

AMENDED SANITARY SEWER ENGINEER'S REPORT

for

***Sharbell Building Company, LLC
Planned Residential Development – KT Tract***

***Block 28005, Lot 66
17 Research Road
Township of Montgomery
Somerset County, New Jersey***

Prepared by:



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A handwritten signature in black ink, appearing to read 'Jeffrey S. Haberman', with a long horizontal line extending to the right.

Jeffrey S. Haberman, PE, PP
NJ Professional Engineer License #53560

January 2018
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DEC # 0043-14-015

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A. Introduction

This report is a summary of the design criteria for the proposed sewer extension for a residential development project to be constructed in the Township of Montgomery, Somerset County, New Jersey for the Sharbell Building Company, LLC.

The project area consists of Block 28005, Lot 66, in the Township of Montgomery, Somerset County, New Jersey. The subject parcel originally consisted of a vacated office building with associated site improvements and wooded area, and is presently under construction for a residential development previously approved under Montgomery Township Planning Board Case No. PB-01-18.

The previously approved project consisted of the new construction of 107 townhome dwellings, a 40-unit condominium building with two bedrooms per unit, roadways, parking areas, recreational open space areas and other associated improvements and amenities as shown on the Site Plan drawings. The 107 townhome dwellings break down to 55 dwellings with three bedrooms and 52 dwellings with four bedrooms.

The Amended Site Plan consists of replacing the 40-unit condominium building (on Block 28009 Lots 1, 2, & 3) with 20-unit stacked townhomes with associated site improvements. In turn, there has been a reduction in total number of units, and therefore a reduction of flow from the previous approval.

The existing conditions of the tract have been verified by the ALTA/NSPS Land Title Survey, prepared by Dynamic Survey, LLC, dated 04/18/2017, last revised 11/29/2017.

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B. Regional Sewer System

The site is located within a sewer service area. There are no existing sanitary sewer lines that serve the subject parcel and there are no public sanitary sewer lines within Georgetown-Franklin Turnpike in the immediate vicinity of the project site. Sanitary sewer service was previously provided to the existing office building via a septic system.

A Treatment Works Approval was previously granted for the sanitary sewer systems that were designed and constructed for the “Hillside” and “Tapestry” residential developments to the north of the subject parcel. Please refer to the Appendix of this Report for detailed mapping of both developments. The existing sanitary sewer collection systems are under the ownership of the Township of Montgomery Department of Public Works.

Due to the lack of an existing conveyance system within the surrounding roadway network, the proposed development will connect to the existing sanitary sewer collection system within the Hillside residential development to the north of the subject parcel. The proposed development proposes 8” SDR-35 PVC sanitary sewer gravity mains which conveys sewerage

from the individual townhome units to the existing manhole (Structure ID NP0254) near the southerly terminus of Hartwick Drive in Hillside. Sewerage from this point will be conveyed through the existing 8" sewer gravity main to the existing pump station (Structure ID NP0275) in the northeast corner of the Hillside development, which in turn will convey sewerage via an existing 4" force main to an existing manhole (Structure ID NP0143) within the adjacent Tapestry residential development to the west. From here, sewerage will be conveyed through the existing 8" sewer gravity main to the existing pump station (Structure ID NP 0125) near the northwestern corner of the Tapestry development where it will be pumped to the Skillman Village Wastewater Treatment Plant for treatment.

C. Design Calculations

The anticipated average daily flow has been determined based on the proposed development and the projected flow criteria set forth by NJAC 7:14A-23.3.

