

The Public Aspect of Private Inflow Removal

The Development and Implementation of a Private Inflow Removal Program



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June 6, 2017

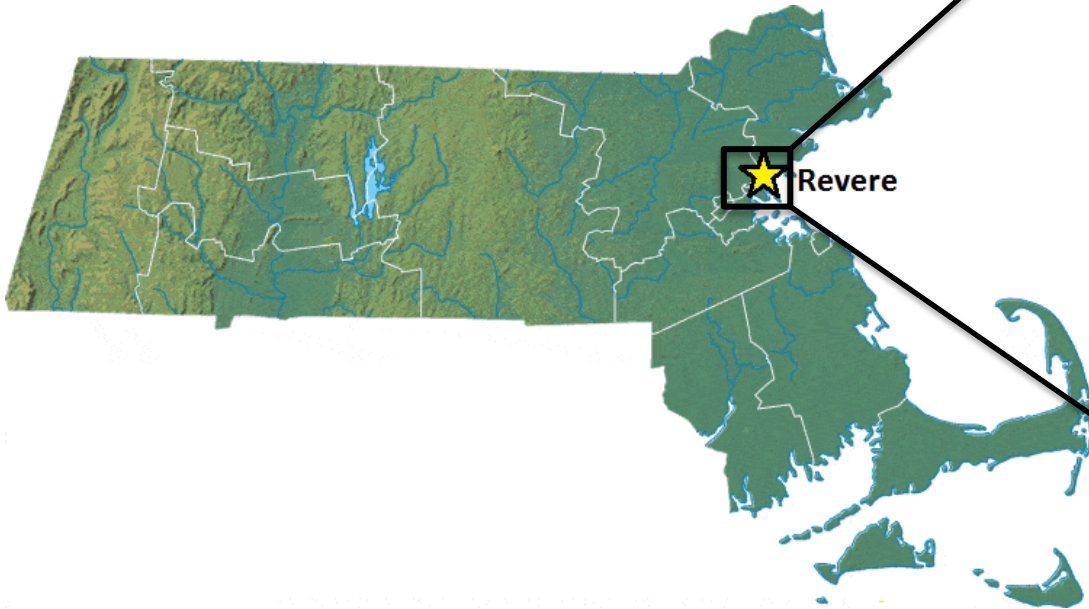
**CDM
Smith**

NEWEA 2017 Spring Meeting & Exhibit



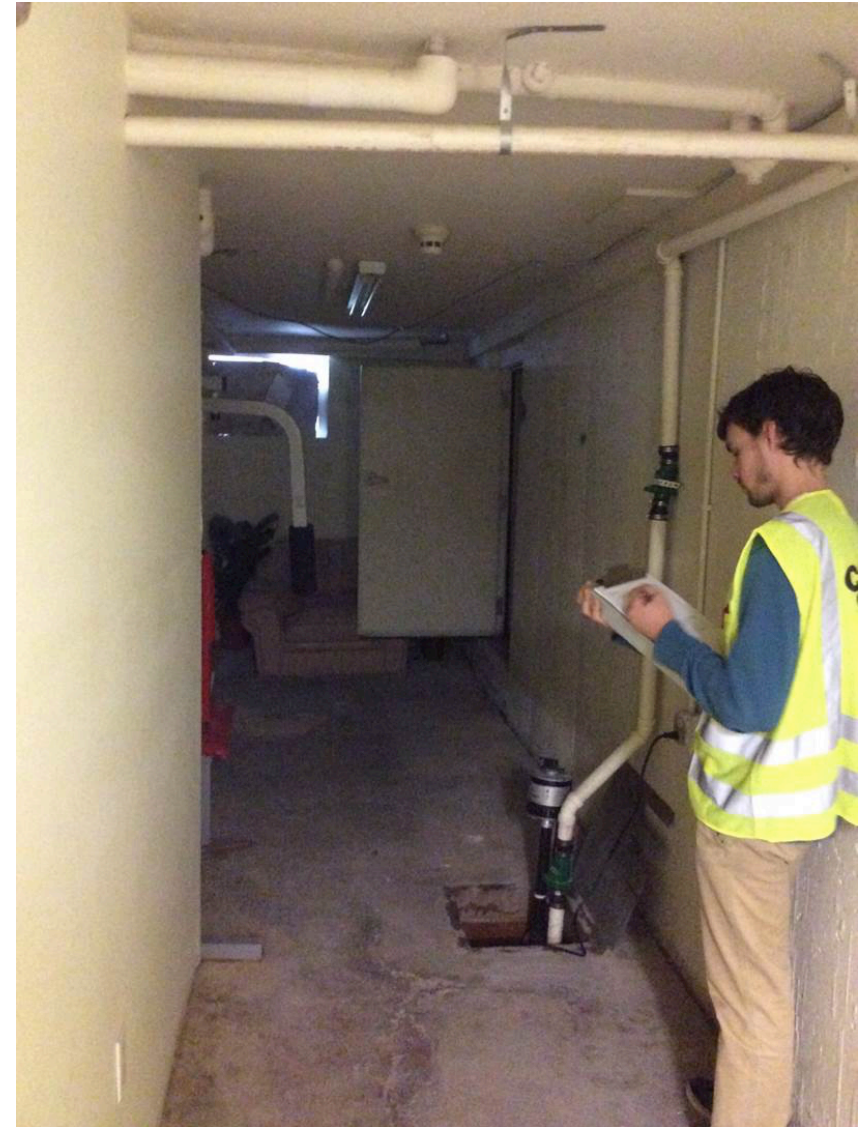
City of Revere

- 55,000 residents
- 11,000 properties
 - Commercial and Residential Mix



Presentation Outline

- Project Background
- Sump Pump Amnesty Program Development
- Public Outreach
- Inspection Methodology
- Results
- Considerations for a Successful Program



Project Background

- EPA Consent Decree
- I/I Removal

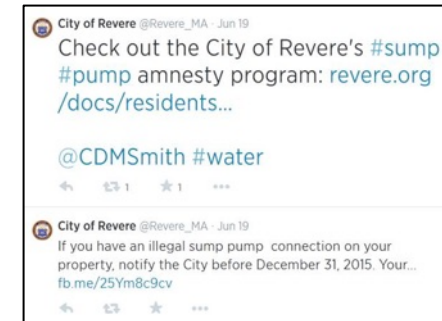


Sump Pump Amnesty Program Development

- Amendment to Local Sewer Ordinance (February 2013)
 - *“13.08.640 Discharge of Unpolluted Waters*
No person shall discharge or cause to be discharged any drainage, unpolluted water, groundwater, roof runoff, subsurface drainage including from sump pumps, uncontaminated cooling waters, live steam or unpolluted industrial process waters, directly or indirectly into the public sewer” Revere, Massachusetts, Municipal Code of Ordinances art. II § 13.08 (2013). ”
- Sump Pump Amnesty Program through December 31, 2015
 - Allowed residents opportunity to notify the City of illegal sump pump(s) on their property
 - Free inspection and free redirection of illegal sources
- SRF Loans through MassDEP – Clean Water Planning

