Public Information Meeting

City of Boone, IA
May 6, 2019

Sump Pump Inspection Program
Introductions

• WHKS & Co. is a multidisciplinary Civil Engineering Firm headquartered in Mason City, Iowa, with offices in Ames, Rochester MN, East Dubuque & Springfield IL.

• Angie Kolz, PE is practice area leader for WHKS & Co water/wastewater department. WHKS has assisted over 30 Iowa and Minnesota communities with sump pump I&I reduction projects.
Presentation Objectives

• Why is a sump pump program being recommended?

• Discuss program details

• Discuss next steps
What is I/I?
Inflow and Infiltration
Some Sources of I/I

- Leaky Manhole
- Roof Drain
- Sump Pump
- Yard Drain
- Foundation Drain
- Leaky Lateral
- Catch Basin
- Pipe Defects

- Direct
- Indirect
Boone System Description:
Average Dry Weather (ADW) flow (MGD): 2.1
Average Wet Weather (AWW) flow (MGD): 7.0
Peak Instantaneous Wet Weather (PIWW) flow (MGD): 24.6

Inflow and Infiltration

FLOW (MGD)

Rainfall

Baseline

Inflow

Infiltration

1170%
Bang for your Buck

- Sump Pumps
- Smoke & Dye Testing
- Manhole Repairs – Casting & Chimneys
- Pipe and Manhole Repairs of Active Leaks
- Manhole Barrel or Other Pipe Repairs
- Upsize Trunk Lines
- Upsize Lift Stations
- Upsize Wastewater Treatment Plant

I/I Removed Per $$ Spent

Less

More
Example Flow Removal & Cost

Public Sector vs. Private Sector

<table>
<thead>
<tr>
<th>Sources of I/I</th>
<th>Cost to Remove I/I</th>
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<tbody>
<tr>
<td>Private</td>
<td>Public</td>
</tr>
<tr>
<td>34%</td>
<td>66%</td>
</tr>
<tr>
<td>66%</td>
<td>34%</td>
</tr>
<tr>
<td>7%</td>
<td>93%</td>
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Example from Kutzky/Slatterly Pilot I/I Study, Rochester MN 2008
National averages range from 50/50 - 75/25
Why a Sump Pump Program?

- A few sump pumps can make a big difference
  - Typical sump pump 20-100 gpm apiece
  - Typical 8” sewer capacity 350 gpm.
  - As few as FOUR pumps can take up the pipe capacity and cause a backup in the neighborhood.

Remaining Capacity for Sanitary Flows?
- 20-100 gpm (Sump # 4)
- 20-100 gpm (Sump # 3)
- 20-100 gpm (Sump # 2)
- 20-100 gpm (Sump # 1)
Why a Sump Pump Program?

Perspective:

- 5%-10% violation rate typical out of 17,000 inspections completed in thirty communities

- Hypothetically, if 5% rate applied to Boone’s proposed 2019 inspection area:
  - Approx. 600 homes x 5% = 30 violations
  - If each pump contributed 50 gpm, 8 hours/day = 720,000 gpd

- 2019 sump area = 10% of Average Wet Weather at WWTP (0.72 MGD / 7 MGD AWW = 10.3%)
Why a Sump Pump Program?

• Sump pump programs are typically the MOST cost effective method to reduce I/I in the system
  – CIPP line sewer and rehab manholes @ $25,000/block
  – Upsize sewer @ $40,000/block (pipe only)
  – The cost of the current program is equivalent to approximately 1 block of upsized sewer.

• Cheaper to reduce wastewater than transport and treat
  – Duluth, MN Study - $4/gal to treat, $1/gal to remove
Why a Sump Pump Program?

Talking Points

- The jump in flows during wet weather is evidence that clear water is entering the system.

- I/I sources are typically 50/50 Public vs Private, recent studies as high as 25/75 Public vs Private

- Removing Inflow/Infiltration (I/I):
  - Reduces Backups
  - Protects Health
  - Controls Costs
Sump Pump Program Approach

- Public Information and Buy-in is KEY!
- Ordinance Revisions *completed*!
- Public Info
- Public Meetings
- Scheduling & Inspections
Public Info

Boone Sump Inspection

City of Boone

Boone News

Sump Pump Inspection Program Coming Soon

DRESSING THE NEEDS OF CITIZENS WITHIN THE INEQUITABLE LIMITS OF BOONE.

