City of Dunwoody Georgia

4800 Ashford Dunwoody Road
Dunwoody, Georgia 30338
dunwoodyga.gov | 678.382.6700

MEMORANDUM

To: Mayor and City Council

From: Cody Dallas, Senior Stormwater Engineer

Date: September 8, 2025

Subject: **Funding Authorization for 1951 and 1970 Wellesley Trace Storm Repairs**

ACTION
Authorize the Mayor, City Manager, or designee to allocate $73,200.40 through the City's unit-price contract with Southern Premier Contractors to fund completed stormwater pipe repairs at 1951 and 1970 Wellesley Trace.

SUMMARY
Wellesley Trace subdivision, being on the 2025 Paving List, had its stormwater infrastructure under the road inspected in 2024. The structural deficiencies found in the storm system at 1970 and 1951 Wellesley Trace required 2 separate repairs. The storm system is composed of an 18-inch reinforced concrete pipe (RCP) measuring +/-96 linear feet located under the cul-de-sac at 1971 Wellesley Trace, and 2 18-inch pipes separated by an unmapped Junction Box. The combined measurement of these pipes is +/-140 linear feet and consists of both RCP and corrugated metal pipe (CMP). The system is approximately 30 years old and was found to be in poor condition. All pipes were found to have multiple fractures, joint separation, exposed soils and root infiltration where they crossed under the roadway. Repairs were completed in July 2025 in order to ensure any excavation work needed in the roadway would not interfere with the paving schedule.

Repairs included:

- CIPP lining of +/-96 LF 18-inch RCP under upper cul-de-sac of Wellesley Trace.
- Point Repair to replace crown of +/-3 LF of 18-inch RCP located under the lower cul-de-sac of Wellesley Trace.
- CIPP lining of +/-140 LF 18-inch CMP and RCP pipes under lower cul-de-sac of Wellesley Trace.

If approved by Council, this project will be funded from the Stormwater Utility's annual repairs and maintenance budget.

RECOMMENDED ACTION
Authorize the Mayor, City Manager, or designee to allocate $73,200.40 through the City's unit-price contract with Southern Premier Contractors to complete stormwater pipe repairs at 1951 and 1970 Wellesley Trace.

City of Dunwoody Georgia

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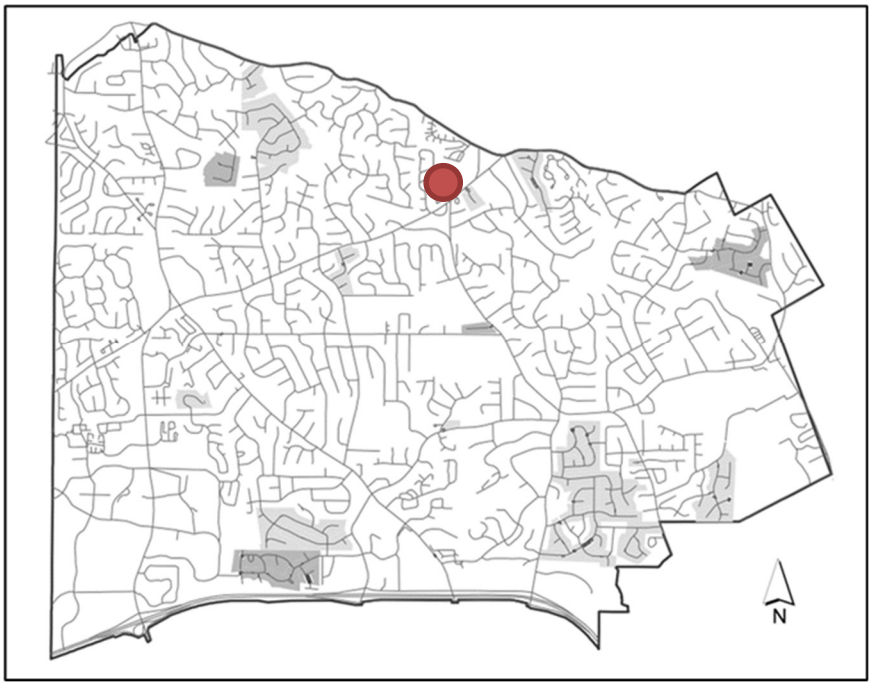
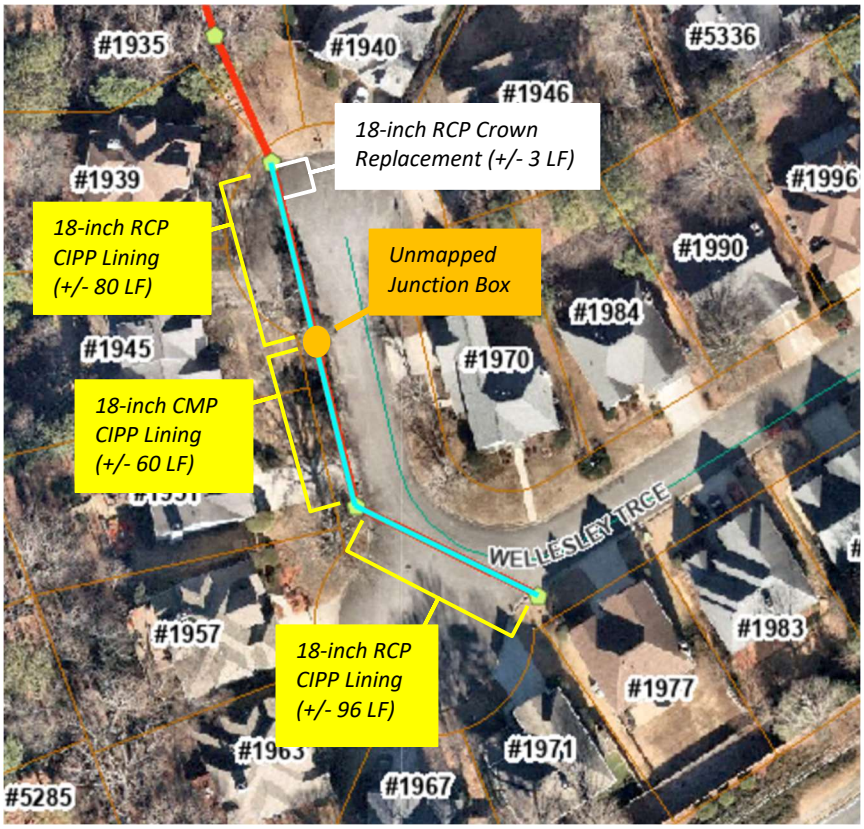
Project Map





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SOUTHERN PREMIER CONTRACTORS, INC
146 CHEEK STREET
HOMER, GA 30547

Invoice

Date	Invoice #
7/3/2025	229636

Bill To

CITY OF DUNWOODY
4800 ASHFORD DUNWOODY
DUNWOODY, GA 30338

PO#	Work Order #	Location
		1951 Wellesley Trace

Item	Quantity	Description	U/M	Rate	Amount
DN001	1	MOBILIZATION	EA	2,169.65	2,169.65
DN002	6	OUT OF SCOPE WORK, FOREMAN	HR	103.06	618.36
DN003	18	OUT OF SCOPE WORK, LABORER	HR	86.79	1,562.22
DN005	3	TRAFFIC CONTROL MINOR 2 - INCLUDES CONES AND SIGNAGE	DAY	1,952.68	5,858.04
DN008	242	TV STORM LINES (INCLUDES DIGITAL FILE & REPORT)	LF	4.34	1,050.28
DN013	242	18" PIPE - CLEANING LESS THAN 25% FULL	LF	6.35	1,536.70
DN048	3	18" SRCMP	LF	75.94	227.82
DN128	9	18" DIAMETER INTERNAL PIPE POINT REPAIR	LF	650.89	5,858.01
DN206	4	INVERT INSTALLATION, 4' DIAMETER	EA	488.17	1,952.68
DN220	6	18" GROUT EACH END TO STRUCTURE	EA	211.54	1,269.24
DN305	236	18" PIPE - 9.0 MM (.354") CIPP	LF	150.00	35,400.00
DN33...	2	INVERSION SETUP CHARGE 15"-36" CIPP	EA	2,712.06	5,424.12
DN353	2	GRADED AGGREGATE BASE	TON	103.06	206.12
DN369	1	TRENCH ROCK EXCAVATION	CY	352.57	352.57
DN406	1	CONNECT TO EXISTING STRUCTURES	EA	2,115.41	2,115.41
DN409	3	REMOVAL OF EXISTING DRAINAGE STRUCTURES	EA	2,440.85	7,322.55
DN410	3	REMOVE EXISTING PIPE, ALL TYPES & SIZES	LF	92.21	276.63

Total $73,200.40

City of Dunwoody Georgia

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Dunwoody, Georgia 30338
dunwoodyga.gov | 678.382.6700

MEMORANDUM

To: Mayor and City Council

From: Cody Dallas, Senior Stormwater Engineer

Date: September 8, 2025

Subject: **Funding Authorization for 4506 Kellogg Circle Storm Repairs**

ACTION
Authorize the Mayor, City Manager, or designee to allocate up to $99,901.48 through the City's unit-price contract with Southern Premier Contractors to complete stormwater pipe repairs at 4506 Kellogg Circle.

SUMMARY
Structural deficiencies to the storm system at 4506 Kellogg Circle were discovered during routine inspections of the stormwater system at this location. The storm system is composed of an 18-inch corrugated metal pipe (CMP) pipe measuring +/-150 linear feet, part of which runs under the roadway. The existing storm system does not end with a headwall as shown on the subdivision plat. The end of the platted pipe is buried and discharges to private pipe extensions that drain to the Kellogg Springs Drive storm system. The system is approximately 60 years old and in poor condition. As part of this repair, the City would install a new junction box to serve as the boundary between City and private maintenance responsibility, the location is consistent with the original subdivision plat.

Recommended repairs include:

- Install junction box where private pipe extension begins
- Repair of +/-150 LF of 18-inch CMP with CIPP

If approved by Council, this project will be funded from the Stormwater Utility's annual repairs and maintenance budget.

RECOMMENDED ACTION
Authorize the Mayor, City Manager, or designee to allocate up to $99,901.48 through the City's unit-price contract with Southern Premier Contractors to complete stormwater pipe repairs at 4506 Kellogg Circle.

City of Dunwoody Georgia

4800 Ashford Dunwoody Road
Dunwoody, Georgia 30338
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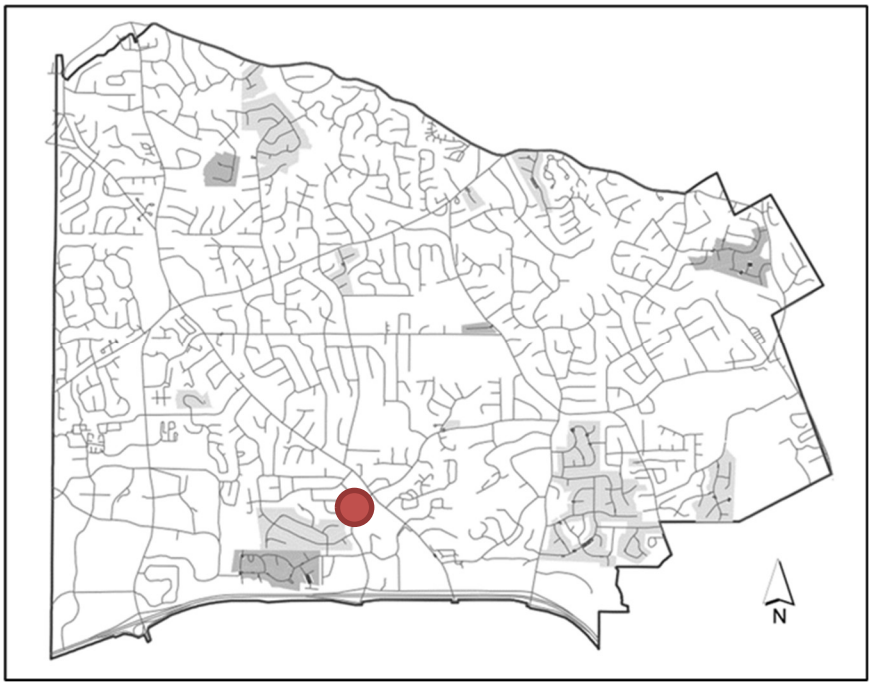
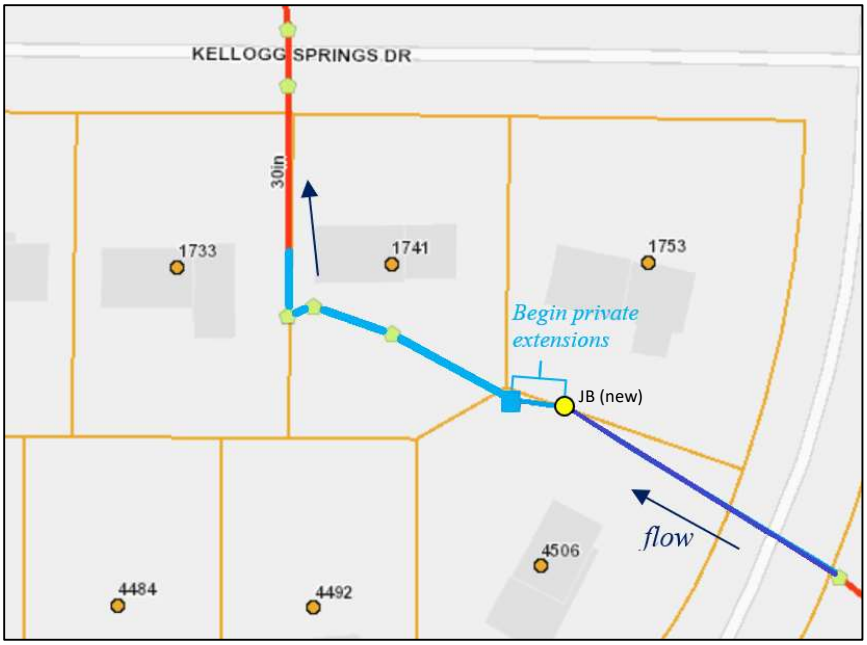
Project Map





CITY OF DUNWOODY RFP 2022-2027 STANDBY STORMWATER REPAIR UNIT PRICE CONTRACT

SOUTHERN PREMIER CONTRACTORS, INC. 2025	
PROJECT LOCATION:	**4506 Kellogg Circle**
Work Order #	
Estimate	**$ 99,901.48**

Item#	Item	Quantity	Unit	Unit Price	Total Cost
1	Mobilization	1	EA	$ 2,208.05	$ 2,208.05
5	Traffic Control Minor 2 – Includes Cones and Signage	5	Per Day	$ 1,987.25	$ 9,936.25
8	TV Storm Lines (includes DVD & Report)	150	LF	$ 4.42	$ 663.00
10	Hydro-Excavation complete (onsite hours only)	4	Per Hour	$ 414.01	$ 1,656.04
13	18" PIPE - Cleaning less than 25% full	150	LF	$6.46	$ 969.00
128	18" Diameter	38	LF	$ 662.42	$ 25,171.96
179	4' Square Brick Manhole w/ Manhole Ring & Cover	5	VF	$ 1,048.82	$ 5,244.10
206	Invert Installation, 4' Diameter	1	EA	$ 496.81	$ 496.81
217	Pressure Grouting (Pumping included if needed)	5	CY	$ 1,987.25	$ 9,936.25
220	18" Grout Each End to Structure	2	EA	$ 215.28	$ 430.56
232	Grout all joint, cracks & holes, in structures, complete (struc	1	EA	$ 883.22	$ 883.22
	18" PIPE - 9.0mm (.354")	150	LF	$ 157.50	$ 23,625.00
	Inversion Setup Charge 15"- 36" CIPP	1	EACH	$ 2,760.06	$ 2,760.06
363	Clear & Grubbing	56	SY	$ 16.56	$ 927.36
367	Haul-Off Soil Material	17	CY	$ 93.84	$ 1,595.28
368	Finish Grading	56	SY	$ 11.04	$ 618.24
384	Seed & Straw (Permanent Grassing)	56	SY	$ 8.83	$ 494.48
391	Pine Straw	3	EA	$ 9.94	$ 29.82
407	Debris Removal, Tandem Dump Truck	1	Per Load	$ 938.42	$ 938.42
410	Remove Existing Pipe all Types and Sizes	5	LF	$ 93.84	$ 469.20
418	Bypass pumping setup-equipment and hose placement	1	EA	$ 1,104.03	$ 1,104.03
419	4" Pumping Operation Time	10	HR	$ 66.24	$ 662.40
438	10% Contingency	1	EA	$ 9,081.95	$ 9,081.95
	TOTAL INVOICE	1			**$ 99,901.48**

City of Dunwoody Georgia

4800 Ashford Dunwoody Road
Dunwoody, Georgia 30338
dunwoodyga.gov | 678.382.6700

MEMORANDUM

To: Mayor and City Council

From: Cody Dallas, Senior Stormwater Engineer

Date: September 8, 2025

Subject: **Funding Authorization for 4328 Bethesda Trail Storm Repairs**

ACTION
Authorize the Mayor, City Manager, or designee to allocate up to $105,682.28, plus an additional 1.77% contingency to match the 2025 annual unit price increase for a total of $107,552.86, through the City's unit-price contract with Southern Premier Contractors to complete stormwater pipe repairs at 4328 Bethesda Trail.

SUMMARY
Structural deficiencies to the storm system at 4328 Bethesda Trail were discovered during routine inspections of the stormwater system at this location. The storm system is composed of an 18-inch corrugated metal pipe (CMP) measuring +/-51 linear feet and a 24-inch CMP measuring +/-289 linear feet, and which runs entirely under the roadway. The system is approximately 62 years old and in poor condition.