Public Outreach – Residential and Commercial

- Informational flyers in water/sewer bills each quarter
 - Includes educational material, contact information to schedule inspection, and translations in multiple languages (English, Spanish, Portuguese, and Arabic)
- Newspaper advertisements in Revere Journal and Revere Advocate
- Published interview by the Revere Advocate with the City Engineer
- Advertisement on the City's website
- Mayor's newsletter
- Social Media Outreach – Twitter, Facebook
- City Events



Public Outreach – House to House Notice Distribution Program

- Notices distributed to all 11,000 buildings in the City
- Reverse 911 phone call to each property the day before notices were distributed in a particular neighborhood
- Trained inspectors
- Roof Leader visual inspection performed during notice distribution
- Catch basin inspections performed during notice distribution

ATTENTION REVERE RESIDENTS



The City of Revere, through the office of the City Engineer, Nick Rystrom, PE, is inspecting **All** dwellings for sump pumps, roofleaders, and flat roof drains.

FREE INSPECTION
CALL TODAY

Illegal connections must be located and disconnected from the sanitary sewer as per City ordinance. ALL inspections are free, please call to schedule.

Fran Zeinert 617-452-6381
CDM Smith ZeinertFM@cdmsmith.com

 Falamos Portugues |  Hablamos Español
Marina Fernandes 617-452-6360

If you have already contacted the program, please disregard this notice.

