

# City Council Presentation Proposed Water Reservoirs

January 31, 2011

*Department of Public Services  
Engineering Services Division*



*“If we want things to stay as they are, things will have to change”*

Giuseppe Tomasi di Lampedusa  
11<sup>th</sup> Prince of Lampedusa



# Background

- A Public Protection Classification study completed for Rochester Hills in 1991.
- The City experienced drought conditions in 2000.
- The 2002 BIOTERRORISM ACT mandates a review of utility operations and the establishment of emergency procedures for public water systems.
- Finkbeiner, Pettis & Strout (FPS) completes a water system analysis in 2002.



# Background, cont.

- A multiple day power failure occurs in August of 2003.
- DWSD establishes a Technical Advisory Committee (TAC) for the development of a Model Contract governing the water purchase rate methodology for customers.
- FPS completes a second water system analysis in 2005.



# Background, cont.

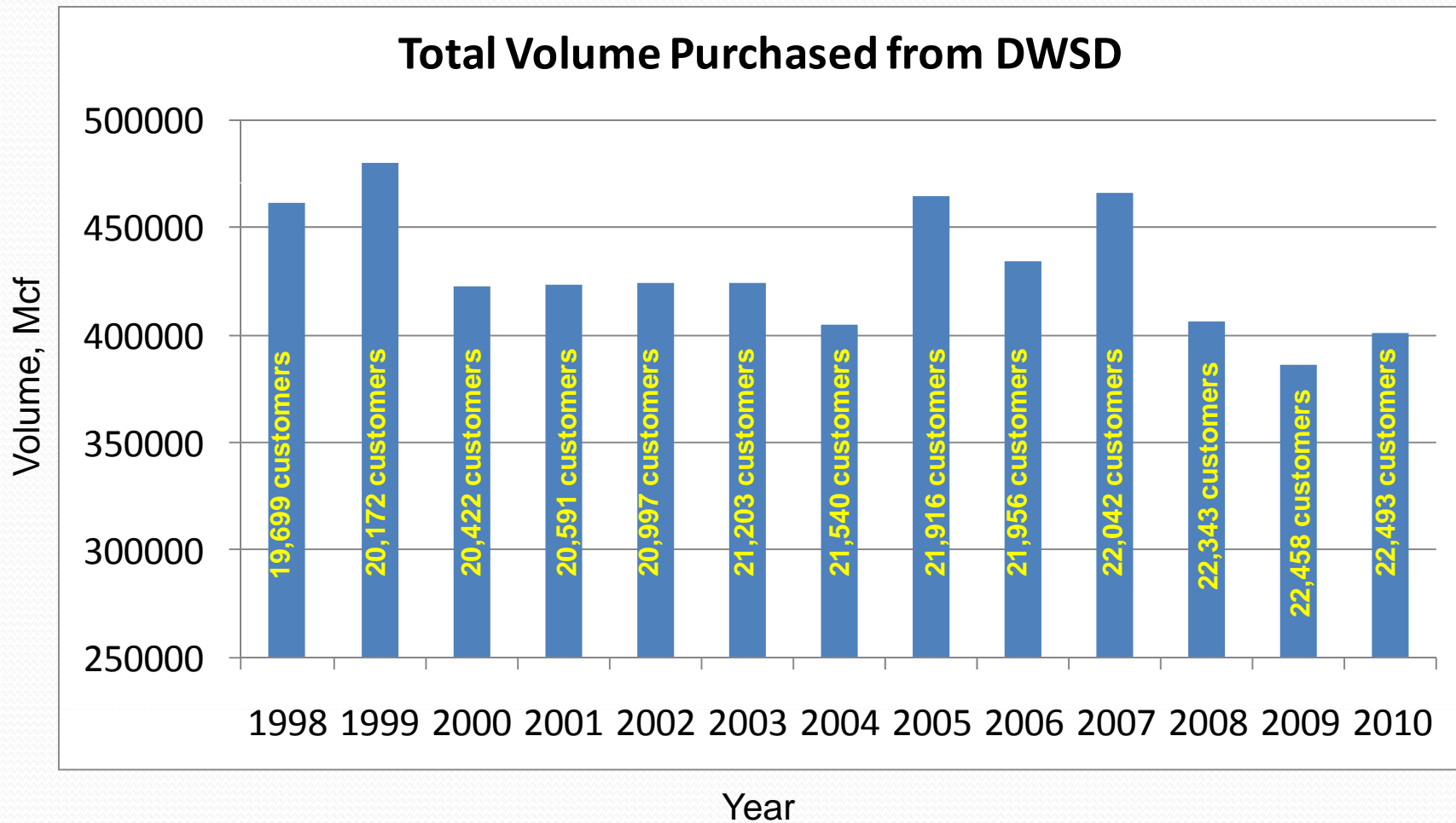
- 2008, DWSD recommends that municipalities consider water storage as an option for reducing water purchase rates.
- August 2008, The City of Rochester Hills establishes watering restrictions.
- In May of 2009 The City of Rochester Hills, adopts a 30-year contract with DWSD.
- Tetra Tech completes a water storage feasibility study in December of 2009.



# Background, cont.

- January 2010, a presentation to City Council on the feasibility of constructing water storage facilities.
- January 2010, the Water and Sewer Rate Technical Review Committee recommend that City Council move forward with the design of water storage facilities.
- Over the past 20 years a need for an improvement to our water system has been identified that will have a positive impact on cost, public safety, improved pressures and customer service.