Previously Approved Sewer Demand:

<u>USE</u>	<u>UNITS</u>	<u>DESIGN FLOW</u>	<u>AVERAGE DAILY FLOW (GPD)</u>
3-4 Bedroom Townhomes	107	300 gpd/unit	32,100
2 Bedroom Condominium	40	225 gpd/unit	9,000
Total anticipated demand:			41,100

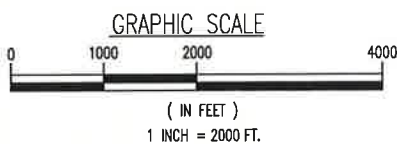
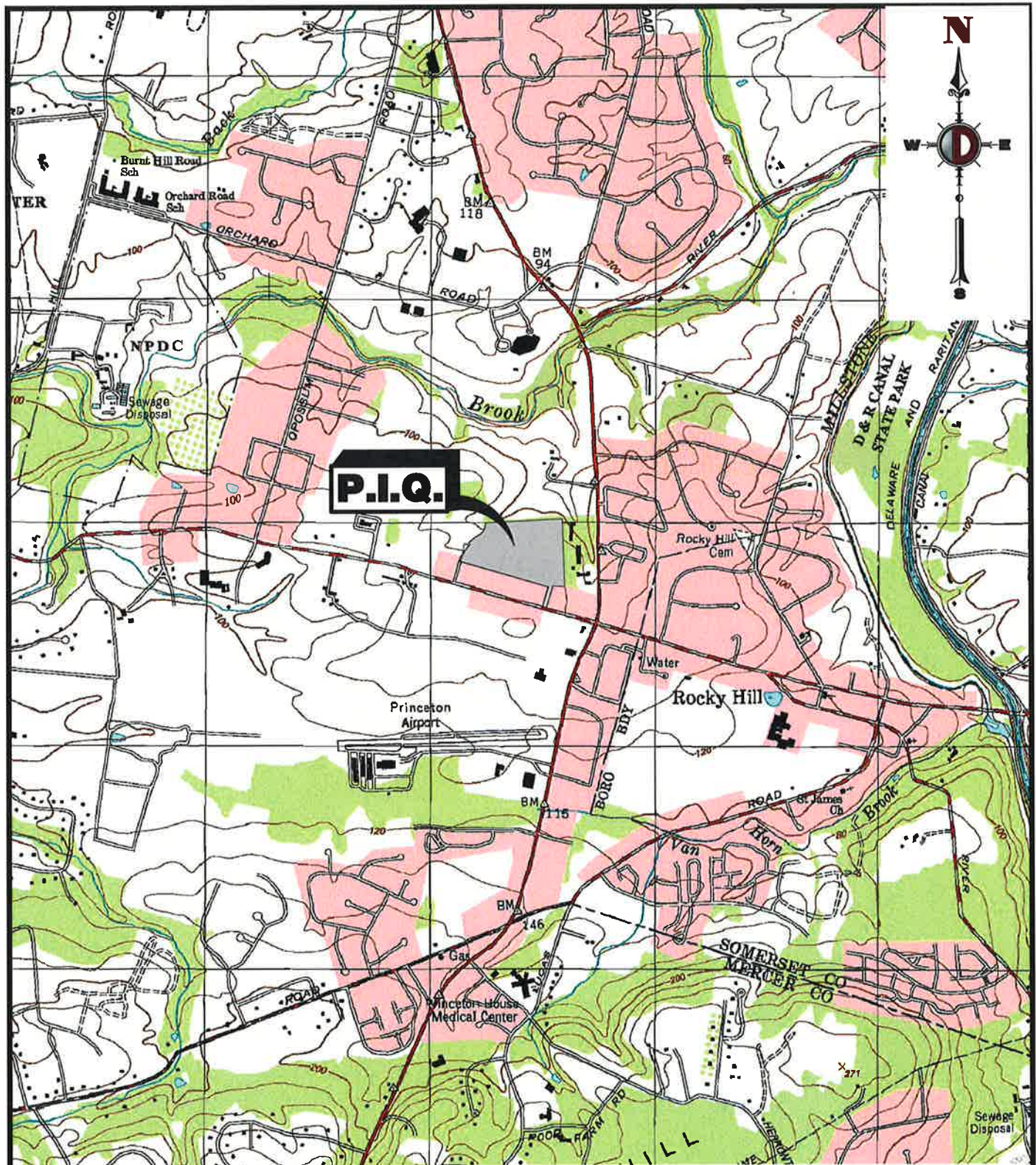
Amended Sewer Design Demand:

<u>USE</u>	<u>UNITS</u>	<u>DESIGN FLOW</u>	<u>AVERAGE DAILY FLOW (GPD)</u>
2 Bedroom Stacked Townhomes	10	225 gpd/unit	2,250
3 Bedroom Stacked Townhome	10	300 gpd/unit	3,000
3-4 Bedroom Townhomes	107	300 gpd/unit	32,100
Total amended anticipated demand:			37,350

As noted above, this is a decrease in sewer demand by 3,750 GPD, which is within the approved sewer flow in the current Treatment Works Approval.

