

APPENDIX F

Utilities



May 27, 2010

Mr. Joseph Schneider
Lessard Group
8521 Leesburg Pike, Suite 700
Vienna, VA 22182

Re: Buena Vista – Engineering Calculations

Dear Joseph:

We have reviewed the architectural drawings for the Buena Vista project and have completed engineering calculations for the sewage and water usage along with preliminary calculations for the geothermal well and the micro turbine systems. We understand that the micro turbine systems will provide power to the geothermal well pumps, condenser water pumps, and the parking garage. The following is an outline of our calculations:

Domestic Water Usage

The daily water consumption for the building is calculated to be approximately 29,099 gallons. This calculation is for water conserving type fixtures through out the building. The following assumptions were used in the calculation: 1.0 gpf water closets, 0.5525 gpm shower heads, 0.375 gpm bathroom sinks, 1.25 gpm kitchen sinks, and an overall reduction in water usage for clothes and dish washing based upon reduced consumption equipment and practices.

The installation of water conserving type fixtures throughout the building will provide an approximate water use reduction of 59.5% when compared to standard type fixtures and an approximate water use reduction of 74% when compared to the American Water Works Association (AWWA) guidelines. The daily water consumption for the baseline building with standard type fixtures is calculated to be 71,918 gallons. The following assumptions were used in the calculation: 1.6 gpf water closets, 2.5 gpm shower heads, 2.2 gpm bathroom sinks, 2.2 gpm kitchen sinks, and standard water usage for clothes and dish washing based upon standard consumption equipment and practices. The daily water consumption as per the AWWA guidelines is calculated to be 112,080 gallons. This calculation was based on a usage of 120 gallons per day per person.

The buildings domestic water service is to be 6 inches based upon a total of 3,985 water fixture units (wFU) as outlining by the Plumbing Code of New York State. The overall peak flow of the building will

be 535 gpm. The first 8 floors of the building will be supplied by street pressure. The upper 18 floors of the building will be supplied by a duplex domestic booster pump. The duplex domestic booster pump will be sized to provide a total flow of 385 gpm at an output pressure of 130 psi. In order to avoid cavitation of the pump the street main will need to be capable of providing 535 gpm at 35 psi to the building.

Sewage Usage

The daily sewerage for the building is calculated to be approximately 29,099 gallons. This number corresponds to the daily water consumption as calculated above and thus utilizes the same assumptions.

The daily sewerage for the baseline building with standard type fixtures is calculated to be approximately 71,918 gallons. This number corresponds to the daily water consumption for the baseline building with standard type fixture as calculated above and thus utilizes the same assumptions. The daily sewerage for the as per the AWWA guidelines is calculated to be approximately 112,080 gallons.

The buildings sanitary sewer is to be either 12 inches at 2% pitch or 15 inches at 1% pitch depending on site conditions and is based upon a total of 5,139 drainage fixture units (dFU) as outlining by the Plumbing Code of New York State.

Fire Protection Water Usage

The maximum flow rate for the buildings fire protection system during a fire event will be 1,000 gpm. The buildings fire protection water service is to be 8 inches. The buildings fire protection system will be supplied by a fire pump. The fire pump will be sized to provide a total flow of 1,000 gpm at an output pressure of 160 psi. In order to avoid cavitation of the pump the street main will need to be capable of providing 1,000 gpm at 35 psi to the building.

Microturbine System

A combined heat and power (CHP) system is planned for the building and will consist of gas-fired microturbines. The electrical power produced will feed selected building loads such as the geo-thermal ground & condenser water pumps and the parking garage with a motorized car stacking system. The heat produced by the CHP system will provide heat for the hydroponics garden in the winter and other building loads such as the pool and some amenity areas.

The baseline load for sizing the CHP system has been calculated to be approximately 382 kilowatts (kW) requiring a nominal size CHP system of 390kW. The CHP system is planned to operate 95% of the year. Our calculations utilizing EPA CHP Partnership Emissions Calculator indicate net savings in emissions by eliminating utility provided grid power. The following tables identify this net savings and their associated environmental benefits:

	Grid Electricity (kWh)	Fuel (MMBTU)	CO2 (Metric tons - MT)	NOx (Metric tons - MT)	SOx (Metric tons - MT)
Avoided Grid Energy	(4,327,440)	0	(2,662.32)	(2.00)	(7.08)
T&D Losses	(346,195)	---	(213)	(0.16)	(0.42)

CCHP System	0	38,198	2,021	0.64	0.02
BALANCE	(4,673,635)	38,198	(854)	(1.51)	(7.48)

Environmental Benefits	Emissions Reduction		
	Metric Tons	Equivalence	%
CO2	854	197 acres of trees	32%
NOx	1.51	87 cars	76%
SOX	7.48		99%

We are available to further qualify our calculations should you have any questions and/or comments.

