SANITARY SEWER REPORT/
SANITARY SEWER DISTRICT EXTENSION

CORPORATE COMMERCE SEWER DISTRICT

LANDS OF KHAN RESIDENTIAL SUBDIVISION

MAY 21, 2018

Prepared For:

Muhammed & Wasim Khan
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Prepared By:

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Appendices

I. PROJECT DESCRIPTION

The proposed sewer installation and improvements discussed in this report will provide public sewer service to future residents of the Lands of Khan Residential Subdivision and are proposed to be owned and maintained by the Town of Clifton Park. The sewer extension will provide service to six (6) new single family unit homes via individual grinder pumps and low pressure forcemain sewer.

II. SITE DESCRIPTION

The Lands of Khan Residential Subdivision is situated on one parcel having a total area of approximately 30.99 acres and a tax map number of 270.-1-44. The project parcel is located on the west side of Waite Road, approximately 1,300 feet south of the intersection of Waite Road and NYS Route 146, in the Town of Clifton Park, Saratoga County, New York. The applicant is proposing to subdivide the parcel for the construction of six (6) single family homes.

The Soil Survey of Saratoga County, New York prepared by the National Resources Conservation Service (NRCS) indicates the site is mantled with six (6) distinct soil units. These units consist of Hudson Silt Loam (HuB), Madalin Mucky Silty Clay Loam (Ma), Raynham Silt Loam (Ra), Rhinebeck Silt Loam (RhA), Scio Silt Loam (SeA/SeB), and Unadilla Very Fine Sandy Loam (UnB). The majority of the site is somewhat poorly drained with some areas of very poorly drained, moderately well drained, and well drained soils.

The site topography can be considered to be undulating, with the majority of the site generally sloping east and west toward the low area containing federally regulated wetlands located within the center of the project area. A low ridge line is located approximately 1,300 feet west of Waite Road, with the western portion of the parcel generally sloping west. Slopes range between 0 and greater than 20 percent.

Access to the project will be provided by one shared driveway connecting to Waite Road, with all six private driveways connecting to the shared driveway. Construction of the project will progress in two phases, with the smaller lots closer to Waite Road being constructed first, followed by the larger parcels to the west. The properties will be cleared to allow for construction of the shared driveway and installation of all necessary utilities. Following the general infrastructure installation, construction will then begin on the individual homes.

III. ALTERNATIVE SELECTION

Selection of this alternative is based on engineering analysis of the proposed site. The surrounding sites have been analyzed based on the likelihood of growth that may potentially result in an increased burden on the proposed wastewater system.

IV. ENGINEERING CRITERIA

As outlined in 11.24 of the "Recommended Standards for Wastewater Facilities" published by the Great Lakes – Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, 2014 Edition, all wastewater conveyance piping has been sized to accommodate the peak hourly flow from the proposed residential subdivision and the potential surrounding area.

Pursuant to the design standards set forth in Chapter 30 of the "Recommended Standards for Wastewater Facilities", the capacity of all sewer conveyance piping shall be designed to accommodate the ultimate tributary population. The sewer piping will be sized to accommodate the design peak hourly flow. All low pressure forcemain sewer piping will be 2" in diameter and all service lines will be 1.25".

Due to topography constraints, individual grinder pumps will be required for all lots to convey wastewater to the existing forcemain sewer on NYS Route 146.

Individually owned external grinder pumps manufactured by Environment One (E-One) pumps will be used on all lots. Wastewater flow from these external grinder pumps will flow through a low pressure forcemain to an existing forcemain manhole for collection. The exterior grinder pump shall be DH071-93 by E-One or equivalent.

A hydraulic analysis was performed by E-One using their model DH071-93 grinder pump and DR-11 forcemain. The forcemain system was broken down into two "zones" which illustrate the hydraulic characteristics of all sections of the system during the occurrence of maximum contribution of flow into the system. The analysis shows that 2" DR-11 forcemain will be installed within the system. The analysis is included in Appendix C.

For forcemain sewage conveyance, a cleansing velocity of at least 2 feet per second must be maintained. Air and vacuum relief valves must be installed on all force main piping to relieve negative pressures where necessary. In addition, all pipe materials must be of sufficient strength for use as a water main.

All sewage piping shall be installed to minimize damage to the piping and all joints. Trenches shall be dug and pipe shall be laid to minimize any bending. According to 33.82 (b) of the Recommended Standards, rocks, boulders and large stones will be removed to provide minimum clearance of 4 inches on all sides of the pipe.

V. EXISTING SANITARY SEWER CONVEYANCE SYSTEM

An existing 3" sanitary sewer forcemain exists along the north side of NYS Route 146, within the Corporate Commerce Sewer District, and is owned and operated by the Clifton Park Sewer Department. All six (6) lots from the Lands of Khan Residential Subdivision are proposed to be serviced by the connection to the existing 3" forcemain via a connection to the existing manhole along the north side of NYS Route 146.

The peak hour flow from this project of 4.58 gpm represents 4.25% of the maximum capacity of the receiving 3" forcemain. Initial discussions with the Town of Clifton Park have indicated that preference for reserve capacity is given to users currently within the Corporate Commerce Sewer District, which may prohibit the proposed connection to the existing forcemain without significant upgrades to the existing main to add additional capacity. Currently, the only known contributors to the forcemain are the MeadowView senior housing apartments (tax map ID# 270.-1-70) and the 21st Century Park building (tax map ID# 270.-2-2). A wastewater analysis of the existing contributors to the existing 3" forcemain has been performed and is included in Appendix B. Sewage waste is ultimately conveyed and treated at the SCSD #1 treatment plant located in Halfmoon, New York.

VI. ENVIRONMENTAL REVIEW

The sewer network for the proposed development has been carefully designed to minimize any potential impacts associated with wastewater conveyance. All joints and piping will be inspected and tested prior to use using the appropriate ASTM standards to ensure the network will limit infiltration and contamination of surface water bodies as well as ground water. Performing a hydrostatic test will ensure the infiltration and exfiltration rates do not exceed required limits. Air tests will conform to ASTM C-924 for concrete pipe and ASTM F-1417 for plastic pipe.

According to the "Recommended Standards for Wastewater Facilities", all sewers must be placed at least 10 feet in the horizontal direction from all existing and proposed water mains. A vertical distance of 18" must be maintained between sewer lines and existing or proposed water mains. Pipe joints in both the water and sewer mains will be installed so the water and sewer joints will be "equidistant and as far as possible from the water main joints." (Recommended Standards for Wastewater Facilities pg. 30-11).