# Water Use, 1998-2010



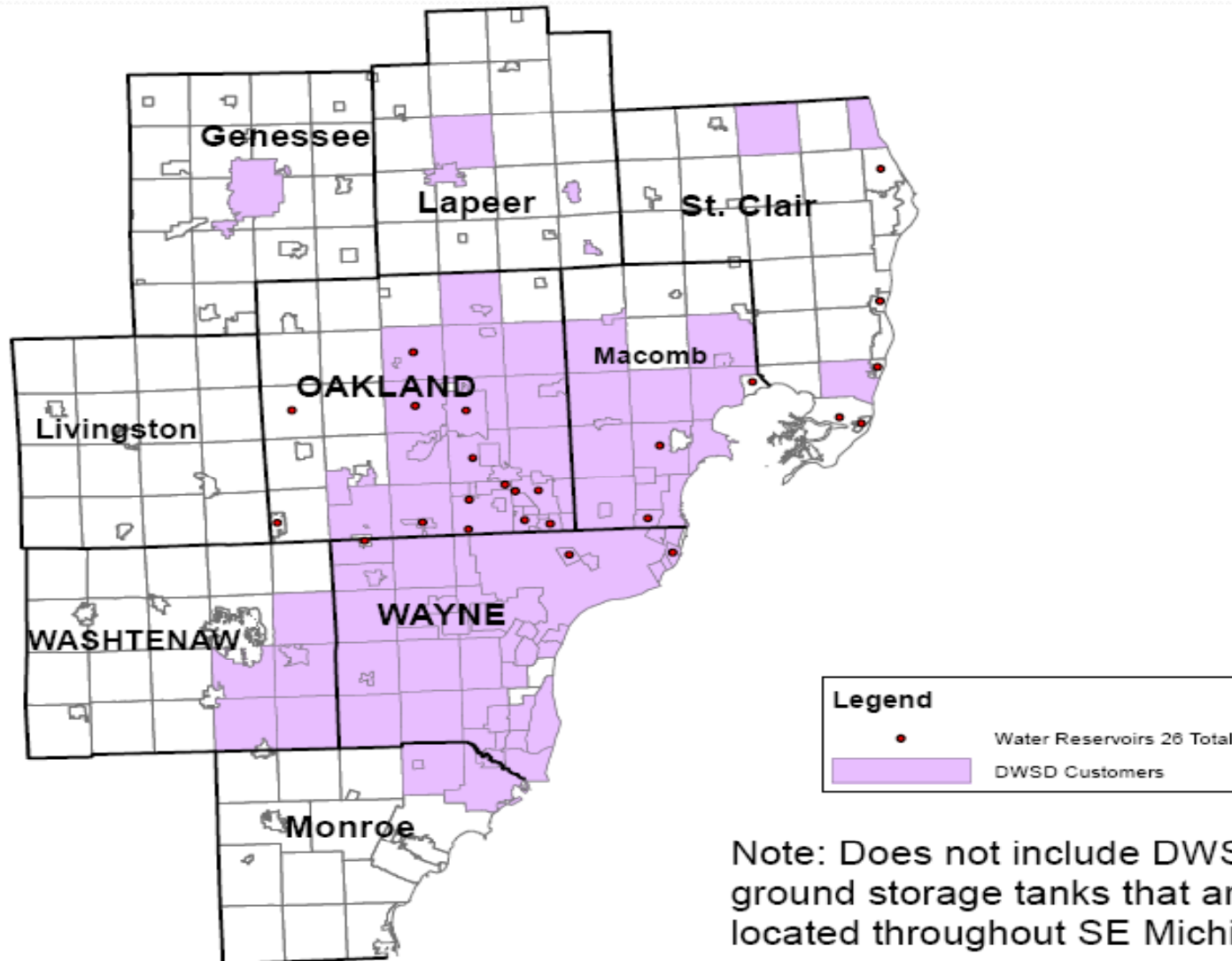


# DWSD Customers

- DWSD has 85 first tier wholesale customers connected to its water system
- Of the 85 customers, 20 customers have some form of water storage
- Two of the 20 customers with storage are water authorities
- Of the 85 customers, 7 customers are max day customers, this includes two of the water authorities. Five of these 7 customers have some form of water storage.



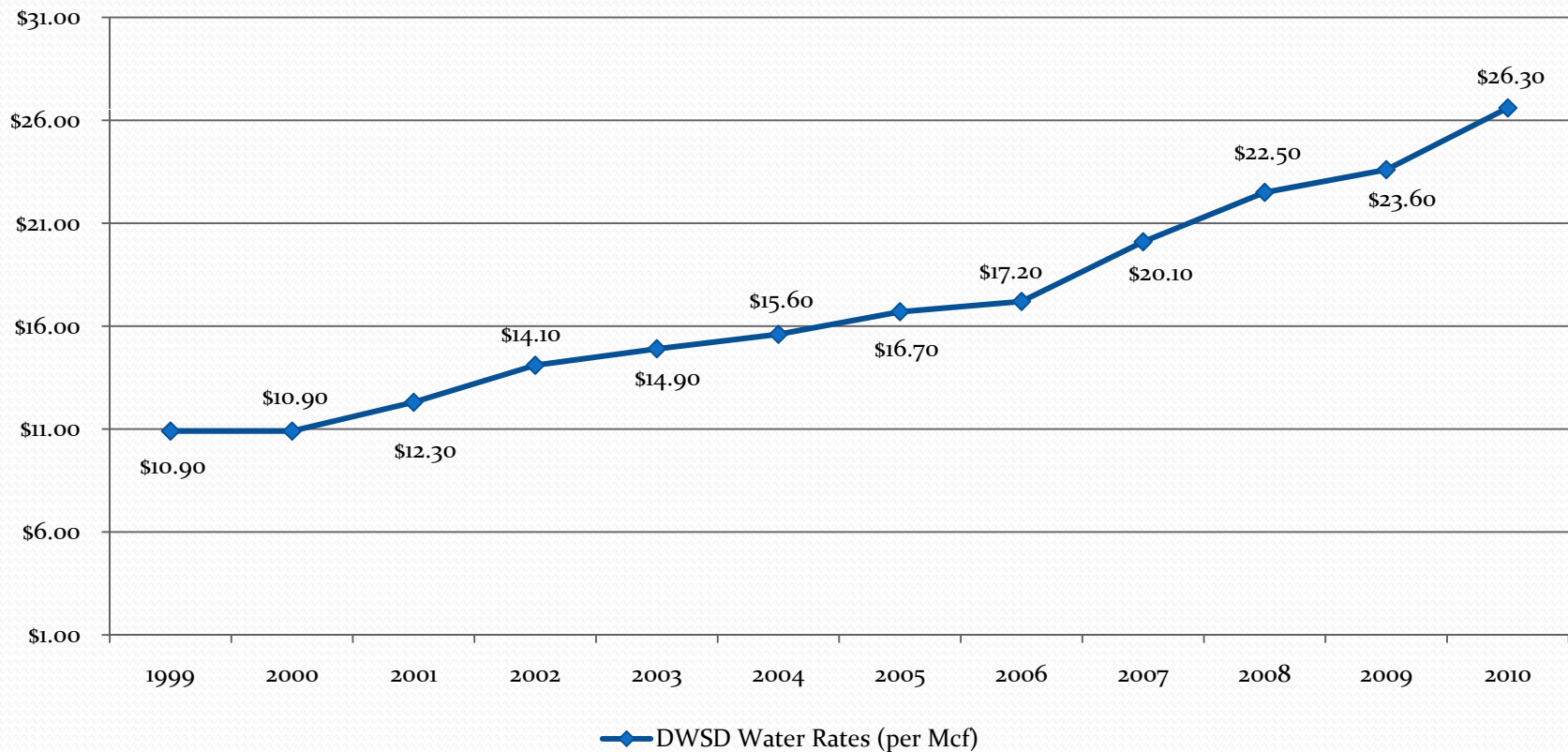
# DWSD Customers



# DWSD Water Rate Increase

Rates include fixed costs

## DWSD Water Rates (per Mcf)





# DWSD Current Rate Structure

The following information is used to develop the City's water rate:

- Base: amount of water used by a customer on an average day
- Maximum Day: the largest amount of water used by a customer during one day throughout the year
- Peak Hour: the largest amount of water used by a customer during a one hour period on the maximum day
- Distance & Elevation factors compared to the five (5) treatment facilities is also used

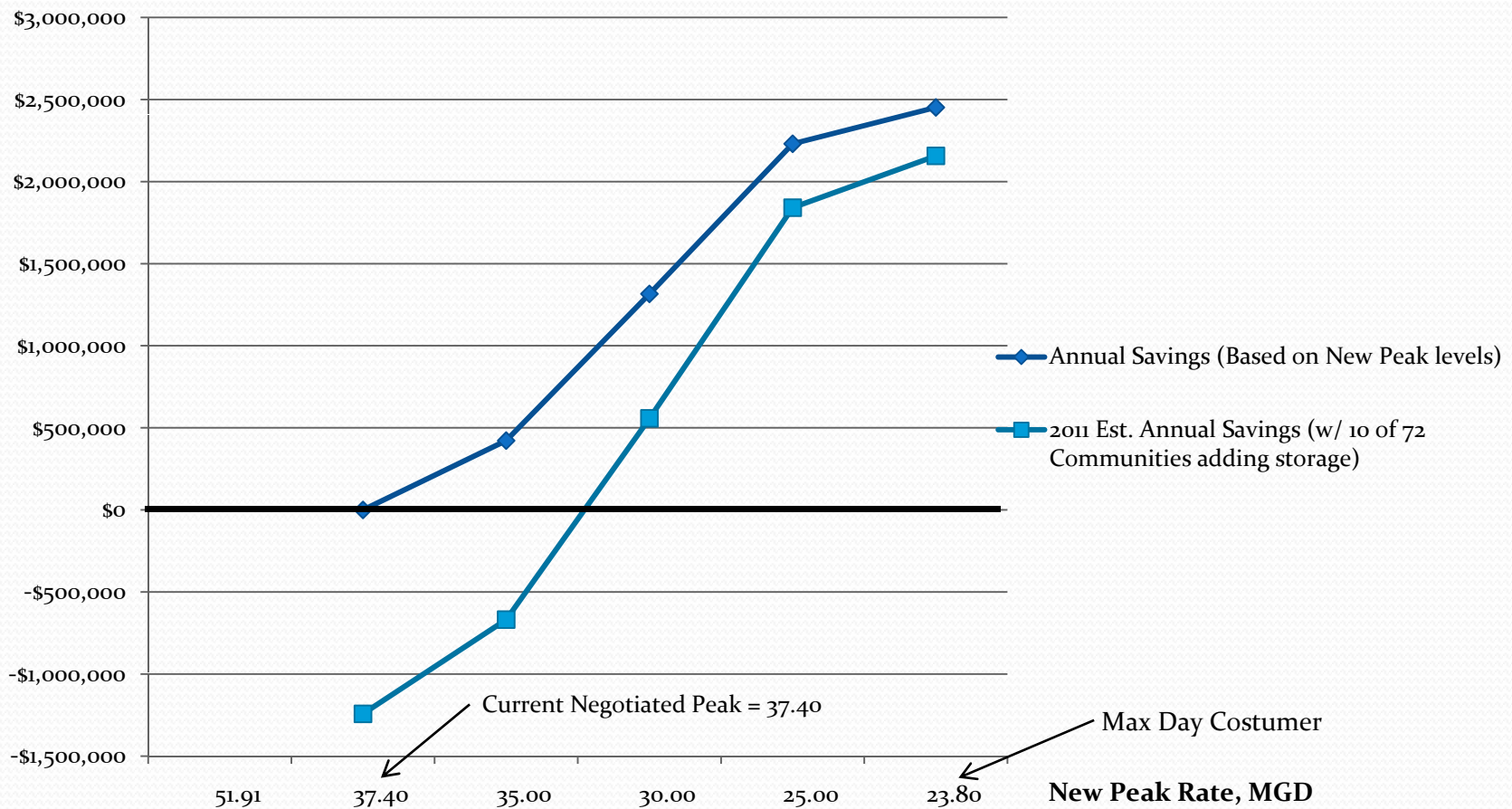
# DWSD Water Rate Calculation Sheet for Rochester Hills

