

# FINDING AND ELIMINATING CROSS CONNECTIONS

VOL. 2



# CITY OF NOVI LOCATION

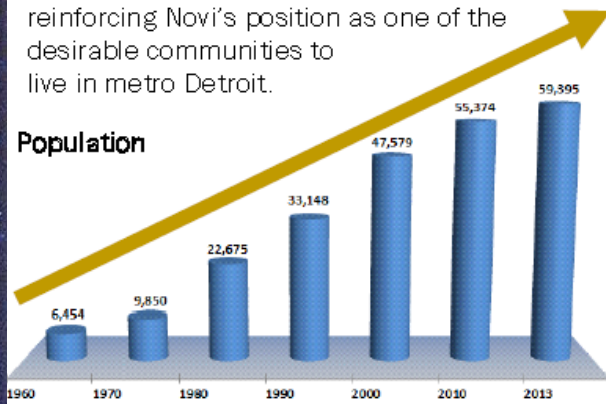




# VITAL STATISTICS

The City of Novi has steadily gained population over the past 50 years, with a 2013 estimated population of nearly 60,000 (SEMCOG). This 7.3% increase is the 2nd largest population increase since 2010 in southeast Michigan, reinforcing Novi's position as one of the desirable communities to live in metro Detroit.

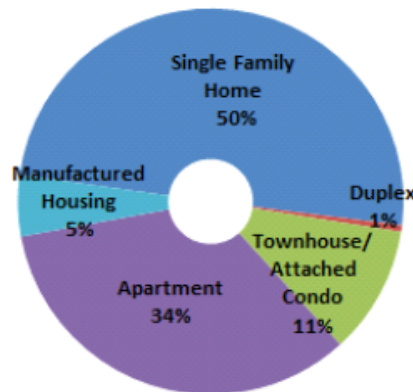
Population



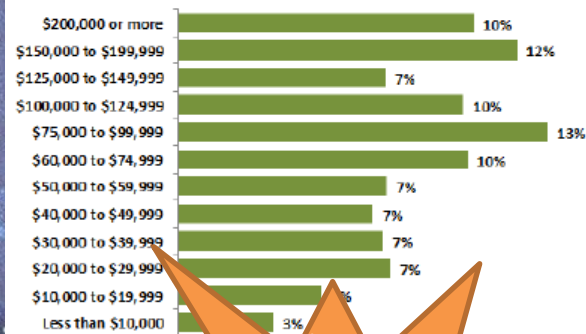
**Median Household Value:** \$259,656, however recent listings in Novi on [realtor.com](http://realtor.com) average over \$300,000.

## Housing Type:

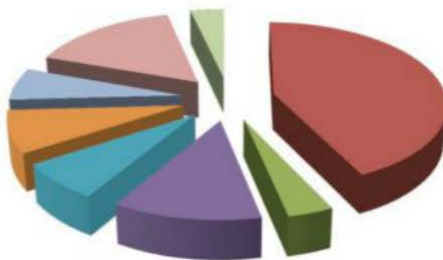
Half of the housing units in the City are detached single family homes, with apartments making up another third.



As result of the higher than average educational attainment, thereby resulting in a large percentage of management and professional jobs, it's no surprise that Novi residents incomes are also surpass county and state averages. In 2010, the median household income in Novi was \$ 80,151.



## LAND USE



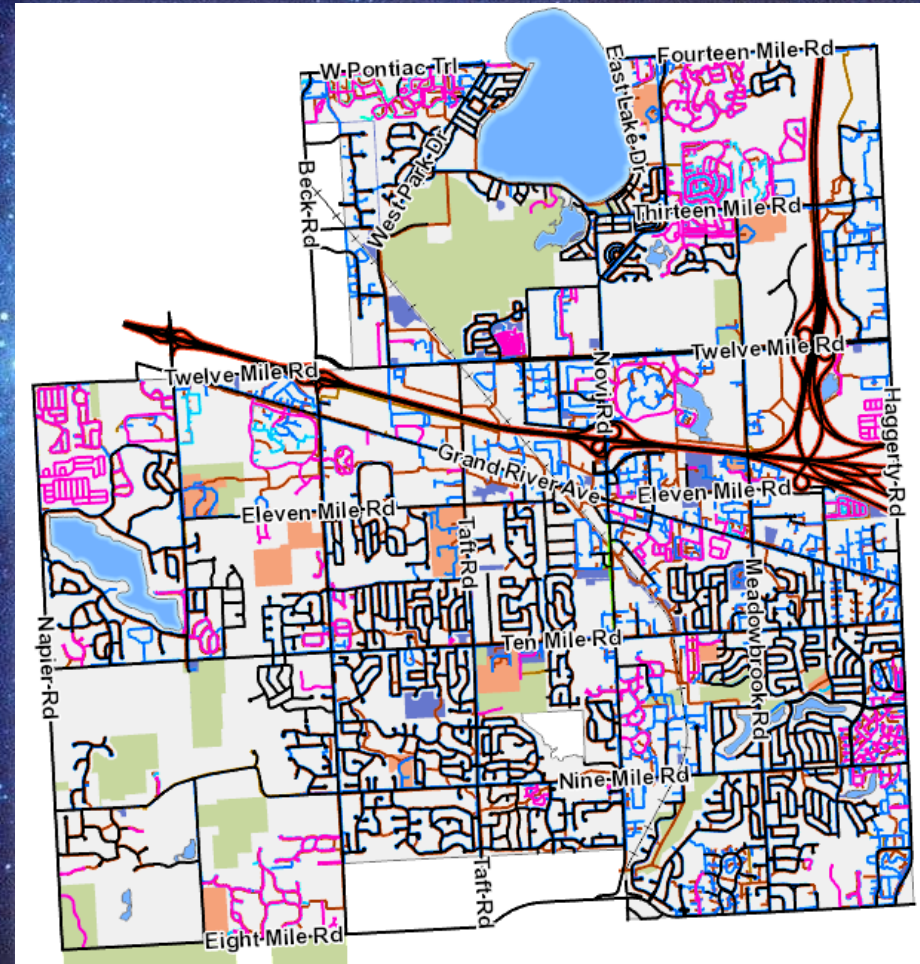
Source: SEMCOG

Money Magazine  
Best Places to  
Live 2016



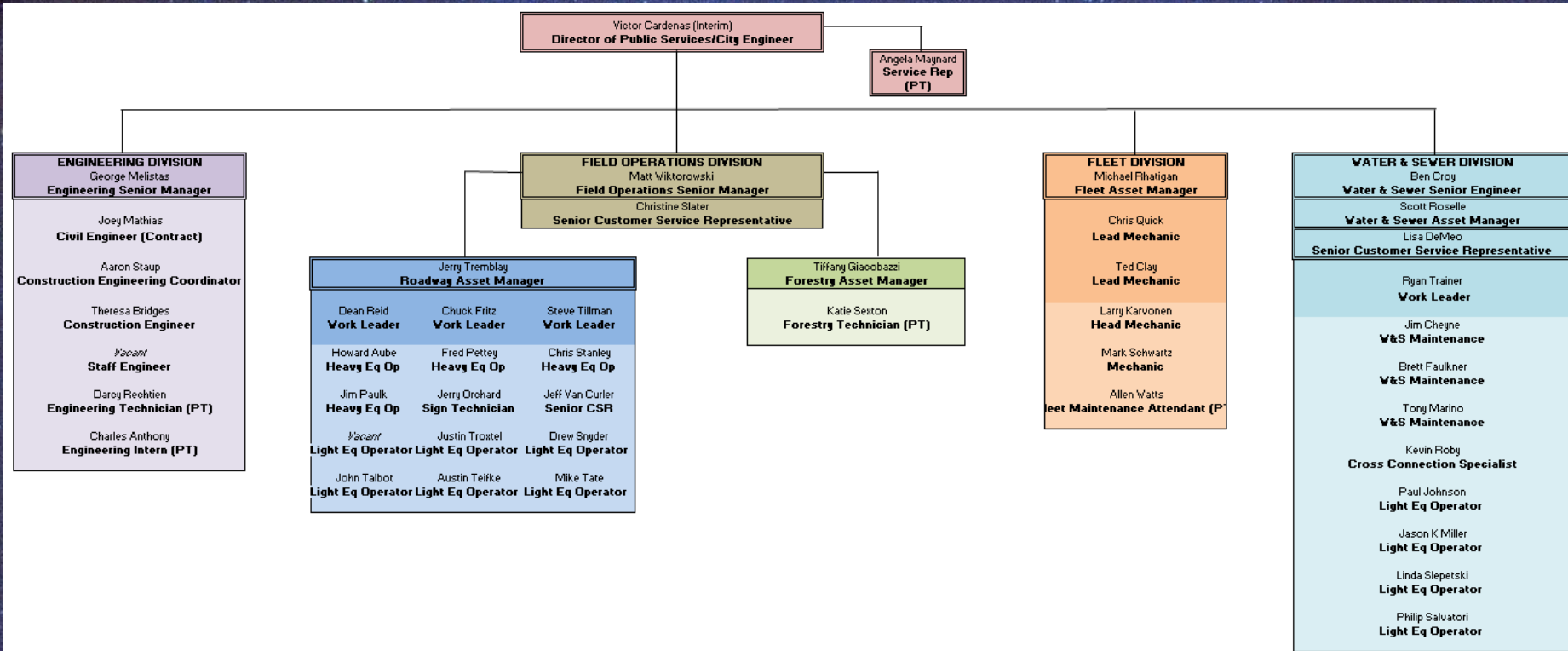
# ASSETS TO MANAGE

- **198 miles** of major **roads** and neighborhood streets
- **4,597** traffic & informational **signs**
- **4** major **bridges**
- **318 miles** of **sidewalks** and multi-use pathways
- **330 miles** of **water main**
- **4,194** fire **hydrants**
- **13,530** **water** service **connections**
- **263 miles** of sanitary **sewer main**
- **6,759** sanitary **manholes**
- **926 acres** of parkland in **12 parks**
- **39,353** **tree sites** along streets & on City-owned property
- **280 vehicles** and major pieces of equipment in the City's fleet
- **22,000** potential **cross connections**