APPENDIX

USGS MAP

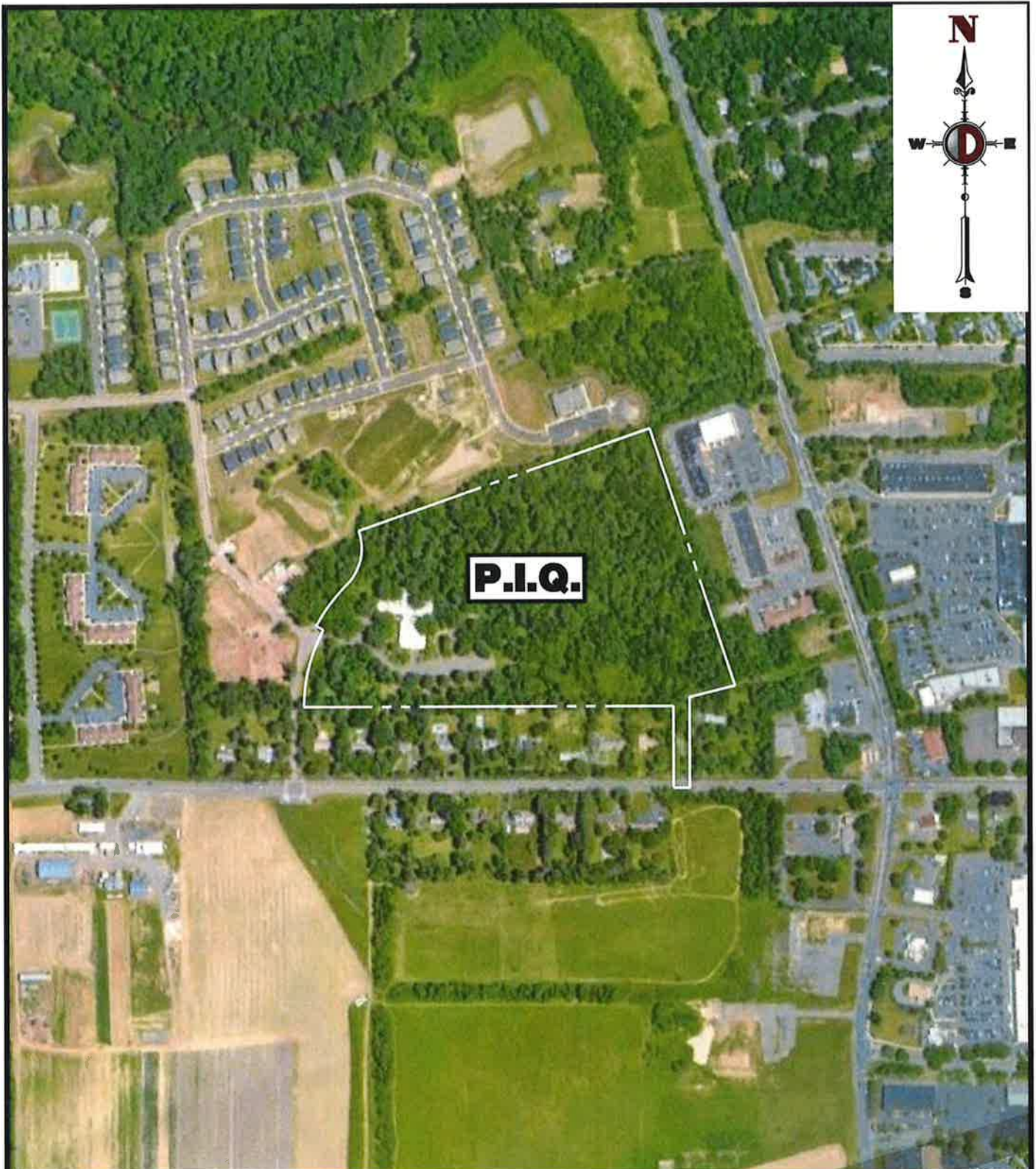


KEY MAP
1" = 2,000'

