

Commercial  
Site  
Assessment™  
Tier II

Prepared for:

Bloomfield  
Single Family  
HOA

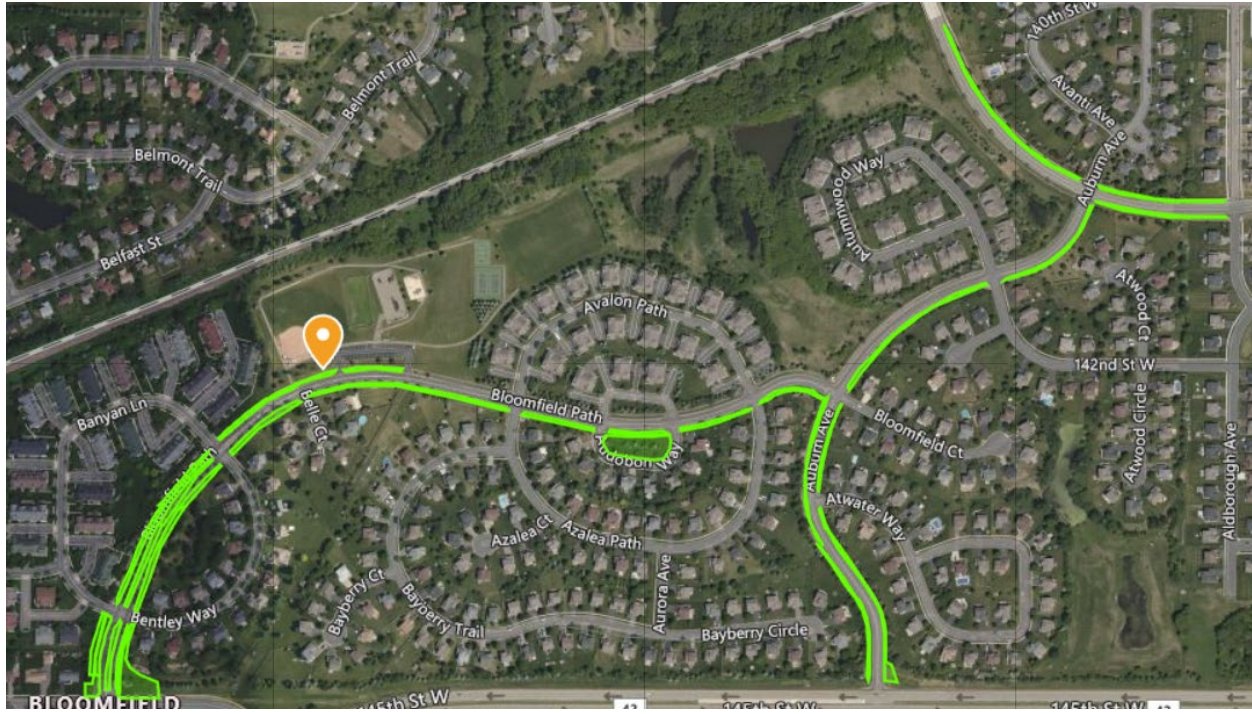
PO Box 461  
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2021 Season



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## Irrigated Area



## **Commercial Site Assessment™**

Date of Tier I CSA: October 27, 2021

Certified Technician: Jake Mathre CLIA, CIC, CIT

Date of Tier II CSA: June 30, 2021

Certified Technician: Jake Mathre CLIA, CIC, CIT

Irrigated Acres: 3.63

Irrigated  $ft^2$ : 158,330  $ft^2$

## **Audit Observations**

Bloomfield Single Family HOA has 3 controllers and 3 water sources with a total of 32 zones.

### **Controller and Sensor:**

Of the three Hunter Pro-C controllers, only one has a functioning rain sensor. These controllers are not smart controllers (weather-based) that are capable of remote monitorization, which results in inefficient watering. The controller programming is incorrect. Ten of the 19 spray zones are watering for 35 minutes. These zones only need to run for a maximum of 24 minutes during the season every other day.

### **Solution:**

- Install two rain sensors
- Retrofit the controllers with Hunter Hydrowise controllers and Air Cards
- Program the controllers with the correct run times needed for each zone

### **Zone by Zone:**

While walking the property, we found:

- 23 of the 155 rotors are leaking and need to be replaced
- 12 of the 636 spray heads were leaking and need to be replaced

### **Solution:**

- Replace 23 rotors
- Replace 12 broken spray heads

All the spray heads are using highly inefficient nozzles. These nozzles should be upgraded to high-efficiency spray nozzles. High-efficiency nozzles use 30-50% less water and will have a significant impact on the overall water use.