## FY 2010-11 PRELIMINARY RATE CALCULATION

COMMUNITY: **Rochester Hills**

	A	B	C	D	E	F		G
	Cct Dmd	Units of	Applied		Allocated	Cost Recovery		
<u>Service Category</u>	<u>Proxies</u>	<u>Service</u>	<u>Units</u>	<u>Unit Cost</u>	<u>Costs</u>	<u>Fixed (c)</u>	<u>Commodity</u>	
	<i>mgd</i>	<i>Mcf/day</i>	<i>Mcf/day ~</i>					
1 Commodity	(a)	1,219.2	1,346.0	\$188.01	\$253,057	\$0	\$253,057	
2 Max Day Usage	25.81	3,450.3	3,577.1	803.54	2,874,353	487,788	2,386,565	
3 Peak Hour Usage	51.91	6,939.4	7,066.2	0.00	0	0	0	
4 <b>Peak Hour Increment</b>			3,489.1	225.77	<b>787,722</b>	0	787,722	
5 Commodity Distance	26.9 miles		36,207.4	0.00	0	0	0	
6 Max Day Distance			96,223.9	0.00	0	0	0	
7 <b>Peak Hour Use Distance</b>			190,079.6	8.89	<b>1,689,427</b>	385,719	1,303,708	
8 Peak Hour Incr Distance			93,855.8	0.00	0	0	0	
9 Commodity Distance-EI	48.7 miles (b)		65,550.2	10.71	701,846	0	701,846	
10 Max Day Distance-Elevation			174,204.5	1.30	226,466	0	226,466	
11 <b>Peak Hour Use Distance-Elevation</b>			344,121.9	11.05	<b>3,800,826</b>	0	3,800,826	
12 <b>Peak Hour Incr Distance-Elevation</b>			169,917.3	7.34	<b>1,247,533</b>	0	1,247,533	
13 Customer B (Meters)		2,385 eq 5/8" mtrs		19.14	45,637	45,637	0	
14 Wholesale Customer Support			1,346.0	58.15	78,275	78,275	0	
15 Total FY 2011 Revenue Requirement					<b>\$11,705,142</b>	<b>\$997,419</b>	<b>\$10,707,723</b>	
16 FY 2011 Billing Units					445,000	12	445,000	
17 FY 2011 Rate Schedule (16)/(17)					\$26.30	<b>\$83,118</b>	<b>\$24.06</b>	

# What happens if other communities build storage?



# Comparison Table

## Rochester Hills

### Based on 2010 Rates

	Volume	Max Day	Peak Hour	Monthly	\$/Mcf	Annual Savings (Based on New Peak levels)
2009 Peaks	445,000	25.81	51.91	83,618	24.34	
New Negotiated Peaks	410,000	23.80	37.40	71,310	20.08	0
	410,000	23.80	35.00	69,858	19.05	\$422,300
	410,000	23.80	30.00	66,821	16.87	\$1,316,100
	410,000	23.80	25.00	63,761	14.64	\$2,230,400
<b>Max Day Customer</b>	410,000	23.80	23.80	63,024	14.10	<b>\$2,451,800</b>

## Rochester Hills

### Sample 2011 rates based on contracts with 72 Customer Approved Contracts

(10 other communities build reservoirs)

	Volume	Max Day	Peak Hour	Monthly	\$/Mcf	Annual \$ diff. to 20.80/Mcf	Annual Savings
	445,000	25.81	51.91	86,596	28.72		
<b>Based on Negotiated Peaks</b>	410,000	23.80	37.40	73,513	23.11	-\$1,242,300	
	410,000	23.80	35.00	71,933	21.71	-\$668,300	\$574,000
	410,000	23.80	30.00	68,618	18.72	\$557,600	\$1,799,900
	410,000	23.80	25.00	65,281	15.59	\$1,840,900	\$3,083,200
<b>Max Day Customer</b>	410,000	23.80	23.80	64,475	14.82	\$2,156,600	\$3,398,900

# Community Max Day /Peak Hour

Community	Max Day Usage	Peak Hour Usage	Peak Hour Increment
Auburn Hills	12.50	13.54	1.04
Bloomfield Township	19.00	35.00	16.00
Brownstown Township	7.62	13.00	5.38
Clinton Township (storage)	25.80	29.00	3.20
Commerce Township	7.62	13.73	6.11
Farmington Hills	25.92	46.72	20.80
Flint (storage)	50.47	52.76	2.29
Gross Pointe Woods (storage)	5.36	5.36	0.00
Livonia	31.55	45.37	13.82
Novi	18.57	34.53	15.96
Oak Park (storage)	4.91	4.91	0.00
Orion Township	8.50	12.00	3.50
Rochester Hills	25.81	51.91	26.10
Sterling Heights	40.50	61.00	20.50
St. Clair Shores	9.10	13.20	4.10
Troy	28.00	38.00	10.00

Note: Info is based on 2010-2011 Rates



## What Have We Done?

- The City's peak hour was reduced from 51.91 to 37.40 due to a shift in peak hour. Years 2006-2008 were at 7:00 am. Years 2009-2010 were at 4:00 am, thus shifting into DWSD non-peak hours.
- Rochester Hills passed the irrigation ordinance in August 2008 requiring irrigation during the hours of midnight – 5 am.
- May 2010, the City launched a water conservation program to inform customers of ways to conserve water.





## What Else Has Been Looked Into to Reduce Water Demands?

- Odd/even watering.
- Area maintenance meters.
- Increase Water Conservation

# DWSD Estimated Water Rates

<b>Volume</b>	<b>Max Day</b>	<b>Peak Hour</b>	<b>Monthly*</b>	<b>\$/Mcf*</b>
445,000	25.81	51.91	\$83,618	\$24.34
430,000	23.80	37.40	\$71,682	\$19.26
430,000	23.80	23.80	\$63,396	\$13.56
420,000	23.80	37.40	\$71,497	\$19.66
420,000	23.80	23.80	\$63,211	\$13.82
410,000	23.80	37.40	\$71,310	\$20.08
410,000	23.80	23.80	\$63,024	\$14.10

\*Based on water service contract re-opener but 2010-2011 rates, annual increase likely



