Appendix A

Force Main Dig Reports

ENengineering
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Pipeline Inspection Direct Examination

Form SI-0702 (rev. 00/00)

LOCATION

Date 9/30/2010 **Indication Number** 1680 P **Stationing** 16+80

Location Description Waukesha, WI - Burr Oak Force Main - 49' WCL Sycamore Dr. / 27' SCL Burr Oak Blvd.

Latitude 43.980961 **Longitude** -88.252991

Purpose of Dig:
- [ ] ECDA Dig
- [ ] ICDA Dig
- [ ] Foreign Crossing
- [ ] ECDA Validation with Indication
- [ ] ICDA Validation
- [ ] Excavation Damage
- [ ] ECDA Validation with No Indication
- [X] Other: Anodic Indication / Cell-to-Cell Survey

Pipe Attributes:

Diameter 12" **W.T.** 0.380" **MAOP** ____ **Grade** ____ **Class** ____ **Critical Angle** ____

SITE CONDITION

Line Location: [ ] Above Ground [ ] In Open Ditch [X] Under Ground [ ] Under Pavement

Land Use: [ ] Commercial [ ] Cultivated [ ] Industrial [X] Residential [ ] Pasture [ ] Wooded [ ] Other ____

Topography: [ ] Level [ ] Rolling [X] Incline [ ] Steep Incline

Drainage: [ ] Good [X] Fair [ ] Poor

Soil Moisture: [ ] Dry [X] Moist [ ] Saturated

Surface Soil Resistivity: 4,600 Ω-cm Collins Rod Probe Depth ____ in

Barnes Analysis Wenner 4-Pin Pin Spacing ____ ft Meter Reading ____ Number ____

Soil Box Multiplication Factor ____ Meter Reading ____ Number ____

Leak Inspection Performed? [X] No [ ] Yes Results: ____ Instrument Used: ____

Comments:

12" diameter force main in drainage ditch R.O.W.

EXCAVATION

Pipeline Depth to Top of Pipe: 96 in. Length of Bell Hole: 15 ft. Exposed Utility ? [X] No [ ] Yes

Ground Water? [X] No [ ] Yes Water Sample Taken? [X] No [ ] Yes Sample ID #: ____

Pipeline Inclination: Inclination Angle 0 degrees Ground Water pH ____

Confirmatory Inclination Measurement: Measured Elevation ____ in. Length of Level ____ in. Inclination Angle ____ degrees

Pipe to Soil At Grade: ____ volts Soil pH: 7

Pipe to Soil:

At Indication		N S E W End of Bell Hole		N S E W End of Bell Hole	
12 o'clock	-0.460 volts	12 o'clock	____ volts	12 o'clock	____ volts
3 o'clock	____ volts	3 o'clock	____ volts	3 o'clock	____ volts
6 o'clock	____ volts	6 o'clock	____ volts	6 o'clock	____ volts
9 o'clock	____ volts	9 o'clock	____ volts	9 o'clock	____ volts

Bell Hole Soil Resistivity: 600 Ω-cm Collins Rod Probe Depth at pipe in Bell Hole Conductivity 0.001667 mho

Soil Moisture: [ ] Dry [X] Moist [ ] Saturated Soil Sample Taken? [ ] No [X] Yes Sample ID #: Burr Oak 1680 P

Soil Type Layers: *Use only when classifying soil in the field*

Depth	Rock %	Silt %	Sand %	Loam %	Gravel %	Clay %
at pipe in.	5	5	30	0	30	30
____ in.	____	____	____	____	____	____
____ in.	____	____	____	____	____	____

Comments:

Soil had clay consistancy next to pipe. 1/2" thick layer of black colored concretion scale on entire observed pipe.
Scale layer may be helping to reduce corrosion activity on piping here.
Low soil resistivity measurement obtained in wet clay beneath pipeline.

COATING CONDITION

Metal Exposed? [X] No [ ] Yes Location Descriptiion: coating in "as new" condition.

Coating Defect Table: Sketch Completed? [X] No [ ] Yes

#	Distance Along Excavation	o'clock position	Length	Width	#	Distance Along Excavation	o'clock position	Length	Width
1					11				
2					12				
3					13				
4					14				
5					15				
6					16				
7					17				
8					18				
9					19				
10					20				

Weld Exposed? [X] n/a [ ] Yes Weld Coating Type: n/a Weld Coating Condition: n/a

Pipe Coating - Type:
- [ ] Bare
- [X] Coated
- [X] Coal Tar Enamel
- [ ] Coal Tar Enamel Reinforced
- [ ] Extruded Polyethylene (Yellow Jacket)
- [ ] FBE
- [ ] Thin Film
- [ ] Mastic
- [ ] Paint (Above Ground)
- [ ] Paint (Below Ground)
- [ ] Paint High Temp (Above Ground)
- [ ] PE Tape Cold Applied with Primer
- [ ] PE Tape Line Travel
- [ ] Pre 2000 Wax
- [ ] Post 1999 Wax
- [ ] Composite
- [ ] Fiberglass
- [ ] Unknown
- [ ] Other

Pipe - Material
- [ ] Steel
- [ ] PVC
- [ ] Poly
- [ ] Unknown
- [X] D.I.

Pipe Coating - Thickness:
Direction: [X] Flow [ ] Increasing station

12 o'clock	5	mils
3 o'clock	5	mils
6 o'clock	5	mils
9 o'clock	5	mils

Pipe Coating - Foreign Object Penetration:
Direction: [ ] Increasing station [X] Flow

12 o'clock	3 o'clock	6 o'clock	9 o'clock
Yes	Yes	Yes	Yes
No	No	No	No
N/A	N/A	N/A	N/A
Unknown	Unknown	Unknown	Unknown

Pipe Coating - Bond:
Direction: [ ] Increasing station [X] Flow

12 o'clock	3 o'clock	6 o'clock	9 o'clock
Excellent	Excellent	Excellent	Excellent
Good	Good	Good	Good
Fair	Fair	Fair	Fair
Poor	Poor	Poor	Poor
Very Poor	Very Poor	Very Poor	Very Poor

Liquid Observed Under Coating? [X] No [ ] Yes Sample Taken? [X] No [ ] Yes Sample ID #: _____

Under Coating pH: n/a

Color of Pipe Under Coating: white metal with some pitting of 0.02-0.05 inch Coating Degradation Drawing Attached? [X] No [ ] Yes

Comments:

1/2" thick black concretion scale well adhered to pipe. A portion removed to observe piping under scale.
Scale was holding moisture.
Tried not to remove too much of the scale as it might be providing a protective corrosion barrier for pipe.

PIPE CONDITION

O.D.: 14 in.

Pipe Temperature: n/a °F

Wrinkle Bends? [X] No [ ] Yes

Joint Type:
- [ ] Weld
- [ ] Coupling
- [ ] Flange
- [ ] Monolithic Insulator
- [X] Bell and Spigot

Insulated? [X] No [ ] Yes

Wall Thickness*:
Direction: [X] Flow [ ] Increasing station

		Opposite Side of Girth Weld *If Applicable*
12 o'clock	0.380 in.	_____ in.
3 o'clock	0.405 in.	_____ in.
6 o'clock	0.398 in.	_____ in.
9 o'clock	0.411 in.	_____ in.

**For ICDA Examinations, document measurements on the Wall Thickness Measurement page.*

Seam Type:
- [X] No Seam
- [ ] Square Shoulder
- [ ] Round Shoulder
- [ ] Not Observed

Seam Orientation: _____ o'clock

Direction:
- [ ] Increasing station
- [ ] Flow

Magnetic Particle Testing Performed?
- [ ] Yes* [ ] Passed
- [X] No [ ] Failed

**Attach Magnetic Particle Testing Report.*

PIPE CONDITION (Continued)

Pipe Cleaning Method: [ ] Hand Brush [ ] Mechanical Brush [ ] Sand Blast [ ] Other: None

Dents? [X] No [ ] Yes Depth: ____ mils Width: ____ in. Length: ____ in. Orientation: ____ o'clock

Gouges? [X] No [ ] Yes Depth: ____ mils Width: ____ in. Length: ____ in. Orientation: ____ o'clock

Other? [X] No [ ] Yes Depth: ____ mils Width: ____ in. Length: ____ in. Orientation: ____ o'clock

Photo Taken? [ ] No [X] Yes Drawing Completed and Attached? No Yes *Attach additional sheets as necessary*

Comments:

No surface corrosion observed. A few well separated pits of 1/2" diameter and 0.05 inch depth were observed.
When coating was removed to thermite weld the anode to the pipe, some coating-filled pits of 0.01 inch depth were observed on the pipe surface.

EXTERNAL CORROSION

External Corrosion Observed? [ ] No * [X] Yes **Skip to Additional Comments Section to complete the inspection.*

Description of External Corrosion (mark all that apply)

- [ ] Dish or Cupped Shaped
- [ ] Pits within Pits
- [ ] Striations in Metal
- [ ] Perfectly Rounded
- [ ] Smooth Edges
- [ ] Sharp Edges
- [ ] Removal of Corrosion Product Leaves Shiny Surface
- [ ] Corrosion Product has Pasty Consistency (similar to liquid soap)

Corrosion Mapped and Attached? [X] No [ ] Yes Photo Taken? [ ] No [X] Yes

Corrosion Defect Table:

#	Distance Along Excavation	o'clock position	Max. Length	Max. Depth	#	Distance Along Excavation	o'clock position	Max. Length	Max. Depth
1					11				
2					12				
3					13				
4					14				
5					15				
6					16				
7					17				
8					18				
9					19				
10					20				

Corrosion Product Observed? [ ] No [X] Yes Sample Taken? [X] No [ ] Yes Sample ID #: ____

External Corrosion: [ ] Active [X] Inactive Corrosion Pit pH n/a

MIC Observed or Suspected? [X] No [ ] Yes MIC Sample Taken? No [X] No [ ] Yes Sample ID #: ____

**Complete Form 90703 MIC Field Testing Data Collection*

Comments:

Pipe appears to be in fairly good condition with shallow 0.05 inch depth x 1/2" round pits widely separated at the observed location.
The excavation at location 1820 P on Burr Oak Blvd. was very similar to what was observed at this location.

INTERNAL CORROSION

Internal Pipe Surface Exposed? [X] No * [ ] Yes ** If "NO," skip to Additional Comments Section to complete the inspection.*

Liquid Observed In Pipe? [X] n/a [ ] Yes Sample Taken? [ ] No [ ] Yes Sample ID #: ____

Quantity of Liquid Seen In Pipe? ____ gal ____ oz Type Of Liquid In Pipe? Water Oil Other: ____

Internal Corrosion Observed? [X] n/a [ ] Yes MIC Sample Taken? [ ] No [ ] Yes ID #: ____

Corrosion Product Observed? [X] n/a [ ] Yes Product Sample Taken? Yes [ ] No [ ] Yes ID #: ____

Most Severe Corrosion Seen At: Depth: ____ mils Length: ____ in. Orientation: ____ o'clock

Internal Corrosion: [X] n/a [ ] Inactive Photo Taken? [ ] No [ ] Yes

INTERNAL CORROSION (Continued)

Comments:

REPAIR

Pipe Repaired? [X] No [ ] Yes

Pipe Repair Method: [ ] Fill & Recoat Only [ ] Full Encirclement Sleeve [ ] Clock Spring [ ] Other 17# magnesium anode installed.

Comments:

Anode installed to protect area of piping where scale was removed.

ADDITIONAL COMMENTS

Photos

Photo 1 - Top view of pipe showing surface with some of the attached concretion scale removed

Photo 2 - Coated anode connection and pipe with some concretion chipped away

Ron Turner

Name (Print)

Name (Signature)

10/6/2010

Date (MM-DD-YYYY):

ENGINEERING ONLY

RSTRENG Program Assessment? [x] n/a [ ] Yes **Attach RSTRENG report.*

Max. Safe Pressure according to:	ASME B31G _____	Modified B31G _____	Effective Area Method _____
Burst Pressure according to:	ASME B31G _____	Modified B31G _____	Effective Area Method _____
Safety Factor according to:	ASME B31G _____	Modified B31G _____	Effective Area Method _____

RSTRENG Analysis Performed By:

ENengineering
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Pipeline Inspection Direct Examination

Form SI-0702 (rev. 00/00)

LOCATION

Date 10/1/2010 **Indication Number** 1820 P **Stationing** 18+20

Location Description Waukesha, WI - Burr Oak Force Main - 56' ECL Sycamore Dr. / 23' SCL Burr Oak Blvd.

Latitude 42.981033 **Longitude** -88.252563

Purpose of Dig:
- [ ] ECDA Dig
- [ ] ICDA Dig
- [ ] Foreign Crossing
- [ ] ECDA Validation with Indication
- [ ] ICDA Validation
- [ ] Excavation Damage
- [ ] ECDA Validation with No Indication
- [X] Other: Anodic Indication / Cell-to-Cell Survey

Pipe Attributes:

Diameter 12" **W.T.** 0.380" **MAOP** ____ **Grade** ____ **Class** ____ **Critical Angle** ____

SITE CONDITION

Line Location: [ ] Above Ground [ ] In Open Ditch [X] Under Ground [ ] Under Pavement

Land Use: [ ] Commercial [ ] Cultivated [ ] Industrial [X] Residential [ ] Pasture [ ] Wooded [ ] Other ____

Topography: [ ] Level [ ] Rolling [X] Incline [ ] Steep Incline

Drainage: [ ] Good [X] Fair [ ] Poor

Soil Moisture: [ ] Dry [X] Moist [ ] Saturated

Surface Soil Resistivity: 4,600 Ω-cm Collins Rod Probe Depth ____ in

Barnes Analysis Wenner 4-Pin Pin Spacing ____ ft Meter Reading ____ Number ____

Soil Box Multiplication Factor ____ Meter Reading ____ Number ____

Leak Inspection Performed? [X] No [ ] Yes Results: ____ Instrument Used: ____

Comments:

12" diameter force main in drainage ditch R.O.W.

EXCAVATION

Pipeline Depth to Top of Pipe: 96 in. Length of Bell Hole: 15 ft. Exposed Utility ? [X] No [ ] Yes

Ground Water? [X] No [ ] Yes Water Sample Taken? [X] No [ ] Yes Sample ID #: ____

Pipeline Inclination: Inclination Angle 0 degrees Ground Water pH ____

Confirmatory Inclination Measurement: Measured Elevation ____ in. Length of Level ____ in. Inclination Angle ____ degrees

Pipe to Soil At Grade: ____ volts Soil pH: 6.6

Pipe to Soil:

At Indication		N S E W End of Bell Hole		N S E W End of Bell Hole	
12 o'clock	-0.658 volts	12 o'clock	____ volts	12 o'clock	____ volts
3 o'clock	____ volts	3 o'clock	____ volts	3 o'clock	____ volts
6 o'clock	____ volts	6 o'clock	____ volts	6 o'clock	____ volts
9 o'clock	____ volts	9 o'clock	____ volts	9 o'clock	____ volts

Bell Hole Soil Resistivity: 800 Ω-cm Collins Rod Probe Depth at pipe in Bell Hole Conductivity 0.00125 mho

Soil Moisture: [ ] Dry [X] Moist [ ] Saturated Soil Sample Taken? [ ] No [X] Yes Sample ID #: Burr Oak 1820 P

Soil Type Layers: *Use only when classifying soil in the field*

Depth	Rock %	Silt %	Sand %	Loam %	Gravel %	Clay %
at pipe in.	5	5	30	0	30	30
____ in.	____	____	____	____	____	____
____ in.	____	____	____	____	____	____

Comments:

Soil had clay consistancy next to pipe. 1/2" thick layer of black colored concretion scale on entire observed pipe.
Scale layer may be helping to reduce corrosion activity on piping here.
Low soil resistivity measurement obtained in wet clay beneath pipeline.

COATING CONDITION

Metal Exposed? [X] No [ ] Yes Location Descriptiion: coating in "as new" condition.

Coating Defect Table: Sketch Completed? [X] No [ ] Yes

#	Distance Along Excavation	o'clock position	Length	Width	#	Distance Along Excavation	o'clock position	Length	Width
1					11				
2					12				
3					13				
4					14				
5					15				
6					16				
7					17				
8					18				
9					19				
10					20				

Weld Exposed? [X] n/a [ ] Yes Weld Coating Type: n/a Weld Coating Condition: n/a

Pipe Coating - Type:
- [ ] Bare
- [X] Coated
- [X] Coal Tar Enamel
- [ ] Coal Tar Enamel Reinforced
- [ ] Extruded Polyethylene (Yellow Jacket)
- [ ] FBE
- [ ] Thin Film
- [ ] Mastic
- [ ] Paint (Above Ground)
- [ ] Paint (Below Ground)
- [ ] Paint High Temp (Above Ground)
- [ ] PE Tape Cold Applied with Primer
- [ ] PE Tape Line Travel
- [ ] Pre 2000 Wax
- [ ] Post 1999 Wax
- [ ] Composite
- [ ] Fiberglass
- [ ] Unknown
- [ ] Other

Pipe - Material
- [ ] Steel
- [ ] PVC
- [ ] Poly
- [ ] Unknown
- [X] D.I.

Pipe Coating - Thickness:
Direction: [X] Flow [ ] Increasing station

12 o'clock	5	mils
3 o'clock	5	mils
6 o'clock	5	mils
9 o'clock	5	mils

Pipe Coating - Foreign Object Penetration:
Direction: [ ] Increasing station [X] Flow

12 o'clock	3 o'clock	6 o'clock	9 o'clock
Yes	Yes	Yes	Yes
No	No	No	No
N/A	N/A	N/A	N/A
Unknown	Unknown	Unknown	Unknown

Pipe Coating - Bond:
Direction: [ ] Increasing station [X] Flow

12 o'clock	3 o'clock	6 o'clock	9 o'clock
Excellent	Excellent	Excellent	Excellent
Good	Good	Good	Good
Fair	Fair	Fair	Fair
Poor	Poor	Poor	Poor
Very Poor	Very Poor	Very Poor	Very Poor

Liquid Observed Under Coating? [X] No [ ] Yes Sample Taken? [X] No [ ] Yes Sample ID #: _____

Under Coating pH: n/a

Color of Pipe Under Coating: white metal with some pitting of 0.02-0.05 inch Coating Degradation Drawing Attached? [X] No [ ] Yes

Comments:

1/2" thick black concretion scale well adhered to pipe. A portion removed to observe piping under scale.
Scale was holding moisture.
Tried not to remove too much of the scale as it might be providing a protective corrosion barrier for pipe.

PIPE CONDITION

O.D.: 14 in.
Pipe Temperature: n/a °F
Wrinkle Bends? [X] No [ ] Yes

Joint Type:
- [ ] Weld
- [ ] Coupling
- [ ] Flange
- [ ] Monolithic Insulator
- [X] Bell and Spigot

Insulated? [X] No [ ] Yes

Wall Thickness*:
Direction: [X] Flow [ ] Increasing station

		Opposite Side of Girth Weld *If Applicable*
12 o'clock	0.440 in.	_____ in.
3 o'clock	0.489 in.	_____ in.
6 o'clock	0.454 in.	_____ in.
9 o'clock	0.449 in.	_____ in.

**For ICDA Examinations, document measurements on the Wall Thickness Measurement page.*

Seam Type:
- [X] No Seam
- [ ] Square Shoulder
- [ ] Round Shoulder
- [ ] Not Observed

Seam Orientation: _____ o'clock

Direction:
- [ ] Increasing station
- [ ] Flow

Magnetic Particle Testing Performed?
- [ ] Yes* [ ] Passed
- [X] No [ ] Failed

**Attach Magnetic Particle Testing Report.*

PIPE CONDITION (Continued)

Pipe Cleaning Method: [ ] Hand Brush [ ] Mechanical Brush [ ] Sand Blast [ ] Other: None

Dents? [X] No [ ] Yes Depth: ____ mils Width: ____ in. Length: ____ in. Orientation: ____ o'clock

Gouges? [X] No [ ] Yes Depth: ____ mils Width: ____ in. Length: ____ in. Orientation: ____ o'clock

Other? [X] No [ ] Yes Depth: ____ mils Width: ____ in. Length: ____ in. Orientation: ____ o'clock

Photo Taken? [ ] No [X] Yes Drawing Completed and Attached? No Yes *Attach additional sheets as necessary*

Comments:

No surface corrosion observed. A few well separated pits of 1/2" diameter and 0.05 inch depth were observed.
When coating was removed to thermite weld the anode to the pipe, some coating-filled pits of 0.01 inch depth were observed on the pipe surface.

EXTERNAL CORROSION

External Corrosion Observed? [ ] No * [X] Yes **Skip to Additional Comments Section to complete the inspection.*

Description of External Corrosion (mark all that apply)

- [ ] Dish or Cupped Shaped
- [ ] Pits within Pits
- [ ] Striations in Metal
- [ ] Perfectly Rounded
- [ ] Smooth Edges
- [ ] Sharp Edges
- [ ] Removal of Corrosion Product Leaves Shiny Surface
- [ ] Corrosion Product has Pasty Consistency (similar to liquid soap)

Corrosion Mapped and Attached? [X] No [ ] Yes Photo Taken? [ ] No [X] Yes

Corrosion Defect Table:

#	Distance Along Excavation	o'clock position	Max. Length	Max. Depth	#	Distance Along Excavation	o'clock position	Max. Length	Max. Depth
1					11				
2					12				
3					13				
4					14				
5					15				
6					16				
7					17				
8					18				
9					19				
10					20				

Corrosion Product Observed? [ ] No [X] Yes Sample Taken? [X] No [ ] Yes Sample ID #: ____

External Corrosion: [ ] Active [X] Inactive Corrosion Pit pH n/a

MIC Observed or Suspected? [X] No [ ] Yes MIC Sample Taken? No [X] No [ ] Yes Sample ID #: ____

**Complete Form 90703 MIC Field Testing Data Collection*

Comments:

Pipe appears to be in fairly good condition with shallow 0.05 inch depth x 1/2" round pits widely separated at the observed location.
The excavation at location 1680 P on Burr Oak Blvd. was very similar to what was observed at this location.

INTERNAL CORROSION

Internal Pipe Surface Exposed? [X] No * [ ] Yes ** If "NO," skip to Additional Comments Section to complete the inspection.*

Liquid Observed In Pipe? [X] n/a [ ] Yes Sample Taken? [ ] No [ ] Yes Sample ID #: ____

Quantity of Liquid Seen In Pipe? ____ gal ____ oz Type Of Liquid In Pipe? Water Oil Other: ____

Internal Corrosion Observed? [X] n/a [ ] Yes MIC Sample Taken? [ ] No [ ] Yes ID #: ____

Corrosion Product Observed? [X] n/a [ ] Yes Product Sample Taken? Yes [ ] No [ ] Yes ID #: ____

Most Severe Corrosion Seen At: Depth: ____ mils Length: ____ in. Orientation: ____ o'clock

Internal Corrosion: [X] n/a [ ] Inactive Photo Taken? [ ] No [ ] Yes

INTERNAL CORROSION (Continued)

Comments:

REPAIR

Pipe Repaired? [X] No [ ] Yes

Pipe Repair Method: [ ] Fill & Recoat Only [ ] Full Encirclement Sleeve [ ] Clock Spring [ ] Other 17# magnesium anode installed.

Comments:

Anode installed to protect piping where scale was removed.

ADDITIONAL COMMENTS

Photos

Photo 1 - Top view of pipe showing surface with some of the attached concretion scale removed

Photo 2 - 0.100" pit at 8:00 position on pipe and wet clay beneath pipe

Photo 3 -

Pipe surface showing scale adhering to pipe

Photo 4 - Pipe with anode attached

Ron Turner

Name (Print)

Ron Turner

Name (Signature)

10/7/2010

Date (MM-DD-YYYY):

ENGINEERING ONLY

RSTRENG Program Assessment? [X] n/a [ ] Yes **Attach RSTRENG report.*

Max. Safe Pressure according to:	ASME B31G _____	Modified B31G _____	Effective Area Method _____
Burst Pressure according to:	ASME B31G _____	Modified B31G _____	Effective Area Method _____
Safety Factor according to:	ASME B31G _____	Modified B31G _____	Effective Area Method _____

RSTRENG Analysis Performed By:

ENengineering
excellence from start to finish

Pipeline Inspection Direct Examination

Form SI-0702 (rev. 00/00)

LOCATION

Date 10/1/2010 **Indication Number** 1890 P **Stationing** 18+90

Location Description Waukesha, WI - Heyer Dr. Force Main - 1890' ECL Tenney Rd. / N. Side Sunset Rd.

Latitude 42.988686 **Longitude** -88.215218

Purpose of Dig:
- [ ] ECDA Dig
- [ ] ICDA Dig
- [ ] Foreign Crossing
- [ ] ECDA Validation with Indication
- [ ] ICDA Validation
- [ ] Excavation Damage
- [ ] ECDA Validation with No Indication
- [x] Other: Anodic Indication / Cell-to-Cell Survey

Pipe Attributes:

Diameter 14" **W.T.** 0.380" **MAOP** ____ **Grade** ____ **Class** ____ **Critical Angle** ____

SITE CONDITION

Line Location: [ ] Above Ground [ ] In Open Ditch [x] Under Ground [ ] Under Pavement

Land Use: [ ] Commercial [ ] Cultivated [ ] Industrial [ ] Residential [ ] Pasture [ ] Wooded [x] Other Highway R.O.W.

Topography: [ ] Level [ ] Rolling [x] Incline [ ] Steep Incline

Drainage: [ ] Good [x] Fair [ ] Poor

Soil Moisture: [ ] Dry [x] Moist [ ] Saturated

Surface Soil Resistivity: 2,900 Ω-cm Collins Rod Probe Depth ____ in

Barnes Analysis Wenner 4-Pin Pin Spacing ____ ft Meter Reading ____ Number ____

Soil Box Multiplication Factor ____ Meter Reading ____ Number ____

Leak Inspection Performed? [x] No [ ] Yes Results: ____ Instrument Used: ____

Comments:

14" diameter force main on north side of highway R.O.W.

EXCAVATION

Pipeline Depth to Top of Pipe: 84 in. Length of Bell Hole: 15 ft. Exposed Utility ? [x] No [ ] Yes

Ground Water? [ ] No [x] Yes Water Sample Taken? [x] No [ ] Yes Sample ID #: ____

Pipeline Inclination: Inclination Angle 0 degrees Ground Water pH ____

Confirmatory Inclination Measurement: Measured Elevation ____ in. Length of Level ____ in. Inclination Angle ____ degrees

Pipe to Soil At Grade: ____ volts Soil pH: 7.5

Pipe to Soil:

At Indication		N S E W End of Bell Hole		N S E W End of Bell Hole	
12 o'clock	-0.601 volts	12 o'clock	____ volts	12 o'clock	____ volts
3 o'clock	____ volts	3 o'clock	____ volts	3 o'clock	____ volts
6 o'clock	____ volts	6 o'clock	____ volts	6 o'clock	____ volts
9 o'clock	____ volts	9 o'clock	____ volts	9 o'clock	____ volts

Bell Hole Soil Resistivity: 2,500 Ω-cm Collins Rod Probe Depth at pipe in Bell Hole Conductivity 0.0004 mho

Soil Moisture: [ ] Dry [x] Moist [ ] Saturated Soil Sample Taken? [ ] No [x] Yes Sample ID #: Heyer 1890 P

Soil Type Layers: *Use only when classifying soil in the field*

Depth	Rock %	Silt %	Sand %	Loam %	Gravel %	Clay %
at pipe in.	5	5	20	0	30	40
____ in.	____	____	____	____	____	____
____ in.	____	____	____	____	____	____

Comments:

Soil was clay and gravel mixture. Wet clay and ground water beneath pipe.
Moderate concretion (scale) on pipe coating surface.

COATING CONDITION

Metal Exposed? [X] No [ ] Yes Location Descriptiion: coating condition generally good

Coating Defect Table: Sketch Completed? [X] No [ ] Yes

#	Distance Along Excavation	o'clock position	Length	Width	#	Distance Along Excavation	o'clock position	Length	Width
1					11				
2					12				
3					13				
4					14				
5					15				
6					16				
7					17				
8					18				
9					19				
10					20				

Weld Exposed? [X] n/a [ ] Yes Weld Coating Type: n/a Weld Coating Condition: n/a

Pipe Coating - Type:
- [ ] Bare
- [X] Coated
- [X] Coal Tar Enamel
- [ ] Coal Tar Enamel Reinforced
- [ ] Extruded Polyethylene (Yellow Jacket)
- [ ] FBE
- [ ] Thin Film
- [ ] Mastic
- [ ] Paint (Above Ground)
- [ ] Paint (Below Ground)
- [ ] Paint High Temp (Above Ground)
- [ ] PE Tape Cold Applied with Primer
- [ ] PE Tape Line Travel
- [ ] Pre 2000 Wax
- [ ] Post 1999 Wax
- [ ] Composite
- [ ] Fiberglass
- [ ] Unknown
- [ ] Other

Pipe - Material
- [ ] Steel
- [ ] PVC
- [ ] Poly
- [ ] Unknown
- [X] D.I.

