

APPENDIX O

Water Report

LJA

Leonard Jackson Associates Consulting Engineers

26 Firemans Memorial Drive . Pomona, New York 10970 . (845) 354-4382 . FAX (845) 354-4401

**ENGINEER'S REPORT
FOR THE PROPOSED WATER
DISTRIBUTION SYSTEM**

Prepared for

PATRICK FARM

**TOWN OF RAMAPO
ROCKLAND COUNTY, NEW YORK**

July 18, 2008
LJA #02033

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APPENDIX

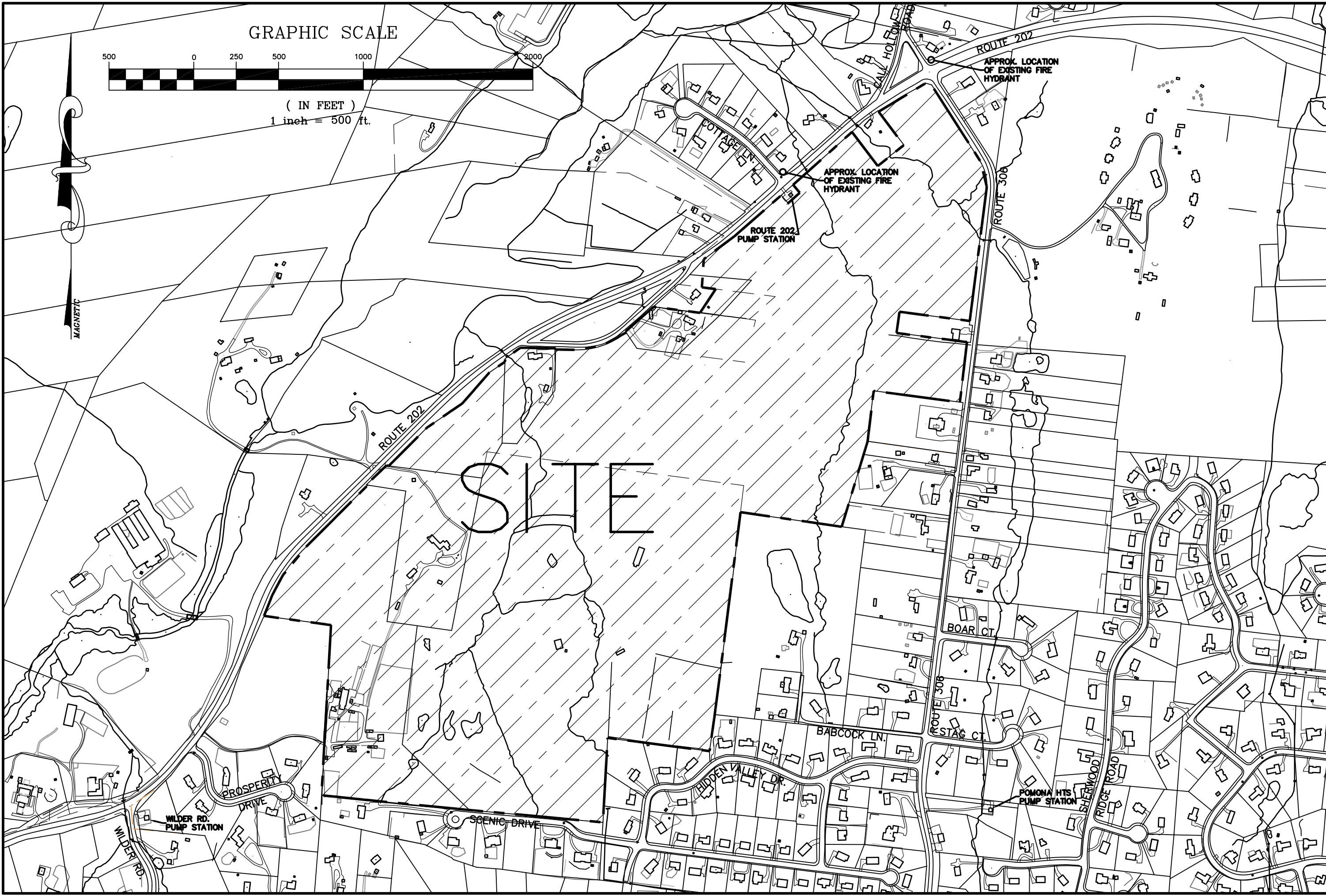
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GRAPHIC SCALE



(IN FEET)
1 inch = 500 ft.

MAGNETIC



LEONARD JACKSON ASSOCIATES		LEONARD JACKSON, P.E. N.Y.S. Lic. No. 42187
CONSULTING ENGINEERS		
26 FIREMENS MEMORIAL DRIVE, POMONA, NEW YORK 10970		
phone: (845) 354-4382 fax: (845) 354-4401		
LJA		
PATRICK FARM	TOWN OF RAMAPO	
	ROCKLAND COUNTY, NEW YORK	
	VICINITY MAP	
Job number:	02033	
Drawn by:	c.f.l.	
Date:	5/13/08	
Scale:	1"=500'	
Drawing Number:	VM	
		REVISION
		DESCRIPTION
		DATE

1. Project Description

This report has been prepared for review by all involved agencies in conjunction with the subject application for construction of a public water distribution system and preparation of a Draft Environmental Impact Statement.