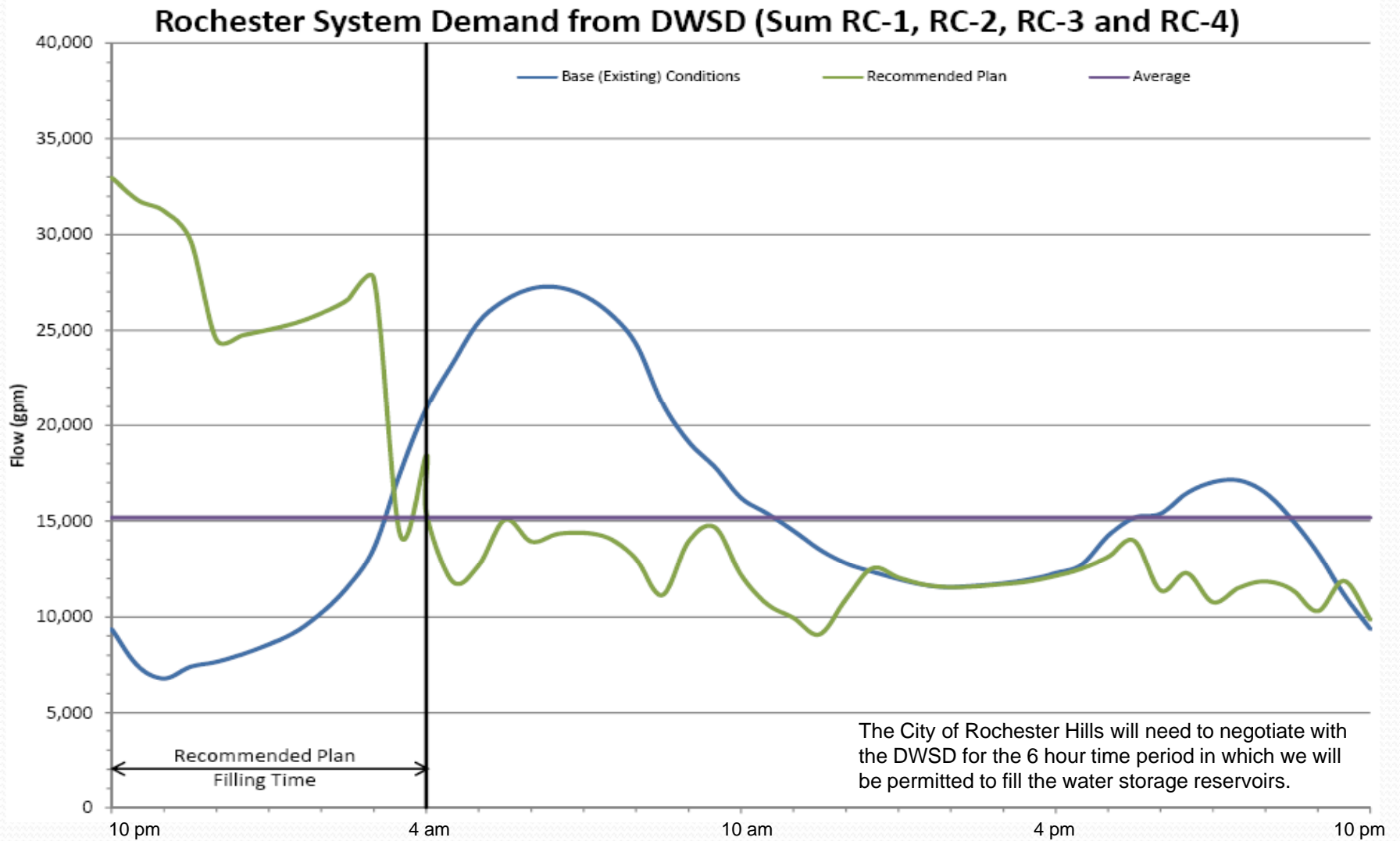
# Water Storage, Estimating the Effects on the Cost of Purchasing Water from DWSD and Water Rates

- Fiscal Evaluation, Keith Sawdon, Director

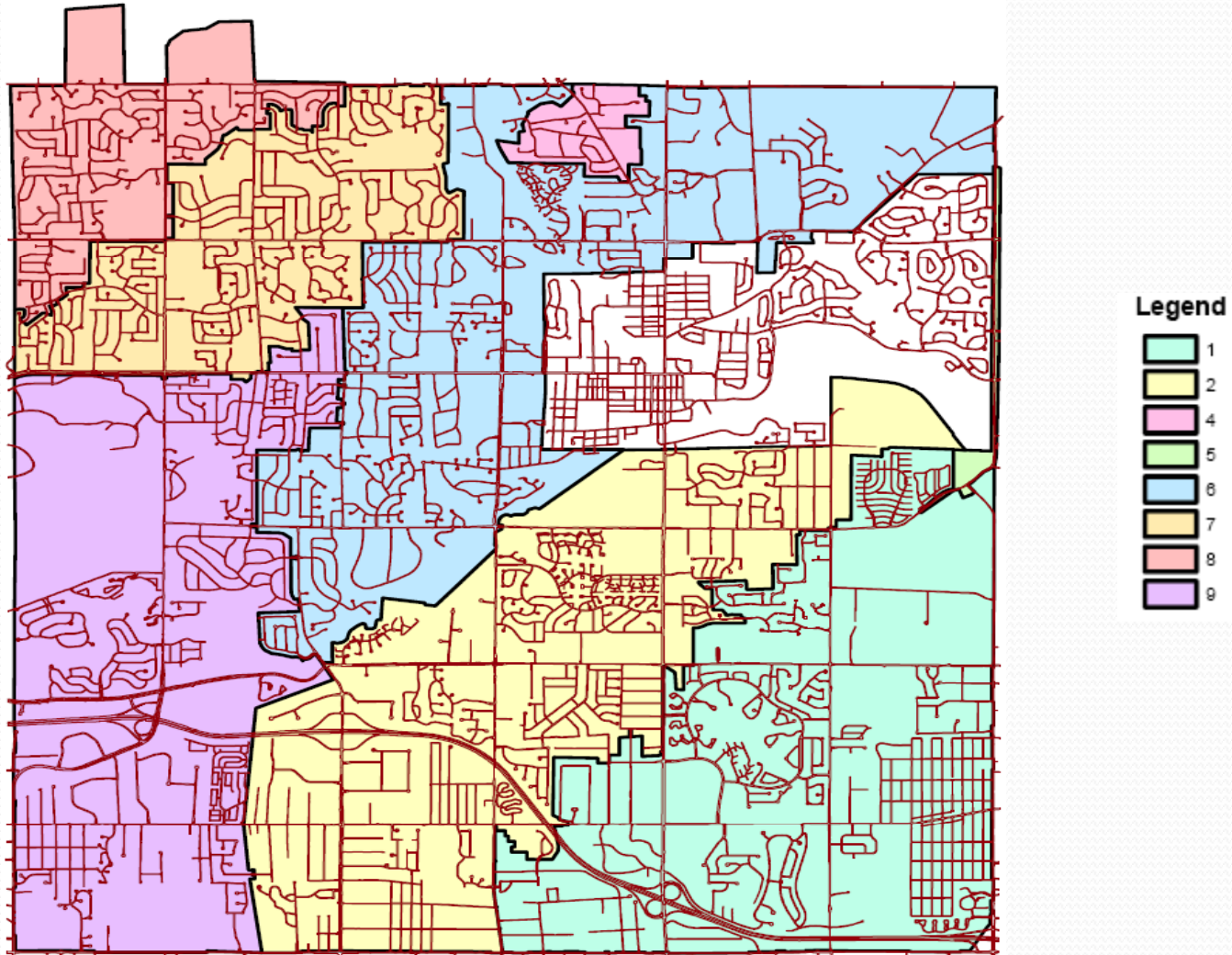
# Rochester Hills Peak Hour

Year	DWSD		Rochester Hills	
	Max Day	Peak Hour	Peak Hour	Peak Hr (MGD)
2002	July 16	4:00 PM	6:00 AM	35.80
2003	July 31	8:00 PM	6:00 AM	37.20
2004	July 2	8:00 AM	6:00 AM	33.29
2005	June 27	7:00 PM	6:00 AM	36.87
2006	June 17	7:00 AM	7:00 AM	40.20
2007	August 3	6:00 AM	7:00 AM	44.99
2008	August 18	5:00 AM	7:00 AM	30.92
2009	August 5	6:00 AM	4:00 AM	26.95
2010	July 7	7:00 PM	4:00 AM	30.06

