

Developing a MOM Program

2015 OWEA Annual Conference

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David Reimer, City of Miamisburg



HAZEN AND SAWYER
Environmental Engineers & Scientists

Developing a MOM Program

Four Questions:

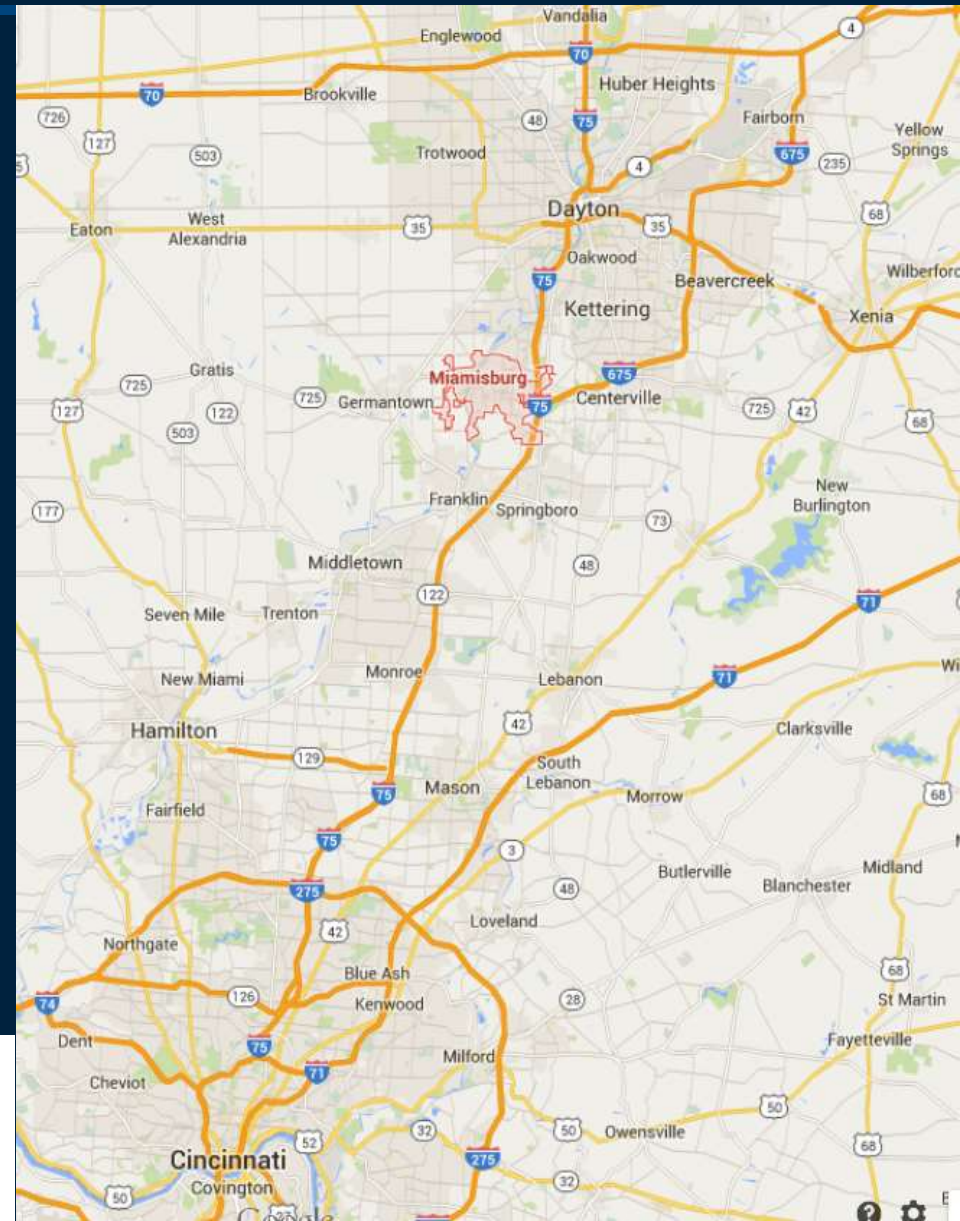
1. Who is Miamisburg?
2. What is a MOM Program?
3. Why develop one?
4. How was the City's MOM Program developed?



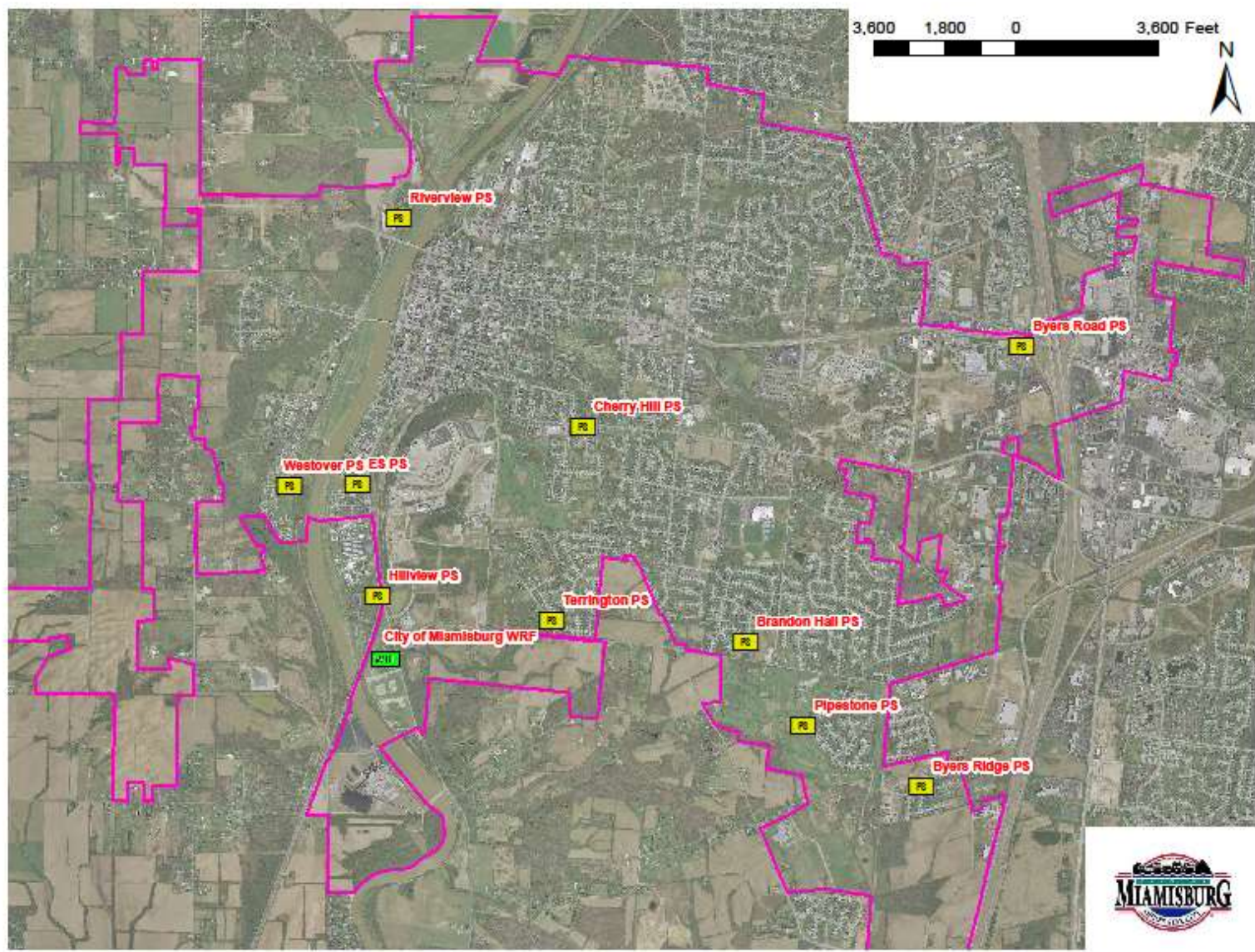
Developing a MOM Program

The City of Miamisburg

- 20,181 residents (Wikipedia)
- 12.4 square miles (Wikipedia)
- 10 pump stations
- ~2,500 sanitary manholes
- ~100 miles of sanitary sewers
- 1 Water Reclamation Facility (3 MGD ADF)



Developing a MOM Program



Developing a MOM Program

What is a MOM Program?

