TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION

Division of Water Resources

William R. Snodgrass Tennessee Tower, 312 Rosa L. Parks Avenue, 11th Floor, Nashville, Tennessee 37243

1-888-891-8332 (TDEC)

Notice of Intent (NOI) for General NPDES Permit for Stormwater Discharges from Construction Activities (TNR100000)

Site or Project Name: 1600 Lebanon Pike			***NPDES Tracking Number: TNR***
Street Address or Location:	1590/1600/1602/1604 Lebanon Pike, Nashville, TN 37210		Construction Start Date: 08/01/2020
			Estimated End Date: 08/01/2021
Site Description:	Multi-family residential: 17 townhouses and an apartment complex		Latitude (dd.dddd): 36.154371
			Longitude (-dd.dddd): -86.719387
County(ies): Davidson	MS4 (if applicable):		Acres Disturbed: 2.93
Check box if a SWPPP is attached: ☑	Check box if a site location map is attached: ☑		Total Acres: 2.94
Check the appropriate box(s) if there are streams and/or wetlands on or adjacent to the construction site:			Streams ☐ Wetlands ☐
Has a jurisdictional determination been made by the USACE or EPA identifying waters of the United States?: Yes ☐ No ☐ Note: if yes, attach the jurisdictional determination			
If an Aquatic Resource Alteration Permit (ARAP) has been obtained for this site, what is the permit number? NR(S)			
Receiving waters:			

Site Owner/Developer (Primary Permittee): (Provide person, company, or entity that has operational or design control over construction plans and specifications): 1600 Lebanon Partners

For corporate entities only, provide correct Tennessee Secretary of State (SOS) Control Number: (an incorrect SOS control number may delay NOI processing)

Site Owner or Developer Contact Name: (signs the certification below) Nick Adler		Title or Position: Partner/Owner	
Mailing Address: 45 Annandale		City: Nashville	State: TN Zip: 37215
Phone: (615) 423-3522	Fax: ( )	E-mail: nick3779@yahoo.com	

Optional Contact:		Title or Position:	
Mailing Address:		City:	State: Zip:
Phone: ( )	Fax: ( )	E-mail:	

Owner/Developer(s) Certification: (must be signed by president, vice-president or equivalent, or ranking elected official) (Primary Permittee)

I certify under penalty of law that this document and all attachments were prepared by me, or under my direction or supervision. The submitted information is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. As specified in Tennessee Code Annotated Section 39-16-702(a)(4), this declaration is made under penalty of perjury.

Owner/Developer Name (print/type): Nick Adler	Signature:	Date: 5/20/2020
Owner/Developer Name (print/type):	Signature:	Date:

Contractor Certification: (must be signed by president, vice-president or equivalent, or ranking elected official) (Secondary Permittee)

I certify under penalty of law that I have reviewed this document, any attachments, and the SWPPP referenced above. Based on my inquiry of the construction site owner/developer identified above and/or my inquiry of the person directly responsible for assembling this NOI and SWPPP, I believe the information submitted is accurate. I am aware that this NOI, if approved, makes the above-described construction activity subject to NPDES permit number TNR100000, and that certain of my activities on-site are thereby regulated. I am aware that there are significant penalties, including the possibility of fine and imprisonment for knowing violations, and for failure to comply with these permit requirements. As specified in Tennessee Code Annotated Section 39-16- 702(a)(4), this declaration is made under penalty of perjury.

Contractor name, address, and SOS control number (if applicable):	Signature:	Date:

OFFICIAL STATE USE ONLY

Received Date: 5-20-20	Reviewer:	Field Office: 04	Permit Tracking Number: TNR 244289	Exceptional TN Water:
Fee(s): 250.	T & E Aquatic Flora/Fauna:	SOS Corporate Status:	Waters with Unavailable Parameters:	Notice of Coverage Date:

1013

S & H GROUP
2606 EUGENIA
STE D
NASHVILLE, TN 37211

DATE 6/8/20 87-863/640

PAY TO THE ORDER OF TDEC $ 250.00

Two hundred fifty dollars +no/100 DOLLARS

Pinnacle

FOR 1600 Lebanon SWPPP Fee

Permit # TNR244289

[redacted]

Details on back
Security Features

Stormwater Pollution Prevention Plan

1600 Lebanon Pike

1590/1600/1602/1604 Lebanon Pike
Nashville,
Davidson County, Tennessee

May 12, 2020

S + H ENGINEERING DESIGN CONSULTING

Prepared for:

1600 Lebanon Partners
45 Annandale
Nashville, TN 37215

TABLE OF CONTENTS

LIST OF TABLES

APPENDICES

1.0 EXECUTIVE SUMMARY

This SWPPP has been prepared for activities associated with the construction of a new multi-family development including 17 townhouses and an apartment complex, construction of associated parking, and miscellaneous landscaping at the project site located at 1590, 1600, 1602, and 1604 Lebanon Pike, Nashville, TN. This SWPPP includes the elements necessary to comply with the national baseline general permit for construction activities enacted by the U.S. Environmental Protection Agency (EPA) under the National Pollutant Discharge Elimination System (NPDES) program and all local governing agency requirements as specified by Nashville / Davidson County. This SWPPP must be implemented at the start of construction.

This SWPPP has been developed in accordance with the "Tennessee Department of the Environment and Conservation (TDEC) State Pollution Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity" General Permit Number TNR100000, effective September 30, 2016 through September 30, 2021. The SWPPP and accompanying plans identify and detail stormwater management (SWM), pollution prevention, and erosion and sediment control measures necessary during and following completion of construction.

This SWPPP and the accompanying plans entitled "1600 Lebanon Pike" have been submitted as a set. These engineering drawings are considered an integral part of this SWPPP, therefore this SWPPP is not considered complete without them. References made herein to "the plans" or to a specific "sheet" refer to these drawings.

This report considers the impacts associated with the intended development with the purpose of:

1. Maintaining existing drainage patterns as much as possible while continuing the conveyance of upland watershed runoff;

2. Controlling increases in the rate of stormwater runoff resulting from the proposed development so as not to adversely alter downstream conditions; and

3. Mitigating potential stormwater quality impacts and preventing soil erosion and sedimentation resulting from stormwater runoff generated both during and after construction.

The analysis and design completed and documented in this report is intended to be part of the application made for a grading permit from the Metro Water Services (MWS) Stormwater Division.

1.1 Project Description

BNA Investments is proposing the construction of a new multi-family residential development including an apartment complex, 17 townhouses, and associated parking. The property is located at 1590, 1600, 1602, and 1604 Lebanon Pike, Nashville, TN 37210.

This SWPPP includes post-construction stormwater management practices as well as erosion and sediment controls.

This project is located within a regulated, traditional land use control Municipal Separate Stormwater Sewer System (MS4).

Runoff from the project site will discharge via sheet flow at the northeastern corner of the property. The storm water travels via overland flow to an unnamed stream approximately 450 feet northeast of the property line.

Project construction activities will consist of site grading and construction of the proposed upgrades to the property. Construction phase pollutant sources anticipated at the site are disturbed (exposed) soil, vehicle fuels and lubricants, chemicals associated with building construction, and building materials. Without adequate control there is the potential for each type of pollutant to be transported by stormwater.

1.1 Stormwater Pollution Controls

The proposed measures outlined herein have been designed to mitigate erosion and pollution to adjacent properties due to surface runoff. These measures have been designed and evaluated in accordance with the following standards and guidelines:

- Tennessee Erosion and Sediment Control Handbook – 4th Edition (August 2012).
- Supplemental Best Management Practices (BMP) Manual

1.1 Conclusion

This SWPPP has been prepared in conformance with the current Tennessee Standards and Specifications for Erosion and Sediment Control and Supplemental BMP Manual.

It is our opinion that the proposed development will not adversely impact adjacent or downstream properties if the erosion control measures are properly constructed and maintained in accordance with the requirements outlined herein.

2.0 SWPPP IMPLEMENTATION RESPONSIBILITIES

A summary of the responsibilities and obligations of all parties involved with compliance with the TDEC General Permit TNR100000 conditions is outlined in the subsequent sections. For a complete listing of the definitions, responsibilities, and obligations, refer to the TDEC General Permit TNR100000 presented in Appendix A.

