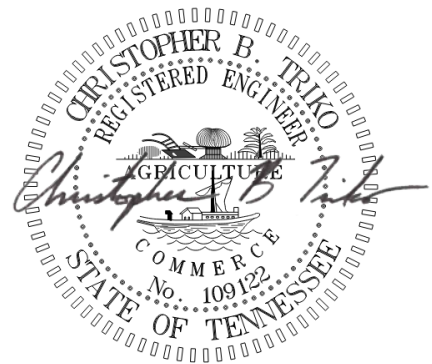


STORMWATER MANAGEMENT PLAN

**Roane County EMS Station 1 Site
KINGSTON, TN**

MBI Project Number: 220397-01



12/22/2022

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Table of Contents

1.0 Introduction..... 3

2.0 Site Location 3

3.0 Project Description..... 4

4.0 Hydraulics & Methodology 4

5.0 Site Drainage & Water Quality Calculations..... 5

6.0 Results..... 5

7.0 Drainage Areas Maps..... A-1

8.0 Detention Pond Calculations..... B-1

1.0 Introduction

This report studies the proposed stormwater management system for a new EMS Station at 664 Gallaher Rd, Roane County, Kingston, TN 37763.

2.0 Site Location

The 0.61-acre site is located at 664 Gallaher Rd, Kingston, TN 37763. (Parcel ID 060 004.00). The project site is located 0.9 miles on the northeastern side of New Hwy 68 and just northwest of Lee Hwy.

