Sterling Environmental Engineering, P.C.

ONSITE WASTEWATER TREATMENT SYSTEM ENGINEERING REPORT

FOR

SHELDRAKE KARMEL RD PROPERTIES LLC
TOWN OF FALLSBURG, SULLIVAN COUNTY, NEW YORK
NYSDEC ID 3-4828-00433/00001

Prepared For:

Sheldrake Karmel Rd Properties LLC

Prepared By:

Sterling Environmental Engineering, P.C.
24 Wade Road
Latham, New York 12110

June 29, 2026

"Serving our clients and the environment since 1993"

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Table of Contents

Page #

1.0 INTRODUCTION 1
- 1.1 Problem Definition and Objectives 1
- 1.2 Flows and Organic Load 2
- 1.3 Impact on Existing Wastewater Facilities 3
- 1.4 Project Description 3
- 1.5 Location Drawings 4
- 1.6 Engineering Criteria 4
- 1.7 Site Information 4
- 1.8 Alternative Selection 4
- 1.9 Environmental Review 4

2.0 PROPOSED FACILITY PLANS 5
- 2.1 Planning and Service Area 5
- 2.2 Population Projection and Planning 5

3.0 HYDRAULIC CAPACITY 5
- 3.1 Design Average Flow 5
- 3.2 Design Maximum Flow 5
- 3.3 Design Peak Hourly 5
- 3.4 Design Peak Instantaneous Flow 5
- 3.5 Organic Load Identification and Design 5

4.0 WASTEWATER TREATMENT SYSTEM 6
- 4.1 Collection and Conveyance 6
- 4.2 Screening and Equalization 6
- 4.3 Packaged MBR Plant 6
- 4.4 Disinfection 6
- 4.5 Effluent Discharge 6
- 4.6 Operation & Maintenance 7
- 4.7 Emergency Operation 7

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Tables

Table 1 Pool Swimmer Estimate....2
Table 2 Wastewater Design Flow....3
Table 3 Influent Organic Load....3
Table 4 Design Organic Loads....6

Figures

Figure 1 Site Location Map
Figure 2 Site Vicinity Map
Figure 3 Wastewater Treatment Block Diagram
Figure 4 Wastewater Outfall Detail

Appendices

Appendix A Site Plan Drawings
Appendix B Wetland Delineation map
Appendix C USDA NRCS Soil Report
Appendix D Planning Board Resolutions
Appendix E Preliminary Effluent Limits
Appendix F MBR Preliminary Schematic
Appendix G Wastewater Equalization Tank Sizing

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1.0 INTRODUCTION

Sterling Environmental Engineering, P.C. (STERLING) was retained by Sheldrake Karmel Rd Properties LLC to prepare an Engineering Report in support of a new onsite wastewater treatment system (OWTS) for the treatment and surface discharge of domestic wastewater. The project site is located on Tax Map Parcel ID 12.-1-7 in the Town of Fallsburg, Sullivan County, New York. A Site Location Map on a United States Geological Survey quadrangle map is provided as Figure 1, and a Site Vicinity Map on an aerial image is provided as Figure 2.

This Engineering Report provides the basis of design, supporting calculations, and evaluations supporting the proposed OWTS.

1.1 Problem Definition and Objectives

The proposed project includes 86 residential dwelling units that require the collection and treatment of domestic wastewater. The proposed project also includes two 1,950 square foot pools, one 600 square foot kiddie pool, and a community building to be used as a Shul/Synagogue. Site Plan Drawings are included in Appendix A. All units will be under single ownership; therefore, formation of a sewage disposal corporation is not required. The project is located within the Town of Fallsburg, which owns and operates a sanitary sewer collection and treatment system on behalf of the Fallsburg Consolidated Sewer District. According to the Sewer District's January 8, 2025 Map, Plan, and Report, the subject property is located north of the northern limit of the Sewer District. As indicated in the report, the district boundaries are not expanding and will remain unchanged due to aging infrastructure and inadequate capacity to accept new users. There are no municipal sewers serving the subject property and installation of municipal sewers is not an economically viable option even if the Sewer District was considering expansion.

The project site contains constrained land including wetlands and slopes exceeding 20%. A wetland delineation map is included in Appendix B. The net usable area of unconstrained land is approximately 52.0 acres. Each dwelling unit requires 21,780 square feet covering a total of approximately 43.0 acres. The remaining 9 acres of unconstrained land is allocated to roadways, recreational facilities, and stormwater management areas. There is insufficient land area to accommodate an onsite groundwater disposal system. A review of the United States Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) Web Soil Survey indicates that the subject property is predominantly Hydrologic Soil Group C and D, which are defined as having slow to very slow infiltration rate. The soils were further evaluated for suitability of septic absorption fields, which indicated the soils are somewhat limited to very limited. Limitations are attributed to shallow saturated zones, shallow bedrock, and restricted permeability. A copy of the USDA NRCS soil report is included in Appendix C.

Based on the infeasibility for connection to a municipal sewer system or groundwater discharge, an Intermittent Stream Analysis and Natural Wastewater Treatment Alternative Analysis was submitted to the Delaware River Basin Commission (DRBC) outlining the need for an OWTS with surface discharge. By email dated October 10, 2025, the DRBC accepted the analysis. The objective of this Engineering Report is to provide the basis of design, supporting calculations, and evaluations supporting the proposed OWTS. This Engineering Report referenced the following design standards and regulations:

- New York State Design Standards for Intermediate Sized Wastewater Treatment Systems (March 5, 2014).

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- Recommended Standards for Wastewater Facilities, Policies for the Design, Review, and Approval of Plans and Specifications for Wastewater Collection and Treatment Systems, aka the "Ten States Standards" (2014 Edition).

1.2 Flows and Organic Load

The design wastewater flow was determined using Method 1 of the New York State Design Standards for Intermediate Sized Wastewater Treatment Systems, which uses established typical per-unit hydraulic loading rates at the maximum expected operational conditions. The 86 residential dwelling units are proposed to have four bedrooms each. The community building is intended to be used as a Shul / Synagogue with water demand equivalent to a church based on the number of seats. NYSDOH regulations at 10 NYCRR 6-1.29 Swimming Pool Design Standard identifies a density of 15 square feet per swimmer in shallow areas and 25 square feet per swimmer in deep areas. Pool swimmers are estimated as follows:

Table 1 – Pool Swimmer Estimate

Pool	Depth	Swimmer Count
Kiddie Pool	100% Shallow	600 sf / 15 sf = 40 swimmers
Main Pools	40% Shallow	1,560 sf / 15 sf = 104 swimmers
Main Pools	60% Deep	2,340 sf / 25 sf = 93 swimmers

An allowance was calculated for the swimming pool backwash as follows:

Total Pool Area	= 4,500 square feet
Average Pool Depth	= 4 feet
Total Pool Volume	= 18,000 cubic feet x 7.481 gal/cf = 134,658 gallons
Minimum Filtration Rate per NYSDOH	= 4x per day = 538,632 gpd = 374 gpm
Maximum High-Rate Sand Filter Rate per NYSDOH Standards	= 5 gpm/sf of filter
Required Filter Area	= 374 gpm / 5 gpm/sf = 75 sf
Representative Pentair THS Series Sand Filter Surface Area	= 27 sf
Required Number of Filters	= 75 sf / 27 sf = 2.8 Round up to 3 filters
Backwash Volume	Per Pentair Manual Backwash at up to 20 gpm for 5 minutes
Backwash Volume	= 3 filters x 20 gpm x 5 minutes = 300 gallons

Backwash occurs over short duration; therefore, allocate 300 gpd to filter backwash.

Average day, maximum day, and peak hourly design flows are further described in Section 3.

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Table 2 – Wastewater Design Flow

Building Use	Number	Unit	Flow Rate (gpd)	Total (gpd)
Residential Dwelling	344	Bedroom	110	37,840
Pools	237	Swimmer	10	2,370
Pool Backwash	1	Allowance	300	300
Community Building	200	Seats	3	600
			Total Daily Flow (gpd)	**41,110**
			Design Daily Flow (gpd)	**52,000**
			Design Daily Flow (gpm)	**36.1**

The design organic load is based on the Ten States Standards Section 11.253 and an assumed population of 500 persons (i.e., 5 persons per dwelling unit x 86 dwelling units = 430 persons rounded up to the next hundred persons):

$$BOD_5(\frac{mg}{L}) = 0.17\ lb/person/day\ x\ 500\ persons\ /\ 0.052MGD\ /\ 8.345 = 196\ mg/L$$

$$TSS\ (\frac{mg}{L}) = 0.20\ lb/person/day\ x\ 500\ persons\ /\ 0.052MGD\ /\ 8.345 = 230\ mg/L$$

These design loads are within the range of typical influent concentrations contained in the New York State Design Standards for Intermediate Sized Wastewater Treatment Systems, as summarized in the following table:

Table 3 – Influent Organic Load

Parameter	Design Standard Concentration (mg/L)	Calculated Organic Load (mg/L)
BOD5	155 – 286	196
TSS	155 – 330	230

1.3 Impact on Existing Wastewater Facilities

There will be no impact on existing wastewater facilities. The proposed project includes a standalone OWTS that is not connected to any existing wastewater facility. As described in Section 1.1, the project site is not located within an established sewer district.

1.4 Project Description

The proposed project includes 86 residential dwelling units that require the collection and treatment of domestic wastewater. The proposed project also includes two 1,950 square foot pools, one 300 square foot kiddie pool, and a community building to be used as a Shul/Synagogue. The project received site plan approval from the Town Planning Board on August 14, 2025. A copy of the Planning Board approval resolution is included in Appendix D. The project team initiated contact with the New York State Department of Environmental Conservation (NYSDEC) and the Delaware River Basin Commission (DRBC) to obtain preliminary effluent limits for the proposed discharge location. A copy of the preliminary

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effluent limits are provided in Appendix E based on discharge to an intermittent stream that flows into the Class B Sheldrake Stream and Minor Tribs (Water Index Number D-1-38).

1.5 Location Drawings

Site Plan Drawings depicting the project location are included in Appendix A depicting the location and alignment of proposed wastewater facilities.

1.6 Engineering Criteria

Raw domestic wastewater composition is based on the calculations in Section 1.2 and typical design loads contained in Section B.6 of the New York State Design Standards for Intermediate Sized Wastewater Treatment Systems. There are no projected commercial or industrial wastewater loads to the system. Treated sanitary discharge from the OWTS must be designed to achieve the preliminary effluent limits provided in Appendix E.

1.7 Site Information

A review of the USDA NRCS Web Soil Survey indicates that the subject property is predominantly Hydrologic Soil Group C and D, which are defined as having slow to very slow infiltration rate. The soils were further evaluated for suitability of septic absorption fields, which indicated the soils are somewhat limited to very limited. Limitations are attributed to shallow saturated zones, shallow bedrock, and restricted permeability. A copy of the USDA NRCS soil report is included in Appendix C.

A wetland delineation identified both Federal Wetlands subject to jurisdiction of the United States Army Corps of Engineers (USACE) and State Freshwater Wetlands subject to jurisdiction of the NYSDEC. A jurisdictional determination was performed to confirm the wetland boundaries with receipt of a positive jurisdictional determination from NYSDEC. A copy of the wetland delineation map signed by NYSDEC subsequent to the jurisdictional determination letter is included in Appendix B.

1.8 Alternative Selection

In accordance with DRBC WQR Section 3.10.3.B.1.a, the discharge of treated sanitary wastewater "shall be substantially free from unsightly or malodorous nuisances due to floating solids, sludge deposits, debris, oil, scum, substances in concentrations or combinations which are toxic or harmful to human, animal, plant, or aquatic life, or that produce color, taste, odor of the water, or taint fish or shellfish flesh." The project sponsor has engaged multiple vendors for the design of an onsite treatment system to achieve the preliminary effluent limits. The considered alternatives included Membrane Bioreactor (MBR), Moving Bed Biofilm Reactor (MBBR), and Sequencing Batch Reactor (SBR) systems. Based on review of the considered alternatives, an MBR system has been selected to proceed to final design. The treatment system will be capable of achieving the WQR requirement to protect stream uses, public health and groundwater quality, and prevent nuisance conditions. A preliminary MBR system schematic is included in Appendix F.

1.9 Environmental Review

An application for Site Plan Review was submitted to the Town of Fallsburg Planning Board in March 2023. The Planning Board classified the project as Type I under the State Environmental Quality Review Act (SEQRA) and undertook a coordinated review as Lead Agency on January 9, 2025. By resolution dated August 18, 2025, the Planning Board adopted a Negative Declaration determining that the proposed project will not have a significant adverse environmental impact on the environment. By resolution dated August

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18, 2025, the Planning Board approved the proposed project subject to a condition that a wastewater discharge permit is obtained from the NYSDEC. The Planning Board Lead Agency circulation, approval resolutions, and Parts 2 and 3 of the Full Environmental Assessment Form are included in Appendix D.

2.0 PROPOSED FACILITY PLANS

2.1 Planning and Service Area

The planning and service area includes the proposed project development described in Section 1.1 consisting of 86 four-bedroom residential dwelling units, two pools, and a community building. The OWTS will only serve the proposed project and does not include any potential future service areas.

2.2 Population Projection and Planning

The design population assumes five persons per dwelling unit (i.e., 86 dwelling units x 5 persons = 430 persons). The design organic loading conservatively assumes a population of 500 persons. Therefore, the design parameters conservatively considers the predicted population.

3.0 HYDRAULIC CAPACITY

3.1 Design Average Flow

As described in Section 1.2, the daily design flow at full buildout and occupancy is 41,340 gpd. As a conservative measure, the design average flow will be 52,000 gpd.

3.2 Design Maximum Flow

The design maximum flow applies a peaking factor of 2 to the calculated base flow of 41,340. Therefore, the design maximum flow is approximately 82,680 gpd.

3.3 Design Peak Hourly

The design peak hourly flow is based on Figure 1 of the Ten States Standards, which identifies a peaking factor of 4 for a design population of 500 persons.

$$Design\ Peak\ Hourly\ Flow = 4\ x\ 41{,}340\ gpd \div 24\ hr/day\ = 6{,}890\ gallons/hr$$

3.4 Design Peak Instantaneous Flow

The design peak instantaneous flow is based on the design peak hourly flow expressed as gallons per minute.

$$Design\ Peak\ Instantaneous\ Flow = 6{,}890\ gph \div 60\ min/hr\ = 115\ gpm$$

3.5 Organic Load Identification and Design

The design average day, maximum day, and peak hour organic load is based on the Ten States Standards Section 11.253 and an assumed population of 500 persons. The maximum day assumes a peaking factor of 2 and the peak hour assumes a peaking factor of 4.

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Table 4 – Design Organic Loads

Parameter	Per Capita Load (lb/day)	Average Day Organic Load (lb/day)	Maximum Day Organic Load (lb/day)	Peak Hour Organic Load (lb/hr)
BOD5	0.17	85	170	14
TSS	0.20	100	200	17

4.0 WASTEWATER TREATMENT SYSTEM

The system will include primary screening and flow equalization, a packaged treatment plant, and UV disinfection prior to discharge of treated effluent. The collection, conveyance, and treatment will comply with applicable code requirements and provide for proper operation and maintenance. A Wastewater Block Diagram is provided as Figure 3. Detailed plans and specifications will be submitted to the NYSDEC for approval prior to initiating construction.

4.1 Collection and Conveyance

Sanitary wastewater will be discharged from each service connection to 8-inch diameter sewer mains for gravity flow to the OWTS.

4.2 Screening and Equalization

Flow equalization will be provided prior to the OWTS to capture variable flows, including peak hourly and instantaneous flows, for controlled release into the OWTS. Primary screening will occur prior to the flow equalization tank to remove large items. Sizing of the equalization tank is based on the NSF 40 protocol for flow distribution over a 24 hour period with 35% of the daily flow occurring from 6AM to 9AM, 25% of the flow occurring from 11AM to 2PM and 40% of the flow occurring from 5PM to 8PM. A flow analysis is included in Appendix G that indicates that up to approximately 22,000 gallons of storage is required in the equalization tank based on the design flow of 52,000 gpd and a constant treatment flow of 36.1 gpm. The equalization tank will be equipped with dual pumps for transfer to the OWTS. The exact size of the equalization tank will be determined in coordination with the OWTS vendor and the peak flow rate that can be accommodated through the OWTS.

4.3 Packaged MBR Plant

A packaged MBR plant will be provided that includes an anaerobic zone, anoxic zone, and aerobic zone prior to membrane filtration. Sludge will be recycled and wasted from the membrane filtration zone as needed to maintain mixed liquor suspended solids within the treatment system. Wasted sludge will be discharged to a holding tank for offsite disposal. No onsite sludge drying is proposed.

4.4 Disinfection

Filtered effluent from the MBR plant will be disinfected with ultraviolet light prior to final discharge.

4.5 Effluent Discharge

Disinfected effluent will be conveyed by piped gravity flow to the ultimate discharge location as shown on Figure 4. The discharge pipe will be equipped with a flow meter and sample port for compliance testing.

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4.6 Operation & Maintenance

The OWTS will be operated by a certified wastewater treatment plant operator meeting the training requirement contained at 6 NYCRR Part 650. Prior to startup of the OWTS, the following documentation must be available onsite:

- OWTS and component Operation and Maintenance Manuals
- As-built Mechanical Drawings and Piping and Instrumentation Diagrams (P&ID).

4.7 Emergency Operation

The OWTS is not located in an area susceptible to flooding. The OWTS will be equipped with a diesel or propane powered emergency backup generator to allow continued operation in the event of a power outage.

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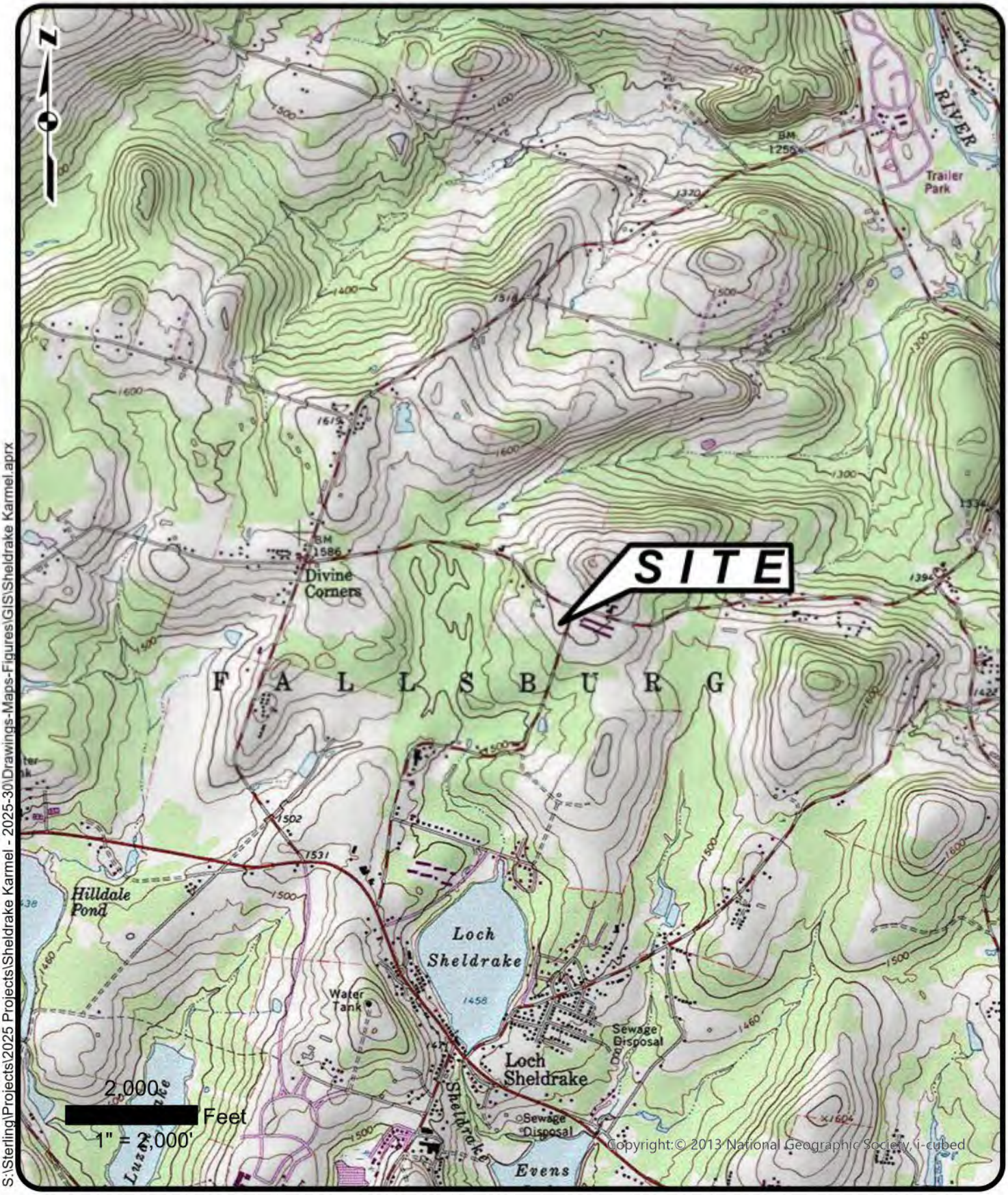
FIGURES



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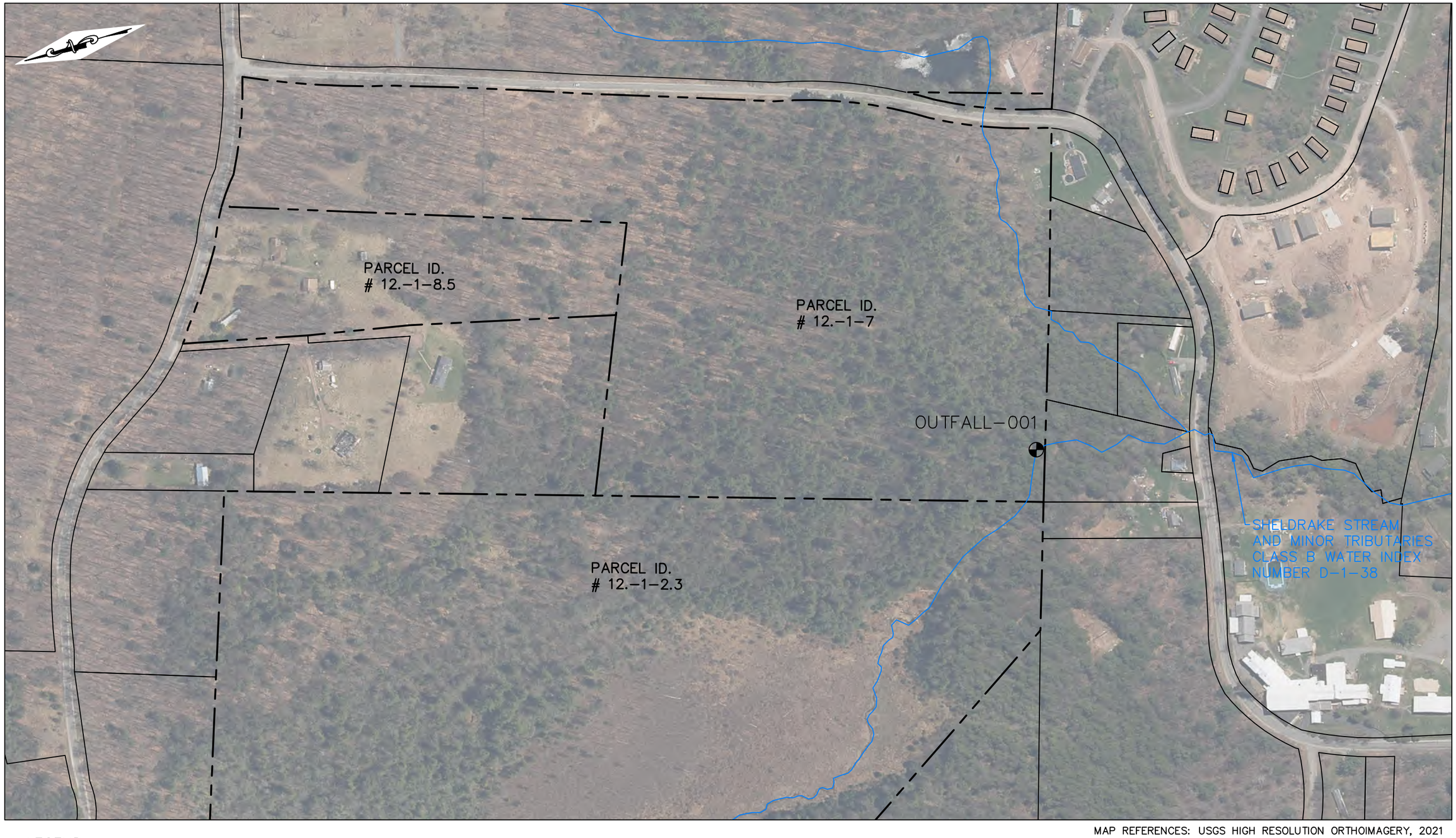
SITE LOCATION MAP

SHELDRAKE KARMEL RD PROPERTIES, LLC

KARMEL AND JACOBS ROAD

TOWN OF FALLSBURG SULLIVAN CO., NY

PROJ.NO.	DATE:	SCALE:	DWG.NO.	FIGURE
2025-30	04/29/2025	1" = 2,000'	2025-30001G	1



MAP REFERENCES: USGS HIGH RESOLUTION ORTHOIMAGERY, 2021

LEGEND

- APPROXIMATE PROPERTY BOUNDARY
- PARCEL LINE
- STREAM OR TRIBUTARY

0 125 250

1" =250'

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SITE VICINITY MAP

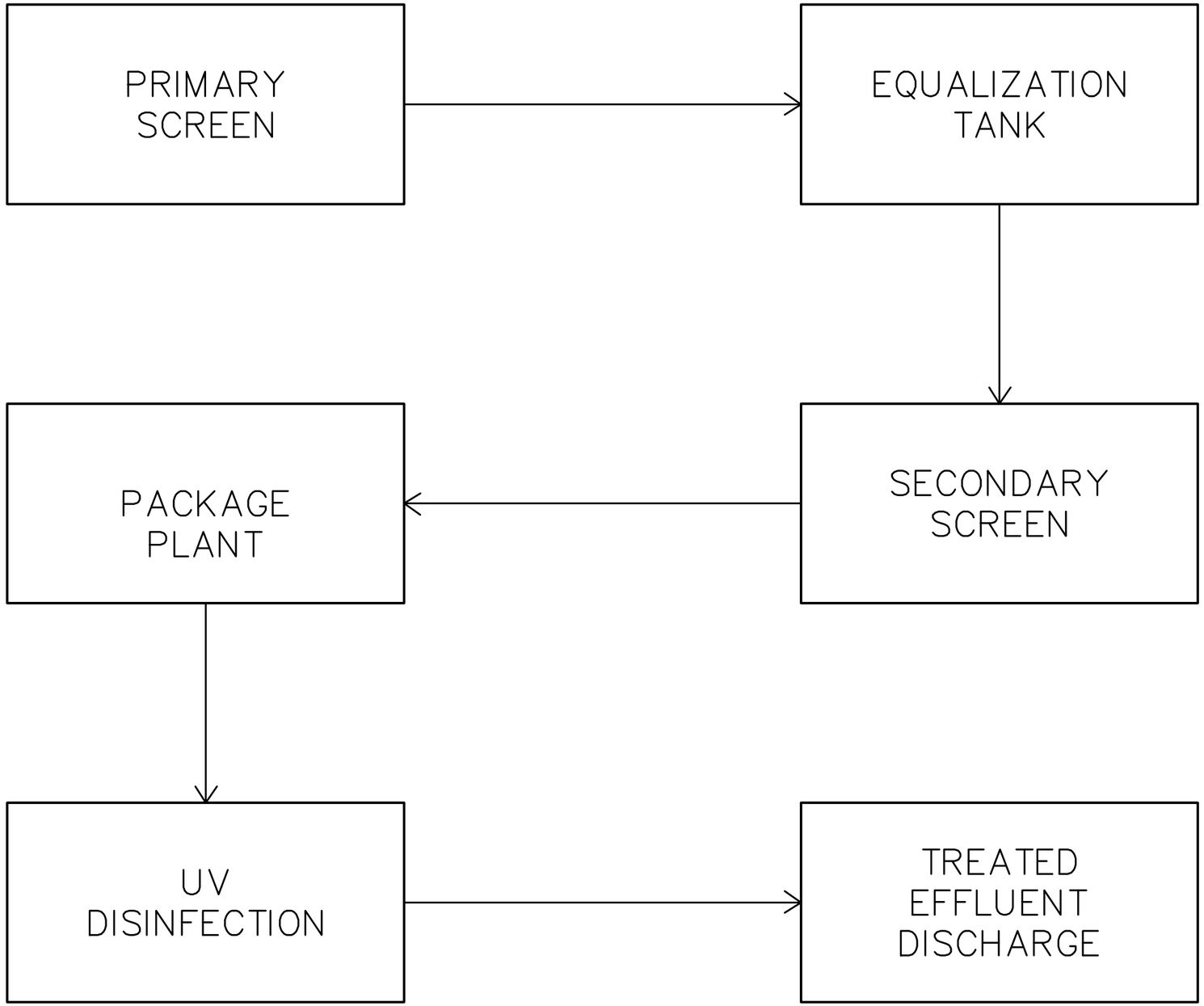
SHELDRAKE AND KARMEL RD PROPERTIES, LLC

KARMEL AND JACOBS ROAD

TOWN OF FALLSBURG SULLIVAN CO., NY

PROJ. No.: 2025-30	DATE: 04/30/2025	SCALE: 1" = 250'	DWG. NO. 2025-30001	FIGURE 2

S:\Sterling\Projects\2025 Projects\Sheldrake Karmel - 2025-30\Drawings-Maps-Figures\ACAD\2025-30001 F2 SITE VICINITY MAP.dwg JADYN.BAIDOO-DAVIS 11/14/2025 5:01 PM



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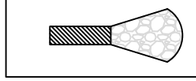
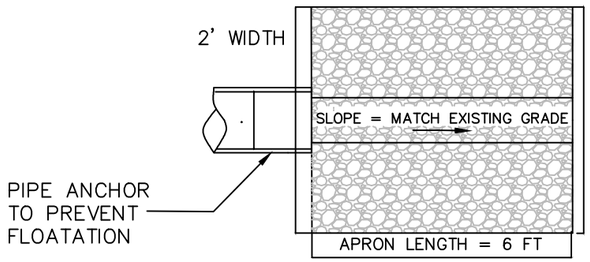
WWTP Block Diagram
SHELDRAKE AND KARMEL RD PROPERTIES, LLC
KARMEL AND JACOBS ROAD
TOWN OF FALLSBURG SULLIVAN CO., NY

PROJ. No.: 2025-30	DATE: 04/30/2025	SCALE: NTS	DWG. NO. 2025-30002	FIGURE 3

S:\Sterling\Projects\2025 Projects\Sheldrake Karmel - 2025-30\Drawings-Maps-Figures\ACAD\2025-30002 F3 PROPOSED WASTE WATER TREATMENT DESIGN.dwg PAUL.SCHOLAR 4/30/2025 8:40 AM

SYMBOL

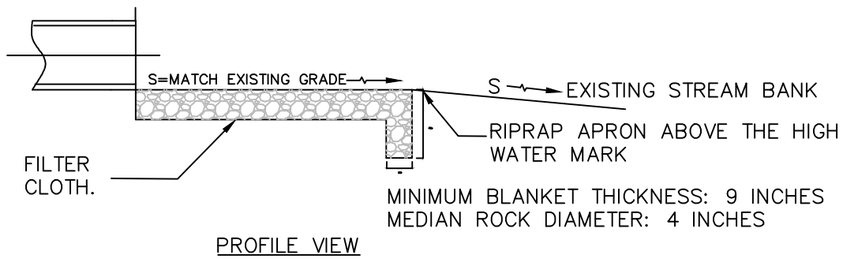




PLAN VIEW

NOTE: DISCHARGE TO INTERMITTENT STREAM

WIDTH OF BOTTOM TO VARY FROM 2 FT AT PIPE OUTLET TO 7FT AT END OF APRON.

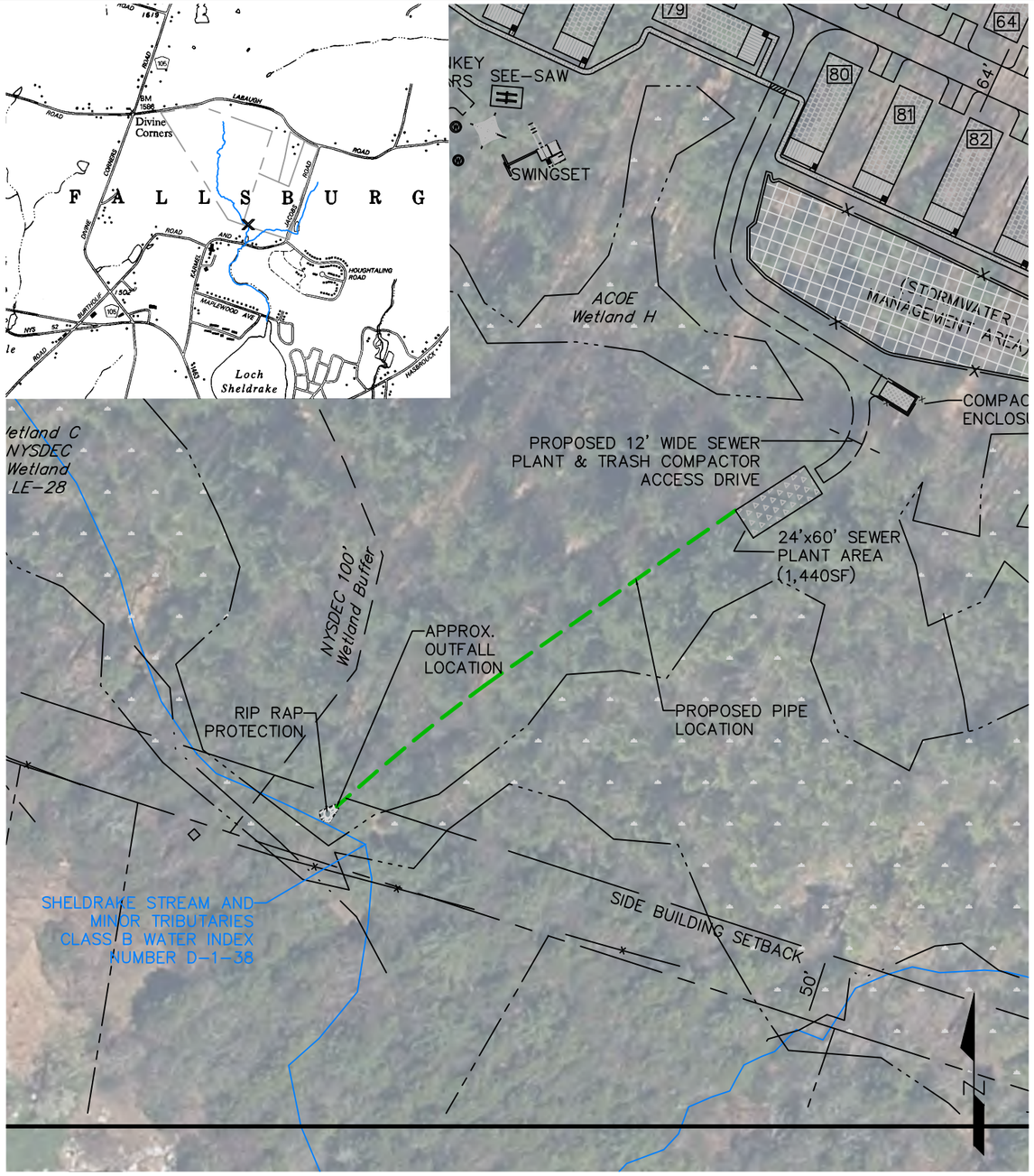


MINIMUM BLANKET THICKNESS: 9 INCHES
MEDIAN ROCK DIAMETER: 4 INCHES

PROFILE VIEW

ADAPTED FROM DETAILS PROVIDED BY: USDA – NRCS,
NEW YORK STATE DEPARTMENT OF TRANSPORTATION,
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION,
NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE

RIPRAP OUTLET PROTECTION



MAP REFERENCES
1) USGS HIGH RESOLUTION ORTHOIMAGERY, 2021
2) OVERALL PLAN FOR SHELDRAKE KARMEL RD PROPERTIES, LLC, BY RIELLY ENGINEERING DPC, 2024
3) NYS 24K QUAD MAP INDEX, QUADNAME: LIBERTY EAST

LEGEND
- APPROXIMATE PROPERTY BOUNDARY
- PARCEL LINE
- STREAM OR TRIBUTARY

0 25 50 100
1" = 100'

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WASTEWATER OUTFALL DETAIL
SHELDRAKE KARMEL RD PROPERTIES, LLC
KARMEL AND JACOBS ROAD
TOWN OF FALLSBURG SULLIVAN CO., NY

PROJ. No.: 2025-30	DATE: 05/15/2026	SCALE: 1" = 100'	DWG. NO. 2025-30003	FIGURE 4

\\enymdc01\shared\Sterling\Projects\2025 Projects\Sheldrake Karmel - 2025-30\Drawings-Maps-Figures\ACAD\2025-30001 F4 Wastewater Outfall Detail.dwg JADYN.BADOO-DAVIS 5/15/2026 4:23 PM

APPENDIX A

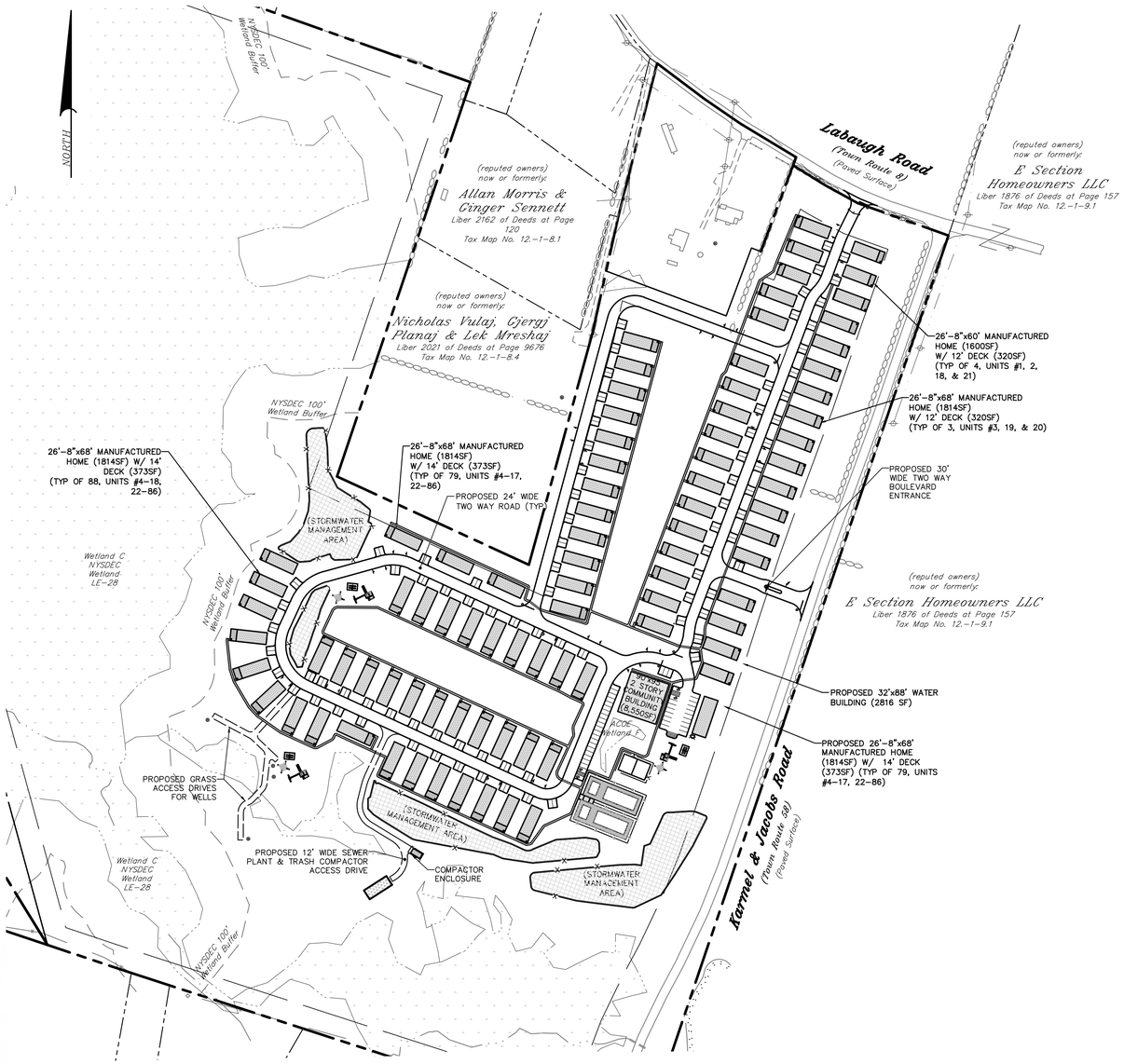
SITE PLAN DRAWINGS

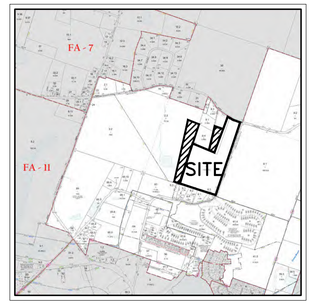
LAND DEVELOPMENT PLAN & LOT IMPROVEMENT

FOR

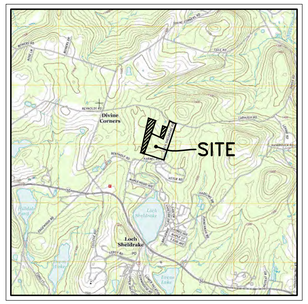
SHELDRAKE KARMEL RD PROPERTIES LLC

TOWN OF FALLSBURG, SULLIVAN COUNTY, NY





TAX PARCEL MAP
SULLIVAN COUNTY NY GIS TAX MAPS
SCALE: 1" = 2000'



SITE LOCATION MAP
USGS LIBERTY EAST QUAD
SCALE: 1" = 4000'

CONSTRUCTION NOTES

1. THE CONTRACTOR SHALL NOTIFY ALL APPROPRIATE UTILITIES AT LEAST 72 HOURS PRIOR TO THE START OF ANY CONSTRUCTION. ALL UTILITIES HAVE BEEN IDENTIFIED BASED ON THE BEST AVAILABLE INFORMATION AND LISTED ON THESE PLANS IN ACCORDANCE WITH CALL BEFORE YOU DIG REQUIREMENTS. THE CONTRACTOR SHALL VERIFY THE LOCATIONS OF EXISTING UTILITIES AND ALL EFFORTS SHALL BE UNDERTAKEN TO PROTECT EXISTING UTILITIES AND MAINTAIN UNINTERRUPTED SERVICE. ANY DAMAGE TO UTILITIES BY THE CONTRACTOR SHALL BE REPAIRED IMMEDIATELY AT THE CONTRACTOR'S EXPENSE. RESTORATION OF ALL EXISTING SURFACE IMPROVEMENTS DAMAGED OR ALTERED DURING CONSTRUCTION, INCLUDING LANDSCAPING, SHALL ALSO BE THE RESPONSIBILITY OF THE CONTRACTOR.
2. THE CONTRACTOR SHALL MAKE PROVISIONS FOR MAINTAINING THE SAFE FLOW OF TRAFFIC DURING CONSTRUCTION WITHIN THE SITE AND THE EXISTING ROAD RIGHTS-OF-WAY WHILE ENTERING AND LEAVING THE SITE.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ANY PERMITS RELATIVE TO THE CONSTRUCTION PROPOSED ON THIS PLAN.
4. ALL STORM SEWERS AND APPURTENANCES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE APPROVED PLANS AND TO THE STANDARDS OF THE MUNICIPAL ORDINANCES.
5. THERE SHALL BE NO CHANGES OR DEVIATION FROM THESE PLANS UNLESS APPROVED BY THE ENGINEER. SUCH PLAN CHANGES, SHOULD THEY BECOME NECESSARY, ARE SUBJECT TO MUNICIPAL ORDINANCES.
6. THE CONTRACTOR SHALL INSPECT EXISTING SITE/PROJECT AREA CONDITIONS AND VERIFY ALL QUANTITIES AND MATERIALS PRIOR TO THE START OF CONSTRUCTION.
7. STORMWATER FACILITIES, INCLUDING SWALES, STORM PIPING, AND APPURTENANCES SHALL BE MAINTAINED IN GOOD WORKING CONDITION BY THE DEVELOPER OR THE SUCCESSIVE LAND OWNER. THE TOWN OF FALLSBURG SHALL HAVE THE RIGHT TO INSPECT THE FACILITIES AT ANY TIME; REQUIRE THE OWNER TO TAKE CORRECTIVE MEASURES AND ASSIGN THE OWNER REASONABLE TIME PERIODS FOR ANY NECESSARY ACTION; AUTHORIZE MAINTENANCE TO BE DONE AND LIEN ALL COST OF THE WORK AGAINST THE PROPERTIES OF THE OWNER RESPONSIBLE FOR MAINTENANCE.
8. THE DEVELOPER SHALL BE RESPONSIBLE FOR PROVIDING ALL PAVEMENT MARKINGS, STREET SIGNS, TRAFFIC DIRECTIONAL AND CONTROL SIGNS SHOWN ON THIS PLAN IN ACCORDANCE WITH APPLICABLE STATE OR MUNICIPAL REGULATIONS AND SPECIFICATIONS. ALL SIGNAGE SHALL BE CONSISTENT WITH EXISTING SIGNAGE WITHIN THE TOWN OF FALLSBURG.
9. THE TOWN OF FALLSBURG SHALL NOT BE RESPONSIBLE FOR THE CONSTRUCTION OR MAINTENANCE OF ANY AREA NOT DEDICATED FOR THE PUBLIC USE.
10. THE PROJECT REQUIRES SITE CLEARING AND GRADING CLOSE OR UP TO BOTH THE WETLANDS AND THE TOWN OF FALLSBURG ZONING "CLEARING LIMITS LINE". CONTRACTOR SHOULD BE AWARE THAT THESE AREAS MUST BE STAKED OUT BY A SURVEYOR PRIOR TO CLEARING.
11. ALL STUMPS MUST BE TUB GROUND AND USED AS MULCH ON SITE, OR BURIED IN AN APPROVED LOCATION.
12. CONTRACTOR MUST USE THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) AS A CONTRACT DOCUMENT TO ACCOMPANY THE PLANS.

LIST OF DRAWINGS

1 OF 29. . . . . COVER SHEET
2 OF 29. . . . . EXISTING CONDITIONS, DEMOLITION, & LOT IMPROVEMENT PLAN
3 OF 29. . . . . OVERALL PLAN
4 OF 29. . . . . LAYOUT PLAN
5 OF 29. . . . . LAYOUT PLAN
6 OF 29. . . . . GRADING PLAN
7 OF 29. . . . . GRADING PLAN
8 OF 29. . . . . EROSION & SEDIMENT CONTROL PLAN
9 OF 29. . . . . EROSION & SEDIMENT CONTROL PLAN
10 OF 29. . . . . UTILITIES PLAN
11 OF 29. . . . . UTILITIES PLAN
12 OF 29. . . . . LIGHTING & LANDSCAPING PLAN
13 OF 29. . . . . PHASING PLAN
14 OF 29. . . . . PROFILES
15 OF 29. . . . . PROFILES
16 OF 29. . . . . PROFILES
17 OF 29. . . . . DETAILS
18 OF 29. . . . . DETAILS
19 OF 29. . . . . DETAILS
20 OF 29. . . . . DETAILS
21 OF 29. . . . . DETAILS
22 OF 29. . . . . DETAILS
23 OF 29. . . . . DETAILS
24 OF 29. . . . . SPECIFICATIONS
25 OF 29. . . . . SPECIFICATIONS
26 OF 29. . . . . SPECIFICATIONS
27 OF 29. . . . . DRAINAGE PLAN
28 OF 29. . . . . DRAINAGE PLAN
29 OF 29. . . . . DRAINAGE DETAILS

LEGEND

EXISTING PROPERTY LINE
EXISTING ADJOINER LINE
EXISTING RIGHT-OF-WAY LINE
EXISTING PAVEMENT
EXISTING MAJOR CONTOUR
EXISTING MINOR CONTOUR
EXISTING STREAM CENTERLINE
EXISTING FENCE
EXISTING TREELINE
EXISTING STONEWALL
TO BE REMOVED — TBR
EXISTING WETLANDS
EXISTING WETLANDS SETBACK
EXISTING SANITARY SEWER MANHOLE
EXISTING STORM MANHOLE
EXISTING STORM INLET
EXISTING STORM HEADWALL/ENDWALL
EXISTING FIRE HYDRANT
EXISTING WELL

LANDOWNER/DEVELOPER

SHELDRAKE KARMEL RD PROPERTIES LLC
PO BOX 1333
JACKSON, NJ 08527
TEL:(732)-719-7200

SOURCE OF TITLE

TAX MAP NUMBER:	TOWN OF FALLSBURG – 12.-1-7 – 39.66 ACRES
	PORTION OF 12.-1-2.3 – 17.03 ACRES
	PORTION OF 12.-1-8.5 – 4.40 ACRES
EXISTING USE	VACANT LAND
PROPOSED USE	MANUFACTURED HOME PARK

GENERAL NOTES

1. MAPPING BASED ON A BOUNDARY SURVEY ENTITLED "SURVEY MAP OF FOUR PARCELS TO BE CONVEYED" AS PREPARED BY ANTHONY F. SICILIANO L.S. P.C. DATED NOVEMBER 2022.
2. TOPOGRAPHY FROM GOLDEN AERIAL, FLOWN IN APRIL OF 2017.
3. WETLAND LOCATIONS ARE BASED ON A WETLAND DELINEATION BY ECOLOGICAL ANALYSIS ON OCTOBER 6, 2022. WETLAND FLAGS WERE LOCATED BY ANTHONY F. SICILIANO L.S. P.C. WETLANDS MAP APPROVED BY MIKE FRAATZ OF NYSDEC ON MAY 5, 2023.
4. 17.03 ACRES OF PARCEL 12.-1-2.3 ARE TO BE CONVEYED TO PARCEL 12.-1-7 VIA LOT IMPROVEMENT.
5. 4.40 ACRES OF PARCEL 12.-1-8.5 ARE TO BE CONVEYED TO PARCEL 12.-1-7 VIA LOT IMPROVEMENT.

ZONING DATA

REC – (RECREATION DISTRICT) – ZONE

(PRIVATE WATER AND SEWER)

	REQUIRED	PROPOSED
MINIMUM LOT AREA	10 ACRES	93.38 ACRES
MINIMUM LOT WIDTH	750 FT.	2149 FT.
MINIMUM FRONT BUILDING SETBACK	75 FT.	76.8 FT.
MINIMUM SIDE BUILDING SETBACK	50 FT./100 FT.	50 FT./157.1 FT.
MINIMUM REAR BUILDING SETBACK	50 FT.	63.1 FT.
MAXIMUM BUILDING HEIGHT	35 FT.	< 35 FT.
MINIMUM FLOOR	980 S.F.	1,600 S.F.
MAXIMUM LOT COVERAGE	20%	16.81%
UNITS SHOWN		86 UNITS

DENSITY CALCULATIONS

TOTAL PROPERTY AREA:	4,067,824 SF
TOTAL AREA OF WETLANDS:	– 1,741,119 SF
50% OF SLOPES OVER 20%	– 61,642 SF
TOTAL NET AREA (R-ZONE):	2,265,063 SF
NET AREA (REC-ZONE) / 21,780 SF PER UNIT:	103.9 UNITS
TOTAL NUMBER OF UNITS ALLOWED:	103 UNITS
TOTAL NUMBER OF UNITS SHOWN:	86 UNITS

LOT COVERAGE CALCULATIONS

PROPOSED ROADS:	126,572 SF
PROPOSED SIDEWALKS:	33,800 SF
PROPOSED UNITS	153,548 SF
PROPOSED PARKING SPACES (218):	39,600 SF
COMMUNITY BUILDING, POOLS, & SPORTS COURTS, SEWER & WATER BUILDING:	27,356 SF
TOTAL IMPERVIOUS AREA:	380,876 SF
TOTAL PROPERTY AREA:	4,067,824 SF
TOTAL NET AREA:	2,265,063 SF
LOT COVERAGE: 16.81%	

PARKING REQUIREMENTS

REQUIRED:
1. 2 SPACES PER UNIT = 2 SPACES PER UNIT x 86 UNITS = 172 SPACES.
2. 25 DUEL PURPOSE SPACES PER COMMUNITY BUILDING (WITH A 150 PERSON OCCUPANCY).

REQUIRED PARKING SPACES: 195
PROVIDED PARKING SPACES: 218

FIRE DEPARTMENT NOTES

1. A KNOX BOX MUST BE INSTALLED FOR THE SHUL AND AND OTHER PUBLIC BUILDINGS THAT MAY BE LOCKED TO FACILITATE FIRE DEPARTMENT ACCESS DURING AN EMERGENCY.
2. GATES WITH LOCKS RESTRICTING ACCESS MUST HAVE A KNOX LOCK.

Dig Safely. New York Call811 before you dig

NO.	DATE	REVISION
2	6/25/25	PROGRESS SET
1	12/11/24	DESIGN REVISIONS

MICHAEL G. RIELLY
NEW YORK STATE PROFESSIONAL ENGINEER
LICENSE NO. 093427

MANAGER: MICHAEL G. RIELLY
DESIGN BY: MTL | DRAWN BY: MTL | CHKD BY: MGR

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CLIENT
SHELDRAKE KARMEL RD PROPERTIES LLC
PO BOX 1333
JACKSON, NJ 08527
TEL: (732)-719-7200

SCALE
0 75 150 300 450
1" = 150'

RIELLY ENGINEERING DPC
PO BOX 69 / 63 LIBERTY STREET
MONTICELLO, NY 12701
T. 845-796-9700
OFFICE@RIELLYENGINEERING.COM

COVER SHEET
FOR
SHELDRAKE KARMEL RD PROPERTIES LLC
TOWN OF FALLSBURG SULLIVAN COUNTY, NY

DATE: JUNE 25, 2024
SHEET NO. 1 OF 29
DWG. NO. 0236-01

NORTH

1140.65'

NYSDEC 100' Wetland Buffer

5/8" iron rod found

3/4" iron rod set @ 30.00'

Gate

Shed

936.64'

(reputed owners) now or formerly:
Allan Morris & Ginger Sennett
Liber 2162 of Deeds at Page 120
Tax Map No. 12.-1-8.1

4.40 ACRES TO BE TRANSFERRED FROM TAX LOT 12.-1-8.5 TO 12.-1-7

3/4" iron rod set

N19°40'52"E

(reputed owners) now or formerly:
Nicholas Vulaj, Gjergj Planaj & Lek Mreshaj
Liber 2021 of Deeds at Page 9676
Tax Map No. 12.-1-8.4

100.0' Well Protection Radius

Well

Wetland C NYSDEC Wetland LE-28

NYSDEC 100' Wetland Buffer

1500

1510

1520

1530

1540

1550

1560

1570

LOT 3
55.94 AC
2,436,947.56 SF

1/2" iron rod found

EXISTING PROPERTY LINE TO BE ADJUSTED

1/2" iron rod found @ 475.15'

EXISTING PROPERTY LINE TO BE ADJUSTED

wood stake in stone pile found

17.03 ACRES TO BE TRANSFERRED FROM TAX LOT 12.-1-2.3 TO 12.-1-7

NEW PROPERTY LINE

LOT 2
61.09 AC
2,661,160.76 SF

0.06 ACRES OF WETLANDS TBR

ACOE Wetland F

ACOE Wetland H

0.01 ACRES OF WETLANDS TBR

Wetland C NYSDEC Wetland LE-28

NYSDEC 100' Wetland Buffer

705.14'

S71°31'19"E
198.87'

L8

1-5/8" iron pipe found

(reputed owners) now or formerly:
Joel Metamed
ber 2013 of Deeds at Page 8452
Tax Map No. 12.-1-6.3

(reputed owners) now or formerly:
James & Minnie Magie
Liber 431 of Deeds at Page 164
Tax Map No. 12.-1-5.2

(reputed owners) now or formerly:
Angela Magie
Liber 2807 of Deeds at Page 4520
Tax Map No. 12.-1-5.1

N72°03'42"W
578.12'

(reputed owners) now or formerly:
George & Candace Ann Ardsall found
Liber 3064 of Deeds at Page 56
Tax Map No. 12.-1-6.2

N72°14'01"W
582.91'

(reputed owners) now or formerly:
EPD Holdings LLC
Liber 2022 of Deeds at Page 6431
Tax Map No. 12.-1-6.1

(reputed owners) now or formerly:
John Kinch
Liber 2971 of Deeds at Page 440
Tax Map No. 12.-1-6.3

NYS Rte. 52

ACOE Wetland C

Small Stream

Greenhouse 48.7' over

Small Pond

15" HDPE

Edge of Lawn

Wood Shed 10.9' over

Gravel Drive & Parking

1/2" iron rod found

Labaugh Road
(Town Route 8)
(Paved Surface)

Approximate 25' ROW from Road Center

L3 Along Assumed Road Bounds

L4

L5

To Levine Road

(reputed owners) now or formerly:
E' Section Homeowners LLC
Liber 1876 of Deeds at Page 157
Tax Map No. 12.-1-9.1

LOT 1
3.02 AC
131,468.88 SF

Shed

Garage

House

100.0' Well Protection Radius

Well

ACOE Wetland

Gazebo In Disrepair

Storage Container

NEW PROPERTY LINE

Barn TBR

Approximate 25' ROW from Road Center

2143.27'

(reputed owners) now or formerly:
E' Section Homeowners LLC
Liber 1876 of Deeds at Page 157
Tax Map No. 12.-1-9.1

Karmel & Jacobs Road
(Town Route 68)
(Paved Surface)

S16°41'39"E

Approximate 25' ROW from Road Center

LEGEND

EXISTING PROPERTY LINE	
EXISTING ADJOINER LINE	
EXISTING RIGHT-OF-WAY LINE	
EXISTING PAVEMENT	
EXISTING MAJOR CONTOUR	
EXISTING MINOR CONTOUR	
EXISTING STREAM CENTERLINE	
EXISTING FENCE	X
EXISTING TREELINE	
EXISTING STONEWALL	
EXISTING WETLANDS	
EXISTING WETLANDS SETBACK	
EXISTING OVERHEAD TELEPHONE	OT
EXISTING U/G TELEPHONE	UT
EXISTING OVERHEAD ELECTRIC	OE
EXISTING U/G ELECTRIC	UE
EXISTING WATER LINE	W
EXISTING SANITARY SEWER	S
EXISTING SANITARY FORCEMAIN	FM
EXISTING GAS LINE	G
EXISTING STORM PIPE	18" RCP
EXISTING SANITARY SEWER MANHOLE	S
EXISTING STORM MANHOLE	
EXISTING STORM INLET	
EXISTING STORM HEADWALL/ENDWALL	
EXISTING FIRE HYDRANT	
EXISTING WELL	W
EXISTING WATER VALVE	WV
EXISTING GAS VALVE	GV
EXISTING TELEPHONE BOX	
EXISTING MAILBOX	
EXISTING UTILITY POLE	
EXISTING GUYWIRE/POLE	
TO REMAIN	TR
TO BE REMOVED	TBR
TO BE REMOVED AND RELOCATED	TBRR
EXISTING 100-YR. FLOODPLAIN	
SOIL TYPE BOUNDARY LINE	

NO.	DATE	REVISION
2	6/25/25	PROGRESS SET
1	12/11/24	DESIGN REVISIONS

MICHAEL G. RIELLY
NEW YORK STATE PROFESSIONAL ENGINEER
LICENSE NO. 093427

MANAGER: MICHAEL G. RIELLY
DESIGN BY: MTL | DRAWN BY: MTL | CHKD BY: MGR

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CLIENT
SHELDRAKE KARMEL RD PROPERTIES LLC
PO BOX 1333
JACKSON, NJ 08527
TEL: (732)-719-7200

SCALE
1" = 120'
0 60 120 240 360

RIELLY ENGINEERING DPC
PO BOX 69 / 63 LIBERTY STREET
MONTICELLO, NY 12701
T. 845-796-9700
OFFICE@RIELLYENGINEERING.COM

EXISTING CONDITIONS, DEMOLITION, & LOT IMPROVEMENT PLAN
FOR
SHELDRAKE KARMEL RD PROPERTIES LLC
TOWN OF FALLSBURG SULLIVAN COUNTY, NY

DATE: JUNE 25, 2024
SHEET NO. 2 OF 29
DWG. NO. 0236-01

LEGEND

- EXISTING PROPERTY LINE
- EXISTING ADJOINER LINE
- EXISTING RIGHT-OF-WAY LINE
- EXISTING PAVEMENT
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- EXISTING STREAM CENTERLINE
- EXISTING FENCE
- EXISTING TREELINE
- EXISTING STONEWALL
- TO BE REMOVED
- EXISTING WETLANDS (TBR)
- EXISTING WETLANDS SETBACK
- EXISTING SANITARY SEWER MANHOLE
- EXISTING STORM MANHOLE
- EXISTING STORM INLET
- EXISTING STORM HEADWALL/ENDWALL
- EXISTING FIRE HYDRANT
- EXISTING WELL
- PROPOSED PAVEMENT
- MINIMUM BUILDING SETBACK LINE
- PROPOSED FENCE
- PROPOSED TREELINE/LIMIT OF DISTURBANCE
- HANDICAPPED PARKING SPACE
- PROPOSED STOP SIGN
- PROPOSED SIGN
- PROPOSED LIGHT
- PROPOSED SEWER MANHOLE
- PROPOSED STORM INLET
- PROPOSED YARD STORM INLET
- PROPOSED STORM HEADWALL/ENDWALL
- PROPOSED FLARED END SECTION

NO.	DATE	REVISION
2	6/25/25	PROGRESS SET
1	12/11/24	DESIGN REVISIONS

MICHAEL G. RIELLY
NEW YORK STATE PROFESSIONAL ENGINEER
LICENSE NO. 093427

MANAGER: MICHAEL G. RIELLY
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CLIENT
SHELDRAKE KARMEL RD
PROPERTIES LLC
PO BOX 1333
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TEL: (732)-719-7200

SCALE
1" = 100'
0 50 100 200 300

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OVERALL PLAN
FOR
SHELDRAKE KARMEL RD PROPERTIES LLC
TOWN OF FALLSBURG SULLIVAN COUNTY, NY

DATE: JUNE 25, 2024
SHEET NO. 3 OF 29
DWG. NO. 0236-01

NORTH

Labargh Road
(Town Route 81)
(Paved Surface)

To Divine Corners Road

To Levine Road

Approximate 25' ROW from Road Center

Trailer

Gravel Drive

House

Garage

Well

Truck Body Storage Container

Gazebo In Disrepair

ACOE Wetland

Wetland C
NYSDEC
Wetland
LE-28

NYSDEC 100' Wetland Buffer

ENTRANCE #2
(EMERGENCY ACCESS ONLY)

PROPOSED BREAK-AWAY GATE (TYP)

PROPOSED 24' WIDE EMERGENCY ENTRANCE

FRONT BUILDING SETBACK

REAR BUILDING SETBACK

SIDE BUILDING SETBACK

PROPOSED SPEED LIMIT SIGN (TYP)

PROPOSED NO PARKING SIGN (TYP)

ROAD A

ROAD B

ROAD C

PROPOSED CROSSWALK (TYP)

PROPOSED 4' SIDEWALK

PROPOSED (2) PARKING SPACES (TYP)

TOTAL PROPOSED LIMIT OF DISTURBANCE 29.01AC

26'-8"x60' MANUFACTURED HOME (1600SF) W/ 12' DECK (320SF) (TYP OF 4, UNITS #1, 2, 18, & 21)

26'-8"x68' MANUFACTURED HOME (1814SF) W/ 12' DECK (320SF) (TYP OF 3, UNITS #3, 19, & 20)

26'-8"x68' MANUFACTURED HOME (1814SF) W/ 14' DECK (373SF) (TYP OF 79, UNITS #4-17, 22-86)

PROPOSED 24' WIDE TWO WAY ROAD (TYP)

TOTAL PROPOSED LIMIT OF DISTURBANCE 29.01AC

(STORMWATER MANAGEMENT AREA)

PLAYGROUND

MATCHLINE

PROPOSED OVERALL PROJECT SIGN FOR FIRE DEPT. SHOWING OVERALL PROJECT LAYOUT & ALL HOMES W/NUMBERS

PROPOSED 30' WIDE TWO WAY BOULEVARD ENTRANCE

ENTRANCE #1

Karmel & Jacobs Road
(Town Route 68)
(Paved Surface)

LEGEND

- EXISTING PROPERTY LINE
- EXISTING ADJOINER LINE
- EXISTING RIGHT-OF-WAY LINE
- EXISTING EASEMENT LINE
- EXISTING PAVEMENT
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- EXISTING STREAM CENTERLINE
- EXISTING FENCE
- EXISTING TREELINE
- EXISTING STONEWALL
- EXISTING WETLANDS
- EXISTING WETLANDS SETBACK
- EXISTING OVERHEAD TELEPHONE (OT)
- EXISTING U/G TELEPHONE (UT)
- EXISTING OVERHEAD ELECTRIC (OE)
- EXISTING U/G ELECTRIC (UE)
- EXISTING WATER LINE (W)
- EXISTING SANITARY SEWER (S)
- EXISTING SANITARY FORCEMAIN (FM)
- EXISTING STORM PIPE (18" RCP)
- EXISTING SANITARY SEWER MANHOLE
- EXISTING STORM MANHOLE
- EXISTING STORM INLET
- EXISTING STORM HEADWALL/ENDWALL
- EXISTING WELL
- EXISTING UTILITY POLE
- EXISTING GUYWIRE/POLE
- PROPOSED LOT LINE
- PROPOSED EASMENT LINE
- PROPOSED PAVEMENT
- MINIMUM BUILDING SETBACK LINE
- PROPOSED FENCE
- PROPOSED TREELINE/LIMIT OF DISTURBANCE
- HANDICAPPED PARKING SPACE
- PROPOSED STOP SIGN
- PROPOSED SIGN
- PROPOSED LIGHT
- PROPOSED SEWER MANHOLE
- PROPOSED STORM INLET
- PROPOSED YARD STORM INLET
- PROPOSED STORM HEADWALL/ENDWALL
- PROPOSED FLARED END SECTION
- PROPOSED WATER VALVE
- PROPOSED FIRE HYDRANT
- PROPOSED FLUSHING HYDRANT

NO.	DATE	REVISION
2	6/25/25	PROGRESS SET
1	12/11/24	DESIGN REVISIONS

MICHAEL G. RIELLY
NEW YORK STATE PROFESSIONAL ENGINEER
LICENSE NO. 093427

MANAGER: MICHAEL G. RIELLY
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CLIENT
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PROPERTIES LLC
PO BOX 1333
JACKSON, NJ 08527
TEL: (732)-719-7200

SCALE
1" = 50'
0 25 50 100 150

RIELLY
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LAYOUT PLAN
FOR
SHELDRAKE KARMEL RD PROPERTIES LLC
TOWN OF FALLSBURG | SULLIVAN COUNTY, NY

DATE: JUNE 25, 2024
SHEET NO. 4 OF 29
DWG. NO. 0236-01

MATCHLINE

NORTH

26'-8"x68' MANUFACTURED HOME (1814SF) W/ 14' DECK (373SF) (TYP OF 79, UNITS #4-17, 22-86)

PROPOSED 24' WIDE TWO WAY ROAD (TYP)

TOTAL PROPOSED LIMIT OF DISTURBANCE 29.01AC

(STORMWATER MANAGEMENT AREA)

SEE BUILDING SETBACK

PLAYGROUND

HYSBEC 100' Wetland Buffer

PROPOSED 4' SIDEWALK

PROPOSED NO PARKING SIGN (TYP)

PROPOSED SPEED LIMIT SIGN (TYP)

PROPOSED GRASS ACCESS DRIVE FOR WELLS

SEE-SAW

MONKEY BARS

SWINGSET

ACOE Wetland H

26'-8"x68' MANUFACTURED HOME (1814SF) W/ 14' DECK (373SF) (TYP OF 88, UNITS #4-18, 22-86)

PROPOSED GRASS ACCESS DRIVE FOR WELLS

PROPOSED 12' WIDE SEWER PLANT & TRASH COMPACTOR ACCESS DRIVE

24'x60' SEWER PLANT AREA (1,440SF)

COMPACTOR ENCLOSURE

TOTAL PROPOSED LIMIT OF DISTURBANCE 29.01AC

(STORMWATER MANAGEMENT AREA)

PROPOSED (2) PARKING SPACES (TYP)

POOL

POOL

SPORTS COURT

PLAYGROUND

PROPOSED NO PARKING SIGN

90'x95' 2 STORY COMMUNITY BUILDING (8,550SF)

PROPOSED HANDICAPPED PARKING SIGN

PROPOSED CROSSWALK (TYP)

PROPOSED 32'x88' WATER BUILDING (2816 SF)

PROPOSED GENERATOR W/ BOLLARDS

PROPOSED SIDEWALK

ACOE Wetland F

ACOE Wetland C

ACOE Wetland C

Wetland C NYSDEC Wetland LE-28

NYSDEC 100' Wetland Buffer

PROPOSED 30' WIDE TWO WAY BOULEVARD ENTRANCE

ENTRANCE #1

PROPOSED STOP SIGN (TYP)

PROPOSED STOP LINE

PROPOSED 26'-8"x68' MANUFACTURED HOME (1814SF) W/ 14' DECK (373SF) (TYP OF 79, UNITS #4-17, 22-86)

ROAD A

ROAD C

Karmel & Jacobs Road (Town Route 58) (Paved Surface)

Approximate 25' ROW from Road Center

FRONT BUILDING SETBACK

75'

111.4'

119.3'

515.479

LEGEND

- EXISTING PROPERTY LINE
- EXISTING ADJOINER LINE
- EXISTING RIGHT-OF-WAY LINE
- EXISTING EASEMENT LINE
- EXISTING PAVEMENT
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- EXISTING STREAM CENTERLINE
- EXISTING FENCE
- EXISTING TREELINE
- EXISTING STONEWALL
- EXISTING WETLANDS
- EXISTING WETLANDS SETBACK
- EXISTING OVERHEAD TELEPHONE (OT)
- EXISTING U/G TELEPHONE (UT)
- EXISTING OVERHEAD ELECTRIC (OE)
- EXISTING U/G ELECTRIC (UE)
- EXISTING WATER LINE (W)
- EXISTING SANITARY SEWER (S)
- EXISTING SANITARY FORCEMAIN (FM)
- EXISTING STORM PIPE (18" RCP)
- EXISTING SANITARY SEWER MANHOLE
- EXISTING STORM MANHOLE
- EXISTING STORM INLET
- EXISTING STORM HEADWALL/ENDWALL
- EXISTING WELL
- EXISTING UTILITY POLE
- EXISTING GUYWIRE/POLE
- PROPOSED LOT LINE
- PROPOSED EASMENT LINE
- PROPOSED PAVEMENT
- MINIMUM BUILDING SETBACK LINE
- PROPOSED FENCE
- PROPOSED TREELINE/LIMIT OF DISTURBANCE
- HANDICAPPED PARKING SPACE
- PROPOSED STOP SIGN
- PROPOSED SIGN
- PROPOSED LIGHT
- PROPOSED SEWER MANHOLE
- PROPOSED STORM INLET
- PROPOSED YARD STORM INLET
- PROPOSED STORM HEADWALL/ENDWALL
- PROPOSED FLARED END SECTION
- PROPOSED WATER VALVE
- PROPOSED FIRE HYDRANT
- PROPOSED FLUSHING HYDRANT

NO.	DATE	REVISION
2	6/25/25	PROGRESS SET
1	12/11/24	DESIGN REVISIONS

MICHAEL G. RIELLY
NEW YORK STATE PROFESSIONAL ENGINEER
LICENSE NO. 093427

MANAGER: MICHAEL G. RIELLY
DESIGN BY: MTL | DRAWN BY: MTL | CHKD BY: MGR

IT IS A VIOLATION OF NEW YORK STATE EDUCATION LAW ARTICLE 145 FOR ANY PERSON, UNLESS HE IS ACTING UNDER THE DIRECTION OF A LICENSED ENGINEER, TO ALTER ANY ITEM ON THIS DOCUMENT IN ANY WAY. IF THIS DOCUMENT IS ALTERED, THE ALTERING ENGINEER SHALL AFFIX TO THE DOCUMENT HIS SEAL AND THE NOTATION "ALTERED BY" FOLLOWED BY HIS SIGNATURE, A DESCRIPTION OF THE ALTERATION, AND THE SPECIFIC DESCRIPTION OF THE ALTERATION.