### **Solution:**

- Retrofit the 624 nozzles not included in the heads mentioned above to high-efficiency nozzles

The coverage in the boulevards is being negated due to the head size and depth. All of these heads should be replaced with six-inch spray bodies for proper height to clear the grass and reduce the time needed to water. The zone run times are programmed for more time than needed in the controller, and this may be due to the coverage gaps in these zones.

**Solution:**

- Retrofit the 624 spray bodies not listed above with six-inch spray bodies for proper coverage

There were some rotors in zones that had the wrong nozzle size installed for their area of coverage. Nozzles of rotors should change depending on area of coverage. If all nozzles are the same and the heads turn at a fixed rate, then areas covered by a 90° head will get more water and those covered by a 360° head will get too little.

**Solution:**

- Retrofit the remaining 132 rotors with new heads and correct nozzle sizes

The heads on the boulevard would have improved coverage by triangulating them. This would improve the coverage and reduce the waste of water currently spraying the road and sidewalk.

**Solutions:**

- Moving 197 heads

Zones 11 and 12 on Controller #3 were not functional due to sidewalk construction during the irrigation audit. See Zone by Zone table for details.



**Water Rates:**

Meter Reading Interval:  Monthly  Quarterly  Other \_\_\_\_\_

Units Measured As:  1000 gallons  CCF

Converted Units:  1 unit = 1000 gallons

WATER RATES	Irrigation Metered System
Price per unit (per 1,000 gals)	Tiered: \$1.79-\$2.24-\$2.80-\$3.62
Threshold per quarter	Irrigation Metered System
Sewer Rate per unit (if unmetered):	Does not apply

**Historical Water Usage:**

Year	Annual Water Usage (gallons)	Annual Water Cost*
<b>2018</b>	1,974,000	\$9,296.42
<b>2019</b>	1,101,000	\$5,040.82
<b>2020</b>	3,410,000	\$14,437.30
<b>3 Year Average</b>	2,161,670	\$8,573.93

\*\* Average Taken from months with recorded water. Zero usage removed from average. Assuming if system ran, what would the average be?

**Plant Water Requirement (ET Data & Average Effective Rainfall):**

Plant Material: **560,667 gallons**                      Cost: **\$1,699/year**

$$Eff \% = \frac{\text{water need}}{\text{water use}} \qquad Eff \% = \frac{560,667}{2,161,670} = 25.94\%$$

Minimum EPA efficiency standard = **75%**

**Water Usage Goals:**

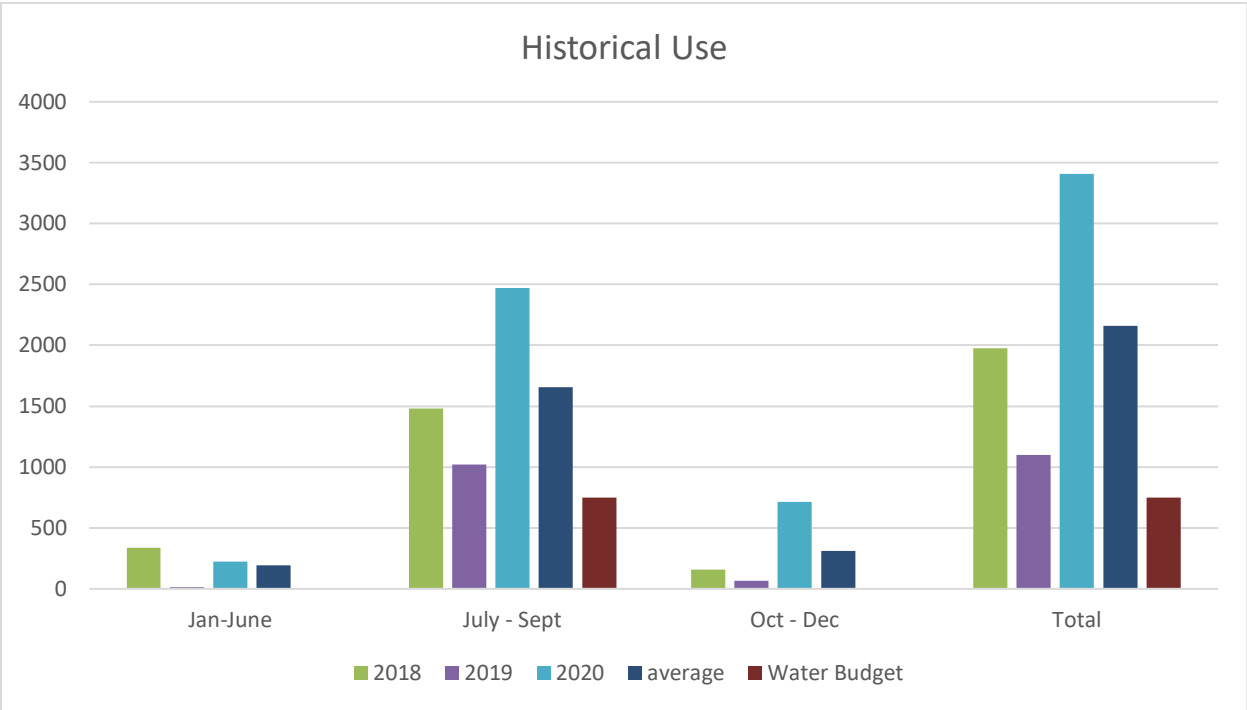
*Eff* = 75% : 747,557 gallons used at an annual cost of **\$3,281**