The Patrick Farm site is a 200±-acre parcel located in the Town of Ramapo at the intersection of Route 202 and Route 306. The project consists of 497 units (sixty-three (63) proposed buildings containing six units each, four (4) buildings containing five units each, three (3) buildings containing 4 units each, and 87 single family homes).

2. Water Demand Analysis

Average Daily Domestic Water Demand:

$$= 497 \text{ units} \times 400 \text{ gal/day/unit} = \underline{198,800 \text{ gpd}}$$

Maximum Daily Domestic Water Demand

$$\begin{aligned} &= 2 \times \text{Average Daily Demand} \\ &= 2 \times 198,800 \text{ gpd} = \underline{397,600 \text{ gpd}} \end{aligned}$$

Peak Hourly Water Demand:

$$\begin{aligned} &= 4 \times \text{Average Daily Demand} \\ &= 4 \times 198,800 \text{ gpd} \times (1 \text{ day}/24 \text{ hrs}) = \underline{33,133 \text{ gph}} \end{aligned}$$

3. Existing Water Infrastructure

Water supply to the site shall be provided by United Water New York (UWNY). Connections to the existing UWNY distribution system shall be made at two locations: to a 16" diameter main in Route 202 and a 16" diameter main located in Route 306. The existing main in Route 306 terminates approximately 1400 feet south of the site, thereby requiring off-site water main improvements in Route 306 from the site to the terminus of the existing main.

4. Summary of Proposed Water Infrastructure

The subject application will provide adequate domestic and fire protection water service to the site. It is anticipated that new water mains

Proposed water system infrastructure will include 8" and 10" diameter ductile iron pipe, fire hydrants, valves and fittings. Below is an estimate of required infrastructure:

A. 40 Fire Hydrants

B. Ductile Iron Main:	Off-site:	1,440 l.f.	10" Ø
	<u>On-site:</u>	<u>20,300 l.f.</u>	<u>8" Ø</u>
		21,740 l.f.	TOTAL

All water distribution related appurtenances shall be construction in accordance with the latest version of the Recommended Standards for Water Works, and all applicable regulations and standards promulgated by the Town of Ramapo, United Water New York, the New York State Department of Health and the Rockland County Department of Health.

5. Verify On-Site High And Low Pressure Extremes

The Applicant’s site engineer has the results of a hydrant flow test conducted at UWNY hydrant 39-28 dated 11/3/06. This hydrant is located at the northerly corner of the intersection of Route 202 and Route 306. The test results indicate more than adequate pressure in the vicinity. Results of that hydrant test are included in the Appendix. Another fire hydrant is located approximately 1100 southwest of the intersection of Route 202 and Route 306 at the northerly intersection of Route 202 and Cottage Lane (hydrant 39-27). A request has been submitted to UWNY to perform a flow test at that hydrant and a copy of same is included in the Appendix.

Below are calculations of anticipated on-site maximum and minimum pressures based upon the available hydrant flow test data.

Summary:

Condition	Location	Pressure
Maximum Service Pressure (Static) in Main	Road D in front of Lot 73	155.2 psi
Minimum Service Pressure (Static) in Main	End of Road A cul-de-sac	95.8 psi
Minimum Hydrant Pressure (At ISO Fire Flow)	End of Road A cul-de-sac	69.6 psi

Detailed Analysis:

Minimum Service Pressure (Static)

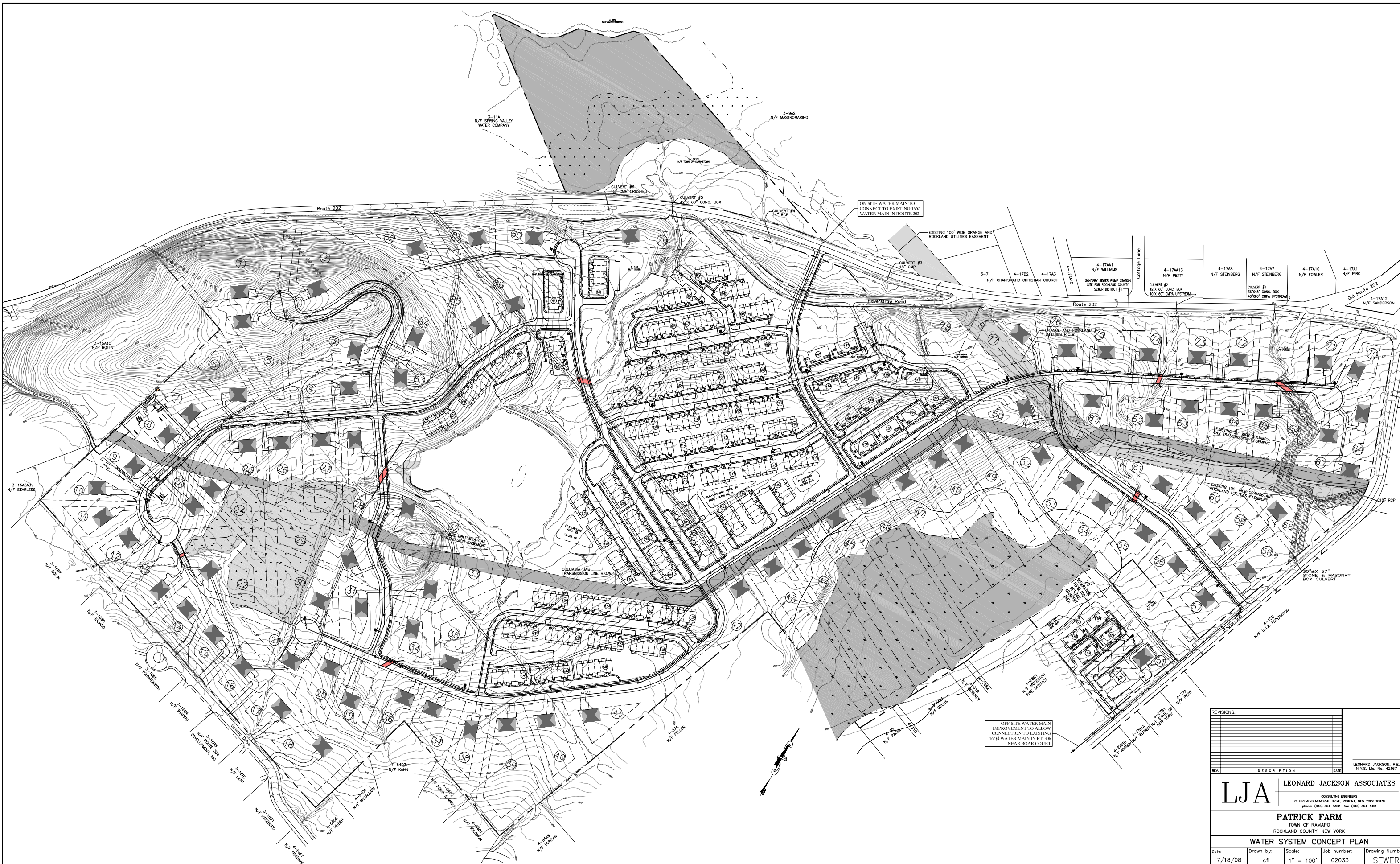
Static Pressure at hydrant: 150 psi
Elevation of Main at end of Road A: 555
Approx. elevation of hydrant 430
 Δ Elev.: 125 ft.
 Δ Pressure: -54.2 psi
Minimum Static Pressure: 95.8 psi