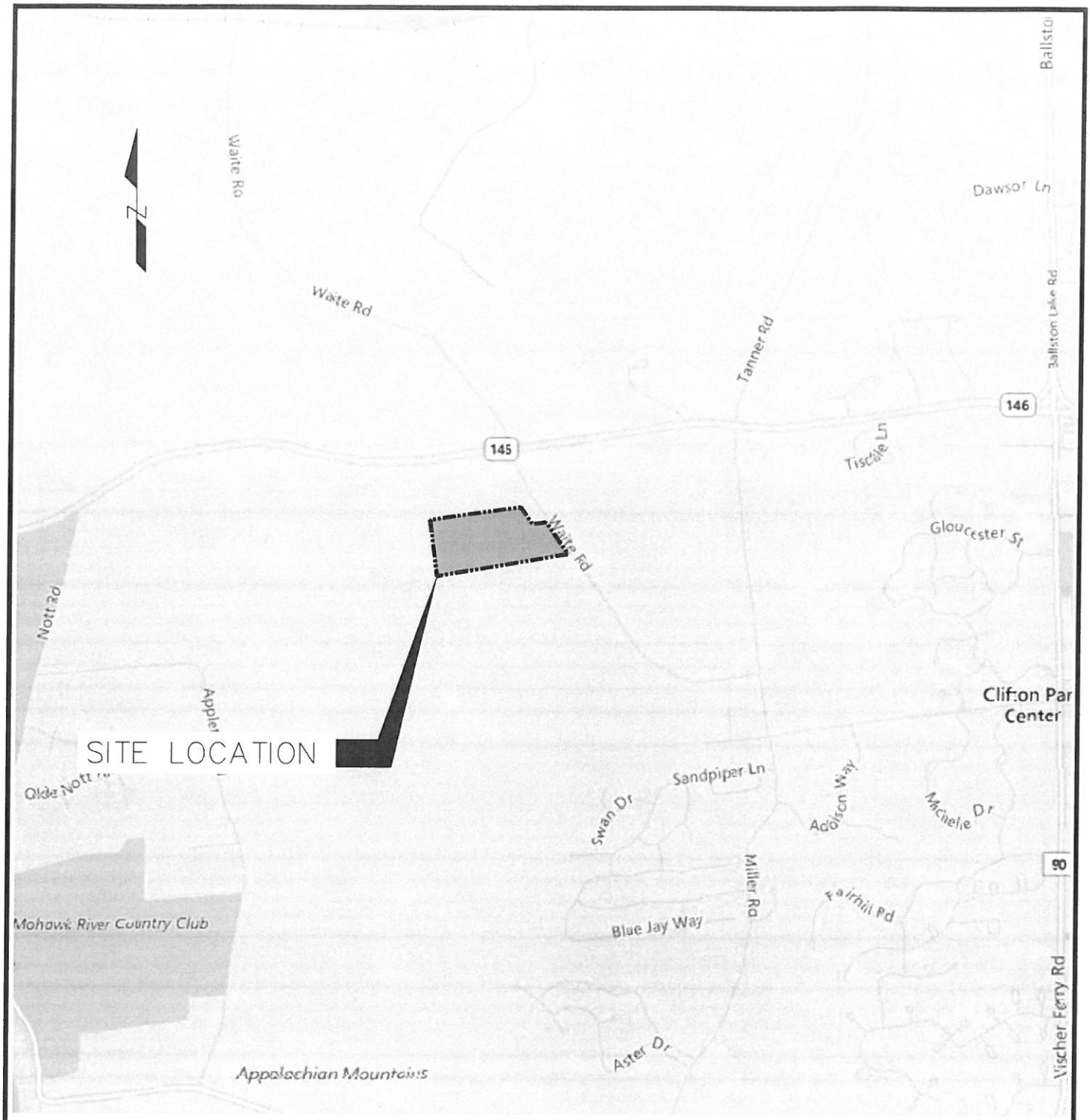
VII. FINANCING

The cost of the sewer system includes all piping, manholes, grinder pumps, directional drilling, backfill, and restoration necessary for the construction of the sewer district extension. The total estimated cost for this installation is $66,394. Please refer to Appendix D for the Project Cost Estimate. All capital costs for all sewer system improvements will be born entirely by the project owner/developer.

VII. SUMMARY

This sewer report, submitted on behalf of the proposed Lands of Khan Residential Subdivision outlines the expected wastewater contribution anticipated for the proposed subdivision. The calculations illustrated in the text of this report and in the appendices confirm the site conditions are favorable for the addition of sewer lines to service the proposed subdivision. The size and location of the sewer line conforms with the "Recommended Standards for Wastewater Facilities, 2014 Edition", published by the Great Lakes – Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers and all provisions set forth by the New York State Department of Environmental Conservation.

Appendix A:
Maps



0 1000 2000 4000 8000

SCALE: 1"=2000'