NOTIFICATION RESIDENTS CITY OF REVERE



Do you have one or more of these items on your property?



- Sump Pump
- Gutters and/or Downspouts
- Roof Leaders/Flat Roof Drains
- Driveway Drains

These discharge stormwater collected on your property. When stormwater enters the sewer system, it may cause sanitary sewer overflows. The City must inspect all properties that may be illegally connected as per City ordinance.

CALL NOW for an
Inspection

FREE

Your participation will help control
water and sewer rates.

Inspection Methodology: Overview

- Property owners call to schedule their free inspection (multiple languages available)
- Reminder calls
- 30 minutes / inspection
- 2 inspectors perform full interior and exterior inspection
- Documentation during inspections:
 - iPad application with photographs
 - Sketch form (preliminary design)
 - Post inspection form



Inspection Methodology: Training and Safety

- Develop a Health & Safety Plan for staff
- Vests, IDs, Boots, Cell Phone, etc.
- Educate staff on all projects going on in the City and how private inflow removal fits into the bigger picture
- Train staff how to speak to the public about the project and its importance
- Train staff on proper note-taking and preliminary design elements

Inspection Methodology: GIS iPad App

- Revere GIS database
- Sewer and drain layers visible for redirection plan
- Inspection results tied to parcel ID
- Buildings color coded by inspection result
- Parcel data pre-loaded using assessor's information
- Pre-loaded historical smoke testing results



Inspection Methodology: GIS iPad App

Sump Pump Inspection [Close]

Parcel ID 14-192J-36

Parcel Comments NO ISSUES

Street Num 73

Street Num Ext

Street Name ALDEN AVE

Contact Name 1

Contact Name 2

Contact Name 3

Date of Inspection 7/25/14, 10:34 AM

Inspector Kara Johnston

[Map navigation icons]

Sump Pump Inspection [Close]

Contact Name 3

Date of Inspection 7/25/14, 10:34 AM

Inspector Kara Johnston

Sewer on Street? Yes

Drain on Street? Yes

Gas on Street? Yes

Other Utilities on Street? Unknown

Smoke Testing No Confirmed or Suspect Source

FM FM3

Contact Phone

[Map navigation icons]

Sump Pump Inspection [Close]

Basement Status Yes - Unfinished

Pipe Access - Main Sewer Access

Pipe Cap - Main Sewer On

House Color Brick

House Type Single Family

Roof Type Gabled Roof

Front of House Grass

Back of House Grass

Right (Facing House) Grass

Left (Facing House) Asphalt

[Map navigation icons]

Inspection - GIS iPad App

Inspection GPS Tools Sump Pump Inspection Maps Legend Info

Add Sump Pump Info 7/25/14, 10:41 AM
Record 2 of 2

Parcel ID 14-192J-36

Type of Source Sump Pump

Disch. Loc Sewer

Disch. Determin. Visual Evidence

Comments

STATUS ACTIVE

Page 1 of 1

Camera, Map, Legend, Checkmark, Green Checkmark

Inspection GPS Tools Sump Pump Inspection Maps Legend Info

Sump Pump Inspection

House Color Brick

House Type Single Family

Roof Type Gabled Roof

Front of House Grass

Back of House Grass

Right (Facing House) Grass

Left (Facing House) Asphalt

House Comment

Additional Comments 1 legal, 1 illegal

Inspection Status Source Found

Camera, Map, Legend, Checkmark, Green Checkmark

Inspection Methodology: Sketch

- Sketch shows existing conditions, pipe connections, location of photos taken, etc.
- Preliminary design in the field
- Interview property owner
- Recommended plan marked in red