Recommended repairs include:

- Repair of +/-51 LF of 18-inch CMP with CIPP
- Repair of +/- 289 LF of 24-inch CMP with CIPP

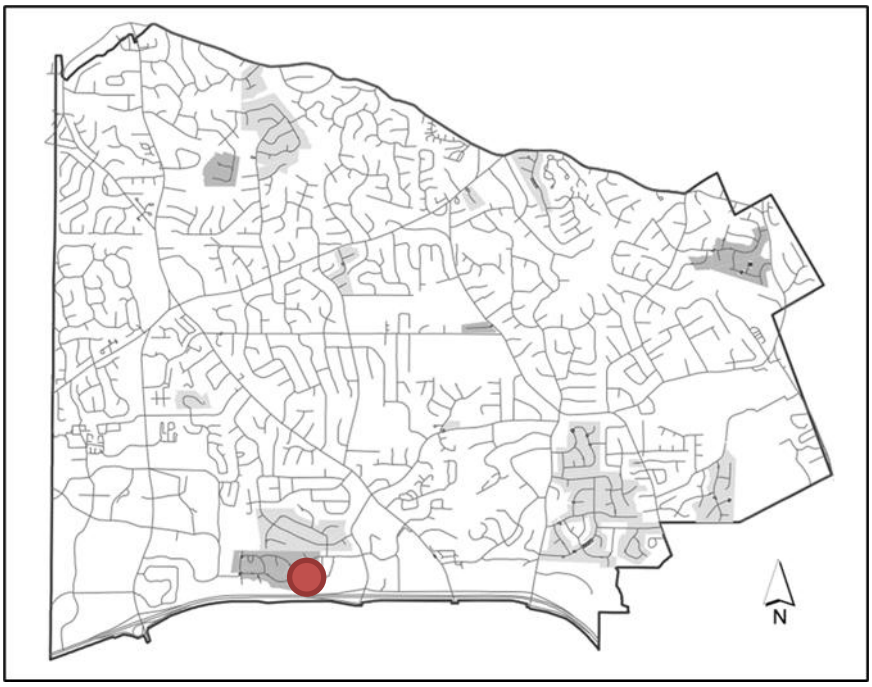
If approved by Council, this project will be funded from the Stormwater Utility's annual repairs and maintenance budget.

RECOMMENDED ACTION
Authorize the Mayor, City Manager, or designee to allocate up to $105,682.28, plus an additional 1.77% contingency to match the 2025 annual unit price increase for a total of $107,552.86, through the City's unit-price contract with Southern Premier Contractors to complete stormwater pipe repairs at 4328 Bethesda Trail.

City of Dunwoody Georgia

4800 Ashford Dunwoody Road
Dunwoody, Georgia 30338
dunwoodyga.gov | 678.382.6700

Project Map



City of Dunwoody Georgia

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Pipe Deformations

Deformations and Joint Offsets. Bituminous Coating worn away with visible rusting of invert.

SOUTHERN PREMIER CONTRACTORS, INC
146 CHEEK STREET
HOMER, GA 30547

Estimate

Date	Estimate #
12/9/2024	229089

Name / Address
CITY OF DUNWOODY 4800 ASHFORD DUNWOODY DUNWOODY, GA 30338

Project
4312-4328 BETHESDA TRAIL

Item	Qty	Description	Rate	Amount
DN001	1	MOBILIZATION	2,133.80	2,133.80
DN004	3	TRAFFIC CONTROL MINOR 1 - INCLUDES CONTINUOUS CREW OF 2 FLAGMEN	2,133.80	6,401.40
DN008	350	TV STORM LINES (INCLUDES DIGITAL FILE & REPORT)	4.27	1,494.50
DN013	57	18" PIPE - CLEANING LESS THAN 25% FULL	6.24	355.68
DN015	293	24" PIPE - CLEANING LESS THAN 25% FULL	7.31	2,141.83
DN128	6	18" DIAMETER INTERNAL PIPE POINT REPAIR	640.14	3,840.84
DN129	6	24" DIAMETER INTERNAL PIPE POINT REPAIR	586.80	3,520.80
DN206	3	INVERT INSTALLATION, 4' DIAMETER	480.11	1,440.33
DN220	4	18" GROUT EACH END TO STRUCTURE	208.05	832.20
DN222	2	24" GROUT EACH END TO STRUCTURE	240.05	480.10
DN232	3	GROUT ALL JOINT, CRACKS & HOLES IN STRUCTURE, COMPLETE (STRUCTURES 8' DEEP OR LESS)	853.52	2,560.56
DN305	51	18" PIPE - 9.0 MM (.354") CIPP	150.00	7,650.00
DN307	289	24" PIPE - 11.0 mm (.433") CIPP	180.00	52,020.00
DN3381	2	INVERSION SETUP CHARGE 15"-36" CIPP	2,667.35	5,334.70
DN380	100	INSTALL & REMOVE ORANGE TREE SAVE FENCE	10.67	1,067.00
DN409	2	REMOVAL OF EXISTING DRAINAGE STRUCTURES	2,400.53	4,801.06
MISC	1	10% CONTINGENCY	9,607.48	9,607.48

Thank you for the opportunity to estimate this project.

Total $105,682.28

City of Dunwoody Georgia

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Dunwoody, Georgia 30338
dunwoodyga.gov | 678.382.6700

MEMORANDUM

To: Mayor and City Council

From: Cody Dallas, Senior Stormwater Engineer

Date: September 8, 2025

Subject: **Funding Authorization for 5161 Joel Court Storm Repairs**

ACTION
Authorize the Mayor, City Manager, or designee to allocate up to $82,477.60 through the City's unit-price contract with Southern Premier Contractors to complete stormwater pipe repairs at 5161 Joel Court.

SUMMARY
Structural deficiencies to the storm system at 5161 Joel Court were discovered during routine inspections of the stormwater system at this location. The storm system is composed of a 30-inch corrugated metal pipe (CMP) measuring +/-139 linear feet and a 36-inch CMP measuring +/-27 linear feet. The system is approximately 56 years old and in poor condition.

Recommended repairs include:

- Reconstruction of Upstream Inlet Structure
- Repair +/-139 LF of 30-inch CMP with CIPP
- Repair +/- 27 LF of 36-inch CMP with CIPP

If approved by Council, this project will be funded from the Stormwater Utility's annual repairs and maintenance budget.

RECOMMENDED ACTION
Authorize the Mayor, City Manager, or designee to allocate up to $82,477.60 through the City's unit-price contract with Southern Premier Contractors to complete stormwater pipe repairs at 5161 Joel Court.

City of Dunwoody Georgia

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Dunwoody, Georgia 30338
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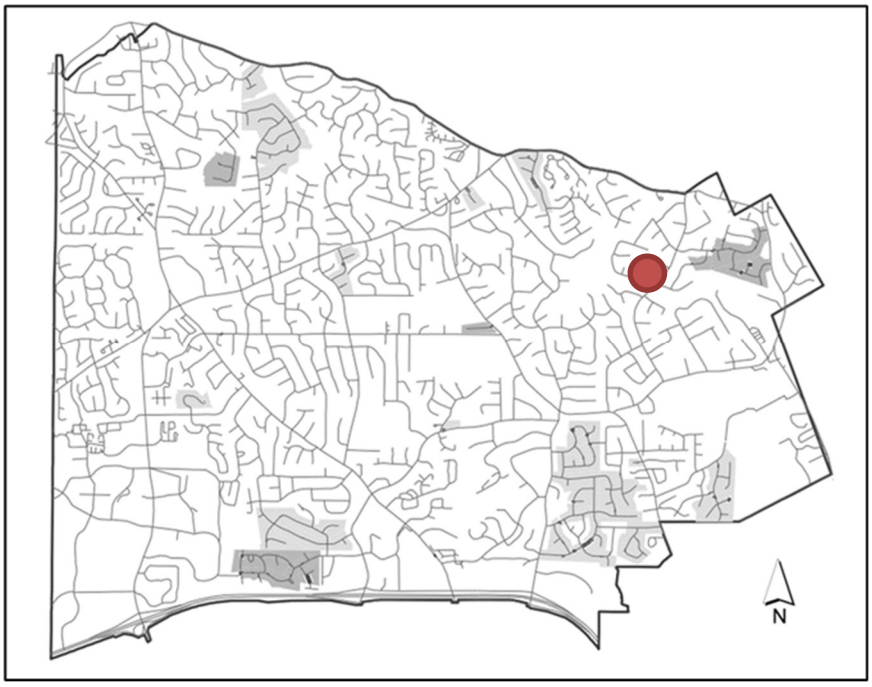
Project Map



City of Dunwoody Georgia

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Large hole in bottom of pipe. Supporting soils undermined.

CITY OF DUNWOODY RFP 2022-2027 STANDBY STORMWATER REPAIR UNIT PRICE CONTRACT

SOUTHERN PREMIER CONTRACTORS, INC. 2025	
PROJECT LOCATION:	**5161 Joel Court**
Work Order #	
Estimate	**$ 82,477.60**

Item#	Item	Quantity	Unit	Unit Price	Total Cost
1	Mobilization	1	EA	$ 2,208.05	$ 2,208.05
5	Traffic Control Minor 2 – Includes Cones and Signage	3	Per Day	$ 1,987.25	$ 5,961.75
8	TV Storm Lines (includes DVD & Report)	174	LF	$ 4.42	$ 769.08
16	30" PIPE - Cleaning less than 25% full	143	LF	$7.84	$ 1,121.12
17	36" PIPE - Cleaning less than 25% full	31	LF	$8.67	$ 268.77
130	30" Diameter	8	LF	$ 552.01	$ 4,416.08
131	36" Diameter	2	LF	$ 524.41	$ 1,048.82
206	Invert Installation, 4' Diameter	2	EA	$ 496.81	$ 993.62
217	Pressure Grouting (Pumping included if needed)	2	CY	$ 1,987.25	$ 3,974.50
232	Grout all joint, cracks & holes, in structures, complete (struc	3	EA	$ 883.22	$ 2,649.66
	30" PIPE - 13.5mm (.532")	139	LF	$ 236.25	$ 32,838.75
	36" PIPE - 16.5mm (.650")	27	LF	$ 262.50	$ 7,087.50
	Inversion Setup Charge 15"- 36" CIPP	2	EACH	$ 2,760.06	$ 5,520.12
380	Install & Remove Orange Tree Save Fence	100	LF	$ 11.04	$ 1,104.00
391	Pine Straw	5	EA	$ 9.94	$ 49.70
409	Removal of Existing Drainage Structure	2	EA	$ 2,484.06	$ 4,968.12
438	10% Contingency	1	EA		$ 7,497.96
	TOTAL INVOICE	1			**$ 82,477.60**

City of Dunwoody Georgia

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Dunwoody, Georgia 30338
dunwoodyga.gov | 678.382.6700

MEMORANDUM

To: Mayor and City Council

From: Cody Dallas, Senior Stormwater Engineer

Date: September 8, 2025

Subject: **Funding Authorization for 1167 Branch Water Court Pond and Storm Repairs**

ACTION
Authorize the Mayor, City Manager, or designee to allocate up to $115,861.24, plus an additional 1.77% contingency to match the 2025 annual unit price increase for a total of $117,911.98, through its unit-price contract with Southern Premier Contractors to complete pond and stormwater pipe repairs at 1167 Branch Water Court.

SUMMARY
The retention pond located on the 1167 Branch Water Court property was constructed in 1979 during the development of the Dunwoody West (Unit 2) subdivision. With documented history of Dekalb County maintaining the outflow structure of the pond, the City of Dunwoody agreed to also perform limited maintenance of the pond's outlet. In 2012, the City performed a more extensive cleaning of the pond in response to resident reports of continuous clogging of the pond's outflow structure. In 2013, the City retrofitted the outflow structure with the intent of reducing the incidence of clogging and increasing water quality. Despite the City performing regular maintenance, clogging continued to be an issue. In 2021, the City performed hydro-excavation between the pond's filter ring and retrofitted outflow structure. In 2022, the City established a Unit Price Contract for design services with several engineering firms. Through this contract, the City requested a proposal from Dewberry to assess the drainage basin and provide a design for an outflow structure less prone to clogging. In late 2023, a final design was provided to the City and construction documents were prepared by Dewberry. The City acquired all necessary easements in accordance with the final plans in 2024. The approved design included a hydrologic analysis demonstrating no downstream impacts would be caused by its construction.

Recommended repairs include:

- Replace the existing retrofitted outflow structure with a headwall.
- Remove existing 18-inch CMP receiving inflow from the existing retrofit outflow structure and replace with +/- 20 LF of 18-inch HDPE at new headwall elevation.
- Pour a new invert within the existing grate inlet junction box to improve drainage through the structure and stabilize both inflow and outflow pipes.
- Excavate the channel to the new headwall.
- Refresh the riprap filter ring.

If approved by Council, this project will be funded from the Stormwater Utility's annual repairs and maintenance budget.

City of Dunwoody Georgia

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RECOMMENDED ACTION

Authorize the Mayor, City Manager, or designee to allocate up to $115,861.24, plus an additional 1.77% contingency to match the 2025 annual unit price increase for a total of $117,911.98, through the City's unit-price contract with Southern Premier Contractors to complete pond and stormwater pipe repairs at 1167 Branch Water Court.

City of Dunwoody Georgia

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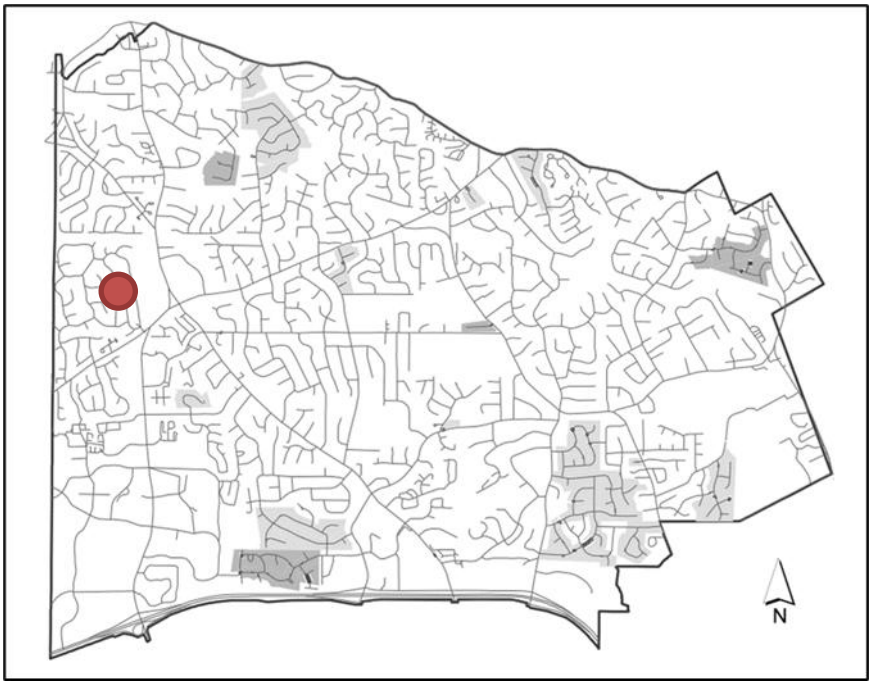
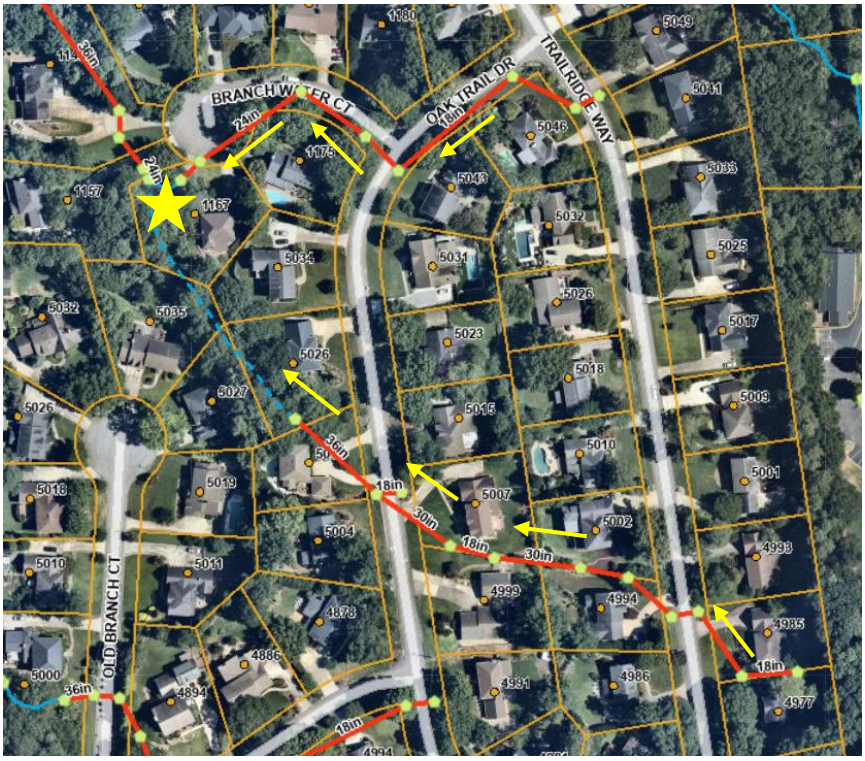
Project Map





Map of Retention Pond Location and Stormwater Drainage Network (Draining to the North and West)

City of Dunwoody Georgia

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dunwoodyga.gov | 678.382.6700

View of Existing Outlet Control Retrofit covered by debris. Orange cone sitting on top of the overflow grate inlet.

Inventory inspection image of retrofit structure (uncovered).