Maximum Service Pressure (Static)

Static Pressure at hydrant: 150 psi
Elevation of Main at Road D low pt.: 418
Approx. elevation of hydrant 430
 Δ Elev.: -12 ft.
 Δ Pressure: +5.2 psi
Maximum Static Pressure: 155.2 psi

Minimum Hydrant Pressure

- Fire Flow: 1000 gpm for 2 hours. The fire flow rate was calculated as per the ISO Fire Suppression Rating Schedule. (Refer to Appendix for the Needed Fire Flow Calculation).
- Calculation of dynamic losses and residual pressure in the system at the required fire flow are included in the Appendix.



OFF-SITE WATER MAIN
IMPROVEMENT TO ALLOW
CONNECTION TO EXISTING
16" WATER MAIN IN RT. 300
NEAR BOARD COURT

REVISIONS:	
REV.	DESCRIPTION

LEONARD JACKSON, P.E.
N.Y.S. Lic. No. 42167

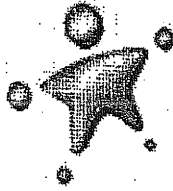
LJA | LEONARD JACKSON ASSOCIATES
CONSULTING ENGINEERS
26 FRIENDS MEMORIAL DRIVE, POMONA, NEW YORK 10970
PHONE: (845) 384-4332 FAX: (845) 384-4401

PATRICK FARM
TOWN OF RAMAPO
ROCKLAND COUNTY, NEW YORK

WATER SYSTEM CONCEPT PLAN

Date:	Drawn by:	Scale:	Job number:	Drawing Number:
7/18/08	cfl	1" = 100'	02033	SEWER

APPENDIX



United Water

SVEZ

360 West Nyack Road
West Nyack, NY 10994
845 620-3328

Hydrant Flow Test

November 03, 2006

Leonard Jackson Ass.

The following are results of a flow test conducted at Hydrant 39-28 on. 11/3/2006

Location: Hydrant is located RT. 202 Ramapo.