Pipe Coating - Thickness:
Direction: [X] Flow [ ] Increasing station

12 o'clock	8	mils
3 o'clock	8	mils
6 o'clock	8	mils
9 o'clock	8	mils

Pipe Coating - Foreign Object Penetration:
Direction: [ ] Increasing station [X] Flow

12 o'clock	3 o'clock	6 o'clock	9 o'clock
Yes	Yes	Yes	Yes
No	No	No	No
N/A	N/A	N/A	N/A
Unknown	Unknown	Unknown	Unknown

Pipe Coating - Bond:
Direction: [ ] Increasing station [X] Flow

12 o'clock	3 o'clock	6 o'clock	9 o'clock
Excellent	Excellent	Excellent	Excellent
Good	Good	Good	Good
Fair	Fair	Fair	Fair
Poor	Poor	Poor	Poor
Very Poor	Very Poor	Very Poor	Very Poor

Liquid Observed Under Coating? [X] No [ ] Yes Sample Taken? [X] No [ ] Yes Sample ID #: _____

Under Coating pH: n/a

Color of Pipe Under Coating: white metal with some pitting of 0.02-0.05 inch Coating Degradation Drawing Attached? [X] No [ ] Yes

Comments:

1/2" thick black concretion scale well adhered to pipe. A portion removed to observe piping under scale.
Scale was holding moisture.
Tried not to remove too much of the scale as it might be providing a protective corrosion barrier for pipe.

PIPE CONDITION

O.D.: 15 in.
Pipe Temperature: n/a °F
Wrinkle Bends? [X] No [ ] Yes

Joint Type:
- [ ] Weld
- [ ] Coupling
- [ ] Flange
- [ ] Monolithic Insulator
- [X] Bell and Spigot

Insulated? [X] No [ ] Yes

Wall Thickness*:
Direction: [X] Flow [ ] Increasing station

		Opposite Side of Girth Weld *If Applicable*
12 o'clock	0.378 in.	in.
3 o'clock	0.362 in.	in.
6 o'clock	0.371 in.	in.
9 o'clock	0.327 in.	in.

**For ICDA Examinations, document measurements on the Wall Thickness Measurement page.*

Seam Type:
- [X] No Seam
- [ ] Square Shoulder
- [ ] Round Shoulder
- [ ] Not Observed

Seam Orientation: _____ o'clock

Direction:
- [ ] Increasing station
- [ ] Flow

Magnetic Particle Testing Performed?
- [ ] Yes* [ ] Passed
- [X] No [ ] Failed

**Attach Magnetic Particle Testing Report.*

PIPE CONDITION (Continued)

Pipe Cleaning Method: [ ] Hand Brush [ ] Mechanical Brush [ ] Sand Blast [ ] Other: None

Dents? [X] No [ ] Yes Depth: ____ mils Width: ____ in. Length: ____ in. Orientation: ____ o'clock

Gouges? [X] No [ ] Yes Depth: ____ mils Width: ____ in. Length: ____ in. Orientation: ____ o'clock

Other? [ ] No [ ] Yes Depth: ____ mils Width: ____ in. Length: ____ in. Orientation: ____ o'clock

Photo Taken? [ ] No [X] Yes Drawing Completed and Attached? No Yes *Attach additional sheets as necessary*

Comments:

No surface corrosion observed.
When coating was removed to thermite weld the anode to the pipe, some coating-filled pits of 0.01 inch depth were observed on the pipe surface.
1/2" layer of scalle on coating surface.

EXTERNAL CORROSION

External Corrosion Observed? [X] No * [ ] Yes **Skip to Additional Comments Section to complete the inspection.*

Description of External Corrosion (mark all that apply)

- [ ] Dish or Cupped Shaped
- [ ] Pits within Pits
- [ ] Striations in Metal
- [ ] Perfectly Rounded
- [ ] Smooth Edges
- [ ] Sharp Edges
- [ ] Removal of Corrosion Product Leaves Shiny Surface
- [ ] Corrosion Product has Pasty Consistency (similar to liquid soap)

Corrosion Mapped and Attached? [X] No [ ] Yes Photo Taken? [ ] No [X] Yes

Corrosion Defect Table:

#	Distance Along Excavation	o'clock position	Max. Length	Max. Depth	#	Distance Along Excavation	o'clock position	Max. Length	Max. Depth
1					11				
2					12				
3					13				
4					14				
5					15				
6					16				
7					17				
8					18				
9					19				
10					20				

Corrosion Product Observed? [X] No [ ] Yes Sample Taken? [X] No [ ] Yes Sample ID #: ____

External Corrosion: [ ] Active [X] Inactive Corrosion Pit pH ____ n/a ____

MIC Observed or Suspected? [X] No [ ] Yes MIC Sample Taken? No [X] No [ ] Yes Sample ID #: ____

**Complete Form 90703 MIC Field Testing Data Collection*

Comments:

Pipe coating is in good condition. No surface corrosion observed.

INTERNAL CORROSION

Internal Pipe Surface Exposed? [X] No * [ ] Yes ** If "NO," skip to Additional Comments Section to complete the inspection.*

Liquid Observed In Pipe? [X] n/a [ ] Yes Sample Taken? [ ] No [ ] Yes Sample ID #: ____

Quantity of Liquid Seen In Pipe? ____ gal ____ oz Type Of Liquid In Pipe? Water Oil Other: ____

Internal Corrosion Observed? [X] n/a [ ] Yes MIC Sample Taken? [ ] No [ ] Yes ID #: ____

Corrosion Product Observed? [X] n/a [ ] Yes Product Sample Taken? Yes [ ] No [ ] Yes ID #: ____

Most Severe Corrosion Seen At: Depth: ____ ____ mils Length: ____ in. Orientation: ____ o'clock

Internal Corrosion: [X] n/a [ ] Inactive Photo Taken? [ ] No [ ] Yes

INTERNAL CORROSION (Continued)

Comments:

REPAIR

Pipe Repaired? [X] No [ ] Yes

Pipe Repair Method: [ ] Fill & Recoat Only [ ] Full Encirclement Sleeve [ ] Clock Spring [ ] Other 17# magnesium anode installed.

Comments:

Anode installed to protect piping where scale was removed.

ADDITIONAL COMMENTS

Photos

Photo 1 - Top view of pipe showing surface with some of the attached concretion scale removed

Photo 2 - No pitting observed - coating holding some moisture

Photo 3 - Coating intact with no pitting observed

Ron Turner

Name (Print)

Ron Turner

Name (Signature)

10/7/2010

Date (MM-DD-YYYY):

ENGINEERING ONLY

RSTRENG Program Assessment? [**X**] n/a [ ] Yes **Attach RSTRENG report.*

Max. Safe Pressure according to:	ASME B31G _____	Modified B31G _____	Effective Area Method _____
Burst Pressure according to:	ASME B31G _____	Modified B31G _____	Effective Area Method _____
Safety Factor according to:	ASME B31G _____	Modified B31G _____	Effective Area Method _____

RSTRENG Analysis Performed By:

ENengineering
excellence from start to finish

Pipeline Inspection Direct Examination

Form SI-0702 (rev. 00/00)

LOCATION

Date 9/30/2010 **Indication Number** 305 P **Stationing** 3+05

Location Description Waukesha, WI - Greenmeadow Force Main - In park near school, 325" NCL Madison St.

Latitude 43.014153 **Longitude** -88.260857

Purpose of Dig:
- [ ] ECDA Dig
- [ ] ICDA Dig
- [ ] Foreign Crossing
- [ ] ECDA Validation with Indication
- [ ] ICDA Validation
- [ ] Excavation Damage
- [ ] ECDA Validation with No Indication
- [X] Other: Anodic Indication / Close Interval Survey

Pipe Attributes:

Diameter 16" **W.T.** 0.4255" **MAOP** ____ **Grade** ____ **Class** ____ **Critical Angle** ____

SITE CONDITION

Line Location: [ ] Above Ground [ ] In Open Ditch [X] Under Ground [ ] Under Pavement

Land Use: [ ] Commercial [ ] Cultivated [ ] Industrial [ ] Residential [ ] Pasture [ ] Wooded [X] Other Park

Topography: [ ] Level [ ] Rolling [X] Incline [ ] Steep Incline

Drainage: [X] Good [ ] Fair [ ] Poor

Soil Moisture: [X] Dry [ ] Moist [ ] Saturated

Surface Soil Resistivity: 16,900 Ω-cm Collins Rod Probe Depth ____ in

Barnes Analysis Wenner 4-Pin Pin Spacing ____ ft Meter Reading ____ Number ____

Soil Box Multiplication Factor ____ Meter Reading ____ Number ____

Leak Inspection Performed? [X] No [ ] Yes Results: ____ Instrument Used: ____

Comments:

16" diameter ductile iron pipeline in park.

EXCAVATION

Pipeline Depth to Top of Pipe: 96 in. Length of Bell Hole: 15 ft. Exposed Utility ? [X] No [ ] Yes

Ground Water? [X] No [ ] Yes Water Sample Taken? [X] No [ ] Yes Sample ID #: ____

Pipeline Inclination: Inclination Angle 0 degrees Ground Water pH ____

Confirmatory Inclination Measurement: Measured Elevation ____ in. Length of Level ____ in. Inclination Angle ____ degrees

Pipe to Soil At Grade: ____ volts Soil pH: 6.8

Pipe to Soil: At Indication		N S E W End of Bell Hole		N S E W End of Bell Hole	
12 o'clock	-0.363 volts	12 o'clock	____ volts	12 o'clock	____ volts
3 o'clock	____ volts	3 o'clock	____ volts	3 o'clock	____ volts
6 o'clock	____ volts	6 o'clock	____ volts	6 o'clock	____ volts
9 o'clock	____ volts	9 o'clock	____ volts	9 o'clock	____ volts

Bell Hole Soil Resistivity: 16,000 Ω-cm Collins Rod Probe Depth at pipe in Bell Hole Conductivity 0.000063 mho

Soil Moisture: [X] Dry [ ] Moist [ ] Saturated Soil Sample Taken? [ ] No [X] Yes Sample ID #: Greenmeadow 305 P

Soil Type Layers: *Use only when classifying soil in the field*

Depth	Rock %	Silt %	Sand %	Loam %	Gravel %	Clay %
at pipe in.	5	0	80	0	15	0
____ in.	____	____	____	____	____	____
____ in.	____	____	____	____	____	____

Comments:

Dry excavation. No ground water encountered during the excavation.
Pipe originally backfilled in primariy sand with some rocks.. Same backfill used to re-fill excavation.

COATING CONDITION

Metal Exposed? [X] No [ ] Yes Location Descriptiion: coating in "as new" condition.

Coating Defect Table: Sketch Completed? [X] No [ ] Yes

#	Distance Along Excavation	o'clock position	Length	Width	#	Distance Along Excavation	o'clock position	Length	Width
1					11				
2					12				
3					13				
4					14				
5					15				
6					16				
7					17				
8					18				
9					19				
10					20				

Weld Exposed? [X] n/a [ ] Yes Weld Coating Type: n/a Weld Coating Condition: n/a

Pipe Coating - Type:
- [ ] Bare
- [X] Coated
- [X] Coal Tar Enamel
- [ ] Coal Tar Enamel Reinforced
- [ ] Extruded Polyethylene (Yellow Jacket)
- [ ] FBE
- [ ] Thin Film
- [ ] Mastic
- [ ] Paint (Above Ground)
- [ ] Paint (Below Ground)
- [ ] Paint High Temp (Above Ground)
- [ ] PE Tape Cold Applied with Primer
- [ ] PE Tape Line Travel
- [ ] Pre 2000 Wax
- [ ] Post 1999 Wax
- [ ] Composite
- [ ] Fiberglass
- [ ] Unknown
- [ ] Other

Pipe - Material
- [ ] Steel
- [ ] PVC
- [ ] Poly
- [ ] Unknown
- [X] D.I.

Pipe Coating - Thickness:
Direction: [X] Flow [ ] Increasing station

12 o'clock	10	mils
3 o'clock	10	mils
6 o'clock	10	mils
9 o'clock	10	mils

Pipe Coating - Foreign Object Penetration:
Direction: [ ] Increasing station [X] Flow

12 o'clock	3 o'clock	6 o'clock	9 o'clock
Yes	Yes	Yes	Yes
No	No	No	No
N/A	N/A	N/A	N/A
Unknown	Unknown	Unknown	Unknown

Pipe Coating - Bond:
Direction: [ ] Increasing station [X] Flow

12 o'clock	3 o'clock	6 o'clock	9 o'clock
Excellent	Excellent	Excellent	Excellent
Good	Good	Good	Good
Fair	Fair	Fair	Fair
Poor	Poor	Poor	Poor
Very Poor	Very Poor	Very Poor	Very Poor

Liquid Observed Under Coating? [X] No [ ] Yes Sample Taken? [X] No [ ] Yes Sample ID #:

Under Coating pH: n/a

Color of Pipe Under Coating: Did not remove coating. Coating in good condition Coating Degradation Drawing Attached? [X] No [ ] Yes

Comments:

PIPE CONDITION

O.D.: 17 in.

Pipe Temperature: n/a °F

Wrinkle Bends? [X] No [ ] Yes

Joint Type:
- [ ] Weld
- [ ] Coupling
- [ ] Flange
- [ ] Monolithic Insulator
- [X] Bell and Spigot

Insulated? [X] No [ ] Yes

Wall Thickness*:
Direction: [X] Flow [ ] Increasing station

		Opposite Side of Girth Weld *If Applicable*
12 o'clock	n/a in.	in.
3 o'clock	n/a in.	in.
6 o'clock	n/a in.	in.
9 o'clock	n/a in.	in.

**For ICDA Examinations, document measurements on the Wall Thickness Measurement page.*

Seam Type:
- [X] No Seam
- [ ] Square Shoulder
- [ ] Round Shoulder
- [ ] Not Observed

Seam Orientation: o'clock

Direction:
- [ ] Increasing station
- [ ] Flow

Magnetic Particle Testing Performed?
- [ ] Yes*
- [X] No
- [ ] Passed
- [ ] Failed

**Attach Magnetic Particle Testing Report.*

PIPE CONDITION (Continued)

Pipe Cleaning Method: [ ] Hand Brush [ ] Mechanical Brush [ ] Sand Blast [ ] Other: None

Dents? [X] No [ ] Yes Depth: ____ mils Width: ____ in. Length: ____ in. Orientation: ____ o'clock

Gouges? [X] No [ ] Yes Depth: ____ mils Width: ____ in. Length: ____ in. Orientation: ____ o'clock

Other? [X] No [ ] Yes Depth: ____ mils Width: ____ in. Length: ____ in. Orientation: ____ o'clock

Photo Taken? [ ] No [X] Yes Drawing Completed and Attached? No Yes *Attach additional sheets as necessary*

Comments:

No surface corrosion observed.

EXTERNAL CORROSION

External Corrosion Observed? [X] No * [ ] Yes **Skip to Additional Comments Section to complete the inspection.*

Description of External Corrosion (mark all that apply)

- [ ] Dish or Cupped Shaped
- [ ] Pits within Pits
- [ ] Striations in Metal
- [ ] Perfectly Rounded
- [ ] Smooth Edges
- [ ] Sharp Edges
- [ ] Removal of Corrosion Product Leaves Shiny Surface
- [ ] Corrosion Product has Pasty Consistency (similar to liquid soap)

Corrosion Mapped and Attached? [X] No [ ] Yes Photo Taken? [ ] No [X] Yes

Corrosion Defect Table:

#	Distance Along Excavation	o'clock position	Max. Length	Max. Depth	#	Distance Along Excavation	o'clock position	Max. Length	Max. Depth
1					11				
2					12				
3					13				
4					14				
5					15				
6					16				
7					17				
8					18				
9					19				
10					20				

Corrosion Product Observed? [X] No [ ] Yes Sample Taken? [X] No [ ] Yes Sample ID #: ____

External Corrosion: [ ] Active [X] Inactive Corrosion Pit pH ____ n/a ____

MIC Observed or Suspected? [X] No [ ] Yes MIC Sample Taken? No [X] No [ ] Yes Sample ID #: ____

**Complete Form 90703 MIC Field Testing Data Collection*

Comments:

INTERNAL CORROSION

Internal Pipe Surface Exposed? [X] No * [ ] Yes ** If "NO," skip to Additional Comments Section to complete the inspection.*

Liquid Observed In Pipe? [X] n/a [ ] Yes Sample Taken? [ ] No [ ] Yes Sample ID #: ____

Quantity of Liquid Seen In Pipe? ____ gal ____ oz Type Of Liquid In Pipe? Water Oil Other: ____

Internal Corrosion Observed? [X] n/a [ ] Yes MIC Sample Taken? [ ] No [ ] Yes ID #: ____

Corrosion Product Observed? [X] n/a [ ] Yes Product Sample Taken? Yes [ ] No [ ] Yes ID #: ____

Most Severe Corrosion Seen At: Depth: ____ mils Length: ____ in. Orientation: ____ o'clock

Internal Corrosion: [X] n/a [ ] Inactive Photo Taken? [ ] No [ ] Yes

INTERNAL CORROSION (Continued)

Comments:

REPAIR

Pipe Repaired? [X] No [ ] Yes

Pipe Repair Method: [ ] Fill & Recoat Only [ ] Full Encirclement Sleeve [ ] Clock Spring [ ] Other _____

Comments:

No anode istalled due to high soil resistivity and good coating quality.

ADDITIONAL COMMENTS

Photos

Photo 1 - View of pipe segment joint

Photo 2 - Top side of pipe showing good coating

Photo 3 - Under side of pipe

Ron Turner

Name (Print)

Ron Turner

Name (Signature)

10/6/2010

Date (MM-DD-YYYY):

ENGINEERING ONLY

RSTRENG Program Assessment? [X] n/a [ ] Yes **Attach RSTRENG report.*

Max. Safe Pressure according to:	ASME B31G _____	Modified B31G _____	Effective Area Method _____
Burst Pressure according to:	ASME B31G _____	Modified B31G _____	Effective Area Method _____
Safety Factor according to:	ASME B31G _____	Modified B31G _____	Effective Area Method _____

RSTRENG Analysis Performed By:

ENengineering
excellence from start to finish

Pipeline Inspection Direct Examination

Form SI-0702 (rev. 00/00)

LOCATION

Date 8/23/2010 **Indication Number** 1300 S **Stationing** 13+00

Location Description Waukesha, WI - Pebble Valley Force Main - 43' SCL Hunting Ridge Rd. / 13' ECL Broken Hill Rd.

Latitude 43.036991 **Longitude** -88.265465

Purpose of Dig:
- [ ] ECDA Dig
- [ ] ICDA Dig
- [ ] Foreign Crossing
- [ ] ECDA Validation with Indication
- [ ] ICDA Validation
- [ ] Excavation Damage
- [ ] ECDA Validation with No Indication
- [X] Other: Anodic Indication / Cell-to-Cell Survey

Pipe Attributes:

Diameter 16" **W.T.** 0.4255" **MAOP** ____ **Grade** ____ **Class** ____ **Critical Angle** ____

SITE CONDITION

Line Location: [ ] Above Ground [ ] In Open Ditch [ ] Under Ground [X] Under Pavement

Land Use: [ ] Commercial [ ] Cultivated [ ] Industrial [X] Residential [ ] Pasture [ ] Wooded [ ] Other ____

Topography: [X] Level [ ] Rolling [ ] Incline [ ] Steep Incline

Drainage: [X] Good [ ] Fair [ ] Poor

Soil Moisture: [ ] Dry [X] Moist [ ] Saturated

Surface Soil Resistivity: n/a Ω-cm Collins Rod Probe Depth ____ in

Wenner 4-Pin Pin Spacing ____ ft Meter Reading ____ Number ____

Soil Box Multiplication Factor ____ Meter Reading ____ Number ____

Leak Inspection Performed? [X] No [ ] Yes Results: ____ Instrument Used: ____

Comments:

16" diameter ductile iron pipeline under Broken Hill Rd. ashpalt pavement.

EXCAVATION

Pipeline Depth to Top of Pipe: 78 in. Length of Bell Hole: 10 ft. Exposed Utility ? [ ] No [X] Yes (PVC storm dr

Ground Water? [X] No [ ] Yes Water Sample Taken? [X] No [ ] Yes Sample ID #: ____

Pipeline Inclination: Inclination Angle 0 degrees Ground Water pH ____

Confirmatory Inclination Measurement: Measured Elevation ____ in. Length of Level ____ in. Inclination Angle ____ degrees

Pipe to Soil At Grade: ____ volts Soil pH: 5.5

Pipe to Soil: At Indication		N S E W End of Bell Hole		N S E W End of Bell Hole	
12 o'clock	-0.470 volts	12 o'clock	volts	12 o'clock	volts
3 o'clock	volts	3 o'clock	volts	3 o'clock	volts
6 o'clock	volts	6 o'clock	volts	6 o'clock	volts
9 o'clock	volts	9 o'clock	volts	9 o'clock	volts

Bell Hole Soil Resistivity: 2,250 Ω-cm Collins Rod Probe Depth at pipe in Bell Hole Conductivity 0.000444 mho

Soil Moisture: [ ] Dry [X] Moist [ ] Saturated Soil Sample Taken? [ ] No [X] Yes Sample ID #: PV 1300 S

Soil Type Layers: *Use only when classifying soil in the field*

Depth	Rock %	Silt %	Sand %	Loam %	Gravel %	Clay %
at pipe in.	5	0	20	0	50	5
in.						
in.						

Comments:

Some ground water encountered during excavation below pipe depth.
Pipe originally backfilled with gravel mix used in making concrete (i.e. #6 gravel with finer screenings). Same type of backfill used to re-fill excavation.

COATING CONDITION

Metal Exposed? [ ] No [X] Yes Location Descriptiion: general surface corrosion along exposed section of pipe / concretion on pipe

Coating Defect Table: Sketch Completed? [X] No [ ] Yes

#	Distance Along Excavation	o'clock position	Length	Width	#	Distance Along Excavation	o'clock position	Length	Width
1					11				
2					12				
3					13				
4					14				
5					15				
6					16				
7					17				
8					18				
9					19				
10					20				

Weld Exposed? [X] n/a [ ] Yes Weld Coating Type: n/a Weld Coating Condition: n/a

Pipe Coating - Type:
- [ ] Bare
- [X] Coated
- [X] Coal Tar Enamel
- [ ] Coal Tar Enamel Reinforced
- [ ] Extruded Polyethylene (Yellow Jacket)
- [ ] FBE
- [ ] Thin Film
- [ ] Mastic
- [ ] Paint (Above Ground)
- [ ] Paint (Below Ground)
- [ ] Paint High Temp (Above Ground)
- [ ] PE Tape Cold Applied with Primer
- [ ] PE Tape Line Travel
- [ ] Pre 2000 Wax
- [ ] Post 1999 Wax
- [ ] Composite
- [ ] Fiberglass
- [ ] Unknown
- [ ] Other _____

Pipe - Material
- [ ] Steel
- [ ] PVC
- [ ] Poly
- [ ] Unknown
- [X] D.I.

Pipe Coating - Thickness:
Direction: [X] Flow [ ] Increasing station

12 o'clock	10	mils
3 o'clock	10	mils
6 o'clock	10	mils
9 o'clock	10	mils

Pipe Coating - Foreign Object Penetration:
Direction: [ ] Increasing station [X] Flow

12 o'clock	3 o'clock	6 o'clock	9 o'clock
Yes	Yes	Yes	Yes
No	No	No	No
N/A	N/A	N/A	N/A
Unknown	Unknown	Unknown	Unknown

Pipe Coating - Bond:
Direction: [ ] Increasing station [X] Flow

12 o'clock	3 o'clock	6 o'clock	9 o'clock
Excellent	Excellent	Excellent	Excellent
Good	Good	Good	Good
Fair	Fair	Fair	Fair
Poor	Poor	Poor	Poor
Very Poor	Very Poor	Very Poor	Very Poor

Liquid Observed Under Coating? [X] No [ ] Yes Sample Taken? [X] No [ ] Yes Sample ID #: _____

Under Coating pH: n/a

Color of Pipe Under Coating: white metal / some pitting 0.050-0.1 in. depth Coating Degradation Drawing Attached? [X] No [ ] Yes

Comments:

PIPE CONDITION

O.D.: 17 in.

Pipe Temperature: n/a °F

Wrinkle Bends? [X] No [ ] Yes

Joint Type:
- [ ] Weld
- [ ] Coupling
- [ ] Flange
- [ ] Monolithic Insulator
- [X] Bell and Spigot

Insulated? [X] No [ ] Yes

Wall Thickness*:
Direction: [X] Flow [ ] Increasing station

		Opposite Side of Girth Weld *If Applicable*
12 o'clock	0.350 in.	_____ in.
3 o'clock	0.355 in.	_____ in.
6 o'clock	0.362 in.	_____ in.
9 o'clock	0.351 in.	_____ in.

**For ICDA Examinations, document measurements on the Wall Thickness Measurement page.*

Seam Type:
- [X] No Seam
- [ ] Square Shoulder
- [ ] Round Shoulder
- [ ] Not Observed

Seam Orientation: _____ o'clock

Direction:
- [ ] Increasing station
- [ ] Flow

Magnetic Particle Testing Performed?
- [ ] Yes* [ ] Passed
- [X] No [ ] Failed

**Attach Magnetic Particle Testing Report.*

PIPE CONDITION (Continued)

Pipe Cleaning Method: [ ] Hand Brush [ ] Mechanical Brush [ ] Sand Blast [X] Other: Scraper

Dents? [X] No [ ] Yes Depth: ____ mils Width: ____ in. Length: ____ in. Orientation: ____ o'clock

Gouges? [X] No [ ] Yes Depth: ____ mils Width: ____ in. Length: ____ in. Orientation: ____ o'clock

Other? [X] No [ ] Yes Depth: ____ mils Width: ____ in. Length: ____ in. Orientation: ____ o'clock

Photo Taken? [ ] No [X] Yes Drawing Completed and Attached? No Yes *Attach additional sheets as necessary*

Comments:

General surface pitting when coating is removed. Pit depth 0.02 - 0.80. Pits remain filled with coating material.
General surface corrosion under gravel concretions attached to pipe.

EXTERNAL CORROSION

External Corrosion Observed? [ ] No * [X] Yes **Skip to Additional Comments Section to complete the inspection.*

Description of External Corrosion (mark all that apply)

- [ ] Dish or Cupped Shaped
- [ ] Pits within Pits
- [ ] Striations in Metal
- [ ] Perfectly Rounded
- [ ] Smooth Edges
- [ ] Sharp Edges
- [X] Removal of Corrosion Product Leaves Shiny Surface
- [ ] Corrosion Product has Pasty Consistency (similar to liquid soap)

Corrosion Mapped and Attached? [X] No [ ] Yes Photo Taken? [ ] No [X] Yes

Corrosion Defect Table:

#	Distance Along Excavation	o'clock position	Max. Length	Max. Depth	#	Distance Along Excavation	o'clock position	Max. Length	Max. Depth
1					11				
2					12				
3					13				
4					14				
5					15				
6					16				
7					17				
8					18				
9					19				
10					20				

Corrosion Product Observed? [ ] No [X] Yes Sample Taken? [X] No [ ] Yes Sample ID #: ____

External Corrosion: [ ] Active [X] Inactive Corrosion Pit pH n/a

MIC Observed or Suspected? [X] No [ ] Yes MIC Sample Taken? No [X] No [ ] Yes Sample ID #: ____

**Complete Form 90703 MIC Field Testing Data Collection*

Comments:

Some shallow generalized pitting observed when coating is removed.

INTERNAL CORROSION

Internal Pipe Surface Exposed? [X] No * [ ] Yes ** If "NO," skip to Additional Comments Section to complete the inspection.*

Liquid Observed In Pipe? [X] n/a [ ] Yes Sample Taken? [ ] No [ ] Yes Sample ID #: ____

Quantity of Liquid Seen In Pipe? ____ gal ____ oz Type Of Liquid In Pipe? Water Oil Other: ____

Internal Corrosion Observed? [X] n/a [ ] Yes MIC Sample Taken? [ ] No [ ] Yes ID #: ____

Corrosion Product Observed? [X] n/a [ ] Yes Product Sample Taken? Yes [ ] No [ ] Yes ID #: ____

Most Severe Corrosion Seen At: Depth: ____ mils Length: ____ in. Orientation: ____ o'clock

Internal Corrosion: [X] n/a [ ] Inactive Photo Taken? [ ] No [ ] Yes

INTERNAL CORROSION (Continued)

Comments:

REPAIR

Pipe Repaired? [X] No [ ] Yes

Pipe Repair Method: [ ] Fill & Recoat Only [ ] Full Encirclement Sleeve
[ ] Clock Spring [X] Other 17 lb. H-1 magnesium anode attached to pipeline as "hot spot" protection

Comments:

ADDITIONAL COMMENTS

Some pitting was observed when the coating was removed. The pH was measured versus an antimony cell. The pH measurement was recorded in soil atthe bottom of the exposed pipeline. Anodic indication occurred at point where plastic storm drain was in contact with the top of the force main. There was surface corrosion and minimal pitting at the storm drain location.

Photos

Photo 1 - Plastic storm drain on force main

Photo 2 - Corroded area beneath plastic storm drain pipe

Photo 3 - Pitting on pipe under coating

Ron Turner

Name (Print)

Ron Turner

Name (Signature)

10/6/2010

Date (MM-DD-YYYY):

ENGINEERING ONLY

RSTRENG Program Assessment? [X] n/a [ ] Yes **Attach RSTRENG report.*

Max. Safe Pressure according to:	ASME B31G _____	Modified B31G _____	Effective Area Method _____
Burst Pressure according to:	ASME B31G _____	Modified B31G _____	Effective Area Method _____
Safety Factor according to:	ASME B31G _____	Modified B31G _____	Effective Area Method _____

RSTRENG Analysis Performed By:

ENengineering
excellence from start to finish

Pipeline Inspection Direct Examination

Form SI-0702 (rev. 00/00)

LOCATION

Date 8/23/2010 **Indication Number** 2780 S **Stationing** 27+80

Location Description Waukesha, WI - Pebble Valley Force Main - 198'ECL Emslie Dr. / 6' NCL Broken Hill Rd.

