ENGINEER’S REPORT

PUBLIC SEWER EXTENSION
TO SERVE
THE PROPOSED

VISTA TECHNOLOGY CAMPUS

TOWN OF BETHLEHEM
&
TOWN OF NEW SCOTLAND
ALBANY COUNTY, NEW YORK

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INTRODUCTION

Hershberg & Hershberg, Consulting Engineers, were retained by Vista Development Group, LLC, developer of the proposed VISTA TECHNOLOGY CAMPUS (hereinafter the “Applicant”), to prepare final civil engineering design of the proposed development. The location of this project is shown in Appendix 1 – Location Map. One task was to design the pumping station located adjacent to a proposed Building M on the VISTA TECHNOLOGY CAMPUS to serve the VISTA TECHNOLOGY CAMPUS (hereinafter VISTA pumping station) and the connection to the existing sewer system. The VISTA TECHNOLOGY CAMPUS has been the subject of review by the Town of Bethlehem and in connection with that an Engineering Report: Water Supply and Sewage Treatment was prepared by The Saratoga Associates. This report was based upon a concept plan. Where appropriate, that report is quoted herein. A further developed and detailed plan for Phase I, Phase II and Phase III has been prepared by Hershberg & Hershberg. The extent of the sewer system is shown on Plan of Sewer System and Water Distribution Plan - Vista Technology Campus (see Appendix 2). That plan forms the basis for the computation of sewer flows and the design of the pump station.

EXISTING CONDITIONS

A majority of the proposed project is located within Sewer District Extension 13, Area 1 in the Town of Bethlehem. Effluent from the development will ultimately be received, treated and discharged to the Hudson River by the existing Town-owned wastewater treatment plant located at the confluence of the Normanskill and Hudson River. An extension of the existing Sewer District into the Town of New Scotland will be required to serve the balance of the Project lands. This action will require the appropriate legal process with the Towns of Bethlehem and New Scotland for extension of the existing district. According to Town officials, there is currently excess capacity at the wastewater treatment plant. The Plant has a design capacity of 6.0 million gallons per day (mgd) and an average daily loading of only 4.8 mgd.¹

The Bethlehem-Sewage Treatment Plant is located at 98 Dinmore Rd & State Rte 144, Cedar Hill, NY 12158 and operates under SPDES Permit #4-0122-00006/00002. The collection system for the Slingerlands area has been evaluated by Barton & Loguidice, P.C. The Applicant is aware of the required upgrades and will negotiate a fair share contribution towards these upgrades.

The site of the proposed VISTA TECHNOLOGY CAMPUS is primarily vacant with the exception of a residence which will be preserved and a cemetery/historic site which will also be preserved.

DESCRIPTION OF PROPOSED SITE USAGE:

A Phase 1A which includes the infrastructure improvements along Vista Boulevard and connections to existing sewer and water services has been defined. This also includes Building P a 40,000 SF office building. Further development includes construction of a Phase I which includes a mixture of retail uses, condominiums and office space. This Phase includes seventeen buildings. Four of these are planned for condominium use. One is a medical office building, two are technical office buildings, one is a general office building, one is a manufacturing facility and eight are retail or mixed use buildings. Phase I is planned to be constructed between January 2009 and July 2012.

A Phase II which is a mixture of technical office and general office buildings in eight buildings totaling 547,000+/- SF is proposed to be complete by 2018. A Phase III which includes technical office and general office buildings in three buildings totaling 220,000+/- SF and is proposed to be complete by 2021.

The exact schedule and building configuration will be dictated by market demands and the needs of tenants.

PROPOSED DEVELOPMENT OF SEWER SERVICE

Sanitary sewer service internal to the park is provided by a mix of gravity sewer and low pressure force mains which utilize grinder pumps at individual buildings. All of the proposed buildings with the exception of the four condominium buildings will be served by a gravity sewer which will run to the VISTA pumping station. This gravity sewer from VISTA 1 pumping station to MH #SAN-2 will be designed as a 12 inch gravity sewer. The balance of the collection sewers are designed to be 8 inch gravity sewers.

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2 Slingerlands Sewer Study dated May, 2007
All of the effluent from the Project is discharged through a force main along the proposed Bypass and along Cherry Avenue to the existing force main near the intersection of McCormack Road and Cherry Avenue. The force main along the Bypass will be an 8-inch HDPE pipe to effectively convey the flows to the ultimate discharge point. Approximately 3,300 lineal feet of offsite force main will be constructed from the VISTA pumping station to the Bypass and within the NYSDOT right-of-way.

- The Applicant proposes to construct the VISTA 1 pumping station and dedicate this station to the Town of Bethlehem.
- The Applicant proposes to construct the force main to the McCormack Road and Cherry Avenue force main and dedicate this main to the Town of Bethlehem.
- The Applicant proposes to construct the gravity sewer to the VISTA pumping station dedicate to the Town of Bethlehem.
- The Applicant proposes to construct a force main collection system and dedicate this force main and flushing manholes to the Town of Bethlehem.