City of Revere, Massachusetts
House to House Program

Address: 281 Broadway FM: 5 Inspectors: KJ/MF Date: 4/3/17 example

DRAW PROPOSED REDIRECTION PLAN IN RED COLOR

Additional Information		Inflow Sources (Indicate # of sources in each box)			Overall Inspection Result		
		Legal	Illegal	Unknown		Sump Pump	Roof Drainage
Flat Roof?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	RD	Roof Drain	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Roof Access Type (Take Photo):	<u>FRA Hotch</u>	RL	Roof Leader	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Height of Sewer Leaving House?	<u>~6' at sill</u>	SP	Sump Pump	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RD Connected to Sewer in bsmt?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	SD	Sidewalk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Police detail necessary?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	YD	Yard	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
STREET UTILITIES		DD	Driveway	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sewage	<input checked="" type="checkbox"/>	SS	Sewer Stack	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Drainage	<input checked="" type="checkbox"/>	Location Shown in Sketch			Redirection Priority for illegal connections		
Catch Basin	<input checked="" type="checkbox"/>	Not Visible, See Comment			HIGH		
Suspect source from previous smoke test?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Dye Test Necessary? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			All illegal roof drainage, simple cut and splash, SP reported to run often		
					MEDIUM		
					Average sump pump run frequency		
					LOW		
					Sump pump rarely runs		

For source picture: Address & Street - Source Initial - Source Number - Picture Number/ Ex. 3rd photo of the second identified Roof Leader, 281 Broadway 16-2-3
For generic picture of house: Address - Picture Number (Ex. 4th photo of house: 281 Broadway 4/1 label 18, starting RL-1 at right front corner of house and continue labeling clockwise around house)

Comments

RD-1 - connects directly to SS
grass in backyard pools regularly
recommend direct connection to CB

SP-1 - flex hose tied to sewer cap
owner says SP runs regularly/during dry weather

Note: neighboring homes are very close

Inspection Methodology: Post Inspection Form



City of Revere Inflow Inspection Program Post-Inspection Form

On _____, your property at _____
(date) (address)
was inspected to determine if a source of inflow drainage is illegally connected to the sewer.
The following determination was made:

- ☐ An illegal source was found on your property. The City of Revere will contact you to about redirecting this connection. The source(s) found are: _____
- ☐ Legal source(s) were found on your property. No further action is necessary. Source(s) determined to be legal are: _____
- ☐ The following source(s) were undetermined at the time of the inspection: _____
The results of this inspection will be further analyzed.

Inspector Initials: _____

If you have any questions please contact:
Kara Johnston, CDM Smith: (617) 452-6621 OR Nick Rystrom, Revere City Engineer: (781) 286-8152