# DEPARTMENT OF PUBLIC SERVICES



- Other departments utilizing Cityworks:
  - Community Development, Landscape Architect
  - Integrated Solutions Team, Parks Maintenance Division



# WHAT IS A CROSS CONNECTION?

- **Potential Sources of Contamination/Pollution:**

- Irrigation systems that contain pesticides, herbicides, animal droppings and other contaminants
- Garden hoses that have been submerged in pools, puddles, buckets, etc. can act as siphon hoses
- Boiler tanks can contain bacteria, mold & chemical additives that could be pushed into the water supply by back pressure



Prevent Water Backflow

- **Eliminating cross connections:**

- Backflow prevention devices must be installed on plumbing systems to separate non-drinking water from drinking water and inspected
- Devices may be testable or non-testable based on type of hazard and end use
- Testable devices must be tested per the cross connection control program and the safe drinking water act





# DESIGNING OUR XC CONTROL PROGRAM

- Cross Connection Specialist position approved in FY14-15 budget
- Ordinance changes
- Website development
  - Commercial
    - Informational materials
    - Standard forms
  - Residential
    - Picture Identifier / Residential Backflow Prevention Devices
  - Approved Backflow Preventer Tester List
  - Informational materials, publications
- Frequently Asked Questions Brochure
- Videos
- Manage data through Cityworks
  - Consolidate all operations on one platform

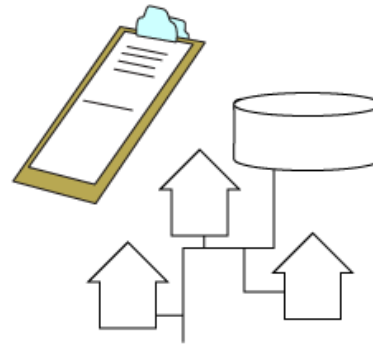




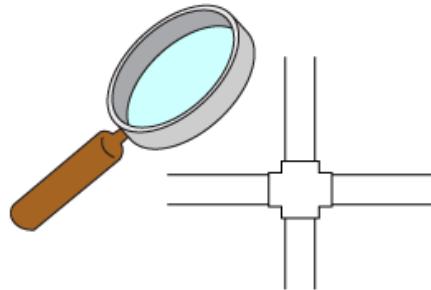
# MANAGING THE CROSS CONNECTION PROGRAM



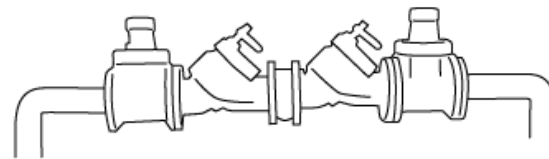
Informing consumers



Conducting inspections of the distribution system



Analyzing and recognizing potential cross-connections



Installing backflow prevention devices when needed



# **HISTORICAL TRACKING**

- **Commercial & Industrial Buildings**

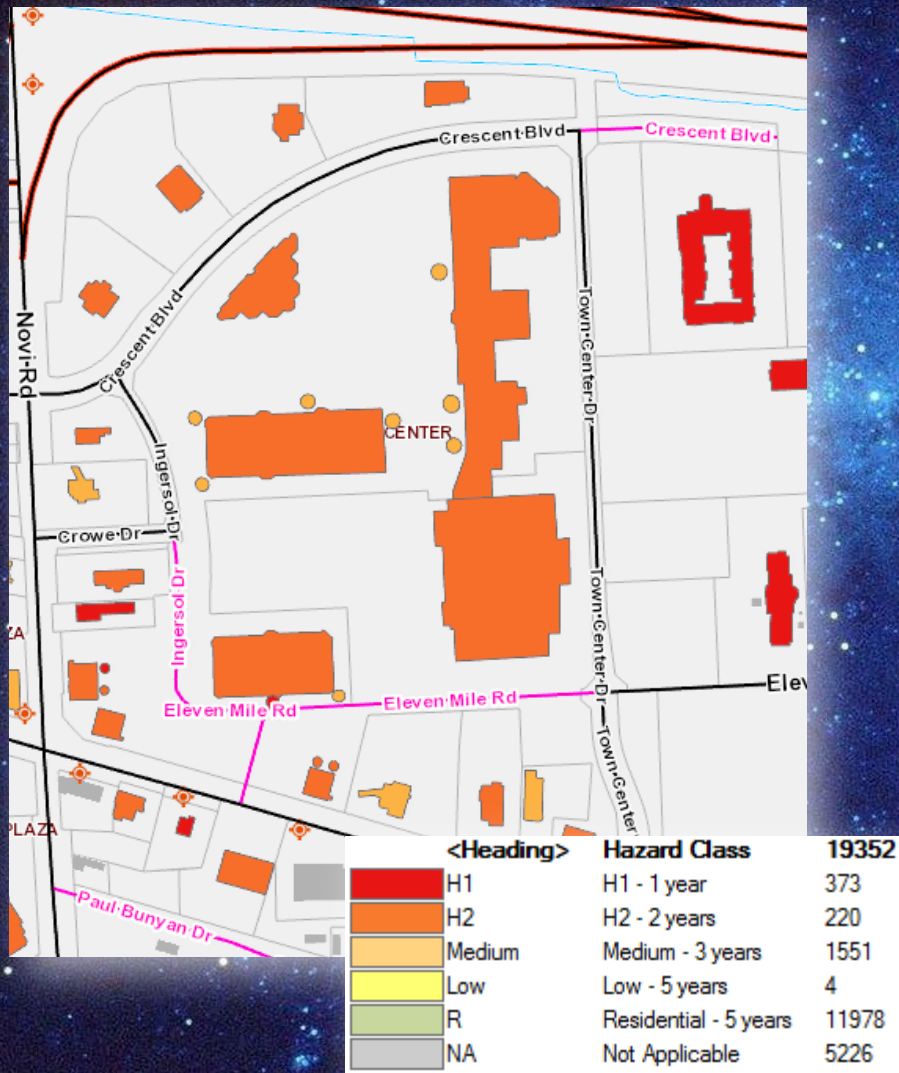
- Backflow device test reports received, reviewed and recorded in a spreadsheet
- Inspections completed for all commercial buildings
- Notifications sent, follow-up

- **Residential Buildings**

- Devices not tracked in any database or spreadsheet
- No inspections or testing conducted
- Per MDEQ requirements, residential properties now included in our cross connection control program



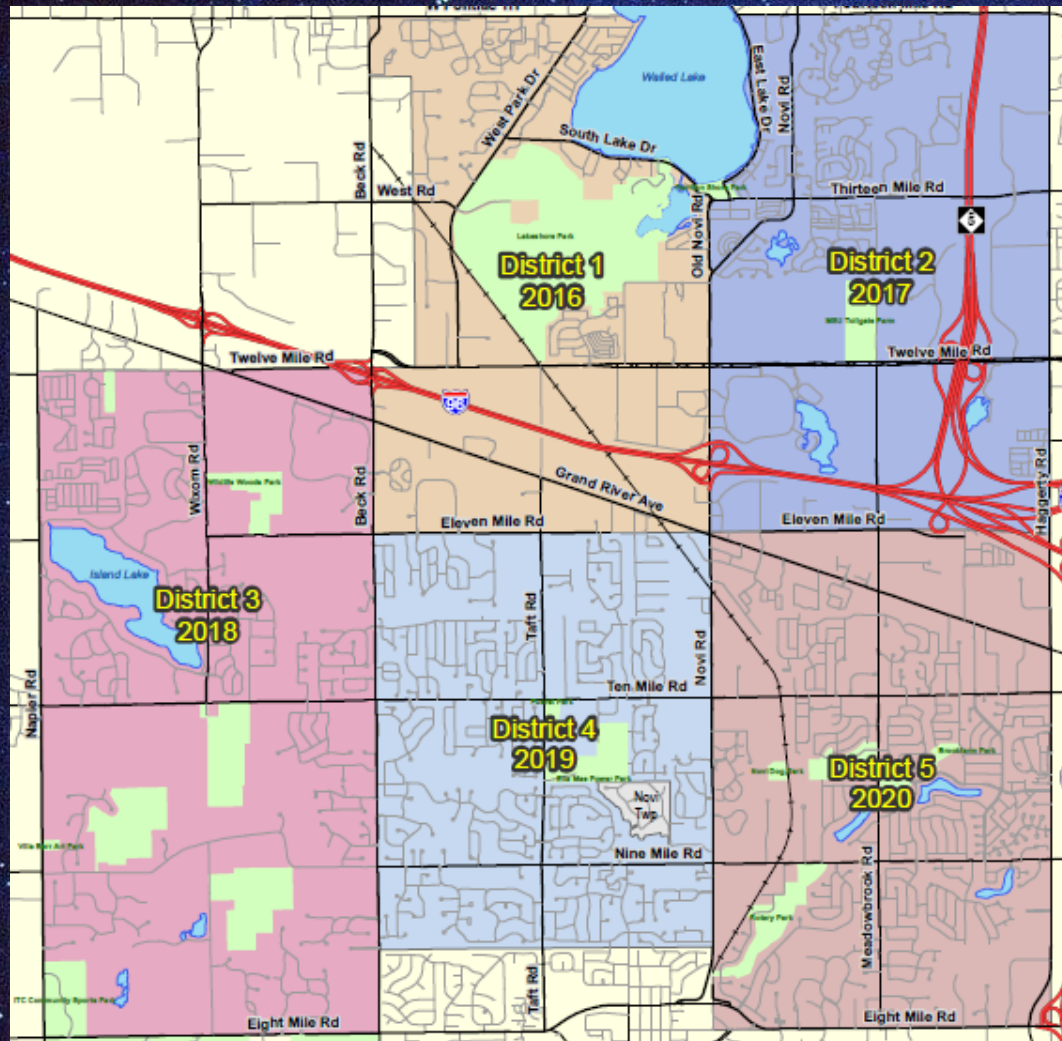
# GIS DATA DEVELOPMENT



- **Building footprints**
  - SEMCOG
  - Additional attributes
  - Monthly updates from C of O list
  - Tenants and irrigation drawn as circles
  - Condo units drawn as diamonds
- **Backflow devices**
  - Related table
  - Conversion from spreadsheet
- **Wells**
  - Oakland County



