.28
J14	150.31	149.29	148.012
J15	150.3	149.42	148.09
J16	150.3	149.41	148.06
J17	151.55	149.35	147.563
J18	152.56	149.33	147.398
J19	151.62	150.29	149.78
J2	150.47	149.38	147.802
J20	150.85	149.56	148.35
J21	151.71	149.2	147.19
J22	152.04	149.08	147.07
J23	151.47	148.59	146.86
J24	152.3	150.07	149.52
J25	150.08	148.27	146.388
J26	150.51	149.21	148.94
J27	150.71	148.29	146.432
J28	151.06	148.3	146.56
J29	149.94	148.19	146.183
J3	150.38	149.32	148.41
J30	150.44	148.08	145.915
J31	150.14	148.14	145.992
J32	150	148.18	146
J33	150	147.53	145.492
J34	150.16	147.51	145.404
J35	149.73	147.51	145.79
J36	148	146.71	144.51
J37	150	147.78	145.639
J38	148	146.3	144.022
J4	150.5	149.32	148.44
J41	150.43	148.14	145.731
J42	150.92	148.38	145.9
J43	150.75	148.84	148.104

J44	151.21	148.84	148.252
J45	150.97	148.52	147.234
J46	150.71	148.48	146.8
J48	150.19	148.6	147.59
J5	150.41	149.3	148.061
J50	150.5	148.67	147.922
J51	151	148.66	147.8
J52	151	148.65	147.5
J53	152	149.29	147.252
J54	152	148.64	147.45
J55	152	148.55	147.2
J56	152	148.62	147.358
J57	152	148.41	147.15
J58	152	148.35	146.91
J59	149	146.66	144.05
J6	150.34	149.27	147.983
J60	150.5	148.49	147
J61	150.71	148.48	147.03
J62	150	147.58	145.5
J63	150.5	149.48	148.2
J65	150.5	148.21	146.513
J7	150.03	148.49	146.044
J8	151.24	149.36	148
J9	151.1	148.86	147.5

Conduit Name	Length (ft)	Cross-Section	Diameter/Bottom Width, ft	No. of Pipes	Slope (ft/ft)	Max. Flow (cfs)	Max. Velocity (ft/s)
C1	121.297	CIRCULAR	1.5	1	0.00288	2.23	1.95
C10	17.755	CIRCULAR	1.5	1	0.03799	4.81	3.34
C11	337.513	CIRCULAR	2.25	1	0.00044	4.54	2.13
C12	30.227	CIRCULAR	2	1	0.00126	7.36	3.5
C13	67.312	CIRCULAR	1.25	1	0.03541	4.3	4.65
C14	20.454	CIRCULAR	2	1	0.00137	7.36	3.83
C15	148.489	CIRCULAR	1.5	1	0.00101	0.83	0.95
C16	29.172	CIRCULAR	2	1	0.00103	3.16	1.74
C17	143.022	CIRCULAR	2	1	0.00099	3.11	1.52
C18	116.514	CIRCULAR	2.5	1	0.00103	12.83	3.04
C19	196.32	CIRCULAR	2.5	1	0.00107	17.22	4.4
C2	24.252	CIRCULAR	1.5	1	0.00082	2.68	1.72
C20	291.636	CIRCULAR	2.5	2	0.00103	24.39	3.6
C21	11.951	CIRCULAR	1	1	0.14285	8.22	19.73

C22	52.78	CIRCULAR	2.5	2	0.00083	35.05	5.6
C23	79.711	CIRCULAR	2.5	2	0.00257	38.01	7.64
C24	65.422	CIRCULAR	2.5	2	0.00292	27.91	3.28
C25	38.945	CIRCULAR	2.5	2	0.00195	31.86	3.57
C26	201.418	CIRCULAR	2.5	2	0.0013	32.67	3.68
C27	132.832	CIRCULAR	2.5	2	0.00111	34.74	3.98
C28	31.738	CIRCULAR	2.5	2	0.0023	37.02	4.28
C29	497.742	TRAPEZOIDAL	3		0.0016	46.65	2.41
C3	23.607	CIRCULAR	1.25	1	0.01	1.97	1.6
C30	104.35	CIRCULAR	2.5	1	0.00542	4.96	2.02
C31	32.534	CIRCULAR	2	1	0.07032	0.85	2.88
C32	38.443	CIRCULAR	1	1	0.00939	7.61	9.69
C33	397.276	TRAPEZOIDAL	3		0.00116	42.53	2.02
C34	16.57	CIRCULAR	2	1	0.07273	5.47	2.97
C35	20.139	CIRCULAR	2	1	-0.18602	31.78	12.26
C36	100.28	CIRCULAR	1	1	0.0001	1.02	2.25
C37	231.424	CIRCULAR	3	1	0.00073	21.24	3.46
C38	129.169	CIRCULAR	3	1	0.00081	18.91	3.09
C39	169.631	CIRCULAR	3	1	0.00136	32.5	5.82
C4	24.735	CIRCULAR	1.5	1	0.00117	2.68	1.68
C40	334.022	CIRCULAR	2	1	0.00093	6.67	2.51
C41	63.121	CIRCULAR	2.5	1	0.00217	11.96	2.92
C42	97.013	CIRCULAR	2.5	1	0.00064	11.99	2.88
C43	39.885	CIRCULAR	2.5	2	0.00321	28.96	4.54
C44	26.486	CIRCULAR	1.5	1	0.004	1.04	1.45
C45	175.389	CIRCULAR	1.5	1	0.00261	2.85	3.82
C46	396.853	CIRCULAR	2.5	1	0.00116	6.67	1.49
C47	27.022	CIRCULAR	2	1	0.00063	4.54	2.27
C48	386.828	TRAPEZOIDAL	3		0.00101	46.16	3.01
C49	434.008	CIRCULAR	3	1	0.00157	23.58	4.22
C5	248.891	CIRCULAR	1.5	1	0.00182	6.78	4.67
C50	185	CIRCULAR	1.5	1	0.00204	0.54	1.31
C51	163.799	CIRCULAR	1.5	1	0.00074	0.57	1.13
C52	116.483	CIRCULAR	1.5	1	0.0016	0.7	1.09
C53	117.381	CIRCULAR	1.5	1	0.0013	1.27	1.06
C54	36.316	CIRCULAR	1.5	1	0.00132	2.32	1.56
C55	139.21	CIRCULAR	1.5	1	0.0004	2.31	1.54
C56	77.856	CIRCULAR	1.5	1	0.00064	4.17	2.98
C57	29.25	CIRCULAR	1.5	1	0.0012	4.79	3.95
C58	224.415	CIRCULAR	2	1	0.00086	5.58	2.54
C59	578.389	CIRCULAR	2.5	1	0.00069	20.49	6.66
C6	21.257	CIRCULAR	1.5	1	0.00141	1.07	1.59
C60	34.076	CIRCULAR	1	1	0.00675	0.01	0.03
C61	38.167	CIRCULAR	2	1	0.00524	4.11	1.88
C62	120.661	CIRCULAR	2	1	0.00194	4.24	2.4
C63	93.638	CIRCULAR	3	1	0.00214	38.92	15.61
C64	88.014	CIRCULAR	2	1	0.00069	6.68	2.81
C65	102.834	CIRCULAR	1.5	1	0.00107	0.83	1.02

C7	78.979	CIRCULAR	1.25	1	0.00022	2.23	1.81
C8	26.741	CIRCULAR	1.5	1	0.00475	1.3	2.57
C9	45.222	CIRCULAR	1.5	1	0.00148	1.4	2.81

Storage Junction	Invert Elev. (ft)	Rim Elev. (ft)	Storage Name	Max. Volume (1000 ft^3)
J39	143.65	149.34	OF2Stor	175.678
J40	145.3	150.89	ChestnutStor3	102.297
J47	148.3	151	ChestnutStor1	2.63
J49	142.5	148.5	ParkStor	56.929

c. – M. L. King Drive PCSWMM Output

Junction Name	Rim Elev. (ft)	Max. HGL (ft)	Invert Elev. (ft)
J1	216.189	218.189	217.99
J10	218.622	220.922	219.1
J11	218.43	220.73	218.99
J12	218.32	220.32	218.84
J13	218.013	220.313	218.7
J14	217.914	220.325	218.61
J15	217.839	220.325	218.57
J16	217.79	220.313	218.53
J17	219.79	222.09	220.02
J18	219.81	222.11	220.02
J19	219.276	221.45	219.68
J2	216.398	219.28	218
J20	219.01	221.31	219.7
J21	219.03	221.33	219.69
J22	219.051	221.351	219.62
J23	218.84	221.14	219.59
J24	218.859	221.159	219.56
J25	218.59	220.89	219.55
J26	218.615	220.915	219.4
J27	218.41	220.71	219.26
J28	218.422	220.758	219.24
J29	218.195	220.59	219.05
J3	219.93	222.23	220.03
J30	218.128	220.51	218.88
J31	218.019	220.444	218.73
J32	217.876	220.34	218.67
J33	217.495	219.795	218.5
J34	217.433	219.733	218.48
J35	217.323	219.623	218.26
J36	217.421	220.182	218.27
J37	217.229	220.05	218.24
J38	217.146	219.92	218.09
J39	217.119	219.903	218.05
J4	219.696	221.78	220.03
J40	216.734	219.73	218.02
J41	216.637	219.746	218.02

J42	215.524	218	216.8
J43	215.588	218.337	216.81
J44	215.406	218	216.77
J47	217.666	220.3	218.5
J48	217.248	219.548	218.24
J49	217.145	219.445	218.04
J5	219.3	221.6	219.71
J50	217.076	219.376	218.02
J51	218.996	221.296	219.49
J52	217.688	219.988	218.68
J53	218.73	221.03	218.73
J54	218.59	220.89	218.59
J55	218.44	220.74	219.33
J56	219	221.3	219
J57	216.527	219.27	218.01
J58	216.5	219.327	218.01
J59	219.523	221.786	219.89
J6	219.18	221.48	219.54
J60	219.499	221.799	219.8
J7	218.76	221.06	219.31
J8	218.73	221.03	219.21
J9	218.65	220.95	219.16

Conduit Name	Length (ft)	Cross-Section	Diameter/Bottom Width, ft	No. of Pipes	Slope (ft/ft)	Max. Flow (cfs)	Max. Velocity (ft/s)
C1	38.978	CIRCULAR	1.25	1	-0.00051	0	0.08
C10	23.974	TRAPEZOIDAL	2		-0.0005	2.63	0.89
C11	152.454	TRAPEZOIDAL	2		0.00149	3.57	1.17
C12	65.075	TRAPEZOIDAL	2		0.00103	4.52	1.57
C13	40.658	TRAPEZOIDAL	2		0.00268	4.51	1.8
C14	23.405	TRAPEZOIDAL	2		0.00611	4.5	1.73
C15	141.816	TRAPEZOIDAL	2.09		0.00321	5.13	1.73
C16	24.001	TRAPEZOIDAL	2		0.008	6.26	1.77
C17	71.504	TRAPEZOIDAL	2		0.00116	6.23	1.69
C18	20.008	TRAPEZOIDAL	2		0.00135	6.18	1.9
C19	66.692	TRAPEZOIDAL	2		0.00577	6.12	1.52
C2	224.283	TRAPEZOIDAL	2		0.00238	0.37	0.57
C20	19.71	TRAPEZOIDAL	2		0.00492	6.03	1.13

C21	25.47	TRAPEZOIDAL	2		0.00432	7.21	0.48
C22	40.241	TRAPEZOIDAL	2		0.00519	7.3	0.96
C23	873.855	TRAPEZOIDAL	3		0.00169	13.03	2.14
C24	978.576	TRAPEZOIDAL	4		0.00174	2.57	1.24
C25	23.985	CIRCULAR	1.25	1	0.00976	0	0.08
C26	77.295	TRAPEZOIDAL	2		0.00224	0.84	0.88
C27	24.896	CIRCULAR	1.25	1	0.00482	1.06	3.36
C28	72.557	TRAPEZOIDAL	2		0.00579	1.51	1.14
C29	23.958	CIRCULAR	1.25	1	0.00125	1.51	3.15
C3	23.498	CIRCULAR	1.25	1	0.01132	1.13	2.27
C30	24.602	CIRCULAR	2	1	0.00325	1.51	2.53
C31	23.899	TRAPEZOIDAL	2		0.00117	1.8	1.23
C32	57.067	TRAPEZOIDAL	2		0.00336	1.8	1.17
C33	28.957	CIRCULAR	1.25	1	0.0038	1.81	3.68
C34	90.276	TRAPEZOIDAL	2		0.0034	2.24	1.16
C35	23.922	CIRCULAR	1.25	1	0.00414	2.42	3.55
C36	44.301	TRAPEZOIDAL	2		0.00169	2.41	1.04
C37	15.183	CIRCULAR	1.25	1	0.00323	2.39	3.37
C38	54.001	TRAPEZOIDAL	2		0.0023	2.35	0.94
C39	1021.499	TRAPEZOIDAL	2		0.00197	3.53	1.19
C4	109.952	TRAPEZOIDAL	2.211	1	-0.00018	1.06	0.48
C40	40.453	CIRCULAR	1.75	1	0.0022	2.86	1.58
C41	34.403	CIRCULAR	1.75	1	0.00343	5.56	3.07
C42	366.068	TRAPEZOIDAL	2		0.00213	7.21	2.04
C43	19.862	CIRCULAR	1.5	2	0.00312	5.78	2.24
C44	129.261	TRAPEZOIDAL	2		0.00085	5.78	1.46
C45	20.158	CIRCULAR	1.5	2	0.00372	6.24	2.61
C46	81.274	TRAPEZOIDAL	2		0.00127	6.23	1.84
C47	19.852	CIRCULAR	1.5	2	0.00348	6.19	3.26
C48	118.521	TRAPEZOIDAL	2		0.00748	6.35	1.29
C49	451.196	TRAPEZOIDAL	2		0.00196	1.59	1
C5	23.496	CIRCULAR	1.25	1	-0.00089	1.35	2.29
C50	110.212	TRAPEZOIDAL	2		0.00175	5.79	1.46
C51	102.27	TRAPEZOIDAL	2		0.00171	2.64	0.87
C52	127.656	TRAPEZOIDAL	2		0.00024	2.59	0.81
C53	19.737	TRAPEZOIDAL	2		0.00137	7.06	1.04
C54	45.173	TRAPEZOIDAL	2.183		0.00226	6.99	0.96
C55	5.727	CIRCULAR	1.25	1	0.00419	0.87	3.29
C56	58.596	TRAPEZOIDAL	2		0.0034	0.83	0.87

C6	74.561	TRAPEZOIDAL	2		0.00283	1.48	0.73
C7	23.79	CIRCULAR	1.25	1	-0.0008	1.44	2
C8	33.173	CIRCULAR	1.25	1	-0.00075	1.48	1.65
C9	62.826	TRAPEZOIDAL	2		0.00428	1.55	0.54

Storage Junction	Invert Elev. (ft)	Rim Elev. (ft)	Storage Name	Max. Volume (1000 ft^3)
J45	214.075	217.28	MLKStor2	90.862

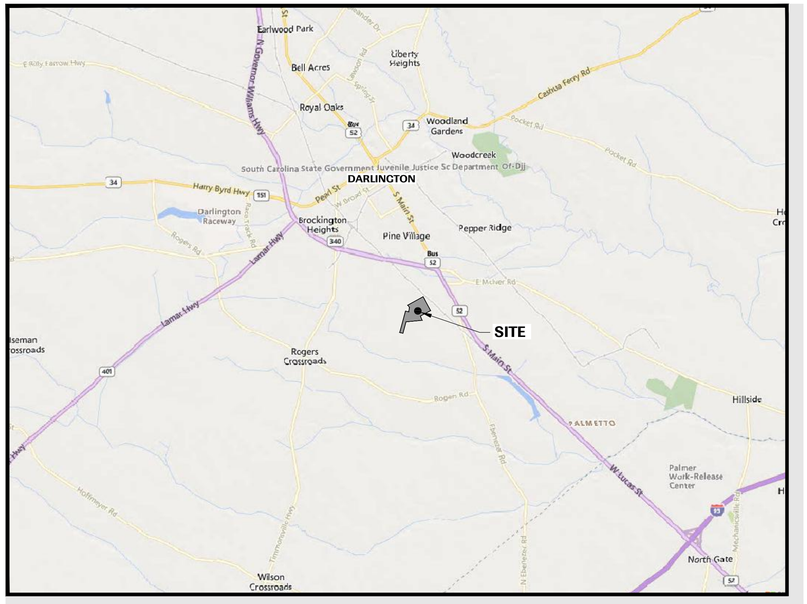
Appendix E – 10% Concept Plans and Profiles

DARLINGTON COUNTY H&H STUDY

PROPOSED CONDITIONS - MOSES DR.

FOR

SOUTH CAROLINA OFFICE OF RESILIENCE



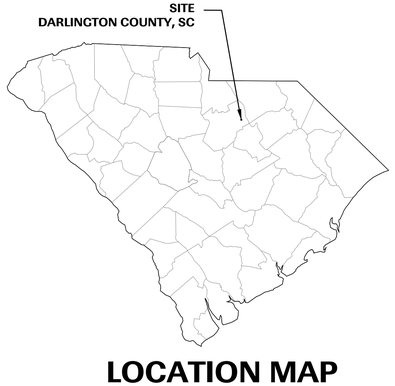
SITE MAP
SCALE: 1"=5,000'

SCOR PROJECT NUMBER PP-21-1600-01
ELR PROJECT NUMBER 1822005

10% PLANS SUBMITTAL

MARCH 24, 2023

PRELIMINARY
NOT FOR CONSTRUCTION



LOCATION MAP

DRAWING INDEX

CIVIL

SOUTH CAROLINA OFFICE OF RESILIENCE
ATTN: PHLEISHA LEWIS
632 ROSEWOOD DRIVE
COLUMBIA, SC 29201
PHLEISHA.LEWIS@SCOR.SC.GOV
Phone: (803) 543-0018

E.L. ROBINSON ENGINEERING
1301 Gervais St., Suite 450
Columbia, SC 29201
Phone: (803) 400-6031
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PROJECT COORDINATES
LATITUDE: 34° 21' 10" N
LONGITUDE: 80° 04' 39" W

DRAWN: CWS	SEAL:	COA: SOUTH CAROLINA E.L. ROBINSON ENGINEERING No. 2544 CERTIFICATE OF AUTHORIZATION
CHECKED: DKB		
APPROVED DKB		

SHEET NO. **C0.0**
PROJECT NO. **1822005**

PRELIMINARY
NOT FOR CONSTRUCTION

100 0 100 200 300
scale in feet
1" = 100'

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SOUTH CAROLINA — E.L. ROBINSON ENGINEERING No. 2544 — CERTIFICATE OF AUTHORIZATION

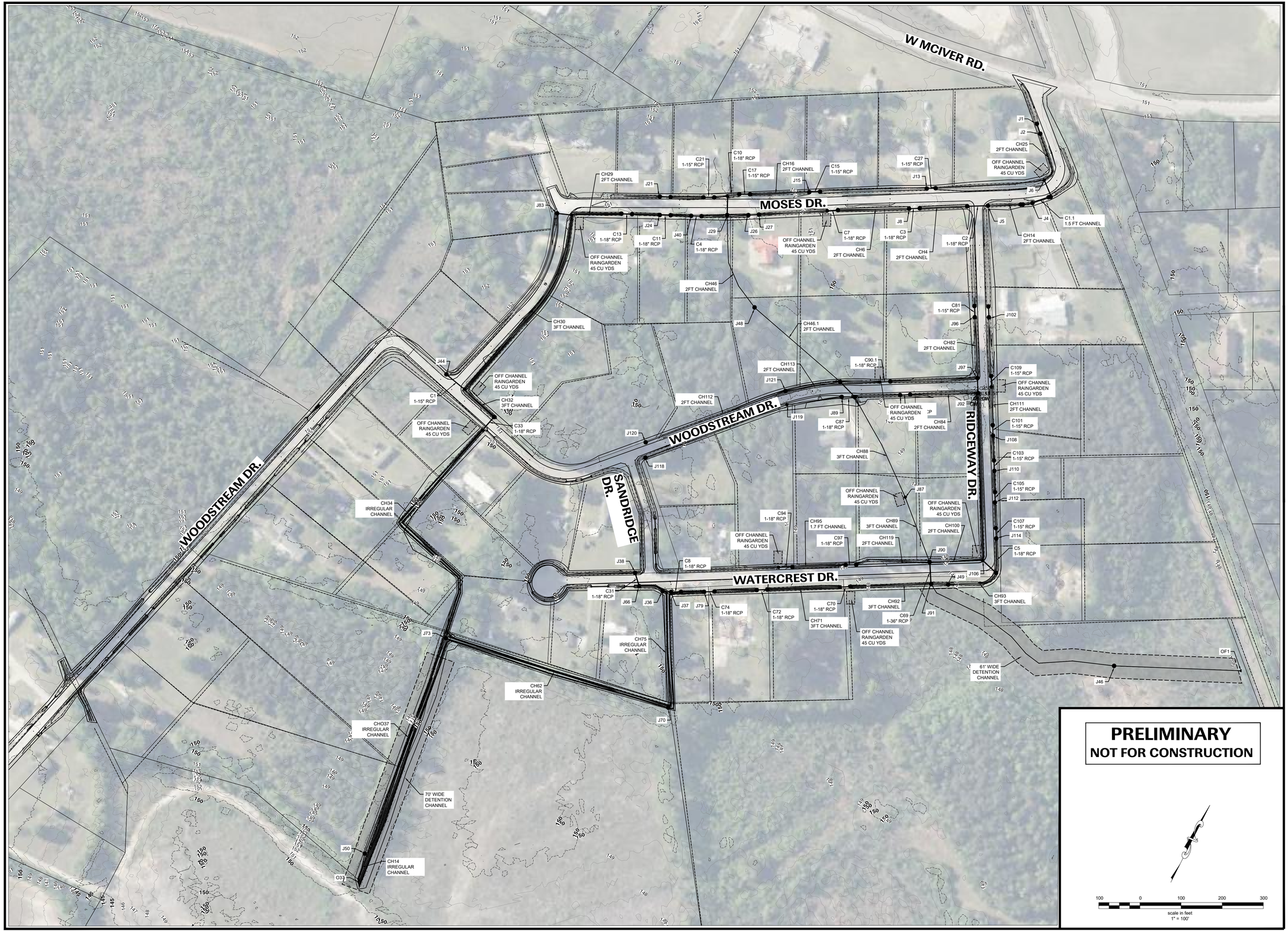
Project Title / Client Information
DARLINGTON COUNTY
H&H STUDY - MOSES DR.
PROPOSED CONDITIONS
SOUTH CAROLINA OFFICE OF RESILIENCE
DARLINGTON COUNTY, SOUTH CAROLINA

Revisions		
No.	Name	Date

Drawing Information
Project No. 1822005
Drawn By
CWS
Date
03.24.23
Checked By
DKB
Date
03.24.23
Approved By
DKB

Drawing Title
EXISTING CONDITIONS PLAN

Drawing No.
C1.1



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Project Title / Client Information
DARLINGTON COUNTY
H&H STUDY - MOSES DR.
PROPOSED CONDITIONS
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Drawing Information
Project No. 1822005
Drawn By CWS
Date 03.24.23
Checked By DKB
Date 03.24.23
Approved By DKB

Drawing Title
STORM DRAINAGE PLAN

Drawing No.
C2.1

CONDUIT TABLE

JUNCTION TABLE

SEQUENCE OF CONSTRUCTION

ITEMS MUST OCCUR IN THE ORDER LISTED; ITEMS CANNOT OCCUR CONCURRENTLY UNTIL SPECIFICALLY NOTED.

1. RECEIVE NPDES COVERAGE FROM SCDHEC.
2. PRE-CONSTRUCTION MEETING WITH DARLINGTON COUNTY STORMWATER MANAGEMENT STAFF PRESENT.
3. THE PROJECT IS A LINEAR DITCH IMPROVEMENT, CLEANING AND REGRADING OF DITCHES, AND INSTALLATION OF STORM DRAINAGE AND BOXES. AS SUCH, THE CONTRACTOR SHALL SCHEDULE HIS WORK TO COMPLETE IN SECTIONS. IT IS NOT INTENDED FOR THE ENTIRE PROJECT TO BE DISTURBED AT ONE TIME.
4. LIMIT WORK BETWEEN ROADS CROSSINGS COMPLETING EACH CLEANING AND REGRADING BETWEEN ROADS COMPLETELY INCLUDING STABILIZATION BEFORE PROCEEDING TO THE NEXT AREA.
5. DISTURBANCE SHOULD BE GENERALLY LIMITED TO 1,000 LF MAX WITH EROSION CONTROL AS "ROLLING" WITH THE PROJECT.
6. ALL EXISTING INLETS SHALL BE PROTECTED BY SEDIMENT TUBES AS DETAILED IN THESE PLANS.
7. ALL NEW INLETS SHALL BE PROTECTED BY SEDIMENT TUBE PLACED IN A CIRCULAR FASHION AS DETAILED IN THESE PLANS.
8. NOTIFY DARLINGTON COUNTY STORMWATER MANAGEMENT STAFF 48 HOURS PRIOR TO BEGINNING LAND-DISTURBING ACTIVITIES.
9. INSTALLATION OF CONSTRUCTION ENTRANCES.
10. CLEARING AND GRUBBING ONLY AS NECESSARY FOR INSTALLATION OF PERIMETER CONTROLS.
11. INSTALLATION OF PERIMETER CONTROLS (E.G. SILT FENCE).
12. CLEARING AND GRUBBING OF SITE AND TREE REMOVAL. (SEDIMENT AND EROSION CONTROL MEASURES FOR THESE AREAS MUST ALREADY BE INSTALLED).
13. TOP SOIL REMOVAL AND STOCKPILE WITH SILT FENCE AROUND PERIMETER.
14. CLEANING AND CLEARING OF CHANNELS INDICATED ON THE PLANS..
15. INSTALLATION OF CHECK DAMS IN CHANNEL.
16. REMOVAL OF TREES, DEBRIS, AND OTHER ITEMS FROM CHANNEL.
17. REGRADING DITCHES IN THE AREAS SHOWN IN THE PLANS..
18. EXCAVATION OF OVERBANK PER GRADING PLAN,
19. INSTALL NEW STORM PIPING AND BOXES.
20. INSTALL ENKAMAT BANK STABILIZATION AND/OR FLEXTERRA AND/OR HYDROSEEDING.
21. PERMANENT/FINAL STABILIZATION TO OTHER AREAS DISTURBED..
22. REMOVAL OF TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES AFTER ENTIRE AREA DRAINING TO THE STRUCTURE IS FINALLY STABILIZED (THE DEPARTMENT RECOMMENDS THAT THE PROJECT OWNER/OPERATOR HAVE THE SWPPP PREPARER OR REGISTRATION EQUIVALENT APPROVE THE REMOVAL OF TEMPORARY STRUCTURES.)
23. PREPARE A DETAILED AS-BUILT SURVEY OF THE STRUCTURES AND GRADED AREAS FOR SUBMITTAL TO THE CITY, SCDHEC, AND FEMA.

ONCE CONSTRUCTION IS COMPLETE THE ITEMS BELOW MUST BE PERFORMED IN THE ORDER SHOWN.

24. SUBMIT NOTICE OF TERMINATION (NOT) TO DARLINGTON COUNTY AND SCDHEC. MANAGEMENT STAFF.

- NOTE: MAINTENANCE OF SEDIMENT AND EROSION CONTROL MEASURES MUST CONTINUE UNTIL THE SITE IS PERMANENTLY STABILIZED AND THE CONTROLS ARE REMOVED.

CONTRACTOR NOTES

1. PRIOR TO BEGINNING CONSTRUCTION, THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFING THAT ALL REQUIRED PERMITS AND APPROVALS HAVE BEEN OBTAINED FROM ALL REGULATORY AUTHORITIES.
2. CARE SHALL BE TAKEN TO PREVENT DAMAGE TO EXISTING UTILITIES DURING CONSTRUCTION. ANY DAMAGE TO THESE UTILITIES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
3. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES AND, WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANY AT LEAST 48 HOURS BEFORE ANY TRENCHING OR EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. FOR ASSISTANCE WITH FIELD LOCATION OF EXISTING UTILITIES THE CONTRACTOR CAN CONTACT PUPS AT 1-888-721-7877.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFYING ALL ILLUSTRATED KNOWN UNDERGROUND ELEMENTS. ADDITIONALLY, THE CONTRACTOR SHALL BE RESPONSIBLE FOR EXERCISING REASONABLE EFFORT TO PROTECT ANY UNKNOWN UNDERGROUND ELEMENTS. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY IF UNKNOWN ELEMENTS ARE DISCOVERED THAT WOULD NECESSITATE MODIFICATION TO THE ILLUSTRATED DESIGN.
5. THE CONTRACTOR SHALL PROTECT ALL ADJACENT PROPERTIES, THE GENERAL PUBLIC, AND ALL OTHER FACILITIES. SHOULD DAMAGES OCCUR, CONTRACTOR SHALL REPAIR IMMEDIATELY AS DIRECTED BY THE MANAGER/OWNER. CONTRACTOR IS FINANCIALLY RESPONSIBLE FOR ALL REPAIRS, AND REPAIRS ARE TO BE PERFORMED TO THE DEVELOPER'S APPROVAL.
6. THE CONTRACTOR SHALL UTILIZE SIGNS, BARRICADES, FLAGMEN, OR GUARDS AS REQUIRED TO ENSURE THE SAFETY OF ALL VEHICULAR AND PEDESTRIAN TRAFFIC DURING ALL CONSTRUCTION ACTIVITIES.
7. ALL IMPROVEMENTS SHALL BE IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
8. THE CONTRACTOR SHALL MAINTAIN THE SITE IN A MANNER SO THAT WORKMEN AND PUBLIC SHALL BE PROTECTED FROM INJURY.
9. THE GENERAL CONTRACTOR SHALL CONTACT ALL OWNERS OF EASEMENTS, UTILITIES AND RIGHT-OF-WAYS, PUBLIC OR PRIVATE, PRIOR TO WORKING IN THESE AREAS.
10. CONTRACTOR TO BE RESPONSIBLE FOR SECURING THE SITE PRIOR TO SUBSTANTIAL COMPLETION OF THE PROJECT. REPAIRS, RESULTING FROM VANDALISM, TO BE AT HIS OWN EXPENSE.

EROSION CONTROL NOTES

1. IF NECESSARY, SLOPES WHICH EXCEED EIGHT (8) VERTICAL FEET SHOULD BE STABILIZED WITH SYNTHETIC OR VEGETATIVE MATS, IN ADDITION TO GRASSING/HYDROSEEDING. IT MAY BE NECESSARY TO INSTALL TEMPORARY SLOPE DRAINS DURING CONSTRUCTION. TEMPORARY BERMS MAY BE NEEDED UNTIL THE SLOPE IS BROUGHT TO GRADE.

2. STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS PRACTICABLE IN PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED, BUT IN NO CASE MORE THAN FOURTEEN (14) DAYS AFTER WORK HAS CEASED , EXCEPT AS STATED BELOW.
   »WHERE STABILIZATION BY THE 14TH DAY IS PRECLUDED BY SNOW COVER OR FROZEN GROUND CONDITIONS STABILIZATION MEASURES MUST BE INITIATED AS SOON AS PRACTICABLE.
   »WHERE CONSTRUCTION ACTIVITY ON A PORTION OF THE SITE IS TEMPORARILY CEASED, AND EARTH-DISTURBING ACTIVITIES WILL BE RESUMED WITHIN 14 DAYS, TEMPORARY STABILIZATION MEASURES DO NOT HAVE TO BE INITIATED ON THAT PORTION OF THE SITE.

3. ALL SEDIMENT AND EROSION CONTROL DEVICES SHALL BE INSPECTED ONCE EVERY CALENDAR WEEK. IF PERIODIC INSPECTION OR OTHER INFORMATION INDICATES THAT A BMP HAS BEEN INAPPROPRIATELY INSTALLED, THE PERMITTEE MUST ADDRESS THE NECESSARY REPLACEMENT OR MODIFICATION REQUIRED TO CORRECT THE BMP WITHIN 48 HOURS OF IDENTIFICATION.

4. PROVIDE SILT FENCE AND/OR OTHER CONTROL DEVICES, AS MAY BE REQUIRED, TO CONTROL SOIL EROSION DURING UTILITY CONSTRUCTION. ALL DISTURBED AREAS SHALL BE CLEANED, GRADED, AND STABILIZED WITH GRASSING IMMEDIATELY AFTER THE UTILITY INSTALLATION. FILL, COVER, AND TEMPORARY SEEDING AT THE END OF EACH DAY ARE RECOMMENDED. IF WATER IS ENCOUNTERED WHILE TRENCHING, THE WATER SHOULD BE FILTERED TO REMOVE ANY SEDIMENTS BEFORE BEING PUMPED BACK INTO ANY WATERS OF THE STATE.

5. ALL EROSION CONTROL DEVICES SHALL BE PROPERLY MAINTAINED DURING ALL PHASES OF CONSTRUCTION UNTIL THE COMPLETION OF ALL CONSTRUCTION ACTIVITIES AND ALL DISTURBED AREAS HAVE BEEN STABILIZED. ADDITIONAL CONTROL DEVICES MAY BE REQUIRED DURING CONSTRUCTION, IN ORDER TO CONTROL EROSION AND/OR OFFSITE SEDIMENTATION. ALL TEMPORARY CONTROL DEVICES SHALL BE REMOVED ONCE CONSTRUCTION IS COMPLETED AND THE SITE IS STABILIZED.

6. THE CONTRACTOR MUST TAKE NECESSARY ACTION TO MINIMIZE TRACKING OF MUD ONTO PAVED ROADWAY(S) FROM CONSTRUCTION AREAS AND THE GENERATION OF DUST. THE CONTRACTOR SHALL DAILY REMOVE MUD/SOIL FROM PAVEMENT, AS MAY BE REQUIRED.

7. RESIDENTIAL SUBDIVISIONS REQUIRE EROSION CONTROL FEATURES FOR INFRASTRUCTURE AS WELL AS FOR INDIVIDUAL LOT CONSTRUCTION. INDIVIDUAL PROPERTY OWNERS SHALL FOLLOW THESE PLANS DURING CONSTRUCTION OR OBTAIN APPROVAL OF AN INDIVIDUAL PLAN IN ACCORDANCE WITH S.C. REG. 72-300 ET SEQ AND SCR100000.

8. TEMPORARY DIVERSION BERMS AND/OR DITCHES WILL BE PROVIDED AS NEEDED DURING CONSTRUCTION TO PROTECT WORK AREAS FROM UPSLOPE RUNOFF AND/OR DIVERT SEDIMENT LADEN WATER TO APPROPRIATE TRAPS OR STABLE OUTLETS.

9. ALL WATERS OF THE STATE (WoS), INCLUDING WETLANDS, ARE TO BE FLAGGED OR OTHERWISE CLEARLY MARKED IN THE FIELD. A DOUBLE ROW OF SILT FENCE IS TO BE INSTALLED IN ALL AREAS WHERE A 50-FT BUFFER CAN'T BE MAINTAINED BETWEEN THE DISTURBED AREA AND ALL WoS. A 10-FT BUFFER SHOULD BE MAINTAINED BETWEEN THE LAST ROW OF SILT FENCE AND ALL WoS.

10. LITTER, CONSTRUCTION DEBRIS, OILS, FUELS, AND BUILDING PRODUCTS WITH SIGNIFICANT POTENTIAL FOR IMPACT (SUCH AS STOCKPILES OF FRESHLY TREATED LUMBER) AND CONSTRUCTION CHEMICALS THAT COULD BE EXPOSED TO STORM WATER MUST BE PREVENTED FROM BECOMING A POLLUTANT SOURCE IN STORM WATER DISCHARGES.