- Basically a CMOM without the “C”
- MOM stands for "management, operations, and maintenance." It is a flexible and dynamic framework for municipalities to identify and incorporate widely-accepted wastewater industry practices to:
 - Better manage, operate, and maintain collection systems
 - Investigate capacity constrained areas of the collection system
 - Proactively prevent SSOs
 - Respond to sanitary sewer overflow (SSO) events



Source: Paraphrasing information found at US EPA online publications

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Developing a MOM Program



GUIDE FOR EVALUATING CAPACITY, MANAGEMENT, OPERATION, AND MAINTENANCE (CMOM) PROGRAMS AT SANITARY SEWER COLLECTION SYSTEMS

United States
Environmental Protection
Agency

Office of Enforcement and
Compliance Assurance (2224A)

EPA 305-B-05-002

www.epa.gov

January 2005

http://water.epa.gov/polwaste/npdes/ssu/upload/cmom_guide_for_collection_systems.pdf



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Developing a MOM Program

Why develop a MOM Program?

- To have an official, documented, routine, proactive, continually reviewed, and updated program to MOM (Manage, Operate, and Maintain) a city's buried assets.



Developing a MOM Program

Why else develop a MOM Program?

- Miamisburg developed one based on the requirements set forth by the OEPA to apply for an NPDES permit.
 - SSOs in collection system and plant bypassing
 - Excessive inflow and infiltration
 - Hydraulic overloading of sewers and lift stations



Developing a MOM Program

How was the City's MOM Program developed?

- First developed a MOM Gap Analysis (what we're missing) – July, 2012
- MOM Analysis – Nov, 2013
- Ongoing Implementation of the MOM – 2015



Developing a MOM Program

Main Goals for MOM Program:

- **Prevent / reduce the effects of / monitor / communicate SSOs**
- Review of staffing for effective management
- Electronic map (GIS) of the collection system
- Computerized management tool (CMMS)



Developing a MOM Program

Main Goals for MOM Program (con't):

- Enforceable design requirements, specification, and standards
- Internal SOPs for sewer, MH, and PS testing
- System condition assessment
- Address O&M issues (FOG, roots, infiltration)
- Continually monitor/update the MOM Program



Developing a MOM Program

How was the City's MOM Program developed?

First major steps:

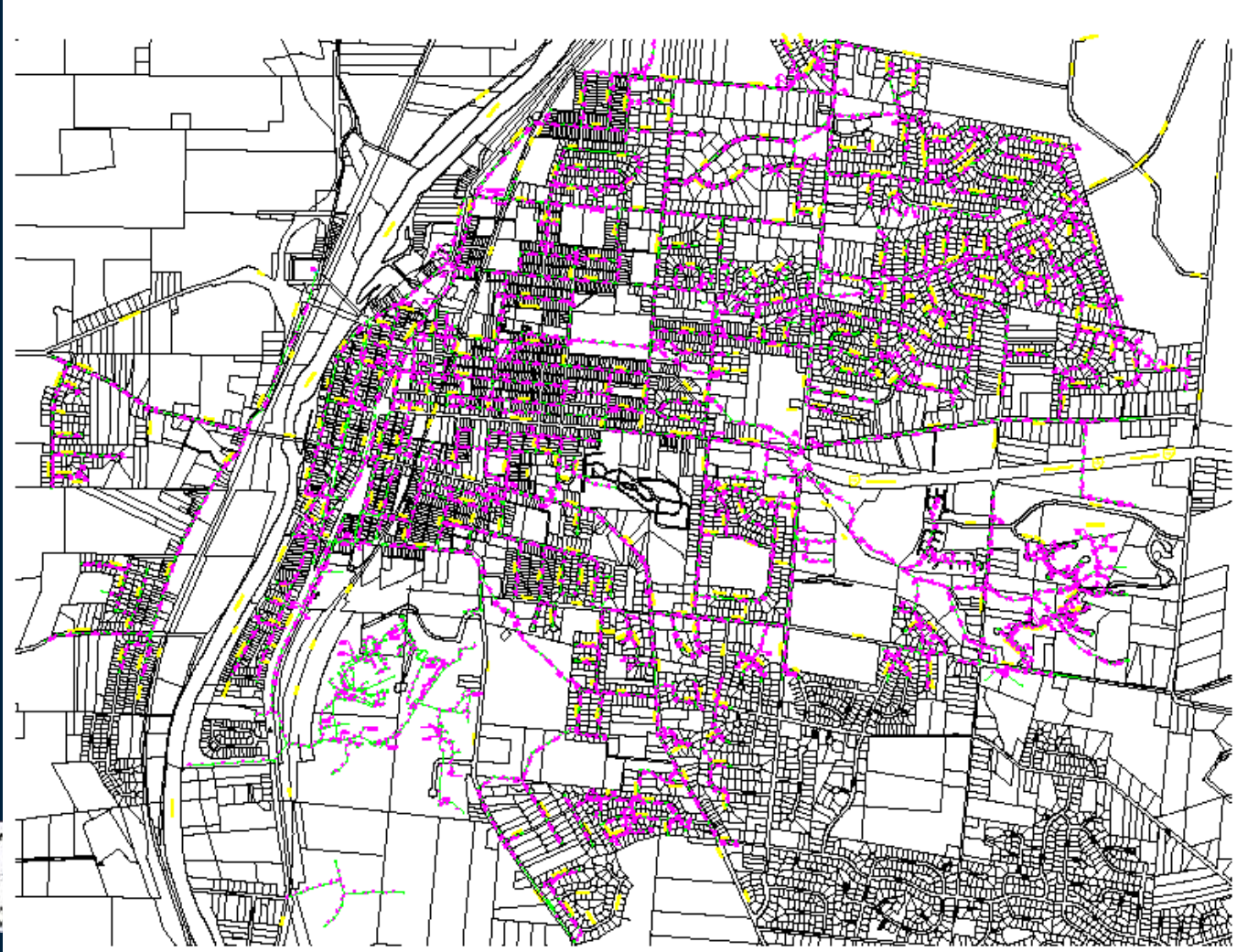
- Create a GIS map of the system
- Develop unique IDs for each asset – e.g. SANMH200001
- Develop sewer shed basins
- Begin surveying MHs



Developing a MOM Program

Sewer basins for unique asset IDs

- Started with existing CAD Sewer Atlas to delineate basins.