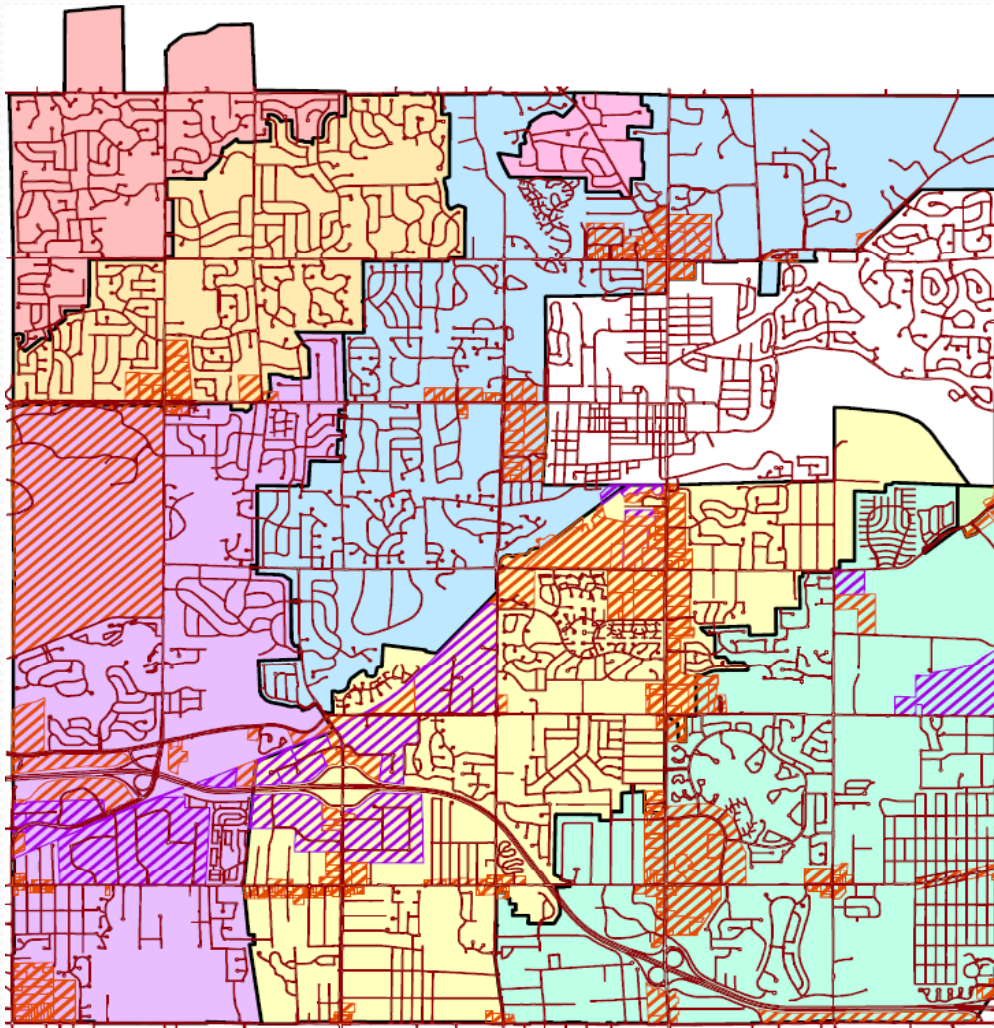
# Peak Flow Reduction



# City of Rochester Hills, Pressure District Map



# City of Rochester Hills, Pressure District Map w/ Industrial Property



**Legend**

-  Commercial/Office/PUD
-  Industrial



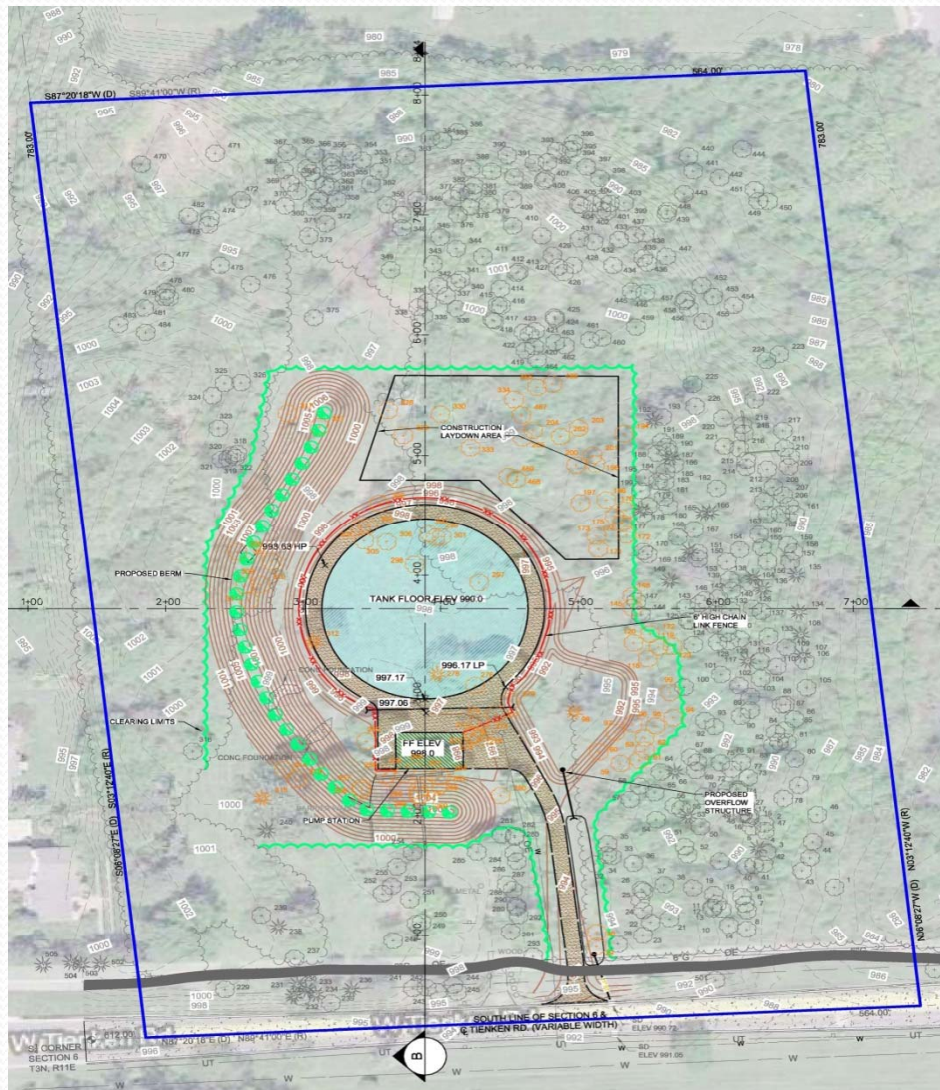
# Proposed Industrial Location

The City looked at the possibility of locating the proposed NW water reservoir in an industrial/commercial location (Crooks/Avon Industrial area). The results from the modeling are as follows:

- City does not own property in this location and vacant properties are limited.
- Max Day requirements can be met at a Crooks/Avon Industrial location
- The cost associated with constructing a reservoir in this area would be approximately \$4,000,000 more than the Tienken / Adams location. This does not include property purchase, engineering or increased annual operating costs.