11. A COPY OF THE SWPPP, INSPECTION RECORDS, AND RAINFALL DATA MUST BE RETAINED AT THE CONSTRUCTION SITE OR A NEARBY LOCATION EASILY ACCESSIBLE DURING NORMAL BUSINESS HOURS, FROM THE DATE OF COMMENCEMENT OF CONSTRUCTION ACTIVITIES TO THE DATE THAT THE FINAL STABILIZATION IS REACHED.

12. INITIATE STABILIZATION MEASURES ON ANY EXPOSED SLOPE (3H:1V OR GREATER) WHERE LAND-DISTURBIUNG ACTIVITIES HAVE PERMANENTLY OR TEMPORARILY CEASED, AND WILL NOT RESUME FOR A PERIOD OF SEVEN (7) CALENDAR DAYS.

13. MINIMIZE SOIL COMPACTION AND, UNLESS INFEASIBLE, PRESERVE TOPSOIL.

14. MINMIMZE THE DISCHARGE OF POLLUTANTS FROM EQUIPMENT AND VEHICLE WASHING, WHEEL WASH WATER, AND OTHER WASH WATERS. WASH WATERS MUST BE TREATED IN A SEDIMENT BASIN OR ALTERNATIVE CONTROL THAT PROVIDES EQUIVALENT OR BETTER TREATMENT PRIOR TO DISCHARGE.

15. MINIMIZE THE DISCHARGE OF POLLUTANTS FROM DEWATERING OF TRENCHES AND EXCAVATED AREAS. THESE DISCHARGES ARE TO BE ROUTED THROUGH APPROPRIATE BMPs (SEDIMENT BASIN, FILTER BAG, ETC.).

16. THE FOLLOWING DISCHARGES FROM SITES ARE PROHIBITED:
   »WASTEWATER FROM WASHOUT OF CONCRETE, UNLESS MANAGED BY AN APPROPRIATE CONTROL
   »WASTEWATER FROM WASHOUT AND CLEANOUT OF STUCCO, PAINT, FROM RELEASE OILS, CURING COMPOUNDS AND OTHER CONSTRUCTION MATERIALS
   »FUELS, OILS, OR OTHER POLLUTANTS USED IN VEHICLE AND EQUIPMENT OPERATION AND MAINTENANCE
   »SOAPS OR SOLVENTS USED IN VEHICLE AND EQUIPMENT WASHING

17. AFTER CONSTRUCTION ACTIVITIES BEGIN, INSPECTIONS MUST BE CONDUCTED AT A MINIMUM OF AT LEAST ONCE EVERY CALENDAR WEEK AND MUST BE CONDUCTED UNTIL FINAL STABILIZATION IS REACHED ON ALL AREAS OF THE CONSTRUCTION SITE.

18. IF EXISTING BMPs NEED TO BE MODIFIED OR IF ADDITIONAL BMPs ARE NECESSARY TO COMPLY WITH THE REQUIREMENTS OF THIS PERMIT AND/OR SC'S WATER QUALITY STANDARDS, IMPLEMENTATION MUST BE COMPLETED BEFORE THE NEXT STORM EVENT WHENEVER PRACTICABLE. IF IMPLEMENTATION BEFORE THE NEXT STORM EVENT IS IMPRACTICABLE, THE SITUATION MUST BE DOCUMENTED IN THE SWPPP AND ALTERNATIVE BMPs MUST BE IMPLEMENTED AS SOON AS REASONABLY POSSIBLE.

19. A PRE-CONSTRUCTION CONFERENCE MUST BE HELD FOR EACH CONSTRUCTION SITE WITH AN APPROVED ON-SITE SWPPP PRIOR TO THE IMPLEMENTATION OF CONSTRUCTION ACTIVITIES. FOR NON-LINEAR PROJECTS THAT DISTURB MORE THAN 10 ACRES OR MORE THIS CONFERENCE MUST BE HELD ON-SITE UNLESS THE DEPARTMENT HAS APPROVED OTHERWISE.

20. SILT FENCING LINE ON EROSION CONTROL PLAN SHEETS ARE SHOWN FOR GRAPHICAL PURPOSES. SILT FENCING SHALL BE PLACED AT THE LIMIITS OF DISTURBANCE

PRELIMINARY
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PALMETTO UTILITY PROTECTION SERVICE

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A one call system for community and job safety.

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NORTH CAROLINA NOTIFICATION
E.L. ROBINSON ENGINEERING No. 2944
CERTIFICATE OF AUTHORIZATION

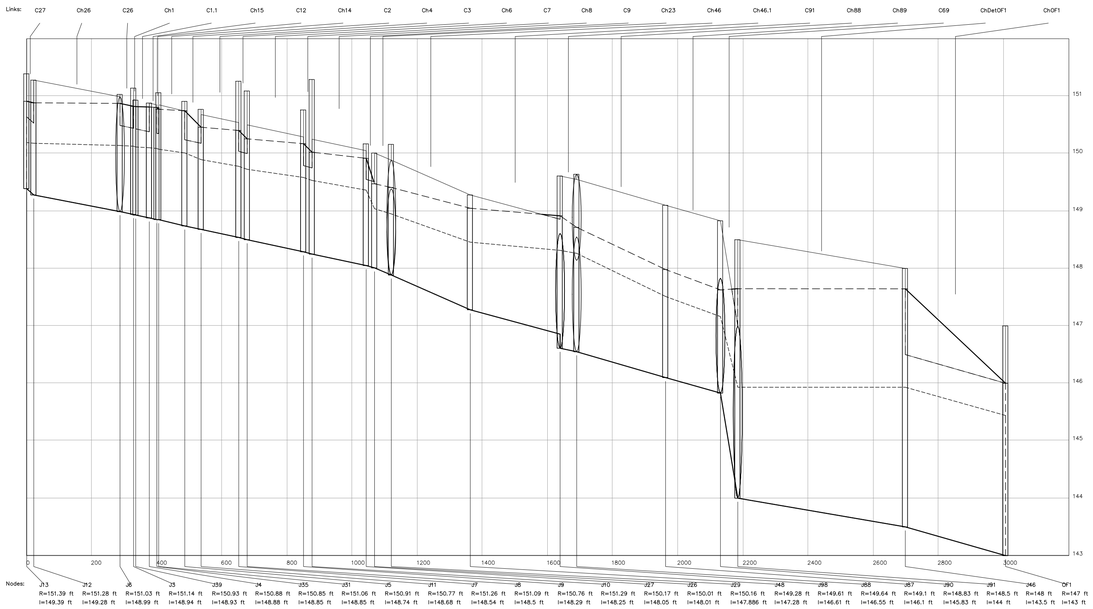
Project Title / Client Information
DARLINGTON COUNTY
H&H STUDY - MOSES DR.
PROPOSED CONDITIONS
SOUTH CAROLINA OFFICE OF RESILIENCE
DARLINGTON COUNTY, SOUTH CAROLINA

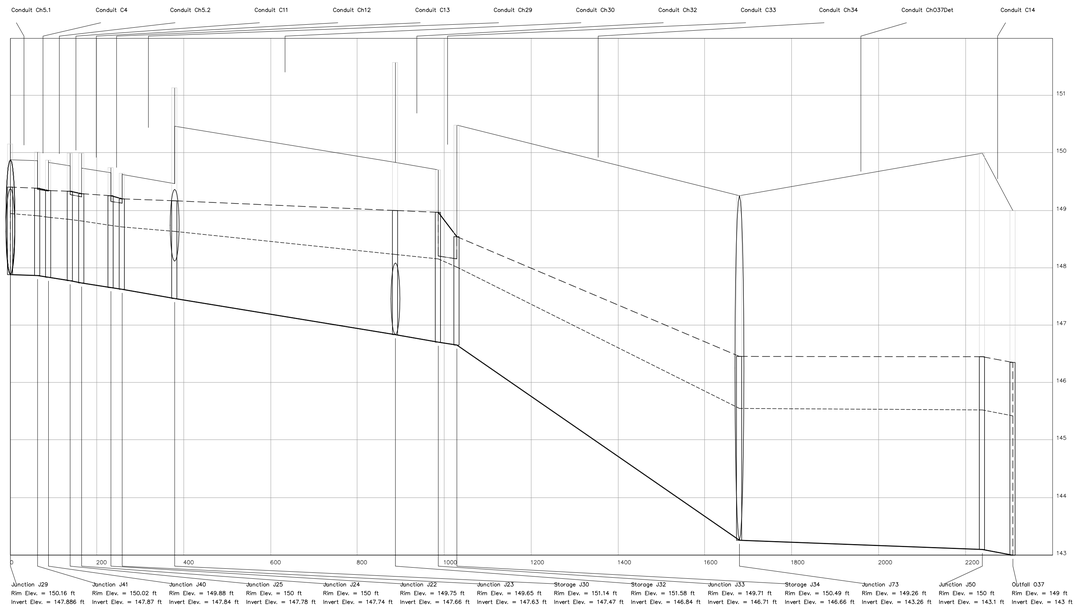
Revisions		
No.	Name	Date

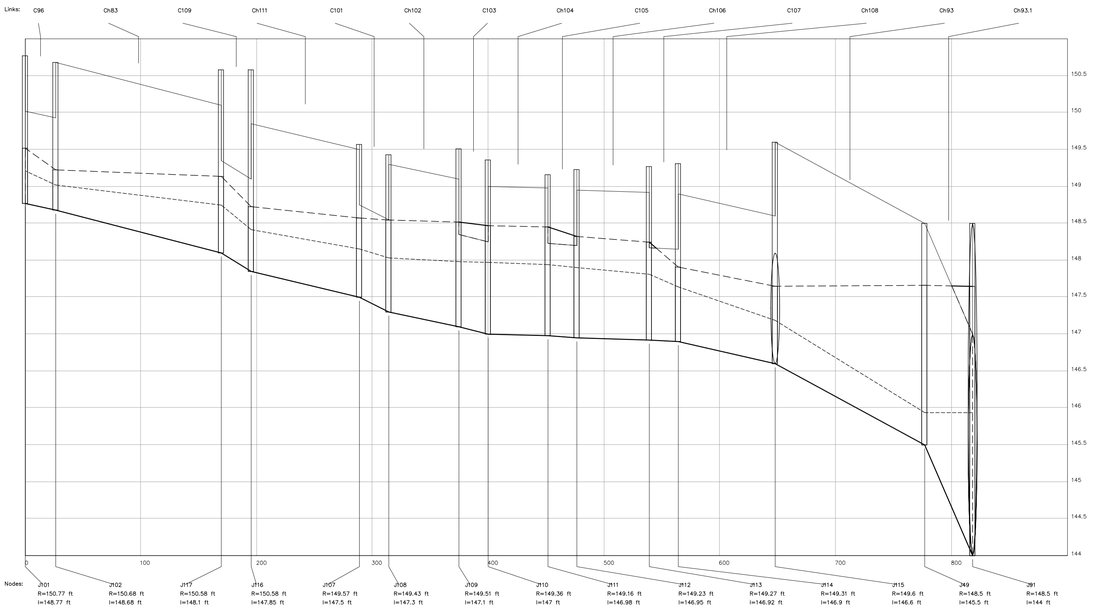
Drawing Information
Project No. 1822005
Drawn By CWS
Date 03.24.23
Checked By DKB
Date 03.24.23
Approved By DKB

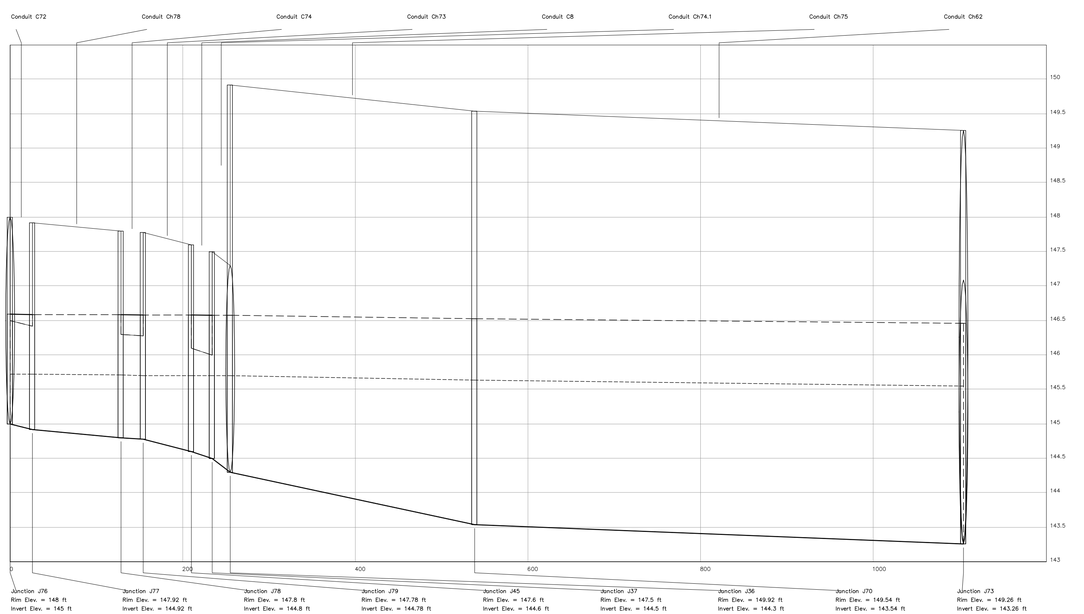
Drawing Title
STORM DRAINAGE TABLES AND NOTES

Drawing No.
C2.2









PRELIMINARY
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LEGEND

- 2-YEAR FLOODPLAIN
- 10-YEAR FLOODPLAIN
- TOP OF PIPE/CHANNEL
- BOTTOM OF PIPE/CHANNEL

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SOUTH CAROLINA E.L. ROBINSON ENGINEERING No. 29544 CERTIFICATE OF AUTHORIZATION

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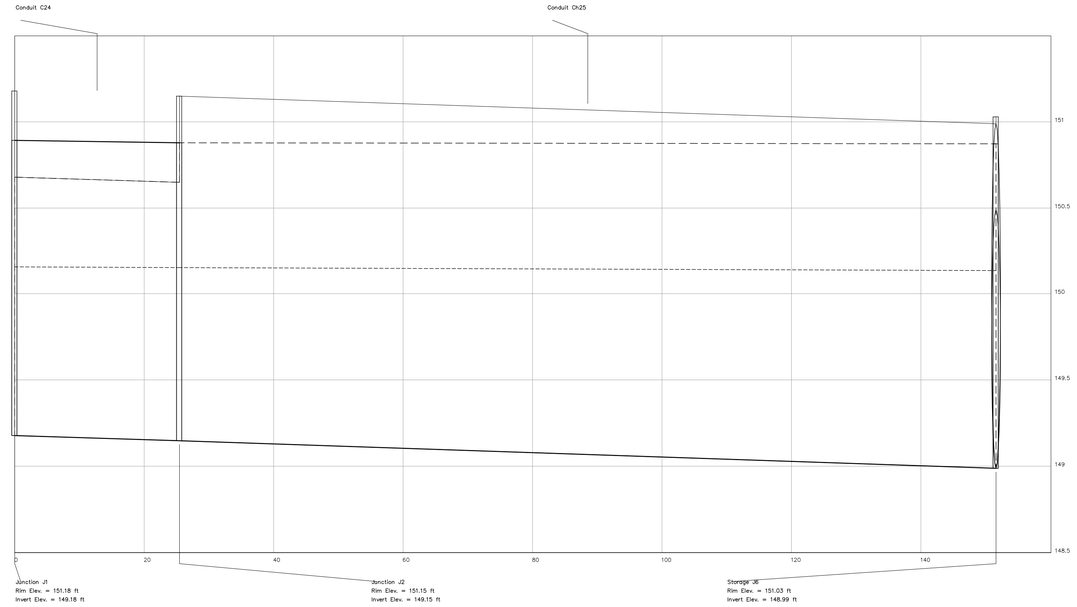
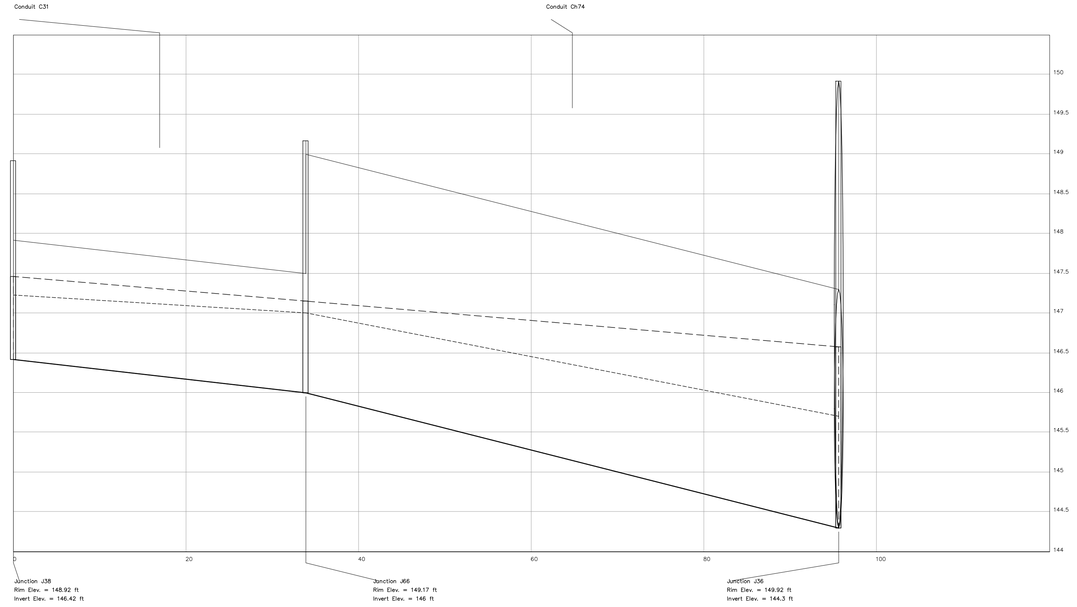
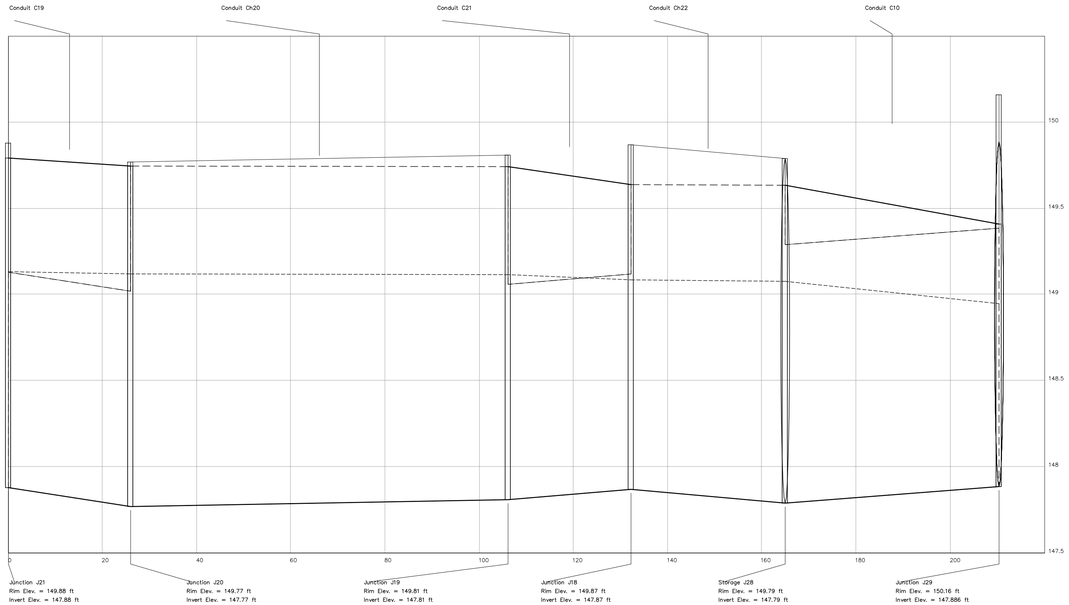
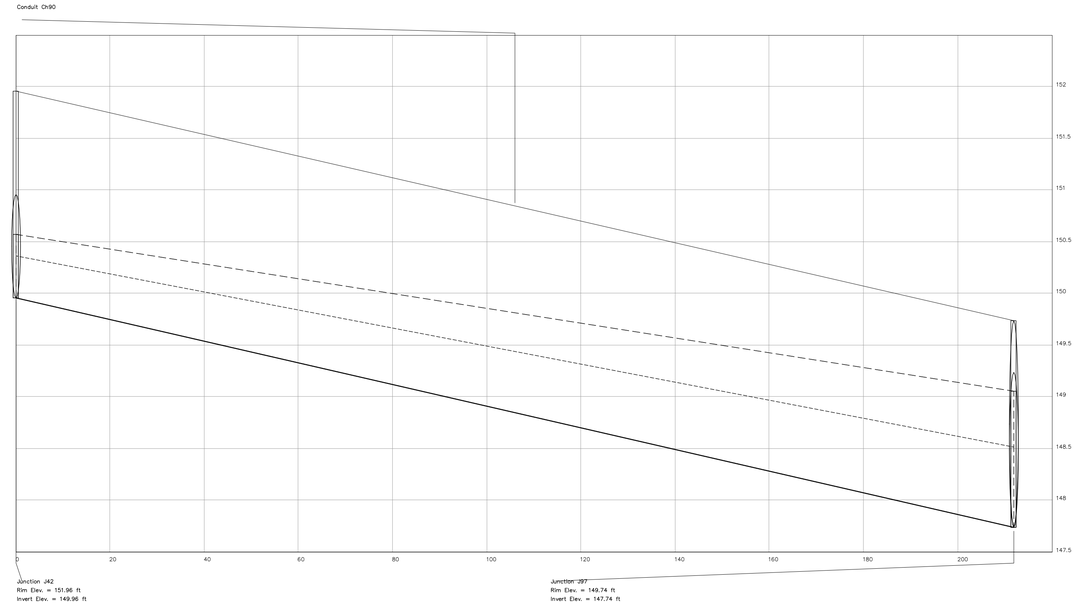
Drawing Title
STORM DRAINAGE PROFILES

Drawing No.
C3.1









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CERTIFICATE OF AUTHORIZATION

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STORM DRAINAGE PROFILES

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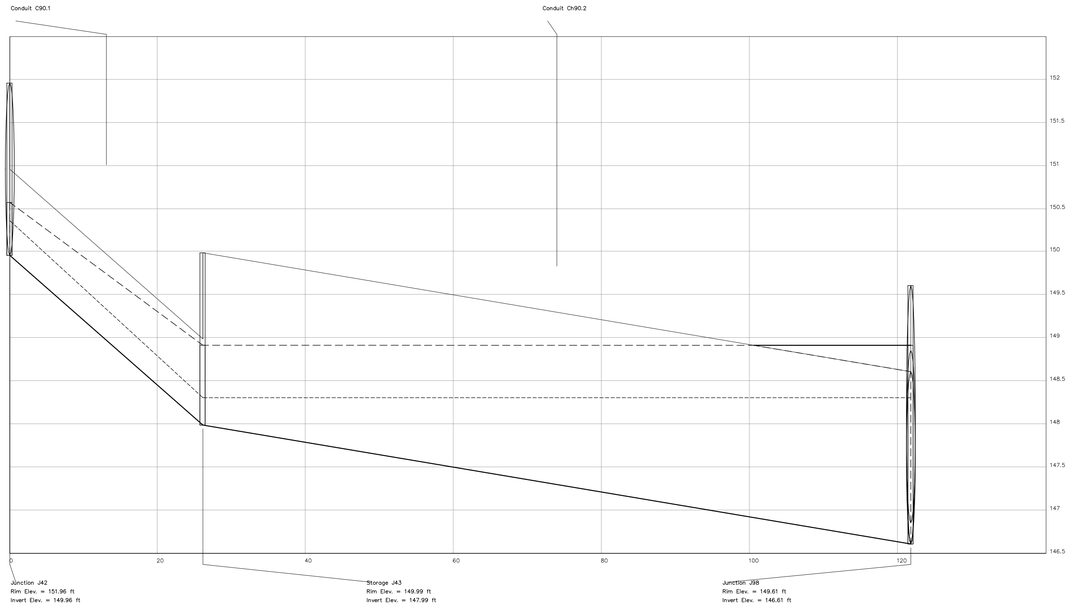
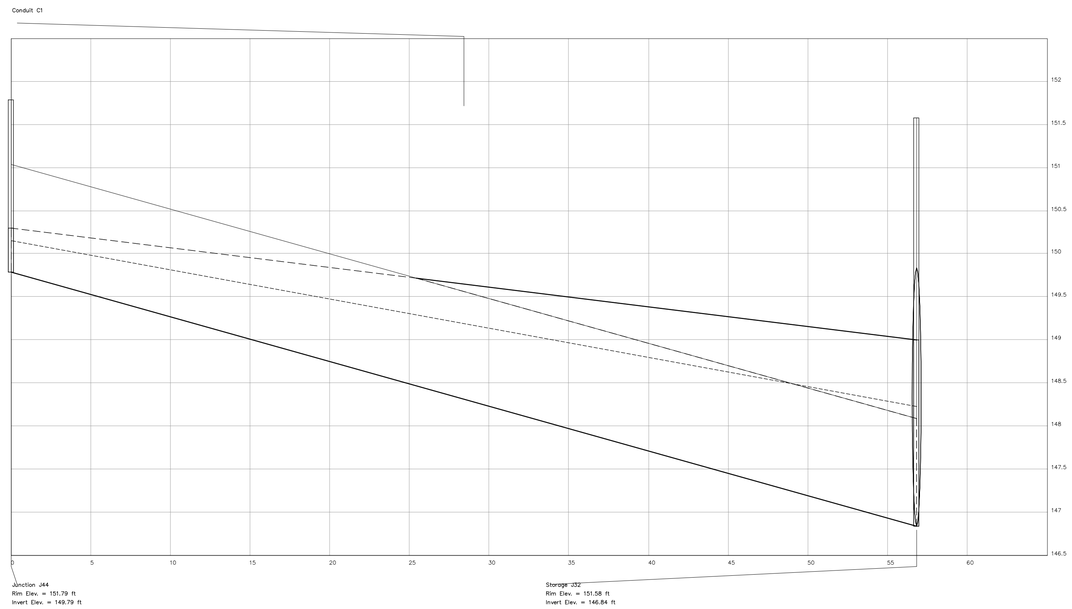
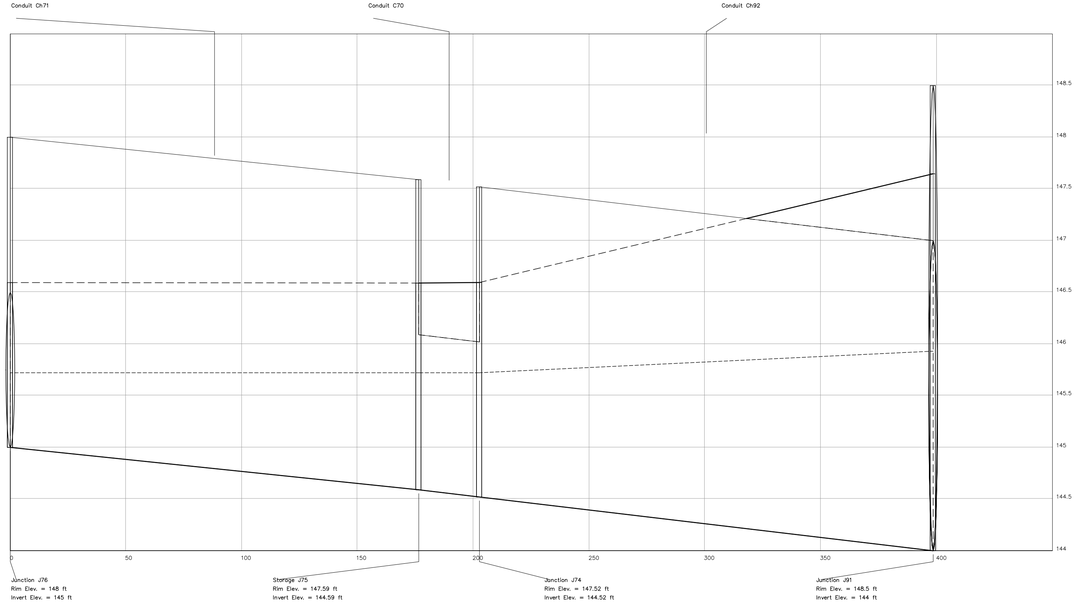
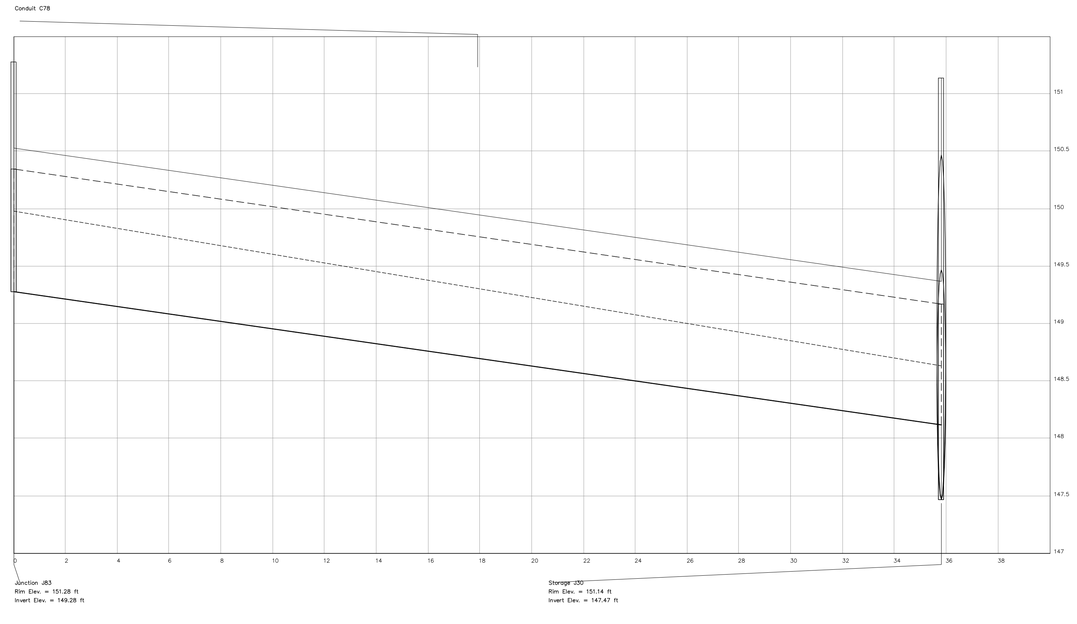
C3.2









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SOUTH CAROLINA — E.L. ROBINSON ENGINEERING No. 2944 — NOT VALID WITHOUT ORIGINAL SIGNATURE — CERTIFICATE OF AUTHORIZATION

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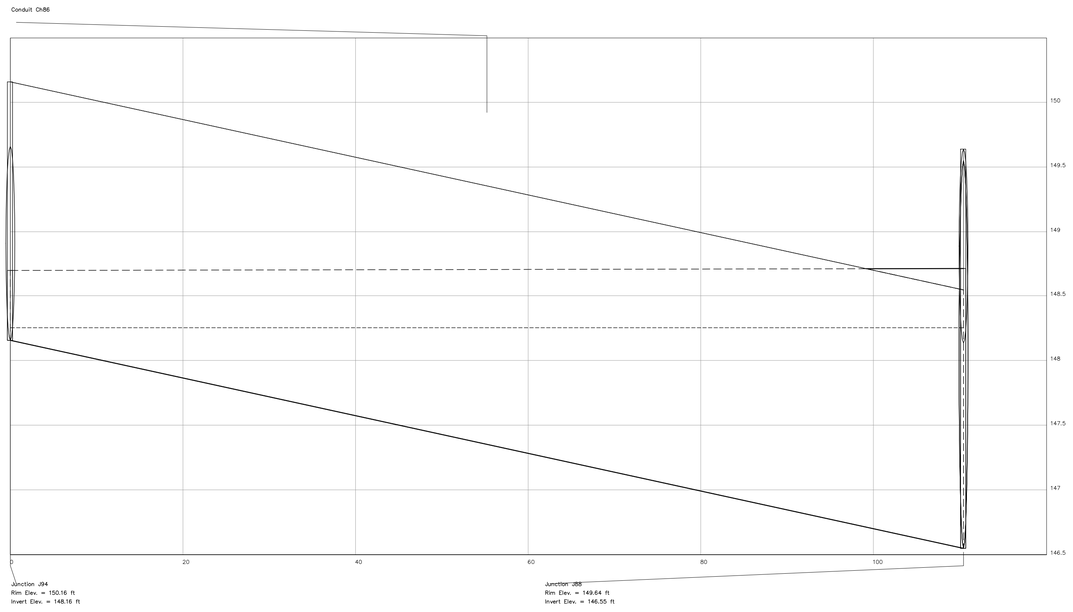
DARLINGTON COUNTY
H&H STUDY - MOSES DR.
PROPOSED CONDITIONS
SOUTH CAROLINA OFFICE OF RESILIENCE
DARLINGTON COUNTY, SOUTH CAROLINA

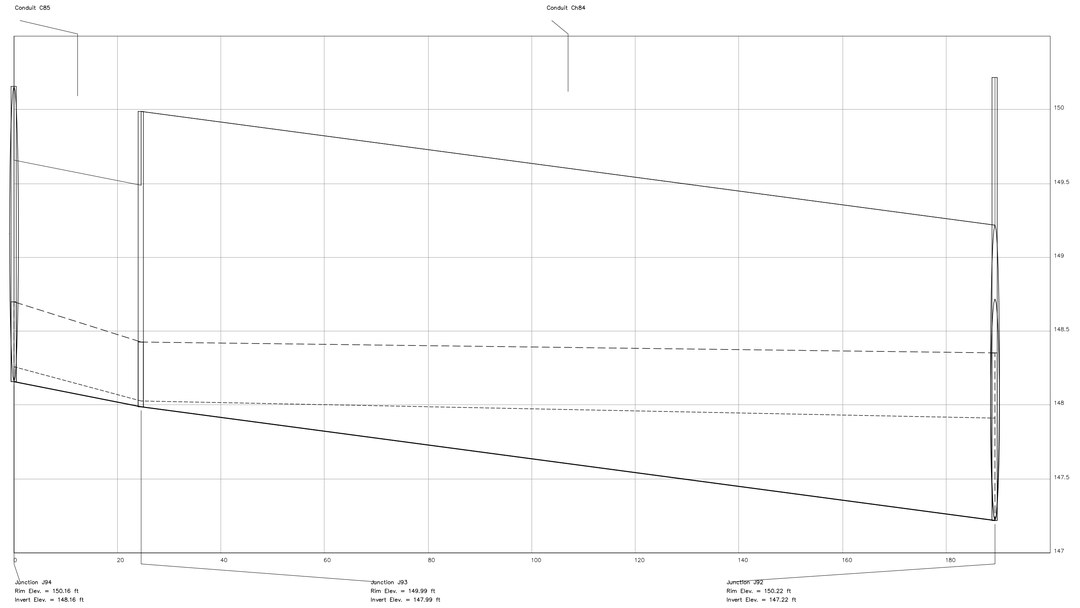
Revisions		
No.	Name	Date

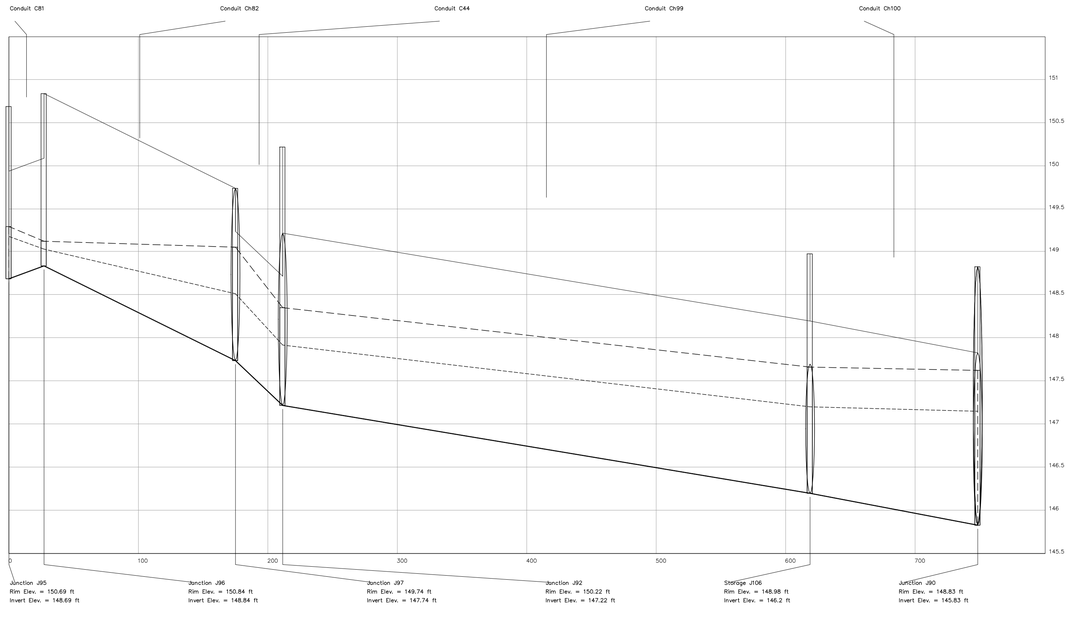
Drawing Information	
Project No. 1822006	
Drawn By	GWS
Date	03.24.23
Checked By	DKB
Date	03.24.23
Approved By	DKB
Date	