City of Dunwoody Georgia

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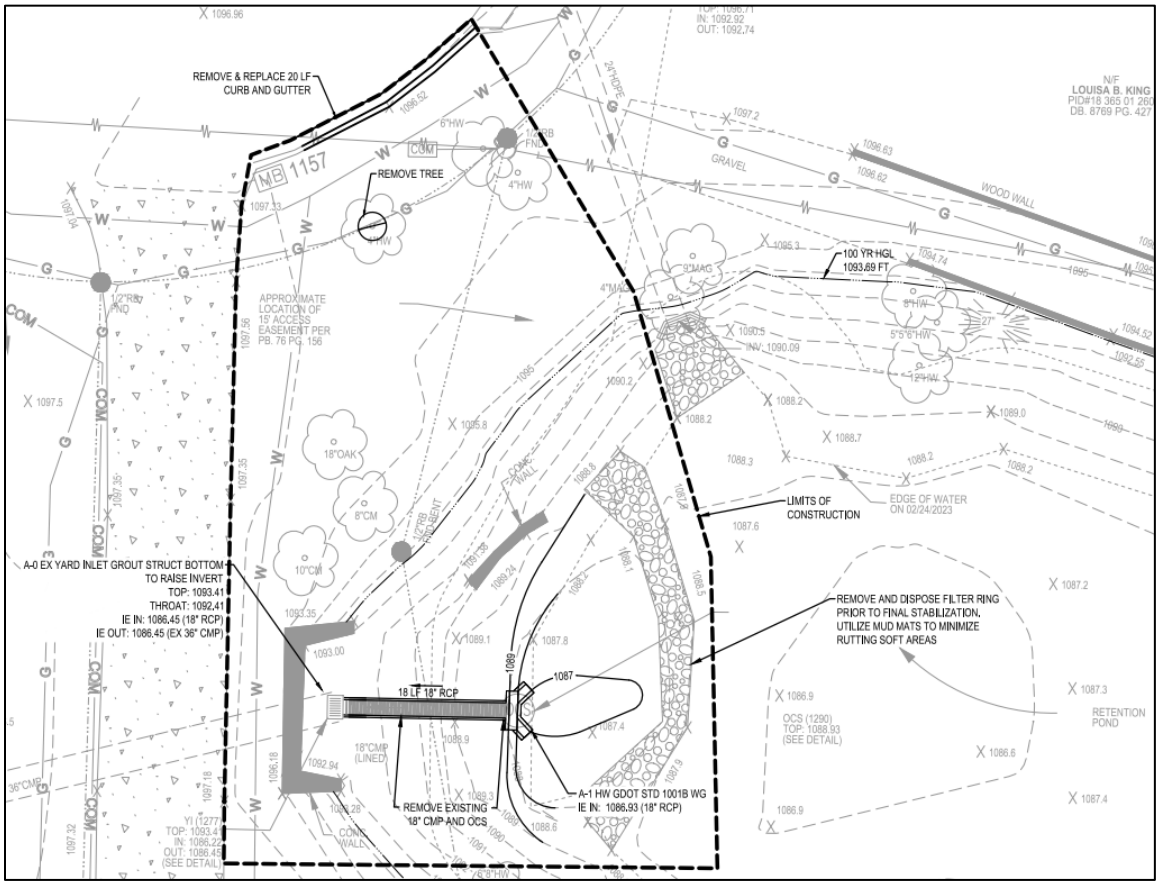

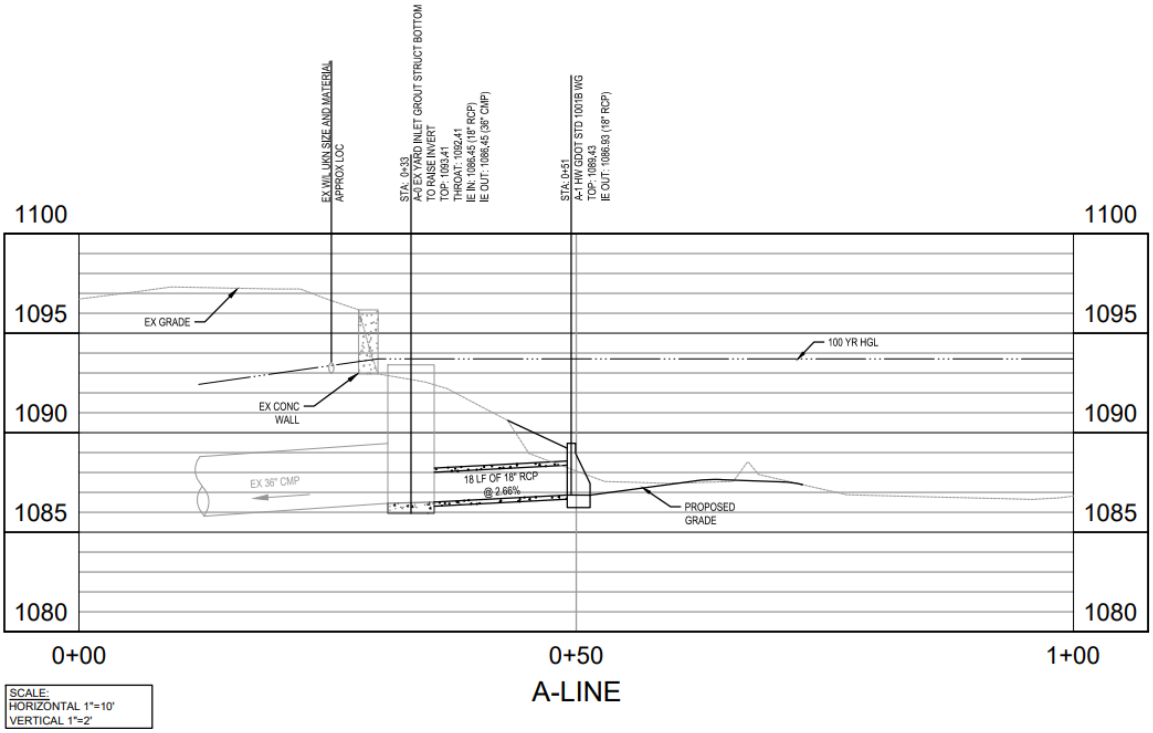

Dewberry proposed design for pond outlet at 1167 Branch Water Ct (Sheet CU-101, 7/31/2023)

CITY OF DUNWOODY RFP 2222-2027 STANDBY STORMWATER REPAIR UNIT PRICE CONTRACT

SOUTHERN PREMIER CONTRACTORS, INC. 2025	
PROJECT LOCATION:	**1167 Branch Water Court**
Work Order #	
Estimate	

Item#	Item	Quantity	Unit	Unit Price	Total Cost
1	Mobilization	1	EA	$ 2,208.05	$ 2,208.05
5	Traffic Control Minor 2 – Includes Cones and Signage	4	Per Day	$ 1,987.25	$ 7,949.00
8	TV Storm Lines (includes DVD & Report)	20	LF	$ 4.42	$ 88.40
13	18" PIPE - Cleaning less than 25% full	20	LF	$6.46	$ 129.20
69	18" HDPE	20	LF	$82.80	$ 1,656.00
101	Precast Headwall for 18" Pipe	1	EA	$ 1,048.82	$ 1,048.82
206	Invert Installation, 4' Diameter	1	EA	$ 496.81	$ 496.81
220	18" Grout Each End to Structure	2	EA	$ 215.28	$ 430.56
232	Grout all joint, cracks & holes, in structures, complete (struct	1	EA	$ 883.22	$ 883.22
346	Curb & Gutter 6"x24"x12" High Back	20	LF	$ 57.41	$ 1,148.20
360	Tree Removal 6"-12""	1	EA	$ 1,104.03	$ 1,104.03
363	Clear & Grubbing	450	SY	$ 16.56	$ 7,452.00
365	Additional Excavation	170	CY	$ 22.08	$ 3,753.60
366	Haul-In Structural Fill Material	170	CY	$ 82.80	$ 14,076.00
367	Haul-Off Soil Material	170	CY	$ 93.84	$ 15,952.80
368	Finish Grading	450	SY	$ 11.04	$ 4,968.00
372	Stone Rip Rap Type III In Place	180	TON	$ 104.88	$ 18,878.40
377	Install & Remove Type C Silt Fence - Alternative	50	LF	$ 8.83	$ 441.50
380	Install & Remove Orange Tree Save Fence	100	LF	$ 11.04	$ 1,104.00
384	Seed & Straw (Permanent Grassing)	450	SY	$ 8.83	$ 3,973.50
385	Seed & Straw (Temporary Grassing)	200	SY	$ 6.62	$ 1,324.00
391	Pine Straw	50	EA	$ 9.94	$ 497.00
407	Debris Removal, Tandem Dump Truck	2	Per Load	$ 938.42	$ 1,876.84
408	Removal of Existing Non Drainage Structure	1	EA	$ 2,760.06	$ 2,760.06
409	Removal of Existing Drainage Structure	1	EA	$ 2,484.06	$ 2,484.06
410	Remove Existing Pipe all Types and Sizes	20	LF	$ 93.84	$ 1,876.80
411	Saw Cut Existing Pavements	24	LF	$ 5.52	$ 132.48
412	Stone #57	34	TON	$ 99.36	$ 3,378.24
418	Bypass pumping setup-equipment and hose placement	1	EA	$ 1,104.03	$ 1,104.03
419	4" Pumping Operation Time	20	HR	$ 66.24	$ 1,324.80
431	Steel Plates (Typ. 5'x8' Size)	5	EA/Day	$ 165.60	$ 828.00
	TOTAL INVOICE	1			**$ 105,328.40**
	10% contingency			10,532.84	115861.24

Dewberry

Dewberry Engineers Inc.
2835 Brandywine Road, Suite 100
Atlanta, GA 30341

678.530.0022
678.530.0044 fax
www.dewberry.com

Date: December 2, 2022

To: Mr. Carl B. Thomas Sr., CSM, CFM
Stormwater Utility Manager
City of Dunwoody

From: Emma Bones, PE
Dewberry

RE: Proposal for Branch Water Court 1167 Drainage Study and OCS Design

Dear Mr. Thomas:

Dewberry Engineers Inc. (Dewberry) is pleased to present this proposal to the City of Dunwoody (Dunwoody) for the Branch Water Court 1167 Drainage Study and OCS Design.

Branch Water Court is a residential road within Dunwoody, and at the termination of the cul-de-sac, there is a detention pond that has experienced repeated maintenance issues. The pond spans six different parcels and provides flow attenuation for Trailridge Way and Oak Trail Drive. Based on the neighborhood plat, the pond was originally constructed in the mid to late 1970s when the area was still part of DeKalb County. Additionally, the plat shows a standpipe for an outlet control structure (OCS) connecting to approximately 35 LF of 36" corrugated metal pipe (CMP) to pass flow from the pond past 1157 Branch Water Court and discharge into the southeastern corner of 1148 Branch Water Court. At an unknown time between the construction of the pond and the formation of the City of Dunwoody in 2008, the 36" CMP was extended by approximately 250 LF to discharge in the northwest corner of the property at 1148 Branch Water Court. Then in 2013, due to repeated maintenance issues associated with the pond and outlet pipe system, Dunwoody retrofitted the original OCS with a modified OCS structure and upgraded the appurtenant downstream stormwater system. As part of the stormwater system upgrades, Dunwoody abandoned approximately 180 LF of the most downstream 36" CMP and installed a new headwall at a higher elevation much closer to the driveway for the house located on 1148 Branch Water Court. In order to move the headwall to the higher elevation, it is anticipated that the entire stormwater system was raised to pass above the original system and that the original system was abandoned with flowable fill. The Georgia Development Partners invoice supports this theory as the largest line item on the invoice is for flowable fill. Finally, as part of the work in 2013, the OCS structure was retrofitted with a hybrid outlet control structure which combines two vertical CMP standpipes attached to a perforated horizontal CMP for low flow drainage. The original overflow concrete riser structure was left in place.

Despite these upgrades, the modified OCS structure still experiences consistent maintenance and clogging issues after significant rainfall events, preventing the pond from properly draining. In order to address these maintenance concerns, Dunwoody has requested that Dewberry design a retrofit to the OCS structure that is less prone to clogging. If possible, Dunwoody would prefer to replace the OCS with a headwall. Therefore, Dewberry will develop a stormwater model for the area draining to the detention pond on Branch Water Court and will extend the model downstream approximately 1,000 ft to include additional conveyances from Hidden Branches Circle. To support model development and collect more accurate data on the stormwater system, Dewberry's subconsultant, TerraMark, will collect topographic survey for the pond area and downstream stormwater system. Once the existing conditions model is complete, Dewberry will assess various OCS options to determine a feasible retrofit that will minimize clogging. Dewberry will then develop a single-sheet plan to provide to Dunwoody to construct the OCS.

Mr. Carl B. Thomas Sr., CSM, CFM
City of Dunwoody
Meadowcreek Dr Stormwater Management Study
December 2, 2022

Task 1 – Survey

Our survey sub-consultant, TerraMark, will provide a detailed topographic survey of the area as shown in the attached survey corridor (approximately 0.6 acre of property) to support a new OCS design. Details of the existing pipe systems will be located along with topographic data at one-foot contour intervals. Trees 4 inches in diameter and larger will be located. Property lines of adjacent parcels and any existing easements in the survey corridor will be reflected on the final survey along with owner information. All survey data will be tied to control established in accordance to the NAD83 Georgia State Plane Coordinate System (West Zone) and NAVD88. TerraMark will contract a private utility locator to mark underground utilities within the scope area (where applicable). Underground utilities will be located and shown to supplement the survey. TerraMark will prepare owner notification letters and mail them prior to beginning work.

The following tasks are not included in TerraMark's scope of services: Individual Property Surveys; Underground Utility Survey Other than Mentioned Above; Wetland Delineation; Wetland Location; Easement Plats; Staking for Easement Acquisition; and Recording of Documents.

Task 2 –Modeling and Design

In order to design a feasible OCS retrofit, Dewberry proposes to develop a PCSWMM model of the stormwater system for all upstream stormwater infrastructure and downstream for up to 1000 LF beyond the headwall outfall on the property of 1148 Branch Water Court. The model will include 25 closed conduits in total. Dewberry has selected PCSWMM for this project because it utilizes the SWMM5 engine, which is based on hydrodynamic rainfall-runoff simulations which integrate the hydrology and hydraulics into a single model that can simulate changes in flow based on updates to structures and cross sections. This method allows time varying rainfall to be routed through the system, accounting for timing of the hydrographs, conduit storage, ponds, flow diversions, backwater, and losses in the system. This is the most accurate representation of actual conditions during a storm event.

Dewberry will use the survey and field data to assess the horizontal and vertical connectivity of the stormwater system in the study area. Since the Dunwoody stormwater inventory includes both closed conduit pipes and non-conduit open channels, Dewberry will confirm system connectivity, conduit direction, and adjust the location of structures nodes to better reflect their actual geolocation based on either the survey, aerial, or terrain data. Once the location of the structures and conduits are updated, measure down values will be assigned to the pipes. For structures and pipes within the survey corridor, the detailed survey data will be used to generate the model input data, but for pipes and structures outside of the corridor, Dewberry will collect measure down information for all accessible pipes and structures. For structures outside of the survey corridor, invert elevations will be calculated based on the rim elevation extracted from the LiDAR terrain minus the measure down values. Lastly weirs and orifices will be added to the model to properly model any outlet control structures and detention ponds.

Dewberry will then develop the hydrologic model inputs for all water-accepting inlets within the stormwater system. Watersheds will be delineated based on the terrain data and stormwater inventory. The longest flowpath for each watershed will be created to calculate the watershed width and average slope. A topology check will also be completed to ensure that the watersheds are a seamless layer with no overlapping areas or gaps. Once each watershed is delineated, curve number and impervious values will be assigned from the landcover dataset. A landcover dataset for this study area will be created using Dunwoody's existing impervious layer and adding any driveways and sidewalks that are missing. The remaining landcover will be separated into three major categories: forest/woods, open space (lawns), and water. The landcover will be merged with the Natural Resources Conservation Services (NRCS) hydrologic soil group data (SSURGO) to create a seamless landcover dataset that will produce detailed curve number

and impervious values for watersheds based on area weighting methods. These values will be used to predict the runoff potential for the subbasins. Rainfall for the model will be based on the NOAA Atlas 14 precipitation frequency estimates and will be centered over the study area. The precipitation frequency estimates will be transformed to a time series using the MSE 5 distribution.

After completing the connectivity and hydrology, hydraulic parameters will be assigned to the closed conduit pipes, and cross sections will be cut from the terrain data and assigned to the open channel sections. Pipe attributes included in the inventory, such as size, shape, material, etc., will be used to assign hydraulic modeling parameters to each closed conduit. Other parameters include roughness values based on the conduit material, entrance and exit loss coefficients based on the structure type, bend angles, and downstream channel condition, and culvert codes based on the entrance structure material, shape, and type. Once the modeling setup is complete, model runs can be completed for each rainfall event (2-, 5-, 10-, 25-, 50-, and 100-year events) to determine the existing level of service of the stormwater system.

Once an existing conditions model is developed, Dewberry will assess various OCS options to determine a feasible retrofit that will minimize maintenance concerns as well as avoid increases in flow and water surface elevations (WSELs) upstream and downstream of the project area. Since the detention pond is not located on a limited detail floodplain, it is not subject to floodplain management regulations that restrict increases in WSEL. However, it is best practice to check both upstream and downstream impacts to ensure there are no negative impacts to property owners. In order to provide Dunwoody with several options, Dewberry will develop up to three (3) proposed models with different configurations for OCS retrofits, and Dewberry will provide a comparison of the existing and proposed flows and WSELs as well as a qualitative list of advantages and disadvantages for each option. These results will be presented to Dunwoody for them to select their preferred option. Upon selection of a preferred option, Dewberry will develop a single-sheet plan to provide to Dunwoody to construct the preferred OCS option. In addition to the one-page plan, Dewberry will provide a report summarizing the hydrologic and hydraulic results from the PCSWMM modeling as well as provide a cost estimate based on on-call contractor unit costs.

Datasets and Assumptions

The following datasets and/or assumptions are required:

- It is assumed construction will be completed by an on-call, annual contractor, and therefore, no development of technical specifications or bid assistance will be required as part of this project. Additionally, only annual contractor cost estimate(s) will be required.
- For stormwater infrastructure outside of the survey corridor, Dewberry will collect measure down invert data. In order to collect measure down data, Dunwoody will need to provide a survey notification letter to Dewberry.
- Permitting of the project is not included in the scope of this project, and if desired, will need to be added at a later date.
- No engineer of record nor construction oversight tasks are included with this fee, and if desired, will need to be added at a later date.

Mr. Carl B. Thomas Sr., CSM, CFM
City of Dunwoody
Meadowcreek Dr Stormwater Management Study
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Deliverables

Final deliverables include:

- Drainage Study Report: Signed/sealed PDF
- PCSWMM models: Existing and Proposed Conditions
- One (1) Page Plan/Profile for preferred option
- Cost Estimate (Annual contractor(s) only)

Fee Estimate and Schedule

Based on the scope of services outlined above, an hourly not to exceed amount of $18,710 is proposed to provide these services. An hourly breakdown is provided below based on the hourly billing rates. In addition, we anticipate the project will take twelve (12) weeks to complete once the notice to proceed is received.

Task 1 - Survey			
Survey Manager	$135.00	6	$810.00
2-Person Survey Crew	$145.00	20	$2,900.00
Drafter	$90.00	12	$1,080.00
SUE Crew	$160.00	5	$800.00
	Task 1 Subtotal	*43*	*$5,590.00*
Task 2 - Modeling & Design			
Principal-in-Charge	$230.00	4	$920.00
Senior Engineer	$150.00	12	$1,800.00
Mid Level Engineer	$130.00	80	$10,400.00
	Task 2 Subtotal	96	$13,120.00
		Total	***$18,710.00***

Thank you for allowing Dewberry the opportunity to provide professional services on this project. If you have any questions or would like to discuss our proposal further, please feel to contact Emma Bones at 678.537.8649 or via email at ebones@dewberry.com.

Regards,

Sam Fleming, PE
Associate Vice President
Dewberry

Emma Bones, PE
Project Manager
Dewberry

BRANCH WATER CT 1167 SURVEY CORRIDOR

THIS PIPE IS ABANDONDED.
DO NOT SURVEY.