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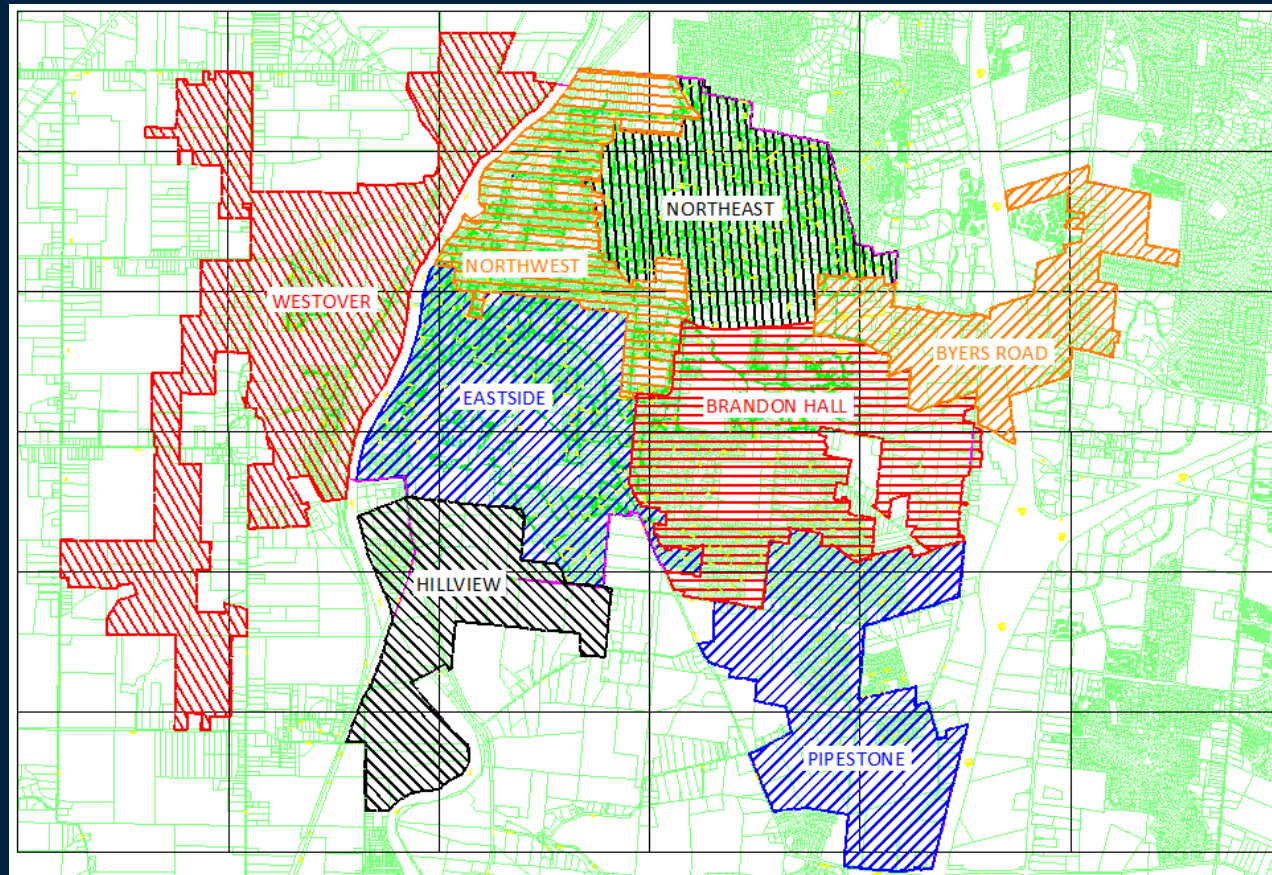
Delineated sewer basins



Developing a MOM Program

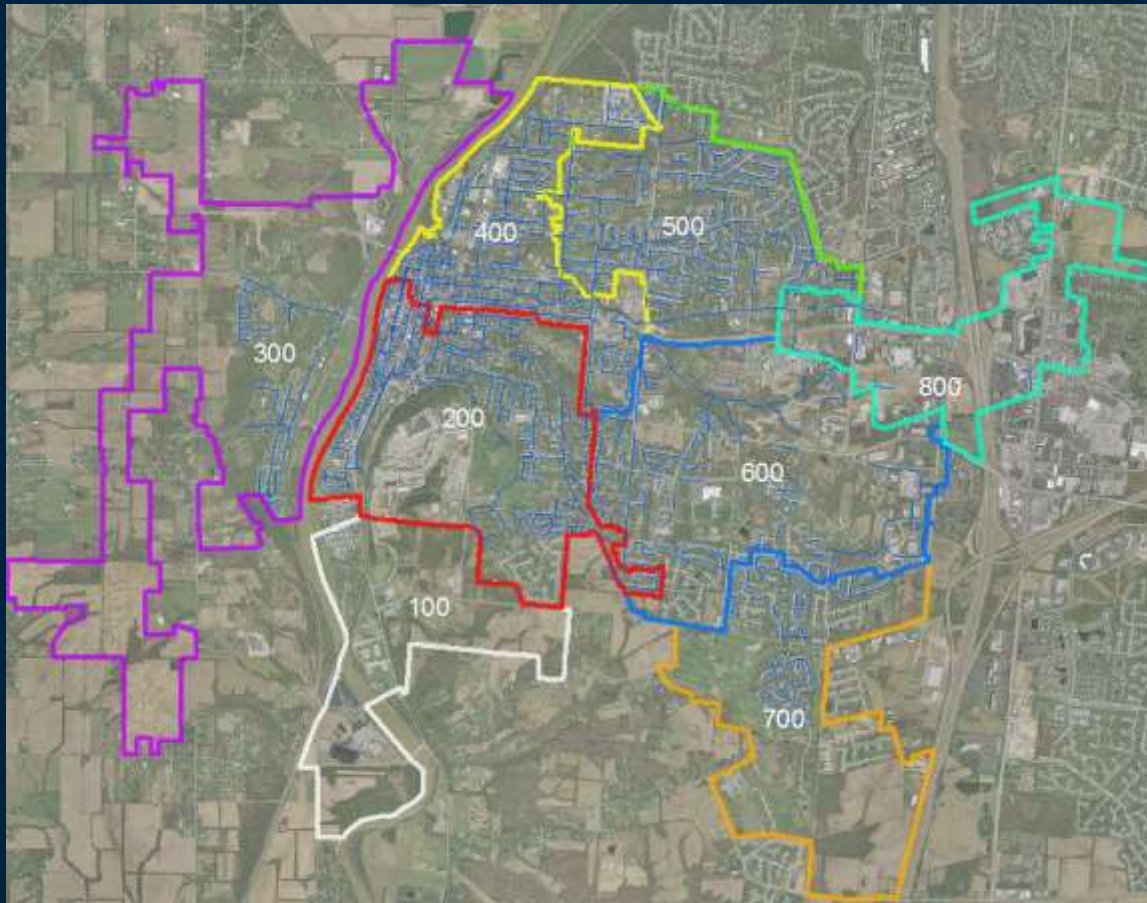
Sewer basins for unique asset IDs

- 8 basins named and numbered 100, 200, 300...
- Ex: the 155th MH surveyed in basin 100 = SANMH100155
- Ex: sewer D/S of this MH is SANGS1001550



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Sewer basins in GIS



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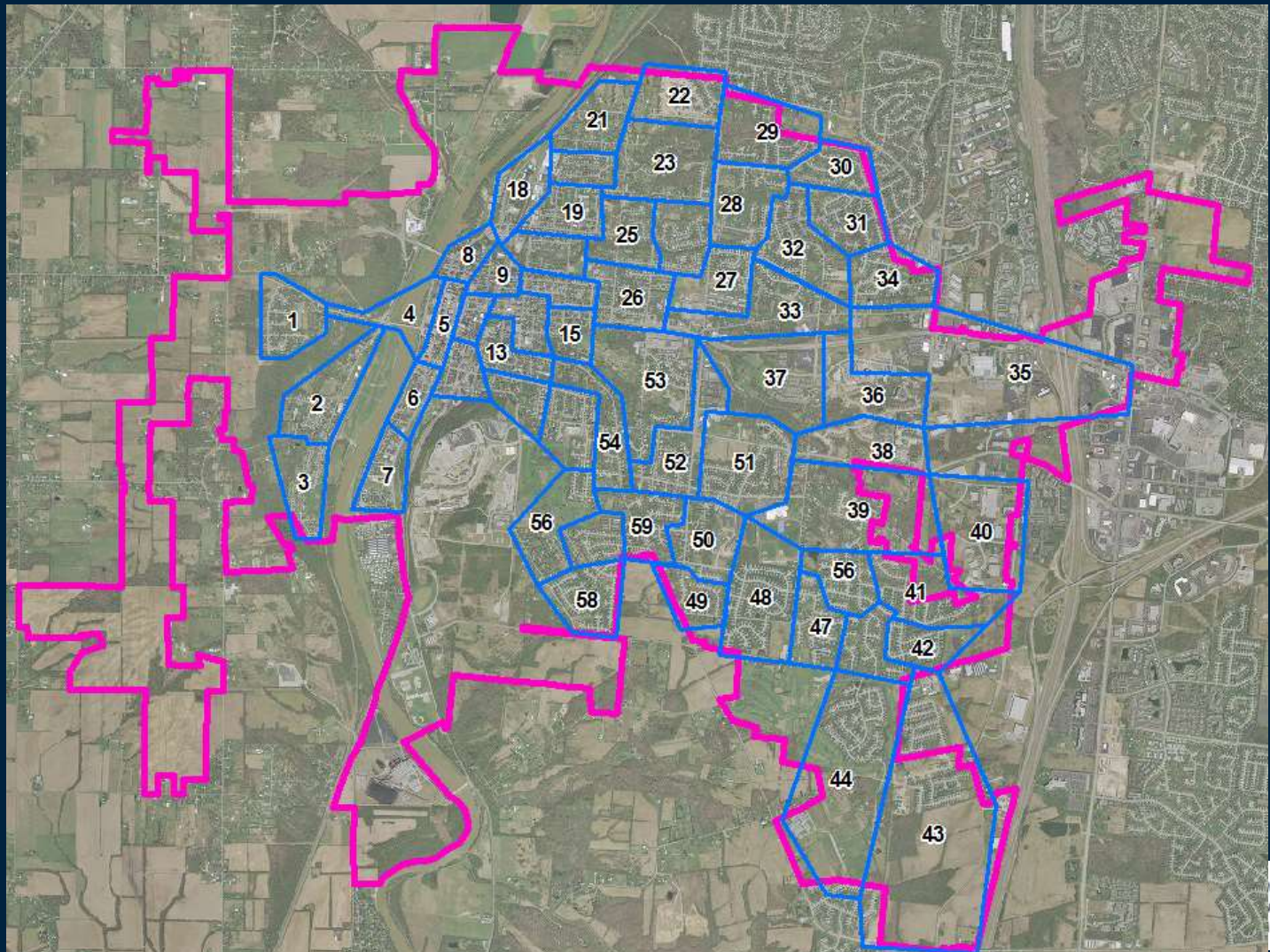
Benefits of GIS map:

- Each asset has a unique ID
- Quantify pipe and MHs (size, depths, material, slope)
- Identify areas of low slopes
- Print out maps
- Develop maintenance plans
- Tie in with CMMS:
 - CCTV
 - Sewer / MH inspection
 - Work orders



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5-year sewer cleaning plan (i.e. 60 equal length areas)



Developing a MOM Program

Reviewed / developed collection system standards and practices:

- Review codified ordinances to ensure authority:
 - FOG traps
 - Private laterals
 - Design and construction of new assets
- Updated design requirements, specification, and standards
- Reviewed / developed S.O.Ps for internal sewer practices



Developing a MOM Program

Collection System Design Checklist

**Sanitary Sewer System
Design Review Checklist**

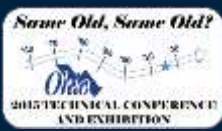
Name of Development: _____
 Drainage Basin Number: _____ Receiving MH or PS Asset ID: _____
 Location: _____
 Developer: _____
 Design Engineer: _____
 Date Submitted: _____ Date Checked: _____
 Checked By: _____

Yes	No	N/A	Element	Reference Code
ENGINEER'S NARRATIVE - PLANNING, CAPACITY AND INITIAL DESIGN				
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Provisions for unique installations, including sewer separations and creek, aerial, railroad, and major road crossings?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	An average daily flow, using criteria 100 gal/(day-person), but not less than 270 gal/(residence-day)?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Peaking Factor using the equation, P.F. = (16+IP)/(4+IP), where P is population in thousands?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Population projection for 20 years?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sewer capacity calculation using Manning's "n" of 0.013 provided?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Capacity in downstream sewer?	
GRAVITY SEWER PIPING				
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	PVC SDR-26 at depths greater than 14 feet?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Class 250 DTP at depths greater than 25 feet?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Prohibitive note about clean water connections (downspout, catch basin, driveway or foundation drain, sump pump, etc.)?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Prohibitive note no building shall be connected to a sanitary sewer lateral until the building is under roof of an structure directed by City Engineer?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Pipes maintain a uniform slope between manholes?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Minimum pipe slopes per regulations?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Minimum pipe velocity (flowing full) 2 ft/sec using Manning's "n" 0.013?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Cleansing velocities (minimum 3 ft/sec) achieved with Peak Daily Flow?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sewers with velocities greater than 15 ft/sec secured and protected?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Minimum manline pipe cover is 32-inches (total depth)?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Minimum of 10-foot horizontal and 18-inch vertical separations between sewers, manholes, and water main?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	One full length of water main pipe centered at the point of crossing such that joints are equidistant and as far from the point of intersection as possible?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Where a water main passes under a sewer main, sewer main material of construction matches that of the water main for that span?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Minimum 30-foot wide easements (if not in the public right-of-way) x (2 x Depth) + 6 feet whichever is greater?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Is there an inverted siphon?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Does inverted siphon have dual lines? Does it have a means to isolate and clear either line?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Minimum of 50-ft horizontal separation between sewers and streams excluding perpendicular crossings?	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sewer crossings perpendicular to the flow of the streams and are free from changes in grade?	

**Sanitary Sewer System
Construction Document Checklist**

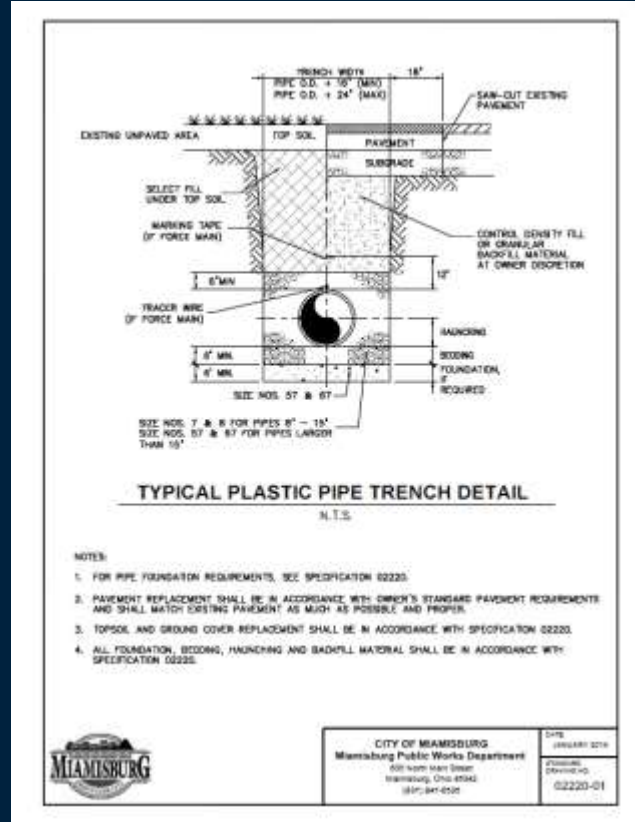
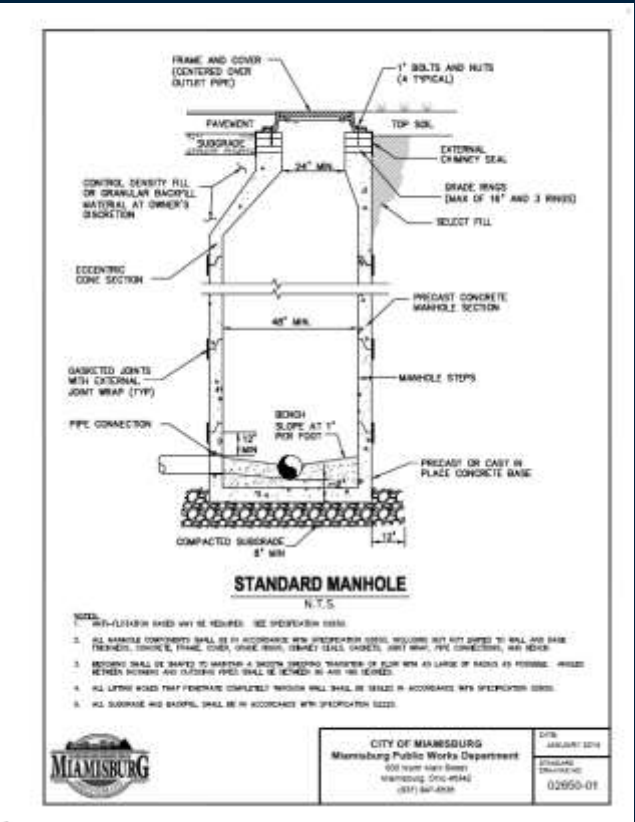
Name of Development: _____
 Location / Drainage Basin Number: _____
 Developer: _____
 Design Engineer: _____
 Date Submitted: _____
 Checked By: _____
 Date Checked: _____