Latitude 43.033051 **Longitude** -88.265785

Purpose of Dig:
- [ ] ECDA Dig
- [ ] ICDA Dig
- [ ] Foreign Crossing
- [ ] ECDA Validation with Indication
- [ ] ICDA Validation
- [ ] Excavation Damage
- [ ] ECDA Validation with No Indication
- [X] Other: Anodic Indication / Cell-to-Cell Survey

Pipe Attributes:

Diameter 16" **W.T.** 0.4255" **MAOP** ____ **Grade** ____ **Class** ____ **Critical Angle** ____

SITE CONDITION

Line Location: [ ] Above Ground [ ] In Open Ditch [ ] Under Ground [X] Under Pavement

Land Use: [ ] Commercial [ ] Cultivated [ ] Industrial [X] Residential [ ] Pasture [ ] Wooded [ ] Other ____

Topography: [X] Level [ ] Rolling [ ] Incline [ ] Steep Incline

Drainage: [X] Good [ ] Fair [ ] Poor

Soil Moisture: [ ] Dry [X] Moist [ ] Saturated

Surface Soil Resistivity: n/a Ω-cm Collins Rod Probe Depth ____ in

Wenner 4-Pin Pin Spacing ____ ft Meter Reading ____ Number ____

Soil Box Multiplication Factor ____ Meter Reading ____ Number ____

Leak Inspection Performed? [X] No [ ] Yes Results: ____ Instrument Used: ____

Comments:

16" diameter ductile iron pipeline under Broken Hill Rd. ashpalt pavement. S. of 90 degree pipe bend.

EXCAVATION

Pipeline Depth to Top of Pipe: 84 in. Length of Bell Hole: 15 ft. Exposed Utility ? [X] No [ ] Yes

Ground Water? [X] No [ ] Yes Water Sample Taken? [X] No [ ] Yes Sample ID #: ____

Pipeline Inclination: Inclination Angle 0 degrees Ground Water pH ____

Confirmatory Inclination Measurement: Measured Elevation ____ in. Length of Level ____ in. Inclination Angle ____ degrees

Pipe to Soil At Grade: ____ volts Soil pH: 5.5

Pipe to Soil:

At Indication		N S E W End of Bell Hole		N S E W End of Bell Hole	
12 o'clock	-0.577 volts	12 o'clock	____ volts	12 o'clock	____ volts
3 o'clock	____ volts	3 o'clock	____ volts	3 o'clock	____ volts
6 o'clock	____ volts	6 o'clock	____ volts	6 o'clock	____ volts
9 o'clock	____ volts	9 o'clock	____ volts	9 o'clock	____ volts

Bell Hole Soil Resistivity: 1,500 Ω-cm Collins Rod Probe Depth at pipe in Bell Hole Conductivity 0.000667 mho

Soil Moisture: [ ] Dry [X] Moist [ ] Saturated Soil Sample Taken? [ ] No [X] Yes Sample ID #: PV 2780 S

Soil Type Layers: *Use only when classifying soil in the field*

Depth	Rock %	Silt %	Sand %	Loam %	Gravel %	Clay %
at pipe in.	5	0	20	0	50	5
____ in.	____	____	____	____	____	____
____ in.	____	____	____	____	____	____

Comments:

Some ground water encountered during excavation below pipe depth.
Pipe originally backfilled with gravel mix used in making concrete (i.e. #6 gravel with finer screenings). Same type of backfill used to re-fill excavation.

COATING CONDITION

Metal Exposed? [ ] No [X] Yes Location Descriptiion: general surface corrosion along exposed section of pipe / concretion on pipe

Coating Defect Table: Sketch Completed? [X] No [ ] Yes

#	Distance Along Excavation	o'clock position	Length	Width	#	Distance Along Excavation	o'clock position	Length	Width
1					11				
2					12				
3					13				
4					14				
5					15				
6					16				
7					17				
8					18				
9					19				
10					20				

Weld Exposed? [X] n/a [ ] Yes Weld Coating Type: n/a Weld Coating Condition: n/a

Pipe Coating - Type:
- [ ] Bare
- [X] Coated
- [X] Coal Tar Enamel
- [ ] Coal Tar Enamel Reinforced
- [ ] Extruded Polyethylene (Yellow Jacket)
- [ ] FBE
- [ ] Thin Film
- [ ] Mastic
- [ ] Paint (Above Ground)
- [ ] Paint (Below Ground)
- [ ] Paint High Temp (Above Ground)
- [ ] PE Tape Cold Applied with Primer
- [ ] PE Tape Line Travel
- [ ] Pre 2000 Wax
- [ ] Post 1999 Wax
- [ ] Composite
- [ ] Fiberglass
- [ ] Unknown
- [ ] Other

Pipe - Material
- [ ] Steel
- [ ] PVC
- [ ] Poly
- [ ] Unknown
- [X] D.I.

Pipe Coating - Thickness:
Direction: [X] Flow [ ] Increasing station

12 o'clock	10	mils
3 o'clock	10	mils
6 o'clock	10	mils
9 o'clock	10	mils

Pipe Coating - Foreign Object Penetration:
Direction: [ ] Increasing station [X] Flow

12 o'clock	3 o'clock	6 o'clock	9 o'clock
Yes	Yes	Yes	Yes
No	No	No	No
N/A	N/A	N/A	N/A
Unknown	Unknown	Unknown	Unknown

Pipe Coating - Bond:
Direction: [ ] Increasing station [X] Flow

12 o'clock	3 o'clock	6 o'clock	9 o'clock
Excellent	Excellent	Excellent	Excellent
Good	Good	Good	Good
Fair	Fair	Fair	Fair
Poor	Poor	Poor	Poor
Very Poor	Very Poor	Very Poor	Very Poor

Liquid Observed Under Coating? [X] No [ ] Yes Sample Taken? [X] No [ ] Yes Sample ID #: _____

Under Coating pH: n/a

Color of Pipe Under Coating: white metal / some pitting 0.050-0.1 in. depth Coating Degradation Drawing Attached? [X] No [ ] Yes

Comments:

Coating appears to have absorbed some moisture.

PIPE CONDITION

O.D.: 17 in.

Pipe Temperature: n/a °F

Wrinkle Bends? [X] No [ ] Yes

Joint Type:
- [ ] Weld
- [ ] Coupling
- [ ] Flange
- [ ] Monolithic Insulator
- [X] Bell and Spigot

Insulated? [X] No [ ] Yes

Wall Thickness*:
Direction: [X] Flow [ ] Increasing station

			Opposite Side of Girth Weld *If Applicable*
12 o'clock	0.361	in.	in.
3 o'clock	0.360	in.	in.
6 o'clock	0.357	in.	in.
9 o'clock	n/a	in.	in.

**For ICDA Examinations, document measurements on the Wall Thickness Measurement page.*

Seam Type:
- [X] No Seam
- [ ] Square Shoulder
- [ ] Round Shoulder
- [ ] Not Observed

Seam Orientation: _____ o'clock

Direction:
- [ ] Increasing station
- [ ] Flow

Magnetic Particle Testing Performed?
- [ ] Yes* [ ] Passed
- [X] No [ ] Failed

**Attach Magnetic Particle Testing Report.*

PIPE CONDITION (Continued)

Pipe Cleaning Method: [ ] Hand Brush [ ] Mechanical Brush [ ] Sand Blast [X] Other: Scraper

Dents? [X] No [ ] Yes Depth: ____ mils Width: ____ in. Length: ____ in. Orientation: ____ o'clock

Gouges? [X] No [ ] Yes Depth: ____ mils Width: ____ in. Length: ____ in. Orientation: ____ o'clock

Other? [X] No [ ] Yes Depth: ____ mils Width: ____ in. Length: ____ in. Orientation: ____ o'clock

Photo Taken? [ ] No [X] Yes Drawing Completed and Attached? No Yes *Attach additional sheets as necessary*

Comments:

General surface pitting when coating is removed. Pit depth 0.05 - 0.90. Pits remain filled with coating material.
General surface corrosion under gravel concretions attached to pipe. No significant pitting observed on pipeline at this location.

EXTERNAL CORROSION

External Corrosion Observed? [ ] No * [X] Yes **Skip to Additional Comments Section to complete the inspection.*

Description of External Corrosion (mark all that apply)

- [ ] Dish or Cupped Shaped
- [ ] Pits within Pits
- [ ] Striations in Metal
- [ ] Perfectly Rounded
- [ ] Smooth Edges
- [ ] Sharp Edges
- [X] Removal of Corrosion Product Leaves Shiny Surface
- [ ] Corrosion Product has Pasty Consistency (similar to liquid soap)

Corrosion Mapped and Attached? [X] No [ ] Yes Photo Taken? [ ] No [X] Yes

Corrosion Defect Table:

#	Distance Along Excavation	o'clock position	Max. Length	Max. Depth	#	Distance Along Excavation	o'clock position	Max. Length	Max. Depth
1					11				
2					12				
3					13				
4					14				
5					15				
6					16				
7					17				
8					18				
9					19				
10					20				

Corrosion Product Observed? [ ] No [X] Yes Sample Taken? [X] No [ ] Yes Sample ID #: ____

External Corrosion: [ ] Active [X] Inactive Corrosion Pit pH ____ n/a ____

MIC Observed or Suspected? [X] No [ ] Yes MIC Sample Taken? No [X] No [ ] Yes Sample ID #: ____

**Complete Form 90703 MIC Field Testing Data Collection*

Comments:

Some shallow generalized pitting observed when coating is removed.
Piping protected by gravel concretion adhering to the pipeline.

INTERNAL CORROSION

Internal Pipe Surface Exposed? [X] No * [ ] Yes ** If "NO," skip to Additional Comments Section to complete the inspection.*

Liquid Observed In Pipe? [X] n/a [ ] Yes Sample Taken? [ ] No [ ] Yes Sample ID #: ____

Quantity of Liquid Seen In Pipe? ____ gal ____ oz Type Of Liquid In Pipe? Water Oil Other: ____

Internal Corrosion Observed? [X] n/a [ ] Yes MIC Sample Taken? [ ] No [ ] Yes ID #: ____

Corrosion Product Observed? [X] n/a [ ] Yes Product Sample Taken? Yes [ ] No [ ] Yes ID #: ____

Most Severe Corrosion Seen At: Depth: ____ mils Length: ____ in. Orientation: ____ o'clock

Internal Corrosion: [X] n/a [ ] Inactive Photo Taken? [ ] No [ ] Yes

INTERNAL CORROSION (Continued)

Comments:

REPAIR

Pipe Repaired? [X] No [ ] Yes

Pipe Repair Method: [ ] Fill & Recoat Only [ ] Full Encirclement Sleeve
[ ] Clock Spring [X] Other 17 lb. H-1 magnesium anode attached to pipeline as "hot spot" protection

Comments:

Some minor pitting was observed when coating was removed. The pH was measured versus an antimony cell.
The pH measurement was recorded in soil at the bottom of the exposed pipeline.
Photo 1 shows coating chipped during excavation. These are not pits.

ADDITIONAL COMMENTS

Photos

Photo 1 - Scraped coating and gravel concretion on pipe surface

Photo 2 - General corrosion on pipe surface

Photo 3 - Gravel concretion adhering to pipe surface

Ron Turner

Name (Print)

Name (Signature)

10/6/2010

Date (MM-DD-YYYY):

ENGINEERING ONLY

RSTRENG Program Assessment? [X] n/a [ ] Yes **Attach RSTRENG report.*

Max. Safe Pressure according to:	ASME B31G _____	Modified B31G _____	Effective Area Method _____
Burst Pressure according to:	ASME B31G _____	Modified B31G _____	Effective Area Method _____
Safety Factor according to:	ASME B31G _____	Modified B31G _____	Effective Area Method _____

RSTRENG Analysis Performed By:

ENengineering
excellence from start to finish

Pipeline Inspection Direct Examination

Form SI-0702 (rev. 00/00)

LOCATION

Date 8/23/2010 **Indication Number** 3250 P **Stationing** 32+50

Location Description Waukesha, WI - Pebble Valley Force Main - Centerline of Northview Rd.

Latitude 43.032043 **Longitude** -88.265877

Purpose of Dig:
- [ ] ECDA Dig
- [ ] ICDA Dig
- [ ] Foreign Crossing
- [ ] ECDA Validation with Indication
- [ ] ICDA Validation
- [ ] Excavation Damage
- [ ] ECDA Validation with No Indication
- [X] Other: Anodic Indication / Cell-to-Cell Survey

Pipe Attributes:

Diameter 16" **W.T.** 0.4255" **MAOP** ____ **Grade** ____ **Class** ____ **Critical Angle** ____

SITE CONDITION

Line Location: [ ] Above Ground [ ] In Open Ditch [ ] Under Ground [X] Under Pavement

Land Use: [ ] Commercial [ ] Cultivated [ ] Industrial [X] Residential [ ] Pasture [ ] Wooded [ ] Other ____

Topography: [X] Level [ ] Rolling [ ] Incline [ ] Steep Incline

Drainage: [X] Good [ ] Fair [ ] Poor

Soil Moisture: [ ] Dry [X] Moist [ ] Saturated

Surface Soil Resistivity: n/a Ω-cm Collins Rod Probe Depth ____ in

Wenner 4-Pin Pin Spacing ____ ft Meter Reading ____ Number ____

Soil Box Multiplication Factor ____ Meter Reading ____ Number ____

Leak Inspection Performed? [X] No [ ] Yes Results: ____ Instrument Used: ____

Comments:

16" diameter ductile iron pipeline under Broken Hill Rd. ashpalt pavement. S. of 90 degree pipe bend.

EXCAVATION

Pipeline Depth to Top of Pipe: 74 in. Length of Bell Hole: 15 ft. Exposed Utility ? [X] No [ ] Yes

Ground Water? [X] No [ ] Yes Water Sample Taken? [X] No [ ] Yes Sample ID #: ____

Pipeline Inclination: Inclination Angle 0 degrees Ground Water pH ____

Confirmatory Inclination Measurement: Measured Elevation ____ in. Length of Level ____ in. Inclination Angle ____ degrees

Pipe to Soil At Grade: ____ volts Soil pH: 5.5

Pipe to Soil:

At Indication		N S E W End of Bell Hole		N S E W End of Bell Hole	
12 o'clock	-0.589 volts	12 o'clock	____ volts	12 o'clock	____ volts
3 o'clock	____ volts	3 o'clock	____ volts	3 o'clock	____ volts
6 o'clock	____ volts	6 o'clock	____ volts	6 o'clock	____ volts
9 o'clock	____ volts	9 o'clock	____ volts	9 o'clock	____ volts

Bell Hole Soil Resistivity: 1,800 Ω-cm Collins Rod Probe Depth at pipe in Bell Hole Conductivity 0.000667 mho

Soil Moisture: [ ] Dry [X] Moist [ ] Saturated Soil Sample Taken? [ ] No [X] Yes Sample ID #: PV 3250 P

Soil Type Layers: *Use only when classifying soil in the field*

Depth	Rock %	Silt %	Sand %	Loam %	Gravel %	Clay %
at pipe in.	5	0	20	0	50	5
____ in.	____	____	____	____	____	____
____ in.	____	____	____	____	____	____

Comments:

Dry excavation. No ground water encountered during the excavation.
Pipe originally backfilled with gravel mix used in making concrete (i.e. #6 gravel with finer screenings). Same type of backfill used to re-fill excavation.

COATING CONDITION

Metal Exposed? [ ] No [X] Yes Location Descriptiion: general surface corrosion along exposed section of pipe / concretion on pipe

Coating Defect Table: Sketch Completed? [X] No [ ] Yes

#	Distance Along Excavation	o'clock position	Length	Width	#	Distance Along Excavation	o'clock position	Length	Width
1					11				
2					12				
3					13				
4					14				
5					15				
6					16				
7					17				
8					18				
9					19				
10					20				

Weld Exposed? [X] n/a [ ] Yes Weld Coating Type: n/a Weld Coating Condition: n/a

Pipe Coating - Type:
- [ ] Bare
- [X] Coated
- [X] Coal Tar Enamel
- [ ] Coal Tar Enamel Reinforced
- [ ] Extruded Polyethylene (Yellow Jacket)
- [ ] FBE
- [ ] Thin Film
- [ ] Mastic
- [ ] Paint (Above Ground)
- [ ] Paint (Below Ground)
- [ ] Paint High Temp (Above Ground)
- [ ] PE Tape Cold Applied with Primer
- [ ] PE Tape Line Travel
- [ ] Pre 2000 Wax
- [ ] Post 1999 Wax
- [ ] Composite
- [ ] Fiberglass
- [ ] Unknown
- [ ] Other

Pipe - Material
- [ ] Steel
- [ ] PVC
- [ ] Poly
- [ ] Unknown
- [X] D.I.

Pipe Coating - Thickness:
Direction: [X] Flow [ ] Increasing station

12 o'clock	10	mils
3 o'clock	10	mils
6 o'clock	10	mils
9 o'clock	10	mils

Pipe Coating - Foreign Object Penetration:
Direction: [ ] Increasing station [X] Flow

12 o'clock	3 o'clock	6 o'clock	9 o'clock
Yes	Yes	Yes	Yes
No	No	No	No
N/A	N/A	N/A	N/A
Unknown	Unknown	Unknown	Unknown

Pipe Coating - Bond:
Direction: [ ] Increasing station [X] Flow

12 o'clock	3 o'clock	6 o'clock	9 o'clock
Excellent	Excellent	Excellent	Excellent
Good	Good	Good	Good
Fair	Fair	Fair	Fair
Poor	Poor	Poor	Poor
Very Poor	Very Poor	Very Poor	Very Poor

Liquid Observed Under Coating? [X] No [ ] Yes Sample Taken? [X] No [ ] Yes Sample ID #: _____

Under Coating pH: n/a

Color of Pipe Under Coating: n/a (did not dislodge coating Coating Degradation Drawing Attached? [X] No [ ] Yes

Comments:

PIPE CONDITION

O.D.: 17 in.

Pipe Temperature: n/a °F

Wrinkle Bends? [X] No [ ] Yes

Joint Type:
- [ ] Weld
- [ ] Coupling
- [ ] Flange
- [ ] Monolithic Insulator
- [X] Bell and Spigot

Insulated? [X] No [ ] Yes

Wall Thickness*:
Direction: [X] Flow [ ] Increasing station

		Opposite Side of Girth Weld *If Applicable*
12 o'clock	n/a in.	____ in.
3 o'clock	n/a in.	____ in.
6 o'clock	n/a in.	____ in.
9 o'clock	n/a in.	____ in.

**For ICDA Examinations, document measurements on the Wall Thickness Measurement page.*

Seam Type:
- [X] No Seam
- [ ] Square Shoulder
- [ ] Round Shoulder
- [ ] Not Observed

Seam Orientation: ____ o'clock

Direction:
- [ ] Increasing station
- [ ] Flow

Magnetic Particle Testing Performed?
- [ ] Yes* [ ] Passed
- [X] No [ ] Failed

**Attach Magnetic Particle Testing Report.*

PIPE CONDITION (Continued)

Pipe Cleaning Method: [ ] Hand Brush [ ] Mechanical Brush [ ] Sand Blast [X] Other: Scraper

Dents? [X] No [ ] Yes Depth: ____ mils Width: ____ in. Length: ____ in. Orientation: ____ o'clock

Gouges? [X] No [ ] Yes Depth: ____ mils Width: ____ in. Length: ____ in. Orientation: ____ o'clock

Other? [X] No [ ] Yes Depth: ____ mils Width: ____ in. Length: ____ in. Orientation: ____ o'clock

Photo Taken? [ ] No [X] Yes Drawing Completed and Attached? No Yes *Attach additional sheets as necessary*

Comments:

General surface pitting when coating is removed. Pit depth 0.05 - 0.90. Pits remain filled with coating material.
General surface corrosion under gravel concretions attached to pipe. No significant pitting observed on pipeline at this location.

EXTERNAL CORROSION

External Corrosion Observed? [ ] No * [X] Yes **Skip to Additional Comments Section to complete the inspection.*

Description of External Corrosion (mark all that apply)

- [ ] Dish or Cupped Shaped
- [ ] Pits within Pits
- [ ] Striations in Metal
- [ ] Perfectly Rounded
- [ ] Smooth Edges
- [ ] Sharp Edges
- [X] Removal of Corrosion Product Leaves Shiny Surface
- [ ] Corrosion Product has Pasty Consistency (similar to liquid soap)

Corrosion Mapped and Attached? [X] No [ ] Yes Photo Taken? [ ] No [X] Yes

Corrosion Defect Table:

#	Distance Along Excavation	o'clock position	Max. Length	Max. Depth	#	Distance Along Excavation	o'clock position	Max. Length	Max. Depth
1					11				
2					12				
3					13				
4					14				
5					15				
6					16				
7					17				
8					18				
9					19				
10					20				

Corrosion Product Observed? [ ] No [X] Yes Sample Taken? [X] No [ ] Yes Sample ID #: ____

External Corrosion: [ ] Active [X] Inactive Corrosion Pit pH ____ n/a ____

MIC Observed or Suspected? [X] No [ ] Yes MIC Sample Taken? No [X] No [ ] Yes Sample ID #: ____

**Complete Form 90703 MIC Field Testing Data Collection*

Comments:

Some shallow generalized pitting observed when coating is removed.
Piping protected by gravel concretion adhering to the pipeline.

INTERNAL CORROSION

Internal Pipe Surface Exposed? [X] No * [ ] Yes ** If "NO," skip to Additional Comments Section to complete the inspection.*

Liquid Observed In Pipe? [X] n/a [ ] Yes Sample Taken? [ ] No [ ] Yes Sample ID #: ____

Quantity of Liquid Seen In Pipe? ____ gal ____ oz Type Of Liquid In Pipe? Water Oil Other: ____

Internal Corrosion Observed? [X] n/a [ ] Yes MIC Sample Taken? [ ] No [ ] Yes ID #: ____

Corrosion Product Observed? [X] n/a [ ] Yes Product Sample Taken? Yes [ ] No [ ] Yes ID #: ____

Most Severe Corrosion Seen At: Depth: ____ mils Length: ____ in. Orientation: ____ o'clock

Internal Corrosion: [X] n/a [ ] Inactive Photo Taken? [ ] No [ ] Yes

INTERNAL CORROSION (Continued)

Comments:

REPAIR

Pipe Repaired? [X] No [ ] Yes

Pipe Repair Method: [ ] Fill & Recoat Only [ ] Full Encirclement Sleeve
[ ] Clock Spring [X] Other 17 lb. H-1 magnesium anode attached to pipeline as "hot spot" protection

Comments:

Some minor pitting was observed when coating was removed. The pH was measured versus an antimony cell.
The pH measurement was recorded in soil at the bottom of the exposed pipeline.
Photo 1 shows a 1/2" diameter location with missing coating. General corrosion exists at this location

ADDITIONAL COMMENTS

Photos

Photo 1 - Exposed pipe 1/2" dia. 0.050 pit depth at lost coating location

Photo 2 - Gravel concretion adhering to pipe

Photo 3 - Anode installed and surrounded by soil

Ron Turner

Name (Print)

Ron Turner

Name (Signature)

10/6/2010

Date (MM-DD-YYYY):

ENGINEERING ONLY

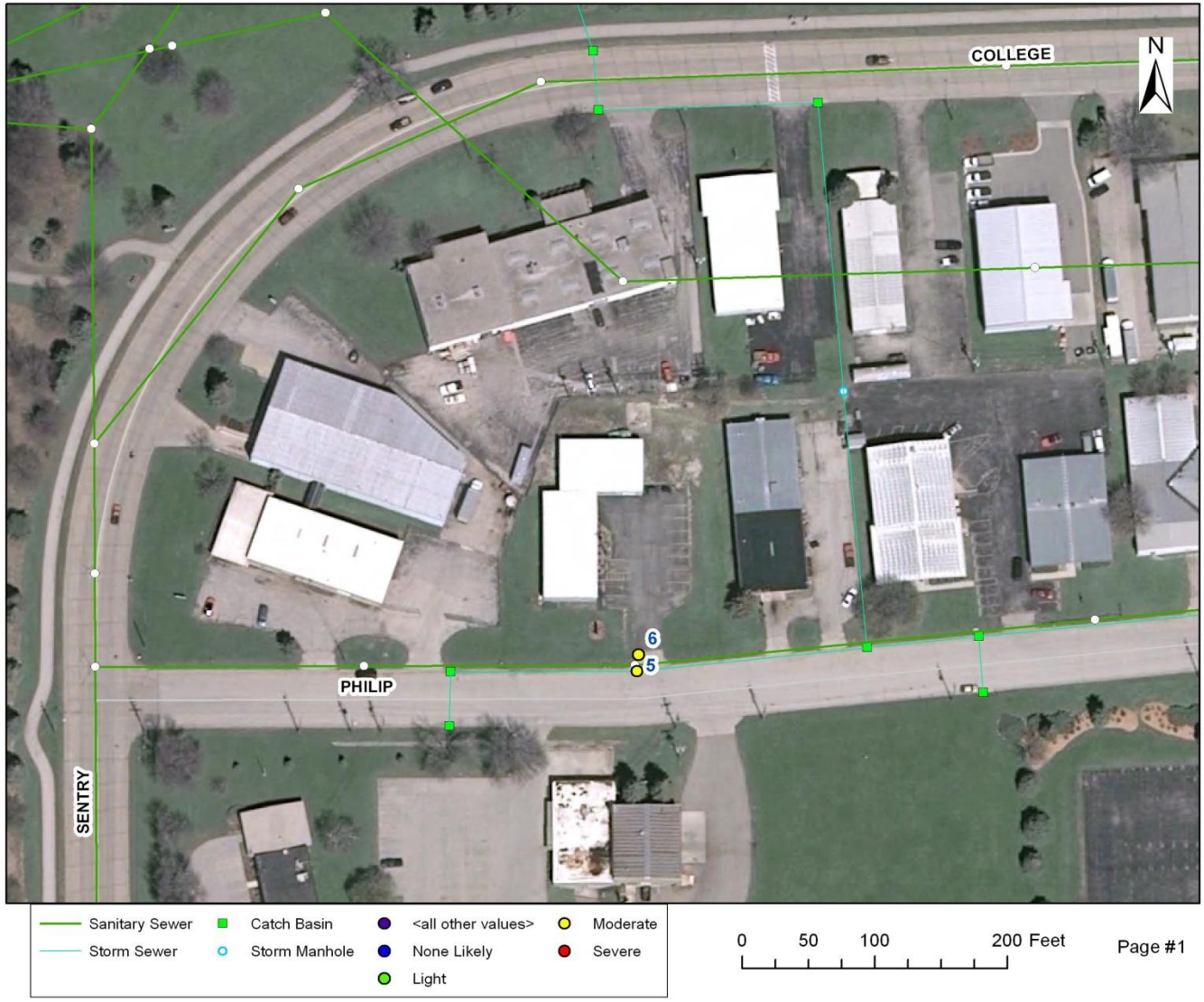
RSTRENG Program Assessment? [X] n/a [ ] Yes **Attach RSTRENG report.*

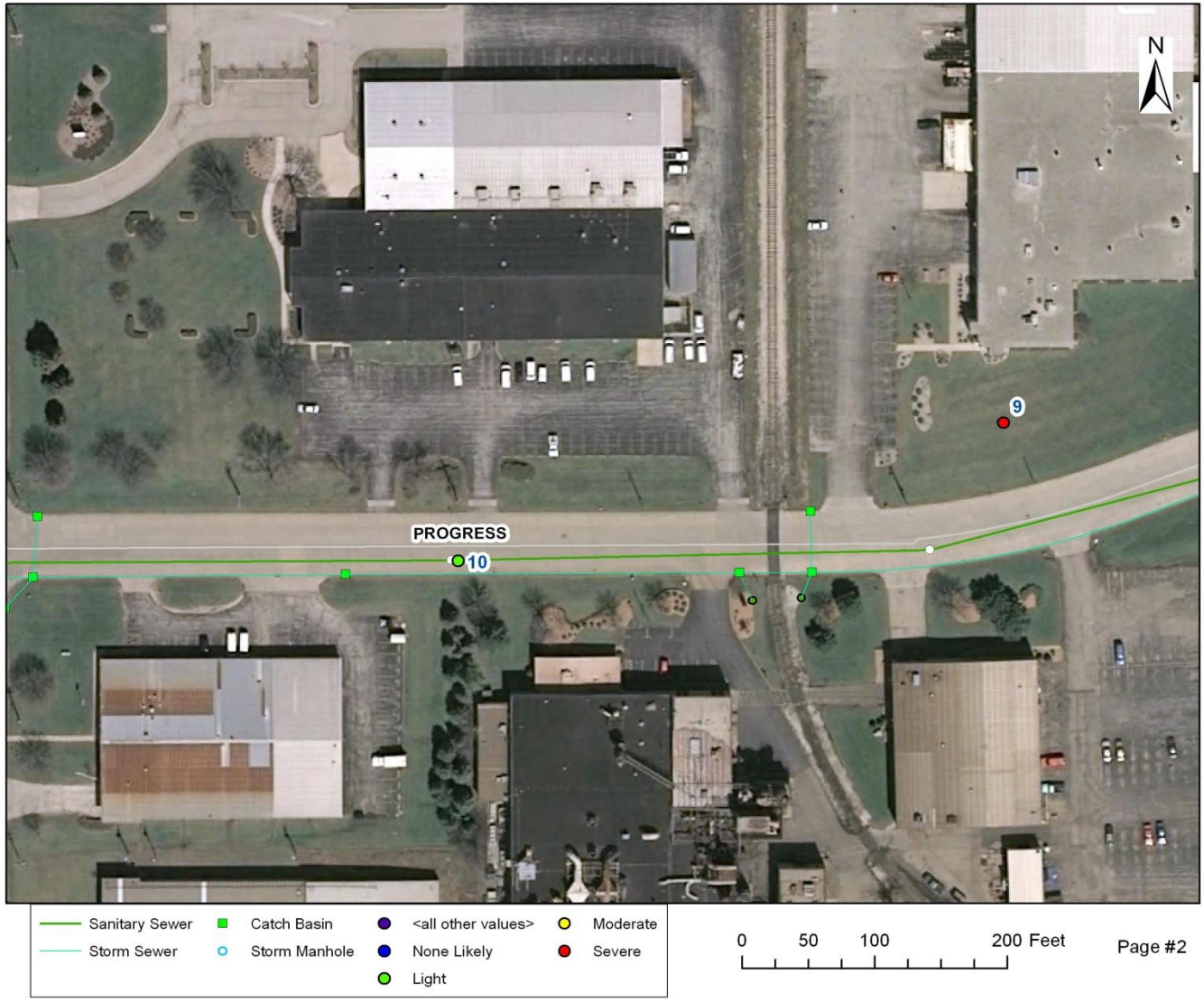
Max. Safe Pressure according to:	ASME B31G _____	Modified B31G _____	Effective Area Method _____
Burst Pressure according to:	ASME B31G _____	Modified B31G _____	Effective Area Method _____
Safety Factor according to:	ASME B31G _____	Modified B31G _____	Effective Area Method _____