Flow Hydrant: 39-28

Control Hydrant: 30-27

Flow: 1657

Static Pressure: 150

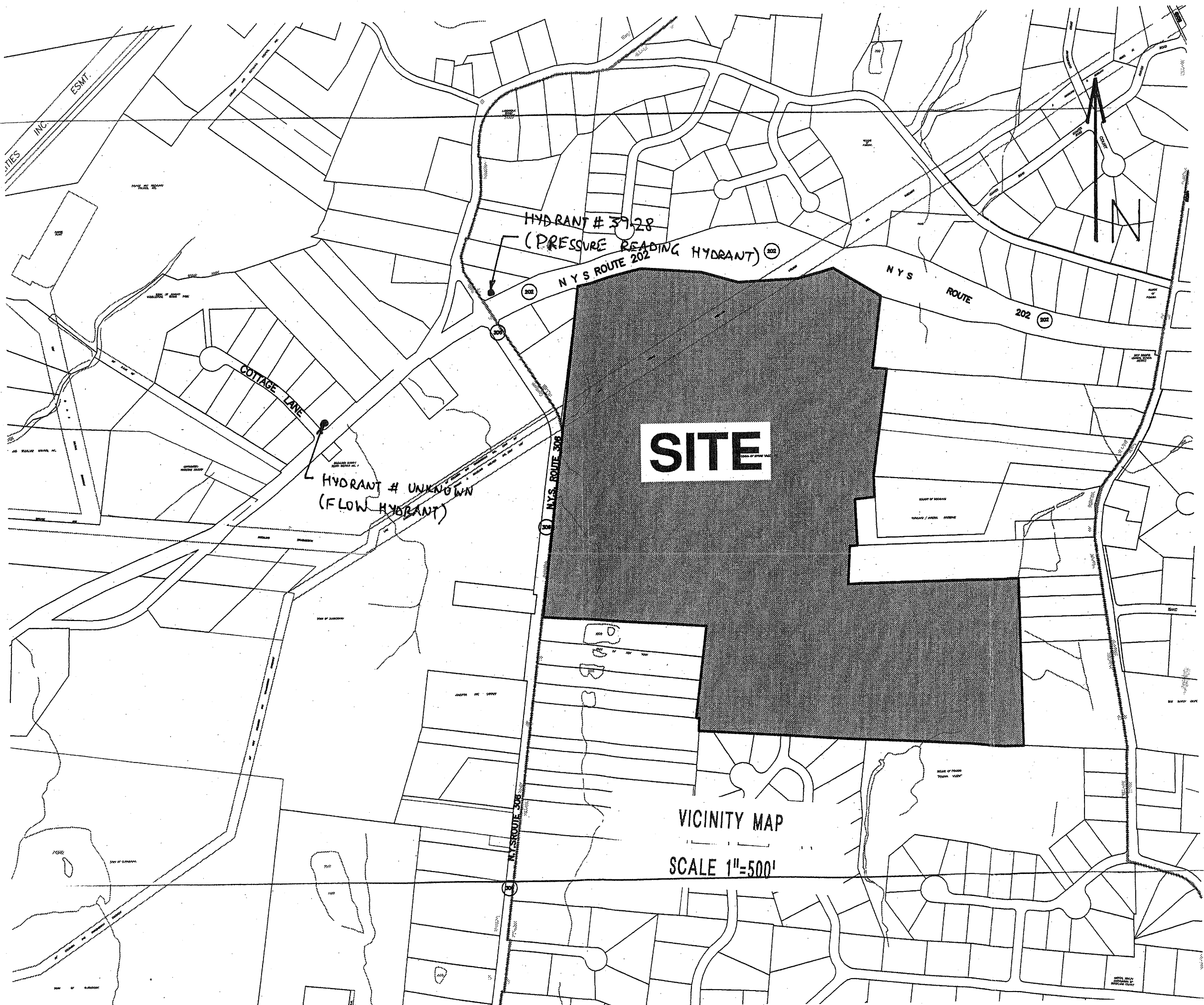
Residual Pressure: 142

Available at 20 psi: 7469

If you have any questions, please call the SCADA Office at 845-620-3328.

Sincerely Yours,

SCADA.



SITE

VICINITY MAP

SCALE 1"=500'



Leonard Jackson Associates Consulting Engineers

26 Firemans Memorial Drive . Pomona, New York 10970 . (845) 354-4382 . FAX (845) 354-4401

June 27, 2008

United Water New York
360 West Nyack Road
West Nyack, NY 10994

Attn: SCADA

Re: **Hydrant Flow Test**
Patrick Farm
LJA #02033

To Whom It May Concern:

At your earliest convenience please perform a flow test at hydrant #39-27. The hydrant is located on the north side of Route 202 near the intersection with Cottage Lane in the Town of Ramapo.

Enclosed is a check for the fee of \$97.63.

Thank you for you attention to this matter.

Very truly yours,

LEONARD JACKSON ASSOCIATES
Rhonda Smith



SITE

HYDRANT # 39-28

HYDRANT 39-27

VICINITY MAP

SCALE 1"=500'

**USING THE HAZEN WILLIAMS FORMULA AND A "C" VALUE FOR DIP = 150
CALCULATED THE FRICTION FACTOR and FRICTION LOSSES FOR FLOW
WITHIN THE WATER MAIN FROM EXISTING HYDRANT AT RT 202/306
INTERSECTION TO THE HIGH POINT AT THE TERMINUS OF THE ROAD A
CUL-DE-SAC**

DISCHARGE (gpm)	FRICTION LOSS IN OFF-SITE 16" DIA. PIPE		FRICTION LOSS IN ON-SITE 8" DIA. PIPE	
	(ft/100 ft)	(ft)	(ft/100 ft)	(ft)
250	0.00	0.1	0.11	4.5
500	0.01	0.4	0.40	16.4
750	0.03	0.9	0.85	34.7
1000	0.05	1.5	1.45	59.0
1250	0.08	2.3	2.19	89.3
1500	0.11	3.2	3.07	125.1
1750	0.14	4.2	4.09	166.4
2000	0.18	5.4	5.24	213.1
2250	0.22	6.7	6.51	265.1
2500	0.27	8.2	7.92	322.2

RESIDUAL PRESSURE AT HYDRANT AT THE TERMINUS OF ROAD A CUL-DE-SAC (NEEDED FIRE FLOW = 1000 GPM)				
DISCHARGE (gpm)	STATIC HEAD AT HYDRANT (psi)	TOTAL FRICTION LOSS		RESIDUAL PRESSURE (psi)
		(ft)	(psi)	
250	93.2	4.6	2.0	91.2
500	93.2	16.8	7.3	85.9
750	93.2	35.5	15.4	77.8
1000	93.2	60.5	26.2	67.0
1250	93.2	91.5	39.7	53.5
1500	93.2	128.3	55.6	37.6
1750	93.2	170.7	74.0	19.2