Figure 1: Aerial Photography of Region

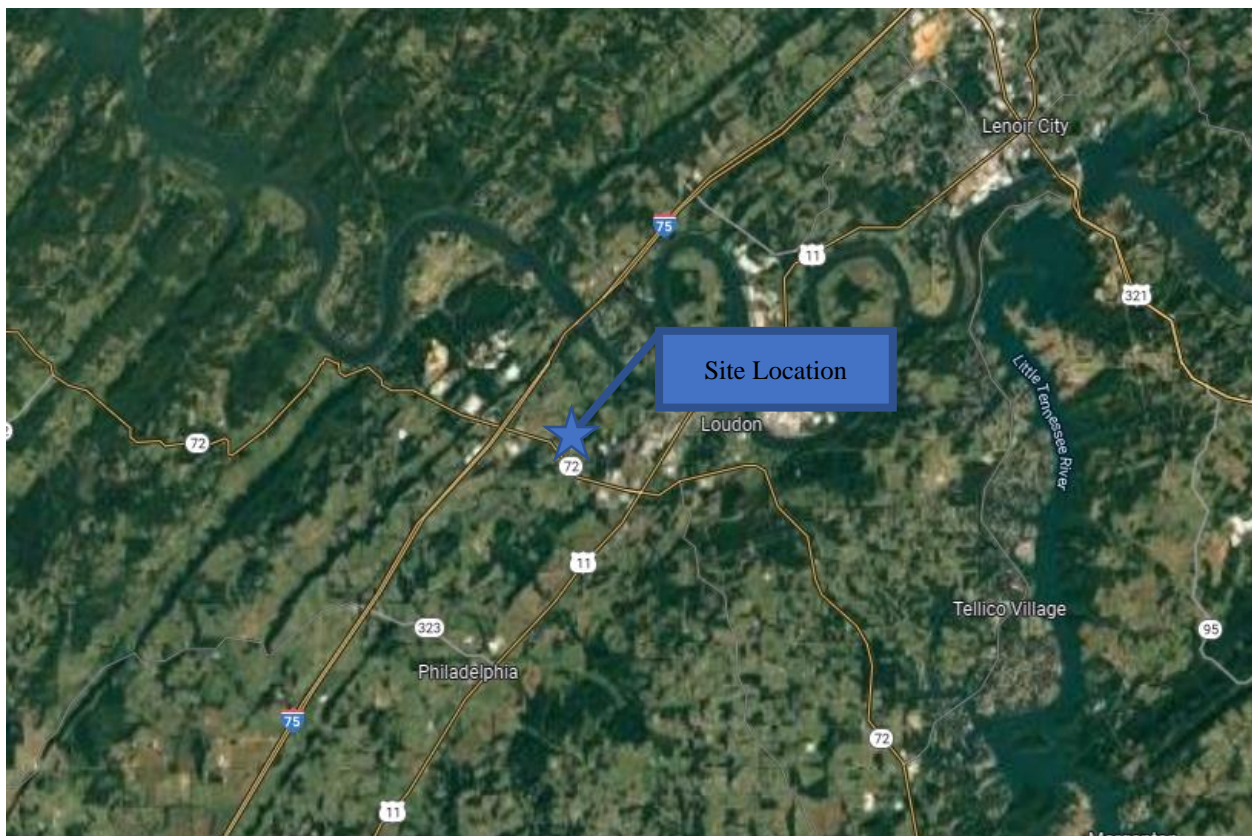
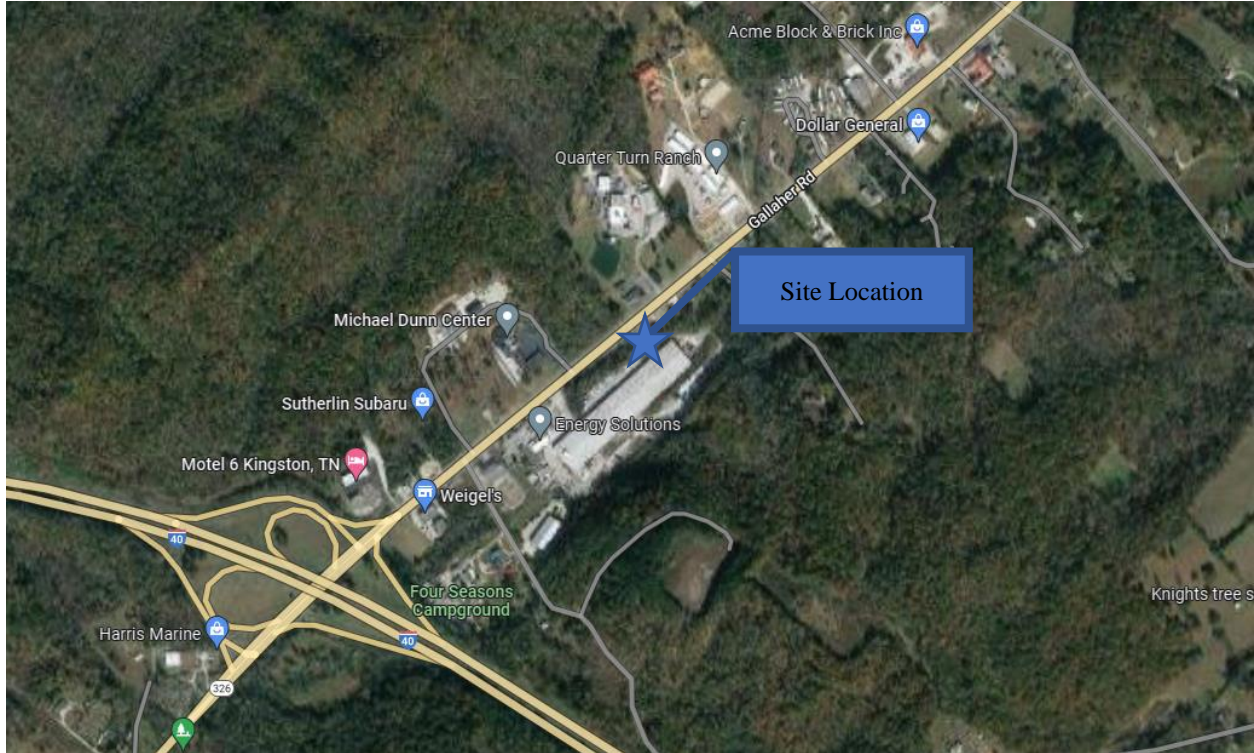


Figure 2: Aerial Photography of Site



3.0 Project Description

The project will include the construction of an EMS Station. The site work will include demolition of any existing structures, grading, erosion prevention and sediment control measures, domestic water, sanitary sewer, stormwater drainage improvements, two driveways, parking, and the preparative construction of an EMS Station.