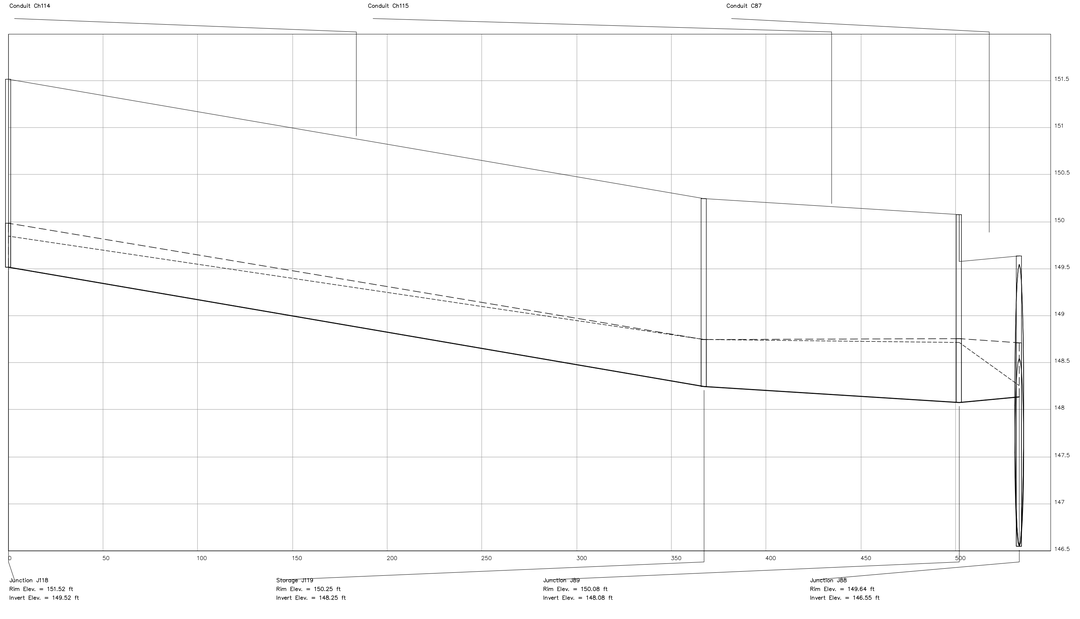
Drawing Title
STORM DRAINAGE PROFILES

Drawing No.
C3.3









PRELIMINARY
NOT FOR CONSTRUCTION

LEGEND

- 2-YEAR FLOODPLAIN
- 10-YEAR FLOODPLAIN
- TOP OF PIPE/CHANNEL
- BOTTOM OF PIPE/CHANNEL

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SOUTH CAROLINA — E.L. ROBINSON ENGINEERING No. 29144 — CERTIFICATE OF AUTHORIZATION

Project Title / Client Information

DARLINGTON COUNTY
H&H STUDY - MOSES DR.
PROPOSED CONDITIONS

SOUTH CAROLINA OFFICE OF RESILIENCE
DARLINGTON COUNTY, SOUTH CAROLINA

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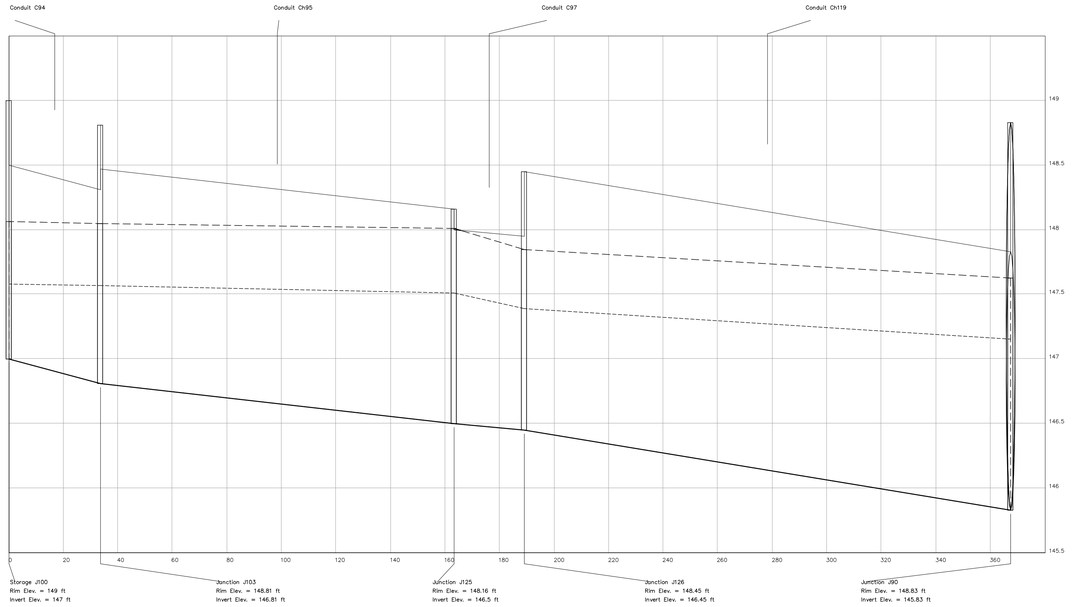
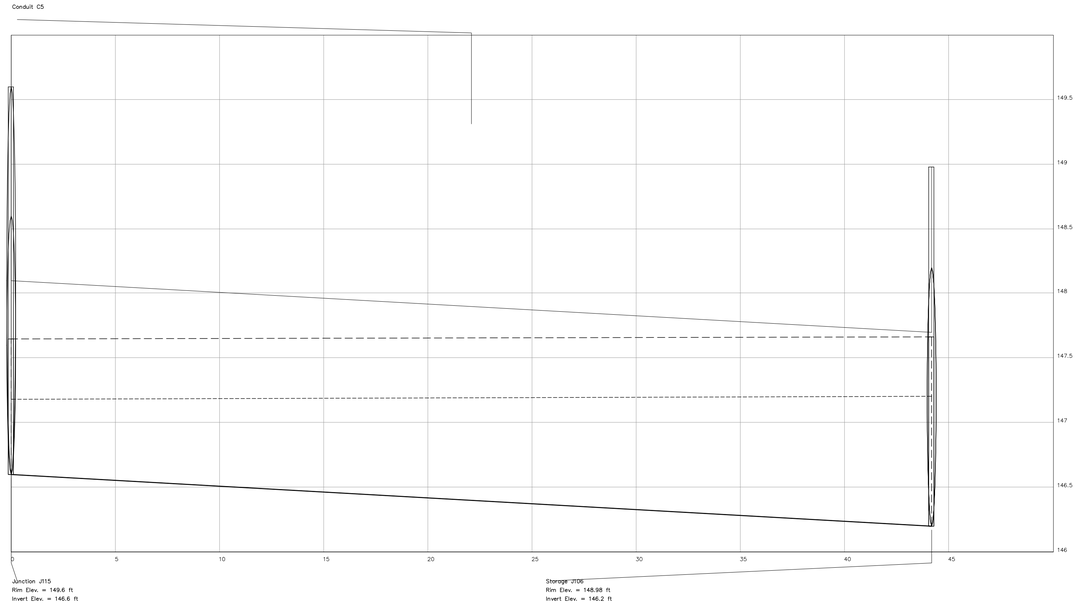
Drawing Title

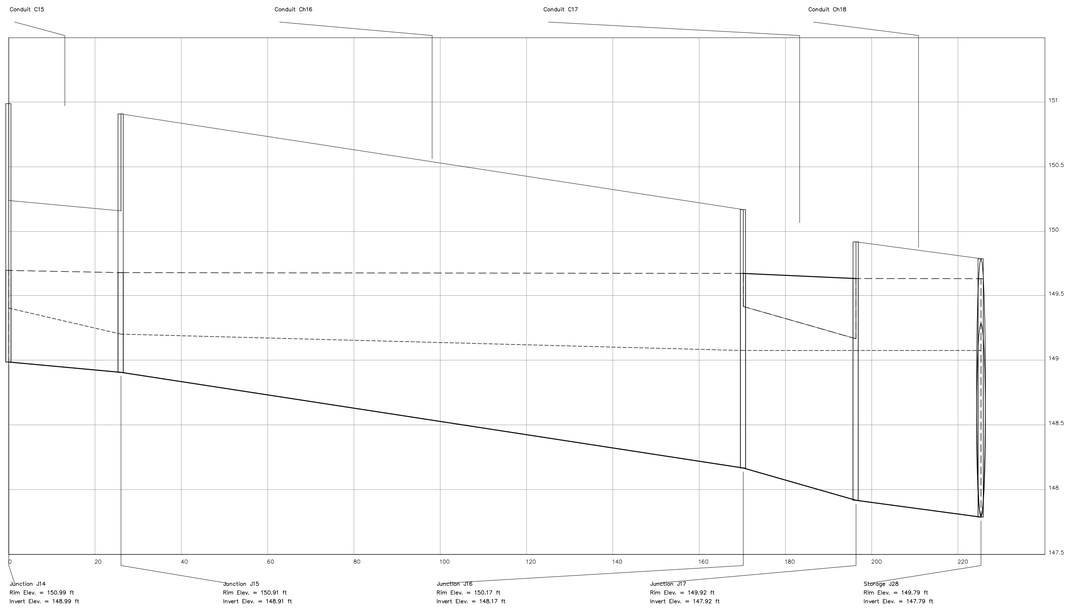
STORM DRAINAGE PROFILES

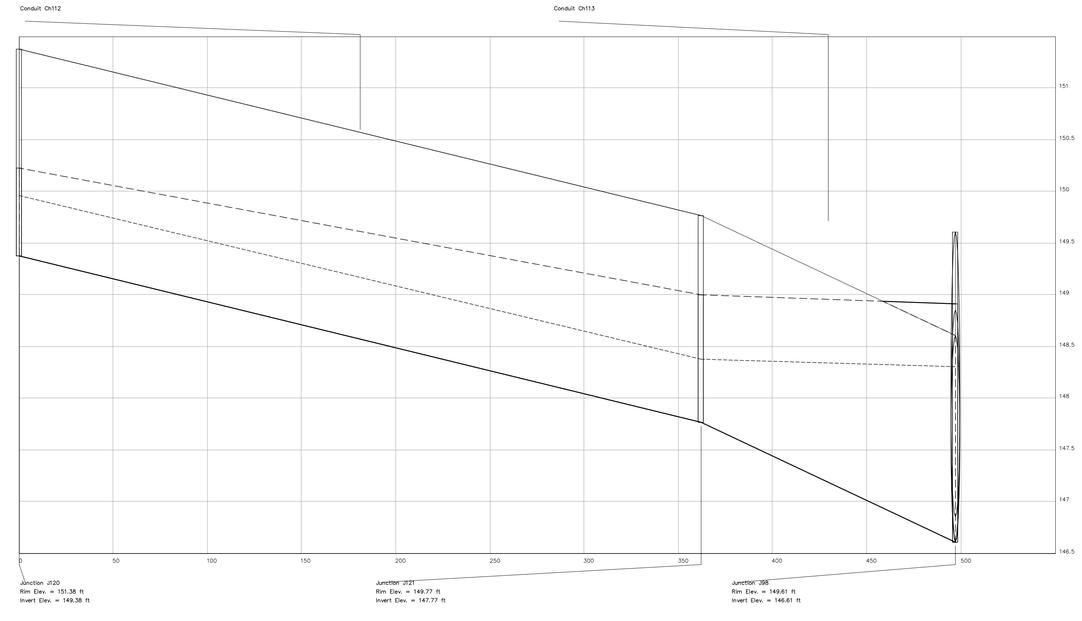
Drawing No.

C3.4









PRELIMINARY
NOT FOR CONSTRUCTION

LEGEND

- 2-YEAR FLOODPLAIN
- 10-YEAR FLOODPLAIN
- TOP OF PIPE/CHANNEL
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SOUTH CAROLINA — E.L. ROBINSON ENGINEERING No. 25944 — CERTIFICATE OF AUTHORIZATION

Project Title / Client Information

DARLINGTON COUNTY
H&H STUDY - MOSES DR.
PROPOSED CONDITIONS

SOUTH CAROLINA OFFICE OF RESILIENCE
DARLINGTON COUNTY, SOUTH CAROLINA

Revisions		
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Drawing Information	
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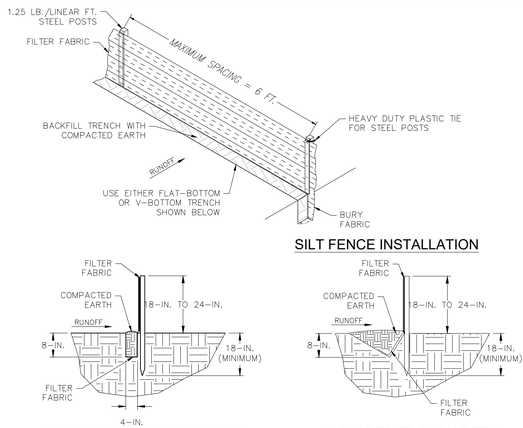
Drawing Title

STORM DRAINAGE PROFILES

Drawing No.

C3.5



SILT FENCE INSTALLATION

FLAT-BOTTOM TRENCH DETAIL

V-SHAPED TRENCH DETAIL

WHEN AND WHERE TO USE IT
SILT FENCE IS APPLICABLE IN AREAS:

WHERE THE MAXIMUM SHEET OR OVERLAND FLOW PATH LENGTH TO THE FENCE IS 100-FEET.
WHERE THE MAXIMUM SLOPE STEEPNESS (NORMAL [PERPENDICULAR] TO FENCE LINE) IS 2H:1V.
THAT DO NOT RECEIVE CONCENTRATED FLOWS GREATER THAN 0.5 CFS.

DO NOT PLACE SILT FENCE ACROSS CHANNELS OR USE IT AS A VELOCITY CONTROL BMP.

MATERIALS

STEEL POSTS
USE 48-INCH LONG STEEL POSTS THAT MEET THE FOLLOWING MINIMUM PHYSICAL REQUIREMENTS:
COMPOSED OF HIGH STRENGTH STEEL WITH MINIMUM YIELD STRENGTH OF 50,000 PSI.
HAVE A STANDARD "T" SECTION WITH A NOMINAL FACE WIDTH OF 1.38-INCHES AND NOMINAL "T" LENGTH OF 1.48-INCHES.
WEIGH 1.25 POUNDS PER FOOT (± 8%).
HAVE A SOIL STABILIZATION PLATE WITH A MINIMUM CROSS SECTION AREA OF 17-SQUARE INCHES ATTACHED TO THE STEEL POSTS.
PAINTED WITH A WATER BASED BAKED ENAMEL PAINT.

USE STEEL POSTS WITH A MINIMUM LENGTH OF 4-FEET, WEIGHING 1.25 POUNDS PER LINEAR FOOT (± 8%) WITH PROJECTIONS TO AID IN FASTENING THE FABRIC. EXCEPT WHEN HEAVY CLAY SOILS ARE PRESENT ON SITE, STEEL POSTS WILL HAVE A METAL SOIL STABILIZATION PLATE WELDED NEAR THE BOTTOM SUCH THAT WHEN THE POST IS DRIVEN TO THE PROPER DEPTH, THE PLATE WILL BE BELOW THE GROUND LEVEL FOR ADDED STABILITY.
THE SOIL PLATES SHOULD HAVE THE FOLLOWING CHARACTERISTICS:
BE COMPOSED OF MINIMUM 15 GAUGE STEEL.
HAVE A MINIMUM CROSS SECTION AREA OF 17-SQUARE INCHES.

GEOTEXTILE FILTER FABRIC

FILTER FABRIC IS:
COMPOSED OF FIBERS CONSISTING OF LONG CHAIN SYNTHETIC POLYMERS COMPOSED OF AT LEAST 85% BY WEIGHT OF
POLYOLEFINS, POLYESTERS, OR POLYAMIDES. FORMED INTO A NETWORK SUCH THAT THE FILAMENTS OR YARNS RETAIN
DIMENSIONAL STABILITY RELATIVE TO EACH OTHER. FREE OF ANY TREATMENT OR COATING WHICH MIGHT ADVERSELY ALTER
ITS PHYSICAL PROPERTIES AFTER INSTALLATION. FREE OF DEFECTS OR FLAWS THAT SIGNIFICANTLY AFFECT ITS PHYSICAL
AND/OR FILTERING PROPERTIES. CUT TO A MINIMUM WIDTH OF 36 INCHES.

USE ONLY FABRIC APPEARING ON SCDOT APPROVAL SHEET #34 MEETING THE REQUIREMENTS OF THE MOST CURRENT EDITION
OF THE SCDOT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION.

INSTALLATION:

EXCAVATE A TRENCH APPROXIMATELY 6-INCHES WIDE AND 6-INCHES DEEP WHEN PLACING FABRIC BY HAND. PLACE 12-INCHES OF GEOTEXTILE FABRIC INTO THE 6-INCH DEEP TRENCH, EXTENDING THE REMAINING 6-INCHES TOWARDS THE UPSLOPE SIDE OF THE TRENCH. BACKFILL THE TRENCH WITH SOIL OR GRAVEL AND COMPACT. BURY 12-INCHES OF FABRIC INTO THE GROUND WHEN PNEUMATICALLY INSTALLING SILT FENCE WITH A SLICING METHOD. PURCHASE FABRIC IN CONTINUOUS ROLLS AND CUT TO LENGTH OF THE BARRIER TO AVOID JOINTS. WHEN JOINTS ARE NECESSARY, WRAP THE FABRIC TOGETHER AT A SUPPORT POST WITH BOTH ENDS FASTENED TO THE POST, WITH A 6-INCH MINIMUM OVERLAP. INSTALL POSTS TO A MINIMUM DEPTH OF 24-INCHES. INSTALL POSTS A MINIMUM OF 1- TO 2-INCHES ABOVE THE FABRIC, WITH NO MORE THAN 3-FEET OF THE POST ABOVE THE GROUND. SPACE POSTS TO MAXIMUM 6-FEET CENTERS. ATTACH FABRIC TO WOOD POSTS USING STAPLES MADE OF HEAVY DUTY WIRE AT LEAST 1 1/2-INCH LONG, SPACED A MAXIMUM OF 6-INCHES APART. STAPLE A 2-INCH WIDE LATHE OVER THE FILTER FABRIC TO SECURELY FASTEN IT TO THE UPSLOPE SIDE OF WOODEN POSTS. ATTACH FABRIC TO THE STEEL POSTS USING HEAVY DUTY PLASTIC TIES THAT ARE EVENLY SPACED AND PLACED IN A MANNER TO PREVENT SAGGING OR TEARING OF THE FABRIC. IN ALL CASES, TIES SHOULD BE AFFIXED IN NO LESS THAN 4 PLACES. INSTALL THE FABRIC A MINIMUM OF 24-INCHES ABOVE THE GROUND. WHEN NECESSARY, THE HEIGHT OF THE FENCE ABOVE GROUND MAY BE GREATER THAN 24-INCHES. IN TIDAL AREAS, EXTRA SILT FENCE HEIGHT MAY BE REQUIRED. THE POST HEIGHT WILL BE TWICE THE EXPOSED POST HEIGHT. POST SPACING WILL REMAIN THE SAME AND EXTRA HEIGHT FABRIC WILL BE 4-,5-, OR 6-FEET TALL. LOCATE SILT FENCE CHECKS EVERY 100 FEET MAXIMUM AND AT LOW POINTS. INSTALL THE FENCE PERPENDICULAR TO THE DIRECTION OF FLOW AND PLACE THE FENCE THE PROPER DISTANCE FROM THE TOE OF STEEP SLOPES TO PROVIDE SEDIMENT STORAGE AND ACCESS FOR MAINTENANCE AND CLEANOUT.

INSPECTION AND MAINTENANCE:

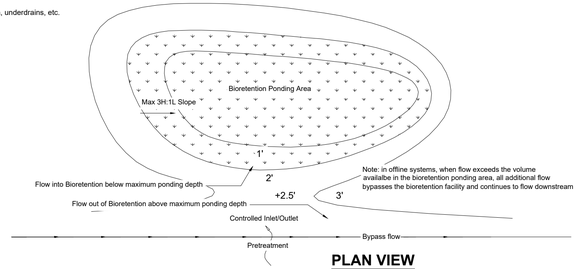
INSPECT EVERY SEVEN CALENDAR DAYS AND WITHIN 24-HOURS AFTER EACH RAINFALL EVENT THAT PRODUCES 1/2-INCH OR MORE OF PRECIPITATION. CHECK FOR SEDIMENT BUILDUP AND FENCE INTEGRITY. CHECK WHERE RUNOFF HAS ERODED A CHANNEL BENEATH THE FENCE, OR WHERE THE FENCE HAS SAGGED OR COLLAPSED BY FENCE OVERTOPPING. IF THE FENCE FABRIC TEARS, BEGINS TO DECOMPOSE, OR IN ANY WAY BECOMES INEFFECTIVE, REPLACE THE SECTION OF FENCE IMMEDIATELY. REMOVE SEDIMENT ACCUMULATED ALONG THE FENCE WHEN IT REACHES 1/3 THE HEIGHT OF THE FENCE, ESPECIALLY IF HEAVY RAINS ARE EXPECTED. REMOVE TRAPPED SEDIMENT FROM THE SITE OR STABILIZE IT ON SITE. REMOVE SILT FENCE WITHIN 30 DAYS AFTER FINAL STABILIZATION IS ACHIEVED OR AFTER TEMPORARY BEST MANAGEMENT PRACTICES (BMPs) ARE NO LONGER NEEDED. PERMANENTLY STABILIZE DISTURBED AREAS RESULTING FROM FENCE REMOVAL.

SILT FENCE DETAIL
(NOT TO SCALE)

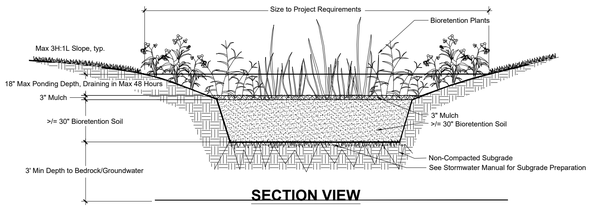
SUGGESTED CONSTRUCTION SEQUENCING (note to designer: edit as needed to meet project requirements)
1. Install appropriate temporary erosion control devices to prevent sediment from leaving or entering the practice during construction.
2. All down-gradient perimeter sediment control bmp's must be in place before any up gradient land disturbing activity begins.
3. Perform continuous inspections of erosion control practices, especially after each rainfall event.
4. Install all utilities (water, sanitary sewer, electric, natural gas, phone, fiber optic, etc) prior to setting final grade of bioretention device.
5. Rough grade the site. If bioretention areas are being used as temporary sediment basins during construction, leave a minimum of 1 feet of cover over the practice to protect the underlying soils from clogging.
6. Complete, stabilize, and vegetate all other site improvements.
7. Construct and vegetate bioretention device following stabilization of contributing drainage area. Ensure that critical elevations, such as underdrain invert, top of media, top of mulch, and invert of overflow structure (if present) are correct.
8. Remove temporary erosion control devices after the contributing drainage area is adequately vegetated.

GENERAL NOTES (note to designer: edit as needed to meet project requirements)
1. In the event that sediment is introduced into the bmp during or immediately following excavation, this material shall be removed from the practice prior to continuing construction.
2. See SCDHEC Stormwater Manual for subgrade preparation.

MATERIAL SPECIFICATIONS
1. See SCDHEC Stormwater Manual for material specifications recommendations for bioretention soil, mulch, underdrains, etc.



PLAN VIEW

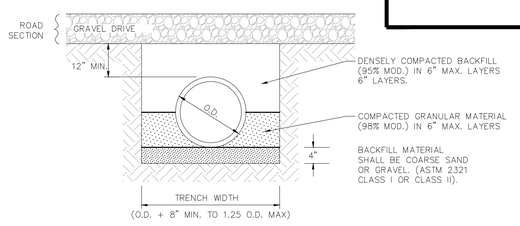


SECTION VIEW

BIO-RETENTION AREA DETAIL
(NOT TO SCALE)

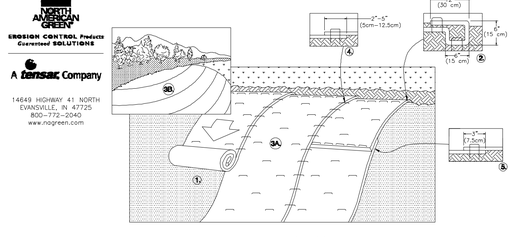
1. IF NECESSARY, SLOPES, WHICH EXCEED (8) VERTICAL FEET SHOULD BE STABILIZED WITH SYNTHETIC OR VEGETATIVE MATS, IN ADDITION TO HYDROSEEDING. IT MAY BE NECESSARY TO INSTALL TEMPORARY SLOPE DRAINS DURING CONSTRUCTION. TEMPORARY BERMS MAY BE NEEDED UNTIL THE SLOPE IS BROUGHT TO GRADE.
2. STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS PRACTICABLE IN PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED, BUT IN NO CASE MORE THAN FOURTEEN (14) DAYS AFTER WORK HAS CEASED, EXCEPT AS STATED BELOW:
   a. WHERE STABILIZATION BY THE 14TH DAY IS PRECLUDED BY SNOW COVER OR FROZEN GROUND CONDITIONS. STABILIZATION MEASURES MUST BE INITIATED AS SOON AS PRACTICABLE.
   b. WHERE CONSTRUCTION ACTIVITY ON A PORTION OF THE SITE IS TEMPORARILY CEASED, AND EARTH DISTURBING ACTIVITIES WILL BE RESUMED WITHIN FOURTEEN (14) DAYS, TEMPORARY STABILIZATION MEASURES DO NOT HAVE TO BE INITIATED ON THAT PORTION OF THE SITE.
3. ALL SEDIMENT AND EROSION CONTROL DEVICES SHALL BE INSPECTED EVERY SEVEN (7) DAYS. IF SITE INSPECTIONS IDENTIFY BMPs THAT ARE DAMAGED AND/OR ARE NOT OPERATING EFFECTIVELY, MAINTENANCE MUST BE PERFORMED AS SOON AS PRACTICAL OR AS REASONABLY POSSIBLE AND BEFORE THE NEXT STORM EVENT WHENEVER PRACTICABLE.
   OR
   ALL SEDIMENT AND EROSION CONTROL DEVICES SHALL BE INSPECTED AT LEAST ONCE EVERY FOURTEEN (14 CALENDAR DAYS AND WITHIN 24 HOURS OF THE END OF A STORM EVENT OF 0.5 INCHES OR GREATER. IF SITE INSPECTIONS IDENTIFY BMPs THAT ARE DAMAGED OR ARE NOT OPERATING EFFECTIVELY, MAINTENANCE MUST BE PERFORMED AS SOON AS PRACTICAL OR AS REASONABLY POSSIBLE AND BEFORE THE NEXT STORM EVENT WHENEVER PRACTICABLE.
4. PROVIDE SILT FENCE AND/OR OTHER CONTROL DEVICES, AS MAY BE REQUIRED, TO CONTROL SOIL EROSION DURING UTILITY CONSTRUCTION. ALL DISTURBED AREAS SHALL BE CLEANED, GRADED, AND STABILIZED WITH GRASSING IMMEDIATELY AFTER THE UTILITY INSTALLATION. FILL, COVER, AND TEMPORARY SEEDING AT THE END OF EACH DAY ARE RECOMMENDED. IF WATER IS ENCOUNTERED WHILE TRENCHING, THE WATER SHOULD BE FILTERED TO REMOVE ANY SEDIMENTS BEFORE BEING PUMPED BACK INTO ANY WATERS OF THE STATE.
5. ALL EROSION CONTROL DEVICES SHALL BE PROPERLY MAINTAINED DURING ALL PHASES OF CONSTRUCTION UNTIL THE COMPLETION OF ALL CONSTRUCTION ACTIVITIES AND ALL DISTURBED AREAS HAVE BEEN STABILIZED. ADDITIONAL CONTROL DEVICES MAY BE REQUIRED DURING CONSTRUCTION IN ORDER TO CONTROL EROSION AND/OR OFFSITE SEDIMENTATION. ALL TEMPORARY CONTROL DEVICES SHALL BE REMOVED ONCE CONSTRUCTION IS COMPLETE AND THE SITE IS STABILIZED.
6. THE GENERAL CONTRACTOR MUST TAKE NECESSARY ACTION TO MINIMIZE THE TRACKING OF MUD ONTO PAVED ROADWAY(S) FROM CONSTRUCTION AREAS AND THE GENERATION OF DUST. THE GENERAL CONTRACTOR SHALL DAILY REMOVE MUD/SOIL FROM PAVEMENT, AS MAY BE REQUIRED.
7. RESIDENTIAL SUBDIVISIONS REQUIRE EROSION CONTROL FEATURES FOR INFRASTRUCTURE AS WELL AS FOR INDIVIDUAL LOT CONSTRUCTION. INDIVIDUAL PROPERTY OWNERS SHALL FOLLOW THESE PLANS DURING CONSTRUCTION OR OBTAIN APPROVAL OF AN INDIVIDUAL PLAN IN ACCORDANCE WITH S.C. REG. 72-300 et seq. AND SCR10000.
8. TEMPORARY DIVERSION BERMS AND/OR DITCHES WILL BE PROVIDED AS NEEDED DURING CONSTRUCTION TO PROTECT WORK AREAS FROM UPSLOPE RUNOFF AND/OR TO DIVERT SEDIMENT-LADEN WATER TO APPROPRIATE TRAPS OR STABLE OUTLETS.
9. ALL WATERS OF THE STATE (WoS), INCLUDING WETLANDS, ARE TO BE FLAGGED OR OTHERWISE CLEARLY MARKED IN THE FIELD. A DOUBLE ROW OF SILT FENCE IS TO BE INSTALLED IN ALL AREAS WHERE A 50-FOOT BUFFER CAN'T BE MAINTAINED BETWEEN THE DISTURBED AREA AND ALL WoS. A 10-FOOT BUFFER SHOULD BE MAINTAINED BETWEEN THE LAST ROW OF SILT FENCE AND ALL WoS.
10. LITTER, CONSTRUCTION DEBRIS, OILS, FUELS, AND BUILDING PRODUCTS WITH SIGNIFICANT POTENTIAL FOR IMPACT (SUCH AS STOCKPILES OF FRESHLY TREATED LUMBER) AND CONSTRUCTION CHEMICALS THAT COULD BE EXPOSED TO STORM WATER MUST BE PREVENTED FROM BECOMING A POLLUTANT SOURCE IN STORM WATER DISCHARGES.

SEDIMENT AND EROSION CONTROL NOTES



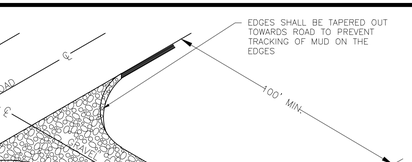
THE PIPE IS TO BE BEDDED IN COMPACTED 6" LAYERS TO THE SPRING LINE FIRST, THEN BACKFILLED WITH HAND PLACED MATERIAL COMPACTED IN 6" LAYERS TO A DEPTH OF 12" MINIMUM ABOVE THE PIPE. SEE COUNTY SPECIFICATIONS FOR THE BACKFILL.

RCP PIPE BEDDING & BACKFILLING DETAIL
(NOT TO SCALE)



1. PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECP's), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE RECP's IN A 6" (15 CM) DEEP X 6" (15 CM) WIDE TRENCH WITH APPROXIMATELY 12" (30cm) OF RECP's EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE RECP's WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30 CM) APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" (30 CM) PORTION OF RECP's BACK OVER SEED AND COMPACTED SOIL. SECURE RECP's OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" (30 CM) APART ACROSS THE WIDTH OF THE RECP's.
3. ROLL THE RECP's (A.) DOWN OR (B.) HORIZONTALLY ACROSS THE SLOPE. RECP's WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL RECP's MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING THE DOT SYSTEM™ , STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
4. THE EDGES OF PARALLEL RECP's MUST BE STAPLED WITH APPROXIMATELY 2" - 5" (5 CM - 12.5 CM) OVERLAP DEPENDING ON RECP's TYPE.
5. CONSECUTIVE RECP's SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" (7.5 CM) OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" (30 CM) APART ACROSS ENTIRE RECP's WIDTH.
   NOTE:
   IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" (15 CM) MAY BE NECESSARY TO PROPERLY SECURE THE RECP's.

EROSION CONTROL MATTING
(NOT TO SCALE)



WHEN AND WHERE TO USE IT

STABILIZED CONSTRUCTION ENTRANCES SHOULD BE USED AT ALL POINTS WHERE TRAFFIC WILL BE LEAVING A CONSTRUCTION SITE AND MOVING DIRECTLY ONTO A PUBLIC ROAD.

IMPORTANT CONSIDERATIONS:

IF WASHING IS USED, PROVISIONS MUST BE MADE TO INTERCEPT THE WASH WATER AND TRAP THE SEDIMENT BEFORE IT IS CARRIED OFFSITE. WASHDOWN FACILITIES SHALL BE REQUIRED AS DIRECTED BY SCDHEC AS NEEDED. WASHDOWN AREAS IN GENERAL MUST BE ESTABLISHED WITH CRUSHED GRAVEL AND DRAIN INTO A SEDIMENT TRAP OR SEDIMENT BASIN. CONSTRUCTION ENTRANCES SHOULD BE USED IN CONJUNCTION WITH THE STABILIZATION OF CONSTRUCTION ROADS TO REDUCE THE AMOUNT OF MUD PICKED UP BY VEHICLES.

INSTALLATION:

REMOVE ALL VEGETATION AND ANY OBJECTIONABLE MATERIAL FROM THE FOUNDATION AREA.

DIVERT ALL SURFACE RUNOFF AND DRAINAGE FROM STONES TO A SEDIMENT TRAP OR BASIN.

INSTALL A NON-WOVEN GEOTEXTILE FABRIC PRIOR TO PLACING ANY STONE.

INSTALL A CULVERT PIPE ACROSS THE ENTRANCE WHEN NEEDED TO PROVIDE POSITIVE DRAINAGE.

THE ENTRANCE SHALL CONSIST OF 1-INCH TO 3-INCH D50 STONE PLACED AT A MINIMUM DEPTH OF 6-INCHES.