APPROX LOCATION OF EX HEADWALL NOT SHOWN IN GIS. SURVEY HEADWALL AND APPROX 50 LF DOWNSTREAM OF HEADWALL

SURVEY CORRIDOR

PROVIDE FFE

PROVIDE SKETCH OF TWO (2) OCS STRUCTURES

Branch Water Ct

Old Branch Ct

5034 5059 5042 5050 5058 5066 5070 5051 1156 1164 1172 1180 5043 1148 5035 1175 1157 5027 1167 5067 5034 5032 5035 5059 5026 5027 5051 5026 5018 5019 5016

Source: Esri, Maxar, GeoEye, Earthstar

BRANCH WATER COURT 1167 DRAINAGE STUDY REPORT

JULY 31, 2023

Dewberry

100-PCT

SUBMITTED BY
Dewberry Engineers Inc.
2835 Brandywine Road Suite 100
Atlanta, Georgia 30341
678.537.0022

SUBMITTED TO
City of Dunwoody
4800 Ashford Dunwoody Road
Dunwoody, Georgia 30338
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GEORGIA REGISTERED No. 041571 PROFESSIONAL ENGINEER EMMA JEAN BONES 7/31/2023

Brach Water Court 1167 Drainage Study Report

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1. Executive Summary

1.1 Background

A detention pond located at the cul-de-sac of Branch Water Court, a residential road within the City of Dunwoody (Dunwoody), has experienced repeated maintenance issues. The pond and its appurtenant drainage structures spans across six different parcels and provide flow attenuation for Trailridge Way and Oak Trail Drive. Based on the neighborhood historical plat, the pond was originally constructed in the mid to late 1970s while the area was still part of DeKalb County. The plat shows a standpipe for an outlet control structure (OCS) connecting to approximately 35 LF of 36" corrugated metal pipe (CMP) to pass flow from the pond past 1157 Branch Water Court and discharge into the southeastern corner of 1148 Branch Water Court. At an unknown time between the construction of the pond and the formation of Dunwoody in 2008, the 36" CMP was extended by approximately 250 LF to discharge the flow in the north west corner of the property at 1148 Branch Water Court. In 2013 after repeated complaints regarding the detention pond from neighbors, Dunwoody retrofitted the original OCS with a modified OCS structure and upgraded the appurtenant downstream stormwater system. The upgrade included abandoning approximately 180 LF of the most downstream 36" CMP and installing a new headwall at a higher elevation much closer to the driveway of 1148 Branch Water Court. It is anticipated that the entire stormwater system was raised to pass above the original system and the original system was abandoned with flowable fill in order to achieve the new headwall elevation. The Georgia Development Partners invoice supports this theory since the largest line item in their invoice is for flowable fill. Lastly, the OCS structure was retrofitted with a hybrid outlet control structure as part of the work in 2013. The retrofit combined two 12" vertical CMP standpipes attached to a perforated 24" horizontal CMP for low flow drainage. The original concrete overflow riser structure was left in place.

Despite the system improvements, the modified OCS structure still experiences continual maintenance and clogging issues after rainfall events. To address the maintenance concerns, Dunwoody has requested that Dewberry design a retrofitted OCS structure that is less prone to clogging. As part of the proposed solution, Dewberry developed a stormwater model for the approximately 20-acre area draining to the detention pond on Branch Water Court and extended the model downstream approximately 1,000 ft to include additional conveyances from Hidden Branches Circle. The model was extended to ensure any proposed modifications would not negatively impact upstream or downstream neighbors with increased flows or water surface elevations. Based on the results of the model, a GDOT STD 1001B Winged Headwall was chosen to replace the hybrid OCS. The existing 18" CMP will be replaced by an 18" reinforced concrete pipe (RCP). Further, the downstream invert of the 18" RCP will be raised by approximately 0.25 ft to match the upstream invert of the outgoing 36" CMP, and the bottom of the existing overflow riser structure will be grouted to raise the invert and prevent standing water in the structure.

2. Existing Conditions

Dewberry developed an existing conditions hydrodynamic model using PCSWMM to analyze the existing stormwater system including the detention pond and ongoing issues associated with repeated maintenance and clogging of the detention pond OCS. The model was developed from survey data collected by TerraMark Land Surveying Inc. (TerraMark) on March 08, 2023, and where needed, the survey data was supplemented with Dunwoody's stormwater inventory data, aerial imagery, topographic data, landcover data, and additional pipe invert data collected by Dewberry beyond the survey corridor. The model was created using the PCSWMM software which utilizes a watershed-wide SWMM5 engine based hydrodynamic rainfall-runoff simulation.

2.1 Hydrology

The NOAA Atlas 14 rainfall frequency estimates were used to model the inflows for the 24-HR 1-, 2-, 5-, 10-, 25-, and 100-YR storm events. The precipitation frequency estimates were transformed to a time series using the MSE 5 distribution. Table 2.1 provides a summary of the rainfall estimates for all the 24-HR storm events used in this model.

The basins were manually delineated using surveyed topographic data, the city terrain data, and aerial imagery. The total drainage area draining to the detention pond is approximately 20 acres. As shown in Figure 2.1, the drainage area and associated subcatchments are divided into 25 subbasins.

The impervious areas and curve number for the delineated basins were computed based on land use in the study area created from the Dunwoody impervious areas and Aerial imagery. The landuse file was divided into four categories – lawn, vegetation, impervious areas, and water – and further split based on hydrologic soil groups (HSG), which were obtained using the NRCS Web Soil Survey online. Each landuse/hydrologic soil group type was assigned a curve number and impervious percentage. Weighted impervious percentage and curve numbers were calculated for each subbasins. Table 2.2 summarizes the basin properties for this study area. Basin area, width, flow length, and average slopes were also calculated as part of the basin delineation step.

Table 2.1 – 24-Hour Rainfall

24-Hour Rainfall	
PERCENT ANNUAL CHANCE EVENT	24-HOUR RAINFALL (IN.)
1-Year	3.29
2-Year	3.69
5-Year	4.38
10-Year	4.98
25-Year	5.85
100-Year	7.29

Table 2.2 – Existing and Proposed Hydrologic Model Inputs

Existing and Proposed Hydrologic Model Inputs						
BASIN ID	AREA (AC)	CN	LENGTH (FT)	WIDTH (FT)	SLOPE (%)	IMPERV (%)
SUB-10234	2.513	72.41	784.52	139.52	9.27	30.84
SUB-10235	0.182	89.82	435.11	18.19	3.87	77.90
SUB-10237	0.773	74.12	420.08	80.13	9.42	35.45
SUB-10238	0.362	79.36	511.32	30.80	11.52	49.63
SUB-12106	1.711	74.41	360.64	206.64	12.34	36.25
SUB-12107	1.169	74.13	251.86	202.17	8.35	37.36
SUB-12108	0.637	72.92	215.33	128.94	19.21	32.22
SUB-12109	1.589	70.75	372.07	186.06	8.87	26.35
SUB-12110	1.477	71.92	426.70	150.83	9.18	29.52
SUB-12111	0.305	75.31	270.25	49.08	4.91	38.66
SUB-12113	1.511	78.57	623.26	105.59	3.93	47.55
SUB-12115	3.479	66.69	535.95	282.80	10.47	22.89
SUB-12116	0.029	81.00	54.71	23.07	11.53	54.04
SUB-12118	0.045	69.43	48.08	40.45	11.07	22.79
SUB-12119	0.480	65.84	373.06	56.03	12.13	23.90
SUB-12121	0.863	76.34	454.44	82.76	6.10	41.45
SUB-12122	1.752	73.45	554.63	137.62	3.97	34.75
SUB-12124	1.474	59.60	307.77	208.67	6.42	5.12
SUB-12125	0.389	69.80	224.37	75.50	11.11	24.92
SUB-12126	1.900	72.60	464.77	178.05	4.28	32.48
SUB-12127	0.442	79.63	263.79	73.01	12.31	50.36
SUB-12129	0.336	68.98	135.27	108.21	11.80	21.56
SUB-90002	7.490	65.11	537.73	606.73	6.77	18.52
SUB-90003	2.422	63.88	409.38	257.72	2.79	16.49
SUB-92001	3.652	65.38	430.71	369.32	3.18	19.42

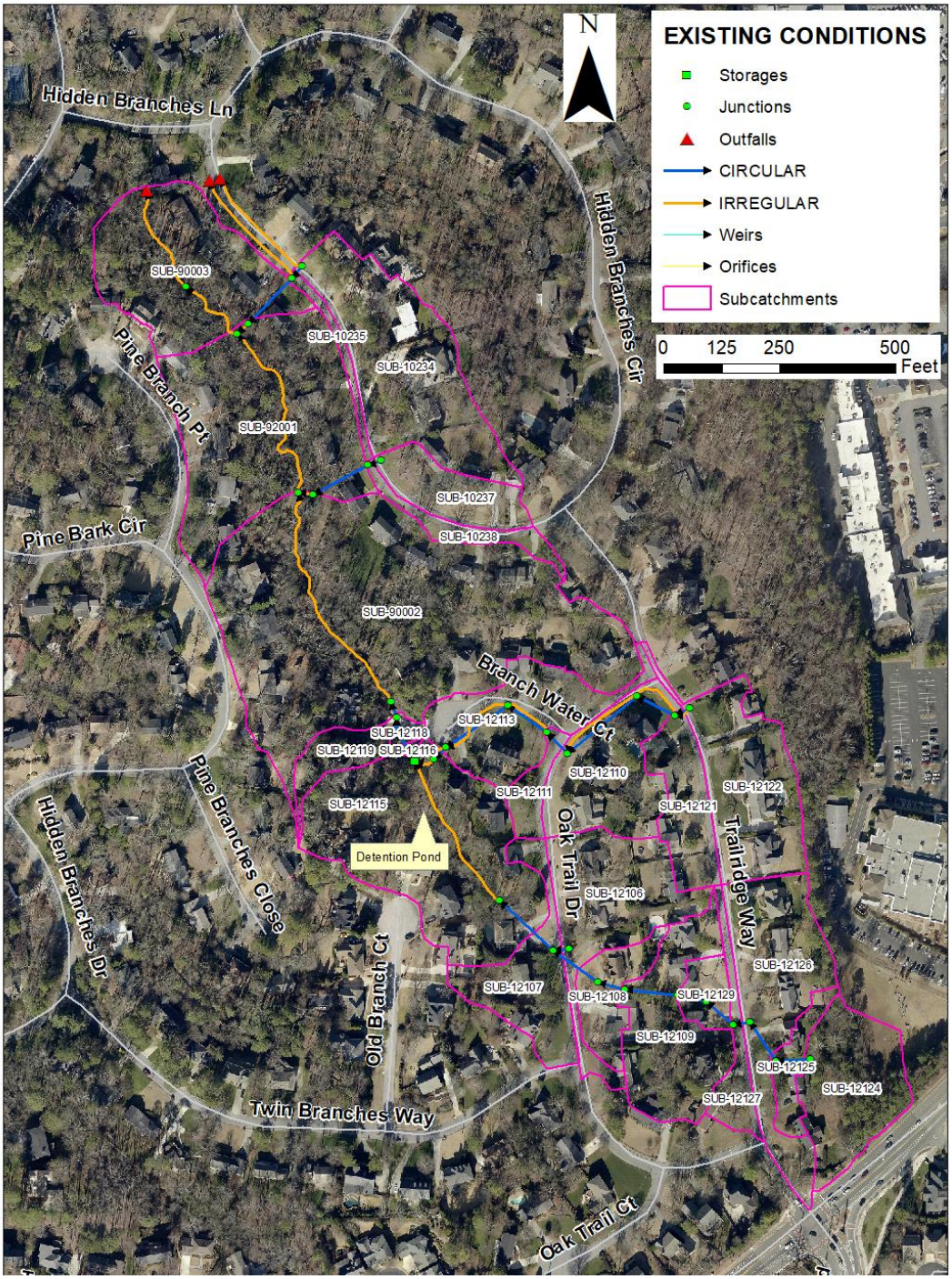


Figure 2.1 – Existing SWMM Model for Branch Water Court 1167

2.2 Hydraulics

To assess the full impact of the proposed conditions model, the model was extended approximately 1,000 ft downstream of the headwall located northwest of the property on 1148 Branch Water Court in order to fully capture any possible downstream impacts caused by the proposed design. The primary stormwater runoff contributing to the detention pond begins near the entrance to Dunwoody West neighborhood at the intersection of Mount Vernon Road and Trailridge Way. This runoff discharges at the upstream end of the detention pond which is located south east of the existing OCS. Additional flow is contributed from the street drainage system located east of the detention pond along the intersection of Trailridge Way and Oak Trail Drive. The existing OCS structure is shown in Figure 2.2 and is modeled as a single weir and orifice. The orifice size was estimated based on the total surface area of the perforations. The area of the perforations was estimated by measuring the average diameter of the perforations and counting the total number of perforations. The 12-inch risers from the OCS are modeled as weirs that convert to bottom orifices when submerged by more than half a foot of water. The existing overflow structure is modeled as a weir for the throat elevation and a separate weir for the rate elevation on top of the structure. Full pipe summary tables are provided in Section 4.3.

Figure 2.2 – Existing OCS and concrete overflow structure

3. Proposed Design

The proposed system calls for the installation of a GDOT STD 1001B Winged Headwall to replace the hybrid OCS. The existing concrete overflow structure will remain in place. It is anticipated that the larger opening of the 18" pipe and headwall will reduce clogging by allowing smaller debris, such as leaves and twigs, to pass through the pipe system rather than getting caught on the OCS. The existing 18" CMP will be replaced by an 18" reinforced concrete pipe (RCP). Further, the downstream invert of the 18" RCP will be raised by approximately 0.25 ft to match the upstream invert of the outgoing 36" CMP, and the bottom of the existing overflow riser structure will be grouted to raise the invert and prevent standing water in the structure.

3.1 Hydrology

The proposed solution did not require any modifications to the hydrology. Therefore, the drainage basins and their parameters did not change as a result of the proposed design. Any changes to flows are due to changes in the attenuation provided by the pond from changes to the OCS.

3.2 Hydraulics

Detailed comparison of the impacts upstream and downstream of the stormwater system is summarized in Table 3.1. For the existing conditions model, the upstream data was taken from the existing OCS (junction #94001) and the downstream data was taken from the existing headwall located on 1148 Branch Water Court (junction #12123). The locations of these junctions are shown on Figure 4.2.

For the proposed conditions model, the upstream data was taken at the new proposed headwall and the downstream data was taken at the same headwall as the existing conditions model. Based on the results, the proposed model decreased the upstream ponding elevations in all storm events. On the downstream side, all three hydraulic parameters – water surface elevation, velocity, and flow – exhibited reductions with the exception of the 5-year storm event. The downstream water surface increased slightly by 0.08 ft and the flow increased slightly by 5.1 cfs in the 5-year event. The model results showed no negative downstream impact to the properties as no homes or buildings were in the 100-yr floodplain.

Table 3.1– Upstream and Downstream Impacts of Multi Year Storms for Existing and Proposed Conditions

24-Hour Rainfall						
		Upstream		Downstream		
		WSEL (ft)	Flow (cfs)	WSEL (ft)	Velocity (fps)	Flow (cfs)
1-Yr	Existing	1091.22	17.1	1082.89	9.4	17.5
	Proposed	1090.60	14.8	1082.84	9.2	15.2
2-Yr	Existing	1091.59	18.1	1082.91	9.5	18.6
	Proposed	1091.08	16.1	1082.87	9.3	16.5
5-Yr	Existing	1092.31	19.4	1082.93	9.5	20.0
	Proposed	1091.79	24.8	1083.01	9.8	25.1
10-Yr	Existing	1092.69	19.6	1083.08	9.9	29.7
	Proposed	1092.25	25.7	1083.03	9.8	26.4
25-Yr	Existing	1093.03	19.6	1083.26	12.3	44.9
	Proposed	1092.79	26.2	1083.21	11.3	40.4
100-Yr	Existing	1093.91	19.6	1083.37	14.6	54.7
	Proposed	1093.69	26.2	1083.36	14.4	53.9

4. Supporting Data

4.1 Time of Concentration Calculations

PCSWMM uses input parameters to determine each basin's response to rainfall. Therefore, time of concentration is not assigned to each subbasin, but rather characteristics used to determine rainfall response in the model are listed in Table 2.2 (length, width, slope, CN, and % impervious).

4.2 Curve Number Calculations

Curve numbers for each subbasin were calculated by area weighting the land use cover and hydrologic soils group in each basin for the existing and proposed model. The CN and impervious percentage for each basin is shown in Table 4.1.

4.3 Pipe Summary

Pipe summaries for the 25 and the 100-yr storms in the existing conditions models are provided in Table 4.2 and Table 4.3. The summaries for the proposed conditions models are provided in Table 4.4 and Table 4.5. Figure 4.1 and Figure 4.2 shows closeup images of the project site in the existing and proposed conditions, respectively. Closed conduits are labeled in blue and irregular conduits in red.