2.1 Definitions

1. "Owner" or "Operator" means the person, persons, or legal entity which owns or leases the property on which the construction activity is occurring; and/or an entity that has operational control over the construction plans and specifications, including the ability to make modifications to the plans and specifications. There may be

occasions during the course of a project in which there are multiple Owners/Operators, all of which will need to file and maintain the appropriate SWPPP documents and plans, including without limitation, the Notice of Intent (NOI), Notice of Coverage (NOC) and Notice of Termination (NOT).

2. "Owner's/Operator's Engineer" shall be that person or entity retained by an Owner/Operator to design and oversee the implementation of the SWPPP.

3. "Contractor" shall be that person or entity identified as such in the construction contract with the Owner/Operator. The term "Contractor" shall also include the Contractor's authorized representative, as well as any and all subcontractors retained by the Contractor.

4. "Qualified Inspector" means a person that is knowledgeable in the principles and practices of erosion and sediment control, such as licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), licensed Landscape Architect, or other Department endorsed individual(s).

   It can also mean someone working under the direct supervision of and at the same company as, the licensed Professional Engineer or licensed Landscape Architect, provided that person has training in the principles and practices of erosion and sediment control. Training in the principles and practices of erosion and sediment control means that an individual performing a site inspection has passed the TDEC Level 1 Certification.

   Note: Inspections of any post-construction stormwater management practices that include structural components, such as a dam for an impoundment, shall be performed by a licensed Professional Engineer.

5. "Qualified Professional" means a person that is knowledgeable in the principles and practices of stormwater management and treatment, such as a licensed Professional Engineer, licensed Landscape Architect, or other Department endorsed individual(s). Individuals preparing SWPPPs that require the post-construction stormwater management practice component must have an understanding of the principles of hydrology, water quality management practice design, water quantity control design, and, in many cases, the principles of hydraulics in order to prepare a SWPPP that conforms to the Department's technical standards. All components of the SWPPP that involve the practice of engineering, shall be prepared by, or under the direct supervision of, a professional engineer licensed to practice in the State of Tennessee.

6. "Trained Contractor" means an employee from a contracting (construction) company that has received training, which has been endorsed by the Department, from a Soil and Water Conservation District, CPESC, Inc. or other Department endorsed entity, in proper erosion and sediment control principles.

   It can also mean an employee from the contracting (construction) company that meets the "qualified inspector" qualifications (e.g. licensed Professional Engineer,

Certified Professional in Erosion and Sediment Control (CPESC), Registered Landscape Architect, or someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided they meet or exceed TDEC requirements).

The "trained contractor" will be responsible for the day to day implementation of the SWPPP.

2.2 Owner's/Operator's Responsibilities

1. Retain the services of a "Qualified Professional", as defined under Section 2.1, to provide the services outlined in Section 2.3 "Owner's/Operator's Engineer's Responsibilities".

2. Pay any and all fees, get all permits as required by Nashville / Davidson County.

3. Retain the services of an independent certified materials testing and inspection firm operating under the direction of a licensed Professional Engineer to perform regular tests, inspections, and certifications of the construction materials used in the construction of all post-construction stormwater management practices.

4. Prior to the commencement of construction activity, identify the contractor(s) and subcontractor(s) that will be responsible for implementing the erosion and sediment control measures and stormwater management practices described in this SWPPP. Have each of these contractors and subcontractors identify at least one "Trained Contractor", as defined under Section 2.1, that will be responsible for the implementation of the SWPPP. Ensure that the Contractor has at least one "Trained Contractor" on site on a daily basis when soil disturbance activities are being performed.

5. Schedule a pre-construction meeting which shall include the necessary Metro Water Services representative(s), Owner's/Operator's Engineer, Contractor, and their sub-contractors to discuss responsibilities as they relate to the implementation of this SWPPP.

6. Require the Contractor to fully implement the SWPPP prepared for the site by the Owner's/Operator's Engineer to ensure that the provisions of the SWPPP are implemented from the commencement of construction activity until all areas of disturbance have achieved final stabilization.

7. Maintain a copy of the General Permit (TN100000), NOI, NOC, SWPPP, inspection reports, Spill Prevention, Countermeasures, and Cleanup ("SPCC") Plan, inspection records, and other required records on the job site so that they may be made available to the regulatory agencies.

8. Post at the site, in a publicly accessible location, a copy of the General Permit (TN100000) and the twice weekly inspection reports.

9. Prepare a written summary of projects status with respect to compliance with the general permit at a minimum frequency of every three months during which coverage under the permit exists. The summary should address the status of achieving the overall goal of the SWPPP. The summary shall be maintained at the site in a publicly accessible location.

10. Prior to completion of all site work, ensure one of the following:

    a) the post-construction stormwater management practice(s) and any right-of-way(s) needed to maintain such practice(s) have been deeded to the municipality in which the practice(s) is located,

    b) for post-construction stormwater management practice(s) that are privately owned, the Owner/Operator has a deed restriction in place that requires operation and maintenance of the practice(s) in accordance with the operation and maintenance plan,

    c) for post-construction stormwater management practice(s) that are owned by a public or private institution (e.g. school, college, university), or government agency or authority, the Owner/Operator has policy and procedures are in place that ensure operation and maintenance of the practice(s) in accordance with the operation and maintenance plan.

11. Request and receive all SWPPP records from the Owner's/Operator's Engineer and archive those records for a minimum of five years after the completion of work.

12. Require the implementation of the Post-Construction Inspections and Maintenance procedures outlined in Section 7.1.5.

13. The Owner/Operator must keep the SWPPP current at all times. At a minimum, the Owner/Operator shall amend the SWPPP:

    a) Whenever the current provisions prove to be ineffective in minimizing pollutants in stormwater discharges from the project site;

    b) Whenever there is a change in design, construction, or operation at the construction site that has or could have an effect on the discharge of pollutants; and

    c) To address issues or deficiencies identified during an inspection by the "qualified inspector," the Department, or other Regulatory Authority.

2.3 Owner's/Operator's Engineers Responsibilities

1. Prepare the SWPPP using good engineering practices, best management practices, and in compliance with all federal, state, and local regulatory requirements.

2. Provide copies of the SWPPP to Metro Water Services once all signatures and attachments are complete.

3. Prepare a construction Site Log Book to be used in maintaining a record of all inspection reports generated throughout the duration of construction.

4. Participate in a pre-construction meeting with the Metro Water Services representative, Owner/Operator, Contractor, and their sub-contractors to discuss responsibilities as they relate to the implementation of this SWPPP.

5. Enter Contractor's information in Section 2.5 "SWPPP Participants" once a Contractor is selected by the Owner/Operator.

6. Retain the services of a TN licensed land surveyor to perform an as-built topographic survey of the completed post-construction stormwater management facilities. All new stormwater management facilities, including detention ponds, shall be contained within a maintenance easement and recorded on the final plan. If a stormwater management facility is not constructed, no As-Built Survey is required.

7. Conduct an initial assessment of the site prior to the commencement of construction and certify in an inspection report that the appropriate erosion and sediment control measures described within this SWPPP have been adequately installed and implemented to ensure overall preparedness of the site.

8. Provide on-site inspections to determine compliance with the SWPPP. Site inspections shall occur at an interval twice per week and at least 72 hours apart. An inspection report shall be completed at the completion of each inspection and included with the onsite SWPPP documents. A sample inspection form is provided in Appendix A.

9. Review the Contractor's SWPPP records on a periodic basis to ensure compliance with the requirements for daily reports and inspections and maintenance logs.

10. Maintain the construction Site Log Book throughout the duration of construction.

11. Update the SWPPP each time there is a significant modification to the pollution prevention measures or a change of the principal Contractor working on the project who may disturb site soil.

12. Based on the as-built survey and material testing certifications performed by others, perform evaluations of the completed stormwater management facilities to determine whether they were constructed in accordance with this SWPPP.