MINIMUM DIMENSIONS OF THE ENTRANCE SHALL BE 24-FEET WIDE BY 100-FEET LONG, AND MAY BE MODIFIED AS NECESSARY TO ACCOMMODATE SITE CONSTRAINTS.

THE EDGES OF THE ENTRANCE SHALL BE TAPERED OUT TOWARDS THE ROAD TO PREVENT TRACKING OF MUD AT THE EDGE OF THE ENTRANCE.

INSPECTION AND MAINTENANCE:

INSPECT CONSTRUCTION ENTRANCES EVERY SEVEN (7) CALENDAR DAYS AND WITHIN 24-HOURS AFTER EACH RAINFALL EVENT THAT PRODUCES 1/2-INCH OR MORE OF PRECIPITATION, OR AFTER HEAVY USE. CHECK FOR MUD AND SEDIMENT BUILDUP AND PAD INTEGRITY. MAKE DAILY INSPECTIONS DUTING PERIODS OF WET WEATHER. MAINTENANCE IS REQUIRED MORE FREQUENTLY IN WET WEATHER CONDITIONS. RESHAPE THE STONE PAD AS NEEDED FOR DRAINAGE AND RUNOFF CONTROL.

WASH OR REPLACE STONES AS NEEDED AND AS DIRECTED BY THE INSPECTOR. THE STONE IN THE ENTRANCE SHOULD BE WASHED OR REPLACED WHENEVER THE ENTRANCE FAILS TO REDUCE MUD BEING CARRIED OFF-SITE BY VEHICLES. FREQUENT WASHING WILL EXTEND THE USEFUL LIFE OF STONE.

IMMEDIATELY REMOVE MUD AND SEDIMENT TRACKED OR WASHED ONTO PUBLIC ROADS BY BRUSHING OR SWEEPING. FLUSHING SHOULD ONLY BE USED WHEN THE WATER CAN BE DISCHARGED TO A SEDIMENT TRAP OR BASIN.

REPAIR ANY BROKEN PAVEMENT IMMEDIATELY.

STABILIZED CONSTRUCTION ENTRANCE/EXIT
(NOT TO SCALE)

SEEDING SCHEDULE FOR TEMPORARY VEGETATION UPPER AND LOWER STATE			
SCHEDULE NO.	COMMON NAME OF SEED	RATE PER ACRE (LBS.)	PLANTING DATES
1	ANNUAL SUDAN GRASS (SWEET OR TIFF)	40	APRIL 1 TO AUGUST 15
2	BROWN TOP MILLET	50	APRIL 1 TO AUGUST 15
3	RYE GRAIN	55	AUGUST 16 TO MARCH 31

SEEDING SCHEDULE FOR PERMANENT VEGETATION				
SCHEDULE NO.	COMMON NAME OF SEED	RURAL RATE	URBAN RATE[1]	PLANTING DATES
3[4]	COMMON BERMUDA (HULLED[3])	20	20	MARCH 1 TO AUGUST 14
	CARPET GRASS	9	9	
4[4]	COMMON BERMUDA (UNHULLED[3])	20	20	AUGUST 15 TO FEBRUARY 28
	RYE GRAIN	20	20	

NOTES:
1. INCLUDES RURAL AREAS ADJACENT TO WELL-DEVELOPED LAWNS.
2. NOT REQUIRED ON SHOULDERS, MEDIANS, ETC., AND SLOPES UNDER 5 FEET IN HEIGHT.
3. GIANT BERMUDA SEED, INCLUDING NK-37, SHALL NOT BE USED.
4. RESEEDING CRIMSON CLOVER SHALL BE INOCULATED IN ACCORDANCE WITH SUBSECTION 810.05. DO NOT PLANT CLOVER IN MEDIANS OR IN RURAL AREAS ADJACENT TO WELL-DEVELOPED LAWNS.

SEEDING SCHEDULE

PRELIMINARY
NOT FOR CONSTRUCTION

E.L. ROBINSON ENGINEERING
1301 Cervais St. Suite 450
Columbia, SC 29201
Phone: (803) 400-6031
www.elrobinsonengineering.com

NO. 24548 E.L. ROBINSON ENGINEERING NORTH CAROLINA CERTIFICATE OF AUTH.

Project Title / Client Information
DARLINGTON COUNTY
H&H STUDY - MOSES DR.
PROPOSED CONDITIONS
SOUTH CAROLINA OFFICE OF RESILIENCE
DARLINGTON COUNTY, SOUTH CAROLINA

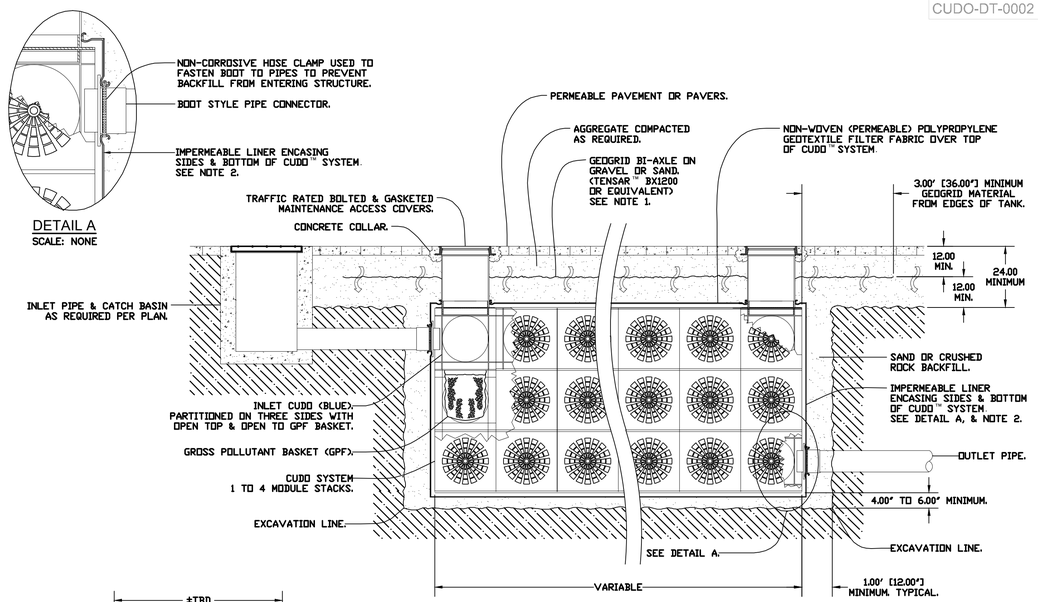
Revisions		
No.	Name	Date

Drawing Information
Project No. 1822005
Drawn By CWS
Date 03.24.23
Checked By DKB
Date 03.24.23
Approved By DKB

Drawing Title
DETAILS

Drawing No.
C4.1

CUDO-DT-0002



NOTES:

1. INSTALL GEOGRID LAYER, (TENSAR™ BX1200 OR EQUIVALENT) IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS IN AREAS SUBJECT TO VEHICLE TRAFFIC.
2. SYSTEM ENCASED ON SIDES & BOTTOM WITH 30-40 MIL PVC LINER OR 36 MIL RE-ENFORCED POLYETHYLENE AS REQUIRED.

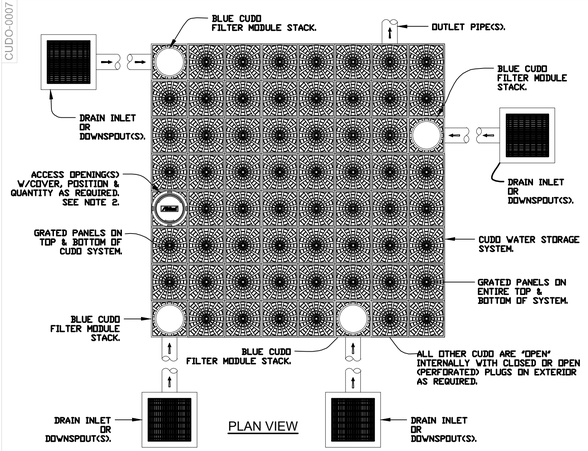
PATENT PENDING

TITLE: CUDO Stormwater Detention System
Typical Installation Detail
Permeable Pavement Area

CUDO Stormwater Products, Inc.
P.O. Box 497 Occidental, CA 95465
Ph. (877) 876-3345 Fax (707) 876-3346

DO NOT SCALE DRAWING | SCALE: NONE | DRAWN / DATE: JPR 7/21/08 | ECO: 0001 JPR 10/22/08 | DRAWING NO.: CUDO-DT-0002 | REV.: A | SHEET 1 OF 1

CUDO-0007



NOTES:

1. REFER TO CUDO INSTALLATION DETAILS.
2. SEE CUDO-0008 FOR TYPICAL MAINTENANCE ACCESS CONFIGURATION.

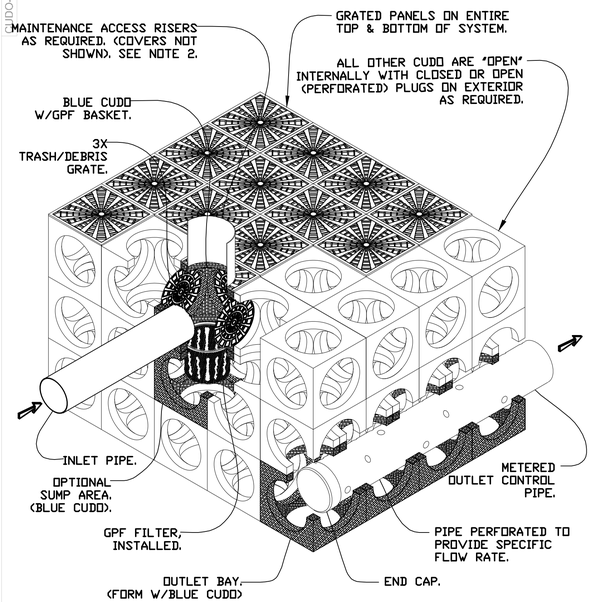
PATENT PENDING

TITLE: CUDO Water Storage System
Typical System Layout
W/ Filter Module Stacks.

CUDO Stormwater Products, Inc.
P.O. Box 497 Occidental, CA 95465
Ph. (877) 876-3345 Fax (707) 876-3346

DRAWING NO.: CUDO-0007 | REV: A | CUDO ECO: 0001 JPR 9/26/08 | DATE: JPR 5/2/08 | SHEET 1 OF 1

CUDO-0005



NOTES:

1. REFER TO CUDO INSTALLATION DETAILS.
2. SEE CUDO-0008 FOR TYPICAL MAINTENANCE ACCESS CONFIGURATION.

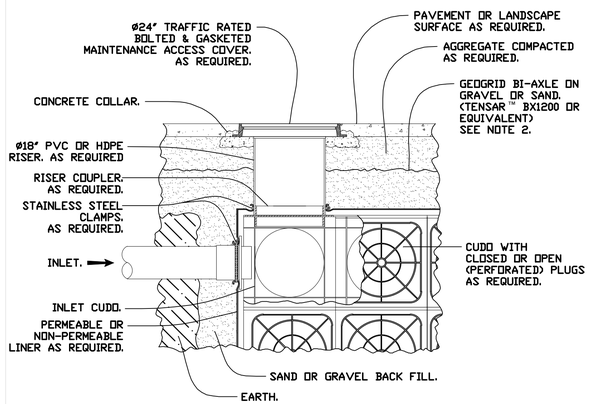
PATENT PENDING

TITLE: CUDO Water Storage System
W/ Metered Outlet Control Device.

CUDO Stormwater Products, Inc.
P.O. Box 497 Occidental, CA 95465
Ph. (877) 876-3345 Fax (707) 876-3346

DRAWING NO.: CUDO-0005 | REV: A | CUDO ECO: 0001 JPR 9/26/08 | DATE: JPR 7/24/08 | SHEET 1 OF 1

CUDO-0008



NOTES:

1. REFER TO CUDO INSTALLATION DETAILS.
2. INSTALL GEOGRID LAYER, (TENSAR™ BX1200 OR EQUIVALENT) IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS IN AREAS SUBJECT TO VEHICLE TRAFFIC.

PATENT PENDING

TITLE: CUDO Water Storage System
TYPICAL MAINTENANCE ACCESS

CUDO Stormwater Products, Inc.
P.O. Box 497 Occidental, CA 95465
Ph. (877) 876-3345 Fax (707) 876-3346

DRAWING NO.: CUDO-0008 | REV: A | CUDO ECO: 0001 JPR 9/26/08 | DATE: JPR 5/2/08 | SHEET 1 OF 1

PRELIMINARY
NOT FOR CONSTRUCTION

E.L. ROBINSON ENGINEERING
1301 Cervais St. Suite 450
Columbia, SC 29201
Phone: (803) 400-6031
www.elrobinsonengineering.com

SOUTH CAROLINA — E.L. ROBINSON ENGINEERING No. 25454 — CERTIFICATE OF AUTHORIZATION

Project Title / Client Information
DARLINGTON COUNTY
H&H STUDY - MOSES DR.
PROPOSED CONDITIONS
SOUTH CAROLINA OFFICE OF RESILIENCE
DARLINGTON COUNTY, SOUTH CAROLINA

Revisions

No.	Name	Date

Drawing Information
Project No. 1822005
Drawn By CWS
Date 03.24.23
Checked By DKB
Date 03.24.23
Approved By DKB

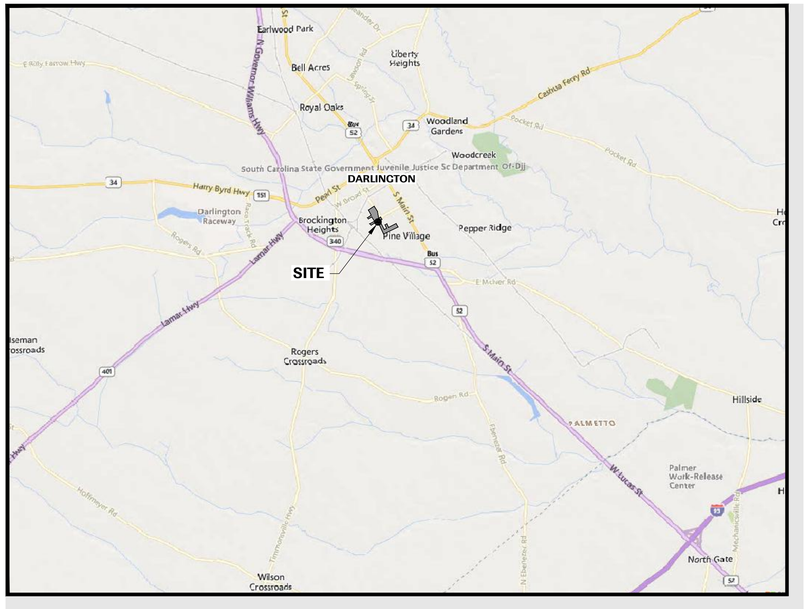
Drawing Title
DETAILS

Drawing No.
C4.2

DARLINGTON COUNTY H&H STUDY
PROPOSED CONDITIONS - CHESTNUT ST.

FOR

SOUTH CAROLINA OFFICE OF RESILIENCE



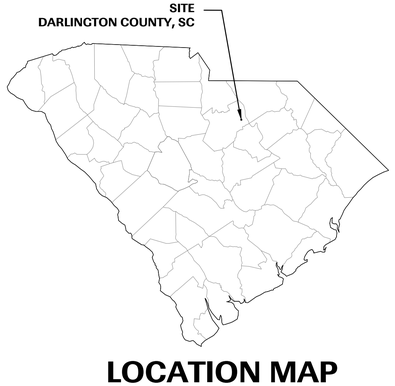
SITE MAP
SCALE: 1"=5,000'

SCOR PROJECT NUMBER PP-21-1600-01
ELR PROJECT NUMBER 1822005

10% PLANS SUBMITTAL

MARCH 24, 2023

PRELIMINARY
NOT FOR CONSTRUCTION



LOCATION MAP

The Palmetto Utility Protection Service, Inc.
810 Dutch Square Boulevard, Suite 320 Columbia, South Carolina 29210 Voice (803) 939-1117 Fax (803) 939-0704

3 DAYS BEFORE DIGGING IN SOUTH CAROLINA
CALL 1-888-721-7877
UNDERGROUND LOCATORS. CONTRACTOR SHALL CONTACT THE UNDERGROUND LOCATORS EVERY 10 DAYS FOR AN UPDATE TO UTILITY LOCATIONS.
Call BEFORE you DIG!

DRAWING INDEX

CIVIL

C0.0	COVER SHEET
C1.1	EXISTING CONDITIONS
C2.1	STORM DRAINAGE PLAN
C2.2	STORM DRAINAGE TABLES AND NOTES
C3.1-C3.5	STORM DRAINAGE PROFILES
C4.1-C4.2	DETAILS

SOUTH CAROLINA OFFICE OF RESILIENCE
ATTN: PHLEISHA LEWIS
632 ROSEWOOD DRIVE
COLUMBIA, SC 29201
PHLEISHA.LEWIS@SCOR.SC.GOV
Phone: (803) 543-0018

E.L. ROBINSON ENGINEERING
1301 Gervais St., Suite 450
Columbia, SC 29201
Phone: (803) 400-6031
www.elrobinsonengineering.com

PROJECT COORDINATES
LATITUDE: 34° 17' 32" N
LONGITUDE: 79° 52' 15" W

DRAWN: CWS	SEAL:	COA: SOUTH CAROLINA — E.L. ROBINSON ENGINEERING No. 2544 — CERTIFICATE OF AUTHORIZATION
CHECKED: DKB		
APPROVED DKB		

SHEET NO. **C0.0**
PROJECT NO. **1822005**

PRELIMINARY
NOT FOR CONSTRUCTION

100 0 100 200 300
scale in feet
1" = 100'

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SOUTH CAROLINA E.L. ROBINSON ENGINEERING No. 2544 AUTHORIZATION CERTIFICATE OF

Project Title / Client Information
DARLINGTON COUNTY
H&H STUDY - CHESTNUT ST.
PROPOSED CONDITIONS
SOUTH CAROLINA OFFICE OF RESILIENCE
DARLINGTON COUNTY, SOUTH CAROLINA

Revisions		
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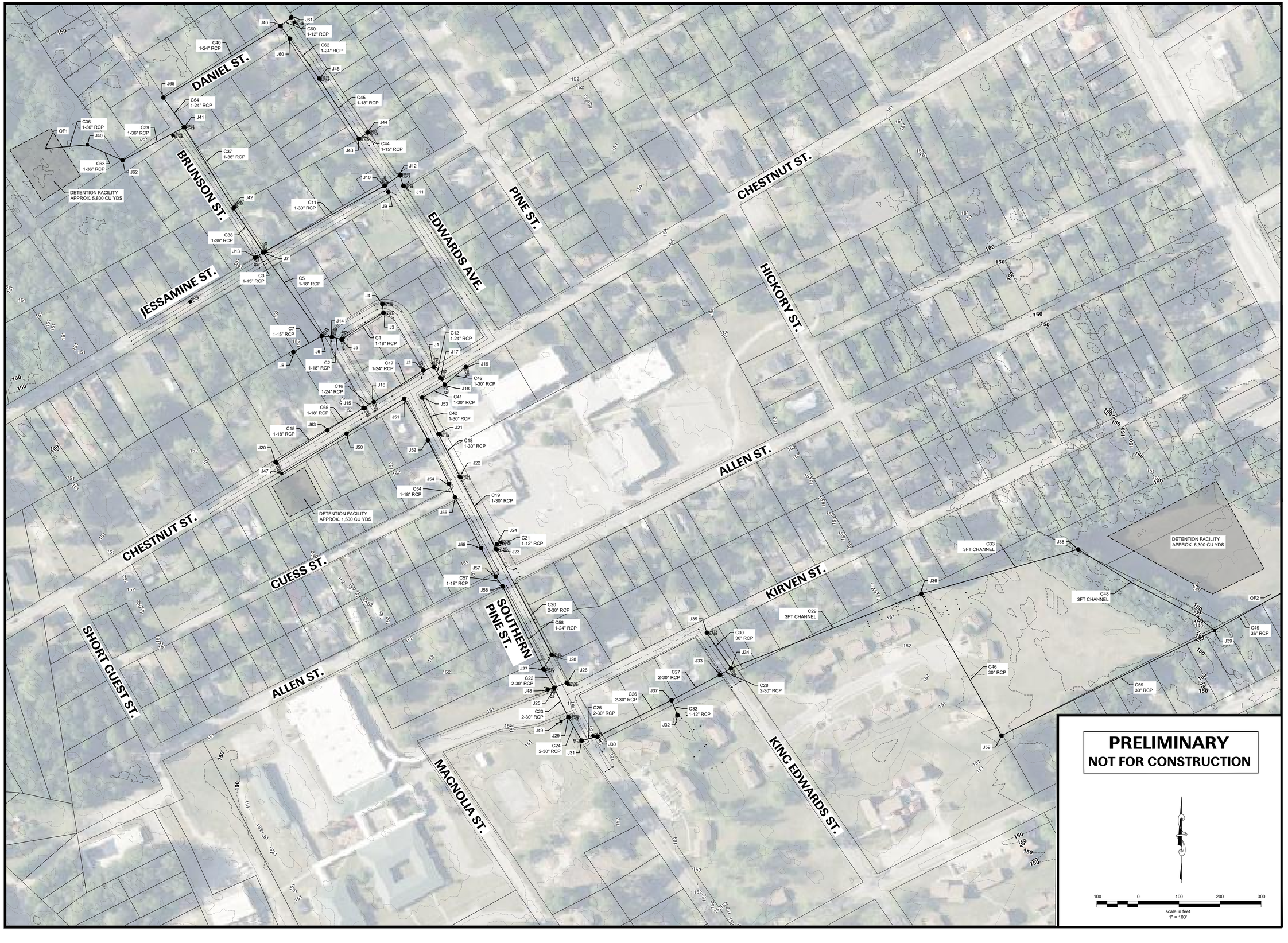
Drawing Information
Project No. 1822005
Drawn By
CWS
Date
03.24.23
Checked By
DKB
Date
03.24.23
Approved By
DKB

Drawing Title
EXISTING CONDITIONS PLAN

Drawing No.
C1.1



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www.elrobinsonengineering.com

SOUTH CAROLINA E.L. ROBINSON ENGINEERING No. 25544 CERTIFICATE OF AUTHORIZATION

Project Title / Client Information
DARLINGTON COUNTY
H&H STUDY - CHESTNUT ST.
PROPOSED CONDITIONS
SOUTH CAROLINA OFFICE OF RESILIENCE
DARLINGTON COUNTY, SOUTH CAROLINA

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Checked By DKB
Date 03.24.23
Approved By DKB

Drawing Title
STORM DRAINAGE PLAN

Drawing No.
C2.1

CONDUIT TABLE

JUNCTION TABLE

SEQUENCE OF CONSTRUCTION

ITEMS MUST OCCUR IN THE ORDER LISTED; ITEMS CANNOT OCCUR CONCURRENTLY UNTIL SPECIFICALLY NOTED.

1. RECEIVE NPDES COVERAGE FROM SCDHEC.
2. PRE-CONSTRUCTION MEETING WITH DARLINGTON COUNTY STORMWATER MANAGEMENT STAFF PRESENT.
3. THE PROJECT IS A LINEAR DITCH IMPROVEMENT, CLEANING AND REGRADING OF DITCHES, AND INSTALLATION OF STORM DRAINAGE AND BOXES. AS SUCH, THE CONTRACTOR SHALL SCHEDULE HIS WORK TO COMPLETE IN SECTIONS. IT IS NOT INTENDED FOR THE ENTIRE PROJECT TO BE DISTURBED AT ONE TIME.
4. LIMIT WORK BETWEEN ROADS CROSSINGS COMPLETING EACH CLEANING AND REGRADING BETWEEN ROADS COMPLETELY INCLUDING STABILIZATION BEFORE PROCEEDING TO THE NEXT AREA.
5. DISTURBANCE SHOULD BE GENERALLY LIMITED TO 1,000 LF MAX WITH EROSION CONTROL AS "ROLLING" WITH THE PROJECT.
6. ALL EXISTING INLETS SHALL BE PROTECTED BY SEDIMENT TUBES AS DETAILED IN THESE PLANS.
7. ALL NEW INLETS SHALL BE PROTECTED BY SEDIMENT TUBE PLACED IN A CIRCULAR FASHION AS DETAILED IN THESE PLANS.
8. NOTIFY DARLINGTON county STORMWATER MANAGEMENT STAFF 48 HOURS PRIOR TO BEGINNING LAND-DISTURBING ACTIVITIES.
9. INSTALLATION OF CONSTRUCTION ENTRANCES.
10. CLEARING AND GRUBBING ONLY AS NECESSARY FOR INSTALLATION OF PERIMETER CONTROLS.
11. INSTALLATION OF PERIMETER CONTROLS (E.G. SILT FENCE).
12. CLEARING AND GRUBBING OF SITE AND TREE REMOVAL. (SEDIMENT AND EROSION CONTROL MEASURES FOR THESE AREAS MUST ALREADY BE INSTALLED).
13. TOP SOIL REMOVAL AND STOCKPILE WITH SILT FENCE AROUND PERIMETER.
14. CLEANING AND CLEARING OF CHANNELS INDICATED ON THE PLANS..
15. INSTALLATION OF CHECK DAMS IN CHANNEL.
16. REMOVAL OF TREES, DEBRIS, AND OTHER ITEMS FROM CHANNEL.
17. REGRADING DITCHES IN THE AREAS SHOWN IN THE PLANS..
18. EXCAVATION OF OVERBANK PER GRADING PLAN,
19. INSTALL NEW STORM PIPING AND BOXES.
20. INSTALL ENKAMAT BANK STABILIZATION AND/OR FLEXTERRA AND/OR HYDROSEEDING.
21. PERMANENT/FINAL STABILIZATION TO OTHER AREAS DISTURBED..
22. REMOVAL OF TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES AFTER ENTIRE AREA DRAINING TO THE STRUCTURE IS FINALLY STABILIZED (THE DEPARTMENT RECOMMENDS THAT THE PROJECT OWNER/OPERATOR HAVE THE SWPPP PREPARER OR REGISTRATION EQUIVALENT APPROVE THE REMOVAL OF TEMPORARY STRUCTURES.)
23. PREPARE A DETAILED AS-BUILT SURVEY OF THE STRUCTURES AND GRADED AREAS FOR SUBMITTAL TO THE CITY, SCDHEC, AND FEMA.

ONCE CONSTRUCTION IS COMPLETE THE ITEMS BELOW MUST BE PERFORMED IN THE ORDER SHOWN.

24. SUBMIT NOTICE OF TERMINATION (NOT) TO DARLINGTON COUNTY AND SCDHEC. MANAGEMENT STAFF.

- NOTE: MAINTENANCE OF SEDIMENT AND EROSION CONTROL MEASURES MUST CONTINUE UNTIL THE SITE IS PERMANENTLY STABILIZED AND THE CONTROLS ARE REMOVED.

CONTRACTOR NOTES

1. PRIOR TO BEGINNING CONSTRUCTION, THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFING THAT ALL REQUIRED PERMITS AND APPROVALS HAVE BEEN OBTAINED FROM ALL REGULATORY AUTHORITIES.
2. CARE SHALL BE TAKEN TO PREVENT DAMAGE TO EXISTING UTILITIES DURING CONSTRUCTION. ANY DAMAGE TO THESE UTILITIES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
3. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES AND, WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANY AT LEAST 48 HOURS BEFORE ANY TRENCHING OR EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. FOR ASSISTANCE WITH FIELD LOCATION OF EXISTING UTILITIES THE CONTRACTOR CAN CONTACT PUPS AT 1-888-721-7877.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFYING ALL ILLUSTRATED KNOWN UNDERGROUND ELEMENTS. ADDITIONALLY, THE CONTRACTOR SHALL BE RESPONSIBLE FOR EXERCISING REASONABLE EFFORT TO PROTECT ANY UNKNOWN UNDERGROUND ELEMENTS. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY IF UNKNOWN ELEMENTS ARE DISCOVERED THAT WOULD NECESSITATE MODIFICATION TO THE ILLUSTRATED DESIGN.
5. THE CONTRACTOR SHALL PROTECT ALL ADJACENT PROPERTIES, THE GENERAL PUBLIC, AND ALL OTHER FACILITIES. SHOULD DAMAGES OCCUR, CONTRACTOR SHALL REPAIR IMMEDIATELY AS DIRECTED BY THE MANAGER/OWNER. CONTRACTOR IS FINANCIALLY RESPONSIBLE FOR ALL REPAIRS, AND REPAIRS ARE TO BE PERFORMED TO THE DEVELOPER'S APPROVAL.
6. THE CONTRACTOR SHALL UTILIZE SIGNS, BARRICADES, FLAQMEN, OR GUARDS AS REQUIRED TO ENSURE THE SAFETY OF ALL VEHICULAR AND PEDESTRIAN TRAFFIC DURING ALL CONSTRUCTION ACTIVITIES.
7. ALL IMPROVEMENTS SHALL BE IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
8. THE CONTRACTOR SHALL MAINTAIN THE SITE IN A MANNER SO THAT WORKMEN AND PUBLIC SHALL BE PROTECTED FROM INJURY.
9. THE GENERAL CONTRACTOR SHALL CONTACT ALL OWNERS OF EASEMENTS, UTILITIES AND RIGHT-OF-WAYS, PUBLIC OR PRIVATE, PRIOR TO WORKING IN THESE AREAS.
10. CONTRACTOR TO BE RESPONSIBLE FOR SECURING THE SITE PRIOR TO SUBSTANTIAL COMPLETION OF THE PROJECT. REPAIRS, RESULTING FROM VANDALISM, TO BE AT HIS OWN EXPENSE.

EROSION CONTROL NOTES

1. IF NECESSARY, SLOPES WHICH EXCEED EIGHT (8) VERTICAL FEET SHOULD BE STABILIZED WITH SYNTHETIC OR VEGETATIVE MATS, IN ADDITION TO GRASSING/HYDROSEEDING. IT MAY BE NECESSARY TO INSTALL TEMPORARY SLOPE DRAINS DURING CONSTRUCTION. TEMPORARY BERMS MAY BE NEEDED UNTIL THE SLOPE IS BROUGHT TO GRADE.

2. STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS PRACTICABLE IN PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED, BUT IN NO CASE MORE THAN FOURTEEN (14) DAYS AFTER WORK HAS CEASED , EXCEPT AS STATED BELOW.
   »WHERE STABILIZATION BY THE 14TH DAY IS PRECLUDED BY SNOW COVER OR FROZEN GROUND CONDITIONS STABILIZATION MEASURES MUST BE INITIATED AS SOON AS PRACTICABLE.
   »WHERE CONSTRUCTION ACTIVITY ON A PORTION OF THE SITE IS TEMPORARILY CEASED, AND EARTH-DISTURBING ACTIVITIES WILL BE RESUMED WITHIN 14 DAYS, TEMPORARY STABILIZATION MEASURES DO NOT HAVE TO BE INITIATED ON THAT PORTION OF THE SITE.

3. ALL SEDIMENT AND EROSION CONTROL DEVICES SHALL BE INSPECTED ONCE EVERY CALENDAR WEEK. IF PERIODIC INSPECTION OR OTHER INFORMATION INDICATES THAT A BMP HAS BEEN INAPPROPRIATELY INSTALLED, THE PERMITTEE MUST ADDRESS THE NECESSARY REPLACEMENT OR MODIFICATION REQUIRED TO CORRECT THE BMP WITHIN 48 HOURS OF IDENTIFICATION.

4. PROVIDE SILT FENCE AND/OR OTHER CONTROL DEVICES, AS MAY BE REQUIRED, TO CONTROL SOIL EROSION DURING UTILITY CONSTRUCTION. ALL DISTURBED AREAS SHALL BE CLEANED, GRADED, AND STABILIZED WITH GRASSING IMMEDIATELY AFTER THE UTILITY INSTALLATION. FILL, COVER, AND TEMPORARY SEEDING AT THE END OF EACH DAY ARE RECOMMENDED. IF WATER IS ENCOUNTERED WHILE TRENCHING, THE WATER SHOULD BE FILTERED TO REMOVE ANY SEDIMENTS BEFORE BEING PUMPED BACK INTO ANY WATERS OF THE STATE.

5. ALL EROSION CONTROL DEVICES SHALL BE PROPERLY MAINTAINED DURING ALL PHASES OF CONSTRUCTION UNTIL THE COMPLETION OF ALL CONSTRUCTION ACTIVITIES AND ALL DISTURBED AREAS HAVE BEEN STABILIZED. ADDITIONAL CONTROL DEVICES MAY BE REQUIRED DURING CONSTRUCTION, IN ORDER TO CONTROL EROSION AND/OR OFFSITE SEDIMENTATION. ALL TEMPORARY CONTROL DEVICES SHALL BE REMOVED ONCE CONSTRUCTION IS COMPLETED AND THE SITE IS STABILIZED.

6. THE CONTRACTOR MUST TAKE NECESSARY ACTION TO MINIMIZE TRACKING OF MUD ONTO PAVED ROADWAY(S) FROM CONSTRUCTION AREAS AND THE GENERATION OF DUST. THE CONTRACTOR SHALL DAILY REMOVE MUD/SOIL FROM PAVEMENT, AS MAY BE REQUIRED.

7. RESIDENTIAL SUBDIVISIONS REQUIRE EROSION CONTROL FEATURES FOR INFRASTRUCTURE AS WELL AS FOR INDIVIDUAL LOT CONSTRUCTION. INDIVIDUAL PROPERTY OWNERS SHALL FOLLOW THESE PLANS DURING CONSTRUCTION OR OBTAIN APPROVAL OF AN INDIVIDUAL PLAN IN ACCORDANCE WITH S.C. REG. 72-300 ET SEQ AND SCR100000.

8. TEMPORARY DIVERSION BERMS AND/OR DITCHES WILL BE PROVIDED AS NEEDED DURING CONSTRUCTION TO PROTECT WORK AREAS FROM UPSLOPE RUNOFF AND/OR DIVERT SEDIMENT LADEN WATER TO APPROPRIATE TRAPS OR STABLE OUTLETS.

9. ALL WATERS OF THE STATE (WoS), INCLUDING WETLANDS, ARE TO BE FLAGGED OR OTHERWISE CLEARLY MARKED IN THE FIELD. A DOUBLE ROW OF SILT FENCE IS TO BE INSTALLED IN ALL AREAS WHERE A 50-FT BUFFER CAN'T BE MAINTAINED BETWEEN THE DISTURBED AREA AND ALL WoS. A 10-FT BUFFER SHOULD BE MAINTAINED BETWEEN THE LAST ROW OF SILT FENCE AND ALL WoS.

10. LITTER, CONSTRUCTION DEBRIS, OILS, FUELS, AND BUILDING PRODUCTS WITH SIGNIFICANT POTENTIAL FOR IMPACT (SUCH AS STOCKPILES OF FRESHLY TREATED LUMBER) AND CONSTRUCTION CHEMICALS THAT COULD BE EXPOSED TO STORM WATER MUST BE PREVENTED FROM BECOMING A POLLUTANT SOURCE IN STORM WATER DISCHARGES.

11. A COPY OF THE SWPPP, INSPECTION RECORDS, AND RAINFALL DATA MUST BE RETAINED AT THE CONSTRUCTION SITE OR A NEARBY LOCATION EASILY ACCESSIBLE DURING NORMAL BUSINESS HOURS, FROM THE DATE OF COMMENCEMENT OF CONSTRUCTION ACTIVITIES TO THE DATE THAT THE FINAL STABILIZATION IS REACHED.

12. INITIATE STABILIZATION MEASURES ON ANY EXPOSED SLOPE (3H:1V OR GREATER) WHERE LAND-DISTURBIUNG ACTIVITIES HAVE PERMANENTLY OR TEMPORARILY CEASED, AND WILL NOT RESUME FOR A PERIOD OF SEVEN (7) CALENDAR DAYS.