CLIENT
SHELDRAKE KARMEL RD
PROPERTIES LLC
PO BOX 1333
JACKSON, NJ 08527
TEL: (732)-719-7200

SCALE
1" = 50'
0 25 50 100 150

RIELLY ENGINEERING DPC
PO BOX 69 / 63 LIBERTY STREET
MONTICELLO, NY 12701
T. 845-796-9700
OFFICE@RIELLYENGINEERING.COM

LAYOUT PLAN
FOR
SHELDRAKE KARMEL RD PROPERTIES LLC
TOWN OF FALLSBURG
SULLIVAN COUNTY, NY

DATE: JUNE 25, 2024
SHEET NO. 5 OF 29
DWG. NO. 0236-01

FOR STORMWATER BMP STRUCTURE & PIPE INFORMATION SEE DRAINAGE PLANS

NORTH

MATCHLINE

Labargh Road (Town Route 8) (Paved Surface)

Karmel & Jacobs (Town Route 68) (Paved Surface)

To Divine Corners Road

To Levine Road

Approximate 25' ROW from Road Center

ENTRANCE #2 (EMERGENCY ACCESS ONLY)

ENTRANCE #1

PROPOSED BREAK-AWAY GATE (TYP)

TOTAL PROPOSED LIMIT OF DISTURBANCE - 29.01AC

ROAD A

ROAD B

ROAD C

POND 9P

POND 9A

DRY SWALE 1B

DRY SWALE 1D

DRY SWALE 4

DRY SWALE (TYP)

DIVERSION SWALE (TYP)

GRASS SWALE (TYP)

PLAYGROUND

Wetland C NYSDEC Wetland LE-28

NYSDEC 100' Wetland Buffer

ACDE Wetland

Trolley

Gone Dirt

House

Garage

Well

Truck Body Storage Container

Gazebo In Disrepair

INV:1504.00
118LF-18"HDPE @0.84%
118LF-18"HDPE 0.84%
INV:1505.00
INV:1509.00
110LF-24"HDPE @1.61%
INV:1509.50
INV:1512.00
76LF-15"HDPE
INV:1512.00
INV:1510.60
113LF-24"HDPE @0.44%
INV:1548.00
123LF-18"HDPE @0.57%
33LF-15"HDPE @0.61%
55LF-15"HDPE @10.91%
42LF-15"HDPE @8.33%
INV:1559.00
62LF-15"HDPE @6.45%
57LF-15"HDPE @7.02%
54LF-15"HDPE @9.26%
53LF-15"HDPE @9.43%
57LF-15"HDPE @8.77%
54LF-15"HDPE @9.26%

CB 1C RIM:1593.00 INV:1586.30
CB 7K RIM:1591.00 INV:1588.00
CB 7J RIM:1587.00 INV:1584.00
CB 7I RIM:1583.00 INV:1580.00
CB 7H RIM:1579.00 INV:1575.00
CB 7G RIM:1573.00 INV:1570.00
CB 7F RIM:1567.00 INV:1565.00
CB 7E RIM:1563.00 INV:1560.00
CB 7D RIM:1557.00 INV:1554.00
CB 7B RIM:1553.50 INV:1548.70
CB 7C RIM:1553.50 INV:1548.90

LEGEND

- EXISTING PROPERTY LINE
- EXISTING ADJOINER LINE
- EXISTING RIGHT-OF-WAY LINE
- EXISTING EASEMENT LINE
- EXISTING PAVEMENT
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- EXISTING STREAM CENTERLINE
- EXISTING FENCE
- EXISTING TREELINE
- EXISTING STONEWALL
- EXISTING WETLANDS
- EXISTING WETLANDS SETBACK
- EXISTING OVERHEAD TELEPHONE (OT)
- EXISTING U/G TELEPHONE (UT)
- EXISTING OVERHEAD ELECTRIC (OE)
- EXISTING U/G ELECTRIC (UE)
- EXISTING WATER LINE (W)
- EXISTING SANITARY SEWER (S)
- EXISTING SANITARY FORCEMAIN (FM)
- EXISTING STORM PIPE (18" RCP)
- EXISTING SANITARY SEWER MANHOLE
- EXISTING STORM MANHOLE
- EXISTING STORM INLET
- EXISTING STORM HEADWALL/ENDWALL
- EXISTING WELL
- EXISTING UTILITY POLE
- EXISTING GUYWIRE/POLE
- PROPOSED LOT LINE
- PROPOSED EASEMENT LINE
- PROPOSED PAVEMENT
- MINIMUM BUILDING SETBACK LINE
- PROPOSED FENCE
- PROPOSED TREELINE/LIMIT OF DISTURBANCE
- PROPOSED SILT FENCE
- PROPOSED LIMIT OF DISTURBANCE
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED STORM PIPE
- HANDICAPPED PARKING SPACE
- PROPOSED STOP SIGN
- PROPOSED SIGN
- PROPOSED LIGHT
- PROPOSED SEWER MANHOLE
- PROPOSED STORM INLET
- PROPOSED YARD STORM INLET
- PROPOSED STORM HEADWALL/ENDWALL
- PROPOSED FLARED END SECTION
- PROPOSED PIPE OUTLET PROTECTION
- PROPOSED SPOT ELEVATION (+350.25)
- PROPOSED FINISHED FLOOR ELEVATION (F.E.=345.00)
- PROPOSED BASEMENT FLOOR ELEVATION (B.E.=345.00)
- PROPOSED WATER VALVE
- PROPOSED FIRE HYDRANT
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NO.	DATE	REVISION
2	6/25/25	PROGRESS SET
1	12/11/24	DESIGN REVISIONS

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NEW YORK STATE PROFESSIONAL ENGINEER
LICENSE NO. 093427

MANAGER: MICHAEL G. RIELLY
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CLIENT
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PO BOX 1333
JACKSON, NJ 08527
TEL: (732)-719-7200

SCALE 1" = 50' (0, 25, 50, 100)

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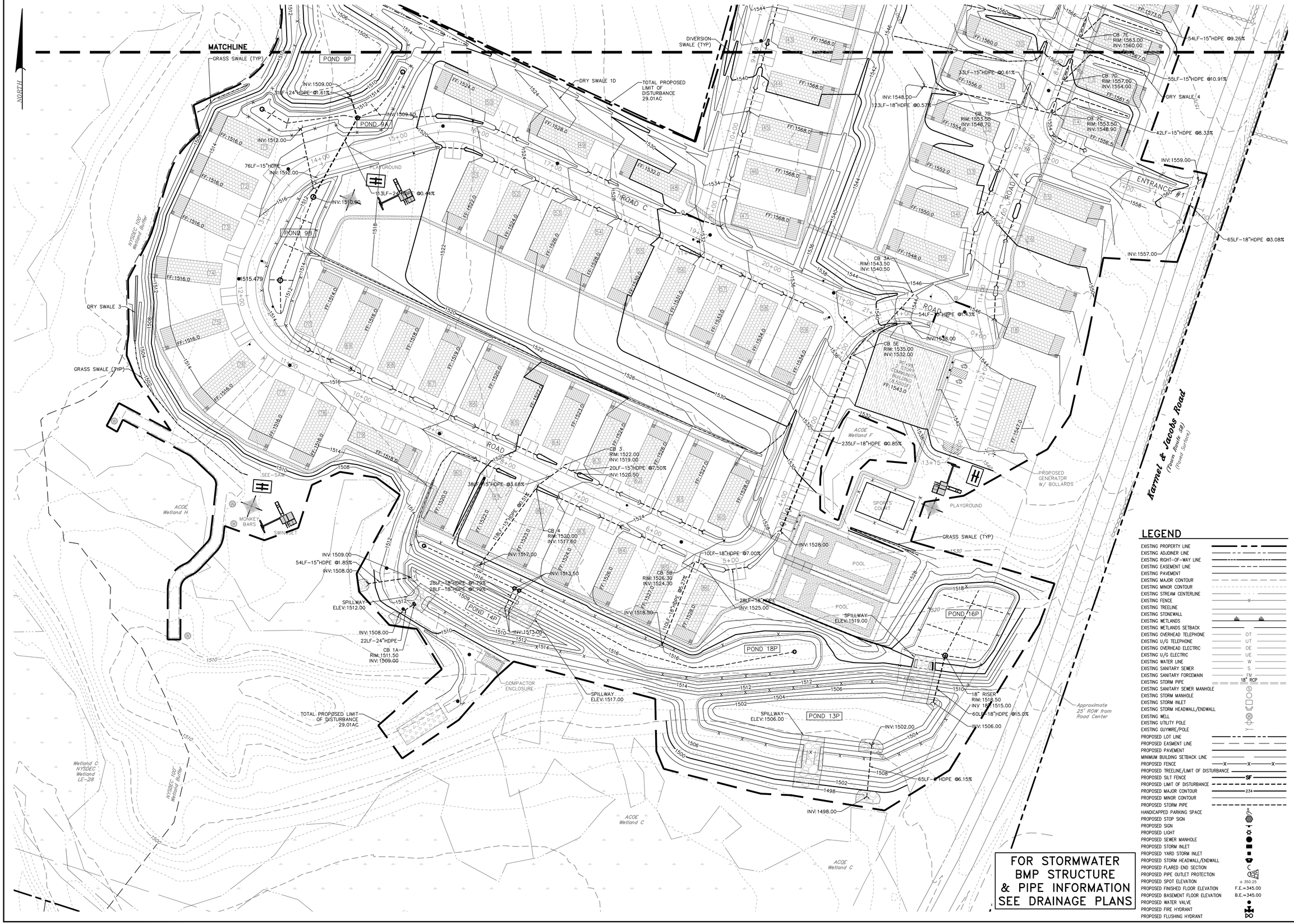
GRADING PLAN
FOR
SHELDRAKE KARMEL RD PROPERTIES LLC
TOWN OF FALLSBURG
SULLIVAN COUNTY, NY

DATE: JUNE 25, 2024
SHEET NO. 6 OF 29
DWG. NO. 0236-01



LEGEND

- EXISTING PROPERTY LINE
- EXISTING ADJOINER LINE
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- MINIMUM BUILDING SETBACK LINE
- PROPOSED FENCE
- PROPOSED TREELINE/LIMIT OF DISTURBANCE
- PROPOSED SILT FENCE
- PROPOSED LIMIT OF DISTURBANCE
- PROPOSED MAJOR CONTOUR (234)
- PROPOSED MINOR CONTOUR
- PROPOSED STORM PIPE
- HANDICAPPED PARKING SPACE
- PROPOSED STOP SIGN
- PROPOSED SIGN
- PROPOSED LIGHT
- PROPOSED SEWER MANHOLE
- PROPOSED STORM INLET
- PROPOSED YARD STORM INLET
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- PROPOSED FIRE HYDRANT
- PROPOSED FLUSHING HYDRANT

FOR STORMWATER BMP STRUCTURE & PIPE INFORMATION SEE DRAINAGE PLANS

NO.	DATE	REVISION
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1	12/11/24	DESIGN REVISIONS

MICHAEL G. RIELLY
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0 25 50 100 150

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GRADING PLAN
FOR
SHELDRAKE KARMEL RD PROPERTIES LLC
TOWN OF FALLSBURG
SULLIVAN COUNTY, NY

DATE: JUNE 25, 2024
SHEET NO. 7 OF 29
DWG. NO. 0236-01

EROSION & SEDIMENT CONTROL PLAN

FOR

SHELDRAKE KARMEL RD PROPERTIES LLC

TOWN OF FALLSBURG SULLIVAN COUNTY, NY

DATE: JUNE 25, 2024

SHEET NO. 8 OF 29

DWG. NO. 0236-01

RIELLY ENGINEERING DPC

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CLIENT

SHELDRAKE KARMEL RD PROPERTIES LLC
PO BOX 1333
JACKSON, NJ 08527
TEL: (732)-719-7200

SCALE

1" = 50'

0 25 50 100 150

MANAGER: MICHAEL G. RIELLY

DESIGN BY:	DRAWN BY:	CHKD BY:
MTL	MTL	MGR

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MICHAEL G. RIELLY
NEW YORK STATE PROFESSIONAL ENGINEER
LICENSE NO. 093427

NO.	DATE	REVISION
2	6/25/25	PROGRESS SET
1	12/11/24	DESIGN REVISIONS

NORTH

MATCHLINE

GRASS SWALE (TYP)

POND 9P

INV: 1509.00

111LF–24"HDPE @1.61%

POND 9A

INV: 1509.60

INV: 1512.00

CONCRETE WASHOUT (TYP)

76LF–15"HDPE

INV: 1512.00

PLAYGROUND

STOCKPILE

113LF–24"HDPE @0.44%

INV: 1510.60

POND 9B

HYDRO 100' Wetland Buffer

PROPOSED SILT FENCE

DRY SWALE 3

GRASS SWALE (TYP)

ROAD C

DRY SWALE 1D

TOTAL PROPOSED LIMIT OF DISTURBANCE 29.01AC

DIVERSION SWALE (TYP)

CB 3
RIM: 1522.00
INV: 1519.00

20LF–15"HDPE @7.50%

INV: 1520.50

38LF–15"HDPE @3.68%

18LF–15"HDPE @2.51%

CB 4
RIM: 1520.00
INV: 1517.60

INV: 1517.00

INV: 1513.50

CB 5B
RIM: 1526.30
INV: 1524.30

INV: 1518.30

10LF–15"HDPE @5.27%

28LF–18"HDPE
INV: 1525.00

10LF–18"HDPE @7.00%

INV: 1528.00

POOL

SPILLWAY
ELEV: 1519.00

POND 16P

POND 18P

POND 13P

SPILLWAY
ELEV: 1506.00

SPILLWAY
ELEV: 1517.00

COMPACTOR ENCLOSURE

PROPOSED ORANGE PROTECTION FENCE

TOTAL PROPOSED LIMIT OF DISTURBANCE 29.01AC

INV: 1509.00

54LF–15"HDPE @1.85%

INV: 1508.00

SPILLWAY
ELEV: 1512.00

28LF–18"HDPE @1.79%

28LF–18"HDPE @1.79%

POND 14P

INV: 1508.00

22LF–24"HDPE

CB 1A
RIM: 1511.50
INV: 1509.00

INV: 1513.00

MONKEY BARS

SWINGSET

SEE–SAW

ACOE Wetland H

Wetland C
NYSDEC
Wetland
LE–28

HYDRO 100' Wetland Buffer

ACOE Wetland C

ACOE Wetland F

CB 7E
RIM: 1563.00
INV: 1560.00

54LF–15"HDPE @9.26%

33LF–15"HDPE @0.61%

INV: 1548.00

123LF–18"HDPE @0.57%

CB 7D
RIM: 1557.00
INV: 1554.00

55LF–15"HDPE @10.91%

DRY SWALE 4

CB 6
RIM: 1553.50
INV: 1548.70

CB 7C
RIM: 1553.50
INV: 1548.90

42LF–15"HDPE @8.33%

INV: 1559.00

ENTRANCE

65LF–18"HDPE @3.08%

INV: 1557.00

PROPOSED ROCK CONSTRUCTION ENTRANCE

CB 3A
RIM: 1543.50
INV: 1540.50

ROAD A

54LF–18"HDPE @1.43%

INV: 1538.00

CB 5E
RIM: 1535.00
INV: 1532.00

2 STORY COMMUNITY BUILDING (8,550SQFT)
FF: 1548.0

PROPOSED GENERATOR W/ BOLLARDS

SPORTS COURT

PLAYGROUND

GRASS SWALE (TYP)

Karmel & Jacobs Road
(Town Route 68)
(Paved Surface)

INV: 1502.00

60LF–18"HDPE @15.0%

INV: 1506.00

18" RISER
RIM: 1510.50
INV: 1515.00

65LF–18"HDPE @6.15%

INV: 1498.00

PROPOSED SILT FENCE

LEGEND

- EXISTING PROPERTY LINE
- EXISTING ADJOINER LINE
- EXISTING RIGHT–OF–WAY LINE
- EXISTING EASEMENT LINE
- EXISTING PAVEMENT
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- EXISTING MINOR CONTOUR
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- EXISTING FENCE
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- EXISTING WETLANDS
- EXISTING WETLANDS SETBACK
- EXISTING OVERHEAD TELEPHONE (OT)
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- EXISTING WATER LINE (W)
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- EXISTING SANITARY FORCEMAIN (FM)
- EXISTING STORM PIPE (18" RCP)
- EXISTING SANITARY SEWER MANHOLE
- EXISTING STORM MANHOLE
- EXISTING STORM INLET
- EXISTING STORM HEADWALL/ENDWALL
- EXISTING WELL
- EXISTING UTILITY POLE
- EXISTING GUYWIRE/POLE
- PROPOSED LOT LINE
- PROPOSED EASEMENT LINE
- PROPOSED PAVEMENT
- MINIMUM BUILDING SETBACK LINE
- PROPOSED FENCE
- PROPOSED TREELINE/LIMIT OF DISTURBANCE
- PROPOSED SILT FENCE (SF)
- PROPOSED LIMIT OF DISTURBANCE
- PROPOSED MAJOR CONTOUR (234)
- PROPOSED MINOR CONTOUR
- PROPOSED STORM PIPE
- HANDICAPPED PARKING SPACE
- PROPOSED STOP SIGN
- PROPOSED SIGN
- PROPOSED LIGHT
- PROPOSED SEWER MANHOLE
- PROPOSED STORM INLET
- PROPOSED YARD STORM INLET
- PROPOSED STORM HEADWALL/ENDWALL
- PROPOSED FLARED END SECTION
- PROPOSED PIPE OUTLET PROTECTION
- PROPOSED SPOT ELEVATION (+ 350.25)
- PROPOSED FINISHED FLOOR ELEVATION (F.E.=345.00)
- PROPOSED BASEMENT FLOOR ELEVATION (B.E.=345.00)
- PROPOSED WATER VALVE
- PROPOSED FIRE HYDRANT
- PROPOSED FLUSHING HYDRANT

NO.	DATE	REVISION
2	6/25/25	PROGRESS SET
1	12/11/24	DESIGN REVISIONS

MICHAEL G. RIELLY
NEW YORK STATE PROFESSIONAL ENGINEER
LICENSE NO. 093427

MANAGER: MICHAEL G. RIELLY
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PO BOX 1333
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TEL: (732)–719–7200

SCALE
1" = 50'
0 25 50 100 150

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EROSION & SEDIMENT CONTROL PLAN
FOR
SHELDRAKE KARMEL RD PROPERTIES LLC
TOWN OF FALLSBURG SULLIVAN COUNTY, NY

DATE: JUNE 25, 2024
SHEET NO. 9 OF 29
DWG. NO. 0236–01

NORTH

Labargh Road
(Town Route 8)
(Paved Surface)

To Divine Corners Road

To Levine Road

ENTRANCE #2
(EMERGENCY ACCESS ONLY)

Trailer

Gravel Drive

200.0' Well Protection Radius

House

Garage

Well

100.0' Well Protection Radius

Trash Body Storage Container

Gazebo In Disrepair

ACOE Wetland

Wetland C
NYSDEC
Wetland
LE-28

NYSDEC 100' Wetland Buffer

SMH-1
RIM:1606.90
INV:1602.90

WATER VALVE WITH END CAP

TOTAL PROPOSED LIMIT OF DISTURBANCE 29.01AC

PROPOSED BLOW OFF HYDRANT

SMH-2
RIM:1588.10
INV:1584.10

SMH-19
RIM:1558.40
INV:1554.40

WATER VALVE (TYP)

SMH-18
RIM:1542.10
INV:1538.10

SMH-3
RIM:1537.30
INV:1553.30

SMH-8
RIM:1520.80
INV:1516.80

SMH-7
RIM:1525.50
INV:1521.50

SMH-6
RIM:1532.40
INV:1528.40

POND 9P

POND 8P

PLAYGROUND

ROAD B

ROAD C

ENTRANCE #1

Karmel & Jacobs Road
(Town Route 68)
(Paved Surface)

MATCHLINE

WATER NOTES

1. ALL WATER SYSTEM COMPONENTS IN DIRECT CONTACT WITH DRINKING WATER MUST BE ANSI/NSF STANDARD 61 COMPLIANT OR EQUIVALENT.
2. WATER AND SEWER UTILITIES MUST MEET THE REQUIRED HORIZONTAL AND VERTICAL SEPARATIONS IN THE DETAILS SHOWN ON SHEET 17.

LEGEND

- EXISTING PROPERTY LINE
- EXISTING ADJOINER LINE
- EXISTING RIGHT-OF-WAY LINE
- EXISTING EASEMENT LINE
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- EXISTING TREELINE
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- EXISTING WETLANDS
- EXISTING WETLANDS SETBACK
- EXISTING OVERHEAD TELEPHONE
- EXISTING U/G TELEPHONE
- EXISTING OVERHEAD ELECTRIC
- EXISTING U/G ELECTRIC
- EXISTING WATER LINE
- EXISTING SANITARY SEWER
- EXISTING SANITARY FORCEMAIN
- EXISTING STORM PIPE (18" RCP)
- EXISTING SANITARY SEWER MANHOLE
- EXISTING STORM MANHOLE
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- MINIMUM BUILDING SETBACK LINE
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- PROPOSED TREELINE/LIMIT OF DISTURBANCE
- PROPOSED LIMIT OF DISTURBANCE
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED STORM PIPE
- PROPOSED WATER LINE
- PROPOSED SANITARY SEWER LINE
- PROPOSED SANITARY FORCEMAIN
- HANDICAPPED PARKING SPACE
- PROPOSED STOP SIGN
- PROPOSED SIGN
- PROPOSED LIGHT
- PROPOSED SEWER MANHOLE
- PROPOSED SEWER CLEANOUT
- PROPOSED STORM INLET
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UTILITIES PLAN
FOR
SHELDRAKE KARMEL RD PROPERTIES LLC
TOWN OF FALLSBURG SULLIVAN COUNTY, NY

DATE: JUNE 25, 2024
SHEET NO. 10 OF 29
DWG. NO. 0236-01

MATCHLINE

SMH-8
RIM: 1520.80
INV: 1516.80

SMH-7
RIM: 1525.50
INV: 1521.50

SMH-6
RIM: 1532.40
INV: 1528.40

TOTAL PROPOSED LIMIT OF DISTURBANCE 29.01AC

SMH-9
RIM: 1516.50
INV: 1512.50

SMH-10
RIM: 1515.50
INV: 1511.00

SMH-11
RIM: 1515.60
INV: 1509.70

SMH-12
RIM: 1518.40
INV: 1507.60

SMH-13
RIM: 1512.20
INV: 1505.80

SMH-14
RIM: 1511.10
INV: 1505.20

SMH-15
RIM: 1509.20
INV: 1504.20

SMH-16
RIM: 1507.90
INV: 1503.60

SMH-17
RIM: 1525.40
INV: 1521.40

SMH-3
RIM: 1559.30
INV: 1553.30

SMH-4
RIM: 1546.90
INV: 1542.90

SMH-5
RIM: 1537.90
INV: 1533.90

POND 9P
POND 8P
POND 14P
POND 18P
POND 13P
POND 16P

PLAYGROUND
SWINGSET
MONKEY BARS
SPORTS COURT
POOL
COMPACTOR ENCLOSURE
PROPOSED BLOW OFF HYDRANT
PROPOSED GENERATOR W/ BOLLARDS
PROPOSED WELL (TYP)
WATER VALVE (TYP)

ENTRANCE #1

Karmel & Jacobs Road
(Town Route 58)
(Paved Surface)

HYDRO 100' Wetland Buffer

ACOE Wetland F
ACOE Wetland H
ACOE Wetland C
Wetland C NYSDEC Wetland LE-28

TOTAL PROPOSED LIMIT OF DISTURBANCE 29.01AC

HARTON

LEGEND

- EXISTING PROPERTY LINE
- EXISTING ADJOINER LINE
- EXISTING RIGHT-OF-WAY LINE
- EXISTING EASEMENT LINE
- EXISTING PAVEMENT
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- EXISTING STREAM CENTERLINE
- EXISTING FENCE
- EXISTING TREELINE
- EXISTING STONEWALL
- EXISTING WETLANDS
- EXISTING WETLANDS SETBACK
- EXISTING OVERHEAD TELEPHONE
- EXISTING U/G TELEPHONE
- EXISTING OVERHEAD ELECTRIC
- EXISTING U/G ELECTRIC
- EXISTING WATER LINE
- EXISTING SANITARY SEWER
- EXISTING SANITARY FORCEMAIN
- EXISTING STORM PIPE
- EXISTING SANITARY SEWER MANHOLE
- EXISTING STORM MANHOLE
- EXISTING STORM INLET
- EXISTING STORM HEADWALL/ENDWALL
- EXISTING WELL
- EXISTING UTILITY POLE
- EXISTING GUYWIRE/POLE
- PROPOSED LOT LINE
- PROPOSED EASEMENT LINE
- PROPOSED PAVEMENT
- MINIMUM BUILDING SETBACK LINE
- PROPOSED FENCE
- PROPOSED TREELINE/LIMIT OF DISTURBANCE
- PROPOSED LIMIT OF DISTURBANCE
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED STORM PIPE
- PROPOSED WATER LINE
- PROPOSED SANITARY SEWER LINE
- PROPOSED SANITARY FORCEMAIN
- HANDICAPPED PARKING SPACE
- PROPOSED STOP SIGN
- PROPOSED SIGN
- PROPOSED LIGHT
- PROPOSED SEWER MANHOLE
- PROPOSED SEWER CLEANOUT
- PROPOSED STORM INLET
- PROPOSED YARD STORM INLET
- PROPOSED STORM HEADWALL/ENDWALL
- PROPOSED FLARED END SECTION
- PROPOSED PIPE OUTLET PROTECTION
- PROPOSED SPOT ELEVATION
- PROPOSED FINISHED FLOOR ELEVATION
- PROPOSED BASEMENT FLOOR ELEVATION
- PROPOSED WATER VALVE
- PROPOSED FIRE HYDRANT
- PROPOSED FLUSHING HYDRANT

WATER NOTES

1. ALL WATER SYSTEM COMPONENTS IN DIRECT CONTACT WITH DRINKING WATER MUST BE ANSI/NSF STANDARD 61 COMPLIANT OR EQUIVALENT.
2. WATER AND SEWER UTILITIES MUST MEET THE REQUIRED HORIZONTAL AND VERTICAL SEPARATIONS IN THE DETAILS SHOWN ON SHEET 17.

NO.	DATE	REVISION
2	6/25/25	PROGRESS SET
1	12/11/24	DESIGN REVISIONS

MICHAEL G. RIELLY
NEW YORK STATE PROFESSIONAL ENGINEER
LICENSE NO. 093427

MANAGER: MICHAEL G. RIELLY
DESIGN BY: MTL | DRAWN BY: MTL | CHKD BY: MGR

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CLIENT
SHELDRAKE KARMEL RD
PROPERTIES LLC
PO BOX 1333
JACKSON, NJ 08527
TEL: (732)-719-7200

SCALE
1" = 50'
0 25 50 100 150

RIELLY ENGINEERING DPC
PO BOX 69 / 63 LIBERTY STREET
MONTICELLO, NY 12701
T. 845-796-9700
OFFICE@RIELLYENGINEERING.COM

UTILITIES PLAN
FOR
SHELDRAKE KARMEL RD PROPERTIES LLC

SULLIVAN COUNTY, NY
TOWN OF FALLSBURG

DATE: JUNE 25, 2024
SHEET NO. 11 OF 29
DWG. NO. 0236-01

LEGEND

- EXISTING PROPERTY LINE
- EXISTING ADJOINER LINE
- EXISTING RIGHT-OF-WAY LINE
- EXISTING EASEMENT LINE
- EXISTING PAVEMENT
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- EXISTING STREAM CENTERLINE
- EXISTING FENCE
- EXISTING TREELINE
- EXISTING STONEWALL
- EXISTING WETLANDS
- EXISTING WETLANDS SETBACK
- EXISTING OVERHEAD TELEPHONE — OT
- EXISTING U/G TELEPHONE — UT
- EXISTING OVERHEAD ELECTRIC — OE
- EXISTING U/G ELECTRIC — UE
- EXISTING WATER LINE — W
- EXISTING SANITARY SEWER — S
- EXISTING SANITARY FORCEMAIN — FM
- EXISTING STORM PIPE — 18" RCP
- EXISTING SANITARY SEWER MANHOLE
- EXISTING STORM MANHOLE
- EXISTING STORM INLET
- EXISTING STORM HEADWALL/ENDWALL
- EXISTING WELL
- EXISTING UTILITY POLE
- EXISTING GUYWIRE/POLE
- PROPOSED LOT LINE
- PROPOSED EASMENT LINE
- PROPOSED PAVEMENT
- MINIMUM BUILDING SETBACK LINE
- PROPOSED FENCE
- PROPOSED TREELINE/LIMIT OF DISTURBANCE
- PROPOSED LIMIT OF DISTURBANCE
- PROPOSED MAJOR CONTOUR — 234
- PROPOSED MINOR CONTOUR
- PROPOSED STORM PIPE
- PROPOSED STOP SIGN
- PROPOSED SIGN
- PROPOSED LIGHT
- PROPOSED SEWER MANHOLE
- PROPOSED SEWER CLEANOUT — SCO
- PROPOSED STORM INLET
- PROPOSED YARD STORM INLET
- PROPOSED STORM HEADWALL/ENDWALL
- PROPOSED FLARED END SECTION
- PROPOSED PIPE OUTLET PROTECTION
- PROPOSED SPOT ELEVATION — + 350.25
- PROPOSED FINISHED FLOOR ELEVATION — F.E.=345.00
- PROPOSED BASEMENT FLOOR ELEVATION — B.E.=345.00
- PROPOSED WATER VALVE
- PROPOSED FIRE HYDRANT

LIGHTING NOTES

1. DOWNWARD FACING DARK SKY COMPLIANT LIGHTS ARE TO BE MOUNTED ON THE FRONT OF EACH BUILDING.

PLANT SCHEDULE

SYMBOL KEY	QTY.	BOTANICAL NAME	COMMON NAME	SIZE	REMARKS	PLANT SYMBOL
DECIDUOUS TREES						
AR	0	*Acer rubrum*	RED MAPLE	6" - 8" CAL	B & B	
CA	0	*Acer Saccharom 'Ommemoration'*	COMMEMORATION SUGAR MAPLE	6" - 8" CAL	B & B	
CC	0	*Ceris Canadensis*	EASTERN REDBUD	6" - 8" CAL	B & B	
MC	0	*Malus 'Centurion'*	CENTURION CRABAPPLE	6" - 8" CAL	B & B	
EVERGREEN TREES						
JP	0	*Pseudosuga Menziesii*	DOUGLAS FIR	6'-8' TALL	B & B	
GG	73	*Arborvitae*	GREEN GIANT	6'-8' TALL	B & B	
SHRUBS						
AA	0	*Aronia arbutifolia 'Brilliantissima'*	BRILLIANT RED CHOKEBERRY	2 GAL	CONTAINER	
VT	0	*Viburnum trilobum 'Compactum'*	COMPACT AMERICAN CRANBERRYBUSH VIBURNUM	2 GAL	CONTAINER	

NO.	DATE	REVISION
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1	12/11/24	DESIGN REVISIONS

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LICENSE NO. 093427

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CLIENT
SHELDRAKE KARMEL RD
PROPERTIES LLC
PO BOX 1333
JACKSON, NJ 08527
TEL: (732)-719-7200

SCALE
1" = 100'
0 50 100 200 300

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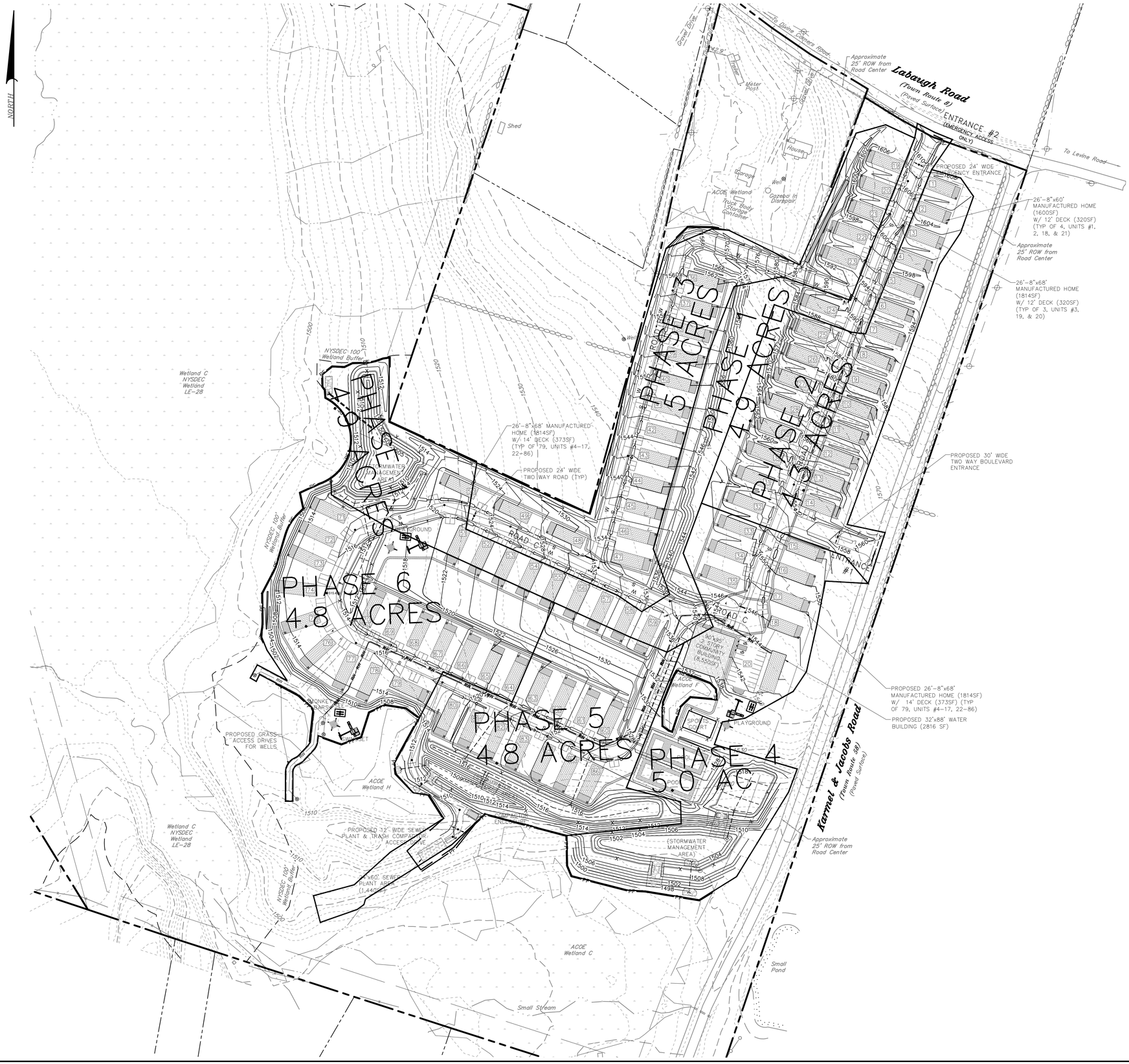
OFFICE@RIELLYENGINEERING.COM

LIGHTING & LANDSCAPING PLAN
FOR
SHELDRAKE KARMEL RD PROPERTIES LLC
TOWN OF FALLSBURG SULLIVAN COUNTY, NY

DATE: JUNE 25, 2024
SHEET NO. 12 OF 29
DWG. NO. 0236-01



LEGEND

EXISTING PROPERTY LINE	
EXISTING ADJOINER LINE	
EXISTING RIGHT-OF-WAY LINE	
EXISTING EASEMENT LINE	
EXISTING PAVEMENT	
EXISTING MAJOR CONTOUR	
EXISTING MINOR CONTOUR	
EXISTING STREAM CENTERLINE	
EXISTING FENCE	X
EXISTING TREELINE	
EXISTING STONEWALL	
EXISTING WETLANDS	
EXISTING WETLANDS SETBACK	
EXISTING OVERHEAD TELEPHONE	OT
EXISTING U/G TELEPHONE	UT
EXISTING OVERHEAD ELECTRIC	OE
EXISTING U/G ELECTRIC	UE
EXISTING WATER LINE	W
EXISTING SANITARY SEWER	S
EXISTING SANITARY FORCEMAIN	FM
EXISTING STORM PIPE	18" RCP
EXISTING SANITARY SEWER MANHOLE	S
EXISTING STORM MANHOLE	
EXISTING STORM INLET	
EXISTING STORM HEADWALL/ENDWALL	
EXISTING WELL	W
EXISTING UTILITY POLE	
EXISTING GUYWIRE/POLE	
PROPOSED LOT LINE	
PROPOSED EASMENT LINE	
PROPOSED PAVEMENT	
MINIMUM BUILDING SETBACK LINE	
PROPOSED FENCE	X X X
PROPOSED TREELINE/LIMIT OF DISTURBANCE	
PROPOSED LIMIT OF DISTURBANCE	
PROPOSED MAJOR CONTOUR	234
PROPOSED MINOR CONTOUR	
PROPOSED STORM PIPE	
PROPOSED PHASING LINE	
PROPOSED STOP SIGN	
PROPOSED SIGN	
PROPOSED LIGHT	
PROPOSED SEWER MANHOLE	
PROPOSED SEWER CLEANOUT	
PROPOSED STORM INLET	
PROPOSED YARD STORM INLET	
PROPOSED STORM HEADWALL/ENDWALL	
PROPOSED FLARED END SECTION	
PROPOSED PIPE OUTLET PROTECTION	
PROPOSED SPOT ELEVATION	+ 350.25
PROPOSED FINISHED FLOOR ELEVATION	F.E.=345.00
PROPOSED BASEMENT FLOOR ELEVATION	B.E.=345.00
PROPOSED WATER VALVE	
PROPOSED FIRE HYDRANT	

NO.	DATE	REVISION
2	6/25/25	PROGRESS SET
1	12/11/24	DESIGN REVISIONS

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JACKSON, NJ 08527
TEL: (732)-719-7200

SCALE
1" = 100'
0 50 100 200 300

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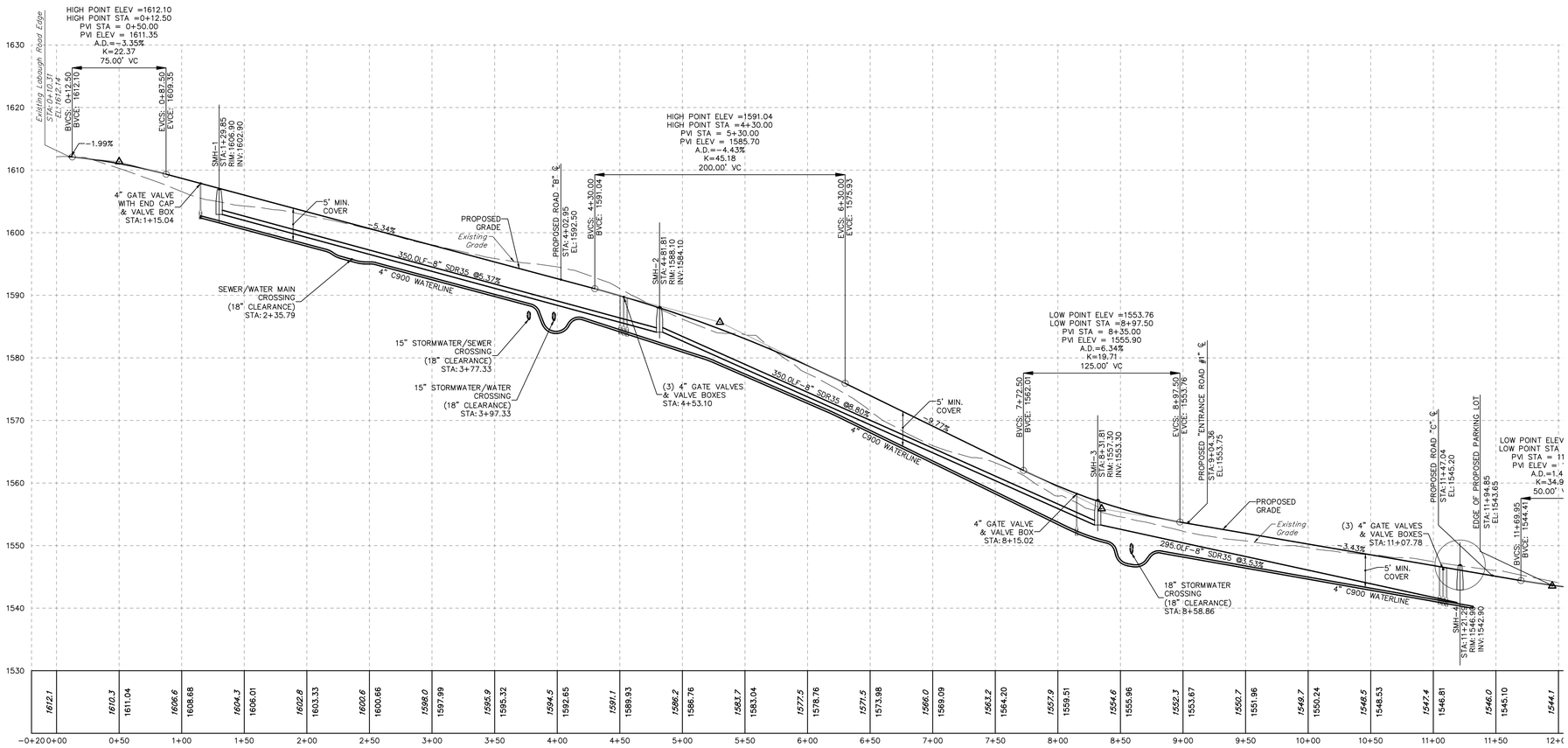
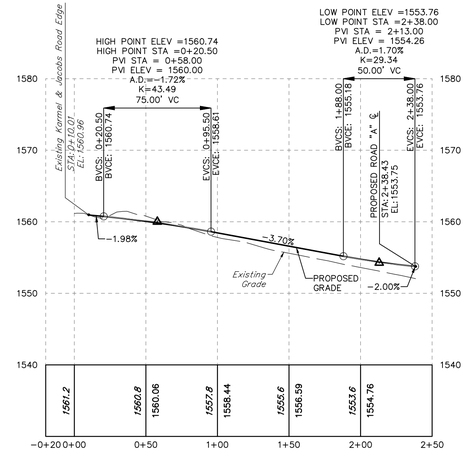
PHASING PLAN
FOR
SHELDRAKE KARMEL RD PROPERTIES LLC
TOWN OF FALLSBURG | SULLIVAN COUNTY, NY

DATE: JUNE 25, 2024
SHEET NO. 13 OF 29
DWG. NO. 0236-01



"Road A" Centerline Profile

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 10'



"Entrance #1" Centerline Profile

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 10'

NO.	DATE	REVISION
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PROPERTIES LLC
PO BOX 1333
JACKSON, NJ 08527
TEL: (732)-719-7200

SCALE
1" = 50'
0 25 50 100 150

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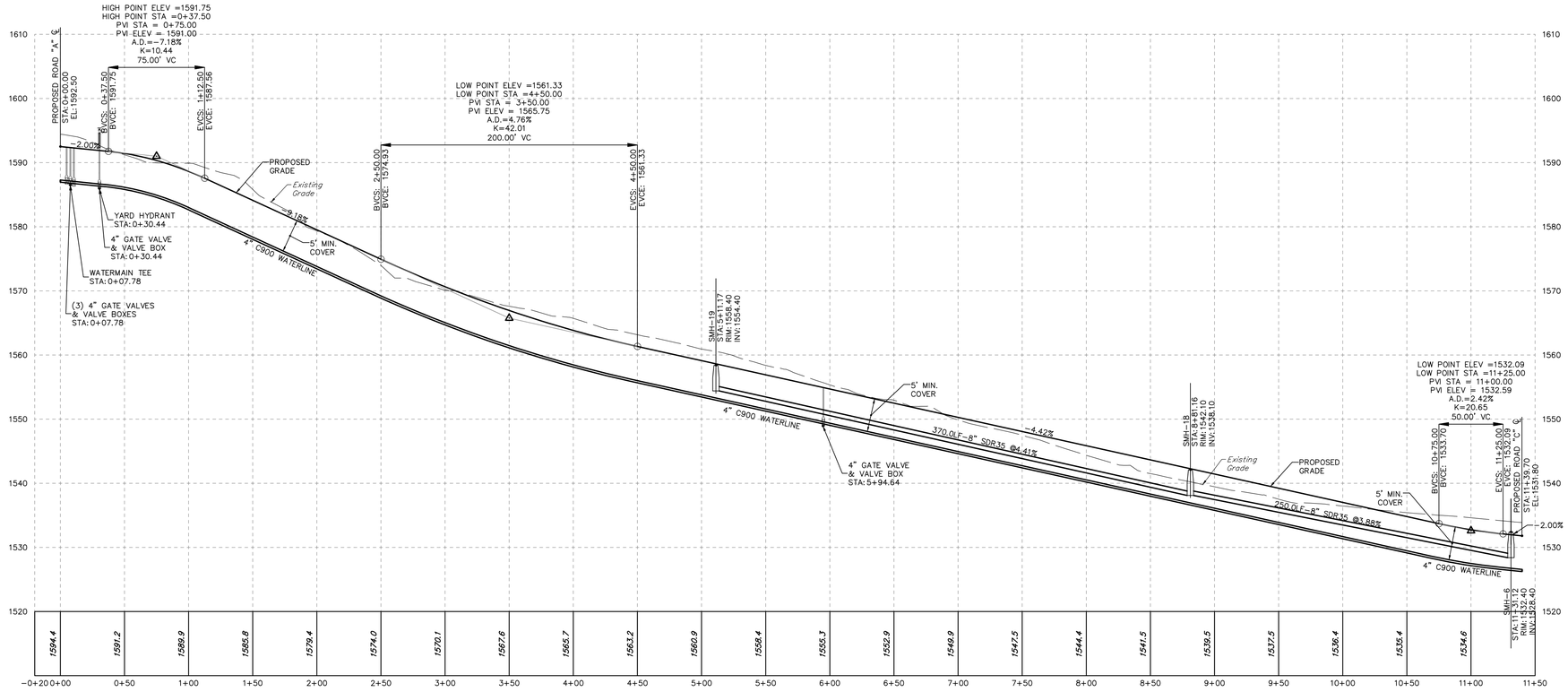
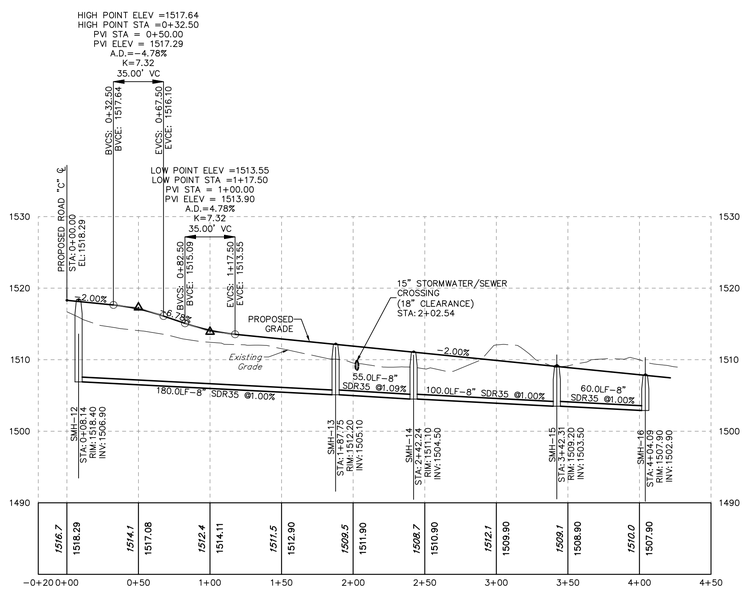
PROFILES
FOR
SHELDRAKE KARMEL RD PROPERTIES LLC
TOWN OF FALLSBURG SULLIVAN COUNTY, NY

DATE: JUNE 25, 2024
SHEET NO. 14 OF 29
DWG. NO. 0236-01



"Road B" Centerline Profile

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 10'



"Sewer Plant Access Road" Centerline Profile

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 10'

NO.	DATE	REVISION
2	6/25/25	PROGRESS SET
1	12/11/24	DESIGN REVISIONS

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SCALE
1" = 50'
0 25 50 100 150

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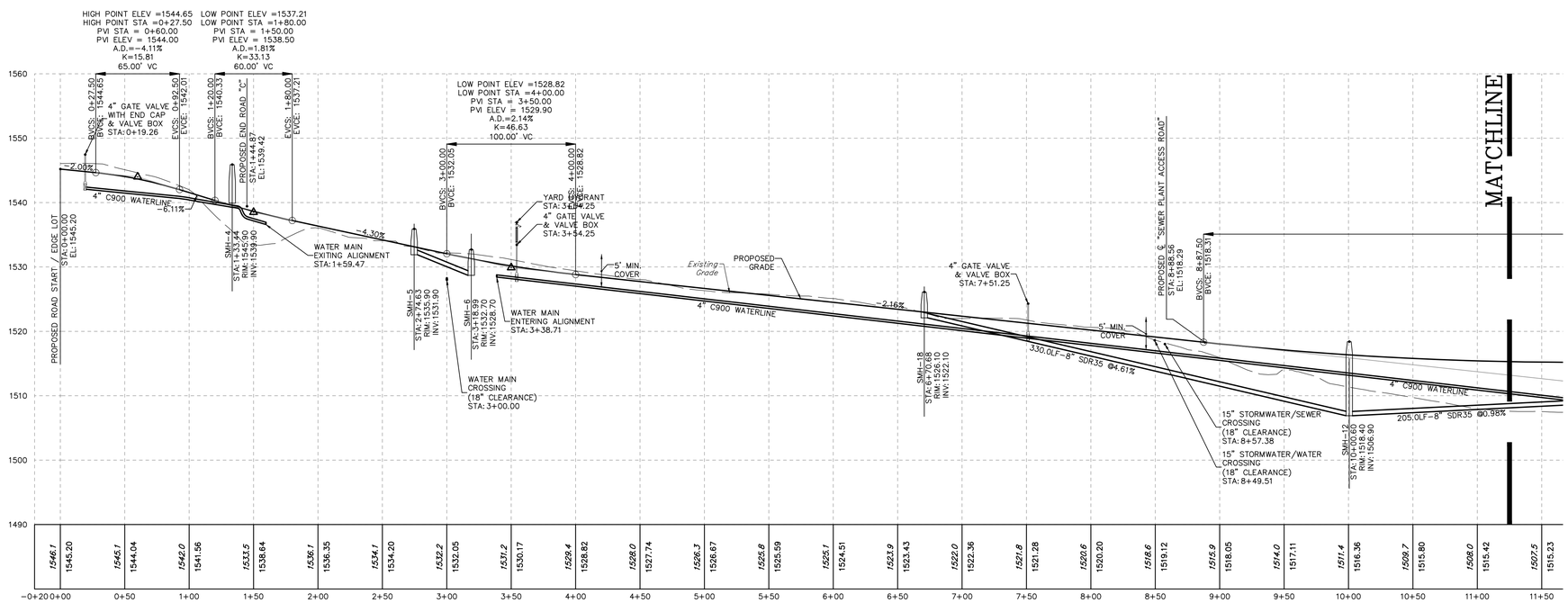
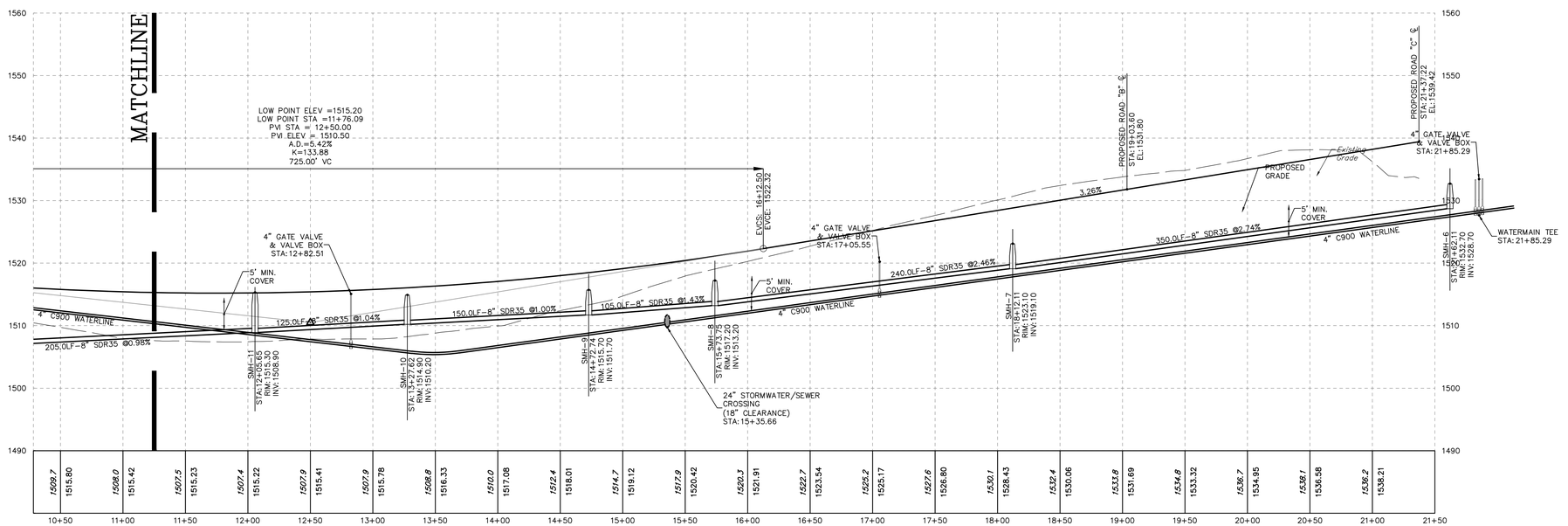
PROFILES
FOR
SHELDRAKE KARMEL RD PROPERTIES LLC
TOWN OF FALLSBURG
SULLIVAN COUNTY, NY

DATE: JUNE 25, 2024
SHEET NO. 15 OF 29
DWG. NO. 0236-01



"Road C" Centerline Profile

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 10'



"Road C" Centerline Profile

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 10'

NO.	DATE	REVISION
2	6/25/25	PROGRESS SET
1	12/11/24	DESIGN REVISIONS

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SCALE
0 25 50 1" = 50' 100 150

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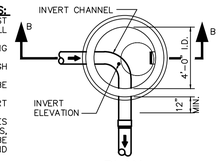
PROFILES
FOR
SHELDRAKE KARMEL RD PROPERTIES LLC
TOWN OF FALLSBURG SULLIVAN COUNTY, NY

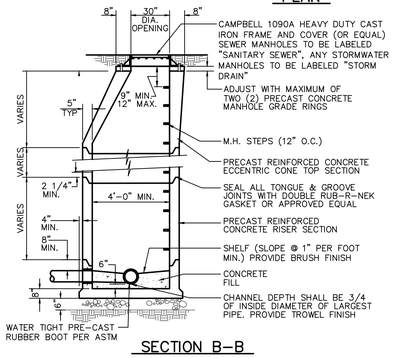
DATE: JUNE 25, 2024
SHEET NO. 16 OF 29
DWG. NO. 0236-01

PRECAST CONCRETE MANHOLE NOTES:

1. MECHANICALLY VIBRATED PRECAST CONCRETE, RISER AND TOP SHALL CONFORM TO A.S.T.M. SPEC. C-478.
2. MANHOLE SHALL HAVE BITUMASTIC COATING ON EXTERIOR WALLS.
3. MAINTAIN POSITIVE GRADE THROUGH MANHOLE.
4. ALL OPENINGS AROUND PIPES SHALL BE FINISHED WITH NON-SHRINK GROUT.
5. CONTRACTOR MAY USE PRECAST INVERT BASES.
6. FOR MANHOLES WITH SEWER LINES ENTERING AT GREATER THAN 10% SLOPES, INDIVIDUAL SHOP DRAWINGS MUST BE SUBMITTED BY THE CONTRACTOR AND REVIEWED BY THE ENGINEER.



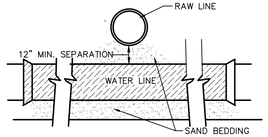
PLAN



SECTION B-B

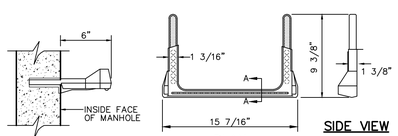
PRECAST CONCRETE MANHOLE

NOT TO SCALE



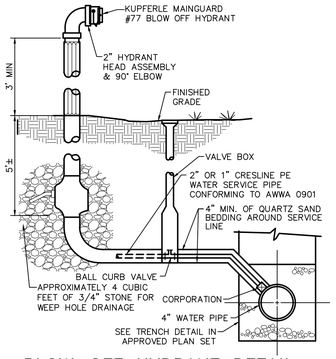
RAW WATER/WATER CROSSING

NOT TO SCALE



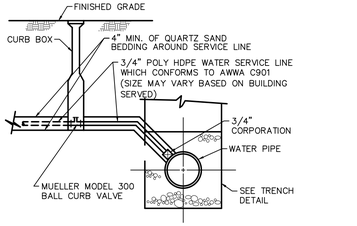
MANHOLE STEP DETAIL

NOT TO SCALE



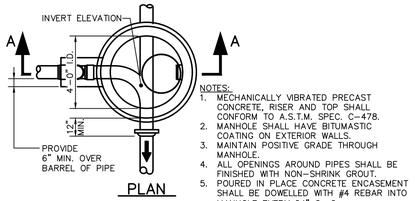
BLOW-OFF HYDRANT DETAIL

NOT TO SCALE



WATER SERVICE CONNNECTION

NOT TO SCALE



PLAN

NOTES:
1. MECHANICALLY VIBRATED PRECAST CONCRETE, RISER AND TOP SHALL CONFORM TO A.S.T.M. SPEC. C-478.
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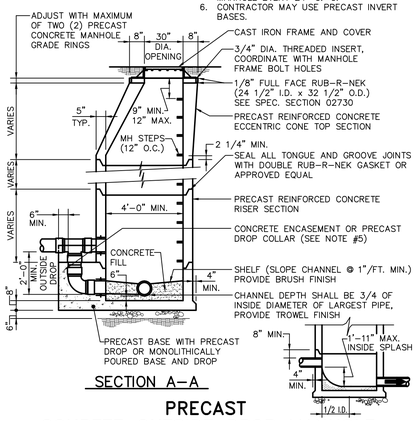
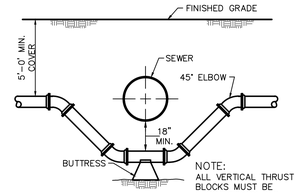
3. MAINTAIN POSITIVE GRADE THROUGH MANHOLE.
4. ALL OPENINGS AROUND PIPES SHALL BE FINISHED WITH NON-SHRINK GROUT.
5. POURED IN PLACE CONCRETE ENCASEMENT SHALL BE DOWELLED WITH #4 REBAR INTO MANHOLE EVERY 24" C-C.
6. CONTRACTOR MAY USE PRECAST INVERT BASES.



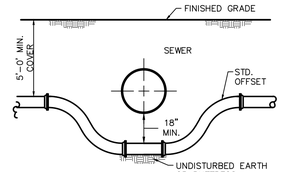
SECTION A-A

PRECAST CONRETE OUTSIDE DROP MANHOLE

NOT TO SCALE



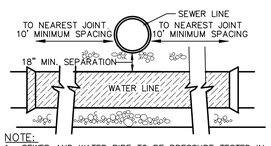
USING ELBOWS



USING STD. OFFSETS

WATER MAIN CROSSING SEWER USING FITTINGS

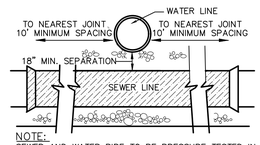
NOT TO SCALE



NOTE:
1. SEWER AND WATER PIPE TO BE PRESSURE TESTED IN ACCORDANCE WITH 10 STATES STANDARDS.
2. THE CROSSING SHALL BE ARRANGED SO THAT SEWER JOINTS WILL BE EQUI-DISTANT AND AS FROM AS POSSIBLE FROM THE WATER MAIN JOINTS.
3. THIS DETAIL IS ONLY TO BE USED WHEN IT IS IMPRACTICAL OR IMPOSSIBLE FOR THE WATER LINE TO CROSS OVERTOP OF THE SEWER LINE. THE DESIGN ENGINEER MUST APPROVE THE USE OF THIS DETAIL.

SEWER/WATER CROSSING

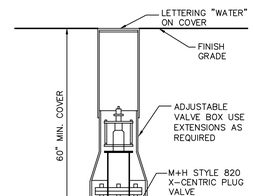
NOT TO SCALE



NOTE:
SEWER AND WATER PIPE TO BE PRESSURE TESTED IN ACCORDANCE WITH 10 STATES STANDARDS.
THE CROSSING SHALL BE ARRANGED SO THAT SEWER JOINTS WILL BE EQUI-DISTANT AND AS FROM AS POSSIBLE FROM THE WATER MAIN JOINTS.

WATER/SEWER CROSSING

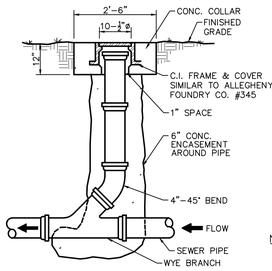
NOT TO SCALE



NOTE:
IF EXTENSIONS ARE NECESSARY CONTRACTOR SHALL SET "PLUMB" & ALIGN PROPERLY FOR ACCESS TO OPERATING NUT.

TYPICAL GATE VALVE & VALVE BOX DETAIL

NOT TO SCALE

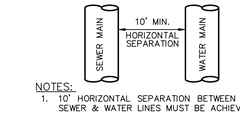


CLEANOUT DETAIL

NOT TO SCALE

WATER MAIN & SEWER MAIN CERTIFICATIONS:

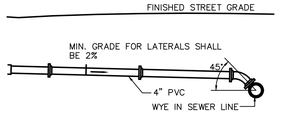
1. THE WATER MAINS AND APPURTENANCES MUST BE INSTALLED IN COMPLIANCE WITH TEN STATE STANDARDS AND AWWA C 605 (LATEST REVISION) OR C 600 (LATEST REVISION), AS APPLICABLE, INCLUDING PRESSURE/LEAKAGE TESTING REQUIREMENTS. TEST RESULTS MUST BE PROVIDED FOR TOWN AND DOH REVIEW AND FILES.
2. A NYS LICENSED PROFESSIONAL ENGINEER MUST PROVIDE A LETTER THAT CERTIFIES THE WATER MAINS AND APPUTENANCES HAVE BEEN DISINFECTED IN COMPLIANCE WITH AWWA C 651 (LATEST REVISION), INCLUDING BACTERIOLOGICAL TESTING. TEST RESULTS MUST BE PROVIDED FOR TOWN AND DOH REVIEW AND FILES.
3. THE SEWER MAINS AND MANHOLES MUST BE INSTALLED AND LEAKAGE TESTED IN COMPLIANCE WITH TEN STATES STANDARDS AND THE CONSTRUCTION DRAWINGS. TEST RESULTS MUST BE PROVIDED FOR NYS DEC AND DOH REVIEW AND FILES.
4. "AS BUILT" DRAWINGS SHALL BE SUBMITTED.
5. DESIGN ENGINEER OF THE WATER AND SEWER SYSTEMS MUST CERTIFY THAT THE WATER AND SEWER SYSTEMS HAVE BEEN INSTALLED IN ACCORDANCE WITH THE PLANS APPROVED BY REGULATORY AGENCIES RESPONSIBLE. COPIES OF THE CERTIFICATIONS ALONG WITH ALL TEST RESULTS AND AS BUILT DRAWINGS ARE TO BE SUBMITTED TO THE TOWN AND THE REGULATORY AGENCIES RESPONSIBLE.



NOTES:
1. 10' HORIZONTAL SEPARATION BETWEEN ALL SEWER & WATER LINES MUST BE ACHIEVED.

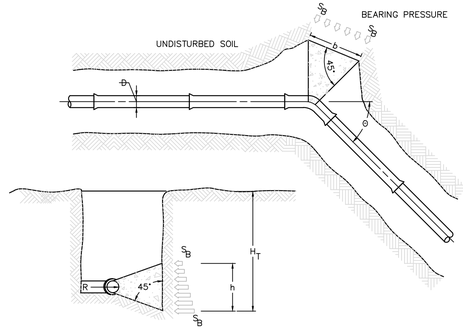
WATER & SEWER HORIZONTAL SEPARATION DETAIL

NOT TO SCALE



SANITARY SEWER HOUSE CONNECTION

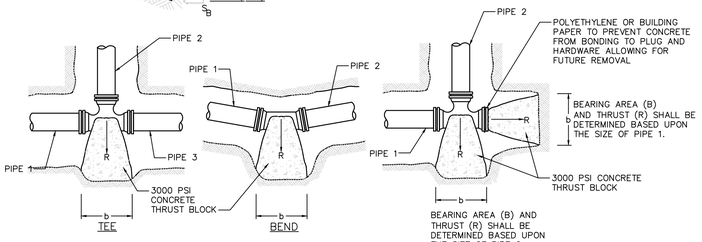
NOT TO SCALE



REQUIRED BEARING AREAS - B (SF) FOR BEARING BLOCKS*					
PIPE SIZE (IN)	TEE	90° BEND	45° BEND	22 1/2° BEND	11 1/4° BEND
4	2.0	2.8	1.5	0.8	0.4
6	4.2	5.9	3.2	1.6	0.8
8	7.2	10.1	5.5	2.8	1.4
10	10.9	15.4	8.3	4.2	2.1
12	15.4	21.8	11.8	6.0	3.0
14	20.6	29.1	15.8	8.0	4.0
16	26.8	37.9	20.5	10.4	5.2
18	33.6	47.5	25.7	13.1	6.6
20	41.2	58.2	31.5	16.1	8.1
24	58.8	83.1	45.0	22.9	11.5
30	90.5	128.0	69.2	35.3	17.7
36	129.6	183.3	99.1	50.5	25.4

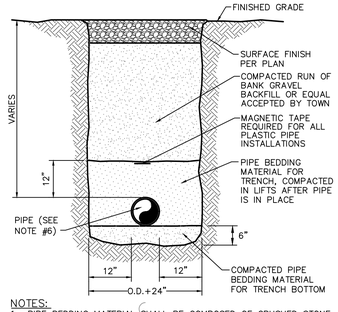
*FACTOR OF SAFETY=1.5 SOIL BEARING OF 3,000 PSF 225 PSI DESIGN PRESSURE

*BEARING AREA (B) = bxh



CONCRETE THRUST BLOCK DETAIL

NOT TO SCALE



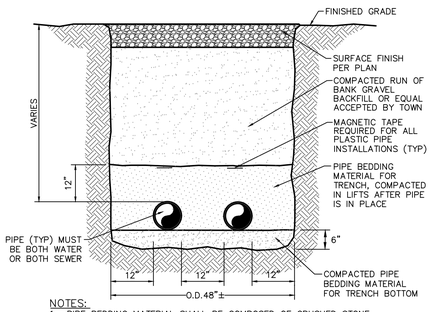
NOTES:
1. PIPE BEDDING MATERIAL SHALL BE COMPOSED OF CRUSHED STONE OR GRAVEL, FREE OF SOFT NON-DURABLE PARTICLES, ORGANIC MATERIAL, AND THIN OR ELONGATED PARTICLES WITH THE FOLLOWING GRADATION REQUIREMENTS:

SIEVE DESIGNATION	% PASSING
2"	100
1"	95-100
1/4"	0-15
NO. 40	0-5

2. TRENCH SHALL BE COMPACTED IN 6" LIFTS TO A MINIMUM OF 95% OF MODIFIED PROCTOR FOR MAXIMUM DENSITY.
3. IF SOFT, SPONGY OR OTHER UNSTABLE SOIL IS ENCOUNTERED AT THE GRADE ESTABLISHED, ALL SUCH UNSTABLE SOIL UP TO TWO FEET UNDER THE PIPE AND FOR THE TOTAL WIDTH OF THE TRENCH SHALL BE REMOVED AND REPLACED WITH RUN OF BANK GRAVEL OR OTHER ACCEPTABLE MATERIAL.
4. IF ROCK OR BOULDERS ARE ENCOUNTERED, ALL SUCH ROCK, AND BOULDERS LARGER THAN 6 INCHES IN DIAMETER, SHALL BE EXCAVATED AT LEAST 8 INCHES CLEAR OF THE PIPE. THE EXCAVATION SHALL BE BACK FILLED WITH RUN OF BANK GRAVEL OR OTHER ACCEPTABLE MATERIAL AND PROPERLY COMPACTED.
5. TRENCHING SHALL CONFORM TO O.S.H.A. REQUIREMENTS.
6. STORM PIPES TO BE SMOOTH FLOW CPE CONFORMING TO AASHTO DESIGNATION M294-921. WATER PIPES TO BE PVC CONFORMING TO AWWA DESIGNATION C-900. SEWER PIPES TO BE SDR 35 PVC.
7. FOR DEPTH OF WATER AND SEWER PIPE SEE PROFILES.
8. SAND IS AN ALLOWABLE BEDDING FOR WATER PIPES.

TRENCH DETAIL

NOT TO SCALE



NOTES:
1. PIPE BEDDING MATERIAL SHALL BE COMPOSED OF CRUSHED STONE OR GRAVEL, FREE OF SOFT NON-DURABLE PARTICLES, ORGANIC MATERIAL, AND THIN OR ELONGATED PARTICLES WITH THE FOLLOWING GRADATION REQUIREMENTS:

SIEVE DESIGNATION	% PASSING
2"	100
1"	95-100
1/4"	0-15
NO. 40	0-5

2. TRENCH SHALL BE COMPACTED IN 6" LIFTS TO A MINIMUM OF 95% OF MODIFIED PROCTOR FOR MAXIMUM DENSITY.
3. IF SOFT, SPONGY OR OTHER UNSTABLE SOIL IS ENCOUNTERED AT THE GRADE ESTABLISHED, ALL SUCH UNSTABLE SOIL UP TO TWO FEET UNDER THE PIPE AND FOR THE TOTAL WIDTH OF THE TRENCH SHALL BE REMOVED AND REPLACED WITH RUN OF BANK GRAVEL OR OTHER ACCEPTABLE MATERIAL.
4. IF ROCK OR BOULDERS ARE ENCOUNTERED, ALL SUCH ROCK, AND BOULDERS LARGER THAN 6 INCHES IN DIAMETER, SHALL BE EXCAVATED AT LEAST 8 INCHES CLEAR OF THE PIPE. THE EXCAVATION SHALL BE BACK FILLED WITH RUN OF BANK GRAVEL OR OTHER ACCEPTABLE MATERIAL AND PROPERLY COMPACTED.
5. TRENCHING SHALL CONFORM TO O.S.H.A. REQUIREMENTS.
6. WATER PIPES TO BE PVC CONFORMING TO AWWA DESIGNATION C-900. SEWER PIPES TO BE SDR 35 PVC.
7. FOR DEPTH OF WATER AND SEWER PIPE SEE PROFILES.
8. SAND IS AN ALLOWABLE BEDDING FOR WATER PIPES.

COMMON UTLITY PIPE TRENCH DETAIL

NOT TO SCALE

NOTES:
1. CONCRETE SHALL NOT TO OVERLAP ANY JOINT.
2. THRUST BLOCKS SHALL BE CONFIGURED IN A MANNER THAT DOES NOT INTERFERE WITH REMOVAL OR INSTALLATION OF ANY JOINTING COMPONENTS.
3. FOR REDUCERS, USE MECHANICAL JOINT FITTINGS WITH RETAINER GLANDS.
4. BEARING SURFACE SHALL, WHERE POSSIBLE, BE PLACED AGAINST UNDISTURBED SOIL. WHERE THAT IS NOT POSSIBLE, THE FILL BETWEEN THE BEARING SURFACE AND UNDISTURBED SOIL MUST BE COMPACTED TO AT LEAST 90% STANDARD PROCTOR DENSITY.
5. BLOCK HEIGHT (h) SHALL BE EQUAL TO OR LESS THAN ONE-HALF THE TOTAL DEPTH TO THE BOTTOM OF THE BLOCK, (HT), BUT NOT LESS THAN THE PIPE DIAMETER (D).
6. BLOCK HEIGHT (h) SHALL BE ESTABLISHED SUCH THAT THE CALCULATED BLOCK WIDTH (b) VARIES BETWEEN ONE AND TWO TIMES THE HEIGHT.
7. VALVES FOR TEES APPLY TO TEES, END PLUGS, CAPS, AND TAPPING SLEEVES.
8. REQUIRED BEARING AREAS ARE DEVELOPED TO RESIST THRUSTS RESULTING FROM 150 PSI WORKING PRESSURE PLUS 50%(75 PSI) SURGE ALLOWANCE RESULTING IN 225 PSI TOTAL INTERNAL PRESSURE. REQUIRED BEARING AREAS ARE BASED UPON AN ALLOWABLE SOIL BEARING CAPACITY OF 3,000 POUNDS PER SQUARE FOOT. IN RESPONSE TO OTHER SOIL CONDITIONS ENCOUNTERED, BEARING ARES REQUIRED MAY BE MODIFIED BY THE ENGINEER.

SOIL	BEARING STRENGTH Sb (LB/SQ FT)
MUCK	0
SOFT CLAY	1,000
SILT	1,500
SANDY SILT	3,000
SAND	4,000
SANDY CLAY	6,000
HARD CLAY	9,000

9. IN MUCK, PEAT, OR RECENTLY PLACED FILL, ALL THRUSTS SHALL BE RESISTED BY PILES OR TIE RODS TO SOLID FOUNDATIONS, OR BY REMOVAL OF SUCH UNSTABLE MATERIAL AND REPLACEMENT WITH BALLAST OF SUFFICIENT STABILITY TO RESIST THE THRUSTS; ALL AS REQUIRED BY THE ENGINEER.

NO.	DATE	REVISION
2	6/25/25	PROGRESS SET
1	12/11/24	DESIGN REVISIONS

MICHAEL G. RIELLY
NEW YORK STATE PROFESSIONAL ENGINEER
LICENSE NO. 092427

MANAGER: MICHAEL G. RIELLY
DESIGN BY: MTL | DRAWN BY: MTL | CHKD BY: MGR

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CLIENT
SHELDRAKE KARMEL RD PROPERTIES LLC
PO BOX 1333
JACKSON, NJ 08527
TEL: (732)-719-7200

SCALE: AS SHOWN

RIELLY ENGINEERING DPC
PO BOX 69 / 63 LIBERTY STREET
MONTICELLO, NY 12701
T. 845-796-9700
OFFICE@RIELLYENGINEERING.COM

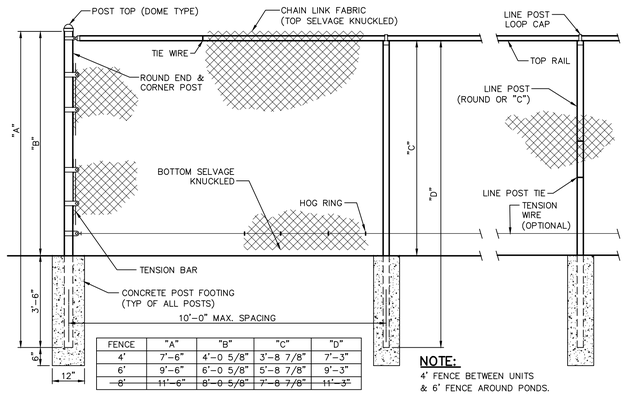
DETAILS FOR SHELDRAKE KARMEL RD PROPERTIES LLC

TOWN OF FALLSBURG | SULLIVAN COUNTY, NY

DATE: JUNE 25, 2024

SHEET NO. 17 OF 29

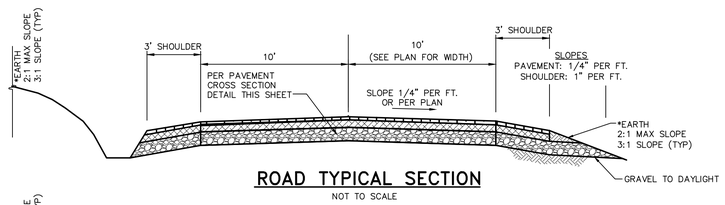
DWG. NO. 0236-01



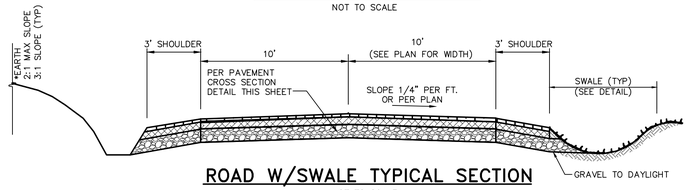
FENCE	"A"	"B"	"C"	"D"
4'	7'-6"	4'-0 5/8"	3'-8 7/8"	7'-3"
6'	9'-6"	6'-0 5/8"	5'-8 7/8"	9'-3"
8'	11'-6"	8'-0 5/8"	7'-8 7/8"	11'-3"

NOTE:
4' FENCE BETWEEN UNITS & 6" FENCE AROUND PONDS.

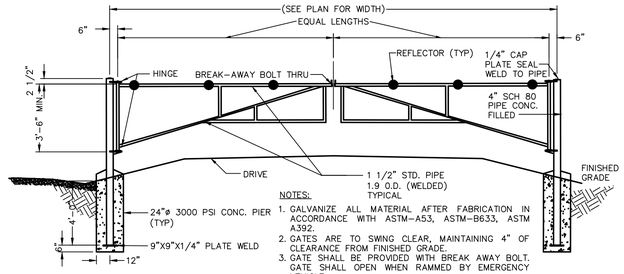
CHAIN LINK FENCE DETAIL
NOT TO SCALE



ROAD TYPICAL SECTION
NOT TO SCALE



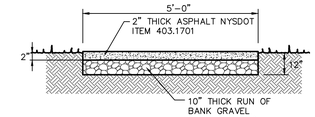
ROAD W/SWALE TYPICAL SECTION
NOT TO SCALE



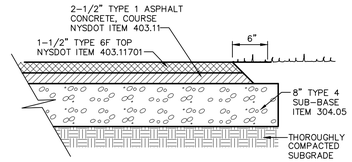
GATE MUST COMPLY WITH CHAPTER 5 OF THE 2020 FIRE CODE OF NYS.

NOTES:
1. GALVANIZE ALL MATERIAL AFTER FABRICATION IN ACCORDANCE WITH ASTM-A53, ASTM-B633, ASTM A392.
2. GATES ARE TO SWING CLEAR, MAINTAINING 4" OF CLEARANCE FROM FINISHED GRADE.
3. GATE SHALL BE PROVIDED WITH BREAK AWAY BOLT. GATE SHALL OPEN WHEN RAMMED BY EMERGENCY VEHICLE.
4. CONTRACTOR TO PROVIDE SHOP DRAWINGS & PRODUCT LITERATURE FOR REVIEW & APPROVAL BY ENGINEER & BUILDING DEPARTMENT.

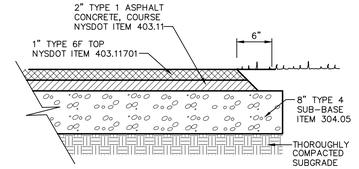
"BREAK AWAY" ACCESS GATE
NOT TO SCALE



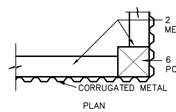
TYPICAL SECTION A-A'
ASPHALT WALKWAY
NOT TO SCALE



INTERNAL ROADS & PARKING LOTS
BITUMINOUS ROAD PAVING SECTION
NOT TO SCALE



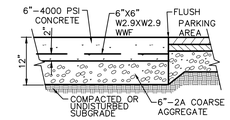
PARKING SPACES
BITUMINOUS ROAD PAVING SECTION
NOT TO SCALE



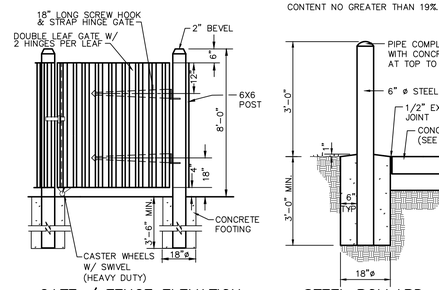
PLAN

FENCE CORNER

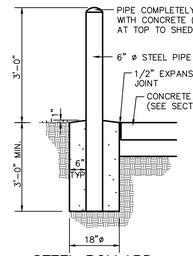
NOTE:
ALL MEMBERS TO BE WOLMANIZED SOUTHERN YELLOW PINE NO.1 LUMBER. ALL FASTENERS TO BE GALVANIZED STEEL. ALL WOOD MEMBERS TO HAVE MOISTURE CONTENT NO GREATER THAN 19%.



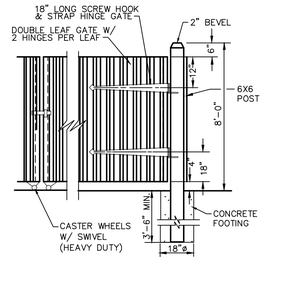
CONCRETE PAD SECTION



GATE / FENCE ELEVATION

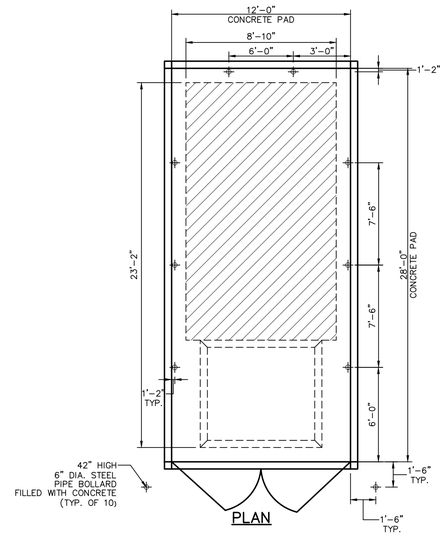


STEEL BOLLARD



COMPACTOR GATE / FENCE ELEVATION

COMPACTOR-DUMPSTER ENCLOSURE W/ CORRUGATED METAL FENCE & GATE
NOT TO SCALE



PLAN

35 C.Y. COMPACTOR
NOT TO SCALE

NO.	DATE	REVISION
2	6/25/25	PROGRESS SET
1	12/11/24	DESIGN REVISIONS

MICHAEL G. RIELLY
NEW YORK STATE PROFESSIONAL ENGINEER
LICENSE NO. 092427

MANAGER: MICHAEL G. RIELLY
DESIGN BY: MTL | DRAWN BY: MTL | CHKD BY: MGR

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PO BOX 1333
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TEL: (732)-719-7200

SCALE: AS SHOWN

RIELLY ENGINEERING DPC
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DETAILS FOR
SHELDRAKE KARMEL RD PROPERTIES LLC
TOWN OF FALLSBURG SULLIVAN COUNTY, NY

DATE: JUNE 25, 2024
SHEET NO. 18 OF 29
DWG. NO. 0236-01

CS CONTRACTOR SELECT™

LITHONIA LIGHTING®

Contractor Select™

TWR LED

Wall Pack

Cast in a traditional dayform, the TWR LED luminaire offers a popular, classic appearance. Its advanced LEDs deliver an expected service life of more than 20 years and eliminate frequent lamp and ballast replacements associated with traditional technologies.

FEATURES:

- Replaces 100W to 400W HID lamps
- Energy savings of 85%, payback within two years
- Photocell option available

Catalog Number	UPC	Description	Replaces Up To	Lumens	Wattage	CCT	Voltage	Finish	Pallet QTY:
TWR1 LED P2 40K MVOLT DDBTXD M2	19172348903	WALL PACKS	150W METAL HALIDE	3,442	28W	4000K	120-277V	TEXTURED DARK BRONZE	48
TWR1 LED P2 50K MVOLT DDBTXD M2	19172348927	WALL PACKS	150W METAL HALIDE	3,519	28W	5000K	120-277V	TEXTURED DARK BRONZE	48
TWR1 LED P3 40K MVOLT DDBTXD M2	19172348941	WALL PACKS	175W METAL HALIDE	4,466	40W	4000K	120-277V	TEXTURED DARK BRONZE	48
TWR1 LED P3 50K MVOLT DDBTXD M2	19172348965	WALL PACKS	175W METAL HALIDE	4,554	40W	5000K	120-277V	TEXTURED DARK BRONZE	48
TWR1 LED P4 40K MVOLT DDBTXD M2	19172348972	WALL PACKS	250W METAL HALIDE	5,551	49W	4000K	120-277V	TEXTURED DARK BRONZE	48
TWR1 LED P4 50K MVOLT DDBTXD M2	19172348989	WALL PACKS	250W METAL HALIDE	5,695	49W	5000K	120-277V	TEXTURED DARK BRONZE	48
TWR2 LED P1 40K MVOLT DDBTXD M2	19172397281 8	WALL PACKS	400W METAL HALIDE	8,150	64W	4000K	120-277V	TEXTURED DARK BRONZE	48
TWR2 LED P1 50K MVOLT DDBTXD M2	19172397278 8	WALL PACKS	400W METAL HALIDE	8,150	64W	5000K	120-277V	TEXTURED DARK BRONZE	48
TWR2 LED P2 40K MVOLT DDBTXD M2	19172397267 0	WALL PACKS	400W METAL HALIDE	9,700	64W	4000K	120-277V	TEXTURED DARK BRONZE	48
TWR2 LED P2 50K MVOLT DDBTXD M2	19172397263 3	WALL PACKS	400W METAL HALIDE	9,700	64W	5000K	120-277V	TEXTURED DARK BRONZE	48

More configurations are available. Click here or visit www.acuitybrands.com and search for TWR LED.

CS CONTRACTOR SELECT™

LITHONIA LIGHTING®

Specifications

INTENDED USE:
The TWR1 LED combines traditional wall pack design with high-output LEDs to provide an energy-efficient, low maintenance LED wall pack suitable for replacing up to 400W Metal Halide fixtures. The traditional shape helps maintain building aesthetics when replacing only a portion of your building's wall packs. TWR LED is ideal for outdoor applications such as carports, loading areas, driveways and parking areas.

CONSTRUCTION:
Rugged cast-aluminum housing with bronze polyester powder paint for lasting durability. Door is hinged on the side so door swings out of the way during installation and service. Castings are sealed with a one-piece gasket to inhibit the entrance of external contaminants. MVOLT driver operates on any line voltage from 120-277V (50/60Hz). All luminaires have 6kV surge protection. Rated for outdoor installations, -40°C minimum ambient. Please consult factory for surge rating of photocells.

ELECTRICAL:
Light engine consists of long-life, high-efficacy LEDs mounted on an internal aluminum heat sink to maximize heat dissipation and promote long life (L95/100,000 hours at 40°C). Driver and integral photocell operate at 120V and are fully enclosed in the upper housing. There are no user serviceable parts. LEDs maintain 70% of light output at 35,000 hours of service. (LED lifespan based on IESNA LM-80-08 results and calculated per IESNA TM-21-11 methodology.)

INSTALLATION
Designed for wall mounting above four feet from ground. Housing is configured for mounting directly over a standard 4" outlet box (by others) or for surface wiring via any of three convenient 1/2" threaded conduit entry hubs.

LISTINGS:
UL Listed to U.S. and Canadian safety standards for wet locations. Tested in accordance with IESNA LM-79 and LM-80 standards.

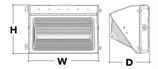
DesignLights Consortium® (DLC) Premium qualified product and DLC qualified product. Not all versions of this product may be DLC Premium qualified or DLC qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified.

WARRANTY:
5-year limited warranty. Complete warranty terms located at:
www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx

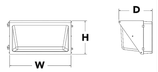
Note: Actual performance may differ as a result of end-user environment and application. All values are design or typical values, measured under laboratory conditions at 25 °C. Specifications subject to change without notice.

Dimensions

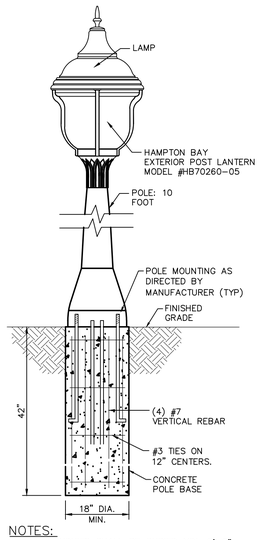
TWR1:
Width: 12-15/16(32.9cm)
Height: 9"(22.9cm)
Depth: 7-1/2 (19cm)
Weight: 11.95 (5.42kg)



TWR2:
Width: 17"(42.2cm)
Height: 9"(22.9cm)
Depth: 9-5/16"(23.6cm)
Weight: 17.2lbs (5.42kg)



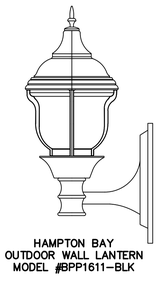
All dimensions are inches (centimeters) unless otherwise indicated.



NOTES:
1. ALL CONDUITS SHALL BE BURIED MIN. 2'-0" BELOW FIN. GRADE. PROVIDE MARKER TAPE TO BE BURIED 6" BELOW FIN. GRADE OVER ALL CONDUITS INCLUDING PARKING AREAS, LAWN AREAS, AND WALKWAYS.
2. HANDHOLES AS ABOVE TO BE INSTALLED AT SITE OF EACH FUTURE LIGHT POLE AND SIGN.

WALKWAY LIGHT DETAIL

NOT TO SCALE



HAMPTON BAY OUTDOOR WALL LANTERN MODEL #BPP1611-BLK

HOUSING
THE HOUSING HAS A BLACK FINISH WITH RUGGED CAST ALUMINUM. CLEAR BEVELED GLASS CREATES A SHARP, CLEAR LOOK WHEN ILLUMINTATED.