Very truly yours,

EDWARDS AND ZUCK, P.C.

Joseph R. Bartels

Joseph R. Bartels, P.E., LEED® AP
Principal

Edwards & Zuck, P.C.

May 27, 2010

Re: Buena Vista – Engineering Calculations

Occupancy

Unit Type	Occupants per Unit	Quantity of Units	Total Occupants
Efficiency	1.5	24	36
1 Bedroom	2	266	532
2 Bedroom	3	122	366
Grand Total			934

Design - Low Flow Fixtures

Fixture	Water Usage	Usage Unit	Daily Fixture Usage per Occupant	Daily Fixture Usage Unit	Total Daily Consumption per Occupant
Toilets		1.0 gal per flush		5 flushes	5.00
Showers	0.5525 gal per minute			12 minutes	6.63
Bathroom Sinks	0.375 gal per minute			5 minutes	1.88
Kitchen Sinks	1.25 gal per minute			5 minutes	6.25
Washers	10 gal per use			1 use	10.00
Dishwashers	1.4 gal per use			1 use	1.40
Grand Total per Occupant					31
Building Grand Total					29,099

Baseline - Standard Flow Fixtures

Fixture	Water Usage	Usage Unit	Daily Fixture Usage per Occupant	Daily Fixture Usage Unit	Total Daily Consumption per Occupant
Toilets		1.6 gal per flush		5 flushes	8.00
Showers	2.5 gal per minute			12 minutes	30.00
Bathroom Sinks	2.2 gal per minute			5 minutes	11.00
Kitchen Sinks	2.2 gal per minute			5 minutes	11.00
Washers	15 gal per use			1 use	15.00
Dishwashers	2 gal per use			1 use	2.00
Grand Total per Occupant					77
Building Grand Total					71,918

AWWA Guidelines

Total Daily Consumption per Occupant:	120 gal
Building Grand Total:	112,080 gal

**PHIL AMICONE
MAYOR**

**JOHN A. LISZEWSKI
COMMISSIONER**

**JOHN SPEIGHT
SUPERINTENDENT**



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CITY OF YONKERS WATER BUREAU

June 8, 2010

Mr. Alan G. Litt
Metro Partners
225 North Route 303
Suite 101
Congers, New York 10920

Re: Fire Flows- Buena Vista Redevelopment Site, Yonkers, New York

Dear Mr. Litt,

Results of a fire flow test, conducted as requested for the Beuna Vista Project are as follows:

Prospect Street test conducted June 8, 2010 at approximately 9:50 a.m.

Pressure Hydrant- # 1860- located in front of 34 Prospect Street.
Static Pressure- Pounds per square inch (psi) -85
Residual Pressure- 80

Flow Hydrant- # 1967, located on Prospect Street at the intersection of Hawthorne Avenue.
Flow-gallons per minute (gpm) - 1350

Calculated fire flow at 20 psi- 5373.0 gallons per minute.

Pressure and flow hydrants are supplied by a twelve (12) inch cast iron water main.

Main Street Test conducted June 10, 2010 at approximately 8:55 a.m.

Pressure Hydrant- # 1825- located in front of 49 Main Street.

Static Pressure- Pounds per square inch (psi)- 105

Residual Pressure- 100

Flow Hydrant- # 1949- located in front of the Post Office approximately 100 feet west of Market Place.

Flow- 1500- gallons per minute (gpm)- 1500

Calculated fire flow at 20 psi- 6900 gallons per minute.

Pressure and flow hydrants are supplied by a twelve (12) inch cast iron water main.

If there are any questions please contact me.

Sincerely,

John Speight
Superintendent of Water

Cc: Albina Glaz, Water Engineer

STORMWATER STORAGE

Buena Vista
Teutonia Development
Buena Vista Avenue
Yonkers, New York
MMI #3099-04

Roof Top Garden Irrigation Storage Demand 0.11 Gallons/ sqft / Day
14,000 sqft
45 Days of Storage

69,300 (Gallons)

Increase in Stormwater Run-off (100-year Storm) 195,907 Existing Conditions (Gallons)
226,764 Proposed Conditions (Gallons)

30,857 Proposed Increase (Gallons)

Water Quality Volume $WQ_v = (P)(R_v)(A)(1/12)$
100% of Impervious P 1.3 90% Rainfall Event (Figure 4.1 NYSSMDM)
NYS Stormwater Management Design Manual R_v 0.9
A 1.21 Acres

0.12 Acre-Feet
38,542 (Gallons)

Additional Stormwater Volume Provided Existing Sanitary Sewage Generation (Gallons)
To Offset Increase In Sanitary Sewage Generation 29,099 Proposed Sanitary Sewage Generation (Gallons)

29,099 Poposed Increase (Gallons)

Total Storage Required **167,798 Gallons**