13. MINIMIZE SOIL COMPACTION AND, UNLESS INFEASIBLE, PRESERVE TOPSOIL.

14. MINMIMZE THE DISCHARGE OF POLLUTANTS FROM EQUIPMENT AND VEHICLE WASHING, WHEEL WASH WATER, AND OTHER WASH WATERS. WASH WATERS MUST BE TREATED IN A SEDIMENT BASIN OR ALTERNATIVE CONTROL THAT PROVIDES EQUIVALENT OR BETTER TREATMENT PRIOR TO DISCHARGE.

15. MINIMIZE THE DISCHARGE OF POLLUTANTS FROM DEWATERING OF TRENCHES AND EXCAVATED AREAS. THESE DISCHARGES ARE TO BE ROUTED THROUGH APPROPRIATE BMPs (SEDIMENT BASIN, FILTER BAG, ETC.).

16. THE FOLLOWING DISCHARGES FROM SITES ARE PROHIBITED:
   »WASTEWATER FROM WASHOUT OF CONCRETE, UNLESS MANAGED BY AN APPROPRIATE CONTROL
   »WASTEWATER FROM WASHOUT AND CLEANOUT OF STUCCO, PAINT, FROM RELEASE OILS, CURING COMPOUNDS AND OTHER CONSTRUCTION MATERIALS
   »FUELS, OILS, OR OTHER POLLUTANTS USED IN VEHICLE AND EQUIPMENT OPERATION AND MAINTENANCE
   »SOAPS OR SOLVENTS USED IN VEHICLE AND EQUIPMENT WASHING

17. AFTER CONSTRUCTION ACTIVITIES BEGIN, INSPECTIONS MUST BE CONDUCTED AT A MINIMUM OF AT LEAST ONCE EVERY CALENDAR WEEK AND MUST BE CONDUCTED UNTIL FINAL STABILIZATION IS REACHED ON ALL AREAS OF THE CONSTRUCTION SITE.

18. IF EXISTING BMPs NEED TO BE MODIFIED OR IF ADDITIONAL BMPs ARE NECESSARY TO COMPLY WITH THE REQUIREMENTS OF THIS PERMIT AND/OR SC'S WATER QUALITY STANDARDS, IMPLEMENTATION MUST BE COMPLETED BEFORE THE NEXT STORM EVENT WHENEVER PRACTICABLE. IF IMPLEMENTATION BEFORE THE NEXT STORM EVENT IS IMPRACTICABLE, THE SITUATION MUST BE DOCUMENTED IN THE SWPPP AND ALTERNATIVE BMPs MUST BE IMPLEMENTED AS SOON AS REASONABLY POSSIBLE.

19. A PRE-CONSTRUCTION CONFERENCE MUST BE HELD FOR EACH CONSTRUCTION SITE WITH AN APPROVED ON-SITE SWPPP PRIOR TO THE IMPLEMENTATION OF CONSTRUCTION ACTIVITIES. FOR NON-LINEAR PROJECTS THAT DISTURB MORE THAN 10 ACRES OR MORE THIS CONFERENCE MUST BE HELD ON-SITE UNLESS THE DEPARTMENT HAS APPROVED OTHERWISE.

20. SILT FENCING LINE ON EROSION CONTROL PLAN SHEETS ARE SHOWN FOR GRAPHICAL PURPOSES. SILT FENCING SHALL BE PLACED AT THE LIMIITS OF DISTURBANCE

PRELIMINARY
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PALMETTO UTILITY PROTECTION SERVICE
Don't Dig! Before you call toll free 1-888-721-7877
A one call system for community and job safety.

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Phone: (803) 400-6031
www.elrobinsonengineering.com

NORTH CAROLINA NOTIFICATION OF CERTIFICATE OF AUTHORIZATION E.L. ROBINSON ENGINEERING No. 2544

Project Title / Client Information
DARLINGTON COUNTY
H&H STUDY - CHESTNUT ST.
PROPOSED CONDITIONS
SOUTH CAROLINA OFFICE OF RESILIENCE
DARLINGTON COUNTY, SOUTH CAROLINA

Revisions No.	Name	Date

Drawing Information
Project No. 1822005
Drawn By CWS
Date 03.24.23
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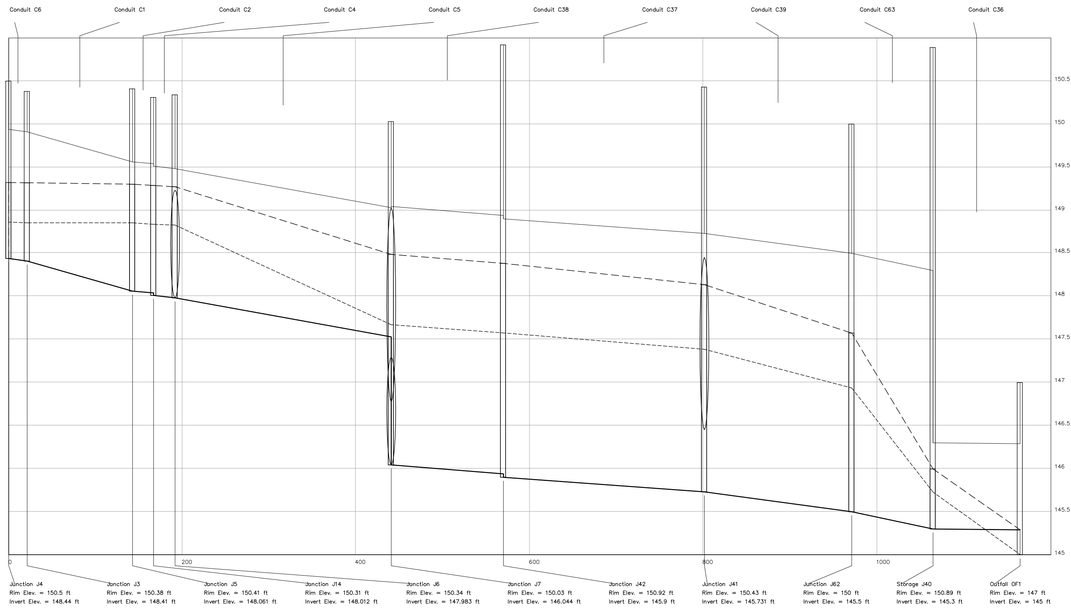
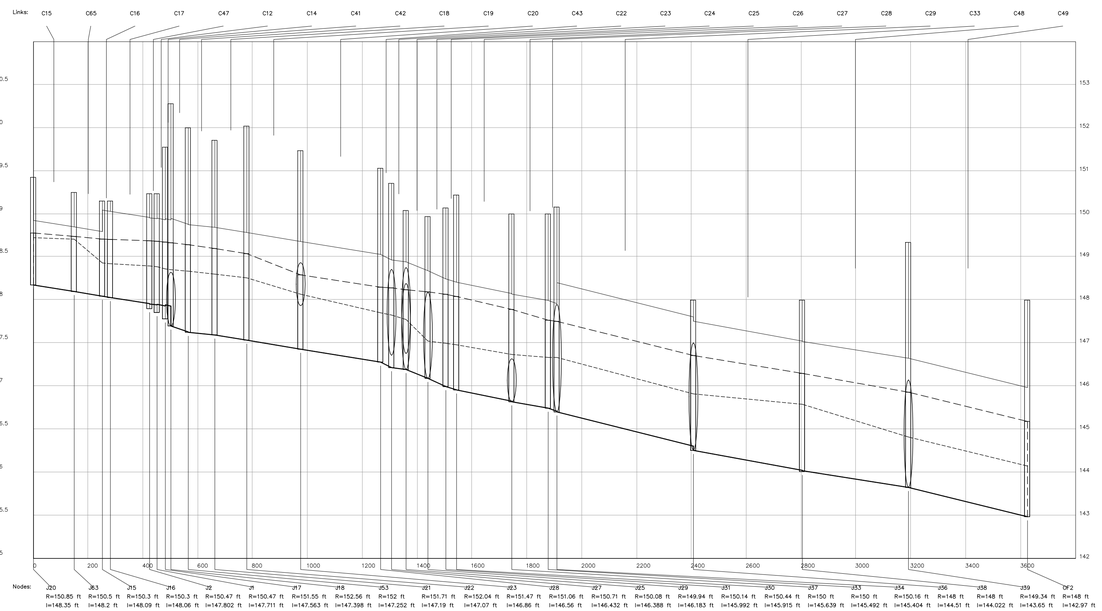
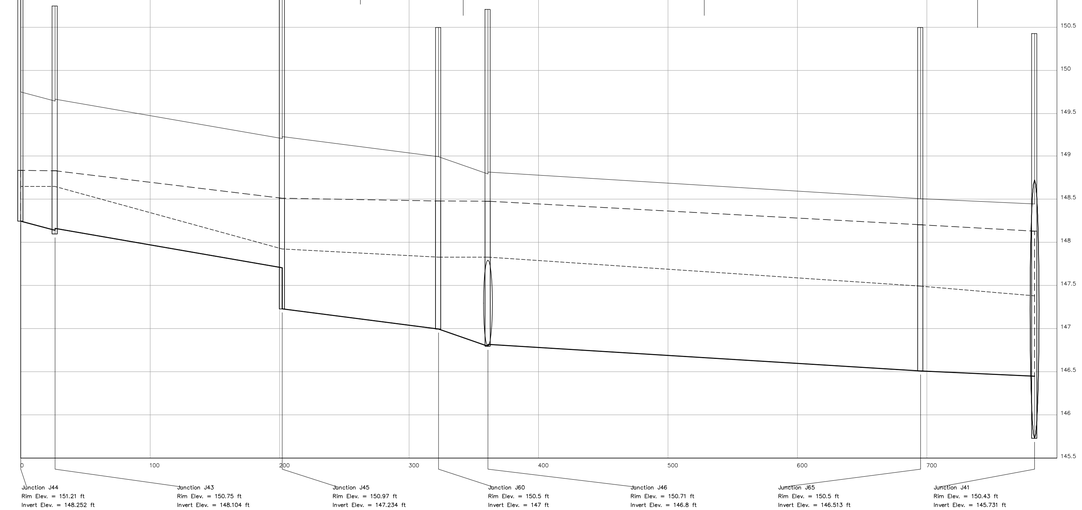
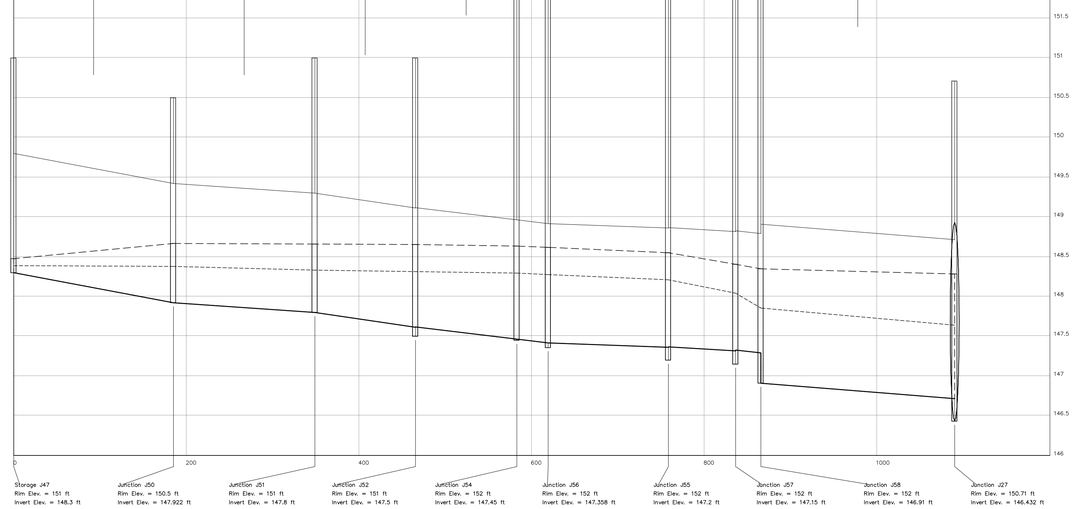
Drawing Title
STORM DRAINAGE TABLES AND NOTES

Drawing No.
C2.2









PRELIMINARY
NOT FOR CONSTRUCTION

LEGEND

- 2-YEAR FLOODPLAIN
- 10-YEAR FLOODPLAIN
- TOP OF PIPE/CHANNEL
- BOTTOM OF PIPE/CHANNEL

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SOUTH CAROLINA NOTIFICATION
E.L. ROBINSON ENGINEERING No. 2944
CERTIFICATE OF AUTHORIZATION

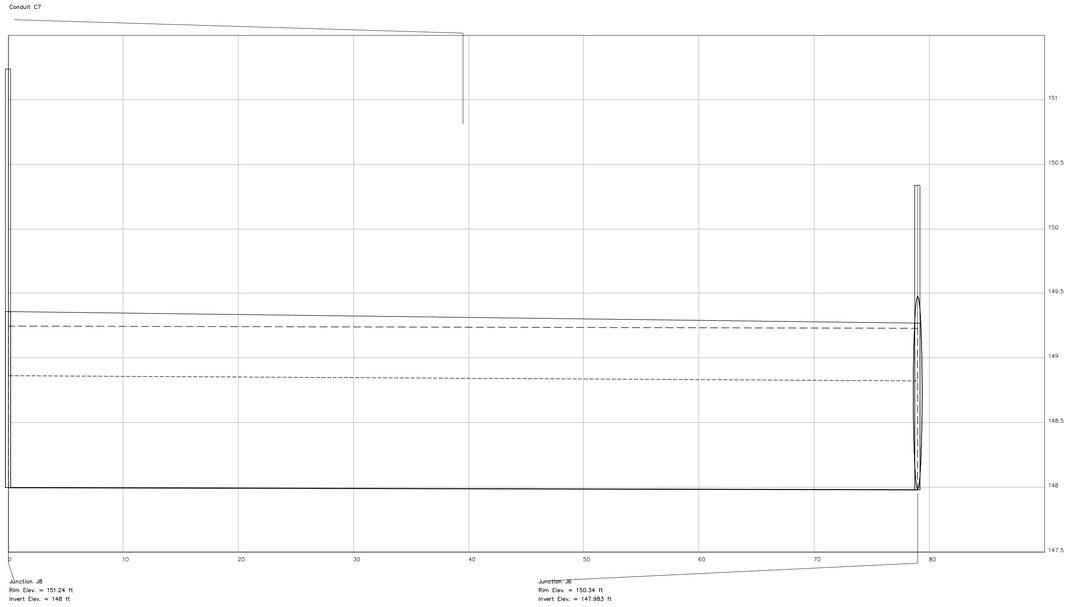
Project Title / Client Information
DARLINGTON COUNTY
H&H STUDY - CHESTNUT ST.
PROPOSED CONDITIONS
SOUTH CAROLINA OFFICE OF RESILIENCE
DARLINGTON COUNTY, SOUTH CAROLINA

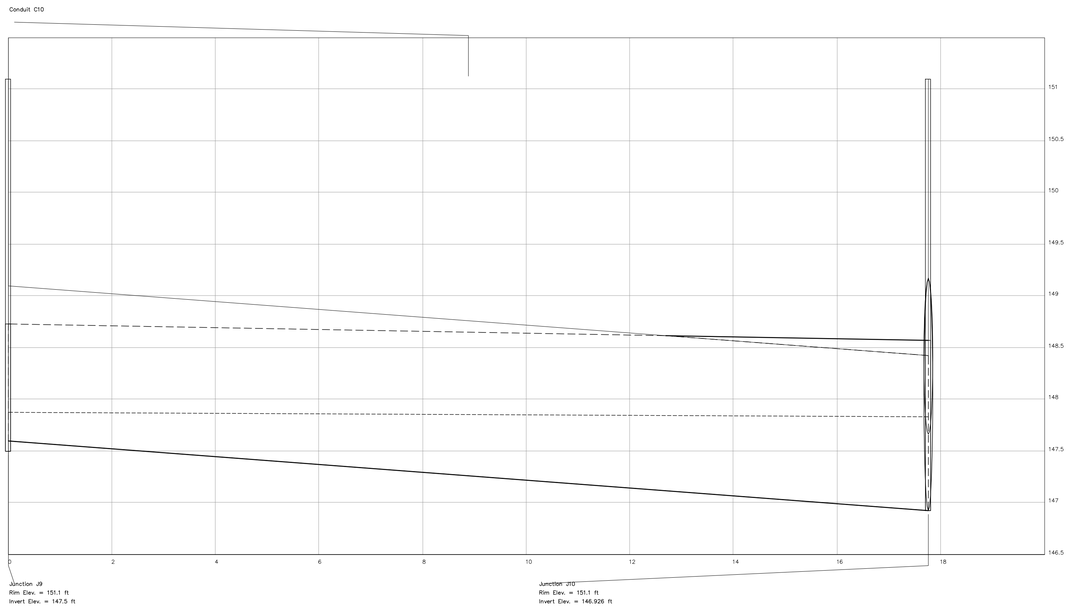
Revisions		
No.	Name	Date

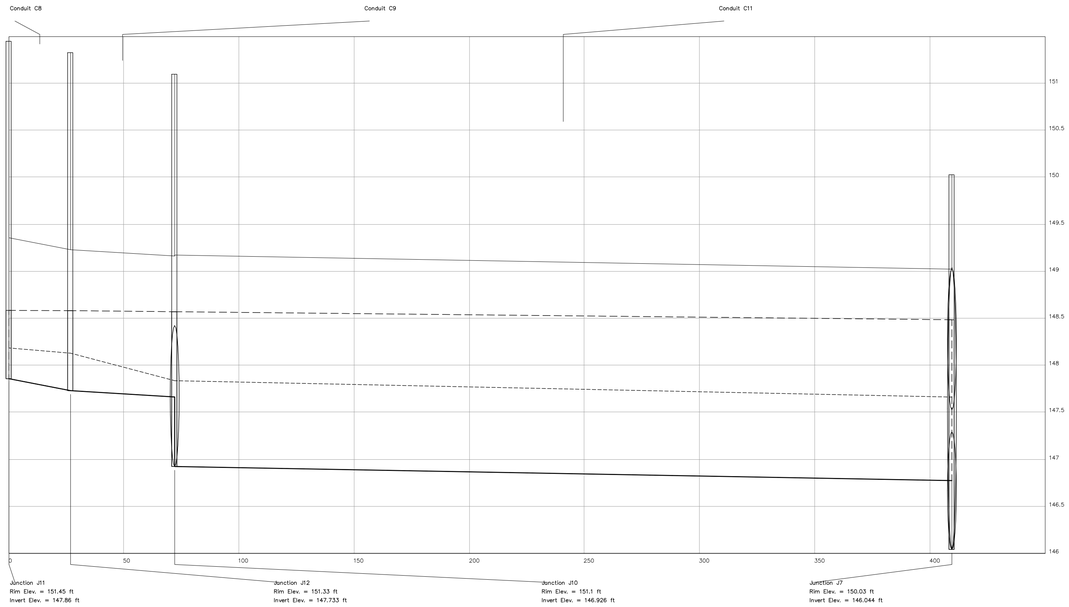
Drawing Information
Project No. 1822005
Drawn By
CWS
Date
03.24.23
Checked By
DKB
Date
03.24.23
Approved By
DKB

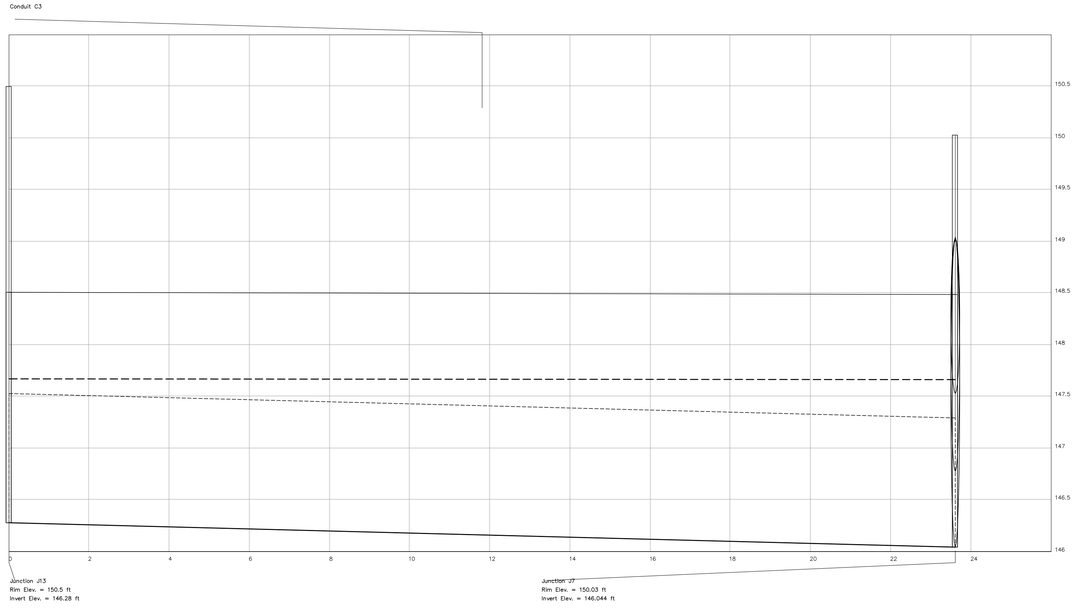
Drawing Title
STORM DRAINAGE PROFILES

Drawing No.
C3.1









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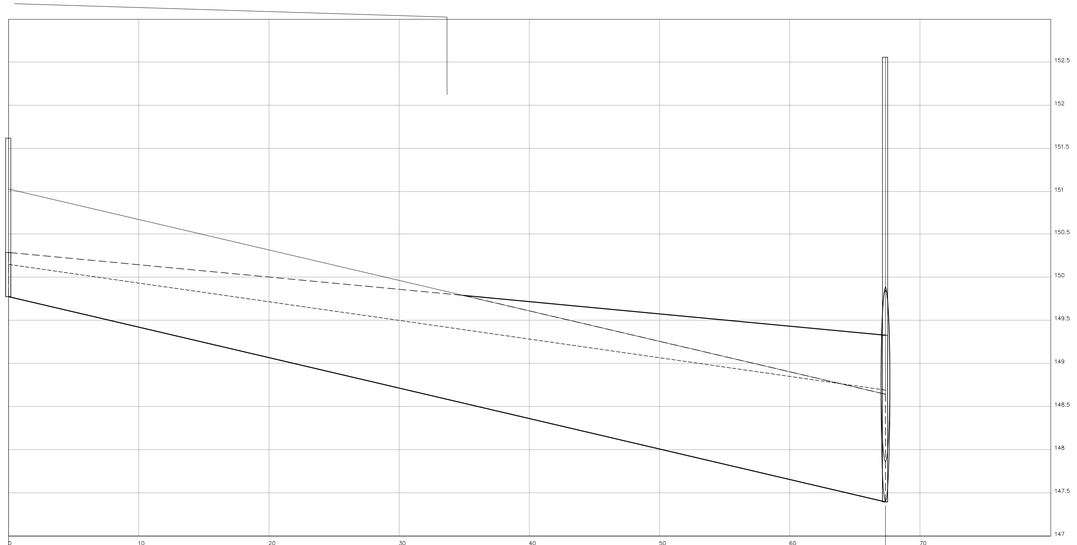
Drawing No.
C3.2

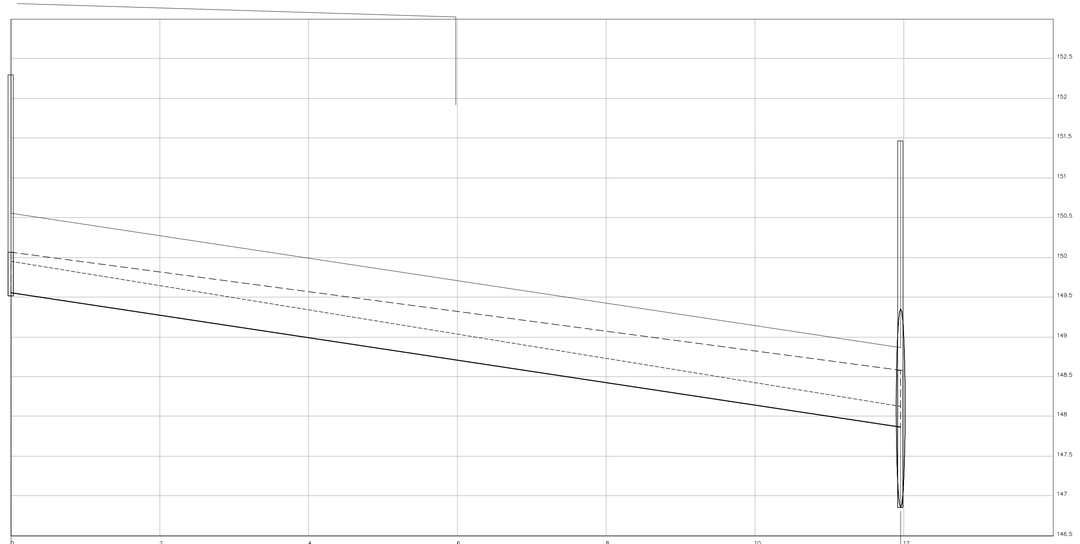
Conduit C13



Junction J19
Rim Elev. = 151.62 ft
Invert Elev. = 149.78 ft

Junction J18
Rim Elev. = 152.56 ft
Invert Elev. = 147.398 ft

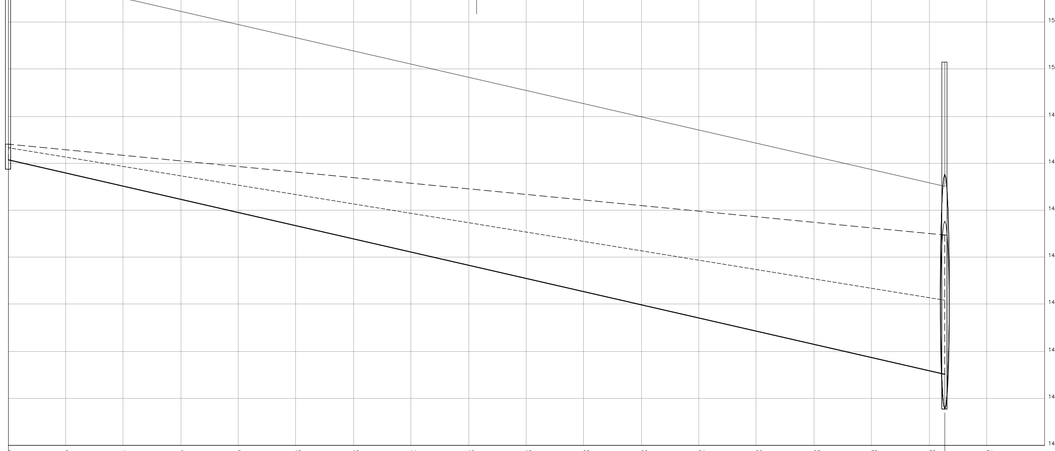
Conduit C21



Junction J24
Rim Elev. = 152.3 ft
Invert Elev. = 149.52 ft

Junction J23
Rim Elev. = 151.47 ft
Invert Elev. = 146.86 ft

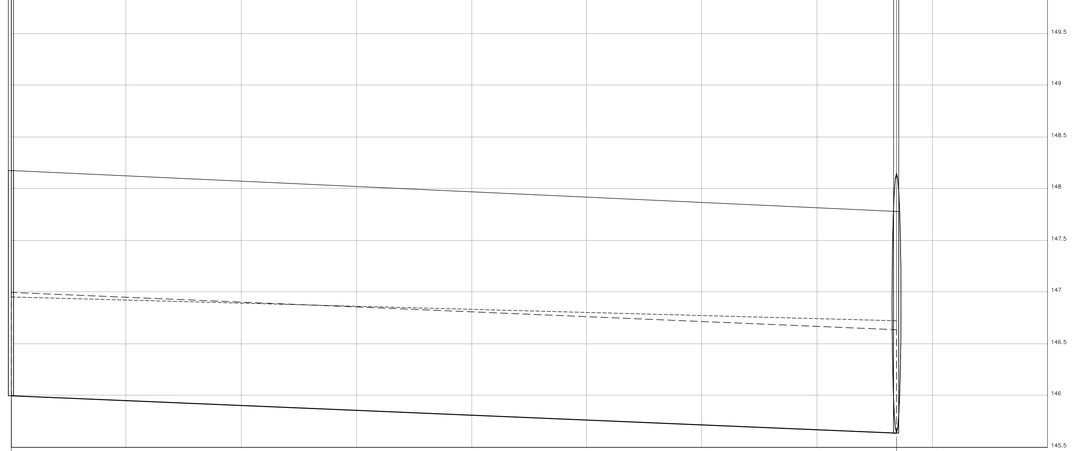
Conduit C31



Junction J26
Rim Elev. = 151.04 ft
Invert Elev. = 148.94 ft

Junction J25
Rim Elev. = 150.08 ft
Invert Elev. = 146.388 ft

Conduit C32



Junction J32
Rim Elev. = 150 ft
Invert Elev. = 146 ft

Junction J37
Rim Elev. = 150 ft
Invert Elev. = 145.639 ft

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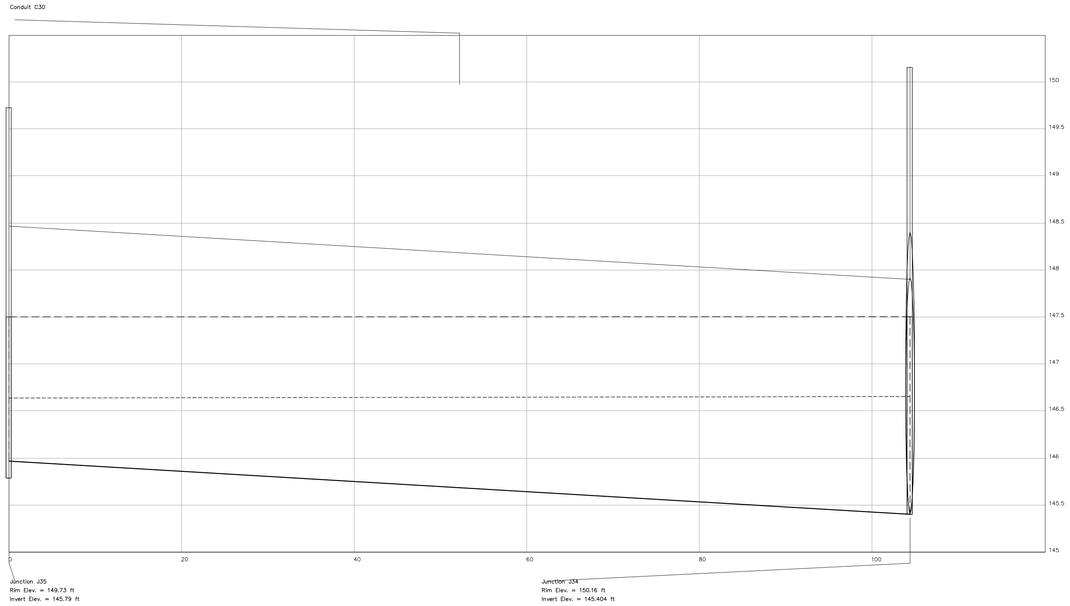
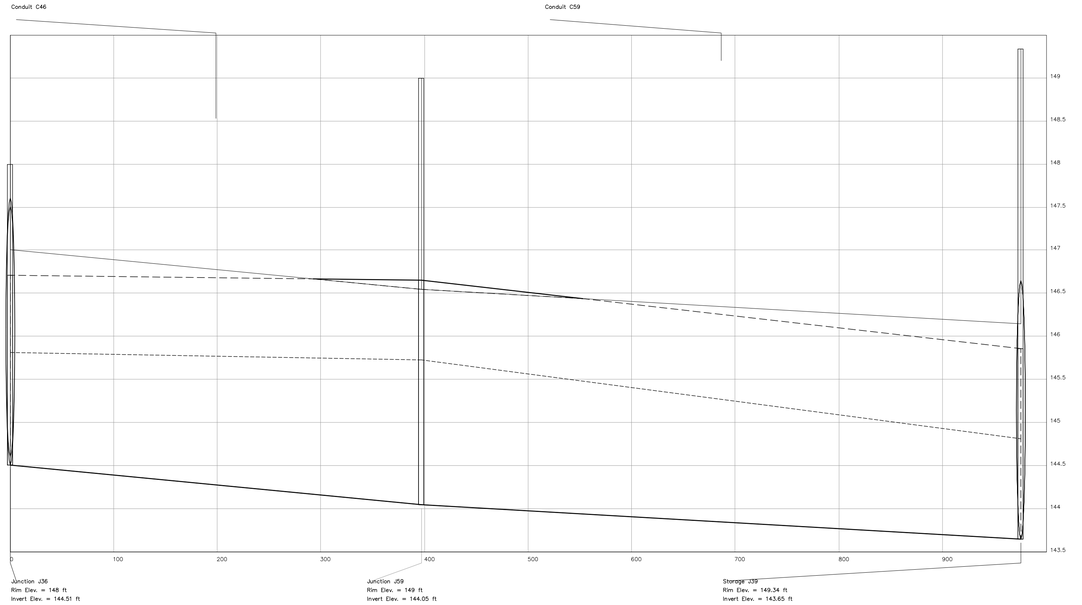
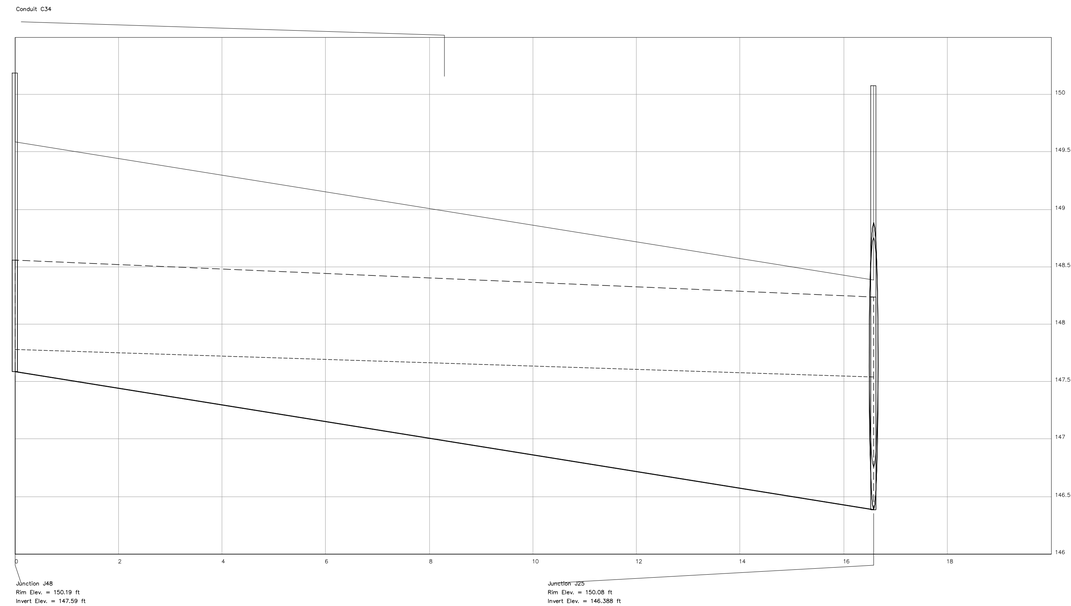
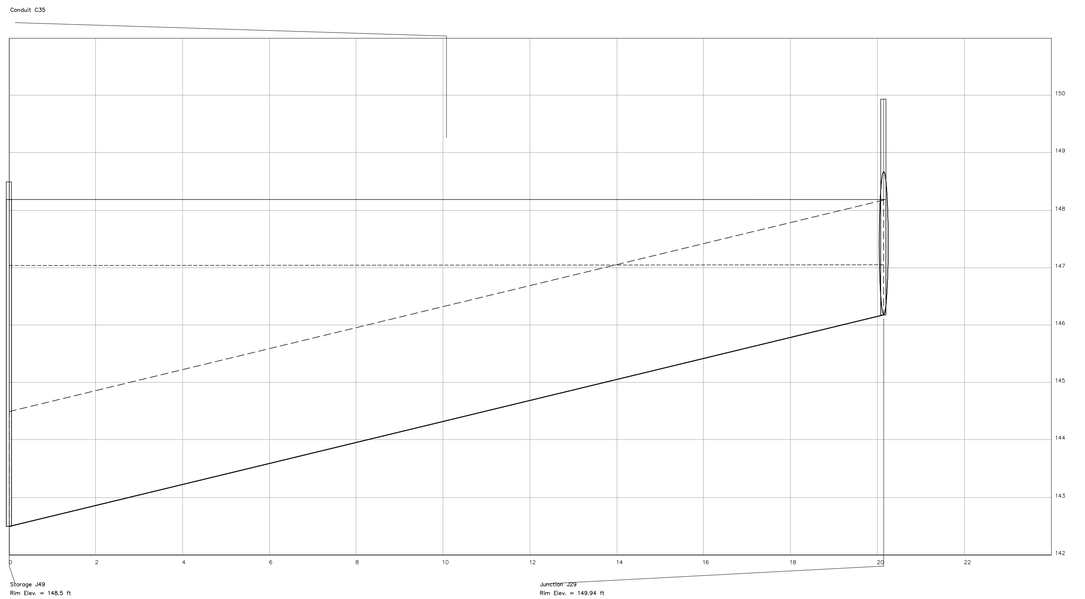
Drawing No.
C3.3









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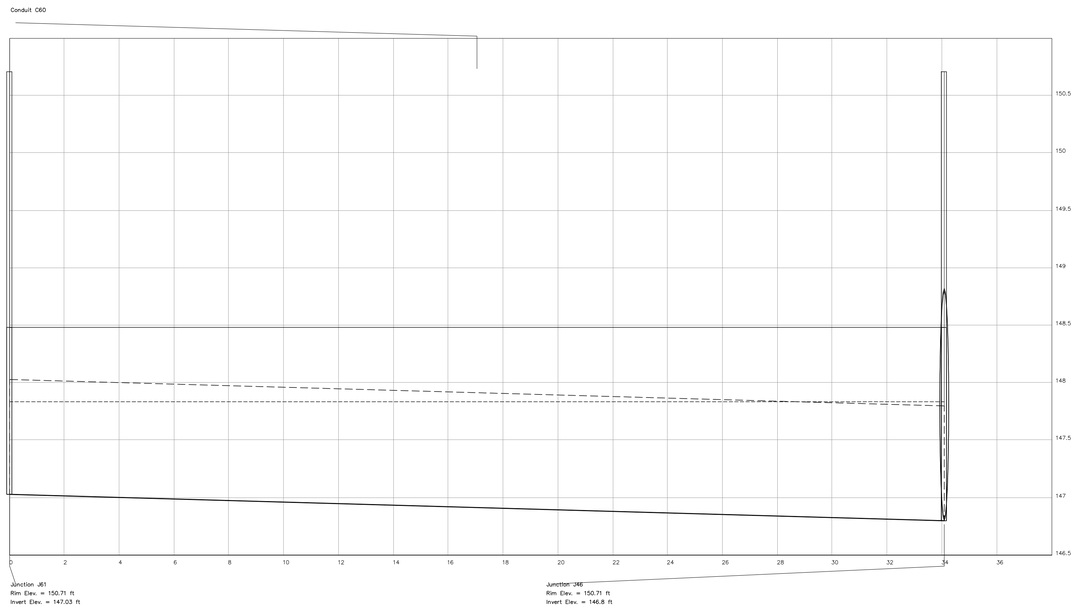
Drawing No.
C3.4



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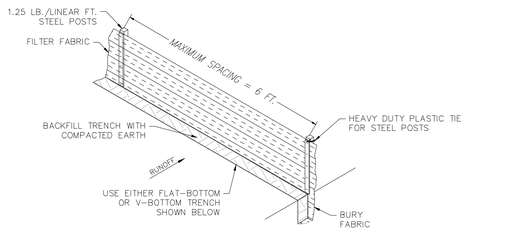
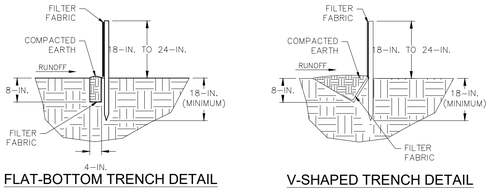


SILT FENCE INSTALLATION



FLAT-BOTTOM TRENCH DETAIL

V-SHAPED TRENCH DETAIL

WHEN AND WHERE TO USE IT
SILT FENCE IS APPLICABLE IN AREAS:

WHERE THE MAXIMUM SHEET OR OVERLAND FLOW PATH LENGTH TO THE FENCE IS 100-FEET.
WHERE THE MAXIMUM SLOPE STEEPNESS (NORMAL [PERPENDICULAR] TO FENCE LINE) IS 2H:1V.
THAT DO NOT RECEIVE CONCENTRATED FLOWS GREATER THAN 0.5 CFS.