BULB
THE LIGHT USES ONE 100-WATT STANDARD BULB OR CFL EQUIVALENT.

ELECTRICAL
ALL ELECTRICAL COMPONENTS AND MATERIALS SHALL BE UL-RECOGNIZED AND WIRED BY A CERTIFIED UL TECHNICIAN. ALL NILAND BALLASTS ARE HIGH POWER FACTOR RATED FOR 30°C/-20°F STARTING. MEDIUM AND MOGUL BASE SOCKETS ARE 5KV RATED. THE ELECTRICAL ASSEMBLY IS PREWIRED WITH QUICK DISCONNECTS FOR SERVICING. FIXTURE SHALL BE UL CERTIFIED FOR WET LOCATIONS.

MOUNTING
FIXTURE SHALL BE MOUNTED TO TENON WITH STAINLESS STEEL ALLEN HEAD SET SCREWS (3 @ 120°)

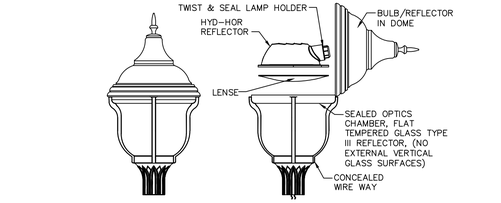
RELAMPING
THE FIXTURE IS REMOVED BY LOOSENING 4 STAINLESS STEEL SCREWS AROUND GLOBE.

CERTIFICATION
THE FIXTURE SHALL BE UL-LISTED FOR WET LOCATION USE, AND ALL HID LISTINGS.

WARRANTY
FIXTURE SHALL BE WARRANTED TO BE FREE OF DEFECTS FOR FIVE YEARS. BALLAST COMPONENTS SHALL CARRY THE BALLAST MANUFACTURERS LIMITED WARRANTY OF TWO YEARS.

WALL MOUNT PORCH LIGHT DETAIL

NOT TO SCALE



HAMPTON BAY EXTERIOR POST LANTERN MODEL #325 670

LUMINAIRE SPECIFICATIONS

HOUSING
THE POST TOP SHALL BE CORE CAST ALUMINUM. ALUMINUM SHALL BE CERTIFIED AS PURE #356 ALLOY, FREE OF ANY POROSITY, FOREIGN MATERIALS OR COSMETIC FILLERS. CASTINGS SHALL BE UNIFORM WALL THICKNESS WITH NO WARPING OR MOLD SHIFTING. MINIMUM WALL THICKNESS SHALL BE 3/16".
ELECTRICAL COMPONENTS ARE MOUNTED TO THE FITTER AND BALLAST CANISTER. THE BALLAST CANISTER
SHALL BE MOUNTED IN THE POST TOP WITH THREE STAINLESS STEEL SCREWS. THE REFRACTOR SHALL BE MOLDED OF BOROSILICATE GLASS OR AN UPGRADED GLOBE WITH EXTERNAL REFRACTOR DESIGNED
FOR EITHER A TYPE III OR TYPE V LIGHT DISTRIBUTION PATTERN.

ELECTRICAL
ALL ELECTRICAL COMPONENTS AND MATERIALS SHALL BE UL-RECOGNIZED AND WIRED BY A CERTIFIED UL TECHNICIAN. ALL NILAND BALLASTS ARE HIGH POWER FACTOR RATED FOR 30°C/-20°F STARTING. MEDIUM AND MOGUL BASE SOCKETS ARE 5KV RATED. THE ELECTRICAL ASSEMBLY IS PREWIRED WITH QUICK DISCONNECTS FOR SERVICING. FIXTURE SHALL BE UL CERTIFIED FOR WET LOCATIONS.

MOUNTING
FIXTURE SHALL BE MOUNTED TO TENON WITH STAINLESS STEEL ALLEN HEAD SET SCREWS (3 @ 120°)

RELAMPING
THE FIXTURE IS REMOVED BY LOOSENING 4 STAINLESS STEEL SCREWS AROUND GLOBE.

FINISH
FIXTURE FINISH SHALL CONSIST OF DEGREASING, PHOSPHATE ACID ETCHING WITH 140+ DEIONIZED WATER, RINSED, OVEN DRY OFF AND TOP COATED WITH A THERMOSET TOIC SUPER POLYESTER POWDER COAT FINISH DESIGNED NOT TO CHALK OR FADE FOR MANY YEARS. ALL NILAND COMPANY POWDERS MUST PASS A MINIMUM 3000-HOUR SALT SPRAY TEST FOR CORROSION RESISTANCE.

CERTIFICATION
THE FIXTURE SHALL BE UL-LISTED FOR WET LOCATION USE, AND ALL HID LISTINGS.

WARRANTY
FIXTURE SHALL BE WARRANTED TO BE FREE OF DEFECTS FOR FIVE YEARS. BALLAST COMPONENTS SHALL CARRY THE BALLAST MANUFACTURERS LIMITED WARRANTY OF TWO YEARS.

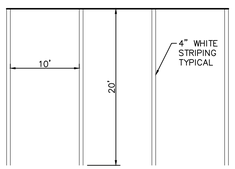
PHOTOMETRICS
COMPLETE PHOTOMETRIC DATA FOR ALL FIXTURES IS AVAILABLE IN IES-FORMATTED 3.5 DISKS. A CERTIFIED INDEPENDENT LABORATORY PERFORMS ALL TESTING. CALL THE NILAND COMPANY DIRECTLY FOR MORE INFORMATION.

LUMINAIRE DETAIL

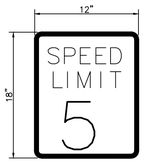
NOT TO SCALE

WALL MOUNTED LIGHT DETAIL

NOT TO SCALE



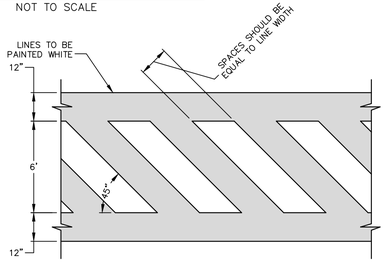
PARKING SPACE
NOT TO SCALE



COLOR: LEGEND AND BORDER BLACK
BACKGROUND WHITE (REFLECTORIZED)

NOTE:
SPEED LIMIT SIGNS TO BE PLACED ALONG ALL ROADS IN PROJECT SITE. SIGNS TO BE SPACED NO GREATER THAN 400 FEET APART THROUGHOUT ON BOTH SIDES OF ROADS.

SPEED LIMIT SIGN
NOT TO SCALE

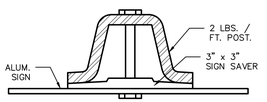


CROSSWALK STRIPING
NOT TO SCALE

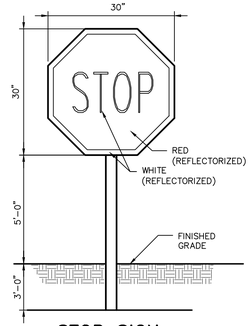
COLOR: LEGEND AND BORDER WHITE (REFLECTORIZED)
BACKGROUND GREEN (REFLECTORIZED)

NOTE:
SIGN CODES REFERENCED IN THESE PLANS ARE PER SIGN STANDARDS OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES".

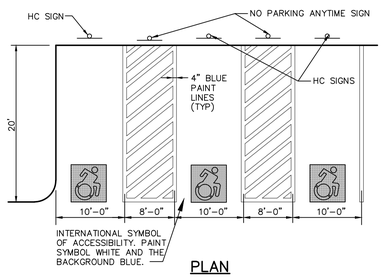
STREET NAME SIGN - D3-1
NOT TO SCALE



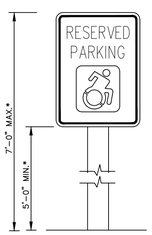
PLAN VIEW



STOP SIGN
NOT TO SCALE



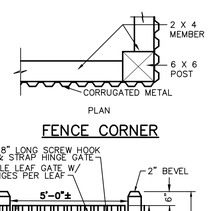
PLAN



NOTE:
RESERVED PARKING SIGNS SHALL BE INSTALLED PER THE SPECIFICATIONS FOUND IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES. SIGN TYPE USED SHALL 12"x18" AS SHOWN. THE HANDICAP PARKING SPACES SHALL BE FURTHER IDENTIFIED BY HAVING THE PERIMETERS OF THE SPACES PAINTED BLUE.

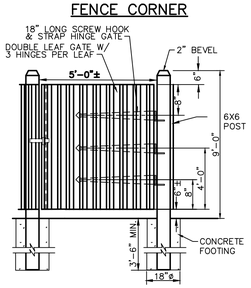
SIGNAGE

HANDICAP PARKING FACILITIES FOR STRAIGHT PARKING
NOT TO SCALE

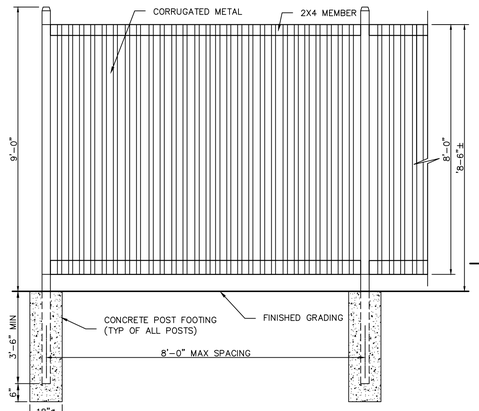


PLAN

FENCE CORNER

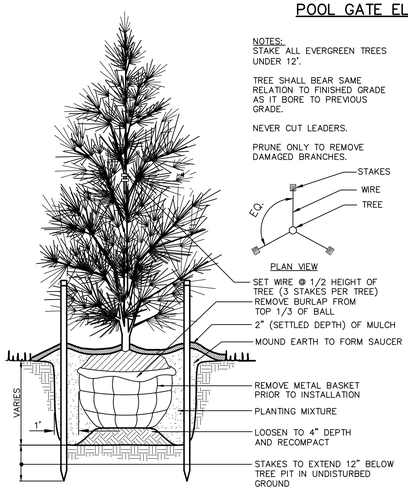


POOL GATE ELEVATION



POOL FENCE ELEVATION

CORRUGATED STEEL POOL FENCE DETAIL
NOT TO SCALE



NOTES:
STAKE ALL EVERGREEN TREES UNDER 12'.

TREE SHALL BEAR SAME RELATION TO FINISHED GRADE AS IT BORE TO PREVIOUS GRADE.

NEVER CUT LEADERS.

PRUNE ONLY TO REMOVE DAMAGED BRANCHES.

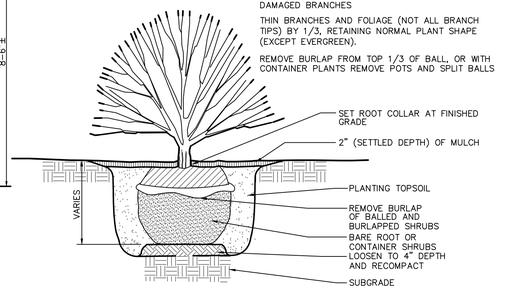
PLAN VIEW

EVERGREEN TREE PLANTING
NOT TO SCALE

NOTES:
DO NOT PRUNE EVERGREENS EXCEPT TO REMOVE DAMAGED BRANCHES

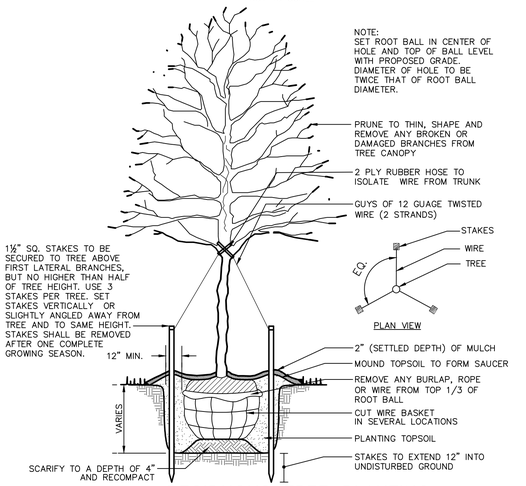
THIN BRANCHES AND FOLIAGE (NOT ALL BRANCH TIPS) BY 1/3, RETAINING NORMAL PLANT SHAPE (EXCEPT EVERGREEN).

REMOVE BURLAP FROM TOP 1/3 OF BALL, OR WITH CONTAINER PLANTS REMOVE POTS AND SPLIT BALLS



SHRUB PLANTING
NOT TO SCALE

NOTE:
SET ROOT BALL IN CENTER OF HOLE AND TOP OF BALL LEVEL WITH PROPOSED GRADE. DIAMETER OF HOLE TO BE TWICE THAT OF ROOT BALL DIAMETER.



DECIDUOUS TREE PLANTING
NOT TO SCALE

NO.	DATE	REVISION
2	6/25/25	PROGRESS SET
1	12/11/24	DESIGN REVISIONS

MICHAEL G. RIELLY
NEW YORK STATE PROFESSIONAL ENGINEER
LICENSE NO. 092427

MANAGER: MICHAEL G. RIELLY
DESIGN BY: MTL | DRAWN BY: MTL | CHKD BY: MGR

IT IS A VIOLATION OF NEW YORK STATE EDUCATION LAW FOR ANY PERSON, UNLESS HE IS ACTING UNDER THE DIRECTION OF A LICENSED ENGINEER, TO ALTER ANY ITEM ON THIS DOCUMENT IN ANY WAY. IF THIS DOCUMENT IS ALTERED, THE ALTERING ENGINEER SHALL AFFIX TO THE DOCUMENT HIS SEAL AND THE NOTATION "ALTERED BY" FOLLOWED BY HIS SIGNATURE, A DETAILED DESCRIPTION OF THE ALTERATION, THE SPECIFIC DESCRIPTION OF THE ALTERATION.

CLIENT
SHELDRAKE KARMEL RD PROPERTIES LLC
PO BOX 1333
JACKSON, NJ 08527
TEL: (732)-719-7200

SCALE: AS SHOWN

RIELLY ENGINEERING DPC
PO BOX 69 / 63 LIBERTY STREET
MONTICELLO, NY 12701
T. 845.796-9700
OFFICE@RIELLYENGINEERING.COM

DETAILS FOR SHELDRAKE KARMEL RD PROPERTIES LLC

SULLIVAN COUNTY, NY
TOWN OF FALLSBURG

DATE: JUNE 25, 2024
SHEET NO. 19 OF 29
DWG. NO. 0236-01

EROSION & SEDIMENT POLLUTION CONTROL NOTES:

A. GENERAL EROSION AND SEDIMENT CONTROL GUIDELINES

1. A COPY OF THIS PLAN SHALL BE KEPT AVAILABLE FOR INSPECTION ON THE CONSTRUCTION SITE AT ALL TIMES THROUGH THE TERMS OF THE PROJECT.

2. THE INTENT OF THIS PLAN/NARRATIVE IS TO INDICATE GENERAL MEANS OF COMPLIANCE WITH THE REQUIREMENTS OF THE RULES AND REGULATIONS OF THE NEW YORK CLEAN STREAMS LAW. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO IMPLEMENT THESE METHODS PLUS ADDITIONAL METHODS AS MAY BE NECESSARY BECAUSE OF THE CONDITIONS CREATED BY LOCALIZED SITE CONDITIONS, AND/OR CONSTRUCTION PROCEDURES IN ORDER TO ASSURE COMPLIANCE WITH APPLICABLE LAW. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO MAINTAIN ALL SEDIMENT AND EROSION CONTROL FACILITIES SO THAT THEY PERFORM AS REQUIRED BY LAW.

3. IF SPOIL MATERIAL OR SOIL IS REMOVED FROM THE SITE THE CONTRACTOR SHALL PREPARE AND SUBMIT TO THE APPROPRIATE CONSERVATION DISTRICT AN EROSION AND SEDIMENTATION CONTROL PLAN FOR THE SITE WHICH WILL RECEIVE THE SPOIL MATERIAL.

B. GENERAL SEDIMENT AND EROSION CONTROL METHODS/PROCEDURES

1. IN ALL CASES, THE SMALLEST PRACTICAL AREA OF STABLE LAND SURFACE SHALL BE DISTURBED.

2. ALL RELATED SEDIMENT AND EROSION CONTROL FACILITIES SHALL BE IN PLACE AND CAPABLE OF FUNCTIONING AS INTENDED PRIOR TO EARTHMOVING ACTIVITY WITHIN THEIR CONTRIBUTING WATERSHED AREAS.

3. UTILITY EXCAVATIONS SHALL BE OPEN ONLY LONG ENOUGH TO PROPERLY INSTALL AND INSPECT ALL UNDERGROUND FACILITIES IN ACCORDANCE WITH APPLICABLE SPECIFICATIONS.

4. EXCAVATED MATERIAL (SPOIL) SHALL BE PLACED UP SLOPE FROM THE EXCAVATION WHENEVER POSSIBLE. RUNOFF FROM SPOIL PILES SHALL BE DIRECTED THROUGH A SEDIMENT FILTER STRUCTURE AND DISCHARGED IN A NON-EROSIVE MANNER.

5. DEWATERING EQUIPMENT DISCHARGE SHALL BE DIRECTED ONTO A STABILIZED SURFACE SO THAT EROSION DOES NOT OCCUR. DISCHARGES SHALL BE DIRECTED THROUGH A SEDIMENT FILTER STRUCTURE AND DISCHARGED IN A NON-EROSIVE MANNER.

6. BACKFILLED EXCAVATIONS SHALL BE RESTORED TO ORIGINAL TYPE OF COVER AND GRADE AS PER SPECIFICATIONS. SEEDING SHALL BE DONE ACCORDING TO SCHEDULE FOR PERMANENT SEEDING. TEMPORARY STABILIZATION IS REQUIRED FOR ANY AND ALL ERODIBLE/SOLUBLE AREAS AND MATERIALS TO BE EXPOSED.

7. LAWN AREAS SHALL BE FINISHED GRADED WITH 6-INCHES OF TOPSOIL UNLESS OTHERWISE NOTED. POSITIVE DRAINAGE SHALL BE MAINTAINED AWAY FROM ALL STRUCTURES. NO ISOLATED LOW SPOTS SHALL BE CREATED.

8. CONSTRUCTION ACCESS INTO UNPAVED AREAS FROM PAVED AREAS OR STREETS (PUBLIC OR PRIVATE) SHALL BE VIA A STABILIZED CONSTRUCTION ENTRANCE.

9. SEDIMENT SPILLED, DROPPED OR TRACKED ONTO PAVED SURFACES SHALL BE REMOVED IMMEDIATELY.

10. AT THE END OF EACH WORKING DAY, ANY SEDIMENT TRACKED OR CONVEYED ONTO A PUBLIC ROADWAY WILL BE REMOVED AND RE-DEPOSITED ONTO THE CONSTRUCTION SITE. REMOVAL CAN BE COMPLETED THROUGH USE OF MECHANICAL OR HAND TOOLS, BUT MUST NEVER BE WASHED OFF THE ROAD BY USE OF WATER.

11. SEDIMENT REMOVED FROM THE E&SPC CONTROLS & FACILITIES SHALL BE DISPOSED OF IN LANDSCAPED AREAS OUTSIDE OF STEEP SLOPES, WETLANDS, FLOODPLAINS OR DRAINAGE SWALES AND IMMEDIATELY STABILIZED OR PLACED IN TOPSOIL STOCKPILES. AN E&S PLAN SHALL BE SUBMITTED TO THE CONSERVATION DISTRICT FOR ALL OFF-SITE SPOIL AREAS.

12. ALL PUMPING OF SEDIMENT-LADEN WATER SHALL BE THROUGH A DIRT BAG FILTRATION DEVICE, OR EQUIVALENT SEDIMENT REMOVAL FACILITY, OVER NON-DISTURBED VEGETATED AREAS. DISCHARGE POINTS SHOULD BE ESTABLISHED TO PROVIDE FOR MAXIMUM DISTANCE TO ACTIVE WATERWAYS.

13. SHOULD UNFORESEEN EROSIVE CONDITIONS DEVELOP DURING CONSTRUCTION, THE CONTRACTOR SHALL TAKE ACTION TO REMEDY SUCH CONDITIONS AND TO PREVENT DAMAGE TO ADJACENT PROPERTIES AS RESULT OF INCREASED RUNOFF AND/OR SEDIMENT DISPLACEMENT. STOCKPILES OF WOOD CHIPS, HAY BALES, CRUSHED STONE AND OTHER MULCHES SHALL BE IN READINESS TO DEAL IMMEDIATELY WITH EMERGENCY PROBLEMS OF EROSION.

14. A COPY OF THIS EROSION AND SEDIMENTATION CONTROL REPORT AND PLANS MUST BE POSTED AT THE CONSTRUCTION SITE.

15. FILTER FABRIC FENCE MUST BE INSTALLED AT LEVEL GRADE. BOTH ENDS OF EACH FENCE SECTION MUST EXTEND AT LEAST 8' UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT.

16. WHERE ENDS OF FILTER FABRIC COME TOGETHER, THEY MUST BE OVERLAPPED, FOLDED AND STAPLED TO PREVENT SEDIMENT BYPASS. THE TOE ANCHOR MUST BE BACKFILLED AND COMPACTED TO A DENSITY EQUAL TO THE SURROUNDING SOILS.

17. STOCKPILE HEIGHTS MUST NOT EXCEED 35'. STOCKPILE SLOPES MUST BE 2:1 OR FLATTER.

18. ANY DISTURBED AREA ON WHICH ACTIVITY HAS CEASED MUST BE STABILIZED IMMEDIATELY. DURING NON-GERMINATING PERIODS, MULCH MUST BE APPLIED AT THE RECOMMENDED RATES. DISTURBED AREAS WHICH ARE NOT AT FINISHED GRADE AND WHICH WILL BE RE-DISTURBED 1 YEAR MAY BE STABILIZED IN ACCORDANCE WITH TEMPORARY SEEDING SPECIFICATIONS. DISTURBED AREAS, WHICH ARE EITHER AT FINISHED GRADE OR WILL NOT BE RE-DISTURBED WITHIN ONE YEAR, MUST BE STABILIZED IN ACCORDANCE WITH PERMANENT SEEDING SPECIFICATIONS.

19. DIVERSION CHANNELS, SEDIMENTATION BASINS, SEDIMENT TRAPS, AND STOCKPILES MUST BE STABILIZED IMMEDIATELY.

20. SEDIMENT MUST BE REMOVED WHEN ACCUMULATIONS REACH 1/3 THE HEIGHT OF THE OUTLETS.

21. ROCK CONSTRUCTION ENTRANCE THICKNESS WILL BE CONSTANTLY MAINTAINED TO THE SPECIFIED DIMENSIONS BY ADDING ROCK. A STOCKPILE OF ROCK MATERIAL WILL BE MAINTAINED ON THE SITE FOR THIS PURPOSE. AT THE END OF EACH CONSTRUCTION DAY, ALL SEDIMENT DEPOSITED ON PUBLIC ROADWAYS WILL BE REMOVED AND RETURNED TO THE CONSTRUCTION SITE.

22. STABILIZATION OF ALL AREAS PROTECTED BY INTERIM CONTROL MEASURES/FACILITIES SHALL BE TO THE PERMANENT STRUCTURAL CONDITION OR 70% UNIFORM PERENNIAL VEGETATION BEFORE THE INTERIM MEASURES/FACILITIES CAN BE REMOVED.

23. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE REGULATIONS RELATING TO SOLID WASTE DISPOSAL/RECYCLING.

C. MAINTENANCE OF SEDIMENT AND EROSION CONTROL FACILITIES

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION AND MAINTENANCE OF ALL EROSION AND SEDIMENT POLLUTION CONTROL MEASURES. IF EROSION CONTROL MEASURES FAIL OR OTHER EROSION PROBLEMS ARISE, THE CONTRACTOR SHALL TAKE IMMEDIATE ACTION TO CORRECT AND ELIMINATE THEM BEFORE THEY DEVELOP INTO UNMANAGEABLE PROBLEMS.

2. MAINTENANCE MUST INCLUDE INSPECTION OF ALL EROSION AND SEDIMENTATION CONTROLS AFTER EACH RUNOFF EVENT AND ON A WEEKLY BASIS. ANY AREAS DISTURBED BY REMOVAL OF CONTROLS SHALL BE REPAIRED, STABILIZED AND PERMANENTLY SEEDED.

D. RESTORATION OF PLANTING AREAS

1. IF EARTH DISTURBANCE OCCURS DURING THE MONTHS OF NOVEMBER THROUGH MARCH, THEN AROOSTOOK WINTER RYE SHALL BE APPLIED TO DISTURBED AREAS AS A TEMPORARY SEED MIXTURE. IF STABILIZATION CANNOT BE ACHIEVED WITH AROOSTOOK WINTER RYE, THEN MULCH WITH TACKIFIER SHALL BE APPLIED TO DISTURBED AREAS. MULCH SHALL BE CLEAN OAT OR WHEAT STRAW AND SHALL BE APPLIED AT THE RATE OF 3 TONS PER ACRE. TACKIFIER SHALL BE APPLIED AT THE MANUFACTURER'S APPLIED RATE. AREAS THAT LOSE THE MULCH COVER SHALL BE REMULCHED.

2. FINAL RESTORATION SHALL BE PERFORMED NO LATER THAN THE START OF THE NEXT PLANTING SEASON FOLLOWING CONSTRUCTION. THE PLANTING SEASON SHALL BE AS ESTABLISHED BY THE U.S. AGRICULTURAL SERVICE FOR THE AREA OF CONSTRUCTION.

3. TOPSOIL SHALL BE FREE FROM SUBSOIL, BRUSH, WEEDS, OR OTHER LITTER, CLAY LUMPS AND STONES, BUT MAY CONTAIN DECAYING VEGETABLE MATTER AS IS PRESENT IN GOOD TOPSOIL.

4. PRECAUTIONS SHALL BE EXERCISED AS NECESSARY TO CONFORM WITH LAWS RELATING TO EROSION AND SEDIMENT CONTROL.

5. SEED SHALL BE NOT MORE THAN TWO (2) YEARS OLD. GERMINATION TESTS OF SEEDS SHALL BE MADE NOT MORE THAN SIX (6) MONTHS PRIOR TO SEEDING. SEED THAT HAS BECOME WET, MOLDY, OR OTHERWISE DAMAGED SHALL NOT BE USED.

6. ALL SEED MIXTURES SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO SEEDING.

7. THE CONTRACTOR SHALL BE RESPONSIBLE TO PRODUCE A STAND OF GRASS IN ALL SEEDED OR SODDED AREAS. EROSION, DROUGHT, OR ANY OTHER CONDITION ENCOUNTERED SHALL NOT RELIEVE THE CONTRACTOR OF THIS REQUIREMENT.

SEEDING NOTES: TEMPORARY

MULCH – CLEAN OAT OR WHEAT STRAW SHALL BE FREE FROM MATURE SEED-BEARING STALKS OR ROOTS OF PROHIBITED OR NOXIOUS WEEDS. APPLY AT A RATE 3 TONS PER ACRE. PRECAUTIONS SHALL BE TAKEN TO STABILIZE THE MULCH UNTIL THE VEGETATIVE COVER IS ESTABLISHED.

SEED MIXTURE SHALL BEAR A GUARANTEED STATEMENT OF ANALYSIS AND SHALL BE COMPOSED OF THE VARIETIES FOLLOWING AND MIXED IN THE PROPORTIONS SPECIFIED.

TEMPORARY SEED MIXTURE	PROPORTION BY WEIGHT	MINIMUM PURITY	MINIMUM GERMINATION
KENTUCKY 31 TALL FESCUE	75%	95%	80%
RYEGRASS OR RED FESCUE	25%	95%	80%

THREE-PERCENT REDTOP MAY BE ADDED TO THE LAWN MIXTURE ON SLOPE AREAS OR FOR LATE SPRING OR LATE FALL SEEDING.

TEMPORARY SEEDING SHALL BE APPLIED AT THE RATE OF ONE (1) POUND PER THOUSAND (1,000) SQUARE FEET.

ALL AREAS TO BE SEEDED SHALL BE LOOSENED TO A DEPTH OF AT LEAST TWO INCHES BY MECHANICAL MEANS.

MULCH SEEDED AREAS IMMEDIATELY AFTER SEEDING.

LIMESTONE AND FERTILIZER SHALL BE APPLIED UNIFORMLY TO AREAS TO BE SEEDED, AND WORKED INTO THE SOIL TO A DEPTH OF 2".

LIMESTONE – PULV. AG.
LIMESTONE – 50 LBS./1000 S.F.
FERTILIZER – 10-20-20
FERTILIZER – 5 LBS./1000 S.F.

SEEDING – SEED ALL DISTURBED AREAS WITH THE TEMPORARY SEED MIXTURE. SEEDING SHALL OCCUR MARCH 15–JUNE 15 OR AUGUST 15– OCTOBER 15, UNLESS OTHERWISE DIRECTED BY THE ENGINEER. MULCH (HAY OR STRAW) SHALL BE APPLIED AT A RATE OF 3 TONS PER ACRE DURING THE NON-GERMINATING PERIOD OF OCTOBER 15–MARCH 15.

SEEDING NOTES: PERMANENT

ALL TOPSOIL SHALL BE LOOSENED TO A DEPTH OF AT LEAST 4". ALL OBJECTIONABLE MATERIAL LARGER THAN 2" SHALL BE REMOVED.

LIMESTONE AND FERTILIZER SHALL BE APPLIED UNIFORMLY TO AREAS TO BE SEEDED, AND WORKED INTO THE SOIL TO A DEPTH OF 6".

LIMESTONE – PULV. AG.
LIMESTONE – 6 TONS PER ACRE
FERTILIZER – 10-20-20
FERTILIZER – 500 LBS. PER ACRE

GRASS SEED SHALL BE BROADCAST AT THE RATE AND KIND INDICATED BELOW:

	% BY WT.	PUR.	GERM.
PROPRIETARY KENTUCKY BLUEGRASS (MIN. 2 VARIETIES)	60%	95%	80%
TURF-TYPE PREMIER RYEGRASS (MIN. 2 VARIETIES)	60%	95%	80%

(MIXTURE TO BE APPLIED AT 5 LBS. PER 1000 SF.)

MULCH OF LONG STEM STRAW SHALL BE APPLIED AT EVEN APPLICATION OF 3 TONS PER ACRE WITH A SURFACE COVERAGE OF 80–90%.

DUST CONTROL NOTES:

DUST CONTROL DESIGN CRITERIA

CONSTRUCTION OPERATIONS SHOULD BE SCHEDULED TO MINIMIZE THE AMOUNT OF AREA DISTURBED AT ONE TIME. BUFFER AREAS OF VEGETATION SHOULD BE LEFT WHERE PRACTICAL. TEMPORARY OR PERMANENT STABILIZATION MEASURES SHALL BE INSTALLED. NO SPECIFIC DESIGN CRITERIA IS GIVEN; SEE CONSTRUCTION SPECIFICATIONS BELOW FOR COMMON METHODS OF DUST CONTROL.

WATER QUALITY MUST BE CONSIDERED WHEN MATERIALS ARE SELECTED FOR DUST CONTROL. WHERE THERE IS A POTENTIAL FOR THE MATERIAL TO WASH OFF TO A STREAM, INGREDIENT INFORMATION MUST BE PROVIDED TO THE NYSDEC.

NO POLYMER APPLICATION SHALL TAKE PLACE WITHOUT WRITTEN APPROVAL FROM THE NYSDEC.

CONSTRUCTION SPECIFICATIONS

A. NON-DRIVING AREAS – THESE AREAS USE PRODUCTS AND MATERIALS APPLIED OR PLACED ON SOIL SURFACES TO PREVENT AIRBORNE MIGRATION OF SOIL PARTICLES.

VEGETATIVE COVER – FOR DISTURBED AREAS NOT SUBJECT TO TRAFFIC, VEGETATION PROVIDES THE MOST PRACTICAL METHOD OF DUST CONTROL.

MULCH (INCLUDING GRAVEL MULCH) – MULCH OFFERS A FAST EFFECTIVE MEANS OF CONTROLLING DUST. THIS CAN ALSO INCLUDE ROLLED EROSION CONTROL BLANKETS.

SPRAY ADHESIVES – THESE ARE PRODUCTS GENERALLY COMPOSED OF POLYMERS IN A LIQUID OR SOLID FORM THAT ARE MIXED WITH WATER TO FORM AN EMULSION THAT IS SPRAYED ON THE SOIL SURFACE WITH TYPICAL HYDROSEEDING EQUIPMENT. THE MIXING RATIONS AND APPLICATION RATES WILL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS FOR THE SPECIFIC SOILS ON THE SPITE. IN NO CASE SHOULD THE APPLICATION OF THESE ADHESIVES BE MADE ON WET SOILS OR IF THERE IS A PROBABILITY OF PRECIPITATION WITHIN 48 HOUR OF ITS PROPOSED USE. MATERIAL SAFETY DATA SHEETS WILL BE PROVIDED TO ALL APPLICATORS AND OTHERS WORKING WITH THE MATERIAL.

B. DRIVING AREAS – THESE AREAS UTILIZE WATER, POLYMER EMULSIONS, AND BARRIERS TO PREVENT DUST MOVEMENT FROM THE TRAFFIC SURFACE INTO THE AIR.

SPRINKLING – THE SITE MAY BE SPRAYED WITH WATER UNTIL THE SURFACE IS WET. THIS IS ESPECIALLY EFFECTIVE ON HAUL ROADS AND ACCESS ROUTE TO PROVIDE SHORT TERM LIMITED DUST CONTROL.

POLYMER ADDITIVES – THESE POLYMERS ARE MIXED WITH WATER AND APPLIED TO THE DRIVING SURFACE BY A WATER TRUCK WITH A GRAVITY FEED DRIP BAR, SPRAY BAR OR AUTOMATED DISTRIBUTOR TRUCK. THE MIXING RATIONS AND APPLICATION RATES WILL BE IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS. INCORPORATION OF THE EMULSION INTO THE SOIL WILL BE DONE TO THE APPROPRIATE DEPT BASED ON EXPECTED TRAFFIC. COMPACTION AFTER INCORPORATION WILL BE BY VIBRATORY ROLLER TO A MINIMUM OF 95%. THE PREPARED SURFACE SHALL BE MOIST AND NO APPLICATION OF THE POLYMER WILL BE MADE IF THERE IS A PROVABILITY OF PRECIPITATION WITHIN 48 HOURS OF ITS PROPOSED USE. MATERIAL SAFETY DATA SHEETS WILL BE PROVIDED TO ALL APPLICATORS WORKING WITH THE MATERIAL.

BARRIERS – WOVEN GEO-TEXTILES CAN BE PLACED ON THE DRIVING SURFACE TO EFFECTIVELY REDUCE DUST THROW AND PARTICLE MIGRATION ON HAUL ROADS. STONE CAN ALSO BE USED FOR CONSTRUCTION ROADS FOR EFFECTIVE DUST CONTROL.

WINDBREAK – A SILT FENCE OR SIMILAR BARRIER CAN CONTROL AIR CURRENTS AT INTERVALS EQUAL TO TEN TIMES THE BARRIER HEIGHT. PRESERVE EXISTING WIND BARRIER VEGETATION AS MUCH AS PRACTICAL.

MAINTENANCE

MAINTAIN DUST CONTROL MEASURES THROUGH DRY WEATHER PERIODS UNTIL ALL DISTURBED AREAS ARE STABILIZED.

SCHEDULE OF MAINTENANCE

SCHEDULE OF MAINTENANCE OF EROSION & SEDIMENTATION CONTROLS

THE SOIL EROSION AND SEDIMENTATION CONTROLS UTILIZED IN THE DEVELOPMENT OF THIS PLAN SHALL BE MAINTAINED AND REPAIRED IN ORDER TO KEEP THEM IN EFFECTIVE CONDITION UNTIL STABILIZATION OCCURS. ALL PREVENTATIVE AND REMEDIAL MAINTENANCE WORK, INCLUDING CLEAN-OUT, REPAIR, REPLACEMENT, RESEEDING, RE-MULCHING, AND RE-NETTING, MUST BE PERFORMED IMMEDIATELY. EROSION AND SEDIMENTATION CONTROL FACILITIES SHALL BE MAINTAINED IN OPERATING CONDITION UNTIL ALL UPSTREAM AREAS ARE STABILIZED WITH FINAL GROUND COVER. EROSION CONTROL FACILITIES SHALL BE INSPECTED WEEKLY AND AFTER ALL PRECIPITATION EVENTS. MAINTENANCE OF THE CONTROLS SHALL INCLUDE, AT A MINIMUM, THE FOLLOWING MAINTENANCE PROCEDURES FOR UTILIZED CONTROLS. THE CONTRACTOR SHALL PERFORM CERTAIN PERIODIC DUTIES IN ORDER TO ASSURE PROPER CONTROL. MISCELLANEOUS ADJUSTMENTS AND CORRECTIONS SHALL BE MADE TO ANY EROSION CONTROL STRUCTURE AS DEEMED NECESSARY BY THE ENGINEER, TOWNSHIP OFFICIAL, OR COUNTY REPRESENTATIVE IN ORDER TO CORRECT UNFORESEEN PROBLEMS CAUSED BY STORM PRIOR TO STABILIZATION.

FILTER FABRIC FENCE

1. THE FILTER FABRIC FENCES SHALL BE INSPECTED AFTER EVERY PRECIPITATION EVENT. ANY NECESSARY REPAIRS WILL BE MADE IMMEDIATELY.

2. ACCUMULATED SEDIMENTS WILL BE REMOVED AS REQUIRED TO KEEP THE FENCE FUNCTIONAL. IN ALL CASES, REMOVE DEPOSITS WHERE ACCUMULATIONS REACH ½ ABOVE THE GROUND HEIGHT OF THE FENCE.

3. ALL UNDERCUTTING OR EROSION OF THE TOE ANCHOR WILL BE REPAIRED IMMEDIATELY AND REPLACED WITH ADDITIONAL SILT FENCE.

4. ADHERE TO ANY MANUFACTURER'S RECOMMENDATIONS FOR REPLACING FILTER FABRIC FENCE.

5. ANY DEBRIS ACCUMULATED AT SILT BARRIERS WILL BE REMOVED AND PROPERLY DISPOSED IN A RESPONSIBLE MANNER. BARRIERS SHALL BE CHECKED AND REALIGNED OR RESET AS REQUIRED. ANY DEBRIS OR SOLID WASTE MATERIAL ACCUMULATED FROM CONSTRUCTION ACTIVITIES SHALL BE REMOVED FROM THE SITE AND DISPOSED OF IN AN APPROVED LANDFILL. CONSTRUCTION WASTE SHALL NOT BE BURIED ON THE SUBJECT SITE.

6. FILTER FABRIC FENCE MUST BE INSTALLED AT LEVEL GRADE. BOTH ENDS OF EACH FENCE SECTION MUST EXTEND AT LEAST 8' UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT.

7. WHERE ENDS OF FILTER FABRIC COME TOGETHER, THEY MUST BE OVERLAPPED, FOLDED AND STAPLED TO PREVENT SEDIMENT BYPASS. THE TOE ANCHOR MUST BE BACKFILLED AND COMPACTED TO A DENSITY EQUAL TO THE SURROUNDING SOILS.

ROCK CONSTRUCTION ENTRANCE

1. THE STRUCTURE'S THICKNESS WILL BE CONSTANTLY MAINTAINED TO THE SPECIFIED DIMENSION BY ADDING ROCK. A STOCKPILE OF ROCK MATERIAL WILL BE MAINTAINED ON SITE FOR THIS PURPOSE. AT THE END OF EACH CONSTRUCTION DAY, ALL SEDIMENT DEPOSITED ON PUBLIC ROADWAYS, WILL BE REMOVED AND RETURNED TO THE SITE. WASHING OF THE ROADWAY IS NOT PERMITTED.

2. STABILIZED CONSTRUCTION ENTRANCES SHALL BE CLEANED AND REDRESSED WHEN VOIDS BECOME CHOKED WITH MUD AND SEDIMENT.

3. FILTER FABRIC WILL BE INSTALLED UNDER ALL ROCK CONSTRUCTION ENTRANCES.

TEMPORARY SEDIMENT BASIN

1. SEDIMENT BASINS MUST BE PROTECTED FROM UNAUTHORIZED ACTS OF THIRD PARTIES.

2. ALL SEALS AND PIPES MUST BE WATERTIGHT.

3. PERMANENT AND TEMPORARY RISERS SHALL BE SET IN CONCRETE.

4. THE RISER PIPE IN THE SEDIMENT BASIN SHALL BE MONITORED AND SEDIMENT SHALL BE REMOVED FROM THE BASIN AND PROPERLY DISPOSED OF WHEN IT REACHES THE SPECIFIED CLEAN-OUT ELEVATION.

5. A "CLEAN-OUT" ELEVATION IS LISTED IN THE STORMWATER POLLUTION PREVENTION PLAN. THIS ELEVATION WILL BE IDENTIFIED BY APPROPRIATE STRUCTURE OR DEVICE WITHIN THE CONSTRUCTION BASIN TO INDICATE WHEN SEDIMENT REMOVAL IS NECESSARY.

SWALES

1. SWALES OR CHANNELS WILL BE MAINTAINED TO ENSURE THAT THE SPECIFIED DESIGN DIMENSIONS AND STABILIZATION ARE AVAILABLE AT ALL TIMES.

POST-CONSTRUCTION STORMWATER MANAGEMENT FACILITIES

THE PROPOSED BMPs MUST BE INSPECTED AFTER EACH RAINFALL EVENT OVER 0.5" AND WEEKLY. THESE INSPECTIONS SHALL AT A MINIMUM INCLUDE ALL NYSDEC REQUIREMENTS AS WELL AS THE FOLLOWING:

A. REMOVE TRASH AND BEBRIS WITHIN BMP.
B. CHECK FOR EXCESSIVE EROSION AND SEDIMENTATION.
C. CHECK EMBANKMENT OR BERM FOR FAULTS OR SETTLING.
D. CHECK FOR ANIMAL BURROWING.
E. CHECK FOR ALGAE, STAGNATION OR ODORS.
F. CHECK FOR POOR OR DISTRESSED STAND OF GRASS.
G. CHECK FOR CRACKS OR DETERIORATION OF INLETS, OUTLETS, PIPES, HEADWALLS, ETC.
H. CHECK FOR SEEPAGE AT OUTSIDE TOE OF EMBANKMENT.
I. CHECK FOR DETERIORATION OF DOWNSTREAM CHANNEL.
J. CHECK CONDITION OF OUTLET PROTECTION.

THE BMPs SHALL BE MAINTAINED TO ENSURE THAT THEY CONTINUE TO FUNCTION AS DESIGNED. ANY NECESSARY REMEDIAL ACTIONS SHALL BE TAKEN BY THE RESPONSIBLE PARTY:

THE SHELDRAKE KARMEL RD PROPERTIES LLC DEVELOPMENT

THE TOWN OF FALLSBURG RESERVES THE RIGHT TO INSPECT THE STORMWATER FACILITIES AT ANY TIME.

CONSTRUCTION SEQUENCE

CONSTRUCTION SEQUENCE NOTES

1. OBTAIN PLAN APPROVAL AND BUILDING PERMITS FROM MUNICIPAL AND REGULATORY AGENCIES FOR PROJECT AS REQUIRED.

2. SUBMIT NOTICE OF INTENT (NOI) FOR STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY UNDER THE SPDES GENERAL PERMIT.

3. THE OPERATOR SHALL INVITE ALL CONTRACTORS, LANDOWNERS, PLAN PREPARER, CONSTRUCTION INSPECTOR, AND ALL OTHER APPLICABLE INDIVIDUALS TO A PRE-CONSTRUCTION MEETING AT LEAST 7 DAYS PRIOR TO EARTH MOVING ACTIVITIES.

4. CONTRACTORS SHALL SIGN CONTRACTOR'S CERTIFICATION STATEMENT PREPARED FOR THE PROJECT.

5. INSTALL ON-SITE MAILBOX (COMBINATION LOCK PREFERRED) TO HOLD NOI, PERMIT NOTICE, SWPPP, INSPECTION REPORTS AND MS4 SWPPP ACCEPTANCE FORM. A SIGN PROVIDING SWPPP CONTACT NAMES AND PHONE NUMBERS IS PREFERRED.

6. AT LEAST 7 DAYS PRIOR TO EARTH MOVING ACTIVITIES, THE SITE CONTRACTORS SHALL NOTIFY "DIG SAFELY NEW YORK" AT 1-800-962-7962.

7. BEFORE IMPLEMENTING ANY REVISIONS TO THE APPROVED EROSION AND SEDIMENTATION CONTROL PLAN OR REVISIONS TO OTHER PLANS WHICH MAY AFFECT THE EFFECTIVENESS OF THE APPROVED EROSION AND SEDIMENTATION CONTROL PLAN, THE OPERATOR MUST RECEIVE APPROVAL OF THE REVISION(S) FROM THE PLAN DESIGNER AND/OR NYSDEC.

8. INSTALL THE ROCK CONSTRUCTION ENTRANCE AS INDICTED ON THE PROPOSED PLANS. ALL VEHICLES ENTERING AND EXITING THE SITE SHOULD DO SO VIA THE CONSTRUCTION ENTRANCE. ANY MUD OR SEDIMENT TRACKED ONTO THE ROADWAY SHALL BE REMOVED BY THE CONTRACTOR AT THE END OF THE WORKDAY. THE CONTRACTOR IS ALSO RESPONSIBLE FOR ALL TRAFFIC CONTROL DEVICES ASSOCIATED WITH THE PROPOSED CONSTRUCTION ACTIVITIES.

9. INSTALL THE SILT FENCE AS SHOWN ON THE PROPOSED PLANS. EROSION CONTROL MEASURE SHALL BE PLACED DOWNSLOPE OF ALL AREAS OF EARTH DISTURBANCE.

10. CLEAR AND GRUB SITE.

11. STOCKPILE TOPSOIL AT LOCATIONS AS INDICATED ON THE PROPOSED PLANS AND SEED THE STOCKPILES WITH A TEMPORARY SEED MIXTURE.

12. ROUGH GRADE THE PROPOSED ACCESS ROADS AND INSTALL UTILITIES WHERE APPLICABLE. SWALES AND STORMWATER PIPING TO BE INSTALLED AS NECESSARY. INSTALL TEMPORARY INLET PROTECTION.

13. PREPARE SUBGRDE AND CONSTRUCT SUBBASE COURSE FOR ROAD, DRIVES AND PARKING AREAS.

10. INSTALL ALL UTILITIES AND PREPARE BUILDING PAD LOCATIONS. WHEN INSTALLING UNDERGROUND UTILITIES, PLACE THE EXCAVATED MATERIALS ON THE UPSLOPE SIDE OF THE TRENCH. EXCAVATE ONLY THE LENGTH OF THE TRENCH WHICH CAN BE BACKFILLED AND SEEDED BY THE END OF THE WORKDAY.

11. CONSTRUCT ANY FINAL GRADING, DRAINAGE, PONDS, INFILTRATION TRENCHES, GRASS SWALES, ETC. (IF APPLICABLE)

12. INSTALL CURBING. (IF APPLICABLE)

13. CONSTRUCT FINAL SURFACE COURSES FOR DRIVES

14. SEED, MULCH, AND PROVIDE SUPPLEMENTS TO ALL REMAINING (UN-STABILIZED) DISTURBED AREAS. IN AREAS WHERE SOIL DISTURBANCE ACTIVITY HAS BEEN TEMPORARILY OR PERMANENTLY CEASED, TEMPORARY AND/OR PERMANENT SOIL STABILIZATION MEASURES SHALL BE INSTALLED AN/OR IMPLEMENTED WITHIN SEVEN (7) DAYS FROM THE DATE THE SOIL DISTURBANCE ACTIVITY CEASED. THE SOIL STABILIZATION MEASURES SELECTED SHALL BE IN CONFORMANCE WITH THE MOST CURRENT VERSION OF THE TECHNICAL STANDARD, NEW YORK STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL.

15. INSPECT ALL EROSION AND SEDIMENT CONTROLS WEEKLY AND AFTER RAINFALL EVENTS; REPAIR AS REQUIRED.

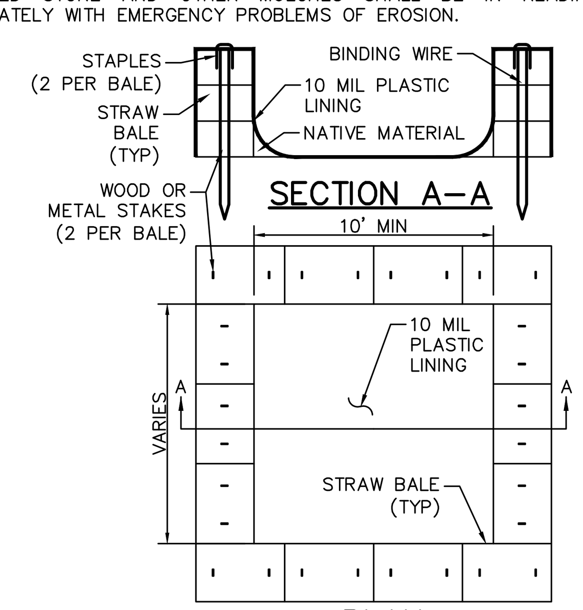
16. WATER VEGETATION AS REQUIRED.

17. *UPON FINAL SITE STABILIZATION, REMOVE ALL REMAINING EROSION CONTROL MEASURES. THEN INSTALL ALL BIORETENTION FACILITIES AS SHOWN ON THE PLANS (IF APPLICABLE). SEED AND MULCH ANY AREAS DISTURBED BY THE REMOVAL OF THE EROSION CONTROL MEASURES AND CONSTRUCTION OF THE BIORETENTION AREAS. (IF APPLICABLE)

18. ALL WASTE MATERIALS (I.E. SILT FENCE STAKES AND FABRIC) MUST BE HAULED TO A NEW YORK STATE APPROVED LANDFILL.

19. SUBMIT NOTICE OF TERMINATION (NOT) FORM FOR STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY UNDER THE SPDES GENERAL PERMIT.

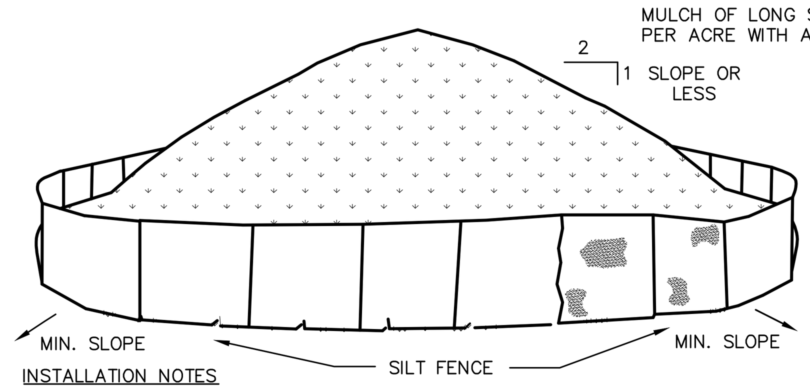
*NOTE: STABILIZATION IS DEFINED AS: "UNIFORM EROSION RESISTANT PERENNIAL VEGETATION THAT IS ESTABLISHED TO THE POINT WHERE THE SURFACE SOIL IS CAPABLE OF RESISTING EROSION DURING RUNOFF EVENTS. THE STANDARD FOR THIS VEGETATIVE COVER SHALL BE A UNIFORM COVERAGE DENSITY EQUALING 80% OF THE DISTURBED AREA.



NOTES:
1. ACTUAL LAYOUT TO BE DETERMINED IN THE FIELD.
2. A SIGN INDICATING THE CONCRETE WASHOUT AREA SHOULD BE POSTED, AND THE CONTRACTOR MUST ENSURE THAT ALL TRUCKS UTILIZE THE WASHOUT AREA.
3. WASHOUT AREA SHALL BE LOCATED 100' MINIMUM FROM ANY STORMWATER FEATURE, STREAM OR WETLAND.
4. WASHOUT AREA IS TO BE INSPECTED DAILY AND ANY DAMAGE IS TO BE REPAIRED.
5. ANY RAINWATER IS TO BE PUMPED OUT TO A STABILIZED AREA.

CONCRETE WASHOUT DETAIL

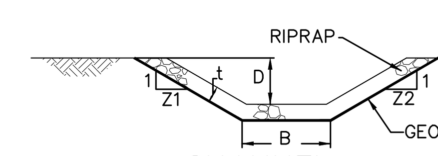
NOT TO SCALE



INSTALLATION NOTES
1. AREA CHOSEN FOR STOCKPILING OPERATIONS SHALL BE DRY AND STABLE.
2. MAXIMUM SLOPE OF STOCKPILE SHALL BE 2:1.
3. UPON COMPLETION OF SOIL STOCKPILING, EACH PILE SHALL BE SURROUNDED WITH SILT FENCING THEN STABILIZED WITH VEGETATION OR COVERED.
4. SEE SPECIFICATIONS FOR INSTALLATION OF SILT FENCE.
5. ALL ACTIVE STOCKPILES SHALL BE ACCESSED FROM THE UPHILL SIDE.

SOIL STOCKPILE

NOT TO SCALE



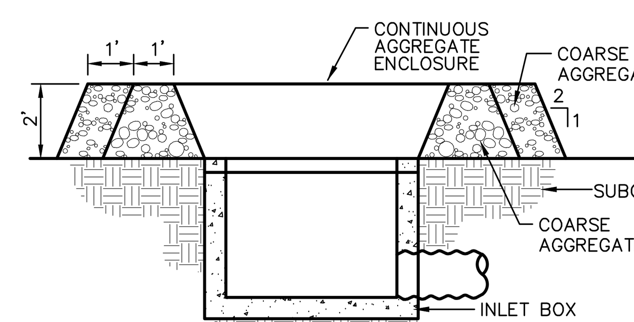
CHANNEL CROSS-SECTION

CHANNEL NO.	BOTTOM WIDTH B (FT)	DEPTH D (FT)	Z1 (FT)	Z2 (FT)	RIPRAP SIZE (R-_)	RIPRAP THICK. t (IN)
ALL	8	2	3	3	6"	8"

ALL RIP RAP CHANNELS ARE SHOWN HATCHED ON THE PLAN

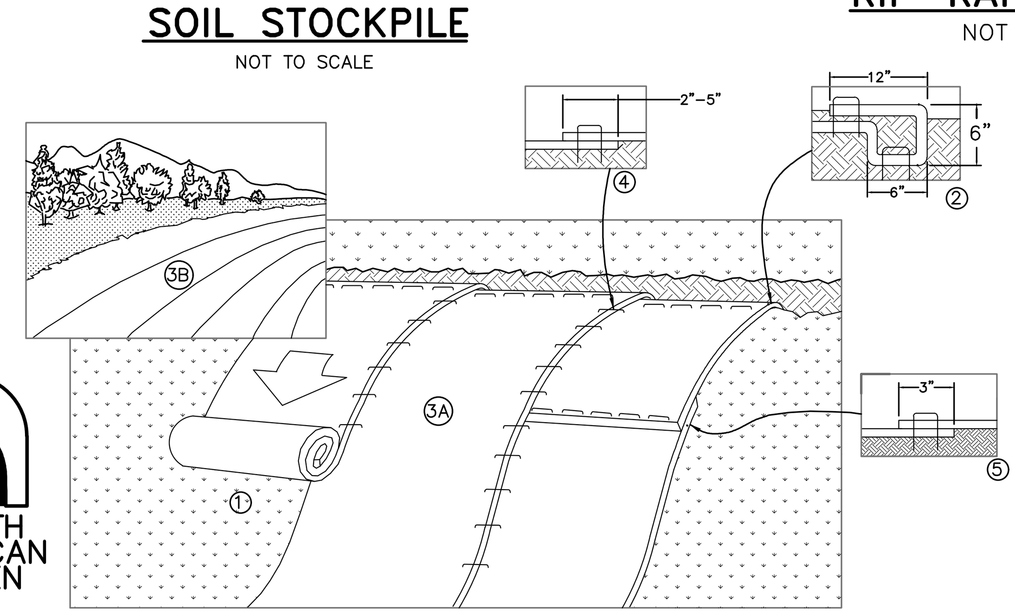
RIP-RAP CHANNELS

NOT TO SCALE



INLET PROTECTION-SECTION

NOT TO SCALE



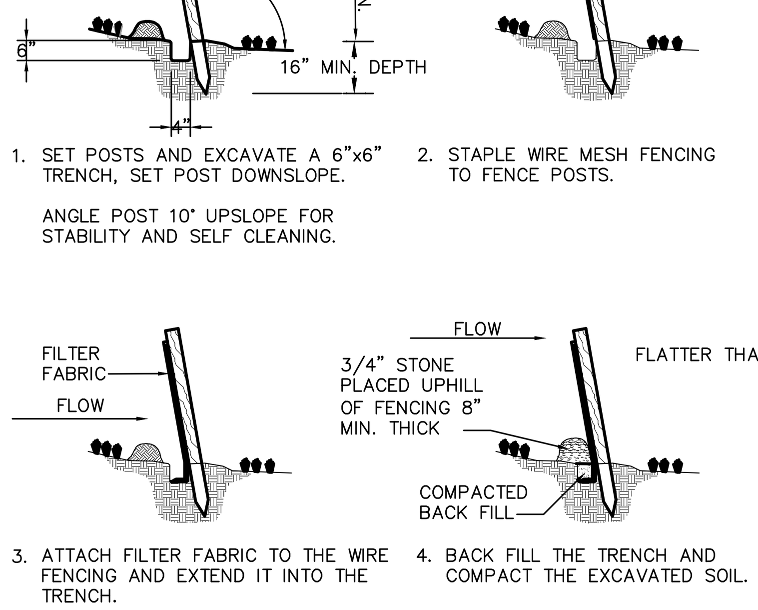
NORTH AMERICAN GREEN

1. PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECP's), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.
2. NOTE: WHEN USING CELL-O-SEED DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
3. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE RECP's IN A 6" (15 CM) DEEP X 6" (15 CM) WIDE TRENCH WITH APPROXIMATELY 12" (30cm) OF RECP's EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE RECP's WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30 CM) APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" (30 CM) PORTION OF RECP's BACK OVER SEED AND COMPACTED SOIL. SECURE RECP's OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" (30 CM) APART ACROSS THE WIDTH OF THE RECP's.
4. ROLL THE RECP's (A.) DOWN OR (B.) HORIZONTALLY ACROSS THE SLOPE. RECP's WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL RECP's MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE™PATTERN GUIDE. WHEN USING THE DOT SYSTEM , STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
5. THE EDGES OF PARALLEL RECP's MUST BE STAPLED WITH APPROXIMATELY 2" – 5" (5 CM – 12.5 CM) OVERLAP DEPENDING ON RECP's TYPE.
6. CONSECUTIVE RECP's SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" (7.5 CM) OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" (30 CM) APART ACROSS ENTIRE RECP's WIDTH.

NOTE:
*IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" (15 CM) MAY BE NECESSARY TO PROPERLY SECURE THE RECP's.

STEEP SLOPE STABILIZATION MATTING

NOT TO SCALE



1. SET POSTS AND EXCAVATE A 6"x6" TRENCH, SET POST DOWNSLOPE.

ANGLE POST 10° UPSLOPE FOR STABILITY AND SELF CLEANING.

2. STAPLE WIRE MESH FENCING TO FENCE POSTS.

3. ATTACH FILTER FABRIC TO THE WIRE FENCING AND EXTEND IT INTO THE TRENCH.

4. BACK FILL THE TRENCH AND COMPACT THE EXCAVATED SOIL.

NOTE

1. SILT FENCING SHALL BE PLACED IN ACCORDANCE WITH NEW YORK STATE STANDARDS AND SPECIFICATIONS FOR URBAN EROSION AND SEDIMENT CONTROL.

2. LENGTH OF SLOPE ABOVE SILT FENCE SHALL NOT EXCEED THE FOLLOWING LIMTS:

SLOPE	SLOPE LENGTH
2:1	50
3:1	75
4:1	125
5:1	175
FLATTER THAN 5:1	200

3. SILT FENCE SHALL BE GEOTEX 914SC OR APPROVED EQUAL.

SILT FENCE PLACEMENT AND CONSTRUCTION

NOT TO SCALE

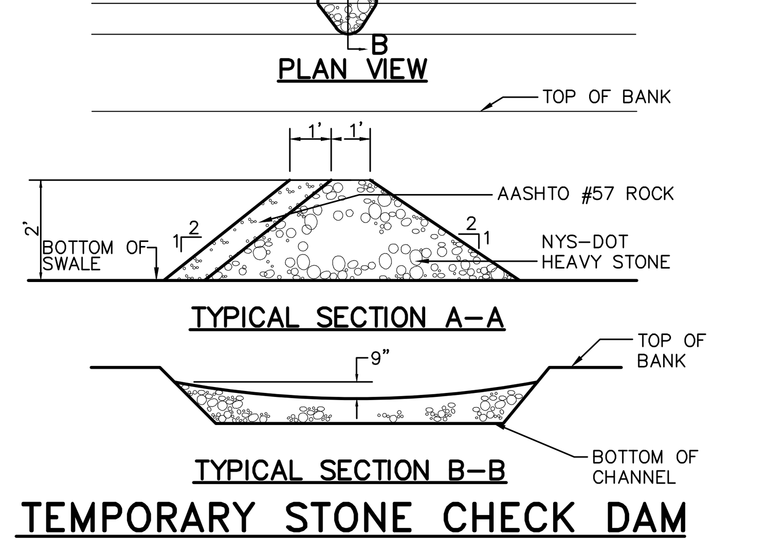
TYPE OF SOIL DISTURBANCE:	SOIL RESTORATION REQUIREMENT		COMMENTS/EXAMPLES
NO SOIL DISTURBANCE	RESTORATION NOT PERMITTED		PRESERVATION OF NATURAL FEATURES
MINIMAL SOIL DISTURBANCE	RESTORATION NOT REQUIRED		CLEARING AND GRUBBING
AREAS WHERE TOPSOIL IS STRIPPED ONLY-NO CHANGE IN GRADE	HSG A & B	HSG C & D	PROTECT AREA FROM ANY ONGOING CONSTRUCTION ACTIVITIES
	APPLY 6 INCHES OF TOPSOIL	AERATE* AND APPLY 6 INCHES OF TOPSOIL	
AREAS OF CUT OR FILL	HSG A & B	HSG C & D	
	AERATE AND APPLY 6 INCHES OF TOPSOIL	APPLY FULL SOIL RESTORATION**	
HEAVY TRAFFIC AREAS ON SITE (ESPECIALLY IN A ZONE 5-25 FEET AROUND BUILDINGS BUT NOT WITHIN A 5 FOOT PERIMETER AROUND FOUNDATION WALLS	APPLY FULL SOIL RESTORATION (DE-COMPACTION AND COMPOST ENHANCEMENT)		
AREAS WHERE RUNOFF REDUCTION AND OR INFILTRATION PRACTICES AREA REQUIRED	RESTORATION NOT REQUIRED, BUT MAY BE APPLIED TO ENHANCE THE REDUCTION SPECIFIED FOR APPROPRIATE PRACTICES		KEEP CONSTRUCTION EQUIPMENT FROM CROSSING THESE AREAS. TO PROTECT NEWLY INSTALLED PRACTICE FROM ANY ONGOING CONSTRUCTION ACTIVITIES CONSTRUCT A SINGLE PHASE OPERATION FENCE AREA
REDEVELOPMENT PROJECTS	SOIL RESTORATION IS REQUIRED ON REDEVELOPMENT PROJECTS IN AREAS WHERE EXISTING IMPERVIOUS AREA WILL BE CONVERTED TO PERVIOUS AREA		

*AERATION INCLUDES THE USE OF MACHINES SUCH AS TRACTOR-DRAWN IMPLEMENTS WITH COULTERS MAKING A NARROW SLIT IN THE SOIL, A ROLLER WITH MANY SPIKES MAKING INDENTIONS IN THE SOIL, OR PRONGS WHICH FUNCTION LIKE A MINI-SUBSOILER.
**PER "DEEP RIPPING AND DE-COMPARCTION, DEC 2008"

SOIL RESTORATION REQUIREMENTS

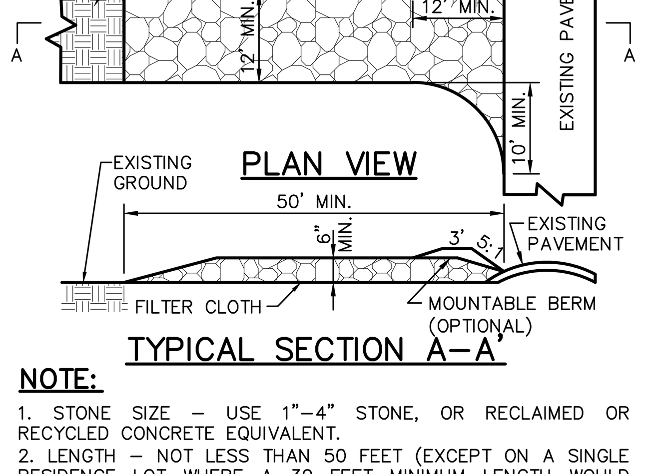
NOT TO SCALE

NOTE:
1. CHECK DAMS SHALL BE SPACED TOE TO CREST AS SPECIFIED IN THE "N.Y.S. STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL"



TEMPORARY STONE CHECK DAM

NOT TO SCALE



NOTE:
1. STONE SIZE – USE 1"–4" STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH – NOT LESS THAN 50 FEET (EXCEPT ON A SINGLE RESIDENCE LOT WHERE A 30 FEET MINIMUM LENGTH WOULD APPLY).
3. THICKNESS – NOT LESS THAN SIX (6) INCHES.
4. WIDTH – TWELVE (12) FEET MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WERE INGRESS OCCURS. TWENTY FOUR (24) FEET IF SINGLE ENTRANCE TO SITE.
5. FILTER CLOTH – WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
6. SURFACE WATER – ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE – THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY, ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
8. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON A AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

STABILIZED CONSTRUCTION ENTRANCE

NOT TO SCALE

NO.	DATE	REVISION
2	6/25/25	PROGRESS SET
1	12/11/24	DESIGN REVISIONS

MICHAEL G. RIELLY
NEW YORK STATE PROFESSIONAL ENGINEER
LICENSE NO. 093427

MANAGER: MICHAEL G. RIELLY
DESIGN BY: MTL
DRAWN BY: MTL
CHKD BY: MGR

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SCALE: AS SHOWN

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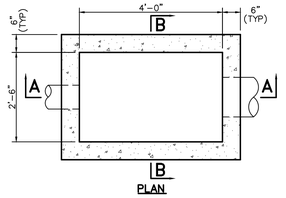
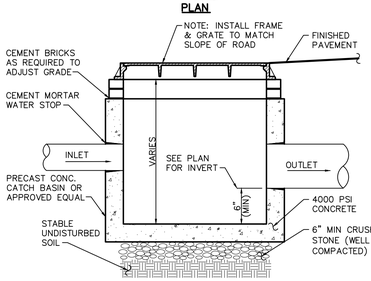
DETAILS
FOR
SHELDRAKE KARMEL RD PROPERTIES LLC
TOWN OF FALLSBURG SULLIVAN COUNTY, NY

DATE: JUNE 25, 2024
SHEET NO. 20 OF 29
DWG. NO. 0236-01

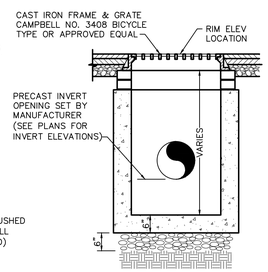


PLAN

NOTES:
1. BACKFILL AROUND CATCH BASIN TO BE COMPACTED IN MAX 9" LIFTS.
2. PRECAST STEEL REINFORCED POLYPROPYLENE PLASTIC STEPS SHALL BE PROVIDED FOR ALL BASINS GREATER THAN FOUR FEET IN DEPTH.
3. CATCH BASIN SHALL BE CAPABLE TO WITHSTAND HS–25 LOADING.



SECTION A–A



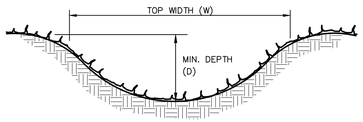
SECTION B–B

FLAT GRATE CATCH BASIN/FIELD INLET DETAIL

NOT TO SCALE

BIO–RETENTION SOIL AND PLANTING NOTES

1. THE SOIL FOR BIORETENTION AREAS SHALL BE A UNIFORM MIX, FREE OF STONES, STUMPS, ROOTS OR OTHER OBJECTS LARGER THAN TWO INCHES (2") IN DIAMETER. THE BIORETENTION SOIL SHALL BE VISIBLY FREE OF NOXIOUS WEEDS.
2. BIORETENTION SOIL SHALL BE A WELL BLENDED MIXTURE OF THREE (3) PARTS SAND AND ONE (1) PART TOPSOIL, BY VOLUME. THE BIORETENTION SOIL SHALL HAVE A PH RANGE OF 5.2 TO 7.6, AND AN ORGANIC CONTENT OF 3–7%.
3. SAND SHALL MEET THE REQUIREMENTS OF NYSDOT SPECIFICATION 703–07 CONCRETE SAND.
4. TOPSOIL SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF NYSDOT 713–01 TOPSOIL FOR TOPSOIL TYPE A, EXCEPT AS FOLLOWS:
   - ALL TOPSOIL SHALL BE SAMPLED AND TESTED, REGARDLESS OF THE SOURCE.
   - SAMPLING OF TOPSOIL, AMENDED TOPSOIL, AND THE BIORETENTION SOIL SHALL BE DONE BY THE CONTRACTOR/SUPPLIER. SAMPLING PROTOCOL SHALL BE IN ACCORDANCE WITH NYSDOT 713–01 TOPSOIL.
5. SOIL AMENDMENTS TO INCREASE ORGANIC CONTENT SHALL BE PEAT MOSS. PEAT MOSS SHALL BE COMMERCIALLY PRODUCED AND SHALL BE COMPOSED OF THE PARTLY DECOMPOSED STEMS AND LEAVES OF ANY OF SEVERAL SPECIES OF SPHAGNUM MOSS. IT SHALL BE FREE FROM WOOD, DECOMPOSED COLLOIDAL RESIDUE, AND OTHER FOREIGN MATTER. IT SHALL HAVE A PH RANGE BETWEEN 3.5 PH – 5.5 PH AS DETERMINED IN ACCORDANCE WITH THE ASSOCIATION OF OFFICIAL AGRICULTURAL CHEMISTS TESTING METHODS. IT'S WATER–ABSORBING ABILITY SHALL BE A MINIMUM OF 1100% BY WEIGHT ON AN OVEN–DRY BASIS.
6. ACCEPTANCE OF BIORETENTION SOIL WILL BE BASED UPON A MATERIAL CERTIFICATION THAT THE MATERIAL CONFORMS TO THE ABOVE REQUIREMENTS. THE CONTRACTOR/SUPPLIER SHALL PROVIDE TO THE ENGINEER COPIES OF TESTING RESULTS OF THE SAND GRADATION, TOPSOIL GRADATION, ORGANIC CONTENT PERCENTAGE OF THE BIORETENTION SOIL, AND PH OF THE BIORETENTION SOIL.
7. THE CONTRACTOR SHALL PROVIDE TO THE ENGINEER COPIES OF TESTING RESULTS FOR SOIL PHOSPHORUS CONCENTRATION, SAMPLES TO BE SUBMITTED TO THE QUALIFIED LABORATORY SHALL BE OBTAINED IN ACCORDANCE WITH NYSDOT 713–01 TOPSOIL.
8. BIORETENTION SOIL SHALL BE INSTALLED AT THE LOCATIONS AND TO THE DEPTH(S) AS SHOWN ON THE DRAWINGS.
9. PLACEMENT OF BIORETENTION SOIL SHALL BE DONE IN LIFTS OF 12 INCHES TO 18 INCHES. THE SOIL SHALL BE LOOSELY COMPACTED, SUCH AS BY TAMPING LIGHTLY WITH A DOVER OR BACKHOE BUCKET. NO OTHER MATERIALS OF SUBSTANCES SHALL BE MIXED OR DUMPED WITHIN THE BIORETENTION AREA THAT MAY BE HARMFUL TO PLANT GROWTH, OR PROVE A HINDRANCE TO PLANTING OR MAINTENANCE OPERATIONS.
10. THE MULCH LAYER MUST BE SHREDDED HARDWOOD MULCH. THE MULCH LAYER SHOULD BE WELL AGED (STOCKPILES OR STORED FOR AT LEAST 12 MONTHS), UNIFORM IN COLOR, AND FREE OF OTHER MATERIALS, SUCH AS WEED SEEDS, SOILS, ROOTS, ETC. THE MULCH SHOULD BE APPLIED TO A MAXIMUM DEPTH OF THREE INCHES. GRASS CLIPPINGS SHOULD NOT BE USED AS A MULCH MATERIAL.
11. PLANTING SHOULD BE DONE PER THE PLANTING SCHEDULE AND SCHEMATIC.

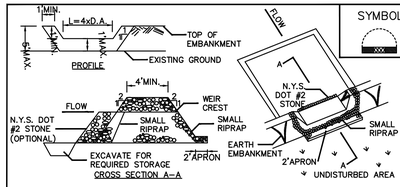


SWALE SIZING SCHEDULE

SWALE	WIDTH (W)	DEPTH (D)	MIN. SLOPE	MAX. SLOPE	EROSION PROTECTION
DIVERSION	5'+	1'+	2.0%	10.0%	FAST GROW SEED/HAY MULCH
ALL OTHERS	6'	1'+/–	1.0%	6.0%	FAST GROW SEED/HAY MULCH

SWALE DETAIL

NOT TO SCALE



SYMBOL

OPTION: A ONE FOOT LAYER OF N.Y.S. DOT #2 STONE MAY BE PLACED ON THE UPSTREAM SIDE OF THE RIPRAP INPLACE OF THE EMBEDDED FILTER CLOTH.

CONSTRUCTION SPECIFICATIONS

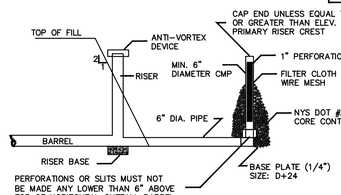
1. AREA UNDER EMBANKMENT SHALL BE CLEARED, GRUBBED AND STRIPPED OF ANY VEGETATION AND ROOT MAT. THE POOL AREA SHALL BE CLEARED.
2. THE FILL MATERIAL FOR THE EMBANKMENT SHALL BE FREE OF ROOTS AND OTHER WOODY VEGETATION AS WELL AS OVER–SIZED STONES, ROCKS, ORGANIC MATERIAL OR OTHER OBJECTIONABLE MATERIAL. THE EMBANKMENT SHALL BE COMPACTED BY TRAVERSING WITH EQUIPMENT WHILE IT IS BEING CONSTRUCTED.
3. ALL CUT AND FILL SLOPES SHALL BE 2:1 OR FLATTER.
4. THE STONE USED IN THE OUTLET SHALL BE SMALL RIPRAP 4"–8" ALONG WITH A 1' THICKNESS OF 2" AGGREGATE PLACED ON THE UP–GRADE SIDE ON THE SMALL RIPRAP OR EMBEDDED FILTER CLOTH IN THE RIPRAP.
5. SEDIMENT SHALL BE REMOVED AND TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO 1/2 THE DESIGN DEPTH OF THE TRAP.
6. THE STRUCTURE SHALL BE INSPECTED AFTER EACH RAIN AND REPAIRS MADE AS NEEDED.
7. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER THAT EROSION AND WATER POLLUTION IS MINIMIZED.
8. THE STRUCTURE SHALL BE REMOVED AND THE AREA STABILIZED WHEN THE DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.

NOTES:
A. MAXIMUM DRAINAGE AREA 5 ACRES
B. STORAGE VOLUME BELOW CREST SHALL BE 3,600 CUBIC FEET PER ACRE OF DRAINAGE AREA.

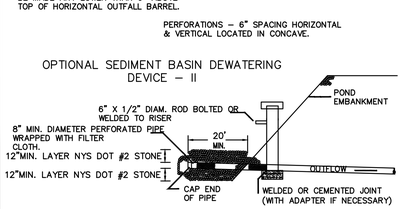
STONE OUTLET SEDIMENT TRAP ST–II

OPTIONAL SEDIMENT BASIN DEWATERING DEVICE – I WITH 6" PERFORATED RISER

SYMBOL



OPTIONAL SEDIMENT BASIN DEWATERING DEVICE – II



OPTIONAL SEDIMENT BASIN DEWATERING DEVICES

SYMBOL

CONSTRUCTION SPECIFICATIONS

RISER PIPE DEWATERING DEVICE CONSTRUCTION NOTES

RISER PIPE CONSTRUCTION NOTES

STANDPIPE AND CONNECTOR PIPE SHALL BE A MINIMUM OF 6 INCHES DIAMETER.

METAL PIPE MAY BE GALVANIZED STEEL OR ALUMINUM; PLAS– TIC PIPE MAY BE SCHEDULE 40 PVC OR HDPP.

CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER THAT EROSION AND WATER POLLUTION ARE MINIMIZED.

THE STRUCTURE SHALL ONLY BE REMOVED WHEN THE CONTRIB– UTING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.

ALL PIPE CONNECTIONS SHALL BE WATERTIGHT. THE LOWER PORTION OF THE STANDPIPE, AT A POINT ABOVE THE BARREL CONNECTION, SHALL BE FITTED WITH AN INTERNAL ORIFICE PLATE SIZED TO RELEASE THE VOLUME OF THE BASIN NO SOONER THAN 48 HOURS.

THE TOP 2/3 OF THE STANDPIPE SHALL BE PERFORATED WITH 1 INCH DIAMETER HOLE OR SLIT SPACED 6 INCHES VERTICALLY AND HORIZONTALLY AND PLACED IN THE CONCAVE PORTION OF THE PIPE. NO HOLES WILL BE ALLOWED WITHIN 6 INCHES INCHES OF THE HORIZONTAL CONNECTOR PIPE.

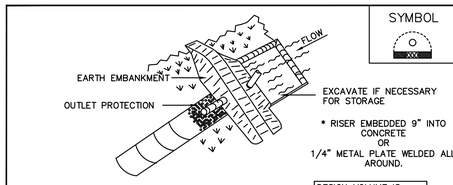
THE RISER SHALL BE WRAPPED WITH A TYPE GD–II GEOTEX– TILE FABRIC. THE FABRIC SHALL EXTEND 6INCHES ABOVE THE HIGHEST HOLE AND 6" BELOW THE LOWEST HOLE. WHERE ENDS OF FABRIC COME TOGETHER, THEY SHALL BE OVERLAPPED, FOLD– ED AND STAPLED TO PREVENT BYPASS.

STRAPS OR CONNECTING BANDS SHALL BE USED TO HOLD THE FABRIC AND WIRE MESH (AS NEEDED) IN PLACE. THEY SHALL BE PLACED AT THE TOP AND BOTTOM OF THE CLOTH.

THE STANDPIPE SHALL BE ANCHORED WITH EITHER CONCRETE BASE OR STEEL PLATE BASE TO PREVENT FLOTATION. CONCRETE BASES SHALL BE 12 INCHES THICK WITH THE STANDPIPE EM– BEDDED NINE INCHES. STEEL PLATE BASES WILL BE 1/4 INCH MINIMUM THICKNESS ATTACHED TO THE STANDPIPE BY A CON– TINUOUS WELD AROUND THE BOTTOM TO FORM A WATERTIGHT CONNECTION. THE PLATE SHALL HAVE 2.5 FEET OF STONE, GRAVEL OR TAMPERED EARTH PLACED ON IT.

THE PERFORATED STANDPIPE SHALL BE SURROUNDED BY NYSDOT #1 OR #2 STONE OR A BLEND OF BOTH TO PROTECT THE FILTER FABRIC.

RISER PIPE DEWATERING DEVICE



EMBANKMENT SECTION THRU RISER

SIZES OF PIPE NEEDED:

BARREL DIAMETER: ____
RISER DIAMETER: ____

NOTE:
CONSTRUCTION SPECIFICATION SHOULD BE ATTACHED TO THIS DETAIL TO COMPLETE DESIGN.