*Eff* = 85% : 659,609 gallons used at an annual cost of **\$2,962**

*Eff* = 95% : 560,667 gallons used at an annual cost of **\$2,711**

## Water Budgeting

	2018	2019	2020	average	Water Budget
Jan-June	338	15	225	192.67	0.00
July - Sept	1479	1021	2470	1656.67	747.56
Oct - Dec	157	65	715	312.33	0.00
<b>Total</b>	<b>1974</b>	<b>1101</b>	<b>3410</b>	<b>2161.67</b>	<b>747.56</b>



## Water Source and Backflow Prevention:

WATER SOURCE						
<b>Water Source #1</b>	<b>Location Address</b>	Corner of 145th and Bloomfield Path				
	<b>Water Source</b>					
	Backflow Device					
	<b>Brand</b>	Watts		<b>Model</b>		
	<b>Type</b>	RPZ		<b>Size</b>		2"
	<b>Visual Inspection</b>	<b>Leaks?</b>	<b>No</b>	<b>Notes</b>	<b>Looks Good</b>	
	<b>Date of Last Backflow Test</b>	5/27/2021			<b>Pass</b>	
	Meter / Deduct Meter					
	<b>Brand</b>	Sensys		<b>Model</b>		
	<b>Type</b>	<b>Analog</b>		<b>Size</b>		2"
	<b>Serial Number</b>	18325409				
	<b>Reading</b>	23,618,300			<b>Leak Detector Spinning?</b>	<b>No</b>
	<b>Visual Inspection</b>	<b>Leaks?</b>	<b>No</b>	<b>Notes</b>	<b>Looks Good</b>	



WATER SOURCE						
<b>Water Source #2</b>	<b>Location Address</b>	14026 Autobon Way				
	<b>Water Source</b>					
	Backflow Device					
	<b>Brand</b>	Wilkins		<b>Model</b>		
	<b>Type</b>	RPZ		<b>Size</b>	2"	
	<b>Visual Inspection</b>	<b>Leaks?</b>	<b>No</b>	<b>Notes</b>	<b>Looks Good</b>	
	<b>Date of Last Backflow Test</b>	NONE				
	Meter / Deduct Meter					
	<b>Brand</b>	Sensys		<b>Model</b>		
	<b>Type</b>	<b>Analog</b>		<b>Size</b>	2"	
	<b>Serial Number</b>	17516031				
	<b>Reading</b>	19,162,404			<b>Leak Detector Spinning?</b>	<b>No</b>
	<b>Visual Inspection</b>	<b>Leaks?</b>	<b>No</b>	<b>Notes</b>	<b>Looks Good</b>	
	<b>Centrifugal</b>			<b>Submersible</b>		