DO NOT PLACE SILT FENCE ACROSS CHANNELS OR USE IT AS A VELOCITY CONTROL BMP.

MATERIALS

STEEL POSTS
USE 48-INCH LONG STEEL POSTS THAT MEET THE FOLLOWING MINIMUM PHYSICAL REQUIREMENTS:
COMPOSED OF HIGH STRENGTH STEEL WITH MINIMUM YIELD STRENGTH OF 50,000 PSI.
HAVE A STANDARD "T" SECTION WITH A NOMINAL FACE WIDTH OF 1.38-INCHES AND NOMINAL "T" LENGTH OF 1.48-INCHES.
WEIGH 1.25 POUNDS PER FOOT (± 8%).
HAVE A SOIL STABILIZATION PLATE WITH A MINIMUM CROSS SECTION AREA OF 17-SQUARE INCHES ATTACHED TO THE STEEL POSTS.
PAINTED WITH A WATER BASED BAKED ENAMEL PAINT.

USE STEEL POSTS WITH A MINIMUM LENGTH OF 4-FEET, WEIGHING 1.25 POUNDS PER LINEAR FOOT (± 8%) WITH PROJECTIONS TO AID IN FASTENING THE FABRIC. EXCEPT WHEN HEAVY CLAY SOILS ARE PRESENT ON SITE, STEEL POSTS WILL HAVE A METAL SOIL STABILIZATION PLATE WELDED NEAR THE BOTTOM SUCH THAT WHEN THE POST IS DRIVEN TO THE PROPER DEPTH, THE PLATE WILL BE BELOW THE GROUND LEVEL FOR ADDED STABILITY.
THE SOIL PLATES SHOULD HAVE THE FOLLOWING CHARACTERISTICS:
BE COMPOSED OF MINIMUM 15 GAUGE STEEL.
HAVE A MINIMUM CROSS SECTION AREA OF 17-SQUARE INCHES.

GEOTEXTILE FILTER FABRIC

FILTER FABRIC IS:
COMPOSED OF FIBERS CONSISTING OF LONG CHAIN SYNTHETIC POLYMERS COMPOSED OF AT LEAST 85% BY WEIGHT OF
POLYOLEFINS, POLYESTERS, OR POLYAMIDES. FORMED INTO A NETWORK SUCH THAT THE FILAMENTS OR YARNS RETAIN
DIMENSIONAL STABILITY RELATIVE TO EACH OTHER. FREE OF ANY TREATMENT OR COATING WHICH MIGHT ADVERSELY ALTER
ITS PHYSICAL PROPERTIES AFTER INSTALLATION. FREE OF DEFECTS OR FLAWS THAT SIGNIFICANTLY AFFECT ITS PHYSICAL
AND/OR FILTERING PROPERTIES. CUT TO A MINIMUM WIDTH OF 36 INCHES.

USE ONLY FABRIC APPEARING ON SCDOT APPROVAL SHEET #34 MEETING THE REQUIREMENTS OF THE MOST CURRENT EDITION
OF THE SCDOT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION.

INSTALLATION:

EXCAVATE A TRENCH APPROXIMATELY 6-INCHES WIDE AND 6-INCHES DEEP WHEN PLACING FABRIC BY HAND. PLACE 12-INCHES OF GEOTEXTILE FABRIC INTO THE 6-INCH DEEP TRENCH, EXTENDING THE REMAINING 6-INCHES TOWARDS THE UPSLOPE SIDE OF THE TRENCH. BACKFILL THE TRENCH WITH SOIL OR GRAVEL AND COMPACT. BURY 12-INCHES OF FABRIC INTO THE GROUND WHEN PNEUMATICALLY INSTALLING SILT FENCE WITH A SLICING METHOD. PURCHASE FABRIC IN CONTINUOUS ROLLS AND CUT TO LENGTH OF THE BARRIER TO AVOID JOINTS. WHEN JOINTS ARE NECESSARY, WRAP THE FABRIC TOGETHER AT A SUPPORT POST WITH BOTH ENDS FASTENED TO THE POST, WITH A 6-INCH MINIMUM OVERLAP. INSTALL POSTS TO A MINIMUM DEPTH OF 24-INCHES. INSTALL POSTS A MINIMUM OF 1- TO 2-INCHES ABOVE THE FABRIC, WITH NO MORE THAN 3-FEET OF THE POST ABOVE THE GROUND. SPACE POSTS TO MAXIMUM 6-FEET CENTERS. ATTACH FABRIC TO WOOD POSTS USING STAPLES MADE OF HEAVY DUTY WIRE AT LEAST 1 1/2-INCH LONG, SPACED A MAXIMUM OF 6-INCHES APART. STAPLE A 2-INCH WIDE LATHE OVER THE FILTER FABRIC TO SECURELY FASTEN IT TO THE UPSLOPE SIDE OF WOODEN POSTS. ATTACH FABRIC TO THE STEEL POSTS USING HEAVY DUTY PLASTIC TIES THAT ARE EVENLY SPACED AND PLACED IN A MANNER TO PREVENT SAGGING OR TEARING OF THE FABRIC. IN ALL CASES, TIES SHOULD BE AFFIXED IN NO LESS THAN 4 PLACES. INSTALL THE FABRIC A MINIMUM OF 24-INCHES ABOVE THE GROUND. WHEN NECESSARY, THE HEIGHT OF THE FENCE ABOVE GROUND MAY BE GREATER THAN 24-INCHES. IN TIDAL AREAS, EXTRA SILT FENCE HEIGHT MAY BE REQUIRED. THE POST HEIGHT WILL BE TWICE THE EXPOSED POST HEIGHT. POST SPACING WILL REMAIN THE SAME AND EXTRA HEIGHT FABRIC WILL BE 4-,5-, OR 6-FEET TALL. LOCATE SILT FENCE CHECKS EVERY 100 FEET MAXIMUM AND AT LOW POINTS. INSTALL THE FENCE PERPENDICULAR TO THE DIRECTION OF FLOW AND PLACE THE FENCE THE PROPER DISTANCE FROM THE TOE OF STEEP SLOPES TO PROVIDE SEDIMENT STORAGE AND ACCESS FOR MAINTENANCE AND CLEANOUT.

INSPECTION AND MAINTENANCE:

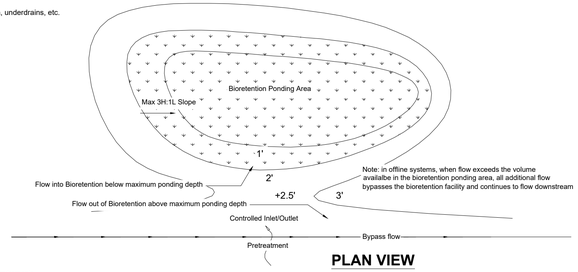
INSPECT EVERY SEVEN CALENDAR DAYS AND WITHIN 24-HOURS AFTER EACH RAINFALL EVENT THAT PRODUCES 1/2-INCH OR MORE OF PRECIPITATION. CHECK FOR SEDIMENT BUILDUP AND FENCE INTEGRITY. CHECK WHERE RUNOFF HAS ERODED A CHANNEL BENEATH THE FENCE, OR WHERE THE FENCE HAS SAGGED OR COLLAPSED BY FENCE OVERTOPPING. IF THE FENCE FABRIC TEARS, BEGINS TO DECOMPOSE, OR IN ANY WAY BECOMES INEFFECTIVE, REPLACE THE SECTION OF FENCE IMMEDIATELY. REMOVE SEDIMENT ACCUMULATED ALONG THE FENCE WHEN IT REACHES 1/3 THE HEIGHT OF THE FENCE, ESPECIALLY IF HEAVY RAINS ARE EXPECTED. REMOVE TRAPPED SEDIMENT FROM THE SITE OR STABILIZE IT ON SITE. REMOVE SILT FENCE WITHIN 30 DAYS AFTER FINAL STABILIZATION IS ACHIEVED OR AFTER TEMPORARY BEST MANAGEMENT PRACTICES (BMPs) ARE NO LONGER NEEDED. PERMANENTLY STABILIZE DISTURBED AREAS RESULTING FROM FENCE REMOVAL.

SILT FENCE DETAIL
(NOT TO SCALE)

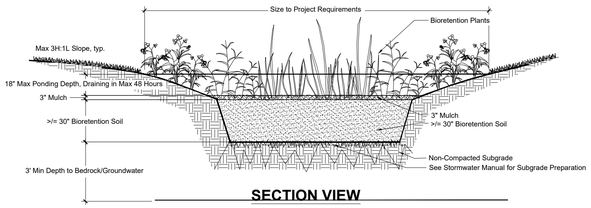
SUGGESTED CONSTRUCTION SEQUENCING (note to designer: edit as needed to meet project requirements)
1. Install appropriate temporary erosion control devices to prevent sediment from leaving or entering the practice during construction.
2. All down-gradient perimeter sediment control bmp's must be in place before any up gradient land disturbing activity begins.
3. Perform continuous inspections of erosion control practices, especially after each rainfall event.
4. Install all utilities (water, sanitary sewer, electric, natural gas, phone, fiber optic, etc) prior to setting final grade of bioretention device.
5. Rough grade the site. If bioretention areas are being used as temporary sediment basins during construction, leave a minimum of 1 feet of cover over the practice to protect the underlying soils from clogging.
6. Complete, stabilize, and vegetate all other site improvements.
7. Construct and vegetate bioretention device following stabilization of contributing drainage area. Ensure that critical elevations, such as underdrain invert, top of media, top of mulch, and invert of overflow structure (if present) are correct.
8. Remove temporary erosion control devices after the contributing drainage area is adequately vegetated.

GENERAL NOTES (note to designer: edit as needed to meet project requirements)
1. In the event that sediment is introduced into the bmp during or immediately following excavation, this material shall be removed from the practice prior to continuing construction.
2. See SCDHEC Stormwater Manual for subgrade preparation.

MATERIAL SPECIFICATIONS
1. See SCDHEC Stormwater Manual for material specifications recommendations for bioretention soil, mulch, underdrains, etc.



PLAN VIEW

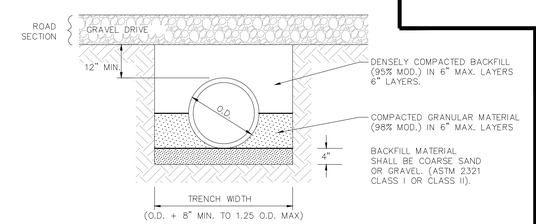


SECTION VIEW

BIO-RETENTION AREA DETAIL
(NOT TO SCALE)

1. IF NECESSARY, SLOPES, WHICH EXCEED (8) VERTICAL FEET SHOULD BE STABILIZED WITH SYNTHETIC OR VEGETATIVE MATS, IN ADDITION TO HYDROSEEDING, IT MAY BE NECESSARY TO INSTALL TEMPORARY SLOPE DRAINS DURING CONSTRUCTION. TEMPORARY BERMS MAY BE NEEDED UNTIL THE SLOPE IS BROUGHT TO GRADE.
2. STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS PRACTICABLE IN PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED, BUT IN NO CASE MORE THAN FOURTEEN (14) DAYS AFTER WORK HAS CEASED, EXCEPT AS STATED BELOW:
   a. WHERE STABILIZATION BY THE 14TH DAY IS PRECLUDED BY SNOW COVER OR FROZEN GROUND CONDITIONS. STABILIZATION MEASURES MUST BE INITIATED AS SOON AS PRACTICABLE.
   b. WHERE CONSTRUCTION ACTIVITY ON A PORTION OF THE SITE IS TEMPORARILY CEASED, AND EARTH DISTURBING ACTIVITIES WILL BE RESUMED WITHIN FOURTEEN (14) DAYS, TEMPORARY STABILIZATION MEASURES DO NOT HAVE TO BE INITIATED ON THAT PORTION OF THE SITE.
3. ALL SEDIMENT AND EROSION CONTROL DEVICES SHALL BE INSPECTED EVERY SEVEN (7) DAYS. IF SITE INSPECTIONS IDENTIFY BMPs THAT ARE DAMAGED AND/OR ARE NOT OPERATING EFFECTIVELY, MAINTENANCE MUST BE PERFORMED AS SOON AS PRACTICAL OR AS REASONABLY POSSIBLE AND BEFORE THE NEXT STORM EVENT WHENEVER PRACTICABLE.
   OR
   ALL SEDIMENT AND EROSION CONTROL DEVICES SHALL BE INSPECTED AT LEAST ONCE EVERY FOURTEEN (14 CALENDAR DAYS AND WITHIN 24 HOURS OF THE END OF A STORM EVENT OF 0.5 INCHES OR GREATER. IF SITE INSPECTIONS IDENTIFY BMPs THAT ARE DAMAGED OR ARE NOT OPERATING EFFECTIVELY, MAINTENANCE MUST BE PERFORMED AS SOON AS PRACTICAL OR AS REASONABLY POSSIBLE AND BEFORE THE NEXT STORM EVENT WHENEVER PRACTICABLE.
4. PROVIDE SILT FENCE AND/OR OTHER CONTROL DEVICES, AS MAY BE REQUIRED, TO CONTROL SOIL EROSION DURING UTILITY CONSTRUCTION. ALL DISTURBED AREAS SHALL BE CLEANED, GRADED, AND STABILIZED WITH GRASSING IMMEDIATELY AFTER THE UTILITY INSTALLATION. FILL, COVER, AND TEMPORARY SEEDING AT THE END OF EACH DAY ARE RECOMMENDED. IF WATER IS ENCOUNTERED WHILE TRENCHING, THE WATER SHOULD BE FILTERED TO REMOVE ANY SEDIMENTS BEFORE BEING PUMPED BACK INTO ANY WATERS OF THE STATE.
5. ALL EROSION CONTROL DEVICES SHALL BE PROPERLY MAINTAINED DURING ALL PHASES OF CONSTRUCTION UNTIL THE COMPLETION OF ALL CONSTRUCTION ACTIVITIES AND ALL DISTURBED AREAS HAVE BEEN STABILIZED. ADDITIONAL CONTROL DEVICES MAY BE REQUIRED DURING CONSTRUCTION IN ORDER TO CONTROL EROSION AND/OR OFFSITE SEDIMENTATION. ALL TEMPORARY CONTROL DEVICES SHALL BE REMOVED ONCE CONSTRUCTION IS COMPLETE AND THE SITE IS STABILIZED.
6. THE GENERAL CONTRACTOR MUST TAKE NECESSARY ACTION TO MINIMIZE THE TRACKING OF MUD ONTO PAVED ROADWAY(S) FROM CONSTRUCTION AREAS AND THE GENERATION OF DUST. THE GENERAL CONTRACTOR SHALL DAILY REMOVE MUD/SOIL FROM PAVEMENT, AS MAY BE REQUIRED.
7. RESIDENTIAL SUBDIVISIONS REQUIRE EROSION CONTROL FEATURES FOR INFRASTRUCTURE AS WELL AS FOR INDIVIDUAL LOT CONSTRUCTION. INDIVIDUAL PROPERTY OWNERS SHALL FOLLOW THESE PLANS DURING CONSTRUCTION OR OBTAIN APPROVAL OF AN INDIVIDUAL PLAN IN ACCORDANCE WITH S.C. REG. 72-300 et seq. AND SCR10000.
8. TEMPORARY DIVERSION BERMS AND/OR DITCHES WILL BE PROVIDED AS NEEDED DURING CONSTRUCTION TO PROTECT WORK AREAS FROM UPSLOPE RUNOFF AND/OR TO DIVERT SEDIMENT-LADEN WATER TO APPROPRIATE TRAPS OR STABLE OUTLETS.
9. ALL WATERS OF THE STATE (WoS), INCLUDING WETLANDS, ARE TO BE FLAGGED OR OTHERWISE CLEARLY MARKED IN THE FIELD. A DOUBLE ROW OF SILT FENCE IS TO BE INSTALLED IN ALL AREAS WHERE A 50-FOOT BUFFER CAN'T BE MAINTAINED BETWEEN THE DISTURBED AREA AND ALL WoS. A 10-FOOT BUFFER SHOULD BE MAINTAINED BETWEEN THE LAST ROW OF SILT FENCE AND ALL WoS.
10. LITTER, CONSTRUCTION DEBRIS, OILS, FUELS, AND BUILDING PRODUCTS WITH SIGNIFICANT POTENTIAL FOR IMPACT (SUCH AS STOCKPILES OF FRESHLY TREATED LUMBER) AND CONSTRUCTION CHEMICALS THAT COULD BE EXPOSED TO STORM WATER MUST BE PREVENTED FROM BECOMING A POLLUTANT SOURCE IN STORM WATER DISCHARGES.

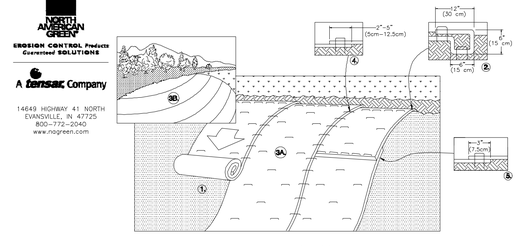
SEDIMENT AND EROSION CONTROL NOTES



THE PIPE IS TO BE BEDDED IN COMPACTED 6" LAYERS TO THE SPRING LINE FIRST, THEN BACKFILLED WITH HAND PLACED MATERIAL COMPACTED IN 6" LAYERS TO A DEPTH OF 12" MINIMUM ABOVE THE PIPE. SEE COUNTY SPECIFICATIONS FOR THE BACKFILL.

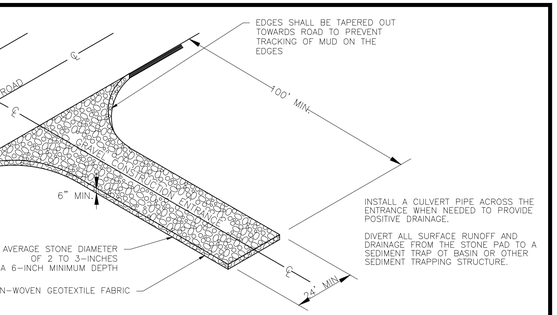
RCP PIPE BEDDING & BACKFILLING DETAIL
(NOT TO SCALE)

NORTH AMERICAN GREEN
EROSION CONTROL Products Guaranteed SOLUTIONS
A tensar Company
14649 HIGHWAY 41 NORTH
EVANSVILLE, IN 47725
800-772-2040
www.nagreen.com



1. PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECP's), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE RECP's IN A 6" (15 CM) DEEP X 6" (15 CM) WIDE TRENCH WITH APPROXIMATELY 12" (30cm) OF RECP's EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE RECP's WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30 CM) APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" (30 CM) PORTION OF RECP's BACK OVER SEED AND COMPACTED SOIL. SECURE RECP's OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" (30 CM) APART ACROSS THE WIDTH OF THE RECP's.
3. ROLL THE RECP's (A.) DOWN OR (B.) HORIZONTALLY ACROSS THE SLOPE. RECP's WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL RECP's MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING THE DOT SYSTEM™ , STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
4. THE EDGES OF PARALLEL RECP's MUST BE STAPLED WITH APPROXIMATELY 2" - 5" (5 CM - 12.5 CM) OVERLAP DEPENDING ON RECP's TYPE.
5. CONSECUTIVE RECP's SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" (7.5 CM) OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" (30 CM) APART ACROSS ENTIRE RECP's WIDTH.
   NOTE:
   IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" (15 CM) MAY BE NECESSARY TO PROPERLY SECURE THE RECP's.

EROSION CONTROL MATTING
(NOT TO SCALE)



WHEN AND WHERE TO USE IT

STABILIZED CONSTRUCTION ENTRANCES SHOULD BE USED AT ALL POINTS WHERE TRAFFIC WILL BE LEAVING A CONSTRUCTION SITE AND MOVING DIRECTLY ONTO A PUBLIC ROAD.

IMPORTANT CONSIDERATIONS:

IF WASHING IS USED, PROVISIONS MUST BE MADE TO INTERCEPT THE WASH WATER AND TRAP THE SEDIMENT BEFORE IT IS CARRIED OFFSITE. WASHDOWN FACILITIES SHALL BE REQUIRED AS DIRECTED BY SCDHEC AS NEEDED. WASHDOWN AREAS IN GENERAL MUST BE ESTABLISHED WITH CRUSHED GRAVEL AND DRAIN INTO A SEDIMENT TRAP OR SEDIMENT BASIN. CONSTRUCTION ENTRANCES SHOULD BE USED IN CONJUNCTION WITH THE STABILIZATION OF CONSTRUCTION ROADS TO REDUCE THE AMOUNT OF MUD PICKED UP BY VEHICLES.

INSTALLATION:

REMOVE ALL VEGETATION AND ANY OBJECTIONABLE MATERIAL FROM THE FOUNDATION AREA.

DIVERT ALL SURFACE RUNOFF AND DRAINAGE FROM STONES TO A SEDIMENT TRAP OR BASIN.

INSTALL A NON-WOVEN GEOTEXTILE FABRIC PRIOR TO PLACING ANY STONE.

INSTALL A CULVERT PIPE ACROSS THE ENTRANCE WHEN NEEDED TO PROVIDE POSITIVE DRAINAGE.

THE ENTRANCE SHALL CONSIST OF 1-INCH TO 3-INCH D50 STONE PLACED AT A MINIMUM DEPTH OF 6-INCHES.

MINIMUM DIMENSIONS OF THE ENTRANCE SHALL BE 24-FEET WIDE BY 100-FEET LONG, AND MAY BE MODIFIED AS NECESSARY TO ACCOMMODATE SITE CONSTRAINTS.

THE EDGES OF THE ENTRANCE SHALL BE TAPERED OUT TOWARDS THE ROAD TO PREVENT TRACKING OF MUD AT THE EDGE OF THE ENTRANCE.

INSPECTION AND MAINTENANCE:

INSPECT CONSTRUCTION ENTRANCES EVERY SEVEN (7) CALENDAR DAYS AND WITHIN 24-HOURS AFTER EACH RAINFALL EVENT THAT PRODUCES 1/2-INCH OR MORE OF PRECIPITATION, OR AFTER HEAVY USE. CHECK FOR MUD AND SEDIMENT BUILDUP AND PAD INTEGRITY. MAKE DAILY INSPECTIONS DUTING PERIODS OF WET WEATHER. MAINTENANCE IS REQUIRED MORE FREQUENTLY IN WET WEATHER CONDITIONS. RESHAPE THE STONE PAD AS NEEDED FOR DRAINAGE AND RUNOFF CONTROL.

WASH OR REPLACE STONES AS NEEDED AND AS DIRECTED BY THE INSPECTOR. THE STONE IN THE ENTRANCE SHOULD BE WASHED OR REPLACED WHENEVER THE ENTRANCE FAILS TO REDUCE MUD BEING CARRIED OFF-SITE BY VEHICLES. FREQUENT WASHING WILL EXTEND THE USEFUL LIFE OF STONE.

IMMEDIATELY REMOVE MUD AND SEDIMENT TRACKED OR WASHED ONTO PUBLIC ROADS BY BRUSHING OR SWEEPING. FLUSHING SHOULD ONLY BE USED WHEN THE WATER CAN BE DISCHARGED TO A SEDIMENT TRAP OR BASIN.

REPAIR ANY BROKEN PAVEMENT IMMEDIATELY.

STABILIZED CONSTRUCTION ENTRANCE/EXIT
(NOT TO SCALE)

SEEDING SCHEDULE FOR TEMPORARY VEGETATION UPPER AND LOWER STATE			
SCHEDULE NO.	COMMON NAME OF SEED	RATE PER ACRE (LBS.)	PLANTING DATES
1	ANNUAL SUDAN GRASS (SWEET OR TIFF)	40	APRIL 1 TO AUGUST 15
2	BROWN TOP MILLET	50	APRIL 1 TO AUGUST 15
3	RYE GRAIN	55	AUGUST 16 TO MARCH 31

SEEDING SCHEDULE FOR PERMANENT VEGETATION				
SCHEDULE NO.	COMMON NAME OF SEED	RURAL RATE	URBAN RATE[1]	PLANTING DATES
3[4]	COMMON BERMUDA (HULLED[3])	20	20	MARCH 1 TO AUGUST 14
	CARPET GRASS	9	9	
4[4]	COMMON BERMUDA (UNHULLED[3])	20	20	AUGUST 15 TO FEBRUARY 28
	RYE GRAIN	20	20	

NOTES:
1. INCLUDES RURAL AREAS ADJACENT TO WELL-DEVELOPED LAWNS.
2. NOT REQUIRED ON SHOULDERS, MEDIANS, ETC., AND SLOPES UNDER 5 FEET IN HEIGHT.
3. GIANT BERMUDA SEED, INCLUDING NK-37, SHALL NOT BE USED.
4. RESEEDING CRIMSON CLOVER SHALL BE INOCULATED IN ACCORDANCE WITH SUBSECTION 810.05. DO NOT PLANT CLOVER IN MEDIANS OR IN RURAL AREAS ADJACENT TO WELL-DEVELOPED LAWNS.

SEEDING SCHEDULE

PRELIMINARY
NOT FOR CONSTRUCTION

E.L. ROBINSON ENGINEERING
1301 Cervais St. Suite 450
Columbia, SC 29201
Phone: (803) 400-6031
www.elrobinsonengineering.com

NO. 24548 E.L. ROBINSON ENGINEERING NORTH CAROLINA CERTIFICATE OF AUTH.

Project Title / Client Information
DARLINGTON COUNTY
H&H STUDY - CHESTNUT ST.
PROPOSED CONDITIONS
SOUTH CAROLINA OFFICE OF RESILIENCE
DARLINGTON COUNTY, SOUTH CAROLINA

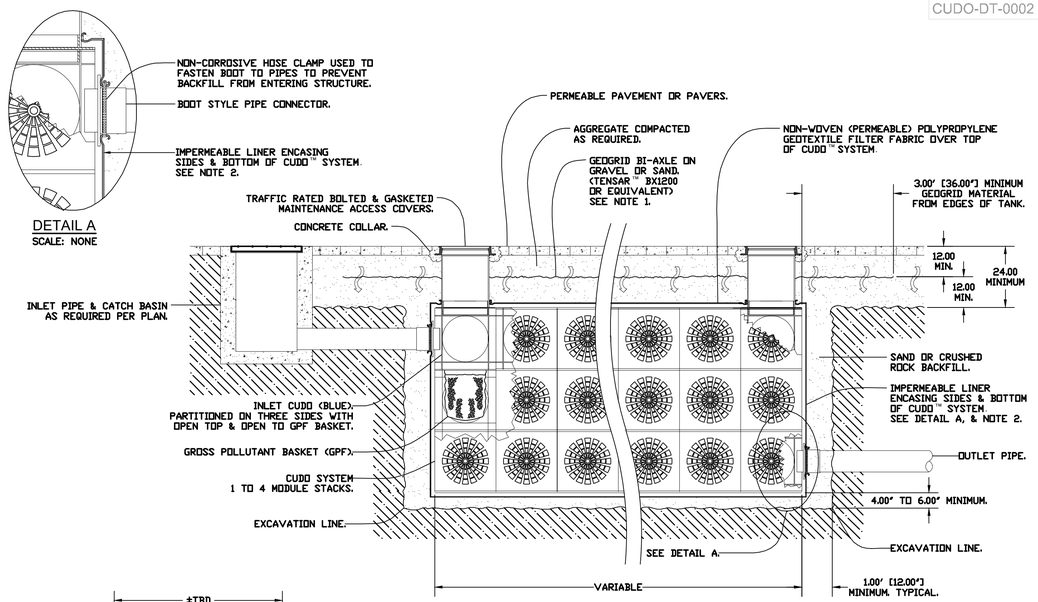
Revisions		
No.	Name	Date

Drawing Information
Project No. 1822005
Drawn By CWS
Date 03.24.23
Checked By DKB
Date 03.24.23
Approved By DKB

Drawing Title
DETAILS

Drawing No.
C4.1

CUDO-DT-0002



NOTES:

1. INSTALL GEOGRID LAYER, (TENSAR™ BX1200 OR EQUIVALENT) IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS IN AREAS SUBJECT TO VEHICLE TRAFFIC.
2. SYSTEM ENCASED ON SIDES & BOTTOM WITH 30-40 MIL PVC LINER OR 36 MIL RE-ENFORCED POLYETHYLENE AS REQUIRED.

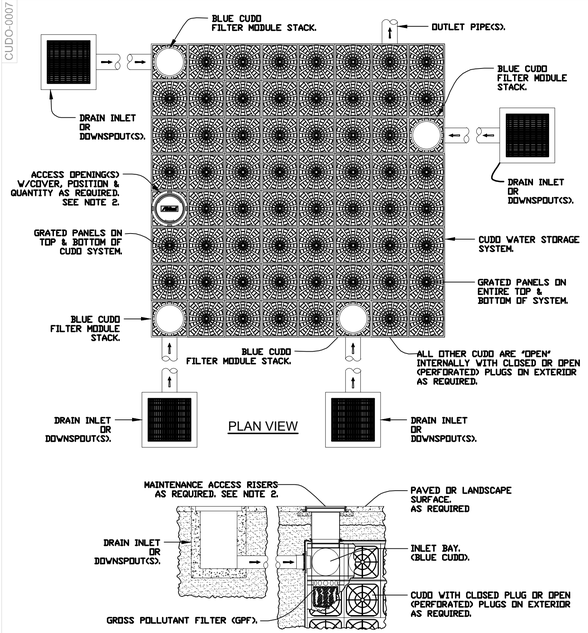
PATENT PENDING

CUDO® Stormwater Products, Inc.
P.O. Box 497 Occidental, CA 95465
Ph. (877) 876-3345 Fax (707) 876-3346

TITLE: CUDO Stormwater Detention System
Typical Installation Detail
Permeable Pavement Area

DO NOT SCALE DRAWING	SCALE: NONE	DRAWN / DATE: JPR 7/21/08	ECO: 0001 JPR 10/22/08	DRAWING NO.: CUDO-DT-0002	REV.: A	SHEET 1 OF 1

CUDO-0007



NOTES:

1. REFER TO CUDO INSTALLATION DETAILS.
2. SEE CUDO-0008 FOR TYPICAL MAINTENANCE ACCESS CONFIGURATION.

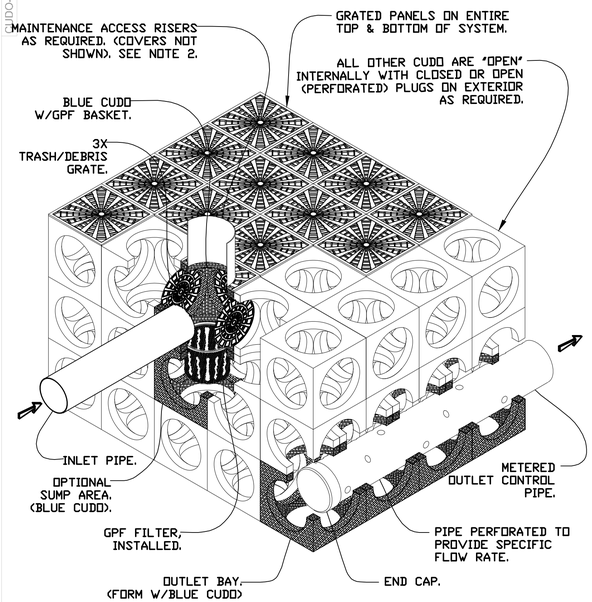
PATENT PENDING

TITLE: CUDO Water Storage System
Typical System Layout
W/ Filter Module Stacks.