MAXIMUM DRAINAGE AREA: 5 ACRES

PIPE OUTLET SEDIMENT TRAP ST–I

1. AREA UNDER EMBANKMENT SHALL BE CLEARED, GRUBBED AND STRIPPED OF ANY VEGETATION AND ROOT MAT. THE POOL AREA SHALL BE CLEARED.
2. THE FILL MATERIAL FOR THE EMBANKMENT SHALL BE FREE OF ROOTS OR OTHER WOODY VEGETATION AS WELL AS OVER–SIZED STONES, ROCKS, ORGANIC MATERIAL, OR OTHER OBJECTIONABLE MATERIAL. THE EMBANKMENT SHALL BE COMPACTED BY TRAVERSING WITH EQUIPMENT WHILE IT IS BEING CONSTRUCTED.
3. VOLUME OF SEDIMENT STORAGE SHALL BE 3600 CUBIC FEET PER ACRE OF CONTRIBUTORY DRAINAGE.
4. SEDIMENT SHALL BE REMOVED AND TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO 1/2 THE DESIGN DEPTH OF THE TRAP. REMOVED SEDIMENT SHALL BE DEPOSITED IN A SUITABLE AREA AND IN SUCH A MANNER THAT IT WILL NOT ERODE.
5. THE STRUCTURE SHALL BE INSPECTED AFTER EACH RAIN AND REPAIRS MADE AS NEEDED.
6. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER THAT EROSION AND WATER POLLUTION ARE MINIMIZED.
7. THE STRUCTURE SHALL BE REMOVED AND AREA STABILIZED WHEN THE DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.
8. ALL FILL SLOPES SHALL BE 2:1 OR FLATTER; CUT SLOPES 1:1 OR FLATTER.
9. ALL PIPE CONNECTIONS SHALL BE WATERTIGHT.
10. THE TOP 2/3 OF THE RISER SHALL BE PERFORATED WITH ONE (1) INCH DIAMETER HOLES OR SLITS SPACED SIX (6) INCHES VERTICALLY AND HORIZONTALLY AND PLACED IN THE CONCAVE PORTION OF PIPE. NO HOLES WILL BE ALLOWED WITHIN SIX (6) INCHES OF THE HORIZONTAL BARREL.
11. THE RISER SHALL BE WRAPPED WITH 1/4 TO 1/2 INCH HARDWARE CLOTH WIRE THEN WRAPPED WITH FILTER CLOTH (HAVING AN EQUIVALENT SIEVE SIZE OF 40–80). THE FILTER CLOTH SHALL EXTEND SIX (6) INCHES ABOVE THE HIGHEST HOLE AND SIX (6) INCHES BELOW THE LOWEST HOLE. WHERE ENDS OF THE FILTER CLOTH COME TOGETHER, THEY SHALL BE OVER–LAPPED, FOLDED AND STAPLED TO PREVENT BYPASS.
12. STRAPS OR CONNECTING BANDS SHALL BE USED TO HOLD THE FILTER CLOTH AND WIRE FABRIC IN PLACE. THEY SHALL BE PLACED AT THE TOP AND BOTTOM OF THE CLOTH.
13. FILL MATERIAL AROUND THE PIPE SPILLWAY SHALL BE HAND COMPACTED IN FOUR (4) INCH LAYERS. A MINIMUM OF TWO (2) FEET OF HAND COMPACTED BACKFILL SHALL BE PLACED OVER THE PIPE SPILLWAY BEFORE CROSSING IT WITH CONSTRUCTION EQUIPMENT.
14. THE RISER SHALL BE ANCHORED WITH EITHER A CONCRETE BASE OR STEEL PLATE BASE TO PREVENT FLOTATION. FOR CONCRETE BASED THE DEPTH SHALL BE TWELVE (12) INCHES WITH THE RISER EMBEDDED NINE (9) INCHES. A 1/4 INCH MINIMUM THICKNESS STEEL PLATE SHALL BE ATTACHED TO THE RISER BY A CONTINUOUS WELD AROUND THE BOTTOM TO FORM A WATERTIGHT CONNECTION AND THEN PLACE TWO (2) FEET OF STONE, GRAVEL, OR TAMPED EARTH ON THE PLATE.

PIPE OUTLET SEDIMENT TRAP ST–I

CONSTRUCTION SPECIFICATIONS

NO.	DATE	REVISION
2	6/25/25	PROGRESS SET
1	12/11/24	DESIGN REVISIONS

MICHAEL G. RIELLY
NEW YORK STATE PROFESSIONAL ENGINEER
LICENSE NO. 092427

MANAGER: MICHAEL G. RIELLY
DESIGN BY: MTL | DRAWN BY: MTL | CHKD BY: MGR

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SCALE: AS SHOWN

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DETAILS FOR SHELDRAKE KARMEL RD PROPERTIES LLC

TOWN OF FALLSBURG | SULLIVAN COUNTY, NY

DATE: JUNE 25, 2024
SHEET NO. 21 OF 29
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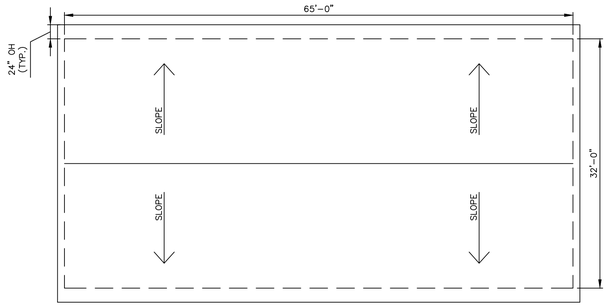
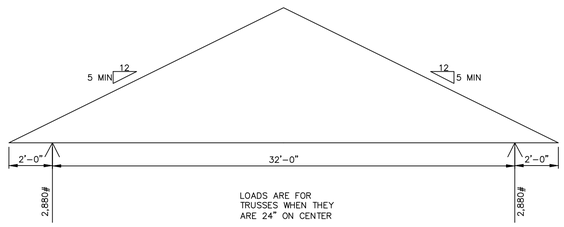


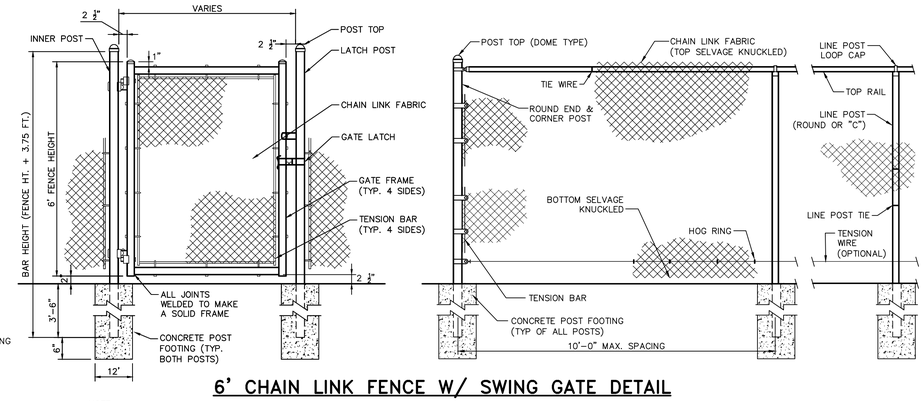
OPERATIONS BUILDING ROOF PLAN

NOT TO SCALE



OPERATIONS BUILDING TRUSS REACTION DIAGRAM

NOT TO SCALE

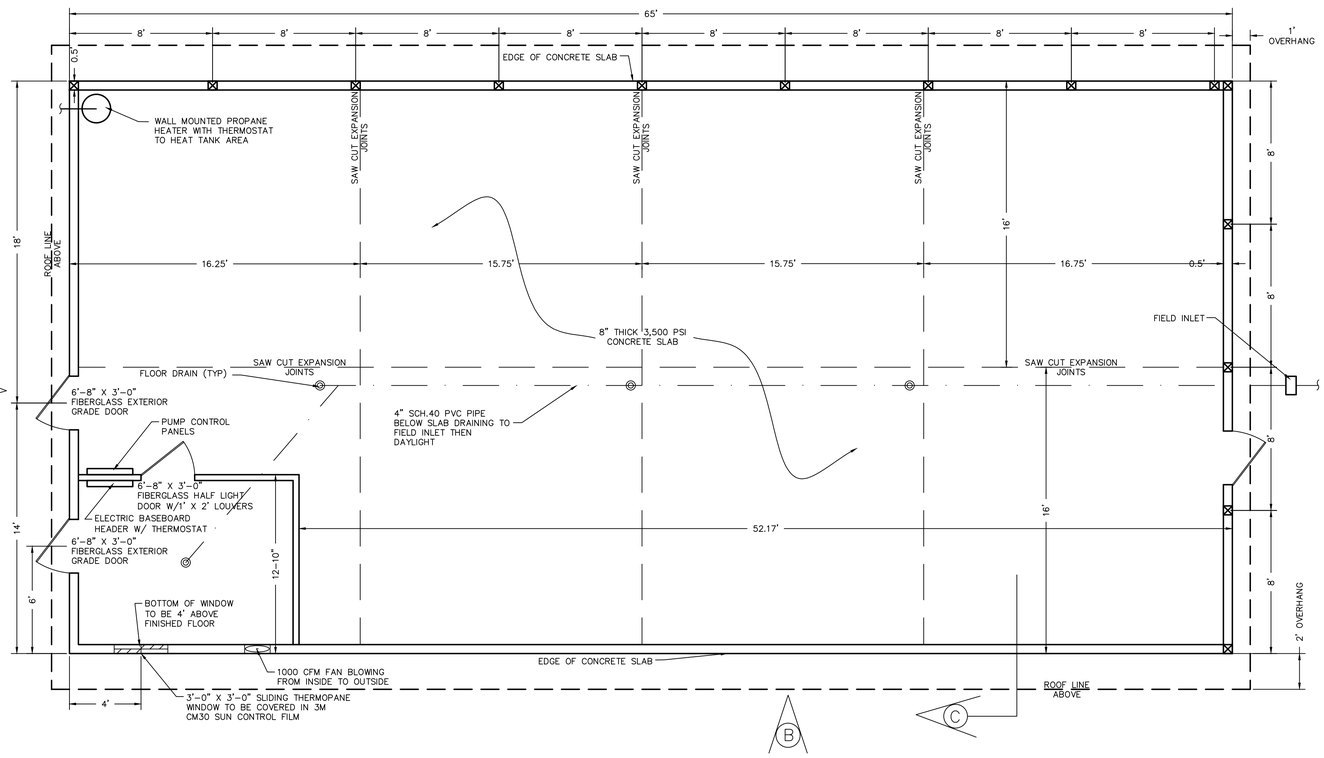


6' CHAIN LINK FENCE W/ SWING GATE DETAIL

NOTE:
1. BOTH WELLS ARE TO BE SURROUNDED WITH A MINIMUM FENCED IN AREA OF 12' X 12'.
2. SIGNS TO BE POSTED ON EACH GATE INDICATING THE PRESENCE OF A WATER SUPPLY WELL.
3. DURING CONSTRUCTION, THE 100' WELL RADIUS IS TO BE SURROUNDED WITH ORANGE CONSTRUCTION FENCING WITH SIGNS INDICATING THE RADIUS.
4. JERSEY BARRIERS OR SOME SORT OF IMMOVABLE OBSTRUCTION APPROVED BY THE ENGINEER MUST BE PLACED AROUND THE WELL DURING CONSTRUCTION OF THE PLAYGROUND AND OTHER ITEMS THAT ARE IN CLOSE PROXIMITY TO THE WELL HEADS.
5. THE WATER SYSTEM OPERATOR SHALL INSPECT THE WELL HEADS DAILY DURING SYSTEM OPERATION TO ENSURE THEY HAVE NOT BEEN TAMPERED WITH.

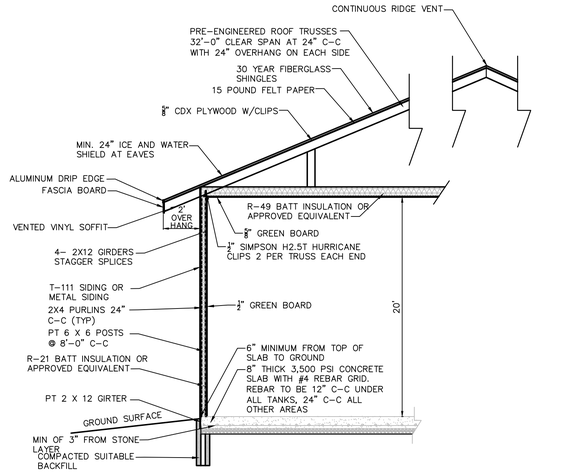
WELLHEAD PROTECTION FENCING

NOT TO SCALE



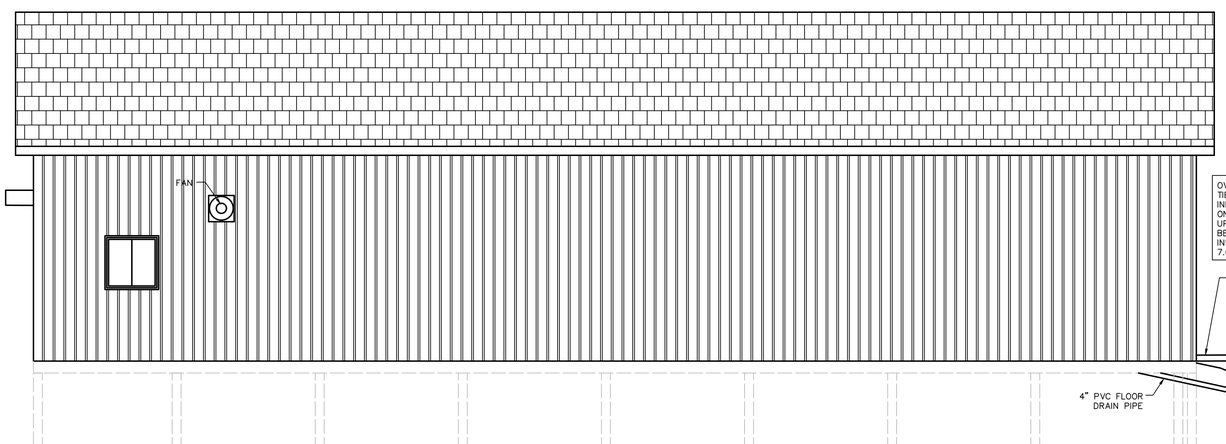
PLAN VIEW OF OPERATIONS BUILDING

SCALE: 1/4"=1-0"



WALL SECTION "C"

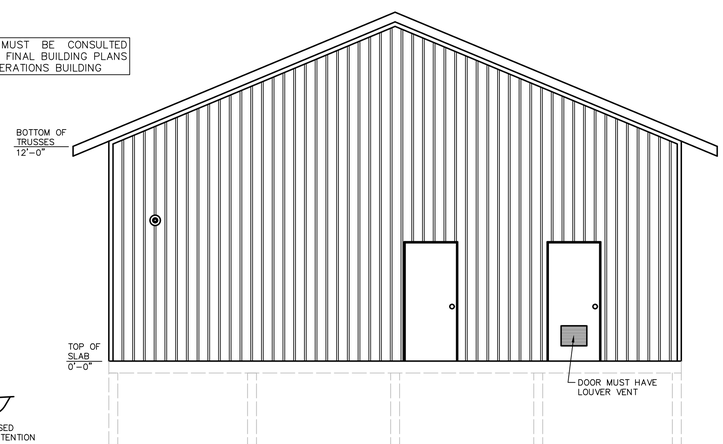
NOT TO SCALE



FRONT ELEVATION "B"

SCALE: 1/4"=1-0"

ARCHITECT MUST BE CONSULTED TO PREPARE FINAL BUILDING PLANS FOR THE OPERATIONS BUILDING



SIDE ELEVATION "A"

SCALE: 1/4"=1-0"

NO.	DATE	REVISION
2	6/25/25	PROGRESS SET
1	12/11/24	DESIGN REVISIONS

MICHAEL G. RIELLY
NEW YORK STATE PROFESSIONAL ENGINEER
LICENSE NO. 092427

MANAGER: MICHAEL G. RIELLY
DESIGN BY: MTL
DRAWN BY: MTL
CHKD BY: MGR

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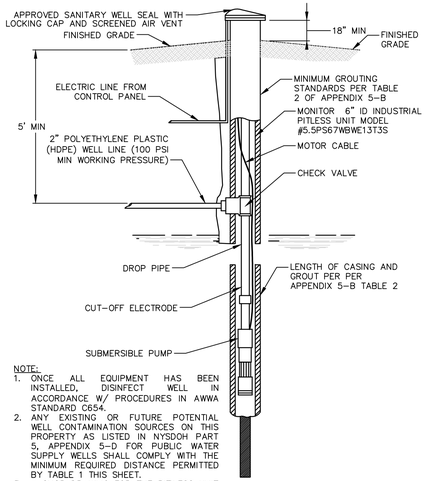
DETAILS
FOR
SHELDRAKE KARMEL RD PROPERTIES LLC
TOWN OF FALLSBURG SULLIVAN COUNTY, NY

DATE: JUNE 25, 2024
SHEET NO. 22 OF 29
DWG. NO. 0236-01



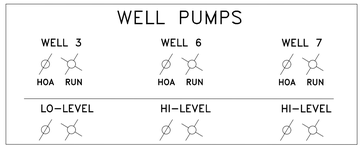
NOTE:
1. ONCE ALL EQUIPMENT HAS BEEN INSTALLED, DISINFECT WELL IN ACCORDANCE W/ PROCEDURES IN AWWA STANDARD C654.
2. ANY EXISTING OR FUTURE POTENTIAL WELL CONTAMINATION SOURCES ON THIS PROPERTY AS LISTED IN NYSDOH PART 5, APPENDIX 5-D FOR PUBLIC WATER SUPPLY WELLS SHALL COMPLY WITH THE MINIMUM REQUIRED DISTANCE PERMITTED BY TABLE 1 THIS SHEET.
3. A SHOP DRAWING FOR THE PITILESS UNIT MUST BE GENERATED AND APPROVED BY THE ENGINEER PRIOR TO ORDERING.
4. THE PITILESS UNIT MUST BE NSF APPROVED.

WATER WELL DETAIL
NOT TO SCALE

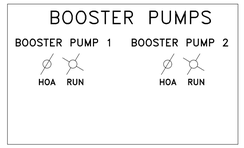
PIPING COLOR CODES

TO FACILITATE IDENTIFICATION OF PIPING IN WATER PLANTS AND PUMPING STATION IT IS RECOMMENDED THAT THE FOLLOWING COLOR SCHEME BE UTILIZED:

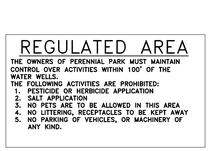
WATER LINES	
RAW OR RECYCLED	OLIVE GREEN
SETTLED OR CLARIFIED	AQUA
FINISHED OR POTABLE	DARK BLUE
CHEMICAL LINES	
ALUM OR PRIMARY COAGULANT	ORANGE
AMMONIA	WHITE
CARBON SLURRY	BLACK
CAUSTIC	YELLOW WITH GREEN BAND
CHLORINE	YELLOW
CHLORINE DIOXIDE	YELLOW WITH VIOLET BAND
FLUORIDE	LIGHT BLUE WITH RED BAND
LIME SLURRY	LIGHT GREEN
OZONE	YELLOW WITH ORANGE BAND
PHOSPHATE COMPOUNDS	LIGHT GREEN WITH RED BAND
POLYMERS OR COAGULANTS	ORANGE WITH GREEN BAND
POTASSIUM PERMANGANATE	VIOLET
SODA ASH	LIGHT GREEN WITH ORANGE BAND
SULFURIC ACID	YELLOW WITH RED BAND
SULFUR DIOXIDE	LIGHT GREEN WITH YELLOW BAND
WASTE LINES	
BACKWASH WASTE	LIGHT BROWN
SLUDGE	DARK BROWN
SEWER (SANITARY OR OTHER)	DARK GRAY
OTHER	
COMPRESSED AIR	DARK GREEN
GAS	RED
OTHER LINES	LIGHT GRAY



WELL PUMPS PANEL DETAIL
NOT TO SCALE

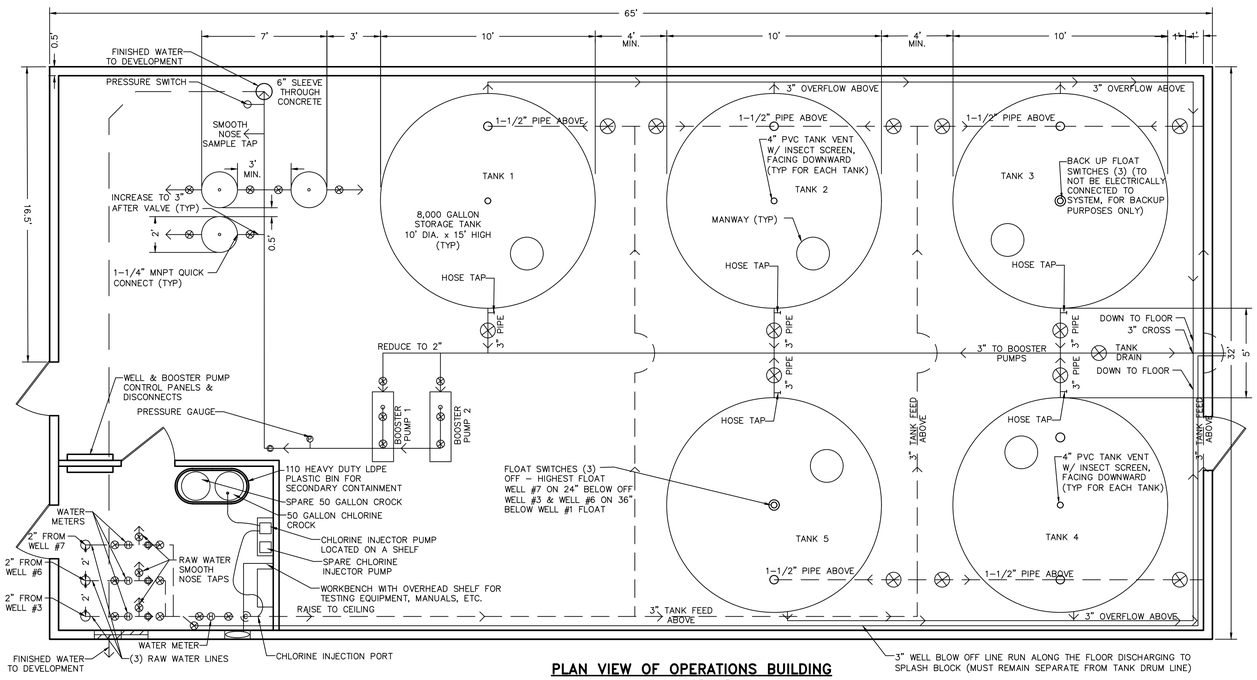


BOOSTER PUMPS PANEL DETAIL
NOT TO SCALE



NOTE:
1. SIGNS TO BE PROMINENTLY DISPLAYED ON THE FENCING SURRONDING EACH WELL.
2. THE OWNER OF THE DEVELOPMENT MUST MAINTAIN CONTROL OVER ALL ACTIVITIES WITHIN BOTH THE 100' AND 200' WELL RADIUS FOR AS LONG AS THE WATER WELLS ARE IN OPERATION.

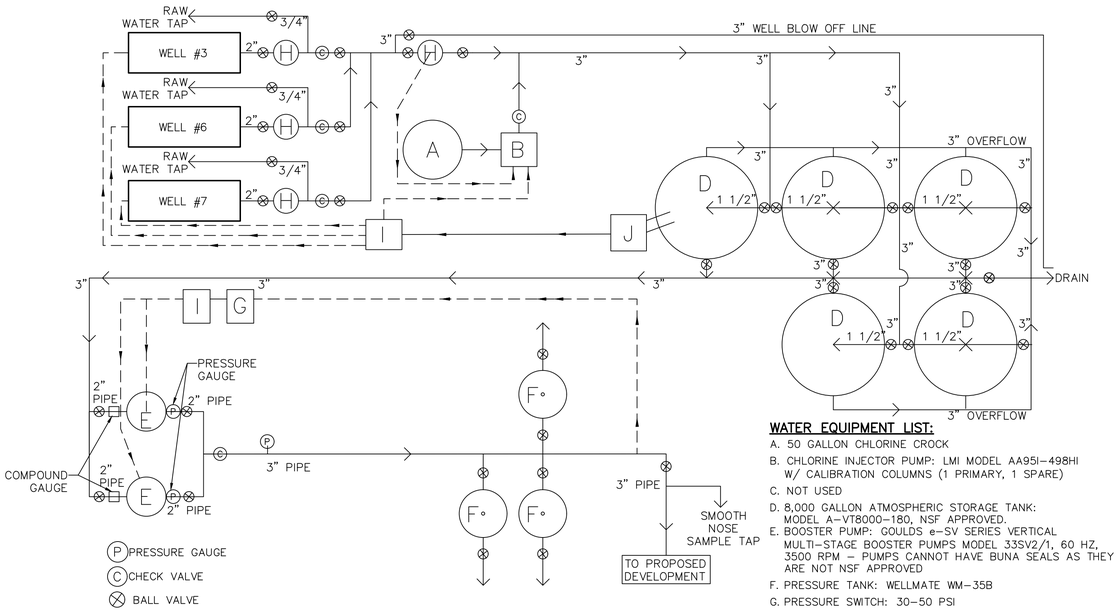
WELL RADIUS PROTECTION SIGNAGE
NOT TO SCALE



PLAN VIEW OF OPERATIONS BUILDING
SCALE: 1/4"=1-0"

ALL RAW AND FINISHED WATER SAMPLE TAPS MUST BE SMOOTH NOSED

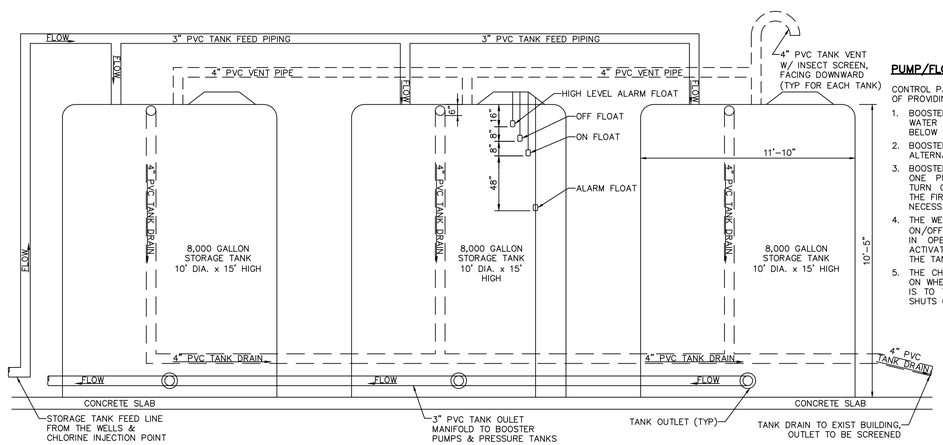
CHLORINATOR & TANK LAYOUT DETAIL
NOT TO SCALE



WATER SUPPLY SYSTEM SCHEMATIC
NOT TO SCALE

WATER EQUIPMENT LIST:

A. 50 GALLON CHLORINE CROCK
B. CHLORINE INJECTOR PUMP: LMI MODEL AA95I-498HI W/ CALIBRATION COLUMNS (1 PRIMARY, 1 SPARE)
C. NOT USED
D. 8,000 GALLON ATMOSPHERIC STORAGE TANK: MODEL A-VT8000-180, NSF APPROVED.
E. BOOSTER PUMP: GOULDS e-SV SERIES VERTICAL MULTI-STAGE BOOSTER PUMPS MODEL 33SV2/1, 60 HZ, 3500 RPM - PUMPS CANNOT HAVE BUNA SEALS AS THEY ARE NOT NSF APPROVED
F. PRESSURE TANK: WELLMATE WM-35B
G. PRESSURE SWITCH: 30-50 PSI
H. WATER METER: SEAMETRICS MJNR-20010G-06
I. PUMP CONTROL PANEL
J. LEVEL SENSOR: SJE-RHOMBUS SJE PUMPMASTER WPS POTABLE WATER FLOAT SWITCH



STORAGE TANK SECTION SCHEMATIC DETAIL
NOT TO SCALE

PUMP/FLOAT CONTROL NOTES:

CONTROL PANEL SHALL BE INSTALLED CAPABLE OF PROVIDING THE FOLLOWING:

1. BOOSTER PUMPS SHALL BE DISABLED WHEN WATER LEVEL IN STORAGE TANKS DROPS BELOW THE THE ALARM FLOAT.
2. BOOSTER PUMPS SHALL BE PROGRAMMED TO ALTERNATE BETWEEN STARTING PUMP.
3. BOOSTER PUMPS SHALL BE SET TO START ONE PUMP WHEN PRESSURE DROPS AND TURN ON THE SECOND PUMP ONLY WHEN THE FIRST PUMP IS UNABLE TO SUPPLY THE NECESSARY PRESSURE.
4. THE WELLS ARE TO BE CONTROLLED BY THE ON/OFF FLOATS. THE WELLS WILL ALTERNATE IN OPERATION WHEN THE ON FLOAT IS ACTIVATED AND THEY WILL TURN OFF WHEN THE TANK IS FULL VIA THE OFF FLOAT.
5. THE CHLORINE INJECTION PUMP IS TO TURN ON WHEN EITHER WELL PUMP TURNS ON AND IS TO TURN OFF WHEN EITHER WELL PUMP SHUTS OFF.

CONSTRUCTION NOTES:

CONCRETE:
1. ALL CAST-IN-PLACE CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE TEST STRENGTH IN 28 DAYS OF 3,500 PSI.
2. CONCRETE SLUMP AT TIME OF PLACEMENT SHALL NOT EXCEED 4 INCHES.
3. ALL CONCRETE SHALL BE PLACED USING WOOD/METAL FORMS IN ACCORDANCE WITH APPLICABLE ACI STANDARDS AND MOIST CURED FOR AT LEAST SEVEN DAYS BY SPRINKLING, COVERING WITH WET BURLAP OR OTHER APPROVED METHODS. SUBJECT TO APPROVAL OF THE ENGINEER. NO LOADS MAY BE PLACED ON FOOTINGS UNTIL THEY HAVE ACHIEVED A MINIMUM OF 90% OF DESIGN STRENGTH.
4. COLD WEATHER CONCRETE SHALL BE PROTECTED AGAINST FROST DAMAGE AND SHALL BE PLACED IN ACCORDANCE WITH ACI 306.
5. CONTRACTOR SHALL PROVIDE ANY NECESSARY SHORING AND DEWATERING IN ACCORDANCE TO OSHA STANDARDS.

STEEL REINFORCEMENT
1. ALL REINFORCING SHALL CONFORM TO ASTM A432 WITH A MINIMUM TEST YIELD POINT OF 60,000 PSI, DEFORMATION SHALL CONFORM TO ASTM A305, BARS SHALL BE SPLICED AND PLACED TO THE TOLERANCES INDICATED IN ACI 381.
2. BARS PLACED AGAINST EXPOSED SURFACES SHALL HAVE A MINIMUM OF 2 INCHES OF COVER. BARS PLACED AGAINST EARTH SHALL HAVE A MINIMUM OF 3" OF COVER.

GENERAL:

1. THE OPERATIONS BUILDING MUST BE STAKED OUT. THE LIMITS OF DISTURBANCE MUST ALSO BE STAKED OUT AND CONSTRUCTION FENCING ADDED ALONG THE LIMITS OF DISTURBANCE TO PREVENT UNAUTHORIZED SITE DISTURBANCES. ANY DEAD TREES OR VEGETATION AROUND THE BUILDINGS ARE TO BE REMOVED. GRADING IS TO BE SLOPED AWAY FROM THE BUILDING.

WATER NOTES:

1. ALL WELL AND BOOSTER PUMP CONTROLS TO INCLUDE LOW WATER SHUT-OFF.
2. BACKUP GENERATOR - GENERAC 25kW QTO25A OR APPROVED EQUIVALENT. GENERATOR TO BE SELF STARTING, SELF TESTING, L.P. FUEL WITH AUTOMATIC TRANSFER SWITCH.
3. ALL PIPING TO BE SECURELY ATTACHED TO FLOOR, TANKS, PUMPS, USING PIPE STANDS, BRACKETS, AND ANCHORS AS NECESSARY SO THE PIPING DOES NOT MOVE AT ALL.
4. ALL PUMPS TO BE SECURELY ATTACHED TO PUMP FRAMES BOLTED TO THE CONCRETE SLAB.
5. INSTALLED PIPE SHALL BE PRESSURE TESTED AND LEAKAGE TESTED IN ACCORDANCE WITH AWWA STANDARDS C605.
6. WATER MAINS SHALL BE DISINFECTED IN ACCORDANCE WITH AWWA STANDARDS C651.
7. ALL PUMPS AND VALVES MUST BE NUMBER, TAGGED AND CORRESPOND TO MAINTENANCE RECORDS TO ENSURE PROPER IDENTIFICATION AND RECORD KEEPING.
8. A SPARE CHLORINE INJECTOR PUMP IS TO BE MAINTAINED AT ALL TIMES.
9. SPARE PARTS SHALL BE AVAILABLE ONSITE FOR ALL CHEMICAL FEED PUMPS TO REPLACE PARTS WHICH ARE SUBJECT TO WEAR AND DAMAGE.

WATER TANK NOTES:

1. ALL TANKS ARE TO BE DISINFECTED IN ACCORDANCE WITH AWWA STANDARD C652. TWO SATISFACTORY MICROBIOLOGICAL TEST RESULTS MUST BE SUBMITTED TO THE DESIGN ENGINEER AND NYSDOH BEFORE THE FACILITY IS CONSIDERED FOR OPERATION.

WATER TANK STANDARD OPERATING PROCEDURE FOR DRAINING AND DISINFECTING THE STORAGE TANKS DURING SHUT-DOWN AND START-UP

1. WHEN SYSTEM IS TO BE SHUT DOWN, OR DRAINED FOR THE WINTER, THE TANKS MUST TO BE DRAINED. WHEN DRAINED, THE TANK WATER MUST BE DECHLORINATED FIRST, THEN DRAINED TO A SUITABLE LOCATION IN ACCORDANCE WITH AWWA STANDARD C655(LATEST REVISION). THIS STANDARD IS INCLUDED WITHIN THE ENGINEERING REPORT.
2. PRIOR TO START UP AND REFILLING THE TANKS, THE TANKS MUST BE CLEANED. TO CLEAN THE TANK, USE A LONG HANDLED BRUSH OR POWER WASHER TO PHYSICALLY REMOVE ANY BUILT UP DEBRIS, CORROSION, BIO-FILM AND/OR SEDIMENTS IN THE TANK.
3. INSPECT THE TANK OVERLOW PIPE AND SCREEN TO ENSURE THE END IS POINTED DOWNWARD, AND PROPERLY SCREENED.
4. THE TANK IS TO THEN BE DISINFECTED PER AWWA C-652.

WATER TREATMENT SYSTEM

1. THE ENTIRE WATER TREATMENT PLANT MUST BE DISINFECTED IN ACCORDANCE WITH AWWA STANDARD C653. THE ENTIRE AWWA STANDARD IS LOCATED IN THE ENGINEERING REPORT FOR THIS WATER SYSTEM.

CHLORINE METERING PUMP NOTES

1. THE CHLORINE METERING PUMP MUST BE ELECTRICALLY INTERLOCKED WITH THE WELL PUMPS SO THAT METERING PUMP TURNS ON AND OFF WITH THE WELL PUMPS.

NO.	DATE	REVISION
2	6/25/25	PROGRESS SET
1	12/11/24	DESIGN REVISIONS

MICHAEL G. RIELLY
NEW YORK STATE PROFESSIONAL ENGINEER
LICENSE NO. 092427

MANAGER: MICHAEL G. RIELLY
DESIGN BY: MTL | DRAWN BY: MTL | CHKD BY: MGR

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CLIENT
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SCALE: AS SHOWN

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DETAILS FOR SHELDRAKE KARMEL RD PROPERTIES LLC
TOWN OF FALLSBURG, SULLIVAN COUNTY, NY

DATE: JUNE 25, 2024
SHEET NO. 23 OF 29
DWG. NO. 0236-01

TRENCH EXCAVATION AND BACKFILL

1. DESCRIPTION OF WORK:

A. THE WORK WITHIN THIS SECTION INCLUDES, BUT IS NOT LIMITED TO, THE FURNISHING OF ALL EQUIPMENT, LABOR AND MATERIALS AND PERFORMING ALL OPERATIONS NECESSARY TO EXCAVATE, PROTECT AND BACKFILL ALL TRENCHES IN ACCORDANCE WITH THE SPECIFICATIONS, APPLICABLE DRAWINGS AND CONTRACT DOCUMENTS.

B. THE CONTRACTOR SHALL PERFORM ALL EXCAVATION OF EVERY DESCRIPTION AND OF WHATEVER SUBSTANCE ENCOUNTERED TO THE DEPTHS REQUIRED, AS SPECIFIED HEREIN. IN PERFORMING THE WORK AS SPECIFIED IN THIS SECTION, THE CONTRACTOR SHALL CONFORM TO THE CURRENT REGULATIONS OF THE NEW YORK DEPARTMENT OF LABOR AND APPLICABLE FEDERAL REGULATIONS FOR EXCAVATIONS AND CONSTRUCTION. ALL EXCAVATED MATERIALS NOT REQUIRED FOR BACKFILL SHALL BE REMOVED AND WASTED OR OTHERWISE DISPOSED OF AS REQUIRED OR SPECIFIED.

C. EXCAVATION UNDER THIS CONTRACT SHALL BE UNCLASSIFIED, THAT IS THE REMOVAL OF ALL MATERIAL OF ANY NATURE, KIND, TYPE, OR ORIGIN WILL BE CONSIDERED THE SAME AND SHALL BE INCLUDED IN THE PRICING.

D. THE ENGINEER WILL ESTABLISH BENCHMARKS AND OTHER CONTROL POINTS. ALL SUCH POINTS ESTABLISHED BY THE ENGINEER SHALL BE CAREFULLY PRESERVED AND PROTECTED BY THE CONTRACTOR. THE COST OF RE-ESTABLISHING THE CONTROL POINTS DISTURBED DURING CONSTRUCTION SHALL BE BORNE BY THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENTIRELY RECTIFYING WORK IMPROPERLY CONSTRUCTED BECAUSE OF FAILURE OF THE CONTRACTOR TO MAINTAIN AND PROTECT THE ESTABLISHED CONTROL POINTS. THE CONTRACTOR SHALL, AT HIS EXPENSE, ESTABLISH ALL WORKING POINTS, CONSTRUCTION LINES AND GRADES FOR THE CONTROL POINTS SET BY THE ENGINEER, AND THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE ACCURACY THEREOF.

2. REMOVAL AND PROTECTION OF PAVEMENT:

A. THE CONTRACTOR SHALL CLEAR THE SURFACE AND REMOVE ALL SURFACE MATERIALS, OF WHATEVER NATURE, OVER THE LINE OF THE TRENCH; AND HE SHALL PROPERLY SEPARATE AND CLASSIFY THE MATERIAL REMOVED; AND STORE, GUARD, AND PRESERVE SAID MATERIAL AS MAY BE REQUIRED FOR USE IN BACKFILLING, RESURFACING, REPAVING OR FOR OTHER PURPOSES. ALL ROCK, EARTH, SAND, CURBING, GUTTER AND FLAGSTONES, AND ALL SECTIONAL PAVING UNITS WHICH MAY BE REMOVED, TOGETHER WITH ALL MATERIALS TAKEN FROM THE TRENCHES, SHALL BE STORED IN SUCH PARTS OF THE STREET OR ROADWAY, OR SUCH OTHER SUITABLE PLACE, AND IN SUCH MANNER AS ACCEPTED BY THE ENGINEER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY LOSS OF OR ANY DAMAGE TO PAVING MATERIALS THROUGH HIS OWN OR HIS EMPLOYEE'S CARELESS REMOVAL OR NEGLECTFUL OR WASTE STORAGE, DISPOSAL OR USE OF SAME.

B. PAVEMENT SHALL BE CUT TO NEAT LINES EQUIDISTANT FROM THE CENTERLINE OF THE TRENCH AND THE EDGES OF THE PAVEMENT SHALL BE PROTECTED AND MAINTAINED BY THE CONTRACTOR UNTIL THE REPAVING IS COMPLETED. IF THE PAVEMENT EDGES ARE NOT MAINTAINED TO THE SATISFACTION OF THE ENGINEER, THE PAVEMENT SHALL BE RECUT WHEN THE PAVING IS DONE. ALL PAVEMENTS SHALL BE CUT BY A MECHANICAL SAW.

C. THE CONTRACTOR SHALL ALSO PROTECT THE STREET SURFACES OUTSIDE OF THE TRENCH LIMITS AND SHALL REPAIR ALL DAMAGE DONE THERETO AS A RESULT OF HIS OPERATIONS.

3. REMOVAL AND STORAGE OF MATERIAL:

A. IN THE BUSINESS DISTRICTS OR IN STREETS THAT ARE IMPORTANT THOROUGHFARES, OR IN NARROW STREETS OR AT ANY OTHER LOCATIONS WHERE THE WORKING SPACE IS LIMITED, THE MATERIAL EXCAVATED FROM THE FIRST 100 FEET OF ANY OPENING, OR FROM SUCH ADDITIONAL LENGTH AS MAY BE NECESSARY, WHEN REQUIRED BY THE ENGINEER, SHALL BE REMOVED FROM THE AREA AS SOON AS EXCAVATED. THE MATERIAL SUBSEQUENTLY EXCAVATED SHALL BE USED TO REFILL THE TRENCH, EXCEPT WITHIN STATE OR TOWN HIGHWAYS WHERE THE MATERIAL USED TO REFILL THE TRENCH SHALL CONSIST OF RUN OF BANK BACKFILL MATERIAL. IN NO CASE WILL THE CONTRACTOR BE ALLOWED TO CAST EXCAVATED MATERIAL BEYOND THE CURB OR RIGHT-OF-WAY LINES, OR ON SIDEWALKS OR LAWNS.

B. IN CASE MORE MATERIAL IS EXCAVATED FROM THE TRENCH THAN CAN BE BACKFILLED OVER THE COMPLETED PIPE OR CAN BE STORED ON THE STREET OR WITHIN THE LIMITS OF THE RIGHT-OF-WAY, LEAVING SPACE FOR THE TRAFFIC AND DRAINAGE AS HEREIN PROVIDED, THE EXCESS MATERIAL SHALL BE REMOVED TO SOME CONVENIENT PLACE PROVIDED BY THE CONTRACTOR. THE CONTRACTOR SHALL BRING BACK AS MUCH OF THE MATERIAL SO REMOVED, AS MAY BE REQUIRED TO PROPERLY BACKFILL THE TRENCH, OR IF THE PROPER KIND; OR, IF SO REQUIRED BY THE ENGINEER, THE CONTRACTOR SHALL FURNISH SUCH OTHER SUITABLE MATERIAL AS MAY BE NECESSARY.

C. WHEN IT IS NECESSARY TO HAUL SOFT OR WET MATERIAL OVER THE STREETS, THE CONTRACTOR SHALL PROVIDE SUITABLE TIGHT VEHICLES TO PREVENT SPILLAGE.

D. ALL TOPSOIL SHALL BE REMOVED FROM THE LIMITS OF TRENCHES BEFORE THE COMMENCEMENT OF TRENCH EXCAVATION. AFTER THE TRENCHES ARE BACKFILLED, THE TOPSOIL SHALL BE REPLACED.

4. ORDER OF WORK:

A. THE CONTRACTOR SHALL SUBMIT A PROGRESS SCHEDULE AND SHALL CARRY ON HIS WORK IN STRICT ACCORDANCE THEREWITH. DEVIATIONS FROM THE PROGRESS SCHEDULE MAY BE MADE ONLY WITH THE APPROVAL OF THE ENGINEER.

B. SERVICE CONNECTIONS SHALL BE CONSTRUCTED EITHER AT THE SAME TIME AS THE MAIN SEWER OR IMMEDIATELY AFTER ITS COMPLETION.

C. ALL STREET PAVING SHALL BE REPLACED BY THE CONTRACTOR, AFTER WHICH THE STREET SURFACES SHALL BE CLEANED AS SPECIFIED HEREIN.

D. THE FAILURE OF THE CONTRACTOR TO COMPLY WITH THESE REQUIREMENTS CONCERNING INSTALLATION OF SERVICE CONNECTIONS AND MANHOLES, REPAVING AND CLEANING OF STREETS SHALL BE SUFFICIENT CAUSE FOR THE ENGINEER TO STOP ALL OTHER WORK ON THE PROJECT UNTIL THESE REQUIREMENTS HAVE BEEN MET.

5. SEWER LINES AND GRADES:

A. SEWER LINES AND GRADES SHALL BE LAID OUT AND MAINTAINED DURING CONSTRUCTION IN THE FOLLOWING MANNER.

B. BEFORE BEGINNING THE EXCAVATION FOR ANY RUN OF MAIN SEWER, THE CONTRACTOR'S FORCES SHALL SET CONTROL POINTS FOR LINE AND GRADE. IN UNPAVED OR UNSURFACED AREAS, THESE POINTS SHALL BE PLACED ON THE TOP OF STAKES SECURELY DRIVEN INTO THE GROUND. IN PAVED AREAS, THEY MAY BE SPIKES DRIVEN INTO THE PAVING OR CROSSES CUT INTO THE PAVING, AND, IN EITHER CASE, ENCLOSED IN A PAINTED CIRCLE. STAKES OR POINTS SHALL BE SUFFICIENTLY OFFSET FROM THE CENTERLINE SO AS TO BE UNDISTURBED DURING THE EXCAVATION AND PIPE LAYING OPERATIONS. THE OFFSET SHALL BE ON THE SIDE OF THE CENTERLINE OPPOSITE TO THAT ON WHICH EXCAVATION WILL BE THROWN. THE FIRST STAKE OR POINT SHALL BE SET 25 FEET DISTANT FROM THE MANHOLE HAVING THE LOWER INVERT; SUCCEEDING STAKES SHALL BE SET 25 FEET APART. ELEVATIONS OF THE TOP OF STAKES, OR IF POINTS ARE USED, ON THE SURFACE OF THE PAVING ON THE CENTERLINE OF THE SEWER OPPOSITE THE POINTS, SHALL BE TAKEN BY THE CONTRACTOR, USING A SURVEYOR'S LEVEL. THE CONTRACTOR SHALL RECORD THESE ELEVATIONS AND COMPUTE THE DEPTHS OF CUT TO THE INVERT OF THE SEWER AND MARK BOTH THE STATIONING AND THE COMPUTED DEPTHS OF CUT ON EACH STAKE WITH KEEP OR ON THE ROAD SURFACE WITH PAINT. THE CONTRACTOR SHALL USE THESE DEPTHS OF CUT AS GUIDES FOR THE ROUGH EXCAVATION, MAKING DUE ALLOWANCE FOR EXCAVATING TO THE LOWER DEPTH TO ACCOMMODATE THE REQUIRED PIPE BEDDING, AND FOR CONCRETE CRADLES OR CONCRETE ENCASEMENTS. EXCAVATION SHALL BEGIN AT THE MANHOLE HAVING THE LOWER INVERT AND PROCEED UPGRADE.

6. WIDTH AND DEPTH OF TRENCHES:

A. FROM THE SUBGRADE ELEVATION TO AN ELEVATION AT LEAST 12 INCHES ABOVE THE TOP OF THE OUTSIDE BARREL OF THE PIPE, THE BANKS OF TRENCHES IN ALL CASES SHALL BE EXCAVATED TO VERTICAL LINES AND THE TRENCHES SHALL BE NOT LESS THAN 12 INCHES NOR MORE THAN 16 INCHES WIDER THAN THE OUTSIDE DIAMETER, AT THE BARREL OF THE PIPE TO BE LAID THEREIN. THE TRENCHES SHALL BE EXCAVATED TRUE TO LINE SO THAT A CLEAR SPACE NOT LESS THAN 12 INCHES OR MORE THAN 14 INCHES IN WIDTH IS PROVIDED ON EACH SIDE OF THE BARREL OF THE PIPE. IF SHEETING IS REQUIRED, THE FOREGOING DIMENSIONS SHALL BE APPLICABLE TO THE INSIDE FACES OF THE SHEETING.

B. FROM A POINT 12 INCHES ABOVE THE TOP OF THE OUTSIDE BARREL OF THE PIPE TO THE SURFACE, THE BANKS OF TRENCHES IN ALL STREETS, ROADS OR HIGHWAYS, PAVED OR UNPAVED, SHALL BE KEPT AS NEARLY VERTICAL AS POSSIBLE, AND IN NO CASE SHALL THE WIDTH OF THE TRENCH AT THE TOP EXCEED THE OUTSIDE DIAMETER OF THE PIPE PLUS 40 INCHES. IF THE SPECIFIED MAXIMUM WIDTH OF THE TRENCH CANNOT OTHERWISE BY MAINTAINED, THE CONTRACTOR SHALL INSTALL TEMPORARY SHEETING. WHERE SEWERS ARE TO BE CONSTRUCTED IN RIGHTS-OF-WAY OR EASEMENTS IN OPEN COUNTRY, THE SPECIFIED MAXIMUM WIDTH OF THE TRENCH AT THE TOP MAY BE EXCEEDED ONLY IF CONSTRUCTION IS KEPT ENTIRELY WITHIN THE LIMITS OF THE EASEMENTS OR RIGHTS-OF-WAY AND CAN BE CARRIED ON WITHOUT DAMAGE TO ADJOINING PROPERTY. THE ANGLE OF SLOPE SHALL BE THE ANGLE AT WHICH THE TRENCH BANK WILL STAND WITHOUT SLIDING AND IN NO CASE SHALL THE ANGLE OF SLOPE BE STEEPER THAN ONE-HALF HORIZONTAL TO ONE VERTICAL.

C. IN LOCATIONS OTHER THAN ON EASEMENTS OR RIGHTS-OF-WAY, THE ENGINEER MAY, AS WARRANTED BY WORKING CONDITIONS AND WHERE PERMITTED BY THE NEW YORK DEPARTMENT OF LABOR REQUIREMENTS, WAIVE THE REQUIREMENTS THAT THE MAXIMUM WIDTH AT THE TOP OF THE TRENCH SHALL NOT EXCEED THE OUTSIDE DIAMETER OF THE PIPE PLUS 40 INCHES.

D. EXCEPT AT LOCATIONS WHERE EXCAVATION OF UNSUITABLE MATERIAL IS REQUIRED, CARE SHALL BE TAKEN NOT TO EXCAVATE BELOW THE DEPTHS SPECIFIED. WHEN THE MATERIAL ENCOUNTERED AT SUBGRADE IS UNSTABLE, OR WHERE, IN THE OPINION OF THE ENGINEER, THE GROUND DOES NOT AFFORD A SUFFICIENTLY FIRM FOUNDATION, THE CONTRACTOR SHALL EXCAVATE THE TRENCH TO SUCH INCREASED DEPTH AS MAY BE REQUIRED BY THE ENGINEER AND THEN SHALL REFILL THE TRENCH TO SUBGRADE WITH RUN OF BANK GRAVEL, THOROUGHLY COMPACTED TO THE SATISFACTION OF THE ENGINEER, OR IF REQUIRED BY THE ENGINEER, THE CONTRACTOR SHALL CONSTRUCT A TIMBER FOUNDATION. IF EARTH TRENCHES ARE EXCAVATED BEYOND THE SPECIFIED DEPTHS WITHOUT WRITTEN REQUIREMENTS OF THE ENGINEER, THEY SHALL BE BACKFILLED TO THE PROPER GRADE WITH THOROUGHLY TAMPED RUN OF BANK GRAVEL.

7. LENGTH OF TRENCH:

A. NO TRENCH SHALL BE OPENED MORE THAN 100 FEET IN ADVANCE OF THE PIPE LINES LAID. THE CONTRACTOR SHALL LIMIT ALL TRENCH OPENINGS TO A DISTANCE COMMENSURATE WITH ALL RULES OF SAFETY.

B. IF THE WORK IS STOPPED EITHER TOTALLY OR PARTIALLY, THE CONTRACTOR SHALL PROVIDE ADEQUATE PLATES, FLASHERS, ETC. TO PROTECT THE MOTORIST AND PEDESTRIAN DURING NON-WORKING HOURS. ALL OPEN TRENCHES SHALL BE COVERED DURING NON-WORKING HOURS.

8. PUMPING AND DRAINING:

A. THE CONTRACTOR SHALL REMOVE, BY PUMPING OR DRAINING, ANY WATER WHICH MAY ACCUMULATE IN THE TRENCHES AND OTHER EXCAVATIONS AND SHALL BUILD ALL DAMS AND DO ALL OTHER WORK NECESSARY TO KEEP THE TRENCHES OR OTHER EXCAVATION AS FREE FROM WATER AS POSSIBLE. WHERE IT IS IMPRACTICAL TO COMPLETELY DRAIN THE TRENCH, SPECIAL PIPE OR JOINTING MATERIALS MAY BE AUTHORIZED AT NO ADDITIONAL EXPENSE TO THE OWNER. WHILE THE PIPELINES ARE BEING LAID, THE CONTRACTOR SHALL HAVE SUFFICIENT PUMPING MACHINERY READY FOR IMMEDIATE USE. ALL SURFACE WATERS SHALL BE PREVENTED FROM ENTERING THE OPEN DITCHES OR EXCAVATIONS BY PROPER GRADING OF THE SURFACE IN THE VICINITY OF THE EXCAVATION. EROSION AND SEDIMENT CONTROL SHALL BE EXERCISED IN ACCORDANCE WITH THE APPROVED PLAN. UNDER NO CIRCUMSTANCES SHALL ANY PUMPED WATER BE DISCHARGED TO ANY SANITARY SEWER.

9. MAINTENANCE OF GUTTERS:

A. THE CONTRACTOR SHALL KEEP THE GUTTERS OPEN AT ALL TIMES SO THE FLOW, STORM OR OTHER WATERS SHALL NOT BE OBSTRUCTED. IF THE MATERIAL EXCAVATED FROM THE TRENCHES MUST TEMPORARILY EXTEND OVER THE GUTTERS, IT SHALL BE THE DUTY OF THE CONTRACTOR TO PLANK OR BRIDGE OVER THE GUTTERS, WITHOUT EXTRA COMPENSATION, SO THE FLOW OF WATER IS NOT IMPEDED. EROSION AND SEDIMENTATION CONTROL SHALL BE EXERCISED IN ACCORDANCE WITH THE APPROVED PLAN.

10. MAINTENANCE OF TRAFFIC:

A. WORK SHALL BE CONDUCTED SO AS TO CAUSE A MINIMUM OF CONVENIENCE TO PEDESTRIAN AND VEHICULAR TRAFFIC AND TO PRIVATE AND PUBLIC PROPERTIES ALONG THE LINE OF WORK. IT SHALL BE THE DUTY OF THE CONTRACTOR, AT ALL TIMES, TO MAINTAIN CROSSING, WALKS, SIDEWALKS, AND OTHER ROADWAYS OPEN TO THE TRAFFIC AND IN A SATISFACTORY CONDITION, AND TO KEEP ALL FIRE HYDRANTS, WATER VALVES, FIRE ALARM BOXES, AND LETTER BOXES ACCESSIBLE FOR USE. WHENEVER IT IS NECESSARY TO MAINTAIN PEDESTRIAN TRAFFIC OVER OPEN TRENCHES, A TIMBER BRIDGE AT LEAST 3 FEET IN WIDTH AND EQUIPPED WITH SIDE RAILINGS SHALL BE PROVIDED. WHEN THE EXCAVATED MATERIAL WILL ENCROACH UPON SIDEWALKS OR PRIVATE PROPERTY, PLANKING SHALL BE PLACED IN ORDER TO KEEP THE SIDEWALK OR PRIVATE PROPERTY CLEAR OF EXCAVATED MATERIAL.

B. IN IMPORTANT THOROUGHFARES, HIGHWAYS OR NARROW STREETS, THE MATERIAL EXCAVATED FROM THE TRENCH SHALL BE REMOVED FROM THE SITE OF THE WORK AT THE CONTRACTOR'S EXPENSE AND TO BRING BACK AS MUCH OF THE ACCEPTED MATERIAL AS NECESSARY TO PROPERLY REFILL THE TRENCH; OR HE SHALL, AT HIS OWN COST AND EXPENSE, FURNISH SUCH OTHER SUITABLE MATERIALS AS MAY BE NECESSARY TO PROPERLY REFILL THE TRENCH.

C. WHEN IT IS NECESSARY TO HAUL SOFT OR WET MATERIALS OVER PUBLIC STREETS, THE CONTRACTOR SHALL PROVIDE SUITABLE VEHICLES AND SHALL CONFORM TO ALL LAWS AND ORDINANCES RELEVANT TO SUCH HAULING.

11. ROCK EXCAVATION:

A. UNDER THIS CONTRACT, ALL EXCAVATION SHALL BE UNCLASSIFIED; THAT IS, THE REMOVAL OF ALL MATERIAL OF ANY NATURE, KIND, TYPE OF ORIGIN WILL BE CONSIDERED THE SAME AND SHALL BE INCLUDED IN THE PRICING.

B. UNLESS OTHERWISE ACCEPTED BY THE ENGINEER, ROCK SHALL BE FULLY TAKEN OUT AT LEAST 25 FEET IN ADVANCE OF PIPE LAYING TO SUBGRADE AS DEFINED HEREIN, AND TO A WIDTH NOT TO EXCEED THE SPECIFIED WIDTH OF THE TRENCH, FOR THE SIZE OF PIPE TO BE LAID THEREIN.

C. IF ROCK BELOW THE SPECIFIED GRADE IS SHATTERED DUE TO EXCESSIVE DRILLING OR BLASTING, AND IF, IN THE OPINION OF THE ENGINEER, IT IS UNFIT FOR FOUNDATION, SUCH SHATTERED ROCK SHALL BE REMOVED AND THE AREA BACKFILLED TO THE PROPER GRADE WITH CONCRETE OR OTHER MATERIAL ACCEPTABLE TO THE ENGINEER.

D. WHERE MANHOLES ARE EXCAVATED IN ROCK, THEY SHALL BE EXCAVATED 1 FOOT OUTSIDE THE EXTERIOR LINES OF THE WALLS OF THE MANHOLES AND TO A DEPTH OF 6 INCHES BELOW THE BOTTOM.

E. ALL EXCAVATED MATERIAL WHICH IS UNFIT FOR REFILLING MUST BE IMMEDIATELY REMOVED FROM THE SITE OF THE WORK.

F. WHEREVER ROCK IS ENCOUNTERED IN THE EXCAVATIONS FOR MANHOLES IN WHICH BLANK CONNECTIONS ARE TO BE LEFT FOR FUTURE EXTENSIONS OF THE SEWERS, THE ROCK SHALL BE EXCAVATED FOR A DISTANCE OF NOT LESS THAN 10 FEET FROM THE CENTER OF THE MANHOLE, IN THE DIRECTION OF THE PROPOSED EXTENSION OF THE SEWER, AND THE EXCAVATION SHALL CONFORM TO THE LINES OF THE PRISM REQUIRED BY THE DIMENSIONS OF SUCH EXTENSION.

12. BLASTING:

A. ALL BLASTS SHALL BE PROPERLY MATTED AND SECURELY COVERED. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR INJURY TO PERSONS OR PROPERTY LOCATED WITHIN OR BEYOND THE AREA OR SCOPE OF THE PROJECT THAT MAY RESULT FROM THIS USE OF EXPLOSIVES.

B. ALL BLASTING SHALL BE DONE UNDER THE SUPERVISION OF A LICENSED BLASTER AND SUBJECT TO STATE, FEDERAL, COUNTY OR LOCAL REGULATIONS FOR BLASTING. WHENEVER ANY PIPE MAIN OR CONDUIT IS ENCOUNTERED IN THE TRENCH, ALL MATERIAL WITHIN 5 FEET OF THE SAME SHALL BE REMOVED BY SOME METHOD OTHER THAN BLASTING OR AS OTHERWISE GOVERNED BY THE OWNER OF THE UTILITY.

C. CONTRACTOR WILL BE RESPONSIBLE FOR THE DEPTHS TO WHICH ALL BLASTING IS PERFORMED.

D. SHOULD ANY STREET PAVING ADJOINING ANY TRENCH BE DAMAGED IN CONSEQUENCE OF THE CONTRACTOR'S BLASTING OPERATIONS, HE SHALL IMMEDIATELY CEASE HIS BLASTING OPERATIONS AND REPAIR THE DAMAGED STREET PAVING; ALSO, HE SHALL NOT AGAIN PROCEED WITH ANY BLASTING UNTIL HE HAS SUBMITTED TO AND OBTAINED APPROVAL FROM THE ENGINEER.

13. BRACED AND SHEETED TRENCHES:

A. OPEN CUT TRENCHES SHALL BE SHEETED AND BRACED AS REQUIRED BY ANY GOVERNING FEDERAL AND STATE LAWS AND MUNICIPAL ORDINANCES, AND AS MAY BE NECESSARY TO PROTECT LIFE, PROPERTY OR THE WORK. THE COST OF FURNISHING, PLACING AND REMOVING THE SHEETING AND BRACING NECESSARY TO PROTECT LIFE, PROPERTY OR THE WORK SHALL BE INCLUDED IN THE BID PRICE FOR THE PIPE.

14. CAUTION IN EXCAVATION:

A. THE CONTRACTOR SHALL PROCEED WITH CAUTION IN THE EXCAVATION AND PREPARATION OF THE TRENCH SO THAT THE EXACT LOCATION OF UNDERGROUND STRUCTURES, BOTH KNOWN AND UNKNOWN MAY BE DETERMINED, AND HE SHALL BE HELD RESPONSIBLE FOR THE REPAIR OF SUCH STRUCTURES WHEN BROKEN OR OTHERWISE DAMAGED BECAUSE OF CARELESSNESS ON HIS PART.

15. SUBSURFACE EXPLORATIONS:

A. WHENEVER, IN OPINION OF THE OWNER, IT IS NECESSARY TO EXPLORE AND EXCAVATE TO DETERMINE THE LOCATION OF EXISTING UNDERGROUND STRUCTURES, THE CONTRACTOR SHALL MAKE EXPLORATIONS AND EXCAVATIONS FOR SUCH PURPOSES.

16. PIPE BEDDING-STORM SEWER:

A. THE TRENCH SHALL BE EXCAVATED TO A DEPTH OF 6 INCHES BELOW THE OUTSIDE DIAMETER OF THE PIPE BARREL, OR DEEPER IF SO SPECIFIED. THE RESULTANT SUBGRADE SHALL BE UNDISTURBED. THE BEDDING SHALL THEN BE PREPARED BY PLACING A THOROUGHLY COMPACTED MATERIAL IN 6 INCH UNCOMPACTED LAYERS TO 12 INCHES ABOVE TOP OF PIPE. BEDDING SHALL PROVIDE UNIFORM AND CONTINUOUS BEARING AND SUPPORT FOR THE PIPE AT EVERY POINT BETWEEN BELL HOLES.

17. PIPE BEDDING-SANITARY SEWER, FORCEMAINS, LOW PRESSURE SANITARY SEWERS AND WATERMAINS:

A. THE TRENCH SHALL BE EXCAVATED TO A DEPTH OF 6 INCHES BELOW THE OUTSIDE DIAMETER OF THE PIPE BARREL, OR DEEPER IF SO SPECIFIED. THE RESULTANT SUBGRADE SHALL BE UNDISTURBED. THE BEDDING SHALL THEN BE PREPARED BY PLACING A THOROUGHLY COMPACTED MATERIAL IN 6 INCH UNCOMPACTED LAYERS TO 12 INCHES ABOVE TOP OF PIPE. BEDDING SHALL PROVIDE UNIFORM AND CONTINUOUS BEARING AND SUPPORT FOR THE PIPE AT EVERY POINT BETWEEN BELL HOLES.

18. CONCRETE CRADLE AND CONCRETE ENCASEMENT:

A. THE TRENCH SHALL BE EXCAVATED TO A DEPTH OF 6 INCHES BELOW THE OUTSIDE OF THE BARREL OF PIPES 24 INCHES OR LESS AND 9 INCHES BELOW THE OUTSIDE OF THE BARREL OF PIPES LARGER THAN 24 INCHES IN DIAMETER. ALL OF THIS EXCAVATION MAY BE DONE BY MACHINE. QUALITY OF CONCRETE AND METHOD OF PLACEMENT IS SPECIFIED ELSEWHERE.

19. UNSTABLE SUBGRADE:

A. WHERE THE BOTTOM OF THE TRENCH AT SUBGRADE IS FOUND TO BE UNSTABLE OR TO INCLUDE ASHES, CINDERS, ANY TYPE OF REFUSE, VEGETABLE OR OTHER ORGANIC MATERIAL, OR LARGE PIECES OF FRAGMENTS OF INORGANIC MATERIAL WHICH, IN THE OPINION OF THE ENGINEER, SHOULD BE REMOVED, THE CONTRACTOR SHALL EXCAVATE AND REMOVE SUCH UNSUITABLE MATERIAL TO THE WIDTH AND DEPTH RECOMMENDED BY THE ENGINEER. BEFORE PIPE IS LAID, THE SUBGRADE SHALL BE MADE BY BACKFILLING WITH BEDDING MATERIAL IN 6 INCH UNCOMPACTED LAYERS, THOROUGHLY TAMPED AND THE BEDDING PREPARED AS HEREIN BEFORE SPECIFIED. NO PAYMENT WILL BE MADE FOR ADDITIONAL EXCAVATION REQUIRED TO REMOVE UNSTABLE MATERIAL BASED ON A UNIT PRICE AGREED UPON BY OWNER AND CONTRACTOR PRIOR TO PERFORMANCE OF THE ADDITIONAL EXCAVATION.

20. SPECIAL FOUNDATIONS:

A. WHERE THE BOTTOM OF THE TRENCH AT THE SUBGRADE IS FOUND TO CONSIST OF MATERIAL WHICH IS UNSTABLE TO SUCH A DEGREE THAT, IN THE OPINION OF THE ENGINEER, IT CANNOT BE REMOVED AND REPLACED WITH AN ACCEPTED MATERIAL THOROUGHLY COMPACTED IN PLACE TO SUPPORT THE PIPE PROPERLY, THE CONTRACTOR SHALL CONSTRUCT A FOUNDATION FOR THE PIPE, CONSISTING OF PILING, TIMBER OR OTHER MATERIALS, IN ACCORDANCE WITH PLANS PREPARED BY THE ENGINEER..

21. EXCAVATION IN FILL:

A. WHEN THE PIPE IS LAID IN FILL, THE COMPACTED EMBANKMENT SHALL BE BROUGHT TO A HEIGHT OF AT LEAST 12 INCHES ABOVE THE PROPOSED TOP OF THE PIPE BEFORE THE TRENCH IS EXCAVATED.

22. EXCAVATION METHODS-STORM SEWER:

A. GENERAL: BACKFILLING SHALL NOT BE DONE IN FREEZING WEATHER EXCEPT BY PERMISSION OF THE ENGINEER, AND IT SHALL NOT BE MADE WITH FROZEN MATERIAL. NO FILL SHALL BE MADE WHERE THE MATERIAL ALREADY IN THE TRENCH IS FROZEN. ANY CONSOLIDATION METHOD UTILIZING WATER, SUCH AS JETTING OR PUDDLING SHALL NOT BE PERMITTED.

B. BACKFILL BENEATH AND TO CENTERLINE OF PIPE - BEDDING MATERIAL: ALL TRENCHES SHALL BE BACKFILLED BY HAND, FROM THE BOTTOM OF THE TRENCH TO THE CENTERLINE OF THE PIPE WITH BEDDING MATERIAL PLACED AND COMPACTED WITH HAND-OPERATED MECHANICAL TAMPERS IN LOOSE LAYERS OF NOT MORE THAN 4 INCHES IN DEPTH TO PROVIDE SPECIFIED COMPACTION AROUND AND UNDER THE HAUNCHES OF THE PIPE. BACKFILL MATERIAL SHALL BE DEPOSITED IN THE TRENCH FOR ITS FULL WIDTH ON EACH SIDE OF THE PIPE AND FITTINGS SIMULTANEOUSLY. BEDDING BACKFILL SHALL BE USED FOR 6-INCH PIPE AND LARGER WHILE BEDDING BACKFILL SHALL BE USED FOR 4 INCH PIPE AND SMALLER. ALL BACKFILL MATERIAL SHALL BE COMPACTED TO A MINIMUM DENSITY OF 95 PERCENT PROCTOR (ASTM D 1577).

C. BACKFILL OVER PIPE - BEDDING MATERIAL: FROM THE CENTERLINE OF THE PIPE AND FITTINGS TO A DEPTH OF 1 FOOT ABOVE THE TOP OF THE PIPE, THE TRENCH SHALL BE BACKFILLED BY HAND OR ACCEPTED MECHANICAL METHODS. THE CONTRACTOR SHALL USE SPECIAL CARE IN PLACING THIS PORTION OF THE BACKFILL TO AVOID INJURING OR MOVING THE PIPE. THE BACKFILL SHALL BE PLACED AND COMPACTED WITH HAND-OPERATED MECHANICAL TAMPERS IN LOOSE LAYERS OF NOT MORE THAN 4 INCHES IN DEPTH TO PROVIDE SPECIFIED COMPACTION AROUND AND OVER THE HAUNCHES OF THE PIPE. BACKFILL IN THIS SECTION OF THE TRENCH SHALL BE WITH BEDDING MATERIAL UNLESS OTHERWISE SPECIFIED. BEDDING BACKFILL SHALL BE USED FOR 6 INCH PIPE AND LARGER WHILE BEDDING BACKFILL SHALL BE USED FOR 4 INCH PIPE AND SMALLER. BACKFILL MATERIAL SHALL BE COMPACTED TO A MINIMUM DENSITY OF 95 PERCENT PROCTOR (ASTM D 1577).

23. EXCAVATION METHODS-SANITARY SEWERS, FORCEMAINS, LOW PRESSURE SEWER SYSTEMS, AND WATERMAINS:

A. GENERAL: BACKFILLING SHALL NOT BE DONE IN FREEZING WEATHER EXCEPT BY PERMISSION OF THE ENGINEER, AND IT SHALL NOT BE MADE WITH FROZEN MATERIAL. NO FILL SHALL BE MADE WHERE THE MATERIAL ALREADY IN THE TRENCH IS FROZEN. ANY CONSOLIDATION METHOD UTILIZING WATER, SUCH AS JETTING OR PUDDLING SHALL NOT BE PERMITTED. ALL SANITARY SEWER LINE INSTALLATION MUST BE OBSERVED BY THE TOWN ENGINEER PRIOR TO BACKFILLING. THE TOWN ENGINEER MUST OBSERVE ALL SEWER AND WATER TESTING.

B. BACKFILL BENEATH AND TO CENTERLINE OF PIPE - BEDDING MATERIAL: ALL TRENCHES SHALL BE BACKFILLED BY HAND, FROM THE BOTTOM OF THE TRENCH TO THE CENTERLINE OF THE PIPE WITH BEDDING MATERIAL PLACED AND COMPACTED WITH HAND-OPERATED MECHANICAL TAMPERS IN LOOSE LAYERS OF NOT MORE THAN 4 INCHES IN DEPTH TO PROVIDE SPECIFIED COMPACTION AROUND AND UNDER THE HAUNCHES OF THE PIPE. BACKFILL MATERIAL SHALL BE DEPOSITED IN THE TRENCH FOR ITS FULL WIDTH ON EACH SIDE OF THE PIPE AND FITTINGS SIMULTANEOUSLY. ALL BACKFILL MATERIAL SHALL BE COMPACTED TO A MINIMUM DENSITY OF 95 PERCENT PROCTOR (ASTM D 1577).

C. BACKFILL OVER PIPE - BEDDING MATERIAL: FROM THE CENTERLINE OF THE PIPE AND FITTINGS TO A DEPTH OF 1 FOOT ABOVE THE TOP OF THE PIPE, THE TRENCH SHALL BE BACKFILLED BY HAND OR ACCEPTED MECHANICAL METHODS. THE CONTRACTOR SHALL USE SPECIAL CARE IN PLACING THIS PORTION OF THE BACKFILL TO AVOID INJURING OR MOVING THE PIPE. THE BACKFILL SHALL BE PLACED AND COMPACTED WITH HAND-OPERATED MECHANICAL TAMPERS IN LOOSE LAYERS OF NOT MORE THAN 4 INCHES IN DEPTH TO PROVIDE SPECIFIED COMPACTION AROUND AND OVER THE HAUNCHES OF THE PIPE. BACKFILL IN THIS SECTION OF THE TRENCH SHALL BE WITH BEDDING MATERIAL UNLESS OTHERWISE SPECIFIED. BACKFILL MATERIAL SHALL BE COMPACTED TO A MINIMUM DENSITY OF 95 PERCENT PROCTOR (ASTM D 1577).

24. BACKFILL TO RESTORATION DEPTH:

A. STATE, CITY AND TOWN ROADS INCLUDING DRIVEWAYS - RUN OF BANK GRAVEL: FROM 1 FOOT ABOVE THE TOP OF THE PIPE TO RESTORATION DEPTH, THE TRENCH SHALL BE BACKFILLED BY HAND OR BY ACCEPTED MECHANICAL METHODS. BACKFILL IN THIS SECTION OF THE TRENCH SHALL BE RUN OF BANK GRAVEL MATERIAL. CONTRACTOR SHALL SUBMIT, PRIOR TO BEGINNING CONSTRUCTION, A LIST OF THE COMPACTION EQUIPMENT TO BE UTILIZED ON THE PROJECT, THE RECOMMENDATIONS OF THE EQUIPMENT MANUFACTURER AS TO THE MAXIMUM LIFT THICKNESS THAT CAN BE PLACED, AND THE METHOD OF COMPACTION. IN NO CASE SHALL LIFT THICKNESS PLACED EXCEED THE LIMITS SPECIFIED BY THE MANUFACTURER'S RECOMMENDATIONS OR A MAXIMUM OF 2 FEET, WHICHEVER IS THE SMALLER. HOWEVER, IF THE EQUIPMENT MANUFACTURER'S SPECIFIED COMPACTION IS FOLLOWED AND THE SPECIFIED COMPACTION IS NOT OBTAINED, THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, REMOVE, REPLACE AND RETEST AS MANY TIMES AS IS REQUIRED TO OBTAIN THE SPECIFIED COMPACTION. CONSOLIDATION SHALL PROCEED FROM THE CENTER OF THE TRENCH TO THE SIDES TO PREVENT ARCHING. BACKFILL MATERIAL SHALL BE COMPACTED TO A MINIMUM DENSITY OF 95 PERCENT PROCTOR (ASTM D1557).

B. LAWN, MEADOWS AND CULTIVATED FIELDS - SUITABLE BACKFILL: FROM 1 FOOT ABOVE THE TOP OF THE PIPE TO RESTORATION DEPTH, THE TRENCH SHALL BE BACKFILLED BY HAND OR BY ACCEPTED MECHANICAL METHODS. BACKFILL IN THIS SECTION OF THE TRENCH SHALL BE SUITABLE BACKFILL MATERIAL. CONTRACTOR SHALL SUBMIT, PRIOR TO BEGINNING CONSTRUCTION, A LIST OF THE COMPACTION EQUIPMENT TO BE UTILIZED ON THE PROJECT, THE RECOMMENDATIONS OF THE EQUIPMENT MANUFACTURER AS TO THE MAXIMUM LIFT THICKNESS WHICH CAN BE PLACED, AND THE METHOD OF COMPACTION TO BE USED WITH THIS EQUIPMENT TO ACHIEVE THE REQUIRED COMPACTION. IN NO CASE SHALL LIFT THICKNESS PLACE EXCEED THE LIMITS SPECIFIED BY THE MANUFACTURER'S RECOMMENDATIONS OR A MAXIMUM OF 2 FEET, WHICHEVER IS THE SMALLER. HOWEVER, IF THE EQUIPMENT MANUFACTURER'S SPECIFIED COMPACTION IS FOLLOWED AND THE SPECIFIED COMPACTION IS NOT OBTAINED, THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, REMOVE, REPLACE AND RETEST AS MANY TIMES AS IS REQUIRED TO OBTAIN THE SPECIFIED COMPACTION. CONSOLIDATION SHALL PROCEED FROM THE CENTER OF THE TRENCH TO THE SIDES TO PREVENT ARCHING. BACKFILL MATERIAL SHALL BE COMPACTED TO A MINIMUM DENSITY OF 95 PERCENT PROCTOR (ASTM D 1557).

25. CLEAN-UP:

A. DURING CONSTRUCTION, THE SURFACES OF ALL AREAS INCLUDING, BUT NOT LIMITED TO, ROADS, STREETS AND DRIVEWAYS SHALL BE MAINTAINED ON A DAILY BASIS TO PRODUCE A SAFE, DESIRABLE, AND CONVENIENT CONDITION. STREETS SHALL BE SWEPT AFTER BACKFILLING AND RECLEANED AS DUST, MUD, STONES AND DEBRIS CAUSED BY THE WORK, OR RELATED TO THE WORK AGAIN ACCUMULATES. FAILURE OF THE CONTRACTOR TO PERFORM THIS WORK SHALL BE CAUSE FOR THE ENGINEER TO ORDER THE WORK BY OTHERS, AND BACK CHARGE ALL COSTS TO THE CONTRACTOR.

B. ALL SURPLUS MATERIALS FURNISHED BY THE CONTRACTOR AND TEMPORARY STRUCTURES SHALL BE REMOVED FROM THE SITE BY THE CONTRACTOR. ALL DIRT, RUBBISH AND EXCESS EARTH FROM THE EXCAVATION SHALL BE DISPOSED OF BY THE CONTRACTOR IN A MANNER ACCEPTABLE TO ALL GOVERNING AGENCIES. THE CONSTRUCTION SITE SHALL BE LEFT CLEAN AT THE END OF EACH WORKING DAY TO THE SATISFACTION OF THE ENGINEER. ALL SURPLUS MATERIALS FURNISHED BY THE OWNER AND DELIVERED TO THE SITE BY THE CONTRACTOR SHALL BE REMOVED AND DELIVERED BY THE CONTRACTOR TO A LOCATION DESIGNATED BY THE OWNER. ALL SURPLUS MATERIALS FURNISHED AND DELIVERED BY THE OWNER WILL BE REMOVED BY THE OWNER.

C. IN THE EXECUTION OF THIS WORK, THE CONTRACTOR SHALL CONFORM TO THE APPROVED EROSION AND SEDIMENTATION CONTROL PLAN.

26. RESTORATION OF UNPAVED AREAS:

A. THE CONTRACTOR SHALL CROWN TO SUCH HEIGHT AS REQUIRED BY THE ENGINEER THE TOP OF ALL BACKFILLED EXCAVATION IN ALL UNPAVED AREAS, WHERE SUCH AREAS ARE NOT USED AS A WAY FOR VEHICLES.

27. RESTORATION OF PAVED AREAS:

A. UNLESS OTHERWISE DIRECTED, TEMPORARY PAVING SHALL BE MAINTAINED IN ALL TRENCHES WITHIN PAVED AREAS FOR A PERIOD OF 90 DAYS OR AS DIRECTED BY THE ENGINEER, AFTER WHICH PERMANENT PAVING SHALL BE INSTALLED.

28. RESPONSIBILITY FOR CONDITION OF EXCAVATION:

A. CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE CONDITION AND RESULTS OF ALL EXCAVATIONS MADE BY HIM. ALL SLIDES AND CAVE-INS SHALL BE REMOVED BY THE CONTRACTOR AT WHATEVER TIME AND UNDER WHATEVER CIRCUMSTANCES THEY MAY OCCUR.

B. THE FAILURE OR REFUSAL OF THE ENGINEER TO SUGGEST THE USE OF BRACING OR SHEETING; OR A BETTER QUALITY, GRADE OR SECTION, OR LARGER SIZES OF STEEL OR TIMBER; OR TO SUGGEST SHEETING, BRACING, STRUTS, OR SHORING TO BE LEFT IN PLACE, SHALL NOT IN ANY WAY OR TO ANY EXTENT RELIEVE THE CONTRACTOR OF ANY RESPONSIBILITY CONCERNING THE CONDITION OF EXCAVATION OR ANY OF HIS OBLIGATIONS, NOR IMPOSE ANY LIABILITY ON THE ENGINEER OR THE AUTHORITY; NOR SHALL ANY DELAY, WHETHER CAUSED BY ANY ACTION OR WANT OF ACTION ON THE PART OF THE CONTRACTOR, OR BY ANY ACT OF THE ENGINEER, AUTHORITY OR THEIR AGENTS OR EMPLOYEES RESULTING IN THE KEEPING OF AN EXCAVATION OPEN LONGER THAN WOULD OTHERWISE BEEN NECESSARY, RELIEVE THE CONTRACTOR FROM THE NECESSITY OF PROPERLY AND ADEQUATELY PROTECTING THE EXCAVATION FROM CAVING OR SLIPPING, NOR FROM ANY OF HIS OBLIGATIONS RELATING TO INJURY OF PERSONS OR PROPERTY.

29. PROTECTION OF UTILITIES, PROPERTY AND STRUCTURES:

A. THE EXISTENCE AND LOCATION OF UNDERGROUND UTILITIES AS INDICATED ON THE PLANS IS PRESENTED MERELY TO SERVE AS A NOTIFICATION THAT SUCH UTILITIES DO EXIST IN THE GENERAL PROXIMITY OF THE WORK. ANY UTILITIES NOT SHOWN, OR NOT LOCATED AS SHOWN, SHALL NOT BE CAUSE FOR THE CONTRACTOR TO DENY RESPONSIBILITY FOR THEIR PROTECTION AND/OR REPAIR DURING CONSTRUCTION.

B. THE CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES IN ADVANCE OF CONSTRUCTION TO INCLUDE REQUESTING THE UTILITIES TO BE LOCATED IN ACCORDANCE WITH NYS INDUSTRIAL CODE RULE 753, AND COOPERATE WITH AGENTS OF THESE COMPANIES DURING THE PROGRESS OF THE WORK. PROCEDURES FOR EMERGENCY ACTION AND REPAIRS TO UTILITIES SHALL BE ESTABLISHED WITH THE UTILITY COMPANY PRIOR TO COMMENCEMENT OF THE WORK. DURING THE COURSE OF HIS WORK, IF THE CONTRACTOR DAMAGES ANY OF THE AFOREMENTIONED UTILITIES, HE SHALL IMMEDIATELY FOLLOW THE PROCEDURE OF EMERGENCY ACTION AND REPAIR AS ESTABLISHED AT HIS OWN EXPENSE.