The city of Boone has revised Ordinance 603-2006 to include mandatory sump pump inspections of all existing sump pump systems. This update was necessitated by the increasing number of sump pump failures and the resulting environmental and public health impacts. The revised ordinance is expected to take effect in the near future.

Why is this important?

Like many communities, Boone is facing challenges with its sanitary sewer system. During significant rain events, the sewer system can become overloaded. When that occurs, stormwater can overflow, causing flooding and potential damage to property and infrastructure.

The city is implementing a sump pump inspection program to help ensure the proper functioning of these systems. The program will be rolled out in phases, with inspections scheduled based on the age and condition of the pump systems.

City Council Mandates Sump Pump Inspections

Boone, IA (ABC News) - The Boone City Council has mandated sump pump inspections to help ensure the proper functioning of these systems. The program will be rolled out in phases, with inspections scheduled based on the age and condition of the pump systems.

City Council Members comment on the importance of these inspections, emphasizing the need to safeguard public health and property integrity.

Whk's

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April 25, 2019

Property Owner: Owner
Property Address: Property Address

Re: 2019 Sump Inspection Program – Public Information Meeting

Due to high wastewater flows in the sanitary sewer system during wet weather, the City of Boone has adopted an Ordinance prohibiting the discharge of clear water into the sanitary sewer system. Clear water from any roof, surface, ground, sump pump, footing tile, swimming pool, seepage collection system (“beaver system”) or other natural precipitation is prohibited from discharging into the sanitary sewer.

The City will be conducting mandatory sump pump inspections to verify that sump pumps, roof drains, and other clear water sources are not connected to the sanitary sewer system. The 2019 inspection area includes approximately 600 homes located between Main St and Division St north of College St. Other areas of the City will be inspected over the next few years. The engineering firm, WHKS & Co., is coordinating this program and will serve as Project consultant.

Public Informational Meeting: The City will host a public informational meeting on Monday, May 6th, 2019 at 5:00 pm at Boone City Hall to discuss the scheduling of inspections, length of inspection, proper sump pump connection and other miscellaneous items.

Thank you for your attention to this matter. If you have any questions, or require any additional information, please do not hesitate to contact Ange Kelz, WHKS & Co., (515) 863-9997, and check out the project website at https://BooneSump.com.

Sincerely,

Daniel Scott, P.E.
City Engineer
Why are we doing this program?

- Cheaper to reduce wastewater than to transport and treat
- Sewer replacement to upsize pipe, $40,000 per block (2.5 blocks for cost of this program)
- Duluth, MN Study - $4/gal to treat, $1/gal to remove
Scheduling

- All inspections are scheduled, no door-to-door inspections.

- Scheduling is fast and easy

- Schedule through website or telephone
  - BooneSump.com or toll free 844-630-0878

- Residents will receive a letter when it is time for their sector to schedule inspections.
2019 Area
The Inspection

• Completed in under 15 minutes, many under 5 minutes
• Adult must be present
• Inspector looks at:
  – Sump pumps
  – Beaver drains
  – Roof drains
  – Site grading
• Occupant and inspector signs
• Notice of Violation and instructional diagrams given if needed
A. Initial Inspection

1. Owner and Address:
   a. Owner Name(s): ______________________________________________________
   b. Address: ____________________________________________________________
   c. Occupants Name (if different) _________________________________________
   d. Owner Address (s) (if different) ________________________________________

2. Date of Initial Inspection: ________________________________

3. Date of construction and Building Type? Building built in year ____________ (ex. 1959)
   Note residential, apt., commercial, industrial: ______________________________

4. History of backups or flooding? Note date, source, and actions taken: ______________________________

5. Does building have:
   a. [ ] Yes [ ] No Exterior grading sloping towards the building?
   b. [ ] Yes [ ] No Roof drains that go into the ground?
   c. [ ] Yes [ ] No Basement?
   d. [ ] Yes [ ] No Seepage collection (beaver) system?
   e. [ ] Yes [ ] No Sump pit?

6. If building has a roof drain that goes into the ground, which of the following apply?
   a. [ ] It is properly constructed to discharge to open air or storm sewer.
   b. [ ] It is improperly constructed to discharge into the sanitary sewer system.
   c. [ ] Discharge location not determined.

7. If there is a seepage collection (beaver) system, which of the following apply?
   a. [ ] It is properly constructed to discharge into a sump pit.
   b. [ ] It is improperly constructed to discharge into the sanitary sewer system.
   c. [ ] Discharge location not determined.