13. Conduct a final site assessment and prepare a certification letter to the Owner/Operator indicating that, upon review of the material testing and inspection reports prepared by the firm retained by the Owner/Operator, completion of the topographic survey, and evaluation of the completed stormwater management facilities, the stormwater management facilities have been constructed substantially in accordance with the contract documents and should function as designed.

14. Transfer the SWPPP documents, along with all permit certificates, construction Site Log Book, and written records required by the General Permit to the Owner/Operator for archiving.

2.4 Contractor's Responsibilities

1. Identify at least one Trained Contractor that will be responsible for implementation of this SWPPP. Ensure that at least one Trained Individual is on site on a daily basis when soil disturbance activities are being performed.

2. Provide the names and addresses of all subcontractors working on the project site. Require all subcontractors who will be involved with construction activities that will result in soil disturbance to identify at least one Trained Contractor that will be on site on a daily basis when soil disturbance activities are being performed; and to sign a copy of the Contractor's Certification Form and forward to the Owner's/Operator's Engineer for inclusion into the Site Log Book. This information must be retained as part of the Site Log Book.

3. Maintain a Spill Prevention and Response Plan in accordance with requirements outlined in Section 5.4 of this SWPPP. This plan shall be provided to the Owner's/Operator's Engineer for inclusion in the Site Log Book.

4. Participate in a pre-construction meeting which shall include the Metro Water Services representative, Owner/Operator, Owner's/Operator's Engineer, and all sub-contractors to discuss responsibilities as they relate to the implementation of this SWPPP.

5. Implement site stabilization (temporary and permanent), erosion and sediment control measures, and other requirements of the SWPPP.

6. Conduct daily inspections of erosion and sediment control measures installed at the site to ensure that they remain in effective operating condition at all times. Prepare, and retain written documentation of inspections as well as of all repairs/maintenance activities performed. This information must be retained as part of the Site Log Book.

7. Maintain a record of the dates when major grading activities occur, when construction activities temporarily or permanently cease on a portion of the site, and when stabilization measures are initiated. A log for keeping such records is provided in Appendix A.

8. Begin implementing corrective actions within one business day of receipt of notification by the Qualified Inspector that deficiencies exist with the erosion and sedimentation control measures employed at the site. Corrective actions shall be completed within a reasonable time frame.

2.5 SWPPP Participants

1.	Owner's/Operator's Engineer:	S + H Group, LLC 2606 Eugenia Avenue, Suite D Nashville, TN 37211 Phone: (615) 647-8775
2.	Owner/Operator:	1600 Lebanon Partners 45 Annandale Nashville, TN 37215 Phone: (615) 423-3522
3.	Contractor:	TBD

3.0 SITE CHARACTERISTICS

3.1 Land Use

The subject site for the proposed construction is located at the addresses of 1590, 1600, 1602, and 1604 Lebanon Pike, Nashville, TN 37210. The subject site is identified as tax parcel numbers 09400004400, 09400004500, 09400020200, and 09400020300. The total parcel size is approximately 2.94 (+/-) acres.

The subject site is currently partially developed with existing surface runoff carrying via overland flow to the northeast corner of the project location. Runoff contributes to an unnamed stream approximately 450 feet to the north via overland flow. The project will not be affecting existing stormwater drainage patterns and will continue to be directed to the north end of the lot where it will exit the property via overland sheet flow.

3.2 Soils

The United States Department of Agriculture (USDA) Soil Conservation Service (SCS) Soil Survey for Davidson County was reviewed and provided surficial soil conditions for the study area. The SCS identified the presence of Stiversville-Urban land complex soil type across the project site. Soil data provided by the SCS is presented in Table 1.

Table 1: USDA Soil Data

MAP SYMBOL/ DESCRIPTION	HYDRO-LOGIC SOIL GROUP	SLOPE (%)	SOIL PROFILE		K Sat (in/hr)	N DEPTH TO WATER TABLE (IN)	DEPTH TO BEDROCK (IN)
			DEPTH (IN)	USDA TEXTURE			
SvD – Stiversville-Urban land complex	A	3-25	0-8 8-53 53-63	Loam Clay loam Bedrock	0.00 – 0.20	>80	39-59

The Soil Conservation Service defines the hydrologic soil groups as follows:

- Type A Soils: Soils having a high infiltration rate and low runoff potential when thoroughly wet. These soils consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a moderate rate of water transmission.

- Type B Soils: Soils having a moderate infiltration rate when thoroughly wet and consists mainly of moderately deep to deep, moderately well to well drained soils with moderately fine to moderately course textures. These soils have a moderate rate of water transmission.

- Type C Soils: Soils having a low infiltration rate when thoroughly wet and consists chiefly of soils with a layer that impedes downward movement of water and soils

with moderately fine-to-fine texture. These soils have a low rate of water transmission.

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

The soils information for the study area is presented in Appendix B.

3.3 Groundwater

Depth to groundwater is noted as being 39-59 inches in the Stiversville-Urban land complex soil region, according to USDA Soil Conservation Service Soil Survey for Davidson County as shown in Table 1 "USDA Soil Data".

3.4 Topography

The overall subject site has fairly steep sloping in the northeast end of the site, with slopes ranging from approximately 3-31 percent. Site elevations range from approximately 530 feet above sea level to 477 feet above sea level.

3.5 Wetlands

According to the National Wetlands Inventory (NWI) mapping[1], there are no wetlands in the project vicinity. The nearest NWI wetland is a freshwater pond (PUBFh) located approximately 0.13 miles away to the north of the project site.

3.6 Surface Waters and Flood Plains

According to the most recently available GIS data there are no mapped regulated streams on the subject site and no portion of the subject site is located in the 100-year FEMA Flood Zone.

3.7 Rainfall Data

Rainfall data utilized in the modeling and analysis was taken from National Weather Service (NWS) Technical Paper 40 (TP-40), Rainfall Frequency Atlas of the U.S. Weather Bureau, published by the U.S. Department of Commerce. Rainfall data specific to the portion of Nashville, TN under consideration, for various 24-hour storm events, are presented in Table 2:

[1] National Wetlands Inventory, Wetlands Digital Data, Available online at http://www.fws.gov/wetlands/Data/Mapper.html, site accessed 6/19/19.

Table 2: Rainfall Data

STORM EVENT	24-HOUR RAINFALL
2-year	3.39–inches
5-year	4.50–inches
10-year	5.23–inches
25-year	6.16–inches
50-year	6.85–inches
100-year	7.53–inches

These values were used to evaluate the pre- and post-development stormwater runoff conditions.

3.8 Pervious and Impervious Areas

The following comparison of the existing and proposed impervious areas was also used for the stormwater calculations. A summary of the existing and proposed (acres) conditions are presented in Table 3:

Table 3: Existing and Proposed Impervious Area

	Existing (Acres)	Proposed (Acres)
Total Lot Area	2.94	2.94
Total Pervious	2.78	1.13
Total Impervious	0.16	1.81

3.9 Percolation Testing

An infiltration test was not performed at the project site.

4.0 CONSTRUCTION SEQUENCE

Described below are the major construction activities that are the subject of this SWPPP. They are presented in the order (or sequence) they are expected to begin, but each activity will not necessarily be completed before the next begins. Also, these activities could occur in a different order if necessary, to maintain adequate erosion and sediment control.

The Contractor will be responsible for implementing the following erosion and sediment control measures. The Contractor may designate these tasks to certain subcontractors as the contractor sees fit, but the ultimate responsibility for implementing these controls and ensuring their proper function remains with the Contractor. The order of activities will be as follows:

1. Prior to the commencement and earth moving the contractor is to verify that all EPSC measures have been installed in accordance with the plans and specifications.

2. Selectively clear only the areas required for the installation of the stabilized construction entrances/exits and erosion and sediment control measures.

3. Install stabilized construction entrances/exits for all construction entrances/exits. This will be the first construction work on the project. This project is surrounded by paved roads that will remain in place throughout the duration of the project. It is intended that all construction vehicles will remain on existing pavement, so no construction entrance/exit is proposed.

4. Install sediment control barriers down slope from construction activities that disturb site soil. Refer to the plans for the slit-fence location.