C. WHENEVER THE CONTRACTOR, DURING THE PROGRESS OF THE EXCAVATION, SHALL UNCOVER SERVICE PIPES OR LINES, WHICH BECAUSE OF INJURY OR AGE ARE IN POOR CONDITION, HE SHALL IMMEDIATELY NOTIFY THE PROPER AUTHORITY IN ORDER THAT STEPS MAY BE TAKEN FOR REPLACEMENT OR REPAIR. LOCATIONS OF REPAIRS AND THE PROCEDURES OF REPAIRS THAT HAVE BEEN MADE SHALL BE RECORDED BY THE CONTRACTOR.

D. THE CONTRACTOR SHALL, AT HIS EXPENSE, SUSTAIN IN THEIR PLACES AND PROTECT FROM DIRECT OR INDIRECT INJURY ALL PIPES, CONDUITS, TRACKS, WALLS, BUILDINGS AND OTHER STRUCTURES OR PROPERTY IN THE VICINITY OF HIS WORK, WHETHER ABOVE OR BELOW THE GROUND, OR THAT MAY APPEAR IN THE TRENCH. HE SHALL AT ALL TIMES HAVE A SUFFICIENT QUANTITY OF TIMBER AND PLANK, CHAINS, ROPES, ETC. ON THE GROUND AND SHALL USE THEM AS NECESSARY FOR SHEETING HIS EXCAVATIONS AND FOR SUSTAINING OR SUPPORTING ANY STRUCTURES THAT ARE UNCOVERED, UNDERMINED, ENDANGERED, THREATENED OR WEAKENED, WHETHER SUCH STRUCTURES ARE OR ARE NOT SHOWN ON THE DRAWINGS.

B. EXISTING PIPES AND UNDERGROUND CONDUITS EXPOSED AS A RESULT OF THE CONTRACTOR'S OPERATIONS SHALL BE ADEQUATELY SUPPORTED ALONG THEIR ENTIRE EXPOSED LENGTH BY TIMBER OR PLANKING, INSTALLED IN SUCH A MANNER THAT THE ANCHORAGE OF THE SUPPORTING MEMBERS WILL NOT BE DISTURBED OR WEAKENED DURING THE BACKFILLING OPERATION. BACKFILL OF SELECTED MATERIAL SHALL BE CAREFULLY RAMMED AND TAMPED UNDER AND AROUND THE SUPPORTS AND ALL SUPPORTS SHALL BE LEFT IN PLACE AS A GUARD AGAINST BREAKAGE OF THE SUPPORTED STRUCTURE DUE TO TRENCH SETTLEMENT. NO ADDITIONAL PAYMENT WILL BE DUE THE CONTRACTOR FOR MATERIAL LEFT IN PLACE AS A GUARD AGAINST BREAKAGE OF THE SUPPORTED STRUCTURE DUE TO TRENCH SETTLEMENT. NO ADDITIONAL PAYMENT WILL BE DUE THE CONTRACTOR FOR MATERIAL LEFT IN PLACE OR FOR THE LABOR OF INSTALLING AND MAINTAINING SUPPORTS.

C. WHERE NECESSARY, IN ORDER TO KEEP ONE SIDE OF THE STREET OR ROADWAY FREE FROM ANY OBSTRUCTION OR TO KEEP THE MATERIAL PILED ALONGSIDE OF THE TRENCH FROM FALLING ON PRIVATE PROPERTY OUTSIDE THE RIGHT-OF-WAY, A SAFE AND SUITABLE FENCE SHALL BE PLACED ALONGSIDE THE TRENCH.

D. THE COST OF ALL WORK RELATED TO UTILITY PROTECTION AND REPAIR SHALL BE INCLUDED IN THE BID PRICE PER LINEAR FEET OF PIPE INSTALLED, OR FOR THE LUMP SUM PRICE OF THE CONTRACT. NO SEPARATE PAYMENT WILL BE MADE FOR UTILITY LOCATION OR REPAIRS.

30. REMOVAL OF OBSTRUCTIONS:

A. SHOULD THE POSITION OF ANY PIPE, CONDUIT, POLE OR OTHER STRUCTURES ABOVE OR BELOW THE GROUND BE SUCH AS, IN THE OPINION OF THE ENGINEER, TO REQUIRE ITS REMOVAL, REALIGNMENT OR CHANGE WILL BE DONE BY THE CONTRACTOR OR WILL BE DONE BY THE OWNER OF THE OBSTRUCTIONS, HOWEVER, SHOULD THIS WORK BE DONE BY THE OWNER OF THE OBSTRUCTIONS, THE CONTRACTOR SHALL UNCOVER AND SUSTAIN THE STRUCTURES BEFORE SUCH REMOVAL AND BEFORE AND AFTER SUCH REALIGNMENT OR CHANGE AS CONSTITUTING PART OF THE WORK OF THE PROJECT.

B. THE CONTRACTOR SHALL BREAK THROUGH AND RECONSTRUCT, IF NECESSARY, THE INVERT OR ARCH OF ANY SEWER, CULVERT OR CONDUIT THAT MAY BE ENCOUNTERED, IF THE SAID STRUCTURE IS IN SUCH A POSITION THAT IN THE JUDGMENT OF THE ENGINEER, AS NOT TO REQUIRE ITS REMOVAL, ALIGNMENT OR COMPLETE RECONSTRUCTION.

C. THE CONTRACTOR SHALL NOT INTERFERE WITH ANY PERSONS, FIRMS OR CORPORATIONS, OR WITH THE AUTHORITY IN PROTECTING, REMOVING, CHANGING OR REPLACING THEIR PIPES, CONDUITS, POLES OR OTHER STRUCTURES; BUT HE SHALL SUFFER SAID PERSONS, FIRMS OR CORPORATIONS, OR THE AUTHORITY TO TAKE ALL SUCH MEASURES AS THEY MAY DEEM NECESSARY OR ADVISABLE FOR THE PURPOSE AFORESAID. AT RAILWAY OR RAILROAD TRACK CROSSINGS, ANY EXPENSE TO WHICH THE OWNER OF THE TRACKAGE IS PUT, IN SHORING UP TRACKS, OR IN MAINTAINING TRAFFIC SHALL BE BORNE BY THE DEVELOPER AND/OR CONTRACTOR WHETHER THE SAME IS BILLED DIRECTLY TO THEM OR TO THE AUTHORITY.D. TREES IN RIGHTS-OF-WAY SHALL NOT BE CUT DOWN EXCEPT BY AUTHORIZATION OF THE ENGINEER.

E. SHRUBBERY THAT WOULD INTERFERE WITH THE CONSTRUCTION SHALL BE CAREFULLY REMOVED, PROTECTED AND REPLANTED OR REPLACED BY THE CONTRACTOR.

31. REPLACEMENT OF STRUCTURES BY CONTRACTOR:

A. THE CONTRACTOR SHALL RESTORE (UNLESS OTHERWISE STIPULATED) ALL SIDEWALKS, CURBINGS, GUTTERS, SHRUBBERY, FENCES, POLES, SOD OR OTHER PROPERTY AND SURFACE STRUCTURES REMOVED OR DISTURBED AS PART OF THE WORK TO A CONDITION EQUIVALENT TO THAT BEFORE THE WORK BEGAN, FURNISHING ALL LABOR AND MATERIALS INCIDENTAL THEREOF.

B. REPLACEMENT OF CURBS, SIDEWALKS, GUTTERS, AND DRAINAGE STRUCTURE(S) SHALL BE IN FULL ACCORDANCE WITH THE MATERIALS AND METHODS IN THESE SPECIFICATIONS, UNLESS OTHERWISE SPECIFIED OR NOTED ON THE DRAWINGS.

32. TOLERANCES:

A. TOP SURFACE OF BACKFILLING UNDER PAVED AREAS AND WITHIN BUILDING AREAS:

1. PLUS OR MINUS ONE INCH FROM REQUIRED ELEVATIONS.

B. TOP SURFACE OF GENERAL BACKFILLING:

1. PLUS OR MINUS ONE INCH FROM REQUIRED ELEVATIONS.

33. FIELD QUALITY CONTROL:

A. COMPACTION TESTING:

1. IN ACCORDANCE WITH ANSI/ASTM D1556, ANSI/ASTM D1557, ASTM D698, ASTM D2167, ASTM D2922, ASTM D3017 AND ASTM D4253.

B. IF TESTS INDICATE WORK DOES NOT MEET SPECIFIED REQUIREMENTS, REMOVE, REPLACE AND RETEST THE WORK.

C. PROOF-ROLL COMPACTED FILL SURFACES UNDER PAVING.

D. FREQUENCY OF TESTS:

1. TRENCH BACKFILL:

A. 1 TEST PER LIFT PER 500 LF, OR FRACTION THEREOF, OF TRENCH IN OPEN AREAS.

B. 1 TEST PER LIFT PER 100 LF, OR FRACTION THEREOF, OF TRENCH IN ROADWAY OR ADJACENT TO STRUCTURES.

2. EMBANKMENT:

A. 1 TEST PER LIFT PER 100 SY.

3. STRUCTURAL BACKFILL:

A. IN-PLACE DENSITY TESTS MAY BE PERFORMED AT ALL LOCATIONS WHERE AT LEAST ONE CUBIC METER OF BACKFILL IS REQUIRED. IN-PLACE DENSITY TESTS WILL BE PERFORMED AS OFTEN AS THE ENGINEER DEEMS NECESSARY TO PROPERLY CONTROL THE QUALITY OF THE COMPACTION WORK.

EARTHWORK

1. DESCRIPTION OF WORK:

A. THE WORK WITHIN THIS SECTION INCLUDES, BUT IS NOT LIMITED TO, THE FURNISHING OF ALL EQUIPMENT, LABOR AND MATERIALS AND PERFORMING ALL OPERATIONS NECESSARY TO PREPARE SUBGRADE FOR BUILDING SLABS, WALKS, AND PAVEMENTS. THIS WILL INCLUDE DRAINAGE FILL COURSE FOR SUPPORT OF BUILDING SLABS; EXCAVATING AND BACKFILLING OF TRENCHES WITHIN BUILDING LINES AND UNDERGROUND MECHANICAL AND ELECTRICAL UTILITIES, AND BURIED MECHANICAL AND ELECTRICAL APPURTENANCES; AND FINAL GRADING IN ACCORDANCE WITH THE SPECIFICATIONS, APPLICABLE DRAWINGS AND CONTRACT DOCUMENTS.

2. SCOPE:

A. SUPPLY ALL MATERIAL, BORROW MATERIAL, EQUIPMENT, AND LABOR NECESSARY OR REQUIRED TO COMPLETE ALL CLEARING, STRIPPING TOPSOIL, EXCAVATING, BACKFILLING, ROUGH GRADING AND SPREADING OF TOPSOIL TO THE GRADES NECESSARY TO COMPLETE THE SITE CONSTRUCTION AS INDICATED ON THE DRAWINGS. THIS SECTION ALSO INCLUDES PROTECTION OF EXISTING FACILITIES AND ANY OTHER WORK PERTAINING TO OR ESSENTIAL TO THE COMPLETE EXCAVATING, FILLING, BACKFILLING, AND ROUGH AND FINE GRADING WORK.

3. DEFINITIONS:

A. EXCAVATION: CONSISTS OF REMOVAL OF MATERIAL ENCOUNTERED TO SUBGRADE ELEVATIONS INDICATED AND SUBSEQUENT DISPOSAL OF MATERIALS REMOVED.

B. UNAUTHORIZED EXCAVATION: CONSISTS OF REMOVAL OF MATERIALS BEYOND INDICATED SUBGRADE ELEVATIONS OR DIMENSIONS WITHOUT SPECIFIC DIRECTION OF ENGINEER. UNAUTHORIZED EXCAVATION, AS WELL AS REMEDIAL WORK DIRECTED BY ENGINEER, SHALL BE AT CONTRACTOR'S EXPENSE.

C. UNDER FOOTINGS, FOUNDATION BASES, OR RETAINING WALLS, FILL UNAUTHORIZED EXCAVATION BY EXTENDING INDICATED BOTTOM ELEVATION OF FOOTING OR BASE TO EXCAVATION BOTTOM WITHOUT ALTERING REQUIRED TOP ELEVATION. LEAN CONCRETE FILL MAY BE USED TO BRING ELEVATIONS TO PROPER POSITION, WHEN ACCEPTABLE TO ENGINEER.

D. IN LOCATIONS OTHER THAN THOSE ABOVE, BACKFILL AND COMPACT UNAUTHORIZED EXCAVATIONS AS SPECIFIED FOR AUTHORIZED EXCAVATIONS OF SAME CLASSIFICATION, UNLESS OTHERWISE DIRECTED BY ENGINEER.

E. ADDITIONAL EXCAVATION: WHEN EXCAVATION HAS REACHED REQUIRED SUBGRADE ELEVATIONS, NOTIFY ENGINEER, WHO WILL MAKE AN INSPECTION OF CONDITIONS. IF ENGINEER DETERMINES THAT BEARING MATERIALS AT REQUIRED SUBGRADE ELEVATIONS ARE UNSUITABLE, CONTINUE EXCAVATION UNTIL SUITABLE BEARING MATERIALS ARE ENCOUNTERED AND REPLACE EXCAVATED MATERIAL AS DIRECTED BY ENGINEER. THE CONTRACT SUM MAY BE ADJUSTED BY AN APPROPRIATE CONTRACT MODIFICATION.

F. REMOVAL OF UNSUITABLE MATERIAL AND ITS REPLACEMENT AS DIRECTED WILL BE PAID ON BASIS OF CONDITIONS OF THE CONTRACT RELATIVE TO CHANGES IN WORK.

G. SUBGRADE: THE UNDISTURBED EARTH OR THE COMPACTED SOIL LAYER IMMEDIATELY BELOW GRANULAR SUBBASE, DRAINAGE FILL, OR TOPSOIL MATERIALS.

H. STRUCTURE: BUILDINGS, FOUNDATIONS, SLABS, TANKS, CURBS, OR OTHER MANMADE STATIONARY FEATURES OCCURRING ABOVE OR BELOW GROUND SURFACE.

4. QUALITY ASSURANCE:

A. REFERENCED STANDARDS SHALL BE THE FOLLOWING:

1. NEW YORK DEPARTMENT OF TRANSPORTATION (NYSDOT)

B. CODES AND STANDARDS: PERFORM EXCAVATION WORK IN COMPLIANCE WITH APPLICABLE REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION.

5. PROJECT CONDITIONS:

A. EXISTING UTILITIES: LOCATE EXISTING UNDERGROUND UTILITIES IN AREAS OF EXCAVATION WORK. IF UTILITIES ARE INDICATED TO REMAIN IN PLACE, PROVIDE ADEQUATE MEANS OF SUPPORT AND PROTECTION DURING EARTHWORK OPERATIONS.

B. SHOULD UNCHARTED, OR INCORRECTLY CHARTED, PIPING OR OTHER UTILITIES BE ENCOUNTERED DURING EXCAVATION, CONSULT UTILITY OWNER IMMEDIATELY FOR DIRECTIONS. COOPERATE WITH OWNER AND UTILITY COMPANIES IN KEEPING RESPECTIVE SERVICES AND FACILITIES IN OPERATION. REPAIR DAMAGED UTILITIES TO SATISFACTION OF UTILITY OWNER.

C. DO NOT INTERRUPT EXISTING UTILITIES SERVING FACILITIES OCCUPIED BY OWNER OR OTHERS, DURING OCCUPIED HOURS, EXCEPT WHEN PERMITTED IN WRITING BY ENGINEER AND THEN ONLY AFTER ACCEPTABLE TEMPORARY UTILITY SERVICES HAVE BEEN PROVIDED.

D. PROVIDE MINIMUM OF 48-HOUR NOTICE TO ENGINEER/OWNER, AND RECEIVE WRITTEN NOTICE TO PROCEED BEFORE INTERRUPTING ANY UTILITY.

E. DEMOLISH AND COMPLETELY REMOVE FROM SITE EXISTING UNDERGROUND UTILITIES INDICATED TO BE REMOVED. COORDINATE WITH UTILITY COMPANIES FOR SHUTOFF OF SERVICES IF LINES ARE ACTIVE.

F. PROTECT STRUCTURES, UTILITIES, SIDEWALKS, PAVEMENTS, AND OTHER FACILITIES FROM DAMAGE CAUSED BY SETTLEMENT, LATERAL MOVEMENT, UNDERMINING, WASHOUT, AND OTHER HAZARDS CREATED BY EARTHWORK OPERATIONS.

G. PERFORM EXCAVATION BY HAND WITHIN DRIPLINE OF LARGE TREES TO REMAIN. PROTECT ROOT SYSTEMS FROM DAMAGE OR DRY OUT TO THE GREATEST EXTENT POSSIBLE. MAINTAIN MOIST CONDITION FOR ROOT SYSTEM AND COVER EXPOSED ROOTS WITH MOISTENED BURLAP.

6. MATERIALS:

A. FILL MATERIALS: SHALL BE APPROVED AND CONFORM TO THE FOLLOWING:

1. FILL, EXCEPT AS OTHERWISE SPECIFIED, SHALL BE EARTH, FREE OF DEBRIS, CINDERS, COMBUSTIBLES, FROST, ICE, ROOTS, SOD, WOOD CELLULOSE, AND ORGANIC MATERIALS. UP TO 30 PERCENT OF FILL MATERIAL MAY BE ROCK-LIKE MATERIALS NOT MORE THAN .05 CUBIC FOOT IN VOLUME OR MORE THAN 12 INCHES IN LENGTH, IF EVENLY DISTRIBUTED IN THE TOTAL FILL.
2. THE TOP 18 INCHES OF FILL UNDER TOPSOIL OF LAWN AND PLANTED AREAS SHALL BE EARTH, FREE OF DEBRIS, CINDERS, FROST, ICE, ROOTS, SOD, WOOD, AND ROOTS OVER ¼ INCH IN DIAMETER. UP TO 10 PERCENT OF FILL MATERIALS MAY BE ROCK-LIKE MATERIALS NOT MORE THAN .05 CUBIC FOOT IN VOLUME, NOR MORE THAN 4 INCHES IN LENGTH. ALSO, UP TO 20 PERCENT OF FILL MATERIALS MAY BE TOPSOIL, BUT NOT SOD, UNDER LAWNS ONLY.
3. FILL WITHIN 2 FEET FROM BUILDING SHALL BE SOIL FREE OF DEBRIS, CINDERS, COMBUSTIBLES, FROST, ICE, ROOTS, SOD, WOOD, CELLULOSE, AND ORGANIC MATERIALS. UP TO 30 PERCENT OF FILL MATERIAL MAY BE ROCK-LIKE MATERIALS NOT MORE THAN .02 CUBIC FOOT IN VOLUME OR MORE THAN 3 INCHES IN LENGTH.
4. CRUSHED STONE BACKFILL: SHALL CONSIST OF CRUSHED STONE OBTAINED FROM CRUSHING SOUND LIMESTONE OR DOLOMITE LEDGE ROCK AND SHALL BE FREE FROM EXCESSIVE AMOUNTS OF CLAY AND OTHER UNDESIRABLE MATERIALS. ALL MATERIALS SHALL CONFORM TO NYSDOT STANDARD SPECIFICATIONS, SECTION 703.

7. CLEARING:

A. CLEAR ENTIRE SITE WITHIN THE CONTRACT LIMIT LINE OF ANY AND ALL EXISTING OBSTRUCTIONS. THIS CONTRACTOR SHALL ACCEPT THE SITE AS HE FINDS IT AND REMOVE OBSTRUCTIONS FROM SITE PRIOR TO STARTING EXCAVATION.

B. DEBRIS SHALL BE REMOVED TO A DEPTH OF 2 FEET BELOW NEW SUBGRADE.

C. REMOVE ROCK, IF ENCOUNTERED, TO A DEPTH OF 10 INCHES BELOW SUBGRADE OF ALL CONSTRUCTION AND TURF AREAS. ROCK MAY REMAIN AS OUTCROPPINGS IN TURF AREAS THAT DO NOT INTERFERE WITH PRESENT OR FUTURE CONSTRUCTION. DECISION FOR REMOVAL OF SUCH ROCK OUTCROPPINGS REMAINS WITH THE ENGINEER.

D. MATERIALS TO BE REMOVED SHALL BE COMPLETELY REMOVED AND DISPOSED OF OFFSITE. NO DISPOSAL BY BURNING WILL BE PERMITTED ONSITE.

E. STRIPPING TOPSOIL: STRIP TOPSOIL TO ITS FULL DEPTH FROM AREAS TO BE CUT OR FILLED. CONTRACTOR MAY SELECT ANY METHOD FOR STRIPPING, BUT SHALL COMPLY WITH THE FOLLOWING:

1. SCRAPE AREAS TO BE STRIPPED CLEAN OF BRUSH, WOOD, AND GRASS ROOTS OVER ½ INCH IN DIAMETER, AND OTHER FOREIGN MATERIALS.
2. DO NOT STRIP TOPSOIL IN A MUDDY OR FROZEN CONDITION.
3. DO NOT INCLUDE SUBSOIL, DEBRIS, STONES OVER 2 INCHES, AND OTHER EXTRANEOUS MATTER IN TOPSOIL.
4. NO TOPSOIL IS TO BE REMOVED FROM THE SITE.
5. STOCKPILE TOPSOIL NEATLY AS DIRECTED AT THE SITE BY THE OWNER.
6. TOPSOIL MAY BE USED IN FILL AREAS OUTSIDE OF PAVED AREAS.

8. EXCAVATION:

A. EXCAVATION CLASSIFICATIONS: THE FOLLOWING CLASSIFICATIONS OF EXCAVATION WILL BE MADE WHEN ROCK IS ENCOUNTERED:

B. EARTH EXCAVATION INCLUDES EXCAVATION OF PAVEMENTS AND OTHER OBSTRUCTIONS VISIBLE ON SURFACE; UNDERGROUND STRUCTURES, UTILITIES, AND OTHER ITEMS INDICATED TO BE DEMOLISHED AND REMOVED; ALONG WITH EARTH AND OTHER MATERIALS ENCOUNTERED THAT ARE NOT CLASSIFIED AS ROCK OR UNAUTHORIZED EXCAVATION.

C. ROCK EXCAVATION MEANS THE REMOVAL AND DISPOSAL OF BOULDERS MORE THAN ½ CUBIC YARD IN VOLUME.

D. MATERIALS THAT CANNOT BE REMOVED WITHOUT SYSTEMATIC DRILLING AND BLASTING SUCH AS ROCK MATERIAL IN LEDGES OR AGGREGATE CONGLOMERATE DEPOSITS SO FIRMLY CEMENTED AS TO POSSESS THE PHYSICAL CHARACTERISTICS OF SOLID ROCK.

E. CONCRETE OR MASONRY STRUCTURES MORE THAN ½ CUBIC YARD IN VOLUME AND NOT LESS THAN 13 INCHES IN DIMENSION.

F. REINFORCED CONCRETE MORE THAN ½ CUBIC YARD IN VOLUME, REINFORCEMENT AREA MORE THAN ½ PERCENT AND NOT LESS THAN 8 INCHES IN DIMENSION.

G. OTHER EXCAVATION MEANS THE REMOVAL AND DISPOSAL OF MATERIALS OF ANY KIND, EXCEPT ROCK EXCAVATION.

9. STABILITY OF EXCAVATIONS:

A. GENERAL: COMPLY WITH LOCAL CODES, ORDINANCES, AND REQUIREMENTS OF AGENCIES HAVING JURISDICTION.

B. SLOPE SIDES OF EXCAVATIONS TO COMPLY WITH LOCAL CODES, ORDINANCES, AND REQUIREMENTS OF AGENCY'S HAVING JURISDICTION. SHORE AND BRACE WHERE SLOPING IS NOT POSSIBLE BECAUSE OF SPACE RESTRICTIONS OR STABILITY OF MATERIAL EXCAVATED. MAINTAIN SIDES AND SLOPES OF EXCAVATIONS IN SAFE CONDITION UNTIL COMPLETION OF BACKFILLING.

C. BRACED AND SHEETED TRENCHES: OPEN CUT TRENCHES SHALL BE SHEETED AND BRACED AS REQUIRED BY ANY GOVERNING FEDERAL AND STATE LAWS, AND MUNICIPAL ORDINANCES, AND AS MAY BE NECESSARY TO PROTECT LIFE, PROPERTY, OR THE WORK. THE COST OF FURNISHING, PLACING AND REMOVING THE SHEETING AND BRACING NECESSARY TO PROTECT LIFE AND PROPERTY OF THE WORK SHALL BE INCLUDED IN THE BID PRICE FOR THE PIPE.

D. THE ENGINEER RESERVES THE RIGHT TO ORDER SHEETING AND BRACING LEFT IN PLACE FOR THE PROTECTION OF THE FINISHED WORK OR ADJACENT PROPERTY. SHEETING AND BRACING THAT HAVE BEEN ORDERED LEFT IN PLACE BY THE ENGINEER MUST BE REMOVED WHEN THE BACKFILLING HAS REACHED THE RESPECTIVE LEVELS OF SUCH BRACING.

E. DEWATERING: PREVENT SURFACE WATER AND SUBSURFACE OR GROUNDWATER FROM FLOWING INTO EXCAVATIONS AND FROM FLOODING PROJECT SITE AND SURROUNDING AREA.

F. DO NOT ALLOW WATER TO ACCUMULATE IN EXCAVATIONS. REMOVE WATER TO PREVENT SOFTENING OF FOUNDATION BOTTOMS, UNDERCUTTING FOOTINGS, AND SOIL CHANGES DETRIMENTAL TO STABILITY OF SUBGRADES AND FOUNDATIONS. PROVIDE AND MAINTAIN PUMPS, WELL POINTS, SUMPS, SUCTION AND DISCHARGE LINES, AND OTHER DEWATERING SYSTEM COMPONENTS NECESSARY TO CONVEY WATER AWAY FROM EXCAVATIONS.

G. ESTABLISH AND MAINTAIN TEMPORARY DRAINAGE DITCHES AND OTHER DIVERSIONS OUTSIDE EXCAVATION LIMITS TO CONVEY RAINWATER AND WATER REMOVED FROM EXCAVATIONS TO COLLECTING OR RUNOFF AREAS. DO NOT USE TRENCH EXCAVATIONS AS TEMPORARY DRAINAGE DITCHES.

H. STORAGE OF EXCAVATED MATERIALS: STOCKPILE EXCAVATED MATERIALS ACCEPTABLE FOR BACKFILL AND FILL WHERE DIRECTED BY ENGINEER. PLACE, GRADE, AND SHAPE STOCKPILES FOR PROPER DRAINAGE.

I. LOCATE AND RETAIN SOIL MATERIALS AWAY FROM EDGE OF EXCAVATIONS. DO NOT STORE WITHIN DRIP LINE OF TREES INDICATED TO REMAIN.

J. DISPOSE OF EXCESS EXCAVATED SOIL MATERIAL AND MATERIALS NOT ACCEPTABLE FOR USE AS BACKFILL OR FILL.

K. EXCAVATION FOR STRUCTURES: CONFORM TO ELEVATIONS AND DIMENSIONS SHOWN WITHIN A TOLERANCE OF PLUS OR MINUS 0.10 FOOT, AND EXTENDING A SUFFICIENT DISTANCE FROM FOOTINGS AND FOUNDATIONS TO PERMIT PLACING AND REMOVAL OF CONCRETE FORMWORK, INSTALLATION OF SERVICES, AND OTHER CONSTRUCTION AND FOR INSPECTION.

L. EXCAVATIONS FOR FOOTINGS AND FOUNDATIONS: DO NOT DISTURB BOTTOM OF EXCAVATION. EXCAVATE BY HAND TO FINAL GRADE JUST BEFORE CONCRETE REINFORCEMENT IS PLACED. TRIM BOTTOMS TO REQUIRED LINES AND GRADES TO LEAVE SOLID BASE TO RECEIVE OTHER WORK.

M. EXCAVATION FOR UNDERGROUND TANKS, BASINS, AND MECHANICAL OR ELECTRICAL STRUCTURES: CONFORM TO ELEVATIONS AND DIMENSIONS INDICATED WITHIN A TOLERANCE OF PLUS OR MINUS 0.10 FOOT; PLUS A SUFFICIENT DISTANCE TO PERMIT PLACING AND REMOVAL OF CONCRETE FORMWORK, INSTALLATION OF SERVICES, AND OTHER CONSTRUCTION AND FOR INSPECTION. DO NOT DISTURB BOTTOM OF EXCAVATIONS INTENDED FOR BEARING SURFACE.

N. TRENCH EXCAVATION FOR PIPES AND CONDUIT: EXCAVATE TRENCHES TO UNIFORM WIDTH, SUFFICIENTLY WIDE TO PROVIDE AMPLE WORKING ROOM AND A MINIMUM OF 12 INCHES OF CLEARANCE ON BOTH SIDES OF PIPE OR CONDUIT.

O. EXCAVATE TRENCHES AND CONDUIT TO A DEPTH OF 6 INCHES BELOW THE OUTSIDE DIAMETER OF THE PIPE BARREL, OR DEEPER, IF SO SPECIFIED. THE RESULTANT SUBGRADE SHALL BE UNDISTURBED, OR COMPACTED AS APPROVED BY THE ENGINEER IF DISTURBED.

P. PIPES OR CONDUIT LESS THAN 6 INCHES IN NOMINAL SIZE, AND FLAT-BOTTOMED, MULTIPLE-DUCT CONDUIT UNITS, DO NOT EXCAVATE BEYOND INDICATED DEPTHS. HAND-EXCAVATE BOTTOM CUT TO ACCURATE ELEVATIONS AND SUPPORT PIPE OR CONDUIT ON UNDISTURBED SOIL.

Q. FOR PIPES AND EQUIPMENT 6 INCHES OR LARGER IN NOMINAL SIZE, THE BEDDING SHALL BE PREPARED BY PLACING A THOROUGHLY COMPACTED BEDDING MATERIAL IN 8 INCH (UNCOMPACTED THICKNESS) LAYERS TO 12 INCHES ABOVE TOP OF PIPE. BEDDING SHALL PROVIDE UNIFORM AND CONTINUOUS BEARING AND SUPPORT FOR THE PIPE AT EVERY POINT BETWEEN BELL HOLES.

R. COLD WEATHER PROTECTION: PROTECT EXCAVATION BOTTOMS AGAINST FREEZING WHEN ATMOSPHERIC TEMPERATURE IS LESS THAN 35°F (2°C).

10. BACKFILL AND FILL:

A. GENERAL: PLACE SOIL MATERIAL IN LAYERS TO REQUIRED SUBGRADE ELEVATIONS, FOR EACH AREA CLASSIFICATION LISTED BELOW, USING MATERIALS SPECIFIED.

B. UNDER GRASSED AREAS, USE SATISFACTORY EXCAVATED OR BORROW MATERIAL.

C. UNDER WALKS AND PAVEMENTS, USE SUBBASE MATERIAL, AND SATISFACTORY EXCAVATED OR BORROW MATERIAL, OR A COMBINATION.

D. UNDER STEPS, USE SUBBASE MATERIAL.

E. UNDER BUILDING SLABS, USE SUBBASE MATERIAL AND SATISFACTORY EXCAVATED OR BORROW MATERIAL, OR A COMBINATION.

F. UNDER PIPING AND CONDUIT AND EQUIPMENT, USE BEDDING MATERIAL.

G. BACKFILL TRENCHES WITH CONCRETE WHERE TRENCH EXCAVATIONS PASS WITHIN 18 INCHES OF COLUMN OR WALL FOOTINGS AND THAT ARE CARRIED BELOW BOTTOM OF SUCH FOOTINGS OR THAT PASS UNDER WALL FOOTINGS. PLACE CONCRETE TO LEVEL OF BOTTOM OF ADJACENT FOOTING.

H. DO NOT BACKFILL TRENCHES UNTIL TESTS AND INSPECTIONS HAVE BEEN MADE AND BACKFILLING IS AUTHORIZED BY ENGINEER. USE CARE IN BACKFILLING TO AVOID DAMAGE OR DISPLACEMENT OF PIPE SYSTEMS.

I. BACKFILL EXCAVATIONS AS PROMPTLY AS WORK PERMITS, BUT NOT UNTIL COMPLETION OF THE FOLLOWING:

1. ACCEPTANCE OF CONSTRUCTION BELOW FINISH GRADE INCLUDING, WHERE APPLICABLE, DAMPPROOFING, WATERPROOFING, AND PERIMETER INSULATION.
2. INSPECTION, TESTING, APPROVAL, AND RECORDING LOCATIONS OF UNDERGROUND UTILITIES HAVE BEEN PERFORMED AND RECORDED.
3. REMOVAL OF CONCRETE FORMWORK.
4. REMOVAL OF SHORING AND BRACING, AND BACKFILLING OF VOIDS WITH SATISFACTORY MATERIALS.
5. CUT OFF TEMPORARY SHEET PILING DRIVEN BELOW BOTTOM OF STRUCTURES AND REMOVE IN MANNER TO PREVENT SETTLEMENT OF THE STRUCTURE OR UTILITIES, OR LEAVE IN PLACE IF REQUIRED.
6. REMOVAL OF TRASH AND DEBRIS FROM EXCAVATION.
7. PERMANENT OR TEMPORARY HORIZONTAL BRACING IS IN PLACE ON HORIZONTALLY SUPPORTED WALLS.

11. PLACEMENT AND COMPACTION:

A. GROUND SURFACE PREPARATION: REMOVE VEGETATION, DEBRIS, UNSATISFACTORY SOIL MATERIALS, OBSTRUCTIONS, AND DELETERIOUS MATERIALS FROM GROUND SURFACE PRIOR TO PLACEMENT OF FILLS. PLOW STRIP, OR BREAK UP SLOPED SURFACES STEEPER THAN 1 VERTICAL TO 4 HORIZONTAL SO THAT FILL MATERIAL WILL BOND WITH EXISTING SURFACE.

B. WHEN EXISTING GROUND SURFACE HAS A DENSITY LESS THAN THAT SPECIFIED UNDER "COMPACTION" FOR PARTICULAR AREA CLASSIFICATION, BREAK UP GROUND SURFACE, PULVERIZE, MOISTURE-CONDITION TO OPTIMUM MOISTURE CONTENT, AND COMPACT TO REQUIRED DEPTH AND PERCENTAGE OF MAXIMUM DENSITY.

C. PLACE BACKFILL AND FILL MATERIALS IN LAYERS NOT MORE THAN 8 INCHES IN LOOSE DEPTH FOR MATERIAL COMPACTED BY HEAVY COMPACTION EQUIPMENT, AND NOT MORE THAN 4 INCHES IN LOOSE DEPTH FOR MATERIAL COMPACTED BY HAND-OPERATED TAMPERS.

D. BEFORE COMPACTION, MOISTEN OR AERATE EACH LAYER AS NECESSARY TO PROVIDE OPTIMUM MOISTURE CONTENT. COMPACT EACH LAYER TO REQUIRED PERCENTAGE OF MAXIMUM DRY DENSITY OR RELATIVE DRY DENSITY FOR EACH AREA CLASSIFICATION. DO NOT PLACE BACKFILL OR FILL MATERIAL ON SURFACES THAT ARE MUDDY, FROZEN, OR CONTAIN FROST OR ICE.

E. PLACE BACKFILL AND FILL MATERIALS EVENLY ADJACENT TO STRUCTURES, PIPING, OR CONDUIT TO REQUIRED ELEVATIONS. PREVENT WEDGING ACTION OF BACKFILL AGAINST STRUCTURES OR DISPLACEMENT OF PIPING OR CONDUIT BY CARRYING MATERIAL UNIFORMLY AROUND STRUCTURE, PIPING, OR CONDUIT TO APPROXIMATELY SAME ELEVATION IN EACH LIFT.

F. CONTROL SOIL AND FILL COMPACTION, PROVIDING MINIMUM PERCENTAGE OF DENSITY SPECIFIED FOR EACH AREA CLASSIFICATION INDICATED BELOW. CORRECT IMPROPERLY COMPACTED AREAS OR LIFTS AS DIRECTED BY ENGINEER IF SOIL DENSITY TESTS INDICATE INADEQUATE COMPACTION.

G. PERCENTAGE OF MAXIMUM DENSITY REQUIREMENTS: COMPACT SOIL TO NOT LESS THAN THE FOLLOWING PERCENTAGES OF MAXIMUM DENSITY, IN ACCORDANCE WITH ASTM D1557:

1. UNDER STRUCTURES, BUILDING SLABS AND STEPS, AND PAVEMENTS, COMPACT TOP 2 FEET OF SUBGRADE AT 100 PERCENT MAXIMUM DENSITY. REMAINING LAYERS OF BACKFILL OR FILL MATERIAL AT 95 PERCENT MAXIMUM DENSITY.
2. UNDER LAWN OR UNPAVED AREAS, COMPACT TOP 6 INCHES OF SUBGRADE AND EACH LAYER OF BACKFILL OR FILL MATERIAL AT 90 PERCENT MAXIMUM DENSITY.
3. UNDER WALKWAYS, COMPACT TOP 6 INCHES OF SUBGRADE AND EACH LAYER OF BACKFILL OR FILL MATERIAL AT 96 PERCENT MAXIMUM DENSITY.

H. MOISTURE CONTROL: WHERE SUBGRADE OR LAYER OF SOIL MATERIAL MUST BE MOISTURE CONDITIONED BEFORE COMPACTION, UNIFORMLY APPLY WATER TO SURFACE OF SUBGRADE OR LAYER OF SOIL MATERIAL. APPLY WATER IN MINIMUM QUANTITY AS NECESSARY TO PREVENT FREEWATER FROM APPEARING ON SURFACE DURING OR SUBSEQUENT TO COMPACTION OPERATIONS.

I. REMOVE AND REPLACE, OR SCARIFY AND AIR DRY, SOIL MATERIAL THAT IS TOO WET TO PERMIT COMPACTION TO SPECIFIED DENSITY.

J. STOCKPILE OR SPREAD SOIL MATERIAL THAT HAS BEEN REMOVED BECAUSE IT IS TOO WET TO PERMIT COMPACTION. ASSIST DRYING BY DISCING, HARROWING, OR PULVERIZING UNTIL MOISTURE CONTENT IS REDUCED TO A SATISFACTORY VALUE.

12. GRADING:

A. GENERAL: UNIFORMLY GRADE AREAS WITHIN LIMITS OF GRADING UNDER THIS SECTION, INCLUDING ADJACENT TRANSITION AREAS. SMOOTH FINISHED SURFACE WITHIN SPECIFIED TOLERANCES, COMPACT WITH UNIFORM LEVELS OR SLOPES BETWEEN POINTS WHERE ELEVATIONS ARE INDICATED OR BETWEEN SUCH POINTS AND EXISTING GRADES.

B. GRADING OUTSIDE BUILDING LINES: GRADE AREAS ADJACENT TO BUILDING LINES TO DRAIN AWAY FROM STRUCTURES AND TO PREVENT PONDING. FINISH SURFACES FREE FROM IRREGULAR SURFACE CHANGES AND AS FOLLOWS:

1. LAWN OR UNPAVED AREAS: FINISH AREAS TO RECEIVE TOPSOIL TO WITHIN NOT MORE THAN 0.10 FOOT ABOVE OR BELOW REQUIRED SUBGRADE ELEVATIONS.
2. WALKS: SHAPE SURFACE OF AREAS UNDER WALKS TO LINE, GRADE, AND CROSS-SECTION, WITH FINISH SURFACE NOT MORE THAN 0.10 FOOT ABOVE OR BELOW REQUIRED SUBGRADE ELEVATION.
3. PAVEMENTS: SHAPE SURFACE OF AREAS UNDER PAVEMENT TO LINE, GRADE, AND CROSS-SECTION, WITH FINISH SURFACE NOT MORE THAN ½ INCH ABOVE OR BELOW REQUIRED SUBGRADE ELEVATION.

NO.	DATE	REVISION
2	6/25/25	PROGRESS SET
1	12/11/24	DESIGN REVISIONS

MICHAEL G. RIELLY
NEW YORK STATE PROFESSIONAL ENGINEER
LICENSE NO. 093427

MANAGER: MICHAEL G. RIELLY
DESIGN BY: MTL
DRAWN BY: MTL
CHKD BY: MGR

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SPECIFICATIONS
FOR
SHELDRAKE KARMEL RD PROPERTIES LLC
TOWN OF FALLSBURG SULLIVAN COUNTY, NY

DATE: JUNE 25, 2024
SHEET NO. 24 OF 29
DWG. NO. 0236-01

C. GRADING SURFACE OF FILL UNDER BUILDING SLABS: GRADE SMOOTH AND EVEN, FREE OF VOIDS, COMPACTED AS SPECIFIED, AND TO REQUIRED ELEVATION. PROVIDE FINAL GRADES WITHIN A TOLERANCE OF ½ INCH WHEN TESTED WITH A 10-FOOT STRAIGHTEDGE.
D. COMPACTION: AFTER GRADING, COMPACT SUBGRADE SURFACES TO THE DEPTH AND INDICATED PERCENTAGE OF MAXIMUM OR RELATIVE DENSITY FOR EACH AREA CLASSIFICATION.

13. PAVEMENT SUBBASE COURSE:
A. GENERAL: SUBBASE COURSE CONSISTS OF PLACING SUBBASE MATERIAL, IN LAYERS OF SPECIFIED THICKNESS, OVER SUBGRADE SURFACE TO SUPPORT A PAVEMENT BASE COURSE.
B. REFER TO DRAWINGS FOR PAVING SPECIFICATIONS.
C. GRADE CONTROL: DURING CONSTRUCTION, MAINTAIN LINES AND GRADES INCLUDING CROWN AND CROSS-SLOPE OF SUBBASE COURSE.
D. PLACING: PLACE SUBBASE COURSE MATERIAL ON PREPARED SUBGRADE IN LAYERS OF UNIFORM THICKNESS, CONFORMING TO INDICATED CROSS-SECTION AND THICKNESS. MAINTAIN OPTIMUM MOISTURE CONTENT FOR COMPACTING SUBBASE MATERIAL DURING PLACEMENT OPERATIONS.
E. WHEN A COMPACTED SUBBASE COURSE IS INDICATED TO BE 6-INCHES THICK OR LESS, PLACE MATERIAL IN A SINGLE LAYER. WHEN INDICATED TO BE MORE THAN 6-INCHES THICK, PLACE MATERIAL IN EQUAL LAYERS, EXCEPT NO SINGLE LAYER MORE THAN 6 INCHES OR LESS THAN 3 INCHES IN THICKNESS WHEN COMPACTED.
F. EROSION CONTROL: PROVIDE EROSION CONTROL METHODS IN ACCORDANCE WITH REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION.

14. MAINTENANCE:
A. PROTECTION OF GRADED AREAS: PROTECT NEWLY GRADED AREAS FROM TRAFFIC AND EROSION. KEEP FREE OF TRASH AND DEBRIS.
B. REPAIR AND RE-ESTABLISH GRADES IN SETTLED, ERODED, AND RUTTED AREAS TO SPECIFIED TOLERANCES.
C. RECONDITIONING COMPACTED AREAS: WHERE COMPLETED COMPACTED AREAS ARE DISTURBED BY SUBSEQUENT CONSTRUCTION OPERATIONS OR ADVERSE WEATHER, SCARIFY SURFACE, RESHAPE, AND COMPACT TO REQUIRED DENSITY PRIOR TO FURTHER CONSTRUCTION.
D. SETTLING: WHERE SETTLING IS MEASURABLE OR OBSERVABLE AT EXCAVATED AREAS DURING GENERAL PROJECT WARRANTY PERIOD, REMOVE SURFACE (PAVEMENT, LAWN, OR OTHER FINISH), ADD BACKFILL MATERIAL, COMPACT, AND REPLACE SURFACE TREATMENT. RESTORE APPEARANCE, QUALITY, AND CONDITION OF SURFACE OR FINISH TO MATCH ADJACENT WORK, AND ELIMINATE EVIDENCE OF RESTORATION TO GREATEST EXTENT POSSIBLE.

15. DISPOSAL OF EXCESS AND WASTE MATERIALS:
A. REMOVE WASTE MATERIALS, INCLUDING UNACCEPTABLE EXCAVATED MATERIAL, TRASH, AND DEBRIS, AND DISPOSE OF IT AS DIRECTED BY OWNER.

WATER DISTRIBUTION

1. DESCRIPTION OF WORK:
A. THE WORK WITHIN THIS SECTION INCLUDES, BUT IS NOT LIMITED TO, THE FURNISHING OF ALL EQUIPMENT, LABOR AND MATERIAL, AND PERFORMING ALL OPERATIONS IN CONNECTION WITH THE INSTALLATION OF WATERMAINS, FIRE SERVICES, VALVES, FIRE HYDRANTS, VAULTS, WATER SERVICES AND APPURTENANCES. THIS INCLUDES PERFORMING ALL TESTS REQUIRED, COMPLETE, IN ACCORDANCE WITH THE SPECIFICATIONS, APPLICABLE DRAWINGS AND CONTRACT DOCUMENTS.

2. QUALITY ASSURANCE:
A. REFERENCED STANDARDS SHALL BE THE FOLLOWING:
1. AMERICAN NATIONAL STANDARD INSTITUTE (ANSI)
2. AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)
3. AMERICAN WATER WORKS ASSOCIATION (AWWA)
4. UNDERWRITER'S LABORATORIES (UL)
5. NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
6. FACTORY MUTUAL (FM)

3. SUBMITTALS:
A. CERTIFICATES: CONTRACTOR SHALL SUBMIT THREE (3) COPIES OF EACH MANUFACTURER'S CERTIFICATION ATTESTING THAT THE MATERIALS MEET OR EXCEED SPECIFICATION REQUIREMENTS.
B. SHOP DRAWINGS: SUBMIT MANUFACTURER'S DESCRIPTIVE AND TECHNICAL PRODUCT DATA FOR PRESSURE PIPE, FITTINGS, ETC. PRIOR TO THE START OF WORK FOR APPROVAL.

4. AWWA C900 POLY VINYL CHLORIDE PIPE:
D. MATERIALS: PIPE SHALL MEET THE REQUIREMENTS OF AWWA C900, AWWA STANDARD FOR POLY (VINYL CHLORIDE) (PVC) PRESSURE PIPE AND FABRICATED FITTINGS, 4 INCHES THROUGH 12 INCHES, FOR WATER DISTRIBUTION. CLASS 150 PIPE SHALL CONFORM TO THE REQUIREMENTS OF DR18, CLASS 100 PIPE SHALL CONFORM TO THE REQUIREMENTS OF DR25, AND CLASS 200 PIPE SHALL CONFORM TO THE REQUIREMENTS OF DR14.
E. ALL PIPE SHALL BE SUITABLE FOR USE AS A PRESSURE CONDUIT. PROVISIONS MUST BE MADE FOR EXPANSION AND CONTRACTION AT EACH JOINT WITH AN ELASTOMERIC RING. THE BELL SHALL CONSIST OF AN INTEGRAL WALL SECTION WITH AN ELASTOMERIC RING, WHICH MEETS THE REQUIREMENTS OF ASTM F477, SPECIFICATION FOR ELASTOMERIC SEALS (GASKETS) FOR JOINING PLASTIC PIPE. THE WALL THICKNESS IN THE BELL SECTION SHALL CONFORM TO THE REQUIREMENTS OF ASTM D3139. SIZES AND DIMENSIONS SHALL BE AS SHOWN IN THE STANDARDS CITED IN THIS SPECIFICATION. WHEN USED FOR POTABLE WATER SYSTEMS, PIPE SHALL MEET ANSI/NSF STANDARD NO. 61. THE PIPE SHALL BE MANUFACTURED TO CAST IRON OR DUCTILE IRON OUTSIDE DIMENSIONS IN ACCORDANCE WITH AWWA C900.

5. HDPE PIPE AND FITTINGS:
A. THE PIPE AND FITTINGS SHALL BE MADE EXTRA HIGH MOLECULAR WEIGHT (EHMW) HIGH-DENSITY POLYETHYLENE WITH A STANDARD THERMOPLASTIC MATERIAL DESIGNATION CODE OF PE3408 AND HAVING A CELL CLASSIFICATION OF 345464C PER ASTM D3350.
B. MATERIALS USED TO MANUFACTURE PIPE AND FITTINGS SHALL BE LISTED UNDER THE MANUFACTURER'S NAME IN THE PLASTICS PIPE INSTITUTE (PPI) TR-4, "PPI LISTING OF HYDROSTATIC DESIGN BASIS (HDB), STRENGTH DESIGN BASIS (SDB), PRESSURE DESIGN BASIS (PDB) AND MINIMUM REQUIRED STRENGTH (MRS) RATINGS FOR THERMOPLASTIC PIPING MATERIALS OR PIPE." THE MANUFACTURER SHALL SUPPLY A PRODUCT WITH STANDARD GRADE HDB RATING OF 1600 PSI (MINIMUM) AT 78°F AND 800 PSI (MINIMUM) FOR 140°F. UPON REQUEST, THE MANUFACTURER SHALL SUPPLY CERTIFICATION THAT THE MATERIALS USED TO MANUFACTURE THE PIPE AND FITTINGS MEET THE ABOVE REQUIREMENTS.
C. ALL MATERIALS, WHICH COME IN CONTACT WITH WATER, INCLUDING LUBRICANTS, SHALL BE EVALUATED, TESTED AND CERTIFIED FOR CONFORMANCE WITH ANSI/NSF STANDARD 61.
D. THE MATERIALS SHALL MEET THE FOLLOWING NOMINAL PHYSICAL PROPERTY REQUIREMENTS: (TEST METHOD (1)1) NOMINALM PE3408 CELL CD3350345464C/CC DENSITY, BLACK D1505 0.955 GM/CC MELT INDEX (190°C/2.16 KG) D1238 0.07 GM/10 MIN FLOW RATE (190°C/21.6 KG) D1238 8.5 GM/10 MIN TENSILE STRENGTH @ ULTIMATE D638 5,000 PSI TENSILE STRENGTH @ YIELD D638 3,500 PSI ULTIMATE ELONGAT PENTF1473>100 hrs.Brittleness TemperatureD746<-180°F790 136,000 PSI END2567 ft-lbf/inModulus of Elasticity (short term)D638V473 >100 HRS. BRITTLENESS TEMPERATURE D746 <-180°F HARDNESS, SHORE D D2240 64 VICAT SOFTENING TEMPERATURE800 psi @ 140°F(1) Test procedures are ASTM unless otherwise specified. (PPI= Plastics Pipe D1525 255°F
IZOD IMPACT STRENGTH, NOTCHED D256 7 FT-LBF/IN
MODULUS OF ELASTICITY (SHORT TERM) D638 125,000 PSI
MODULUS OF ELASTICITY (LONG TERM) D638 30,000 PSI
THERMAL EXPANSION COEFFICIENT D696 1.0 X 10-4 IN/IN/°F
AVERAGE MOLECULAR WEIGHT GPC 330,000
PPI HYDROSTATIC DESIGN BASIS: (AS LISTED IN PPI TR-4) D2837 1,600 PSI @ 73.4°F
800 PSI @ 140°F
(1) TEST PROCEDURES ARE ASTM UNLESS OTHERWISE SPECIFIED. (PPI= PLASTICS PIPE INSTITUTE, AND GPC= GEL PERMEATION CHROMATOGRAPHY.)

6. VALVES:
A. GATE VALVES: VALVES SHALL BE IRON BODY COMPRESSION RESILIENT SEATED DISC TYPE WITH RESTRAINED JOINT ENDS AS CALLED FOR ON THE PLANS. ALL BURIED VALVES SHALL BE NON-RISING STEM TYPE WITH O-RINGS. THE DESIGN OF THE VALVE AND SEAL PLATE SHALL BE SUCH THAT THE SEAL PLATE CAN BE FITTED WITH NEW O-RINGS WHILE THE VALVE IS UNDER PRESSURE IN THE FULLY OPEN POSITION. VALVES SHALL BE EQUIPPED WITH A 2 INCH SQUARE OPERATING NUT AND ADJUSTABLE CAST IRON VALVE BOXES AND COVERS. GATE VALVES SHALL OPEN COUNTERCLOCKWISE. GATE VALVES SHALL BE MANUFACTURED IN ACCORDANCE WITH AWWA C500 AS A MINIMUM REQUIREMENT, SHALL BE UL/FM LISTED WHEN USED IN FIRE PROTECTION APPLICATIONS, AND SHALL BE AS MANUFACTURED BY AMERICAN DARLING, CRS-80, OR APPROVED SUBSTITUTION.
B. CHECK VALVES: VALVES SHALL BE STANDARD IRON BODY SWING TYPE WITH STRAIGHTAWAY PASSAGES FOR FULL PIPE AREA. VALVES SHALL BE BRONZE MOUNTED WITH SELF-ADJUSTING RUBBER OR LEATHER-FACED DISCS. VALVES SHALL BE EITHER PLAIN TYPE OR EQUIPPED WITH OUTSIDE LEVER AND SHALL HAVE JOINT ENDS AS SHOWN ON THE PLANS. CHECK VALVES SHALL BE MANUFACTURED IN ACCORDANCE WITH AWWA C508, AND SHALL BE UL LISTED WHEN USED IN FIRE PROTECTION APPLICATIONS.
C. AIR RELEASE VALVE: AIR RELEASE VALVES SHALL BE INSTALLED AS SHOWN ON THE PLANS. THE WORK SHALL INCLUDE THE COMPLETE ASSEMBLY WITH TAP, SHUTOFF VALVE, BLOWOFF, AIR VALVE, PIPING WITH FITTINGS AND UNION, ALL COMPLETE AND READY FOR OPERATION. AIR VALVES SHALL BE A SPECIAL STAINLESS STEEL FLOAT ENCLOSED IN THE VALVE BODY WITH AN ATTACHED LEVER FOR OPENING AND CLOSING THE AIR DISCHARGE PORT. THE DESIGN OF THE FLOAT AND LEVER SHALL BE SUCH AS TO ENSURE OPENING OF THE VALVE PORT UNDER MAXIMUM INTERNAL PRESSURE. THE ASSEMBLY SHALL NOT LEAK OR THE VALVE STICK UNDER SERVICE CONDITIONS. APCO OR APPROVED SUBSTITUTION.
D. VALVE BOXES: VALVE BOXES SHALL BE ADJUSTABLE ROADWAY TYPE CONSTRUCTED OF CAST IRON WITH A 5¼ INCH SHAFT PROVIDED WITH SCREW TYPE EXTENSION PIECES AND EITHER A ROUND OR OVAL DETACHABLE BASE. BOX SHALL HAVE A PLUG LID FITTING INTO A RECESSED SEAT. THE LID SHALL HAVE THE WORD "WATER" CAST ON THE TOP SURFACE. ALL PARTS OF THE BOX SHALL BE OF TOUGH GRAY IRON, FREE FROM COLD SHUTS AND BLOW HOLES, AND SHALL BE PAINTED WITH BLACK BITUMINOUS PAINT. VALVE BOXES SHALL BE SET AT OR ABOVE THE SURFACE OF THE ADJOINING GROUND OR ROADWAY.

7. WATER SERVICE LINES:
I. COPPER TUBING: THE WATER SERVICE LINE SHALL BE IN CONFORMANCE WITH ASTM B88, TYPE K, FOR ¾INCH TO 2½ INCH LINES.
J. SERVICE LINE FITTINGS: THREADS FOR UNDERGROUND SERVICE LINE FITTINGS SHALL BE IN FULL ACCORDANCE WITH AWWA C800.
K. CORPORATION COCKS: SIZE SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. INLET THREAD SHALL BE MUELLER OR IRON PIPE TYPE AS DIRECTED, WITH FLANGE UNION COUPLINGS OR WIPED JOINTS. TYPE SHALL BE MUELLER OR APPROVED SUBSTITUTION.
L. CURB STOPS: GROUND KEY FOR USE WITH COPPER WATER SERVICE. MAKE SHALL BE MUELLER OR APPROVED SUBSTITUTION.
M. CURB BOXES: EXTENSION TYPE WITH THE STATIONARY ROD. PATTERN SHALL BE APPROVED BY OWNER. THE BOXES AND LIDS SHALL BE COATED WITH BITUMINOUS ENAMEL. EXTENSION RANGE SHALL BE 42 INCHES TO 60 INCHES.

8. MISCELLANEOUS:
H. CONCRETE THRUST BLOCKS: THRUST BLOCKS SHALL BE IN ACCORDANCE WITH ANSI/AWWA C600 AND SHALL BE CONSTRUCTED TO THE DIMENSIONS SHOWN ON THE PLANS. CARE SHALL BE TAKEN DURING THE CONCRETE PLACEMENT SO THAT NO JOINT NUTS AND BOLTS COME IN CONTACT WITH THE CONCRETE.
I. TAPPING SLEEVES AND VALVES: TAPPING SLEEVES AND VALVES SHALL BE OF THE SIZES SHOWN ON THE DRAWINGS AND SHALL BE DESIGNED TO OPERATE AT A WORKING PRESSURE OF 200 PSI UNLESS OTHERWISE SPECIFIED. THE VALVES SHALL BE INSIDE SCREW, IRON BODY, COMPRESSION RESILIENT SEATED DISC WITH EITHER MECHANICAL JOINT OR HUB ENDS AND 2 INCH SQUARE OPERATING NUTS. VALVES SHALL OPEN TO THE LEFT.
J. BRICK: BRICK FOR FRAME AND COVER ADJUSTMENT SHALL BE NEW, WHOLE, COMMON BRICK, FURNISHED IN ACCORDANCE WITH ASTM C62, GRADE MW.
K. MORTAR: MORTAR FOR JOINTING AND PLASTERING THE OUTSIDE OF BRICK MANHOLES SHALL CONSIST OF 1 PART PORTLAND CEMENT AND 2 PARTS FINE SAND. FOR BRICKWORK, LIME MAY BE ADDED TO THE MORTAR IN AN AMOUNT OF NOT MORE THAN 25 PERCENT OF THE VOLUME OF THE CEMENT. SAND SHALL BE CLEAN AND SHARP AND CONFORM TO ASTM C144. HYDRATED LIME SHALL CONFORM TO ASTM C6. RE-TEMPERED MORTAR OR MORTAR WHICH HAS BEEN MIXED FOR MORE THAN 45 MINUTES SHALL NOT BE USED.
L. CONCRETE: CONCRETE SHALL HAVE A COMPRESSIVE STRENGTH OF NOT LESS THAN 3,000 PSI AFTER 28 DAYS (TESTS TO BE IN ACCORDANCE WITH STANDARD METHOD OF COMPRESSION TESTS OF ASTM).
M. CAST IRON: CAST IRON SHALL BE OF SOFT-GRAY IRON, TRUE TO PATTERN, SMOOTH AND STRAIGHT AND FREE FROM DEFECTS IMPAIRING STRENGTH, DURABILITY OR APPEARANCE. CASTINGS SHALL CONFORM TO FEDERAL SPECIFICATIONS QQ-1-65A AND ASTM A48.
N. FRAMES/COVERS: MANHOLE FRAME AND COVER SHALL BE OF SOFT-GRAY IRON EQUIVALENT IN DESIGN TO FRAME PATTERN NO. 1009A, AS MANUFACTURED BY THE CAMPBELL FOUNDRY COMPANY, HARRISON, NEW JERSEY, OR APPROVED SUBSTITUTION. MANHOLE FRAME AND COVER SHALL BE ACCEPTED BY THE ENGINEER AND SHALL HAVE THE WORD "WATER" CAST IN THE CENTER.
O. TIE-RODS: THE RODS SHALL BE CONSTRUCTED OF SUITABLE MATERIAL AND ADEQUATE DIMENSIONS TO WITHSTAND AT LEAST TWICE THE RATED WORKING PRESSURE OF THE ADJOINING PIPE OR FITTING, WHICHEVER IS GREATER. ALL COMPONENTS OF DISSIMILAR METAL SHALL BE PROTECTED FROM CORROSION BY HAND APPLICATION OF A BITUMINOUS COATING.

9. INSPECTION:
A. FIELD INSPECTION: ALL PIPE AND APPURTENANCES SHALL BE FURNISHED, INSTALLED AND TESTED FOR DEFECTS IN MATERIAL AND/OR WORKMANSHIP IN THE MANNER SPECIFIED AND IN THE PRESENCE OF AND AS ACCEPTED BY THE OWNER/ENGINEER.
B. DISPOSITION OF DEFECTIVE MATERIAL: ALL MATERIAL FOUND DURING THE PROGRESS OF THE WORK TO HAVE CRACKS, FLAWS OR OTHER DEFECTS WILL BE REJECTED BY THE OWNER/ENGINEER. ALL DEFECTIVE MATERIALS FURNISHED BY THE CONTRACTOR SHALL BE PROMPTLY REMOVED FROM THE SITE BY THE CONTRACTOR, AT HIS OWN EXPENSE.

10. HANDLING OF MATERIAL:
A. REPLACEMENT OF DAMAGED MATERIAL: THE CONTRACTOR SHALL REPLACE, AT HIS OWN EXPENSE, ALL MATERIAL FURNISHED BY HIM AND FOUND DEFECTIVE IN MANUFACTURE OR DAMAGED IN HANDLING AFTER DELIVERY BY THE MANUFACTURER. THIS SHALL INCLUDE THE FURNISHING OF ALL MATERIALS AND LABOR REQUIRED FOR REPLACEMENT OF INSTALLED MATERIAL. ANY MATERIAL FURNISHED BY THE OWNER THAT BECOMES DAMAGED AFTER ACCEPTANCE BY THE CONTRACTOR SHALL BE REPLACED BY THE CONTRACTOR AT HIS OWN EXPENSE.
B. RESPONSIBILITY FOR SAFE STORAGE: THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFE STORAGE OF MATERIAL FURNISHED BY OR TO HIM, AND ACCEPTED BY HIM, AND INTENDED FOR THE WORK, UNTIL IT HAS BEEN INCORPORATED INTO THE COMPLETED PROJECT. THE INTERIOR OF ALL PIPE, FITTINGS AND OTHER ACCESSORIES SHALL BE KEPT FREE FROM DIRT AND FOREIGN MATTER AT ALL TIMES. ALL EQUIPMENT AND MATERIALS SUBJECT TO DAMAGE FROM FREEZING SHALL BE DRAINED AND STORED IN A MANNER WHICH WILL PROTECT THEM.
A. HAULING: ALL MATERIALS FURNISHED BY THE CONTRACTOR SHALL BE DELIVERED AND DISTRIBUTED ONSITE BY THE CONTRACTOR. MATERIALS FURNISHED BY THE OWNER SHALL BE PICKED UP BY THE CONTRACTOR AT POINTS DESIGNATED AND HAULED TO AND DISTRIBUTED ONSITE.
B. CARE OF PIPE COATING AND LINING: PIPE SHALL BE HANDLED SO THE LINING WILL NOT BE DAMAGED. IF, HOWEVER, ANY PART OF THE LINING IS DAMAGED, THE REPAIR SHALL BE MADE BY THE CONTRACTOR AT HIS EXPENSE IN A MANNER SATISFACTORY TO THE ENGINEER.

11. MAINTENANCE OF FLOW:
A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING AND MAINTAINING CONSTRUCTION OF ALL EXISTING WATERMAINS, WATER SERVICES AND FIRE HYDRANTS. THIS WILL BE CONSIDERED INCIDENTAL WORK RELATED TO THE CONSTRUCTION OF THE WATERMAIN AND APPURTENANCES WILL BE INCLUDED IN THE CONTRACT UNIT BID PRICE PER LINEAR FOOT OF PIPE OR LUMP SUM PRICE. THE CONTRACTOR SHALL SUBMIT HIS PLANS FOR MAINTENANCE OF FLOW PRIOR TO THE START OF CONSTRUCTION FOR APPROVAL BY THE OWNER OR ENGINEER

12. PIPE INSTALLATION:
A. GENERAL: ALL PIPE SHALL BE LAID AND MAINTAINED TO THE REQUIRED LINES AND GRADES WITH FITTINGS AND VALVES AT THE REQUIRED LOCATIONS; SPIGOTS CENTERED IN BELLS; AND ALL VALVES PLUMB. THE PIPE SHALL BE LAID IN THE BACKFILL MATERIALS AS SPECIFIED. PIPE LAYING SHALL COMMENCE AT THE LOWEST POINT AND PROCEED UPGRADE.
B. CAUTION IN EXCAVATION: THE CONTRACTOR SHALL PROCEED WITH CAUTION IN THE EXCAVATION AND PREPARATION OF THE TRENCH SO THAT THE EXACT LOCATION OF UNDERGROUND STRUCTURES, BOTH KNOWN AND UNKNOWN, MAY BE DETERMINED, AND HE SHALL BE HELD RESPONSIBLE FOR THE REPAIR OF SUCH STRUCTURES WHEN BROKEN OR OTHERWISE DAMAGED BECAUSE OF CARELESSNESS ON HIS PART.
C. SUBSURFACE EXPLORATIONS: WHENEVER IT IS NECESSARY TO EXPLORE AND EXCAVATE TO DETERMINE THE LOCATION OF EXISTING UNDERGROUND STRUCTURES, THE CONTRACTOR SHALL MAKE EXPLORATIONS AND EXCAVATIONS FOR SUCH PURPOSES.
D. DEPTH OF PIPE: ALL PIPE SHALL BE LAID TO THE DEPTH SHOWN ON THE CONTRACT DRAWINGS OR A MINIMUM OF 4.5 FEET FROM FINISHED GRADE TO THE CROWN OF PIPE.
E. HANDLING OF WATER MAIN MATERIAL INTO TRENCH: PROPER IMPLEMENTS, TOOLS AND FACILITIES SATISFACTORY TO THE ENGINEER SHALL BE PROVIDED AND USED BY THE CONTRACTOR FOR THE SAFE AND CONVENIENT PROSECUTION OF THE WORK. ALL PIPE, FITTINGS, VALVES, ETC., SHALL BE CAREFULLY LOWERED INTO THE TRENCH PIECE BY PIECE BY MEANS OF A DERRICK, ROPES OR OTHER SUITABLE TOOLS OR EQUIPMENT, IN SUCH A MANNER AS TO PREVENT DAMAGE TO SEWER LINE MATERIALS, PROTECTIVE COATINGS AND LININGS. UNDER NO CIRCUMSTANCES SHALL SUCH MATERIALS BE DROPPED OR DUMPED INTO THE TRENCH.
F. HAMMER TEST: THE PIPE AND FITTINGS SHALL BE INSPECTED FOR DEFECTS AND WHILE SUSPENDED ABOVE GRADE, BE RUNG WITH A LIGHT HAMMER TO DETECT CRACKS.
G. CLEANING PIPE AND FITTINGS: ALL LUMPS, BLISTERS AND EXCESS COAL TAR COATING SHALL BE REMOVED FROM THE BELL AND SPIGOT END OF EACH PIPE, AND THE OUTSIDE OF THE SPIGOT AND THE INSIDE OF THE BELL SHALL BE WIRE BRUSHED AND WIPED CLEAN AND DRY AND FREE FROM OIL AND GREASE BEFORE THE PIPE IS LAID.
H. LAYING PIPE: EVERY PRECAUTION SHALL BE TAKEN TO PREVENT FOREIGN MATERIAL FROM ENTERING THE PIPE WHILE THE PIPE IS BEING PLACED IN THE LINE. IF THE PIPE-LAYING CREW CANNOT PUT THE PIPE INTO THE TRENCH AND IN PLACE WITHOUT GETTING INTO IT, THE ENGINEER MAY REQUIRE THAT, BEFORE LOWERING THE PIPE INTO THE TRENCH, A HEAVY, TIGHTLY WOVEN CANVAS BAG OF SUITABLE SIZE SHALL BE PLACED OVER EACH END AND LEFT THERE UNTIL THE CONNECTION IS TO BE MADE INTO THE ADJACENT PIPE. DURING LAYING OPERATIONS, NO DEBRIS, TOOLS, CLOTHING, OR OTHER MATERIALS SHALL BE PLACED IN THE PIPE.
I. CUTTING PIPE: THE CUTTING OF PIPE FOR INSERTING VALVES, FITTINGS OR CLOSURE PIECES SHALL BE DONE IN A NEAT AND WORKMANLIKE MANNER, WITHOUT DAMAGE TO THE PIPE, SO AS TO LEAVE A SMOOTH END AT RIGHT ANGLES TO THE AXIS OF THE PIPE.
J. PERMISSIBLE DEFLECTION OF JOINTS: IF DEFLECTION IS REQUIRED, MAKE AFTER JOINT IS ASSEMBLED. THE AMOUNT OF DEFLECTION SHALL NOT EXCEED 50 PERCENT OF THE MAXIMUM LIMITS AS SPECIFIED IN AWWA C600.
K. UNSUITABLE CONDITIONS FOR LAYING PIPE: NO PIPE SHALL BE LAID IN WATER OR WHEN, IN THE OPINION OF THE ENGINEER, TRENCH CONDITIONS ARE UNSUITABLE.
L. THE PLANS OF CROSS CONNECTIONS BETWEEN NEW MAIN AND EXISTING MAINS AS SHOWN ON PLANS HAVE BEEN PREPARED FROM ALL AVAILABLE INFORMATION; HOWEVER, SHOULD THE EXISTING MAINS WHEN EXPOSED VARY IN SIZE FROM THAT SHOWN ON THE PLANS, THE CONTRACTOR SHALL PROVIDE THE NECESSARY FITTING FOR THE CROSS CONNECTION AND INSTALL THE SAME AT THE PRICE BID.
M. VARIATIONS: THE ENGINEER RESERVES THE RIGHT TO VARY THE LINE AND/OR GRADE FROM THAT SHOWN ON THE DRAWINGS FOR THE PIPE LINES AND MANHOLES AND TO VARY THE LOCATION OF FITTINGS, VALVES AND HYDRANTS WHEN SUCH CHANGES MAY BE NECESSARY OR ADVANTAGEOUS. NO CLAIMS FOR EXTRA WORK WILL BE ALLOWED FOR CHANGES IN LOCATION OR GRADE EXCEPT AS SUCH CHANGES ARE MADE AFTER TRENCHING HAS BEEN DONE.
N. MECHANICAL JOINTS: THE SPIGOT END OF THE PIPE SHALL BE CENTRALLY LOCATED IN THE BELL SO THAT THE RUBBER GASKET IS EVENLY SEATED.O. ALL LOOSE RUST OR FOREIGN MATTER SHALL BE REMOVED FROM THE INSIDE SURFACES OF THE BELL AND OUTSIDE SURFACE OF THE SPIGOT PRIOR TO ASSEMBLY. BOLTS SHALL BE TIGHTENED UNIFORMLY WITH A RACHET WRENCH SO AS TO AFFECT THE JOINT SEAL. THE NORMAL RANGE OF BOLT TORQUES TO BE APPLIED ARE:

BOLT SIZE-INCHES	TORQUE-FT. LBS.
–	45 – 60
¾	75 – 90
1	100 – 120
1¼	120 – 150

O. IF EFFECTIVE SEALING IS NOT ATTAINED AT THE MAXIMUM TORQUE INDICATED ABOVE, THE JOINT SHALL BE DISASSEMBLED AND REASSEMBLED AFTER THOROUGH CLEANING.
P. PUSH-ON TYPE JOINTS: THE JOINT SHALL BE ASSEMBLED AS RECOMMENDED BY THE MANUFACTURER.
Q. HDPE JOINING, HEAT FUSION: PIPE AND FITTINGS SHALL BE JOINED BY ONE OF THE FOLLOWING TYPES OF THERMAL FUSION PER THE MANUFACTURER'S RECOMMENDED PROCEDURES: BUTT FUSION, SADDLE FUSION OR SOCKET FUSION.
1. UPON REQUEST, THE MANUFACTURER SHALL PROVIDE FUSION TRAINING BY AUTHORIZED PERSONNEL OR AN AUTHORIZED REPRESENTATIVE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT PERSONNEL HAVE RECEIVED PROPER TRAINING PER THE MANUFACTURER'S RECOMMENDED PROCEDURE. RECORDS OF TRAINING SHALL BE MAINTAINED BY THE CONTRACTOR AND SHOULD NOT EXCEED 12 MONTHS FROM DATE OF CONSTRUCTION.
2. BUTT FUSIONS PERFORMED BETWEEN PIPE ENDS OR PIPE ENDS AND FITTING OUTLETS SHALL BE WITHIN THE FOLLOWING ALLOWABLE WALL MISMATCHES:
A. 2 DR DIFFERENCE FOR PIPE AND FITTING DIAMETERS 6" IPS AND SMALLER.
B. 1 DR DIFFERENCE FOR ABOVE 6" THROUGH 18".
C. NO DIFFERENCE FOR DIAMETERS ABOVE 18".
THE DIFFERENCE IN DR'S IS DETERMINED FROM THE FOLLOWING DR VALUES: 7.3, 9, 11, 13.5, 17, 21, 26 AND 32.5.
S. OTHER METHODS OF JOINING: POLYETHYLENE PIPE AND FITTINGS MAY BE JOINED TOGETHER OR TO OTHER MATERIALS THROUGH THE USE OF ELECTROFUSION FITTINGS, FLANGE ADAPTERS WITH BACK-UP RINGS, MECHANICAL COUPLINGS DESIGNED FOR CONNECTING POLYETHYLENE PIPE AND FITTINGS TO ITSELF OR TO ANOTHER MATERIAL, OR MJ ADAPTERS. THE MANUFACTURER OF THE JOINING DEVICE SHALL BE CONSULTED FOR PROPER INSTALLATION PROCEDURES.

13. FITTINGS AND VALVES:
A. GENERAL: VALVES AND FITTINGS SHALL BE SET AND JOINTED TO PIPE AS SPECIFIED HEREIN FOR CLEANING, LAYING AND JOINTING PIPE.
B. VALVE BOXES AND VALVE PITS: A CAST IRON VALVE BOX OR A MASONRY PIT SHALL BE PROVIDED FOR EVERY VALVE AS SHOWN ON THE PLANS. A VALVE BOX SHALL BE PROVIDED FOR EVERY VALVE WHICH HAS NO GEARING OR MECHANISM OR IN WHICH THE GEARING OR OPERATING MECHANISM IS FULLY PROTECTED WITH A CAST IRON GREASE CASE. THE VALVE BOX SHALL NOT TRANSMIT SHOCK OR STRESS TO THE VALVE AND SHALL BE CENTERED AND PLUMB OVER THE WRENCH NUT OF THE VALVE, WITH THE BOX COVER FLUSH WITH THE SURFACE OF THE FINISHED PAVEMENT OR SUCH OTHER LEVEL AS MAY BE DIRECTED.
C. DRAINAGE OF MAINS: MAINS SHALL BE DRAINED THROUGH DRAINAGE BRANCHES OR BLOWOFFS TO DRY WELLS FROM WHICH THE WATER CAN BE PUMPED. DRAINAGE BRANCHES, BLOWOFFS, AIR VENTS, AND APPURTENANCES SHALL BE PROVIDED WITH GATE VALVES AND SHALL BE LOCATED AND INSTALLED AS SHOWN ON THE PLANS.

14. HYDRANTS:
A. LOCATION: HYDRANTS SHALL BE LOCATED AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER TO PROVIDE COMPLETE ACCESSIBILITY AND TO MINIMIZE THE POSSIBILITY OF DAMAGE FROM VEHICLES OR INJURY TO PEDESTRIANS.
B. CONNECTION TO MAIN: EACH HYDRANT SHALL BE CONNECTED TO THE MAIN WITH A BRANCH CONTROLLED BY AN INDEPENDENT GATE VALVE EXCEPT AS OTHERWISE DIRECTED.
C. HYDRANT DRAINAGE IN PERVIOUS SOIL: WHEREVER A HYDRANT IS SET IN SOIL THAT IS PERVIOUS, DRAINAGE SHALL BE PROVIDED AT THE BASE OF THE HYDRANT BY PLACING COARSE GRAVEL OR CRUSHED STONE MIXED WITH COARSE SAND FROM THE BOTTOM OF THE TRENCH TO AT LEAST 6 INCHES ABOVE THE WASTE OPENING IN THE HYDRANT AND TO A DISTANCE OF 1 FOOT AROUND THE ELBOW.
D. HYDRANT DRAINAGE IN IMPERVIOUS SOIL: WHEREVER A HYDRANT IS SET IN CLAY OR OTHER IMPERVIOUS SOIL, A DRAINAGE PIT 2 FEET IN DIAMETER AND 3 FEET DEEP SHALL BE EXCAVATED BELOW EACH HYDRANT AND FILLED COMPLETELY WITH COARSE GRAVEL OR CRUSHED STONE MIXED WITH COARSE SAND UNDER AND AROUND THE ELBOW OF THE HYDRANT AND TO A LEVEL OF 6 INCHES ABOVE THE WASTE OPENING.

15. ANCHORAGE:
A. ANCHORAGE FOR HYDRANTS: THE BOWL OF EACH HYDRANT SHALL BE WELL BRACED AGAINST UNEXCAVATED EARTH AT THE END OF THE TRENCH WITH STONE SLABS OR CONCRETE BACKING OR IT SHALL BE TIED TO RODS OR CLAMPS AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.
B. ANCHORAGE FOR PLUGS, CAPS, TEES, AND BENDS: ALL PLUGS, CAPS, TEES, AND BENDS DEFLECTING 11¼ DEGREES OR MORE ON MAINS 6 INCHES IN DIAMETER OR LARGER SHALL BE PROVIDED WITH A REACTION BACKING OR MOVEMENT SHALL BE PREVENTED BY ATTACHING SUITABLE METAL RODS OR CLAMPS AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. ALL LATERAL LINE VALVES SHALL BE RODDED TO THE MAIN LINE TEE WITH ¾INCH THREADED TIE RODS IF A FLANGED OR RESTRAINED JOINT IS NOT UTILIZED.
C. REACTION BACKING: REACTION BACKING SHALL BE CONCRETE OF A MIX NOT LEANER THAN 1 CEMENT; 2½ SAND; 5 STONE; AND HAVING A COMPRESSIVE STRENGTH OF NOT LESS THAN 2,000 PSI, AT 28 DAYS. BACKING SHALL BE PLACED BETWEEN SOLID GROUND AND THE FITTING TO BE ANCHORED; THE AREA OF BEARING ON THE PIPE AND ON THE GROUND IN EACH INSTANCE SHALL BE AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. THE BACKING SHALL, UNLESS OTHERWISE SHOWN OR DIRECTED, BE SO PLACED THAT THE PIPE AND FITTING JOINTS WILL BE ACCESSIBLE FOR REPAIR.
D. VERTICAL REACTION BLOCKING: ALL VERTICAL REACTION BLOCKING SHALL BE ACCEPTED BY THE ENGINEER. REACTION BLOCKING SHALL BE USED WHERE ANY ELBOW OR OFFSET IS USED IN A VERTICAL DIRECTION.
E. TIE RODS: METAL HARNESS OF TIE RODS OF ADEQUATE STRENGTH TO PREVENT MOVEMENT SHALL BE USED. STEEL RODS OR CLAMPS SHALL BE GALVANIZED AND PAINTED WITH TWO COATS OF ASPHALT TYPE PAINT.

16. CONCRETE CRADLE AND ENCASEMENT:
A. PREPARATION: PRIOR TO THE FORMATION OF THE CRADLE OR ENCASEMENT, TEMPORARY SUPPORTS CONSISTING OF SOLID CONCRETE BRICKS OR CAP BLOCKS SHALL HAVE MINIMUM DIMENSIONS AND SHALL SUPPORT THE PIPE AT NOT MORE THAN TWO LOCATIONS, ONE AT THE BOTTOM OF THE BARREL OF THE PIPE ADJACENT TO THE SHOULDER OF THE SOCKET AND THE OTHER NEAR THE SPIGOT END.
B. PLACING: AFTER JOINTING OF THE PIPE HAS BEEN COMPLETED, CONCRETE SHALL BE UNIFORMLY POURED BENEATH AND ON BOTH SIDES OF THE PIPE. PLACEMENT SHALL BE DONE BY THE USE OF SUITABLE EQUIPMENT. THE CONCRETE SHALL BE WET ENOUGH DURING PLACEMENT TO PERMIT ITS FLOW, WITHOUT EXCESSIVE PRODDING, TO ALL REQUIRED POINTS AROUND THE PIPE SURFACE. THE WIDTH OF THE CRADLE SHALL BE SUCH AS TO COMPLETELY FILL THE TRENCH WIDTH. IN CASE OF EXTREMELY WIDE TRENCHES, CONCRETE ENCASEMENT MAY BE CONFINED ABOVE THE TOP OF THE PIPE TO A NARROWER WIDTH, BUT IN NO CASE SHALL IT BE LESS THAN THE WIDTH OF TRENCH REQUIRED FOR THE SIZE OF PIPE BEING USED.
C. BEFORE DEPOSITING CONCRETE, THE SPACE WITHIN THE LIMITS OF THE POUR SHALL HAVE BEEN CLEARED OF ALL DEBRIS AND WATER. WATER SHALL NOT BE ALLOWED TO RISE ADJACENT TO, OR FLOW OVER, CONCRETE DEPOSITED FOR LESS THAN 24 HOURS. CONCRETE SHALL BE PROTECTED FROM THE DIRECT RAYS OF THE SUN AND KEPT MOIST BY A METHOD ACCEPTABLE TO THE ENGINEER, FOR A PERIOD OF 7 DAYS OR UNTIL BACKFILLING IS BEGUN. IN NO CASE SHALL BACKFILL BEGIN WITHIN 36 HOURS OF THE TIME OF PLACING AND THE ENGINEER SHALL HAVE STRICT CONTROL OF THE RATE OF BACKFILLING.