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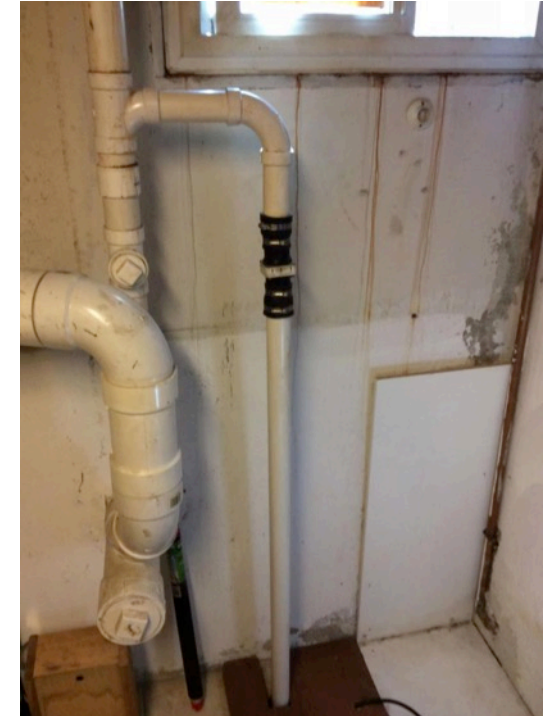
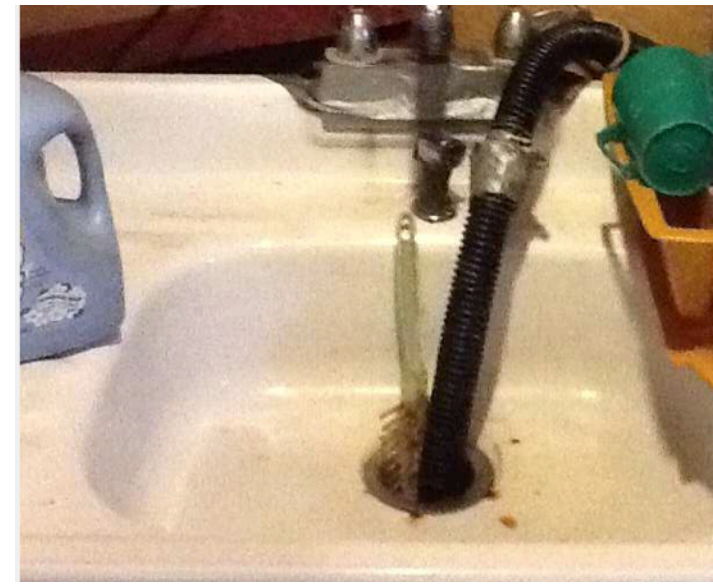
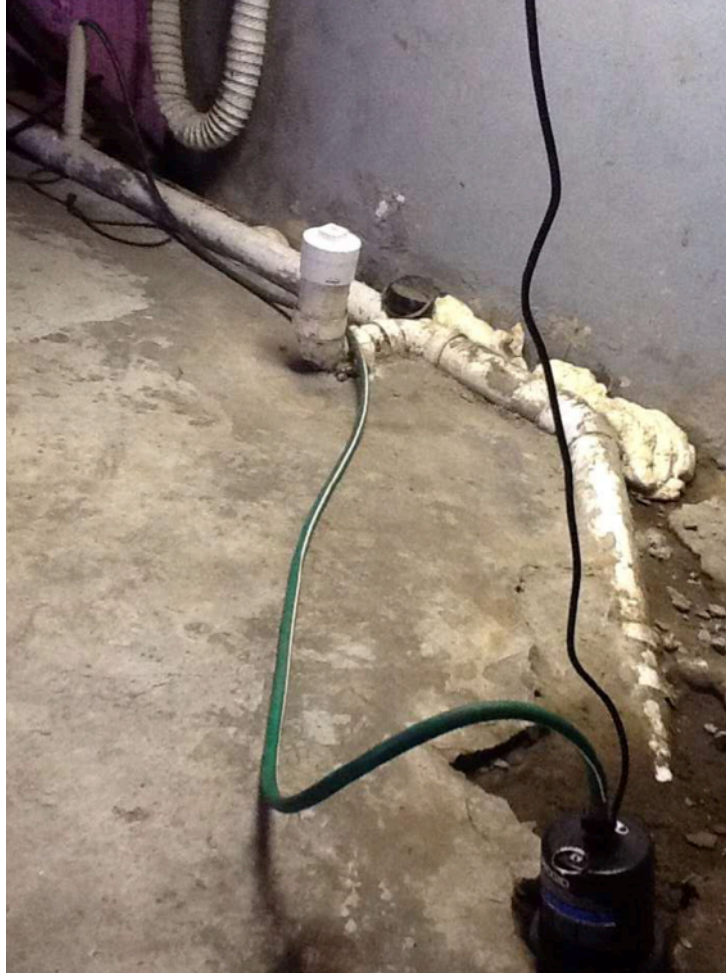
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Inspection Results

- Legal Roof Drainage and No Sump Pump
- Legal Source
- Illegal Source
 - Hard Pipe to Sewer
 - Flexible Piping
 - Illegal Flat Roof
- Unknown Source (Requires follow-up dye test)