LANDS OF KHAN RESIDENTIAL SUBDIVISION

WAITE ROAD, TOWN OF CLIFTON PARK, SARATOGA COUNTY, NEW YORK

LANSING ENGINEERING
2452 STATE ROUTE 9, SUITE 301
MALTA, NY 12020
(518) 899-5243

SITE LOCATION MAP

PROJ. NO: 747.01
SCALE: AS NOTED
DATE: 09/28/15

MAP – 1
SHEET 1 OF 1

PROPOSED SEWER DISTRICT EXTENSION

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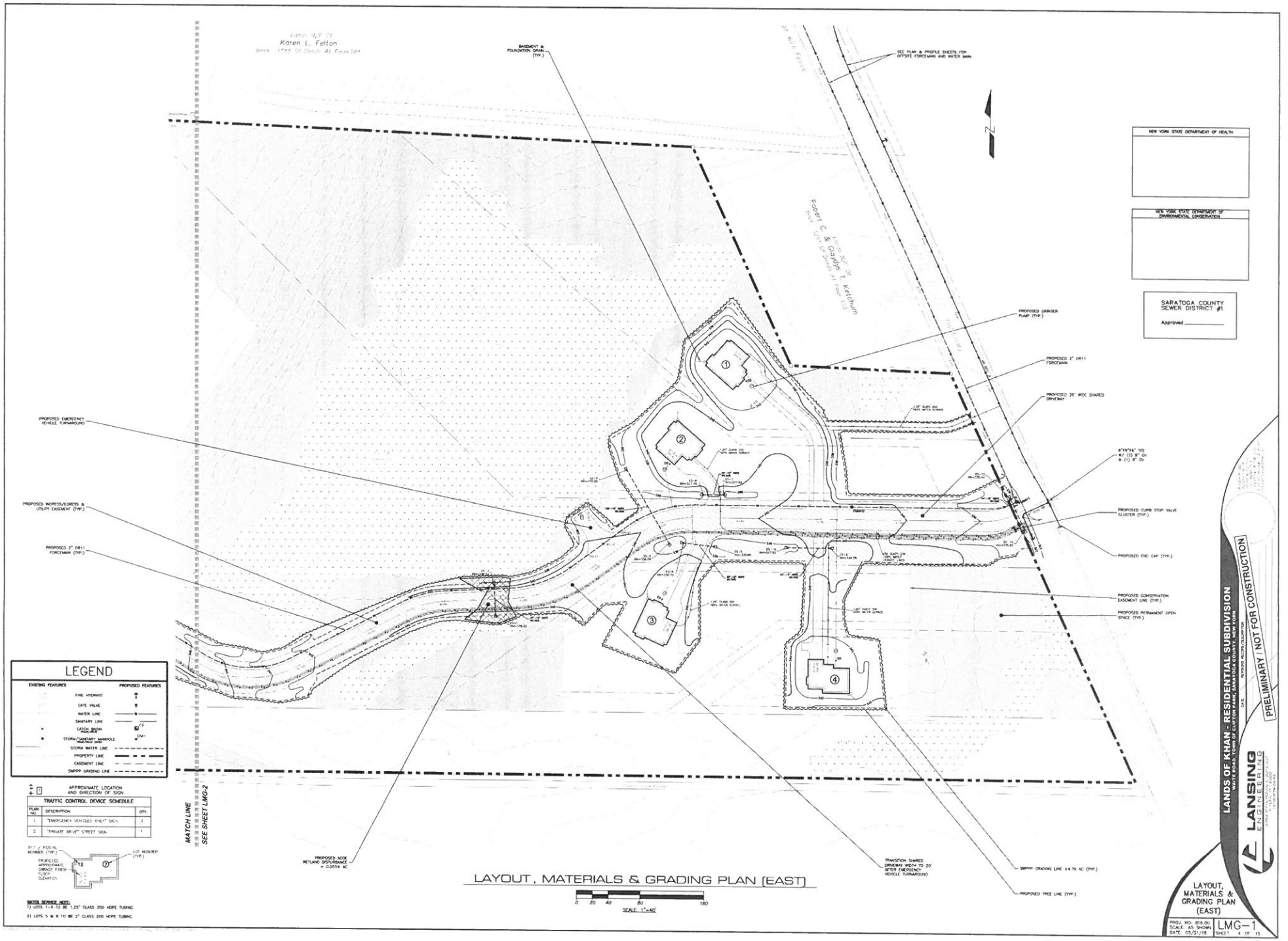
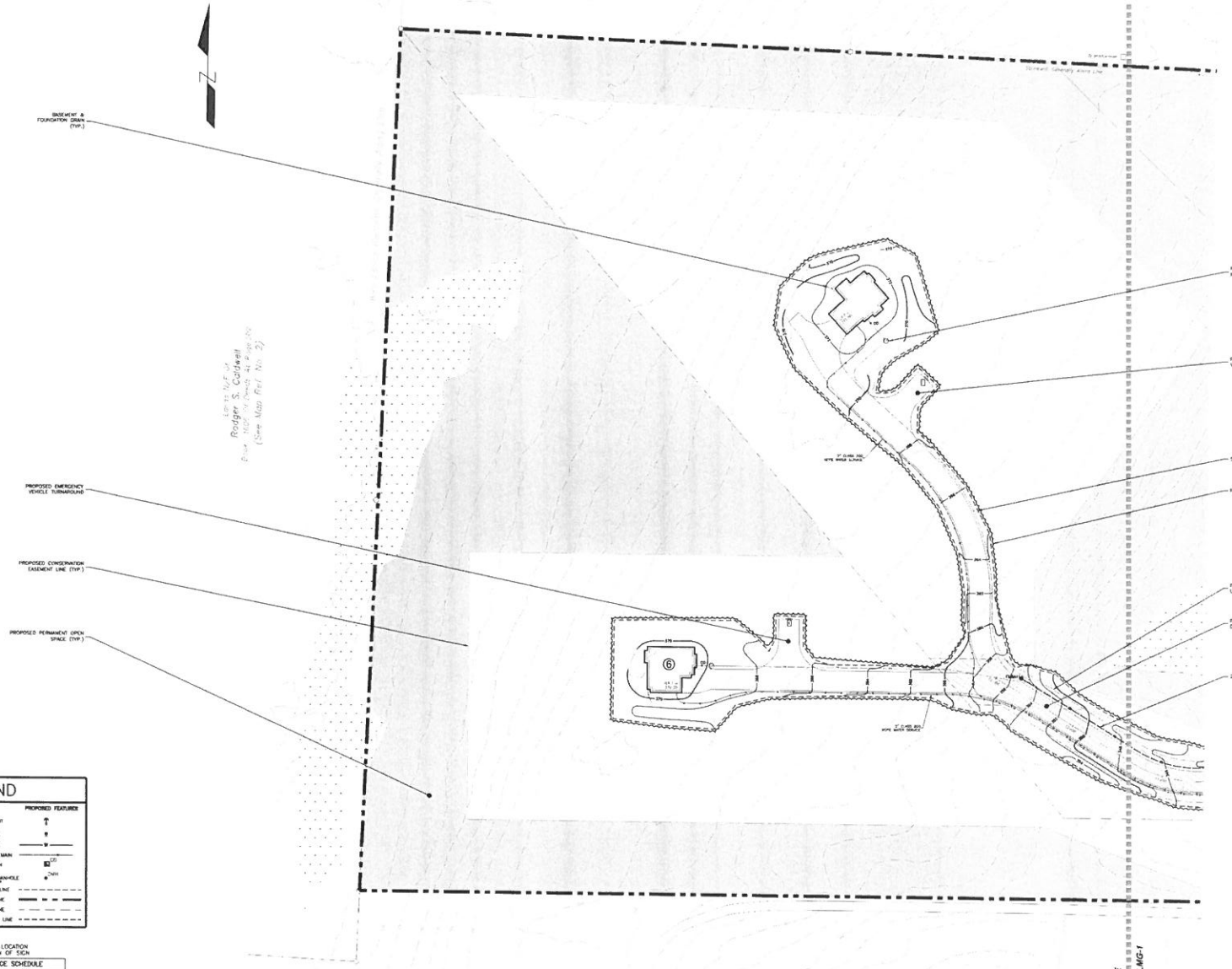
SCALE: 1"=1000'


Lands N/F Of
Karen L. Felton
BASEMENT & FOUNDATION DRAIN (TYP.)
SEE PLAN & PROFILE SHEETS FOR OFFSITE FORCEMAIN AND WATER MAIN
NEW YORK STATE DEPARTMENT OF HEALTH
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
SARATOGA COUNTY SEWER DISTRICT #1
Approved _____
PROPOSED GRINDER PUMP (TYP.)
PROPOSED 2" DR11 FORCEMAIN
PROPOSED 26' WIDE SHARED DRIVEWAY
PROPOSED EMERGENCY VEHICLE TURNAROUND
PROPOSED INGRESS/EGRESS & UTILITY EASEMENT (TYP.)
PROPOSED 2" DR11 FORCEMAIN (TYP.)
PROPOSED CURB STOP VALVE CLUSTER (TYP.)
PROPOSED END CAP (TYP.)
PROPOSED CONSERVATION EASEMENT LINE (TYP.)
PROPOSED PERMANENT OPEN SPACE (TYP.)
MATCH LINE
SEE SHEET LMG-2
PROPOSED ACOE WETLAND DISTURBANCE = 0.0556 AC
TRANSITION SHARED DRIVEWAY WIDTH TO 20' AFTER EMERGENCY VEHICLE TURNAROUND
SWPPP GRADING LINE ±4.76 AC (TYP.)
PROPOSED TREE LINE (TYP.)
LEGEND
EXISTING FEATURES
PROPOSED FEATURES
FIRE HYDRANT
GATE VALVE
WATER LINE
SANITARY LINE
CATCH BASIN
STORM/SANITARY MANHOLE
STORM WATER LINE
PROPERTY LINE
EASEMENT LINE
SWPPP GRADING LINE
APPROXIMATE LOCATION AND DIRECTION OF SIGN
TRAFFIC CONTROL DEVICE SCHEDULE
PLAN NO.
DESCRIPTION
QTY.
1 "EMERGENCY VEHICLE ONLY" SIGN 3
2 "PRIVATE DRIVE" STREET SIGN 1
911 / POSTAL NUMBER (TYP.)
LOT NUMBER (TYP.)
PROPOSED APPROXIMATE GARAGE FINISH FLOOR ELEVATION
WATER SERVICE NOTE:
1) LOTS 1-4 TO BE 1.25" CLASS 200 HDPE TUBING
2) LOTS 5 & 6 TO BE 2" CLASS 200 HDPE TUBING
LAYOUT, MATERIALS & GRADING PLAN (EAST)
0 20 40 80 160
SCALE: 1"=40'
LANDS OF KHAN - RESIDENTIAL SUBDIVISION
WATTS ROAD, TOWN OF CLIFTON PARK, SARATOGA COUNTY, NEW YORK
PRELIMINARY / NOT FOR CONSTRUCTION
LANSING ENGINEERING
LAYOUT, MATERIALS & GRADING PLAN (EAST)
PROJ. NO.: 818.00
SCALE: AS SHOWN
DATE: 05/21/18
LMG-1
SHEET 4 OF 15



NEW YORK STATE DEPARTMENT OF HEALTH

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SARATOGA COUNTY SEWER DISTRICT #1
Approved _____

LEGEND

EXISTING FEATURES	PROPOSED FEATURES
	FIRE HYDRANT
	GATE VALVE
	WATER LINE
	SANITARY FORCEMAIN
	CATCH BASIN
	STORM/SANITARY MANHOLE
	STORM WATER LINE
	PROPERTY LINE
	EASEMENT LINE
	SWPPP GRADING LINE

APPROXIMATE LOCATION AND DIRECTION OF SIGN

TRAFFIC CONTROL DEVICE SCHEDULE

PLAN NO.	DESCRIPTION	QTY.
1	"EMERGENCY VEHICLES ON 'I' SIGN	3
2	"PRIVATE DRIVE" STREET SIGN	1

911 / POSTAL NUMBER (TYP.)
LOT NUMBER (TYP.)
PROPOSED APPROXIMATE GARAGE FINISH FLOOR ELEVATION

WATER SERVICE NOTE:
1) LOTS 1-4 TO BE 1.25" CLASS 200 HDPE TUBING.
2) LOTS 5 & 6 TO BE 2" CLASS 200 HDPE TUBING.