5. Transplant all identified trees and shrubs.

6. Begin clearing and grubbing operations. Clearing and grubbing shall be done only in areas where earthwork will be performed and only in areas where construction is planned to commence within 15 days after clearing and grubbing.

7. Frequent watering of the excavation and fill areas shall be done to minimize wind erosion.

8. Commence site grading and other construction activities.

9. Install stormwater infrastructure including conveyance systems and detention basins. All detention area shall be protected from construction traffic and other construction site sediments though the use of silt fence.

10. Disturbed areas of the site, where construction activity has ceased for more than 15 days, shall be temporarily or permanently seeded, mulched, and watered in accordance to the seeding schedule on the plans.

11. Remove stabilized construction entrance(s) only prior to final stabilization (These areas are to be removed last).

12. Carry out final grading, seeding, mulching, and landscaping.

13. Complete final ground stabilization including the placement of sod.

14. Remove silt fencing only after all exposed tributary surfaces are stabilized.

15. Complete on-site final stabilization.

16. Remove temporary sediment controls only after all paving is complete and exposed surfaces are completely stabilized, and cleanout all stormwater collection conveyance, and treatment facilities.

5.0 CONSTRUCTION PHASE POLLUTION CONTROLS

The SWPPP and accompanying plans identify the temporary and permanent erosion and sediment control measures that have been incorporated into the design of this project. These measures will be implemented during construction, to minimize soil erosion and control sediment transport off-site, and after construction, to control the quality and quantity of stormwater runoff from the developed site.

Erosion control measures, designed to minimize soil loss, and sediment control measures, intended to retain eroded soil and prevent it from reaching water bodies or adjoining properties, have been developed in accordance with the following documents:

- Tennessee Erosion and Sediment Control Handbook – 4th Edition (August 2012).

The SWPPP and accompanying plans outline the construction scheduling for implementing the erosion and sediment control measures. The SWPPP and accompanying plans include limitations on the duration of soil exposure, criteria and specifications for placement and installation of the erosion and sediment control measures, a maintenance schedule, and specifications for the implementation of erosion and sediment control practices and procedures.

Temporary and permanent erosion and sediment control measures that shall be applied during construction generally include:

1. Minimizing soil erosion and sedimentation by stabilization of disturbed areas and by removing sediment from construction-site discharges.

2. Preservation of existing vegetation as much as possible. Following the completion of construction activities in any portion of the site permanent vegetation shall be established on all exposed soils.

3. Site preparation activities shall be planned to minimize the area and duration of soil disruption.

4. Permanent traffic corridors shall be established and "routes of convenience" shall be avoided.

5.1 Temporary Erosion and Sediment Control Measures

Temporary erosion and sediment control measures are included as part of the construction documents and are designed to control the rainfall from a 2-year, 24-hour return interval storm. These generally include the following:

1. Stabilized Construction Entrance

   Prior to construction, stabilized construction entrances will be installed, as shown on the detail plan, to reduce the tracking of sediment onto public roadways. For this project the exiting driveway shall be used to minimize ground disturbance.

Construction traffic must enter and exit the site at the stabilized construction entrance. The intent is to trap dust and mud that would otherwise be carried off-site by construction traffic.

The entrance shall be maintained in a condition, which will control tracking of sediment onto public rights-of-way or streets. When necessary, the placement of additional aggregate atop the filter fabric will be done to assure the minimum thickness is maintained. All sediments and soils spilled, dropped, or washed onto the public rights-of-way must be removed immediately. Periodic inspection and needed maintenance shall be provided after each substantial rainfall event.

2. Dust Control

Water trucks or hoses shall be used as needed during construction to reduce dust generated on the site. Dust control must be provided by the general Contractor to a degree that is acceptable to the Owner, and in compliance with the applicable local and state dust control requirements.

3. Temporary Soil Stockpile

Materials, such as topsoil, will be temporarily stockpiled (if necessary) on the site during the construction process. Stockpiles shall be located in an area away from storm drainage, water bodies and/or courses, and will be properly protected from erosion by a surrounding silt fence barrier.

4. Silt Fencing

Prior to the initiation of and during construction activities, a geotextile filter fabric (or silt fence) will be established along the perimeter of areas to be disturbed as a result of the construction, which lie up gradient of water courses or adjacent properties. These barriers may extend into non-impact areas to ensure adequate protection of adjacent lands.

Clearing and grubbing will be performed only as necessary for the installation of the sediment control barrier. To ensure effectiveness of the silt fencing, daily site personnel will perform inspections and inspections immediately after significant storm events. Maintenance of the fence will be performed as needed. Trapped sediment is to be removed from sediment controls at or before 50% design capacity.

5. Temporary Seeding

Within 15 days after construction activity ceases on any particular area of the site, all disturbed areas where there will not be construction for longer than 15 days shall be temporarily seeded and mulched to minimize erosion and sediment loss. Temporary seeding shall be performed in accordance with the Tennessee Erosion and Sediment Control Handbook. The table below provides temporary seeding guidelines:

Species	**Rate (lb/acre)**
Rye	120

Seeding dates

East .....Above 2500 feet: Feb. 15 - May 15
Below 2500 feet: Feb. 1- May 1
Middle ..... Jan. 1 - May 1
West ..... Dec. 1 - Apr. 15

Soil amendments

Follow recommendations of soil tests or apply 2,000 lb/acre ground agricultural limestone and 750 lb/acre 10-10-10 fertilizer.

Mulch

Apply 4,000 lb/acre straw. Anchor straw by tacking with asphalt, netting, or a mulch anchoring tool. A disk with blades set nearly straight can be used as a mulch anchoring tool.

Maintenance

Refertilize if growth is not fully adequate. Reseed, refertilize and mulch immediately following erosion or other damage.

5.2 Permanent Erosion and Sediment Control Measures

Permanent erosion and sediment control measures are included as part of the construction documents and include the following:

1. Establishment of Permanent Vegetation

   Disturbed areas that will be vegetated must be seeded in accordance with the contract documents. The type of seed, mulch, and maintenance measures as described in the contract documents shall also be followed.

   All areas at final grade must be seeded and mulched within 14 days after completion of the major construction activity. All seeded areas should be protected with mulch.

   Final site stabilization is achieved when all soil-disturbing activities at the site has been completed and a uniform, perennial vegetative cover with a density of 80 percent has been established or equivalent stabilization measures (such as the use of mulches or geotextiles) have been employed on all unpaved areas and areas not covered by permanent structures.

Permanent stabilization includes sod and or seeding based on the requirement of the Tennessee Erosion and Sediment control handbook and as outline in the table below. The project site is located within Region II.

Zone		Best	Marginal	Rate/Mix (lb/ac PLS)
Region I	Poorly drained soils	Feb 1 – Mar 20 Sept 1 – Sept 30	Mar 20 – Apr 30 Sept 30 – Oct 31	80 Pensacola bahiagrass 30 Bermudagrass (hulled) 20 Korean lespedeza** 10 Kobe lespedeza**
	Well drained soils	Apr 1 – July 15		50 Pensacola bahiagrass 15 Bermudagrass (hulled) 30 Korean lespedeza** 15 Foxtail millet**
	High maintenance	Apr 1 – July 15		40 Bermudagrass (hulled)
Region II	Low maintenance; Slopes and Poor, shallow soils	Aug 25 – Sept 15 **Feb 15 – Mar 21**	Sept 15 – Oct 25 Mar 21 – Apr 15	100 Pensacola bahiagrass 40 Bermudagrass (hulled) 20 Korean lespedeza** 10 Kobe lespedeza**
	Low maintenance; Moderate slopes; soils >6 in. depth	Aug 25 – Sept 15 **Feb 15 – Mar 21**	Sept 15 – Oct 25 Mar 21 – Apr 15	80 Pensacola bahiagrass 30 Bermudagrass (hulled) 20 Korean lespedeza** 10 Kobe lespedeza**
	High maintenance	Aug 15 – Oct 15	Feb 15 – Apr 15	200 KY 31 fescue**

5.3 Other Pollutant Controls

Control of sediments has been described previously. Other aspects of this SWPPP are listed below:

1. Solid Waste Disposal

   No solid materials, including building materials, are allowed to be discharged from the site with stormwater. All solid waste, including disposable materials incidental to the major construction activities, must be collected and placed in containers. The containers will be emptied periodically by a contract trash disposal service and hauled away from the site.