Yes	No	N/A	Element	Reference Code
DRAWING COVER SHEET				
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Project name, date, city, and Engineer	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ohio professional engineer's stamp, number and original signature	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	North arrow and vicinity map	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Name and boundaries of municipality, subdivision or area to be served	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Developer contact information and all effective utility contact information	
PLAN AND PROFILE SHEETS				
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Title block containing Project name, date, Engineer, revisions, addenda, etc.	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	North arrow	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Graphical scales for plan (max of 1" = 50') and profile	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Existing and proposed roads shown and labeled	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Existing and proposed right-of-ways shown and labeled	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Property boundaries shown and property owner names/addresses labeled	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Existing structures and utilities including water, gas, storm, telephone, etc.	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Existing and proposed contours shown and labeled	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Existing and proposed surfaces shown in profile	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Existing natural features including tree line, streams, etc. shown and labeled in plan and profile (if applicable)	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proposed features clearly identified as proposed	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proposed sewers labeled with pipe size, material, length, and slope	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proposed manholes labeled with identifier, diameter, riser, and inverts	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proposed bends and fittings on force mains shown and labeled	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proposed air release or bypass pumping vaults shown and labeled	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Features shown in profile match plan view	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Location of test boxes shown and labeled	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proposed easements shown and labeled, including indication of public or private ownership	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Minimum Service Levels labeled on each property	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Proposed lateral connections shown to right-of-way	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Control points or benchmarks and datum shown and labeled	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Call CUPB logo and phone number provided in notes	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Reference to specifications or detail sheet in notes	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Standard details provided, including all applicable City of Miamisburg Details	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Erosion and sediment control notes and/or details provided	



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Collection System Standard Details and Specs



Developing a MOM Program

Collection System SOPs:

- Sewer CCTV and cleaning
 - Roots and FOG
 - Transfer data to GIS group
- SSO response
 - Contractors to call
 - How to contain spillage
 - How to report



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Existing Collection System SOPs:

- Pump station:
 - How to hook up generator
 - Who to contact for electrical / motor repair
 - Basic inspection / lubrication
 - Check run times / valves / discharge pressure
 - Periodic scouring velocity in FM



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New Collection System SOPs:

- New sewer, force main, and MH construction
 - Inspection for compliance with specs
 - Witnessing test pipes and MHs
 - Insertion of data into GIS
- MH inspection and basic repair
 - How to address any issues with MHs in-house



Developing a MOM Program

New MH Construction Inspection SOP

1. New Manhole Design Review Checklist

Date: ___/___/___ Owner: City of Mansfield, Ohio

Contractor: _____ Inspector: _____

Manhole Description: _____

Complete the following checklist to ensure the manhole has been constructed in compliance with the standard details and specifications:

	Description	Y/N	Comments
Labeling Manhole	Date of manufacture, manufacturer trademarks, and manhole number marked on inside of each manhole component		
	Manhole components and designations match the laying schedule		
Trench Manhole	Engineer approved trench excavation and underlying soil material		
	Trench preparation, bedding and backfill in accordance with specification 02320 and standard details		
Manholes and Manhole Structures	Steps are not aligned over flow channel		
	Steps are in true alignment with each manhole section		
Manholes and Manhole Structures	Frame aligned with opening, minimum of 22 inches		
	Cover type matches Contract Drawings (vented, solid, locking, etc.)		
Structure	Flexible pipe joint seals used for each penetration		
	12 inch clearance between pipe penetrations and manhole section joints		
Disposal Contract	Branch height and orientation match Contract drawings and details		
	Plug material and diameter match the inlet sewer pipe		
Coatings	Pipe encased in Class C concrete		
	Coatings applied if indicated on the Contract Drawings		
	Coating application certification and final report provided		

Additional Notes: _____

Signature of Inspector: _____

2. Vacuum Testing Procedure and Checklist

Purpose:
Vacuum testing demonstrates the integrity of the installed material, construction procedures, and the water-tightness of joint and penetration seals prior to backfilling activities.

Apparatus:

1. Plugs for pipes entering manhole
2. Non-shrinkable grout for cover lifting holes
3. Vacuum Pump
4. Stopwatch/Timer

Pretesting Procedure:

1. This test should be completed after the manhole has been constructed but before backfill activities occur around the manhole.
2. Prior to this test, the visual inspection procedure should be followed with the corresponding checklist finished.
3. Lifting holes, if any, shall be plugged with an approved, non-shrinkable grout prior to testing.
4. The vacuum test shall include testing of the seal between the cast iron frame and the concrete curb, slab or grade rings.

Testing Procedure:

1. Plug all lift holes and place entering manhole in accordance with Contract Specifications or at least 8-inches into the sewer pipe. The plug must be inflated at a location past the manhole/pipe gasket.
2. Secure plugs to prevent withdrawal when vacuum is drawn.
3. Place test head at the top of manhole in accordance with manufacturer's recommendations.
4. Draw a vacuum pressure of 10 in. of mercury (Hg) using a vacuum pump.
5. Shut valve on vacuum line of the test head and shut off or disconnect pump.
6. Start a stopwatch precisely when the vacuum pump is shut off or disconnected and monitor the exact test time required for the internal pressure to drop to exactly 9 in. Hg.
7. Record the time it takes for the vacuum pressure to reduce to 9 in. Hg.

Interpreting the Test:

1. Table 2 on Page 16 can be used to determine the minimum test time allowed for the required pressure drop based on manhole depth.
2. If the vacuum drops from 10 in. Hg to 9 in. Hg at or after the test time elapses, the manhole is acceptable and passes the test.
3. For intermediate drops of manholes, determine required holding time using following interpolation formula in conjunction with Table 2:

$$\text{Holding Time} = \text{Time}(A) + \left[\frac{\text{Time}(B) - \text{Time}(A)}{\text{Depth}(B) - \text{Depth}(A)} \right] \times [\text{Actual Depth} - \text{Depth}(A)]$$

Vacuum Testing of Manholes Checklist

Date: ___/___/___ Owner: City of Mansfield, Ohio

Contractor: _____ Inspector: _____

Test Number: _____ Manhole Material: _____

Depth: _____ feet Diameter: _____ inches

No. of pipes entering manhole: _____ Downstream MH Station No.: _____

Required holding time: ____ min. ____ sec. (Table 2) Initial Vacuum Pulled: _____ in. Hg

Time to reach 9 in. Hg: ____ min. ____ sec. Manhole Acceptable? (Y/N): _____

Complete the following checklist to ensure the manhole has been vacuum tested in compliance with the standard operating procedure:

Description	Y/N	Comments
Backfill not performed		
Drop connections installed		
Visual signs of water intrusion		
Lifting holes grouted flush		
Temporary plugs inflated 8-inches at a location past the pipe gasket		
Plugs secured appropriately		
Test head installed in accordance with manufacturer's recommendations		
Approved pressure gauge for test head		
Vacuum of 10 in. Hg achieved		
Overall procedure followed properly and completely		

Complete if pipe test(s) failed:
Leak located: Yes / No (circle one)
If yes, describe: _____

Corrective action by Contractor: _____


Signature of Inspector: _____



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Manhole Inspection & Basic Repair SOP