RSTRENG Analysis Performed By:

Appendix B

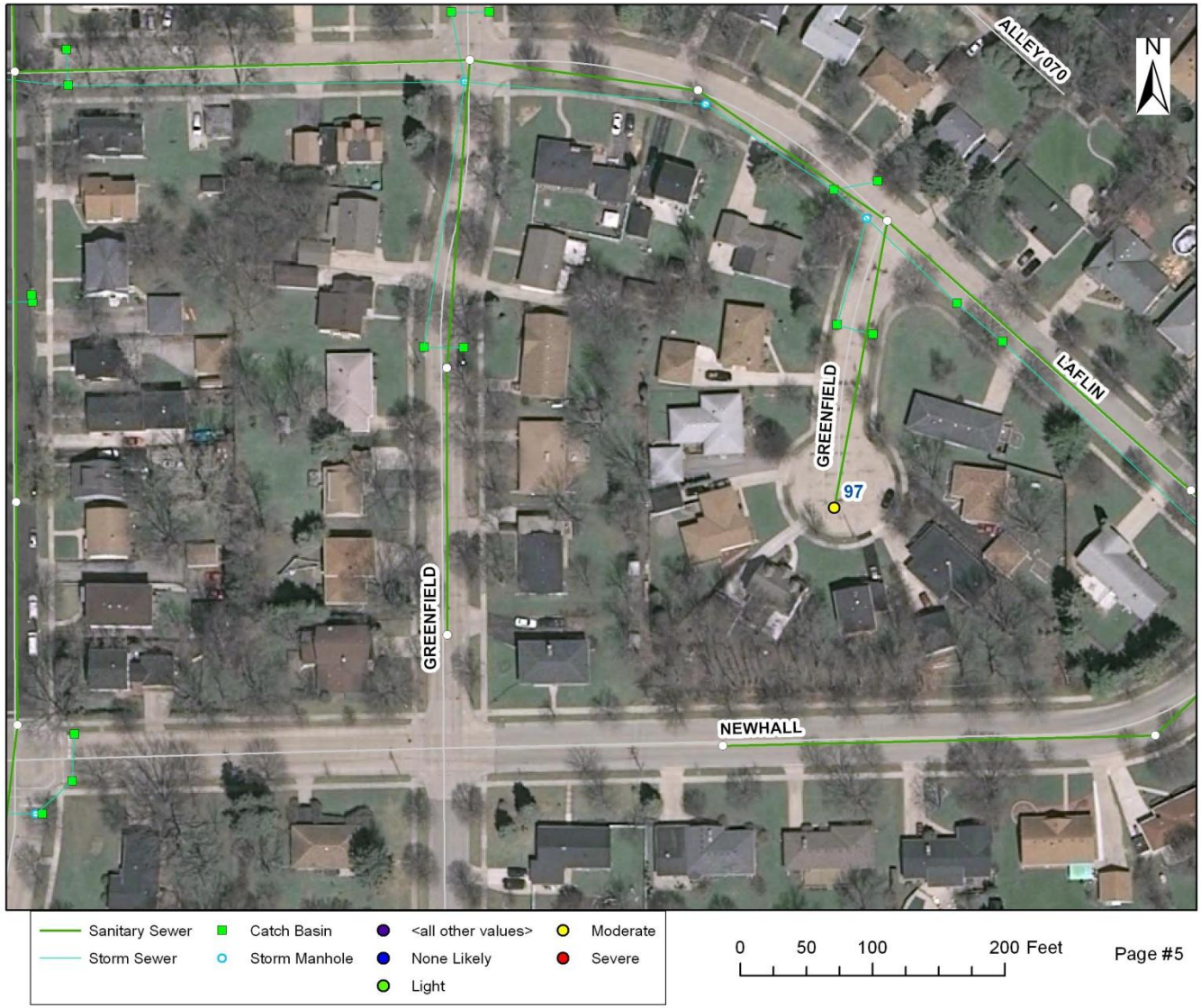
Defect Location Maps


COLLEGE
N
PHILIP
SENTRY
6
5
Sanitary Sewer
Storm Sewer
Catch Basin
Storm Manhole
<all other values>
None Likely
Light
Moderate
Severe
0
50
100
200 Feet
Page #1


N
PROGRESS
10
9
Sanitary Sewer
Storm Sewer
Catch Basin
Storm Manhole
<all other values>
None Likely
Light
Moderate
Severe
0
50
100
200 Feet
Page #2

PROGRESS AVE
12
11
Sanitary Sewer
Storm Sewer
Catch Basin
Storm Manhole
<all other values>
None Likely
Light
Moderate
Severe
0
50
100
200 Feet
Page #3

ROBERTA
GARFIELD
COOLIDGE
8
EAST
HOOVER
N
Sanitary Sewer
Storm Sewer
Catch Basin
Storm Manhole
<all other values>
None Likely
Light
Moderate
Severe
0
50
100
200 Feet
Page #4

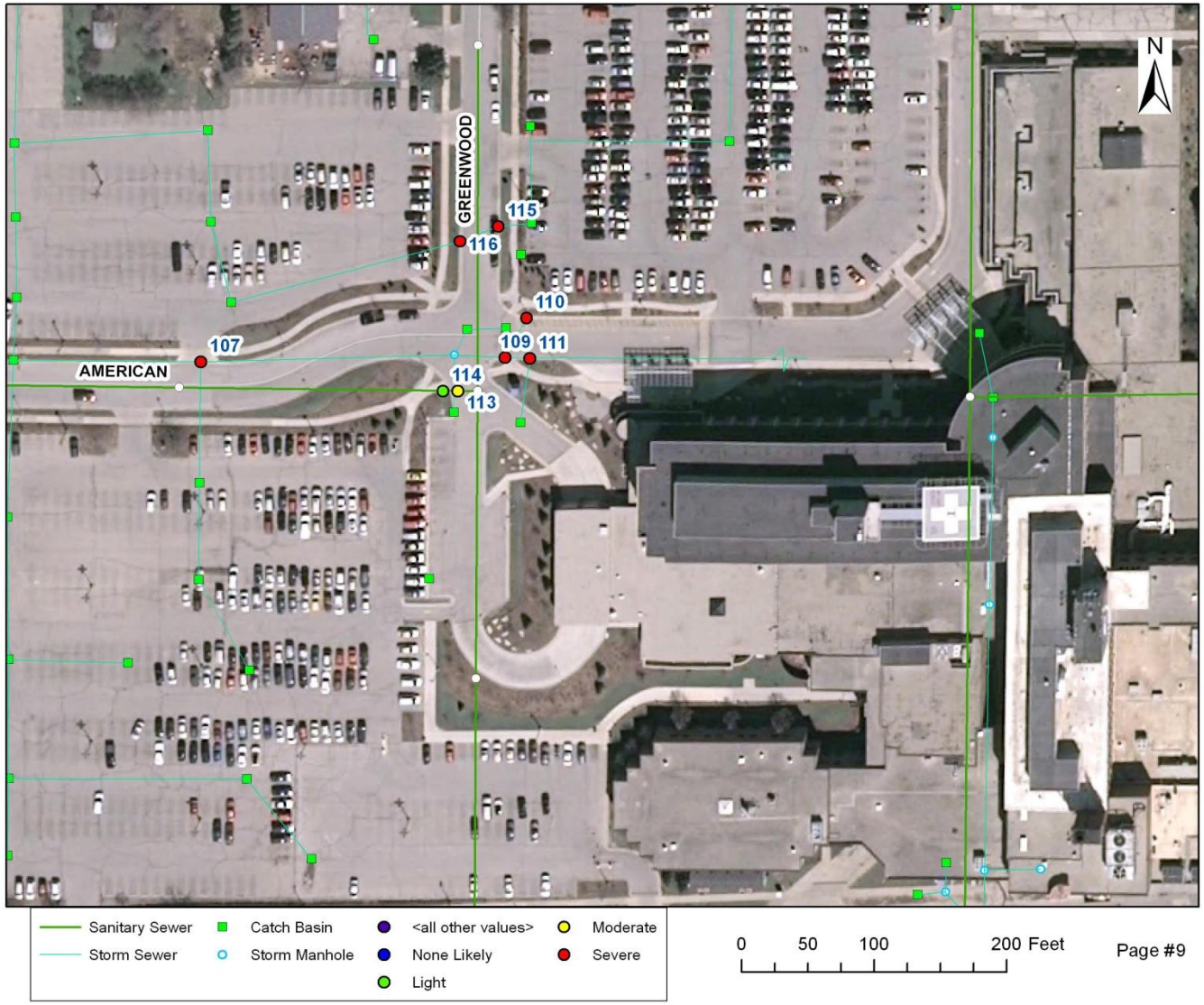

ALLEY 070
N
LAFLIN
GREENFIELD
97
GREENFIELD
NEWHALL
Sanitary Sewer
Storm Sewer
Catch Basin
Storm Manhole
<all other values>
None Likely
Light
Moderate
Severe
0
50
100
200 Feet
Page #5

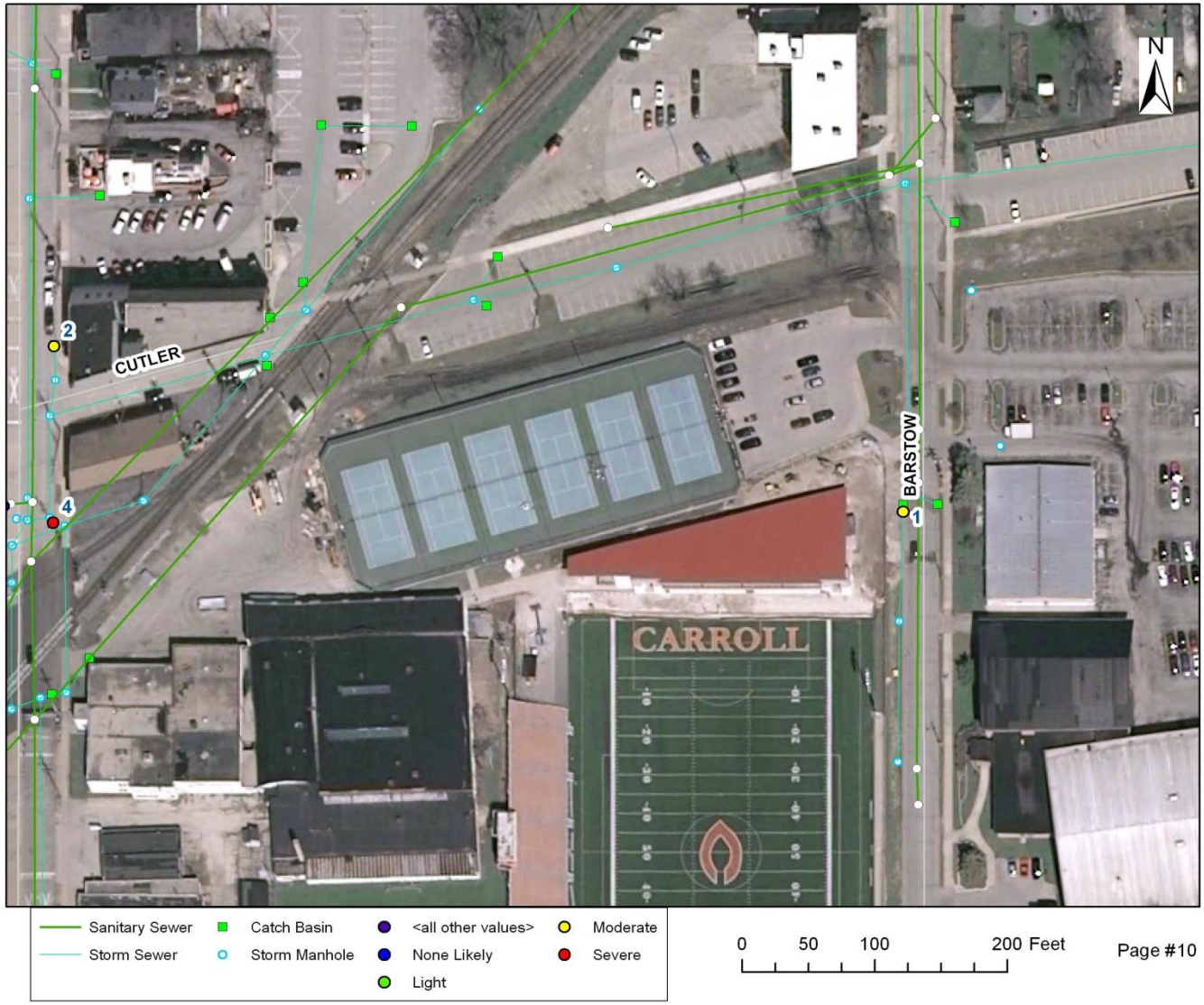
HILLSIDE
ALLEY 071
PORTER
HARRIS
96
N
Sanitary Sewer
Storm Sewer
Catch Basin
Storm Manhole
<all other values>
None Likely
Light
Moderate
Severe
0
50
100
200 Feet

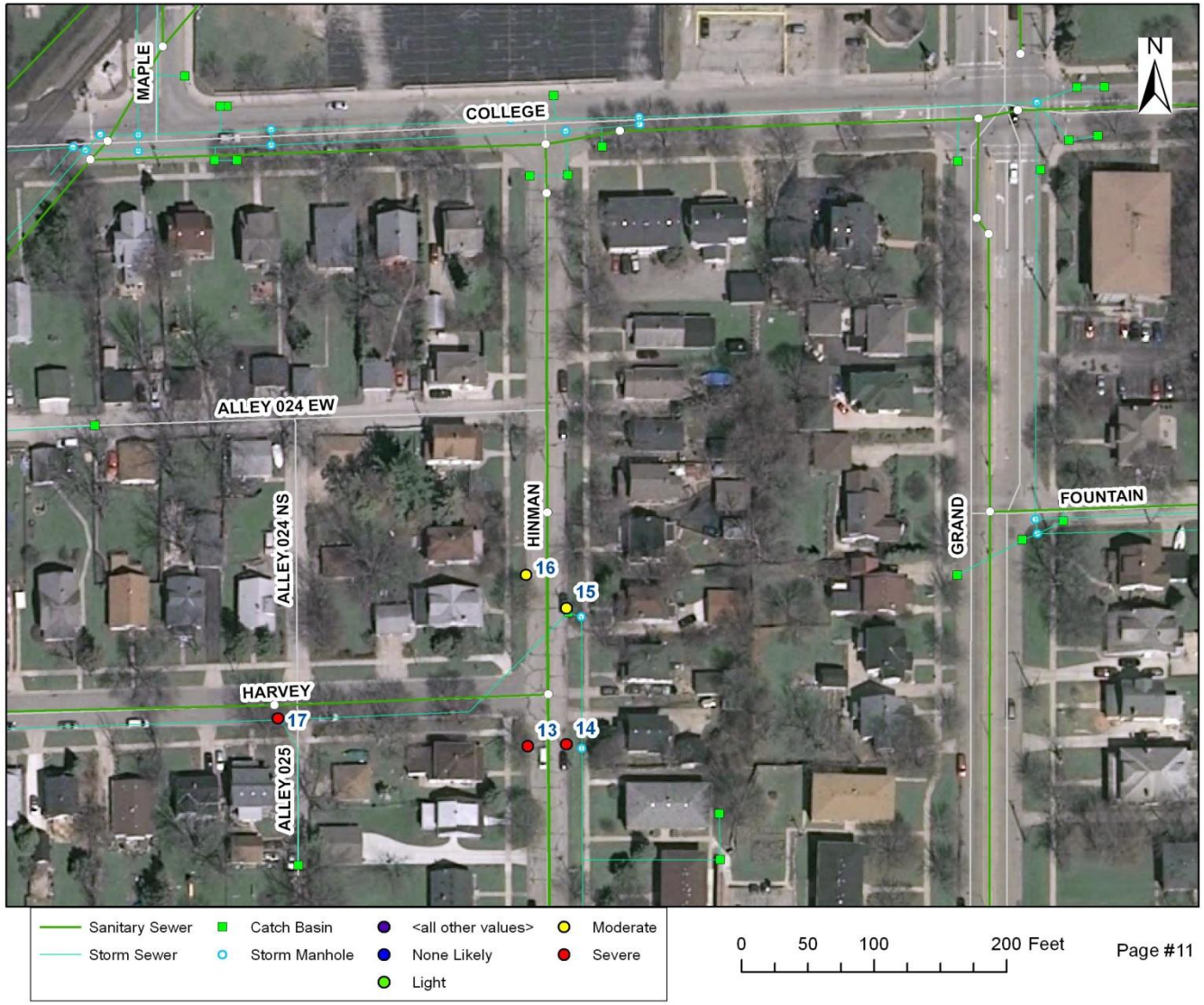
Page #6

BIDDLE ST
PEARL ST
MIDLAND AVE
ELLIS ST
93
94
95
Sanitary Sewer
Storm Sewer
Catch Basin
Storm Manhole
<all other values>
None Likely
Light
Moderate
Severe
0
50
100
200 Feet
Page #7

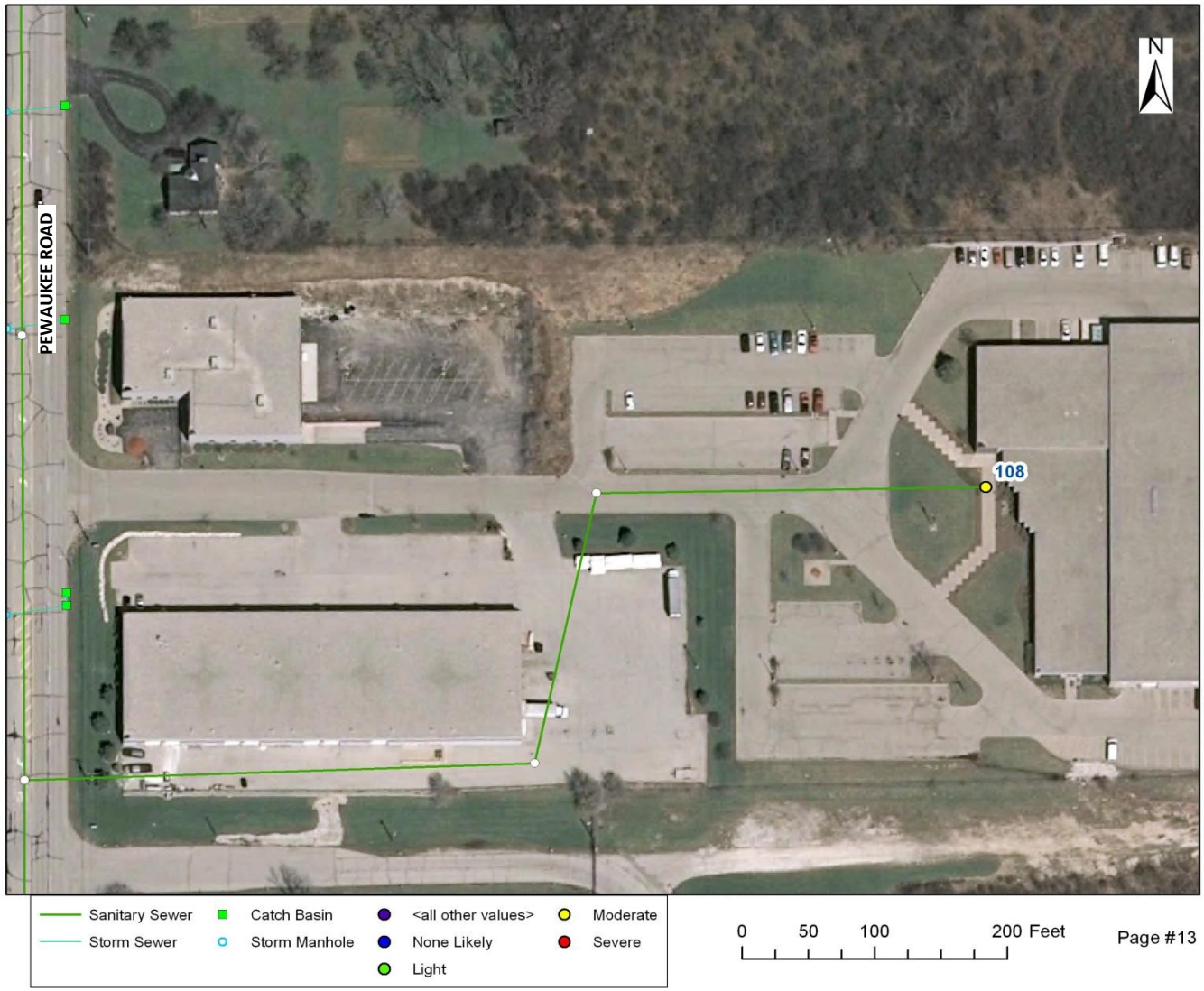
N
ST PAUL
COMMERCE
91
92
ELLIS
Sanitary Sewer
Storm Sewer
Catch Basin
Storm Manhole
<all other values>
None Likely
Light
Moderate
Severe
0
50
100
200 Feet
Page #8


N
GREENWOOD
AMERICAN
115
116
110
109
111
107
114
113
Sanitary Sewer
Storm Sewer
Catch Basin
Storm Manhole
<all other values>
None Likely
Light
Moderate
Severe
0
50
100
200 Feet
Page #9


N
CUTLER
BARSTOW
CARROLL
2
4
1
Sanitary Sewer
Storm Sewer
Catch Basin
Storm Manhole
<all other values>
None Likely
Light
Moderate
Severe
0
50
100
200 Feet
Page #10


MAPLE
COLLEGE
ALLEY 024 EW
ALLEY 024 NS
HINMAN
GRAND
FOUNTAIN
HARVEY
ALLEY 025
16
15
17
13
14
N
Sanitary Sewer
Storm Sewer
Catch Basin
Storm Manhole
<all other values>
None Likely
Light
Moderate
Severe
0
50
100
200 Feet
Page #11

N
99
MOREY
MORELAND
101
NORTH
100
Sanitary Sewer
Storm Sewer
Catch Basin
Storm Manhole
<all other values>
None Likely
Light
Moderate
Severe
0
50
100
200 Feet
Page #12


PEWAUKEE ROAD
108
N
Sanitary Sewer
Storm Sewer
Catch Basin
Storm Manhole
<all other values>
None Likely
Light
Moderate
Severe
0 50 100 200 Feet
Page #13

UNIVERSITY
UNIVERSITY
FIELDING
85
84
PRIVATE
PRIVATE
CREST
N
Sanitary Sewer
Storm Sewer
Catch Basin
Storm Manhole
<all other values>
None Likely
Light
Moderate
Severe
0
50
100
200 Feet
Page #14

N
PRIVATE
PRIVATE
PRIVATE
86
UNIVERSITY
ROLLING RIDGE
YORKSHIRE
Sanitary Sewer
Storm Sewer
Catch Basin
Storm Manhole
<all other values>
None Likely
Light
Moderate
Severe
0
50
100
200 Feet
Page #15

BAXTER
WHITE ROCK
LOMBARDI
PHOENIX
7
N
Sanitary Sewer
Storm Sewer
Catch Basin
Storm Manhole
<all other values>
None Likely
Light
Moderate
Severe
0
50
100
200 Feet
Page #16

Appendix C

Smoke Testing Defect Photos

Defect 1

Defect 2

Defect 3

Defect 4

Defect 5

Defect 6

Defect 7

Defect 8

Defect 9

Defect 10

Defect 11

Defect 12

Defect 13

Defect 14

Defect 15

Defect 16

Defect 17

Defect 18

Defect 84

Defect 85

Defect 86

Defect 91

Defect 92

Defect 93

Defect 94

Defect 95

Defect 96

Defect 97

Defect 99

Defect 100

Defect 101

Defect 107

CAUTION
DRIVE
SLOWLY

NEENAH FOUNDRY CO
DUCTILE IRON
USA
NEENAH FOUNDRY CO
USA

Defect 108

Defect 109

Defect 110

Defect 111

Defect 113

Defect 114

Appendix D

Manhole Condition and Characteristics

Appendix D
Manhole Condition Assessment

Manhole Identifier						Physical Condition/Characteristics															
Manhole ID	Invert Elevation	Rim Elevation	Manhole Depth	Street	On 30 Day List?	Surface Cover	Surface Cracking	Frame Condition	Cover Condition	Cover Gasket Condition	Chimney Material	Chimney Seal Condition	Chimney Defects	Chimney Height (in)	Chimney Height (ft)	Cone Material	Cone Defects	Barrel Material	Barrel Defects	Bench Condition	Invert Condition
12		91.66	91.66	Delefield St		Concrete	Minor	Good	Good	None	PreCast Concrete	None	None	28	2.33	Precast Concrete	none	Precast Concrete	None	Good	Good
25			10	Delefield St		Concrete	Minor	Good	Good	None	PreCast Concrete	None	None	14	1.17	Block	none	Block	None	Good	Good
26	48.85	56.04	7.19	Delefield St		Concrete	Minor	Good	Good	None	PreCast Concrete	None	None	6	0.50	Block	none	Block	None	Good	Good
30			10	Mary St		Concrete	Severe	Good	Good	None	PreCast Concrete	None	Loose Mortar	9	0.75	Precast Concrete	none	Precast Concrete	None	Good	Good
31			10	South St		Asphalt	Minor	Good	Good	None	Block	None	Loose Mortar	14	1.17	Precast Concrete	none	Precast Concrete	None	No Lateral Trough	Good
32	30.07	38.06	7.99	MapleAvenue and Williams Street	√	Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	24	2.00	Precast Concrete	none	Precast Concrete	None	Good	Good
33	14.54	19	4.46	Dunbar Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	3	0.25	Precast Concrete	none	Precast Concrete	None	Good	Good
46	81.15	89.15	8	Barstow St		Asphalt	Fair	Worn	Good	None	Brick	None	Missing Brick	10	0.83	Brick	Missing Brick	Brick	Bad Joint	Good	Good
48	78.32	86.32	8	Barstow St		Asphalt	Fair	Good	Good	None	PreCast Concrete	None	Cracked	3	0.25	Precast Concrete	Cracked	Precast Concrete	None	Good	Good
49	90.52	97	6.48	Barstow St		Asphalt	Fair	Good	Good	None	PreCast Concrete	None	None	2	0.17	Precast Concrete	none	Precast Concrete	None	No Lateral Trough	Good
50	87.22	96.5	9.28	Barstow St		Asphalt	Fair	Good	Good	None	PreCast Concrete	None	None	13	1.08	Precast Concrete	none	Precast Concrete	None	Good	Good
51	82.58	90	7.42	Barstow St and Buena Vista Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	Loose Mortar	12	1.00	Precast Concrete	none	Precast Concrete	None	Good	Good
52			10	Barstow St		Concrete	Minor	Good	Good	None	PreCast Concrete	None	None	8	0.67	Precast Concrete	none	Precast Concrete	None	Good	Good
53	32.76	39.06	6.3	Barstow St and North Ave		Concrete	Minor	Good	Good	None	PreCast Concrete	None	Missing Brick	9	0.75	Precast Concrete	none	Precast Concrete	None	Good	Good
54		31	31	Barstow St and Bank St		Concrete	Minor	Good	Good	None	PreCast Concrete	None	None	12	1.00	Precast Concrete	none	Precast Concrete	None	Good	Good
55	23.8	32	8.2	Barstow St		Concrete	Minor	Good	Good	None	PreCast Concrete	None	Cracked	14	1.17	Precast Concrete	none	Precast Concrete	None	No Lateral Trough	Poor
56	29.5	36.8	7.3	Barstow St		Grass	Minor	Good	Good	None	PreCast Concrete	None	Cracked	3	0.25	Precast Concrete	none	Precast Concrete	None	Good	Good
60			10	Woodward Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	10	0.83	Precast Concrete	Cracked	Precast Concrete	None	No Lateral Trough	Good
61			10	Woodward Ave		Asphalt	Minor	Good	Good	None	Block	None	Loose Mortar	10	0.83	Block	none	Block	None	Good	Good
62			10	Colton St		Asphalt	Minor	Worn	Worn	None	Brick	None	Missing Brick	25	2.08	Brick	Loose Mortar	Brick	Loose Mortar	No Lateral Trough	Poor
67	60		10	Linden St		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	40	3.33	Precast Concrete	none	Precast Concrete	None	Good	Good
68	54.55		10	Linden St		Asphalt	Fair	Cracked	Good	None	PreCast Concrete	None	Loose Mortar	13	1.08	Precast Concrete	none	Precast Concrete	None	Good	Good
69	53.92		10	Linden St		Asphalt	Minor	Good	Good	Good	PreCast Concrete	None	None	17	1.42	Precast Concrete	none	Precast Concrete	None	Good	Good
70	57.27		10	Linden St		Asphalt	Severe	Good	Good	None	Brick	None	Missing Brick	20	1.67	Brick	none	Brick	Cracked	See Comments	Poor