CUDO® Stormwater Products, Inc.
P.O. Box 497 Occidental, CA 95465
Ph. (877) 876-3345 Fax (707) 876-3346

DRAWING NO.: CUDO-0007	REV: A	CUDO ECO: 0001 JPR 9/26/08	DATE: JPR 5/2/08	SHEET 1 OF 1

CUDO-0005



NOTES:

1. REFER TO CUDO INSTALLATION DETAILS.
2. SEE CUDO-0008 FOR TYPICAL MAINTENANCE ACCESS CONFIGURATION.

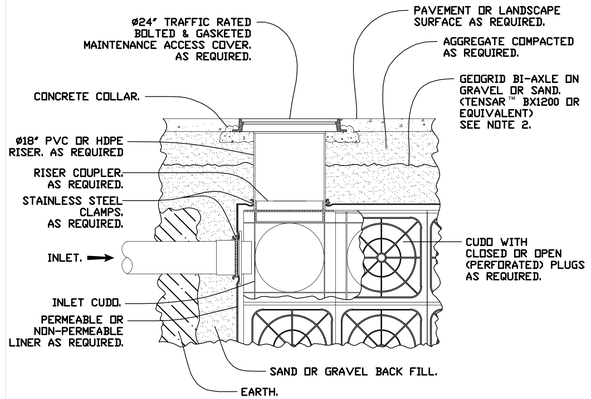
PATENT PENDING

TITLE: CUDO Water Storage System
W/ Metered Outlet Control Device.

CUDO® Stormwater Products, Inc.
P.O. Box 497 Occidental, CA 95465
Ph. (877) 876-3345 Fax (707) 876-3346

DRAWING NO.: CUDO-0005	REV: A	CUDO ECO: 0001 JPR 9/26/08	DATE: JPR 7/24/08	SHEET 1 OF 1

CUDO-0008



NOTES:

1. REFER TO CUDO INSTALLATION DETAILS.
2. INSTALL GEOGRID LAYER, (TENSAR™ BX1200 OR EQUIVALENT) IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS IN AREAS SUBJECT TO VEHICLE TRAFFIC.

PATENT PENDING

TITLE: CUDO Water Storage System
TYPICAL MAINTENANCE ACCESS

CUDO® Stormwater Products, Inc.
P.O. Box 497 Occidental, CA 95465
Ph. (877) 876-3345 Fax (707) 876-3346

DRAWING NO.: CUDO-0008	REV: A	CUDO ECO: 0001 JPR 9/26/08	DATE: JPR 5/2/08	SHEET 1 OF 1

PRELIMINARY
NOT FOR CONSTRUCTION

E.L. ROBINSON ENGINEERING
1301 Cervais St. Suite 450
Columbia, SC 29201
Phone: (803) 400-6031
www.elrobinsonengineering.com

SOUTH CAROLINA — NO. 24361 — E.L. ROBINSON ENGINEERING — CERTIFICATE OF AUTHORIZATION

Project Title / Client Information
DARLINGTON COUNTY
H&H STUDY - CHESTNUT ST.
PROPOSED CONDITIONS
SOUTH CAROLINA OFFICE OF RESILIENCE
DARLINGTON COUNTY, SOUTH CAROLINA

Revisions No.	Name	Date

Drawing Information
Project No. 1822005
Drawn By CWS
Date 03.24.23
Checked By DKB
Date 03.24.23
Approved By DKB

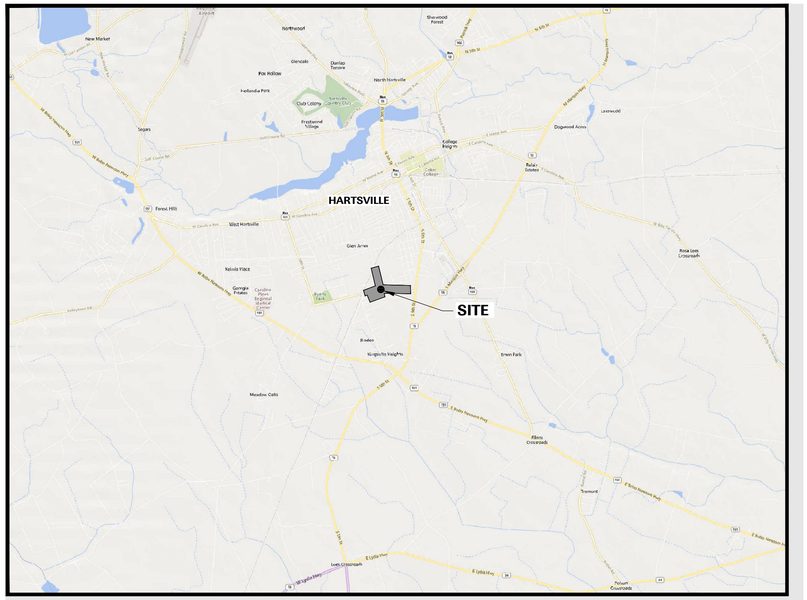
Drawing Title: **DETAILS**

Drawing No.
C4.2

DARLINGTON COUNTY H&H STUDY
PROPOSED CONDITIONS - MLK DR.

FOR

SOUTH CAROLINA OFFICE OF RESILIENCE



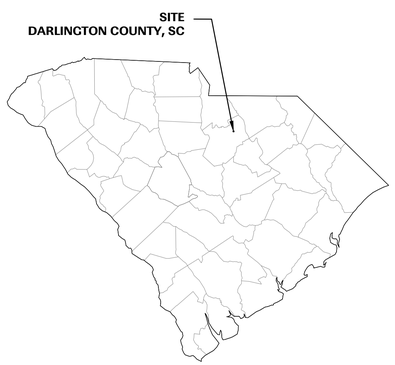
SITE MAP
SCALE: 1"=5,000'

SCOR PROJECT NUMBER PP-21-1600-01
ELR PROJECT NUMBER 1822005

10% PLANS SUBMITTAL

MARCH 24, 2023

PRELIMINARY
NOT FOR CONSTRUCTION



LOCATION MAP

The Palmetto Utility Protection Service, Inc.
810 Dutch Square Boulevard, Suite 320 Columbia, South Carolina 29210 Voice (803) 939-1117 Fax (803) 939-0704

3 DAYS BEFORE DIGGING IN SOUTH CAROLINA
CALL 1-888-721-7877
UNDERGROUND LOCATORS. CONTRACTOR SHALL CONTACT THE UNDERGROUND LOCATORS EVERY 10 DAYS FOR AN UPDATE TO UTILITY LOCATIONS.
Call BEFORE you DIG!

DRAWING INDEX

CIVIL

SOUTH CAROLINA OFFICE OF RESILIENCE
ATTN: PHLEISHA LEWIS
632 ROSEWOOD DRIVE
COLUMBIA, SC 29201
PHLEISHA.LEWIS@SCOR.SC.COV
Phone: (803) 543-0018

E.L. ROBINSON ENGINEERING
1301 Gervais St., Suite 450
Columbia, SC 29201
Phone: (803) 400-6031
www.elrobinsonengineering.com

PROJECT COORDINATES
LATITUDE: 34° 21' 10" N
LONGITUDE: 80° 04' 39" W

DRAWN:	SEAL:	COA:	SHEET NO.
CWS		SOUTH CAROLINA E.L. ROBINSON ENGINEERING No. 2544 CERTIFICATE OF AUTHORIZATION	C0.0
CHECKED: DKB			
APPROVED DKB			PROJECT NO. 1822005

E.L. ROBINSON
ENGINEERING
1301 Cervais St. Suite 450
Columbia, SC 29201
Phone: (803) 400-6031
www.elrobinsonengineering.com

SOUTH CAROLINA
E.L. ROBINSON ENGINEERING No. 2544
CERTIFICATE OF AUTHORIZATION

Project Title / Client Information
DARLINGTON COUNTY
H&H STUDY - MLK DR.
PROPOSED CONDITIONS
SOUTH CAROLINA OFFICE OF RESILIENCE
DARLINGTON COUNTY, SOUTH CAROLINA

Revisions		
No.	Name	Date

Drawing Information	
Project No. 1822005	
Drawn By	CWS
Date	03.24.23
Checked By	DKB
Date	03.24.23
Approved By	DKB

Drawing Title
EXISTING CONDITIONS PLAN

Drawing No.
C1.1

PRELIMINARY
NOT FOR CONSTRUCTION

100 0 100 200 300
scale in feet
1" = 100'

E.L. ROBINSON ENGINEERING
1301 Gervais St. Suite 450
Columbia, SC 29201
Phone: (803) 400-6031
www.elrobinsonengineering.com

SOUTH CAROLINA E.L. ROBINSON ENGINEERING No. 2544 CERTIFICATE OF AUTHORIZATION

Project Title / Client Information
DARLINGTON COUNTY
H&H STUDY - MLK DR.
PROPOSED CONDITIONS
SOUTH CAROLINA OFFICE OF RESILIENCE
DARLINGTON COUNTY, SOUTH CAROLINA

Revisions		
No.	Name	Date

Drawing Information
Project No. 1822005
Drawn By
CWS
Date
03.24.23
Checked By
DKB
Date
03.24.23
Approved By
DKB

Drawing Title
STORM DRAINAGE PLAN

Drawing No.
C2.1

CONDUIT TABLE

JUNCTION TABLE

SEQUENCE OF CONSTRUCTION

ITEMS MUST OCCUR IN THE ORDER LISTED; ITEMS CANNOT OCCUR CONCURRENTLY UNTIL SPECIFICALLY NOTED.

1. RECEIVE NPDES COVERAGE FROM SCDHEC.
2. PRE-CONSTRUCTION MEETING WITH CHESTERFIELD COUNTY STORMWATER MANAGEMENT STAFF PRESENT.
3. THE PROJECT IS A LINEAR DITCH IMPROVEMENT, CLEANING AND REGRADING OF DITCHES, AND INSTALLATION OF STORM DRAINAGE AND BOXES. AS SUCH, THE CONTRACTOR SHALL SCHEDULE HIS WORK TO COMPLETE IN SECTIONS. IT IS NOT INTENDED FOR THE ENTIRE PROJECT TO BE DISTURBED AT ONE TIME.
4. LIMIT WORK BETWEEN ROADS CROSSINGS COMPLETING EACH CLEANING AND REGRADING BETWEEN ROADS COMPLETELY INCLUDING STABILIZATION BEFORE PROCEEDING TO THE NEXT AREA.
5. DISTURBANCE SHOULD BE GENERALLY LIMITED TO 1,000 LF MAX WITH EROSION CONTROL AS "ROLLING" WITH THE PROJECT.
6. ALL EXISTING INLETS SHALL BE PROTECTED BY SEDIMENT TUBES AS DETAILED IN THESE PLANS.
7. ALL NEW INLETS SHALL BE PROTECTED BY SEDIMENT TUBE PLACED IN A CIRCULAR FASHION AS DETAILED IN THESE PLANS.
8. NOTIFY chesterfield county STORMWATER MANAGEMENT STAFF 48 HOURS PRIOR TO BEGINNING LAND-DISTURBING ACTIVITIES.
9. INSTALLATION OF CONSTRUCTION ENTRANCES.
10. CLEARING AND GRUBBING ONLY AS NECESSARY FOR INSTALLATION OF PERIMETER CONTROLS.
11. INSTALLATION OF PERIMETER CONTROLS (E.G. SILT FENCE).
12. CLEARING AND GRUBBING OF SITE AND TREE REMOVAL. (SEDIMENT AND EROSION CONTROL MEASURES FOR THESE AREAS MUST ALREADY BE INSTALLED).
13. TOP SOIL REMOVAL AND STOCKPILE WITH SILT FENCE AROUND PERIMETER.
14. CLEANING AND CLEARING OF CHANNELS INDICATED ON THE PLANS..
15. INSTALLATION OF CHECK DAMS IN CHANNEL.
16. REMOVAL OF TREES, DEBRIS, AND OTHER ITEMS FROM CHANNEL.
17. REGRADING DITCHES IN THE AREAS SHOWN IN THE PLANS..
18. EXCAVATION OF OVERBANK PER GRADING PLAN,
19. INSTALL NEW STORM PIPING AND BOXES.
20. INSTALL ENKAMAT BANK STABILIZATION AND/OR FLEXTERRA AND/OR HYDROSEEDING.
21. PERMANENT/FINAL STABILIZATION TO OTHER AREAS DISTURBED..
22. REMOVAL OF TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES AFTER ENTIRE AREA DRAINING TO THE STRUCTURE IS FINALLY STABILIZED (THE DEPARTMENT RECOMMENDS THAT THE PROJECT OWNER/OPERATOR HAVE THE SWPPP PREPARER OR REGISTRATION EQUIVALENT APPROVE THE REMOVAL OF TEMPORARY STRUCTURES.)
23. PREPARE A DETAILED AS-BUILT SURVEY OF THE STRUCTURES AND GRADED AREAS FOR SUBMITTAL TO THE CITY, SCDHEC, AND FEMA.

ONCE CONSTRUCTION IS COMPLETE THE ITEMS BELOW MUST BE PERFORMED IN THE ORDER SHOWN.

24. SUBMIT NOTICE OF TERMINATION (NOT) TO CHESTERFIELD COUNTY AND SCDHEC. MANAGEMENT STAFF.

- NOTE: MAINTENANCE OF SEDIMENT AND EROSION CONTROL MEASURES MUST CONTINUE UNTIL THE SITE IS PERMANENTLY STABILIZED AND THE CONTROLS ARE REMOVED.

CONTRACTOR NOTES

1. PRIOR TO BEGINNING CONSTRUCTION, THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFING THAT ALL REQUIRED PERMITS AND APPROVALS HAVE BEEN OBTAINED FROM ALL REGULATORY AUTHORITIES.
2. CARE SHALL BE TAKEN TO PREVENT DAMAGE TO EXISTING UTILITIES DURING CONSTRUCTION. ANY DAMAGE TO THESE UTILITIES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
3. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES AND, WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANY AT LEAST 48 HOURS BEFORE ANY TRENCHING OR EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. FOR ASSISTANCE WITH FIELD LOCATION OF EXISTING UTILITIES THE CONTRACTOR CAN CONTACT PUPS AT 1-888-721-7877.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFYING ALL ILLUSTRATED KNOWN UNDERGROUND ELEMENTS. ADDITIONALLY, THE CONTRACTOR SHALL BE RESPONSIBLE FOR EXERCISING REASONABLE EFFORT TO PROTECT ANY UNKNOWN UNDERGROUND ELEMENTS. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY IF UNKNOWN ELEMENTS ARE DISCOVERED THAT WOULD NECESSITATE MODIFICATION TO THE ILLUSTRATED DESIGN.
5. THE CONTRACTOR SHALL PROTECT ALL ADJACENT PROPERTIES, THE GENERAL PUBLIC, AND ALL OTHER FACILITIES. SHOULD DAMAGES OCCUR, CONTRACTOR SHALL REPAIR IMMEDIATELY AS DIRECTED BY THE MANAGER/OWNER. CONTRACTOR IS FINANCIALLY RESPONSIBLE FOR ALL REPAIRS, AND REPAIRS ARE TO BE PERFORMED TO THE DEVELOPER'S APPROVAL.
6. THE CONTRACTOR SHALL UTILIZE SIGNS, BARRICADES, FLAGMEN, OR GUARDS AS REQUIRED TO ENSURE THE SAFETY OF ALL VEHICULAR AND PEDESTRIAN TRAFFIC DURING ALL CONSTRUCTION ACTIVITIES.
7. ALL IMPROVEMENTS SHALL BE IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
8. THE CONTRACTOR SHALL MAINTAIN THE SITE IN A MANNER SO THAT WORKMEN AND PUBLIC SHALL BE PROTECTED FROM INJURY.
9. THE GENERAL CONTRACTOR SHALL CONTACT ALL OWNERS OF EASEMENTS, UTILITIES AND RIGHT-OF-WAYS, PUBLIC OR PRIVATE, PRIOR TO WORKING IN THESE AREAS.
10. CONTRACTOR TO BE RESPONSIBLE FOR SECURING THE SITE PRIOR TO SUBSTANTIAL COMPLETION OF THE PROJECT. REPAIRS, RESULTING FROM VANDALISM, TO BE AT HIS OWN EXPENSE.

EROSION CONTROL NOTES

1. IF NECESSARY, SLOPES WHICH EXCEED EIGHT (8) VERTICAL FEET SHOULD BE STABILIZED WITH SYNTHETIC OR VEGETATIVE MATS, IN ADDITION TO GRASSING/HYDROSEEDING. IT MAY BE NECESSARY TO INSTALL TEMPORARY SLOPE DRAINS DURING CONSTRUCTION. TEMPORARY BERMS MAY BE NEEDED UNTIL THE SLOPE IS BROUGHT TO GRADE.

2. STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS PRACTICABLE IN PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED, BUT IN NO CASE MORE THAN FOURTEEN (14) DAYS AFTER WORK HAS CEASED , EXCEPT AS STATED BELOW.
   »WHERE STABILIZATION BY THE 14TH DAY IS PRECLUDED BY SNOW COVER OR FROZEN GROUND CONDITIONS STABILIZATION MEASURES MUST BE INITIATED AS SOON AS PRACTICABLE.
   »WHERE CONSTRUCTION ACTIVITY ON A PORTION OF THE SITE IS TEMPORARILY CEASED, AND EARTH-DISTURBING ACTIVITIES WILL BE RESUMED WITHIN 14 DAYS, TEMPORARY STABILIZATION MEASURES DO NOT HAVE TO BE INITIATED ON THAT PORTION OF THE SITE.

3. ALL SEDIMENT AND EROSION CONTROL DEVICES SHALL BE INSPECTED ONCE EVERY CALENDAR WEEK. IF PERIODIC INSPECTION OR OTHER INFORMATION INDICATES THAT A BMP HAS BEEN INAPPROPRIATELY INSTALLED, THE PERMITTEE MUST ADDRESS THE NECESSARY REPLACEMENT OR MODIFICATION REQUIRED TO CORRECT THE BMP WITHIN 48 HOURS OF IDENTIFICATION.

4. PROVIDE SILT FENCE AND/OR OTHER CONTROL DEVICES, AS MAY BE REQUIRED, TO CONTROL SOIL EROSION DURING UTILITY CONSTRUCTION. ALL DISTURBED AREAS SHALL BE CLEANED, GRADED, AND STABILIZED WITH GRASSING IMMEDIATELY AFTER THE UTILITY INSTALLATION. FILL, COVER, AND TEMPORARY SEEDING AT THE END OF EACH DAY ARE RECOMMENDED. IF WATER IS ENCOUNTERED WHILE TRENCHING, THE WATER SHOULD BE FILTERED TO REMOVE ANY SEDIMENTS BEFORE BEING PUMPED BACK INTO ANY WATERS OF THE STATE.

5. ALL EROSION CONTROL DEVICES SHALL BE PROPERLY MAINTAINED DURING ALL PHASES OF CONSTRUCTION UNTIL THE COMPLETION OF ALL CONSTRUCTION ACTIVITIES AND ALL DISTURBED AREAS HAVE BEEN STABILIZED. ADDITIONAL CONTROL DEVICES MAY BE REQUIRED DURING CONSTRUCTION, IN ORDER TO CONTROL EROSION AND/OR OFFSITE SEDIMENTATION. ALL TEMPORARY CONTROL DEVICES SHALL BE REMOVED ONCE CONSTRUCTION IS COMPLETED AND THE SITE IS STABILIZED.

6. THE CONTRACTOR MUST TAKE NECESSARY ACTION TO MINIMIZE TRACKING OF MUD ONTO PAVED ROADWAY(S) FROM CONSTRUCTION AREAS AND THE GENERATION OF DUST. THE CONTRACTOR SHALL DAILY REMOVE MUD/SOIL FROM PAVEMENT, AS MAY BE REQUIRED.

7. RESIDENTIAL SUBDIVISIONS REQUIRE EROSION CONTROL FEATURES FOR INFRASTRUCTURE AS WELL AS FOR INDIVIDUAL LOT CONSTRUCTION. INDIVIDUAL PROPERTY OWNERS SHALL FOLLOW THESE PLANS DURING CONSTRUCTION OR OBTAIN APPROVAL OF AN INDIVIDUAL PLAN IN ACCORDANCE WITH S.C. REG. 72-300 ET SEQ AND SCR100000.

8. TEMPORARY DIVERSION BERMS AND/OR DITCHES WILL BE PROVIDED AS NEEDED DURING CONSTRUCTION TO PROTECT WORK AREAS FROM UPSLOPE RUNOFF AND/OR DIVERT SEDIMENT LADEN WATER TO APPROPRIATE TRAPS OR STABLE OUTLETS.

9. ALL WATERS OF THE STATE (WoS), INCLUDING WETLANDS, ARE TO BE FLAGGED OR OTHERWISE CLEARLY MARKED IN THE FIELD. A DOUBLE ROW OF SILT FENCE IS TO BE INSTALLED IN ALL AREAS WHERE A 50-FT BUFFER CAN'T BE MAINTAINED BETWEEN THE DISTURBED AREA AND ALL WoS. A 10-FT BUFFER SHOULD BE MAINTAINED BETWEEN THE LAST ROW OF SILT FENCE AND ALL WoS.

10. LITTER, CONSTRUCTION DEBRIS, OILS, FUELS, AND BUILDING PRODUCTS WITH SIGNIFICANT POTENTIAL FOR IMPACT (SUCH AS STOCKPILES OF FRESHLY TREATED LUMBER) AND CONSTRUCTION CHEMICALS THAT COULD BE EXPOSED TO STORM WATER MUST BE PREVENTED FROM BECOMING A POLLUTANT SOURCE IN STORM WATER DISCHARGES.

11. A COPY OF THE SWPPP, INSPECTION RECORDS, AND RAINFALL DATA MUST BE RETAINED AT THE CONSTRUCTION SITE OR A NEARBY LOCATION EASILY ACCESSIBLE DURING NORMAL BUSINESS HOURS, FROM THE DATE OF COMMENCEMENT OF CONSTRUCTION ACTIVITIES TO THE DATE THAT THE FINAL STABILIZATION IS REACHED.

12. INITIATE STABILIZATION MEASURES ON ANY EXPOSED SLOPE (3H:1V OR GREATER) WHERE LAND-DISTURBIUNG ACTIVITIES HAVE PERMANENTLY OR TEMPORARILY CEASED, AND WILL NOT RESUME FOR A PERIOD OF SEVEN (7) CALENDAR DAYS.

13. MINIMIZE SOIL COMPACTION AND, UNLESS INFEASIBLE, PRESERVE TOPSOIL.

14. MINMIMZE THE DISCHARGE OF POLLUTANTS FROM EQUIPMENT AND VEHICLE WASHING, WHEEL WASH WATER, AND OTHER WASH WATERS. WASH WATERS MUST BE TREATED IN A SEDIMENT BASIN OR ALTERNATIVE CONTROL THAT PROVIDES EQUIVALENT OR BETTER TREATMENT PRIOR TO DISCHARGE.

15. MINIMIZE THE DISCHARGE OF POLLUTANTS FROM DEWATERING OF TRENCHES AND EXCAVATED AREAS. THESE DISCHARGES ARE TO BE ROUTED THROUGH APPROPRIATE BMPs (SEDIMENT BASIN, FILTER BAG, ETC.).

16. THE FOLLOWING DISCHARGES FROM SITES ARE PROHIBITED:
   »WASTEWATER FROM WASHOUT OF CONCRETE, UNLESS MANAGED BY AN APPROPRIATE CONTROL
   »WASTEWATER FROM WASHOUT AND CLEANOUT OF STUCCO, PAINT, FROM RELEASE OILS, CURING COMPOUNDS AND OTHER CONSTRUCTION MATERIALS
   »FUELS, OILS, OR OTHER POLLUTANTS USED IN VEHICLE AND EQUIPMENT OPERATION AND MAINTENANCE
   »SOAPS OR SOLVENTS USED IN VEHICLE AND EQUIPMENT WASHING

17. AFTER CONSTRUCTION ACTIVITIES BEGIN, INSPECTIONS MUST BE CONDUCTED AT A MINIMUM OF AT LEAST ONCE EVERY CALENDAR WEEK AND MUST BE CONDUCTED UNTIL FINAL STABILIZATION IS REACHED ON ALL AREAS OF THE CONSTRUCTION SITE.

18. IF EXISTING BMPs NEED TO BE MODIFIED OR IF ADDITIONAL BMPs ARE NECESSARY TO COMPLY WITH THE REQUIREMENTS OF THIS PERMIT AND/OR SC'S WATER QUALITY STANDARDS, IMPLEMENTATION MUST BE COMPLETED BEFORE THE NEXT STORM EVENT WHENEVER PRACTICABLE. IF IMPLEMENTATION BEFORE THE NEXT STORM EVENT IS IMPRACTICABLE, THE SITUATION MUST BE DOCUMENTED IN THE SWPPP AND ALTERNATIVE BMPs MUST BE IMPLEMENTED AS SOON AS REASONABLY POSSIBLE.

19. A PRE-CONSTRUCTION CONFERENCE MUST BE HELD FOR EACH CONSTRUCTION SITE WITH AN APPROVED ON-SITE SWPPP PRIOR TO THE IMPLEMENTATION OF CONSTRUCTION ACTIVITIES. FOR NON-LINEAR PROJECTS THAT DISTURB MORE THAN 10 ACRES OR MORE THIS CONFERENCE MUST BE HELD ON-SITE UNLESS THE DEPARTMENT HAS APPROVED OTHERWISE.

20. SILT FENCING LINE ON EROSION CONTROL PLAN SHEETS ARE SHOWN FOR GRAPHICAL PURPOSES. SILT FENCING SHALL BE PLACED AT THE LIMIITS OF DISTURBANCE

PRELIMINARY
NOT FOR CONSTRUCTION

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www.elrobinsonengineering.com

NORTH CAROLINA — E.L. ROBINSON ENGINEERING No. 2944 — CERTIFICATE OF AUTHORIZATION

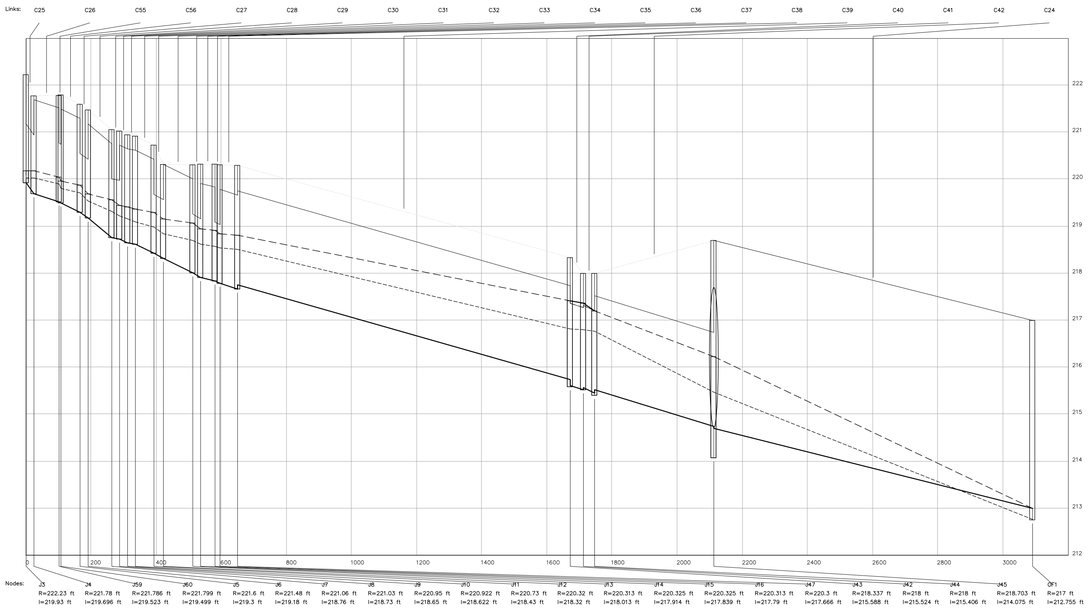
Project Title / Client Information
DARLINGTON COUNTY
H&H STUDY - MLK DR.
PROPOSED CONDITIONS
SOUTH CAROLINA OFFICE OF RESILIENCE
DARLINGTON COUNTY, SOUTH CAROLINA

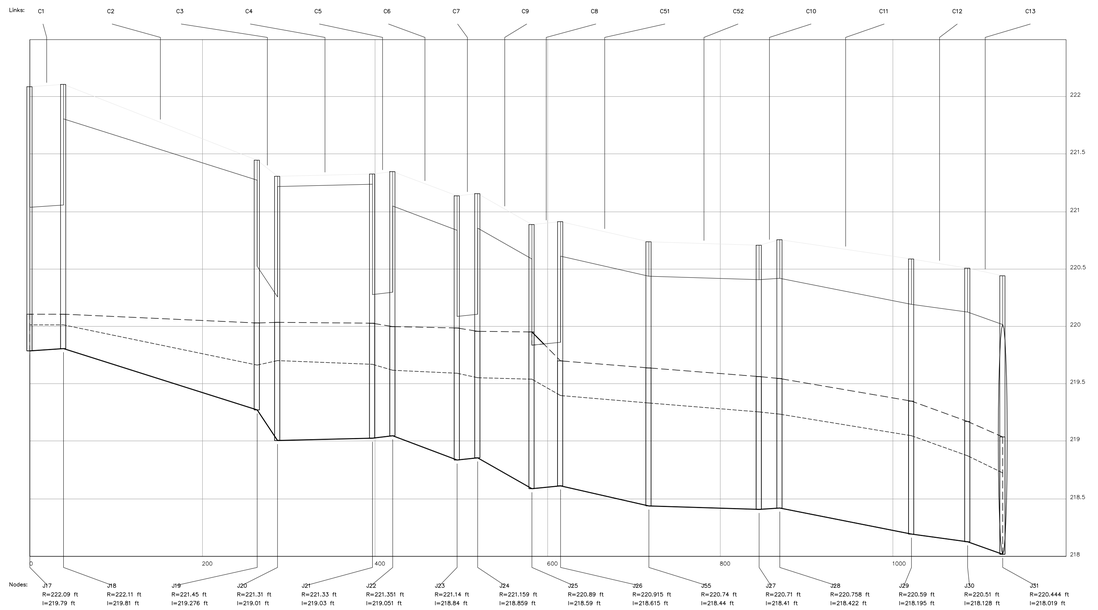
Revisions		
No.	Name	Date

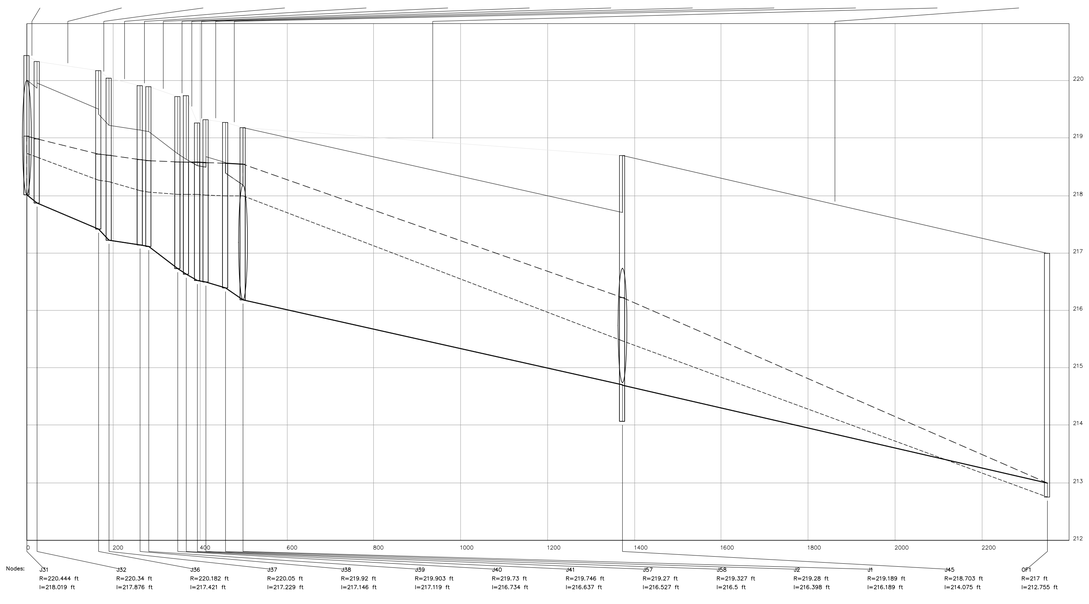
Drawing Information
Project No. 1822005
Drawn By CWS
Date 03.24.23
Checked By DKB
Date 03.24.23
Approved By DKB

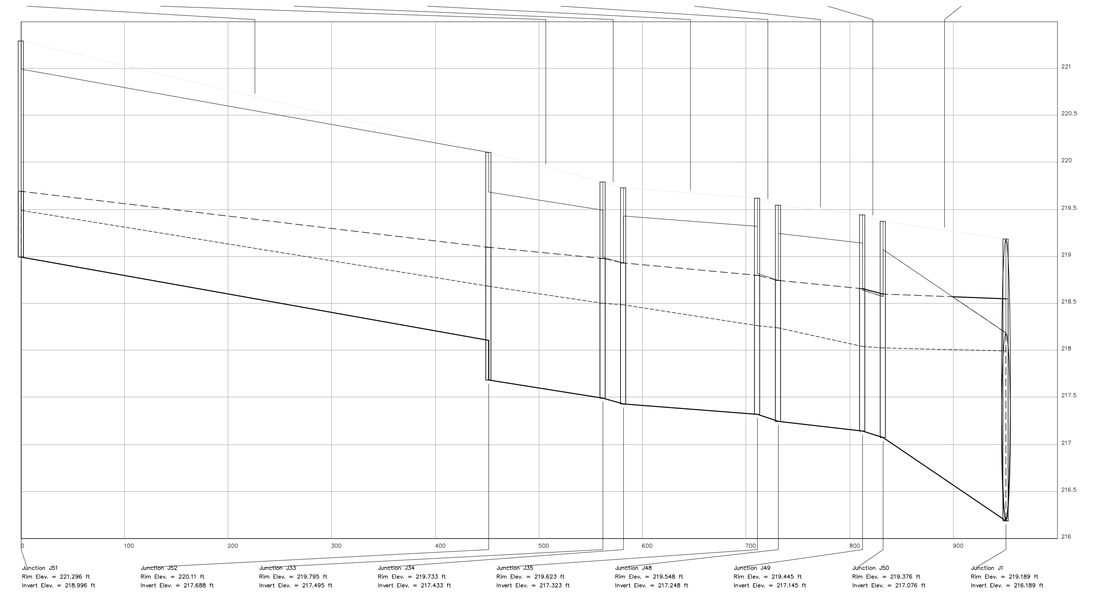
Drawing Title
STORM DRAINAGE TABLES AND NOTES

Drawing No.
C2.2









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LEGEND

- 2-YEAR FLOODPLAIN
- 10-YEAR FLOODPLAIN
- TOP OF PIPE/CHANNEL
- BOTTOM OF PIPE/CHANNEL

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SOUTH CAROLINA NOTIFICATION OF RESILIENCE — E.L. ROBINSON ENGINEERING No. 29544 — CERTIFICATE OF AUTHORIZATION

Project Title / Client Information

DARLINGTON COUNTY
H&H STUDY - MLK DR.
PROPOSED CONDITIONS

SOUTH CAROLINA OFFICE OF RESILIENCE
DARLINGTON COUNTY, SOUTH CAROLINA

Revisions

No.	Name	Date

Drawing Information

Project No. 1822006
Drawn By GWS
Date 03.24.23
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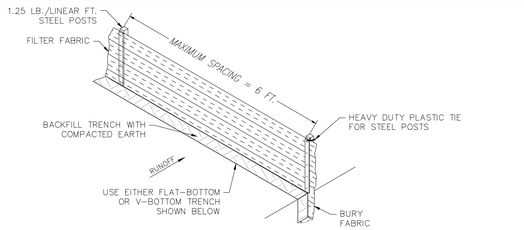
Drawing Title

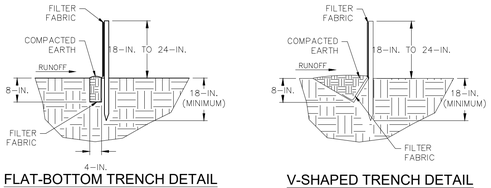
STORM DRAINAGE PROFILES

Drawing No.

