ENVIRONMENTAL DESIGN PARTNERSHIP, LLP.
Shaping the physical environment

900 Route 146 Clifton Park, NY 12065
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Engineer's Water Narrative

JACOBIE'S PARKSIDE FARM

11-29 Moreau Rec Road
Town of Moreau
Saratoga County, New York

Applicant:

Cerrone Builders
1589 Route 9
Fort Edward, NY 12828

March 2025

Prepared By:
The Environmental Design Partnership, LLP
900 Route 146
Clifton Park, NY 12065

1.0 PROJECT DESCRIPTION

The following narrative has been prepared to provide the supporting information necessary for an extension of the existing Town of Moreau water distribution system in order to serve the proposed Jacobie's Parkside Farm development. The Jacobie's Parkside Farm project includes the construction of 181 units split between; apartments, duplexes and single-family dwellings on two parcels located in the Town of Moreau that are split between Moreau Rec Road. The overall project area is 27.19 acres and water and sewer are proposed to be supplied by an existing Town of Moreau municipal source.

The project site is located within the boundaries of the Town of Moreau Water District No. 4. The proposed subdivision will be serviced via extension of the Town of Moreau water distribution system location along Bluebird Road and NYS Route 32. 8-inch diameter water mains will be extended along the proposed development along Moreau Rec Road with necessary valves and hydrants in order to serve the proposed residential units.

Sanitary sewer service for the proposed subdivision will be via an extension of the existing Town of Moreau sewer collection system (see separate Engineers Sewer Narrative).

2.0 EXISTING CONDITIONS

The existing project site consists of predominantly abandoned agricultural land. Ground cover on site is comprised primarily of fallow farmland. The topography of the land general slopes from northwest to southeast at slopes generally ranging from 1 to 5%, with localized areas over 15%. Elevations at the site vary between 325 and 355 feet above sea level.

The USDA Natural Resources Conservation Service Soil Survey (NRCSS) identifies the soils on the site to be Windsor Loamy Sand. The Soil Survey identifies Windsor Loamy Sand as excessively drained and classified as Hydrologic Soil Group (HSG) "A". Soil test pits observed by the Environmental Design Partnership, LLP during December of 2020 indicate fine to coarse sand with no evidence of groundwater up to 8 ft. No bedrock was encountered on the site during the soil testing.

Mapping available from the Federal Emergency Management Agency (FEMA) indicates that the project site is located outside of the 500-year floodplain. There are also no known NYS Department of Environmental Conservation or US Army Corp of Engineers regulated wetlands located on or directly adjacent to the project site.

3.0 WATER DEMANDS

The proposed Jacobie's Parkside Farm project consists of a total of 181 units split between; apartments (100 units), townhomes (32 units) and single-family dwellings (49 units). The hydraulic loading for the proposed residential units was calculated in accordance with the Recommended Standards for Wastewater Facilities, 2014 Edition (Ten State Standards) using US Census data for the Town of Moreau. According to 2020 census data for the Town of Moreau there is an average of 2.4 persons per household (see Exhibit A). Ten State Standards recommends a design flow rate of 100 gallons per day per capita for design of new collection systems. Based on the census data the average daily flow and peak hourly flow for the proposed townhomes and single-family dwellings were calculated as follows:

<u>Townhomes and Single-Family Dwelling Design Flows</u>

- Residential units = 81 units

- Persons per household in Moreau = 2.4
- Design hydraulic loading = 100 gallons per day per capita
- Average daily hydraulic loading = 81*2.4*100 = 19,440 gpd (14 gpm)
- Peaking factor = 4.0
- Peak Hourly Flow Rate = **54 gpm**

Based on water data from previous apartment projects that EDP has worked on throughout Saratoga County, Schenectady County, Albany County, and Warren County (See Appendix A for locations and flow data), the median daily water usage for these apartments is on the order of 57 gallons per day per bedroom, with the maximum being on the order of 60 gallons per day per bedroom. Based on the historical water data, a conservative usage rate of 70 gallons per day per bedroom has been used for the apartments on this project site. Based on the median daily water usage data the average daily flow and peak hourly flow for the proposed apartments were calculated as follows:

Apartment Design Flows

- Residential units = 100 units
- Total number of bedrooms = 150 bedrooms
- Design hydraulic loading = 70 gallons per day per bedroom
- Average daily hydraulic loading = 150*70 = 10,500 gpd (7 gpm)
- Peaking factor = 4.0
- Peak Hourly Flow Rate = **29 gpm**

In summary, the total projected average daily flow for this development is on the order of **29,940 gpd** with a peak hourly flow of **83 gpm**.