Calculation of “Needed Fire Flow” as per the Insurance Services Office, Inc. Fire Suppression Rating Schedule:

$$\text{Needed Fire Flow (NFFi)} = (C_i) (O_i) (X + P) i$$

Where

C_i = Construction Factor

O_i = Occupancy Factor

X_i = Exposure Factor

P_i = Communication Factor

$$\text{Construction Factor (C}_i) = 18F (A_i)^{0.5}$$

F = Coefficient related to the class of construction
= 1.5 for Construction Class 1 (Frame)

A_i = Effective area
= 1763 sf (see attached calculation)

C_i = (18) (1.5) (1763)^{0.5}
= 1134 gpm
⇒ 1250 gpm (rounded to the nearest 250 gpm per Needed Fire Flow Instructions)

Occupancy Factor (O_i) = 0.85
Based upon occupancy
Class C-2 (Limited Combustible)

Exposure Factor (X_i)

The Exposure factor is 0 since the multifamily buildings shall be sprinklered.

Communication Factor (P_i)

The Communication factor is 0 since the multifamily buildings shall be sprinklered.

Needed Fire Flow

NFF_i = (1250 gpm) (0.85) (0) = 1063
⇒ 1000 gpm (rounded per instructions)

Effective Area Calculation:

Effective Area is based upon the floor areas within an individual townhome since each party wall will be constructed with a 2-hour fire rating. (Refer to attached excerpt from Specific Commercial Property Evaluation Schedule).

Since architectural plans have not yet been finalized, the Effective Area calculation is based upon conservative assumptions of the building layout.

Effective Area = Largest Modified Floor Area + 50% of all other modified floor areas:

- Assume the units have a full basement which is undivided = 1175 s.f.
- Assume the other modified floor areas consist of the first and second floors, each of which shall have a unmodified area of 50% of the entire floor
= $1175 \times 50\% = 587.5$ s.f.
- Effective area = $(1175 \text{ s.f.}) + [(587.5 \text{ s.f.} + 587.5 \text{ s.f.}) \times (0.5)] = 1763$ s.f.

EXCERPTS FROM THE
INSURANCE SERVICES OFFICE, INC.

FIRE SUPPRESSION RATING SCHEDULE

FIRE SUPPRESSION RATING SCHEDULE



INSURANCE SERVICES OFFICE, INC.

NEEDED FIRE FLOW

300. GENERAL:

This item develops Needed Fire Flows for selected locations throughout the city, which are used in the review of subsequent items of this Schedule. The calculation of a Needed Fire Flow (NFF_i) for a subject building in gallons per minute (gpm) considers the Construction (C_i), Occupancy (O_i), Exposure (X_i) and Communication (P_i) of each selected building, or fire division, as outlined below.

310. CONSTRUCTION FACTOR (C_i):

That portion of the Needed Fire Flow attributed to the construction and area of the selected building is determined by the following formula:

$$C_i = 18F (A_i)^{0.5}$$

F = Coefficient related to the class of construction:

- **F = 1.5 for Construction Class 1* (Frame)** ←
- = 1.0 for Construction Class 2* (Joisted Masonry)
 - = 0.8 for Construction Class 3* (Non-Combustible) and Construction Class 4* (Masonry Non-Combustible)
 - = 0.6 for Construction Class 5* (Modified Fire Resistive) and Construction Class 6* (Fire Resistive)

A_i = Effective* area

In buildings with mixed construction a value, C_{im}, shall be calculated for each class of construction using the effective area of the building. These C_{im} values are multiplied by their individual percentage of the total area. The C_i applicable to the entire building is the sum of these values. However, the value of the C_i shall not be less than the value for any part of the building based upon its own construction and area.

The maximum value of C_i is limited by the following:

- **8,000 gpm for Construction Classes 1 and 2** ←
- 6,000 gpm for Construction Classes 3, 4, 5 and 6
 - 6,000 gpm for a 1-story building of any class of construction.

The minimum value of C_i is 500 gpm. The calculated value of C_i shall be rounded to the nearest 250 gpm.

320. OCCUPANCY FACTOR (O_i):

The factors below reflect the influence of the occupancy in the selected building on the Needed Fire Flow:

OCCUPANCY COMBUSTIBILITY CLASS*	OCCUPANCY FACTOR (O _i)
C-1* (Non-Combustible)	0.75
→ C-2* (Limited Combustible) ←	0.85
C-3* (Combustible)	1.00
C-4* (Free Burning)	1.15
C-5* (Rapid Burning)	1.25

330. EXPOSURES (X_i) AND COMMUNICATION (P_i) FACTORS:

The factors developed in this item reflect the influence of exposed and communicating buildings on the Needed Fire Flow. A value for (X_i + P_i) shall be developed for each side of the subject building:

$$(X + P)_i = 1.0 + \sum_{i=1}^n (X_i + P_i), \text{ maximum } 1.75, \text{ where } n = \text{number of sides of subject building.}$$

A. Factor for Exposure (X_i):

The factor for X_i depends upon the construction and length-height value* (length of wall in feet, times height in stories) of the exposed building and the distance between facing walls of the subject building and the exposed building, and shall be selected from Table 330.A.

*When an asterisk is shown next to a term in this item, the term is defined in greater detail in the Specific Commercial Property Evaluation Schedule.