   Substances that have the potential for polluting surface and/or groundwater must be controlled by whatever means necessary in order to ensure that they do not discharge from the site. As an example, special care must be exercised during equipment fueling and servicing operations. If a spill occurs, it must be contained and disposed so that it will not flow from the site or enter groundwater, even if this requires removal, treatment, and disposal of soil. In this regard, potentially polluting substances should be handled in a manner consistent with the impact they represent.

2. Sanitary Facilities

   Temporary sanitary facilities will be provided by the Contractor throughout the construction phase. They must be utilized by all construction personnel and will be serviced by a commercial Contractor. These facilities must comply with state and local sanitary or septic system regulations.

3. Water Source

   Non-stormwater components of site discharge must be clean water. Water used for construction, which discharges from the site, must originate from a public water supply or private well approved by the Health Department. Water used for construction that does not originate from an approved public supply must not discharge from the site. It can be retained in the ponds until it infiltrates and evaporates.

4. Long-Term Pollutant Controls

   In addition to the permanent stormwater management facilities, identified on the accompanying plans, stormwater pollutant control measures installed during construction that will also provide benefits after construction include temporary sediment basins and rip-rapped outfalls. Temporary sediment basins that do not interfere with normal operations and appear to provide long-term benefits may be left in place after construction is completed, as directed by the Operator.

5.4 Construction Housekeeping Practices

During the construction phase, the general Contractor will implement the following measures:

1. Material resulting from the clearing and grubbing operation will be stockpiled up slope from adequate sedimentation controls.

2. The general Contractor will designate areas for equipment cleaning, maintenance, and repair. The general Contractor and subcontractors will utilize those areas.

3. The use of detergents for large scale washing is prohibited (i.e., vehicles, buildings, pavement surfaces, etc.)

4. Spill Prevention and Response

   A Spill Prevention and Response Plan shall be developed for the site by the Contractor. The plan shall detail the steps needed to be followed in the event of an accidental spill and shall identify contact names and phone numbers of people and agencies that must be notified.

   The plan shall include Material Safety Data Sheets (MSDS) for all materials to be stored on-site. All workers on-site will be required to be trained on safe handling

and spill prevention procedures for all materials used during construction. Regular tailgate safety meetings shall be held and all workers that are expected on the site during the week shall be required to attend.

5. Material Storage

   Construction materials shall be stored in a dedicated staging area. The staging area shall be located in an area that minimizes the impacts of the construction materials effecting stormwater quality.

   Chemicals, paints, solvents, fertilizers, and other toxic material must be stored in waterproof containers. Except during application, the contents must be kept in trucks or within storage facilities. Runoff containing such material must be collected, removed from the site, treated and disposed at an approved solid waste or chemical disposal facility.

6.0 STORMWATER MANAGEMENT PLAN

The goals of this Stormwater Management Plan are to analyze the peak rate of runoff under pre- and post-development conditions, to maintain the pre-development rate of runoff in order to minimize impacts to adjacent or downstream properties, and to minimize the impact of the quality to runoff exiting the site.

These objectives will be met by applying Best Management Practices (BMPs) to limit peak runoff rates.

6.1 Stormwater Management Systems

The existing site is predominantly pervious, as shown above in Table 3. The proposed construction disturbs enough area (greater than one acre) to warrant an erosion control plan, but the total additional impervious area added to the project site ultimately does not affect the stormwater flows for the project area.

The site was analyzed in pre and post-developed conditions and it was determined that the change in discharge rate because of the additional impervious post development stormwater controls will be mitigated by a series of bioretention ponds.

6.2 Hydrologic and Hydraulic Analysis

This report presents the pre-development and post-development features and conditions associated with surface water runoff within the study area. For both cases, the drainage patterns, drainage structures, soil types, and ground cover types are considered in this study.

1. Methodology

The methodology used for the hydrologic and hydraulic analysis was obtained from the United States Department of Agriculture (USDA) Soil Conservation Service's (SCS) Technical Release No. 20, as utilized by the application program HydroCAD. HydroCAD, developed by Applied Microcomputer Systems of Chocorua, New Hampshire, is a Computer-Aided-Design (CAD) program for analyzing the hydrologic and hydraulic characteristics of a given watershed and associated stormwater management facilities. It utilizes the latest techniques to predict the consequences of any given storm.

HydroCAD has the capability of computing hydrographs (which represents discharge rates characteristic of specified watershed conditions, precipitation, and geologic factors) combining hydrographs and routing flows though pipes, streams and ponds. Documentation for HydroCAD can be found on their website: http://www.hydrocad.net/.

For this analysis, the watershed and drainage system were broken down into a network consisting of four types of components as described below:

1. Subcatchment: A relatively homogeneous area of land, which produces a volume and rate of runoff unique to that area.

2. Reach: Uniform streams, channels or pipes that convey stormwater from one point to another.

3. Pond: Natural or man-made impoundment, which temporarily stores stormwater runoff and empties in a manner determined by its geometry and the hydraulic structure located at its outlets.

4. Link: A multi-purpose mechanism used to introduce a hydrograph from another file.

Subcatchments, reaches, ponds and links are represented by hexagons, squares, triangles, and broken boxes respectively, on the watershed routing diagrams provided with the computations included in Appendix C and Appendix D.

2. Analysis

The analysis of hydrologic and hydraulic conditions and proposed stormwater management facilities, servicing the study area, was performed by dividing the tributary watershed into relative homogeneous sub-catchments. The separation of the watershed into sub-catchments was dictated by watershed conditions, methods of collection, conveyance, and points of discharge. Watershed characteristics for each subcatchment were then assessed from United States Geological Service (USGS) 7.5-minute topographic maps, aerial photographs, a topographical survey, soil surveys, site investigations, and land use maps.

Proposed stormwater management facilities were designed and evaluated in accordance with the *TDEC Erosion & Sediment Control Handbook* and local regulatory requirements. The hydrologic and hydraulic analysis considered the SCS, Type II 24-hour storm events identified in Table 3.

Table 4: Design Events

Facility	24 Hour Storm Event
Bioretention Ponds and Detention Ponds	2-year
	5-year
	10-year
	25-year
	50-year
	100-year

3. Study Area and Design Points (DP)

   The study area consists of an overall watershed that encompasses the project site. The project site is light to moderately sloping from south to north, and ultimately to the south east corner of the property. The project site was broken down into smaller watersheds, or subcatchments, to allow for analysis of runoff conditions for pervious and impervious areas. Subcatchments contribute to two Design Points (DP) located across the site, where stormwater leaves the project site.

   A description of the design points and descriptions of each subcatchment are in Section 6.3 Pre-Development Watershed Conditions. Section 6.4 discusses the Post-Development Conditions as well as the proposed stormwater management features. Figures showing the watersheds and subcatchments are provided at the beginning of each of the hydraulic calculation section for pre- and post- watershed conditions.

6.3 Pre-Development Watershed Conditions

The Study Area Subcatchment Map has been provided in Appendix C. The results of the computer modeling used to analyze the overall watershed under pre-development conditions are presented in Appendix C. The pre-development discharge rates are presented in Table 5.

6.4 Post-Development Watershed Conditions

The proposed construction at the project site will increase the impervious area of the property. The analysis of post-development conditions considered existing drainage patterns, soil types, ground cover to remain, planned site development, site grading and, stormwater management facilities proposed as part of site improvements. While the design points have remained unchanged between the existing and proposed conditions, the percentage of impervious area has been updated to account for the increased runoff.

The breakdown of subcatchments for post-development conditions is presented in Appendix D. The results of the computer modeling used to analyze the overall watershed under post-development conditions are presented in Appendix D. A summary of the post-development discharge rates is presented in Table 5.

6.5 Hydrologic and Hydraulic Calculations

Comparison of pre- and post-development watershed conditions demonstrates that the peak rate of runoff from the subject site will not be increase and therefore will not pose a significant adverse impact to the adjacent or downstream properties or receiving water courses. Table 4 "Summary of Pre- and Post-Development Peak Discharge Rates" summarizes the results of the analyses for such comparison.