4.0 DISTRIBUTION SYSTEM

The Town of Moreau currently owns and maintains the existing water mains located along NYS Route 32 and Bluebird Road. The proposed Jacobie's Parkside Farm will be served water via the construction of approximately 4,000 linear feet of 8-inch PVC water main extending along the proposed development roads from the water mains located along NYS Route 32. Hydrants are proposed at all high points and at 500 ft maximum intervals.

All new water mains, valves, meters and hydrants will comply with the Great Lakes Upper Mississippi River Board of State Public Health & Environmental Managers publication "Recommended Standards for Water Works" and WWSA specifications. The main and service laterals shall be installed to provide a minimum five feet of soil cover over all sections of the water lines. The Town of Moreau Water District No. 4 will own and maintain the water distribution system upon completion of the project.

5.0 OPERATING PRESSURE AND FIRE PROTECTION

The Town of Moreau Water District purchases water through an agreement with the Town of Queensbury and the Saratoga County Water Authority (SCWA), both of which use the Hudson River as a surface water supply. The Town of Moreau has a current agreement with the Town of Queensbury to receive an average (over a 30-day period) of 1.25 MGD and the agreement with SCWA to purchase a minimum of 0.15 MGD. The existing SCWA infrastructure allows for up to 1.73 MGD.

In 2023 the Town of Moreau had an average daily demand on the order of 0.76 MGP and a max day on the order of 2.20 MGD. These demands are well below the system capacity that has a maximum of 2.98 MGD and therefore has 0.78 MGD of remaining capacity.

The projected max daily flows from the proposed project are on the order of 29,940 gpd (0.030 MGD) which is well within the capacity of the existing Town of Moreau water system. Individual water meters will be installed on each individual lot as the lots are developed.

Hydrant flow testing was performed by the Town of Moreau and observed by EDP near the connection points on both Bluebird Road and NYS Route 32 (see Appendix A). Static water pressures were measured at 64 psi and 65 psi and the elevation of the gauge hydrants is on the order of 337 ft. Ground elevations throughout the project site vary from 332 ft to 342 ft. This results in expected water pressures between 52 and 76 psi within the Water District extension.

The hydrant testing indicates fire flows on the order of 4,882 gpm at 20 psi on NYS Route 32 and 5,183 gpm at 20 psi along Bluebird Road. These fire flows exceed the fire flows required by the NYS Fire Code Section B105 for single family dwellings, townhouses, and apartment buildings.

6.0 SUMMARY

Water service will be provided to the proposed 181 residential units via the extension of the Town of Moreau water distribution along the proposed development roads. The proposed water distribution system has been designed in accordance with Ten State Standard in order to provide adequate water pressure and flows. Each residential unit or apartment building will be served with an individual water service.