# RESIDENTIAL DISTRICTS



## Number of homes by District

- District 1 - 935
- District 2 – 1744
- District 3 – 1728
- District 4 – 4167
- District 5 - 3399



# ADDITIONAL ATTRIBUTES

## Important Fields

- Hazard Class
- XC Location Type
- XC Contact Info
- Location
- City Water

Asset Viewer		
Attributes	Work History	Relationships
Asset ID	BFD-010189	
Location	Internal	
Device Type		
Manufacturer		
Model		
Size		
Serial Number		
OBJECTID	2728	
Related Building Asset ID	BLD-14731	
<div>Save Return Map</div>		

Asset Viewer		
Attributes	Work History	Relationships
Asset ID	BLD-14731	
Location	29936 BRUSH PARK CT	
Development	Westpark Place	
District	District 1	
Hazard Class	Residential - 5 years	
XC Location Type	Single Family Residential	
Building Type	Single-Family Detached House	
Business Name		
XC Contact	WATER CUSTOMER	
XC Contact Address	29936 BRUSH PARK CT	
XC Contact City	NOVI	
XC Contact ZIP Code	48377	
XC Contact Phone		
Building Containment Method		
Building Containment Only		
Containment Letter		
Building Isolation Only		
Boiler		
Cooling Tower		
Number of Testable Devices		
Fire Suppression		
Fire Notes		
Specialty Equipment		
Pool or Pond to Inspect		
Tank to Inspect		
Irrigation on Well		
City Water	Yes	
Inspection Frequency		
Next Inspection		
Testing Frequency		
Next Test		
NonTestable Devices to Inspect		
Map Status	Active	
OBJECTID	7645	
<div>Save Return Map</div>		



# GIS DATA EDITING IN CW

- Group called Cross Connection Editor allowed to update geometry & attributes
- Equipment Changeout used by field staff to add new backflow device records
- Device information captured from returned test reports and field inspections
- An ArcGIS Server Object Interceptor is used to populate the AssetID value

Attributes	Work History
Asset ID	BFD-012459
Location	
Device Type	
Manufacturer	
Model	
Size	
Serial Number	
OBJECTID	21007
Related Building Asset ID	BLD-9199

EditMap



# **GIS DATA PREPARATION**



- **Preparation for starting a new district**
  - Get water customer data from Treasury Department
  - Determine whether or not condos have individual water service
  - Predict types of devices we may encounter, based on Water Dept. knowledge of subdivision
  - Add related 'placeholder' device(s) to each building



# RESIDENTIAL PROCESS

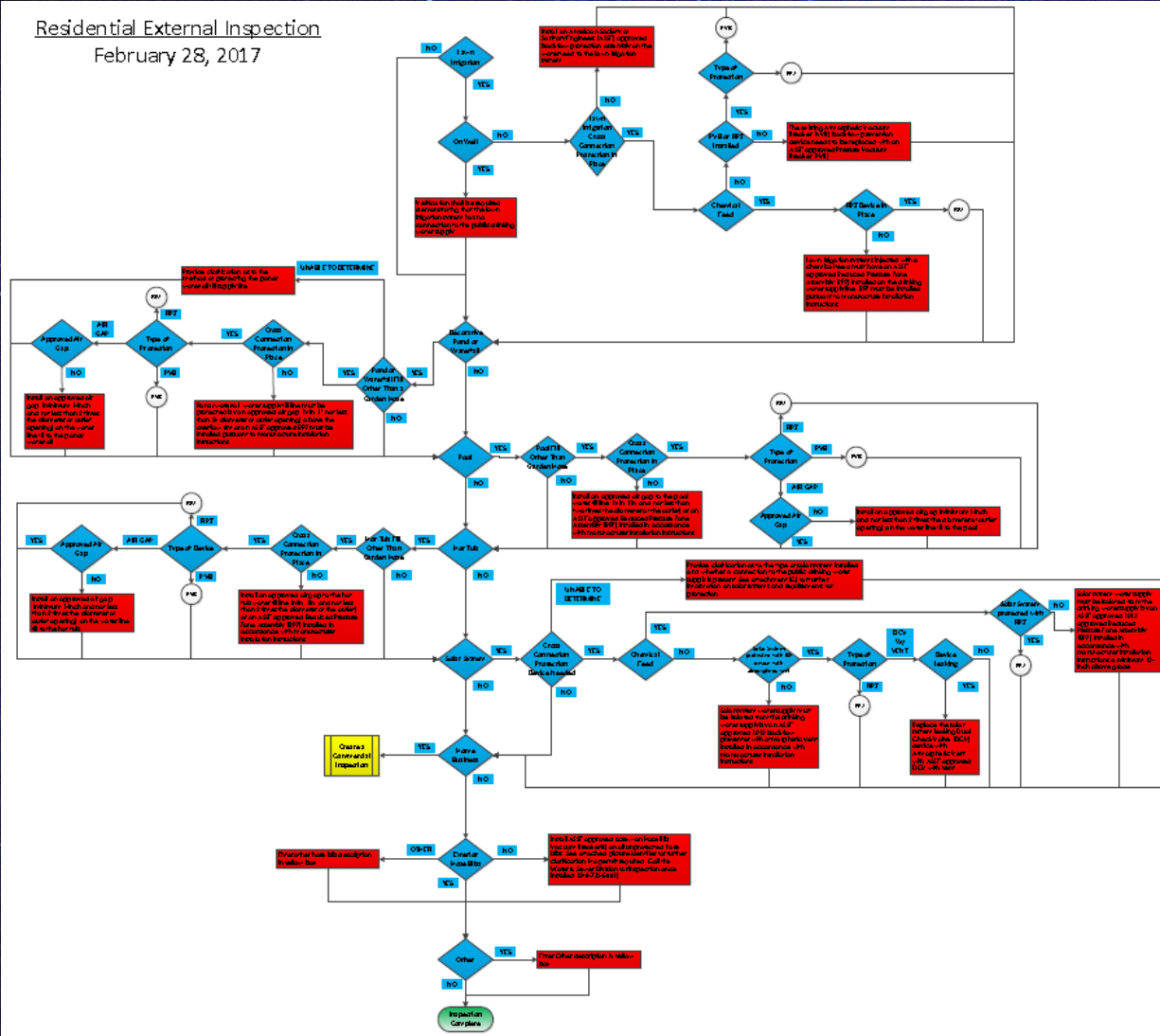
<b>Please check the box or boxes that best describe the use of the water at your residence.</b>	
<input type="checkbox"/> Typical water usage, such as bathrooms, household laundry or dishwashing appliances, and outside faucets.	
<input type="checkbox"/> Private well(s) supplying any part of your residence.	<input type="checkbox"/> Home based business (which utilizes additional water connections). Clarify: _____
<input type="checkbox"/> Connected into a chemical or agricultural process.	<input type="checkbox"/> Water Cooled Compressor <input type="checkbox"/> Exterior drive radiant heating system
<b>External Water Usage</b>	
<input type="checkbox"/> Underground lawn sprinkler or irrigation system connected to City Water Supply.	<input type="checkbox"/> Pond with water fill other than garden hose.
<input type="checkbox"/> Does the irrigation system have a chemical or fertilizer system?	<input type="checkbox"/> Pool with water fill other than a garden hose.
<input type="checkbox"/> Are outside hose Bibbs present?	<input type="checkbox"/> Hot Tub with water fill other than a garden hose.
<input type="checkbox"/> Are hose Bibbs frost free or anti siphon?	
<b>Internal Water Usage</b>	
<input type="checkbox"/> Water-assisted sump pump	<input type="checkbox"/> Steam Bath
<input type="checkbox"/> Pool with water fill other than a garden hose.	<input type="checkbox"/> Pond with water fill other than garden hose
<input type="checkbox"/> Hot Tub (other than typical garden tub master bath).	<input type="checkbox"/> Connected into a solar system
<input type="checkbox"/> Fire sprinkler suppression system.	<input type="checkbox"/> Connected into a boiler (other than hot water heater).
<input type="checkbox"/> Are chemical additives utilized in the fire suppression system?	<input type="checkbox"/> If yes, are chemicals used in the system?
<b>Testable backflow devices are required to be tested by an Approved Certified Backflow Testing Contractor who is also a Licensed Plumber at a frequency of every three (3) years with the exception of the lawn irrigation system required to be tested once every (5) years.</b>	
****Survey must be completed and returned within 30 days of receipt****	
****Backflow testing must be completed within 60 days of receipt****	

- Plumbing survey
- External inspection
- Internal inspection
- Testable device inspection(s)
- Evaluate test results for testable device(s)
- Non-compliance notification(s)
  - Termination of water service
- Compliance notification