**ESTIMATED FLOWS**

Based upon the Sewage Generation Table reproduced in Appendix 3 the sewage generation is estimated to be 145,376 GPD at full buildout. These figures use NYSDEC publication entitled *Standards for Waste Treatment Works* as a basis for use calculations with an additional allowance for technological office uses.

Estimated Average Daily Flow at Full Buildout = 145,376 GPD

Estimated Average Daily Flow at Completion of Phase I = 72,912 GPD

Estimated Average Daily Flow at Completion of Phase 1A Building (Only) = 3,200 GPD

Estimated Additional Flow Tributary to the VISTA 1 Pump Station Due to Infiltration at Full Buildout with laterals (Infiltration figure is used throughout the computation)

\[
\begin{align*}
6 \times 100 \times 0.3 & = 180 \text{ GPD} \\
8 \times 100 \times 0.6 & = 480 \text{ GPD}
\end{align*}
\]

Total Infiltration Allowance = 660 GPD

DESIGN BASIS at Full Buildout = 145,376 GPD + 660 GPD = 146,036 GPD
DESIGN BASIS at Completion of Phase I
= 72,912 GPD + 660 GPD = 73,572 GPD

DESIGN BASIS at Completion of Phase 1A Building (Only)
= 3,200 GPD + 660 GPD = 3860 GPD

Design Basis Average Instantaneous Flow Rate at Full Buildout
= 146,036 GPD/24/60 = 101.4 GPM

Design Basis Average Instantaneous Flow Rate at Completion of Phase I
= 73,572 GPD/24/60 = 51.1 GPM

Design Basis Average Instantaneous Flow Rate at Completion of Building I (Only)
= 3,860 GPD/24/60 = 2.7 GPM

Design Basis Peak Instantaneous Flow Rate at Full Buildout
= 4.0 \times 101.4 = 406 GPM

Design Basis Peak Instantaneous Flow Rate at Completion of Phase I =
4.0 \times 51.1 = 205 GPM

Design Basis Peak Instantaneous Flow Rate at Completion of Building I (Only)=
4.0 \times 2.7 = 11 GPM

Selected Pump Rate = 492 GPM

PUMP SELECTION

A Flygt Model No. NP3171 HT sewage pump was selected. See attached pump curve and specifications (Appendix 4) for operating information.

\[ ^3 \text{The factor from the Recommended Standards for Wastewater Facilities (see graph on Page 10-6) "Ten State Standards" indicates a ratio of 3.8 based upon an equivalent population of 1000 persons.} \]
BUOYANCY CALCULATION

A buoyancy analysis is included as Appendix 6. Based upon observation of surfacing groundwater in the nearby intermittent stream the elevation of the seasonal high groundwater is assumed to be at Elevation 192. Calculations are made to indicate that even in its entirely empty condition without any allowance for pumps, the wet well would not be subject to any buoyancy impact. The bottom of the valve pit is above the estimated seasonal high ground water level. Since the bottom of the wet well is below the seasonal high ground water level, dewatering will be necessary to set the base. Contractor will continue dewatering until the entire barrel of the wet well is in place.

Because the geotechnical report identifies the potential for perched ground water tables at higher elevations, the buoyancy analysis was computed for seasonal high ground water elevations of 196 and 200. Neither the wet well would suffer nay impact due to buoyancy.

COST OF PUMP STATION, FORCE MAIN AND SEWER IMPROVEMENTS

The estimated total cost of the provision of equipment and installation of the pump station including a new pump house building and an emergency generator is $240,000 (see Appendix 5 for this estimate). The total estimated cost of all sanitary sewer improvements exclusive of grinder pumps in Buildings A, B, C & D is $875,968 (2008 $).

IMPACT ON WASTEWATER TREATMENT FACILITY

The sanitary flow from this system is tributary to the Town of Bethlehem Sewage Treatment Plant which has a design capacity of 6.0 million gallons per day (MGD) . The current average daily loading is 4.8 MGD. With the addition of the flow at full buildout level from this project the average daily loading would increase to 4.95 MGD.
ENGINEER’S CONCLUSION

It is the engineer's conclusion that the system described in this report will provide a publicly owned and maintained sewer extension which is capable of serving the Vista Technology Campus at full buildout and at all levels leading up to the full buildout level.

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APPENDIX 1

SITE LOCATION MAP
APPENDIX 2

UTILITY PLANS PHASE 1A SEWER SYSTEMS
VISTA TECHNOLOGY CAMPUS
(COMPLETE IN 8 SHEETS)

SHEETS C-2, C-3, C-4, C-5, C-7, C-8, C14, C-15
APPENDIX 3

SEWAGE GENERATION ANALYSIS
APPENDIX 5

ESTIMATE OF COST OF SEWER EXTENSION
INCLUDING PUMPING STATION, FORCE MAIN
AND INSTALLATION OF SEWERS
APPENDIX 6

BUOYANCY CALCULATIONS