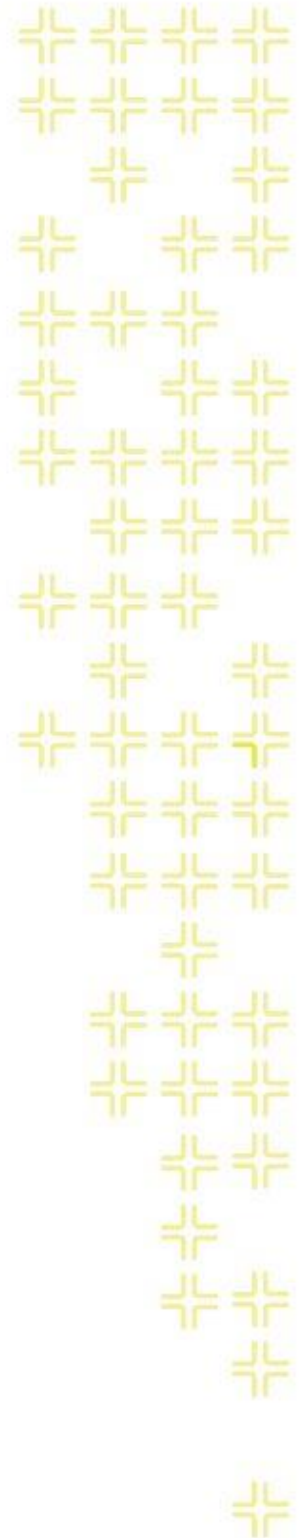




TRAINING GUIDE

# Water Flushing Routes



# Water Flushing

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The water flushing modules allow you to setup a plan for systematically flushing out different parts of your water system.

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# Water Flushing Routes

The Water Flushing Routes module allows you to set up and record water flushing routes to valves, hydrants, and pipes. This module also displays flushing history recorded in the Water Flushing History module for each route, as well as work orders associated with the flushing history. We will look at the Water Flushing Routes module as it is used in the Lucity Web interface.

Water Flushing Routes is located in the Water > Water Distribution > Water Flushing menu.

Route ID	Zone	Zone Text	Reach	Type	Type Text	Reason	Reason Text	Location	Total Pipe Length
1	2	Pressure Zone 2	Standard	2	Dead-End	2	Semi-Annual Cleaning	Moody Hills Subdivision	
14									0.00
2	1	Pressure Zone 1	Standard	3	Low Point	2	Semi-Annual Cleaning		
3	2	Pressure Zone 2	Standard	1	Unidirectional	2	Semi-Annual Cleaning		
4	2	Pressure Zone 2	Standard	3	Low Point	1	Annual Cleaning		
5	2	Pressure Zone 2	Standard	3	Low Point	1	Annual Cleaning		
Cresthill Estates				1	Unidirectional	1	Annual Cleaning	Cresthill Estates	2979.76

The Water Flushing Routes view displays information for various Water Flushing Route records. The fields displayed in this view are totally customizable for your organization (or department, or user, etc), so may vary. The fields displayed in the view are immediately filterable and sortable.

Notes: \_\_\_\_\_


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You can click the form button beside any record to see the detailed information for the record. Once again, this form is completely customizable, but will generally display the following information.



## Water Flushing Routes Form

7 of 7

**Route Rec #**  **Route ID\***   Inactive Route

### Attributes

<b>Zone</b> <input type="text"/>	<b>Total Duration</b> <input type="text"/>
<b>Reach</b> <input type="text"/>	<b>Total Target Vol</b> <input type="text"/>
<b>Type</b> <input type="text" value="1"/> Unidirectional	<b>Total Pipe Length</b> <input type="text" value="2979.76"/>
<b>Reason</b> <input type="text" value="1"/> Annual Cleaning	
<b>Location</b> <input type="text" value="Cresthill Estates"/>	

### Work Data

**Default WO Cat**   No WO/PM/Req

### Custom

<b>User 1</b> <input type="text"/>	<b>User 7</b> <input type="text"/>
<b>User 2</b> <input type="text"/>	<b>User 8</b> <input type="text"/>
<b>User 3</b> <input type="text"/>	<b>User 9</b> <input type="text"/>
<b>User 4</b> <input type="text"/>	<b>User 10</b> <input type="text"/>
<b>User 5</b> <input type="text"/>	<b>User 11</b> <input type="text"/>
<b>User 6</b> <input type="text"/>	<b>User 12</b> <input type="text"/>
<input type="checkbox"/> <b>User 13</b>	<input type="checkbox"/> <b>User 14</b>
<input type="checkbox"/> <b>User 15</b>	

**WO Comment**

<b>Last Modified By</b> <input type="text" value="Lucy"/>	<b>Last Modified Date</b> <input type="text" value="1/27/2015"/>	<b>Last Modified Time</b> <input type="text" value="10:55 AM"/>
--	---	--

**General Comment**

## Header Information

The **Route Rec #** is an auto-generated unique identifier for this record. The system uses this record for look-ups behind the scenes.