LAYOUT, MATERIALS & GRADING PLAN

0 20 40 80 160
SCALE: 1"=40'

LANDS OF KHAN - RESIDENTIAL SUBDIVISION
WATTS ROAD, TOWN OF CLIFTON PARK, SARATOGA COUNTY, NEW YORK

REVISION / RECORD / DESCRIPTION
DATE

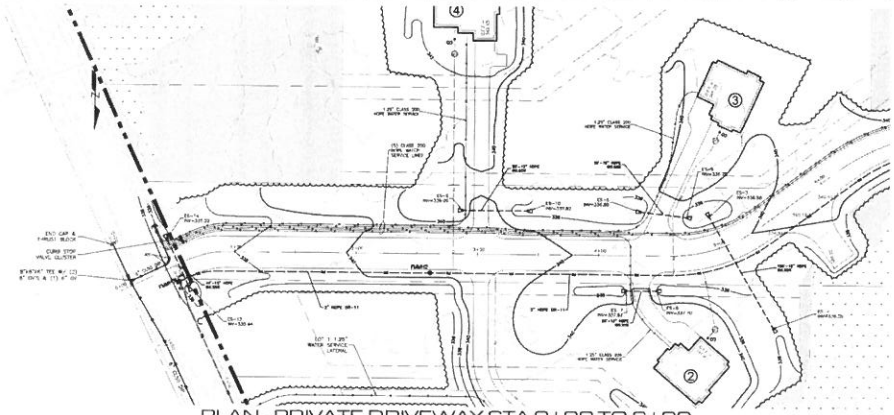
PRELIMINARY / NOT FOR CONSTRUCTION

LANSING ENGINEERING

LAYOUT, MATERIALS & GRADING PLAN (WEST)

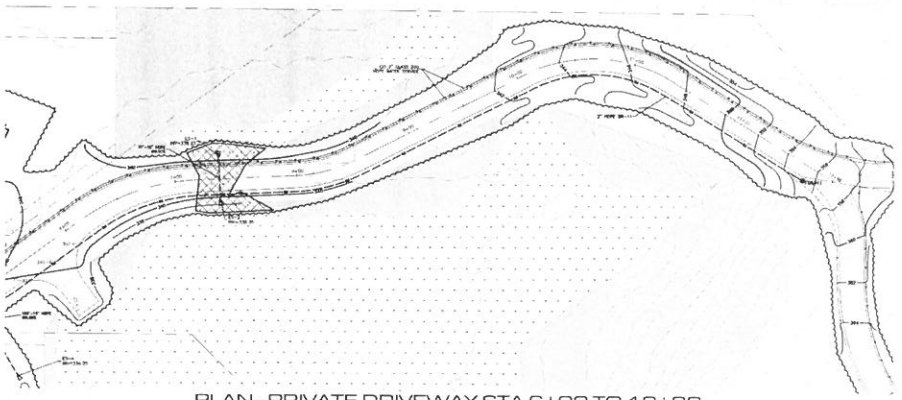
PROJ. NO.: 816.00
SCALE: AS SHOWN
DATE: 05/21/18

LMG-2
SHEET 5 OF 15



PLAN - PRIVATE DRIVEWAY STA 0+00 TO 6+00

SCALE: 1"=40'



PLAN - PRIVATE DRIVEWAY STA 6+00 TO 12+88

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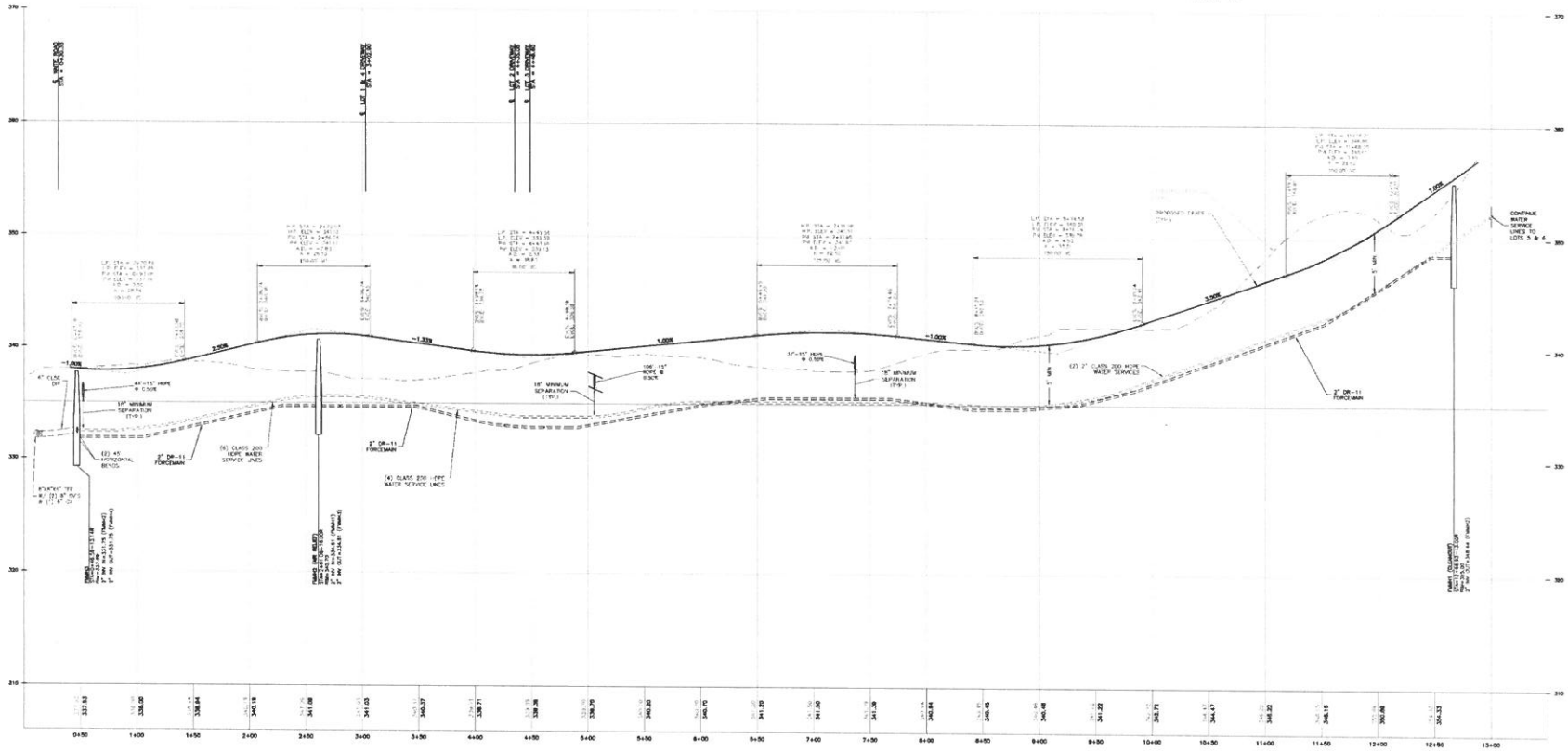