Table 4.1 – Curve Number Area Weighting for Existing and Proposed Conditions Model

Curve Number Area Weighting for Existing and Proposed Conditions Models													
		% IMPERV B SOIL	% IMPERV C SOIL	% IMPERV D SOIL	% LAWN B SOIL	% LAWN C SOIL	% LAWNS D SOIL	% VEG A SOIL	% VEG B SOIL	% VEG C SOIL	% VEG D SOIL	% WATER B SOIL	% WATER C SOIL
BASIN ID	CN	98	98	98	61	74	80	25	55	70	77	98	98
SUB-10234	72.4	30.84	0.0	0.0	69.16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SUB-10235	89.8	77.89	0.0	0.0	22.11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SUB-10237	74.1	35.45	0.0	0.0	64.55	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SUB-10238	79.4	49.63	0.0	0.0	50.37	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SUB-12106	74.4	36.25	0.0	0.0	63.75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SUB-12107	74.1	37.36	0.0	0.0	51.18	0.0	0.0	0.0	11.47	0.0	0.0	0.0	0.0
SUB-12108	72.9	32.22	0.0	0.0	67.78	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SUB-12109	70.7	26.35	0.0	0.0	73.65	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SUB-12110	71.9	29.52	0.0	0.0	70.48	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SUB-12111	75.3	38.66	0.0	0.0	61.34	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SUB-12113	78.6	47.55	0.0	0.0	51.98	0.0	0.0	0.0	0.47	0.0	0.0	0.0	0.0
SUB-12115	66.7	22.89	0.0	0.0	30.82	0.0	0.0	0.0	46.29	0.0	0.0	0.0	0.0
SUB-12116	81.0	54.04	0.0	0.0	45.96	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SUB-12118	69.4	22.79	0.0	0.0	77.21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SUB-12119	65.8	23.9	0.0	0.0	9.39	0.0	0.0	0.0	66.71	0.0	0.0	0.0	0.0
SUB-12121	76.3	41.45	0.0	0.0	58.55	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SUB-12122	73.5	34.75	0.0	0.0	58.5	0.0	0.0	0.0	6.75	0.0	0.0	0.0	0.0
SUB-12124	59.6	5.12	0.0	0.0	40.02	0.0	0.0	0.0	54.86	0.0	0.0	0.0	0.0
SUB-12125	69.8	24.92	0.0	0.0	68.09	0.0	0.0	0.0	6.99	0.0	0.0	0.0	0.0
SUB-12126	72.6	32.48	0.0	0.0	60.63	0.0	0.0	0.0	6.89	0.0	0.0	0.0	0.0
SUB-12127	79.6	50.36	0.0	0.0	49.64	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SUB-12129	69.0	21.56	0.0	0.0	78.44	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SUB-90002	65.1	18.52	0.0	0.0	35.81	0.0	0.0	0.0	45.66	0.0	0.0	0.0	0.0
SUB-90003	63.9	16.49	0.0	0.0	29.79	0.0	0.0	0.0	53.72	0.0	0.0	0.0	0.0
SUB-92001	65.4	19.41	0.0	0.0	33.87	0.0	0.0	0.0	46.72	0.0	0.0	0.0	0.0

Table 4.2 – Pipe Summary for Existing Model 25-YR Storm Event

Pipe Summary for Existing Model 25-YR Storm Event												
CONDUIT #	UP-STREAM NODE	DOWN-STREAM NODE	PIPE LENGTH (FT.)	RIM ELEV. (UPSTREAM) (FT.)	INLET INVERT ELEV. (FT.)	OUTLET INVERT ELEV. (FT.)	PIPE SLOPE (%)	PIPE DIA. (IN.)	MANNING'S ROUGHNESS	MAX HGL AT US NODE	PEAK FLOW (CFS)	PEAK VELOCITY (FPS)
01506	12110	12111	62.16	1110.71	1102.71	1099.03	0.06	2.0	0.024	1104.21	18.58	7.41
01992	10237	10238	30.20	1068.48	1062.65	1061.71	0.03	1.5	0.024	1063.36	4.01	5.11
02676	12118	12119	35.04	1093.39	1085.34	1084.91	0.01	3.0	0.024	1089.10	43.94	6.35
02677	12119	12123	35.41	1093.06	1083.82	1082.29	0.04	2.5	0.015	1088.09	44.91	12.34
02678	10234	10235	33.61	1050.55	1045.30	1044.77	0.02	1.5	0.024	1050.67	10.6	6
02678_OL	10234	92003	262.77	1050.55	1050.55	1033.20	0.07	0.0	0.010	1050.67	0.54	2.81
02679	10235	10236	135.92	1050.77	1044.52	1041.50	0.02	1.5	0.024	1049.29	11.32	7.31
02679_OL	10235	92002	276.90	1050.77	1050.77	1033.00	0.06	0.0	0.010	1049.29	0	0
03119	12120	12110	194.39	1118.34	1108.00	1102.46	0.03	1.5	0.024	1113.56	11.86	6.71
03120	12121	12120	92.69	1120.53	1115.20	1108.00	0.08	1.5	0.024	1118.43	11.86	7.45
03120_OL	12121	12110	319.27	1120.53	1120.53	1110.71	0.03	0.0	0.020	1118.43	0	0
03121	12122	12121	35.04	1120.75	1116.57	1115.28	0.04	1.5	0.024	1119.38	7.85	5.85
03121_ol	12122	12121	37.72	1120.75	1120.75	1120.53	0.01	0.0	0.010	1119.38	0	0
03266	12109	12108	59.78	1104.99	1098.91	1098.06	0.01	2.5	0.013	1100.66	26.26	8.35
03347	10238	10240	133.01	1068.13	1061.55	1052.78	0.07	1.5	0.024	1062.25	6.12	7.75
04093	12129	12109	114.39	1111.30	1105.80	1098.91	0.06	2.5	0.024	1106.83	19.08	6.85
04253	12106	12107	33.85	1105.94	1100.36	1098.63	0.05	1.5	0.015	1101.34	9.24	9.11
04254	12108	12107	118.37	1103.56	1098.06	1094.80	0.03	2.5	0.015	1099.66	29.44	6.85
04497	12127	12128	76.70	1122.46	1111.96	1108.00	0.05	2.5	0.015	1112.84	17.54	8.9
04498	12128	12129	63.81	1118.97	1108.00	1105.80	0.03	2.5	0.024	1109.24	17.51	8.16
05070	12124	12125	73.30	1128.20	1125.00	1121.00	0.05	1.5	0.024	1125.64	4.25	6.6
05071	12125	12126	102.19	1125.05	1120.00	1113.70	0.06	2.5	0.024	1121.54	6.13	5.54
05072	12126	12127	35.82	1122.87	1113.37	1112.21	0.03	2.5	0.024	1114.66	14.82	6.59
05208	12112	12113	161.31	1100.06	1095.50	1092.92	0.02	2.0	0.024	1099.16	19.82	6.45
05209	12113	12114	35.47	1096.71	1092.74	1090.09	0.07	2.0	0.015	1094.90	27.67	10.27
05209_OL	12113	12114	39.09	1096.71	1096.71	1090.09	0.17	0.0	0.010	1094.90	0	0
05210	12115	12116	17.92	1092.41	1086.93	1086.22	0.04	1.5	0.015	1091.75	19.6	11.09
05369	12116	12118	52.12	1096.50	1086.45	1085.59	0.02	3.0	0.024	1090.45	43.87	6.21
05470	12111	12112	103.42	1106.78	1099.20	1095.50	0.04	2.0	0.024	1102.54	19.81	6.39

05470_OL	12111	12113	289.52	1106.78	1106.78	1096.71	0.03	0.0	0.010	1102.54	0	0
06890	12107	25007	157.80	1105.80	1094.72	1093.80	0.01	3.0	0.015	1098.35	44.22	10.07
08198	90002	90001	430.71	1045.89	1045.89	1032.20	0.03	0.0	0.000	1047.57	62.42	5.13
08199	10236	90001	31.69	1041.50	1041.50	1032.20	0.31	0.0	0.000	1042.46	11.32	4.55
08200	90001	90003	170.14	1032.20	1032.20	1029.07	0.02	0.0	0.000	1033.75	76.35	4.25
08201	10240	90002	32.70	1052.78	1052.78	1045.89	0.22	0.0	0.000	1053.10	6.12	0.70
08202	12123	90002	537.73	1082.29	1082.29	1045.89	0.07	0.0	0.000	1083.26	44.85	3.80
08208	12114	94001	25.00	1091.72	1090.09	1089.00	0.04	0.0	0.000	1093.04	24.86	1.08
08209	25007	94001	11.00	1093.80	1093.80	1093.50	0.03	0.0	0.000	1094.37	44.21	3.08
91001	90003	92001	239.24	1029.07	1029.07	1020.76	0.03	0.0	0.000	1030.38	81.19	5.19

Table 4.3 – Pipe Summary for Existing Model 100-YR Storm Event

Pipe Summary for Existing Model 100-YR Storm Event												
CONDUIT #	UP-STREAM NODE	DOWN-STREAM NODE	PIPE LENGTH (FT.)	RIM ELEV. (UPSTREAM) (FT.)	INLET INVERT ELEV. (FT.)	OUTLET INVERT ELEV. (FT.)	PIPE SLOPE (%)	PIPE DIA. (IN.)	MANNING'S ROUGHNESS	MAX HGL AT US NODE	PEAK FLOW (CFS)	PEAK VELOCITY (FPS)
01506	12110	12111	62.16	1110.71	1102.71	1099.03	0.06	2.0	0.024	1108.82	22.91	7.52
01992	10237	10238	30.20	1068.48	1062.65	1061.71	0.03	1.5	0.024	1063.49	5.25	5.45
02676	12118	12119	35.04	1093.39	1085.34	1084.91	0.01	3.0	0.024	1091.35	53.57	7.58
02677	12119	12123	35.41	1093.06	1083.82	1082.29	0.04	2.5	0.015	1089.85	54.7	14.56
02678	10234	10235	33.61	1050.55	1045.30	1044.77	0.02	1.5	0.024	1050.82	11.42	6.46
02678_OL	10234	92003	262.77	1050.55	1050.55	1033.20	0.07	0.0	0.010	1050.82	4.71	4.82
02679	10235	10236	135.92	1050.77	1044.52	1041.50	0.02	1.5	0.024	1049.49	11.49	7.4
02679_OL	10235	92002	276.90	1050.77	1050.77	1033.00	0.06	0.0	0.010	1049.49	0	0
03119	12120	12110	194.39	1118.34	1108.00	1102.46	0.03	1.5	0.024	1116.73	12.32	6.97
03120	12121	12120	92.69	1120.53	1115.20	1108.00	0.08	1.5	0.024	1120.83	12.32	7.39
03120_OL	12121	12110	319.27	1120.53	1120.53	1110.71	0.03	0.0	0.020	1120.83	4.26	3.53
03121	12122	12121	35.04	1120.75	1116.57	1115.28	0.04	1.5	0.024	1121.17	8.56	5.91
03121_ol	12122	12121	37.72	1120.75	1120.75	1120.53	0.01	0.0	0.010	1121.17	5.98	2.49
03266	12109	12108	59.78	1104.99	1098.91	1098.06	0.01	2.5	0.013	1104.27	35.42	8.49
03347	10238	10240	133.01	1068.13	1061.55	1052.78	0.07	1.5	0.024	1062.37	7.95	8.25
04093	12129	12109	114.39	1111.30	1105.80	1098.91	0.06	2.5	0.024	1107.09	26.24	6.93
04253	12106	12107	33.85	1105.94	1100.36	1098.63	0.05	1.5	0.015	1102.31	12.04	9.32
04254	12108	12107	118.37	1103.56	1098.06	1094.80	0.03	2.5	0.015	1103.06	39.77	8.1
04497	12127	12128	76.70	1122.46	1111.96	1108.00	0.05	2.5	0.015	1113.03	23.66	9.39
04498	12128	12129	63.81	1118.97	1108.00	1105.80	0.03	2.5	0.024	1109.49	23.64	8.65
05070	12124	12125	73.30	1128.20	1125.00	1121.00	0.05	1.5	0.024	1125.81	6.19	7.31
05071	12125	12126	102.19	1125.05	1120.00	1113.70	0.06	2.5	0.024	1121.65	8.69	5.6
05072	12126	12127	35.82	1122.87	1113.37	1112.21	0.03	2.5	0.024	1114.95	20.22	7.05
05208	12112	12113	161.31	1100.06	1095.50	1092.92	0.02	2.0	0.024	1101.35	21.3	6.78
05209	12113	12114	35.47	1096.71	1092.74	1090.09	0.07	2.0	0.015	1096.05	29.95	10.18
05209_OL	12113	12114	39.09	1096.71	1096.71	1090.09	0.17	0.0	0.010	1096.05	0	0
05210	12115	12116	17.92	1092.41	1086.93	1086.22	0.04	1.5	0.015	1093.53	19.6	11.09
05369	12116	12118	52.12	1096.50	1086.45	1085.59	0.02	3.0	0.024	1093.33	53.48	7.57
05470	12111	12112	103.42	1106.78	1099.20	1095.50	0.04	2.0	0.024	1106.13	24.25	7.72

05470_OL	12111	12113	289.52	1106.78	1106.78	1096.71	0.03	0.0	0.010	1106.13	0	0
06890	12107	25007	157.80	1105.80	1094.72	1093.80	0.01	3.0	0.015	1100.95	60.14	13.29
08198	90002	90001	430.71	1045.89	1045.89	1032.20	0.03	0.0	0.000	1047.81	86.31	5.58
08199	10236	90001	31.69	1041.50	1041.50	1032.20	0.31	0.0	0.000	1042.46	11.49	4.43
08200	90001	90003	170.14	1032.20	1032.20	1029.07	0.02	0.0	0.000	1034.05	111.46	4.75
08201	10240	90002	32.70	1052.78	1052.78	1045.89	0.22	0.0	0.000	1053.14	7.94	0.72
08202	12123	90002	537.73	1082.29	1082.29	1045.89	0.07	0.0	0.000	1083.37	54.68	4.14
08208	12114	94001	25.00	1091.72	1090.09	1089.00	0.04	0.0	0.000	1093.91	26.34	1.07
08209	25007	94001	11.00	1093.80	1093.80	1093.50	0.03	0.0	0.000	1094.47	60.09	3.42
91001	90003	92001	239.24	1029.07	1029.07	1020.76	0.03	0.0	0.000	1030.66	119.94	5.76

Table 4.4 – Pipe Summary for Proposed Model 25-YR Storm Event

Pipe Summary for Proposed Model 25-YR Storm Event												
CONDUIT #	UP-STREAM NODE	DOWN-STREAM NODE	PIPE LENGTH (FT.)	RIM ELEV. (UPSTREAM) (FT.)	INLET INVERT ELEV. (FT.)	OUTLET INVERT ELEV. (FT.)	PIPE SLOPE (%)	PIPE DIA. (IN.)	MANNING'S ROUGHNESS	MAX HGL AT US NODE	PEAK FLOW (CFS)	PEAK VELOCITY (FPS)
01506	12110	12111	62.16	1110.71	1102.71	1099.03	0.06	2.0	0.024	1104.22	18.52	7.4
01992	10237	10238	30.20	1068.48	1062.65	1061.71	0.03	1.5	0.024	1063.36	4.01	5.11
02676	12118	12119	35.04	1093.39	1085.34	1084.91	0.01	3.0	0.024	1088.32	39.65	6.35
02677	12119	12123	35.41	1093.06	1083.82	1082.29	0.04	2.5	0.015	1087.36	40.44	11.3
02678	10234	10235	33.61	1050.55	1045.30	1044.77	0.02	1.5	0.024	1050.67	10.6	6
02678_OL	10234	92003	262.77	1050.55	1050.55	1033.20	0.07	0.0	0.010	1050.67	0.54	2.81
02679	10235	10236	135.92	1050.77	1044.52	1041.50	0.02	1.5	0.024	1049.29	11.32	7.31
02679_OL	10235	92002	276.90	1050.77	1050.77	1033.00	0.06	0.0	0.010	1049.29	0	0
03119	12120	12110	194.39	1118.34	1108.00	1102.46	0.03	1.5	0.024	1113.57	11.85	6.71
03120	12121	12120	92.69	1120.53	1115.20	1108.00	0.08	1.5	0.024	1118.44	11.85	7.45
03120_OL	12121	12110	319.27	1120.53	1120.53	1110.71	0.03	0.0	0.020	1118.44	0	0
03121	12122	12121	35.04	1120.75	1116.57	1115.28	0.04	1.5	0.024	1119.39	7.85	5.85
03121_ol	12122	12121	37.72	1120.75	1120.75	1120.53	0.01	0.0	0.010	1119.39	0	0
03266	12109	12108	59.78	1104.99	1098.91	1098.06	0.01	2.5	0.013	1100.66	26.26	8.35
03347	10238	10240	133.01	1068.13	1061.55	1052.78	0.07	1.5	0.024	1062.25	6.12	7.75
04093	12129	12109	114.39	1111.30	1105.80	1098.91	0.06	2.5	0.024	1106.83	19.08	6.85
04253	12106	12107	33.85	1105.94	1100.36	1098.63	0.05	1.5	0.015	1101.34	9.24	9.11
04254	12108	12107	118.37	1103.56	1098.06	1094.80	0.03	2.5	0.015	1099.66	29.44	6.85
04497	12127	12128	76.70	1122.46	1111.96	1108.00	0.05	2.5	0.015	1112.84	17.54	8.9
04498	12128	12129	63.81	1118.97	1108.00	1105.80	0.03	2.5	0.024	1109.24	17.51	8.16
05070	12124	12125	73.30	1128.20	1125.00	1121.00	0.05	1.5	0.024	1125.64	4.25	6.6
05071	12125	12126	102.19	1125.05	1120.00	1113.70	0.06	2.5	0.024	1121.54	6.13	5.54
05072	12126	12127	35.82	1122.87	1113.37	1112.21	0.03	2.5	0.024	1114.66	14.82	6.59
05208	12112	12113	161.31	1100.06	1095.50	1092.92	0.02	2.0	0.024	1100.06	19.76	6.64
05209	12113	12114	35.47	1096.71	1092.74	1090.09	0.07	2.0	0.015	1094.47	27.73	11.04
05209_OL	12113	12114	39.09	1096.71	1096.71	1090.09	0.17	0.0	0.010	1094.47	0	0
05210	94001	12116	17.92	#N/A	1086.93	1086.45	0.03	1.5	0.015	#N/A	26.18	14.81
05369	12116	12118	52.12	1096.50	1086.45	1085.59	0.02	3.0	0.024	1089.41	39.62	5.85
05470	12111	12112	103.42	1106.78	1099.20	1095.50	0.04	2.0	0.024	1102.55	19.76	6.39

05470_OL	12111	12113	289.52	1106.78	1106.78	1096.71	0.03	0.0	0.010	1102.55	0	0
06890	12107	25007	157.80	1105.80	1094.72	1093.80	0.01	3.0	0.015	1098.35	44.22	10.07
08198	90002	90001	430.71	1045.89	1045.89	1032.20	0.03	0.0	0.000	1047.50	56.1	4.99
08199	10236	90001	31.69	1041.50	1041.50	1032.20	0.31	0.0	0.000	1042.46	11.32	4.67
08200	90001	90003	170.14	1032.20	1032.20	1029.07	0.02	0.0	0.000	1033.74	75.9	4.23
08201	10240	90002	32.70	1052.78	1052.78	1045.89	0.22	0.0	0.000	1053.10	6.12	0.68
08202	12123	90002	537.73	1082.29	1082.29	1045.89	0.07	0.0	0.000	1083.21	40.32	3.65
08208	12114	94001	25.00	1091.72	1090.09	1089.00	0.04	0.0	0.000	1092.82	29.84	2.86
08209	25007	94001	11.00	1093.80	1093.80	1093.50	0.03	0.0	0.000	1094.37	44.21	3.08
91001	90003	92001	239.24	1029.07	1029.07	1020.76	0.03	0.0	0.000	1030.39	81.71	5.19