TABLE 330.A FACTOR FOR EXPOSURE (X_i)

Construction of Facing Wall of Subject Building	Distance Feet to the Exposed Building	Length-Height of Facing Wall of Exposed Building	Construction of Facing Wall of Exposed Building Classes			
			1, 3	2, 4, 5, & 6		
				Unprotected Openings	Semi-Protected Openings (wired glass or outside open sprinklers)	Blank Wall
Frame, Metal or Masonry with Openings	0-10	1-00	0.22	0.21	0.16	0
		101-200	0.23	0.22	0.17	0
		201-300	0.24	0.23	0.18	0
		301-400	0.25	0.24	0.19	0
		Over 400	0.25	0.25	0.20	0
	11-30	1-00	0.17	0.15	0.11	0
		101-200	0.18	0.16	0.12	0
		201-300	0.19	0.18	0.14	0
		301-400	0.20	0.19	0.15	0
		Over 400	0.20	0.19	0.15	0
	31-60	1-00	0.12	0.10	0.07	0
		101-200	0.13	0.11	0.08	0
		201-300	0.14	0.13	0.10	0
		301-400	0.15	0.14	0.11	0
		Over 400	0.15	0.15	0.12	0
	61-100	1-00	0.08	0.06	0.04	0
		101-200	0.08	0.07	0.05	0
		201-300	0.09	0.08	0.06	0
		301-400	0.10	0.09	0.07	0
		Over 400	0.10	0.10	0.08	0
Blank Masonry Wall	Facing Wall of the Exposed Building Is Higher Than Subject Building: Use the above table EXCEPT use only the Length-Height of Facing Wall of the Exposed Building ABOVE the Height of the Facing Wall of the Subject Building. Buildings five stories or over in Height, consider as five stories.					
	When the Height of the Facing Wall of the Exposed Building is the Same or Lower than the Height of the Facing Wall of the Subject Building, $X_i = 0$.					

330. EXPOSURE (X_i) AND COMMUNICATION (P_i) FACTORS: (Continued)

B. Factor for Communications (P_i):

The factor for P_i depends upon the protection for communicating party wall* openings and the length and construction of communications between fire divisions* and shall be selected from Table 330.B. When more than one communication type exists in any one side wall, apply only the largest factor P_i for that side. When there is no communication on a side, $P_i = 0$.

*When an asterisk is shown next to a term in this item, the term is defined in greater detail in the Commercial Fire Rating Schedule.

TABLE 330.B FACTOR FOR COMMUNICATIONS (P_i)

Description of Protection of Passageway Openings	Fire Resistive, Non-Combustible or Slow-Burning Communications				Communications with Combustible Construction					
	Open		Enclosed		Open			Enclosed		
	Any Length	10 Ft. or Less	11 Ft. to 20 Ft.	21 Ft. to 50 Ft. +	10 Ft. or Less	11 Ft. to 20 Ft.	21 Ft. to 50 Ft. +	10 Ft. or Less	11 Ft. to 20 Ft.	21 Ft. to 50 Ft. +
Unprotected	0	+ +	0.30	0.20	0.30	0.20	0.10	+ +	+ +	0.30
Single Class A Fire Door at One End of Passageway	0	0.20	0.10	0	0.20	0.15	0	0.30	0.20	0.10
Single Class B Fire Door at One End of Passageway	0	0.30	0.20	0.10	0.25	0.20	0.10	0.35	0.25	0.15
Single Class A Fire Door at Each End or Double Class A Fire Doors at One End of Passageway	0	0	0	0	0	0	0	0	0	0
Single Class B Fire Door at Each End or Double Class B Fire Doors at One End of Passageway	0	0.10	0.05	0	0	0	0	0.15	0.10	0

+ For over 50 feet, $P_i = 0$.

+ + For unprotected passageways of this length, consider the 2 buildings as a single Fire Division.

Note: When a party wall has communicating openings protected by a single automatic or self-closing Class B fire door, it qualifies as a division wall* for reduction of area.

Note: Where communications are protected by a recognized water curtain, the value of P_i is 0.

*When an asterisk is shown next to a term in this item, the term is defined in greater detail in the Commercial Fire Rating Schedule.

340. CALCULATION OF NEEDED FIRE FLOW (NFF_i):

$$\boxed{NFF_i = (C_i)(O_i)(X + P)^i}$$

When a wood shingle roof covering on the building being considered, or on exposed buildings, can contribute to spreading fires, add 500 gpm to the Needed Fire Flow.

The Needed Fire Flow shall not exceed 12,000 gpm nor be less than 500 gpm.

The Needed Fire Flow shall be rounded off to the nearest 250 gpm if less than 2,500 gpm and to the nearest 500 gpm if greater than 2,500 gpm.

Note 1: For 1- and 2-family dwellings not exceeding 2 stories in height, the following Needed Fire Flows shall be used:

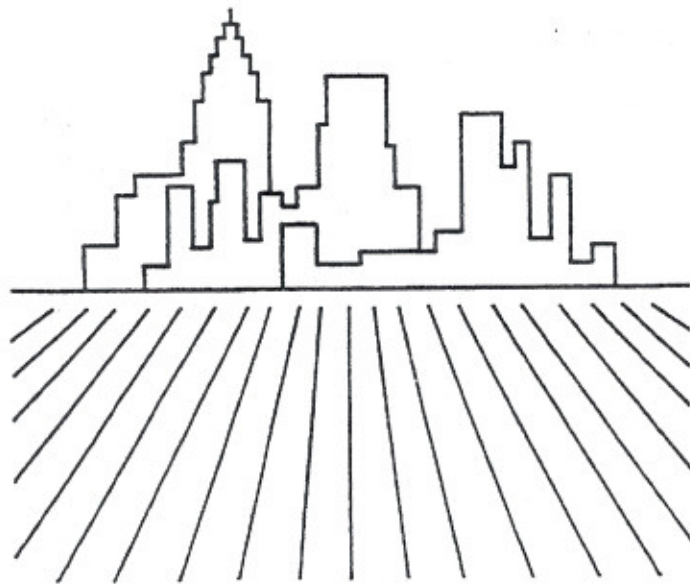
DISTANCE BETWEEN BUILDINGS	NEEDED FIRE FLOW
Over 100'	500 gpm
31-100'	750
11-30'	1,000
10' or less	1,500

Note 2: Other habitational buildings, up to 3,500 gpm maximum.