PROFILE - PRIVATE DRIVEWAY STA 0+00 TO 12+88

VERTICAL SCALE: 1" = 4'

HORIZONTAL SCALE: 1" = 40'

NEW YORK STATE DEPARTMENT OF HEALTH	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SARATOGA COUNTY SEWER DISTRICT #1

Approved _____

LANDS OF KHAN - RESIDENTIAL SUBDIVISION

PARTS OF PARCELS TOWN OF GALWAY, SARATOGA COUNTY, NEW YORK

PRELIMINARY / NOT FOR CONSTRUCTION

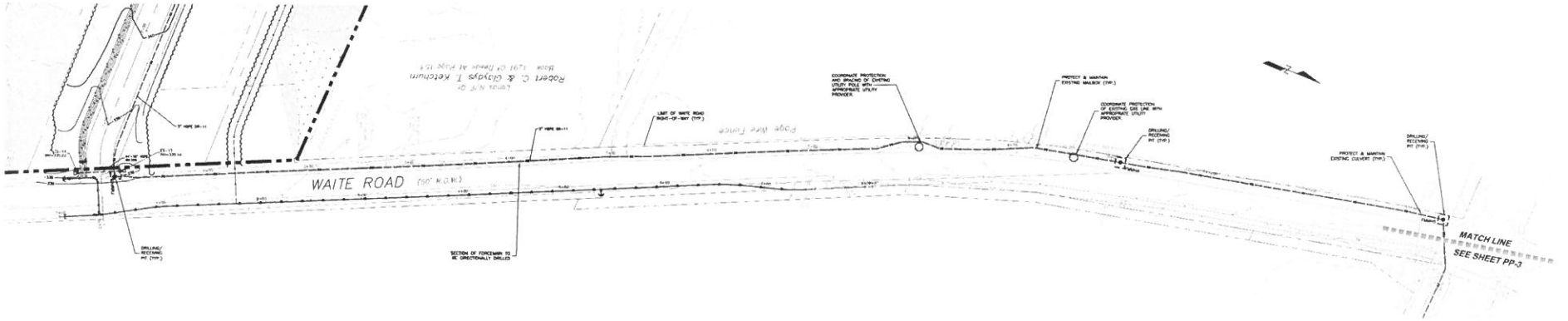
LANSING ENGINEERING

PLAN & PROFILE - PRIVATE DRIVEWAY

PROJ. NO. 816.00
SCALE: AS SHOWN
DATE: 05/21/18

PP-1

SHEET 6 OF 15



PLAN - OFFSITE FORCEMAIN STA 0+00 TO 13+50

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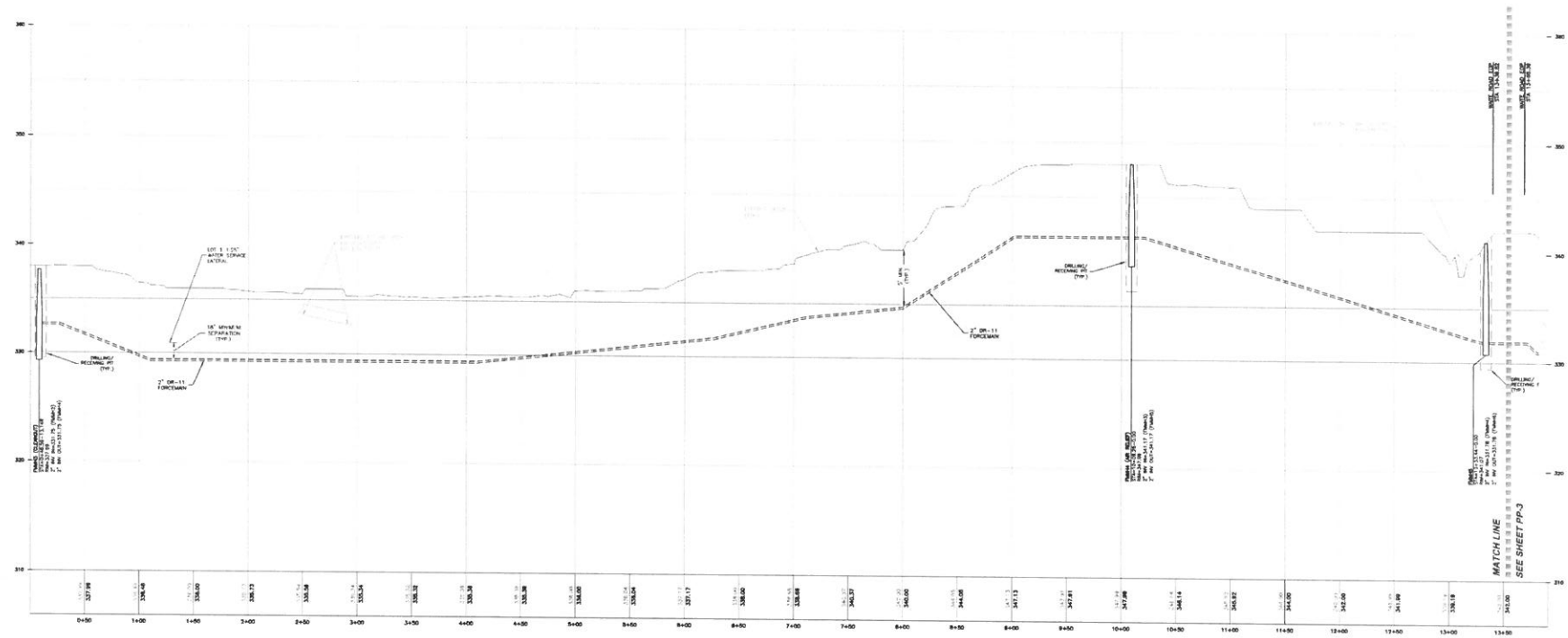


PROFILE - OFFSITE FORCEMAIN STA 0+00 TO 13+50

VERTICAL SCALE: 1" = 4'

HORIZONTAL SCALE: 1" = 40'

NEW YORK STATE DEPARTMENT OF HEALTH	NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SARATOGA COUNTY SEWER DISTRICT #1

Approved _____

LANDS OF KHAN - RESIDENTIAL SUBDIVISION

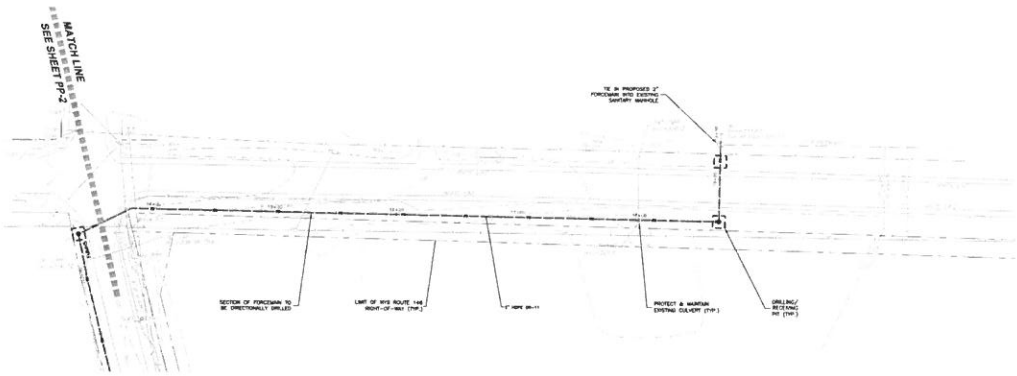
PRELIMINARY / NOT FOR CONSTRUCTION

LANSING ENGINEERING

PLAN & PROFILE - OFFSITE FORCEMAIN (1 OF 2)