Table 4.5 – Pipe Summary for Proposed Model 100-YR Storm Event

Pipe Summary for Proposed Model 100-YR Storm Event												
CONDUIT #	UP-STREAM NODE	DOWN-STREAM NODE	PIPE LENGTH (FT.)	RIM ELEV. (UPSTREAM) (FT.)	INLET INVERT ELEV. (FT.)	OUTLET INVERT ELEV. (FT.)	PIPE SLOPE (%)	PIPE DIA. (IN.)	MANNING'S ROUGHNESS	MAX HGL AT US NODE	PEAK FLOW (CFS)	PEAK VELOCITY (FPS)
01506	12110	12111	62.16	1110.71	1102.71	1099.03	0.06	2.0	0.024	1108.70	22.92	7.52
01992	10237	10238	30.20	1068.48	1062.65	1061.71	0.03	1.5	0.024	1063.49	5.25	5.45
02676	12118	12119	35.04	1093.39	1085.34	1084.91	0.01	3.0	0.024	1091.15	52.7	7.46
02677	12119	12123	35.41	1093.06	1083.82	1082.29	0.04	2.5	0.015	1089.70	53.83	14.37
02678	10234	10235	33.61	1050.55	1045.30	1044.77	0.02	1.5	0.024	1050.82	11.41	6.46
02678_OL	10234	92003	262.77	1050.55	1050.55	1033.20	0.07	0.0	0.010	1050.82	4.71	4.82
02679	10235	10236	135.92	1050.77	1044.52	1041.50	0.02	1.5	0.024	1049.49	11.49	7.4
02679_OL	10235	92002	276.90	1050.77	1050.77	1033.00	0.06	0.0	0.010	1049.49	0	0
03119	12120	12110	194.39	1118.34	1108.00	1102.46	0.03	1.5	0.024	1116.70	12.35	6.99
03120	12121	12120	92.69	1120.53	1115.20	1108.00	0.08	1.5	0.024	1120.83	12.36	7.39
03120_OL	12121	12110	319.27	1120.53	1120.53	1110.71	0.03	0.0	0.020	1120.83	4.21	3.52
03121	12122	12121	35.04	1120.75	1116.57	1115.28	0.04	1.5	0.024	1121.17	8.55	5.91
03121_ol	12122	12121	37.72	1120.75	1120.75	1120.53	0.01	0.0	0.010	1121.17	5.97	2.49
03266	12109	12108	59.78	1104.99	1098.91	1098.06	0.01	2.5	0.013	1104.11	35.43	8.49
03347	10238	10240	133.01	1068.13	1061.55	1052.78	0.07	1.5	0.024	1062.37	7.95	8.25
04093	12129	12109	114.39	1111.30	1105.80	1098.91	0.06	2.5	0.024	1107.09	26.24	6.92
04253	12106	12107	33.85	1105.94	1100.36	1098.63	0.05	1.5	0.015	1102.32	12.05	9.32
04254	12108	12107	118.37	1103.56	1098.06	1094.80	0.03	2.5	0.015	1103.06	39.77	8.1
04497	12127	12128	76.70	1122.46	1111.96	1108.00	0.05	2.5	0.015	1113.03	23.67	9.39
04498	12128	12129	63.81	1118.97	1108.00	1105.80	0.03	2.5	0.024	1109.49	23.64	8.65
05070	12124	12125	73.30	1128.20	1125.00	1121.00	0.05	1.5	0.024	1125.81	6.19	7.31
05071	12125	12126	102.19	1125.05	1120.00	1113.70	0.06	2.5	0.024	1121.65	8.69	5.6
05072	12126	12127	35.82	1122.87	1113.37	1112.21	0.03	2.5	0.024	1114.95	20.23	7.05
05208	12112	12113	161.31	1100.06	1095.50	1092.92	0.02	2.0	0.024	1101.19	21.44	6.82
05209	12113	12114	35.47	1096.71	1092.74	1090.09	0.07	2.0	0.015	1095.81	30.2	10.8
05209_OL	12113	12114	39.09	1096.71	1096.71	1090.09	0.17	0.0	0.010	1095.81	0	0
05210	94001	12116	17.92	#N/A	1086.93	1086.45	0.03	1.5	0.015	#N/A	26.16	14.8
05369	12116	12118	52.12	1096.50	1086.45	1085.59	0.02	3.0	0.024	1093.06	52.62	7.44
05470	12111	12112	103.42	1106.78	1099.20	1095.50	0.04	2.0	0.024	1106.01	24.28	7.73

05470_OL	12111	12113	289.52	1106.78	1106.78	1096.71	0.03	0.0	0.010	1106.01	0	0
06890	12107	25007	157.80	1105.80	1094.72	1093.80	0.01	3.0	0.015	1100.95	60.16	13.3
08198	90002	90001	430.71	1045.89	1045.89	1032.20	0.03	0.0	0.000	1047.77	81.98	5.51
08199	10236	90001	31.69	1041.50	1041.50	1032.20	0.31	0.0	0.000	1042.46	11.49	4.58
08200	90001	90003	170.14	1032.20	1032.20	1029.07	0.02	0.0	0.000	1034.01	106.41	4.68
08201	10240	90002	32.70	1052.78	1052.78	1045.89	0.22	0.0	0.000	1053.14	7.94	0.71
08202	12123	90002	537.73	1082.29	1082.29	1045.89	0.07	0.0	0.000	1083.36	53.82	4.11
08208	12114	94001	25.00	1091.72	1090.09	1089.00	0.04	0.0	0.000	1093.69	28.18	2.77
08209	25007	94001	11.00	1093.80	1093.80	1093.50	0.03	0.0	0.000	1094.47	60.11	3.42
91001	90003	92001	239.24	1029.07	1029.07	1020.76	0.03	0.0	0.000	1030.63	114.82	5.7

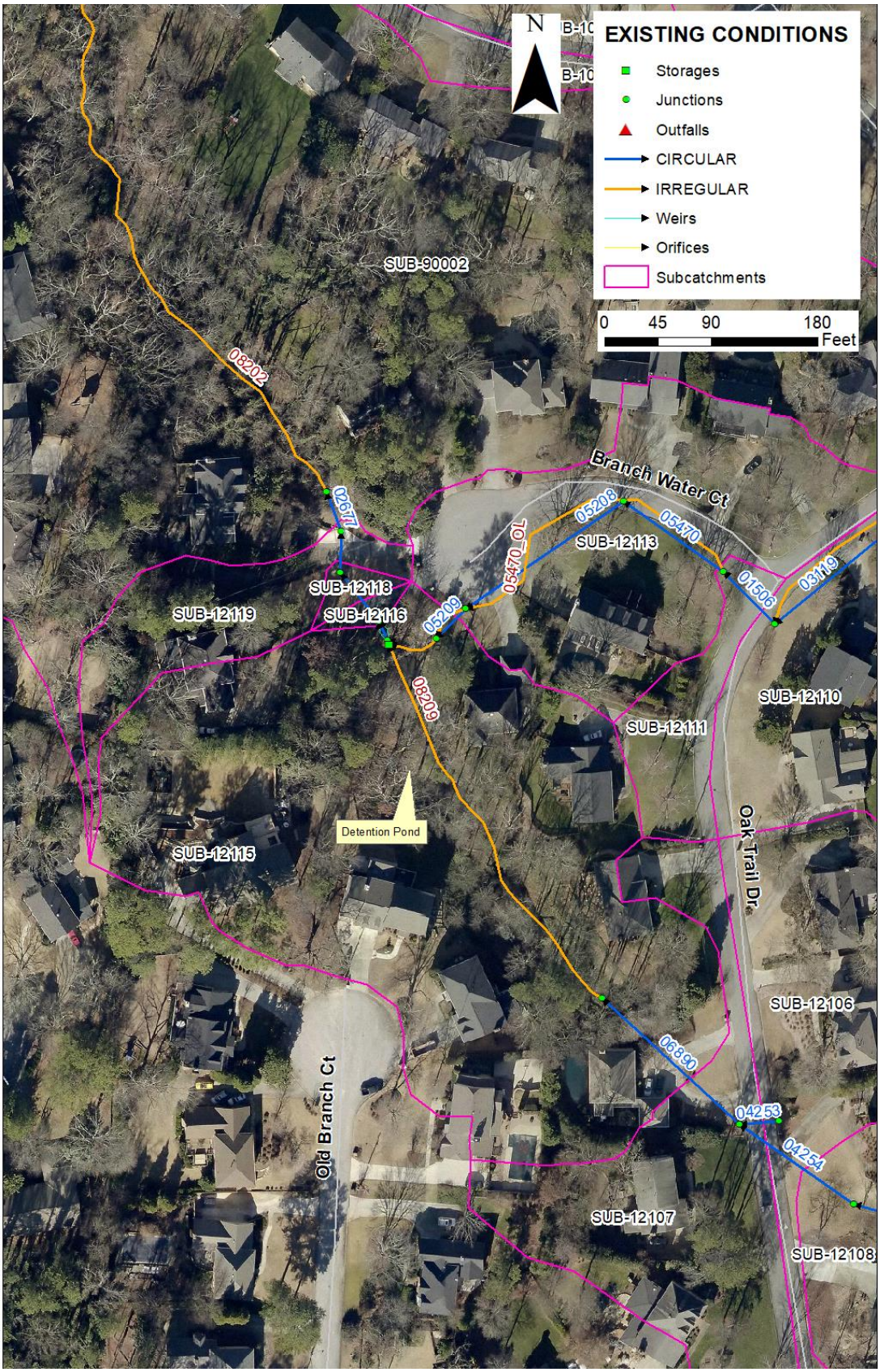


Figure 4.1 – Closeup Project Area Image of the Existing Hydraulic Model

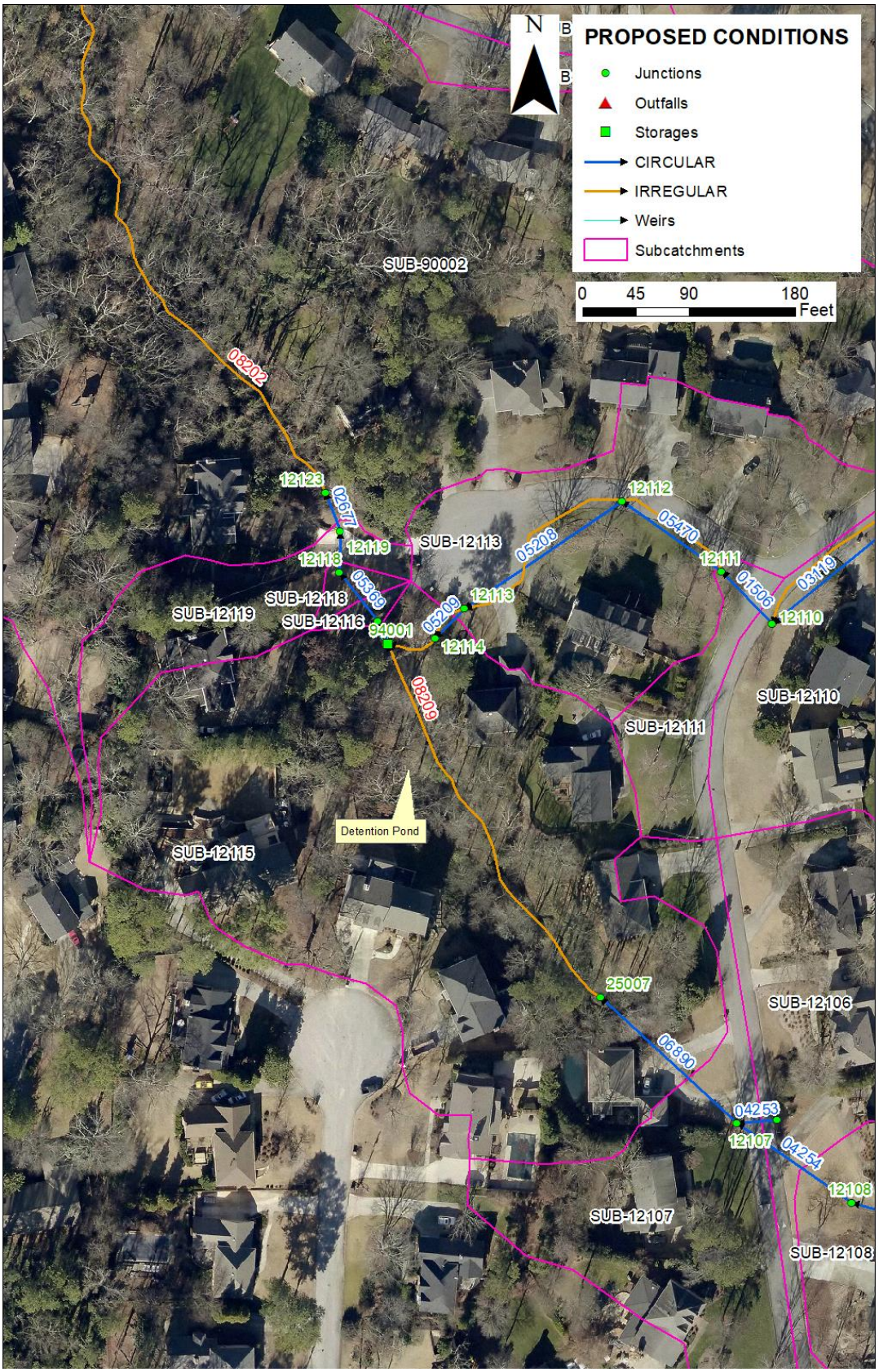
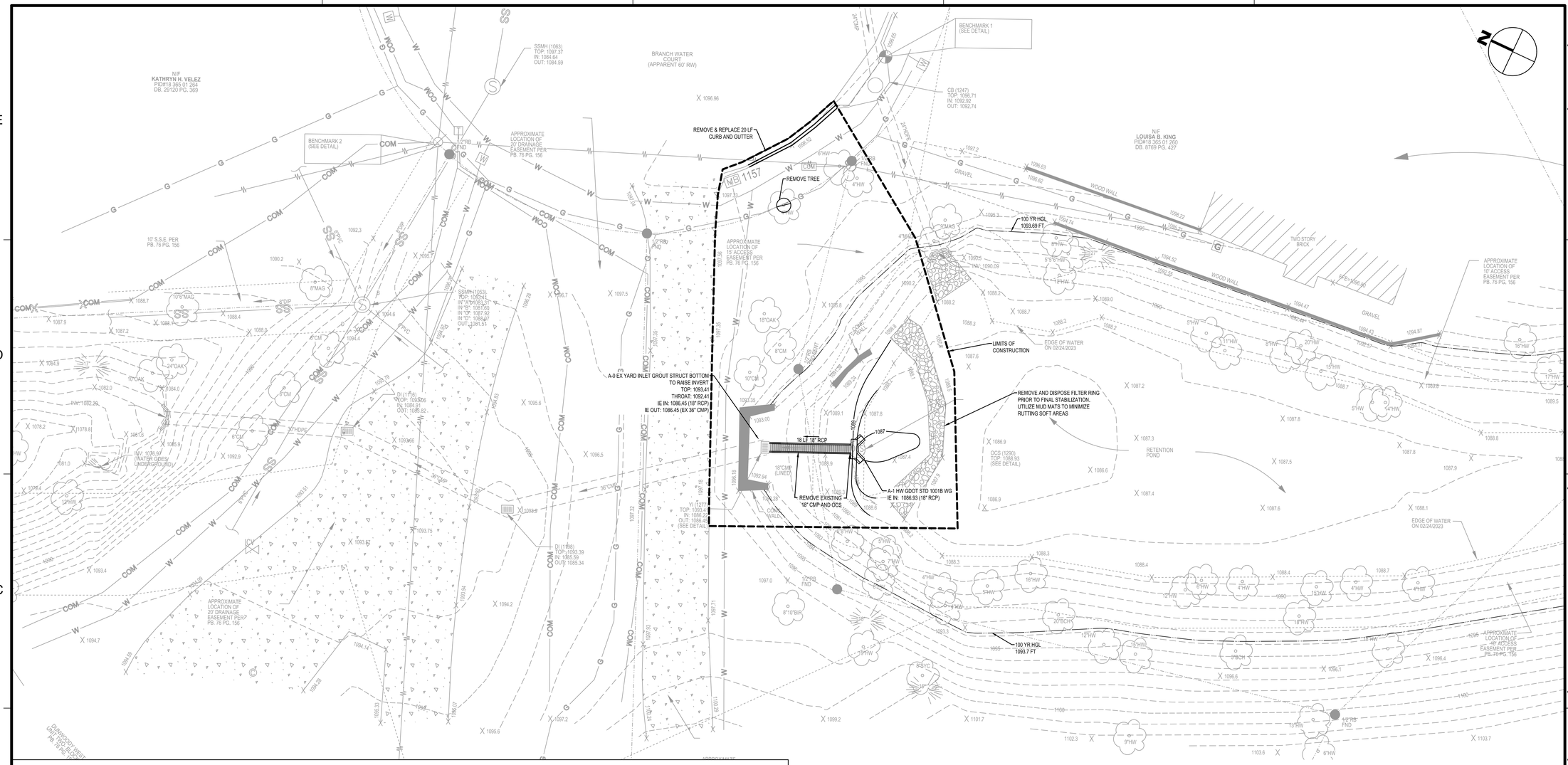
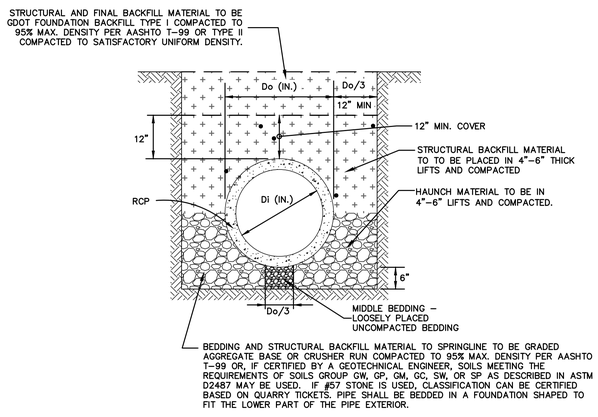


Figure 4.2 – Close-up Project Area Image of the Proposed Hydraulic Model



STANDARD PIPE BEDDING AND BACKFILL DETAIL
RCP

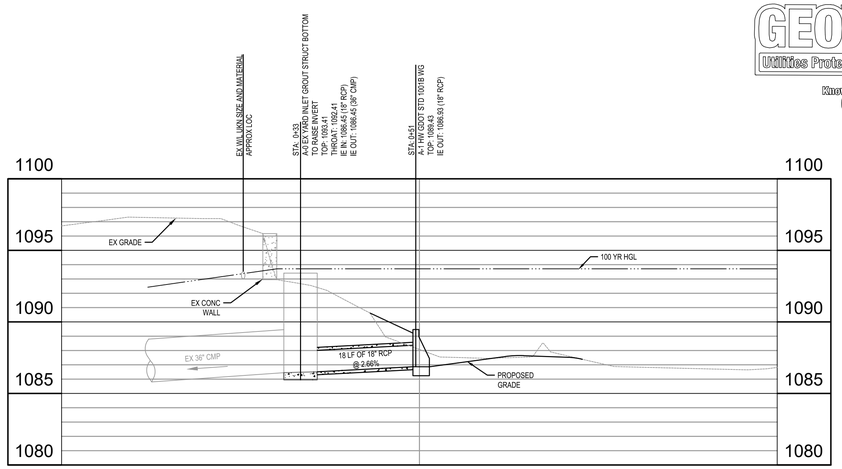


GENERAL NOTES:

1.) TRENCH BOTTOMS SHOULD BE FREE OF LARGE STONES, CLUMPS OF SOIL, FROZEN SOIL AND DEBRIS. WHERE AN INCOMPRESSIBLE FOUNDATION EXISTS, EXCAVATE AN ADDITIONAL 6". WHERE AN UNSTABLE FOUNDATION IS ENCOUNTERED, EXCAVATE AN ADDITIONAL DEPTH AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER AND BACKFILL WITH GDOT FOUNDATION BACKFILL TYPE II.