The **Route ID\*** is another unique identifier, selected by the record creator. This can be any combination of numbers, letters and symbols to help you identify this specific route.

**Inactive Route** allows you to remove the route from selectability in picklists, in essence, to “retire” the route, but maintain the historical linked information to the route.

## Attributes

**Zone** is a user-defined area picklist, likely a list of pressure zones that the route is located in.

**Reach** is a text field that allows anything to be typed in it.

**Type** allows you to select the type of route it is (unidirectional, dead-end, etc).

**Reason** provides a way to track the reason the flushing route was created. This could be due to a set cleaning schedule.

**Location** is a text field that allows you to fill in any general location information.

**Total duration**, **Total Target Volume**, and **Total Pipe Length** are all auto-calculated based on the associated assets to the Water Flushing Route. For example, the Total Pipe Length is a sum of all linked pipes to the Hydrants being flushed.

## Work Data



**Default Work Order Category** allows to you to set a type of category which will be auto-filled in whenever a Work Order, etc. is generated from this record.

**No Work Order/Pm/Template** is a checkbox, which, when set to true, will remove this route from any related Work Order/Pm/Template picklists so it is not selectable. This will also remove the ability to create these records directly from the record from the Water Flushing Route view.

## Custom

Provides a variety of field types for any additional information you wish to track, as well as a short general or Work Order-specific comment. Last Modified By fields will track when and who last updated this record.

## Water Flushing Route Child Records

		Cresthill Estates			1	Unidirectional	1	Annual Cleaning	Cresthill Estates	2979.76
<a href="#">History (1)</a>   <a href="#">Work Orders (0)</a>   <a href="#">Hydrants (3)</a>   <a href="#">Comments (0)</a>   <a href="#">PM/Work Templates (0)</a>										

When hitting the + button, you display related child records for each Water Flushing Route record. The child records displayed vary, but could include: Water Hydrant Flushing History for that Route, Work Orders, Hydrants (including the linked Valves and Pipes), Comments, and PM/Work Templates.

## Water Flushing Route Child Records

### History:

This view shows some basic information about historical flushing history. Water Flushing History is also a separate module to track additional dates, multiple assets, and individual amounts of the flushing. All the information for a historical event will roll up into this child record. This includes Total Volume & Total Pipe Length. More detailed event information can be found by opening up the History record separately. *See Water Flushing Route History section for more details.*

### Work Orders:

When a flushing route is used to generate a work order, the route is automatically linked to that work order, which is displayed in the child grid. The work orders may display additional information about the water flushing process, including labor, time, materials, etc.

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## Hydrants:

This child grid is where all the hydrant asset information related to the water flushing is stored. The individual hydrants that are on the water flushing route are tracked here. Each hydrant record is specific for the water flushing route: it tracks not only the Hydrant number, but the sequence in the route, the individual flush type, and the Target Flush Duration, Gallons Per Minute, and Volume for each hydrant. You can also track # of Nozzles Used and any related Notes.

**Water Flushing Route Hydrant Form**  
1 of 3

Sequence: 1

Flush Type: Hydrant Flush

Hydrant Number\*: 4125

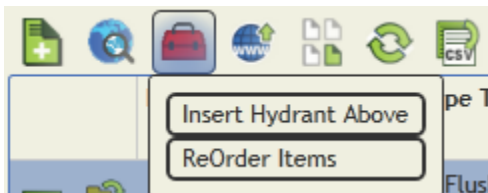
Target Flush Duration: 10.00      Target Pipe Vol (gal): 2679

Target GPM: 60      Target Volume:

# of Nozzles Used:

Notes:

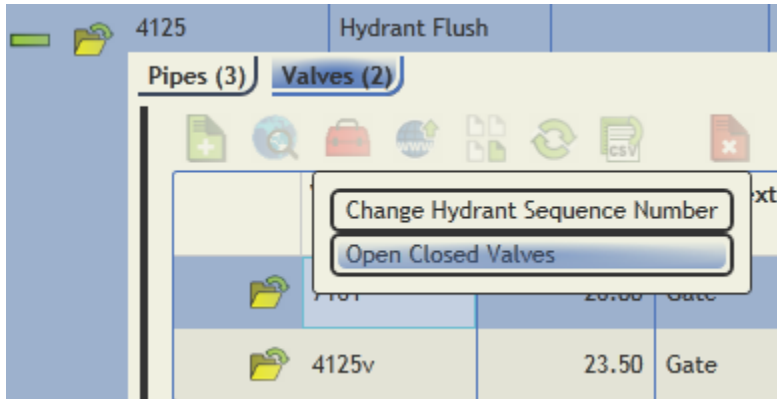
A toolkit item in the hydrants view allows the hydrants that are added to be reordered, or that allows you to insert a new hydrant at the top of the list (rather than the bottom, which is the default).



Hydrant Number	Flush Type Text	# of Nozzles Used	Sequence	Target Flush Duration	Target GPM
4125	Hydrant Flush		1	10.00	60

The pipes and valves for each hydrant can be linked as well. This allows calculation of the total length of pipes flushed, and additional information about valve exercising.

In the valves grid, the toolkit provides an option to set all the Opened Valves to Closed when the flushing occurs.



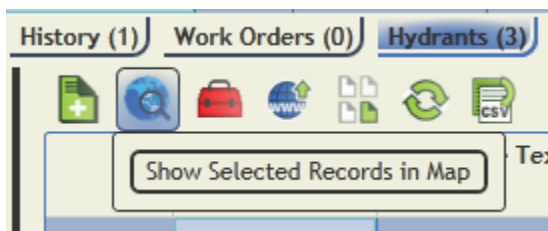
This will automatically add all valves that were closed in a previous sequence that have not yet been opened. This provides an easy method for the user to quickly add valves to close in the system. Those valves that should not be opened can simply be deleted from the grid.

In the example below, a dummy “Hydrant” has been created that allows us to track gate valves for the purpose of doing valve changes only:

The screenshot shows a software interface with a 'Dummy Hydrant' window. A 'Valves (3)' grid is visible, containing three records. The records are:

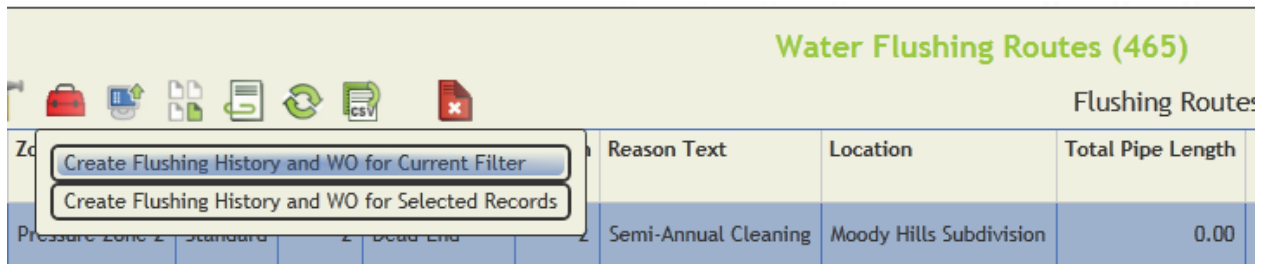
Valve Number	Turns to Open	Type Text	Size (in)	Set Valve to Text	Direction Open Text
7169	25.00	Gate	8.00	Open	Clockwise
7157	23.00	Gate	8.00	Open	Clockwise
4125v	23.50	Gate		Close	Clockwise

For any of these route, hydrant, pipe or valve assets, you can use the show in map feature for all selected in order to view in the GIS Web map.





Finally, the Water Flushing Routes module has two toolkit items called “Create Flushing History and WO for Current Filter” and “Create Flushing History and WO for Selected Records”.



These will allow you to select all filtered or selected routes you are viewing and generate new flushing histories for them, along with an associated work order. The work order will automatically include the flushing route as an asset. Depending on your Water Option settings, the following assets may also be included:

- In Flushing Route, Copy Hydrants to Work Orders with Tool
- In Flushing Route, Copy Valves to Work Orders with Tool
- In Flushing Route, Copy Pipes to Work Orders with Tool

Notes: \_\_\_\_\_

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# Water Flushing History

The Water Flushing History module allow you to record water flushing data and attributes, as well as track the flushing records related to valves, hydrants, and pipes. This module allows you to record flushing data using the routes defined in the Water Flushing Route module. We will look at the Water Flushing History module as it is used in the Lucity Web interface.