PROJ. NO. 816.00
SCALE: AS SHOWN
DATE: 05/21/18

PP-3
SHEET 8 OF 15



PLAN - OFFSITE FORCEMAIN STA 13+50 TO 19+38

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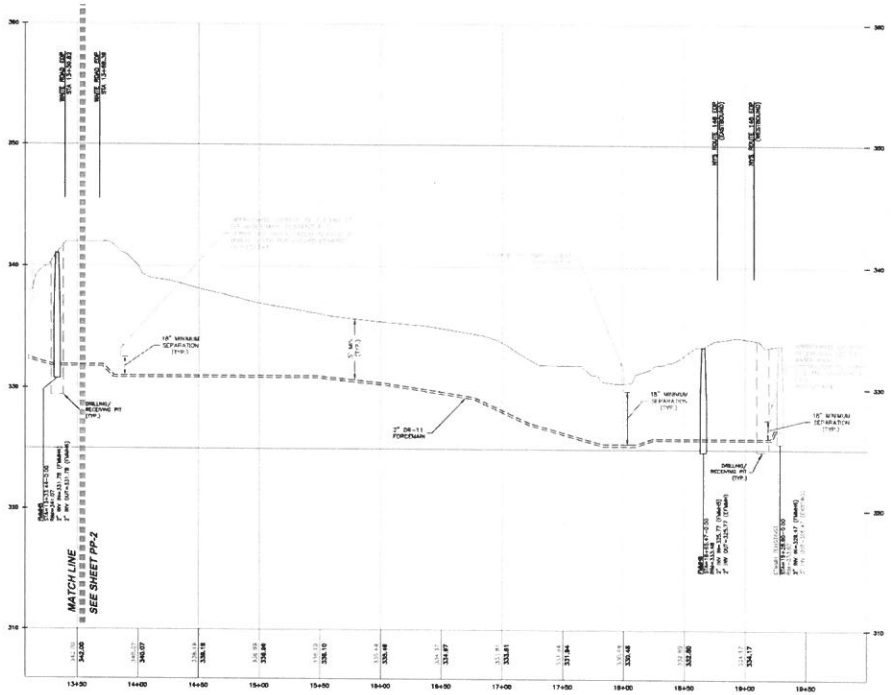

PROFILE - OFFSITE FORCEMAIN STA 13+50 TO 19+38

VERTICAL SCALE: 1" = 4'
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0 20 40 80 160
HORIZONTAL SCALE: 1" = 40'

NEW YORK STATE DEPARTMENT OF HEALTH

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SARATOGA COUNTY SEWER DISTRICT #1
Approved _____

LANDS OF KHAN - RESIDENTIAL SUBDIVISION
WAITE ROAD, TOWN OF ALL TOWNS, SARATOGA COUNTY, NEW YORK

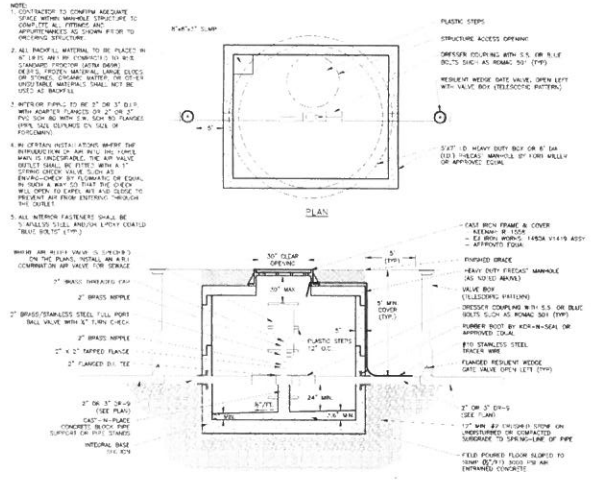
PRELIMINARY / NOT FOR CONSTRUCTION

LANSING ENGINEERING

PLAN & PROFILE - OFFSITE FORCEMAIN (2 OF 2)

PROJ. NO: 818.00
SCALE: AS SHOWN
DATE: 05/21/18

PP-4
SHEET 9 OF 15



5 CLEAN OUT AND AIR RELIEF STATION
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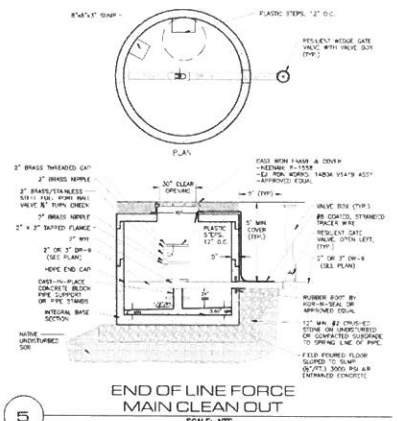

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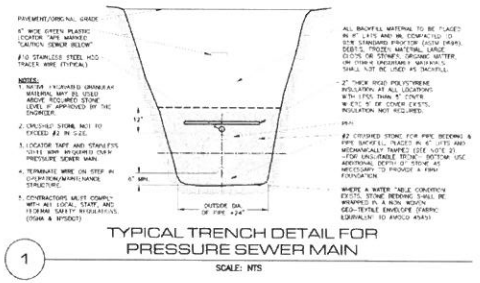

1 TYPICAL TRENCH DETAIL FOR PRESSURE SEWER MAIN
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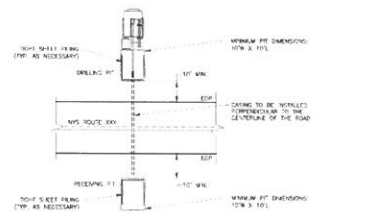


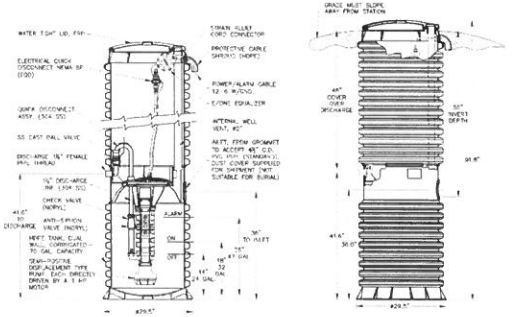
7 DIRECTIONAL DRILLING FOR SEWER DETAIL
SCALE: NTS

NEW YORK STATE DEPARTMENT OF HEALTH

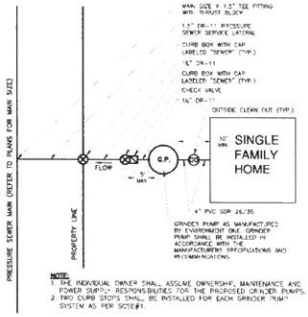
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

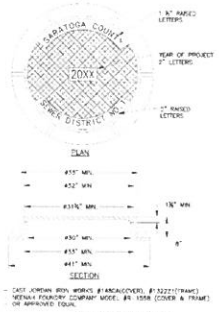
SARATOGA COUNTY SEWER DISTRICT #1
Approved _____