2.) GROUNDWATER MAY CAUSE MIGRATION OF FINES WHEN COARSE AND OPEN-GRADED MATERIAL IS PLACED ADJACENT TO A FINER MATERIAL. USE GEOTEXTILE FILTER FABRIC TO MINIMIZE SUCH MIGRATION.

3.) BELL HOLES SHALL BE EXCAVATED IN THE BEDDING WHEN INSTALLING PIPE WITH EXTENDED BELLS SO THAT THE PIPE IS SUPPORTED BY THE BARREL AND NOT BY THE BELLS.



SCALE: HORIZONTAL 1"=10' VERTICAL 1"=2'

GEORGIA811 Utilities Protection Center, Inc
Know what's below. Call before you dig.

Dewberry

DEWBERRY ENGINEERS INC.
2835 Brandywine Road
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678.530.0022
License No. PEF002398
Expires 6/30/2024

BRANCH WATER COURT OCS DESIGN

CITY OF DUNWOODY
4800 ASHFORD DUNWOOD RD NE
DUNWOODY, GA 30338

SEAL

GEORGIA REGISTERED PROFESSIONAL ENGINEER EMMA JEAN BONES No. 041871

CITY APPROVAL

SCALE
0' 5' 10' 20'
SCALE: 1" = 10'

NO.	DESCRIPTION	DATE
3	100 PERCENT SUBMITTAL	07/31/2023
2	90PCT SUBMITTAL	06/06/2023
1	CONCEPT PLAN	04/13/2023

REVISIONS

DRAWN BY	JJ
APPROVED BY	SF
CHECKED BY	EB
DATE	07/31/2023

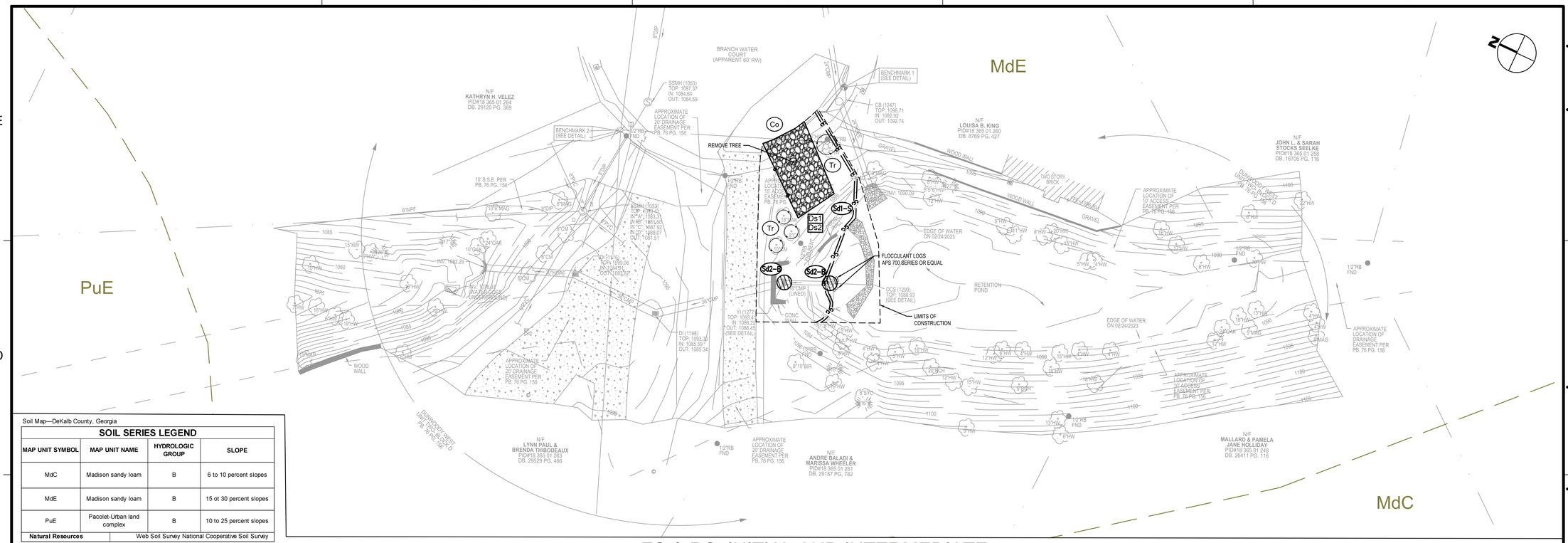
TITLE

CONSTRUCTION PLAN

PROJECT NO. 50158594

CU-101

SHEET NO.



Soil Map—DeKalb County, Georgia

SOIL SERIES LEGEND

MAP UNIT SYMBOL	MAP UNIT NAME	HYDROLOGIC GROUP	SLOPE
MdC	Madison sandy loam	B	6 to 10 percent slopes
MdE	Madison sandy loam	B	15 to 30 percent slopes
PuE	Pacolet-Urban land complex	B	10 to 25 percent slopes
Natural Resources	Web Soil Survey National Cooperative Soil Survey		

LEGEND

Ds3 Ss	PERMANENT SEEDING WITH ORGANIC MATERIAL FILTER BLANKET
Ds4	PERMANENT SODDING

EMMA BONES, PE
LEVEL II CERTIFIED DESIGN PROFESSIONAL
GSWCC CERTIFICATION NO. 87789
EXPIRES 05/03/2025

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BRANCH WATER COURT OCS DESIGN
CITY OF DUNWOODY
4800 ASHFORD DUNWOODY RD NE
DUNWOODY, GA 30338

SEAL

GEORGIA REGISTERED PROFESSIONAL ENGINEER EMMA JEAN BONES PE. 041871

COUNTY APPROVAL

SCALE
0' 10' 20' 40'
SCALE: 1" = 20'

NO.	DESCRIPTION	DATE
2	100 PERCENT SUBMITTAL	07/31/2023
1	90 PERCENT SUBMITTAL	06/06/2023

REVISIONS

DRAWN BY	JJ
APPROVED BY	SF
CHECKED BY	EB
DATE	07/31/2023

TITLE

ES&PC PLAN

PROJECT NO. 50158594

EC-101

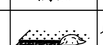
SHEET NO.

UNIFORM CODING SYSTEM

FOR SOIL EROSION AND SEDIMENT CONTROL PRACTICES

GEORGIA SOIL AND WATER CONSERVATION COMMISSION

STRUCTURAL PRACTICES

CODE	PRACTICE	DETAIL	MAP SYMBOL	DESCRIPTION
Sd1-S	SEDIMENT BARRIER			A barrier to prevent sediment from leaving the construction site. It may be sandbags, bales of straw or hay, brush, logs and poles, gravel, or a silt fence.
Sd2	INLET SEDIMENT TRAP			An impounding area created by excavating around a storm drain drop inlet. The excavated area will be filled and stabilized on completion of construction activities.
Tp	TOPSOILING			The practice of stripping off the more fertile soil, storing it, then spreading it over the disturbed area after completion of construction activities.
Tr	TREE PROTECTION			To protect desirable trees from injury during construction activity.

VEGETATIVE PRACTICES

CODE	PRACTICE	DETAIL	MAP SYMBOL	DESCRIPTION
Ds1	DISTURBED AREA STABILIZATION (WITH MULCHING ONLY)		Ds1	Establishing temporary protection for disturbed areas where seedlings may not have a suitable growing season to produce an erosion retarding cover.
Ds2	DISTURBED AREA STABILIZATION (WITH TEMP SEEDING)		Ds2	Establishing a temporary vegetative cover with fast growing seedings on disturbed areas.
Ds3	DISTURBED AREA STABILIZATION (WITH PERM SEEDING)		Ds3	Establishing a permanent vegetative cover such as trees, shrubs, vines, grasses, or legumes on disturbed areas.
Ss	SLOPE STABILIZATION		Ss	A protective covering used to prevent erosion and establish temporary or permanent vegetation on steep slopes, shore lines, or channels.

TYPE OF SPECIES	YEAR	ANALYSIS OR EQUIVALENT N–P–K	RATE	N TOP DRESSING RATE
1. COOL SEASON GRASSES	FIRST SECOND MAINTENANCE	6–12–12 6–12–12 10–10–10	1500 LBS/AC 1000 LBS/AC 400 LBS/AC	50–100 LBS/AC 1/2/ – 30
2. COOL SEASON GRASSES AND LEGUMES	FIRST SECOND MAINTENANCE	6–12–12 0–10–10 0–10–10	1500 LSB/AC 1000 LBS/AC 400 LBS/AC	0–50 LBS/AC 1/ – –
3. GROUND COVERS	FIRST SECOND MAINTENANCE	10–10–10 10–10–10 10–10–10	1300 LBS/AC 3/ 1300 LBS/AC 3/ 1100 LBS/AC	– – –
4. SHRUBS LESPEDEZA	FIRST MAINTENANCE	0–10–10 0–10–10	700 LBS/AC 700 LBS/AC 4/	– –
5. TEMPORARY COVER CROPS SEEDED ALONE	FIRST	10–10–10	500 LBS/AC	30 LBS/AC 5/
6. WARM SEASON GRASSES	FIRST SECOND MAINTENANCE	6–12–12 6–12–12 10–10–10	1500 LBS/AC 800 LBS/AC 400 LBS/AC	50–100 LBS/AC 2/6/ 50–100 LBS/AC 2/ 30 LBS/AC
7. WARM SEASON GRASSES AND LEGUMES	FIRST SECOND MAINTENANCE	6–12–12 0–10–10 0–10–10	1500 LBS/AC 1000 LBS/AC 400 LBS/AC	50 LBS/AC 6/

MULCHING RATES:
1. DRY STRAW: 2 TONS PER ACRE.
2. DRY HAY: 2–1/2 TONS PER ACRE.
3. FOR HYDRAULIC SEEDING USE WOOD CELLULOSE MULCH OR WOOD PULP FIBER AT THE RATE OF 500 POUNDS PER ACRE.

1/ APPLY IN SPRING FOLLOWING SEEDING.
2/ APPLY IN SPLIT APPLICATIONS WHEN HIGH RATES ARE USED.
3/ APPLY IN 3 SPLIT APPLICATIONS.
4/ APPLY WHEN PLANTS ARE PRUNED.
5/ APPLY TO GRASS SPECIES ONLY.
6/ APPLY WHEN PLANTS GROW TO A HEIGHT OF 2 TO 4 INCHES.

FERTILIZER AND MULCHING REQUIREMENTS

SCALE:NTS E41

Ds1

SPECIES	BROADCAST PER ACRE	BROADCAST PER 1000 SF	RESOURCE AREA	PLANTING DATES J F M A M J J A S O N D	REMARKS
BARLEY			M–L		
ALONE	144 LBS	3.3 LBS	P		14,000 SEED PER POUND WINTER HARDY. USE ON PRODUCTIVE SOILS
IN MIXTURE	24 LBS	0.6 LBS	C		
MILLET, BROWN TOP			M–L		
ALONE	40 LBS	0.9 LBS	P		137,000 SEED PER POUND, QUICK DENSE COVER. WILL PROVIDE TOO MUCH COMPETITION IN MIXTURES IF SEEDED AT HIGH RATES
IN MIXTURE	10 LBS	0.2 LBS	C		
RYE			M–L		
ALONE	3 BU	3.9 LBS	P		18,000 SEED PER POUND. QUICK COVER. DROUGHT TOLERANT AND WINTER HARDY
IN MIXTURE	1/2 BU	0.6 LBS	C		
RYEGRASS, ANNUAL			M–L		
ALONE	40 LBS	0.9 LBS	P		227,000 SEED PER POUND. DENSE COVER. VERY COMPETITIVE AND IS NOT TO BE USED IN MIXTURES.
			C		

M–L REPRESENTS TO MOUNTAIN; BLUE RIDGE; AND RIDGES AND VALLEYS MLRA'S

C REPRESENTS THE SOUTHERN COASTAL PLAIN; SAND HILLS; AND ATLANTIC COAST. FLATWOOS MLRA'S

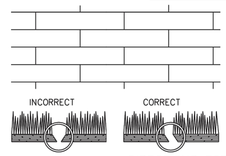
DISTURBED AREA STABILIZATION (TEMP)

SCALE:NTS E42

Ds2

SOD MAINTENANCE AND INSTALLATION

SOD LAYOUT AND PREPARATION



LAY SOD IN A STAGGERED PATTERN. BUTT THE STRIPS TIGHTLY AGAINST EACH OTHER. DO NOT LEAVE SPACES AND DO NOT OVERLAP. A SHARPENED MASON'S TROWEL IS A HANDY TOOL FOR TUCKING DOWN THE ENDS AND TRIMMING PIECES.

BUTTING: ANGLED ENDS CAUSED BY THE AUTOMATIC SOD CUTTER MUST BE MATCHED CORRECTLY.

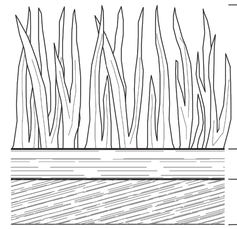
DIRECTIONS FOR INITIAL MAINTENANCE

Step 1. ROLL SOD IMMEDIATELY TO ACHIEVE FIRM CONTACT WITH THE SOIL

Step 2. WATER TO A DEPTH OF 4" AS NEEDED. WATER WELL AS SOON AS THE SOD IS LAID.

Step 3. MOW WHEN THE SOD IS ESTABLISHED -- IN 2-3 WEEKS. SET THE MOWER HIGH (2"-3").

APPEARANCE OF GOOD SOD



SHOOTS OR GRASS BLADES: GRASS SHOULD BE GREEN AND HEALTHY, MOWED AT A 2"-3" CUTTING HEIGHT.

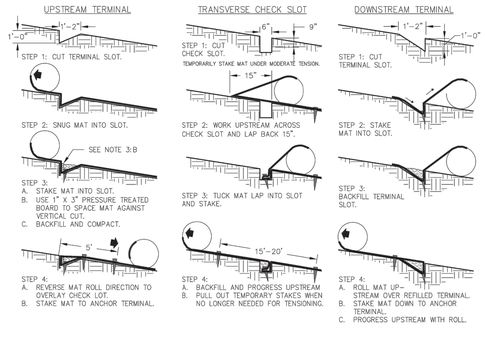
THATCH: GRASS CLIPPINGS AND DEAD LEAVES (UP TO 1/2" THICK).

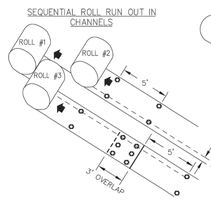
ROOT ZONE: SOIL AND ROOTS. SHOULD BE 1/2"-3/4" THICK WITH DENSE ROOT MAT FOR STRENGTH.

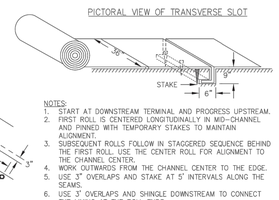
Ds4

TYPICAL INSTALLATION GUIDELINES FOR ROLLED EROSION CONTROL PRODUCTS (RECP)

BLANKET AND MATTING CROSS-SECTIONS







NOTES:
1. START AT DOWNSTREAM TERMINAL AND PROGRESS UPSTREAM.
2. FIRST ROLL IS CENTERED LONGITUDINALLY IN MID–CHANNEL AND PINNED WITH TEMPORARY STAKES TO MAINTAIN ALIGNMENT.
3. SUBSEQUENT ROLLS FOLLOW IN STAGGERED SEQUENCE BEHIND THE FIRST ROLL. USE THE CENTER ROLL FOR ALIGNMENT TO THE CHANNEL CENTER.
4. WORK OUTWARDS FROM THE CHANNEL CENTER TO THE EDGE.
5. USE 3" OVERLAPS AND STAKE AT 5' INTERVALS ALONG THE SEAMS.
6. USE 3" OVERLAPS AND SHINGLE DOWNSTREAM TO CONNECT THE LINING AT THE ROLL ENDS.