Table 5: Summary of Pre- & Post-Development Peak Discharge Rates

Pre- vs. Post-Development Discharge Rate (cfs)												
Design Point (DP)	2- year 24-hour Storm		5-year 24-hour Storm		10-year 24-hour Storm		25-year 24-hour Storm		50-year 24-hour Storm		100-year 24-hour Storm	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
1	**0.11**	**0.02**	**1.13**	**0.24**	**2.16**	**0.50**	**3.72**	**0.92**	**5.02**	**1.79**	**6.39**	**5.35**
2	**0.18**	**0.00**	**0.79**	**0.05**	**1.33**	**0.09**	**2.11**	**0.16**	**2.75**	**0.22**	**3.42**	**0.28**

The results of the computer modeling used to analyze the stormwater management system under pre- and post-development conditions are presented in Appendix C and Appendix D, respectively.

7.0 INSPECTIONS, MAINTENANCE, AND REPORTING

7.1 Inspection and Maintenance Requirements

7.1.1 Pre-Construction Inspection and Certification

Prior to the commencement of construction, the Owner's/Operator's Engineer shall conduct an assessment of the site and certify that the appropriate erosion and sediment control measures have been adequately installed and implemented. The Contractor shall contact the Owner's/Operator's Engineer once the erosion and sediment control measures have been installed.

7.1.2 Construction Phase Inspections and Maintenance

A Qualified Inspector, as defined in the General Permit TNR-100000, shall conduct regular site inspections between the time this SWPPP is implemented and final site stabilization. Site inspections shall occur at an interval of at least once every seven calendar days.

The purpose of site inspections is to assess performance of pollutant controls. Based on these inspections, the qualified inspector will decide whether it is necessary to modify this SWPPP, add or relocate sediment barriers, or whatever else may be needed in order to prevent pollutants from leaving the site via stormwater runoff. The general contractor has the duty to cause pollutant control measures to be repaired, modified, maintained, supplemented, or whatever else is necessary in order to achieve effective pollutant control.

Examples of particular items to evaluate during site inspections are listed below. This list is not intended to be comprehensive. During each inspection the inspector must evaluate overall pollutant control system performance as well as particular details of individual system components. Additional factors should be considered as appropriate to the circumstances.

1. Locations where vehicles enter and exit the site must be inspected for evidence of off-site sediment tracking. A stabilized construction entrance will be constructed where vehicles enter and exit. This entrance will be maintained or supplemented as necessary to prevent sediment from leaving the site on vehicles.
2. Sediment barriers must be inspected and, if necessary, they must be enlarged or cleaned in order to provide additional capacity. All material from behind sediment barriers will be stockpiled on the up slope side. Additional sediment barriers must be constructed as needed.
3. Inspections will evaluate disturbed areas and areas used for storing materials that are exposed to rainfall for evidence of, or the potential for, pollutants entering the drainage system. If necessary, the materials must be covered or original covers must be repaired or supplemented.
4. Grassed areas will be inspected to confirm that a healthy stand of grass is maintained. The site has achieved final stabilization once all areas are covered with building foundation or pavement, or have a stand of grass with at least 80 percent density. The density of 80 percent or greater must be maintained to be considered

as stabilized. Areas must be watered, fertilized, and reseeded as needed to achieve this goal.

5. All discharge points must be inspected to determine whether erosion control measures are effective in preventing significant impacts to receiving waters.
6. The system shall be maintained and inspected according to the "Post-Construction Inspections and Maintenance" as outlined in Section I-01 of the "Tennessee Guide to Selection & Design of Stormwater BMPs".
7. Maintenance of the systems may include but not be limited to excavation and replacement of the infiltration bed every 5 years.

The inspection reports must be completed entirely and additional remarks should be included if needed to fully describe a situation. An important aspect of the inspection report is the description of additional measures that need to be taken to enhance plan effectiveness. The inspection report must identify whether the site was in compliance with the SWPPP at the time of inspection and specifically identify all incidents of non-compliance.

Within one business day of the completion of an inspection, the qualified inspector shall notify the Owner/Operator and appropriate contractor (or subcontractor) of any corrective actions that need to be taken. The contractor (or subcontractor) shall begin implementing corrective actions within one business day of this notification and shall complete the corrective actions in a reasonable time frame.

In addition to the inspections performed by the Owner's/Operator's Engineer, the Contractor shall perform routine inspections that include a visual check of all erosion and sediment control measures. All inspections and maintenance shall be performed in accordance with the inspection and maintenance schedule provided on the accompanying plans. Sediment removed from erosion and sediment control measures will be exported from the site, stockpiled for later use, or used immediately for general non-structural fill.

It is the responsibility of the general contractor to assure the adequacy of site pollutant discharge controls. Actual physical site conditions or contractor practices could make it necessary to install more structural controls than are shown on the accompanying plans. (For example, localized concentrations of runoff could make it necessary to install additional sediment barriers.) Assessing the need for additional controls and implementing them or adjusting existing controls will be a continuing aspect of this SWPPP until the site achieves final stabilization.

7.1.3 Temporary Suspension of Construction Activities

For constructions sites where soil disturbance activities have been temporarily suspended (e.g. Winter shutdown) and temporary stabilization measures have been applied to all disturbed areas, the frequency of Qualified Inspector inspections can be reduced to once every 30 calendar days. Prior to reducing the frequency of inspections, the Owner/Operator shall notify the Nashville Metro contact person in writing.

7.1.4 Partial Project Completion

For constructions sites where soil disturbance activities have been shut down with partial project completion, all areas disturbed as of the project shutdown date have achieved final stabilization, and all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational, the Qualified Inspector inspections can stop. Prior to the shutdown, the Owner/Operator shall notify the Nashville Metro contact person in writing

7.1.5 Post-Construction Inspections and Maintenance

Inspections and maintenance of post-construction stormwater management facilities shall be performed by a Qualified Inspector, as defined herein, and shall conducted on an annual basis to ensure that the stormwater management systems are in place and operable. Inspections and maintenance include checking all cleanouts and removing any sediment that has collected in the system. The following areas of the system shall at a minimum be checked.

General System:

1. All cleanouts from downspouts.
2. All cleanouts related to the stormwater management system and identified in the plans.
3. All grates related to the storm water management system.
4. Visual inspection of the detention basins.
5. Visual inspection of the level spreaders

As Needed:

1. Inspect to insure that all vegetation is healthy and replace as necessary to ensure desired density.
2. Inspect and remove leaves and debris from inlets and outlets.
3. Inspect sumps for detention basin and clean if necessary.

Annually:

1. Spring inspection and cleanup
2. Inspect and replace vegetation as necessary
3. Inspect level spreaders, sumps and StormTech system.

Records shall be kept for all annual inspection in accordance to the Reporting Requirement in Section 7.2.

If any portion of the systems is found to damaged or not be functioning as designed the owner shall contract the engineer of record and or replace the portion of the system to meet the original design specifications.

7.2 Reporting Requirements

7.2.1 Inspection and Maintenance Reports

Inspection/maintenance reports shall be prepared prior to and during construction in accordance with the schedule outlined herein. The reports shall be prepared to identify and document the maintenance of the erosion and sediment control measures. A sample inspection form is provided in Appendix A and shall only be prepared if required by Nashville Metro.

Specifically, each inspection shall record the following information:

1. Date and time of inspection.

2. Name and title of person(s) performing inspection.

3. A description of the weather and soil conditions (e.g. dry, wet, saturated) at the time of the inspection.

4. A description of the condition of the runoff at all points of discharge (including conveyance systems and overland flow) from the construction site. This shall include identification of any discharges of sediment from the construction site.

5. A description of the condition of all natural surface waterbodies located within, or immediately adjacent to, the property boundaries of the construction site which receive runoff from disturbed areas. This shall include identification of any discharges of sediment to the surface waterbody.

6. Identification of all erosion and sediment control practices that need repair or maintenance.

7. Identification of all erosion and sediment control practices that were not installed properly or are not functioning as designed and need to be reinstalled or repaired.