Illegal Sump Pump Connections Found in Revere



Illegal Roof Leaders and Flat Roof Drains Found in Revere

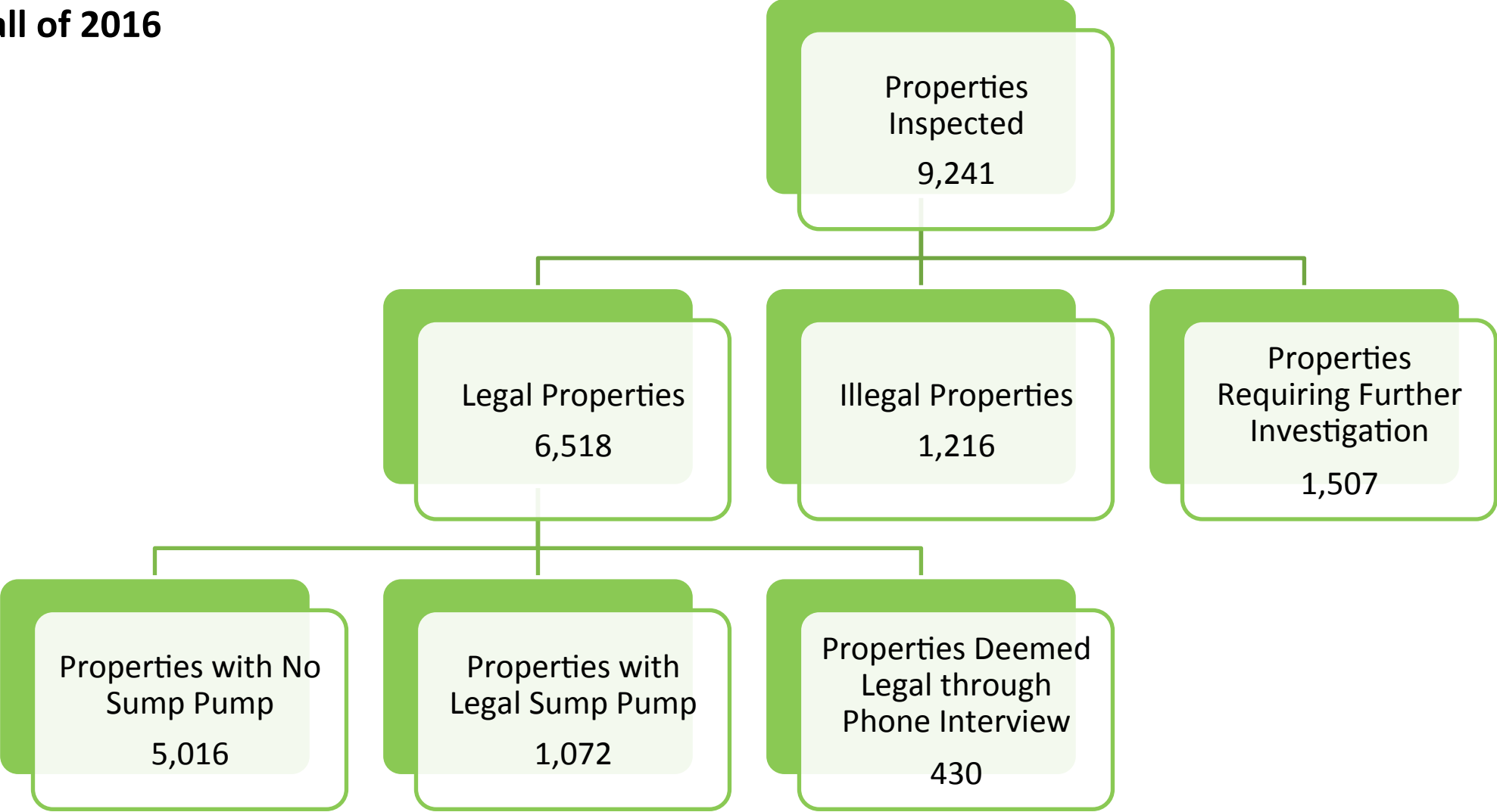


Property Access through Other City Programs

- Automatic Meter Reader (AMR) Installation Program
 - Inflow inspector with AMR installer
 - If no inflow inspector present, AMR installer still required to note whether or not a sump pump was present
- Use of subcontractors in pilot areas
- Smoke Testing
- Other Construction Projects
 - Potential drain connections