# RESIDENTIAL EXTERNAL INSP

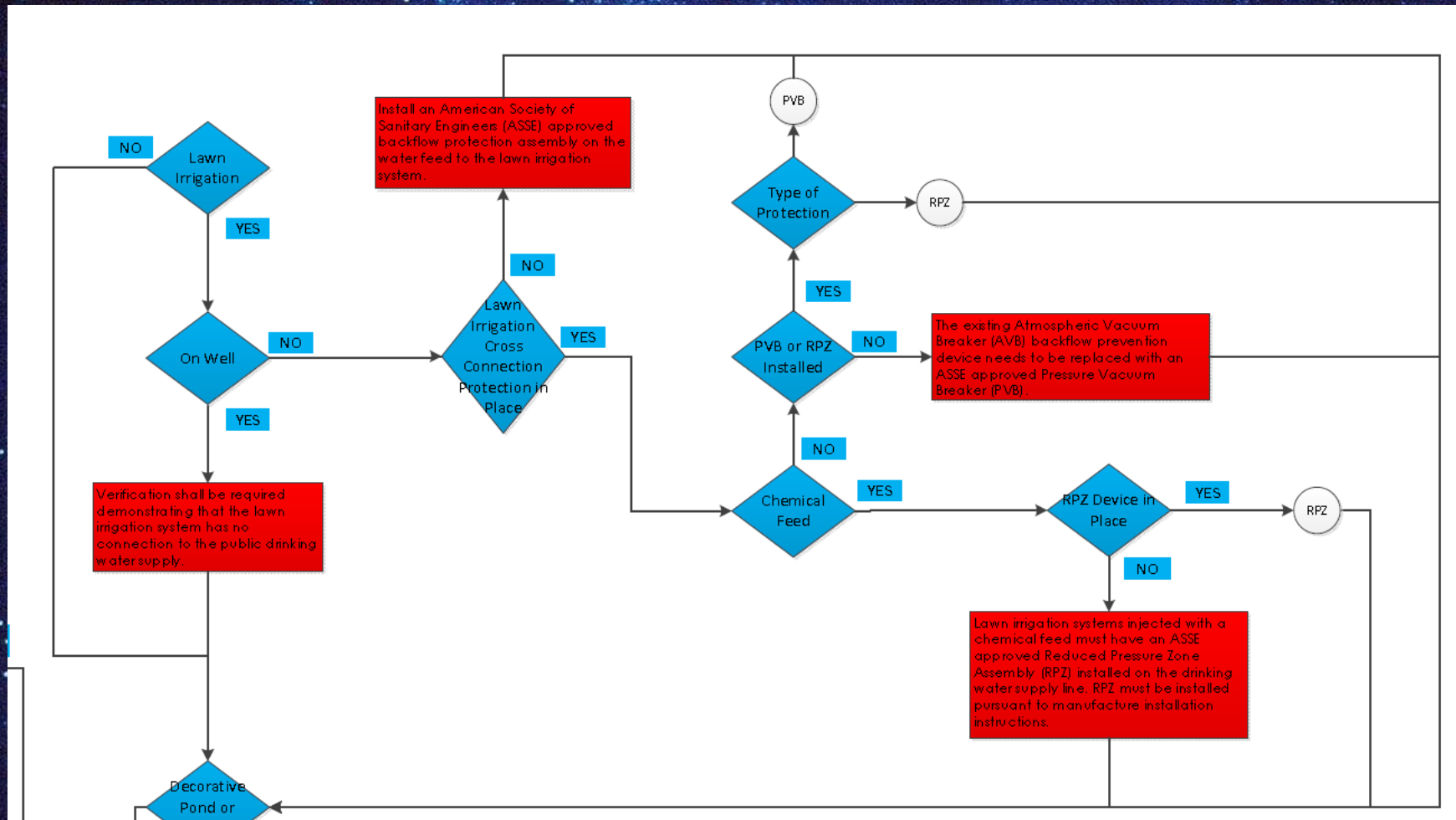
Residential External Inspection  
February 28, 2017



- Lawn Irrigation
- Decorative Pond or Waterfall
- Pool
- Hot Tub
- Solar System
- Home Business
- Anti-Siphon
- Hose Bibs
- Other

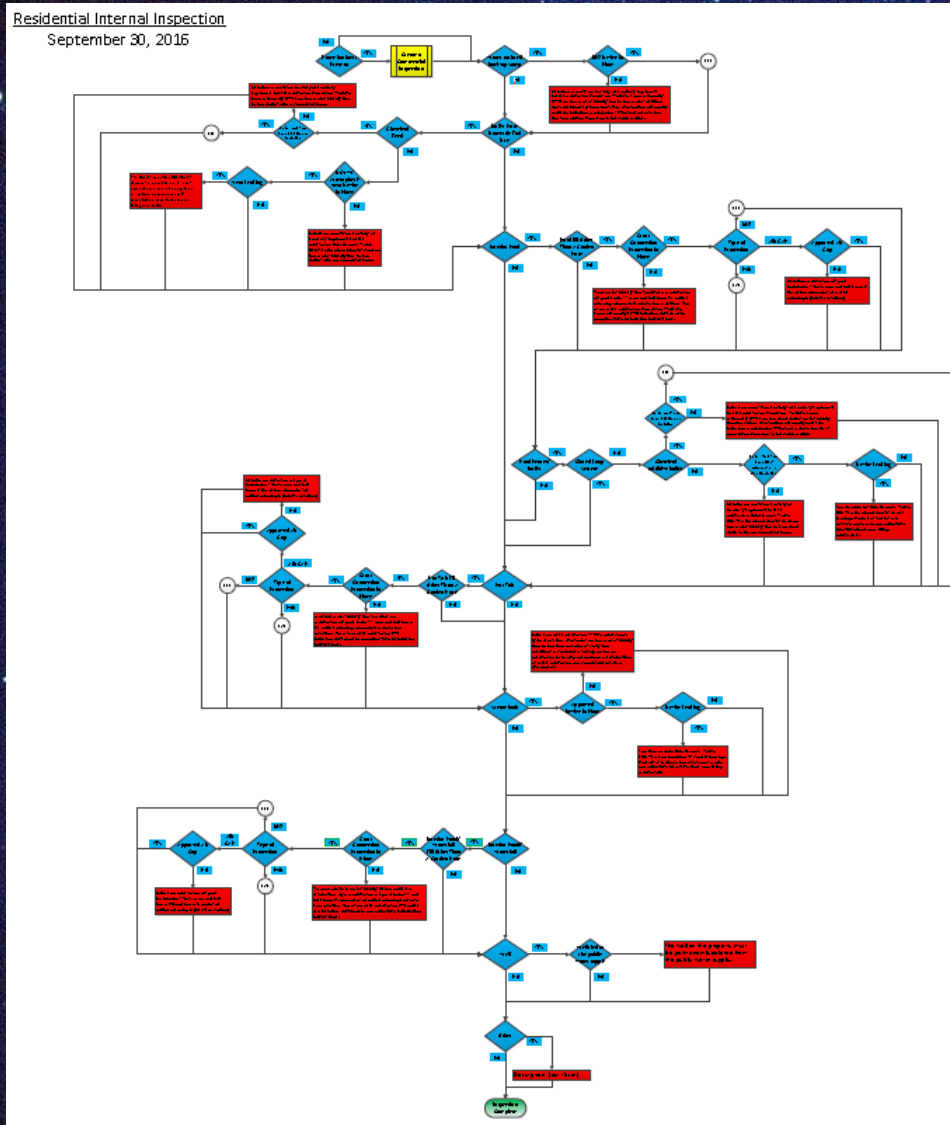


# EXTERNAL INSP. DETAIL





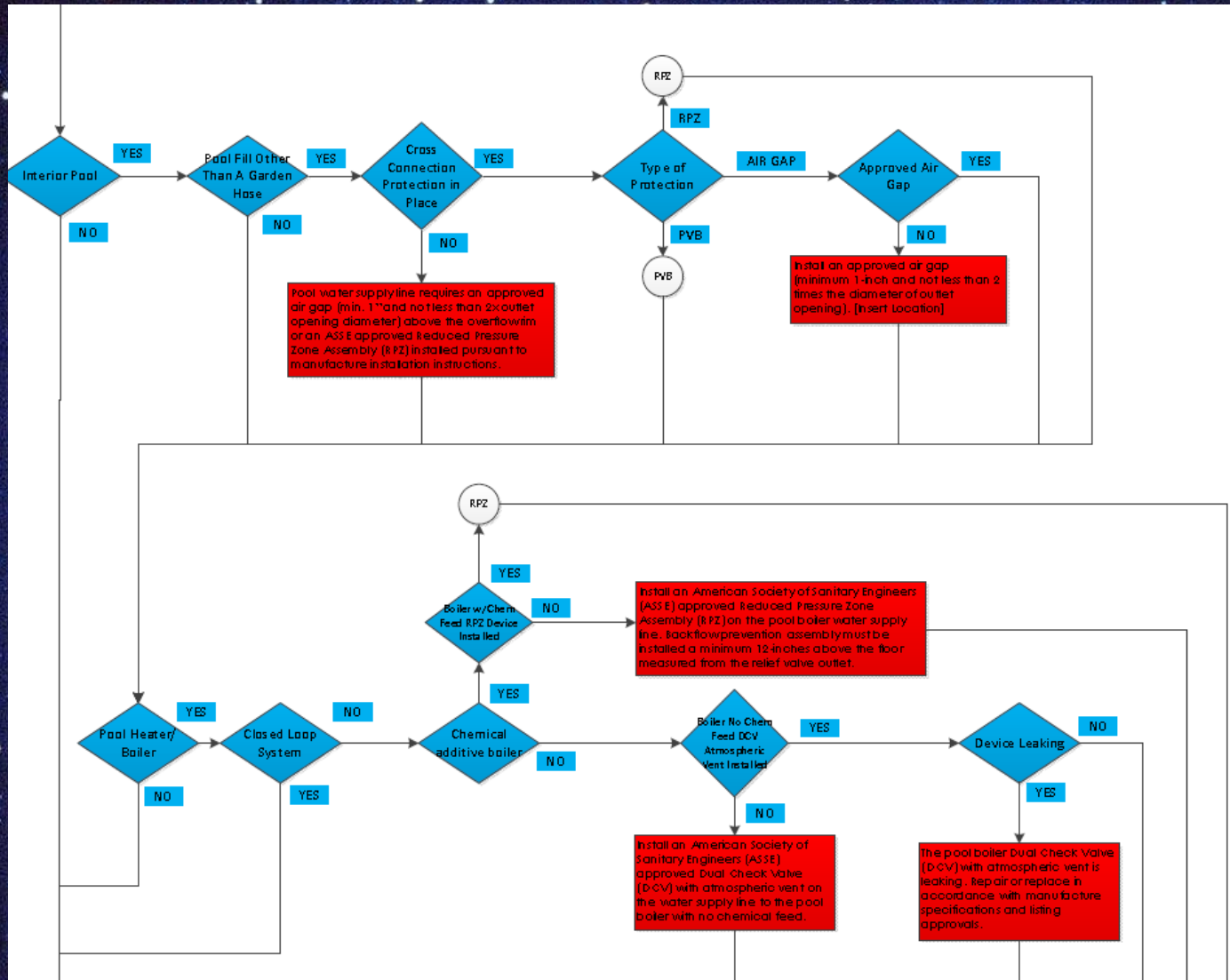
# RESIDENTIAL INTERNAL INSP



- **Home Business**
- **Water Assisted Back-up Sump**
- **Boiler Non-Domestic End Use**
- **Interior Pool**
- **Interior Hot Tub**
- **Steam Bath**
- **Interior Pond/Waterfall**
- **Well**
- **Other**