8. Description and sketch of areas that are disturbed at the time of the inspection and areas that have been stabilized (temporary and/or final) since the last inspection.

9. Current phase of construction of all post-construction stormwater management practices and identification of all construction that is not in conformance with the SWPPP and technical standards.

10. Corrective action(s) that must be taken to install, repair, replace or maintain erosion and sediment control practices; and to correct deficiencies identified with the construction of the post-construction stormwater management practice(s).

11. Digital photographs, with date stamp, which show the condition of all practices that have been identified as needing corrective action or have undergone corrective action, must be attached to the associated inspection report.

7.2.2 Site Log Book

The Owner/Operator shall retain a copy of the SWPPP at the construction-site from the date of initiation of construction activities to the date of final stabilization.

During construction, the Owner's/Operator's Engineer shall maintain a record of all SWPPP inspection reports at the site in the Site Log Book. The Site Log Book shall be maintained on-site and made available to the permitting authority.

7.2.3 Post Construction Records and Archiving

Following construction, the Owner/Operator shall retain copies of the SWPPP, the complete construction Site Log Book, and records of all data used to complete the NOI to be covered by this permit, for a period of at least five years from the date that the site is finally stabilized.

8.0 CONCLUSION

S+H Group, LLC has completed a Stormwater Pollution Prevention Plan for the planned construction at 1590, 1600, 1602, and 1604 Lebanon Pike, Nashville, Davidson County Tennessee. The analysis included the review of watershed conditions, hydrologic and hydraulic analysis using computer modeling, and an evaluation of the proposed improvements across the subject site.

The Stormwater Management Plan allows for the maintenance of existing drainage patterns while continuing the conveyance of stormwater runoff from upland watershed areas.

The Stormwater Management Plan controls decrease in the stormwater rate of runoff resulting from the proposed development without adversely affecting downstream conditions. This is demonstrated by comparing pre- and post-development flows for various storm events. Table 5 "Summary of Pre- and Post-Development Peak Discharge Rates" summarizes the results of the analyses for such comparison.

The comparison of pre- and post-development watershed rate of runoff demonstrates that off-site peak flow conditions at the design points will pose no significant adverse impacts to the adjacent or downstream properties or receiving water courses.

Stormwater quality will be enhanced through the implementation of the proposed erosion and sediment control measures and maintenance practices outlines herein.

In conclusion, it is our opinion that the proposed development will not adversely impact adjacent or downstream properties if the stormwater management facilities are properly constructed and maintained in accordance with the requirements outlines herein.

OWNER'S CERTIFICATION OF THE STORMWATER POLLUTION PREVENTION PLAN

GENERAL PERMIT FOR STORMWATER DISCHARGES FROM CONSTRUCTION ACTIVITIES

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage this system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Signature of Owner

Nick Adler

Printed Name

Developer

Title

5/20/2020

Date

APPENDIX B

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Davidson County, Tennessee

April 10, 2020

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:888 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 10 20 40 60

Feet
0 40 80 160 240

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Davidson County, Tennessee
Survey Area Data: Version 17, Sep 16, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Nov 2, 2019—Nov 16, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
SvD	Stiversville-Urban land complex, 3 to 25 percent slopes	3.1	100.0%
Totals for Area of Interest		**3.1**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however,

onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Davidson County, Tennessee

SvD—Stiversville-Urban land complex, 3 to 25 percent slopes

Map Unit Setting

National map unit symbol: kkp7
Mean annual precipitation: 39 to 57 inches
Mean annual air temperature: 48 to 70 degrees F
Frost-free period: 190 to 205 days
Farmland classification: Not prime farmland

Map Unit Composition

Stiversville and similar soils: 60 percent
Urban land: 35 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Stiversville

Setting

Landform: Ridges
Landform position (three-dimensional): Crest
Parent material: Loamy residuum weathered from limestone, sandstone, and shale

Typical profile

H1 - 0 to 8 inches: loam
H2 - 8 to 53 inches: clay loam
Cr - 53 to 63 inches: bedrock

Properties and qualities

Slope: 3 to 25 percent
Depth to restrictive feature: 39 to 59 inches to paralithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Hydric soil rating: No

Description of Urban Land

Typical profile

H1 - 0 to 6 inches: material

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydric soil rating: No

Minor Components

Minor components

Percent of map unit: 5 percent
Hydric soil rating: No

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EROSION PREVENTION AND SEDIMENT CONTROL NOTES

1. ALL EROSION CONTROL MEASURES SHALL BE INSTALLED AND APPROVED BY THE ENGINEER PRIOR TO THE COMMENCEMENT OF ANY GRADING OR GROUND DISTURBANCE.
2. THE CONTRACTOR SHALL INSTALL ALL EROSION AND SEDIMENT CONTROL MEASURES AS IDENTIFIED ON THE DRAWINGS.
3. DO NOT OPERATE OR STORE HEAVY EQUIPMENT, OR HANDLE AND/OR STORE CONSTRUCTION DEBRIS OR MATERIALS, WITHIN THE DRIPLINE OF EXISTING OR PROPOSED TREES.
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7. THE CONTRACTOR SHALL BE REQUIRED TO VERIFY ALL CONSTRUCTION ACCESS POINTS WITH THE OWNER AND THE ENGINEER PRIOR TO CONSTRUCTION.
8. REQUIRED BMPs ARE DESIGNED TO CONTROL SITE WASTES SUCH AS DISCARDED BUILDING MATERIALS, CONCRETE TRUCK WASHOUT, CHEMICALS, LITTER, AND SANITARY WASTE.
9. ALL DISTURBED AREAS ARE TO BE STABILIZED WITHIN 14 DAYS AFTER CONSTRUCTION ACTIVITY ENDS.
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13. THE AREA OF DISTURBANCE IS APPROXIMATELY 2.93 ACRES.
14. CONTRACTOR SHALL NOT PROCEED WITH WORK UNTIL NOI/SWPPP SIGNATURE PAGES HAVE BEEN EXECUTED BY AN OFFICIAL OF THE CONTRACTOR AND A NOC HAS BEEN RECEIVED.
15. CONTRACTOR SHALL BE RESPONSIBLE FOR TWICE WEEKLY INSPECTIONS TO BE IN COMPLIANCE WITH TN CGP, METRO AND STATE SWPPP REQUIREMENTS.
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EPSC LEGEND

	CONSTRUCTION ENTRANCE (TCP#03)
SF	SILT FENCING (TCP#13)
SOCK	WEIGHTED SEDIMENT TUBE (TC#14)

NOC NOTE:

THE PROJECT ASSOCIATED WITH THESE SUBMITTED PLANS IS COVERED UNDER TENNESSEE CONSTRUCTION GENERAL PERMIT TNRXXXXXX. THE TOTAL DISTURBED AREA IS: 2.93 ACRES.

CHECK ALL THAT APPLY: THE SITE DISCHARGES INTO WATERS IDENTIFIED BY TDEC AS: __IMPAIRED FOR SILTATION __ IMPAIRED FOR HABITAT ALTERATION __ EXCEPTIONAL