Appendix D
Manhole Condition Assessment

Manhole Identifier						Physical Condition/Characteristics															
Manhole ID	Invert Elevation	Rim Elevation	Manhole Depth	Street	On 30 Day List?	Surface Cover	Surface Cracking	Frame Condition	Cover Condition	Cover Gasket Condition	Chimney Material	Chimney Seal Condition	Chimney Defects	Chimney Height (in)	Chimney Height (ft)	Cone Material	Cone Defects	Barrel Material	Barrel Defects	Bench Condition	Invert Condition
72	63.25	73.99	10.74	Greenfield Ave and Lincoln Ave		Asphalt	Fair	Good	Good	None	Block	None	None	14	1.17	Precast Concrete	none	Block	None	Good	Good
75	37.77	44.95	7.18	Caroline St		Asphalt	Fair	Good	Good	None	PreCast Concrete	None	Cracked	12	1.00	Precast Concrete	none	Precast Concrete	None	Good	Good
80	86.04	97.3	11.26	Cheviat Chase		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	12	1.00	Precast Concrete	Other	Precast Concrete	None	Good	Good
86	75.3	82.14	6.84	Pearl Stt and Midland Ave	√	Concrete	Minor	Good	Good	None	PreCast Concrete	None	None	14	1.17	Precast Concrete	none	Precast Concrete	None	Good	Good
88	73.12	80.09	6.97	Pearl St and Frederick St	√	Asphalt	Severe	Good	Good	None	Block	None	Missing Brick	13	1.08	Block	Loose Mortar	Block	Loose Mortar	Good	Good
89	70.13	77.08	6.95	Pearl St		Asphalt	Minor	Good	Good	None	Block	None	None	14	1.17	Block	none	Block	None	Good	Good
98			10	Greenfield Ave		Asphalt	Fair	Good	Worn	None	Block	None	Missing Brick	16	1.33	Block	none	Block	None	Good	Good
134	51.38	61.59	10.21	1221 Chippewa Drive		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	17	1.42	Precast Concrete	None	Precast Concrete	None	Good	Fair
381	21.8	30.78	8.98	905 School Drive		Asphalt	Minor	Good	Good	Good	PreCast Concrete	None	None	5	0.42	Precast Concrete	None	Precast Concrete	None	Good	Good
419			10	Fairview Ave	√	Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	18	1.50	Precast Concrete	none	Precast Concrete	None	Good	Good
420	82.72	90.52	7.8	Mountain Ave		Asphalt	Fair	Good	Good	None	Block	None	None	16	1.33	Block	none	Block	None	No Trough	Fair
421	160.8		10	Mountain St		Asphalt	Severe	Good	Good	None	PreCast Concrete	None	None	6	0.50	Precast Concrete	none	Precast Concrete	None	No Lateral Trough	Good
425	128.34	135.82	7.48	Fairview Ave		Asphalt	Minor	Good	Good	Good	PreCast Concrete	None	None	5	0.42	Precast Concrete	none	Precast Concrete	None	Good	Good
428	128		10	Caldwell Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	13	1.08	Precast Concrete	none	Precast Concrete	None	Good	Good
429		165	165	Caldwell Ave		Asphalt	Fair	Good	Good	Good	PreCast Concrete	None	None	3	0.25	Precast Concrete	none	Precast Concrete	None	No Lateral Trough	Good
430	143.2		10	Fairview Ave and Lawndale Ave		Asphalt	Fair	Good	Good	Good	PreCast Concrete	None	Missing Brick	4	0.33	Precast Concrete	none	Precast Concrete	None	Good	Good
438	148.21	154.84	6.63	Mountain Ave		Asphalt	Fair	Good	Good	Good	PreCast Concrete	None	None	15	1.25	Precast Concrete	none	Precast Concrete	None	Good	Good
481		31.87	31.87	Buckly Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	7	0.58	Precast Concrete	none	Precast Concrete	None	Good	Good
482	26.37	32.07	5.7	Corrina Ave and Buckly St		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	9	0.75	Precast Concrete	none	Precast Concrete	None	Good	Good
499	75.19	83.6	8.41	115 Douglass Ave		Concrete	Minor	Worn	Good	None	Brick	None	Loose Mortar	6	0.50	Brick	Other	Brick	Loose Mortar	Good	Fair
505	70.72	80.83	10.11	134 Fountain St		Asphalt	Minor	Worn	Good	None	PreCast Concrete	None	None	5	0.42	Block	Loose Mortar	Block	None	Good	Good
511	71.15	78.15	7	East Avenue and Laflin Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	16	1.33	Precast Concrete	none	Precast Concrete	None	Good	Good
512		90.35	90.35	Laflin Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	10	0.83	Precast Concrete	Other	Precast Concrete	Bad Joint	Fair	Good
513	63		10	Laflin Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	15	1.25	Precast Concrete	Other	Precast Concrete	Bad Joint	Good	Good

Appendix D
Manhole Condition Assessment

Manhole Identifier						Physical Condition/Characteristics															
Manhole ID	Invert Elevation	Rim Elevation	Manhole Depth	Street	On 30 Day List?	Surface Cover	Surface Cracking	Frame Condition	Cover Condition	Cover Gasket Condition	Chimney Material	Chimney Seal Condition	Chimney Defects	Chimney Height (in)	Chimney Height (ft)	Cone Material	Cone Defects	Barrel Material	Barrel Defects	Bench Condition	Invert Condition
515	57.5	65	7.5	Fountain Ave		Asphalt	Fair	Good	Good	Good	Block	None	Loose Mortar	8	0.67	Block	none	Block	None	Good	Good
516	56.54	68.75	12.21	Laflin Ave		Asphalt	Minor	Cracked	Cracked	None	PreCast Concrete	None	None	8	0.67	Precast Concrete	Other	Precast Concrete	Bad Joint	Good	Good
517	59	68.5	9.5	Laflin Ave and Garfield Ave		Asphalt	Fair	Good	Good	None	PreCast Concrete	None	Cracked	30	2.50	Precast Concrete	Other	Precast Concrete	Bad Joint	Good	Good
538	20.29	32.76	12.47	Walton Ave		Asphalt	Minor	Good	Good	None	Block	None	None	6	0.50	Block	none	Block	None	Good	Good
541	21.34	31.55	10.21	Luke Ave and Born Pl	√	Asphalt	Minor	Good	Good	Good	Brick	None	Missing Brick	15	1.25	Block	Other	Block	None	Good	Good
549	71.65	79.27	7.62	Douglass Ave and Grand Ave	√	Concrete	Fair	Worn	Good	None	PreCast Concrete	None	None	11	0.92	Precast Concrete	Other	Precast Concrete	Bad Joint	Good	Good
551			10	Wabash Ave		Asphalt	Minor	Worn	Good	None	Brick	None	Loose Mortar	5	0.42	Block	Loose Mortar	Block	None	Good	Good
553	68.35	76.6	8.25	Grand Ave and Wabash Ave		Gravel	Minor	Good	Good	Good	PreCast Concrete	Good	Loose Mortar	13	1.08	Precast Concrete	Other	Precast Concrete	None	Good	Good
554	70.65	99.6	28.95	224 W Wabash Ave		Asphalt	Minor	Worn	Good	None	PreCast Concrete	None	Cracked	4	0.33	Block	Other	Block	None	Good	Good
596	76.91	82.78	5.87	214 Hoover Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	13	1.08	Precast Concrete	None	Precast Concrete	None	No Trough	Fair
597	81.15	90.68	9.53	Hickory Drive North and Hoover Ave	√	Concrete	Fair	Good	Good	None	Brick	None	Missing Brick	7	0.58	Block	None	Block	Bad Joint	Fair	Good
602	88.02	89.36	1.34	College St and Charles St	√	Asphalt	Minor	Good	Good	None	PreCast Concrete	None	Loose Mortar	15	1.25	Precast Concrete	none	Precast Concrete	None	Good	Good
603	79.4	85.75	6.35	East Avenue and Newhall Ave		Asphalt	Fair	Good	Good	None	PreCast Concrete	None	Cracked	15	1.25	Precast Concrete	none	Precast Concrete	Bad Joint	Good	Good
644			10	Hartwell Ave		Concrete	Fair	Good	Worn	None	Block	None	Cracked	25	2.08	Block	none	Precast Concrete	None	Good	Good
646	43.49	53.96	10.47	Barney Street	√	Asphalt	Fair	Good	Good	None	PreCast Concrete	None	None	5	0.42	Precast Concrete	none	Precast Concrete	None	Good	Good
647	37.26	44.76	7.5	504 Barney Street		Asphalt	Minor	Worn	Good	None	PreCast Concrete	None	None	2	0.17	Precast Concrete	none	Precast Concrete	Bad Joint	Good	Good
648			10	Mccall Street		Asphalt	Minor	Cracked	Good	Good	PreCast Concrete	None	Loose Mortar	26	2.17	Precast Concrete	none	Precast Concrete	None	Good	Good
649			10	James St		Asphalt	Minor	Worn	Good	None	PreCast Concrete	None	None	16	1.33	Precast Concrete	Other	Precast Concrete	None	Good	Good
650	83.53	91.6	8.07	lLaflin Ave and James St		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	10	0.83	Precast Concrete	Other	Precast Concrete	Bad Joint	Good	Good
653	85.02	92.68	7.66	College St		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	8	0.67	Precast Concrete	none	Precast Concrete	None	Good	Good
654	79.48	87.28	7.8	College St		Asphalt	Minor	Good	Good	None	Brick	None	None	13	1.08	Precast Concrete	none	Precast Concrete	None	Good	Good
655			10	College St		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	20	1.67	Precast Concrete	none	Precast Concrete	None	Good	Good
656	73.33	82	8.67	College St		Asphalt	Minor	Good	Good	None	Block	None	None	16	1.33	Block	none	Block	None	Good	Good
657	69.43	78.6	9.17	College St and Barstow St		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	6	0.50	Precast Concrete	none	Precast Concrete	None	Good	Good

Appendix D
Manhole Condition Assessment

Manhole Identifier						Physical Condition/Characteristics															
Manhole ID	Invert Elevation	Rim Elevation	Manhole Depth	Street	On 30 Day List?	Surface Cover	Surface Cracking	Frame Condition	Cover Condition	Cover Gasket Condition	Chimney Material	Chimney Seal Condition	Chimney Defects	Chimney Height (in)	Chimney Height (ft)	Cone Material	Cone Defects	Barrel Material	Barrel Defects	Bench Condition	Invert Condition
721	79.21	86.84	7.63	113 Roberta Ave		Asphalt	Minor	Good	Good	None	Brick	None	Missing Brick	14	1.17	Brick	Other	Brick	None	No Trough	Fair
723	72.57	80.85	8.28	Grand Avenue and Roberta Ave		Concrete	Minor	Good	Good	None	PreCast Concrete	None	None	14	1.17	Precast Concrete	Other	Precast Concrete	Bad Joint	Good	Good
724	73.67	83.82	10.15	226 Roberta Ave		Concrete	Minor	Worn	Good	None	PreCast Concrete	None	None	10	0.83	Precast Concrete	Other	Precast Concrete	Bad Joint	Good	Good
725	75.13	85.21	10.08	Roberta Ave and Greenfield		Concrete	Minor	Worn	Good	None	PreCast Concrete	None	None	8	0.67	Block	Other	Block	None	Good	Good
733	85.13	96.23	11.1	1405 E Wabash Ave		Asphalt	Minor	Worn	Good	None	PreCast Concrete	None	None	15	1.25	Precast Concrete	Other	Precast Concrete	None	Good	Good
744	80.66	89.26	8.6	809 S Charles St	√	Concrete	Minor	Good	Good	None	PreCast Concrete	None	Missing Brick	8	0.67	Brick	Other	Brick	None	Good	Good
747	83.75	92.35	8.6	Wabash Ave and S Hartwell	√	Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	16	1.33	Precast Concrete	Other	Precast Concrete	None	Good	Good
751	82	89	7	Charles St	√	Asphalt	Minor	Worn	Good	None	PreCast Concrete	None	None	5	0.42	Precast Concrete	none	Precast Concrete	None	Good	Good
752	77	87.8	10.8	Wright St and Charles St		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	12	1.00	Precast Concrete	none	Precast Concrete	None	Good	Good
753			10	Charles St	√	Asphalt	Minor	Good	Good	Good	PreCast Concrete	None	None	12	1.00	Precast Concrete	none	Precast Concrete	None	Good	Good
754	62.07		10	Mccall Street and N. Charles Street		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	26	2.17	Precast Concrete	none	Precast Concrete	None	Good	Good
755	100.4		10	Newhall Ave and Charles St		Asphalt	Fair	Good	Good	None	Brick	None	Loose Mortar	5	0.42	Block	Loose Mortar	Block	None	Good	Fair
756	117.2	124.53	7.33	Newhall Ave		Asphalt	Minor	Good	Good	Good	Brick	None	Missing Brick	4	0.33	Block	Other	Precast Concrete	Bad Joint	Fair	Fair
757	108.8		10	Newhall Ave		Asphalt	Fair	Good	Good	None	Brick	None	None	3	0.25	Block	Other	Block	None	Fair	Fair
758	129.96	139.18	9.22	Newhall Ave		Concrete	Minor	Good	Good	None	PreCast Concrete	None	None	8	0.67	Precast Concrete	Other	Precast Concrete	None	Good	Good
761	76		10	Mccall Street		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	Loose Mortar	15	1.25	Precast Concrete	none	Precast Concrete	None	No Lateral Trough	Good
791	108.29	116.84	8.55	1320 E Laflin Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	10	0.83	Precast Concrete	Other	Precast Concrete	None	Good	Good
805	88.55	96.92	8.37	618 Lee Ct	√	Concrete	Minor	Good	Good	None	PreCast Concrete	None	None	21	1.75	Precast Concrete	Other	Precast Concrete	None	Good	Fair
863	84.72	95.89	11.17	1220 Chippewa Drive	√	Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	40	3.33	Precast Concrete	None	Precast Concrete	None	Good	Good
865	90.83	100.75	9.92	1225 Chippewa Drive	√	Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	12	1.00	Precast Concrete	None	Precast Concrete	None	Good	Good
867	83.28	92.37	9.09	1241 Chippewa Drive	√	Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	27	2.25	Precast Concrete	None	Precast Concrete	None	Good	Good
884	85.84	96.05	10.21	1720 Blackhawk Trail	√	Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	16	1.33	Precast Concrete	None	Precast Concrete	None	Good	Good
998			10	Summit Ave	√	Concrete	Fair	Good	Good	None	PreCast Concrete	None	None	3	0.25	Block	Other	Block	None	Good	Good
999	116.25	124.44	8.19	Summit Ave		Concrete	Fair	Good	Good	Good	Brick	None	Loose Mortar	5	0.42	Block	Loose Mortar	Block	None	Good	Fair

Appendix D
Manhole Condition Assessment

Manhole Identifier						Physical Condition/Characteristics															
Manhole ID	Invert Elevation	Rim Elevation	Manhole Depth	Street	On 30 Day List?	Surface Cover	Surface Cracking	Frame Condition	Cover Condition	Cover Gasket Condition	Chimney Material	Chimney Seal Condition	Chimney Defects	Chimney Height (in)	Chimney Height (ft)	Cone Material	Cone Defects	Barrel Material	Barrel Defects	Bench Condition	Invert Condition
1000	109.37	117.37	8	Summit Ave		Concrete	Minor	Cracked	Good	None	Brick	None	Loose Mortar	22	1.83	Block	Other	Block	Bad Joint	Good	Good
1001	103.45	109.75	6.3	Summit Ave and Hyde Park Ave		Concrete	Minor	Worn	Good	None	Brick	None	Loose Mortar	22	1.83	Block	Other	Precast Concrete	Bad Joint	Good	Good
1002			10	Summit Ave		Concrete	Severe	Worn	Good	None	Brick	None	None	16	1.33	Block	Other	Precast Concrete	Bad Joint	Fair	Good
1003	77.36	87.64	10.28	Delefield St		Concrete	Minor	Good	Good	None	PreCast Concrete	None	None	17	1.42	Precast Concrete	none	Precast Concrete	None	Good	Good
1014	91.61	99.25	7.64	Delefield St and Lemira Ave		Concrete	Fair	Good	Good	None	Block	None	Loose Mortar	16	1.33	Block	none	Block	None	Good	Good
1015			10	Delefield St and Prospect Ave		Concrete	Minor	Good	Good	None	PreCast Concrete	None	Cracked	16	1.33	Precast Concrete	none	Precast Concrete	None	Good	Good
1017			10	Bidwell Ave		Asphalt	Minor	Worn	Good	Good	PreCast Concrete	None	None	6	0.50	Precast Concrete	Other	Precast Concrete	Cracked	Good	Good
1018	89.53	99.53	10	Barstow St and Bidwell Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	12	1.00	Precast Concrete	Other	Precast Concrete	None	Good	Good
1019			10	Prospect Ave		Asphalt	Minor	Good	Good	None	Brick	None	None	14	1.17	Brick	Other	Brick	None	Good	Good
1020			10	Prospect Ave and Barstow St		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	20	1.67	Precast Concrete	Other	Precast Concrete	None	Good	Good
1021			10	Prospect Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	16	1.33	Precast Concrete	Other	Precast Concrete	None	Good	Good
1071		92	92	3rd St		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	Loose Mortar	22	1.83	Precast Concrete	Cracked	Precast Concrete	None	Good	Good
1072		101.9	101.9	3rd St		Asphalt	Severe	Good	Good	None	PreCast Concrete	None	Cracked	19	1.58	Precast Concrete	none	Precast Concrete	None	Fair	Poor
1077			10	Eales Ave		Asphalt	Minor	Good	Good	Good	Block	None	Loose Mortar	9	0.75	Block	none	Block	None	Good	Good
1078		59.95	59.95	Eales Ave		Asphalt	Minor	Good	Good	None	Brick	None	Loose Mortar	11	0.92	Precast Concrete	none	Precast Concrete	None	No Lateral Trough	Good
1085			10	Cleveland Ave	√	Asphalt	Minor	Good	Good	None	Block	None	None	11	0.92	Block	none	Block	None	Good	Good
1087	47.45		10	Eales Ave		Asphalt	Minor	Good	Good	None	Block	None	Loose Mortar	5	0.42	Block	Loose Mortar	Block	Loose Mortar	See Comments	Poor
1106			10	North Ave	√	Concrete	Minor	Good	Good	None	Block	None	Cracked	23	1.92	Block	none	Block	None	Good	Good
1110		38.37	38.37	Delefield St and Madison St and North Ave		Concrete	Fair	Good	Good	None	PreCast Concrete	None	None	14	1.17	Precast Concrete	none	Precast Concrete	None	Good	Good
1111			10	St Paul and Fairview Ave		Asphalt	Minor	Good	Good	Good	PreCast Concrete	None	None	5	0.42	Block	none	Block	Loose Mortar	Good	Good
1114			10	St Paul and Brook St		Concrete	Minor	Good	Good	None	PreCast Concrete	None	None	4	0.33	Precast Concrete	none	Precast Concrete	None	Good	Good
1115	23.5	33.6	10.1	Barstow St and St Paul		Concrete	Fair	Good	Good	None	PreCast Concrete	None	Cracked	12	1.00	Precast Concrete	none	Precast Concrete	None	No Lateral Trough	Poor
1129	24.4	34.98	10.58	Main St and Clinton St		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	8	0.67	Precast Concrete	none	Precast Concrete	None	Good	Good
1130	40.5	49.4	8.9	Grand Avenue		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	Loose Mortar	12	1.00	Precast Concrete	none	Precast Concrete	None	Good	Good

Appendix D
Manhole Condition Assessment

Manhole Identifier						Physical Condition/Characteristics															
Manhole ID	Invert Elevation	Rim Elevation	Manhole Depth	Street	On 30 Day List?	Surface Cover	Surface Cracking	Frame Condition	Cover Condition	Cover Gasket Condition	Chimney Material	Chimney Seal Condition	Chimney Defects	Chimney Height (in)	Chimney Height (ft)	Cone Material	Cone Defects	Barrel Material	Barrel Defects	Bench Condition	Invert Condition
1131			10	220 Wisconsin Ave		Gravel	Minor	Good	Worn	None	Block	None	None	5	0.42	Block	none	Block	None	Good	Good
1132			10	Barstow St and Wisconsin Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	5	0.42	Precast Concrete	none	Precast Concrete	None	Good	Good
1133			10	W Broadway		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	Loose Mortar	10	0.83	Precast Concrete	none	Precast Concrete	None	Good	Good
1140			10	Clinton St	√	Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	17	1.42	Precast Concrete	none	Precast Concrete	None	No Lateral Trough	Good
1144		131.3	131.3	Madison St and Caldwell Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	33	2.75	Precast Concrete	none	Precast Concrete	None	Good	Good
1146		134.13	134.13	Madison St and Fairview Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	20	1.67	Precast Concrete	none	Precast Concrete	None	Good	Good
1199		85.54	85.54	Madison St and 3rd St		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	15	1.25	Precast Concrete	none	Precast Concrete	None	Good	Good
1210			10	Grand Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	11	0.92	Precast Concrete	none	Precast Concrete	None	No Lateral Trough	Good
1211	37.4	43.5	6.1	Grand Ave		Asphalt	Minor	Good	Good	Good	Block	None	Loose Mortar	11	0.92	Block	none	Block	None	Good	Good
1212			10	Grand Ave		Asphalt	Minor	Good	Good	Good	Block	None	Loose Mortar	12	1.00	Block	Loose Mortar	Block	None	Good	Good
1213	31.73	41	9.27	Grand Avenue and Williams Street		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	18	1.50	Precast Concrete	none	Precast Concrete	Loose Mortar	Good	Good
1214	34.63	43.75	9.12	Grand Avenue and Arlington Avenue		Asphalt	Fair	Good	Good	None	PreCast Concrete	None	Loose Mortar	16	1.33	Precast Concrete	none	Precast Concrete	None	Good	Good
1215	37.28	46.4	9.12	Grand Avenue and College Street		Asphalt	Fair	Good	Good	None	PreCast Concrete	None	Loose Mortar	4	0.33	Precast Concrete	none	Precast Concrete	None	Good	Good
1216	38.73	47.8	9.07	Grand Avenue		Asphalt	Fair	Good	Good	None	PreCast Concrete	None	Loose Mortar	12	1.00	Precast Concrete	none	Precast Concrete	None	Good	Good
1217	40	49.5	9.5	Wisconsin Ave and Grand Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	Cracked	12	1.00	Precast Concrete	none	Precast Concrete	Bad Joint	Good	Poor
1218	26.02	37.3	11.28	Grand Ave and W Broadway		Asphalt	Minor	Good	Worn	None	PreCast Concrete	None	None	13	1.08	Precast Concrete	none	Precast Concrete	None	No Trough	Fair
1219			10	355 Broadway		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	Cracked	6	0.50	Precast Concrete	none	Precast Concrete	None	Good	Good
1324	23.17	34.4	11.23	Barstow St		Concrete	Fair	Good	Good	None	PreCast Concrete	None	None	16	1.33	Precast Concrete	none	Precast Concrete	None	Good	Good
1325	24.5	32.8	8.3	Barstow St		Concrete	Fair	Good	Good	None	PreCast Concrete	None	Cracked	15	1.25	Precast Concrete	none	Precast Concrete	None	Good	Good
1328	31.07	40	8.93	Grand Avenue		Asphalt	Minor	Good	Good	None	Block	None	Loose Mortar	16	1.33	Block	none	Precast Concrete	None	Good	Good
1365			10	Prairie Ave		Concrete	Minor	Good	Good	None	PreCast Concrete	None	Cracked	14	1.17	Precast Concrete	none	Precast Concrete	None	Fair	Good
1711		114.05	114.05	kossow and moreland		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	Cracked	29	2.42	Precast Concrete	None	Precast Concrete	None	Good	Fair
1714	19.15	29.4	10.25	Prospect Ct and Bethesda Ct	√	Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	16	1.33	Precast Concrete	none	Precast Concrete	None	Good	Good
1715	25.32	32.2	6.88	Bethesda Ave		Asphalt	Minor	Good	Good	None	Brick	None	Missing Brick	10	0.83	Brick	Loose Mortar	Brick	None	No Trough	Fair

Appendix D
Manhole Condition Assessment

Manhole Identifier						Physical Condition/Characteristics															
Manhole ID	Invert Elevation	Rim Elevation	Manhole Depth	Street	On 30 Day List?	Surface Cover	Surface Cracking	Frame Condition	Cover Condition	Cover Gasket Condition	Chimney Material	Chimney Seal Condition	Chimney Defects	Chimney Height (in)	Chimney Height (ft)	Cone Material	Cone Defects	Barrel Material	Barrel Defects	Bench Condition	Invert Condition
1718	67.01	74.15	7.14	Pearl St and Greenfield Ave	√	Asphalt	Minor	Good	Good	Good	PreCast Concrete	None	None	16	1.33	Precast Concrete	none	Precast Concrete	None	Good	Good
1719	65.96	72.36	6.4	Greenfield Ave		Asphalt	Minor	Good	Good	Good	PreCast Concrete	None	None	3	0.25	Precast Concrete	none	Precast Concrete	Cracked	Good	Good
1720	66.76	74.64	7.88	Greenfield Ave and Anoka Ave		Asphalt	Fair	Good	Good	None	PreCast Concrete	None	None	12	1.00	Precast Concrete	none	Precast Concrete	None	Good	Good
1721	73	81.1	8.1	Genesee Ave and Anoka Ave		Asphalt	Severe	Good	Good	None	Block	None	Loose Mortar	5	0.42	Block	Loose Mortar	Block	Loose Mortar	Fair	Fair
1736			10	Aurora St		Asphalt	Severe	Good	Worn	None	Brick	None	Missing Brick	20	1.67	Block	Loose Mortar	Block	None	See Comments	Poor
1737			10	Aurora St		Asphalt	Severe	Worn	Good	None	Brick	None	Missing Brick	16	1.33	Brick	Loose Mortar	Brick	None	Good	Fair
1742			10	Woodward Ave		Asphalt	Minor	Worn	Good	None	Brick	None	Loose Mortar	10	0.83	Brick	Loose Mortar	Brick	Loose Mortar	See Comments	Fair
1743	96		10	Woodward Ave		Asphalt	Fair	Good	Good	None	PreCast Concrete	None	None	13	1.08	Precast Concrete	none	Precast Concrete	None	Good	Good
1747	53.37	57.08	3.71	Linden St		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	Cracked	12	1.00	Precast Concrete	none	Precast Concrete	None	Good	Good
1755	35.7	43.1	7.4	Arcadian Ave and Pleasant St		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	13	1.08	Precast Concrete	none	Precast Concrete	None	Good	Good
1756	34.2		10	Pleasant St		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	7	0.58	Precast Concrete	none	Precast Concrete	None	Good	Good
1757			10	Arcadian Ave		Asphalt	Fair	Good	Good	None	PreCast Concrete	None	Loose Mortar	12	1.00	Precast Concrete	none	Precast Concrete	None	Good	Good
1759	52.68	59.29	6.61	Arcadian Ave and Rosemary St		Concrete	Fair	Good	Good	None	PreCast Concrete	None	None	12	1.00	Precast Concrete	none	Precast Concrete	None	Good	Good
1778	76.86	84.56	7.7	Ellis St		Asphalt	Fair	Good	Good	None	PreCast Concrete	None	None	24	2.00	Precast Concrete	none	Precast Concrete	None	Good	Good
1779	73	80	7	Fisk Ave andEellis St		Asphalt	Minor	Good	Good	Good	PreCast Concrete	None	None	11	0.92	Precast Concrete	none	Precast Concrete	None	Good	Good
1788	47.39	54.55	7.16	Raymond St and Perkins Ave		Concrete	Fair	Good	Good	None	PreCast Concrete	None	None	14	1.17	Block	none	Block	None	Good	Good
1794			10	Regiont Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	17	1.42	Precast Concrete	none	Precast Concrete	None	No Lateral Trough	Good
1795		54.8	54.8	Raymond St		Asphalt	Minor	Good	Good	None	Brick	None	Loose Mortar	11	0.92	Brick	Loose Mortar	Brick	None	Good	Good
1796	62.1	70.1	8	Raymond St and Ryan St		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	7	0.58	Precast Concrete	none	Precast Concrete	None	Good	Good
1797	63.01	68.81	5.8	Ryan St		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	Cracked	12	1.00	Precast Concrete	none	Precast Concrete	None	No Lateral Trough	Good
1798	58.18	66.18	8	Ryan St and Adams St		Asphalt	Minor	Good	Good	Good	PreCast Concrete	None	None	14	1.17	Precast Concrete	none	Precast Concrete	None	Good	Good
1799			10	Raymond St		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	8	0.67	Precast Concrete	none	Precast Concrete	None	No Lateral Trough	Good
1800	59.95	68.95	9	Adams Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	Cracked	9	0.75	Precast Concrete	none	Precast Concrete	None	No Trough	Good
1804	87		10	Oakland Ave and National Ave		Asphalt	Minor	Good	Good	Good	PreCast Concrete	None	None	10	0.83	Precast Concrete	none	Precast Concrete	None	Good	Good