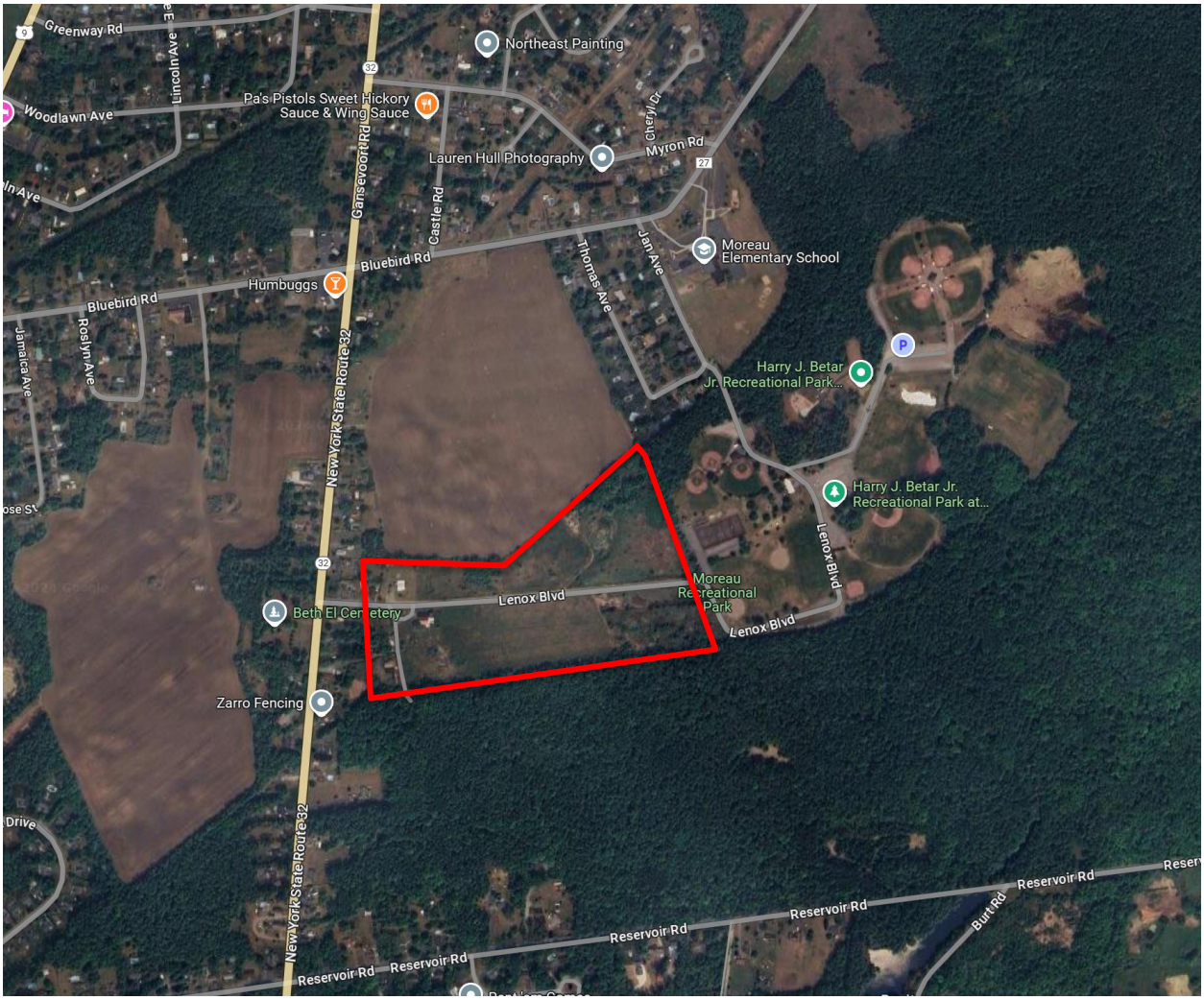
The proposed project will result in a max daily water demand on the order of 0.030 MGD which is well within the Town of Moreau water distribution capacity and the Town of Queensbury and SCWA water treatment and conveyance capacity.

Prepared by:

Jakob Cruikshank, P.E.

Environmental Design Partnership, LLP

SITE LOCATION MAP


Greenway Rd
Woodlawn Ave
Lincoln Ave
Northeast Painting
Pa's Pistols Sweet Hickory Sauce & Wing Sauce
Lauren Hull Photography
Myron Rd
Cheryl Dr
Gansevoort Rd
Castle Rd
Bluebird Rd
Humbuggs
Thomas Ave
Jan Ave
Moreau Elementary School
Harry J. Betar Jr. Recreational Park...
Harry J. Betar Jr. Recreational Park at...
Jamaica Ave
Roslyn Ave
New York State Route 32
Lenox Blvd
Moreau Recreational Park
Beth El Cemetery
Zarro Fencing
Reservoir Rd
Burt Rd