Water Flushing History is located in the Water > Water Distribution > Water Flushing menu.

Route Rec #	Route ID	Flushed By	Total Volume	Last Date Flushed
1	1	Andrea	0	
7	14			
6	Cresthill Estates	Don	2100	1/27/2014
1	1	Conner	0	
5	5	Alex Green		
4	4	Alex Gray	0	
3	3	Alex Green		
2	2	Alex Green		
1	1	Gray Brown	0	

The Water Flushing History view displays information for the historic flushing events. These are separate than, but could be associated with, a work order. The fields displayed are customizable and easily sortable and filterable.

Notes: \_\_\_\_\_

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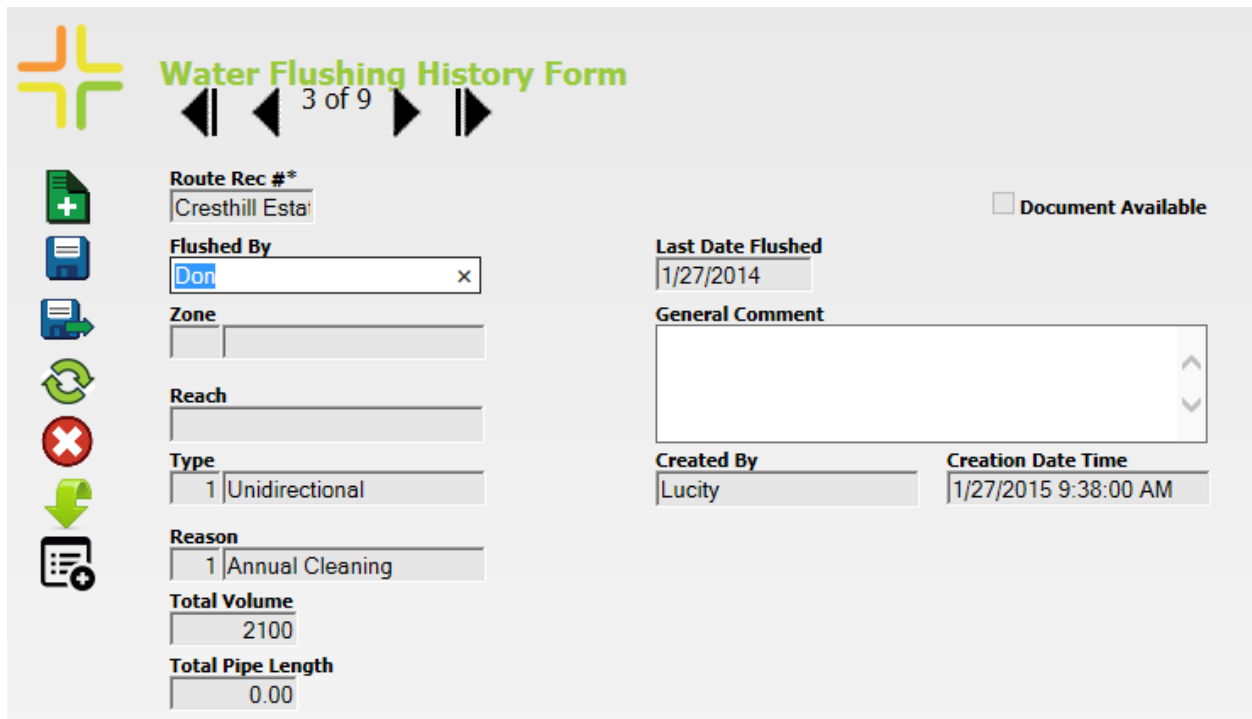
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You can click the form button beside any record to see the detailed information for the record. Once again, this form is completely customizable, but will generally display the following information.



The screenshot shows a web-based form titled "Water Flushing History Form" with a navigation bar at the top indicating "3 of 9" records. On the left side, there is a vertical toolbar with icons for adding, saving, deleting, refreshing, canceling, and printing. The form fields are organized into two columns. The left column contains: "Route Rec #\*" (Cresthill Esta), "Flushed By" (Don), "Zone", "Reach", "Type" (1 Unidirectional), "Reason" (1 Annual Cleaning), "Total Volume" (2100), and "Total Pipe Length" (0.00). The right column contains: "Document Available" (checkbox), "Last Date Flushed" (1/27/2014), "General Comment" (text area), "Created By" (Lucy), and "Creation Date Time" (1/27/2015 9:38:00 AM).