# INTERNAL INSP DETAIL

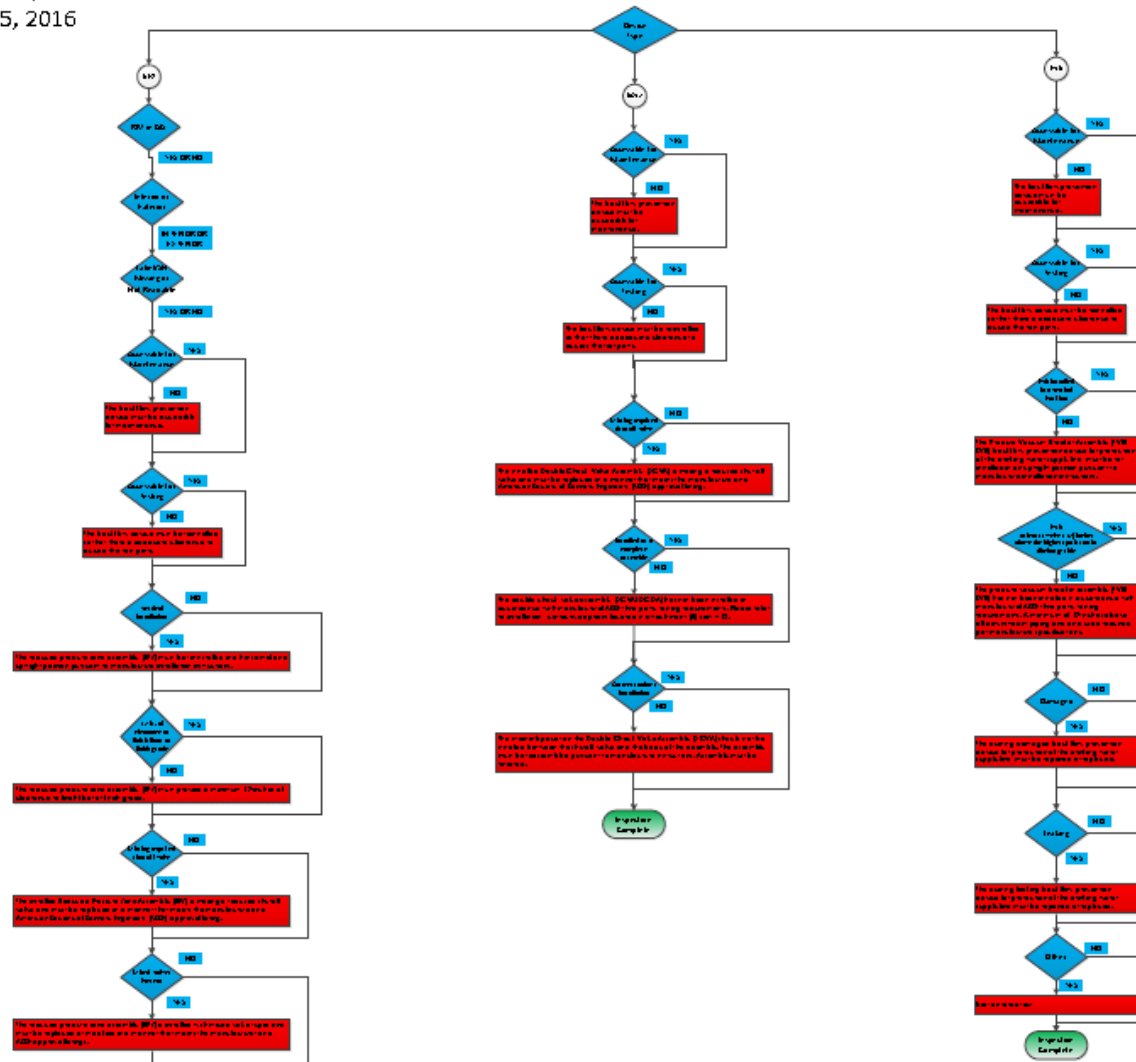




# TESTABLE DEVICE INSP

Testable Device Inspection

September 15, 2016

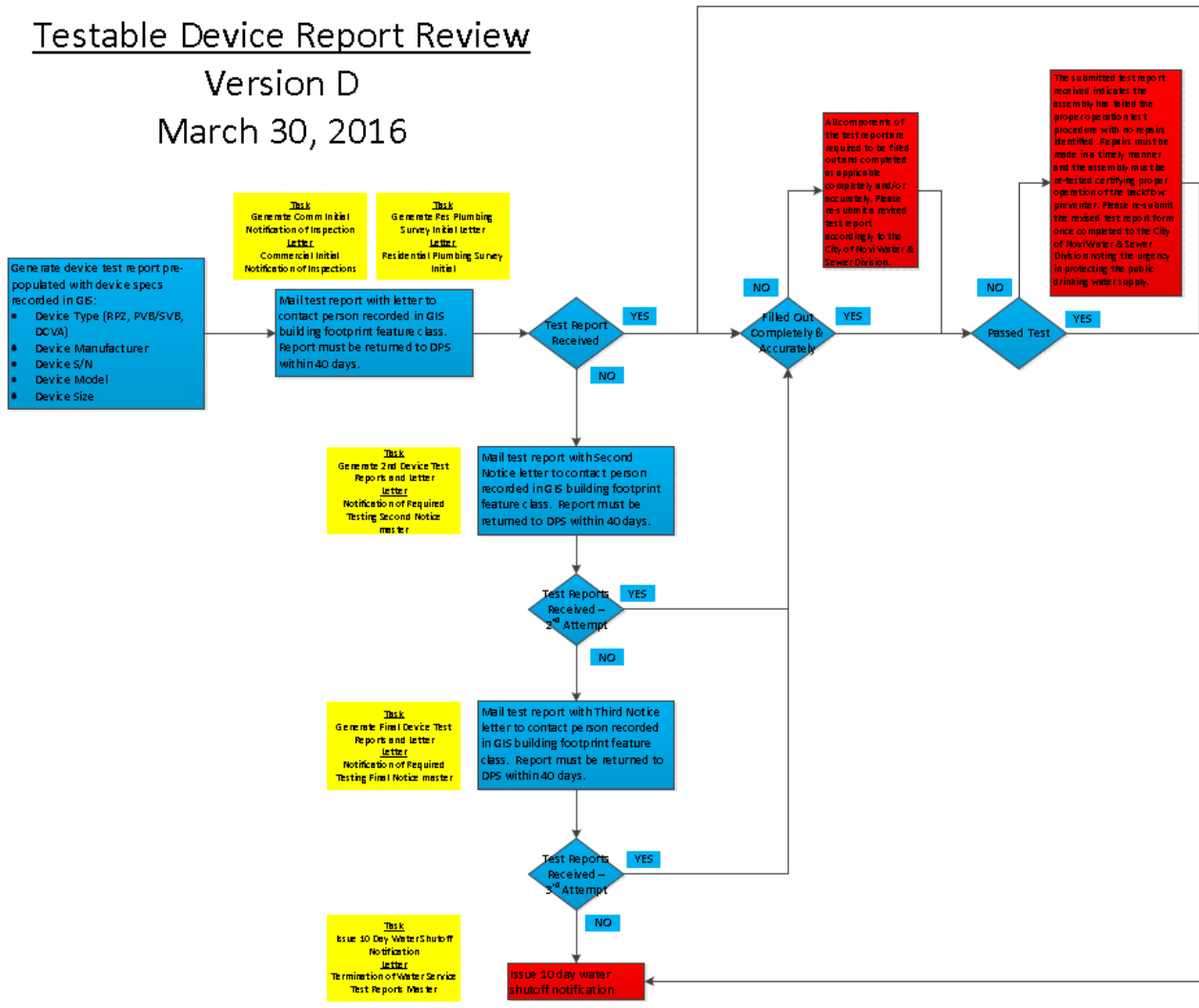




# TEST REPORT WORKFLOW

## Testable Device Report Review

Version D  
March 30, 2016



## • Testable Dev:

- RPZ
- DCVA
- PVB/SVB

## • Sample Observations

- Filled out completely
- Passed test
- Legible
- Licensed Plumber
- Test Date
- Etc.