Appendix A

Hydrant Flow Testing Results

APARTMENT COMPLEX NAME	LOCATION	TOTAL UNITS CONSTRUCTED	% OCCUPANCY	TOTAL UNITS OCCUPIED	AVG BEDROOMS PER UNIT	TOTAL BEDROOMS	TOTAL WATER USAGE (GALLONS)	PERIOD OF TIME (DAYS)	AVERGAE FLOW RATE (GALLONS PER DAY)	AVERAGE FLOW RATE PER BEDROOM (GPD/BR)	WATER DATA REFERANCE
LEXINGTON HILLS PHASE 1	COHOES, NY	138	100.00%	138	1.6	221	3,436,900	273	12,589	**57**	WATER BILLING DATA FROM 11-1-18 TO 8-1-19
KENSINGTON AT HALFMOON	HALFMOON, NY	200	78.50%	157	1.7	264	1,341,660	92	14,583	**56**	WATER DATA FROM 7-23-16 TO 10-22-16
NET ZERO VILLAGE	ROTTERDAM, NY	180	100.00%	180	1.3	232	--	--	13,500	**59**	WATER DATA FROM OWNER
NORTHBROOK APARTMENT COMPLEX	QUEENSBURY, NY	128	100.00%	128	2.0	256	3,750,000	365	10,274	**41**	WATER USAGE DATA FROM 3-17-01 TO 3-25-03

MIN =	41	GPD/BR
MAX =	59	GPD/BR
AVG =	53.25	GPD/BR
MEDIAN =	56.5	GPD/BR
FOR DESIGN USE	**70**	**GPD/BR**

United States Census Bureau

QuickFacts

Moreau town, Saratoga County, New York

QuickFacts provides statistics for all states and counties. Also for cities and towns with a ***population of 5,000 or more***.

Families & Living Arrange…	Moreau town, Saratoga County, New York
Population estimates, July 1, 2023, (V2023)	⚠ 16,671
PEOPLE	
Families & Living Arrangements	
Households, 2018-2022	6,748
Persons per household, 2018-2022	2.42
Living in same house 1 year ago, percent of persons age 1 year+, 2018-2022	87.3%
Language other than English spoken at home, percent of persons age 5 years+, 2018-2022	4.0%

About datasets used in this table

Value Notes

⚠ Methodology differences may exist between data sources, and so estimates from different sources are not comparable.

Some estimates presented here come from sample data, and thus have sampling errors that may render some apparent differences between geographies statistically indistinguishable. Click the Quick Info ⓘ icon to the left of each row in TAI learn about sampling error.

The vintage year (e.g., V2023) refers to the final year of the series (2020 thru 2023). Different vintage years of estimates are not comparable.

Users should exercise caution when comparing 2018-2022 ACS 5-year estimates to other ACS estimates. For more information, please visit the 2022 5-year ACS Comparison Guidance page.

Fact Notes

(a)	Includes persons reporting only one race
(b)	Hispanics may be of any race, so also are included in applicable race categories
(c)	Economic Census - Puerto Rico data are not comparable to U.S. Economic Census data

Value Flags

D	Suppressed to avoid disclosure of confidential information
F	Fewer than 25 firms
FN	Footnote on this item in place of data
NA	Not available
S	Suppressed; does not meet publication standards
X	Not applicable
Z	Value greater than zero but less than half unit of measure shown
-	Either no or too few sample observations were available to compute an estimate, or a ratio of medians cannot be calculated because one or both of the median estimates falls in the lowest or upper interval of an open ende
N	Data for this geographic area cannot be displayed because the number of sample cases is too small.

QuickFacts data are derived from: Population Estimates, American Community Survey, Census of Population and Housing, Current Population Survey, Small Area Health Insurance Estimates, Small Area Income and Poverty Estimates, Stat Housing Unit Estimates, County Business Patterns, Nonemployer Statistics, Economic Census, Survey of Business Owners, Building Permits.

HYDRANT FLOW TEST DATA SHEET

ENVIRONMENTAL DESIGN PARTNERSHIP, LLP
900 Route 146
Clifton Park, NY 12065
(P) 518.371-7621 edpllp.com

March 13, 2025

1. **Reason for Test:**
   - ☐ Bid Information
   - ☐ Design Base
   - ☐ Municipal Engineer Requirement
   - ☒ Other: NYS DOH Requirement

2. **Project:** Arrowhead Subdivision

3. **Test Location:** Bluebird Road Between Rt. 32 and Thomas Ave.
   Moreau, New York

4. **Date and Time of Test:** Date: March 13, 2025
   Time: 12:00 p.m.