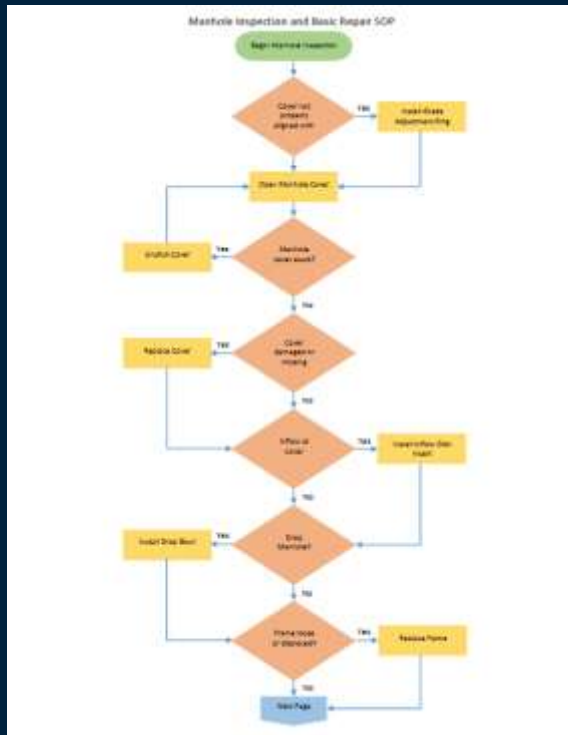
Manhole Inspection and Basic Repair SOP



City of Miamisburg

Standard Operating Procedure and Checklists

Manhole Inspection and Basic Repair



stormwaterworks.com, LLC
 48 Union Street, Suite M
 Stamford, CT 06906-0025
 Phone: 203-324-0045 / Fax: 203-324-0075

No Flow Inflow Manhole Seal



Prevent rainfall from entering collection systems easily and cost effectively with the no flow inflow manhole seal.

Manufactured from ultra high density polyethylene, explosion resistant material known as Marlex HD300, no flow inflow seals are custom sized to provide enhanced fit and seal.

Each no flow inflow dish is outfitted with a 1" woven polypropylene strip for easy removal.

A small ventilation hole located on the side of the dish allows a maximum of 5 gallons of water per 24 hours to enter the system.

The no flow inflow dish can be inexpensively installed by your "in-house" maintenance personnel.

Take accurate measurements to order your custom fit no flow inflow dish

- Remove the manhole cover.
- Clean the manhole rim or ledge of any dirt or debris to insure accurate measurement.
- Locate the clear opening of the manhole diameter measurement (ID) as above.
- Take two of three readings along the ID circumference and record the smallest measurement to the nearest 1/8 of an inch.
- Locate the outer edge of the manhole rim. This is the outside diameter measurement (OD).
- Take two or three readings along the OD circumference and record the smallest measurement to the nearest 1/8.
- Provide dimensions A&D on cover as above.
- Please indicate the specific type of manhole frame and cover that you have (i.e. locking, bolt down, set-in, etc.) along with the name of the bundy and drawing if possible.



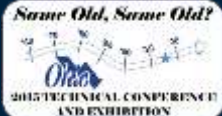
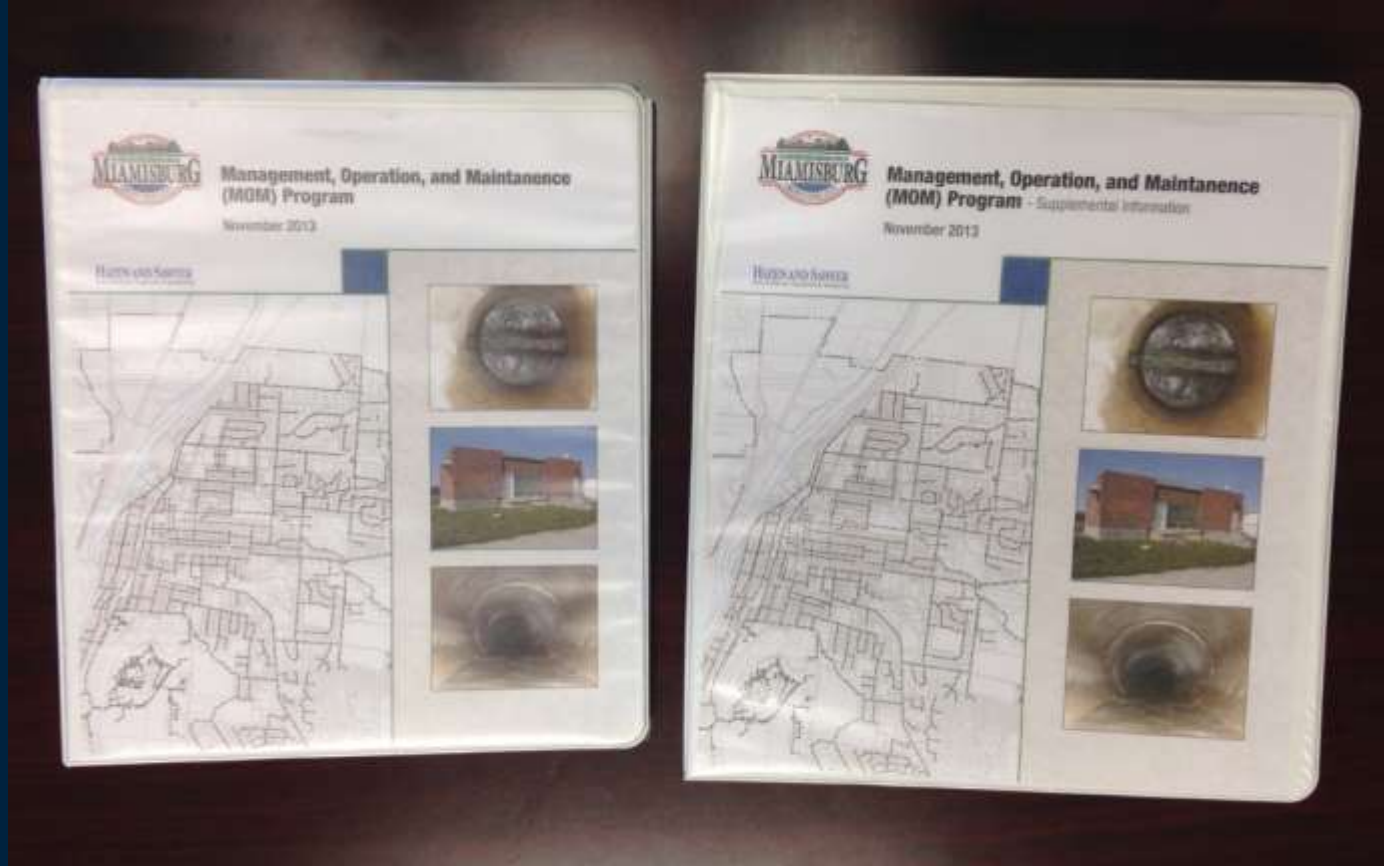
Developing a MOM Program

What does the City's
MOM Program look like?



Developing a MOM Program

What does the City's MOM Program look like?



Developing a MOM Program

City of Miamisburg

Sewer and Manhole Assessment Project Year 1



Sewer and MH Assessment project

Developed an RFP to select a contractor:

- Mapped out the most critical ~40% of the system
- Unit prices for PACP/MACP sewer and MH inspection
- Tech specs for data, submittals, cleaning, etc.
- 4 Contractors submitted proposals



7870 E. Kemper Rd
Suite 300
Cincinnati, OH 45249
513-465-2950
www.hazenandsawyer.com

December 1, 2014

RE: Request for Proposals for Sewer and Manhole Assessment – Year One
City of Miamisburg, Ohio

Background

The City of Miamisburg (Owner) has approximately 100 miles of sanitary sewer pipelines and 2,500 sanitary manholes that require condition assessment over the next three calendar years. Each year, a total of \$250,000 is to be allocated for sewer and manhole inspection and assessment. Due to the age, known problems, and urban nature, the areas thought to be in the worst conditions have been designated as Year One of condition assessment. This is generally the downtown region and the area west of the Great Miami River as seen below. Year Two and Year Three Assessment projects will either follow as separate RFPs or may be awarded to the successful Year One contractor, at Year One or revised unit costs, based on the progression of Year One Assessment project.