# DEVICE TEST REPORT

BACKFLOW PREVENTER TEST REPORT											
Test Reports shall be forwarded to 26300 Lee BeGole Drive, Novi, MI 48375											
*** Only One Device Per Test Form / Test Reports MUST be filled out Completely											
Plumbing Permit No.:					Fire System Permit No.:						
Service Location Name:											
Service Location Address: 131 BUFFINGTON ST											
ASSE / CSA Approval Number:											
Manufacture:		Model No.:		S/N:		Size:					
Type of Device: <input type="checkbox"/> RPZ <input type="checkbox"/> DCVA <input type="checkbox"/> DCDA <input type="checkbox"/> PVB <input type="checkbox"/> SVB <input type="checkbox"/> Int. Test <input type="checkbox"/> Pass <input type="checkbox"/> Fail <input type="checkbox"/> Final Test <input type="checkbox"/> Pass <input type="checkbox"/> Fail											
Physical Location of Device, floor, room, purpose (descriptive as possible):											
<input type="checkbox"/> New Install <input type="checkbox"/>											
Use of Device: <input type="checkbox"/> Boiler Feed <input type="checkbox"/> Water Service Containment <input type="checkbox"/> Irrigation <input type="checkbox"/> Cooling Tower Feed											
<input type="checkbox"/> Main Fire Line <input type="checkbox"/> Fire Meter Bypass <input type="checkbox"/> Anti-freeze Isolation Fire Line <input type="checkbox"/> Water Cooled Compressor											
<input type="checkbox"/> Pot Filler <input type="checkbox"/> Dental Suction Equip. <input type="checkbox"/> X-Ray Developer <input type="checkbox"/> Pool Fill <input type="checkbox"/> Sterilizer <input type="checkbox"/> Reverse Osmosis											
<input type="checkbox"/> Water Activated Sump <input type="checkbox"/> Test Equipment <input type="checkbox"/> Pond Feed <input type="checkbox"/> Baptismal Feed <input type="checkbox"/> Other											
Reduced Pressure Zone Assembly (RPZ)					Pressure Vacuum Breaker (PVB)						
Static Line	Double Check Valve Assembly (DCVA)(DCDA)				Pressure Dif.	Air Inlet	Check Valve				
Pressure	Check	Check	Pres. Dif.	Pres. Dif.	When Relief	Valve Diff.	Differential				
PSI	Valve #1	Valve #2	#1	Across #2	Opens	Opened	<input type="checkbox"/> Closed Tight				
	Leaked <input type="checkbox"/>	Leaked <input type="checkbox"/>	Check <input type="checkbox"/>	Check <input type="checkbox"/>	PSID	PSID	<input type="checkbox"/> Leaked				
	Closed <input type="checkbox"/>	Closed <input type="checkbox"/>	PSID	PSID	<input type="checkbox"/> Did Not	<input type="checkbox"/> Did Not	PSID				
	Tight <input type="checkbox"/>	Tight <input type="checkbox"/>	Check #2 Confirm		Open	Open					
R E P A I R S	<input type="checkbox"/> Cleaned	<input type="checkbox"/> Cleaned	Comments			<input type="checkbox"/> Cleaned	<input type="checkbox"/> Cleaned	Shut Off Valves			
	Replaced	Replaced				Replaced	Replaced			#1	#2
	<input type="checkbox"/> Disc	<input type="checkbox"/> Disc				<input type="checkbox"/> Disc	<input type="checkbox"/> Air Inlet				
	<input type="checkbox"/> Spring	<input type="checkbox"/> Spring				<input type="checkbox"/> Spring	<input type="checkbox"/> Disc	Closed Tight	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/> Guide	<input type="checkbox"/> Guide				<input type="checkbox"/> Guide			<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/> Seat	<input type="checkbox"/> Seat				<input type="checkbox"/> Seat	<input type="checkbox"/> Air Inlet	Leaked	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/> O-Ring(s)	<input type="checkbox"/> O-Ring(s)				<input type="checkbox"/> O-Ring(s)	<input type="checkbox"/> Spring	Cleaned	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/> Module	<input type="checkbox"/> Module				<input type="checkbox"/> Module	<input type="checkbox"/> Chk Disc	Replaced	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/> Rubber Kit	<input type="checkbox"/> Rubber Kit		<input type="checkbox"/> Check	Repair	<input type="checkbox"/>	<input type="checkbox"/>					
			<input type="checkbox"/> Spring	Other	<input type="checkbox"/>	<input type="checkbox"/>					
	Check #1	Check #2	Check #1	Check #2	Relief	Air Inlet	Check				
	<input type="checkbox"/> Closed	<input type="checkbox"/> Closed	PSID	PSID	Open at	Opened at	Valve	<input type="checkbox"/> Closed			
	<input type="checkbox"/> Leaked	<input type="checkbox"/> Leaked	Check #2 Confirm		PSID	PSID	PSID	<input type="checkbox"/> Leaked			
CERTIFICATION: I hereby certify that the data here within to be accurate and that the tested device function within the limits of required performance standards ASSE 5000. Tester Name (Please Print):											
NFPA 25 Main Drain Test performed on Fire Sprinkler System: <input type="checkbox"/> Yes <input type="checkbox"/> No											
Testing Company:					Phone No.						
Tester Name (Please Print):					Tester Signature:						
Tester Cert. No.					Gauge Model No.						
Serial No.					Date of Last Calibration:						
Test Gauges Must Be Certified Annually Time of Test: _____ <input type="checkbox"/> AM <input type="checkbox"/> PM Initial Test Date: _____											
Final Test Date: _____											

- Test report required on date different than inspection
- Address populated from building footprint
- Populate from backflow device table:
  - Manufacturer
  - Model
  - Serial Number
  - Size
- Sent to homeowner for each device
- Returned reports scanned & attached to work order



# WORK ORDER CONFIG.

**Cityworks** | [Inbox](#) | [Service Request](#) | [Work Orders](#) | [Equipment Changeout](#) | [Inspections](#) | [Recent Activity](#) | [Reports](#) | [GIS Search](#) | [Projects](#)

[Work Order](#) | [Email](#) | [Print](#) | [Save](#) | [Close](#) | [Delete](#)

### Work Order

Description: Residential Inspection (5 years)

Number: 29144

Category: Cross Connection

Initiated By: DEMEO, LISA M Date: 02/16/2017 3:13 PM

Status: Open Priority: Medium

Requested By: Work Leader:

Submit To: DEMEO, LISA M Date: 05/6/2017 1:28 PM

Sched. Start: 02/16/2017 3:13 PM Sched. Finish: 02/16/2017 3:13 PM

Closed By: Date:

Completed By:

Actual Start: Actual Finish:

Expense Type: Maintenance

Comments: [Add Comment](#) [Sort](#)

no comments

Instructions:

Reactive? ☐

### Location Information

WO Address: 43050 Sandstone Dr, 48377

Location Details:

X Location: 13,364,181.39 Y Location: 367,213.2

### Assets

Total Entities: 2

Asset	Asset Id	Asset Uid	Location	Warranty
BUILDINGFOOTPRINTS	9349	BLD-13682	43050 SANDSTONE DR	
BACKFLOWDEVICES	32874	BFD-012897	Irrigation	

- Pink rows indicate inventory still under warranty.

### Map Layer Fields

[Reset](#)

### Tasks

SeqID	Name	Description
1	Plumb Survey Init Lt	Generate Res Plumbing Survey Initial Letter
2	Res Cust Test Forms	Test Form(s) to Residential Customer
3	Res Plmb Survey Rcvd	Residential Plumbing Survey Received

### Details

Project: Residential Cross Conne Account: Water - All Work

- Work order templates are not cyclical
  - Many backflow devices are discovered during inspections
  - Next work order in cycle only includes devices present when 1<sup>st</sup> work order is created
  - Will re-evaluate after 1<sup>st</sup> inspection cycle is complete



# TASK DRIVEN WORKFLOW

Work Order ID: 28039

Tasks

<input type="checkbox"/>	SeqId	Name	Description	Status	Proceed	Rework	Assigned To
<input type="checkbox"/>	1	Plumb Survey Init Lt	Generate Res Plumbing Survey Initial Letter	CURRENT	False	False	DEMEO, LISA M
<input type="checkbox"/>	2	Res Cust Test Forms	Test Form(s) to Residential Customer	PENDING	False	False	DEMEO, LISA M
<input type="checkbox"/>	3	Plumb Survey 2nd Lt	Generate Res Plumbing Survey 2nd	PENDING	False	False	DEMEO, LISA M
<input type="checkbox"/>	4	Plumb Survey Final L	Generate Res Plumbing Survey Final	PENDING	False	False	DEMEO, LISA M
<input type="checkbox"/>	5	Res Plmb Survey Rcvd	Residential Plumbing Survey Received	PENDING	False	False	DEMEO, LISA M
<input checked="" type="checkbox"/>	6	Res Field Insp	Residential Field Inspection	PENDING	False	False	SLEPETSKI, LINDA M
<input type="checkbox"/>	7	Res Field Reinsp	Residential Field Re-inspection	PENDING	False	False	SLEPETSKI, LINDA M
<input type="checkbox"/>	8	Res Ext BF Passed In	Residential External BF Device(s) Passed Insp	PENDING	False	False	SLEPETSKI, LINDA M
<input type="checkbox"/>	9	Sched Int Res Insp	Schedule Internal Residential Inspection	PENDING	False	False	DEMEO, LISA M
<input type="checkbox"/>	10	Res Internal Insp	Residential Internal Inspection	PENDING	False	False	ROBY, KEVIN R
<input type="checkbox"/>	11	Res Internal Reinsp	Residential Internal Re-inspection	PENDING	False	False	ROBY, KEVIN R
<input type="checkbox"/>	12	Res Int BF Passed In	Residential Internal BF Device(s) Passed Insp	PENDING	False	False	ROBY, KEVIN R

New

Edit

Delete

Task/Entity

Search By:

Keyword:

Find

<input type="checkbox"/>	Asset	Asset Id	Location	Warranty D
<input type="checkbox"/>	BUILDING FOOTPRINTS	0		

Highlight Selected Assets

Details

Sequence: 6

Result:

Assigned To: SLEPETSKI, LINDA M

Status:

Permit No.:

FAIL

PASS

Comments:

Scheduled Start:

Scheduled Finish:

Actual Start:

Actual Finish:

Rework: N

Proceed: N

Save

Task

Synchronize

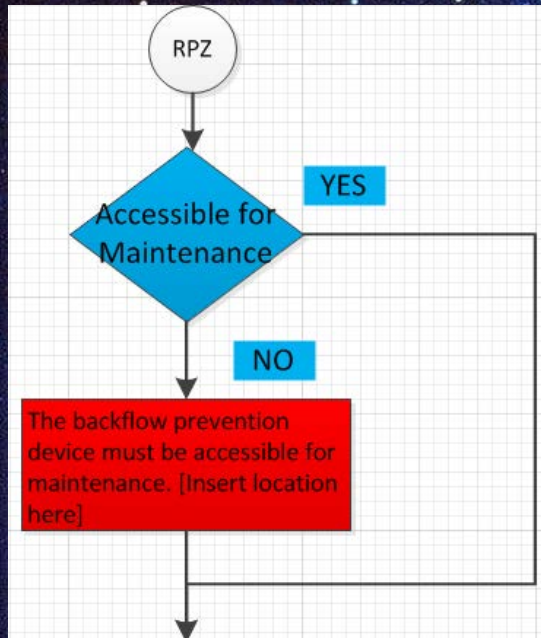


# WORKING WITH TASKS

- **Easier to have all tasks available when work order is created vs. adding them manually later**
  - Residential work order has 20 tasks
- **Delete unneeded tasks immediately**
  - For example, if home passes external inspection, then subsequent re-inspection tasks need to be deleted
- **Reorder tasks to set a specific task as “Current”**
- **Created custom responses to record inspection results that can be viewed on work order**
- **Task Synchronize custom functionality**
  - Complete task for multiple work orders at one time