Ss

RIPARIAN BUFFER MIX - ERNMX 178				
COMMON NAME	**BOTANICAL NAME**	**PERCENT**	**TYPE**	**QTY**
VIRGINIA WILDRYE	ELYMUS VIRGINICUS, PA ECOTYPE	20.0%		
INDIANGRASS	SORGHASTRUM NUTANS, PA ECOTYPE	15.0%		
BIG BLUESTEM	ANDROPOGON GERARDII, 'NIAGARA'	15.0%		
DEERTONGUE	PANICUM CLANDESTINUM	10.0%		
SWITCHGRASS	PANICUM VIRGATUM, 'CARTHAGE', NC ECOTYPE	9.0%		
PARTRIDGE PEA	CHAMAECRISTA FASCICULATA	6.0%		
AUTUMN BENTGRASS	AGROSTIS PERENNIANS, PA ECOTYPE	4.0%		
BLUE VERVAIN	VERBENA HASTATA, PA ECOTYPE	4.0%		
OXEYE SUNFLOWER	HELIOPSIS HELIANTHOIDES, PA ECOTYPE	3.0%		
BLACKEYED SUSAN	RUDBECKIA HIRTA, COASTAL PLAIN NC ECOTYPE	3.0%		
BONESET	EUPATORIUM PERFOLIATUM, PA ECOTYPE	2.0%		
GIANT IRONWEED	VERNONIA GIGANTEA	2.0%		
SOFT RUSH	JUNCUS EFFUSUS	2.0%		
COMMON SNEEZEWEED	HELENIUM AUTUMNALE, PA ECOTYPE	1.5%		
BLUE FALSE INDIGO	BAPTISIA AUSTRALIS, SOUTHERN WV ECOTYPE	1.0%		
JOE PYE WEED	EUPATORIUM FISTULOSUM, PA ECOTYPE	1.0%		
GREAT BLUE LOBELIA	LOBELIA SIPHILITICA, PA ECOTYPE	1.0%		
WILD BERGAMOT	MONARDA FISTULOSA, PA ECOTYPE	0.5%		
ZONE 1 - BANKFULL BENCH				
COMMON NAME	**BOTANICAL NAME**	**PLANTING RATE**	**TYPE**	**QTY**
RIPARIAN BUFFER MIX SEED	ERNMX-178	20 LBS/AC	SQUARE YARDS	300
BLACK WILLOW	SALIX NIGRA	4' OC	LIVE STAKE	
SILKY DOGWOOD	CORNUS AMOMUM	4' OC	LIVE STAKE	
ELDERBERRY	SAMBUCUS CANADENSIS	4' OC	LIVE STAKE	
SOFT RUSH	JUNCUS EFFUSUS	1.5' O.C.	2" PLUG	
ZONE 2 - BACK OF BANKFULL BENCH TO TOP OF BANK				
COMMON NAME	**BOTANICAL NAME**	**PLANTING RATE**	**TYPE**	**QTY**
RIPARIAN BUFFER MIX SEED	ERNMX-178	20 LBS/AC	SQUARE YARDS	
AMERICAN BEAUTYBERRY	CALLICARPA AMERICANA	8' OC	1 GALLON CONTAINER	
MUSCLEWOOD	CARPINUS CAROLINIANA	8' OC	1 GALLON CONTAINER	
SILKY DOGWOOD	CORNUS AMOMUM	8' OC	1 GALLON CONTAINER	
POSSUMHAW	ILEX DECIDUAS	8' OC	1 GALLON CONTAINER	
WINTERBERRY	ILEX VERTICILLATA	8' OC	1 GALLON CONTAINER	
SWEETSPIRE, VIRGINIA	ITEA VIRGINICA	8' OC	1 GALLON CONTAINER	
NORTHERN SPICEBUSH	LINDERA BENZOIN	8' OC	1 GALLON CONTAINER	
ARROWWOOD	VIBURNUM DENTATUM	8' OC	1 GALLON CONTAINER	

ZONE 3 - TOP OF BANK TO LIMITS OF DISTURBANCE				
COMMON NAME	**BOTANICAL NAME**	**PLANTING RATE**	**TYPE**	**QTY**
TALL FESCUE	SCHEDONORUS PHOENIX	80 LBS/AC	SQUARE YARDS	
SWEETSHRUB	CALYCANTHUS FLORIDUS	12' OC	3 GALLON CONTAINER	
AMERICAN HOLLY	ILEX OPACA	12' OC	3 GALLON CONTAINER	
HIGHBUSH BLUEBERRY	VACCINIUM CORYMBOSUM	12' OC	3 GALLON CONTAINER	
WAX MYRTLE	MORELLA CERIFERA	12' OC	3 GALLON CONTAINER	
RED MAPLE	ACER RUBRUM	30' OC	2" CALIPER TREE	
MUSCLEWOOD	CARPINUS CAROLINIANA	30' OC	2" CALIPER TREE	
EASTERN REDBUD	CERCIS CANADENSIS	30' OC	2" CALIPER TREE	
FLOWERING DOGWOOD	CORNUS FLORIDA	30' OC	2" CALIPER TREE	
ZONE 4 - LAWN GRASS, SEED				
COMMON NAME	**BOTANICAL NAME**	**PLANTING RATE**	**TYPE**	**QTY**
TALL FESCUE, SEED	SCHEDONORUS PHOENIX	80 LBS/AC	SQUARE YARDS	
ZONE 5 - POND, SHALLOW LAND				
COMMON NAME	**BOTANICAL NAME**	**PLANTING RATE**	**TYPE**	**QTY**
SWAMP MILKWEED	ACSCLEPIAS INCARNATA	1.5' OC	2" PLUG	
SHALLOW SEDGE	CAREX LURIDA	1.5' OC	2" PLUG	
ROSE MALLOW	HIBISCUS MOSCHEUTOS	1.5' OC	2" PLUG	
LEATHERY RUSH	JUNCUS CORIACEUS	1.5' OC	2" PLUG	
CARDINAL FLOWER	LOBELIA CARDINALIS	1.5' OC	2" PLUG	
ZONE 6 - SHALLOW MARSH				
COMMON NAME	**BOTANICAL NAME**	**PLANTING RATE**	**TYPE**	**QTY**
FOX SEDGE	CAREX CULPINOIDEA	1.5' OC	2" PLUG	
SOUTHERN BLUE FLAG IRIS	IRIS VIRGINICA	1.5' OC	2" PLUG	
COMMON RUSH	JUNCUS EFFUSUS	1.5' OC	2" PLUG	
SOFTSTEM BULLRUSH	SCHOENOPLECTUS TABERNAEMONTCINI	1.5' OC	2" PLUG	
WOOLGRASS	SCIRPUS CYPERINUS (L.) KUNTH	1.5' OC	2" PLUG	
ZONE 7 - DEEP MARSH				
COMMON NAME	**BOTANICAL NAME**	**PLANTING RATE**	**TYPE**	**QTY**
ARROW ARUM	PELTANDRA VIRGINICA	1.5' OC	2" PLUG	
PICKERELWEED	PONTEDERIA CORDATA	1.5' OC	2" PLUG	
DUCK POTATO	SAGITTARIA LATIFOLIA	1.5' OC	2" PLUG	

GENERAL PLANTING NOTES

1. CONTRACTOR SHALL OBTAIN LATEST EDITION OF THE FOLLOWING DOCUMENTS:
   A. "GUIDELINES FOR RIPARIAN BUFFER RESTORATION", NCDENR-NCEEP (WWW.NCEEP.NET/NEWS/REPORTS/BUFFERS.PDF)
   B. "LANDSCAPING WITH NATIVE PLANTS IN THE GEORGIA PIEDMONT" (WWW.GPS.ORG/PDF/GNPSIS.PDF)
   C. "NONNATIVE INVASIVE PLANTS OF SOUTHERN FORESTS" (WWW.SRS.FS.USDA.GOV/PUBS/VIEWPUB.JSP?INDEX=5424)
   D. "INVASIVE PLANTS OF GEORGIA'S FORESTS" (WWW.GAINVASIVES.ORG/PUBS/GFCNEW.PDF)

   ALL PLANTS SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THESE DOCUMENTS.
2. CONTRACTOR SHALL SUBMIT A PLANTING PLAN WITH A RECOMMENDED PLANT LIST TO GCDWR FOR REVIEW PRIOR TO COMMENCING PLANTING. PREFERRED PLANTS ARE SHOWN IN THE PLANTING SCHEDULES. CONTRACTOR SHALL REFER TO "GUIDELINES FOR RIPARIAN BUFFER RESTORATION", AND "LANDSCAPING WITH NATIVE PLANTS IN THE GEORGIA PIEDMONT" FOR PREPARING PLAN. CONTRACTOR MAY SUBSTITUTE OTHER SPECIES FOR THOSE LISTED IN THE PLANTING SCHEDULES IN COORDINATION WITH AND SUBJECT TO REVIEW BY THE GCDWR.
3. PLANT DENSITIES, QUANTITIES, AND AREAS SHOWN IN PLANTING SCHEDULES ARE FOR CONVENIENCE ONLY AND MAY NOT BE ACCURATE WITH AS-BUILT CONDITIONS. CONTRACTOR SHALL SUBMIT ESTIMATES FOR PLANT DENSITIES AND PLANTING AREAS IN THE PLANTING PLAN.
4. CONTRACTOR SHALL STAKE OUT PLANTING ZONES FOR REVIEW BY GCDWR PRIOR TO INSTALLING PLANTS.
5. SEED SHALL BE INSTALLED ON SCARIFIED, BARE GROUND. SEED PER ZONE IS SPECIFIED IN THE PLANTING SCHEDULES.

Ds3 - Disturbed Area Stabilization (with Permanent Vegetation)

GWINNETT COUNTY
DEPARTMENT OF WATER RESOURCES
STANDARD DRAWING
TYPICAL PLANTING SCHEDULE
DATE: MAY 2014 SHEET: 2075

EMMA BONES, PE
LEVEL II CERTIFIED DESIGN PROFESSIONAL
GSWCC CERTIFICATION NO. 87789
EXPIRES 05/03/2025

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CITY OF DUNWOODY
4800 ASHFORD DUNWOODY RD NE
DUNWOODY, GA 30338

SEAL

GEORGIA REGISTERED LICENSE NO. 041871 PROFESSIONAL ENGINEER EMMA JEAN BONES

COUNTY APPROVAL

SCALE
0' 10' 20' 40'
SCALE: 1" = 20'

NO.	DESCRIPTION	DATE
2	100 PERCENT SUBMITTAL	07/31/2023
1	90 PERCENT SUBMITTAL	06/06/2023

REVISIONS

DRAWN BY	JJ
APPROVED BY	SF
CHECKED BY	EB
DATE	07/31/2023

TITLE

ES&PC DETAILS (1)

PROJECT NO. 50158594

EC-501

SHEET NO.

Baffle Box (Sd2-B)

- Applicable for inlets receiving a higher volume or velocity.
- Construct 2"x4" boards spaced a maximum of 1" apart OR of plywood with weep holes 2" in diameter.
- Place weep holes ~6" on center vertically or horizontally.
- Place gravel outside of the box and around the inlet at a depth of 2-4".
- Wrap entire box in Type C filter fabric and entrench at a depth of 12".

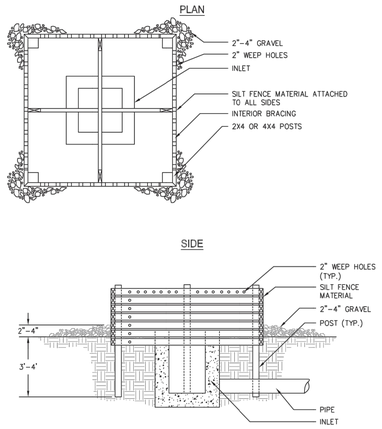
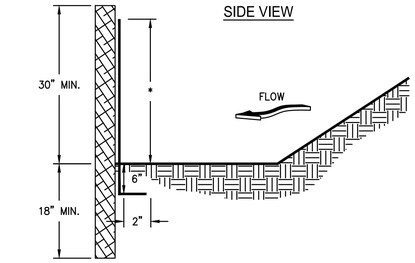
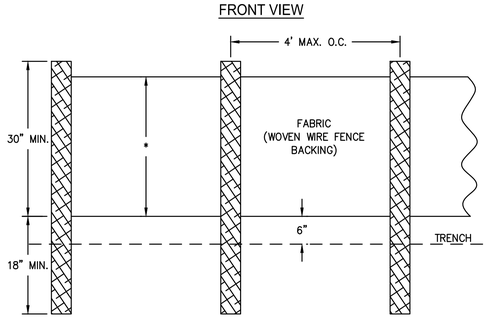


Figure 3. Baffle Box Installation Requirements (Sd2-B)

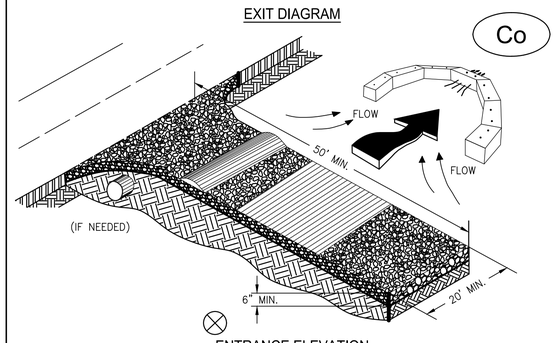
SILT FENCE - TYPE SENSITIVE (Sd1-S)

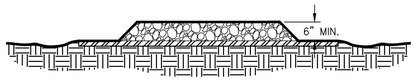




NOTES:
1. USE STEEL POSTS WITH WIRE REINFORCEMENT OR AS SPECIFIED BY THE EROSION, SEDIMENTATION, AND POLLUTION CONTROL PLAN.
2. HEIGHT (*) IS TO BE SHOWN ON THE EROSION, SEDIMENTATION, AND POLLUTION CONTROL PLAN.

CRUSHED STONE CONSTRUCTION EXIT (Co)





NOTES:
1. AVOID LOCATING ON STEEP SLOPES OR AT CURVES ON PUBLIC ROADS.
2. REMOVE ALL VEGETATION AND OTHER UNSUITABLE MATERIAL FROM THE FOUNDATION AREA, GRADE, AND CROWN FOR POSITIVE DRAINAGE.
3. AGGREGATE SIZE SHALL BE IN ACCORDANCE WITH NATIONAL STONE ASSOCIATION R–2 (1.5"–3.5" STONE).
4. GRAVEL PAD SHALL HAVE A MINIMUM THICKNESS OF 6".
5. PAD WIDTH SHALL BE EQUAL FULL WIDTH AT ALL POINTS OF VEHICULAR EGRESS, BUT NO LESS THAN 20'.
6. A DIVERSION RIDGE SHOULD BE CONSTRUCTED WHEN GRADE TOWARD PAVED AREA IS GREATER THAN 2%.
7. INSTALL PIPE UNDER THE ENTRANCE IF NEEDED TO MAINTAIN DRAINAGE DITCHES.
8. WHEN WASHING IS REQUIRED, IT SHOULD BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN (DIVERT ALL SURFACE RUNOFF AND DRAINAGE FROM THE ENTRANCE TO A SEDIMENT CONTROL DEVICE).
9. WASHRACKS AND/OR TIRE WASHERS MAY BE REQUIRED DEPENDING ON SCALE AND CIRCUMSTANCE. IF NECESSARY, WASHRACK DESIGN MAY CONSIST OF ANY MATERIAL SUITABLE FOR TRUCK TRAFFIC THAT REMOVE MUD AND DIRT.
10. MAINTAIN AREA IN A WAY THAT PREVENTS TRACKING AND/OR FLOW OF MUD ONTO PUBLIC RIGHTS–OF–WAYS. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.

Topsoiling (Tp)

DEFINITION
Stripping off the more fertile top soil, storing it, then spreading it over the disturbed area after completion of construction activities.

PURPOSE
To provide a suitable soil medium for vegetative growth on areas where other measures will not produce or maintain a desirable stand.

CONDITIONS
This practice is recommended for sites of 2:1 or flatter slopes where:

1. The texture of the exposed subsoil or parent material is not suitable to produce adequate vegetative growth.
2. The soil material is so shallow that the rooting zone is not deep enough to support plants with continuing supplies of moisture and food.
3. The soil to be vegetated contains material toxic to plant growth.

CONSTRUCTION SPECIFICATIONS
Materials
Topsoil should be friable and loamy, free of debris, objectionable weeds and stones and contain no toxic substance that may be harmful to plant growth. A pH range of 5.0-7.5 is acceptable. Soluble salts should not exceed 500 ppm.

Testing
Field exploration should be made to determine whether the quantity and quality of surface soil justifies stripping.

Stripping
Stripping should be confined to the immediate construction area.

A 4 to 6 inch stripping depth is common, but may vary depending on the particular soil.

Topsoil pH
If pH value is less than 6.0, lime shall be applied and incorporated with the topsoil to adjust the pH to 6.5 or higher. Topsoils containing soluble salts greater than 500 parts per million shall not be used.

Stockpiles
The location of topsoil stockpiles should not obstruct natural drainage or cause off-site environmental damage.

Stabilization
Stockpiles shall be contained by sediment barriers to prevent sedimentation on adjacent areas. Stockpiles shall be stabilized in accordance with specifications **Ds1 and Ds2 - Disturbed Area Stabilization (With Mulching) and (With Temporary Grassing),** respectively, or T**ac-Tackifiers.**

Site Preparation
(Where topsoil is to be added)

Topsoiling - When topsoiling, maintain needed erosion control practices such as diversions, grade stabilization structures, berms, dikes, level spreaders, waterways, sediment basins, etc.

Grading - Grades on the areas to be topsoiled that have been previously established shall be maintained.

Liming - Soil tests should be used to determine the pH of the soil. Where the pH of the subsoil is 5.0 or less or composed of heavy clays, agricultural limestone shall be spread at the rate of 100 pounds per 1,000 square feet. Lime shall be distributed uniformly over designated areas and worked into the soil in conjunction with tillage operations as described in the following procedure.

Bonding - Use one of the following methods to insure bonding of topsoil and subsoil:

1. Tilling. After the areas to be topsoiled have been brought to grade, and immediately prior to dumping and spreading the topsoil, the subgrade shall be loosened by discing or scarifying to a depth of at least 3 inches to permit bonding of the topsoil to the subsoil.
2. Tracking. Passing a bulldozer over the entire surface area of the slope to leave horizontal depressions.

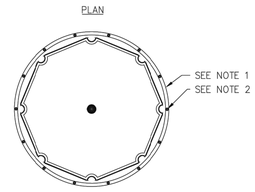
Applying Topsoil
1. Topsoil should be handled only when it is dry enough to work without damaging soil structure.
2. A uniform application of 5 inches (unsettled) is recommended, but may be adjusted at the discretion of the design professional.

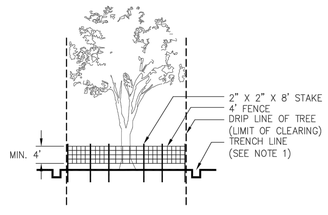
Table 6-37.1. Cubic Yards Of Topsoil Required For Application To Various Depths

Depth (Inches)	Per 1,000 Square Feet	Per Acre
1	3.1	134
2	6.2	268
3	9.3	403
4	12.4	537
5	15.5	672
6	18.6	806

TREE PROTECTION (Tr)

"SNOW" FENCE





NOTES:
1. USE TRENCHER (I.E. DITCH WHICH) TO CUT A 4"–5" W X 18" D TRENCH ALONG DRIP LINE (LIMIT OF CLEARING) AND BACKFILL WITH SAND AND LIGHTLY COMPACT.
2. SPACE STAKES AT INTERVALS SUFFICIENT TO MAINTAIN ALL FENCING OUT OF DRIP LINE OR AS SHOWN BY ENGINEER (SET STAKES NO GREATER THAN 6 FEET ON CENTER–REBAR IS NOT TO BE USED FOR STAKES).
3. MAINTAIN FENCE BY REPAIRING AND/OR REPLACING DAMAGED FENCE. DO NOT REMOVE FENCING PRIOR TO LANDSCAPING OPERATIONS.
4. DO NOT STORE OR STACK MATERIALS, EQUIPMENT, OR VEHICLES WITHIN FENCED AREA.
5. FENCE SHALL BE ORANGE VINYL "SNOW FENCE" 4' HIGH MINIMUM.

Figure 6-38.1

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TITLE

ES&PC DETAILS (2)

PROJECT NO. 50158594

EC-502

SHEET NO.

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