4.0 Hydraulics & Methodology

The rational method was used to size pipes and for the proposed drainage system. The NRCS method was used to design the site's detention pond. Mapping from a field survey was used in these calculations. A drainage map for the site can be found in Appendix A.

5.0 Site Drainage & Water Quality Calculations

The pipes were sized to convey a 10-year frequency storm event. A summary table and accompanying calculations can be located in Section 6.0. The pond was designed to attenuate the 25-year storm event such that post-development does not exceed pre-development flowrates from the 10-year storm event. Supporting calculations are in Section 8.0.

6.0 Results

Design Storms

Description	24-hr Precipitation (in)
10-YR	4.61
25-YR	5.50

Pipe Sizing

Pipe	Downstream Structure	Upstream Structure	Downstream Inv. (ft)	Upstream Inv. (ft)	Length (ft)	Slope	Material	Diameter (in)	10-YR Flowrate (cfs)	Capacity (cfs)
1	HW-1	OS-1	934.76	835.00	24	1.00%	RCP	15	0.335	6.47

Pre-Development Outflow vs Post-Development Outflow

Pre-Development Outflow (10-Yr)	Post-Development Outflow (25-Yr)
2.01 CFS	1.80 CFS

7.0 Appendix A – Drainage Areas Maps



PRE-DEVELOPMENT DRAINAGE AREAS

GALLAHER ROAD - STATE HWY 58



AREA #	AREA (AC)	TC (MIN)	CN	Q10 (CFS)	Q25 (CFS)
1	0.32	5	85	1.60	2.00
2	0.29	5	77	1.12	1.48

POST-DEVELOPMENT DRAINAGE AREAS

8.0 Appendix B – Detention Pond Calculations

Hydrograph 10-yr Summary

Project Name: Roane County EMS Station 1

Hydrology Studio v 3.0.0.27

03-08-2023

Hyd. No.	Hydrograph Type	Hydrograph Name	Peak Flow (cfs)	Time to Peak (hrs)	Hydrograph Volume (cuft)	Inflow Hyd(s)	Maximum Elevation (ft)	Maximum Storage (cuft)
1	NRCS Runoff	Pre Drainage Area #1	2.024	12.00	5,253	---		
2	NRCS Runoff	Post Drainage Area #1	1.589	11.93	3,277	---		
3	NRCS Runoff	Post Drainage Area #2	1.124	11.93	2,270	---		
4	Pond Route	Pond	0.335	12.10	3,276	2	837.29	1,083
5	Junction	Total Post Outflow	1.432	11.97	5,546	3, 4		

Hydrograph 25-yr Summary

Project Name: Roane County EMS Station 1

Hydrology Studio v 3.0.0.27

03-08-2023

Hyd. No.	Hydrograph Type	Hydrograph Name	Peak Flow (cfs)	Time to Peak (hrs)	Hydrograph Volume (cuft)	Inflow Hyd(s)	Maximum Elevation (ft)	Maximum Storage (cuft)
1	NRCS Runoff	Pre Drainage Area #1	2.682	12.00	6,957	---		
2	NRCS Runoff	Post Drainage Area #1	2.000	11.93	4,174	---		
3	NRCS Runoff	Post Drainage Area #2	1.482	11.93	3,007	---		
4	Pond Route	Pond	0.365	12.10	4,172	2	837.68	1,443
5	Junction	Total Post Outflow	1.803	11.93	7,179	3, 4		

Hydrograph 100-yr Summary

Project Name: Roane County EMS Station 1

Hydrology Studio v 3.0.0.27

03-08-2023

Hyd. No.	Hydrograph Type	Hydrograph Name	Peak Flow (cfs)	Time to Peak (hrs)	Hydrograph Volume (cuft)	Inflow Hyd(s)	Maximum Elevation (ft)	Maximum Storage (cuft)
1	NRCS Runoff	Pre Drainage Area #1	3.861	12.00	10,072	---		
2	NRCS Runoff	Post Drainage Area #1	2.715	11.93	5,772	---		
3	NRCS Runoff	Post Drainage Area #2	2.123	11.93	4,353	---		
4	Pond Route	Pond	2.342	12.00	5,771	2	837.92	1,652
5	Junction	Total Post Outflow	3.988	12.00	10,124	3, 4		