John Jacoby 5/12/2020
SIGNATURE DATE

CIRCLE ONE: DEVELOPER (PROJECT ENGINEER) OTHER:_____

LINE TABLE

LINE	BEARING
L1	N 14°46'51" E
L2	N 10°47'24" E
L3	N 78°31'51" W

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1600 LEBANON PIKE
INITIAL ESPC & DEMOLITION PLAN

JOHN JACOBY 2604 LICENSED PROFESSIONAL ENGINEER No. 121815 STATE OF TENNESSEE
05/12/2020

S+H ENGINEERING DESIGN CONSULTING
2606 EUGENIA AVENUE
NASHVILLE TN 37211 SUITE D
TEL: 615.645.1560

DATE:	4/3/2020
SCALE:	1" = 20'
DRAWN BY:	JPJ
REVIEWED BY:	FPS
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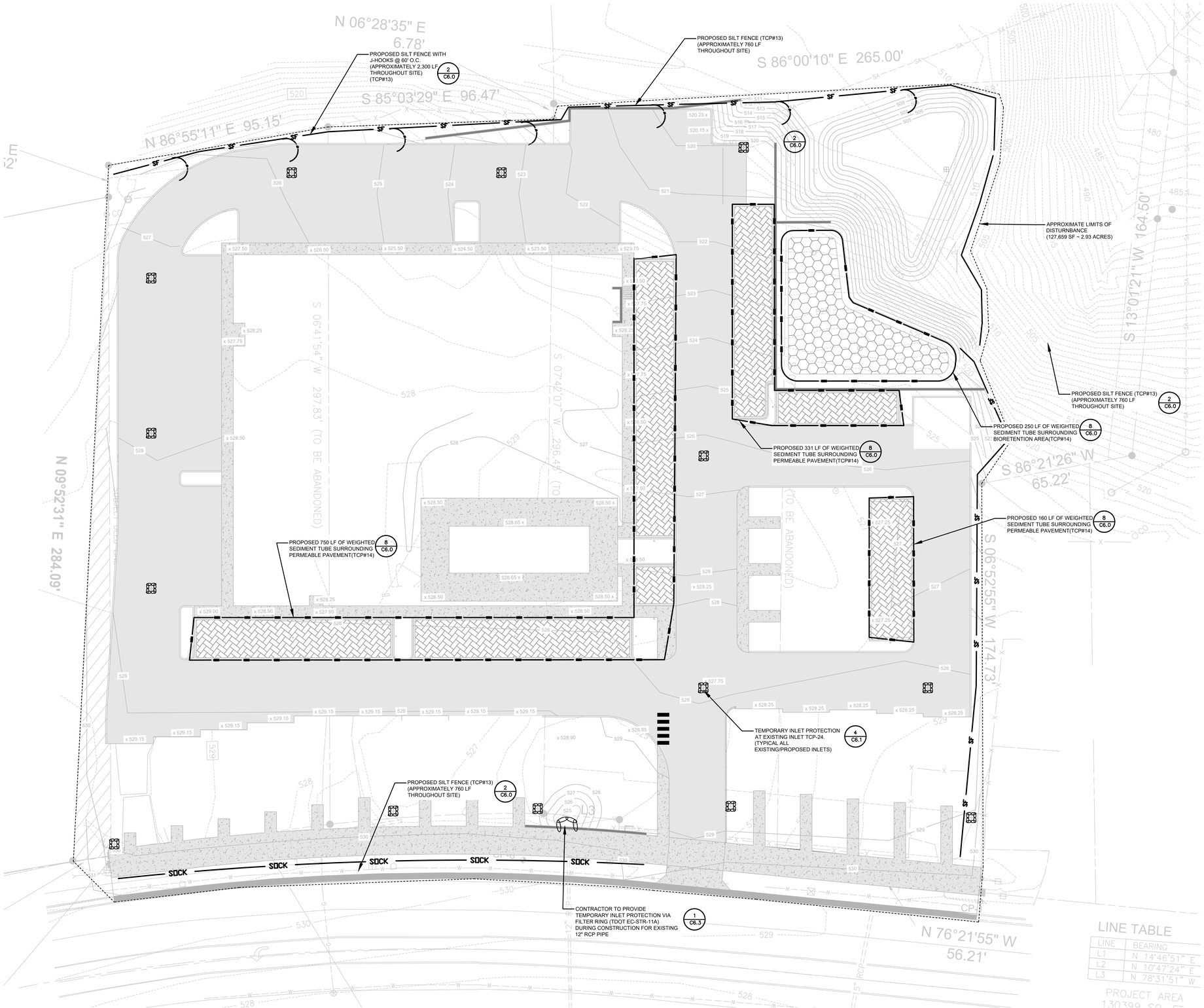

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EPSC LEGEND

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- SF — SILT FENCING (TCP#13)
- SOCK — WEIGHTED SEDIMENT TUBE (TC#14)

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INTERMEDIATE ESPC PLAN

JOHN JACOB PAGE
REGISTERED ENGINEER
AGENT OF RECORD
05/12/2020
STATE OF TENNESSEE

S + H ENGINEERING DESIGN CONSULTING
2606 EUGENIA AVENUE
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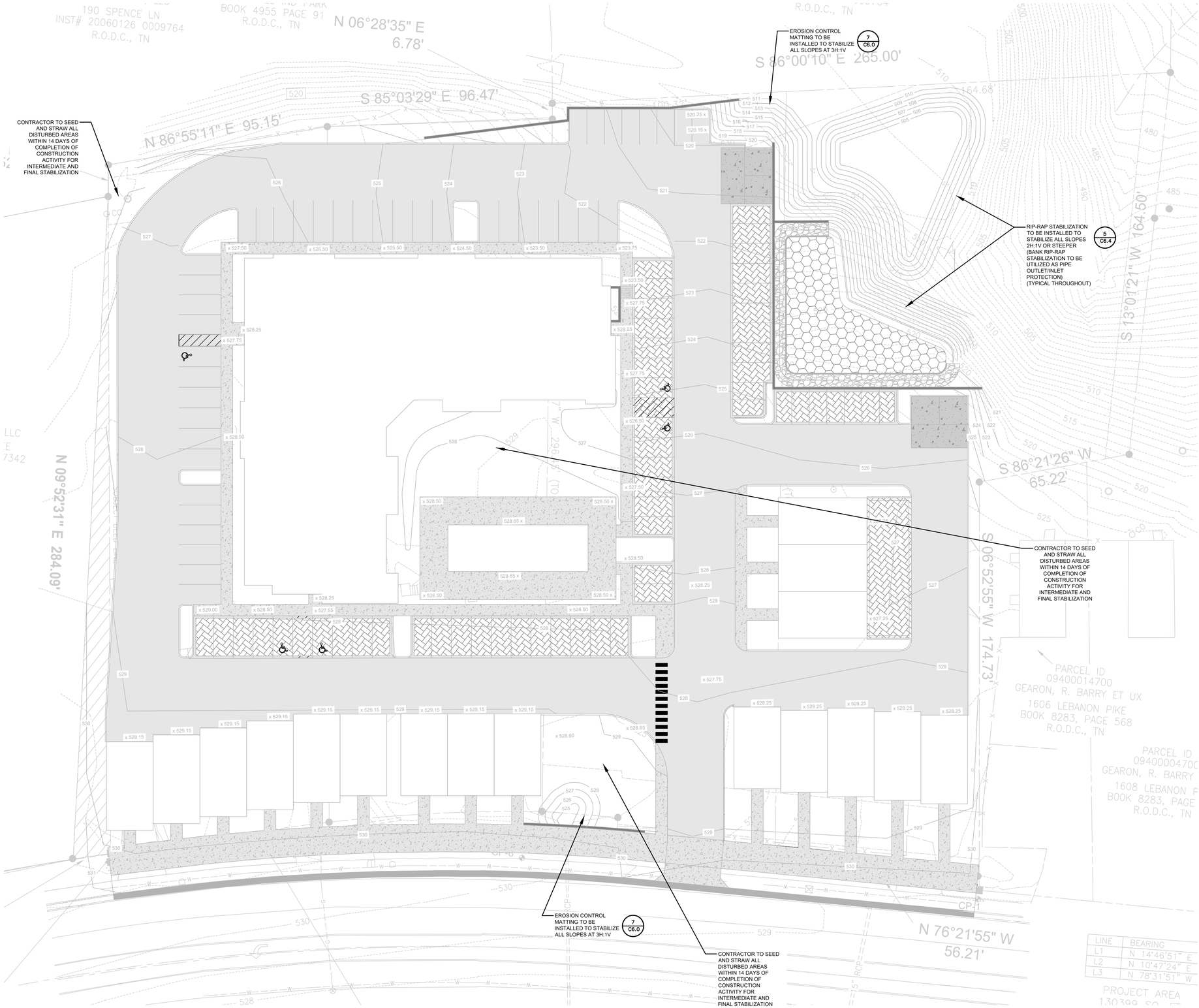

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FINAL ESPC PLAN

JOHN JACOB PAGE
LICENSED ENGINEER
STATE OF TENNESSEE
No. 121811
05/12/2020

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