Appendix D

Manhole Condition Assessment

Manhole Identifier						Physical Condition/Characteristics															
Manhole ID	Invert Elevation	Rim Elevation	Manhole Depth	Street	On 30 Day List?	Surface Cover	Surface Cracking	Frame Condition	Cover Condition	Cover Gasket Condition	Chimney Material	Chimney Seal Condition	Chimney Defects	Chimney Height (in)	Chimney Height (ft)	Cone Material	Cone Defects	Barrel Material	Barrel Defects	Bench Condition	Invert Condition
1805	69.87	77.33	7.46	Greenfield Ave		Asphalt	Severe	Good	Good	None	Block	None	Missing Brick	14	1.17	Block	none	Block	None	Good	Good
1807	65.05	72.18	7.13	Greenfield Ave	√	Asphalt	Minor	Good	Good	Good	PreCast Concrete	None	None	16	1.33	Precast Concrete	none	Precast Concrete	None	Good	Good
1815	37.25	44.25	7	East Avenue		Asphalt	Fair	Worn	Worn	None	PreCast Concrete	None	None	15	1.25	Precast Concrete	none	Precast Concrete	None	Good	Good
1816	39	47.5	8.5	East Avenue and South St		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	Cracked	8	0.67	Precast Concrete	none	Precast Concrete	None	Good	Good
1817	42	50	8	East Avenue and Arcadian Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	13	1.08	Precast Concrete	none	Precast Concrete	None	See Comments	Fair
1818	40	47.8	7.8	East Avenue and Main St		Concrete	Minor	Good	Good	None	PreCast Concrete	None	Loose Mortar	18	1.50	Precast Concrete	Cracked	Precast Concrete	None	Good	Good
1819	26.15	36.63	10.48	Buckly Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	16	1.33	Precast Concrete	none	Precast Concrete	Bad Joint	Good	Good
1820	24.42	32.51	8.09	Buckly Ave and Baxter Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	22	1.83	Precast Concrete	none	Precast Concrete	None	Good	Good
1822			10	Laflin Ave and Wilbur Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	10	0.83	Precast Concrete	Other	Precast Concrete	Bad Joint	Good	Good
1835	96.62	105.97	9.35	1223 Hickory Drive North		Asphalt	Fair	Good	Good	None	PreCast Concrete	None	None	24	2.00	Block	None	Block	None	No Trough	Fair
1838	114.92	119.82	4.9	College St	√	Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	6	0.50	Precast Concrete	none	Precast Concrete	None	No Lateral Trough	Good
1839	88.89	88.89	0	East Avenue		Concrete	Minor	Good	Good	None	PreCast Concrete	None	None	14	1.17	Precast Concrete	Other	Precast Concrete	None	Good	Good
1842	54.02	61.92	7.9	Barney Street		Asphalt	Fair	Good	Good	None	PreCast Concrete	None	Loose Mortar	5	0.42	Precast Concrete	none	Precast Concrete	None	No Lateral Trough	Good
1844			10	James St		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	12	1.00	Precast Concrete	none	Precast Concrete	None	Good	Good
1857	80.02	88.29	8.27	E Wabash Ave and S Charles St		Concrete	Minor	Good	Good	None	PreCast Concrete	None	None	15	1.25	Precast Concrete	Other	Precast Concrete	None	Good	Good
1872			10	Rastid Ave	√	Asphalt	Minor	Worn	Good	None	PreCast Concrete	None	None	11	0.92	Precast Concrete	none	Precast Concrete	Cracked	Good	Good
1874	73		10	Mccall Street		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	Loose Mortar	17	1.42	Precast Concrete	none	Precast Concrete	Cracked	Good	Good
1875			10	617 Mccall Street		Asphalt	Minor	Worn	Good	None	Block	None	Loose Mortar	8	0.67	Block	Loose Mortar	Block	Loose Mortar	No Lateral Trough	Good
1892	77.83	87.9	10.07	Perkins Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	11	0.92	Precast Concrete	none	Precast Concrete	None	See Comments	Poor
1893			10	Racine Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	9	0.75	Precast Concrete	none	Precast Concrete	None	Good	Good
1894			10	Racine Ave		Asphalt	Minor	Good	Good	Good	PreCast Concrete	None	None	10	0.83	Precast Concrete	none	Precast Concrete	None	Good	Good
1895			10	Racine Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	10	0.83	Precast Concrete	none	Precast Concrete	None	Good	Good
1896	55		10	Lake St		Asphalt	Fair	Good	Good	None	PreCast Concrete	None	None	3	0.25	Precast Concrete	none	Precast Concrete	None	No Lateral Trough	Good
1897			10	Racine Ave		Asphalt	Minor	Good	Good	Poor	PreCast Concrete	None	None	30	2.50	Block	none	Block	None	Fair	Good

Appendix D
Manhole Condition Assessment

Manhole Identifier						Physical Condition/Characteristics															
Manhole ID	Invert Elevation	Rim Elevation	Manhole Depth	Street	On 30 Day List?	Surface Cover	Surface Cracking	Frame Condition	Cover Condition	Cover Gasket Condition	Chimney Material	Chimney Seal Condition	Chimney Defects	Chimney Height (in)	Chimney Height (ft)	Cone Material	Cone Defects	Barrel Material	Barrel Defects	Bench Condition	Invert Condition
1899	68.42	75.4	6.98	Perkins Ave and Anoka Ave		Asphalt	Fair	Good	Good	None	PreCast Concrete	None	None	11	0.92	Precast Concrete	none	Precast Concrete	None	Good	Good
1904	27		10	Baxter Ave		Asphalt	Severe	Good	Good	None	Block	None	Cracked	22	1.83	Block	none	Block	None	Fair	Fair
1909		50.49	50.49	Elm Ct		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	2	0.17	Precast Concrete	none	Precast Concrete	None	Good	Good
1915	23.99		10	Gaspar St and Main St		Asphalt	Minor	Good	Good	None	Block	None	None	10	0.83	Block	none	Block	None	Good	Good
1925	24.52	35.4	10.88	Barstow St and Main St		Asphalt	Minor	Good	Good	None	Block	None	Cracked	21	1.75	Block	none	Block	None	Good	Good
1932	100.26	107.56	7.3	Parklawn rd		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	22	1.83	Precast Concrete	None	Precast Concrete	None	Good	Good
2092	129.58	138.04	8.46	Buffalo St and Western Ave	√	Asphalt	Minor	Good	Good	Good	PreCast Concrete	Good	None	9	0.75	Block	Other	Block	None	Good	Good
2281			10	Summit Ave	√	Concrete	Minor	Good	Good	None	PreCast Concrete	None	Missing Brick	9	0.75	Block	Cracked	Block	Bad Joint	Good	Good
2300		132.4	132.4	Madison St and Hyde Park Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	21	1.75	Precast Concrete	none	Precast Concrete	None	Good	Good
2302			10	Hyde Park Ave		Asphalt	Fair	Good	Good	None	PreCast Concrete	None	Missing Brick	5	0.42	Precast Concrete	none	Precast Concrete	None	Good	Good
2310	62.46	70.98	8.52	Madison St		Asphalt	Minor	Cracked	Good	None	PreCast Concrete	None	None	23	1.92	Precast Concrete	none	Precast Concrete	None	Good	Good
2378	101.25	110.91	9.66	Mountain Ave and Dopp sSt		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	Loose Mortar	27	2.25	Precast Concrete	Loose Mortar	Precast Concrete	Bad Joint	Good	Good
2462	92	103.97	11.97	Bidwell Ave		Asphalt	Minor	Good	Good	None	Brick	None	Loose Mortar	9	0.75	Block	Other	Block	Bad Joint	Good	Good
2463			10	Delefield St and Bidwell Ave		Concrete	Minor	Good	Cracked	None	Block	None	Loose Mortar	7	0.58	Block	none	Block	None	Good	Good
2466			10	Delefield St		Concrete	Fair	Good	Good	None	Block	None	Loose Mortar	14	1.17	Block	none	Block	None	Good	Good
2467			10	Delefield St		Concrete	Minor	Good	Good	None	Block	None	None	6	0.50	Block	none	Block	None	See Comments	Good
2469	87.67	95.67	8	438 Barstow St		Asphalt	Fair	Cracked	Good	None	Block	None	Missing Brick	3	0.25	Block	Loose Mortar	Block	None	No Lateral Trough	Good
2471			10	Delefield St		Concrete	Minor	Good	Good	None	Block	None	Cracked	28	2.33	Block	none	Block	None	Good	Good
2476			10	Delefield St		Grass	Minor	Worn	Good	None	Block	None	Loose Mortar	11	0.92	Block	none	Block	None	See Comments	Good
2477			10	Delefield St	√	Grass	Minor	Cracked	Good	None	Block	None	None	13	1.08	Block	none	Block	None	Good	Good
2478			10	Delefield St		Concrete	Fair	Good	Good	None	Block	None	Loose Mortar	18	1.50	Block	none	Block	None	See Comments	Good
2479			10	Delefield St		Concrete	Minor	Good	Good	None	Block	None	Cracked	18	1.50	Block	none	Block	None	See Comments	Good
2517	22.02	31.57	9.55	2200 Badger Ct		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	30	2.50	Precast Concrete	None	Precast Concrete	None	Good	Good
2724	25.56		10	Maria St	√	Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	6	0.50	Precast Concrete	none	Precast Concrete	None	Good	Good

Appendix D
Manhole Condition Assessment

Manhole Identifier						Physical Condition/Characteristics															
Manhole ID	Invert Elevation	Rim Elevation	Manhole Depth	Street	On 30 Day List?	Surface Cover	Surface Cracking	Frame Condition	Cover Condition	Cover Gasket Condition	Chimney Material	Chimney Seal Condition	Chimney Defects	Chimney Height (in)	Chimney Height (ft)	Cone Material	Cone Defects	Barrel Material	Barrel Defects	Bench Condition	Invert Condition
2725			10	Maria St		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	19	1.58	Precast Concrete	none	Block	None	Good	Good
2726			10	St Paul and Maria St		Concrete	Minor	Good	Good	None	Block	None	Missing Brick	13	1.08	Block	none	Block	None	Good	Good
2749			10	Albert St		Concrete	Severe	Good	Good	None	PreCast Concrete	None	Cracked	9	0.75	Precast Concrete	none	Precast Concrete	None	No Lateral Trough	Good
2753	114.65	124.06	9.41	Riverview Ave and Buena Vist Ave		Asphalt	Fair	Good	Good	None	PreCast Concrete	None	None	9	0.75	Precast Concrete	Other	Precast Concrete	None	Good	Good
2758	116.69	122.39	5.7	Riverview Ave	√	Asphalt	Minor	Worn	Good	None	PreCast Concrete	None	Cracked	9	0.75	Precast Concrete	Other	Precast Concrete	None	Good	Good
2760	121.6	128.6	7	Buena Vista Ave		Asphalt	Severe	Good	Good	None	Block	None	Loose Mortar	8	0.67	Block	none	Block	None	Good	Good
2761	24.75	30.33	5.58	Brook St		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	8	0.67	Precast Concrete	none	Precast Concrete	None	Fair	Good
2762	25.4	32.8	7.4	Brook St		Asphalt	Fair	Good	Good	None	PreCast Concrete	None	Cracked	8	0.67	Precast Concrete	none	Precast Concrete	None	No Lateral Trough	Good
2774			10	300 Main St		Asphalt	Minor	Good	Good	Good	PreCast Concrete	None	None	14	1.17	Precast Concrete	none	Precast Concrete	None	Good	Good
2775	28.26	40.5	12.24	Grand Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	14	1.17	Precast Concrete	none	Precast Concrete	None	Good	Good
2776	30.9	42.5	11.6	Grand Ave and South St		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	9	0.75	Precast Concrete	none	Precast Concrete	None	Fair	Good
2777			10	South St and Clinton St		Asphalt	Fair	Good	Good	None	Block	None	Loose Mortar	19	1.58	Block	none	Block	None	Good	Good
2779			10	Main St		Asphalt	Fair	Good	Good	None	Block	None	None	5	0.42	Block	none	Block	None	Good	Good
2780			10	292 Main St		Asphalt	Minor	Good	Good	None	Block	None	None	16	1.33	Block	none	Block	None	Good	Good
2782			10	South St		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	Loose Mortar	18	1.50	Precast Concrete	none	Precast Concrete	None	Good	Good
2783	35.37	42.95	7.58	Wisconsin Ave and Maple Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	8	0.67	Precast Concrete	none	Precast Concrete	None	Good	Good
2785			10	Wisconsin Ave and Clinton St		Asphalt	Minor	Good	Worn	None	PreCast Concrete	None	None	15	1.25	Precast Concrete	none	Precast Concrete	None	Good	Good
2786			10	Martin St		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	7	0.58	Precast Concrete	Cracked	Precast Concrete	None	Good	Good
2788			10	Martin St		Asphalt	Minor	Good	Good	None	Block	None	None	1	0.08	Block	none	Block	None	Good	Good
2789			10	Martin St		Asphalt	Fair	Good	Good	None	PreCast Concrete	None	None	9	0.75	Precast Concrete	none	Precast Concrete	Cracked	No Lateral Trough	Good
2791			10	Wisconsin Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	6	0.50	Precast Concrete	none	Precast Concrete	None	No Lateral Trough	Good
2793	32	40.4	8.4	Barstow Street and Park Avenue		Asphalt	Fair	Good	Good	None	PreCast Concrete	None	None	2	0.17	Precast Concrete	none	Precast Concrete	Bad Joint	Good	Good
2794	35	42	7	Barstow Street		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	11	0.92	Precast Concrete	none	Precast Concrete	Bad Joint	Good	Good
2801	30.63	38.4	7.77	Barstow Street and Carroll Avenue		Concrete	Minor	Good	Worn	None	PreCast Concrete	None	Cracked	23	1.92	Precast Concrete	none	Precast Concrete	None	Good	Fair

Appendix D
Manhole Condition Assessment

Manhole Identifier						Physical Condition/Characteristics															
Manhole ID	Invert Elevation	Rim Elevation	Manhole Depth	Street	On 30 Day List?	Surface Cover	Surface Cracking	Frame Condition	Cover Condition	Cover Gasket Condition	Chimney Material	Chimney Seal Condition	Chimney Defects	Chimney Height (in)	Chimney Height (ft)	Cone Material	Cone Defects	Barrel Material	Barrel Defects	Bench Condition	Invert Condition
2804	30.42	36.7	6.28	Barstow Street		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	8	0.67	Precast Concrete	none	Precast Concrete	None	See Comments	Fair
2805	32	38.5	6.5	Barstow Street and Cook Street		Asphalt	Minor	Cracked	Good	Good	PreCast Concrete	None	Loose Mortar	8	0.67	Block	none	Precast Concrete	None	Good	Good
2806		38.53	38.53	Barstow Street and Cook Street		Asphalt	Minor	Good	Good	Good	PreCast Concrete	None	Loose Mortar	10	0.83	Precast Concrete	none	Precast Concrete	Cracked	Good	Good
2807	34.41	40.8	6.39	127 Cook Street		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	Loose Mortar	7	0.58	Precast Concrete	none	Precast Concrete	None	Good	Good
2809	34	41	7	Barstow Street		Asphalt	Minor	Good	Good	Good	PreCast Concrete	None	None	15	1.25	Precast Concrete	none	Precast Concrete	None	See Comments	Fair
2811		38.8	38.8	Grand Ave		Asphalt	Minor	Good	Good	Good	PreCast Concrete	None	None	15	1.25	Precast Concrete	none	Precast Concrete	None	Good	Good
2817			10	College St		Asphalt	Minor	Good	Worn	None	PreCast Concrete	None	None	35	2.92	Precast Concrete	none	Precast Concrete	None	Good	Good
2820			10	College St		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	12	1.00	Precast Concrete	none	Precast Concrete	None	Good	Good
2821			10	Grand Ave and College St		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	17	1.42	Precast Concrete	none	Precast Concrete	None	Good	Good
2822	37.36	46.4	9.04	Grand Ave and College St		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	5	0.42	Precast Concrete	none	Precast Concrete	None	Good	Good
2823			10	Grand Ave		Gravel	Minor	Good	Good	Good	PreCast Concrete	None	None	5	0.42	Precast Concrete	none	Precast Concrete	None	Good	Good
2824			10	Grand Ave		Concrete	Minor	Good	Good	Good	PreCast Concrete	None	None	6	0.50	Precast Concrete	none	Precast Concrete	None	Good	Good
2827		42.85	42.85	Arcadian Ave andPleasant St		Asphalt	Minor	Good	Good	None	Block	None	None	21	1.75	Block	none	Block	None	Good	Good
2833	38.26	45.76	7.5	Caroline St		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	Missing Brick	6	0.50	Precast Concrete	none	Block	None	Good	Good
2835	37.01	43.7	6.69	Maple Avenue and Park Avenue		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	11	0.92	Precast Concrete	none	Precast Concrete	None	Good	Good
2837	30.92	38.28	7.36	Maple Avenue		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	Loose Mortar	14	1.17	Precast Concrete	none	Precast Concrete	None	Good	Good
2839	29.31	37.23	7.92	MapleAvenue		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	12	1.00	Precast Concrete	none	Precast Concrete	None	Good	Good
2841			10	Williams Street		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	2	0.17	Precast Concrete	none	Precast Concrete	None	Good	Good
2842	35.42	43.47	8.05	Grand Avenue		Asphalt	Fair	Good	Good	None	PreCast Concrete	None	None	5	0.42	Block	none	Block	Loose Mortar	Good	Good
2844			10	Carroll Avenue		Asphalt	Fair	Good	Good	None	Block	None	Loose Mortar	3	0.25	Block	Loose Mortar	Block	Loose Mortar	Good	Good
2845	34.77	46.2	11.43	Carroll Avenue		Asphalt	Severe	Good	Good	None	PreCast Concrete	None	Loose Mortar	3	0.25	Precast Concrete	none	Precast Concrete	None	Good	Good
2847			10	Arlington Avenue		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	12	1.00	Precast Concrete	none	Precast Concrete	None	Good	Good
2848			10	Arlington Avenue		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	9	0.75	Precast Concrete	Cracked	Precast Concrete	Cracked	Good	Good
2852			10	Maple Ave		Asphalt	Minor	Cracked	Good	None	PreCast Concrete	None	None	4	0.33	Precast Concrete	none	Precast Concrete	None	Good	Good

Appendix D
Manhole Condition Assessment

Manhole Identifier						Physical Condition/Characteristics															
Manhole ID	Invert Elevation	Rim Elevation	Manhole Depth	Street	On 30 Day List?	Surface Cover	Surface Cracking	Frame Condition	Cover Condition	Cover Gasket Condition	Chimney Material	Chimney Seal Condition	Chimney Defects	Chimney Height (in)	Chimney Height (ft)	Cone Material	Cone Defects	Barrel Material	Barrel Defects	Bench Condition	Invert Condition
2853			10	Maple Ave		Asphalt	Fair	Worn	Worn	None	Brick	None	Missing Brick	10	0.83	Brick	Missing Brick	Brick	Missing Brick	See Comments	Fair
2854			10	Maple Ave		Asphalt	Fair	Cracked	Good	None	Brick	None	Missing Brick	6	0.50	Block	none	Block	None	Good	Good
2855			10	Maple Ave		Asphalt	Minor	Good	Good	Good	PreCast Concrete	None	None	16	1.33	Precast Concrete	none	Precast Concrete	None	No Trough	Good
2856	31		10	Central Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	3	0.25	Precast Concrete	none	Precast Concrete	Bad Joint	Good	Good
2862	16.4	24.2	7.8	Wisconsin Ave and West Avenue	√	Concrete	Minor	Good	Good	Good	PreCast Concrete	None	None	18	1.50	Precast Concrete	none	Precast Concrete	None	Good	Good
2863			10	Wisconsin Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	25	2.08	Precast Concrete	none	Precast Concrete	None	Good	Good
2864	29.4		10	Prospect Avenue	√	Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	16	1.33	Precast Concrete	none	Precast Concrete	None	Good	Good
2868	16	23.5	7.5	Marshall St and Dunbar Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	10	0.83	Precast Concrete	none	Precast Concrete	Cracked	Good	Good
2869	20	28.5	8.5	Dunbar Ave and Hamilton Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	4	0.33	Precast Concrete	none	Precast Concrete	None	Good	Good
2870	21	29	8	Dunbar Ave		Asphalt	Fair	Good	Good	None	PreCast Concrete	None	None	8	0.67	Precast Concrete	none	Precast Concrete	None	No Lateral Trough	Good
2871	20	29	9	Hamilton Ave and Franklin Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	10	0.83	Precast Concrete	none	Precast Concrete	None	Good	Good
2873	22	30.5	8.5	Franklin Ave		Asphalt	Minor	Good	Good	Good	PreCast Concrete	None	None	20	1.67	Precast Concrete	none	Precast Concrete	None	Good	Good
2874	24	32	8	Elizabeth Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	4	0.33	Precast Concrete	none	Precast Concrete	None	Good	Good
2875	26	34	8	Elizabeth Ave		Asphalt	Minor	Good	Good	Good	PreCast Concrete	None	None	12	1.00	Precast Concrete	none	Precast Concrete	None	Good	Good
2878	11.79		10	Marshall St		Asphalt	Fair	Good	Good	None	PreCast Concrete	None	None	3	0.25	Precast Concrete	none	Precast Concrete	Bad Joint	See Comments	Good
2881			10	Park Avenue		Asphalt	Minor	Good	Good	None	Block	None	None	11	0.92	Block	none	Block	None	Good	Good
2882			10	Park Avenue		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	11	0.92	Precast Concrete	none	Precast Concrete	None	Good	Good
2885	57.3	66	8.7	College St		Asphalt	Minor	Good	Good	None	Block	None	None	16	1.33	Block	none	Block	None	Good	Good
2913	78.76	85.72	6.96	East Avenue and Wabash Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	3	0.25	Block	Other	Block	None	Good	Good
2921	76.84	86.32	9.48	East Avenue	√	Concrete	Minor	Worn	Good	None	PreCast Concrete	None	None	10	0.83	Block	Other	Block	None	Fair	Fair
2923	73.65	83.9	10.25	118 Estburg Ave		Concrete	Minor	Good	Good	None	Brick	None	Loose Mortar	10	0.83	Brick	Other	Brick	None	Good	Good
2925	71.37	79.2	7.83	Estburg Ave		Concrete	Minor	Worn	Worn	None	Brick	None	Loose Mortar	4	0.33	Brick	Loose Mortar	Brick	None	Good	Good
2931	83.84	93.38	9.54	1210 Hickory Drive North		Asphalt	Fair	Good	Good	None	PreCast Concrete	None	Missing Brick	8	0.67	Block	None	Block	None	Poor	Poor
3015			10	Blackhawk Trail and E Sunset Drive	√	Grass	Minor	Good	Good	None	PreCast Concrete	None	None	4	0.33	Precast Concrete	None	Precast Concrete	None	Good	Good

Appendix D
Manhole Condition Assessment

Manhole Identifier						Physical Condition/Characteristics															
Manhole ID	Invert Elevation	Rim Elevation	Manhole Depth	Street	On 30 Day List?	Surface Cover	Surface Cracking	Frame Condition	Cover Condition	Cover Gasket Condition	Chimney Material	Chimney Seal Condition	Chimney Defects	Chimney Height (in)	Chimney Height (ft)	Cone Material	Cone Defects	Barrel Material	Barrel Defects	Bench Condition	Invert Condition
3026	29.76	39.81	10.05	Gaspar St	√	Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	22	1.83	Precast Concrete	none	Precast Concrete	None	Good	Good
3028	25.62	37.45	11.83	Gaspar St		Concrete	Minor	Good	Good	None	PreCast Concrete	None	None	23	1.92	Precast Concrete	none	Precast Concrete	None	Good	Good
3035			10	Perkins Ave and Adams Ave		Concrete	Minor	Good	Good	Good	Brick	None	Loose Mortar	19	1.58	Block	none	Block	None	Good	Good
3037	57.06	68.5	11.44	Moreland Ave and Cleveland Ave		Concrete	Minor	Good	Good	Good	PreCast Concrete	None	None	20	1.67	Precast Concrete	none	Precast Concrete	None	Good	Good
3044	46.15	54.85	8.7	White Rock Ave and Rock St		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	Loose Mortar	16	1.33	Precast Concrete	none	Precast Concrete	None	Good	Good
3115	109.61	112.8	3.19	Morey St	√	Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	10	0.83	Precast Concrete	none	Precast Concrete	None	Good	Poor
3119	76.68	85.47	8.79	East Avenue	√	Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	17	1.42	Precast Concrete	Other	Precast Concrete	None	Good	Good
3127	32.88	40.43	7.55	W Broadway		Asphalt	Fair	Good	Good	None	PreCast Concrete	None	None	5	0.42	Precast Concrete	none	Precast Concrete	None	Good	Good
3174	115.66	125.45	9.79	Downing Dr and Oxford Rd	√	Asphalt	Minor	Worn	Good	None	PreCast Concrete	None	None	2	0.17	Precast Concrete	Other	Precast Concrete	None	Fair	Good
3215	67.23	76.01	8.78	1516 Camden Ct	√	Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	23	1.92	Precast Concrete	None	Precast Concrete	None	Good	Good
3260	105	111.65	6.65	205 S Greenfield	√	Concrete	Fair	Worn	Good	None	Brick	None	None	2	0.17	Brick	Other	Brick	None	Good	Good
3301	88.84	95.74	6.9	Windsor Ave and East Avenue	√	Asphalt	Minor	Good	Good	None	PreCast Concrete	None	Loose Mortar	12	1.00	Precast Concrete	Cracked	Precast Concrete	Cracked	No Trough	Fair
3306	83.15	96.35	13.2	1575 Racine Avenue		Grass	Minor	Good	Good	None	PreCast Concrete	None	None	9	0.75	Precast Concrete	None	Precast Concrete	None	Good	Good
3316	81.66	93.91	12.25	Racine Avenue	√	Asphalt	Minor	Worn	Good	None	PreCast Concrete	None	None	6	0.50	Precast Concrete	None	Precast Concrete	None	Good	Good
3335	81.38	88.18	6.8	East Avenue and Newhall Ave	√	Asphalt	Severe	Worn	Good	Good	Brick	None	Loose Mortar	9	0.75	Block	Loose Mortar	Precast Concrete	None	Good	Good
3340			10	147 Wilbur Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	11	0.92	Block	none	Block	None	Good	Good
3342		93.05	93.05	Charles St		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	12	1.00	Precast Concrete	Other	Precast Concrete	None	Good	Good
3343		104.24	104.24	Charles St		Asphalt	Minor	Good	Good	Good	PreCast Concrete	None	None	25	2.08	Precast Concrete	Other	Precast Concrete	Bad Joint	Good	Good
3344	92.8	102	9.2	James St		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	4	0.33	Block	Other	Block	None	Good	Good
3345	109.83	117.83	8	James St		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	Cracked	10	0.83	Block	Other	Block	None	Good	Good
3347	80.7	87.4	6.7	Charles St		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	13	1.08	Precast Concrete	none	Precast Concrete	None	Good	Good
3349	73.46	83.36	9.9	East Avenue		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	Cracked	14	1.17	Precast Concrete	none	Precast Concrete	None	Good	Good
3350			10	Wright St		Asphalt	Minor	Good	Good	None	Block	None	Missing Brick	5	0.42	Block	Loose Mortar	Block	None	Good	Good
3351			10	Wright St		Asphalt	Minor	Worn	Good	None	PreCast Concrete	None	None	9	0.75	Precast Concrete	none	Precast Concrete	None	Good	Good

Appendix D
Manhole Condition Assessment

Manhole Identifier						Physical Condition/Characteristics															
Manhole ID	Invert Elevation	Rim Elevation	Manhole Depth	Street	On 30 Day List?	Surface Cover	Surface Cracking	Frame Condition	Cover Condition	Cover Gasket Condition	Chimney Material	Chimney Seal Condition	Chimney Defects	Chimney Height (in)	Chimney Height (ft)	Cone Material	Cone Defects	Barrel Material	Barrel Defects	Bench Condition	Invert Condition
3352	60		10	Barney Street and Mccall Street		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	Cracked	8	0.67	Precast Concrete	none	Precast Concrete	Bad Joint	Good	Good
3375	39.4	48.72	9.32	Barney Street		Asphalt	Fair	Good	Good	None	PreCast Concrete	None	Loose Mortar	8	0.67	Precast Concrete	Cracked	Precast Concrete	None	Good	Good
3381	32.82		10	Pleasant Street		Grass	Minor	Worn	Good	None	Block	None	None	5	0.42	Block	none	Block	None	Good	Good
3383	32.7	42.95	10.25	Pleasant Street and Broadway		Asphalt	Minor	Worn	Good	None	PreCast Concrete	None	None	6	0.50	Block	Loose Mortar	Block	Loose Mortar	Good	Good
3392	72.41	79.34	6.93	Greenfield Ave		Asphalt	Minor	Good	Good	Good	PreCast Concrete	None	None	12	1.00	Precast Concrete	none	Precast Concrete	None	Good	Good
3398	106.03	116.18	10.15	103 Columbia St		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	17	1.42	Precast Concrete	Other	Precast Concrete	None	Good	Good
3399	103.26	112.26	9	126 Columbia St		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	9	0.75	Precast Concrete	Other	Precast Concrete	None	Good	Good
3402	88	98	10	Fisk Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	17	1.42	Precast Concrete	none	Precast Concrete	None	No Lateral Trough	Good
3403	83.7	92.8	9.1	Fisk Ave		Asphalt	Minor	Good	Good	None	Block	None	Loose Mortar	16	1.33	Block	none	Block	None	Good	Good
3404	75		10	Fisk Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	15	1.25	Precast Concrete	none	Precast Concrete	None	Good	Good
3408	80.8	88.6	7.8	Bethesda Ave		Asphalt	Minor	Good	Good	None	Brick	None	Missing Brick	7	0.58	Brick	Loose Mortar	Brick	None	Good	Good
3420	125.29	134.6	9.31	East Avenue		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	20	1.67	Precast Concrete	none	Precast Concrete	Bad Joint	Good	Good
3485	20	26.4	6.4	Bethesda Ave		Asphalt	Minor	Worn	Good	None	PreCast Concrete	None	Cracked	13	1.08	Precast Concrete	none	Precast Concrete	None	Good	Good
3486	26.12	34.04	7.92	Bethesda Ave		Asphalt	Minor	Good	Cracked	None	PreCast Concrete	None	None	3	0.25	Precast Concrete	Cracked	Precast Concrete	None	Good	Good
3487	23.32	30.4	7.08	Bethesda Ave		Asphalt	Fair	Good	Good	None	Block	None	Loose Mortar	5	0.42	Block	none	Block	None	No Trough	Good
3489	18.39		10	Bethesda Ave	√	Asphalt	Minor	Good	Good	None	Block	None	Cracked	15	1.25	Block	Loose Mortar	Block	Loose Mortar	No Trough	Fair
3490	13.76	18.4	4.64	Dunbar Avenue		Grass	Minor	Good	Good	None	Plastic/Rubber Rings	Leaking	None	6	0.50	Block	none	Block	Bad Joint	See Comments	Good
3492	37	43	6	Arcadian Avee and Caroline St		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	10	0.83	Precast Concrete	Cracked	Precast Concrete	None	Good	Good
3511			10	Greenbush St and Main St		Concrete	Fair	Good	Good	None	PreCast Concrete	None	Missing Brick	13	1.08	Precast Concrete	none	Precast Concrete	None	Good	Good
3512	51.7		10	Main St and Aurora St		Concrete	Minor	Good	Good	None	PreCast Concrete	None	Missing Brick	16	1.33	Precast Concrete	none	Precast Concrete	None	Good	Good
3513	57.67		10	Main St and The Strand		Concrete	Minor	Good	Good	None	PreCast Concrete	None	Loose Mortar	11	0.92	Precast Concrete	none	Precast Concrete	None	Good	Good
3514	61		10	Main St and Oakland Ave		Concrete	Severe	Good	Good	None	Block	None	Loose Mortar	14	1.17	Precast Concrete	none	Precast Concrete	None	Good	Good
3515	65.7	70.88	5.18	Main St and Greenfield Ave		Concrete	Fair	Good	Good	None	PreCast Concrete	None	Missing Brick	13	1.08	Precast Concrete	none	Precast Concrete	None	Good	Good
3516	63		10	Main Stt and Adams St		Concrete	Fair	Good	Good	None	PreCast Concrete	None	Loose Mortar	11	0.92	Precast Concrete	none	Precast Concrete	None	Good	Good