SINGLE FAMILY UNITS: MODEL #DH071-93



TYPICAL LATERAL INSTALLATION





4 MANHOLE COVER DETAIL
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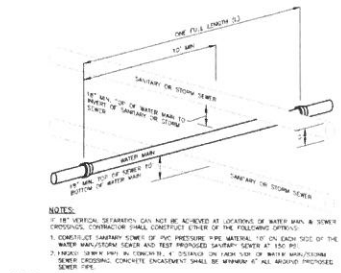

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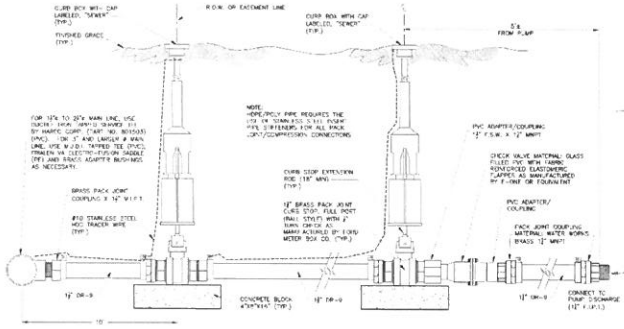
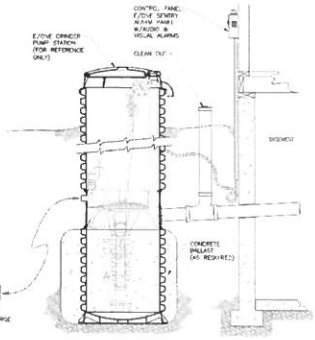


3 TYPICAL EXTERNAL GRINDER PUMP LAYOUT



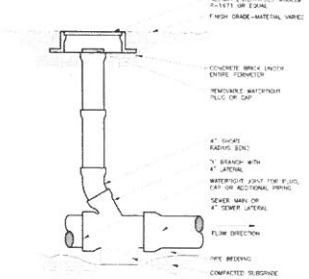
FORCE MAIN TESTING:

1. THE COMPLETE SEWAGE FORCE MAIN INCLUDING VALVES, FITTINGS CONNECTIONS TO PUMPS AND OTHER PIPELINE SYSTEMS SHALL BE TESTED FOR LEAKAGE.

2. THE SYSTEM SHALL BE PRESSURIZED TO 1.5 TIMES THE PIPE WORKING PRESSURE OR 100 PSI, WHICHEVER IS GREATER, AT THE POINT OF TESTING AFTER FIVE PRESSURE (45 PSI) HAS BEEN MAINTAINED SUCCESSFULLY FOR (1) HOUR. THE LEAKAGE TEST SHALL BE PERFORMED FOR A PERIOD OF NO LESS THAN (2) HOURS. HYDRAULIC TESTS SHALL BE PERFORMED AND SUCCESSFUL TEST RESULTS DERIVED IN ACCORDANCE WITH AWWA C 600, SECTION 5. IF THE LEAKAGE IN THE SYSTEM EXCEEDS THE SPECIFIED AMOUNT, MAKE ANY REPAIRS OR REPLACEMENTS NECESSARY TO REDUCE THE LEAKAGE TO THE ALLOWED LIMITS AND RE-TEST THE SYSTEM.

THE MAXIMUM ALLOWABLE LEAKAGE SHALL BE AS SHOWN IN THE FOLLOWING TABLE. ALLOWABLE LEAKAGE IN GALLONS PER HOUR PER 1000 FT (305 m) OF PIPELINE.

AVG. TEST PRESSURE	NOMINAL PIPE DIAMETER-IN.	
PSI (BAR)	2	4
450 (31)	0.32	0.64
400 (28)	0.30	0.60
350 (24)	0.28	0.56
300 (21)	0.26	0.52
275 (19)	0.25	0.50
250 (17)	0.24	0.47
225 (15)	0.23	0.45
200 (14)	0.21	0.43
175 (12)	0.20	0.40
150 (10)	0.19	0.37
125 (9)	0.17	0.34
100 (7)	0.15	0.30



1 TYPICAL CLEAN OUT
SCALE: NTS

LANDS OF KHAN - RESIDENTIAL SUBDIVISION
WAITE ROAD, TOWN OF CLIFTON PARK, SARATOGA COUNTY, NEW YORK

PRELIMINARY / NOT FOR CONSTRUCTION

LANSING ENGINEERING

SANITARY SEWER DETAILS

PROJ. NO: 818.00
SCALE: AS SHOWN
DATE: 05/21/18

DT-3
SHEET 14 OF 15

Appendix B:
Hydraulic Capacity Calculations

Hydraulic Capacity Calculations

Wastewater Flow Contributors

Lands of Khan Residential Subdivision – The network includes the proposed 6 single family residential units.

Population = (6 single family residences) x (2.5 residents/unit) = 15 residents
Design Average Daily Wastewater Flow = (15) x (100 gpd/resident) = 1,500 gpd

Wastewater System Configuration

The sanitary sewer network within the Lands of Khan Residential Subdivision collects the wastewater flow from the residents by means of individual grinder pumps which connect to a 2" low pressure forcemain. Wastewater will be conveyed by low pressure forcemain first along the proposed shared driveway for the subdivision, then north along Waite Road, and then east on the south side of NYS Route 146 before crossing under the road to connect to the existing 3" forcemain along the north side of NYS Route 146. The collected wastewater will ultimately be conveyed to, and treated at, the Saratoga County Sewer District No.1 Wastewater Treatment Plant located in the Town of Halfmoon, Saratoga County, New York.

Wastewater System Capacity Design

Lands of Khan Residential Subdivision – The network includes the proposed 6 single family residential units.

Population = 15 residents

Cumulative Design Average Daily Wastewater Flow

= (Population) x (100 gpd/residents)
= (15) x (100 gpd/household)
= 1,500 gpd = 1.04 gpm

Peak Hour Factor (P = population in thousands)

$$= \frac{(18 + P^{1/2})}{(4 + P^{1/2})} = \frac{(18 + 0.015^{1/2})}{(4 + 0.015^{1/2})} = 4.40$$

PHF = 4.40

Cumulative Peak Hour Wastewater Flow

= (Average Daily Wastewater Flow) x (Peak Hour Factor)
= (1,500 gpd) x (4.40)
= 6,600 gpd
= 4.58 gpm (calculated design flow, required flow)

Low Pressure Forcemain Pipe Sizing

Individual grinder pumps at each residence will pump wastewater thru a low pressure forcemain system to sanitary manholes on and off the subdivision parcel. A 2" diameter DR 11 Forcemain pipe will handle the flow from the project. The pipe size analysis is below:

2" Diameter DR 11 Forcemain (actual average diameter = 1.917")
Area = 0.020 SF

Velocity	= 2.0 FPS minimum	= 6.0 FPS maximum
Flow	= 0.040 CFS minimum	= 0.12 CFS maximum
	= 17.95 gpm minimum	= 53.86 gpm maximum
	17.95 gpm > 4.58 gpm	53.86 gpm > 6.98 gpm

2" Diameter DR 11 Forcemain is greater than needed
Therefore, 2" Diameter DR 11 Forcemain is OK.

Downstream Analysis

Based on conversations with the Clifton Park Sewer Department, the 3" forcemain along NYS Route 146 has approximately 9,000 GPD remaining capacity based on existing usage. The following is an analysis of the contributing areas of the 3" line to determine if there is an issue with adding the additional wastewater flow from the Lands of Khan Residential Subdivision project. The contributing areas are as follows:

MeadowView Senior Apartments – This senior apartment complex is located at the southeast corner of the intersection of Waite Road and NYS Route 146. The building is ± 63,000 SF and includes 70 apartment units (64 1-bedroom, 6 2-bedroom, 76 total bedrooms).

Average daily wastewater flow = (76 bedrooms) x (110 gpd)
Average daily wastewater flow = 8,360 gpd = 5.81 gpm

21st Century Park Building – The 21st Century Park building is located on the north side of NYS Route 146 and includes a church and car rental agency. The church is assumed to have 150 seats, while the car rental facility is assumed to have 5 employees.