# Proposed Site Plan, Tienken/Adams



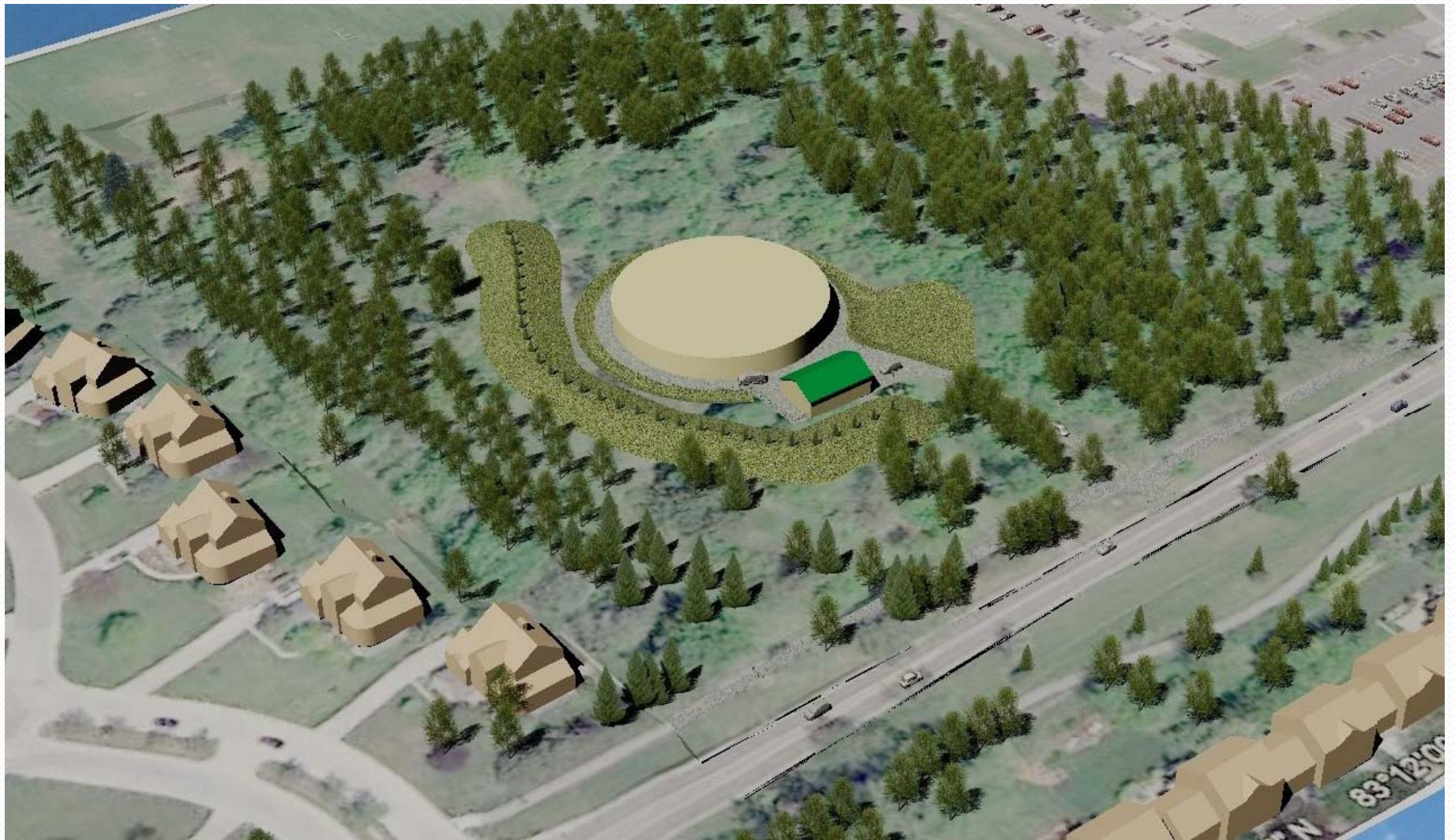
Note: location on site is conceptual

# Proposed Tienken/Adams Site, conceptual

Looking East – from back of homes along the east side of Royal Doulton Blvd



# Proposed Tienken/Adams Site, conceptual

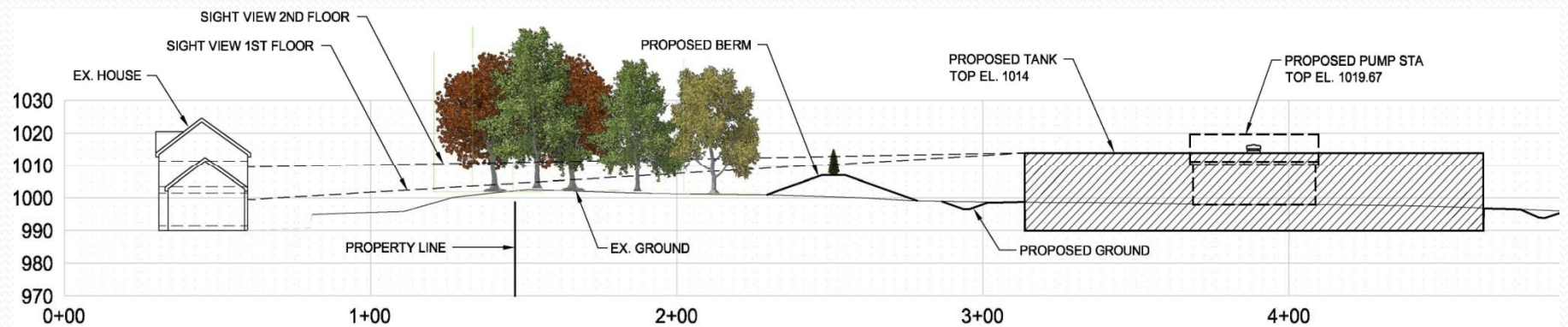




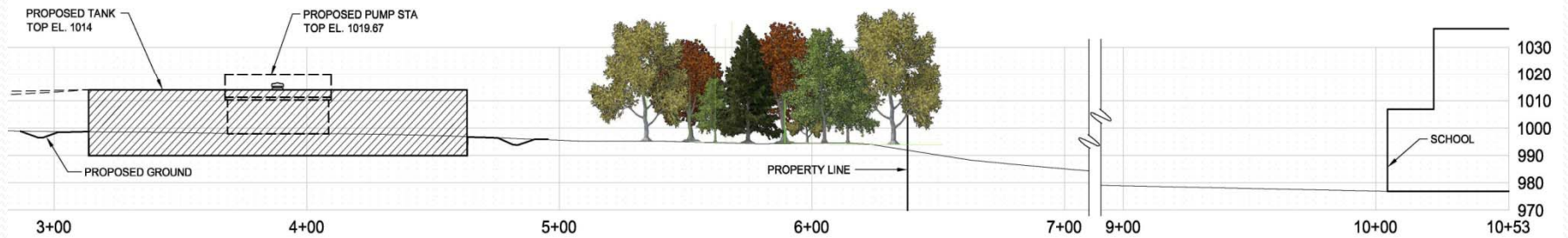
# Video

- Location of reservoir conceptual
- Height of structure in video is at 30' and not buried, terrain is flat

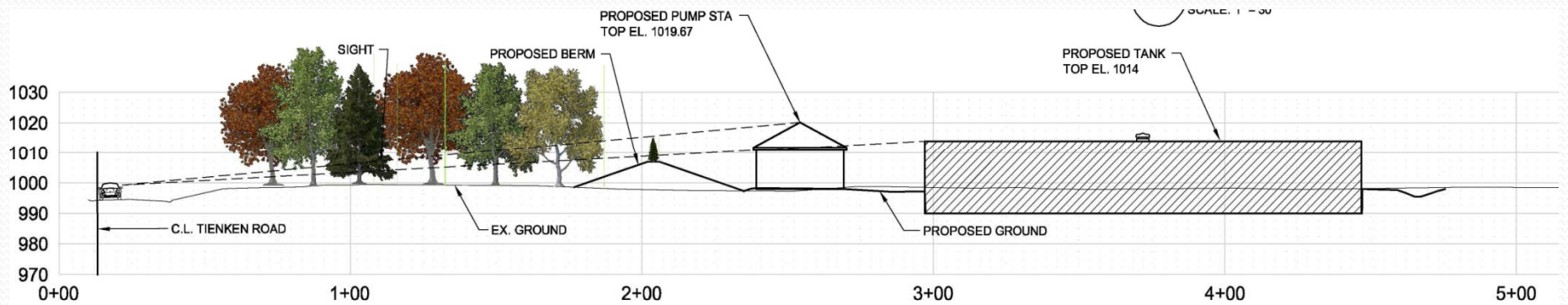
# Proposed Site Plan, Tienken /Adams, profile west to east (homes to reservoir)