Most of these fields are automatically filled in and un-editable. The values are being carried over from the route information. The Flushed By field and General Comment field are available for editing by the user. There also a number of custom fields available for any additional information that needs to be tracked.

Notes: \_\_\_\_\_

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## Water Flushing History Child Records

6 Cresthill Estates Don 2100 1/27/2014

**Additional Dates (0)** Hydrants (3)

**Additional Dates**  
No records to display.

When hitting the + button, you display related child records for each Water Flushing History record. The available child records display Additional Dates and Hydrants (including associated valves and pipes).

### Hydrants

All of the hydrants along the associated Water Flushing Route will be included in this list. This will also include the associated valves and cleaned pipes. Each individual Water Flushing History Hydrant record will have its own unique information to be filled out about the flushing event. This includes the following fields:

**Water Flushing History Hydrants Form**  
1 of 3

**Sequence**: 1

**Flush Type**: [Dropdown]

**Hydrant Number\***: 4125

**Notes**: [Text Area]

**Flushed By**: Tom, Jack, Bill

**Date Flushed**: 1/27/2014

**Start Time**: 08:15 AM

**End Time**: 08:30 AM

**Time Flushed**: 15.00

**Discharge Rate**: 60

**Discharge Volume**: 900

**Target Pipe Vol (gal)**: 2679

**Total Pipe Length**: 1026.55

**Water Loss Rec #**: 7

**Target Flush Duration**: [Text Box]

**# of Nozzles Used**: [Text Box]

**Target GPM**: [Text Box]

**Static Pressure (psi)**: 42.00

**Residual Pressure (psi)**: 25.00

**Flow at 20 psi**: [Text Box]

**Chlorine Start**: [Text Box]

**Chlorine End**: [Text Box]

**Problem 1**: [Text Box]

**Problem 2**: [Text Box]

**Problem 3**: [Text Box]

**Exercised**:

**Exercised Date**: 1/27/2014

**Sequence** is the order of the hydrant in the flushing route.

**Flush Type** is the specific type of flushing that occurred.

**Hydrant Number\*** is a required field that needs to be associated with an existing Hydrant Asset Record.

**Notes** allows any additional comments or notes regarding the event.

**Target Flush Duration** allows you to track a number of minutes of anticipated flushing.

**# of Nozzles Used** allows you to track a number.

**Target GPM** allows you to track a number of gallons per minute desired.

**Exercised** and **Exercised Date** allow you to select if and when the valves were exercised.

**Flushed by** is a text field for tracking who did the flushing.

**Date Flushed**, **Start Time** and **End Time** track when the flushing on this hydrant actually occurred.

**Time flushed** is a number of minutes the flushing took.

**Discharge Rate** allows you to track the number of gallons per minute of water flushed.

**Discharge Volume** will use Time and Discharge Rate to auto calculate a number of gallons flushed.

**Target Pipe Volume in Gallons** and **Total Pipe Length** are auto calculated from the associated Pipe records.

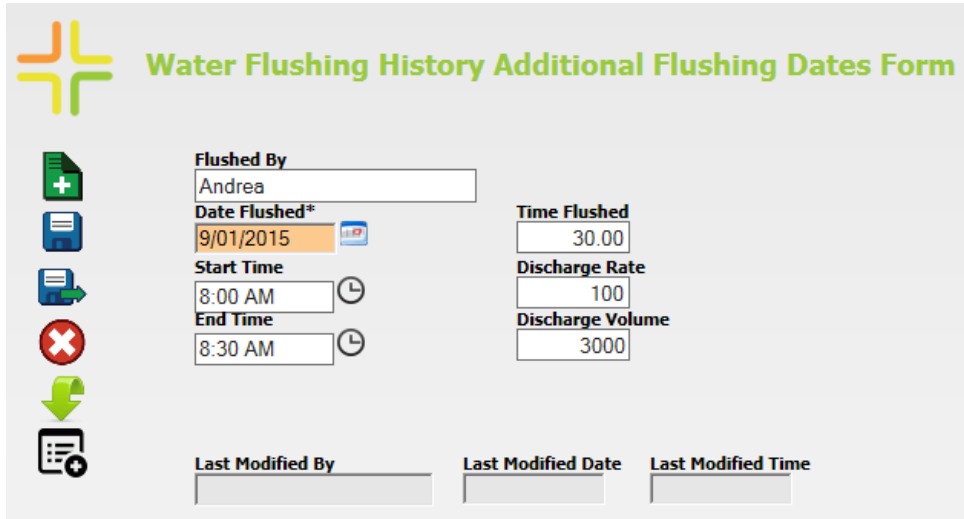
**Water Loss Record #** is the auto ID of a new Water Loss Record in the Lucity system. This is automatically generated when the new History record is saved, and tracks the total Volume used during the flushing.