Year One of the City of Miamisburg's Collection System Map



BID PROPOSAL FORM
CITY OF MIAMISBURG - SEWER AND MANHOLE ASSESSMENT
YEAR ONE
(REISSUED WITH ADDENDUM 1)

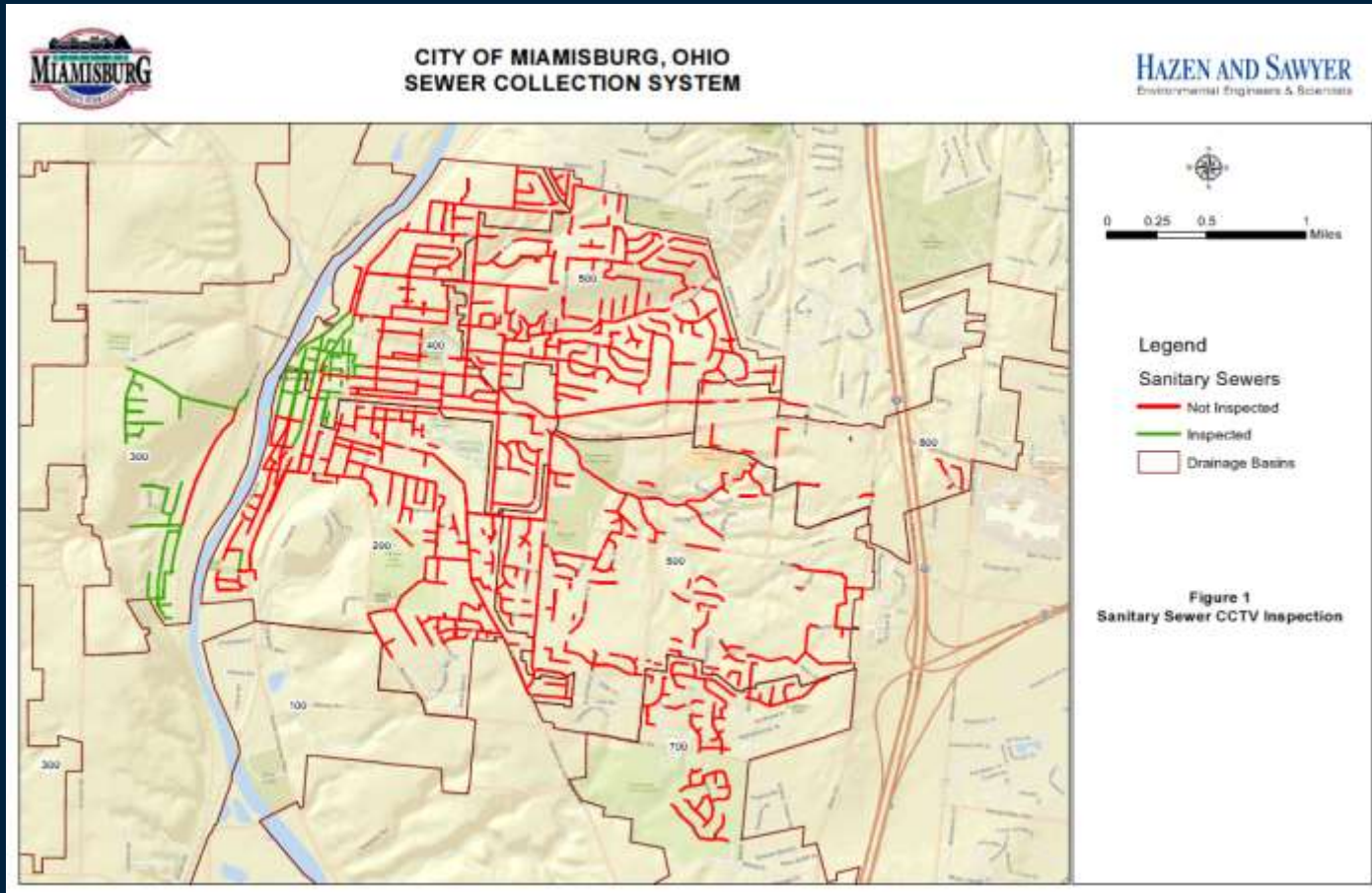
Quantities listed are approximate for Year One work. Work will be directed by the Owner/Engineer in the field at the indicated unit prices. All indicated unit prices shall include all costs associated with the item as measured and described in the Technical Specifications including all materials, software, equipment, labor, fees, taxes, insurance, miscellaneous costs, overhead, and profit.

ITEM NO.	ITEM DESCRIPTION	UNITS	ESTIMATED QUANTITY	UNIT PRICE	TOTAL AMOUNT
1	MOBILIZATION AND DEMOBILIZATION (NOT TO EXCEED 5% OF TOTAL BID)	LD	1	\$	\$
2 - MANHOLE INSPECTION					
2.A	LEVEL 1	EA	300	\$	\$
2.B	LEVEL 2	EA	600	\$	\$
3 - LIGHT CLEANING					
3.A	8-INCH THROUGH 10-INCH	LF	29,630	\$	\$
3.B	12-INCH THROUGH 15-INCH	LF	4,940	\$	\$
3.C	18-INCH THROUGH 24-INCH	LF	813	\$	\$
3.D	27-INCH THROUGH 33-INCH	LF	433	\$	\$
3.E	36-INCH AND ABOVE	LF	123	\$	\$
4 - HEAVY CLEANING					
4.A	8-INCH THROUGH 10-INCH	LF	3,880	\$	\$
4.B	12-INCH THROUGH 15-INCH	LF	250	\$	\$
4.C	18-INCH THROUGH 24-INCH	LF	200	\$	\$
4.D	27-INCH THROUGH 33-INCH	LF	200	\$	\$
4.E	36-INCH AND ABOVE	LF	200	\$	\$
5	PROTRUDING TAP REMOVAL	EA	25	\$	\$
6	EXCESSIVE HEAVY CLEANING	HRI	12	\$	\$
7	EXTERNAL MATERIAL DISPOSAL	TON	00	\$	\$
8	ALLOWANCE FOR BYPASS PUMPING	LD	1	\$	18,000 \$
9 - SEWER CCTV INSPECTION					
9.A	8-INCH THROUGH 10-INCH	LF	143,198	\$	\$
9.B	12-INCH THROUGH 15-INCH	LF	24,700	\$	\$
9.C	18-INCH THROUGH 24-INCH	LF	8,288	\$	\$
9.D	27-INCH THROUGH 33-INCH	LF	8,700	\$	\$
9.E	36-INCH AND ABOVE	LF	2,480	\$	\$
GRAND TOTAL OF BID (ITEMS 1 THROUGH 9)					\$



Sewer and MH Assessment project

Inspected as of early May



Sewer and MH Assessment project



Hydromax USA
11425 Watson Ct. Suite 1100
Louisville KY 40299
(502) 925-3600



Defect Listing Plot with Images



File System Name	City	State	Parcel	Parcel	Location	Scale
SANBH40000P	Marienburg, OH	1996 N 4th St	RCP	0	0	88
Location	Top Left	Top Left	Shape	C	Location	Scale
SANBH40000Z	273.8					88
SANBH40000I	373.8					88



SPN	IN	SPN	4	NO NUMBER	CONCRETE
APR	IN	SPN	2	1996	Watch & Sewer?
SPN	IN	SPN	2288	1996	Watch & Sewer?
SPN	IN	SPN	4	20150218	Watch & Sewer?
SPN	IN	SPN	4	20150218	Watch & Sewer?
SPN	IN	SPN	4	20150218	Watch & Sewer?
SPN	IN	SPN	4	20150218	Watch & Sewer?
SPN	IN	SPN	4	20150218	Watch & Sewer?
SPN	IN	SPN	4	20150218	Watch & Sewer?