8. If there is a sump pit, which of the following apply?
   a. [ ] Pump is properly plumbed to discharge outside the basement through rigid piping.
   b. [ ] Pump is improperly plumbed to discharge into the sanitary sewer system.
   c. [ ] Pump has the capability of discharging into the sanitary sewer system (ex. flex hose).
   d. [ ] There is a pit with no pump. Plumbing is checked as (a)(b)(c) or (d) if present.
   e. [ ] Discharge location not determined.

9. Other comments (exterior drains, uncapped cleanouts, inactive sump pit, etc) ______________________________

10. Photos taken of Interior Surfaces and Collection System, and Building Exterior? [ ] Yes [ ] No

11. If 5a, 7b, 9b or 9c was checked, a Violation Notice was given to the Occupant or Owner directing them to correct the violation by (date): ______________________________

   PASS _______ FAIL _______ City Follow-Up _______

B. Subsequent Inspection

1. Date of subsequent inspection ______________________________

2. Inspection conducted by ______________________________

3. Does the building now comply with the applicable Ordinance for the City of Boone?
   [ ] Yes [ ] No

I hereby verify that the City Representative has inspected the above-described sump pump and the information set forth above is true and correct to the best of my knowledge.

Occupant/Owner
Date ______________________________

I hereby verify that the City Representative has inspected the above-described sump pump and the information set forth above is true and correct to the best of my knowledge.

City Representative
Licensed Plumbers sign with license # ______________________________
Date ______________________________
Inspector Identification

- All inspections are scheduled
- No door-to-door
- WHKS logos on
  - Badges
  - Clothing
  - Vehicles

EXAMPLE
Installation Examples: Sump Pumps

- Rigid Pipe to Outside
  *PROPER*

- Flex Hose to Drain
  *IMPROPER*
Installation Examples: Sump Pumps

- Rigid Pipe to Outside, PROPER
- Flex Hose to Outside, IMPROPER
Installation Examples: Sump Pumps

- Rigid Pipe to Outside
- PROPER
- Mipsbe.com/post
- Flex Hose to Sanitary via stool
- No.
Installation Examples: Beaver Drains

- Beaver Drain to Sump Pit
  PROPER

- Beaver Drain to Floor Drain
  IMPROPER
Installation Examples: Beaver Drain / Tile

– Tile into Floor Drain under Cover

IMPROPER
Installation Examples:

Tile Pit

Tile Pit into Floor Drain

“Running Trap”

IMPROPER

Plugged + Pump Installed

PROPER
Discharge Options

Flexible Pipe
Discharge Options

- Curb outlet
Discharge Options

- Air Gap & underground pipe
Discharge Options

Legal, but not a good idea
Discharge Options

Many options exist for discharge lines!
Any questions, call WHKS 515-663-9997 or your local plumber!
Sump Pump Recommendations

• Continue Public Info!
• Schedule Public Info Meeting
• Begin Inspections
## Ordinance & Inspection Timeline

<table>
<thead>
<tr>
<th>Item</th>
<th>Date</th>
</tr>
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<tbody>
<tr>
<td>Council Kickoff / Public Info Meeting</td>
<td>Feb 4, 2019</td>
</tr>
<tr>
<td>Public Information Meeting</td>
<td>May 6, 2019</td>
</tr>
<tr>
<td>Inspections: Inspections Begin</td>
<td>May 2019</td>
</tr>
<tr>
<td>Inspections: Inspections Complete</td>
<td>Nov 2019</td>
</tr>
</tbody>
</table>
Long Range I/I Plan: Field Investigations

- **Private:**
  - Building Inspections

- **Public:**
  - Smoke and Dye Testing
  - Manhole Inspections
Smoke Testing

- Inexpensive & Quick
- Detect inflow sources & structural damage
  - Roof leaders, drains, faulty connections
  - Pipe cracks, leaking joints
- Procedure
  - Public Notification: Newspaper, TV, Radio
  - Testing: Assisted by City staff
- Results
  - Cracked chimneys, pavement
  - Cross connection, cracked cleanout
Manhole Inspection

- I/I defects
  - Cover, frame seal, chimney, barrel

- Confirmed/updated system configuration
  - Location, depth, pipe size
Questions?
Contact and Project Information

• Contact/ Project information
  – Angie Kolz, PE
    akolz@whks.com
    515-663-9997