# Proposed Site Plan, Tienken/Adams, profile west to east (from reservoir to school)

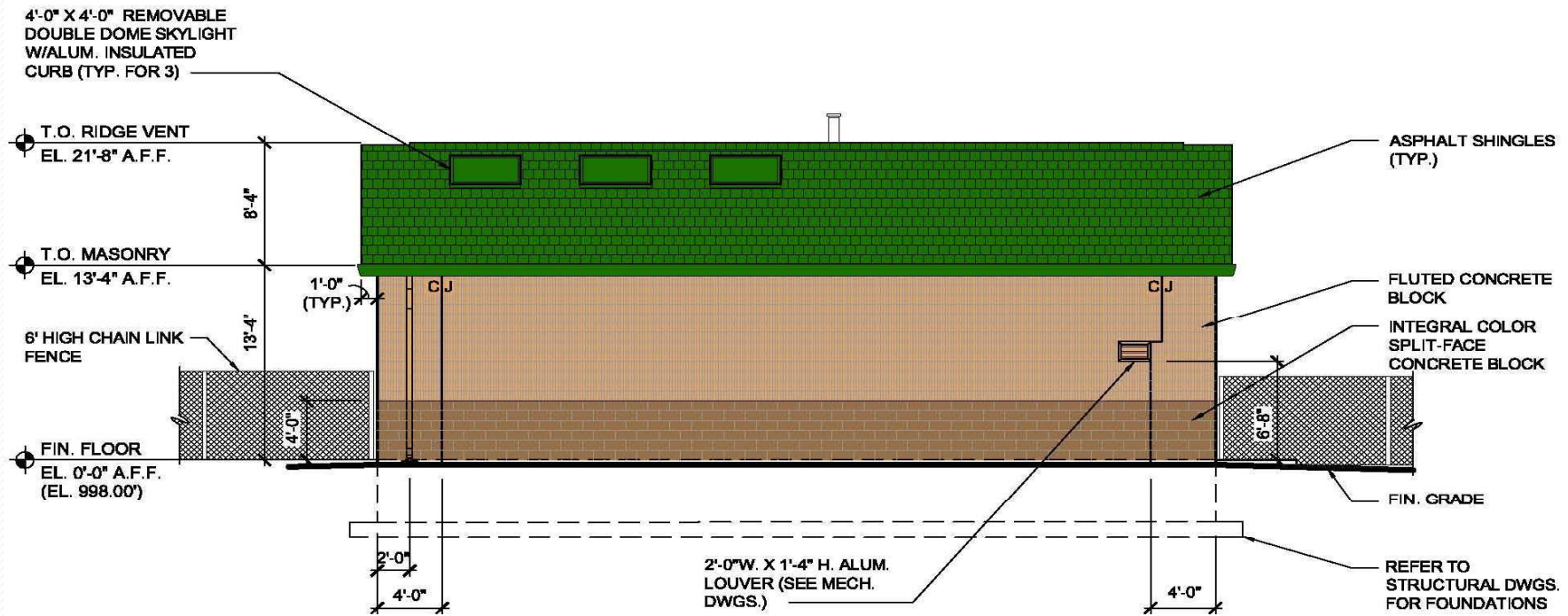


# Proposed Site Plan, Tienken/Adams, profile south to north (Tienken Rd to reservoir)



# Proposed Site Plan, Tienken/Adams

## Booster Station



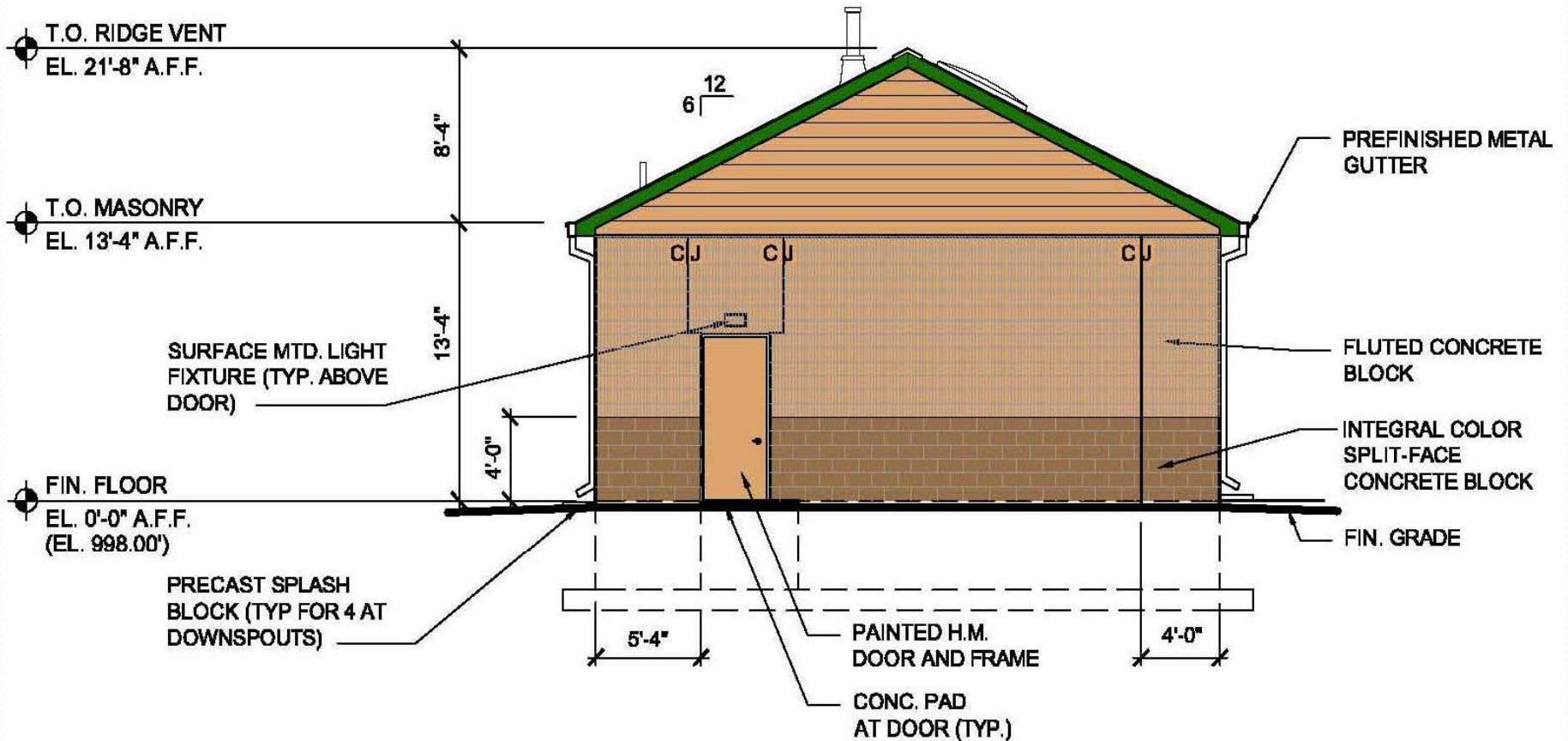
### PUMP STATION SOUTH - ELEVATION

SCALE: 1" = 10'