WATER SOURCE						
<b>Water Source #3</b>	<b>Location Address</b>	Corner of 142nd and Auburn				
	<b>Water Source</b>					
	Backflow Device					
	<b>Brand</b>	Wilkins		<b>Model</b>		
	<b>Type</b>	RPZ		<b>Size</b>	2"	
	<b>Visual Inspection</b>	<b>Leaks?</b>	<b>No</b>	<b>Notes</b>	<b>Looks Good</b>	
	<b>Date of Last Backflow Test</b>	5/27/2021		<b>Pass</b>		
	Meter / Deduct Meter					
	<b>Brand</b>	Sensys		<b>Model</b>		
	<b>Type</b>	<b>Analog</b>		<b>Size</b>	1.5"	
	<b>Serial Number</b>	17494018				
	<b>Reading</b>	12,708,126			<b>Leak Detector Spinning?</b>	<b>No</b>
	<b>Visual Inspection</b>	<b>Leaks?</b>	<b>No</b>	<b>Notes</b>	<b>Looks Good</b>	

## Controller Data:

IRRIGATION CONTROLLER										
Location:										
Brand:		Hunter			Model:		Pro-C		Zone Count	10
Start Times	#	Program A	Program B	Program C	Program D	Auxiliary	Sensors:		Rain	Weather
	1	12:15 AM					Installed?		Yes	
	2						Bypassed?		Yes	
	3						Tested?		Yes	
	4						Functional?		No(see notes)	
	5						Notes	Invalid location, Move to top of monument		
	6									
Water Days		Even					Remote Access Installed?			
							Cell Card		Active?	
							WiFi		Active?	
							Hand Held		Active?	
Ohm Reading	Zone	Zone Runtime	Zone Runtime	Zone Runtime	Zone Runtime	Zone Runtime	Zone Type	R = Rotor S = Spray D = Drip MP = MP Rotator B = Bubblers		
	1	35					R	9 Volt Back-up Battery		
	2	35					R	Installed?	Tested?	Voltage
	3	35					R	Yes	Yes	
	4	35					R			
	5	35					S	Controller Working?		
	6	35					S	Powered Up?	LCD Panel and Buttons Working?	
	7	35					R			
	8	35					R	Yes	Yes	
	9	35					R			
	10	35					R	Seasonal Adjust		
	11							Global Adjust %		140%
	12							Monthly Adjust		
	13							Month	Currently Set As	Recommended
	14									
	15							January		
	16							February		
	17							March		
	18							April		
	19							May		
	20							June		
	21							July		
	22							August		
	23							September		
	24							October		
	25							November		
	26							December		

Irrigation Controller



IRRIGATION CONTROLLER										
Location:		Inside Doghouse								
Brand:		Hunter			Model:		Pro-C	Zone Count	10	
Start Times	#	Program A	Program B	Program C	Program D	Auxiliary	Sensors:		Rain	Weather
	1	12:15 AM					Installed?		Yes	
	2						Bypassed?		Yes	
	3						Tested?		NA	
	4						Functional?		NA	
	5						Notes	Can't find the physical sensor		
	6									
Water Days		Even								
Ohm Reading		Zone	Zone Runtime	Zone Runtime	Zone Runtime	Zone Runtime	Zone Runtime	Zone Type R = Rotor S = Spray D = Drip MP = MP Rotator B = Bubbler		
	1	33					S	9 Volt Back-up Battery		
	2	33					S	Installed?	Tested?	Voltage
	3	33					S	Yes	Yes	
	4	55					R	Controller Working?		
	5	55					R	Powered Up?	LCD Panel and Buttons Working?	
	6	33					S	Yes	Yes	
	7	33					S	Seasonal Adjust		
	8	33					S	Global Adjust %		140%
	9	33					S	Monthly Adjust		
	10	33					S	Month	Currently Set As	Recommend
	11							January		
	12							February		
	13							March		
	14							April		
	15							May		
	16							June		
	17							July		
	18							August		
	19							Sept		
	20							October		
	21							November		
	22							December		
	23									
	24									
	25									
	26									
	27									
	28									