5. **Test Conducted by:** Jeff Ferguson, EDP
   Jeff Parrish, Town of Moreau Water Dept.
   _____
   _____

6. **Source of Water Supply:** ☒ Gravity ☐ Pump ☐ Other:_____

7. **Name of Water System:** Town of Moreau
   Saratoga County, New York

8. **Flow Test Data:**

Gage Hydrant		Pump House		Delta P* (psi)	Flow Hydrant			Adjusted Flow; Flow @ 20 psi
Static Pressure (psi)	Residual Pressure (psi)	Static Pressure (psi)	Residual Pressure (psi)		Pitot-Tube Pressure "p"(psi)	Outlet Coef. "c"	Discharge Rate** (gpm)	
65	62	N/A	N/A	N/A	51.25	0.9	1,201	5,183

*Delta P = Gage Static + Change in Pump House Pressure (+ increase – decrease) – gage residual.

**From Table or calculated using: $Q = 29.83cd^2\sqrt{p}$

9. **Outlet Diameter, "d":**
   - ☒ 2.5"
   - ☐ Other:

10. **Outlet Coefficient:**
    - ☐ Outlet Square & Projecting into Barrel, coef. = 0.70
    - ☐ Outlet Square & Sharp, coefficient = 0.80
    - ☒ Outlet Smooth & Rounded, coefficient = 0.90

11. Calculated Flow (Q): $Q = 29.83cd^2\sqrt{p}$
$Q = 29.83 \times 0.9 \times 2.5^2\sqrt{51.25}$
$Q = 1{,}201$ gpm

12. Observed Flow: (1,202.5) = (n/a×1.0) gpm (Pitot Tube Gauge Comp. Table)

13. Fire Flow Calculation (Theoretical Flow @ 20 psi):

$$QA = QT \times \frac{hA^{0.54}}{hT^{0.54}}$$

Where QA is the flow available with a residual of 20 psi, QT is the test flow, hA is the pressure drop available, and hT is the pressure drop during the test.

$$QA = 1{,}201 \times \frac{(65-20)^{0.54}}{(65-63)^{0.54}}$$

QA =**5,184 gpm at 20 psi**

14. Sketch of Test Location:

15. Remarks: _____

_____

_____

16. Signed: _____

Jeffrey A. Ferguson,
Quality Control Engineer
Environmental Design Partnership

HYDRANT FLOW TEST DATA SHEET

ENVIRONMENTAL DESIGN PARTNERSHIP, LLP
900 Route 146
Clifton Park, NY 12065
(P) 518.371-7621 edpllp.com

March 11, 2025

1. **Reason for Test:**
   - ☐ Bid Information
   - ☐ Design Base
   - ☐ Municipal Engineer Requirement
   - ☒ Other: NYS DOH Requirement

2. **Project:** Arrowhead Subdivision

3. **Test Location:** NYS Rt. 32, Between Lenox Blvd. & Bluebird Road
   Moreau, New York

4. **Date and Time of Test:** Date: March 11, 2025
   Time: 11:45 a.m.

5. **Test Conducted by:** Jeff Ferguson, EDP
   Kristian Mechanick, Town of Moreau Water Dept.
   Jeff Parrish, Town of Moreau Water Dept.

6. **Source of Water Supply:** ☒ Gravity ☐ Pump ☐ Other:_____

7. **Name of Water System:** Town of Moreau
   Saratoga County, New York

8. **Flow Test Data:**

Gage Hydrant		Pump House			Flow Hydrant			
Static Pressure (psi)	Residual Pressure (psi)	Static Pressure (psi)	Residual Pressure (psi)	Delta P* (psi)	Pitot-Tube Pressure "p"(psi)	Outlet Coef. "c"	Discharge Rate** (gpm)	Adjusted Flow; Flow @ 20 psi
64	61	N/A	N/A	N/A	46	0.9	1,145	4,882

*Delta P = Gage Static + Change in Pump House Pressure (+ increase – decrease) – gage residual.

**From Table or calculated using: $Q = 29.83cd^2\sqrt{p}$

9. **Outlet Diameter, "d":**
   - ☒ 2.5"
   - ☐ Other:

10. **Outlet Coefficient:**
    - ☐ Outlet Square & Projecting into Barrel, coef. = 0.70
    - ☐ Outlet Square & Sharp, coefficient = 0.80
    - ☒ Outlet Smooth & Rounded, coefficient = 0.90