Appendix D
Manhole Condition Assessment

Manhole Identifier						Physical Condition/Characteristics															
Manhole ID	Invert Elevation	Rim Elevation	Manhole Depth	Street	On 30 Day List?	Surface Cover	Surface Cracking	Frame Condition	Cover Condition	Cover Gasket Condition	Chimney Material	Chimney Seal Condition	Chimney Defects	Chimney Height (in)	Chimney Height (ft)	Cone Material	Cone Defects	Barrel Material	Barrel Defects	Bench Condition	Invert Condition
3517			10	Main St and Genesee St		Concrete	Fair	Good	Good	None	PreCast Concrete	None	Missing Brick	8	0.67	Precast Concrete	none	Precast Concrete	None	Good	Good
3518	61	68.04	7.04	1125 Main St		Concrete	Minor	Good	Worn	None	Block	None	Missing Brick	9	0.75	Block	Loose Mortar	Block	Loose Mortar	Good	Good
3520	37.56	44.43	6.87	Pleasant St		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	18	1.50	Precast Concrete	none	Precast Concrete	None	Good	Good
3540	84.99	94.02	9.03	Alley off of Perkins Ave		Asphalt	Fair	Worn	Worn	None	Block	None	None	1	0.08	Block	none	Precast Concrete	None	See Comments	Poor
3541	99		10	Rosemary St		Asphalt	Minor	Good	Good	None	Block	None	None	12	1.00	Block	none	Block	None	Good	Good
3542	67		10	Oakland Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	Cracked	11	0.92	Precast Concrete	none	Precast Concrete	None	Good	Good
3543	46	55.02	9.02	Greenbush St		Asphalt	Fair	Good	Good	None	PreCast Concrete	None	Loose Mortar	16	1.33	Precast Concrete	none	Precast Concrete	None	Good	Good
3547	84.31	91.87	7.56	Greenfield Ave		Asphalt	Severe	Good	Good	None	Block	None	Loose Mortar	6	0.50	Block	none	Block	None	Good	Good
3548	84	90.33	6.33	Greenfield Ave		Asphalt	Minor	Good	Good	Good	PreCast Concrete	None	None	11	0.92	Precast Concrete	none	Precast Concrete	None	Good	Good
3549	82	90	8	Greenfield Ave	√	Asphalt	Severe	Worn	Good	None	Brick	None	Missing Brick	16	1.33	Brick	Loose Mortar	Brick	Missing Brick	See Comments	Fair
3558	24.44		10	Main St	√	Asphalt	Minor	Cracked	Good	None	Block	None	Missing Brick	11	0.92	Block	none	Block	None	Good	Good
3559	27.48		10	Main St		Asphalt	Minor	Good	Good	Good	PreCast Concrete	None	None	10	0.83	Block	none	Block	None	Good	Good
3560			10	Main St and Martin St		Asphalt	Minor	Good	Good	Good	PreCast Concrete	None	None	20	1.67	Precast Concrete	none	Precast Concrete	None	Good	Good
3561			10	Main St		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	20	1.67	Precast Concrete	Cracked	Precast Concrete	None	Good	Good
3562			10	Main St		Concrete	Minor	Good	Good	None	PreCast Concrete	None	None	13	1.08	Precast Concrete	none	Precast Concrete	None	Good	Good
3563	39.9		10	Main St		Concrete	Fair	Good	Good	Good	Block	None	Missing Brick	8	0.67	Block	none	Block	Cracked	Good	Good
3564			10	Main St and Caroline St		Concrete	Minor	Good	Good	None	Block	None	Loose Mortar	6	0.50	Block	none	Block	None	Good	Good
3565			10	Main St and Hartwell Ave		Concrete	Minor	Good	Good	None	Block	None	Loose Mortar	12	1.00	Block	none	Block	None	Good	Good
3566	41.58		10	610	√	Concrete	Severe	Good	Good	None	PreCast Concrete	None	Cracked	9	0.75	Precast Concrete	none	Precast Concrete	None	Good	Good
3567	46.34		10	708 Main St		Concrete	Minor	Good	Good	None	Block	None	Missing Brick	9	0.75	Precast Concrete	Cracked	Precast Concrete	None	Good	Good
3568	65		10	Main St and Raymond St		Concrete	Fair	Good	Good	None	PreCast Concrete	None	Cracked	13	1.08	Precast Concrete	none	Precast Concrete	None	Good	Good
3570	43.12		10	White Rock Ave		Concrete	Fair	Good	Good	None	PreCast Concrete	None	Missing Brick	31	2.58	Precast Concrete	none	Precast Concrete	None	Good	Good
3580	43.92	51.68	7.76	White Rock Ave		Concrete	Minor	Good	Good	None	PreCast Concrete	None	None	30	2.50	Precast Concrete	none	Precast Concrete	None	Good	Good
3581	45.38	53.01	7.63	White Rock Ave		Concrete	Minor	Good	Good	None	PreCast Concrete	None	None	30	2.50	Precast Concrete	none	Precast Concrete	None	Good	Good

Appendix D
Manhole Condition Assessment

Manhole Identifier						Physical Condition/Characteristics															
Manhole ID	Invert Elevation	Rim Elevation	Manhole Depth	Street	On 30 Day List?	Surface Cover	Surface Cracking	Frame Condition	Cover Condition	Cover Gasket Condition	Chimney Material	Chimney Seal Condition	Chimney Defects	Chimney Height (in)	Chimney Height (ft)	Cone Material	Cone Defects	Barrel Material	Barrel Defects	Bench Condition	Invert Condition
3584	24.78	34.45	9.67	Baxter St		Asphalt	Fair	Good	Good	Poor	PreCast Concrete	None	None	10	0.83	Precast Concrete	none	Precast Concrete	None	Good	Good
3600	105.4	112.7	7.3	Pewaukee Rd and Buena Vista Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	31	2.58	Precast Concrete	none	Precast Concrete	None	Good	Good
3651	17.24	23.2	5.96	In Bethesda Park off Dunbar Ave		Grass	Minor	Worn	Good	None	Block	None	None	3	0.25	Block	none	Block	None	No Trough	Good
3652	15	23.5	8.5	Prairie Ave and Hamilton Ave		Concrete	Fair	Good	Good	None	PreCast Concrete	None	None	15	1.25	Precast Concrete	Other	Precast Concrete	None	Good	Good
3653	18	26.25	8.25	Hamilton Ave		Asphalt	Minor	Worn	Good	Good	PreCast Concrete	None	None	8	0.67	Precast Concrete	none	Precast Concrete	None	No Lateral Trough	Good
3655	12.67	24.06	11.39	Prairie Ave and Marshall St		Asphalt	Minor	Good	Good	Good	Brick	Leaking	Loose Mortar	13	1.08	Block	Other	Block	None	See Comments	Good
3658	64.56	71.35	6.79	MotorAav and Fairview Ave		Asphalt	Fair	Good	Good	None	PreCast Concrete	None	None	20	1.67	Precast Concrete	none	Precast Concrete	None	Good	Good
3659			10	Fairview Ave	√	Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	29	2.42	Precast Concrete	none	Precast Concrete	None	Good	Good
3660			10	Fairview Ave		Asphalt	Fair	Worn	Worn	None	Block	None	None	8	0.67	Block	none	Block	None	Good	Good
3676	17.5		10	Fuller Ave and Ann St	√	Asphalt	Minor	Good	Worn	None	PreCast Concrete	None	None	6	0.50	Precast Concrete	none	Precast Concrete	None	Good	Good
3677	18.41		10	Ann St	√	Asphalt	Minor	Cracked	Good	None	PreCast Concrete	None	None	20	1.67	Precast Concrete	none	Precast Concrete	None	Good	Good
3678	20	30	10	Ann St	√	Asphalt	Fair	Good	Good	None	PreCast Concrete	None	None	23	1.92	Precast Concrete	none	Precast Concrete	None	Good	Good
3680	25.5	32.45	6.95	North Ave		Concrete	Fair	Good	Good	None	PreCast Concrete	None	None	20	1.67	Precast Concrete	none	Precast Concrete	None	Good	Good
3681			10	North Ave		Concrete	Minor	Good	Good	Good	PreCast Concrete	None	None	11	0.92	Precast Concrete	none	Precast Concrete	None	Good	Good
3691	24.58	33.27	8.69	North Ave		Concrete	Minor	Good	Good	None	PreCast Concrete	None	None	9	0.75	Precast Concrete	none	Precast Concrete	None	Good	Good
3692	21	35	14	North Ave		Concrete	Fair	Good	Good	None	PreCast Concrete	None	None	16	1.33	Precast Concrete	none	Precast Concrete	None	No Lateral Trough	Good
3703	163.44	171.25	7.81	moreland		Grass	Minor	Good	Good	None	PreCast Concrete	None	None	40	3.33	Precast Concrete	None	Precast Concrete	None	Good	Good
3718	178.84	188.34	9.5	davidson street		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	20	1.67	Precast Concrete	None	Precast Concrete	Cracked	Good	Fair
3750			10	Paramont Ct	√	Asphalt	Minor	Good	Good	Good	PreCast Concrete	None	None	42	3.50	Precast Concrete	None	Precast Concrete	None	Good	Good
3754			10	Manhattan Ave	√	Asphalt	Minor	Good	Good	Good	PreCast Concrete	None	None	20	1.67	Precast Concrete	none	Precast Concrete	None	Good	Good
3815		135.22	135.22	bluemound	√	Grass	Minor	Good	Good	None	PreCast Concrete	None	None	35	2.92	Precast Concrete	None	Precast Concrete	Bad Joint	Good	Good
3833	150.12	156.07	5.95	heritage	√	Grass	Minor	Cracked	Good	None	PreCast Concrete	None	None	10	0.83	Precast Concrete	None	Precast Concrete	None	Good	Good
3835	107.31	113.61	6.3	moreland	√	Grass	Minor	Good	Good	None	PreCast Concrete	None	None	34	2.83	Precast Concrete	None	Precast Concrete	None	Good	Good
3838	123.72	135.18	11.46	bluemound	√	Grass	Minor	Good	Good	None	PreCast Concrete	None	None	30	2.50	Precast Concrete	None	Precast Concrete	None	Good	Good

Appendix D
Manhole Condition Assessment

Manhole Identifier						Physical Condition/Characteristics															
Manhole ID	Invert Elevation	Rim Elevation	Manhole Depth	Street	On 30 Day List?	Surface Cover	Surface Cracking	Frame Condition	Cover Condition	Cover Gasket Condition	Chimney Material	Chimney Seal Condition	Chimney Defects	Chimney Height (in)	Chimney Height (ft)	Cone Material	Cone Defects	Barrel Material	Barrel Defects	Bench Condition	Invert Condition
3846	94.33	100.68	6.35	Plaza	√	Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	31	2.58	Precast Concrete	None	Precast Concrete	None	Good	Good
3939			10	Prospect Avenue	√	Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	3	0.25	Precast Concrete	none	Precast Concrete	None	Good	Good
3944			10	Dunbar Ave	√	Asphalt	Minor	Good	Good	None	Block	None	Loose Mortar	8	0.67	Block	none	Block	None	Fair	Good
4017	133.25	142.07	8.82	East Avenue and Oxford Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	13	1.08	Precast Concrete	none	Precast Concrete	None	Good	Good
4157			10	Pearl St		Asphalt	Minor	Good	Good	Good	PreCast Concrete	None	None	14	1.17	Precast Concrete	none	Precast Concrete	None	Good	Good
4420	135.93	142.96	7.03	Tall Grass Cir and Tree Line Ct		Asphalt	Minor	Good	Good	Good	PreCast Concrete	Good	None	20	1.67	Precast Concrete	Other	Precast Concrete	None	Good	Good
4499	82.89	93.44	10.55	Marlin Ct		Concrete	Minor	Good	Good	None	PreCast Concrete	Good	None	29	2.42	Precast Concrete	None	Precast Concrete	None	Good	Good
4500	20.44	29.52	9.08	Bank St	√	Asphalt	Minor	Good	Good	Poor	PreCast Concrete	None	Missing Brick	15	1.25	Precast Concrete	none	Precast Concrete	None	Good	Good
4501			10	Barstow St	√	Concrete	Fair	Good	Good	None	PreCast Concrete	None	Loose Mortar	28	2.33	Precast Concrete	none	Precast Concrete	None	No Lateral Trough	Fair
4506			10	Bell St		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	9	0.75	Precast Concrete	none	Precast Concrete	None	No Lateral Trough	Good
4507			10	Bell St and Lincoln Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	8	0.67	Block	none	Block	None	Good	Good
4511	57.36	65.8	8.44	Bell St		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	3	0.25	Precast Concrete	none	Precast Concrete	None	Good	Good
4595	63.9	71.6	7.7	Frame Ave		Asphalt	Minor	Good	Good	None	Brick	None	Loose Mortar	4	0.33	Block	Loose Mortar	Block	None	Good	Good
4608	56	64.58	8.58	Garfield Ave and Fountain Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	4	0.33	Precast Concrete	none	Precast Concrete	Cracked	Good	Good
4609	40	54	14	Grand Ave and Fountain Ave		Asphalt	Minor	Good	Good	None	Brick	None	Missing Brick	16	1.33	Brick	Missing Brick	Brick	Loose Mortar	See Comments	Fair
4610	68.23	74.25	6.02	Frame Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	5	0.42	Precast Concrete	Other	Precast Concrete	None	Good	Good
4612			10	College St		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	16	1.33	Precast Concrete	none	Precast Concrete	None	Good	Good
4613	119	127.2	8.2	College St		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	20	1.67	Precast Concrete	none	Precast Concrete	None	Good	Fair
4622	68	78	10	Mccall Street and Hartwell Avenue		Asphalt	Fair	Good	Good	None	PreCast Concrete	None	None	17	1.42	Precast Concrete	none	Precast Concrete	None	Good	Good
4623	90.11	99.01	8.9	Windsor Ave and Hartwell Avenue		Asphalt	Minor	Good	Good	None	Brick	None	Missing Brick	8	0.67	Block	Other	Block	None	Good	Good
4631			10	Oxford Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	Cracked	12	1.00	Precast Concrete	Other	Precast Concrete	None	Good	Good
4662			10	2222 Invernus Dr		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	8	0.67	Precast Concrete	None	Precast Concrete	None	Good	Good
4718	54.2		10	Lake St and Broadway		Asphalt	Severe	Good	Good	None	PreCast Concrete	None	None	8	0.67	Precast Concrete	none	Precast Concrete	None	No Lateral Trough	Good
4719	53.28	61.76	8.48	Lake St and Lincoln	√	Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	6	0.50	Precast Concrete	none	Precast Concrete	None	Good	Good

Appendix D
Manhole Condition Assessment

Manhole Identifier						Physical Condition/Characteristics															
Manhole ID	Invert Elevation	Rim Elevation	Manhole Depth	Street	On 30 Day List?	Surface Cover	Surface Cracking	Frame Condition	Cover Condition	Cover Gasket Condition	Chimney Material	Chimney Seal Condition	Chimney Defects	Chimney Height (in)	Chimney Height (ft)	Cone Material	Cone Defects	Barrel Material	Barrel Defects	Bench Condition	Invert Condition
4720	54.18		10	Fulton St and Lake St		Asphalt	Minor	Good	Good	Good	PreCast Concrete	None	None	6	0.50	Precast Concrete	none	Precast Concrete	None	Good	Good
4728	80.21	94.46	14.25	Niagara St and Niagara Ct		Asphalt	Minor	Good	Good	None	Block	None	Cracked	19	1.58	Block	Loose Mortar	Block	None	Good	Fair
4760	22.94	32	9.06	Clinton St	√	Asphalt	Minor	Good	Good	None	Block	None	None	8	0.67	Block	none	Block	None	Good	Good
4761	59.99	67.39	7.4	Racine Ave and Broadway	√	Asphalt	Minor	Good	Good	Good	PreCast Concrete	None	None	14	1.17	Precast Concrete	none	Precast Concrete	None	Good	Good
5011			10	1237 Foxwood Trail		Asphalt	Minor	Good	Good	Good	PreCast Concrete	None	None	17	1.42	Precast Concrete	None	Precast Concrete	None	Good	Good
5049	39.17	48.66	9.49	1236 Highpoint Lane		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	Loose Mortar	10	0.83	Precast Concrete	None	Precast Concrete	None	Good	Good
5051	42.79	50.8	8.01	2267 Wren Lane	√	Asphalt	Minor	Good	Good	Good	PreCast Concrete	None	Cracked	20	1.67	Precast Concrete	None	Precast Concrete	None	Good	Good
5121			10	2421 Tanager Ct	√	Asphalt	Minor	Good	Good	Good	PreCast Concrete	None	None	10	0.83	Precast Concrete	None	Precast Concrete	None	Good	Good
5171	7.2	13.91	6.71	Riverpoint Ct and River Valley Rd	√	Asphalt	Minor	Good	Good	None	PreCast Concrete	Good	None	31	2.58	Precast Concrete	None	Precast Concrete	None	Good	Good
5206			10	Portage Trail and Rivers Crossing Dr	√	Asphalt	Minor	Good	Good	Good	PreCast Concrete	None	None	9	0.75	Precast Concrete	Other	Precast Concrete	None	Good	Good
5239			10	1031 Riverhill Drive	√	Asphalt	Fair	Good	Good	Good	PreCast Concrete	None	None	14	1.17	Precast Concrete	None	Precast Concrete	None	Poor	Poor
5274			10	Aviation Dr and Northview Rd	√	Asphalt	Minor	Good	Good	Good	Brick	None	Cracked	23	1.92	Precast Concrete	Other	Precast Concrete	None	Fair	Good
5289			10	Barstow St	√	Concrete	Fair	Good	Good	None	PreCast Concrete	None	Cracked	25	2.08	Precast Concrete	none	Precast Concrete	None	Good	Good
5290			10	Clinton St	√	Asphalt	Fair	Good	Good	None	PreCast Concrete	None	None	25	2.08	Precast Concrete	none	Precast Concrete	None	Good	Good
5296	31.7	40.6	8.9	Carroll Avenue		Asphalt	Fair	Good	Good	None	PreCast Concrete	None	Loose Mortar	15	1.25	Precast Concrete	none	Precast Concrete	None	Good	Good
5303			10	Glenwood Ct		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	5	0.42	Precast Concrete	none	Precast Concrete	None	Good	Good
5310	81.38	85.75	4.37	East Avenue and Harrison Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	8	0.67	Precast Concrete	none	Precast Concrete	None	Fair	Fair
5311	65.67	66.67	1	Grand Ave and Wilson Ave		Gravel	Minor	Good	Good	Good	PreCast Concrete	None	None	13	1.08	Precast Concrete	none	Precast Concrete	None	Good	Good
5312	42	49	7	Fountain Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	14	1.17	Precast Concrete	none	Precast Concrete	None	Good	Good
5355			10	1935 Wexford Lane		Asphalt	Minor	Good	Good	Good	PreCast Concrete	None	None	29	2.42	Monolithic	None	Precast Concrete	None	Good	Good
5365			10	Penhurst		Asphalt	Minor	Good	Good	Good	PreCast Concrete	None	None	18	1.50	Precast Concrete	None	Precast Concrete	None	Good	Good
5367			10	Austin Ct	√	Asphalt	Minor	Good	Good	Good	PreCast Concrete	None	None	2	0.17	Precast Concrete	None	Precast Concrete	None	Good	Fair
5463	108	120	12	Hartwell Ave	√	Asphalt	Minor	Worn	Good	None	PreCast Concrete	None	None	12	1.00	Precast Concrete	none	Precast Concrete	None	Good	Good
5485	48.95	57.71	8.76	Moreland Ave and Jefferson Ave	√	Concrete	Minor	Good	Good	Good	PreCast Concrete	None	None	9	0.75	Precast Concrete	none	Precast Concrete	None	Good	Good

Appendix D
Manhole Condition Assessment

Manhole Identifier						Physical Condition/Characteristics															
Manhole ID	Invert Elevation	Rim Elevation	Manhole Depth	Street	On 30 Day List?	Surface Cover	Surface Cracking	Frame Condition	Cover Condition	Cover Gasket Condition	Chimney Material	Chimney Seal Condition	Chimney Defects	Chimney Height (in)	Chimney Height (ft)	Cone Material	Cone Defects	Barrel Material	Barrel Defects	Bench Condition	Invert Condition
5486			10	Jefferson Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	Missing Brick	5	0.42	Precast Concrete	none	Precast Concrete	None	Good	Good
5487			10	1535 Jefferson Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	Loose Mortar	12	1.00	Precast Concrete	none	Precast Concrete	None	Good	Good
5488			10	Jefferson Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	18	1.50	Precast Concrete	none	Precast Concrete	None	Good	Good
5489		59.6	59.6	Jefferson Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	6	0.50	Precast Concrete	none	Precast Concrete	None	Good	Good
5537	84.5	92.7	8.2	Oxford Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	14	1.17	Precast Concrete	Other	Precast Concrete	None	Good	Good
5538	86.5	96.5	10	Oxford Ave and Charles St		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	14	1.17	Precast Concrete	Other	Precast Concrete	None	Good	Good
5539	92.8	102.8	10	Oxford Ave		Concrete	Minor	Good	Good	None	PreCast Concrete	None	None	13	1.08	Precast Concrete	Other	Precast Concrete	Bad Joint	Good	Good
5541	90.45	98.5	8.05	Oxford Ave		Asphalt	Minor	Good	Good	None	Brick	None	Missing Brick	9	0.75	Block	Other	Block	None	Good	Good
5542	93.72	104.81	11.09	Hartwell Ave		Asphalt	Fair	Good	Good	None	Brick	None	Loose Mortar	4	0.33	Block	Loose Mortar	Block	Bad Joint	Fair	Fair
5548			10	Windsor Ave		Grass	Minor	Good	Good	None	PreCast Concrete	None	Loose Mortar	8	0.67	Block	Loose Mortar	Block	Loose Mortar	Good	Good
5550			10	Windsor Ave and Charles St		Asphalt	Minor	Worn	Good	None	Brick	None	Missing Brick	5	0.42	Block	Cracked	Block	Cracked	Good	Good
5560	55.96	62.23	6.27	Broadway and Buchner Ct		Asphalt	Minor	Good	Good	None	Block	None	None	12	1.00	Block	none	Block	None	Good	Good
5561	56.22	62.46	6.24	Broadway and Buchner Ct		Asphalt	Minor	Good	Good	None	Block	None	Loose Mortar	15	1.25	Block	none	Block	None	Good	Good
5583	13.72	29.01	15.29	Prairie Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	13	1.08	Block	none	Block	None	Good	Good
5634	50.03	56.64	6.61	The Strand		Asphalt	Minor	Good	Good	None	Block	None	Loose Mortar	4	0.33	Block	Cracked	Block	None	Good	Good
5645	75.65	83.02	7.37	Frederick St and Ellis St		Asphalt	Minor	Good	Good	None	Block	None	None	10	0.83	Block	none	Block	None	Good	Good
5776	30.06	39.6	9.54	Carroll Avenue		Asphalt	Fair	Good	Good	Poor	PreCast Concrete	None	None	14	1.17	Precast Concrete	none	Precast Concrete	None	Good	Good
5779			10	Prospect Avenue and West Avenue		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	6	0.50	Precast Concrete	none	Precast Concrete	None	Good	Good
5781			10	Prospect Avenue		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	Loose Mortar	12	1.00	Precast Concrete	none	Precast Concrete	Bad Joint	Good	Good
5785	59.96	68.07	8.11	Scott Ave and Frame Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	11	0.92	Precast Concrete	Other	Precast Concrete	Bad Joint	Fair	Good
5852			10	Mary St		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	Loose Mortar	22	1.83	Precast Concrete	none	Precast Concrete	None	Good	Good
5867	84	91.8	7.8	Grove St and Hartwell Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	11	0.92	Precast Concrete	none	Precast Concrete	None	Good	Good
5868	96.64	101	4.36	Brasted Ave and Hartwell Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	9	0.75	Precast Concrete	none	Precast Concrete	None	Good	Good
5869	90	100	10	Grove St		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	14	1.17	Precast Concrete	none	Precast Concrete	None	Good	Good

Appendix D
Manhole Condition Assessment

Manhole Identifier						Physical Condition/Characteristics															
Manhole ID	Invert Elevation	Rim Elevation	Manhole Depth	Street	On 30 Day List?	Surface Cover	Surface Cracking	Frame Condition	Cover Condition	Cover Gasket Condition	Chimney Material	Chimney Seal Condition	Chimney Defects	Chimney Height (in)	Chimney Height (ft)	Cone Material	Cone Defects	Barrel Material	Barrel Defects	Bench Condition	Invert Condition
5870	91	101.8	10.8	Grove St		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	12	1.00	Precast Concrete	none	Precast Concrete	Cracked	Good	Good
5883			10	Rock St		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	10	0.83	Precast Concrete	none	Precast Concrete	None	Good	Good
5892	86.98	98.18	11.2	Manhattan Ave		Asphalt	Fair	Cracked	Good	None	PreCast Concrete	None	Cracked	14	1.17	Precast Concrete	none	Precast Concrete	None	Good	Good
5895			10	Mccall Street		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	Loose Mortar	20	1.67	Precast Concrete	none	Precast Concrete	Cracked	No Lateral Trough	Good
5899			10	Wisconsin Ave	√	Concrete	Fair	Good	Good	None	Block	None	Missing Brick	40	3.33	Block	none	Block	None	Good	Good
6913	35		10	Arlington Avenue		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	14	1.17	Precast Concrete	none	Precast Concrete	None	Good	Good
8201			10	Delefield St		Concrete	Fair	Good	Good	None	Block	None	Loose Mortar	15	1.25	Block	none	Block	None	Good	Good
8205			10	Cook Street		Asphalt	Minor	Good	Good	Good	PreCast Concrete	None	Loose Mortar	18	1.50	Precast Concrete	none	Precast Concrete	None	No Lateral Trough	Good
8843			10	4024 Stillwater Cir		Asphalt	Minor	Good	Good	Good	PreCast Concrete	None	None	10	0.83	Precast Concrete	Other	Precast Concrete	None	No Trough	Fair
9161			10	Oxbow Dr and Bayberry		Asphalt	Minor	Good	Good	Good	Plastic/Rubber Rings	None	None	9	0.75	Precast Concrete	Other	Precast Concrete	None	Good	Good
10126			10	Prairie Ave	√	Asphalt	Minor	Good	Good	None	Block	None	None	4	0.33	Block	none	Block	None	See Comments	Good
11731			10	4146 Stillwater Cir	√	Asphalt	Minor	Good	Good	Good	PreCast Concrete	None	None	10	0.83	Precast Concrete	Other	Precast Concrete	None	Good	Good
12359			10	Franklin Ave		Asphalt	Minor	Good	Good	None	PreCast Concrete	None	None	8	0.67	Precast Concrete	none	Precast Concrete	None	No Lateral Trough	Good
13966	27.36	37.8	10.44	North Ave	√	Concrete	Fair	Good	Cracked	None	PreCast Concrete	None	Cracked	11	0.92	Precast Concrete	none	Precast Concrete	None	Good	Fair
14280			10	Central Ave		Asphalt	Minor	Good	Good	Good	PreCast Concrete	None	None	12	1.00	Precast Concrete	none	Precast Concrete	None	Good	Good
17511			10	222 Maple Ave		Asphalt	Fair	Good	Good	None	Block	None	Missing Brick	8	0.67	Block	none	Block	None	No Lateral Trough	Fair
19125			10			Grass	Minor	Good	Good	Good	PreCast Concrete	None	None	6	0.50	Precast Concrete	None	Precast Concrete	None	Good	Good
19215			10	1631 Moccasin Trail		Asphalt	Minor	Good	Good	Good	PreCast Concrete	None	Cracked	9	0.75	Precast Concrete	None	Precast Concrete	None	Good	Good
19237			10	2915 Broken Arrow Ct	√	Grass	Minor	Good	Good	None	PreCast Concrete	None	None	6	0.50	Precast Concrete	None	Precast Concrete	None	Fair	Good
19299			10	Carpenter Pl and Oakland Ave	√	Asphalt	Minor	Good	Good	Good	PreCast Concrete	None	None	12	1.00	Precast Concrete	none	Precast Concrete	None	Good	Good
19300			10	Oakland Ave and Ellis St	√	Asphalt	Minor	Good	Good	Good	PreCast Concrete	None	None	17	1.42	Precast Concrete	none	Precast Concrete	None	Good	Good