C3.1



SILT FENCE INSTALLATION



FLAT-BOTTOM TRENCH DETAIL

V-SHAPED TRENCH DETAIL

WHEN AND WHERE TO USE IT
SILT FENCE IS APPLICABLE IN AREAS:

WHERE THE MAXIMUM SHEET OR OVERLAND FLOW PATH LENGTH TO THE FENCE IS 100-FEET.
WHERE THE MAXIMUM SLOPE STEEPNESS (NORMAL [PERPENDICULAR] TO FENCE LINE) IS 2H:1V.
THAT DO NOT RECEIVE CONCENTRATED FLOWS GREATER THAN 0.5 CFS.

DO NOT PLACE SILT FENCE ACROSS CHANNELS OR USE IT AS A VELOCITY CONTROL BMP.

MATERIALS

STEEL POSTS
USE 48-INCH LONG STEEL POSTS THAT MEET THE FOLLOWING MINIMUM PHYSICAL REQUIREMENTS:
COMPOSED OF HIGH STRENGTH STEEL WITH MINIMUM YIELD STRENGTH OF 50,000 PSI.
HAVE A STANDARD "T" SECTION WITH A NOMINAL FACE WIDTH OF 1.38-INCHES AND NOMINAL "T" LENGTH OF 1.48-INCHES.
WEIGH 1.25 POUNDS PER FOOT (± 8%).
HAVE A SOIL STABILIZATION PLATE WITH A MINIMUM CROSS SECTION AREA OF 17-SQUARE INCHES ATTACHED TO THE STEEL POSTS.
PAINTED WITH A WATER BASED BAKED ENAMEL PAINT.

USE STEEL POSTS WITH A MINIMUM LENGTH OF 4-FEET, WEIGHING 1.25 POUNDS PER LINEAR FOOT (± 8%) WITH PROJECTIONS TO AID IN FASTENING THE FABRIC. EXCEPT WHEN HEAVY CLAY SOILS ARE PRESENT ON SITE, STEEL POSTS WILL HAVE A METAL SOIL STABILIZATION PLATE WELDED NEAR THE BOTTOM SUCH THAT WHEN THE POST IS DRIVEN TO THE PROPER DEPTH, THE PLATE WILL BE BELOW THE GROUND LEVEL FOR ADDED STABILITY.
THE SOIL PLATES SHOULD HAVE THE FOLLOWING CHARACTERISTICS:
BE COMPOSED OF MINIMUM 15 GAUGE STEEL.
HAVE A MINIMUM CROSS SECTION AREA OF 17-SQUARE INCHES.

GEOTEXTILE FILTER FABRIC

FILTER FABRIC IS:
COMPOSED OF FIBERS CONSISTING OF LONG CHAIN SYNTHETIC POLYMERS COMPOSED OF AT LEAST 85% BY WEIGHT OF
POLYOLEFINS, POLYESTERS, OR POLYAMIDES. FORMED INTO A NETWORK SUCH THAT THE FILAMENTS OR YARNS RETAIN
DIMENSIONAL STABILITY RELATIVE TO EACH OTHER. FREE OF ANY TREATMENT OR COATING WHICH MIGHT ADVERSELY ALTER
ITS PHYSICAL PROPERTIES AFTER INSTALLATION. FREE OF DEFECTS OR FLAWS THAT SIGNIFICANTLY AFFECT ITS PHYSICAL
AND/OR FILTERING PROPERTIES. CUT TO A MINIMUM WIDTH OF 36 INCHES.

USE ONLY FABRIC APPEARING ON SCDOT APPROVAL SHEET #34 MEETING THE REQUIREMENTS OF THE MOST CURRENT EDITION
OF THE SCDOT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION.

INSTALLATION:

EXCAVATE A TRENCH APPROXIMATELY 6-INCHES WIDE AND 6-INCHES DEEP WHEN PLACING FABRIC BY HAND. PLACE 12-INCHES OF GEOTEXTILE FABRIC INTO THE 6-INCH DEEP TRENCH, EXTENDING THE REMAINING 6-INCHES TOWARDS THE UPSLOPE SIDE OF THE TRENCH. BACKFILL THE TRENCH WITH SOIL OR GRAVEL AND COMPACT. BURY 12-INCHES OF FABRIC INTO THE GROUND WHEN PNEUMATICALLY INSTALLING SILT FENCE WITH A SLICING METHOD. PURCHASE FABRIC IN CONTINUOUS ROLLS AND CUT TO LENGTH OF THE BARRIER TO AVOID JOINTS. WHEN JOINTS ARE NECESSARY, WRAP THE FABRIC TOGETHER AT A SUPPORT POST WITH BOTH ENDS FASTENED TO THE POST, WITH A 6-INCH MINIMUM OVERLAP. INSTALL POSTS TO A MINIMUM DEPTH OF 24-INCHES. INSTALL POSTS A MINIMUM OF 1- TO 2-INCHES ABOVE THE FABRIC, WITH NO MORE THAN 3-FEET OF THE POST ABOVE THE GROUND. SPACE POSTS TO MAXIMUM 6-FEET CENTERS. ATTACH FABRIC TO WOOD POSTS USING STAPLES MADE OF HEAVY DUTY WIRE AT LEAST 1 1/2-INCH LONG, SPACED A MAXIMUM OF 6-INCHES APART. STAPLE A 2-INCH WIDE LATHE OVER THE FILTER FABRIC TO SECURELY FASTEN IT TO THE UPSLOPE SIDE OF WOODEN POSTS. ATTACH FABRIC TO THE STEEL POSTS USING HEAVY DUTY PLASTIC TIES THAT ARE EVENLY SPACED AND PLACED IN A MANNER TO PREVENT SAGGING OR TEARING OF THE FABRIC. IN ALL CASES, TIES SHOULD BE AFFIXED IN NO LESS THAN 4 PLACES. INSTALL THE FABRIC A MINIMUM OF 24-INCHES ABOVE THE GROUND. WHEN NECESSARY, THE HEIGHT OF THE FENCE ABOVE GROUND MAY BE GREATER THAN 24-INCHES. IN TIDAL AREAS, EXTRA SILT FENCE HEIGHT MAY BE REQUIRED. THE POST HEIGHT WILL BE TWICE THE EXPOSED POST HEIGHT. POST SPACING WILL REMAIN THE SAME AND EXTRA HEIGHT FABRIC WILL BE 4-,5-, OR 6-FEET TALL. LOCATE SILT FENCE CHECKS EVERY 100 FEET MAXIMUM AND AT LOW POINTS. INSTALL THE FENCE PERPENDICULAR TO THE DIRECTION OF FLOW AND PLACE THE FENCE THE PROPER DISTANCE FROM THE TOE OF STEEP SLOPES TO PROVIDE SEDIMENT STORAGE AND ACCESS FOR MAINTENANCE AND CLEANOUT.

INSPECTION AND MAINTENANCE:

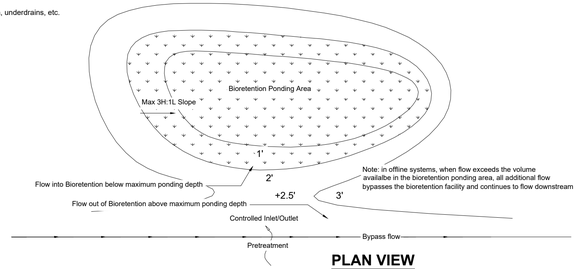
INSPECT EVERY SEVEN CALENDAR DAYS AND WITHIN 24-HOURS AFTER EACH RAINFALL EVENT THAT PRODUCES 1/2-INCH OR MORE OF PRECIPITATION. CHECK FOR SEDIMENT BUILDUP AND FENCE INTEGRITY. CHECK WHERE RUNOFF HAS ERODED A CHANNEL BENEATH THE FENCE, OR WHERE THE FENCE HAS SAGGED OR COLLAPSED BY FENCE OVERTOPPING. IF THE FENCE FABRIC TEARS, BEGINS TO DECOMPOSE, OR IN ANY WAY BECOMES INEFFECTIVE, REPLACE THE SECTION OF FENCE IMMEDIATELY. REMOVE SEDIMENT ACCUMULATED ALONG THE FENCE WHEN IT REACHES 1/3 THE HEIGHT OF THE FENCE, ESPECIALLY IF HEAVY RAINS ARE EXPECTED. REMOVE TRAPPED SEDIMENT FROM THE SITE OR STABILIZE IT ON SITE. REMOVE SILT FENCE WITHIN 30 DAYS AFTER FINAL STABILIZATION IS ACHIEVED OR AFTER TEMPORARY BEST MANAGEMENT PRACTICES (BMPs) ARE NO LONGER NEEDED. PERMANENTLY STABILIZE DISTURBED AREAS RESULTING FROM FENCE REMOVAL.

SILT FENCE DETAIL
(NOT TO SCALE)

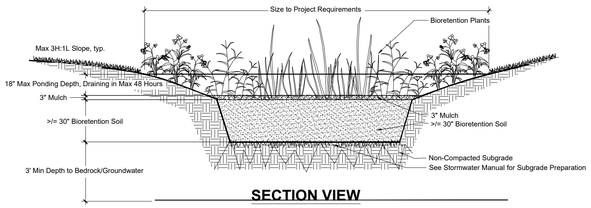
SUGGESTED CONSTRUCTION SEQUENCING (note to designer: edit as needed to meet project requirements)
1. Install appropriate temporary erosion control devices to prevent sediment from leaving or entering the practice during construction.
2. All down-gradient perimeter sediment control bmp's must be in place before any up gradient land disturbing activity begins.
3. Perform continuous inspections of erosion control practices, especially after each rainfall event.
4. Install all utilities (water, sanitary sewer, electric, natural gas, phone, fiber optic, etc) prior to setting final grade of bioretention device.
5. Rough grade the site. If bioretention areas are being used as temporary sediment basins during construction, leave a minimum of 1 feet of cover over the practice to protect the underlying soils from clogging.
6. Complete, stabilize, and vegetate all other site improvements.
7. Construct and vegetate bioretention device following stabilization of contributing drainage area. Ensure that critical elevations, such as underdrain invert, top of media, top of mulch, and invert of overflow structure (if present) are correct.
8. Remove temporary erosion control devices after the contributing drainage area is adequately vegetated.

GENERAL NOTES (note to designer: edit as needed to meet project requirements)
1. In the event that sediment is introduced into the bmp during or immediately following excavation, this material shall be removed from the practice prior to continuing construction.
2. See SCDHEC Stormwater Manual for subgrade preparation.

MATERIAL SPECIFICATIONS
1. See SCDHEC Stormwater Manual for material specifications recommendations for bioretention soil, mulch, underdrains, etc.



PLAN VIEW

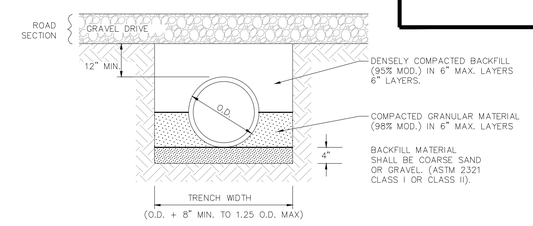


SECTION VIEW

BIO-RETENTION AREA DETAIL
(NOT TO SCALE)

1. IF NECESSARY, SLOPES, WHICH EXCEED (8) VERTICAL FEET SHOULD BE STABILIZED WITH SYNTHETIC OR VEGETATIVE MATS, IN ADDITION TO HYDROSEEDING. IT MAY BE NECESSARY TO INSTALL TEMPORARY SLOPE DRAINS DURING CONSTRUCTION. TEMPORARY BERMS MAY BE NEEDED UNTIL THE SLOPE IS BROUGHT TO GRADE.
2. STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS PRACTICABLE IN PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED, BUT IN NO CASE MORE THAN FOURTEEN (14) DAYS AFTER WORK HAS CEASED, EXCEPT AS STATED BELOW:
   a. WHERE STABILIZATION BY THE 14TH DAY IS PRECLUDED BY SNOW COVER OR FROZEN GROUND CONDITIONS. STABILIZATION MEASURES MUST BE INITIATED AS SOON AS PRACTICABLE.
   b. WHERE CONSTRUCTION ACTIVITY ON A PORTION OF THE SITE IS TEMPORARILY CEASED, AND EARTH DISTURBING ACTIVITIES WILL BE RESUMED WITHIN FOURTEEN (14) DAYS, TEMPORARY STABILIZATION MEASURES DO NOT HAVE TO BE INITIATED ON THAT PORTION OF THE SITE.
3. ALL SEDIMENT AND EROSION CONTROL DEVICES SHALL BE INSPECTED EVERY SEVEN (7) DAYS. IF SITE INSPECTIONS IDENTIFY BMPs THAT ARE DAMAGED AND/OR ARE NOT OPERATING EFFECTIVELY, MAINTENANCE MUST BE PERFORMED AS SOON AS PRACTICAL OR AS REASONABLY POSSIBLE AND BEFORE THE NEXT STORM EVENT WHENEVER PRACTICABLE.
   OR
   ALL SEDIMENT AND EROSION CONTROL DEVICES SHALL BE INSPECTED AT LEAST ONCE EVERY FOURTEEN (14 CALENDAR DAYS AND WITHIN 24 HOURS OF THE END OF A STORM EVENT OF 0.5 INCHES OR GREATER. IF SITE INSPECTIONS IDENTIFY BMPs THAT ARE DAMAGED OR ARE NOT OPERATING EFFECTIVELY, MAINTENANCE MUST BE PERFORMED AS SOON AS PRACTICAL OR AS REASONABLY POSSIBLE AND BEFORE THE NEXT STORM EVENT WHENEVER PRACTICABLE.
4. PROVIDE SILT FENCE AND/OR OTHER CONTROL DEVICES, AS MAY BE REQUIRED, TO CONTROL SOIL EROSION DURING UTILITY CONSTRUCTION. ALL DISTURBED AREAS SHALL BE CLEANED, GRADED, AND STABILIZED WITH GRASSING IMMEDIATELY AFTER THE UTILITY INSTALLATION. FILL, COVER, AND TEMPORARY SEEDING AT THE END OF EACH DAY ARE RECOMMENDED. IF WATER IS ENCOUNTERED WHILE TRENCHING, THE WATER SHOULD BE FILTERED TO REMOVE ANY SEDIMENTS BEFORE BEING PUMPED BACK INTO ANY WATERS OF THE STATE.
5. ALL EROSION CONTROL DEVICES SHALL BE PROPERLY MAINTAINED DURING ALL PHASES OF CONSTRUCTION UNTIL THE COMPLETION OF ALL CONSTRUCTION ACTIVITIES AND ALL DISTURBED AREAS HAVE BEEN STABILIZED. ADDITIONAL CONTROL DEVICES MAY BE REQUIRED DURING CONSTRUCTION IN ORDER TO CONTROL EROSION AND/OR OFFSITE SEDIMENTATION. ALL TEMPORARY CONTROL DEVICES SHALL BE REMOVED ONCE CONSTRUCTION IS COMPLETE AND THE SITE IS STABILIZED.
6. THE GENERAL CONTRACTOR MUST TAKE NECESSARY ACTION TO MINIMIZE THE TRACKING OF MUD ONTO PAVED ROADWAY(S) FROM CONSTRUCTION AREAS AND THE GENERATION OF DUST. THE GENERAL CONTRACTOR SHALL DAILY REMOVE MUD/SOIL FROM PAVEMENT, AS MAY BE REQUIRED.
7. RESIDENTIAL SUBDIVISIONS REQUIRE EROSION CONTROL FEATURES FOR INFRASTRUCTURE AS WELL AS FOR INDIVIDUAL LOT CONSTRUCTION. INDIVIDUAL PROPERTY OWNERS SHALL FOLLOW THESE PLANS DURING CONSTRUCTION OR OBTAIN APPROVAL OF AN INDIVIDUAL PLAN IN ACCORDANCE WITH S.C. REG. 72-300 et seq. AND SCR10000.
8. TEMPORARY DIVERSION BERMS AND/OR DITCHES WILL BE PROVIDED AS NEEDED DURING CONSTRUCTION TO PROTECT WORK AREAS FROM UPSLOPE RUNOFF AND/OR TO DIVERT SEDIMENT-LADEN WATER TO APPROPRIATE TRAPS OR STABLE OUTLETS.
9. ALL WATERS OF THE STATE (WoS), INCLUDING WETLANDS, ARE TO BE FLAGGED OR OTHERWISE CLEARLY MARKED IN THE FIELD. A DOUBLE ROW OF SILT FENCE IS TO BE INSTALLED IN ALL AREAS WHERE A 50-FOOT BUFFER CAN'T BE MAINTAINED BETWEEN THE DISTURBED AREA AND ALL WoS. A 10-FOOT BUFFER SHOULD BE MAINTAINED BETWEEN THE LAST ROW OF SILT FENCE AND ALL WoS.
10. LITTER, CONSTRUCTION DEBRIS, OILS, FUELS, AND BUILDING PRODUCTS WITH SIGNIFICANT POTENTIAL FOR IMPACT (SUCH AS STOCKPILES OF FRESHLY TREATED LUMBER) AND CONSTRUCTION CHEMICALS THAT COULD BE EXPOSED TO STORM WATER MUST BE PREVENTED FROM BECOMING A POLLUTANT SOURCE IN STORM WATER DISCHARGES.

SEDIMENT AND EROSION CONTROL NOTES



THE PIPE IS TO BE BEDDED IN COMPACTED 6" LAYERS TO THE SPRING LINE FIRST, THEN BACKFILLED WITH HAND PLACED MATERIAL COMPACTED IN 6" LAYERS TO A DEPTH OF 12" MINIMUM ABOVE THE PIPE. SEE COUNTY SPECIFICATIONS FOR THE BACKFILL.

RCP PIPE BEDDING & BACKFILLING DETAIL
(NOT TO SCALE)

NORTH AMERICAN GREEN
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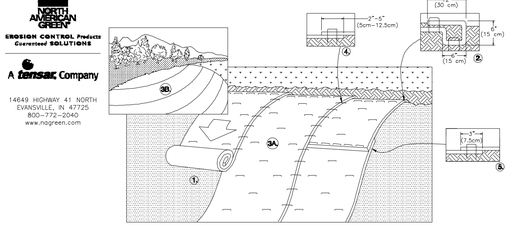
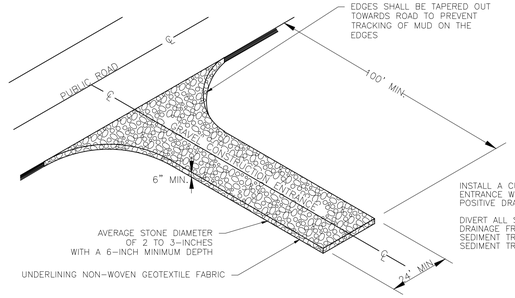


1. PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECP's), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE RECP's IN A 6" (15 CM) DEEP X 6" (15 CM) WIDE TRENCH WITH APPROXIMATELY 12" (30cm) OF RECP's EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE RECP's WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30 CM) APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" (30 CM) PORTION OF RECP's BACK OVER SEED AND COMPACTED SOIL. SECURE RECP's OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" (30 CM) APART ACROSS THE WIDTH OF THE RECP's.
3. ROLL THE RECP's (A.) DOWN OR (B.) HORIZONTALLY ACROSS THE SLOPE. RECP's WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL RECP's MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING THE DOT SYSTEM™ , STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
4. THE EDGES OF PARALLEL RECP's MUST BE STAPLED WITH APPROXIMATELY 2" - 5" (5 CM - 12.5 CM) OVERLAP DEPENDING ON RECP's TYPE.
5. CONSECUTIVE RECP's SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" (7.5 CM) OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" (30 CM) APART ACROSS ENTIRE RECP's WIDTH.
   NOTE:
   IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" (15 CM) MAY BE NECESSARY TO PROPERLY SECURE THE RECP's.

EROSION CONTROL MATTING
(NOT TO SCALE)



WHEN AND WHERE TO USE IT

STABILIZED CONSTRUCTION ENTRANCES SHOULD BE USED AT ALL POINTS WHERE TRAFFIC WILL BE LEAVING A CONSTRUCTION SITE AND MOVING DIRECTLY ONTO A PUBLIC ROAD.

IMPORTANT CONSIDERATIONS:

IF WASHING IS USED, PROVISIONS MUST BE MADE TO INTERCEPT THE WASH WATER AND TRAP THE SEDIMENT BEFORE IT IS CARRIED OFFSITE. WASHDOWN FACILITIES SHALL BE REQUIRED AS DIRECTED BY SCDHEC AS NEEDED. WASHDOWN AREAS IN GENERAL MUST BE ESTABLISHED WITH CRUSHED GRAVEL AND DRAIN INTO A SEDIMENT TRAP OR SEDIMENT BASIN. CONSTRUCTION ENTRANCES SHOULD BE USED IN CONJUNCTION WITH THE STABILIZATION OF CONSTRUCTION ROADS TO REDUCE THE AMOUNT OF MUD PICKED UP BY VEHICLES.

INSTALLATION:

REMOVE ALL VEGETATION AND ANY OBJECTIONABLE MATERIAL FROM THE FOUNDATION AREA.

DIVERT ALL SURFACE RUNOFF AND DRAINAGE FROM STONES TO A SEDIMENT TRAP OR BASIN.

INSTALL A NON-WOVEN GEOTEXTILE FABRIC PRIOR TO PLACING ANY STONE.

INSTALL A CULVERT PIPE ACROSS THE ENTRANCE WHEN NEEDED TO PROVIDE POSITIVE DRAINAGE.

THE ENTRANCE SHALL CONSIST OF 1-INCH TO 3-INCH D50 STONE PLACED AT A MINIMUM DEPTH OF 6-INCHES.

MINIMUM DIMENSIONS OF THE ENTRANCE SHALL BE 24-FEET WIDE BY 100-FEET LONG, AND MAY BE MODIFIED AS NECESSARY TO ACCOMMODATE SITE CONSTRAINTS.

THE EDGES OF THE ENTRANCE SHALL BE TAPERED OUT TOWARDS THE ROAD TO PREVENT TRACKING OF MUD AT THE EDGE OF THE ENTRANCE.

INSPECTION AND MAINTENANCE:

INSPECT CONSTRUCTION ENTRANCES EVERY SEVEN (7) CALENDAR DAYS AND WITHIN 24-HOURS AFTER EACH RAINFALL EVENT THAT PRODUCES 1/2-INCH OR MORE OF PRECIPITATION, OR AFTER HEAVY USE. CHECK FOR MUD AND SEDIMENT BUILDUP AND PAD INTEGRITY. MAKE DAILY INSPECTIONS DUTING PERIODS OF WET WEATHER. MAINTENANCE IS REQUIRED MORE FREQUENTLY IN WET WEATHER CONDITIONS. RESHAPE THE STONE PAD AS NEEDED FOR DRAINAGE AND RUNOFF CONTROL.

WASH OR REPLACE STONES AS NEEDED AND AS DIRECTED BY THE INSPECTOR. THE STONE IN THE ENTRANCE SHOULD BE WASHED OR REPLACED WHENEVER THE ENTRANCE FAILS TO REDUCE MUD BEING CARRIED OFF-SITE BY VEHICLES. FREQUENT WASHING WILL EXTEND THE USEFUL LIFE OF STONE.

IMMEDIATELY REMOVE MUD AND SEDIMENT TRACKED OR WASHED ONTO PUBLIC ROADS BY BRUSHING OR SWEEPING. FLUSHING SHOULD ONLY BE USED WHEN THE WATER CAN BE DISCHARGED TO A SEDIMENT TRAP OR BASIN.

REPAIR ANY BROKEN PAVEMENT IMMEDIATELY.

STABILIZED CONSTRUCTION ENTRANCE/EXIT
(NOT TO SCALE)

SEEDING SCHEDULE FOR TEMPORARY VEGETATION UPPER AND LOWER STATE			
SCHEDULE NO.	COMMON NAME OF SEED	RATE PER ACRE (LBS.)	PLANTING DATES
1	ANNUAL SUDAN GRASS (SWEET OR TIFF)	40	APRIL 1 TO AUGUST 15
2	BROWN TOP MILLET	50	APRIL 1 TO AUGUST 15
3	RYE GRAIN	55	AUGUST 16 TO MARCH 31

SEEDING SCHEDULE FOR PERMANENT VEGETATION				
SCHEDULE NO.	COMMON NAME OF SEED	RURAL RATE	URBAN RATE[1]	PLANTING DATES
3[4]	COMMON BERMUDA (HULLED[3])	20	20	MARCH 1 TO AUGUST 14
	CARPET GRASS	9	9	
4[4]	COMMON BERMUDA (UNHULLED[3])	20	20	AUGUST 15 TO FEBRUARY 28
	RYE GRAIN	20	20	

NOTES:
1. INCLUDES RURAL AREAS ADJACENT TO WELL-DEVELOPED LAWNS.
2. NOT REQUIRED ON SHOULDERS, MEDIANS, ETC., AND SLOPES UNDER 5 FEET IN HEIGHT.
3. GIANT BERMUDA SEED, INCLUDING NK-37, SHALL NOT BE USED.
4. RESEEDING CRIMSON CLOVER SHALL BE INOCULATED IN ACCORDANCE WITH SUBSECTION 810.05. DO NOT PLANT CLOVER IN MEDIANS OR IN RURAL AREAS ADJACENT TO WELL-DEVELOPED LAWNS.

SEEDING SCHEDULE

PRELIMINARY
NOT FOR CONSTRUCTION

E.L. ROBINSON ENGINEERING
1301 Cervais St. Suite 450
Columbia, SC 29201
Phone: (803) 400-6031
www.elrobinsonengineering.com

NO. 24548 E.L. ROBINSON ENGINEERING NORTH CAROLINA CERTIFICATE OF AUTH.

Project Title / Client Information
DARLINGTON COUNTY
H&H STUDY - MLK DR.
PROPOSED CONDITIONS
SOUTH CAROLINA OFFICE OF RESILIENCE
DARLINGTON COUNTY, SOUTH CAROLINA

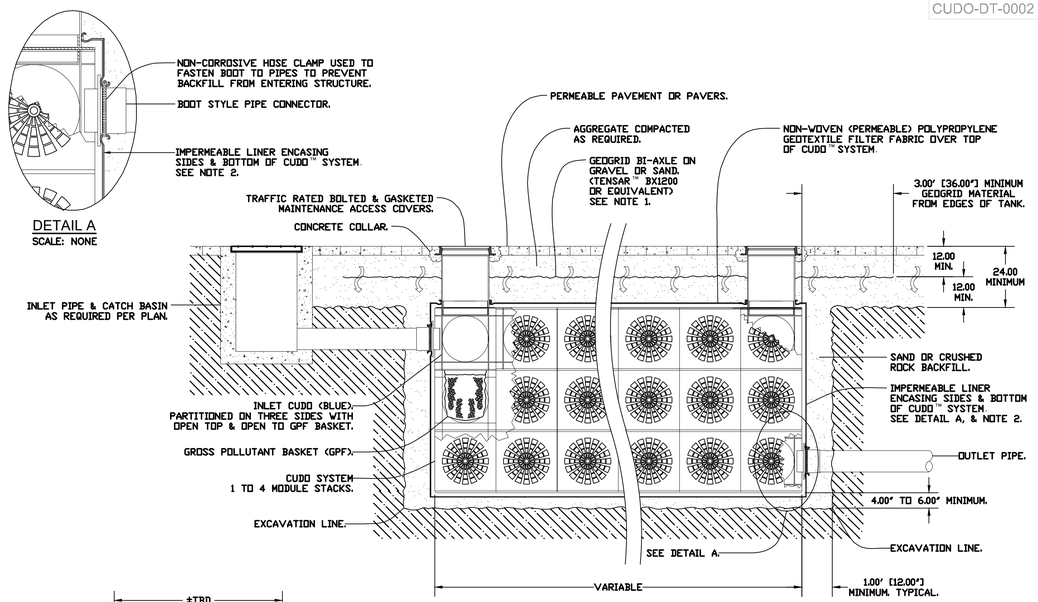
Revisions		
No.	Name	Date

Drawing Information
Project No. 1822025
Drawn By CWS
Date 03.24.23
Checked By DKB
Date 03.24.23
Approved By DKB

Drawing Title
DETAILS

Drawing No.
C4.1

CUDO-DT-0002



NOTES:

1. INSTALL GEOGRID LAYER, (TENSAR™ BX1200 OR EQUIVALENT) IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS IN AREAS SUBJECT TO VEHICLE TRAFFIC.
2. SYSTEM ENCASED ON SIDES & BOTTOM WITH 30-40 MIL PVC LINER OR 36 MIL RE-ENFORCED POLYETHYLENE AS REQUIRED.

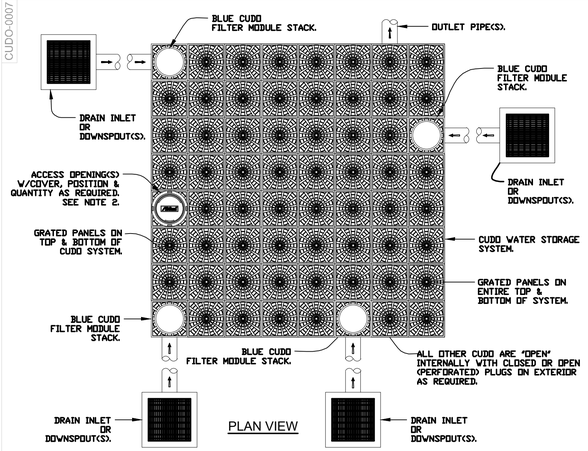
PATENT PENDING

CUDO® Stormwater Products, Inc.
P.O. Box 497 Occidental, CA 95465
Ph. (877) 876-3345 Fax (707) 876-3346

TITLE: CUDO Stormwater Detention System
Typical Installation Detail
Permeable Pavement Area

DO NOT SCALE DRAWING	SCALE: NONE	DRAWN / DATE: JPR 7/21/08	ECO: 0001 JPR 10/22/08	DRAWING NO.: CUDO-DT-0002	REV.: A	SHEET 1 OF 1

CUDO-0007



NOTES:

1. REFER TO CUDO INSTALLATION DETAILS.
2. SEE CUDO-0008 FOR TYPICAL MAINTENANCE ACCESS CONFIGURATION.

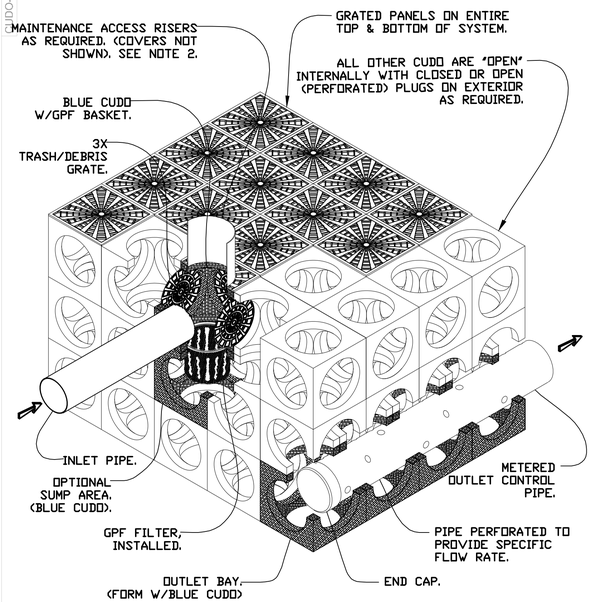
PATENT PENDING

TITLE: CUDO Water Storage System
Typical System Layout
W/ Filter Module Stacks.

CUDO® Stormwater Products, Inc.
P.O. Box 497 Occidental, CA 95465
Ph. (877) 876-3345 Fax (707) 876-3346

DRAWING NO.: CUDO-0007	REV: A	CUDO ECO: 0001 JPR 9/26/08	DATE: JPR 5/2/08	SHEET 1 OF 1

CUDO-0005



NOTES:

1. REFER TO CUDO INSTALLATION DETAILS.
2. SEE CUDO-0008 FOR TYPICAL MAINTENANCE ACCESS CONFIGURATION.

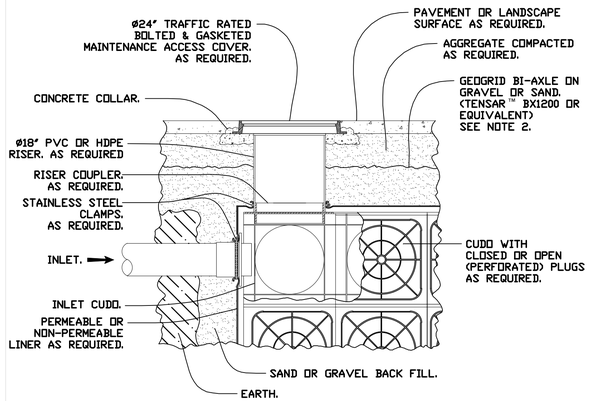
PATENT PENDING

TITLE: CUDO Water Storage System
W/ Metered Outlet Control Device.

CUDO® Stormwater Products, Inc.
P.O. Box 497 Occidental, CA 95465
Ph. (877) 876-3345 Fax (707) 876-3346

DRAWING NO.: CUDO-0005	REV: A	CUDO ECO: 0001 JPR 9/26/08	DATE: JPR 7/24/08	SHEET 1 OF 1

CUDO-0008



NOTES:

1. REFER TO CUDO INSTALLATION DETAILS.
2. INSTALL GEOGRID LAYER, (TENSAR™ BX1200 OR EQUIVALENT) IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS IN AREAS SUBJECT TO VEHICLE TRAFFIC.

PATENT PENDING

TITLE: CUDO Water Storage System
TYPICAL MAINTENANCE ACCESS

CUDO® Stormwater Products, Inc.
P.O. Box 497 Occidental, CA 95465
Ph. (877) 876-3345 Fax (707) 876-3346

DRAWING NO.: CUDO-0008	REV: A	CUDO ECO: 0001 JPR 9/26/08	DATE: JPR 5/2/08	SHEET 1 OF 1

PRELIMINARY
NOT FOR CONSTRUCTION

E.L. ROBINSON ENGINEERING
1301 Cervais St. Suite 450
Columbia, SC 29201
Phone: (803) 400-6031
www.elrobinsonengineering.com

SOUTH CAROLINA — E.L. ROBINSON ENGINEERING No. 25454 — CERTIFICATE OF AUTHORIZATION

Project Title / Client Information
DARLINGTON COUNTY
H&H STUDY - MLK DR.
PROPOSED CONDITIONS
SOUTH CAROLINA OFFICE OF RESILIENCE
DARLINGTON COUNTY, SOUTH CAROLINA

Revisions		
No.	Name	Date

Drawing Information
Project No. 1822005
Drawn By CWS
Date 03.24.23
Checked By DKB
Date 03.24.23
Approved By DKB

Drawing Title
DETAILS

Drawing No.
C4.2