17. BLOWOFF CONNECTION:
A. BLOWOFF CONNECTIONS SHALL BE INSTALLED WHERE INDICATED ON DRAWINGS. UNLESS OTHERWISE SHOWN ON THE DRAWINGS OR SPECIFIED, EACH BLOWOFF SHALL CONSIST OF A GATE VALVE AND BOX OF THE SAME SIZE AS THE WATERMAIN, A REDUCER WHERE NECESSARY, 4 INCH BEND DRILLED FOR DRAINAGE, PIECE OF 4 INCH PIPE RISING TO THE SURFACE AND A VALVE BOX TELESCOPED OVER THE RISER PIPE. BLOWOFFS SHALL NOT BE CONNECTED TO ANY SEWER AND/OR SUBMERGED IN ANY OTHER MANNER THAT WILL PERMIT BACK SIPHONING INTO THE DISTRIBUTION SYSTEM.

18. VAULTS/PITS:
A. GENERAL: WATER SYSTEM VAULTS/PITS SHALL BE CONSTRUCTED OF PRECAST CONCRETE UNITS WITH CAST IRON FRAMES AND COVERS IN THE LOCATIONS SHOWN ON THE DRAWINGS OR AS DIRECTED BY THE ENGINEER AND IN ACCORDANCE WITH THE CONSTRUCTION DETAILS. SHOP DRAWINGS SHALL BE SUBMITTED BY THE CONTRACTOR FOR THE ENGINEER'S REVIEW.
B. CONCRETE OR MORTAR SHALL CONFORM TO THE REQUIREMENTS SPECIFIED HEREIN.
C. FRAMES, COVERS AND STEPS: CAST IRON FRAMES AND COVERS AND MANHOLE STEPS SHALL CONFORM TO THE DRAWINGS IN ALL ESSENTIALS OF DESIGN. STANDARD CASTINGS DIFFERING IN NONESSENTIAL DETAILS AND ACCEPTED BY THE ENGINEER WILL BE ACCEPTABLE. FRAMES AND COVERS SHALL BE MACHINED TO PRODUCE A TIGHT, RATTLEPROOF FIT. THE FRAMES AND COVERS SHALL BE SET THAT THE TOP OF THE COVER WILL BE FLUSH WITH OR HIGHER THAN THE FINISHED GRADE AS DIRECTED BY THE ENGINEER. STEPS WHEN SHOWN ON DRAWINGS OR SPECIFIED SHALL BE FURNISHED AND SET AS MANHOLE CONSTRUCTION PROGRESSES.

19. WATER SERVICE LINES:
A. ALL SERVICES OVER ¼ INCH SHALL BE OF A TYPE AS SHOWN ON THE PLANS. TO AVOID CUTTING OR EXCAVATING THE EXISTING ROADWAY, ALL SERVICES LESS THAN 4 INCHES SHALL BE BORED WITH AN AUGER OR PUSHED THROUGH A DRIVE PIPE. (THE DRIVE PIPE MAY BE REMOVED WHEN THE SERVICE IS INSTALLED.) WHERE ROCK OR OTHER OBSTRUCTIONS ARE ENCOUNTERED, THE LOCATION OF THE SERVICE LINE MAY BE MOVED AS MUCH AS IS NECESSARY WITH THE ENGINEER'S APPROVAL. SHOULD IT BE IMPOSSIBLE TO PUSH OR DRIVE ANY SERVICE LINE UNDER THE ROADWAY, THE CONTRACTOR SHALL MAKE SUCH EXCAVATIONS AS NECESSARY WITH APPROVAL OF THE ENGINEER. ALL EXCAVATIONS AND PAVING ENCOUNTERED IN LAYING A SERVICE LINE SHALL BE INCLUDED IN THE UNIT PRICE.

20. HYDROSTATIC TESTS:
A. LEAKAGE TEST: AFTER THE PIPE HAS BEEN LAID AND BACKFILLED AS SPECIFIED, ALL NEWLY LAID PIPE OR ANY VALVE SECTIONS THEREOF, SHALL BE SUBJECTED TO A HYDROSTATIC PRESSURE OF 150 PSI, OR 50 PERCENT IN EXCESS OF THE NORMAL WORKING PRESSURE, WHICHEVER IS GREATER. IN APPLICATIONS WHERE THE WATERMAIN IS USED SOLELY FOR FIRE PROTECTION, I.E., DEDICATED PRIVATE FIRE WATER SERVICE, IT SHALL BE TESTED IN ACCORDANCE WITH NFPA 13 AND NFPA 24, WHICH REQUIRES A TEST OF 200 PSI FOR A DURATION OF 2 HOURS.
B. LEAKAGE IS DEFINED AS THE QUANTITY OF WATER TO BE SUPPLIED INTO THE NEWLY LAID PIPE, OR ANY VALVED SECTION THEREOF, NECESSARY TO MAINTAIN THE SPECIFIED LEAKAGE TEST PRESSURE AFTER THE PIPE HAS BEEN FILLED WITH WATER AND THE AIR EXPELLED.
C. NO PIPE INSTALLATION WILL BE ACCEPTED UNTIL THE LEAKAGE IS LESS THAN THE NUMBER OF GALLONS PER HOUR AS DETERMINED BY THE FORMULA

$$L = \frac{ND(P)^{1/2}}{7400}$$

IN WHICH "L" EQUALS THE ALLOWABLE LEAKAGE IN GALLONS PER HOUR; "N" IS THE NUMBER OF JOINTS IN THE LENGTH OF PIPELINES TESTED; "D" IS THE NOMINAL DIAMETER OF THE PIPE, IN INCHES AND "P" IS THE AVERAGE TEST PRESSURE DURING THE LEAKAGE TEST, IN POUNDS PER SQUARE INCH GAUGE. (THE ALLOWABLE LEAKAGE ACCORDING TO THE FORMULA IS EQUIVALENT TO 23.3 U.S. GALLONS PER 24 HOURS PER MILE OF PIPE PER INCH NOMINAL DIAMETER, FOR PIPE IN 18 FOOT LENGTHS EVALUATED ON A PRESSURE BASIS OF 150 PSI.) THE DURATION OF THE TEST UNDER PRESSURE SHALL BE 2 HOURS.
D. PROCEDURE: EACH VALVED SECTION OF PIPE SHALL BE SLOWLY FILLED WITH WATER AND THE SPECIFIED TEST PRESSURE, BASED ON THE ELEVATION OF THE LOWEST POINT OF THE LINE OR SECTION UNDER TEST AND CORRECTED TO THE ELEVATION OF THE TEST GAUGE, SHALL BE APPLIED BY MEANS OF A PUMP CONNECTED TO THE PIPE IN A MANNER SATISFACTORY TO THE ENGINEER. THE PUMP, PIPE CONNECTIONS, AND ALL NECESSARY APPARATUS INCLUDING GAUGES SHALL BE FURNISHED BY THE CONTRACTOR. THE CONTRACTOR WILL MAKE ALL TAPS INTO THE PIPE AND FURNISH ALL NECESSARY ASSISTANCE FOR CONDUCTING THE TESTS.
E. EXPELLED AIR BEFORE TEST: BEFORE APPLYING THE SPECIFIED TEST PRESSURE, ALL AIR SHALL BE EXPELLED FROM THE PIPE. IF HYDRANTS OR BLOWOFFS ARE NOT AVAILABLE AT HIGH PLACES, THE CONTRACTOR SHALL MAKE THE NECESSARY TAPS AT SUCH POINTS BEFORE THE TEST IS MADE AND INSERT THE PLUGS AFTER THE TEST HAS BEEN COMPLETED.
F. VARIATION FROM PERMISSIBLE LEAKAGE: SHOULD ANY TEST OF PIPE LAID DISCLOSE LEAKAGE GREATER THAN THAT SPECIFIED, THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, LOCATE, REPAIR AND REPLACE THE DEFECTIVE JOINTS, PIPE OR FITTINGS UNTIL THE LEAKAGE IS WITHIN THE SPECIFIED ALLOWANCE.
G. WHERE ANY SECTION OF A MAIN IS PROVIDED WITH CONCRETE REACTION BACKING, THE HYDROSTATIC PRESSURE TEST SHALL NOT BE MADE UNTIL AT LEAST FIVE (5) DAYS HAVE ELAPSED AFTER THE CONCRETE REACTION BACKING WAS INSTALLED. IF HIGH EARLY STRENGTH CEMENT IS USED IN THE CONCRETE REACTION BACKING, THE HYDROSTATIC PRESSURE TEST SHALL NOT BE MADE UNTIL AT LEAST TWO (2) DAYS HAVE ELAPSED.
H. THE ENGINEER SHALL BE PRESENT DURING THE OPERATION OF VALVES REQUIRED TO FILL MAINS FOR PRESSURE AND LEAKAGE TESTS.
I. THE CONTRACTOR SHALL SCHEDULE THE PRESSURE AND LEAKAGE TEST AT LEAST 48 HOURS IN ADVANCE OF THE TEST DAY WITH THE ENGINEER. NO TESTING WILL BE AUTHORIZED UNLESS AIR TEMPERATURE IS GREATER THAN 35°F (2 °C).
J. THE PRESSURE AND LEAKAGE TESTS SHALL BE MONITORED BY THE ENGINEER.
K. THE CONTRACTOR WILL FURNISH THE LABORATORY-CALIBRATED TEST GAUGE AND MEASURING DEVICE FOR THE LEAKAGE TEST.
L. ALL FIELD JOINTS OF FITTINGS, VALVES AND HYDRANTS SHALL BE EXPOSED AND EXAMINED DURING PRESSURE AND LEAKAGE TEST.
M. THE SECTION UNDER TESTING SHALL BE BROUGHT TO TEST PRESSURE OF 150 PSI AT ½ HOUR INTERVALS DURING THE TEST. THE ENGINEER WILL RECORD BOTH THE MAKEUP WATER PRESSURE AT EACH ½ HOUR RE-PRESSURIZATION.
N. IF THE TEST IS APPLIED AGAINST AN EXISTING VALVE AND THE CONTRACTOR HAS DETERMINED THAT SAID VALVE IS PASSING, CONTRACTOR SHALL EXCAVATE VALVE AT HIS EXPENSE SO ENGINEER CAN SOUND VALVE. IN ADDITION TO THE SOUND TEST, TEST SECTION SHALL BE VALVED OFF AND POST PRESSURE APPLIED. ENGINEER WILL OBSERVE PRESSURE FOR 24 HOURS. THIS SECTION SHOULD REMAIN AT POST PRESSURE IF VALVE IS PASSING.

21. DISINFECTION OF LINES:
A. PRELIMINARY FLUSHING: PRIOR TO DISINFECTION, THE LINES SHALL BE FLUSHED AS THOROUGHLY AS POSSIBLE WITH THE WATER PRESSURE AND OUTLETS AVAILABLE. FLUSHING SHALL BE DONE AFTER THE LINE LEAKAGE TEST HAS BEEN MADE. DISINFECTION SHALL BE IN FULL ACCORDANCE WITH AWWA C651 AND THESE SPECIFICATIONS.
B. CHLORINATION OF COMPLETED LINE: BEFORE BEING PLACED IN SERVICE, THE ENTIRE LINE SHALL BE CHLORINATED. CHLORINE MAY BE APPLIED BY THE FOLLOWING METHODS: LIQUID CHLORINE AND CALCIUM HYPOCHLORITE GRANULES, AND SODIUM HYPOCHLORITE SOLUTION.
C. THE CHLORINATING AGENT SHALL BE APPLIED AT THE BEGINNING OF THE SECTION ADJACENT TO THE FEEDER CONNECTION AND SHALL BE INJECTED THROUGH A CORPORATION COCK, HYDRANT, OR OTHER CONNECTION ENSURING TREATMENT OF ENTIRE LINE.
D. WATER SHALL BE FED SLOWLY INTO NEW LINE WITH CHLORINE APPLIED IN AMOUNTS TO PRODUCE A DOSAGE OF 40 TO 50 PARTS PER MILLION (PPM). MAINS PREVIOUSLY FILLED SHALL BE TREATED TO A CONCENTRATED DOSAGE AT INTERVALS ALONG THE LINE AND RETAINED FOR A PERIOD OF 8 HOURS OR MORE. A RESIDUAL OF NOT LESS THAN 5 PPM SHALL BE PRODUCED IN ALL PARTS OF THE LINE.
E. DURING THE CHLORINATION PROCESS, ALL VALVES AND ACCESSORIES SHALL BE OPERATED.
F. AFTER CHLORINATION, THE WATER SHALL BE FLUSHED FROM THE LINE AT ITS EXTREMITIES UNTIL THE REPLACEMENT WATER TESTS ARE EQUAL CHEMICALLY AND BACTERIOLOGICALLY TO THOSE OF THE PERMANENT SOURCE OF SUPPLY.
G. CONTRACTOR SHALL REVIEW DISINFECTION PROCEDURES AND TIME TABLES AT LEAST 3 DAYS PRIOR TO IMPLEMENTING THEM.
H. LIQUID CHLORINE: CHLORINE GAS-WATER MIXTURE SHALL BE APPLIED BY MEANS OF A SOLUTION FEED CHLORINATING DEVICE. CHLORINE GAS SHALL BE FED DIRECTLY FROM A CHLORINE CYLINDER EQUIPPED WITH SUITABLE DEVICE FOR REGULATING THE RATE OF FLOW AND THE EFFECTIVE DIFFUSION OF GAS WITHIN THE PIPE.
I. CALCIUM HYPOCHLORITE: CALCIUM HYPOCHLORITE SHALL BE COMPARABLE TO COMMERCIAL PRODUCTS KNOWN AS HTH PERCHLOREN AND MAXOCHLOR, A SOLUTION CONSISTING OF 5 PERCENT OF POWER TO 95 PERCENT OF WATER BY WEIGHT, SHOULD BE PREPARED. THE CALCIUM HYPOCHLORITE AND WATER MIXTURE, FIRST MADE INTO A PASTE AND THEN THINNED TO A SLURRY, SHALL BE INJECTED OR PUMPED INTO THE NEWLY LAID LINE UNDER THE CONDITIONS SPECIFIED HEREINBEFORE.
J. FINAL FLUSHING: FOLLOWING CHLORINATION, ALL TREATED WATER SHALL BE THOROUGHLY FLUSHED FROM THE LINE, AT ITS EXTREMITIES.

22. BACTERIOLOGICAL TESTS:
A. CHLORINATION OF THE COMPLETED LINE AND THE NECESSARY BACTERIOLOGICAL TESTS SHALL BE DONE AT THE EXPENSE OF THE CONTRACTOR AS PART OF THE CONSTRUCTION CONTRACT. THE TESTS SHALL BE CARRIED OUT BY AN APPROVED LABORATORY AND THE RESULTS GIVEN TO THE ENGINEER. NO SEPARATE OR EXTRA PAYMENTS WILL BE MADE FOR PERFORMING ANY OF THIS WORK.

23. ABANDONMENT OF LINES AND SERVICES:
A. LINE AND SERVICES TO BE ABANDONED SHALL BE CUT FREE FROM THEIR SOURCES AS SHOWN ON THE DRAWINGS AND PERMANENTLY CAPPED TO PREVENT LEAKAGE.

STORM DRAINAGE

1. DESCRIPTION OF WORK:
A. THE WORK WITHIN THIS SECTION INCLUDES, BUT IS NOT LIMITED TO, THE FURNISHING OF ALL EQUIPMENT, LABOR AND MATERIALS, AND PERFORMING ALL OPERATIONS NECESSARY TO CONSTRUCT PIPE CULVERTS, COMBINATION STORM SEWER AND UNDERDRAIN, ENDWALLS, INLETS, PIPES UNDERDRAIN, PAVEMENT BASE DRAIN, AND END SECTIONS IN ACCORDANCE WITH THE SPECIFICATIONS, APPLICABLE DRAWINGS, AND CONTRACT DOCUMENTS.

2. QUALITY ASSURANCE:
A. REFERENCED STANDARDS SHALL BE THE CURRENT NEW YORK DEPARTMENT OF TRANSPORTATION (NYSDOT) STANDARD SPECIFICATIONS AND ITS REVISIONS.

3. SUBMITTALS:
A. CERTIFICATES: CONTRACTOR SHALL SUBMIT THREE (3) COPIES OF EACH MANUFACTURER'S CERTIFICATION CERTIFYING THAT THE MATERIALS MEET OR EXCEED SPECIFICATION REQUIREMENTS.
B. SHOP DRAWINGS: SUBMIT DETAILED SHOP DRAWINGS FOR PRECAST CONCRETE CATCH BASINS, INLET GRATES AND FRAMES, AND PRECAST CONCRETE CONSTRUCTION. SUBMIT MANUFACTURER'S DESCRIPTIVE AND TECHNICAL PRODUCT DATA FOR STORM SEWER PIPES.

4. PIPE CULVERTS:
A. AS SPECIFIED IN NYSDOT STANDARD SPECIFICATIONS 2006, SECTION 706-12.

5. PRECAST CONCRETE DRAINAGE UNITS:
A. AS SPECIFIED IN NYSDOT STANDARD SPECIFICATIONS 2006, SECTION 706-04.

6. FRAMES, GRATES, AND COVERS:
A. AS SPECIFIED IN NYSDOT STANDARD SPECIFICATIONS 2006, SECTION 655.

7. END SECTIONS:
A. AS SUGGESTED BY PIPE MANUFACTURER.

8. PIPE CULVERTS:
A. AS SPECIFIED IN NYSDOT STANDARD SPECIFICATIONS 2006, SECTION 603.

9. INLETS:
A. AS SPECIFIED IN NYSDOT STANDARD SPECIFICATIONS 2006, SECTION 604.

10. END SECTIONS:
A. AS SPECIFIED BY PIPE MANUFACTURER.

MANHOLES

1. DESCRIPTION OF WORK:
A. THE WORK WITHIN THIS SECTION INCLUDES, BUT IS NOT LIMITED TO, THE FURNISHING OF ALL EQUIPMENT, LABOR, MATERIALS AND PERFORMING ALL OPERATIONS NECESSARY TO CONSTRUCT AND INSTALL PRECAST REINFORCED CONCRETE ROUND MANHOLES INCLUDING STEPS AND FRAMES AND COVERS AT THE LOCATIONS SHOWN ON THE DRAWINGS OR AS DIRECTED BY THE ENGINEER, IN ACCORDANCE WITH THE SPECIFICATIONS, APPLICABLE DRAWINGS AND CONTRACT DOCUMENTS.

2. QUALITY ASSURANCE:
A. REFERENCED STANDARDS SHALL BE THE FOLLOWING:
1. AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

3. SUBMITTALS:
A. CERTIFICATES: CONTRACTOR SHALL SUBMIT THREE (3) COPIES OF EACH MANUFACTURER'S CERTIFICATION CERTIFYING THAT THE MATERIALS MEET OR EXCEED SPECIFICATION REQUIREMENTS.
B. SHOP DRAWINGS: SUBMIT DETAIL SHOP DRAWINGS OF MANHOLES, FRAMES AND COVERS, MANHOLE STEPS, MANHOLE JOINT SEALING MATERIAL, AND FLEXIBLE WATERTIGHT GASKETS PRIOR TO THE START OF WORK FOR APPROVAL.

4. GENERAL:
A. MATERIALS FOR CONSTRUCTION OF MANHOLES SHALL BE NEW AND UNUSED AND SHALL CONFORM TO THE FOLLOWING.
1. PRECAST REINFORCED CONCRETE MANHOLE BASES, RISERS, CONES OR FLAT SLAB TOPS:
A. CONCRETE AND STEEL REINFORCEMENT USED IN THE MANUFACTURE OF PRECAST MANHOLE BASES, RISERS, CONES AND FLAT SLAB TOPS SHALL CONFORM TO ASTM C478 (LATEST REVISION). TYPE II CEMENT SHALL BE USED IN THE CONSTRUCTION OF ALL MANHOLE COMPONENTS.
2. MANHOLES SHALL CONFORM TO THE DESIGN AND DIMENSIONS SHOWN ON THE DETAIL DRAWINGS. CONE SECTIONS SHALL BE ECCENTRIC.
3. THRU-WALL LIFTING HOLES ARE NOT PERMITTED. PROVIDE FACTORY INSTALLED LIFTING KEYS OR LUGS CAST INTEGRALLY IN MANHOLE COMPONENTS.
4. THE ENTIRE OUTER SURFACE SHALL BE COATED WITH BITUMASTIC TO A MINIMUM THICKNESS OF 20 MILS. THE MANHOLE SECTIONS SHALL BE PRECOATED AT THE FACTORY, HOWEVER, THE CONTRACTOR SHALL BE REQUIRED TO COMPLETE ANY PATCHING DUE TO DAMAGE DURING INSTALLATION.
5. CONCRETE: COMPOSITION AND COMPRESSIVE STRENGTH CONFORMING TO ASTM C478 EXCEPT USE TYPE II CEMENT IN MANHOLE COMPONENTS AND INCREASE COMPRESSIVE STRENGTH TO 4000 PSI (AT 28 DAYS) IN PRECAST BASES.
A. OPENINGS IN PRECAST CONCRETE MANHOLES TO ACCOMMODATE THE CONNECTION OF PIPING SHALL BE CUSTOM PREFORMED FOR EACH MANHOLE AT THE TIME OF MANUFACTURE. OPENINGS FOR CONNECTION OF THE PIPING SHALL BE OF THE SIZE AND SHAPE REQUIRED FOR THE PARTICULAR TYPE OF SEAL PROVIDED.
B. ALL PRECAST CONCRETE MANHOLES SHALL BE DESIGNED TO ACCOMMODATE AASHTO HIGHWAY LOAD CLASS HS-20
C. THE TOPS OF THE PRECAST BASES SHALL BE ACCURATELY FORMED TO RECEIVE THE TONGUE OF THE BOTTOM PRECAST CONCRETE MANHOLE SECTION OF THE WALL.
6. MONOLITHIC POURED-IN-PLACE CONCRETE BASES:
A. MONOLITHIC POURED-IN-PLACE CONCRETE BASES SHALL BE OF THE DESIGN DIMENSIONS INDICATED ON THE DETAIL DRAWINGS.
B. PORTLAND CEMENT: ASTM C150 TYPE II, MODERATE SULFATE RESISTANCE.
C. CONCRETE USED FOR POURED-IN-PLACE MANHOLE BASES SHALL BE OF A 4,000 PSI MIX DESIGN.
D. CONSISTENCY: THE CONCRETE SHALL BE OF UNIFORM CONSISTENCY. THE MAXIMUM ALLOWABLE SLUMP SHALL BE 2 INCHES.
1) THIS STRENGTH REQUIREMENT SHALL BE VERIFIED BY TESTS. AT LEAST ONE TEST SHALL BE MADE ONCE A DAY OR ONE TEST PER STRUCTURE. A TEST SHALL CONSIST OF AT LEAST TWO CYLINDERS WHOSE 28-DAY COMPRESSIVE STRENGTHS SHALL BE DETERMINED BY AN APPROVED LABORATORY.
7. CONCRETE USED FOR CHANNELS INSIDE PRECAST MANHOLE BASES SHALL BE OF A 3,500 PSI MIX DESIGN WITH A 5/8" DIAMETER MAXIMUM ALLOWABLE AGGREGATE SIZE.
A. CONSISTENCY: THE MIXED CONCRETE SHALL BE OF UNIFORM CONSISTENCY. THE MAXIMUM ALLOWABLE SLUMP SHALL BE 1 INCH.
B. CEMENT SHALL BE TYPE II.
8. STEEL REINFORCEMENT:
A. STEEL REINFORCEMENT USED IN THE MANUFACTURE OF PRECAST CONCRETE MANHOLE BASES AND PRECAST RISER AND TOP SECTIONS SHALL CONFORM TO THE REQUIREMENTS SPECIFIED IN SECTION 6 OF ASTM C478.
9. PIPE OPENINGS AND SEALS:
A. OPENINGS SHALL BE PREFORMED DURING MANUFACTURING IN EACH BASE AND RISER SECTION REQUIRING A PIPED OPENING. EACH OPENING SHALL ACCOMMODATE THE TYPE OF PIPE AND PIPE SEAL REQUIRED.
B. PIPE OPENING SEALS SHALL MEET THE REQUIREMENTS SPECIFIED IN ASTM C923.
A. PIPE OPENING SEALS INTEGRALLY CAST WITH HOLES FOR PIPE IN PRECAST CONCRETE MANHOLE WALLS SHALL BE ALL-RUBBER COMPOSITION, FLEXIBLE, PLIABLE, AND PROVIDE UP TO 15 DEGREES LATERAL, DIAGONAL, OR VERTICAL PIPE DEFLECTION. GASKETS SHALL BE LEAK PROOF TESTED TO 20 PSI., AND SHALL MEET OR EXCEED RUBBER QUALITY STANDARDS OF ASTM C-443.
B. PIPE OPENING SEALS NOT CAST WITH HOLES FOR PIPE SHALL BE PLIABLE AND PERMIT DEFLECTION. A STRONG RUBBER COATED STEEL CENTER COMPRESSION RING AND A LONG RUBBER SLEEVE WITH A DEEP GROVE SECURED STAINLESS STEEL CLAMP SHALL BE USED TO CREATE A POSITIVE SEAL.
C. RUBBER ADAPTER RING FOR USE ON PVC PIPE IN POURED-IN -PLACE MANHOLE BASES SHALL BE RECOMMENDED BY THE MANUFACTURER.
D. MANHOLE ADAPTERS SHALL BE PROVIDED FOR ALL PVC PIPE IN CUT-IN PIPE OPENINGS AND SHALL BE RECOMMENDED BY THE PIPE MANUFACTURER.

1. MANHOLE JOINT SEALING MATERIAL:
A. JOINTS BETWEEN MANHOLE SECTIONS SHALL BE PROVIDED WITH DOUBLE PERFORMED PLASTIC JOINT SEALING MATERIAL SUCH AS RUBBER-NECK, OR APPROVED EQUIVALENT. THE CHEMICAL COMPOSITION OF THE SEALER SHALL BE AS FOLLOWS: BITUMEN, ASTM D477; INERT ASH MATERIAL, AASHTO T11142 (1974); VOLATILE MATTER, ASTM D667 (1973).

6. FLEXIBLE WATERTIGHT GASKETS:
A. BASES SHALL HAVE FLEXIBLE WATERTIGHT GASKETS AT THE POINT OF ENTRY OF SEWER PIPE INTO THE MANHOLE. THE RUBBER MATERIALS SHALL CONFORM TO ASTM C443. THE GASKETS SHALL BE CAST INTO THE MANHOLE BASE TO BECOME AN INTEGRAL PART OF THE CONCRETE. THE GASKETS SHALL BE PRESSWEDGE II AS MANUFACTURED BY PRESS-SEAL GASKET CORPORATION, DURA-SEAL II AS SUPPLIED BY TERRE HILL CONCRETE PRODUCTS, OR EQUIVALENT.
B. CUTTING OF OPENINGS IN PRECAST MANHOLES IN THE FIELD WILL ONLY BE PERMITTED WHERE AUTHORIZED BY THE ENGINEER, AND THESE OPENINGS SHALL BE OF PROPER SIZE AS REQUIRED FOR THE INSTALLATION OF A GASKET TYPE WATERSTOP. NON-SHRINK GROUT SHALL BE TIGHTLY PLACED INTO THE ANNULAR SPACE FROM BOTH THE INSIDE AND OUTSIDE OF THE WALL IN SUCH A MANNER AS TO COMPLETELY FILL THE ANNULAR SPACE AND PROVIDE A WATERTIGHT INSTALLATION.

7. STANDARD FRAME AND COVER:
A. MANHOLE FRAME AND COVER SHALL BE OF SOFT GRAY IRON EQUIVALENT IN DESIGN TO PATTERN NO. 1009A WITH COVER AS MANUFACTURED BY CAMPBELL FOUNDRY COMPANY, OR APPROVED EQUIVALENT, MACHINED AND HAVING THE WORD "SEWER" CAST APPROXIMATELY IN THE CENTER OF THE COVER. FRAME AND COVER SHALL HAVE AN AASHTO H20 HIGHWAY LOADING CAPACITY. JOINT MATERIAL BETWEEN THE FRAME AND MANHOLE OR GRADE RING SHALL BE AS SPECIFIED IN MANHOLE JOINT SEALING MATERIAL.

8. WATERTIGHT FRAME AND COVER:
A. WATERTIGHT FRAME AND COVER SHALL BE OF SOFT GRAY IRON SIMILAR IN DESIGN TO PATTERN NO. 6542 AS MANUFACTURED BY CAMPBELL FOUNDRY COMPANY, OR APPROVED EQUIVALENT, MACHINED AND HAVING THE WORD "SEWER" CAST APPROXIMATELY IN THE CENTER OF THE COVER. FRAME SHALL BE SECURELY ATTACHED TO THE TOP OF THE MANHOLE SECTION BY TWO ANCHOR BOLTS AT 180° C TO C. FRAME AND COVER SHALL HAVE AN AASHTO HS-25 HIGHWAY LOADING CAPACITY. JOINT MATERIAL BETWEEN THE FRAME AND MANHOLE SHALL BE AS SPECIFIED IN MANHOLE JOINT SEALING MATERIAL.

9. MANHOLE STEPS:
A. CONTRACTOR SHALL PROVIDE REINFORCED PLASTIC, OR APPROVED EQUIVALENT, MANHOLE STEPS FOR MANHOLES.
B. MANHOLE STEPS SHALL BE INSTALLED AT THE MANUFACTURER'S PLANT. INSTALLATION OF MANHOLE STEPS IN THE FIELD SHALL NOT BE PERMITTED. MANHOLE STEPS SHALL BE ALIGNED VERTICALLY AND SPACED A MAXIMUM DISTANCE OF 12 INCHES APART.
C. REINFORCED PLASTIC STEPS SHALL CONSIST OF ½ INCH DIAMETER DEFORMED STEEP REINFORCING BAR COMPLETELY ENCAPSULATED IN POLYPROPYLENE PLASTIC. REINFORCING STEEL BAR SHALL BE GRADE 60 AS PER ASTM A615 AND THE ENCAPSULATION MATERIAL AS PER ASTM D2146-82, TYPE II, GRADE 43758.

10. MANHOLE GRADE RINGS:
A. CONCRETE MANHOLE GRADE RINGS FOR LEVELING UNITS SHALL BE FULL CIRCLE AND SHALL BE MANUFACTURED AS PER ASTM C-478 AND SHALL BE AS THICK AS NECESSARY TO PROVIDE THE REQUIRED GRADE ADJUSTMENT. JOINT MATERIAL BETWEEN GRADE RINGS SHALL BE AS SPECIFIED IN MANHOLE JOINT SEALING MATERIAL.
B. RUBBER GRADE RINGS:
1. RUBBER GRADE RINGS (RUBBER ADJUSTMENT RISER) FOR LEVELING UNITS SHALL COMPLY WITH THE FOLLOWING:
A. DENSITY:
1) AS SPECIFIED IN ASTM C 642-90.
B. DUROMETER HARDNESS:
1) AS SPECIFIED IN ASTM D 2240.
C. COMPRESSION:
1) AS SPECIFIED IN ASTM D 575.
D. COMPRESSION SET:
1) AS SPECIFIED IN ASTM D 395.
E. FREEZE AND THAW:
1) AS SPECIFIED IN ASTM C 672-91.
F. COEFFICIENT OF THERMAL EXPANSION:
1) AS SPECIFIED IN ASTM C 5314-85.
G. WEATHERING (70 HOURS AT 70°C):
1) AS SPECIFIED IN ASTM D 573-88.
2. RUBBER GRADE RINGS SHALL ONLY BE USED IN PAVED AREAS.
3. TAPERED RUBBER GRADE RINGS SHALL BE USED TO ACCOMMODATE SLOPED PAVED SURFACES.
C. CHEMICAL GROUT:
1. CEMENT GROUT SHALL BE NON-SHRINK NON-METALLIC.
2. USE TYPE I CEMENT WHERE GROUT IS NOT IN CONTACT WITH SEWAGE.
3. USE TYPE II (SULFATE RESISTANT) CEMENT WHERE GROUT IS IN CONTACT WITH SEWAGE.
D. WATERPROOFING MORTAR:
1. MATERIAL COMPOSITION MEETING THE REQUIREMENTS OF ASTM C270, TYPE M WITH WATERPROOFING ADMIXTURE INCLUDED.
2. APPLY IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
E. EPOXY BONDING COMPOUND
1. PROVIDE A HIGH-MODULUS, LOW VISCOSITY, MOISTURE INSENSITIVE EPOXY ADHESIVE HAVING THE FOLLOWING CHARACTERISTICS.
A. MIX RATIO: 100 PERCENT SOLIDS, TWO COMPONENTS; MIXED ONE PART BY VOLUME COMPONENT B TO TWO PARTS BY VOLUME COMPONENT B.
B. ULTIMATE COMPRESSIVE STRENGTH: 13,000 PSI AFTER CURE AT 73° F AND 50 PERCENT RELATIVE HUMIDITY DETERMINED IN ACCORDANCE WITH ASTM D695.

11. INSPECTION:
A. FIELD INSPECTION: ALL PIPE AND APPURTENANCES SHALL BE INSTALLED AND TESTED FOR DEFECTS IN MATERIAL AND/OR WORKMANSHIP IN THE MANNER SPECIFIED AND IN THE PRESENCE OF, AND AS APPROVED BY, THE ENGINEER OR OWNER.

12. HANDLING OF MATERIAL:
A. REPLACEMENT OF DAMAGED MATERIAL: THE CONTRACTOR SHALL REPLACE, AT HIS OWN EXPENSE, ALL MATERIAL FURNISHED BY HIM AND FOUND DEFECTIVE IN MANUFACTURE OR DAMAGED IN HANDLING AFTER DELIVERY BY THE MANUFACTURER. THIS SHALL INCLUDE THE FURNISHING OF ALL MATERIALS AND LABOR REQUIRED FOR REPLACEMENT OF INSTALLED MATERIAL. ANY MATERIAL FURNISHED BY THE OWNER THAT BECOMES DAMAGED AFTER ACCEPTANCE BY THE CONTRACTOR SHALL BE REPLACED BY THE CONTRACTOR AT HIS OWN EXPENSE.
B. RESPONSIBILITY OF SAFE STORAGE: THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFE STORAGE OF MATERIAL FURNISHED BY OR TO HIM AND ACCEPTED BY HIM, AND INTENDED FOR THE WORK UNTIL IT HAS BEEN INCORPORATED IN THE COMPLETED PROJECT. THE INTERIOR OF ALL PIPE, FITTINGS, AND OTHER ACCESSORIES SHALL BE KEPT FREE FROM DIRT AND FOREIGN MATTER AT ALL TIMES. ALL EQUIPMENT AND MATERIALS SUBJECT TO DAMAGE FROM FREEZING SHALL BE DRAINED AND STORED IN A MANNER THAT WILL PROTECT THEM.
C. HAULING: ALL MATERIALS FURNISHED BY THE CONTRACTOR SHALL BE DELIVERED AND DISTRIBUTED AT THE SITE BY THE CONTRACTOR. ALL MATERIALS FURNISHED BY THE OWNER SHALL BE PICKED UP BY THE CONTRACTOR AT POINTS DESIGNATED BY THE OWNER AND HAULED TO AND DISTRIBUTED AT THE SITE.
D. PIPE, FITTINGS, ITEMS OF EQUIPMENT, AND OTHER MATERIALS OF CONSTRUCTION SHALL BE LOADED AND UNLOADED BY LIFTING WITH HOISTS OR SKIDDING TO AVOID SHOCK OR DAMAGE. UNDER NO CIRCUMSTANCES SHALL SUCH MATERIALS BE DROPPED. MATERIALS HANDLED ON SKIDWAYS SHALL NOT BE SKIDDED OR ROLLED AGAINST MATERIALS ALREADY ON THE GROUND.
E. AT SITE OF WORK: IN DISTRIBUTING THE MATERIAL AT THE SITE OF THE WORK, EACH PIECE SHALL BE UNLOADED OPPOSITE OR NEAR THE PLACE WHERE IT IS TO BE LAID IN THE TRENCH, OR AS OTHERWISE DIRECTED BY THE ENGINEER. UNDER NO CIRCUMSTANCES SHOULD LAWNS, GRASS PLOTS OR OTHER PRIVATE PROPERTY BE USED FOR THIS PURPOSE WITHOUT THE CONSENT OF THE PROPERTY OWNER.

13. GENERAL:
A. MANHOLES SHALL, IN ALL CASES, BE FULLY AND COMPLETELY BUILT AND FITTED WITH THEIR FRAMES AND COVERS AS THE WORK PROGRESSES. MANHOLES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE FOLLOWING.
1. EXCAVATION AND BACKFILL: EXCAVATION AND BACKFILL SHALL CONFORM TO THE APPLICABLE REQUIREMENTS AND TO THE FOLLOWING:
A. EXCAVATIONS FOR MANHOLES SHALL BE MADE TO A VERTICAL PLANE 1 FOOT OUTSIDE THE WALLS OF THE MANHOLE. RIGID TYPE PAVEMENT IF ENCOUNTERED SHALL BE CUT TO A RECTANGULAR SHAPE WHOSE SIDES DO NOT EXCEED MORE THAN 2 FEET OF THE DIAMETER OF THE MANHOLE BASE.
B. SPACES OUTSIDE THE MANHOLE SHALL BE BACKFILLED WITH ACCEPTABLE MATERIAL IN UNIFORM LAYERS NOT EXCEEDING 4 INCHES IN DEPTH.
B. PRECAST CONCRETE BASES: ALL PRECAST CONCRETE BASES SHALL BE INSTALLED ON A LAYER OF CRUSHED STONE WHICH SHALL HAVE A MINIMUM DEPTH OF 6 INCHES. THE CRUSHED STONE SHALL CONFORM TO THE QUALITY AND GRADING REQUIREMENTS SPECIFIED IN SECTION 703.4 OF NYSDOT 2006 STANDARD SPECIFICATIONS FOR 403-0201 SIZE 2 CRUSHED STONE AGGREGATE.
C. WHERE RUBBER GASKET PIPE SEALS USED FOR CONNECTING PIPE SEWER PIPING TO PRECAST CONCRETE BASES ARE OF A TYPE IN WHICH AN ANNULAR SPACE REMAINS ON THE INTERIOR AND EXTERIOR OF THE WALL OF THE BASE AFTER THE PIPE CONNECTION HAS BEEN MADE, THESE ANNULAR SPACES SHALL BE COMPLETELY FILLED WITH PREFORMED PLASTIC SEALING COMPOUND. THE SEALING COMPOUND SHALL BE TIGHTLY CAULKED INTO THE ANNULAR SPACES IN SUCH A MANNER AS TO COMPLETELY FILL THE ANNULAR SPACES AND PROVIDE A COMPLETELY WATERTIGHT INSTALLATION. THE SEALING COMPOUND SHALL BE TROWELLED SMOOTH AT THE INSIDE FACE OF THE MANHOLE BASE.
D. CONCRETE CHANNEL FILL: THE CONCRETE CHANNEL FILL SHALL BE POURED IN THE FIELD FOR ALL MANHOLE BASES. INVERTS SHALL BE FORMED DIRECTLY IN THE CONCRETE CHANNEL FILL OF THE MANHOLE BASE, AND SHALL BE SMOOTH (STEEL TROWEL FINISH) AND ACCURATELY SHAPED TO A SEMI-CIRCULAR BOTTOM CONFORMING TO THE INSIDE OF THE ADJACENT SEWER SECTIONS. CHANGES IN SIZE AND GRADE SHALL BE MADE GRADUALLY. CHANGES IN THE DIRECTION OF THE SEWER AND ENTERING BRANCHES SHALL HAVE A TRUE CURVE OF AS LARGE A RADIUS AS THE SIZE OF THE MANHOLE WILL PERMIT. STEEP SLOPES OUTSIDE THE INVERT CHANNELS SHALL BE AVOIDED.
E. CONTRACTOR MAY USE A PRECAST INVERT BASE. CONTRACTOR SHALL NOTIFY ENGINEER OF THEIR INTENT TO USE THE PRECAST INVERT BASE PRIOR TO SUBMITTING THE REQUIRED SHOP DRAWINGS.

NO.	DATE	REVISION
2	6/25/25	PROGRESS SET
1	12/11/24	DESIGN REVISIONS

MICHAEL G. RIELLY
NEW YORK STATE PROFESSIONAL ENGINEER
LICENSE NO. 093427

MANAGER: MICHAEL G. RIELLY
DESIGN BY: MTL
DRAWN BY: MTL
CHKD BY: MGR

IT IS A VIOLATION OF NEW YORK STATE EDUCATION LAW FOR ANY PERSON, UNLESS HE IS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER. TO ALTER THIS DOCUMENT IN ANY WAY. IF THIS DOCUMENT IS ALTERED, THE ALTERING ENGINEER SHALL AFFIX TO THE ITEM HIS SEAL AND THE NOTATION "ALTERED BY" FOLLOWED BY HIS SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

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SPECIFICATIONS
FOR
SHELDRAKE KARMEL RD PROPERTIES LLC
TOWN OF FALLSBURG SULLIVAN COUNTY, NY

DATE: JUNE 25, 2024
SHEET NO. 25 OF 29
DWG. NO. 0236-01

F. MANHOLE WALLS: ALL PRECAST REINFORCED CONCRETE RISER AND TOP SECTIONS NECESSARY TO BUILD A COMPLETED MANHOLE SHALL BE FURNISHED AND THE DIFFERENT SECTIONS SHALL FIT TOGETHER READILY TO PERMIT EFFECTIVE JOINTING.

G. RUBBER GASKET JOINTS BETWEEN ADJACENT SECTIONS SHALL BE CAREFULLY MADE IN ACCORDANCE WITH THE WRITTEN INSTRUCTIONS OF THE MANUFACTURER OF THE PRECAST CONCRETE MANHOLE SECTIONS.

H. PREFORMED PLASTIC SEALING COMPOUND JOINTS BETWEEN ADJACENT SECTIONS SHALL BE CAREFULLY MADE IN ACCORDANCE WITH WRITTEN INSTRUCTIONS OF THE MANUFACTURER OF THE PREFORMED PLASTIC SEALING COMPOUND. AFTER THE JOINTS HAVE BEEN MADE, THE PREFORMED PLASTIC SEALING COMPOUND SHALL BE TROWELLED SMOOTH ACROSS THE JOINT ON THE INSIDE OF THE MANHOLE WALL.

I. PIPE CONNECTIONS TO MANHOLE WALLS SHALL BE MADE IN THE SAME MANNER AS SPECIFIED HEREINBEFORE FOR PIPE CONNECTIONS TO PRECAST MANHOLE BASES.

J. FRAMES AND COVERS: WHERE REQUIRED, FINAL ADJUSTMENT OF FRAME TO ELEVATION SHALL BE MADE BY PRECAST CONCRETE MANHOLE GRADE RINGS. ALL JOINTS LOCATED BETWEEN THE BOTTOM OF THE FRAME AND THE TOP MANHOLE SECTION SHALL HAVE MANHOLE JOINT SEALING MATERIAL. THE INTERIOR FACE OF THIS AREA SHALL RECEIVE A ½ INCH THICK TROWELLED MORTAR FINISH.

14. ACCEPTANCE TESTS:

A. GENERAL: TEST EACH MANHOLE CONSTRUCTED IN THE PROJECT BY THE METHOD SPECIFIED HEREIN. IF THE MANHOLE IS CONSTRUCTED ON AN EXISTING SEWER WHERE SEWAGE FLOW MUST BE MAINTAINED, THE TEST WILL BE WAIVED. CONTRACTOR SHALL NOTIFY ENGINEER 24 HOURS IN ADVANCE OF TESTING FOR SCHEDULING. CONDUCT TESTS IN PRESENCE OF AND TO THE COMPLETE SATISFACTION OF THE ENGINEER. SHOULD A MANHOLE NOT SATISFACTORILY PASS TESTING, DISCONTINUE MANHOLE CONSTRUCTION IN THE PROJECT UNTIL THAT MANHOLE DOES TEST SATISFACTORILY. PROVIDE TOOLS, MATERIALS (INCLUDING WATER), EQUIPMENT AND INSTRUMENTS NECESSARY TO CONDUCT THE MANHOLE TESTING SPECIFIED HEREIN.

B. VACUUM TEST:

1. VACUUM TESTING EQUIPMENT: USE VACUUM APPARATUS EQUIPPED WITH NECESSARY PIPING, CONTROL VALVES AND GAUGES TO CONTROL AIR REMOVAL RATE FROM THE MANHOLE AND TO MONITOR VACUUM. PROVIDE AN EXTRA VACUUM GAUGE OF KNOWN ACCURACY TO FREQUENTLY CHECK TESTING EQUIPMENT AND APPARATUS. VACUUM TESTING EQUIPMENT AND ASSOCIATED TESTING APPARATUS ARE SUBJECT TO ENGINEER'S APPROVAL. PROVIDE SEAL PLATE WITH VACUUM PIPING CONNECTIONS FOR INSERTING IN MANHOLE FRAME.
2. PRIOR TO TESTING, CLEAN MANHOLES THOROUGHLY AND SEAL OPENINGS, BOTH TO THE COMPLETE SATISFACTION OF THE ENGINEER. SEAL OPENINGS USING PROPERLY SIZED PLUGS. PERFORM TESTING WITH FRAMES INSTALLED. INCLUDE THE JOINT BETWEEN THE MANHOLE AND MANHOLE FRAME IN THE TEST. THE CONTRACTOR MAY ELECT TO MAKE A TEST FOR HIS OWN PURPOSES PRIOR TO BACKFILLING. HOWEVER, CONDUCT TESTS OF THE MANHOLES FOR ACCEPTANCE ONLY AFTER BACKFILLING HAS BEEN COMPLETED.
3. VACUUM TEST PROCEDURE: PERFORM VACUUM TESTING IN ACCORDANCE WITH THE TESTING EQUIPMENT MANUFACTURER'S WRITTEN INSTRUCTION. DRAW A VACUUM OF 10 INCHES OF MERCURY AND CLOSE THE VALVES. CONSIDER MANHOLE ACCEPTANCE WHEN VACUUM DOES NOT DROP BELOW 9 INCHES OF MERCURY FOR THE FOLLOWING MANHOLE SIZES AND TIMES:
   - 4-FOOT DIAMETER – 60 SECONDS
   - 5-FOOT DIAMETER – 75 SECONDS
   - 6-FOOT DIAMETER – 90 SECONDS
   - 7-FOOT DIAMETER – 105 SECONDS
4. REPAIR AND RETEST: DETERMINE SOURCE OR SOURCES OF LEAKS IN MANHOLES FAILING ACCEPTANCE LIMITS. REPAIR OR REPLACE DEFECTIVE MATERIALS AND WORKMANSHIP, AS IS THE CASE, AND CONDUCT ADDITIONAL MANHOLE ACCEPTANCE TESTS AND SUCH SUBSEQUENT REPAIRS AND RETESTING AS REQUIRED UNTIL MANHOLES MEET TEST REQUIREMENTS. MATERIALS AND METHODS USED TO MAKE MANHOLE REPAIRS SHALL MEET WITH ENGINEER'S APPROVAL PRIOR TO USE. MAKE REPAIRS, REPLACEMENTS AND RETESTS AT NO INCREASE IN CONTRACT PRICE.
5. ACCEPTANCE: OBSERVATIONS OF SUCCESSFUL TESTING OF MANHOLES BY THE ENGINEER DOES NOT CONSTITUTE ACCEPTANCE OF THE SYSTEM OR ANY PORTION THEREOF. UPON COMPLETION OF ANY DETERMINED PORTION OF A TOTAL SYSTEM, AND SUCCESSFUL TESTING THEREOF, THE ENGINEER MAY RECOMMEND FINAL ACCEPTANCE BY THE OWNER.
6. MANHOLE TESTING MUST BE PERFORMED IN THE PRESENCE OF THE TOWN ENGINEER. ONLY UPON FINAL INSPECTION BY THE ENGINEER AND TOWN ENGINEER, AND UPON WRITTEN ACCEPTANCE FOR THE SAME, WILL THE SYSTEM OR PORTION THEREOF BE CONSIDERED SUBSTANTIALLY COMPLETED. UPON SUCH ACCEPTANCE, THE WARRANTY PERIOD AS SPECIFIED FOR THE MANHOLES WILL COMMENCE.

SANITARY SEWER PIPE

1. DESCRIPTION OF WORK:

A. THE WORK WITHIN THIS SECTION INCLUDES, BUT IS NOT LIMITED TO, THE FURNISHING OF ALL EQUIPMENT, LABOR AND MATERIALS AND PERFORMING ALL OPERATIONS NECESSARY TO CONSTRUCT ALL GRAVITY SANITARY SEWERS, INCLUDING ALL MAIN SEWERS AND SERVICE CONNECTIONS OF WHATEVER SIZE AND TYPE REQUIRED, IN ACCORDANCE WITH THE SPECIFICATIONS, APPLICABLE DRAWINGS AND CONTRACT DOCUMENTS.

2. QUALITY ASSURANCE:

A. REFERENCED STANDARDS SHALL BE THE FOLLOWING:
1. AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)
2. AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)
3. AMERICAN WATER WORKS ASSOCIATION (AWWA)

3. SUBMITTALS:

A. CERTIFICATES: CONTRACTOR SHALL SUBMIT THREE (3) COPIES OF EACH MANUFACTURER'S CERTIFICATION ATTESTING THAT THE MATERIALS MEET OR EXCEED SPECIFICATION REQUIREMENTS.

B. SHOP DRAWINGS: SUBMIT MANUFACTURER'S DESCRIPTIVE AND TECHNICAL PRODUCT DATA FOR GRAVITY SANITARY SEWER PIPE AND FITTINGS PRIOR TO START OF WORK FOR APPROVAL.

4. POLYVINYL CHLORIDE PIPE (PVC):

A. PIPE AND FITTINGS: THE PIPE AND FITTINGS SHALL BE MADE OF VIRGIN TYPE 1, GRADE 1 PVC COMPOUNDS AS DEFINED AND DESCRIBED IN ASTM D3034 (PSM) FOR RIGID POLY (VINYL CHLORIDE) COMPOUNDS AND CHLORINATED POLY (VINYL CHLORIDE) COMPOUNDS. PIPE WALL THICKNESS SHALL CONFORM TO SDR 35. PIPE AND FITTINGS SHALL BE JOINED WITH AN INTEGRAL BELL-AND-SPIGOT TYPE RUBBER GASKETED JOINT. EACH INTEGRAL BELL JOINT SHALL CONSIST OF A FORMED BELL WITH A SINGLE RUBBER GASKET. GASKETS SHALL CONFORM TO ASTM F477.

5. DETECTION TAPE:

A. DETECTION TAPE SHALL BE A METAL DETECTABLE REINFORCED UNDERGROUND UTILITY MARKING TAPE WITH A 50 GAUGE (0.0005") SOLID ALUMINUM FOIL CORE WITH PERMANENT PRINTING UNDER A MYLAR LAYER.

B. THE DETECTION TAPE SHALL CONSIST OF A MINIMUM 9.0 MIL (0.0009") OVERALL THICKNESS, COATED AND COLORED CROSS WOVEN POLYETHYLENE, WITH NO LESS THAN 2,500 LBS. OF TENSILE BREAK STRENGTH PER 12" WIDTH AND COLOR CODED SUITABLE FOR DIRECT BURIAL.

C. DETECTION TAPE SHALL BE 2-INCH WIDTH MINIMUM, COLOR CODED AS SAFETY GREEN FOR SANITARY SEWERS AND FORCE MAIN WITH LETTERING IN BLACK LETTERS "CAUTION BURIED SEWER LINE BELOW".

6. INSPECTION:

A. FIELD INSPECTION: ALL PIPE SHALL BE INSTALLED AND TESTED FOR DEFECTS IN MATERIAL AND/OR WORKMANSHIP IN THE MANNER SPECIFIED AND IN THE PRESENCE OF AND AS APPROVED BY THE ENGINEER OR OWNER.

7. HANDLING OF MATERIAL:

A. REPLACEMENT OF DAMAGED MATERIAL: ANY MATERIAL FURNISHED BY THE OWNER THAT BECOMES DAMAGED AFTER ACCEPTANCE BY THE CONTRACTOR SHALL BE REPLACED BY THE CONTRACTOR AT HIS OWN EXPENSE.

B. RESPONSIBILITY FOR SAFE STORAGE: THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFE STORAGE OF MATERIAL FURNISHED BY OR TO HIM AND ACCEPTED BY HIM, AND INTENDED FOR THE WORK, UNTIL IT HAS BEEN INCORPORATED IN THE COMPLETED PROJECT. THE INTERIOR OF ALL PIPES, FITTINGS AND OTHER ACCESSORIES SHALL BE KEPT FREE FROM DIRT AND FOREIGN MATTER AT ALL TIMES. ALL EQUIPMENT AND MATERIALS SUBJECT TO DAMAGE FROM FREEZING SHALL BE DRAINED AND STORED IN A MANNER THAT WILL PROTECT THEM.

C. HAULING: ALL MATERIALS FURNISHED BY THE CONTRACTOR SHALL BE DELIVERED AND DISTRIBUTED AT THE SITE BY THE CONTRACTOR. MATERIALS FURNISHED BY THE OWNER SHALL BE PICKED UP BY THE CONTRACTOR AT POINTS DESIGNATED BY THE OWNER AND HAULED TO, AND DISTRIBUTED AT, THE SITE.

D. PIPE, FITTINGS, ITEMS OF EQUIPMENT, AND OTHER MATERIALS OF CONSTRUCTION SHALL BE LOADED AND UNLOADED BY LIFTING WITH HOISTS OR SKIDDING TO AVOID SHOCK OR DAMAGE. UNDER NO CIRCUMSTANCES SHALL SUCH MATERIALS BE DROPPED. MATERIALS HANDLED ON SKIDWAYS SHALL NOT BE SKIDDED OR ROLLED AGAINST MATERIALS ALREADY ON THE GROUND.

E. AT SITE OF WORK: IN DISTRIBUTING THE MATERIAL AT THE SITE OR THE WORK, EACH PIECE SHALL BE UNLOADED OPPOSITE OR NEAR THE PLACE WHERE IT IS TO BE LAID IN THE TRENCH, OR AS OTHERWISE DIRECTED BY THE ENGINEER. UNDER NO CIRCUMSTANCES SHOULD LAWNS, GRASS PLOTS OR OTHER PRIVATE PROPERTY BE USED FOR THIS PURPOSE WITHOUT THE CONSENT OF THE PROPERTY OWNER.

F. HANDLING OF PIPE AND FITTINGS: PROPER IMPLEMENTS, TOOLS AND FACILITIES SATISFACTORY TO THE ENGINEER SHALL BE PROVIDED AND USED BY THE CONTRACTOR FOR THE SAFE AND CONVENIENT PROSECUTION OF THE WORK. ALL PIPES, FITTINGS, JOINTING MATERIALS, ETC. SHALL BE CAREFULLY LOWERED INTO THE TRENCH PIECE BY PIECE BY MEANS OF A DERRICK, ROPES OR OTHER SUITABLE TOOLS OR EQUIPMENT IN SUCH A MANNER AS TO PREVENT DAMAGE TO SEWER LINE MATERIALS AND/OR WORKMEN AND IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. UNDER NO CIRCUMSTANCES SHALL SUCH MATERIALS BE DROPPED OR DUMPED INTO THE TRENCH.

8. PIPE INSTALLATION:

A. GENERAL: ALL PIPE SHALL BE LAID TO A UNIFORM LINE AND GRADE BETWEEN MANHOLES, SOCKET ENDS UPGRADE, WITH A FIRM AND EVEN BEARING ALONG THE BARREL OF THE PIPE, CLOSE JOINTS AND SMOOTH INVERT. THE SPIGOT END OF THE PIPE IS TO BE CENTERED IN, SHOVED TIGHT, AND SECURED AGAINST THE BELL OR SOCKET OF THE PREVIOUSLY LAID PIPE.

B. THE INTERIOR OF EACH PIPE SHALL BE CLEANED OF ALL EXCESS JOINT AND FOREIGN MATERIAL BEFORE THE NEXT PIPE IS LAID. THE PIPE SHALL BE LAID IN THE BACKFILL MATERIALS AS SPECIFIED. PIPE LAYING SHALL COMMENCE AT THE LOWEST POINT AND PROCEED UPGRADE. AT THE CLOSE OF EACH DAY'S WORK AND AT SUCH OTHER TIMES WHEN PIPE IS NOT BEING LAID, THE OPEN END OF THE PIPE SHALL BE PROTECTED WITH A CLOSE FITTING STOPPER.

C. CONSTRUCTION CONTROL: IF GRADE BOARDS ARE TO BE USED, THE CONTRACTOR SHALL PROVIDE AT LEAST THREE (3) GRADE BOARDS IN ADVANCE OF PIPE LYING AT ALL TIMES AT INTERVALS NOT EXCEEDING 50 FEET AND STRETCH A LINE PARALLEL WITH THE GRADE LINE. FROM THIS LINE, THE TRENCH AND EVERY PIPE LAID SHALL BE TESTED AS TO GRADE AND ALIGNMENT. BASE LINES AND CONTROLLING ELEVATIONS ESTABLISHED FOR THE CONSTRUCTION OF THE WORK SHALL BE PRESERVED AND KEPT UNCOVERED SO THEY CAN BE EXAMINED AT ANY TIME.

D. THE USE OF LASER EQUIPMENT SHALL BE PERMITTED. GRADE BOARDS AS SPECIFIED WILL NOT BE REQUIRED IF A LASER IS USED.

E. CONTRACTOR SHALL PROVIDE VERIFICATION OF GRADE AS WORK PROGRESSES. PIPE NOT LAID TO PROPER LINE AND GRADE WILL BE REMOVED AND RECONSTRUCTED AT THE CONTRACTOR'S EXPENSE.

F. VARIATIONS: THE ENGINEER RESERVES THE RIGHT TO VARY THE LINE AND/OR GRADE FROM THAT SHOWN ON THE DRAWINGS FOR PIPE LINES AND MANHOLES WHEN SUCH CHANGES MAY BE NECESSARY AND ADVANTAGEOUS. NO CLAIMS FOR EXTRA WORK WILL BE ALLOWED FOR CHANGES IN LOCATION OR GRADE EXCEPT AS WHEN SUCH CHANGES ARE MADE AFTER TRENCHING HAS BEEN DONE.

G. PIPE CLEARANCE IN ROCKS: LEDGE ROCK, BOULDERS AND LARGE STONES SHALL BE REMOVED TO PROVIDE A CLEARANCE OF AT LEAST 6 INCHES BELOW AND ON EACH SIDE OF ALL PIPE AND FITTINGS FOR PIPES 24 INCHES OR LESS IN DIAMETER, AND 9 INCHES FOR PIPES LARGER THAN 24 INCHES IN DIAMETER.

H. THE SPECIFIED MINIMUM CLEARANCES ARE THE MINIMUM CLEAR DISTANCES WHICH WILL BE PERMITTED BETWEEN ANY PART OF THE PIPE AND/OR FITTING BEING LAID AND ANY PART, PROJECTION OR POINT OF SUCH ROCK, STONE OR BOULDER.

I. PIPES AT MANHOLES OR OTHER RIGID STRUCTURES: PIPE DIRECTLY CONNECTED TO OR SUPPORTED BY RIGID STRUCTURES SHALL BE AS INDICATED ON THE DRAWINGS.

J. DIVERSION OF SEWAGE DURING CONSTRUCTION

1. SEWAGE FLOWING IN EXISTING SEWER SHALL BE TEMPORARILY PLUGGED OR DIVERTED AROUND OR THROUGH THE CONSTRUCTION BY MEANS OF BY-PASS PUMPING, FLUMING, OR ANY OTHER MEANS ACCEPTABLE TO ENGINEER.

A. IF BY-PASS PUMPING IS REQUIRED, PROVIDE STAND-BY PUMP EQUIVALENT TO THE LARGEST BY-PASS PUMP IN SERVICE.

2. AT COMPLETION OF EACH WORKDAY TIE SEWAGE BACK INTO EXISTING SEWER. TIE-IN SHALL BE COVERED SO THERE IS NO VISIBLE SEWAGE.
3. PRIOR TO BEGINNING WORK, CONTRACTOR SHALL HAVE ON HAND ALL REQUIRED MATERIALS NECESSARY TO ACCOMPLISH THE WORK.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY PROPERTY DAMAGE CAUSED BY SEWAGE HANDLING.

9. CONCRETE CRADLE AND ENCASEMENT:

A. PREPARATION: PRIOR TO THE FORMATION OF THE CRADLE OR ENCASEMENT, TEMPORARY SUPPORTS CONSISTING OF TIMBER WEDGES AND SOLID CONCRETE BRICKS OR CAP BLOCKS SHALL BE USED TO SUPPORT THE PIPE IN PLACE. TEMPORARY SUPPORTS SHALL HAVE MINIMUM DIMENSIONS AND SHALL SUPPORT THE PIPE AT NOT MORE THAN TWO LOCATIONS, ONE AT THE BOTTOM OF THE BARREL OF THE PIPE ADJACENT TO THE SHOULDER OF THE SOCKET AND THE OTHER NEAR THE SPIGOT END.

B. PLACING: AFTER JOINTING OF THE PIPE HAS BEEN COMPLETED, CONCRETE SHALL BE UNIFORMLY POURED BENEATH AND ON BOTH SIDES OF THE PIPE AS SHOWN ON THE DETAILS. PLACEMENT SHALL BE WET ENOUGH DURING PLACEMENT TO PERMIT ITS FLOW, WITHOUT EXCESSIVE PRODDING, TO ALL REQUIRED POINTS AROUND THE PIPE SURFACE. THE WIDTH OF CRADLE SHALL BE SUCH AS TO FILL COMPLETELY THE TRENCH WIDTH. IN CASE OF EXTREMELY WIDE TRENCHES, CONCRETE EASEMENT MAY BE CONFINED ABOVE THE TOP OF THE PIPE TO A NARROWER WIDTH BUT IN NO CASE SHALL IT TO LESS THAN THE WIDTH OF TRENCH REQUIRED FOR THE SIZE OF PIPE BEING USED.

C. BEFORE DEPOSITING CONCRETE, THE SPACE WITHIN THE LIMITS OF THE POUR SHALL HAVE BEEN CLEARED OF ALL DEBRIS AND WATER. WATER SHALL NOT BE ALLOWED TO RISE ADJACENT TO, OR FLOW OVER, CONCRETE DEPOSITED FOR LESS THAN 24 HOURS. CONCRETE SHALL BE PROTECTED FROM THE DIRECT RAYS OF THE SUN AND KEPT MOIST, BY A METHOD ACCEPTABLE TO THE ENGINEER, FOR A PERIOD OF SEVEN DAYS OR UNTIL BACKFILLING IS BEGUN. IN NO CASE SHALL BACKFILLING BEGIN WITHIN 24 HOURS OF THE TIME OF PLACING AND THE ENGINEER SHALL HAVE STRICT CONTROL OF THE RATE OF BACKFILLING.

10. DROP CONNECTIONS:

A. CONTRACTOR SHALL BUILD DROP CONNECTIONS WHERE SHOWN ON THE DRAWINGS, WHERE DROP IN THE INVERT IS 2 FEET OR MORE, OR AS REQUIRED BY THE ENGINEER, AND IN CONFORMITY WITH THE DETAIL DRAWINGS AND AS SPECIFIED HEREIN. DROP CONNECTIONS SHALL BE OF THE SAME PIPE MATERIAL USED TO CONSTRUCT THE MAIN FROM WHICH THE DROP CONNECTION IS MADE.

11. SERVICE CONNECTIONS:

A. FITTINGS (WYE BRANCHES, RISERS AND BENDS) AND SERVICE PIPE SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THESE SPECIFICATIONS, AND, ANY AND ALL PRACTICES AND PRECAUTIONS REQUIRED FOR THE STREET SEWERS ARE EQUALLY APPLICABLE TO THE BUILDING CONNECTIONS FROM THE SEWER TO THE RIGHT-OF-WAY LINE, OR TO A LOCATION DESIGNATED BY THE ENGINEER. THE CONTRACTOR SHALL PLACE A 2 INCH X 4 INCH WOODEN MARKER AT THE END OF EACH SEWER LATERAL. THE MARKER SHALL BE ONE PIECE AND MAY NOT BE CONSTRUCTED FROM TWO OR MORE SMALLER PIECES. THE MARKER SHALL EXTEND FROM THE LATERAL INVERT TO 12 INCHES ABOVE GRADE.

B. RE-CONNECTION OF EXISTING SERVICE CONNECTIONS: ALL EXISTING SERVICE CONNECTIONS MUST BE RECONNECTED TO THE NEW SEWER LINE AND SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THESE SPECIFICATIONS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN TOTAL USE OF ALL SERVICE CONNECTIONS DURING CONSTRUCTION. INTERRUPTION IN SERVICE IS NOT PERMITTED.

C. THE CONTRACTOR SHALL SUBMIT TO THE OWNER, ON A MONTHLY BASIS, ALL AS-BUILT INFORMATION WHICH SHALL INCLUDE: MANHOLE RUN, STATION, LENGTH FROM CENTERLINE OF SEWER, AND INVERT ELEVATION AT THE TERMINATION POINT OF LATERAL.

D. IF ROCK IS ENCOUNTERED DURING THE INSTALLATION OF THE LATERAL, THE CONTRACTOR SHALL EXTEND THE LATERAL TO THE REQUIRED DISTANCE AS SPECIFIED ELSEWHERE IN THESE SPECIFICATIONS, AND HE SHALL PROVIDE A MINIMUM "ROCK-FREE" DISTANCE OF 5 FEET BEYOND THE END OF THE LATERAL. NO LATERAL SHALL BE "BUTTED" AGAINST ROCK.

E. STANDPIPE: IN GENERAL, WHERE THE SEWER IS LAID IN TRENCH AND THE DEPTH OF THE INVERT IS MORE THAN 12 FEET, OR ELSEWHERE AS REQUIRED, SERVICE CONNECTIONS WILL ENTER THE SEWER AS SHOWN ON THE DETAIL DRAWINGS FOR "SERVICE CONNECTION – DEEP SEWER".

F. PLUGS: THE UPPER FREE ENDS OF SERVICE CONNECTION LINES AND WYE OR TEE BRANCHES AND PIPE OUTLETS (WHEN CONNECTIONS ARE NOT MADE THERETO AT THE TIME THE MAINS ARE LAID) SHALL BE PROVIDED WITH A CAREFULLY FITTED PLUG. THE TYPE OF PLUG USED AND THE MANNER IN WHICH IT IS SECURED AND BRACED SHALL BE ACCEPTABLE TO THE ENGINEER. AFTER INSTALLATION, ALL PLUGS SHALL BE CAPABLE OF BEING SECURE AND COMPLETELY AIRTIGHT WHEN SUBJECTED TO THE TEST PROCEDURES SPECIFIED HEREINAFTER.

12. END OF PIPE TO BE PROTECTED:

A. IN ALL CASES THE MOUTH OF THE PIPE SHALL BE PROVIDED WITH A CIRCULAR BOARD OR STOPPER, CAREFULLY FITTED TO THE PIPE, TO PREVENT EARTH OR OTHER SUBSTANCES FROM WASHING INTO THE PIPE.

B. IN ROCK EXCAVATION, THE MOUTH OF THE PIPE SHALL BE CAREFULLY PROTECTED FROM ALL BLASTS, AND THE EXCAVATION SHALL BE FULLY COMPLETED AT LEAST 25 FEET IN ADVANCE OF LAYING OF THE PIPE.

13. STORM SEWER OBSTRUCTION:

A. WHEN IT IS NECESSARY TO CONSTRUCT A PIPE SEWER BENEATH AN EXISTING STORM SEWER IN A LOCATION WHERE THE VERTICAL SEPARATION BETWEEN THE TOP OF THE PIPE SEWER PIPING AND THE BOTTOM OF THE STORM SEWER PIPING IS 3 FEET OR LESS, THE PIPE SEWER PIPING SHALL BE ENCASED IN CONCRETE, WHICH ENCASEMENT SHALL EXTEND FOR A DISTANCE OF NOT LESS THAN 5 FEET ON EACH SIDE OF THE OUTSIDE SURFACE OF THE STORM SEWER PIPING.

14. TESTS:

A. GENERAL: CONTRACTOR SHALL NOTIFY ENGINEER 72 HOURS IN ADVANCE OF TESTING FOR SCHEDULING. CONDUCT TESTS IN PRESENCE OF AND TO THE COMPLETE SATISFACTION OF THE ENGINEER. TEST SHALL INCLUDE ALIGNMENT, DEFLECTION, INFILTRATION, AND AIR.

B. THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR APPROVAL THE DETAILED TEST PROCEDURE AND LIST OF TEST EQUIPMENT HE PROPOSES TO USE PRIOR TO TESTING. SANITARY SEWER PIPE ACCEPTANCE TESTING MUST BE PERFORMED IN THE PRESENCE OF THE TOWN ENGINEER. ALL PIPE LINE TESTING INCLUDING WATER AND SEWER TESTING SHOULD BE IN ACCORDANCE WITH THE APPROVAL OF THE TOWN WATER AND SEWER SUPERINTENDENT.

C. CLEANING PRIOR TO TESTS: BEFORE TESTS ARE CONDUCTED, CLEAN PIPING INCLUDING SEWERS, BRANCHES AND SERVICE CONNECTIONS UNTIL FREE OF DIRT OR SILT OR CONSTRUCTION DEBRIS.

D. ALIGNMENT: AFTER THE MAINS HAVE BEEN LAID AND BACKFILLED, A LIGHT WILL BE FLASHED BETWEEN MANHOLES OR MANHOLE LOCATIONS TO DETERMINE WHETHER THE ALIGNMENT OF THE SEWER IS TRUE AND WHETHER ANY PIPE HAS BEEN DISPLACED, BROKEN OR OTHERWISE DAMAGED SUBSEQUENT TO LAYING. THIS TEST WILL AGAIN BE CONDUCTED BEFORE FINAL ACCEPTANCE OF THE SEWER. EACH SECTION (MANHOLE TO MANHOLE) OF SEWER SHALL SHOW A GOOD LIGHT CIRCLE THROUGHOUT ITS LENGTH AND ANY AND ALL DEFECTS SHALL BE CORRECTED BY THE CONTRACTOR, TO THE SATISFACTION OF THE ENGINEER, BEFORE THE WORK SHALL PROCEED AND BEFORE ACCEPTANCE OF AND/OR PAYMENT THEREFORE SHALL BE MADE.

E. DEFLECTION TEST: PROVIDE GO-NO-GO MANDREL AND INCIDENTAL EQUIPMENT FOR DEFLECTION TEST. MANDREL TO CONFORM TO FOLLOWING REQUIREMENTS:

1. CYLINDRICAL IN SHAPE WITH ODD NUMBER OF ARMS NOT LESS THAN NINE, SPACED EVENLY AROUND THE MANDREL.
2. MINIMUM 12 INCHES CONTACT LENGTH OF MANDREL ARMS WITH PIPE WALL.
3. MANDREL DIAMETER NINETY-FIVE PERCENT (95%) OF INSIDE PIPE DIAMETER.
4. CONDUCT DEFLECTION TESTING NO LESS THAN THIRTY (30) DAYS AFTER SECTION OF PIPE SEWER MAIN AND SERVICE CONNECTION BETWEEN ADJACENT MANHOLES IS BACKFILLED.
5. PULL MANDREL THROUGH PIPE SECTION MANUALLY; POWERED PULLING DEVICES NOT PERMITTED.
6. CONSIDER SEWER LINE SECTION WHICH MANDREL CANNOT PASS THROUGH, TO HAVE MORE THAN MAXIMUM ALLOWABLE DEFLECTION OF FIVE PERCENT (5%).

F. AIR TESTING: THE CONTRACTOR SHALL TEST EACH SECTION OF SEWER BETWEEN MANHOLES AND ALL LATERALS TO THE LIMIT OF THIS CONTRACT USING LOW PRESSURE AIR. TESTING SHALL NOT BE PERFORMED UNTIL ALL BACKFILLING HAS BEEN COMPLETED. THE CONTRACTOR MAY, AT HIS OPTION, TEST THE SECTION OF SEWER FOR HIS OWN PURPOSES, PRIOR TO COMPLETION OF BACKFILLING. HOWEVER, THE REQUIREMENTS OF THIS SUBSECTION SHALL NOT BE DEEMED TO BE COMPLETED UNTIL THE LINES HAVE BEEN TESTED AFTER THE BACKFILLING HAS BEEN COMPLETED AND TRENCH SETTLEMENT HAS BEEN MINIMIZED. THE COSTS OF ANY TESTING INCURRED PRIOR TO AUTHORIZATION FROM THE ENGINEER AFTER BACKFILLING HAS BEEN COMPLETED SHALL BE BORNE BY THE CONTRACTOR.

1. A MINIMUM PERIOD OF TWO MINUTES SHALL BE PROVIDED TO ALLOW EQUILIBRIUM OF THE AIR TEMPERATURE WITH PIPE WALL BEFORE TEST READINGS SHALL COMMENCE. THE RATE OF AIR LOSS SHALL BE DETERMINED BY MEASURING THE TIME INTERVAL REQUIRED FOR THE AVERAGE INTERNAL PRESSURE TO DECREASE BY 1.0 POUNDS PER SQUARE INCH OF GRAVITY (PSIG).
2. THE INITIAL TEST PRESSURE TO BE DEVELOPED IN THE SEWER AND LATERALS SHALL BE DETERMINED AS FOLLOWS:
3. INTERNAL PRESSURE IN PSIG SHALL BE CALCULATED AS THE SUM OF 3.5, PLUS THE MAXIMUM HEIGHT IN FEET BETWEEN THE INVERT OF THE SEWER AND THE EXISTING GROUND SURFACE IN THE SECTION OF SEWER TO BE TESTED DIVIDED BY 2.3. (FOR EXAMPLE, IF THE MAXIMUM HEIGHT IS DETERMINED TO BE 9.2 FEET, THE ADDED PRESSURE WOULD BE 4.0 PSIG. THE INITIAL TEST PRESSURE IN THE SEWER WOULD THEN BE 7.5 PSIG. THE ALLOWABLE DROP WOULD BE TO 6.5 PSIG WITHIN THE TIME INDICATED ELSEWHERE IN THIS SUBSECTION. IN NO CASE SHALL THE TEST PRESSURE IN THE SEWERS OR LATERALS BE GREATER THAN 10 PSIG OR THE MAXIMUM INTERNAL DIFFERENTIAL JOINT PRESSURE RECOMMENDED BY THE MANUFACTURER OF THE PIPE, WHICHEVER IS LESS.
4. THE PIPE SHALL BE CONSIDERED ACCEPTABLE IF THE AIR LOSS RATE DOES NOT EXCEED 0.0030 CUBIC FEET PER MINUTE PER SQUARE FOOT OF INTERNAL PIPE SURFACE WHEN TESTED AT THE INITIAL PRESSURE PREVIOUSLY DEFINED IN THIS SUBSECTION. THE TIME FOR THE AIR PRESSURE TO DECREASE 1.0 PSIG SHALL NOT BE LESS THAN THE TIME INDICATED IN THE FOLLOWING TABLE:

PIPE DIAMETER	MINUTES	SECONDS
6" – 12"	6	0
15" – 18"	8	0

5. IF THE ABOVE RATES OF LEAKAGE ARE EXCEEDED, THE CONTRACTOR SHALL, AT HIS EXPENSE, DETERMINE THE SOURCE OF LEAKAGE AND MAKE ALL NECESSARY CORRECTIONS AND RETEST.

G. INFILTRATION: AFTER THE AIR TESTING DESCRIBED IN THE PRECEDING SUBSECTION HAS BEEN COMPLETED BY THE CONTRACTOR, REGARDLESS OF ANY INDICATIONS OF THE TEST RESULTS MADE BY THE ENGINEER OR THE OWNER, THE ENGINEER AND OWNER RESERVE THE RIGHT TO PERFORM FIELD INVESTIGATIONS, PRIOR TO FINAL WRITTEN ACCEPTANCE PERIOD SPECIFIED ELSEWHERE IN THESE SPECIFICATIONS, TO ESTABLISH THE LEAKAGE OF GROUNDWATER INTO THE SEWER AND LATERALS CONSTRUCTED UNDER THIS CONTRACT. THE COST OF THESE INVESTIGATIONS SHALL BE BORNE BY THE OWNER.

1. SHOULD THE LEAKAGE EXCEED 100 GALLONS PER DAY PER INCH DIAMETER PER MILE OF PIPE FOR ANY SECTION, THE CONTRACTOR SHALL, AT THE DIRECTION OF THE ENGINEER OR OWNER, AND AT NO COST TO THE OWNER, PERFORM ANY ADDITIONAL TESTING OR CORRECTIVE WORK REQUIRED TO REDUCE THE INFILTRATION IN EACH MANHOLE RUN FROM THOSE LINES INSTALLED BY THE CONTRACTOR TO LESS THAN 100 GALLONS PER DAY PER INCH DIAMETER OF PIPE. THIS LEAKAGE APPLIES TO EACH MANHOLE RUN SEPARATELY AND SHOULD NOT BE CONSTRUED TO MEAN TOTAL LEAKAGE IN THE TOTAL SYSTEM. THE SCOPE OF THIS CORRECTIVE WORK SHALL INCLUDE, BUT NOT BE LIMITED TO, CLEANING, TELEVISING AND TESTING THE SEWER AND LATERALS TO THE LIMITS INSTALLED BY THE CONTRACTOR, TO INCLUDE TESTING AND GROUTING OF JOINTS, EXCAVATION AND REPLACEMENT OF FAULTY OR DAMAGED PORTIONS OF THE WORK, AND ALL FINAL RESTORATION.

NO.	DATE	REVISION
2	6/25/25	PROGRESS SET
1	12/11/24	DESIGN REVISIONS

MICHAEL G. RIELLY
NEW YORK STATE PROFESSIONAL ENGINEER
LICENSE NO. 093427

MANAGER: MICHAEL G. RIELLY
DESIGN BY: MTL
DRAWN BY: MTL
CHKD BY: MGR

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TEL: (732)-719-7200

SCALE
AS SHOWN

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OFFICE@RIELLYENGINEERING.COM

SPECIFICATIONS
FOR
SHELDRAKE KARMEL RD PROPERTIES LLC
TOWN OF FALLSBURG SULLIVAN COUNTY, NY

DATE: JUNE 25, 2024
SHEET NO. 26 OF 29
DWG. NO. 0236-01

NOTES:
1. WATERSHED BOUNDARIES BY BERGER ENGINEERING AND SURVEYING, PLLC.
2. POST CONSTRUCTION STORMWATER FACILITIES BY BERGER ENGINEERING AND SURVEYING, PLLC.