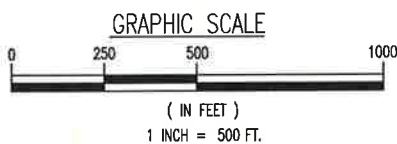
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AERIAL MAP



P.I.Q.



KEY MAP
1" = 500'

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PIPE CAPACITY CALCULATIONS



DYNAMIC ENGINEERING

Capacity of Circular Pipe Flowing 1/2 Full

Project: Sharbell Montgomery

Job #: 0043-14-015

Location: Montgomery Township, Somerset County, NJ

Computed By: MSA

Checked By: JSH

Date: 1/15/2018

PIPE DESCRIPTION	MIN. SLOPE (%)	SIZE (IN)	MANNING'S COEFFICIENT (n)	VELOCITY (FT/S)	CAPACITY (CFS)	CAPACITY (GPD)	CAPACITY (MGD)
8" PVC Sanitary	0.500%	8	0.010	3.19	0.56	359,937	0.36

Variables Defined

Q=Capacity of Pipe (CFS)

V=Velocity in Pipe Section (FT/S)

R=Hydraulic Radius of Pipe Section

S=Slope of Pipe Section (FT/FT)

D=Diameter of Pipe (FT)

d=Depth of Flow in Pipe (FT)

n=Manning's Coefficient

Wp=Wetted Perimeter (FT)

Typical Values for Manning's Coefficient (n)

n(RCP)= 0.013

n(HDPE-Smooth Interior)= 0.012 *Varies with Manufacturer

n(DIP)= 0.013

n(PVC)= 0.010

n(CMP)= 0.024

Equations used:

Q=VA

$V = (1.49/n) \cdot R^{2/3} \cdot S^{1/2}$

$Q = (1.49/n) \cdot R^{2/3} \cdot S^{1/2} \cdot A$

Utilizing Appendix 16.A from the Civil Engineering Reference Manual-Seventh Edition, by Micheal Lindeburg, Copyright 1999

The following equations were utilized to calculate the Hydraulic Radius and Area of a Circular Pipe Section flowing 1/2 full

$A = (\pi \cdot D^2 / 4) \cdot 0.5 = 0.3927 \cdot D^2$

$R = A / Wp = 0.3927 \cdot D^2 / ((2 \cdot \pi \cdot D / 2) \cdot 0.5) = 0.25 \cdot D$

Therefore:

$Q = (1.49/n) \cdot (0.25 \cdot D)^{2/3} \cdot S^{1/2} \cdot (0.3927 \cdot D^2)$

$V = (1.49/n) \cdot (0.25 \cdot D)^{2/3} \cdot S^{1/2}$

Unit Conversion Equations

1 Cubic Foot=7.4805 Gallons

1 Day = 86,400 Seconds

Therefore:

$\frac{\text{Cubic Foot}}{\text{Second}}$	X	$\frac{86,400 \text{ Seconds}}{1 \text{ Day}}$	X	$\frac{7.4805 \text{ Gallons}}{1 \text{ Cubic Foot}}$	=	$\frac{\text{Gallon}}{\text{Day}}$
$\frac{\text{Gallon}}{\text{Day}}$	X	$\frac{1 \text{ Million Gallons}}{1,000,000 \text{ Gallons}}$	=	$\frac{\text{Million Gallons}}{\text{Day}}$		

**TOWNSHIP OF MONTGOMERY
SEWER GIS MAPPING**