Irrigation Controller #2



IRRIGATION CONTROLLER										
Location:		Inside Doghouse								
Brand:		Hunter			Model:		Pro-C	Zone Count	12	
Start Times	#	Program A	Program B	Program C	Program D	Auxiliary	Sensors:		Rain	Weather
	1	11:30 PM					Installed?		Yes	
	2						Bypassed?		Yes	
	3						Tested?		No	
	4						Functional?		No	
	5						Notes	Can't find the physical sensor		
	6									
Water Days		Even								
Ohm Reading	Zone	Zone Runtime	Zone Runtime	Zone Runtime	Zone Runtime	Zone Runtime	Remote Access Installed?			
							Cell Card	Active?		
							WiFi	Active?		
							Hand Held	Active?		
							Zone R = Rotor S = Spray D = Drip MP = MP Rotator B = Bubbler			
	1	23					S	9 Volt Back-up Battery		
	2	23					S	Installed?	Tested?	Voltage
	3	23					S	Yes	Yes	
	4	23					S	Controller Working?		
	5	23					S	Powered Up?	LCD Panel and Buttons Working?	
	6	23					R	Yes	Yes	
	7	23					S	Seasonal Adjust		
	8	23					S	Global Adjust %		
	9	23					S	Monthly Adjust		
	10	23						Month	Currently Set As	Recommend
	11	23						January		
	12	23						February		
	13							March		
	14							April		
	15							May		
	16							June		
	17							July		
	18							August		
	19							Sept		
	20							October		
	21							November		
	22							December		

Irrigation Controller #3

**Zone by Zone Findings:**

**Controller #1**

Controller #1 - ZONE DATA											
ZONE	1	2	3	4	5	6	7	8	9	10	Total
TOTAL # of Rotors	19	5	17	8			12	12	19	19	111
4" Rotor Broken	5		2	1					5	4	17
Retrofit Rotors	14	5	15	7			12	12	14	15	94
TOTAL # of Sprays					37	53					90
4" Spray Broken						2					2
Retrofit Spray Nzl					37	51					88
Replace 4" Spray with 6"					37	51					88
Move Heads	1			2							3

**Controller #2**

Controller #2 - ZONE DATA											
ZONE	1	2	3	4	5	6	7	8	9	10	Total
TOTAL # of Rotors				19	12					5	36
4" Rotor Broken				3							3
Retrofit Rotors				16	12						28
TOTAL # of Sprays	34	27	21			21	18	40	35	27	223
4" Spray Broken			1				1				2
Retrofit Spray Nozzle	34	27	20			21	17	40	35	27	221
Replace 4" Spray with 6"	34	27	20			21	17	40	35	27	221
Move Heads	17	13				10	9				49

**Controller #3**

Controller #3 - ZONE DATA													
ZONE	1	2	3	4	5	6	7	8	9	10	11	12	Totals
TOTAL # of Rotors							8						8
4" Rotor Broken							3						3
Retrofit Rotors							5						5
TOTAL # of Sprays	25	26	25	19	19	15		55	40	33	33	33	323
4" Spray Broken			6	2									8
Retrofit Spray Nozzle	25	26	19	17	19	15		55	40	33	33	33	315
Replace 4" Spray with 6"	25	26	19	17	19	15		55	40	33	33	33	315
Move Heads	12	13	12	10	10	8		20	15	15	15	15	145

\*\* Zones 11 and 12 on Controller #3 were not functional due to sidewalk construction. The 33 heads for each of these zones was assumed based on linear feet and expected head spacing

**Critical Repairs and Adjustments**

Repairs	Price (each)	Count		Total
Installed Rotor	\$ 65.00	23		\$ 1,495.00
Installed 6" Spray w/ Nozzle	\$ 95.00	12		\$ 1,140.00
Rain Sensor Installed	\$ 175.00	2		\$ 350.00

**Design Issues**

Repairs	Price (each)	Count		Total
Heads Needing to be Moved	\$ 100.00	197		\$ 19,700.00
Retrofit 4" Spray Bodies w/ 6" Spray Bodies	\$ 75.00	624		\$ 46,800.00
Retrofit Rotors for correct nozzling & check valves	\$ 75.00	132		\$ 9,900.00

**Recommended Efficiency Upgrades**

Repairs	Price (each)	Count		Total
Smart Controller Upgrade	\$ 795.00	3		\$ 2,385.00
High-Efficiency Spray Nozzle Upgrade	\$ 20.00	624		\$ 12,480.00
Upgrade ALL Rotors w/ Proper Nozzle Size	\$ 65.00	132		\$ 8,580.00

In summary, completing the recommended critical repairs and upgrades will result in substantially more efficient water usage and healthier plant material.

## **Next Steps:**

- Fix critical repair issues
- Install functional rain sensors
- Retrofit controllers with Smart controller technology
- Upgrade existing spray nozzles with high-efficiency nozzles
- Retrofit 4" spray bodies with 6" spray bodies for improved coverage
- Triangulate the head spacing on the boulevards to reduce waste of watering street and sidewalks
- Annually maintain and monitor property