EXCERPTS FROM THE
ISO COMMERCIAL RISK SERVICES, INC.

SPECIFIC COMMERCIAL PROPERTY EVALUATION SCHEDULE

SPECIFIC COMMERCIAL PROPERTY EVALUATION SCHEDULE



SECONDARY CONSTRUCTION

310 EFFECTIVE AREA (Continued):

c. Modification for Division Walls:

An acceptable Division Wall shall be constructed entirely of non-combustible materials with a fire resistance rating of not less than one hour, or of masonry materials, and shall:

- (1) Extend from one exterior wall to another (or form an enclosed area within the building).
- (2) Extend from one masonry or fire resistive floor to another masonry or fire resistive floor, or from a masonry or fire resistive floor to a roof of any construction.
- (3) Have all openings through the wall protected by an automatic or self-closing labeled Class B (not less than 1 hour) fire door.

Where Division Walls meet the above requirements, the maximum area on any floor used to determine the Effective Area shall be the largest undivided area plus 50% of the second largest undivided area on that floor.

d. Determination of Effective Area:

After modification for Division Walls as provided above, the Effective Area shall be the total square foot area of the largest floor in the building, plus the following percentage of the total area of the other floors:

- (1) Buildings classified as CSP Construction Classes 1-4: 50% of all other floors.
- (2) Buildings classified as CSP Construction Classes 5 or 6:
 - (a) If all vertical openings in the building are Protected (item 300), 25% of the area of not exceeding the two other largest floors.
 - (b) If one or more vertical openings in the building are Unprotected (item 300), 50% of the area of not exceeding 8 other floors with Unprotected Openings.

Note: The Effective Area determined under item (2)(b) above shall not be less than the Effective Area that would be determined under item (2)(a) above if all openings were Protected.

e. Area Charge:

Determine the appropriate Area Charge from the table below based upon the Effective Area, CSP Construction Class and Combustibility Class applicable to the building.

Note: Where the building is of mixed construction, and where sections of the building, if classified separately, would be subject to different construction classes (and therefore different area charges), the area charge shall be determined as follows:

- (1) If 85% or over of the building is of one construction class, the area charge shall be determined as though the entire building were such construction class.
- (2) If less than 85%,
 - (a) For each construction class which would be applicable to the various building sections, determine the area charge which would apply if the entire building were subject to such class.
 - (b) Prorate each charge developed in (a) above according to the percent of the building represented by each construction class; the sum of these charges shall be the final area charge.

July 9, 2008

United Water New York
360 West Nyack Road
West Nyack, NY 10994

Attn: Chris Brophy

Re: **Willingness to Serve Application**
Patrick Farm
LJA #02033

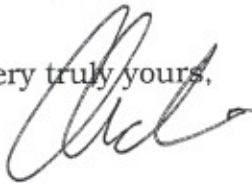
Dear Mr. Brophy:

Enclosed for your review and approval is an application for "Willingness to Serve". Included in support of the subject application are the following materials:

- Willingness to Serve Form
- NYSDOH-348 Application for Approval of Plans for Public Water Supply Improvement.
- Narrative Summary
- Overview Plan for the proposed development

Thank you for your attention to this matter.

Very truly yours,



LEONARD JACKSON ASSOCIATES
Christopher Landis, P.E.

Willingness to Serve Form

General Information:

Date: JULY 9, 2008
Project Name: Patrick Farm
Engineer: Leonard Jackson Associates
Developer: Scenic Development
Location: Intersection of Rt. 202 and Rt 306
Ramapo NEW YORK

Projected Demands:

1. Average Daily Demand: 198,800 GPD
2. Maximum Daily Demand: 397,600 GPD
3. Peak Hourly Demand: 33,133 GPH
4. Required Fire Flows: 1000 GPM

Additional Comments:

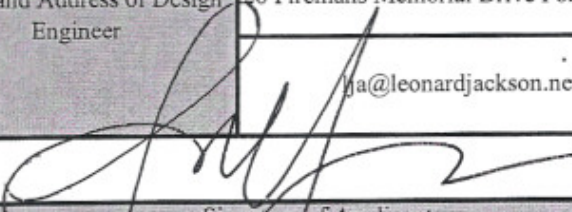
Additional Information:

Your Company's Information

Contact: Chris Landis, P.E.
Company: Leonard Jackson Associates
Address: 26 Firemans Memorial Drive
Town: Pomona State: NY Zip: 10970
Phone Number: 8453544382
Fax Number: 8453544401
Email: clandis@leonardjackson.net