Additional



0.0 E. MBP-Access Point Manhole   SANBH40000Z



0.0 E. MFL-Water Level  

10.7 E. TB-Tap Breakin  

212.2 E. TB-Tap Breakin  

227.2 E. MFL-Water Level Day  

228.2 E. MFL-Water Level  

232.2 E. MFL-Water Level Day  



Marienburg OH CCTV Page: 2



MACP Survey Report SANBH300001

Report Date: 2015/04/29

Sheet No. 24 Surveyor's name A.E.S.U.T Certificate Number 121110218 Date 2015/04/13
System Owner City of Marienburg Survey Customer Rosen & Sawyer Time 14:11
Location (No. & Name) SR Schroeder G.
Storage Area Locality/City Name Marienburg, OH
P.O. No. 30071 004
Further Location Details in parking lot of city park
Shipping Wks to Inspect 17.1 E. Outgoing Grade to Inspect 17.1 E. Rim to Grade 0.0 E.
Site of Sewer Secondary Top Land Year Reinstated Type Media Number
Purpose Initial and follow-up investigation Sewer Category
Pre-Cleaning Date Cleaned Weather City
Location Date Paving Lot Potential for Runoff Evidence of Surcharge Yes
Access Point Type Manhole Coordinate System NAD 83
South Plane Dis. South FIPS 3422 Feet

Netting 08075.428 Reading 1401256.369 Elevation Accuracy of GPS Sun Meter
Inspection Status Remote Inspection Image Reference
Additional Information
Manhole Surface Types
Concrete Pavement Concrete Curb Asphalt Grass/Gr Gravel Other

Survey  Survey 
File Name: Map_SANBH300001.jpg File Name: SANBH300001_Picture_2.jpg
File Date: 2015/04/29 16:02 File Date: 2015/04/21 08:47

Survey  Cover 
File Name: SANBH300001_COVER.jpg File Name: SANBH300001_COVER.jpg
File Date: 2015/04/21 08:47 File Date: 2015/04/21 08:47

Hydromax USA Phone: 502-409-9105 Fax: 502-955-0228

Sewer Inspection Report

MH Inspection Report



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Environmental Engineers & Scientists

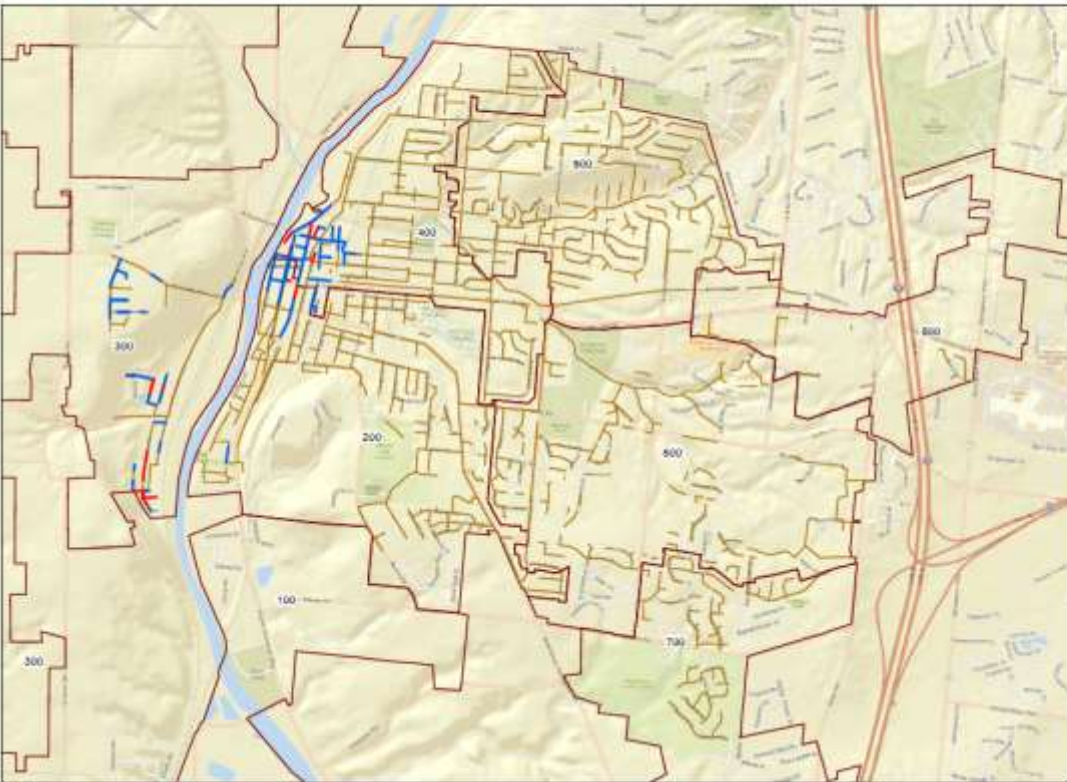
Sewer and MH Assessment project

Structural Defects (Grade 4 & 5)



CITY OF MIAMISBURG, OHIO
SEWER COLLECTION SYSTEM

HAZEN AND SAWYER
Environmental Engineers & Scientists



Legend

Sanitary Sewers

<all other values>

Structural Grade=4

Structural Grade=5

Drainage Basins

Figure 2
Sanitary Sewer with Structural
Grade 4 and 5



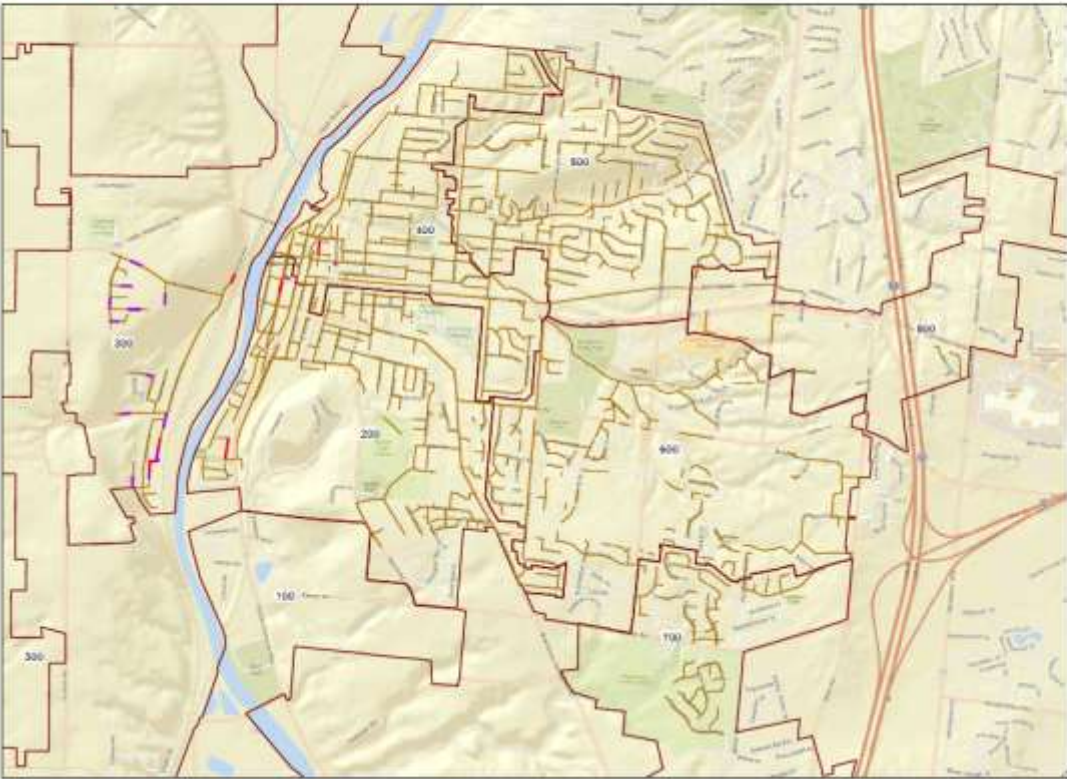
Sewer and MH Assessment project

O&M Defects (Grade 4 & 5)



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SEWER COLLECTION SYSTEM

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- Legend
- Sanitary Sewers
 - <all other values>
 - O&M Grade=4
 - O&M Grade=5
 - Drainage Basins

Figure 3
Sanitary Sewer with O&M
Grade 4 and 5



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Environmental Engineers & Scientists

Sewer and MH Assessment project

Value of Sewer & MH Inspection project:

- Physical record of buried assets
 - Picture, lengths, diameters, materials, laterals
- Identify areas of needed repair / rehabilitation
- Identify areas of infiltration, roots, FOG, etc.
- Update GIS with more accurate pipe sizes and materials



Questions??

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