# Proposed Site Plan, Tienken/Adams

## Booster Station

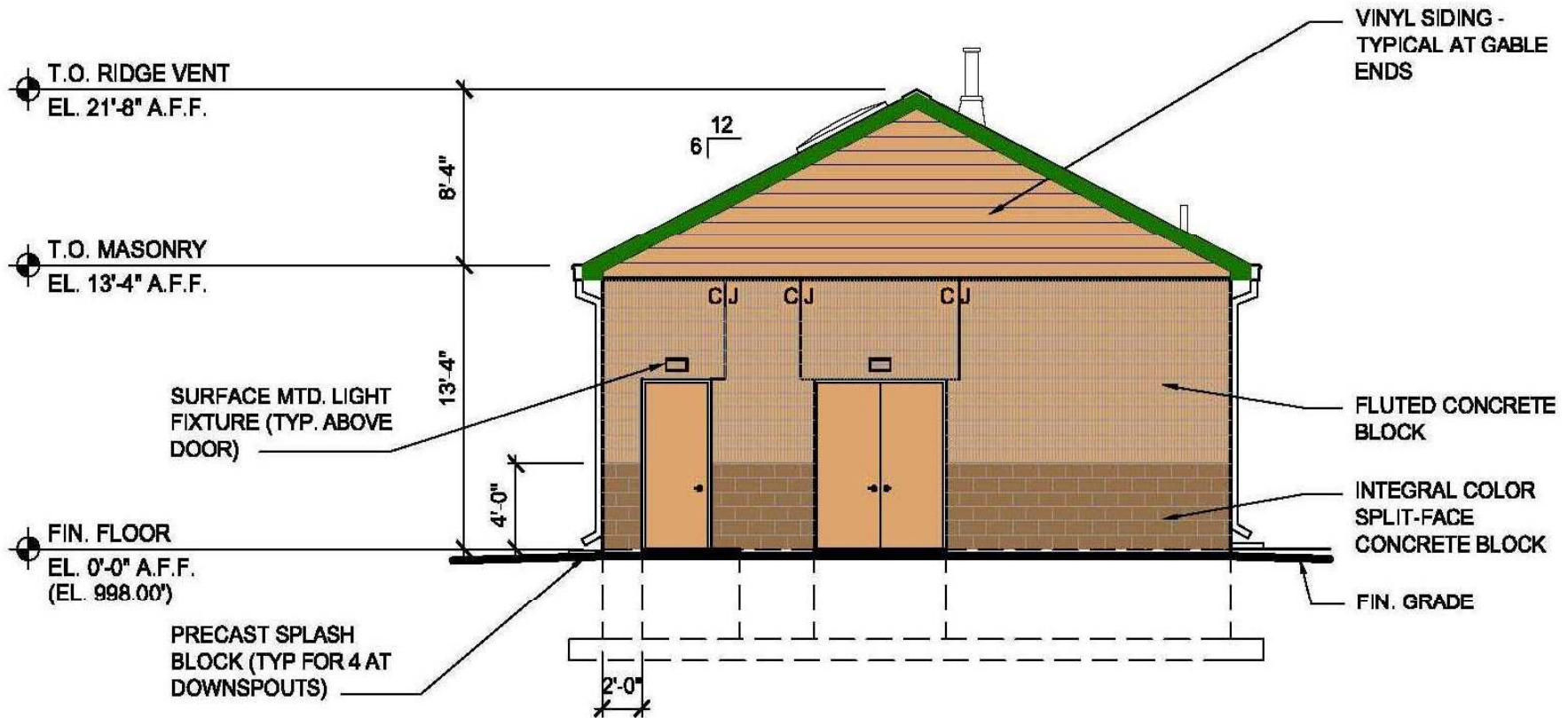


## PUMP STATION WEST - ELEVATION

SCALE: 1" = 10'

# Proposed Site Plan, Tienken/Adams

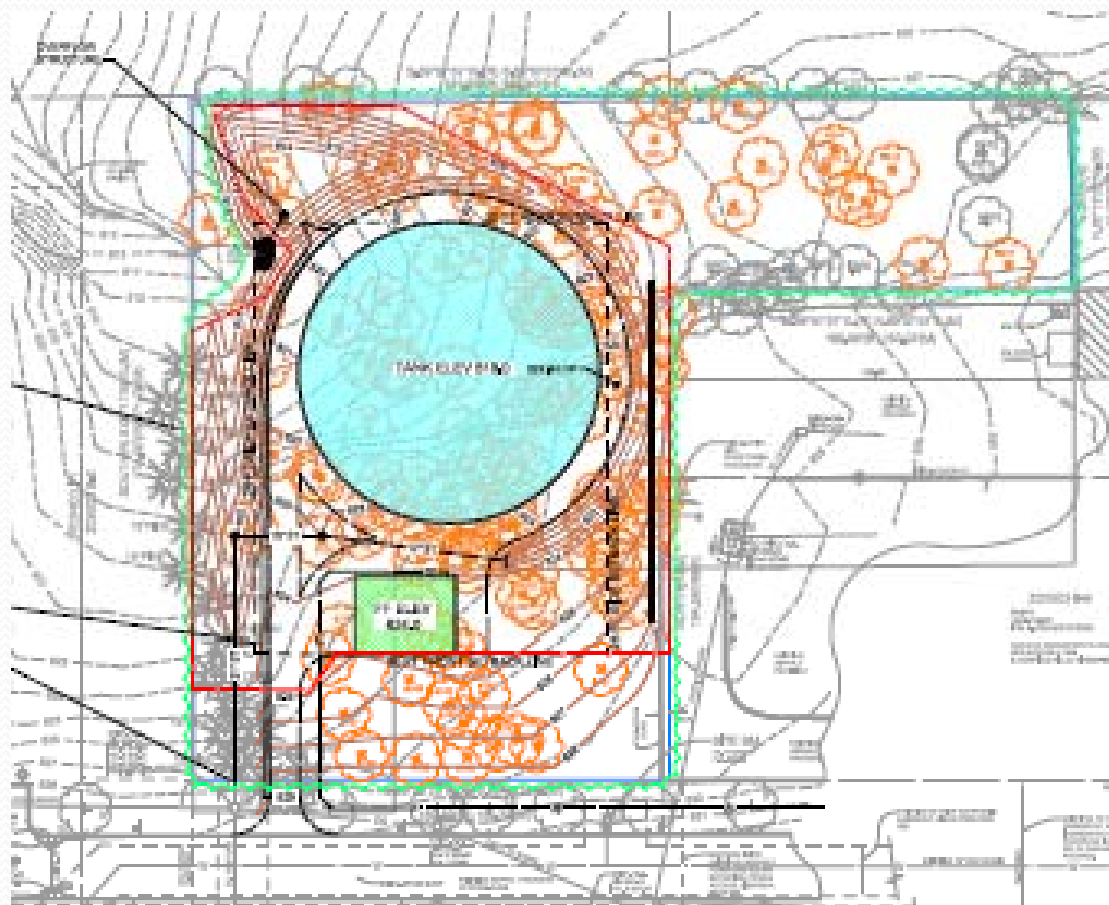
## Booster Station



## PUMP STATION EAST - ELEVATION

SCALE: 1" = 10'

# Proposed Site Plan, Rochester /Avon

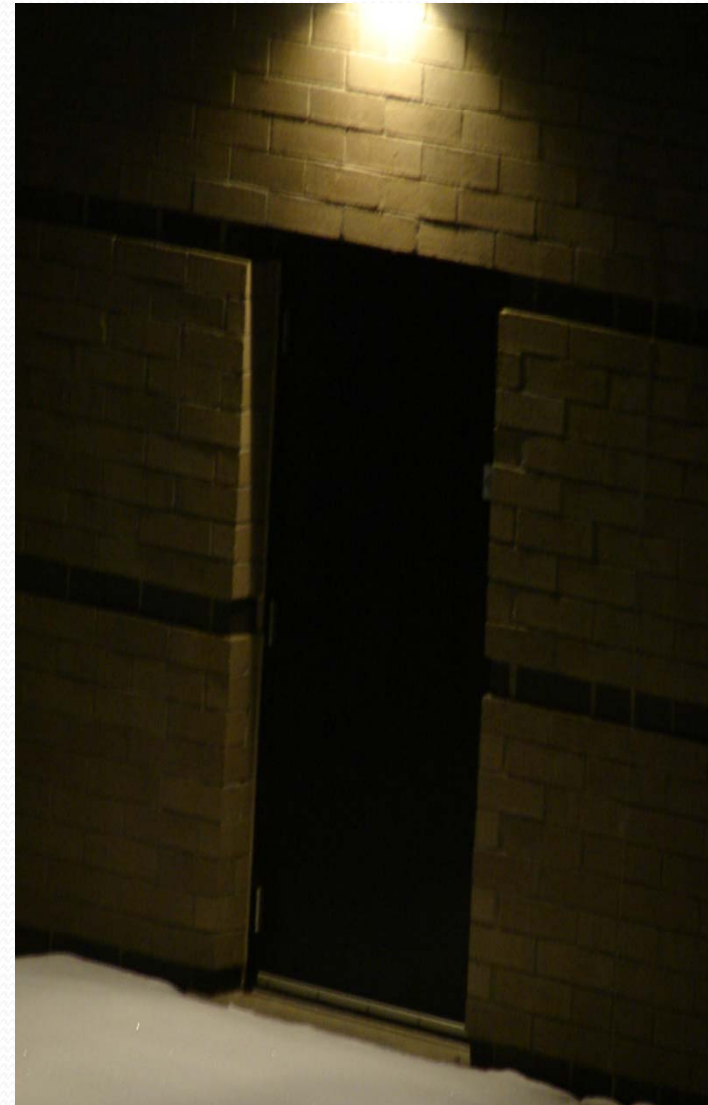




# Concerns

- Lighting
- Noise from booster station
- Tank Failure
- Need for Flood Insurance
- Decrease in property Values
- Homeland Security / US Army Corps of Engineers Requirements
- Close proximity to schools and neighborhoods


# Booster Station, Proposed Lighting





## Booster Station, Noise Concerns

- Reservoir will be filled by system pressure, booster stations to run during the day
- Booster station blocks are insulated
- Roof is insulated
- Generator is inside structure with damping mufflers



*“Nobody can really guarantee the future. The best we can do is size up the chances, calculate the risks involved, estimate our ability to deal with them and make our plans with confidence.”*

Henry Ford II



# Questions