# INSPECTION CONFIG.



### Templates

Boardwalk Inspection

Brookfarm Park Inspection

Comm Non-Testable Device Insp

Comm Testable BF Device Insp

Commercial XC Inspection

Curb Ramp Inspection

Detention Basin Inspection

Dog Park Inspection

Dog Park Winter Inspection

Res Testable BF Device Insp

Residential XC External Insp

Residential XC Internal Insp

Rotary Park Inspection

Sidewalk Inspection

Storm Structure Inspection

Street Light Inspection

Test Report Review

### Details

GeneralObservationsAsset Configuration

Lawn Irrigation

Lawn irrigation on well

Lawn Irrigation - Cross Connection Protection in Place

Lawn Irrigation - Chemical Feed in Place

Lawn Irrigation - Chem Feed - RPZ BF Device Installed

Lawn irrigation - PVB or RPZ installed

Lawn Irrigation - Type of BF Device

Lawn Irrigation - Create Res Testable BF Device Insp

Decorative pond or waterfall

Pond or Waterfall - Fill Other than a Garden Hose

Pond or Waterfall - Cross Connection Protection in Place

Pond or Waterfall - Type of BF device

Pond or Waterfall - Create Res Testable BF Device Insp

Pond or Waterfall - Approved Air Gap Present

Pool



# INSPECTION RESULTS

Observations				
Observation	Result	Instruction	Explanation	
Lawn Irrigation	Yes			<input checked="" type="checkbox"/>
Lawn irrigation on well	No			<input checked="" type="checkbox"/>
Lawn Irrigation - Cross Connection	Yes			<input checked="" type="checkbox"/>
Protection in Place				
Lawn Irrigation - Chemical Feed in Place	No			<input checked="" type="checkbox"/>
Lawn irrigation - PVB or RPZ installed	Yes			<input checked="" type="checkbox"/>
Lawn Irrigation - Type of BF Device	PVB			<input checked="" type="checkbox"/>
Lawn Irrigation - Create Res Testable	Yes			<input checked="" type="checkbox"/>
BF Device Insp				
Decorative pond or waterfall	No			<input checked="" type="checkbox"/>
Pool	No			<input checked="" type="checkbox"/>
Hot Tub	No			<input checked="" type="checkbox"/>
Solar System	No			<input checked="" type="checkbox"/>
Home Business	No			<input checked="" type="checkbox"/>
Anti-Siphon Hose Bibs	No			<input checked="" type="checkbox"/>
Standard Hose Bibs	Yes			<input checked="" type="checkbox"/>
Standard Hose Bibs-Approved Hose Bib Vacuum Breaker-Present	Not All	Install ASSE approved Hose Bib Vacuum Breakers (HBVB) on the hose bib leading to the irrigation system. This is a screw on device that can be purchased at a home improvement store. No permit is needed. See ex. pictures. Call when installed.	Location(s):	<input checked="" type="checkbox"/>
Standard Hose Bibs-Approved Hose Bib Vacuum Breaker-Damage	No			<input checked="" type="checkbox"/>
Other	No			<input checked="" type="checkbox"/>
Inspection Complete	Yes			<input checked="" type="checkbox"/>

- Branching observations
- Violation & corrective action listed in Instruction window
  - Only 250 characters!
  - Additional explanation page created
- Any text entered in Instruction or Explanation windows appear on letter
- Edit specific observation deletes all subsequent results



# CRYSTAL REPORTS

- **Templates**
  - **Commercial (8)**
  - **Residential (8)**
  - **Test Report (7)**
- **Address from building footprint**
- **Inspection violations are inserted as a list**
- **Due date calculated**

**Re: 131 BUFFINGTON ST Cross Connection Control**

Dear Water Customer,

A recent inspection of backflow prevention devices was conducted at your residence. The purpose of this communication is to inform you of your non-compliance status as it relates to the protection of the public drinking water supply.

Pursuant to the Safe Drinking Water Act, P.A. 399, Part 14 Rules; Rule 1404(1) and the City of Novi Cross Connection Control Program (CCCCP), the Water and Sewer Division is required to eliminate all cross connections and ensure inspection and testing of all backflow prevention devices. **The following bullet items outline the reasons for corrective requirements of the backflow prevention devices at your residence and the corrective measures necessary to comply with the CCCC:**

**Location: 131 BUFFINGTON ST**

- Install an American Society of Sanitary Engineers (ASSE) approved backflow protection assembly on the water feed to the lawn irrigation system.
- Install an ASSE approved Reduced Pressure Zone Assembly (RPZ) on the water supply line to the water assisted backup sump system. Backflow prevention assembly must be installed a minimum 12-inches above the floor measured from the relief valve outlet.

**Location: Irrigation**

- The backflow prevention device must be accessible for maintenance.
- The backflow device must be reinstalled so that there is adequate clearance to access the test ports.
- The Pressure Vacuum Breaker Assembly (PVB/SVB) for protection of the drinking water supply line must be re-installed in an up-right position pursuant to manufacturer installation instructions.

**Location: Sump**

- The backflow prevention device must be accessible for maintenance.
- The reduced pressure zone assembly (RPZ) must be re-installed in a horizontal and up-right position pursuant to manufacture installation instructions.
- The installed Reduced Pressure Zone Assembly (RPZ) is missing a required shutoff valve and must be replaced in a manner that meets the manufacture and American Society of Sanitary Engineers (ASSE) approval listing.



# SAVED SEARCHES

- Query parameters to produce a list
- Populate inbox panels and event layers
  - User Inboxes
  - Residential process divided into separate Inboxes

The screenshot shows a software interface with a top navigation bar containing 'Search', 'Clear', 'Open', and 'Save As...'. Below this is a 'General' tab with various filters for 'WO D(s)', 'Entity Group', 'Category', 'Status', 'Requested By', 'Submit To', 'Sched. Start', 'Closed By', 'Completed By', 'Actual Start', 'Expense Type', 'Has Request', 'Has PII Case', 'Closed?', 'Reactive?', and 'Request D(s)'. There are also filters for 'Entity Type', 'Descriptions', 'Priority', 'Initiated By', 'Work Leader', 'Sched. Finish', 'Actual Finish', 'Past Due', 'Has Attachment', 'Cancelled?', and 'Init App'. On the right, a 'Search Query' panel shows the current query: 'Tasks: Generate Comm Notification of Compliance. Category: Cross Connection. Status: Open. Task Status: COMPLETE. Entity Group: Water and Sewer. Apply to Entity: Building Footprints.' Below this is a 'Fields Visible in Search Results' list with fields like 'Entity Type', 'Address', 'Description', 'Priority', 'Status', 'Submit To', 'Sched Start Date', 'Sched Finish Date', 'Actual Start', 'Actual Finish', 'Location', 'Entity Group', 'Category', 'Initiated By', 'Date Initiated', 'Date Submit To', 'Completed By', 'Work Leader', 'Legal Billable', 'Contractor Billable', 'Project', 'Account', 'Expense Type', 'Stage', and 'Requested By'. At the bottom, a 'Task Fields Visible in Search Results' section is visible.

Chris's Inbox XC Res Letters - District 1 XC Res Letters - District 2 **XC Comm Letters** XC Comm Inspection XC Co  
XC Test Letters - 15 Days XC Comm Letters - 15 Days Katie's Inbox XC WO Ready to be Closed

## Commercial Letters to be Sent

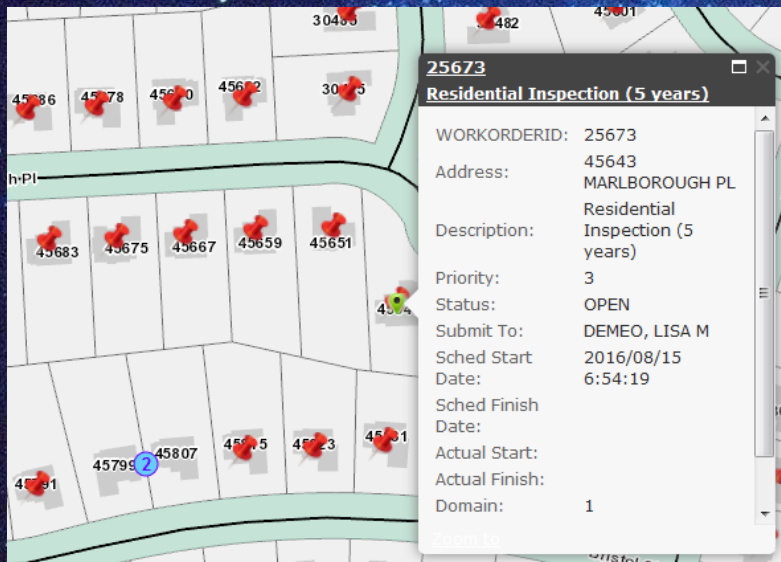
Generate Initial Notification of Inspection							
Open	Print	Expand	Configure	Map	Search...		
<input type="checkbox"/>	Wo	Address	Description	Sched Start Date	Sched Finish Date	Initiated By	Date Initiated
<input type="checkbox"/>	30585	21111 Haggerty Rd, 48375	Commercial H1 Inspection (yearly)	2017-03-16 9:42 AM	2017-03-16 9:42 AM	DEMEO, LISA M	2017-03-16 9:42 AM
<input type="checkbox"/>	26297	25549 Taft Rd, 48374	Commercial H1 Inspection (yearly)	2017-08-23 9:15 AM		ROBY, KEVIN R	2016-08-25 8:03 AM
<input type="checkbox"/>	28935	27550 Novi Rd, 48377	Commercial H1 Inspection (yearly)	2017-02-15 10:45 AM	2017-02-15 10:45 AM	DEMEO, LISA M	2017-02-15 10:45 AM
<input type="checkbox"/>	29516	27855 Cabot Dr, 48377	Commercial Medium Inspection (3 years)	2017-03-03 11:21 AM	2017-03-03 11:21 AM	DEMEO, LISA M	2017-03-03 11:21 AM
<input type="checkbox"/>	26224	28351 Clymer Dr, 48377	Commercial H1 Inspection (yearly)	2017-08-23 2:13 PM		DEMEO, LISA M	2016-08-23 2:13 PM
Rows 5		1 - 5 of 13					