Private Inflow Inspection Program Results

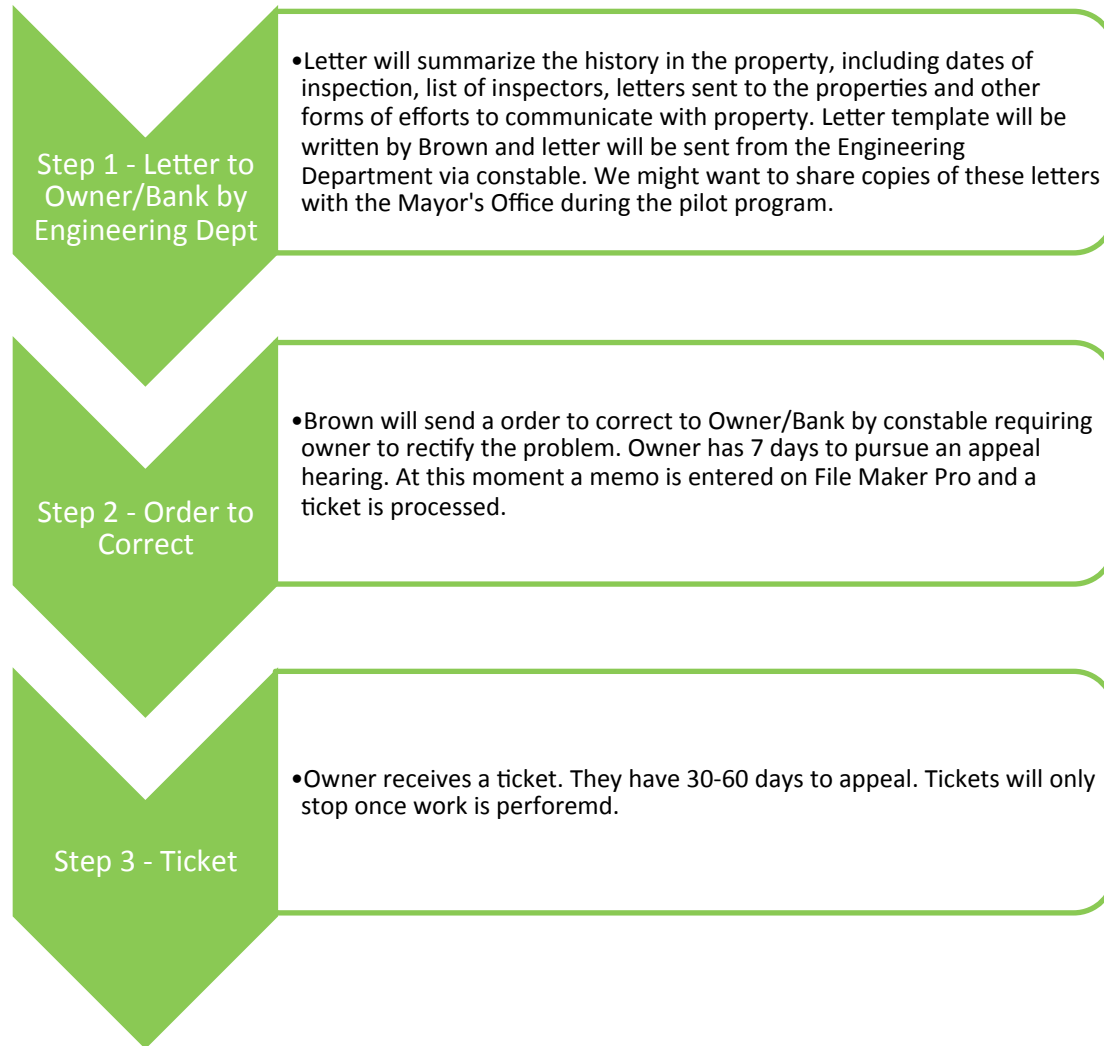
As of Fall of 2016



Inspectional Services

- GOAL: Include the Engineering Department in process under which the City enforces select sewer ordinances in the City.
- Issues:
 - Illicit Connections; i.e., sump pump connected to sewer as opposed to drain.
 - Illicit Discharge; i.e., IDDE to natural watercourse
 - Overcapacity
- Use of existing 40U Ticketing Mechanism
 - Existing Program used by the Inspection Services Department
 - Constitutes as a violation of the Massachusetts State Sanitary Code
- Successful use in pilot program: 100% reach of non-compliant properties

Ticketing Process



- Ticketing Process – required letters/ notifications to all stakeholders.
- Ticket – Up to \$490/day fines assessed by the City.
- The importance of the Mayor's office buy-in at the beginning of the program.
- Due to strain in resources when each time a 40U ticket is issued, this a conscientious last effort.
- Future expansion of Program

Considerations for a Successful Program

- Marketing the program as helping to control water and sewer rates
- Publicize in multiple languages if necessary
- Reverse 911 before door to door flyer distribution led to increase in calls
- Train inspectors
 - How to speak with residents and commercial owners about the project
 - How to create preliminary design during inspection
- Importance of data tracking/efficiency
 - Electronic folder for each property with scans of all correspondence
- Link results to GIS
- Pictures, pictures, pictures!
- Enforcement mechanism for non-compliant properties



Questions

Contact us!



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Find more insights through our water partnership
at cdmsmith.com/water and [@CDMSmith](https://twitter.com/CDMSmith)