NEW YORK STATE DEPARTMENT OF HEALTH
Bureau of Water Supply Protection

**Application of Approval of Plans for
Public Water Supply Improvement**

Applicant		Location of works (C,V,T)		County		Water District (specific area served)	
United Water New York		(T) Ramapo		Rockland		United Water New York	
Type of Ownership		<input type="checkbox"/> Private - Other		<input type="checkbox"/> Authority		<input type="checkbox"/> Interstate	
<input checked="" type="checkbox"/> Municipal		<input type="checkbox"/> Commercial		<input type="checkbox"/> Private - Institutional		<input type="checkbox"/> Federal	
<input type="checkbox"/> Industrial		<input type="checkbox"/> Water Works Corp.		<input type="checkbox"/> Board of Education		<input type="checkbox"/> State	
<input checked="" type="checkbox"/> Modifications to existing system. If checked, provide PWS ID # NY		4303673					
<input type="checkbox"/> New System. If checked, provide capacity development (viability) analysis*							
If this project involves a new system, new water district, or a district extension provide boundary description location details in digital format on CD or Floppy Disk. If digital boundary location details are not available provide a text description.							
<input type="checkbox"/> Digital GIS Data Provided		<input type="checkbox"/> Digital CAD Data Provided		<input type="checkbox"/> Other Digital Data Provided		<input type="checkbox"/> Text Description Provided	
						<input type="checkbox"/> N/A	
Funding Source		<input checked="" type="checkbox"/> Private		<input type="checkbox"/> DWSRF**		<input type="checkbox"/> Federal	
						<input type="checkbox"/> Other	
If DWSRF is checked, please provide DWSRF #							
Estimated Project Cost \$							
Source		Treatment		Storage		Distribution	
						\$2,000,000	
Pumping		Engineering		Legal/Permitting		Total	
		\$175,000		\$50,000		\$2,225,000	
Type of Project		<input type="checkbox"/> Corrosion Control		<input type="checkbox"/> U.V. Light Disinfection		<input checked="" type="checkbox"/> Distribution	
<input type="checkbox"/> Source		<input type="checkbox"/> Pumping Unit		<input type="checkbox"/> Fluoridation		<input type="checkbox"/> Storage	
<input type="checkbox"/> Transmission		<input type="checkbox"/> Chlorination		<input type="checkbox"/> Other Treatment		<input type="checkbox"/> Other	
Project Description		Residential development consisting of 397 units within both single family detached and multi-family attached dwellings.					
Total Population of Service Area				298,000		NYS Professional Licensed Engineer Stamp and Signature***	
% population actually served				90			
% population affected by project				<1			
Latest Total Consumption Data (in MGD)							
Average Day		Year					
31.4		2007					
Maximum Day		Year					
44.8		2007					
Peak Hour		Year					
63.8		2007					
Name and Address of Design Engineer		Leonard Jackson Associates 26 Firemans Memorial Drive Pomona, NY 10970					
		lja@leonardjackson.net		Tel. 845-354-4382			
				Fax 845-354-4401			
Signature of Applicant						Date	
						7/18/08	
NOTE: All applications must be accompanied by 3 sets of plans, 3 sets of specifications and an engineer's report describing the project in detail. The project must first be discussed with the appropriate city, county, district or regional public health engineer. Signature by a designated representative <i>must</i> be accompanied by a letter of authorization.							
*Additional information regarding capacity development may be found at:				http://www.health.state.ny.us/nvsdoh/water/main.htm			
**Current DWSRF project listings may be found at:				http://www.health.state.ny.us/nvsdoh/water/main.htm			
***By affixing the stamp and signature the Design Engineer agrees that the plans and specifications have been prepared in accordance with the most recent version of the recommended standards for water works and in accordance with the NYS Sanitary Code.							

LEONARD JACKSON ASSOCIATES

LJA #02033
July 9, 2008

Water Supply Narrative Summary

The Patrick Farm site is located in the Town of Ramapo at the southwest corner of the intersection of Route 202 and Route 306. Proposed development consists of 497 dwelling units, which shall include single family detached residences and multi-family attached structures.

Following is a breakdown of proposed building types:

- (63) 6-unit buildings = 378 units
 - (4) 5-unit buildings = 20 units
 - (3) 4-unit buildings = 12 units
 - Single family homes = 87 units
- Total = 497 units

The above description accounts for complete build-out of the site. Water demand calculations are as follows:

Water Demand Data

- a) Proposed: 497 residential units
- b) Location: Southwest corner of the intersection of Route 202 & Route 306; Town of Ramapo
- c) Anticipated Start of Construction: Spring 2009
- d) Anticipated End of Construction: Fall 2014
- e) Average Daily Domestic Water Demand:

$$497 \text{ units} \times 400 \text{ gal/day/unit} = \underline{198,800 \text{ gpd}}$$

- f) Maximum Daily Domestic Water Demand

$$\begin{aligned} &= 2 \times \text{Average Daily Demand} \\ &= 2 \times 198,800 \text{ gpd} = 397,600 \text{ gpd} \end{aligned}$$

- g) Peak Hourly Water Demand:

$$\begin{aligned} &= 4 \times \text{Average Daily Demand} \\ &= 4 \times 198,800 \text{ gpd} \times (1 \text{ day}/24 \text{ hrs}) = 33,133 \text{ gph} \end{aligned}$$

Connections to the existing UWNY distribution system shall be made at two locations: 16" diameter main in Route 202 and the 16" diameter main located in Route 306. The existing main in Route 306 terminates approximately 1400 feet south of the site, thereby requiring off-site water main improvements in Route 306 from the site to the terminus of the existing main.