11. Calculated Flow (Q): $Q = 29.83cd^2\sqrt{p}$
$Q = 29.83 \times 0.9 \times 2.5^2\sqrt{46.25}$
$Q = 1{,}141$ gpm

12. Observed Flow: (1145) = (n/a×1.0) gpm (Pitot Tube Gauge Comp. Table)

13. Fire Flow Calculation (Theoretical Flow @ 20 psi):

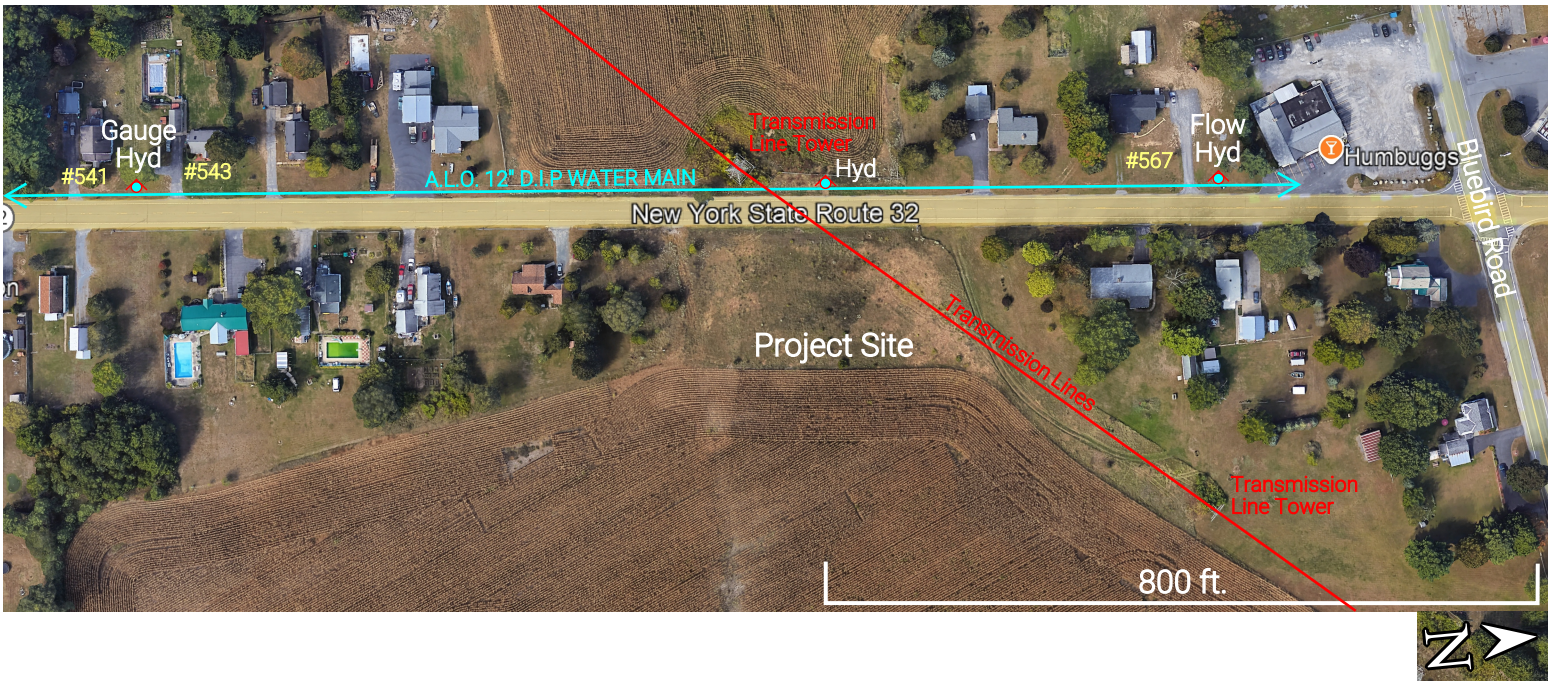
$$Q_A = Q_T \times \frac{h_A^{0.54}}{h_T^{0.54}}$$

Where Q_A is the flow available with a residual of 20 psi, Q_T is the test flow, h_A is the pressure drop available, and h_T is the pressure drop during the test.

$$Q_A = 1{,}145 \times \frac{(64-20)^{0.54}}{(64-61)^{0.54}}$$

$Q_A = 4{,}882$ gpm at 20 psi

14. Sketch of Test Location:



15. Remarks: _____

_____

_____

16. Signed: _____

Jeffrey A. Ferguson,
Quality Control Engineer
Environmental Design Partnership