Generate Non-Compliance Letter #1							
Open	Print	Expand	Configure	Map	Search...		
<input type="checkbox"/>	Wo	Address	Description	Sched Start Date	Sched Finish Date	Initiated By	Date Initiated
<input type="checkbox"/>	26205	25549 Taft Rd, 48374	Commercial H1 Inspection (yearly)	2016-08-23 9:15 AM		ROBY, KEVIN R	2016-08-23 9:15 AM
<input type="checkbox"/>	29373	26159 Novi Rd, 48375	Commercial Medium Inspection (3 years)	2017-02-25 9:05 AM	2017-02-25 9:05 AM	ROBY, KEVIN R	2017-02-25 9:05 AM
<input type="checkbox"/>	31208	28845 Cabot Dr, Suite 100, 48377	Commercial H1 Inspection (yearly)	2017-03-24 10:37 AM	2017-03-24 10:37 AM	BLOUGH, KERI	2017-03-24 10:37 AM
Rows 5		1 - 3 of 3					



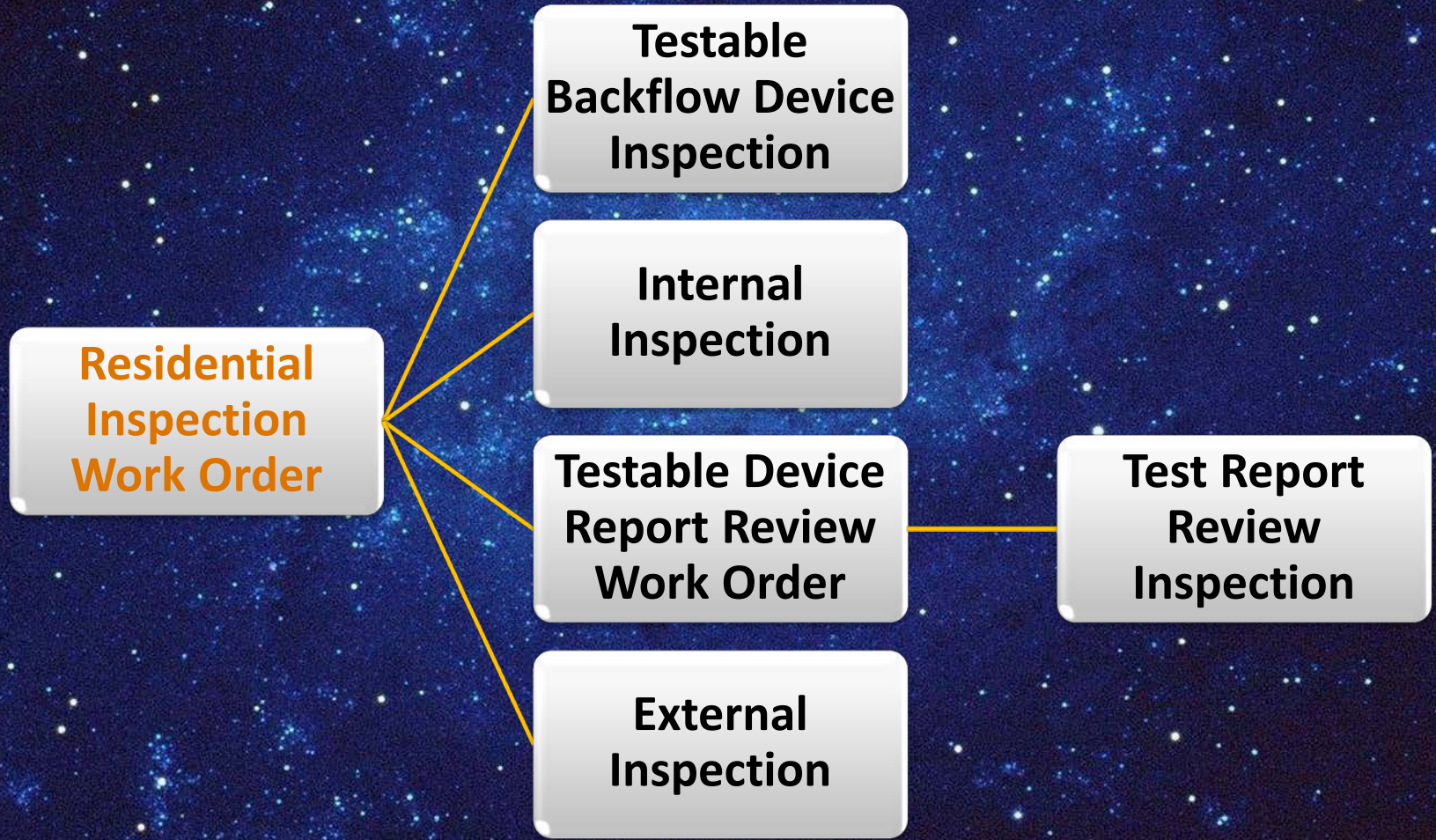
# EVENT LAYERS

- Created using Saved Searches
- Saves time for users when looking for Work Orders
- Designate a unique symbol for each layer



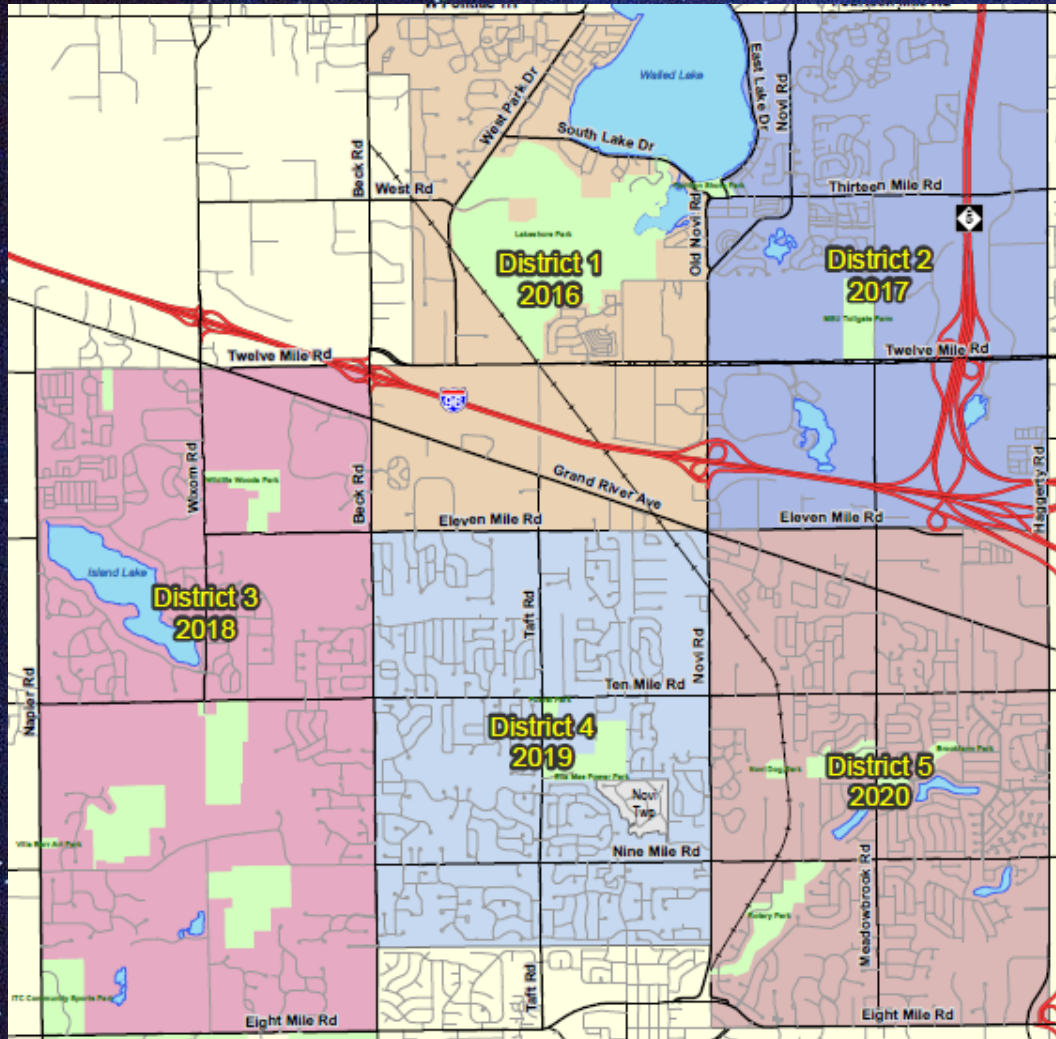


# PROCESS DIAGRAM





# DISTRICT 1 RESULTS



- District 1 - 935 homes
- Process started July 2016
- External inspections complete
- Some devices need to be tested
- Will finish District 1 this spring
- District 2 – 1744 homes



# LESSONS LEARNED

- **Workflow diagrams are really important!**
- **Starting a project soon after a person begins a position results in delays while processes are established.**
- **“Other” is an acceptable option. You cannot configure a workflow for every possible scenario.**
- **Communication with our residents is key to achieving compliance.**
- **Instruct residents to schedule re-inspections by contacting DPS.**
- **Testing, testing, testing...**



# **FUTURE ENHANCEMENTS**

- **Review current workflows and Cityworks processes before beginning residential inspections in District 3**
- **Create cyclical work orders for buildings or devices when the attributes are correct**
- **Revise plumbing survey**
- **Integrate Cityworks service request scheduled start date with Outlook calendar to trigger alerts that an inspection is due**
- **Gather backflow device details while collecting stop boxes in field**



“FIRST COMPLETE THIS TASK,  
THEN THIS TASK...”





# CONTACT INFO

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