BERGER ENGINEERING AND SURVEYING
100 FULTON AVE.
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(845) 471 - 7383
bergerengr@gmail.com
PE REGISTRATION 069634 CERT 0405443 EXPIRE ON 04-30-25
LS REGISTRATION 049745 CERT 1255930 EXPIRE ON 04-30-24
COA FOR PE AND LS CERT 0018252 AND 0018253

BIO-RETENTION & DETENTION POND DATA								
PONDS	TYPES	BOTTOM ELEV (FT)	OUTLET DIA (IN)	CULVERT LENGTH (FT)	INV IN (FT)	INV OUT (FT)	ORIFICE DIA (IN)	HORIZ. ELEV (FT)
9A	BIO-RETENTION	1512.0	24	31 @ 1.61%	1509.5	1509.0	24	1512.5
9P	DETENTION POND	1505.0	(2) 18	118 @ 0.84%	1505.0	1504.0		
13P	DETENTION POND	1502.0	8	65 @ 6.15%	1502.0	1498.0		
14P	DETENTION POND	1509.0	15	54 @ 1.85%	1509.0	1508.0		
16P	BIO-RETENTION	1518.0	18	60 @ 15.00%	1515.0	1506.0	15	1518.5
18P	BIO-RETENTION	1516.0	(2) 18	28 @ 1.79%	1513.5	1513.0	30	1516.5
9P - BROAD CRESTED WEIR, ELEV: 1510.2, 10 FT WIDE, SIDE 1:3, DEPTH 10FT								
13P - BROAD CRESTED WEIR, ELEV: 1506.0, 10 FT WIDE, SIDE 1:3, DEPTH 10FT								
14P - BROAD CRESTED WEIR, ELEV: 1512.0, 10 FT WIDE, SIDE 1:3, DEPTH 10FT								
16P - BROAD CRESTED WEIR, ELEV: 1519.0, 10 FT WIDE, DEPTH 15FT								
18P - BROAD CRESTED WEIR, ELEV: 1517.0, 10 FT WIDE, DEPTH 15FT								

LEGEND

- EXISTING PROPERTY LINE
- EXISTING ADJOINER LINE
- EXISTING RIGHT-OF-WAY LINE
- EXISTING EASEMENT LINE
- EXISTING PAVEMENT
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- EXISTING STREAM CENTERLINE
- EXISTING FENCE
- EXISTING TREELINE
- EXISTING STONEWALL
- EXISTING WETLANDS
- EXISTING WETLANDS SETBACK
- EXISTING OVERHEAD TELEPHONE
- EXISTING U/G TELEPHONE
- EXISTING OVERHEAD ELECTRIC
- EXISTING U/G ELECTRIC
- EXISTING WATER LINE
- EXISTING SANITARY SEWER
- EXISTING SANITARY FORCEMAIN
- EXISTING STORM PIPE
- EXISTING SANITARY SEWER MANHOLE
- EXISTING STORM MANHOLE
- EXISTING STORM INLET
- EXISTING STORM HEADWALL/ENDWALL
- EXISTING WELL
- EXISTING UTILITY POLE
- EXISTING GUYWIRE/POLE
- PROPOSED LOT LINE
- PROPOSED EASEMENT LINE
- PROPOSED PAVEMENT
- MINIMUM BUILDING SETBACK LINE
- PROPOSED FENCE
- PROPOSED CURB
- PROPOSED TREELINE/LIMIT OF DISTURBANCE
- PROPOSED LIMIT OF DISTURBANCE
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED STORM PIPE
- PROPOSED STOP SIGN
- PROPOSED SIGN
- PROPOSED LIGHT
- PROPOSED SEWER MANHOLE
- PROPOSED SEWER CLEANOUT
- PROPOSED STORM INLET
- PROPOSED YARD STORM INLET
- PROPOSED STORM HEADWALL/ENDWALL
- PROPOSED FLARED END SECTION
- PROPOSED PIPE OUTLET PROTECTION
- PROPOSED SPOT ELEVATION
- PROPOSED FINISHED FLOOR ELEVATION
- PROPOSED BASEMENT FLOOR ELEVATION
- PROPOSED WATER VALVE
- PROPOSED FIRE HYDRANT

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1	12/11/24	DESIGN REVISIONS

MICHAEL G. RIELLY
NEW YORK STATE PROFESSIONAL ENGINEER
LICENSE NO. 093427

MANAGER: MICHAEL G. RIELLY
DESIGN BY: MTL | DRAWN BY: MTL | CHKD BY: MGR

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SCALE 1" = 50'
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DRAINAGE PLAN
FOR
SHELDRAKE KARMEL RD PROPERTIES LLC
TOWN OF FALLSBURG SULLIVAN COUNTY, NY

DATE: JUNE 25, 2024
SHEET NO. 27 OF 29
DWG. NO. 0236-01

BIO–RETENTION & DETENTION POND DATA								
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EXISTING MAJOR CONTOUR
EXISTING MINOR CONTOUR
EXISTING STREAM CENTERLINE
EXISTING FENCE
EXISTING TREELINE
EXISTING STONEWALL
EXISTING WETLANDS
EXISTING WETLANDS SETBACK
EXISTING OVERHEAD TELEPHONE (OT)
EXISTING U/G TELEPHONE (UT)
EXISTING OVERHEAD ELECTRIC (OE)
EXISTING U/G ELECTRIC (UE)
EXISTING WATER LINE (W)
EXISTING SANITARY SEWER (S)
EXISTING SANITARY FORCEMAIN (FM)
EXISTING STORM PIPE (18" RCP)
EXISTING SANITARY SEWER MANHOLE
EXISTING STORM MANHOLE
EXISTING STORM INLET
EXISTING STORM HEADWALL/ENDWALL
EXISTING WELL
EXISTING UTILITY POLE
EXISTING GUYWIRE/POLE
PROPOSED LOT LINE
PROPOSED EASMENT LINE
PROPOSED PAVEMENT
MINIMUM BUILDING SETBACK LINE
PROPOSED FENCE
PROPOSED CURB
PROPOSED TREELINE/LIMIT OF DISTURBANCE
PROPOSED LIMIT OF DISTURBANCE
PROPOSED MAJOR CONTOUR (234)
PROPOSED MINOR CONTOUR
PROPOSED STORM PIPE
PROPOSED STOP SIGN
PROPOSED SIGN
PROPOSED LIGHT
PROPOSED SEWER MANHOLE
PROPOSED SEWER CLEANOUT
PROPOSED STORM INLET
PROPOSED YARD STORM INLET
PROPOSED STORM HEADWALL/ENDWALL
PROPOSED FLARED END SECTION
PROPOSED PIPE OUTLET PROTECTION
PROPOSED SPOT ELEVATION (+350.25)
PROPOSED FINISHED FLOOR ELEVATION (F.E.=345.00)
PROPOSED BASEMENT FLOOR ELEVATION (B.E.=345.00)
PROPOSED WATER VALVE
PROPOSED FIRE HYDRANT

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1	12/11/24	DESIGN REVISIONS

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DRAINAGE PLAN
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SULLIVAN COUNTY, NY
TOWN OF FALLSBURG

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TYPICAL BIORETENTION PLANTING MEDIA SOIL

BIORETENTION SOIL – NYSDEC
FROM NYSDEC STORMWATER DESIGN MANUAL, 2015, H.2 "THE PLANTING SOIL SHOULD BE A SANDY LOAM, LOAMY SAND, LOAM (USDA), OR A LOAM/SAND MIX (SHOULD CONTAIN A MINIMUM 35 TO 60% SAND, BY VOLUME). THE CLAY CONTENT FOR THESE SOILS SHOULD BY LESS THAN 25% BY VOLUME. SOILS SHOULD FALL WITHIN THE SM, OR ML CLASSIFICATIONS OF THE UNIFIED SOIL CLASSIFICATION SYSTEM (USCS). A PERMEABILITY OF AT LEAST 1.0 FEET PER DAY (0.5"/HR) IS REQUIRED (A CONSERVATIVE VALUE OF 0.5 FEET PER DAY IS USED FOR DESIGN). THE SOIL SHOULD BE FREE OF STONES, STUMPS, ROOTS, OR OTHER WOODY MATERIAL OVER 1" IN DIAMETER. BRUSH OR SEEDS FROM NOXIOUS WEEDS. PLACEMENT OF PLANTING SOIL SHOULD BE IN LIFTS OF 12" TO 18", LOOSELY COMPACTED (TAMPED LIGHTLY WITH A DOZER OR BACKHOE BUCKET). THE SPECIFIC CHARACTERISTICS ARE PRESENTED IN TABLE H.2.

TABLE H.2 PLANTING SOIL CHARACTERISTICS

PARAMETER	VALUE
PH RANGE	5.2 TO 7.00
ORGANIC MATTER	1.5 TO 4.0%
MAGNESIUM	35 LBS. PER ACRE, MINIMUM
PHOSPHORUS (P_2O_5)	75 LBS. PER ACRE, MINIMUM
POTASSIUM (K_2O)	85 LBS. PER ACRE, MINIMUM
SOLUBLE SALTS	500 PPM
CLAY	10 TO 25%
SILT	30 TO 55%
SAND	35 TO 60%

BIORETENTION AND DRY SWALE SOIL – NYSDOT
FROM NYSDOT ITEM 208.0103002: THE SOILD FOR BIORETENTION AREAS AND DRY SWALES WHALL BE UNIFORM MIX, FREE OF STONES, STUMPS, ROOTS OR OTHER OBJECTS LARGER THAN TWO INCHES (2") IN DIAMETER. THE BIORETENTION AND DRY SWALE SOIL SHALL BE VISIBLY FREE OF NOXIOUS WEEDS.

BIORETENTION AND DRY SWALE SOIL SHALL BE A WELL BLENDED MIXTURE OF THREE (3) PARTS SAND AND ONE (1) PART TOPSOIL, BY VOLUME. THE BIORETENTION AND DRY SWALE SOIL SHALL HAVE A pH RANGE OF 5.2 TO 7.6, AND AN ORGANIC CONTENT OF 3–7%. SAND SHALL MEET THE REQUIREMENTS OF NYSDOT SECTION 703–07 CONCRETE SAND
TOPSOIL SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF NYSDOT SECTION 713–01 TOPSOIL FOR TOPSOIL TYPE A, EXCEPT AS FOLLOWS: ALL TOPSOIL SHALL BE SAMPLED AND TESTED REGARDLESS OF THE SOURCE, SAMPLING OF TOPSOIL, AMENDED TOPSOIL, AND THE BIORETENTION AND DRY SWALE SOIL SHALL BE DONE BY THE CONTRACTOR/SUPPLIER. SAMPLING PROTOCOL SHALL BE IN ACCORDANCE WITH NYSDOT SECTION 713–01 TOPSOIL.

SOIL AMENDMENTS TO INCREASE ORGANIC CONTENT SHALL BE PEAT MOSS. PEAT MOSS SHALL BE COMMERCIALLY PRODUCED AND SHALL BE COMPOSED OF THE PARTLY DECOMPOSED COLLODIAL RESIDUE, AND OTHER FOREIGN MATTER. IT SHALL HAVE A pH RANGE BETWEEN 3.5 pH–5.5 pH AS DETERMINED IN ACCORDANCE WITH THE ASSOCIATION OF OFFICIAL AGRICULTURAL CHEMISTS' TESTING METHODS. IT'S WATER–ABSORBING ABILITY SHALL BE A MINIMUM OF 1100% BY WEIGHT ON AN OVEN–DRY BASIS.
NYSDOT SECTION 713–01 TOPSOIL:

A TOPSOIL–REUSE OR ON–SITE MATERIALS

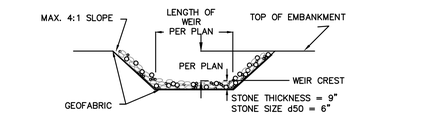
SIEVE SIZE	% PASSING BY WEIGHT
2 INCH	100
1 INCH	85 TO 100

B TOPSOIL–MANUFACTURED OR OFF–SITE MATERIALS 3.–SPECIAL PLANTING MIX

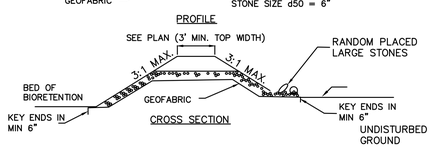
SIEVE SIZE	% PASSING BY WEIGHT
2 INCH	100
1 INCH	85 TO 100
1/4 INCH	65 TO 100
NO. 200	20 TO 40
2 MICRON	5 TO 35

pH BETWEEN 5.5 AND 7, ORGANIC CONTENT BETWEEN 10% AND 15%

OTHER NYSDOT SECTION 713–01 MANUFACTURED TOPSOILS MAY BE USED WITH APPROVAL OF ENGINEER. OBTAIN APPROVAL PRIOR TO PURCHASE



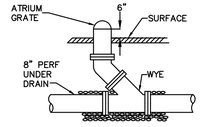
PROFILE



CROSS SECTION

OVERFLOW WEIR DETAIL

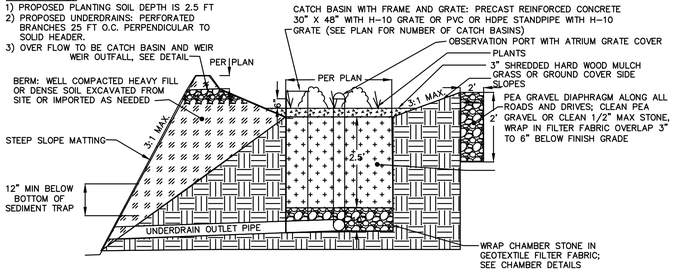
NOT TO SCALE



BIORETENTION OBSERVATION PORT/CLEANOUT

NOT TO SCALE

PROJECT NOTES:
1) PROPOSED PLANTING SOIL DEPTH IS 2.5 FT
2) PROPOSED UNDERDRAINS: PERFORATED BRANCHES 25 FT O.C. PERPENDICULAR TO SOLID HEADER.
3) OVER FLOW TO BE CATCH BASIN AND WEIR WEIR OUTFALL, SEE DETAIL



SOIL RESTORATION (DECOMPACTION) REQUIRED IF BIORETENTION AREA DISTURBED OR USED AS SEDIMENT TRAP OR AS ORDERED BY ENGINEER. IF USED AS SEDIMENT TRAP ALL SEDIMENT TO BE REMOVED, SPREAD ON–SITE UP SLOPE FROM BIORETENTION AND IMMEDIATELY SEEDED AND MULCHED.

TYPICAL REGULAR BIORETENTION

NOT TO SCALE

TYPICAL BIORETENTION PLANTING LIST

Symbol	Species Name	Common Name	No. of Plants/100 SQ FT(2)	Planting Size(2)	Spacing Max(2)
TREES					
Ar	Acer Rubrum	Red Maple	1/1000 SQ FT	3 ft to 4 ft tall	
Qp	Quercus palustris	Pin Oak	1/1000 SQ FT	3 ft to 4 ft tall	
Mv	Magnolia virginiana	Sweetbay Magnolia	1/1000 SQ FT	3 ft to 4 ft tall	
SHRUBS					
Cs	Cornus stolonifera	Red–Osier Dogwood	3/1000 SQ FT	18" Tubling	
Ca	Clethra alnifolia	Sweet Pepperbush	3/1000 SQ FT	18" Tubling	
Iv	Ilex verticillata	Winterberry Holly	3/1000 SQ FT	18" Tubling	
HERBACEOUS					
Ac	Aconus calamus	Sweet Flag	5	Plug	2 ft. O.C.
Al	Asclepias incarnata	Swamp milkweed	5	Plug	2 ft. O.C.
As	Alisma subcordatum	Water plantain	3	Plug	2 ft. O.C.
Ch	Carex hystricina	Bottle brush sedge	5	Plug	2 ft. O.C.
Cv	Carex vulpinoidea	Fox sedge	5	Plug	2 ft. O.C.
Iv	Iris versicolor	Northern blue flag iris	5	Plug	2 ft. O.C.
Jt	Juncus torreyi	Torrey's rush	4	Plug	2 ft. O.C.
Lc	Lobelia cardinalis	Cardinal flower	5	Plug	2 ft. O.C.
Pv	Physostegia virginiana	False dragon's head	3	Plug	2 ft. O.C.
Sl	Sagittaria latifolia	Arrowhead	5	Plug	2 ft. O.C.
Sa	Scirpus atrovirens	Green bulrush	5	Plug	2 ft. O.C.
Sf	Scirpus fluviatilis	River bulrush	3	Plug	2 ft. O.C.
Sv	Scirpus validus	Soft–stemmed bulrush	5	Plug	2 ft. O.C.

Total Herbaceous Plants Needed/100 Sq Ft 58

NOTES:
1. PLANT VARIOUS SPECIES THROUGHOUT BIORETENTION AREA IN VARIED, MIXED ARRANGEMENTS WITH CONSIDERATION OF PLANT GROWTH SIZES, WATER/DRY TOLERANCES, COLORS AND APPEARANCE.
2. PLANT TREES AND SHRUBS IN SUITABLE LOCATION WITHIN BIORETENTION AREA. PLANT TREES AND SHRUBS APART.
3. PLACE FLAT STONES ON MULCH TO ALLOW WALKING ACCESS THROUGH BIORETENTION FOR INSPECTION OF PLANTS AND OBSERVATION PORTS.
4. IF LARGER PLANTS ARE PLANTED, THE NUMBER AND SPACING CAN BE ADJUSTED ACCORDINGLY WITH APPROVAL OF INSPECTION ENGINEER PRIOR TO PURCHASE.
5. PLANTS MAY BE SUBSTITUTED WITH DROUGHT RESISTANT, NATIVE, NON–INVASIVE PLANTS OF SIMILAR TYPE WITH APPROVAL OF INSPECTION ENGINEER. PRIOR TO PURCHASE.
6. PLANTS ARE TO BE MAINTAINED (WATERED IF NECESSARY) AND ANY THAT FAIL TO THRIVE, BECOME DISEASED OR DIE SHALL BE REPLACED

POST CONSTRUCTION STORMWATER PRACTICES

QUALITY TREATMENT.

A. PRETREATMENT

SWALES WITH CHECK DAMS

SWALES WITH CHECK DAMS FOR STORMWATER PRETREATMENT TO REMOVE SEDIMENT PRIOR TO THE TREATMENT.

MATERIAL: VEGETATIVE LINED SWALES WITH STONE CHECK DAMS. THE VEGETATION FILTERS OUT SEDIMENT. THE STONE CHECK DAMS ALSO PROVIDE FILTERING AS WELL AS DETAINING RUNOFF TO ALLOW SOME SEDIMENT TO SETTLE OUT.

MAINTENANCE: MAINTENANCE SHALL BE THE RESPONSIBILITY OF THE OWNER. DEBRIS SHOULD BE REMOVED REGULARLY. MOW OR CUT DOWN HIGH OR WOODY VEGETATION, A MINIMUM OF TWICE A YEAR. FULL INSPECTIONS SHALL TAKE PLACE YEARLY. COMPONENTS SHOULD BE REPAIRED OR REPLACED WHEN NEEDED. REMOVE SEDIMENT ANNUALLY. FULL INSPECTIONS INVOLVE CHECKING ALL COMPONENTS THOROUGHLY. IF A REPAIR IS NECESSARY, IT SHALL BE INITIATED IN A TIMELY FASHION.

VEGETATED SWALES (5.3.3) AS TREATMENT AND RUNOFF REDUCTION.

VEGETATED SWALE RUNOFF REDUCTION CAPACITY FOR THIS PRACTICE IS 20% IN AREAS WITH HSG A AND B SOILS AND 12% IN AREAS WITH MODIFIED IN ACCORDANCE WITH SOIL RESTORATION HSG C AND D SOILS.

PEA GRAVEL DIAPHRAGM

PEA GRAVEL DIAPHRAGM BEFORE THE BIORETENTION FOR STORMWATER PRETREATMENT TO REMOVE SEDIMENT PRIOR TO THE BIORETENTION AREAS.

MATERIAL: SMALL GRAVEL OR STONE FILLED TRENCH.

MAINTENANCE:

MAINTENANCE SHALL BE THE RESPONSIBILITY OF THE OWNER. DEBRIS SHOULD BE REMOVED REGULARLY. CLEAN TOP LAYER OF GRAVEL EVERY COUPLE OF YEARS OR MORE IF NEEDED. FULL INSPECTIONS SHALL TAKE PLACE YEARLY. COMPONENTS SHOULD BE REPAIRED OR REPLACED WHEN NEEDED. REMOVE SEDIMENT ANNUALLY. FULL INSPECTIONS INVOLVE CHECKING ALL COMPONENTS THOROUGHLY. IF A REPAIR IS NECESSARY, IT SHALL BE INITIATED IN A TIMELY FASHION.

B. BIORETENTION (F–5), RAIN GARDENS (5.3.7), DRY SWALES (O–1) AND SURFACE SAND FILTER (F–1)

STORMWATER FILTERING SYSTEMS CAPTURE AND TEMPORARILY STORE THE WATER QUALITY VOLUME AND PASS IT THROUGH A FILTER BED OF SAND, ORGANIC MATTER, OR SOIL. SPECIFIED AS A STANDARD PRACTICE IN CHAPTERS 5 AND 6 OF THE 'NEW YORK STATE STORMWATER MANAGEMENT DESIGN MANUAL.' A BIORETENTION AREA IS A SHALLOW STORMWATER BASIN OR LANDSCAPED AREA THAT TREATS AND INFILTRATES STORMWATER AS IT FLOWS THROUGH PLANTS AND A SOIL MATRIX. AN UNDERDRAIN CAN BE INSTALLED WHERE SOILS ARE NOT CONDUCIVE TO INFILTRATION. IN AN UNDERDRAIN SYSTEM, STORMWATER IS STILL FILTERED PRIOR TO ENTERING THE DRAIN AND REACHING THE DISCHARGE POINT. THE PRACTICE IS OFTEN LOCATED IN PARKING LOT ISLANDS, AND CAN ALSO BE USED TO TREAT OTHER AREAS.

BIORETENTION RUNOFF REDUCTION CAPACITY FOR THIS PRACTICE IS 100% IN AREAS WITH HSG A AND B SOILS WITHOUT UNDERDRAIN AND 40% IN AREAS WITH HSG C AND D SOILS WITH UNDERDRAIN.

DRY SWALE RUNOFF REDUCTION CAPACITY FOR THIS PRACTICE IS 40% IN AREAS WITH HSG A AND B SOILS AND 20% IN AREAS WITH HSG C AND D SOILS WITH UNDERDRAIN.

LANDSCAPING:

PLANTS FOR THE BIORETENTION AREA AND RAIN GARDENS CAN BE FOUND ON THE WATER QUALITY DETAILS SHEET. PLANTS FOR THE LANDSCAPING PLAN WILL BE CHOSEN FROM THE NATIVE PLANT LIST IN APPENDIX H OF THE "NYS STORMWATER MANAGEMENT DESIGN MANUAL." A LIST DEVELOPED BY APPLIED ECOLOGICAL SERVICES INC. IN A BROCHURE CALLED "BUILD YOUR OWN RAIN GARDENS," OR A PLANT LIST AVAILABLE THROUGH NATIVE LANDSCAPES IN PAWLING, NY (WWW.NATIVELANDSCAPING.NET). DRY SWALES AND SURFACE SAND FILTERS HAVE GRASS COVER.

MAINTENANCE:

MAINTENANCE SHALL BE THE RESPONSIBILITY OF THE OWNER. TREATMENT AREA PLANTS AND COMPONENTS SHOULD BE REPAIRED OR REPLACED WHEN NEEDED. A 6 INCH STONE DROP SHOULD BE PROVIDED AND MAINTAINED AT THE PIPE INLETS. MULCH SHOULD BE REPLACED ANNUALLY. SEDIMENT SHALL BE REMOVED BEFORE IT REACHES 1 INCH DEEP AND EACH SPRING. GRASS TO BE MAINTAINED AT 4" TO 6" HEIGHT.

FULL INSPECTIONS SHALL TAKE PLACE YEARLY UNLESS THE FULL PRE–TREATMENT IS NOT PROVIDED THEN FULL INSPECTIONS SHALL TAKE PLACE TWICE YEARLY; ONE IN THE SPRING AND ONE IN LATE SUMMER. FULL INSPECTIONS INVOLVE CHECKING ALL COMPONENTS OF THE BIORETENTION AREA THOROUGHLY. IF A REPAIR IS NECESSARY, IT SHALL BE INITIATED IN A TIMELY FASHION.

C. CATCH BASINS, STORM PIPES AND RIPRAP OUTLET PROTECTION

STORMWATER FACILITIES TO COLLECT, CARRY RUNOFF AND DISCHARGE RUNOFF IS A CONTROLLED NON–EROSIVE MANNER.

PROTECTION: THE AREAS UPSLOPE OF THE CATCH BASINS AND PIPE INLETS ARE TO BE PERMANENTLY STABILIZED WITH VEGETATION, GRAVEL, ASPHALT, CONCRETE, ETC. THE DISCHARGE FROM THE LAST PIPE IS TO BE ONTO A PERMANENTLY STABILIZED APRON/SURFACE CAPABLE OF HANDLING THE DISCHARGE VELOCITY AND FLOW FROM THE PIPE.

MAINTENANCE: MAINTENANCE SHALL BE THE RESPONSIBILITY OF THE OWNER. FULL INSPECTIONS SHALL TAKE PLACE YEARLY. FULL INSPECTIONS INVOLVE CHECKING ALL COMPONENTS THOROUGHLY. REMOVE SEDIMENT AND DEBRIS FROM CATCH BASIN GRATE AND SUMPS, PIPES AND DISCHARGE APRONS. IF DOWN STREAM WASHOUTS OR EROSION OCCURS, REPAIR AND EXTEND OR MODIFY STABILIZED APRON/SURFACE APPROPRIATELY. IF A REPAIR IS NECESSARY, IT SHALL BE INITIATED IN A TIMELY FASHION

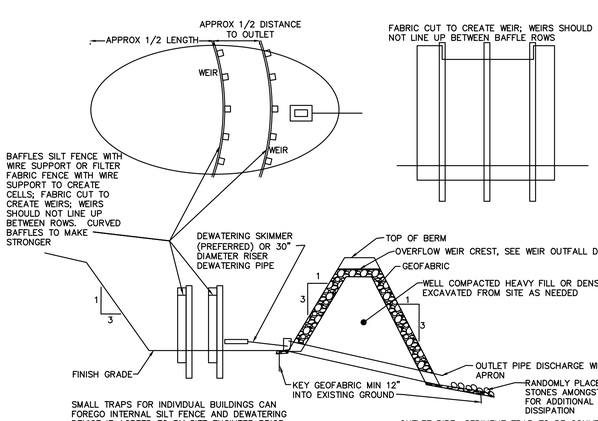
D. FLOW DIFFUSER / LEVEL SPREADER / PERMEABLE BERM

STORMWATER SYSTEM CAPTURES AND TEMPORARILY STORES THE FLOW AND THEN ALLOWS FOR A GRADUAL RELEASE AS SHEET FLOW. THE PERMEABLE BERM IS OFTEN LOCATED AT THE TOE OF SLOPE AND BEFORE VEGETATED FILTER STRIPS, RIPARIAN BUFFERS OR BEFORE LEAVING PROPERTY.

MAINTENANCE
MAINTENANCE SHALL BE THE RESPONSIBILITY OF THE OWNER. FULL INSPECTIONS SHALL TAKE PLACE YEARLY. FULL INSPECTIONS INVOLVE CHECKING ALL COMPONENTS. REMOVAL OF SEDIMENT AND DEBRIS. RESHAPING STONE BERM. IF A REPAIR IS NECESSARY, IT SHALL BE INITIATED IN A TIMELY FASHION.

E. SOIL RESTORATION (NYSDEC SMDM 5.1.6)

SOIL RESTORATION IS REQUIRED WHERE SOILS HAVE BEEN DISTURBED AND WILL BE VEGETATED. FOR THIS PROJECT, THE MAJORITY OF THE HEAVY TRAFFIC DISTURBANCE WILL BE IN AREAS THAT WILL BE BUILDING OR PAVEMENT. MINIMAL SOIL DISTURBANCE WILL OCCUR IN PROPOSED VEGETATED AREAS. THE COMMON PRACTICE IN PREPARING AN AREA FOR LANDSCAPE IS TO LOOSEN THE SOIL AND APPLY TOPSOIL. THE NATIVE SOIL IN INFILTRATION AREAS IS REMOVED AND REPLACED WITH STONE AS ORDERED BY ENGINEER. THE NEED FOR FULL SOIL RESTORATION IS NOT WARRANTED FOR THE DISTURBED, PROPOSED VEGETATED AREAS. IF EXCESSIVE COMPACTION OCCURS DURING CONSTRUCTION, MITIGATION INCLUDING, BUT NOT LIMITED TO DEEP RIPPING AND DE–COMPACTION AS OUTLINED IN THE NYSDEC STORMWATER MANUAL, SECTION 5.1.6, MAY BE ORDERED BY THE SITE ENGINEER.

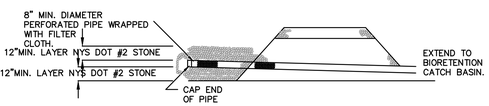


SMALL TRAPS FOR INDIVIDUAL BUILDINGS CAN FOREGO INTERNAL SILT FENCE AND DEWATERING DEVICE IF AGREED TO BY SITE ENGINEER PRIOR TO EXCAVATION OR DISTURBANCE FOR BUILDING.

OUTLET PIPE: SEDIMENT TRAP TO BE CONVERTED TO FINAL USE AFTER UPSLOPE AREAS ARE STABILIZED AND SEDIMENT IS REMOVED; IF CONVERTING TO BIORETENTION, OVER EXCAVATE BY 2 FT AND FILL EXCAVATION WITH BIORETENTION MEDIA.

SEDIMENT TRAP / SILT TRAP DEWATERING

NOT TO SCALE



DEWATERING DEVICE

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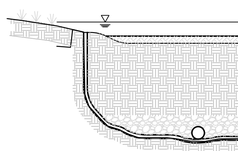
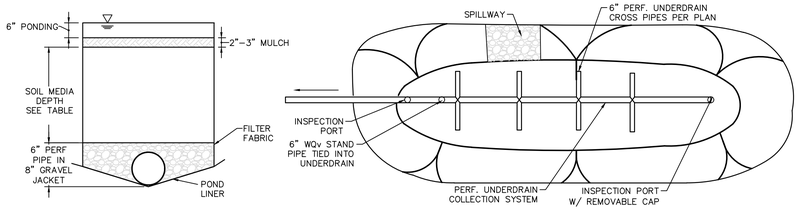


BIORETENTION NOTES

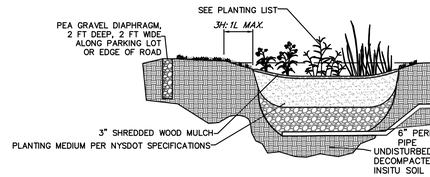
1. BIORETENTION FACILITIES SHALL NOT BE CONSTRUCTED UNTIL UP GRADIENT AREAS ARE STABILIZED OR VEGETATED. IF CONSTRUCTED PRIOR TO THIS, THEN AREAS MUST BE PROTECTED FROM RUNOFF WITH BERMS, SWALES, OR SILT FENCE.

THE BIO–RETENTION AREAS ARE NOT TO BE FULLY CONSTRUCTED UNTIL THE SITE IS STABILIZED SO THAT SILT FROM CONSTRUCTION DOES NOT CLOG THE MEDIA.



BIORETENTION POND DETAIL

NOT TO SCALE



Symbol	Species Name	Common Name	No. of Plants/100 SQ FT(2)	Planting Size(2)	Spacing Max(2)
TREES					
Ar	Acer rubrum	Red Maple	3/10,000 SQ FT	3 Gallon	
SHRUBS					
Cs	Cornus stolonifera	Red–Osier Dogwood	6/10,000 SQ FT	18" Tubling	
HERBACEOUS					
Ac	Aconus calamus	Sweet Flag	5	Plug	2 ft. O.C.
Al	Asclepias incarnata	Swamp milkweed	5	Plug	2 ft. O.C.
As	Alisma subcordatum	Water plantain	3	Plug	2 ft. O.C.
Ch	Carex hystricina	Bottle brush sedge	5	Plug	2 ft. O.C.
Cv	Carex vulpinoidea	Fox sedge	5	Plug	2 ft. O.C.
Iv	Iris versicolor	Northern blue flag iris	5	Plug	2 ft. O.C.
Jt	Juncus torreyi	Torrey's rush	4	Plug	2 ft. O.C.
Lc	Lobelia cardinalis	Cardinal flower	5	Plug	2 ft. O.C.
Pv	Physostegia virginiana	False dragon's head	3	Plug	2 ft. O.C.
Sl	Sagittaria latifolia	Arrowhead	5	Plug	2 ft. O.C.
Sa	Scirpus atrovirens	Green bulrush	5	Plug	2 ft. O.C.
Sf	Scirpus fluviatilis	River bulrush	3	Plug	2 ft. O.C.
Sv	Scirpus validus	Soft–stemmed bulrush	5	Plug	2 ft. O.C.

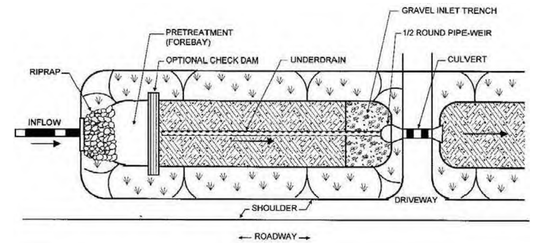
Total Plants Needed/100 Sq Ft 58

NOTES:
1. PLANT VARIOUS SPECIES THROUGHOUT BIORETENTION AREA IN VARIED, MIXED ARRANGEMENTS WITH CONSIDERATION OF PLANT GROWTH SIZES, COLORS AND APPEARANCE.
2. PLANT TREES IN SUITABLE LOCATION WITHIN BIORETENTION AREA. PLANT TREES APART.
3. PLACE FLAT STONES ON MULCH TO ALLOW WALKING ACCESS THROUGH BIORETENTION FOR INSPECTION OF PLANTS.
4. IF LARGER PLANTS ARE PLANTED, THE NUMBER AND SPACING CAN BE ADJUSTED ACCORDINGLY WITH APPROVAL OF INSPECTION ENGINEER PRIOR TO PURCHASE.
5. PLANTS MAY BE SUBSTITUTED WITH DROUGHT RESISTANT, NATIVE, NON–INVASIVE PLANTS OF SIMILAR TYPE WITH APPROVAL OF INSPECTION ENGINEER. PRIOR TO PURCHASE.

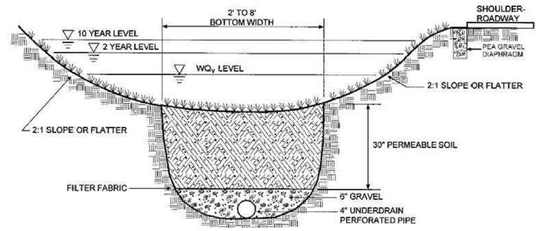
TYPICAL BIORETENTION PLANTING DETAIL

NOT TO SCALE

BIORETENTION SOIL:
THE FOLLOWING SECTIONS OF THE STANDARD SPECIFICATIONS APPLY:
NYSDOT §703–07 CONCRETE SAND
NYSDOT §713–01 TOPSOIL, TYPE A (SEE EXCEPTIONS BELOW)
THE SOIL FOR BIORETENTION AREAS AND DRY SWALES SHALL BE A UNIFORM MIX, FREE OF STONES, STUMPS, ROOTS OR OTHER OBJECTS LARGER THAN TWO INCHES (2") IN DIAMETER. THE BIORETENTION AND DRY SWALE SOIL SHALL BE VISIBLY FREE OF NOXIOUS WEEDS.
BIORETENTION AND DRY SWALE SOIL SHALL BE A WELL BLENDED MIXTURE OF THREE (3) PARTS SAND AND ONE (1) PART TOPSOIL, BY VOLUME. THE BIORETENTION AND DRY SWALE SOIL SHALL HAVE A PH RANGE OF 5.2 TO 7.6, AND AN ORGANIC CONTENT OF 3–7% SAND SHALL MEET THE REQUIREMENTS OF §703–07 CONCRETE SAND.
TOPSOIL SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF §713–01 TOPSOIL FOR TOPSOIL TYPE A, EXCEPT AS FOLLOWS:
SOIL AMENDMENTS TO INCREASE ORGANIC CONTENT SHALL BE PEAT MOSS. PEAT MOSS SHALL BE COMMERCIALLY PRODUCED AND SHALL BE COMPOSED OF THE PARTLY DECOMPOSED STEMS AND LEAVES OF ANY OR SEVERAL SPECIES OF SPHAGNUM MOSS. IT SHALL BE FREE FROM WOOD, DECOMPOSED COLLOIDAL RESIDUE, AND OTHER FOREIGN MATTER. IT SHALL HAVE A PH RANGE BETWEEN 3.5 PH – 5.5 PH AS DETERMINED IN ACCORDANCE WITH THE ASSOCIATION OF OFFICIAL AGRICULTURAL CHEMISTS TESTING METHODS. IT'S WATER–ABSORBING ABILITY SHALL BE A MINIMUM OF 1100% BY WEIGHT ON AN OVEN–DRY BASIS



PLAN VIEW

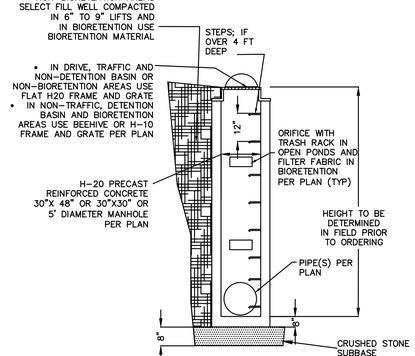


SECTION

FIGURE 6.20 IN THE NYS STORMWATER MANAGEMENT DEGIN MANUAL

DRY SWALE DETAIL

NOT TO SCALE



STORM STRUCTURE CATCH BASIN BIORETENTION OVERFLOW DETAIL

NOT TO SCALE

NOTES:
1. WATERSHED BOUNDARIES BY BERGER ENGINEERING AND SURVEYING, PLLC.
2. POST CONSTRUCTION STORMWATER FACILITIES BY BERGER ENGINEERING AND SURVEYING, PLLC.

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POUGHKEEPSIE N.Y. 12603
(845) 471 - 7383
bergerengr@gmail.com
PE REGISTRATION 069634 CERT 0405443 EXPIRE ON 04-30-25
LS REGISTRATION 049745 CERT 1255930 EXPIRE ON 04-30-24
COA FOR PE AND LS CERT 0018252 AND 0018253

NO.	DATE	REVISION
2	6/25/25	PROGRESS SET
1	12/11/24	DESIGN REVISIONS

MICHAEL G. RIELLY
NEW YORK STATE PROFESSIONAL ENGINEER
LICENSE NO. 093427

MANAGER: MICHAEL G. RIELLY
DESIGN BY: MTL | DRAWN BY: MTL | CHKD BY: MGR

IT IS A VIOLATION OF NEW YORK STATE EDUCATION ARTICLE 145 FOR ANY PERSON, UNLESS HE IS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT IN ANY WAY. IF THIS DOCUMENT IS ALTERED, THE ALTERING ENGINEER SHALL AFFIX TO THE DOCUMENT HIS SEAL AND THE NOTATION "ALTERED BY" FOLLOWED BY HIS SIGNATURE, A DESCRIPTION OF THE ALTERATION, AND THE SPECIFIC DESCRIPTION OF THE ALTERATION.

CLIENT
SHELDRAKE KARMEL RD
PROPERTIES LLC
PO BOX 1333
JACKSON, NJ 08527
TEL: (732)–719–7200

RIELLY ENGINEERING DPC
PO BOX 69 / 63 LIBERTY STREET
MONTICELLO, NY 12701
T. 845-796-9700
OFFICE@RIELLYENGINEERING.COM

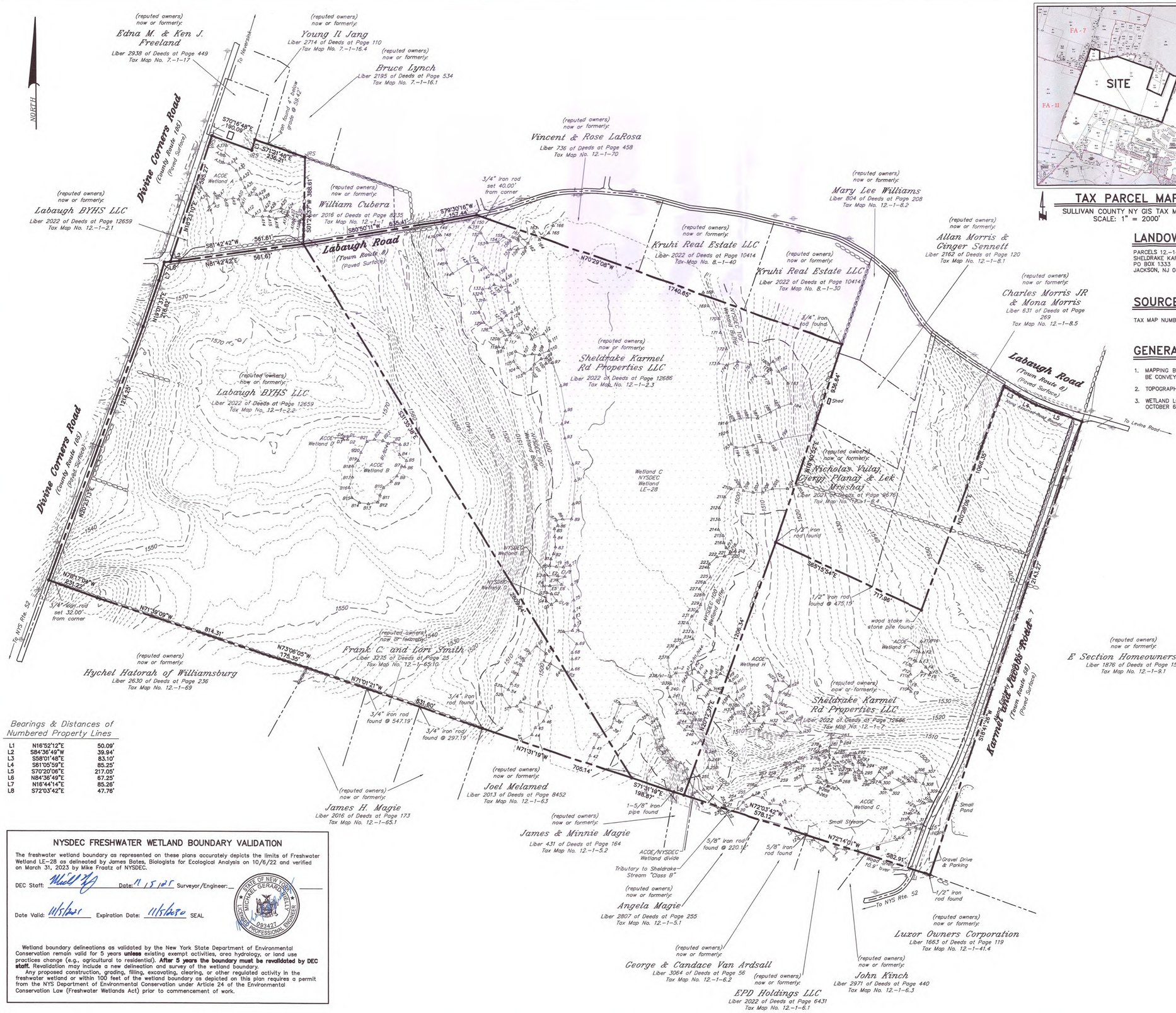
DRAINAGE DETAILS
FOR
SHELDRAKE KARMEL RD PROPERTIES LLC
TOWN OF FALLSBURG | SULLIVAN COUNTY, NY

SCALE: AS SHOWN

DATE: JUNE 25, 2024
SHEET NO. 29 OF 29
DWG. NO. 0236–01

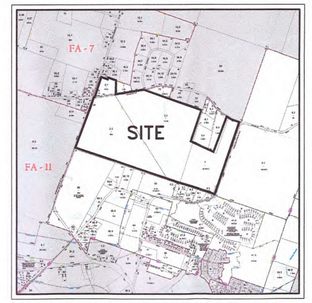
APPENDIX B

WETLAND DELINEATION MAP



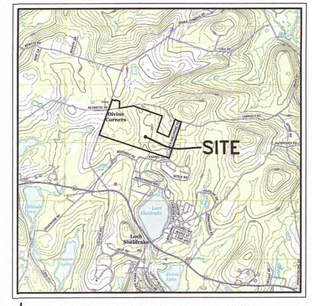
TAX PARCEL MAP

SULLIVAN COUNTY NY GIS TAX MAPS
SCALE: 1" = 2000'



SITE LOCATION MAP

USGS LIBERTY EAST QUAD
SCALE: 1" = 4000'



LANDOWNERS

PARCELS 12.-1-2.3 ; 12.-1-7
SHELDRAKE KARMEL RD PROPERTIES LLC
PO BOX 1333
JACKSON, NJ 08527

PARCELS 12.-1-2.1 ; 12.-1-2.2
LABAUGH BYHS LLC
1415 CEDARVIEW AVE
LAKEWOOD, NY 08701

SOURCE OF TITLE

TAX MAP NUMBER:

TOWN OF FALLSBURG – 12.-1-2.1 – 5.58 ACRES
TOWN OF FALLSBURG – 12.-1-2.2 – 66.48 ACRES
TOWN OF FALLSBURG – 12.-1-2.3 – 72.97 ACRES
TOWN OF FALLSBURG – 12.-1-7 – 39.66 ACRES

GENERAL NOTES

1. MAPPING BASED ON A BOUNDARY SURVEY ENTITLED "SURVEY MAP OF FOUR PARCELS TO BE CONVEYED" AS PREPARED BY ANTHONY F. SICILIANO L.S. P.C. DATED NOVEMBER 2022.
2. TOPOGRAPHY FROM GOLDEN AERIAL SURVEYS, BASED ON IMAGERY FLOWN IN APRIL OF 2017.
3. WETLAND LOCATIONS ARE BASED ON A WETLAND DELINEATION BY ECOLOGICAL ANALYSIS ON OCTOBER 6, 2022. WETLAND FLAGS WERE LOCATED BY ANTHONY F. SICILIANO L.S. P.C.

WETLAND AREA TABLE

TYPE OF WETLAND		AREA	
NYSDEC	ACOE	SQUARE FEET	ACRES
	A	49,697	1.14
	B	48,153	1.11
C		1,746,238	40.09
	C	203,733	4.68
	D	245	0.006
E		3,286	0.08
	F	6,248	0.14
G		1,534	0.04
	H	29,647	0.68

Bearings & Distances of Numbered Property Lines

L1	N16°52'12"E	50.09'
L2	S84°36'49"W	39.94'
L3	S58°01'48"E	83.10'
L4	S61°05'59"E	85.25'
L5	S70°20'06"E	217.05'
L6	N84°36'49"E	67.25'
L7	N16°44'14"E	85.28'
L8	S72°03'42"E	47.76'

NYSDEC FRESHWATER WETLAND BOUNDARY VALIDATION

The freshwater wetland boundary as represented on these plans accurately depicts the limits of Freshwater Wetland LE-28 as delineated by James Bates, Biologists for Ecological Analysis on 10/6/22 and verified on March 31, 2023 by Mike Fraatz of NYSDEC.

DEC Staff: _____ Date: 11/5/2025 Surveyor/Engineer: _____

Date Valid: 11/5/2025 Expiration Date: 11/5/2030 SEAL

STATE OF NEW YORK · MICHAEL GERARD RIELLY · 093427 · LICENSED PROFESSIONAL ENGINEER

Wetland boundary delineations as validated by the New York State Department of Environmental Conservation remain valid for 5 years **unless** existing exempt activities, area hydrology, or land use practices change (e.g., agricultural to residential). **After 5 years the boundary must be revalidated by DEC staff.** Revalidation may include a new delineation and survey of the wetland boundary.

Any proposed construction, grading, filling, excavating, clearing, or other regulated activity in the freshwater wetland or within 100 feet of the wetland boundary as depicted on this plan requires a permit from the NYS Department of Environmental Conservation under Article 24 of the Environmental Conservation Law (Freshwater Wetlands Act) prior to commencement of work.

NO.	DATE	REVISION
3	05/04/23	REVISED NYSDEC WETLAND SIGNATURE BLOCK
2	04/25/23	REVISED PER NYSDEC COMMENTS
1	01/12/23	REVISED WETLAND CALCULATIONS

MICHAEL G. RIELLY
NEW YORK LICENSED PROFESSIONAL ENGINEER
LICENSE NO. 093427

MANAGER: MICHAEL G. RIELLY
DESIGN BY: MTL | DRAWN BY: MTL | CHKD BY: MGR

IT IS A VIOLATION OF NEW YORK STATE EDUCATION LAW FOR ANY PERSON, UNLESS HE IS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT IN ANY WAY. IF THIS DOCUMENT IS ALTERED, THE ALTERING ENGINEER SHALL AFFIX TO THE ITEM HIS SEAL AND THE NOTATION "ALTERED BY" FOLLOWED BY HIS SIGNATURE AND THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

CLIENT
SHELDRAKE KARMEL ROAD PROPERTIES LLC
PO BOX 1333
JACKSON, NJ 08527

SCALE: 1" = 200' (0, 100', 200', 300', 400')

RIELLY ENGINEERING DPC
PO BOX 69 / 63 LIBERTY STREET
MONTICELLO, NY 12701
T. 845-796-9700
OFFICE@RIELLYENGINEERING.COM

NYSDEC WETLANDS MAP
FOR
SHELDRAKE KARMEL RD. PROPERTIES LLC & LABAUGH BYHS LLC

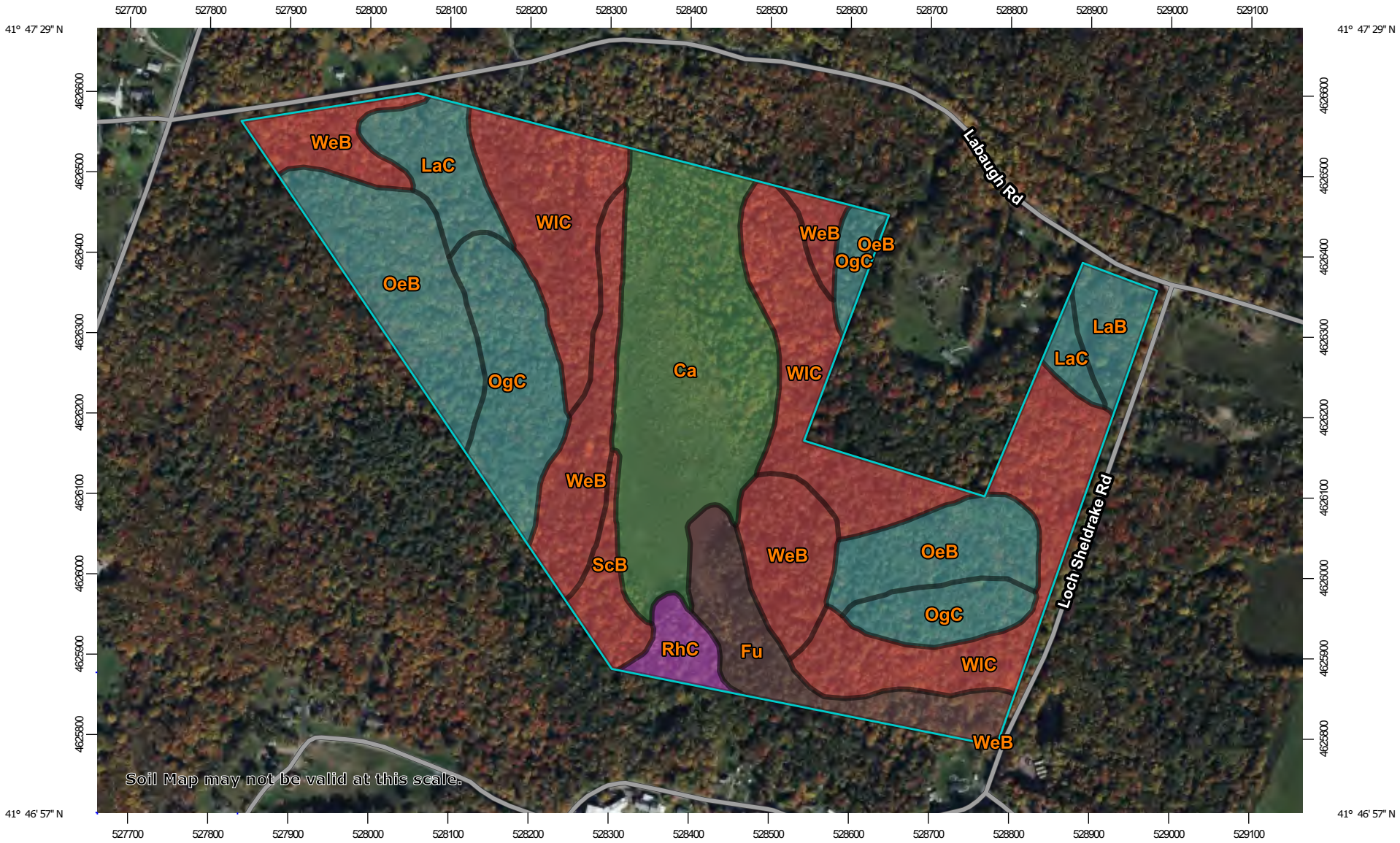
TOWN OF FALLSBURG — SULLIVAN COUNTY, NY

DATE: JANUARY 3, 2023
SHEET NO. 1 OF 1
DWG. NO. 0236-01

APPENDIX C

USDA NRCS SOIL MAP

Hydrologic Soil Group—Sullivan County, New York
(Sheldrake Karmel)



Map Scale: 1:6,880 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 100 200 400 600

Feet: 0 300 600 1200 1800

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A
A/D
B
B/D
C
C/D
D
Not rated or not available

Soil Rating Lines

A
A/D
B
B/D
C
C/D
D
Not rated or not available

Soil Rating Points

A
A/D
B
B/D
C
C/D
D
Not rated or not available

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: Sullivan County, New York
Survey Area Data: Version 23, Aug 26, 2024

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

Date(s) aerial images were photographed: May 31, 2022—Oct 27, 2022

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.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
Ca	Carlisle muck	A/D	21.2	18.6%
Fu	Fluvaquents-Udifluvents complex, frequently flooded	B/D	7.2	6.3%
LaB	Lackawanna channery loam, 3 to 8 percent slopes	C	2.8	2.4%
LaC	Lackawanna channery loam, 8 to 15 percent slopes	C	5.5	4.8%
OeB	Oquaga very channery silt loam, 3 to 8 percent slopes	C	15.4	13.5%
OgC	Oquaga-Arnot complex, 8 to 15 percent slopes	C	13.0	11.4%
RhC	Riverhead sandy loam, 8 to 15 percent slopes	A	2.1	1.9%
ScB	Scriba loam, 3 to 8 percent slopes, stony	D	2.6	2.3%
WeB	Wellsboro gravelly loam, 3 to 8 percent slopes	D	15.6	13.7%
WlC	Wellsboro and Wurtsboro soils, strongly sloping, extremely stony	D	28.6	25.1%
Totals for Area of Interest			**113.9**	**100.0%**

Description

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

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

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

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

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

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

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

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Septic Tank Absorption Fields (NY)—Sullivan County, New York
(Sheldrake Karmel)

Map Scale: 1:6,880 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 100 200 400 600

Feet: 0 300 600 1200 1800

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

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

Soils

Soil Rating Polygons
- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

Soil Rating Lines
- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

Soil Rating Points
- Very limited
- Somewhat limited
- Not limited
- Not rated or not available

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: Sullivan County, New York
Survey Area Data: Version 23, Aug 26, 2024

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

Date(s) aerial images were photographed: May 31, 2022—Oct 27, 2022

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.

Septic Tank Absorption Fields (NY)

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
Ca	Carlisle muck	Very limited	Carlisle (85%)	Depth to saturated zone (1.00)	21.2	18.6%
				Ponding (1.00)		
Fu	Fluvaquents-Udifluvents complex, frequently flooded	Very limited	Fluvaquents (45%)	Flooding (1.00)	7.2	6.3%
				Depth to saturated zone (1.00)		
				Ponding (1.00)		
				Restricted permeability (0.31)		
			Udifluvents, frequently flooded (40%)	Flooding (1.00)		
				Leaching or seepage (1.00)		
				Filtering capacity (1.00)		
				Depth to saturated zone (0.33)		
LaB	Lackawanna channery loam, 3 to 8 percent slopes	Somewhat limited	Lackawanna (85%)	Depth to saturated zone (0.85)	2.8	2.4%
				Depth to dense material (0.83)		
				Restricted permeability (0.20)		
			Wellsboro (10%)	Depth to saturated zone (0.91)		
				Depth to dense material (0.89)		
				Restricted permeability (0.20)		
			Oquaga (2%)	Depth to bedrock (0.75)		
				Slope (0.20)		
				Restricted permeability (0.20)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Content of large stones (0.02)		
LaC	Lackawanna channery loam, 8 to 15 percent slopes	Somewhat limited	Lackawanna (85%)	Depth to saturated zone (0.85)	5.5	4.8%
				Depth to dense material (0.83)		
				Slope (0.20)		
				Restricted permeability (0.20)		
			Wellsboro (10%)	Depth to saturated zone (0.91)		
				Depth to dense material (0.89)		
				Slope (0.20)		
				Restricted permeability (0.20)		
OeB	Oquaga very channery silt loam, 3 to 8 percent slopes	Somewhat limited	Oquaga (90%)	Depth to bedrock (0.75)	15.4	13.5%
				Restricted permeability (0.20)		
				Content of large stones (0.09)		
			Wellsboro (5%)	Depth to saturated zone (0.91)		
				Depth to dense material (0.89)		
				Restricted permeability (0.20)		
OgC	Oquaga-Arnot complex, 8 to 15 percent slopes	Somewhat limited	Oquaga (55%)	Depth to bedrock (0.75)	13.0	11.4%
				Slope (0.20)		
				Restricted permeability (0.20)		
				Content of large stones (0.09)		
RhC	Riverhead sandy loam, 8 to 15 percent slopes	Somewhat limited	Riverhead (85%)	Leaching or seepage (0.90)	2.1	1.9%
				Slope (0.20)		

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
ScB	Scriba loam, 3 to 8 percent slopes, stony	Very limited	Scriba, stony (75%)	Depth to saturated zone (1.00)	2.6	2.3%
				Restricted permeability (1.00)		
				Depth to dense material (0.95)		
WeB	Wellsboro gravelly loam, 3 to 8 percent slopes	Very limited	Wellsboro (85%)	Depth to saturated zone (1.00)	15.6	13.7%
				Depth to dense material (0.95)		
				Restricted permeability (0.31)		
WIC	Wellsboro and Wurtsboro soils, strongly sloping, extremely stony	Very limited	Wellsboro, extremely stony (41%)	Depth to saturated zone (1.00)	28.6	25.1%
				Depth to dense material (0.95)		
				Surface rock fragments (0.80)		
				Restricted permeability (0.31)		
				Slope (0.20)		
			Wurtsboro, extremely stony (39%)	Depth to saturated zone (1.00)		
				Surface rock fragments (0.80)		
				Depth to dense material (0.76)		
				Restricted permeability (0.31)		
				Slope (0.20)		
Totals for Area of Interest					**113.9**	**100.0%**

Rating	Acres in AOI	Percent of AOI
Very limited	75.1	66.0%
Somewhat limited	38.8	34.0%
Totals for Area of Interest	**113.9**	**100.0%**

Description

Septic tank absorption fields are subsurface systems of perforated pipe or similar devices that distribute effluent from a septic tank into the soil. New York State Department of Health regulations allow installation of septic system absorption fields of varying designs, depending upon the depth of suitable soil material above any limitation in the natural soil at a site (New York State Department of Health, 1990). Where necessary, imported fill material may be used to elevate absorption trenches to at least the minimum distance of 24 inches above limiting soil horizons. The depth ranges of suitable material and corresponding types of absorption systems allowed are as follows:

Less than 12 inches-no system allowed

12 to 24 inches-alternative raised trench

24 to 48 inches-conventional shallow trench

More than 48 inches-conventional system

The ratings in this interpretation are based on evaluation of the soil between depths of 12 and 48 inches. In addition, the bottom layer of the soil is evaluated for risk of seepage. This interpretation does not evaluate bedrock below the soil. The soil properties and site features considered are those that affect absorption of the effluent, construction and maintenance of the system, and public health.

The soil properties and qualities that affect the absorption and effective treatment of wastewater effluent are saturated hydraulic conductivity (Ksat), depth to a seasonal high water table, depth to bedrock, depth to dense material, and susceptibility to flooding. Stones and boulders and a shallow depth to bedrock or dense material interfere with installation. Excessive slope may cause lateral seepage and surfacing of the effluent in downslope areas. In addition, the hazards of erosion and sedimentation increase as slope increases.

Some soils are underlain by loose sand and gravel or fractured bedrock at a depth of less than 2 feet below the distribution lines. In these soils the absorption field may not adequately filter the effluent, particularly when the system is new. As a result, ground water may be contaminated.

The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the specified use. "Not limited" indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. "Somewhat limited" indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. "Very limited" indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen, which is displayed on the report. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as listed for the map unit. The percent composition of each component in a particular map unit is presented to help the user better understand the percentage of each map unit that has the rating presented.

Other components with different ratings may be present in each map unit. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the Selected Soil Interpretations report with this interpretation included from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

The information in this interpretation is based on criteria developed specifically for soils in New York. The information is not site specific and does not eliminate the need for onsite investigation of the soils.

Reference:

New York State Department of Health. 1990. Appendix 75-A of Part 75, Section 201(1)(1) of New York Public Health Law. Nassau and Suffolk Counties have a waiver from this portion of New York State Department of Health regulations.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

APPENDIX D

SEQR DOCUMENTATION

RIELLY ENGINEERING, D.P.C.

office@riellyengineering.com

Office: 845-796-9700
Mobile: 845-594-2937

63 Liberty Street / PO Box 69
Monticello, NY 12701

January 10, 2025

RE: **Sheldrake Karmel Rd. Properties LLC - Manufactured Home Park**
Town of Fallsburg, Sullivan County, NY
RE Project No. 0236-01

To Whom it may Concern:

Enclosed with this letter is the lead agency package for the Sheldrake Karmel Rd. Properties LLC – Manufactured Home Park project located southwest of the Labaugh Road and Karmel and Jacobs Road Intersection in the Town of Fallsburg.

The Town of Fallsburg Planning Board declared their intent to be Lead Agent in the SEQRA Process at the January 9, 2025 Planning Board.

If you have any questions, please call me at 845-796-9700 or email me at mrielly@riellyengineering.com. Thank you!

Sincerely,

Michael G. Rielly, PE
Engineer

_____X

In the Matter of Town of Fallsburg Planning Board

Name of Applicant Sheldrake Karmel Road Properties LLC

SEQR Status: Lead Agency Notice

_____X

STATE OF NEW YORK)
)ss:
COUNTY OF SULLIVAN)

Michael G. Rielly, being over 18 years of age and residing in Rock Hill, New York 12775, affirms residing at the following:

On January 10, 2025, I served a true copy of the annexed following in regard to the above-reference matter in the following manner:

1.) Long Environmental Assessment Form
2.) Project Site Plans, Cover Sheet and Overall Plan

By mailing the same in a sealed envelope, with postage prepaid thereon, in a post office or official depository of the U.S. Postal Service within the State of New York, addresses to the last known address of the persons indicated below:

New York State DEC Environmental Region 3
21 South Putt Corners Road
New Paltz, New York 12561

NYS Dept. Of Health
90 Crystal Run Road
Suite 200
Middletown, NY 10941

Sullivan County Div. of Public Works
100 North Street
Monticello, New York 12701

Sullivan County Div. Of Planning and Environmental Management
100 North Street
Monticello, New York 12701

NYS Office of Historic Preservation
Field Service Bureau
Peebles Island
POB 189
Waterford, New York 12188- 0189

Delaware River Basin Commission
25 Cosey Road
PO Box 7360
West Trenton, NJ 08268-0360

Michael G. Rielly, PE

Sworn to be this
10 day of January 2025

Notary Public

Amy M. Bohlen
Notary Public, State of New York
NYS Reg. No. 04BO6439952
Qualified in Sullivan County
Commission Expires September 06, 2026

Sheldrake Karmel Rd Properties LLC
LEAD AGENCY DESIGNATION

The Town of Fallsburg Planning Board has received an application from the applicant dated February 21, 2023, and a Long NYS Short Form Environmental Assessment Form dated December 13, 2024 and is reviewing the above-proposed request for Site Plan Approval for property located at the southwest corner of Labaugh Road and Karmel & Jacobs Road upon the Town of Fallsburg Tax Roll as Section 12 Block 1 Lot 7 and portion of Section 12 Block 1 Lot 2.3 and a portion of Section 12 Block 1 Lot 8.5. The developer wishes to construct a 94 unit manufactured home park served by a private packaged sewer plan and drilled water wells. A tentative determination that the project is an Type 1 Action has been made for the project.

Please take note that within thirty (30) days of the dated that this document is mailed to you, a Lead Agency for this project must be designated by agreement among the interested and involved agencies.

Under the applicable standards of Title 5 NYCRR Section 617.6(b), the Town of Fallsburg Planning Board concludes that it is the appropriate agency to serve as Lead Agency in the environmental review of the proposed action.

This notification is being sent to interested and involved agencies with the request that you consent to the Town of Fallsburg Planning Board serving as Lead Agency. In the event that you as an interested or involved agency do not agree with the Planning Board's designation as Lead Agency, you may follow procedures outlined in NYCRR 617.6(b) (5).

If you have any questions or comments, please contact Chairman Arthur Rosenshein of the Town Planning Board, Town of Fallsburg, 5250 Main Street, South Fallsburg, NY 12779; (845)-434-8811.

This notice is being mailed on January 10, 2025. Your agreement or disagreement with the Town Planning Board serving as Lead Agency is requested on or before February 10, 2025. Please send your response to Chairman Arthur Rosenshein of the Town of Fallsburg Planning Board, at the above address.

If no response is received from your agency within thirty (30) days, it will be assumed that you are in agreement with the designation of the Town Planning Board as Lead Agency. You will continue to be notified of SEQR determinations and hearings and copies of all environmental documents will be made available to you.

Thank you for your cooperation.
Town of Fallsburg Planning Board
Chairman Arthur Rosenshein

Attachments:

1.) Long Environmental Assessment Form
2.) Project Site Plans: Cover sheet and Overall Site Plan

UNITED STATES POSTAL SERVICE.

MONTICELLO
486 BROADWAY
MONTICELLO, NY 12701-9998
(800)275-8777

01/10/2025 12:33 PM

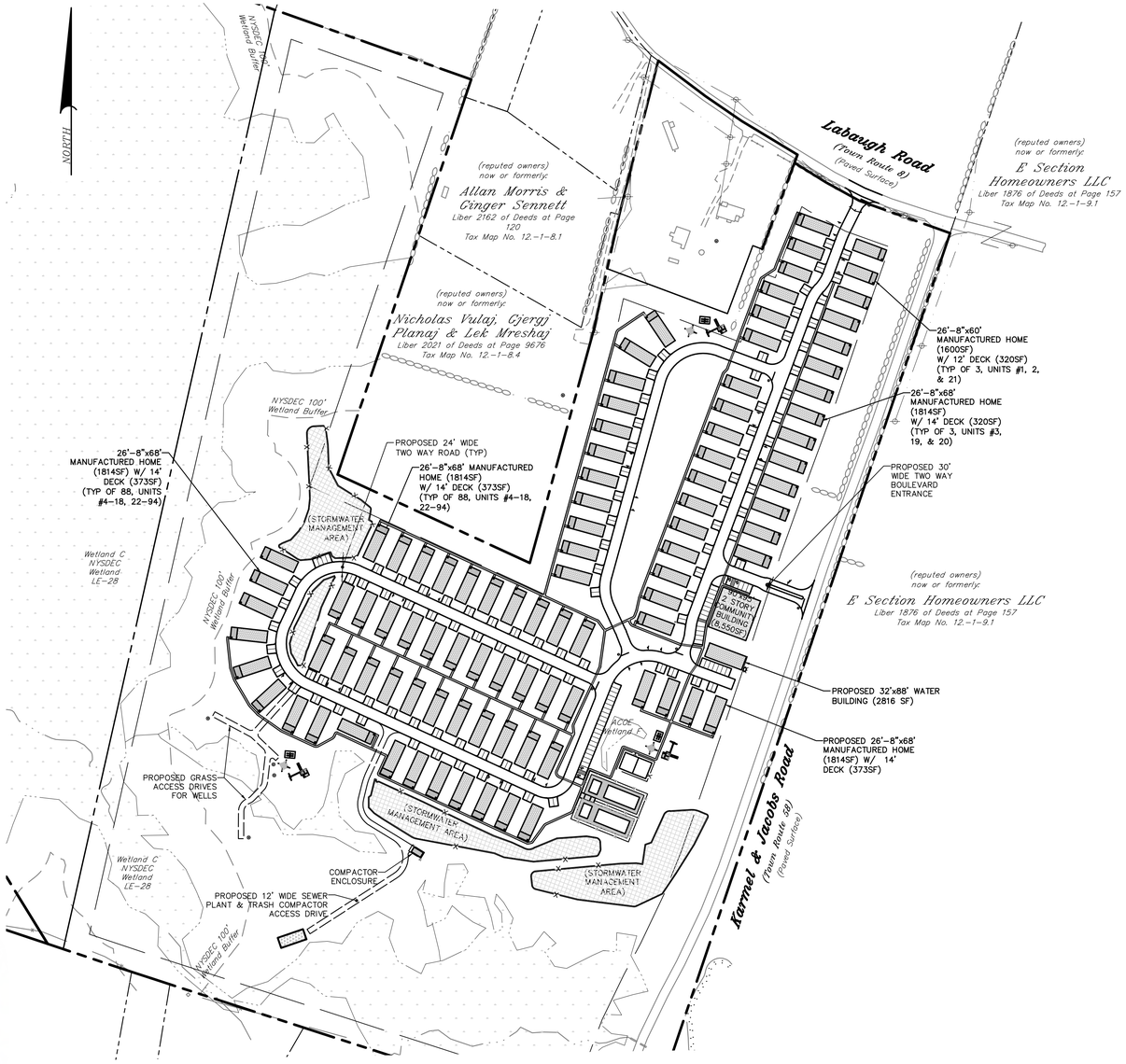
Product	Qty	Unit Price	Price
Priority Mail®	1		$9.90
Corona, NY 11368			
Weight: 0 lb 6.80 oz			
Expected Delivery Date Mon 01/13/2025			
Tracking #: 9505 5141 9327 5010 5119 74			
Insurance			$0.00
Up to $100.00 included			
Total			$9.90
Priority Mail®	1		$9.90
New Paltz, NY 12561			
Weight: 0 lb 6.90 oz			
Expected Delivery Date Mon 01/13/2025			
Tracking #: 9505 5141 9327 5010 5119 98			
Insurance			$0.00
Up to $100.00 included			
Total			$9.90
Priority Mail®	1		$9.65
Middletown, NY 10941			
Weight: 0 lb 6.90 oz			
Expected Delivery Date Mon 01/13/2025			
Tracking #: 9505 5141 9327 5010 5120 18			
Insurance			$0.00
Up to $100.00 included			
Total			$9.65
Priority Mail®	1		$9.65
Monticello, NY 12701			
Weight: 0 lb 6.90 oz			
Expected Delivery Date Mon 01/13/2025			
Tracking #: 9505 5141 9327 5010 5120 32			
Insurance			$0.00
Up to $100.00 included			
Total			$9.65
Priority Mail®	1		$9.65
Monticello, NY 12701			
Weight: 0 lb 6.90 oz			
Expected Delivery Date Mon 01/13/2025			
Tracking #: 9505 5141 9327 5010 5120 56			
Insurance			$0.00
Up to $100.00 included			
Total			$9.65
Priority Mail®	1		$9.90
Waterford, NY 12188			
Weight: 0 lb 6.90 oz			
Expected Delivery Date Mon 01/13/2025			
Tracking #: 9505 5141 9327 5010 5120 70			
Insurance			$0.00
Up to $100.00 included			
Total			$9.90
Priority Mail®	1		$9.90
Trenton, NJ 08628			
Weight: 0 lb 6.90 oz			
Expected Delivery Date Mon 01/13/2025			
Tracking #: 9505 5141 9327 5010 5120 94			
Insurance			$0.00
Up to $100.00 included			
Total			$9.90
Grand Total:			$68.55

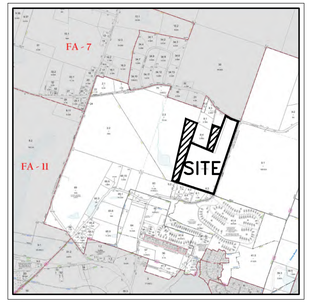
LAND DEVELOPMENT PLAN & LOT IMPROVEMENT

FOR

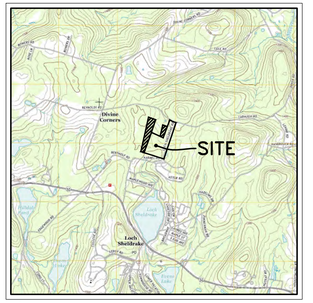
SHELDRAKE KARMEL RD PROPERTIES LLC

TOWN OF FALLSBURG, SULLIVAN COUNTY, NY





TAX PARCEL MAP
SULLIVAN COUNTY NY GIS TAX MAPS
SCALE: 1" = 2000'



SITE LOCATION MAP
USGS LIBERTY EAST QUAD
SCALE: 1" = 4000'

CONSTRUCTION NOTES

1. THE CONTRACTOR SHALL NOTIFY ALL APPROPRIATE UTILITIES AT LEAST 72 HOURS PRIOR TO THE START OF ANY CONSTRUCTION. ALL UTILITIES HAVE BEEN IDENTIFIED BASED ON THE BEST AVAILABLE INFORMATION AND LISTED ON THESE PLANS IN ACCORDANCE WITH CALL BEFORE YOU DIG REQUIREMENTS. THE CONTRACTOR SHALL VERIFY THE LOCATIONS OF EXISTING UTILITIES AND ALL EFFORTS SHALL BE UNDERTAKEN TO PROTECT EXISTING UTILITIES AND MAINTAIN UNINTERRUPTED SERVICE. ANY DAMAGE TO UTILITIES BY THE CONTRACTOR SHALL BE REPAIRED IMMEDIATELY AT THE CONTRACTOR'S EXPENSE. RESTORATION OF ALL EXISTING SURFACE IMPROVEMENTS DAMAGED OR ALTERED DURING CONSTRUCTION, INCLUDING LANDSCAPING, SHALL ALSO BE THE RESPONSIBILITY OF THE CONTRACTOR.
2. THE CONTRACTOR SHALL MAKE PROVISIONS FOR MAINTAINING THE SAFE FLOW OF TRAFFIC DURING CONSTRUCTION WITHIN THE SITE AND THE EXISTING ROAD RIGHTS-OF-WAY WHILE ENTERING AND LEAVING THE SITE.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ANY PERMITS RELATIVE TO THE CONSTRUCTION PROPOSED ON THIS PLAN.
4. ALL STORM SEWERS AND APPURTENANCES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE APPROVED PLANS AND TO THE STANDARDS OF THE MUNICIPAL ORDINANCES.
5. THERE SHALL BE NO CHANGES OR DEVIATION FROM THESE PLANS UNLESS APPROVED BY THE ENGINEER. SUCH PLAN CHANGES, SHOULD THEY BECOME NECESSARY, ARE SUBJECT TO MUNICIPAL ORDINANCES.
6. THE CONTRACTOR SHALL INSPECT EXISTING SITE/PROJECT AREA CONDITIONS AND VERIFY ALL QUANTITIES AND MATERIALS PRIOR TO THE START OF CONSTRUCTION.
7. STORMWATER FACILITIES, INCLUDING SWALES, STORM PIPING, AND APPURTENANCES SHALL BE MAINTAINED IN GOOD WORKING CONDITION BY THE DEVELOPER OR THE SUCCESSIVE LAND OWNER. THE TOWN OF FALLSBURG SHALL HAVE THE RIGHT TO INSPECT THE FACILITIES AT ANY TIME; REQUIRE THE OWNER TO TAKE CORRECTIVE MEASURES AND ASSIGN THE OWNER REASONABLE TIME PERIODS FOR ANY NECESSARY ACTION; AUTHORIZE MAINTENANCE TO BE DONE AND LIEN ALL COST OF THE WORK AGAINST THE PROPERTIES OF THE OWNER RESPONSIBLE FOR MAINTENANCE.
8. THE DEVELOPER SHALL BE RESPONSIBLE FOR PROVIDING ALL PAVEMENT MARKINGS, STREET SIGNS, TRAFFIC DIRECTIONAL AND CONTROL SIGNS SHOWN ON THIS PLAN IN ACCORDANCE WITH APPLICABLE STATE OR MUNICIPAL REGULATIONS AND SPECIFICATIONS. ALL SIGNAGE SHALL BE CONSISTENT WITH EXISTING SIGNAGE WITHIN THE TOWN OF FALLSBURG.
9. THE TOWN OF FALLSBURG SHALL NOT BE RESPONSIBLE FOR THE CONSTRUCTION OR MAINTENANCE OF ANY AREA NOT DEDICATED FOR THE PUBLIC USE.
10. THE PROJECT REQUIRES SITE CLEARING AND GRADING CLOSE OR UP TO BOTH THE WETLANDS AND THE TOWN OF FALLSBURG ZONING "CLEARING LIMITS LINE". CONTRACTOR SHOULD BE AWARE THAT THESE AREAS MUST BE STAKED OUT BY A SURVEYOR PRIOR TO CLEARING.
11. ALL STUMPS MUST BE TUB GROUND AND USED AS MULCH ON SITE, OR BURIED IN AN APPROVED LOCATION.
12. CONTRACTOR MUST USE THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) AS A CONTRACT DOCUMENT TO ACCOMPANY THE PLANS.

LIST OF DRAWINGS

1 OF 29. . . . . COVER SHEET
2 OF 29. . . . . EXISTING CONDITIONS, DEMOLITION, & LOT IMPROVEMENT PLAN
3 OF 29. . . . . OVERALL PLAN
4 OF 29. . . . . LAYOUT PLAN
5 OF 29. . . . . LAYOUT PLAN
6 OF 29. . . . . GRADING PLAN
7 OF 29. . . . . GRADING PLAN
8 OF 29. . . . . EROSION & SEDIMENT CONTROL PLAN
9 OF 29. . . . . EROSION & SEDIMENT CONTROL PLAN
10 OF 29. . . . . UTILITIES PLAN
11 OF 29. . . . . UTILITIES PLAN
12 OF 29. . . . . LIGHTING & LANDSCAPING PLAN
13 OF 29. . . . . PHASING PLAN
14 OF 29. . . . . PROFILES
15 OF 29. . . . . PROFILES
16 OF 29. . . . . PROFILES
17 OF 29. . . . . DETAILS
18 OF 29. . . . . DETAILS
19 OF 29. . . . . DETAILS
20 OF 29. . . . . DETAILS
21 OF 29. . . . . DETAILS
22 OF 29. . . . . DETAILS
23 OF 29. . . . . DETAILS
24 OF 29. . . . . SPECIFICATIONS
25 OF 29. . . . . SPECIFICATIONS
26 OF 29. . . . . SPECIFICATIONS
27 OF 29. . . . . DRAINAGE PLAN
28 OF 29. . . . . DRAINAGE PLAN
29 OF 29. . . . . DRAINAGE DETAILS

LEGEND

EXISTING PROPERTY LINE
EXISTING ADJOINER LINE
EXISTING RIGHT-OF-WAY LINE
EXISTING PAVEMENT
EXISTING MAJOR CONTOUR
EXISTING MINOR CONTOUR
EXISTING STREAM CENTERLINE
EXISTING FENCE
EXISTING TREELINE
EXISTING STONEWALL
TO BE REMOVED — TBR
EXISTING WETLANDS
EXISTING WETLANDS SETBACK
EXISTING SANITARY SEWER MANHOLE
EXISTING STORM MANHOLE
EXISTING STORM INLET
EXISTING STORM HEADWALL/ENDWALL
EXISTING FIRE HYDRANT
EXISTING WELL

LANDOWNER/DEVELOPER

SHELDRAKE KARMEL RD PROPERTIES LLC
PO BOX 1333
JACKSON, NJ 08527
TEL:(732)-719-7200

SOURCE OF TITLE

TAX MAP NUMBER:	TOWN OF FALLSBURG – 12.-1-7 – 39.66 ACRES
	PORTION OF 12.-1-2.3 – 17.03 ACRES
	PORTION OF 12.-1-8.5 – 4.40 ACRES
EXISTING USE	VACANT LAND
PROPOSED USE	MANUFACTURED HOME PARK

GENERAL NOTES

1. MAPPING BASED ON A BOUNDARY SURVEY ENTITLED "SURVEY MAP OF FOUR PARCELS TO BE CONVEYED" AS PREPARED BY ANTHONY F. SICILIANO L.S. P.C. DATED NOVEMBER 2022.
2. TOPOGRAPHY FROM GOLDEN AERIAL, FLOWN IN APRIL OF 2017.
3. WETLAND LOCATIONS ARE BASED ON A WETLAND DELINEATION BY ECOLOGICAL ANALYSIS ON OCTOBER 6, 2022. WETLAND FLAGS WERE LOCATED BY ANTHONY F. SICILIANO L.S. P.C. WETLANDS MAP APPROVED BY MIKE FRAATZ OF NYSDEC ON MAY 5, 2023.
4. 17.03 ACRES OF PARCEL 12.-1-2.3 ARE TO BE CONVEYED TO PARCEL 12.-1-7 VIA LOT IMPROVEMENT.
5. 4.40 ACRES OF PARCEL 12.-1-8.5 ARE TO BE CONVEYED TO PARCEL 12.-1-7 VIA LOT IMPROVEMENT.

ZONING DATA

REC – (RECREATION DISTRICT) – ZONE

(PRIVATE WATER AND SEWER)

	REQUIRED	PROPOSED
MINIMUM LOT AREA	10 ACRES	61.09 ACRES
MINIMUM LOT WIDTH	750 FT.	2149 FT.
MINIMUM FRONT BUILDING SETBACK	75 FT.	76.8 FT.
MINIMUM SIDE BUILDING SETBACK	50 FT./100 FT.	58.8 FT./135.8 FT.
MINIMUM REAR BUILDING SETBACK	50 FT.	63.1 FT.
MAXIMUM BUILDING HEIGHT	35 FT.	< 35 FT.
MINIMUM FLOOR	980 S.F.	1,600 S.F.
MAXIMUM LOT COVERAGE	20%	18.76%
UNITS SHOWN		94 UNITS

DENSITY CALCULATIONS

TOTAL PROPERTY AREA:	2,661,124 SF
TOTAL AREA OF WETLANDS:	– 513,784 SF
50% OF SLOPES OVER 20%	– 62,468 SF
TOTAL NET AREA (R-ZONE):	2,084,872 SF
NET AREA (REC-ZONE) / 21,780 SF PER UNIT:	95.7 UNITS
TOTAL NUMBER OF UNITS ALLOWED:	95 UNITS
TOTAL NUMBER OF UNITS SHOWN:	94 UNITS

LOT COVERAGE CALCULATIONS

PROPOSED ROADS:	111,034 SF
PROPOSED SIDEWALKS:	33,800 SF
PROPOSED UNITS	169,874 SF
PROPOSED PARKING SPACES (245):	49,000 SF
COMMUNITY BUILDING, POOLS, & SPORTS COURTS, SEWER & WATER BUILDING:	27,356 SF
TOTAL IMPERVIOUS AREA:	391,064 SF
TOTAL PROPERTY AREA:	2,661,124 SF
TOTAL NET AREA:	2,084,872 SF
LOT COVERAGE: 18.76%	

PARKING REQUIREMENTS

REQUIRED:
1. 2 SPACES PER UNIT = 2 SPACES PER UNIT x 94 UNITS = 188 SPACES.
2. 25 DUEL PURPOSE SPACES PER COMMUNITY BUILDING (WITH A 150 PERSON OCCUPANCY).