Average daily wastewater flow = (150 seats) x (3 gpd) + (5 employees) x (15 gpd/employee)
= 450 gpd + 75 gpd
= 525 gpd = 0.4 gpm

Total (Including Project) = 1,500 gpd + 8,360 gpd + 525 gpd = 10,385 gpd

Population = (10,385 gpd)/(100 gpd/capita) = 104 persons

Peak Hour Factor (P = population in thousands)

$$= \frac{(18 + P^{1/2})}{(4 + P^{1/2})} = \frac{(18 + 0.104^{1/2})}{(4 + 0.104^{1/2})} = 4.24$$

Peak Hour Wastewater Flow
= (10,385 gpd) x (4.24)
= 44,032 gpd
= 30.58 gpm

Downstream Analysis - The following represents an isolated local analysis of the receiving lines to determine the percentage of increase in flows to the existing 3" gravity main that the project will be conveying all wastewater flows to.

3" Diameter DR 9 Forcemain

Area	= 0.04 SF	= 0.04 SF
Velocity	= 2.0 FPS minimum	= 6.0 FPS maximum
Flow	= 0.08 CFS minimum	= 0.24 CFS maximum
	= 35.9 gpm minimum	= 107.7 gpm maximum
	35.9 gpm > 30.58 gpm	30.58 gpm < 107.7 gpm

Therefore, 3" existing forcemain is OK to convey full buildout scenario wastewater

flows from the Lands of Khan Residential Subdivision in addition to the

107.7 gpm (design capacity) > 4.58 gpm
4.58 gpm ≈ 4.25% of the capacity of the existing 3" forcemain pipe

Appendix C:
Environment One Corporation
Pressure Sewer Preliminary Cost and Design Analysis

SEWER SYSTEMS

Environment One Corporation

Pressure Sewer Preliminary Cost and Design Analysis For Kahn Residential rev. 1 Saratoga County, NY

Prepared For:
Lansing Engineering
2452 State Route 9, Suite 301
Malta NY 12020 USA
Tel: 518-899-5243
Fax: 518-899-5245
Prepared By: M. Crowley / N. Shafarzek

May 9, 2018

May 9, 2018

Budgetary Low Pressure Sewer System Costs

Kahn Residential rev. 1
Saratoga County, NY

	Quantity	Description	Unit Cost	Installation	Sub Total
Valves	2	Air/Vacuum Release Valve	$0.00	0.00	$0.00
	4	Clean Out	$0.00	0.00	$0.00
					$0.00
Pumps	6	DH071-93	$0.00	0.00	$0.00
	6	Lateral (Boundary) Installation	$0.00	0.00	$0.00
	6	Pump/Panel Installation	$0.00	0.00	$0.00
	6	Lateral Kits (Includes Ball\Check Valve Assembly)	$0.00	0.00	$0.00
	300	LF of 1.25" Lateral Pipe	$0.00	0.00	$0.00
					$0.00
Piping	3,533	2.00" Pipe	$0.00	0.00	$0.00
					$0.00

Number of Connections	**6**		
Total Per Connection	**$0.00**	**Total (w/o other)** >>>>>>>>>>>>	**$0.00**
Grand Total Per Connection	**$0.00**	**Grand Total (including other)** >>>>>>>>>>>>	**$0.00**

Note: The System Costs above are based on piping sized for, and Grinder Pumps manufactured by Environment One Corporation.

Kahn Residential rev. 1
Saratoga County, NY

Prepared by : M. Crowley / N. Shafarzek **On:** May 9, 2018

Notes :
Analysis based upon drawings and data provided. Station recommendations are preliminary.

GPD values impact retention times only, not line sizing or hydraulics.

Lateral assembly required on GP station discharge.

Per lansing engineering, this LPS system will tie in to an existing force main. At the time of creation of this report, this tie-in pressure is not known.

Based on the following analysis, I have determined that the maximum allowable tie in pressure is 40 psi. Beyond this tie-in pressure the pumps' performance will be negatively effected. If the tie-in pressure is discovered to be higher than 40 psi, we would not recommend e/one grinder pumps for this application.

rev. 1: theoretical tie-in pressure of 37 psi determined by town of clifton park. tie-in pressure added to static head calculations. System will work with this tie-in pressure. Any further additions will need to be analyzed to ensure the system will still work properly.

<<<<< END OF NOTES >>>>>

PRELIMINARY PRESSURE SEWER - PIPE SIZING AND BRANCH ANALYSIS

Prepared By:
M. Crowley / N. Shafarzek

Kahn Residential rev. 1
Saratoga County, NY

May 9, 2018

Zone Number	Connects to Zone	Number of Pumps in Zone	Accum Pumps in Zone	Gals/day per Pump	Max Flow Per Pump (gpm)	Max Sim Ops	Max Flow (GPM)	Pipe Size (inches)	Max Velocity (FPS)	Length of Main this Zone	Friction Loss Factor (ft/100 ft)	Friction Loss This Zone	Accum Fric Loss (feet)	Max Main Elevation	Minimum Pump Elevation	Static Head (feet)	Total Dynamic Head (ft)
This spreadsheet was calculated using pipe diameters for: SDR11HDPE											Friction loss calculations were based on a Constant for inside roughness "C" of: 150						
1.00	2.00	2	2	250	11.00	2	22.00	2.00	2.38	1,185.00	1.19	14.09	73.25	455.00	370.00	85.00	158.25
2.00	2.00	4	6	250	11.00	3	33.00	2.00	3.57	2,348.00	2.52	59.16	59.16	431.00	341.00	90.00	149.16

Note: This analysis is valid only with the use of progressive cavity type grinder pumps as manufactured by Environment One.

Prepared By:
M. Crowley / N. Shafarzek

PRELIMINARY PRESSURE SEWER - ACCUMULATED RETENTION TIME (HR)

Kahn Residential rev. 1
Saratoga County, NY

May 9, 2018

Zone Number	Connects to Zone	Accumulated Total of Pumps this Zone	Pipe Size (inches)	Gallons per 100 lineal feet	Length of Zone	Capacity of Zone	Average Daily Flow	Average Fluid Changes per Day	Average Retention Time (Hr)	Accumulated Retention Time (Hr)
This spreadsheet was calculated using pipe diameters for: SDR11HDPE								Gals per Day per Dwelling		250
1.00	2.00	2	2.00	15.40	1,185.00	182.52	500	2.74	8.76	14.55
2.00	2.00	6	2.00	15.40	2,348.00	361.66	1,500	4.15	5.79	5.79

Note: This analysis is valid only with the use of progressive cavity type grinder pumps as manufactured by Environment One

LANSING ENGINEERING, PC

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LANDS OF KHAN RESIDENTIAL SUBDIVISION

SANITARY SEWER EXTENSION COST ESTIMATE

CATEGORY	ITEM	QUANTITY	UNITS	UNIT COST	ITEM COST
2" Diameter Off-Site Forcemain					
Structures					
	Air Release Manhole	1	EA	$ 10,000	**$ 10,000**
	Clean Out Manhole	3	EA	$ 4,500	**$ 13,500**
Pipe Network					
	2" DR11 HDPE/Fittings/Valves/etc.	1,920	LF	$ 5	**$ 9,600**
Directional Drilling					
	Horizontal Directional Drilling	1,920	LF	$ 12	**$ 23,040**
Traffic Protection					
	Work Zone Traffic Control & Shoulder Closure	6	DAY	$ 675	**$ 4,050**
Miscellaneous					
	Mobilization & Setup	1	LS	$ 5,000	**$ 5,000**
	Construction Stakeout	2.0%	LS	$ 60,190	**$ 1,204**
				Total Cost	**$ 66,394**

Item costs were determined by referencing the "RS Means Site Work and Landscape Cost Data", "RS Means Heavy Construction Cost Data", the New York State Department of Transportation weighted average bid price program, as well as similar projects, professional experience, and contractor quotes.

Appendix D:
Legal Description of Sewer District Extension