**Static Pressure** and **Residual Pressure** allow you to track the pounds per square inch of pressure during the flushing.

**Flow at 20 psi** will allow you to track the rate of flow at 20 psi, and will automatically calculate if discharge rate and the two pressures have values.

Chlorine Start and Chlorine End can track the Chlorine measurement of the water at the beginning and end of the flushing.

Problem fields allow you to select any problems that occurred during the flushing. These use a user-defined picklist.



The form is titled "Water Flushing History Additional Flushing Dates Form" and features a green and orange logo on the left. It contains several input fields and labels:

- Flushed By:** Text input field containing "Andrea".
- Date Flushed\*:** Date input field containing "9/01/2015" with a calendar icon.
- Start Time:** Time input field containing "8:00 AM" with a clock icon.
- End Time:** Time input field containing "8:30 AM" with a clock icon.
- Time Flushed:** Text input field containing "30.00".
- Discharge Rate:** Text input field containing "100".
- Discharge Volume:** Text input field containing "3000".
- Last Modified By:** Text input field.
- Last Modified Date:** Text input field.
- Last Modified Time:** Text input field.

On the left side of the form, there is a vertical column of icons: a green plus sign, a blue document icon, a blue document with a right-pointing arrow, a red circle with a white 'X', a green downward arrow, and a black document with a plus sign.

### Additional Dates

This module allows you to track additional flushing dates on the same route. For each additional flushing date, you can track the Flushed By, Date, Start/End Time for the event. Additionally, the Times Flushed will get multiplied by the Discharge Rate, and the Discharge Volume will be automatically calculated for each additional event.

Notes: \_\_\_\_\_

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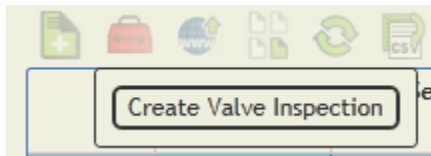
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## Hydrants - Valves

Hydrants														
Sequence	Hydrant Number	Building No	Address	Street Name	Street Suffix	Street Type	Notes	Flushed By	Date Flushed	Time Flushed	Discharge Rate	Discharge Volume	Exercised	Exercised Date
1	4125	2643	W	WARNER		RD		Tom, Jack, Bill	1/27/2014	15.00	60	900	<input checked="" type="checkbox"/>	
Valves (2) Water Flushing History Pipes (3)														
Valves														
Valve Number	Valve Set to Text	Exercised Date	Exercised	Building No	Address	Street Name	Street Suffix	Street Type	Classification Text	Type Text	Size (in)	Direction Open Text	Turns to Open	
7161	Closed	1/27/2014	<input checked="" type="checkbox"/>	5321	W	BAHIA		CT	Line	Gate	8.00	Clockwise	26.00	
4125v	Open	1/27/2014	<input checked="" type="checkbox"/>						Hydrant	Gate		Clockwise	23.50	

The valves associated with each hydrant flushing are displayed. The Valve status, location, and Turn # and direction are tracked in this child record. The Exercised Status and Exercised Date are automatically updated with each Hydrant Flushing record.



A toolkit item allows you to create a Valve Inspection record directly from the grid.

## Hydrants - Pipes

Hydrants														
Sequence	Hydrant Number	Building No	Address	Street Name	Street Suffix	Street Type	Notes	Flushed By	Date Flushed	Time Flushed	Discharge Rate	Discharge Volume	Exercised	Exercised Date
1	4125	2643	W	WARNER		RD		Tom, Jack, Bill	1/27/2014					
Valves (2) Water Flushing History Pipes (3)														
Water Flushing History Pipes														
Pipe Number	From End Type Text	From End	To End Type Text	To End	Length (ft)	Diameter (in)								
PP0249	Node	1306	System Valve	7160	443.45	8.00								
13714	Node	4948	Node	4949	525.10	8.00								
PP0250	System Valve	7160	Node	4949	58.00	8.00								

The pipes being flushed are associated with each hydrant record. The total lengths for these pipes is what will calculate the flushed pipe length in the Hydrant Flushing History record. This value will dynamically change as pipes are added or deleted from this list.