REQUIRED PARKING SPACES: 213
PROVIDED PARKING SPACES: 245

Dig Safely. New York Call 811 before you dig

NO.	DATE	REVISION
1	12/11/24	DESIGN REVISIONS

MICHAEL G. RIELLY
NEW YORK STATE PROFESSIONAL ENGINEER
LICENSE NO. 093427

MANAGER: MICHAEL G. RIELLY
DESIGN BY: MTL | DRAWN BY: MTL | CHKD BY: MGR

IT IS A VIOLATION OF NEW YORK STATE EDUCATION LAW FOR ANY PERSON, UNLESS HE IS ACTING UNDER THE DIRECTION OF A LICENSED ENGINEER, TO ALTER ANY ITEM ON THIS DOCUMENT IN ANY WAY. IF THIS DOCUMENT IS ALTERED, THE ALTERING ENGINEER SHALL AFFIX TO THE DOCUMENT HIS SEAL AND THE NOTATION "ALTERED BY" FOLLOWED BY HIS SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

CLIENT
SHELDRAKE KARMEL RD PROPERTIES LLC
PO BOX 1333
JACKSON, NJ 08527
TEL: (732)-719-7200

SCALE
0 75 150 300 450
1" = 150'

RIELLY ENGINEERING DPC
PO BOX 69 / 63 LIBERTY STREET
MONTICELLO, NY 12701
T. 845-796-9700
OFFICE@RIELLYENGINEERING.COM

COVER SHEET
FOR
SHELDRAKE KARMEL RD PROPERTIES LLC
TOWN OF FALLSBURG SULLIVAN COUNTY, NY

DATE: JUNE 25, 2024
SHEET NO. 1 OF 29
DWG. NO. 0236-01

NORTH

Labargh Road (Town Route 84) (Paved Surface)

Kormel & Jacobs Road (Town Route 58) (Paved Surface)

To Divine Corners Road

To Levine Road

540' ACTUAL SIGHT DISTANCE
445' REQUIRED FOR 40 MPH ZONE

551' ACTUAL SIGHT DISTANCE
385' REQUIRED FOR 40 MPH ZONE

335' ACTUAL SIGHT DISTANCE
335' REQUIRED FOR 30 MPH ZONE

310' ACTUAL SIGHT DISTANCE
280' REQUIRED FOR 30 MPH ZONE

ENTRANCE #2
(EMERGENCY ACCESS ONLY)

ENTRANCE #1

PROPOSED 24' WIDE EMERGENCY ENTRANCE

PROPOSED 24' WIDE TWO WAY ROAD (TYP)

PROPOSED 30' WIDE TWO WAY BOULEVARD ENTRANCE

PROPOSED 4' SIDEWALK

ROAD A

ROAD B

ROAD C

26'-8"x60' MANUFACTURED HOME (1600SF) W/ 12' DECK (320SF) (TYP OF 3, UNITS #1, 2, & 21)

26'-8"x68' MANUFACTURED HOME (1814SF) W/ 14' DECK (320SF) (TYP OF 3, UNITS #3, 19, & 20)

26'-8"x68' MANUFACTURED HOME (1814SF) W/ 14' DECK (373SF) (TYP OF 88, UNITS #4-18, 22-94)

PROPOSED 32'x88' WATER BUILDING (2816 SF)

PROPOSED 26'-8"x68' MANUFACTURED HOME (1814SF) W/ 14' DECK (373SF)

90'x95' 2.5 STORY COMMUNITY BUILDING (8,550SF)

PLAYGROUND

SPORTS COURT

POOL

POOL

PROPOSED (2) PARKING SPACES (TYP)

(STORMWATER MANAGEMENT AREA)

(STORMWATER MANAGEMENT AREA)

(STORMWATER MANAGEMENT AREA)

MONKEY BARS

SEE-SAW

SWINGSET

PROPOSED GRASS ACCESS DRIVES FOR WELLS

COMPACTOR ENCLOSURE

PROPOSED 12' WIDE SEWER PLANT & TRASH COMPACTOR ACCESS DRIVE

24'x60' SEWER PLANT AREA (1,440SF)

NYSDEC 100' Wetland Buffer

Wetland C NYSDEC Wetland LE-28

ACOE Wetland C

ACOE Wetland F

ACOE Wetland H

Small Pond

Small Stream

Approximate 25' ROW from Road Center

Shed

Trailer

Meter Post

House

Garage

Well

Gazebo In Disrepair

ACOE Wetland Truck Body Storage Container

Gravel Drive

FRONT BUILDING SETBACK 75'

SIDE BUILDING SETBACK 50'

REAR BUILDING SETBACK 50'

LEGEND

- EXISTING PROPERTY LINE
- EXISTING ADJOINER LINE
- EXISTING RIGHT-OF-WAY LINE
- EXISTING PAVEMENT
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- EXISTING STREAM CENTERLINE
- EXISTING FENCE
- EXISTING TREELINE
- EXISTING STONEWALL TO BE REMOVED — TBR
- EXISTING WETLANDS
- EXISTING WETLANDS SETBACK
- EXISTING SANITARY SEWER MANHOLE
- EXISTING STORM MANHOLE
- EXISTING STORM INLET
- EXISTING STORM HEADWALL/ENDWALL
- EXISTING FIRE HYDRANT
- EXISTING WELL
- PROPOSED PAVEMENT
- MINIMUM BUILDING SETBACK LINE
- PROPOSED FENCE
- PROPOSED TREELINE/LIMIT OF DISTURBANCE
- HANDICAPPED PARKING SPACE
- PROPOSED STOP SIGN
- PROPOSED SIGN
- PROPOSED LIGHT
- PROPOSED SEWER MANHOLE
- PROPOSED STORM INLET
- PROPOSED YARD STORM INLET
- PROPOSED STORM HEADWALL/ENDWALL
- PROPOSED FLARED END SECTION

NO.	DATE	REVISION
1	12/11/24	DESIGN REVISIONS

MICHAEL G. RIELLY
NEW YORK STATE PROFESSIONAL ENGINEER
LICENSE NO. 093427

MANAGER: MICHAEL G. RIELLY
DESIGN BY: MTL | DRAWN BY: MTL | CHKD BY: MGR

IT IS A VIOLATION OF NEW YORK STATE EDUCATION LAW ARTICLE 145 FOR ANY PERSON WHO IS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER TO ALTER THIS DOCUMENT IN ANY WAY. IF THIS DOCUMENT IS ALTERED, THE ALTERING ENGINEER SHALL AFFIX TO THE ITEM HIS SEAL AND THE NOTATION "ALTERED BY" FOLLOWED BY HIS SIGNATURE, A DETAILED DESCRIPTION OF THE ALTERATION, A SPECIFIC DESCRIPTION OF THE ALTERATION.

CLIENT
SHELDRAKE KARMEL RD
PROPERTIES LLC
PO BOX 1333
JACKSON, NJ 08527
TEL: (732)-719-7200

SCALE 1" = 100' (0, 50, 100, 200, 300)

RIELLY ENGINEERING DPC
PO BOX 69 / 63 LIBERTY STREET
MONTICELLO, NY 12701
T. 845-796-9700
OFFICE@RIELLYENGINEERING.COM

OVERALL PLAN
FOR
SHELDRAKE KARMEL RD PROPERTIES LLC
TOWN OF FALLSBURG SULLIVAN COUNTY, NY

DATE: JUNE 25, 2024
SHEET NO. 3 OF 29
DWG. NO. 0236-01

TOWN OF FALLSBURG
CODE ENFORCEMENT OFFICE
Member: New York State Building Officials Conference, Inc

5250 MAIN STREET
SOUTH FALLSBURG
NEW YORK 12779
(845) 434-8811
FAX:(845) 434-5883

PLANNING BOARD DECISION

Date 8/18/25
Meeting Date: 8/14/25

Applicant Name: **SHELDRAKE KARMEL RD PROPERTIES LLC – SBL: 12-1-7/12-1-2.3**

Request: –Requests conditional approval of site plan review to construct a manufactured home park, as well as a boundary line adjustment with the adjoining property. Zone: REC. Acres: 56.69A Location: Karmel Jacobs Rd and Labaugh Rd.

The request was: Approved: __X_____ Denied _____

Conditions:
See attached Resolution

Jennifer Edwards
Planning Board Secretary
Town of Fallsburg

Email: tjbrawley@fallsburgny.com- jedwards@fallsburgny.com – codeclerk@fallsburgny.com

Planning Board of the Town of Fallsburg

Site Plan Review
Sheldrake-Karmel Rd Properties, LLC ("Project")
(SBL # 12.-1-7 and portions of 12.-1-2.3 and 12.-1-8.5)

August 14, 2025

WHEREAS, the Town of Fallsburg Planning Board (the "Planning Board") received an application from Sheldrake-Karmel Rd Properties, LLC (the "Applicant") for site plan approval and a lot improvement on or about February 21, 2023 with regard to construction of an 84-unit manufactured home development on ±56.7 acres (the "Project") located at the corner of Karmel-Jacobs Road and Labaugh Road in the hamlet of Loch Sheldrake; and

WHEREAS, the Applicant subsequently acquired additional property in the vicinity of the Project and is now seeking approval to construct an 86-unit manufactured home development with associated recreational amenities on a combined total of 93.38 acres; and

WHEREAS, the property is located in the Recreation Residential (REC) zoning district which allows Manufactured Home Developments as a permitted use in accordance with §310-5.13 of the Town of Fallsburg Zoning Code, and the project meets the meets all supplementary regulations and bulk requirements contained therein; and

WHEREAS, the Planning Board held a duly noticed public hearing on January 9, 2025 for the proposed project at which time the public had an opportunity to be heard; and

WHEREAS, the Planning Board declared its intent to serve as lead agency for environmental review of the project on January 9, 2025 in accordance with the requirements of Article 8, Part 617 of the Environmental Conservation Law (SEQR), and classified the project as a Type I Action; and

WHEREAS, the Planning Board reviewed and completed Parts II and III of the Full Environmental Assessment Form (FEAF), reviewed the requirements of SEQRA and other information in the record with respect to the Project, and issued a Negative Declaration on August 14, 2025 after determining that there will be no significant environmental impacts from the project; and

NOW THEREFORE BE IT RESOLVED, the Town of Fallsburg Planning Board, based on the record before it, including the general, specific and detailed knowledge of the Project and the community, hereby determines that the current site plan dated June 25, 2025 and the lot line adjustments contained therein should receive preliminary approval, subject to the following conditions:

1) Standard Conditions:

   a) Adherence to any and all changes requested by Planning Board members, Town of Fallsburg staff, the Planning Board Attorney, Town Engineer, Town Planner, and/or other technical consultants during the review and approval process.

   b) Implementation of all mitigation measures referred to in the Environmental Assessment Form and the Negative Declaration as adopted by the Planning Board.

c) Payment of all fees in accordance with Town fee schedule, including fees in lieu of recreation land specified in §135-2, and payment of any outstanding consultant escrow fees.

d) Offer of dedication to the town of land or easements for roads, utilities, etc. that may be shown on the plans or as determined to be necessary by the Town Engineer and/or the Town Superintendent of Highways.

2) Site-Specific Conditions:

a) Prior to signature by the Planning Board Chairman, the Applicant shall add a note to the plans confirming that the portion of the 17.01 acres to be transferred from tax lot 12.-1-2.3 to tax lot 12.-1-7 containing the NYSDEC-regulated freshwater wetlands and 100-foot check zone shall remain undisturbed.

b) Prior to issuance of any land disturbance or building permits, the Applicant:

i) Shall produce evidence that it has secured all necessary stormwater, wastewater discharge and water supply permits from applicable regulatory agencies, including NYSDOH and NYSDEC.

ii) Shall execute an Agreement approved by the Planning Board attorney and contribute escrow payments to a Transportation Improvement Fund or other fund deemed appropriate by the Town of Fallsburg, representing the project's proportional share of the costs associated with implementation of traffic mitigation measures for the Route 52 corridor in a final amount to be determined by the Town's traffic consultant.

c) During construction and prior to issuance of any Certificates of Occupancy, the Applicant:

i) Shall maintain an existing vegetative buffer within the 75-foot front yard setback along Karmel-Jacobs Road, and refrain from significant tree removal within that setback, except for construction of the proposed entry drive and stormwater management facilities.

ii) Shall adhere to the landscape and lighting plan (Sheet 12), including the planting of a row of seventy-three (73) Green Giant Arborvitae (in either the Spring or Fall) along the north and east perimeter of the project to shield it from public view, and the installation of downward-facing Dark Sky compliant lighting throughout the project.

iii) Shall not construct any manufactured homes with full or walk-out basements. Only slabs on grade or crawl spaces are permitted.

iv) Shall obtain a bond in an amount to be determined by the Town Engineer in consultation with the Planning Board Attorney sufficient to ensure the site utilities are constructed properly prior to occupancy.

v) Shall provide evidence that a certified wastewater treatment plant operator has been contracted to perform all required maintenance, testing and operation of the package sewage treatment facility in accordance with the SPDES permit issued by NYSDEC.

d) Prior to issuance of a building permit, the Developer shall purchase and provide the town with a solar speed sign.

e) Prior to May 1st of every year, the Applicant shall submit copies of any maintenance and operation contracts in effect, Daily Maintenance Reports submitted to the NYSDEC or annual inspection reports for the prior year.

3) Staff review and inspections:

a) A final review of plans and supporting materials will be made by staff to confirm that all of the requested changes have been made and conditions have been met prior to issuance of a building permit;

b) Staff may conduct periodic field visits and inspections during construction. Any variations from the approved plans may require additional board approvals.

BE IT FURTHER RESOLVED, that no disturbance or construction will take place except for any specific exceptions identified in this resolution until the map has been signed by the Town Engineer and Planning Board Chairman (or his designee); and that no building permits or certificates of occupancy will be issued until all conditions are met, unless specific conditions in this resolution have other requirements for implementation.

Motion offered by: BUCKY LUCKS

Motion seconded by: PAUL LUCAS

Vote as follows:

5 For

0 Against

0 Absent

Irv Newmark, Planning Board Chairman

8/18/25
Date

Planning Board of the Town of Fallsburg

SEQR Negative Declaration

Sheldrake Karmel Road Properties LLC ("Project")
(SBL 12.-1-7 and portions of 12-1-2.3 and 12-1-8.5)

August 14, 2025

WHEREAS, the proposed action is located on Karmel Jacobs Road in the hamlet of Loch Sheldrake, and entails construction of an 86-unit manufactured home development with associated common amenities and recreational facilities on 93.38 acres; and

WHEREAS, the Town of Fallsburg Planning Board began its review of the project with the submission of a Site Plan Application and sketch plan in March of 2023, with the most recent plan set updated on or about June 2025;

WHEREAS, a Short Environmental Assessment form dated February 21, 2023 was originally submitted to the Planning Board, and was subsequently updated as a Long Environmental Assessment Form as part of a full SEQR package submitted on December 23, 2023; and

WHEREAS, the Planning Board classified the project as a Type I Action and declared its intent to serve as lead agency for coordinated review on January 9, 2025 in accordance with the requirements of Article 8, Part 617 of the Environmental Conservation Law (SEQR); and

WHEREAS, Lead Agency Notices were circulated to all involved and interested agencies and the Planning Board assumed its role as Lead Agency in the environmental review on February 9, 2025; and

WHEREAS, the Planning Board reviewed and completed Part 2 of the Long Environmental Assessment Form (attached here to and part hereof) on March 10, 2025, and thoroughly discussed the requirements of SEQRA and other information in the record with respect to the Project on April 7, May 7, June 12 and July 10, 2025, and

NOW, THEREFORE, in consideration of the foregoing, the Fallsburg Planning Board hereby:

1) Determines that the Project will not have a significant adverse environmental impact on the environment; and

2) Adopts the annexed SEQRA Negative Declaration and directs that it be filed and circulated to all involved agencies in accordance with applicable provisions of law.

Motion offered by: Mike Webber

Motion seconded by: Bucky Lancks

Vote as follows:

5 For

0 Against

0 Absent

Irv Newmark

Planning Board Chairman – Irv Newmark

8/18/25

Date

TOWN OF FALLSBURG
CODE ENFORCEMENT OFFICE
Member: New York State Building Officials Conference, Inc.

5250 MAIN STREET
SOUTH FALLSBURG
NEW YORK 12779
(845) 434-8811
FAX: (845) 434-5883

Date:8/18/25
Meeting Date: 8/14/25

SHELDRAKE KARMEL RD PROPERTIES LLC – SBL: 12-1-7/12-1-2.3

INVOICE

DESCRIPTION	TOTAL
Final Filing Fee	$ 100.00
$100 per dwelling (86 units)	$ 860.00

TOTAL DUE $960.00

Email: tjbrawley@fallsburgny.com jedwards@fallsburgny.com – codeclerk2@fallsburgny.com

MEMO

DATE: March 10, 2024

TO: Fallsburg Planning Board

FROM: Helen Budrock, AICP, Senior Planner

SUBJECT: Sheldrake-Karmel Manufactured Home Park

As consulting planner to the Town of Fallsburg Planning Board, I was asked to provide guidance regarding next steps in the State Environmental Quality Review (SEQR) process for the above-captioned project.

Environmental Assessment Form – Part 1

The proposed project was first presented to the Planning Board in March of 2023 in sketch plan form. A detailed site plan set with a full "SEQRA Package" including Part 1 of the Long Environmental Assessment Form (EAF) was submitted by the Applicant to the Planning Board in December of 2024.

Classification of the Action: Type I

Following a public hearing held on February 13, 2025, the Fallsburg Planning Board classified the project as a **Type I Action** under SEQR and declared their intent to serve as Lead Agency in the review.

The proposed action is a Type I Action under SEQR because it involves the construction of more than 50 residential units not connected to existing public water and sewerage systems. Type I actions are presumed to have a significant adverse impact on the environment and are more likely to require preparation of an Environmental Impact Statement (EIS). While that presumption is strong, the need for an EIS is determined on a case-by-case basis through completion of Parts 2 and 3 of the EAF Environmental Assessment Form (EAF) and coordination with all other agencies having jurisdiction over the project.

In addition to Part 1 of the Long Form EAF, the applicant has submitted the following reports and studies to date as part of the SEQR review:

1) Wetland Reports prepared by Ecological Analysis (10/17/22 & 12/12/2023)
2) NYSDEC certified wetland Map (5/18/23)
3) Traffic Study Prepared by Stephan Maffia, PE (8/17/23)
4) Wildlife Habitat Assessment (2/13/25)
5) Hydrogeologic Evaluation Report (2/25/25)

Environmental Assessment Form – Part 2

Attached is a draft of Part 2 of the Long Form EAF for your review. While the applicant has already submitted substantial documentation related to potential impacts on wetlands, wildlife, traffic, and hydrology, I have identified the following impact areas (highlighted in yellow on the attached EAF) that could be addressed in more detail in an Environmental Impact Statement or through the submission of additional documents:

- **Impact on Land:** A Stormwater Pollution Prevention Plan (SWPPP) has not yet been prepared and submitted as part of the SEQR review process to address erosion & sediment control.
- **Impact on Surface Waters:** The PB could request more detail on the proposed WWTP including discharge limits, design & maintenance.
- **Impact on Agricultural Resources:** The parcel is located in the county-designated agricultural district, and EAF Part 2 asks if project will indirectly result in increased development potential or pressure on neighboring farmland, and also whether the proposed project is consistent with the County Ag & Farmland Protection Plan.
- **Impact on Aesthetic Resources:** The EAF Part 2 asks if the project will be visible from publicly accessible vantage points and whether similar projects are visible within prescribed distances. The PB could ask for visual simulations showing the extent to which the project will be visible from the road.
- **Consistency with Community Plans**: The EAF Part 2 asks if the project is consistent with surrounding land use patterns, if the project will cause a change in density that is not supported by existing infrastructure, and if it is located in an area that is characterized by low-density development and will require new or expanded infrastructure. The PB could ask for a more detailed analysis of surrounding land uses and evidence that the proposed project is consistent with the Town's comprehensive plan.
- **Consistency with Community Character:** The Part 2 EAF asks if the project will create a demand for additional community services, displace affordable or low-income housing in an area where there is a shortage of such housing, or is inconsistent with the character of the existing landscape.

Next Steps:

As the Planning Board is aware, it is ultimately the Lead Agency's responsibility to take a "hard look" at all environmental impacts associated with a proposed action prior to rendering any decisions or approvals. This can be accomplished through:

1) A **positive declaration** and the preparation of an Environmental Impact Statement (EIS) at an early stage in the review process, or

2) Through submission of various reports and studies requested by the Planning Board over a period of time (sometimes several months) until the Planning Board is satisfied that all potential impact areas have been thoroughly addressed and a **negative declaration** can be reasonably issued.

If a positive declaration is issued, public participation is required during the EIS preparation and review process, and the document must identify reasonable alternatives to the proposed action, as well as specific measures required to mitigate any potentially adverse environmental impacts.

Agency Use Only [If applicable]

Project : Sheldrake-Karmel Road Properties

Date :

Full Environmental Assessment Form
Part 2 - Identification of Potential Project Impacts

Part 2 is to be completed by the lead agency. Part 2 is designed to help the lead agency inventory all potential resources that could be affected by a proposed project or action. We recognize that the lead agency's reviewer(s) will not necessarily be environmental professionals. So, the questions are designed to walk a reviewer through the assessment process by providing a series of questions that can be answered using the information found in Part 1. To further assist the lead agency in completing Part 2, the form identifies the most relevant questions in Part 1 that will provide the information needed to answer the Part 2 question. When Part 2 is completed, the lead agency will have identified the relevant environmental areas that may be impacted by the proposed activity.

If the lead agency is a state agency **and** the action is in any Coastal Area, complete the Coastal Assessment Form before proceeding with this assessment.

Tips for completing Part 2:

- Review all of the information provided in Part 1.
- Review any application, maps, supporting materials and the Full EAF Workbook.
- Answer each of the 18 questions in Part 2.
- If you answer "**Yes"** to a numbered question, please complete all the questions that follow in that section.
- If you answer "**No"** to a numbered question, move on to the next numbered question.
- Check appropriate column to indicate the anticipated size of the impact.
- Proposed projects that would exceed a numeric threshold contained in a question should result in the reviewing agency checking the box "Moderate to large impact may occur."
- The reviewer is not expected to be an expert in environmental analysis.
- If you are not sure or undecided about the size of an impact, it may help to review the sub-questions for the general question and consult the workbook.
- When answering a question consider all components of the proposed activity, that is, the "whole action".
- Consider the possibility for long-term and cumulative impacts as well as direct impacts.
- Answer the question in a reasonable manner considering the scale and context of the project.

1. Impact on Land

Proposed action may involve construction on, or physical alteration of, the land surface of the proposed site. (See Part 1. D.1)

☐ NO ☑ YES

If "Yes", answer questions a - j. If "No", move on to Section 2.

	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. The proposed action may involve construction on land where depth to water table is less than 3 feet.	E2d	☐	☑
b. The proposed action may involve construction on slopes of 15% or greater.	E2f	☑	☐
c. The proposed action may involve construction on land where bedrock is exposed, or generally within 5 feet of existing ground surface.	E2a	☑	☐
d. The proposed action may involve the excavation and removal of more than 1,000 tons of natural material.	D2a	☑	☐
e. The proposed action may involve construction that continues for more than one year or in multiple phases.	D1e	☑	☐
f. The proposed action may result in increased erosion, whether from physical disturbance or vegetation removal (including from treatment by herbicides).	D2e, D2q	☐	☑
g. The proposed action is, or may be, located within a Coastal Erosion hazard area.	B1i	☐	☐
h. Other impacts: _____ _____		☐	☐

2. Impact on Geological Features

The proposed action may result in the modification or destruction of, or inhibit access to, any unique or unusual land forms on the site (e.g., cliffs, dunes, minerals, fossils, caves). (See Part 1. E.2.g)

☑ NO ☐ YES

If "Yes", answer questions a - c. If "No", move on to Section 3.

	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. Identify the specific land form(s) attached: _____ _____	E2g	☐	☐
b. The proposed action may affect or is adjacent to a geological feature listed as a registered National Natural Landmark. Specific feature: _____	E3c	☐	☐
c. Other impacts: _____ _____		☐	☐

3. Impacts on Surface Water

The proposed action may affect one or more wetlands or other surface water bodies (e.g., streams, rivers, ponds or lakes). (See Part 1. D.2, E.2.h)

☐ NO ☑ YES

If "Yes", answer questions a - l. If "No", move on to Section 4.

	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. The proposed action may create a new water body.	D2b, D1h	☑	☐
b. The proposed action may result in an increase or decrease of over 10% or more than a 10 acre increase or decrease in the surface area of any body of water.	D2b	☑	☐
c. The proposed action may involve dredging more than 100 cubic yards of material from a wetland or water body.	D2a	☑	☐
d. The proposed action may involve construction within or adjoining a freshwater or tidal wetland, or in the bed or banks of any other water body.	E2h	☐	☑
e. The proposed action may create turbidity in a waterbody, either from upland erosion, runoff or by disturbing bottom sediments.	D2a, D2h	☐	☑
f. The proposed action may include construction of one or more intake(s) for withdrawal of water from surface water.	D2c	☑	☐
g. The proposed action may include construction of one or more outfall(s) for discharge of wastewater to surface water(s).	D2d	☐	☑
h. The proposed action may cause soil erosion, or otherwise create a source of stormwater discharge that may lead to siltation or other degradation of receiving water bodies.	D2e	☐	☑
i. The proposed action may affect the water quality of any water bodies within or downstream of the site of the proposed action.	E2h	☐	☑
j. The proposed action may involve the application of pesticides or herbicides in or around any water body.	D2q, E2h	☐	☐
k. The proposed action may require the construction of new, or expansion of existing, wastewater treatment facilities.	D1a, D2d	☐	☑

l. Other impacts: _____ _____		☐	☐

4. Impact on groundwater

The proposed action may result in new or additional use of ground water, or may have the potential to introduce contaminants to ground water or an aquifer. (See Part 1. D.2.a, D.2.c, D.2.d, D.2.p, D.2.q, D.2.t)

☐ NO ☑ YES

If "Yes", answer questions a - h. If "No", move on to Section 5.

	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. The proposed action may require new water supply wells, or create additional demand on supplies from existing water supply wells.	D2c	☐	☑
b. Water supply demand from the proposed action may exceed safe and sustainable withdrawal capacity rate of the local supply or aquifer. Cite Source: _____	D2c	☑	☐
c. The proposed action may allow or result in residential uses in areas without water and sewer services.	D1a, D2c	☑	☐
d. The proposed action may include or require wastewater discharged to groundwater.	D2d, E2l	☑	☐
e. The proposed action may result in the construction of water supply wells in locations where groundwater is, or is suspected to be, contaminated.	D2c, E1f, E1g, E1h	☑	☐
f. The proposed action may require the bulk storage of petroleum or chemical products over ground water or an aquifer.	D2p, E2l	☑	☐
g. The proposed action may involve the commercial application of pesticides within 100 feet of potable drinking water or irrigation sources.	E2h, D2q, E2l, D2c	☑	☐
h. Other impacts: _____ _____		☐	☐

5. Impact on Flooding

The proposed action may result in development on lands subject to flooding. (See Part 1. E.2)

☐ NO ☑ YES

If "Yes", answer questions a - g. If "No", move on to Section 6.

	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. The proposed action may result in development in a designated floodway.	E2i	☑	☐
b. The proposed action may result in development within a 100 year floodplain.	E2j	☑	☐
c. The proposed action may result in development within a 500 year floodplain.	E2k	☑	☐
d. The proposed action may result in, or require, modification of existing drainage patterns.	D2b, D2e	☐	☑
e. The proposed action may change flood water flows that contribute to flooding.	D2b, E2i, E2j, E2k	☑	☐
f. If there is a dam located on the site of the proposed action, is the dam in need of repair, or upgrade?	E1e	☑	☐

g. Other impacts: _____ _____		☐	☐

6. Impacts on Air

The proposed action may include a state regulated air emission source. (See Part 1. D.2.f., D.2.h, D.2.g) ☑ NO ☐ YES

If "Yes", answer questions a - f. If "No", move on to Section 7.

	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. If the proposed action requires federal or state air emission permits, the action may also emit one or more greenhouse gases at or above the following levels:			
i. More than 1000 tons/year of carbon dioxide (CO_2)	D2g	☐	☐
ii. More than 3.5 tons/year of nitrous oxide (N_2O)	D2g	☐	☐
iii. More than 1000 tons/year of carbon equivalent of perfluorocarbons (PFCs)	D2g	☐	☐
iv. More than .045 tons/year of sulfur hexafluoride (SF_6)	D2g	☐	☐
v. More than 1000 tons/year of carbon dioxide equivalent of hydrochloroflourocarbons (HFCs) emissions	D2g	☐	☐
vi. 43 tons/year or more of methane	D2h	☐	☐
b. The proposed action may generate 10 tons/year or more of any one designated hazardous air pollutant, or 25 tons/year or more of any combination of such hazardous air pollutants.	D2g	☐	☐
c. The proposed action may require a state air registration, or may produce an emissions rate of total contaminants that may exceed 5 lbs. per hour, or may include a heat source capable of producing more than 10 million BTU's per hour.	D2f, D2g	☐	☐
d. The proposed action may reach 50% of any of the thresholds in "a" through "c", above.	D2g	☐	☐
e. The proposed action may result in the combustion or thermal treatment of more than 1 ton of refuse per hour.	D2s	☐	☐
f. Other impacts: _____ _____		☐	☐

7. Impact on Plants and Animals

The proposed action may result in a loss of flora or fauna. (See Part 1. E.2. m.-q.) ☐ NO ☑ YES

If "Yes", answer questions a - j. If "No", move on to Section 8.

	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. The proposed action may cause reduction in population or loss of individuals of any threatened or endangered species, as listed by New York State or the Federal government, that use the site, or are found on, over, or near the site.	E2o	☑	☐
b. The proposed action may result in a reduction or degradation of any habitat used by any rare, threatened or endangered species, as listed by New York State or the federal government.	E2o	☑	☐
c. The proposed action may cause reduction in population, or loss of individuals, of any species of special concern or conservation need, as listed by New York State or the Federal government, that use the site, or are found on, over, or near the site.	E2p	☑	☐
d. The proposed action may result in a reduction or degradation of any habitat used by any species of special concern and conservation need, as listed by New York State or the Federal government.	E2p	☑	☐

e. The proposed action may diminish the capacity of a registered National Natural Landmark to support the biological community it was established to protect.	E3c	☑	☐
f. The proposed action may result in the removal of, or ground disturbance in, any portion of a designated significant natural community. Source: _____	E2n	☑	☐
g. The proposed action may substantially interfere with nesting/breeding, foraging, or over-wintering habitat for the predominant species that occupy or use the project site.	E2m	☑	☐
h. The proposed action requires the conversion of more than 10 acres of forest, grassland or any other regionally or locally important habitat. Habitat type & information source: _____ _____	E1b	☑	☐
i. Proposed action (commercial, industrial or recreational projects, only) involves use of herbicides or pesticides.	D2q	☑	☐
j. Other impacts: _____ _____		☐	☐

8. Impact on Agricultural Resources

The proposed action may impact agricultural resources. (See Part 1. E.3.a. and b.) ☐ NO ☑ YES

If "Yes", answer questions a - h. If "No", move on to Section 9.

	Relevant Part I Question(s)	**No, or small impact may occur**	**Moderate to large impact may occur**
a. The proposed action may impact soil classified within soil group 1 through 4 of the NYS Land Classification System.	E2c, E3b	☑	☐
b. The proposed action may sever, cross or otherwise limit access to agricultural land (includes cropland, hayfields, pasture, vineyard, orchard, etc).	E1a, Elb	☑	☐
c. The proposed action may result in the excavation or compaction of the soil profile of active agricultural land.	E3b	☑	☐
d. The proposed action may irreversibly convert agricultural land to non-agricultural uses, either more than 2.5 acres if located in an Agricultural District, or more than 10 acres if not within an Agricultural District.	E1b, E3a	☑	☐
e. The proposed action may disrupt or prevent installation of an agricultural land management system.	El a, E1b	☑	☐
f. The proposed action may result, directly or indirectly, in increased development potential or pressure on farmland.	C2c, C3, D2c, D2d	☑	☐
g. The proposed project is not consistent with the adopted municipal Farmland Protection Plan.	C2c	☑	☐
h. Other impacts: _____		☐	☐

9. Impact on Aesthetic Resources

The land use of the proposed action are obviously different from, or are in sharp contrast to, current land use patterns between the proposed project and a scenic or aesthetic resource. (Part 1. E.1.a, E.1.b, E.3.h.)

☐ NO ☑ YES

If "Yes", answer questions a - g. If "No", go to Section 10.

	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. Proposed action may be visible from any officially designated federal, state, or local scenic or aesthetic resource.	E3h	☑	☐
b. The proposed action may result in the obstruction, elimination or significant screening of one or more officially designated scenic views.	E3h, C2b	☑	☐
c. The proposed action may be visible from publicly accessible vantage points: i. Seasonally (e.g., screened by summer foliage, but visible during other seasons) ii. Year round	E3h	☑ ☐	☐ ☐
d. The situation or activity in which viewers are engaged while viewing the proposed action is: i. Routine travel by residents, including travel to and from work ii. Recreational or tourism based activities	E3h E2q, E1c	☑ ☐	☐ ☐
e. The proposed action may cause a diminishment of the public enjoyment and appreciation of the designated aesthetic resource.	E3h	☑	☐
f. There are similar projects visible within the following distance of the proposed project: 0-1/2 mile ½ -3 mile 3-5 mile 5+ mile	D1a, E1a, D1f, D1g	☑	☐
g. Other impacts: _____ _____		☐	☐

10. Impact on Historic and Archeological Resources

The proposed action may occur in or adjacent to a historic or archaeological resource. (Part 1. E.3.e, f. and g.)

☑ NO ☐ YES

If "Yes", answer questions a - e. If "No", go to Section 11.

	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. The proposed action may occur wholly or partially within, or substantially contiguous to, any buildings, archaeological site or district which is listed on the National or State Register of Historical Places, or that has been determined by the Commissioner of the NYS Office of Parks, Recreation and Historic Preservation to be eligible for listing on the State Register of Historic Places.	E3e	☐	☐
b. The proposed action may occur wholly or partially within, or substantially contiguous to, an area designated as sensitive for archaeological sites on the NY State Historic Preservation Office (SHPO) archaeological site inventory.	E3f	☐	☐
c. The proposed action may occur wholly or partially within, or substantially contiguous to, an archaeological site not included on the NY SHPO inventory. Source: _____	E3g	☐	☐

d. Other impacts: _____ _____		☐	☐
e. If any of the above (a-d) are answered "Moderate to large impact may occur", continue with the following questions to help support conclusions in Part 3:			
i. The proposed action may result in the destruction or alteration of all or part of the site or property.	E3e, E3g, E3f	☐	☐
ii. The proposed action may result in the alteration of the property's setting or integrity.	E3e, E3f, E3g, E1a, E1b	☐	☐
iii. The proposed action may result in the introduction of visual elements which are out of character with the site or property, or may alter its setting.	E3e, E3f, E3g, E3h, C2, C3	☐	☐

11. Impact on Open Space and Recreation

The proposed action may result in a loss of recreational opportunities or a reduction of an open space resource as designated in any adopted municipal open space plan.
(See Part 1. C.2.c, E.1.c., E.2.q.)
If "Yes", answer questions a - e. If "No", go to Section 12.

☐ NO ☑ YES

	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. The proposed action may result in an impairment of natural functions, or "ecosystem services", provided by an undeveloped area, including but not limited to stormwater storage, nutrient cycling, wildlife habitat.	D2e, E1b E2h, E2m, E2o, E2n, E2p	☑	☐
b. The proposed action may result in the loss of a current or future recreational resource.	C2a, E1c, C2c, E2q	☑	☐
c. The proposed action may eliminate open space or recreational resource in an area with few such resources.	C2a, C2c E1c, E2q	☑	☐
d. The proposed action may result in loss of an area now used informally by the community as an open space resource.	C2c, E1c	☑	☐
e. Other impacts: _____ _____		☑	☐

12. Impact on Critical Environmental Areas

The proposed action may be located within or adjacent to a critical environmental area (CEA). (See Part 1. E.3.d)
If "Yes", answer questions a - c. If "No", go to Section 13.

☑ NO ☐ YES

	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. The proposed action may result in a reduction in the quantity of the resource or characteristic which was the basis for designation of the CEA.	E3d	☐	☐
b. The proposed action may result in a reduction in the quality of the resource or characteristic which was the basis for designation of the CEA.	E3d	☐	☐
c. Other impacts: _____ _____		☐	☐

13. Impact on Transportation

The proposed action may result in a change to existing transportation systems. ☐ NO ☑ YES
(See Part 1. D.2.j)
If "Yes", answer questions a - f. If "No", go to Section 14.

	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. Projected traffic increase may exceed capacity of existing road network.	D2j	☐	☑
b. The proposed action may result in the construction of paved parking area for 500 or more vehicles.	D2j	☑	☐
c. The proposed action will degrade existing transit access.	D2j	☑	☐
d. The proposed action will degrade existing pedestrian or bicycle accommodations.	D2j	☑	☐
e. The proposed action may alter the present pattern of movement of people or goods.	D2j	☑	☐
f. Other impacts: _____ _____		☐	☐

14. Impact on Energy

The proposed action may cause an increase in the use of any form of energy. ☐ NO ☑ YES
(See Part 1. D.2.k)
If "Yes", answer questions a - e. If "No", go to Section 15.

	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. The proposed action will require a new, or an upgrade to an existing, substation.	D2k	☑	☐
b. The proposed action will require the creation or extension of an energy transmission or supply system to serve more than 50 single or two-family residences or to serve a commercial or industrial use.	D1f, D1q, D2k	☑	☐
c. The proposed action may utilize more than 2,500 MWhrs per year of electricity.	D2k	☑	☐
d. The proposed action may involve heating and/or cooling of more than 100,000 square feet of building area when completed.	D1g	☑	☐
e. Other Impacts: _____ _____		☐	☐

15. Impact on Noise, Odor, and Light

The proposed action may result in an increase in noise, odors, or outdoor lighting. ☐ NO ☑ YES
(See Part 1. D.2.m., n., and o.)
If "Yes", answer questions a - f. If "No", go to Section 16.

	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. The proposed action may produce sound above noise levels established by local regulation.	D2m	☑	☐
b. The proposed action may result in blasting within 1,500 feet of any residence, hospital, school, licensed day care center, or nursing home.	D2m, E1d	☑	☐
c. The proposed action may result in routine odors for more than one hour per day.	D2o	☑	☐

d. The proposed action may result in light shining onto adjoining properties.	D2n	☑	☐
e. The proposed action may result in lighting creating sky-glow brighter than existing area conditions.	D2n, E1a	☑	☐
f. Other impacts: _____ _____		☐	☐

16. Impact on Human Health

The proposed action may have an impact on human health from exposure to new or existing sources of contaminants. (See Part 1.D.2.q., E.1. d. f. g. and h.) ☑ NO ☐ YES

If "Yes", answer questions a - m. If "No", go to Section 17.

	Relevant Part I Question(s)	No,or small impact may cccur	Moderate to large impact may occur
a. The proposed action is located within 1500 feet of a school, hospital, licensed day care center, group home, nursing home or retirement community.	E1d	□	□
b. The site of the proposed action is currently undergoing remediation.	E1g, E1h	□	□
c. There is a completed emergency spill remediation, or a completed environmental site remediation on, or adjacent to, the site of the proposed action.	E1g, E1h	□	□
d. The site of the action is subject to an institutional control limiting the use of the property (e.g., easement or deed restriction).	E1g, E1h	□	□
e. The proposed action may affect institutional control measures that were put in place to ensure that the site remains protective of the environment and human health.	E1g, E1h	□	□
f. The proposed action has adequate control measures in place to ensure that future generation, treatment and/or disposal of hazardous wastes will be protective of the environment and human health.	D2t	□	□
g. The proposed action involves construction or modification of a solid waste management facility.	D2q, E1f	□	□
h. The proposed action may result in the unearthing of solid or hazardous waste.	D2q, E1f	□	□
i. The proposed action may result in an increase in the rate of disposal, or processing, of solid waste.	D2r, D2s	□	□
j. The proposed action may result in excavation or other disturbance within 2000 feet of a site used for the disposal of solid or hazardous waste.	E1f, E1g E1h	□	□
k. The proposed action may result in the migration of explosive gases from a landfill site to adjacent off site structures.	E1f, E1g	□	□
l. The proposed action may result in the release of contaminated leachate from the project site.	D2s, E1f, D2r	□	□
m. Other impacts: _____ _____			

17. Consistency with Community Plans

The proposed action is not consistent with adopted land use plans. (See Part 1. C.1, C.2. and C.3.) ☐ NO ☑ YES

If "Yes", answer questions a - h. If "No", go to Section 18.

	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. The proposed action's land use components may be different from, or in sharp contrast to, current surrounding land use pattern(s).	C2, C3, D1a E1a, E1b	☑	☐
b. The proposed action will cause the permanent population of the city, town or village in which the project is located to grow by more than 5%.	C2	☑	☐
c. The proposed action is inconsistent with local land use plans or zoning regulations.	C2, C2, C3	☑	☐
d. The proposed action is inconsistent with any County plans, or other regional land use plans.	C2, C2	☐	☐
e. The proposed action may cause a change in the density of development that is not supported by existing infrastructure or is distant from existing infrastructure.	C3, D1c, D1d, D1f, D1d, Elb	☐	☑
f. The proposed action is located in an area characterized by low density development that will require new or expanded public infrastructure.	C4, D2c, D2d D2j	☐	☑
g. The proposed action may induce secondary development impacts (e.g., residential or commercial development not included in the proposed action)	C2a	☐	☐
h. Other: _____ _____		☐	☐

18. Consistency with Community Character

The proposed project is inconsistent with the existing community character. (See Part 1. C.2, C.3, D.2, E.3) ☐ NO ☑ YES

If "Yes", answer questions a - g. If "No", proceed to Part 3.

	Relevant Part I Question(s)	No, or small impact may occur	Moderate to large impact may occur
a. The proposed action may replace or eliminate existing facilities, structures, or areas of historic importance to the community.	E3e, E3f, E3g	☑	☐
b. The proposed action may create a demand for additional community services (e.g. schools, police and fire)	C4	☑	☐
c. The proposed action may displace affordable or low-income housing in an area where there is a shortage of such housing.	C2, C3, D1f D1g, E1a	☑	☐
d. The proposed action may interfere with the use or enjoyment of officially recognized or designated public resources.	C2, E3	☑	☐
e. The proposed action is inconsistent with the predominant architectural scale and character.	C2, C3	☐	☑
f. Proposed action is inconsistent with the character of the existing natural landscape.	C2, C3 E1a, E1b E2g, E2h	☑	☐
g. Other impacts: _____ _____		☐	☐

PRINT FULL FORM

Agency Use Only [IfApplicable]

Project : Sheldrake Karmel Rd Properties LLC

Date : 8/14/25

Full Environmental Assessment Form
Part 3 - Evaluation of the Magnitude and Importance of Project Impacts
and
Determination of Significance

Part 3 provides the reasons in support of the determination of significance. The lead ageney must complete Part 3 for every question in Part 2 where the impact has been identified as potentially moderate to large or where there is a need to explain why a particular element of the proposed action will not, or may, result in a significant adverse environmental impact.

Based on the analysis in Part 3, the lead agency must decide whether to require an environmental impact statement to further assess the proposed action or whether available information is sufficient for the lead agency to conclude that the proposed action will not have a significant adverse environmental impact. By completing the certification on the next page, the lead agency can complete its determination of significance.

Reasons Supporting This Determination:

To complete this section:

- Identify the impact based on the Part 2 responses and describe its magnitude. Magnitude considers factors such as severity, size or extent of an impact.
- Assess the importance of the impact. Importance relates to the geographic scope, duration, probability of the impact occurring, number of people affected by the impact and any additional environmental consequences if the impact were to occur.
- The assessment should take into consideration any design element or project changes.
- Repeat this process for each Part 2 question where the impact has been identified as potentially moderate to large or where there is a need to explain why a particular element of the proposed action will not, or may, result in a significant adverse environmental impact.
- Provide the reason(s) why the impact may, or will not, result in a significant adverse environmental impact
- For Conditional Negative Declarations identify the specific condition(s) imposed that will modify the proposed action so that no significant adverse environmental impacts will result.
- Attach additional sheets, as needed.

Please see attached Part 3 Narrative.

Determination of Significance - Type 1 and Unlisted Actions

SEQR Status: ☑ Type 1 ☐ Unlisted

Identify portions of EAF completed for this Project: ☑ Part 1 ☑ Part 2 ☑ Part 3

Upon review of the information recorded on this EAF, as noted, plus this additional support information

and considering both the magnitude and importance of each identified potential impact, it is the conclusion of the Fallsburg Planning Board as lead agency that:

☑ A. This project will result in no significant adverse impacts on the environment, and, therefore, an environmental impact statement need not be prepared. Accordingly, this negative declaration is issued.

☐ B. Although this project could have a significant adverse impact on the environment, that impact will be avoided or substantially mitigated because of the following conditions which will be required by the lead agency:

There will, therefore, be no significant adverse impacts from the project as conditioned, and, therefore, this conditioned negative declaration is issued. A conditioned negative declaration may be used only for UNLISTED actions (see 6 NYCRR 617.7(d)).

☐ C. This Project may result in one or more significant adverse impacts on the environment, and an environmental impact statement must be prepared to further assess the impact(s) and possible mitigation and to explore alternatives to avoid or reduce those impacts. Accordingly, this positive declaration is issued.

Name of Action: Sheldrake Karmel Road Properties LLC

Name of Lead Agency: Town of Fallsburg Planning Board

Name of Responsible Officer in Lead Agency: Irv Newmark

Title of Responsible Officer: Acting Planning Board Chairman

Signature of Responsible Officer in Lead Agency: Irwin Newmark Date: 8/18/25

Signature of Preparer (if different from Responsible Officer) Helen Budrock, AICP Date: 8/6/25

For Further Information:

Contact Person: Jennifer Edwards

Address: Town of Fallsburg, 9 Railroad Plaza, PO Box 2019, South Fallsburg, NY 12779

Telephone Number: 845-434-8810

E-mail: jedwards@fallsburgny.com

For Type 1 Actions and Conditioned Negative Declarations, a copy of this Notice is sent to:

Chief Executive Officer of the political subdivision in which the action will be principally located (e.g., Town / City / Village of)
Other involved agencies (if any)
Applicant (if any)
Environmental Notice Bulletin: http://www.dec.ny.gov/enb/enb.html

PRINT FULL FORM

ENVIRONMENTAL ASSESSMENT FORM - PART 3

SHELDRAKE-KARMEL RD PROPERTIES, LLC

A proposed 86-unit manufactured home park with associated recreational facilities on 93.38 acres located at the southwest corner of Labaugh Road and Karmel-Jacobs Road in the hamlet of Loch Sheldrake (Town of Fallsburg, NY). The project is to be served by a private water system with drilled wells and a private sewage disposal system via a package sewer plant.

Town of Fallsburg
Sullivan County

Prepared for Arthur Rosenshein, Chairman
Members of the Fallsburg Planning Board C/O
Fallsburg Building Department
5250 Main Street
Fallsburg, New York 12779

Prepared by:

Helen Budrock, AICP
Delaware Engineering, DPC
548 Broadway
Monticello, New York 10701

Planning Consultant to the Town of Fallsburg

ACCEPTED:

August 14, 2025

TABLE OF CONTENTS

		Page Number
A.	Introduction and SEQRA Process	1
B.	Project History & Description	1
C.	Environmental Assessment Form - Parts 1, 2 and 3	2
	Section 1. Impact on Land	2
	Section 3. Impact on Surface Water	2
	Section 4. Impact on Groundwater	3
	Section 5. Impact on Flooding	4
	Section 7. Impact on Plants and Animals	4
	Section 13. Impact on Transportation	4
	Section 17. Consistency with Community Plans	4
	Section 18. Consistency with Community Character	5
D.	Summary & Conclusions	5

ASSOCIATED REPORTS & TECHNICAL STUDIES*:

1) Wetland Report (Ecological Analysis LLC; October 17, 2022 and December 12, 2023)
2) NYDEC Wetlands map certified by NYSDEC (5/17/23).
3) Traffic Impact Study (Stephan A. Maffia, PE; August 17, 2023)
4) Stormwater Pollution Prevention Plan (Berger Engineering and Surveying, PLLC; September 19, 2024).
5) Wildlife Habitat Assessment (Ecological Analysis LLC; February 13, 2025)
6) Hydrogeologic Evaluation Report (Hanson Van Vleet PLLC, February 25, 2025)
7) *Sewer Report (Sterling Environmental; June 25, 2025)*

* *Copies of these reports are on file at the Building Department offices.*

A. Introduction and SEQRA Process

The applicant (Sheldrake Karmel Rd Properties LLC) proposes to construct a residential development of 86 manufactured homes on a 93.38-acre site in the Town of Fallsburg, Sullivan County, New York. The project will include various amenities including a community building, swimming pools and playgrounds, and is to be serviced by private water and sewer utilities. Access will be via a primary entrance from Karmel Jacobs Road and an emergency access on LaBaugh Road in the hamlet of Loch Sheldrake.

The property is located in the REC (Recreation) Zoning District, which includes manufactured home parks (without central water and sewer) as permitted uses subject to Site Plan review by the Planning Board. The project is also subject to the regulations contained in 6 NYCRR Part 617 - State Environmental Quality Review (SEQR).

SEQR requires that no agency involved in any action undertake, fund, or approve an action until it has taken a "hard look" at all significant environmental impacts. The applicant submitted to the Planning Board an initial sketch plan and a Short Environmental Assessment Form on February 21, 2023. A fully engineered plan set and complete SEQR package (including an updated Full Environmental Assessment Form, Part 1) was submitted on December 23, 2024. The Planning Board expressed its intent to serve as Lead Agency on January 9, 2025. Part 2 was prepared by the Town's Planning Consultant and reviewed by the Planning Board on March 10, 2025 and April 7, 2025. This Part 3 is being provided to assist the Board in making its determination of significance, to evaluate project impacts, and identify appropriate mitigation measures. Several studies were prepared and submitted to the Planning Board by the applicant and reviewed by the Town's consultants to assist in evaluating potential impacts, including a Wetlands Report, Traffic Impact Study, Stormwater Pollution Prevention Plan, Wildlife Habitat Assessment, Hydrogeologic Evaluation Report, and a Sewer Report.

B. Project History & Description

The Proposed Action has been the subject of Planning Board review for over two years. The project's first appearance was in February of 2023, at which time an 83-unit manufactured home park on 56.69 acres was proposed. After acquiring additional acreage from a neighboring property owner, the size of the project was increased to 94 proposed units on 61.09 acres. In response to feedback received at the February 9, 2025 public hearing, and following a workshop with Town staff and consultants, the applicant reconfigured the layout to provide more open space between units and reduced the overall unit count from 94 to 86. In addition, the Applicant again expanded the acreage of the project, this time via a proposed lot line adjustment, which added 32.29 acres of mostly undevelopable land to the west. An updated submission dated February 26, 2025 documented the increase in acreage to 93.38 acres, with a maximum of 103 units permitted as of right under the current zoning. The applicant also responded to all public comments in writing. Additional documentation, including views of the project site from the public roadway, an architectural rendering and written responses to comments made by the Town's technical consultants, were submitted over the ensuing months.

C. Environmental Assessment Forms Parts 1, 2 and 3

Parts 1 and 2 were submitted previously and reviewed by the Planning Board. The following narrative addresses the potentially "moderate to large" impacts identified in the Part 2 reviewed by the Planning Board on March 10, 2025 and April 7, 2025. It should be noted that identifying that an impact will be potentially "moderate to large" does not necessarily mean that it is significant, but rather that it be further evaluated in Part 3 before a final determination of significance is made. Below are the Lead Agency's responses to the items noted in their review as having potentially moderate to large impacts:

Section 1. Impact on Land

Erosion and sediment control will be mitigated by implementation of the measures described in the Storm Water Pollution Prevention Plan (SWPPP) and included on the final site plan prepared by Rielly Engineering, which have been reviewed by the Town Engineer.

All proposed grading and drainage improvements described in the SWPPP and indicated on the site plan have been designed to ensure that stormwater runoff from all new impervious surfaces and other disturbed areas is captured and treated by stormwater detention ponds. The re-routing of stormwater runoff within the site and providing ponds for treatment helps to detain water coming off new impervious surfaces. The peak discharges offsite will be controlled to ensure that the post-development rate of runoff from the site will be "relatively equal" to, or less than, the existing discharge rates.

Water table depth varies across the site. Each home will be placed on a concrete pad, rather than a foundation with a basement. During installation of the utilities, if any groundwater is encountered the trenches will be dewatered in accordance with the SWPPP. If any springs or prolific groundwater seeps are discovered during construction, curtain drains will be installed to manage the runoff.

Section 3. Impacts on Surface Water

A soil erosion and sediment control plan has been prepared in accordance with the Erosion and Sediment Control Guidelines associated with the NYSDEC SPDES General Permit for Stormwater Discharge for Construction Activities and the latest revision of the NYSDEC Stormwater Management Design Manual. The measures to be incorporated into the design of the project are detailed in the erosion control features detailed in the Storm Water Pollution Prevention Plan (SWPPP) prepared by Berger Engineering dated September 19, 2024 and reviewed by the Town Engineer.

The purpose of the Erosion and Sediment Control Plan is to minimize the erosion of disturbed soil and to prevent the migration of sediment into surface waters and off-site properties during construction and until the site has received final stabilization. The plan accomplishes that purpose through reducing runoff velocities, limiting the area of disturbed soils at any one time, and stabilizing disturbed soils. The plan contains construction notes, erosion and sediment

control notes, specifications for erosion controls, a sequence of construction, construction phasing, and associated construction details designed to mitigate potential impacts associated with erosion and sedimentation.

During construction, areas of active disturbance would be limited to five acres and runoff from areas outside of disturbances would be diverted away from erodible soils. Both temporary and permanent erosion control facilities and activities will be employed, and throughout the construction process strict adherence to the Erosion and Sediment Control Plan will be maintained to prevent the migration of sediment into surface waters or onto adjacent properties.

A privately-owned "package plant" is being proposed for onsite wastewater treatment for the proposed project. A SPDES draft discharge permit has been provided to the applicant by the New York State Department of Environmental Conservation (NYSDEC). The proposed package plant would discharge into an intermittent stream that flows in the Class B Sheldrake Stream, and intermittent stream effluent limits are generally recognized as the highest degree of treatment that can reasonably be achieved. The final design will be based on the effluent limits issued by the NYSDEC in the final SPDES discharge permit and will be subject to review and approval by the regulatory agency. According to a report submitted by Sterling Environmental, the most likely design to be used are either a Membrane Bioreactor (MBR) or Moving Bed Biofilm Reactor (MBBR) and will be designed for year-round use even though the occupancy of the proposed action is projected to be mostly seasonal. To ensure the treatment system is operated correctly and within the required effluent limits, a certified wastewater treatment plant operator will be retained to operate the plant, collect samples, and submit regular Discharge Monitoring Reports (DMRs) to the NYSDEC.

Section 4. Impact on Groundwater

The project is proposed to be serviced by a privately-owned Community Water System consisting of onsite drilled water wells, storage, disinfection and pumping equipment. A Hydrogeologic Evaluation Report was prepared by Hanson Van Vleet for four water production wells located on the subject property. The report presented data, evaluations and conclusions from 72-hour pump tests conducted to determine the individual long-term safe yield of each well. In addition, all property owners located within 1,500 feet of the proposed wells were contacted via certified mail to solicit participation in groundwater monitoring for the duration of the 72-hour pump test. Six (6) property owners were sent letters, and three (3) agreed to have their wells monitored. The pump tests on various wells were performed in August and November of 2024. The cumulative effects of pumping the production wells simultaneously while the homeowner wells are in regular use was evaluated, and during all combined rate pumping scenarios the hydrogeologic report concluded that no adverse impacts would occur to the on-site production wells or nearby private water wall users. In addition, the testing results concluded that the production wells were found to be of sufficient water quality and quantity to service the proposed project. As a condition of approval, the potable water system design must receive final approval by the NYS Department of Health before any building permits are issued.

Section 5. Impact on Flooding

The project site is not located within a designated floodway or floodplain. While the proposed project may alter existing drainage patterns, all proposed grading and drainage improvements described in the SWPPP and indicated on the site plan have been designed to ensure that stormwater runoff from all new impervious surfaces and other disturbed areas is captured and treated by stormwater detention ponds. The re-routing of stormwater runoff within the site and providing ponds for treatment helps to detain water coming off new impervious surfaces. Existing drainage patterns are replicated in the post development condition and discharge points are analyzed to compare pre and post development conditions. The peak discharges offsite will be controlled to ensure that the post-development rate of runoff from the site will be "relatively equal" to, or less than, the existing discharge rates.

Section 7. Impact on Plants and Animals

The proposed action will disturb approximately 29 acres of land, or 31% of the project site. A report entitled "Wildlife Habitat Assessment" dated February 13, 2025 was prepared by Ecological Analysis, LLC. The report indicates the site is almost entirely wooded, with the exception of an area of open wetland scrub/shrub habitat within a NYSDEC Freshwater Wetland (LE-28) that encompasses approximately 13.5 acres. The report concludes that while there may be some loss of habitat as a result of the proposed action, there are no known threatened or endangered species in the project area and the proposed construction activities would by unlikely to impact larger wildlife populations as long as adjacent areas remain undeveloped.

Section 13. Impact on Transportation:

A Traffic Impact Study dated August 17, 2023 was prepared by Stephan Maffia, PE. The Level of Service analysis summarized in the study indicates that there will be increases in summertime peak hour traffic volumes on the adjacent streets, with minor increases in control delay times at the Karmel & Jacobs Road intersections. However, with combined additional traffic from several other proposed development projects in the Loch Sheldrake area, the impacts of increased traffic delays would reach unacceptable levels at the Route 52/Karmel Jacobs Road intersection.

It was determined that the installation of a traffic signal and left-turn lanes on Route 52 would mitigate those impacts. As a condition of approval, the applicant will be required to contribute the project's share of funds to a Traffic Mitigation Fund to be established by the Town of Fallsburg. The purpose of the fund would be to finance any necessary roadway improvements when and if the NYSDOT determines that installation of a traffic signal and/or a dedicated turn lane is warranted.

Section 17. Consistency with Community Plans

Since the site is presently undeveloped, the density of development will increase from zero to approximately 0.9 units per acre. This density is well below the permitted density in the REC (Recreation Residential) zoning district for manufactured home parks of 2.0 units per

acre. This density is also comparable to the density found in existing neighboring residential developments such as Luxor Estates, Evergreen Estates, and the Orchards development.

The Town's 2018 Comprehensive plan describes lands zoned as "recreational residential" as transitional areas between the low-density agricultural areas and the medium-density residential development that is found surrounding the hamlets. While these areas are not intended to be served by central sewer or water facilities, the Comprehensive Plan does recognize that private "package" sewage treatment plants could be appropriate in some circumstances, particularly if the plant serves a smaller lot single family neighborhood where the majority of the property is preserved for environmental protection and other open space purposes. For the proposed action, roughly two thirds of the site will remain undisturbed, including a contiguous swath of wetland scrub/shrub habitat within a NYSDEC-regulated freshwater wetland that encompasses approximately 13.5 acres.

Section 18. Consistency with Community Character

There are no manufactured home parks in the immediate vicinity of the proposed action. However, "The Orchards" (an 84-unit manufactured home development on 67 acres constructed in 2022) is located approximately one mile to the east on Labaugh road. In addition, there are many single-family homes and a few housing developments of a similar density located immediately to the southeast of the project area (i.e. Evergreen Estates and Luxor Estates) although these areas do have access to municipal water and sewer. This emphasizes the fact that the project location is indeed a transitional area between the more rural agricultural lands to the north, and the more densely populated lands to the southeast surrounding the hamlet of Loch Sheldrake.

D. Summary & Conclusions

The Environmental Assessment form (EAF) Part 2 listed several impacts as being potentially significant. This Part 3 discusses each of these in some detail, based on information provided in several technical reports and studies submitted by the Applicant and thoroughly reviewed by the Town's independent consultants. As a result of this review, the Town of Fallsburg Planning Board, as Lead Agency, has determined that the only significant adverse impact from the proposed action will be increased traffic congestion on local roadways, but that all such effects can be eliminated or avoided by implementation of the specific mitigation measures outlined below:

1) A financial contribution to a Traffic Mitigation Fund established by the Town of Fallsburg, in an amount determined by the Town's traffic consultant that represents the proposed project's proportional share of the costs associated with installation of roadway improvements and/or a traffic signal at the intersection of Route 52 and Karmel-Jacobs Road as determined by and approved by the NYSDOT. No land disturbance or building permits shall be issued for the proposed action unless and until this condition has been satisfied.

APPENDIX E

PRELIMINARY EFFLUENT LIMITS

Preliminary Effluent Limits:
Shlomo Katz

2025-4-25

Prepared by: Edward Schneider (edward.schneider@dec.ny.gov)

The limits provided below are not guaranteed for this facility. Upon receipt of approved SPDES permit application final effluent limits will be provided.

Outfall No.	Acute Dilution Ratio A(A)	Chronic Dilution Ratio A(C)	Human, Aesthetic, Wildlife Dilution Ratio (HEW)	Basis
001	1:1	1:1	1:1	TOGS 1.3.1 ISEL Limits

Parameter	Units	Averaging Period	Limit	Reason for Limit
Flow Rate	GPD	Monthly Average	52,000	
pH	SU	Min-Max	6.5-8.5	Intermittent Stream Effluent Limit
Temperature	°F	Daily Max	90	Class B Standard
Dissolved Oxygen	mg/L	Daily Min	7.0	Intermittent Stream Effluent Limit
BOD5	mg/L lbs/d % Rem	Daily Max Daily Max Minimum	5.0 mg/L 2.2 lbs/d 85 %	Intermittent Stream Effluent Limit
TSS	mg/L lbs/d % Rem	Daily Max Daily Max Minimum	10.0 mg/L 4.3 lbs/d 85%	Intermittent Stream Effluent Limit
Settleable Solids	mL/L	Daily Max	0.1 or 0.3	Intermittent Stream Effluent Limit
Nitrogen, Ammonia (as N) June 1st – Oct. 31st	mg/L	Monthly Average	1.2	Intermittent Stream Effluent Limit
Nitrogen, Ammonia (as N) Nov. 1st – May 31st	mg/L	Monthly Average	1.9	Intermittent Stream Effluent Limit
Total Phosphorus	mg/L lbs/d	Monthly Average	0.5 mg/L 0.22 lbs/d	TOGS 1.3.6 New Discharge
Fecal Coliform	#/100 ml	30d Geo Mean 7d Geo Mean	200 400	Standard Disinfection requirement.

Total Residual Chlorine	mg/L	Daily Max	0.03	Minium detection limit
Total Dissolved Solids	mg/L	Monthly Average	1000	DRBC

Additional Comments from DRBC to consider and account for:

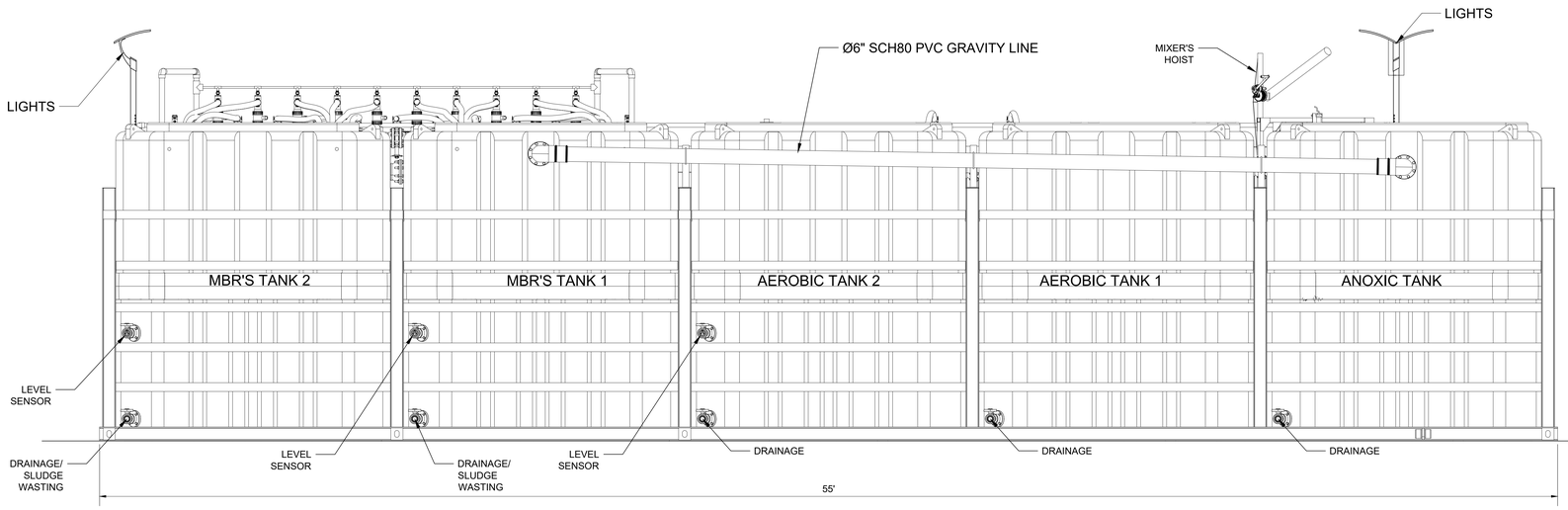
According to DRBC Water Quality Regulations (WQR) Section 3.10.4.F., as the proposed project will discharge to an intermittent stream, before the project can be approved, the project sponsor must first demonstrate that there is no reasonable economical alternative to discharging to an intermittent stream, the project is environmentally acceptable, and would not violate the stream quality objectives set forth in the WQR Section 3.10.3B.1.a.

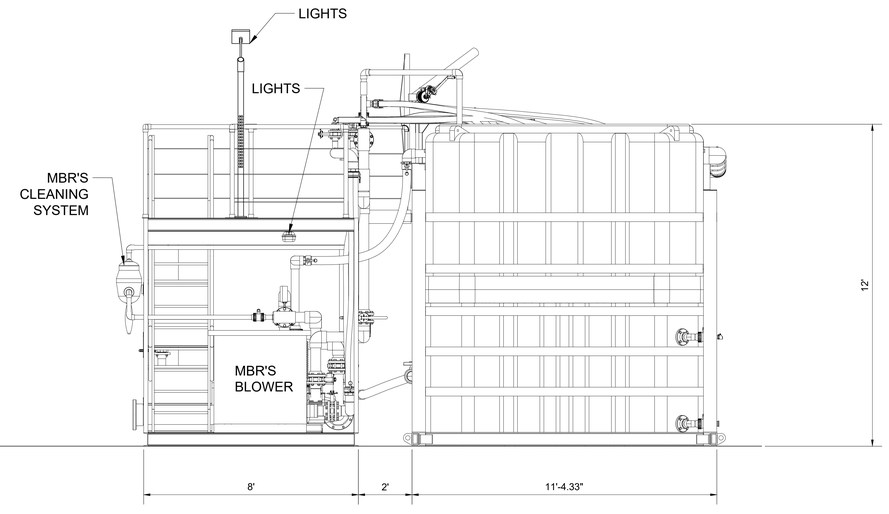
Additionally, according to WQR Section 3.10.3.A.2.c.2), Within the drainage area to Special Protection Waters, a new WWTP or substantial alterations and additions to an existing WWTP may be approved only after the applicant demonstrates that it has fully evaluated all natural wastewater treatment system alternatives and is unable to implement these alternatives because of technical and/or financial infeasibility. When evaluating natural treatment alternatives, the applicant shall consider alternatives to any and all loadings – both existing and proposed – in excess of actual loadings at the time of SPW designation.

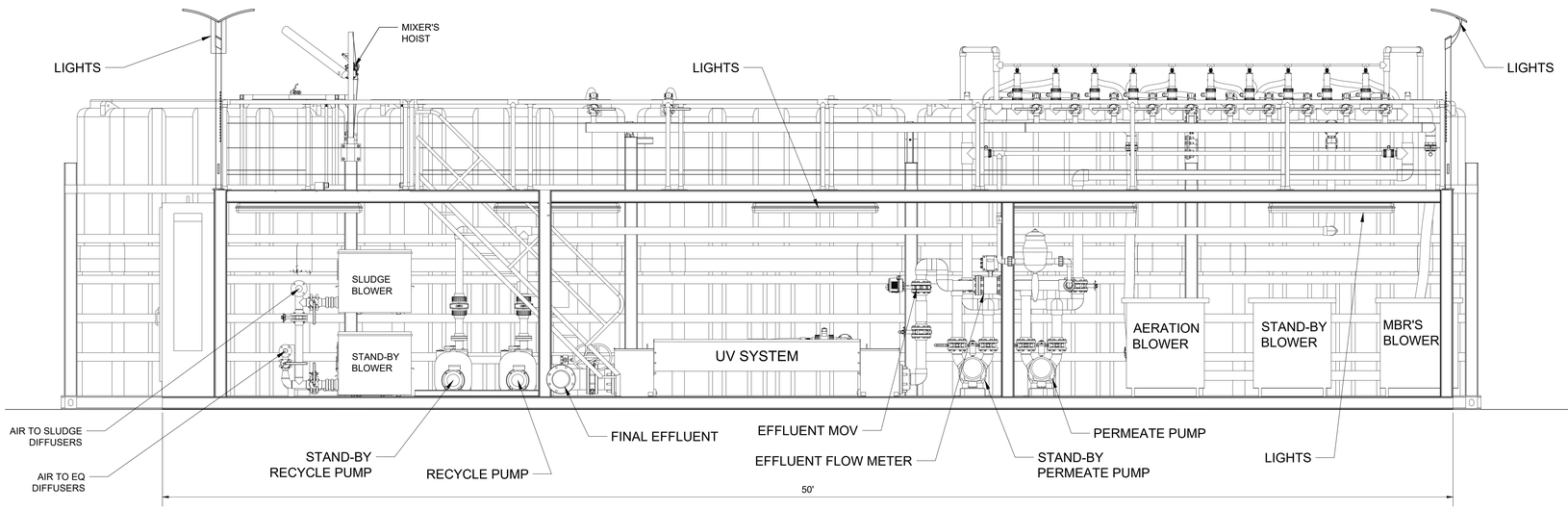
“Natural Wastewater Treatment Systems” are soil-based, vegetative and/or aquatic wastewater treatment systems characterized by the use of low energy treatment processes that use and simulate "natural" environmental processes such as primary and secondary productivity, crop production, wetlands, ponds and others.

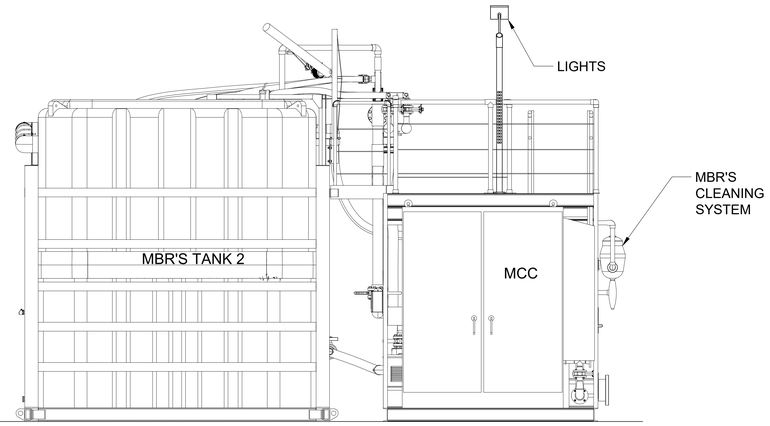
APPENDIX F

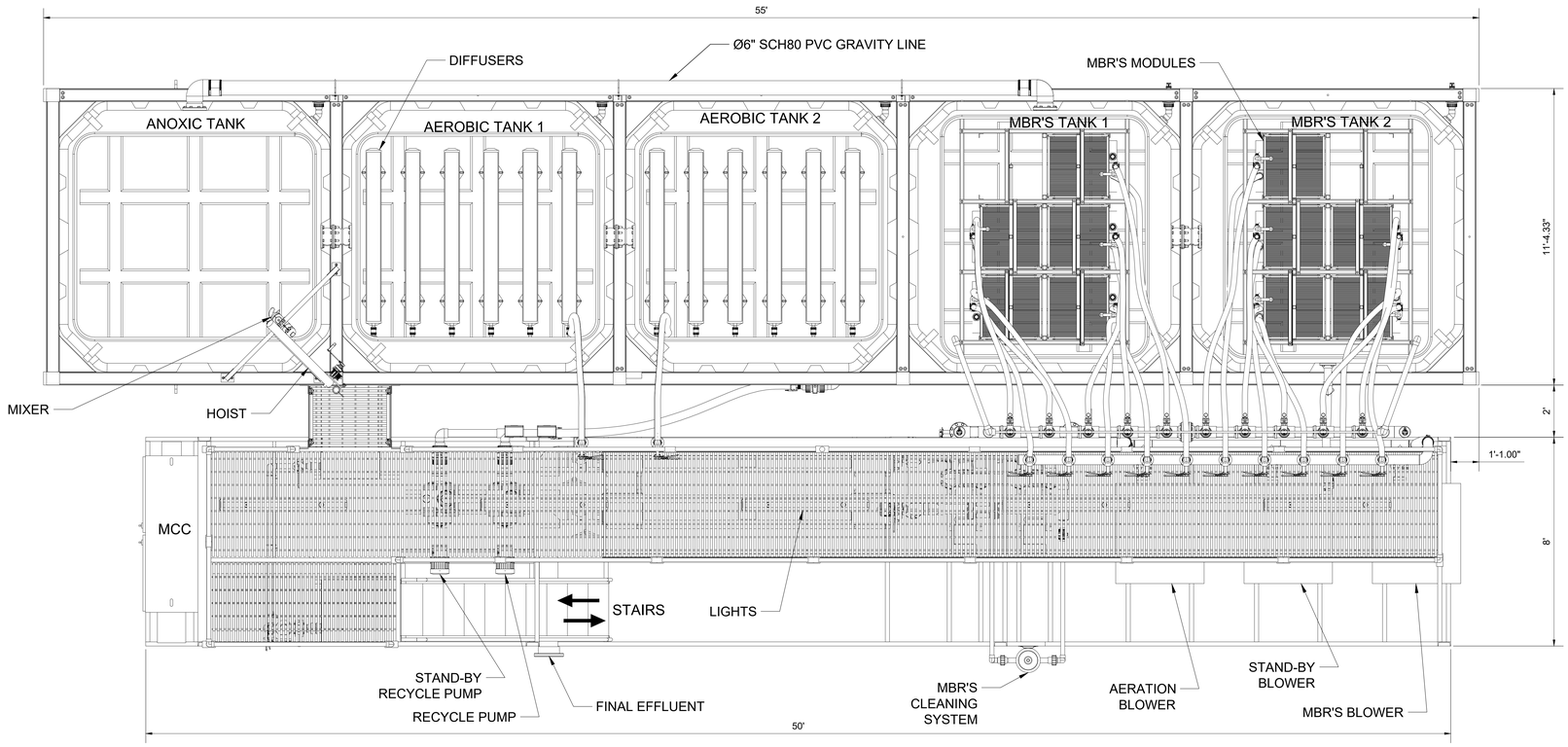
MBR PRELIMINARY SCHEMATIC











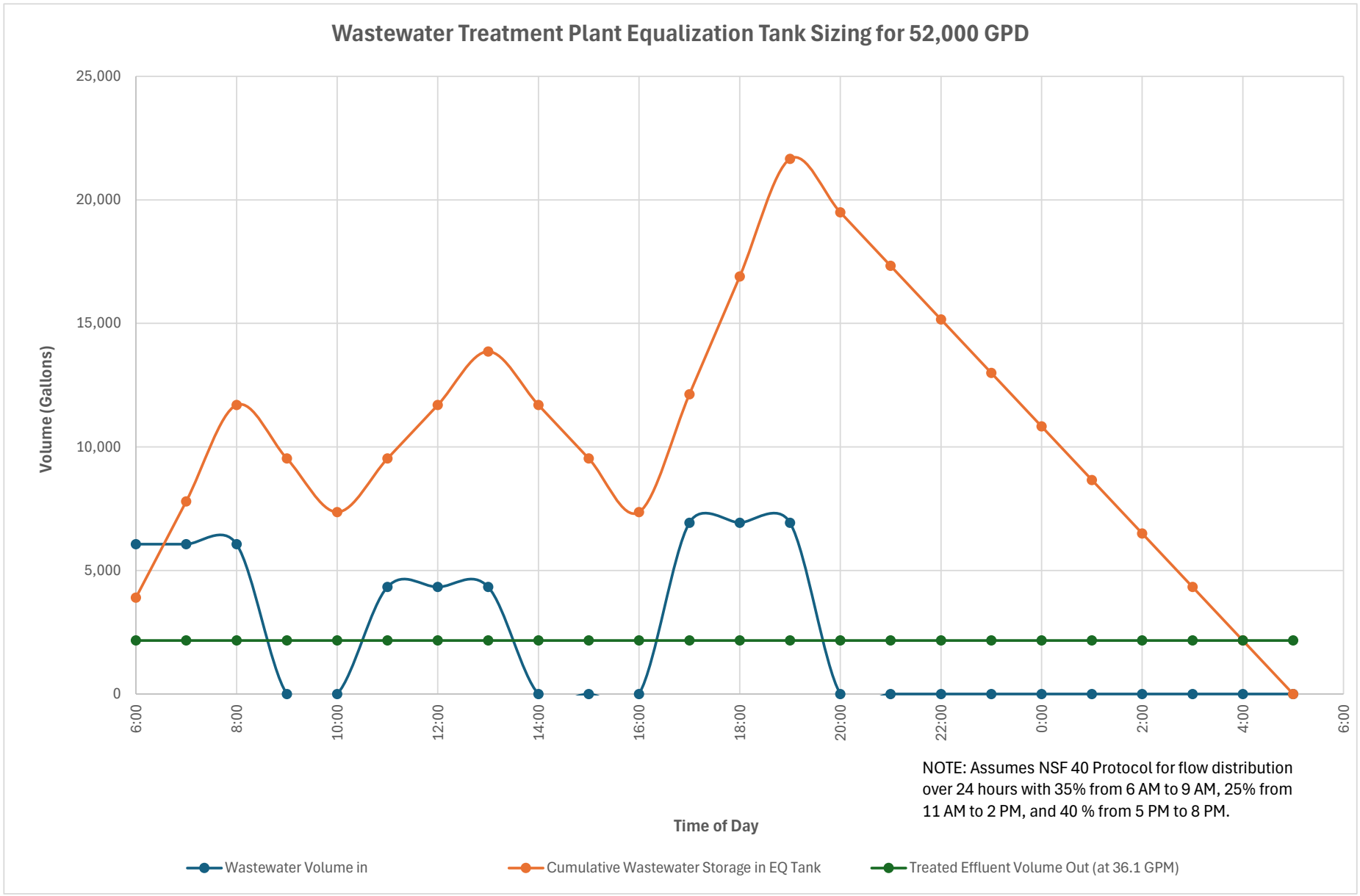
1674 FOUNTAINTOWN RD
CHINQUAPIN, NC 28521
http://www.a3-usa.com

TITLE: 50000 GPD MBR EXAMPLE

DRAWN	L.ESTRADA	DATE	02/24/2022
REVISED	L.ESTRADA	DATE	05/05/2022
SCALE	1/2"=1'-0"	SIZE	48"X36"
DWG NO.	BP868-001	REV	00

APPENDIX G

WASTEWATER EQUALIZATION TANK SIZING


Wastewater Treatment Plant Equalization Tank Sizing for 52,000 GPD
Volume (Gallons)
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15,000
10,000
5,000
0
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
0:00
2:00
4:00
6:00
Time of Day
NOTE: Assumes NSF 40 Protocol for flow distribution over 24 hours with 35% from 6 AM to 9 AM, 25% from 11 AM to 2 PM, and 40 % from 5 PM to 8 PM.
Wastewater Volume in
Cumulative Wastewater Storage in EQ Tank
Treated Effluent Volume Out (at 36.1 GPM)