Appendix E

Manhole Rehabilitation and Replacement Recommendations

Appendix E
Manhole Rehabilitation and Replacement Recommendations

Manhole Identifier	Recommendations																	Costs									
																		per VF	Each	per VF	per VF	per VF	per MH	$70/hr/2-man crew (4 hours)	per MH	per MH	
																		$ 450	$ 50	$ 350	$ 400	$ 125	$ 1,200	$ 560	$ 100	$ 450	
Manhole ID	Recommen-dation	Priority	Field Verify?	Repair Pavement?	Replace Cover?	Replace Frame?	Replace/Rehab Chimney	Chimney Rehab	Chimney Replace	Replace/ Rehab Cone	Cone Rehab	Cone Replace	Rehab Barrel?	Rehab Bench?	Build Trough?	Rehab Invert?	Leaking?	Total Manhole Replacement	Cover Replacement	Frame & Chimney Replacement	Cone or Barrel Replacement	Cone/Chimney Rehab	Barrel Rehab	Bench / Invert / Trough Rehab	Bypass Pumping	Leak Grouting	Total Cost
12	Rehab	Low	√		√		√							√				$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ -	$ -	$ 560
25	Re-inspect	Re-inspect in 5 years.																$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
26	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
30	Rehab	Low		√	√		Rehab	√										$ -	$ -	$ -	$ -	$ 125	$ -	$ -	$ -	$ -	$ 125
31	Rehab	Moderate			√		Rehab	√							√			$ -	$ -	$ -	$ -	$ 146	$ -	$ 560	$ 100	$ -	$ 806
32	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
33	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
46	Replace	Moderate			√													$ 3,600	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 3,600
48	Rehab	Low			√		Rehab	√		Rehab	√							$ -	$ -	$ -	$ -	$ 531	$ -	$ -	$ -	$ -	$ 531
49	Rehab	Moderate			√									√	√			$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 660
50	None	Low		√	√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
51	Rehab	Low			√		Rehab	√										$ -	$ -	$ -	$ -	$ 125	$ -	$ -	$ -	$ -	$ 125
52	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
53	Partial Replace	Low			√		Replace		√									$ -	$ -	$ 350	$ -	$ -	$ -	$ -	$ -	$ -	$ 350
54	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
55	Rehab	Moderate		√	√		Rehab	√						√	√	√		$ -	$ -	$ -	$ -	$ 146	$ -	$ 560	$ 100	$ -	$ 806
56	Rehab	Low			√		Rehab	√										$ -	$ -	$ -	$ -	$ 125	$ -	$ -	$ -	$ -	$ 125
60	Rehab	Moderate		√	√					Rehab	√			√	√			$ -	$ -	$ -	$ -	$ 604	$ -	$ 560	$ 100	$ -	$ 1,264
61	Rehab	With street reconstruction.		√	√	√	Rehab	√										$ -	$ -	$ 350	$ -	$ 125	$ -	$ -	$ -	$ -	$ 475
62	Replace	Moderate			√													$ 4,500	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 4,500
67	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
68	Rehab	Low		√	√	√	Rehab	√										$ -	$ -	$ 379	$ -	$ 135	$ -	$ -	$ -	$ -	$ 515
69	None																	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
70	Replace	Moderate			√													$ 4,500	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 4,500
72	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
75	Rehab	With street reconstruction.		√	√		Rehab	√										$ -	$ -	$ -	$ -	$ 125	$ -	$ -	$ -	$ -	$ 125
80	Rehab	Low			√					Rehab	√						√	$ -	$ -	$ -	$ -	$ 625	$ -	$ -	$ -	$ 450	$ 1,075
86	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
88	Replace	Moderate		√	√		Replace		√	Replace		√	√					$ 3,137	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 3,137
89	Rehab	Low		√	√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
98	Partial Replace	Low			√		Replace		√									$ -	$ -	$ 467	$ -	$ -	$ -	$ -	$ -	$ -	$ 467
134	Rehab	With street reconstruction.	√		√											√		$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 660
381	Partial Replace	Low			√	√												$ -	$ -	$ 350	$ -	$ -	$ -	$ -	$ -	$ -	$ 350
419	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50

Appendix E
Manhole Rehabilitation and Replacement Recommendations

Manhole Identifier	Recommendations																	Costs									
																		per VF	Each	per VF	per VF	per VF	per MH	$70/hr/2-man crew (4 hours)	per MH	per MH	
																		$ 450	$ 50	$ 350	$ 400	$ 125	$ 1,200	$ 560	$ 100	$ 450	
Manhole ID	Recommen-dation	Priority	Field Verify?	Repair Pavement?	Replace Cover?	Replace Frame?	Replace/Rehab Chimney	Chimney Rehab	Chimney Replace	Replace/ Rehab Cone	Cone Rehab	Cone Replace	Rehab Barrel?	Rehab Bench?	Build Trough?	Rehab Invert?	Leaking?	Total Manhole Replacement	Cover Replacement	Frame & Chimney Replacement	Cone or Barrel Replacement	Cone/Chimney Rehab	Barrel Rehab	Bench / Invert / Trough Rehab	Bypass Pumping	Leak Grouting	Total Cost
420	Rehab	With street reconstruction.			√										√			$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 660
421	Rehab	With street reconstruction.		√	√										√			$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 660
425	None																	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
428	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
429	Rehab	Moderate			√									√	√			$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 660
430	Partial Replace	Low			√		Replace		√									$ -	$ -	$ 350	$ -	$ -	$ -	$ -	$ -	$ -	$ 350
438	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
481	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
482	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
499	Replace	Low			√	√	Replace		√							√		$ 3,785	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 3,785
505	Rehab	Low			√	√				Rehab	√							$ -	$ -	$ 350	$ -	$ 552	$ -	$ -	$ -	$ -	$ 902
511	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
512	Rehab	With street reconstruction.			√								√	√				$ -	$ -	$ -	$ -	$ -	$ 1,200	$ 560	$ -	$ -	$ 1,760
513	Rehab	Low			√								√					$ -	$ -	$ -	$ -	$ -	$ 1,200	$ -	$ -	$ -	$ 1,200
515	Rehab	Low			√		Rehab	√										$ -	$ -	$ -	$ -	$ 125	$ -	$ -	$ -	$ -	$ 125
516	Rehab	Low			√	√							√					$ -	$ -	$ 350	$ -	$ -	$ 1,200	$ -	$ -	$ -	$ 1,550
517	Rehab	Low			√		Rehab	√					√					$ -	$ -	$ -	$ -	$ 313	$ 1,200	$ -	$ -	$ -	$ 1,513
538	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
541	Partial Replace	Low			√		Replace		√									$ -	$ -	$ 438	$ -	$ -	$ -	$ -	$ -	$ -	$ 438
549	Rehab	Low			√	√							√					$ -	$ -	$ 350	$ -	$ -	$ 1,200	$ -	$ -	$ -	$ 1,550
551	Rehab	Low			√	√	Replace		√	Rehab	√							$ -	$ -	$ 350	$ -	$ 552	$ -	$ -	$ -	$ -	$ 902
553	Rehab	With street reconstruction.					Rehab	√										$ -	$ -	$ -	$ -	$ 135	$ -	$ -	$ -	$ -	$ 135
554	Rehab	With street reconstruction.			√	√	Rehab	√										$ -	$ -	$ 350	$ -	$ 125	$ -	$ -	$ -	$ -	$ 475
596	Rehab	Moderate			√									√	√	√		$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 660
597	Partial Replace	Low			√		Replace		√				√	√				$ -	$ -	$ 350	$ -	$ -	$ 1,200	$ 560	$ -	$ -	$ 2,110
602	Rehab	Low	√		√		Rehab	√						√				$ -	$ -	$ -	$ -	$ 156	$ -	$ 560	$ -	$ -	$ 716
603	Rehab	With street reconstruction.		√	√		Rehab	√					√					$ -	$ -	$ -	$ -	$ 156	$ 1,200	$ -	$ -	$ -	$ 1,356
644	Rehab	Low		√	√		Rehab	√										$ -	$ -	$ -	$ -	$ 260	$ -	$ -	$ -	$ -	$ 260
646	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
647	Rehab	Low	√		√	√							√	√				$ -	$ -	$ 350	$ -	$ -	$ 1,200	$ 560	$ -	$ -	$ 2,110
648	Rehab	Low				√	Rehab	√										$ -	$ -	$ 758	$ -	$ 271	$ -	$ -	$ -	$ -	$ 1,029
649	Partial Replace	Low			√	√												$ -	$ -	$ 467	$ -	$ -	$ -	$ -	$ -	$ -	$ 467
650	Rehab	With street reconstruction.			√								√					$ -	$ -	$ -	$ -	$ -	$ 1,200	$ -	$ -	$ -	$ 1,200
653	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50

Appendix E
Manhole Rehabilitation and Replacement Recommendations

Manhole Identifier	Recommendations																	Costs									
																		per VF	Each	per VF	per VF	per VF	per MH	$70/hr/2-man crew (4 hours)	per MH	per MH	
																		$ 450	$ 50	$ 350	$ 400	$ 125	$ 1,200	$ 560	$ 100	$ 450	
Manhole ID	Recommen-dation	Priority	Field Verify?	Repair Pavement?	Replace Cover?	Replace Frame?	Replace/Rehab Chimney	Chimney Rehab	Chimney Replace	Replace/ Rehab Cone	Cone Rehab	Cone Replace	Rehab Barrel?	Rehab Bench?	Build Trough?	Rehab Invert?	Leaking?	Total Manhole Replacement	Cover Replacement	Frame & Chimney Replacement	Cone or Barrel Replacement	Cone/Chimney Rehab	Barrel Rehab	Bench / Invert / Trough Rehab	Bypass Pumping	Leak Grouting	Total Cost
654	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
655	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
656	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
657	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
721	Partial Replace	Moderate	√		√		Replace		√					√	√	√		$ -	$ -	$ 408	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 1,068
723	Rehab	Low			√								√					$ -	$ -	$ -	$ -	$ -	$ 1,200	$ -	$ -	$ -	$ 1,200
724	Rehab	Low			√	√							√					$ -	$ -	$ 350	$ -	$ -	$ 1,200	$ -	$ -	$ -	$ 1,550
725	Rehab	Low		√	√	√												$ -	$ -	$ 350	$ -	$ -	$ -	$ -	$ -	$ -	$ 350
733	Partial Replace	Low			√	√												$ -	$ -	$ 438	$ -	$ -	$ -	$ -	$ -	$ -	$ 438
744	Partial Replace	Moderate		√	√		Replace		√									$ -	$ -	$ 350	$ -	$ -	$ -	$ -	$ -	$ -	$ 350
747	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
751	Partial Replace	Low			√	√												$ -	$ -	$ 350	$ -	$ -	$ -	$ -	$ -	$ -	$ 350
752	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
753	Partial Replace	Low					Replace		√								√	$ -	$ -	$ 350	$ -	$ -	$ -	$ -	$ -	$ 450	$ 800
754	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
755	Replace	High/With street reconstruction.			√													$ 4,500	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 4,500
756	Partial Replace	With street reconstruction.			√		Replace		√				√	√		√		$ -	$ -	$ 350	$ -	$ -	$ 1,200	$ 560	$ 100	$ -	$ 2,210
757	Rehab	With street reconstruction.		√	√									√		√		$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 660
758	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
761	Rehab	Moderate			√		Rehab	√							√			$ -	$ -	$ -	$ -	$ 156	$ -	$ 560	$ 100	$ -	$ 816
791	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
805	Rehab	Moderate			√											√		$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 660
863	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
865	Rehab	Moderate	√		√										√			$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 660
867	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
884	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
998	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
999	Rehab	Moderate		√	√		Replace		√	Rehab	√					√		$ -	$ -	$ 350	$ -	$ 552	$ -	$ 560	$ 100	$ -	$ 1,562
1000	Rehab	Moderate		√	√	√	Replace		√				√					$ -	$ -	$ 642	$ -	$ -	$ 1,200	$ -	$ -	$ -	$ 1,842
1001	Rehab	Low			√	√	Replace		√				√					$ -	$ -	$ 642	$ -	$ -	$ 1,200	$ -	$ -	$ -	$ 1,842
1002	Rehab	Low			√	√							√	√				$ -	$ -	$ 467	$ -	$ -	$ 1,200	$ 560	$ -	$ -	$ 2,227
1003	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
1014	Rehab	Low		√	√		Rehab	√										$ -	$ -	$ -	$ -	$ 167	$ -	$ -	$ -	$ -	$ 167
1015	Rehab	Low			√		Rehab	√										$ -	$ -	$ -	$ -	$ 167	$ -	$ -	$ -	$ -	$ 167

Appendix E
Manhole Rehabilitation and Replacement Recommendations

Manhole Identifier	Recommendations																	Costs									
																		per VF	Each	per VF	per VF	per VF	per MH	$70/hr/2-man crew (4 hours)	per MH	per MH	
																		$ 450	$ 50	$ 350	$ 400	$ 125	$ 1,200	$ 560	$ 100	$ 450	
Manhole ID	Recommen-dation	Priority	Field Verify?	Repair Pavement?	Replace Cover?	Replace Frame?	Replace/Rehab Chimney	Chimney Rehab	Chimney Replace	Replace/ Rehab Cone	Cone Rehab	Cone Replace	Rehab Barrel?	Rehab Bench?	Build Trough?	Rehab Invert?	Leaking?	Total Manhole Replacement	Cover Replacement	Frame & Chimney Replacement	Cone or Barrel Replacement	Cone/Chimney Rehab	Barrel Rehab	Bench / Invert / Trough Rehab	Bypass Pumping	Leak Grouting	Total Cost
1017	Rehab	Low				√							√					$ -	$ -	$ 350	$ -	$ -	$ 1,200	$ -	$ -	$ -	$ 1,550
1018	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
1019	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
1020	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
1021	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
1071	Rehab	Moderate			√		Rehab	√		Rehab	√							$ -	$ -	$ -	$ -	$ 729	$ -	$ -	$ -	$ -	$ 729
1072	Rehab	Moderate		√	√		Rehab	√						√		√		$ -	$ -	$ -	$ -	$ 198	$ -	$ 560	$ 100	$ -	$ 858
1077	Rehab	Low					Rehab	√										$ -	$ -	$ -	$ -	$ 125	$ -	$ -	$ -	$ -	$ 125
1078	Rehab	Moderate	√		√		Replace		√					√	√			$ -	$ -	$ 350	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 1,010
1085	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
1087	Replace	Moderate			√													$ 4,500	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 4,500
1106	Rehab	Low			√		Rehab	√										$ -	$ -	$ -	$ -	$ 240	$ -	$ -	$ -	$ -	$ 240
1110	None	Low		√	√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
1111	Rehab	Low											√					$ -	$ -	$ -	$ -	$ -	$ 1,200	$ -	$ -	$ -	$ 1,200
1114	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
1115	Rehab	Moderate		√	√		Rehab	√						√	√	√		$ -	$ -	$ -	$ -	$ 125	$ -	$ 560	$ 100	$ -	$ 785
1129	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
1130	Rehab	Low			√		Rehab	√										$ -	$ -	$ -	$ -	$ 125	$ -	$ -	$ -	$ -	$ 125
1131	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
1132	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
1133	Rehab	Low			√		Rehab	√										$ -	$ -	$ -	$ -	$ 125	$ -	$ -	$ -	$ -	$ 125
1140	Rehab	With street reconstruction.			√										√			$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 660
1144	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
1146	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
1199	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
1210	Rehab	Moderate			√									√	√			$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 660
1211	Rehab	Low					Rehab	√										$ -	$ -	$ -	$ -	$ 125	$ -	$ -	$ -	$ -	$ 125
1212	Rehab	Low					Rehab	√		Rehab	√							$ -	$ -	$ -	$ -	$ 625	$ -	$ -	$ -	$ -	$ 625
1213	Rehab	Low		√	√								√					$ -	$ -	$ -	$ -	$ -	$ 1,200	$ -	$ -	$ -	$ 1,200
1214	Rehab	Low		√	√		Rehab	√										$ -	$ -	$ -	$ -	$ 167	$ -	$ -	$ -	$ -	$ 167
1215	Rehab	Low		√	√		Rehab	√										$ -	$ -	$ -	$ -	$ 125	$ -	$ -	$ -	$ -	$ 125
1216	Rehab	Low		√	√		Rehab	√										$ -	$ -	$ -	$ -	$ 125	$ -	$ -	$ -	$ -	$ 125
1217	Rehab	With street reconstruction.			√		Rehab	√					√			√		$ -	$ -	$ -	$ -	$ 125	$ 1,200	$ 560	$ 100	$ -	$ 1,985
1218	Rehab	Moderate			√										√			$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 660

Appendix E
Manhole Rehabilitation and Replacement Recommendations

Manhole Identifier	Recommendations																	Costs									
																		per VF	Each	per VF	per VF	per VF	per MH	$70/hr/2-man crew (4 hours)	per MH	per MH	
																		$ 450	$ 50	$ 350	$ 400	$ 125	$ 1,200	$ 560	$ 100	$ 450	
Manhole ID	Recommen-dation	Priority	Field Verify?	Repair Pavement?	Replace Cover?	Replace Frame?	Replace/Rehab Chimney	Chimney Rehab	Chimney Replace	Replace/ Rehab Cone	Cone Rehab	Cone Replace	Rehab Barrel?	Rehab Bench?	Build Trough?	Rehab Invert?	Leaking?	Total Manhole Replacement	Cover Replacement	Frame & Chimney Replacement	Cone or Barrel Replacement	Cone/Chimney Rehab	Barrel Rehab	Bench / Invert / Trough Rehab	Bypass Pumping	Leak Grouting	Total Cost
1219	Rehab	With street reconstruction.			√		Rehab	√										$ -	$ -	$ -	$ -	$ 125	$ -	$ -	$ -	$ -	$ 125
1324	Rehab	Low	√	√	√									√				$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ -	$ -	$ 560
1325	Rehab	Low		√	√		Rehab	√										$ -	$ -	$ -	$ -	$ 156	$ -	$ -	$ -	$ -	$ 156
1328	Rehab	Low			√		Rehab	√										$ -	$ -	$ -	$ -	$ 167	$ -	$ -	$ -	$ -	$ 167
1365	Rehab	Low		√	√		Rehab	√						√				$ -	$ -	$ -	$ -	$ 146	$ -	$ 560	$ -	$ -	$ 706
1711	Rehab	Moderate	√		√		Rehab	√						√		√		$ -	$ -	$ -	$ -	$ 302	$ -	$ 560	$ 100	$ -	$ 962
1714	None																	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
1715	Partial Replace	Moderate	√		√		Replace		√	Replace		√		√	√	√		$ -	$ -	$ 350	$ 1,600	$ -	$ -	$ 560	$ 100	$ -	$ 2,610
1718	None																	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
1719	Rehab	Low			√								√					$ -	$ -	$ -	$ -	$ -	$ 1,200	$ -	$ -	$ -	$ 1,200
1720	None	Low		√	√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
1721	Rehab	Moderate		√	√		Rehab	√		Rehab	√		√	√		√		$ -	$ -	$ -	$ -	$ 552	$ 1,200	$ 560	$ 100	$ -	$ 2,412
1736	Replace	Moderate			√													$ 4,500	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 4,500
1737	Partial Replace	Moderate			√	√	Replace		√	Replace		√				√		$ -	$ -	$ 467	$ 1,600	$ -	$ -	$ 560	$ 100	$ -	$ 2,727
1742	Replace	With street reconstruction.			√	√	Rehab	√		Rehab	√							$ 4,500	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 4,500
1743	None	Low		√	√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
1747	Rehab	Low			√		Rehab	√					√				√	$ -	$ -	$ -	$ -	$ 125	$ 1,200	$ -	$ -	$ 450	$ 1,775
1755	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
1756	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
1757	Rehab	With street reconstruction.		√	√		Rehab	√										$ -	$ -	$ -	$ -	$ 125	$ -	$ -	$ -	$ -	$ 125
1759	None	Low		√	√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
1778	None	Low		√	√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
1779	None																	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
1788	Rehab	Low		√	√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
1794	Rehab	Moderate			√										√			$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 660
1795	Rehab	Low			√		Replace		√	Replace		√						$ -	$ -	$ 350	$ 1,600	$ -	$ -	$ -	$ -	$ -	$ 1,950
1796	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
1797	Rehab	Moderate			√		Rehab	√						√	√			$ -	$ -	$ -	$ -	$ 125	$ -	$ 560	$ 100	$ -	$ 785
1798	Rehab	Low	√		√									√		√		$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 660
1799	Rehab	Moderate			√										√			$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 660
1800	Rehab	Moderate			√		Rehab	√						√	√			$ -	$ -	$ -	$ -	$ 125	$ -	$ 560	$ 100	$ -	$ 785
1804	None																	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
1805	Partial Replace	Low			√		Replace		√									$ -	$ -	$ 408	$ -	$ -	$ -	$ -	$ -	$ -	$ 408
1807	None																	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -

Appendix E
Manhole Rehabilitation and Replacement Recommendations

Manhole Identifier	Recommendations																	Costs									
																		per VF	Each	per VF	per VF	per VF	per MH	$70/hr/2-man crew (4 hours)	per MH	per MH	
																		$ 450	$ 50	$ 350	$ 400	$ 125	$ 1,200	$ 560	$ 100	$ 450	
Manhole ID	Recommen-dation	Priority	Field Verify?	Repair Pavement?	Replace Cover?	Replace Frame?	Replace/Rehab Chimney	Chimney Rehab	Chimney Replace	Replace/ Rehab Cone	Cone Rehab	Cone Replace	Rehab Barrel?	Rehab Bench?	Build Trough?	Rehab Invert?	Leaking?	Total Manhole Replacement	Cover Replacement	Frame & Chimney Replacement	Cone or Barrel Replacement	Cone/Chimney Rehab	Barrel Rehab	Bench / Invert / Trough Rehab	Bypass Pumping	Leak Grouting	Total Cost
1815	Partial Replace	Low		√	√	√												$ -	$ -	$ 438	$ -	$ -	$ -	$ -	$ -	$ -	$ 438
1816	Rehab	With street reconstruction.			√		Rehab	√										$ -	$ -	$ -	$ -	$ 125	$ -	$ -	$ -	$ -	$ 125
1817	Rehab	With street reconstruction.			√									√		√		$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 660
1818	Rehab	Low			√		Rehab	√		Rehab	√							$ -	$ -	$ -	$ -	$ 688	$ -	$ -	$ -	$ -	$ 688
1819	Rehab	Low			√								√					$ -	$ -	$ -	$ -	$ -	$ 1,200	$ -	$ -	$ -	$ 1,200
1820	None																	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
1822	Rehab	With street reconstruction.			√								√					$ -	$ -	$ -	$ -	$ -	$ 1,200	$ -	$ -	$ -	$ 1,200
1835	Rehab	Moderate		√	√										√	√		$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 660
1838	Rehab	Moderate			√									√	√			$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 660
1839	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
1842	Rehab	Moderate			√		Rehab	√							√			$ -	$ -	$ -	$ -	$ 125	$ -	$ 560	$ 100	$ -	$ 785
1844	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
1857	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
1872	Rehab	Moderate			√	√							√					$ -	$ -	$ 350	$ -	$ -	$ 1,200	$ -	$ -	$ -	$ 1,550
1874	Rehab	Low			√	√	Rehab	√					√					$ -	$ -	$ 496	$ -	$ 177	$ 1,200	$ -	$ -	$ -	$ 1,873
1875	Rehab	Moderate			√	√	Rehab	√		Rehab	√		√		√			$ -	$ -	$ 350	$ -	$ 583	$ 1,200	$ 560	$ 100	$ -	$ 2,793
1892	Rehab	Low	√		√									√		√		$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 660
1893	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
1894	None																	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
1895	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
1896	Rehab	Moderate		√	√										√			$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 660
1897	Rehab	Low												√				$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ -	$ -	$ 560
1899	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
1904	Rehab	Moderate		√	√		Rehab	√						√		√		$ -	$ -	$ -	$ -	$ 229	$ -	$ 560	$ 100	$ -	$ 889
1909	None																	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
1915	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
1925	Rehab	Low			√		Rehab	√										$ -	$ -	$ -	$ -	$ 219	$ -	$ -	$ -	$ -	$ 219
1932	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
2092	Rehab	Moderate								Rehab	√						√	$ -	$ -	$ -	$ -	$ 594	$ -	$ -	$ -	$ 450	$ 1,044
2281	Partial Replace	Low			√		Replace		√	Rehab	√		√					$ -	$ -	$ 350	$ -	$ 594	$ 1,200	$ -	$ -	$ -	$ 2,144
2300	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
2302	Partial Replace	Low		√	√		Replace		√									$ -	$ -	$ 350	$ -	$ -	$ -	$ -	$ -	$ -	$ 350
2310	Partial Replace	Low			√	√												$ -	$ -	$ 671	$ -	$ -	$ -	$ -	$ -	$ -	$ 671
2378	Rehab	With street reconstruction.			√		Rehab	√		Rehab	√		√					$ -	$ -	$ -	$ -	$ 781	$ 1,200	$ -	$ -	$ -	$ 1,981

Appendix E
Manhole Rehabilitation and Replacement Recommendations

Manhole Identifier	Recommendations																	Costs									
																		per VF	Each	per VF	per VF	per VF	per MH	$70/hr/2-man crew (4 hours)	per MH	per MH	
																		$ 450	$ 50	$ 350	$ 400	$ 125	$ 1,200	$ 560	$ 100	$ 450	
Manhole ID	Recommen-dation	Priority	Field Verify?	Repair Pavement?	Replace Cover?	Replace Frame?	Replace/Rehab Chimney	Chimney Rehab	Chimney Replace	Replace/ Rehab Cone	Cone Rehab	Cone Replace	Rehab Barrel?	Rehab Bench?	Build Trough?	Rehab Invert?	Leaking?	Total Manhole Replacement	Cover Replacement	Frame & Chimney Replacement	Cone or Barrel Replacement	Cone/Chimney Rehab	Barrel Rehab	Bench / Invert / Trough Rehab	Bypass Pumping	Leak Grouting	Total Cost
2462	Rehab	Low			√		Replace		√				√					$ -	$ -	$ 350	$ -	$ -	$ 1,200	$ -	$ -	$ -	$ 1,550
2463	Rehab	Low			√		Rehab	√										$ -	$ -	$ -	$ -	$ 125	$ -	$ -	$ -	$ -	$ 125
2466	Rehab	Low		√	√		Rehab	√										$ -	$ -	$ -	$ -	$ 146	$ -	$ -	$ -	$ -	$ 146
2467	Rehab	Low	√		√									√				$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ -	$ -	$ 560
2469	Replace	Moderate			√													$ 3,600	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 3,600
2471	Rehab	Low			√		Rehab	√										$ -	$ -	$ -	$ -	$ 292	$ -	$ -	$ -	$ -	$ 292
2476	Rehab	Moderate	√		√	√	Rehab	√						√				$ -	$ -	$ 350	$ -	$ 125	$ -	$ 560	$ -	$ -	$ 1,035
2477	Partial Replace	Low			√	√												$ -	$ -	$ 379	$ -	$ -	$ -	$ -	$ -	$ -	$ 379
2478	Rehab	Low		√	√		Rehab	√										$ -	$ -	$ -	$ -	$ 188	$ -	$ -	$ -	$ -	$ 188
2479	Rehab	Low			√		Rehab	√										$ -	$ -	$ -	$ -	$ 188	$ -	$ -	$ -	$ -	$ 188
2517	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
2724	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
2725	Re-inspect	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
2726	Partial Replace	Low			√		Replace		√									$ -	$ -	$ 379	$ -	$ -	$ -	$ -	$ -	$ -	$ 379
2749	Rehab	Moderate		√	√		Rehab	√						√	√			$ -	$ -	$ -	$ -	$ 125	$ -	$ 560	$ 100	$ -	$ 785
2753	Rehab	Moderate	√		√									√	√			$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 660
2758	Rehab	Low			√	√	Rehab	√										$ -	$ -	$ 350	$ -	$ 125	$ -	$ -	$ -	$ -	$ 475
2760	Rehab	Low		√	√		Rehab	√										$ -	$ -	$ -	$ -	$ 125	$ -	$ -	$ -	$ -	$ 125
2761	Rehab	Low			√									√				$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ -	$ -	$ 560
2762	Rehab	Moderate		√	√		Rehab	√							√			$ -	$ -	$ -	$ -	$ 125	$ -	$ 560	$ 100	$ -	$ 785
2774	None																	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
2775	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
2776	Rehab	With street reconstruction.		√	√									√				$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ -	$ -	$ 560
2777	Rehab	With street reconstruction.		√	√		Rehab	√										$ -	$ -	$ -	$ -	$ 198	$ -	$ -	$ -	$ -	$ 198
2779	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
2780	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
2782	Rehab	Low			√		Rehab	√										$ -	$ -	$ -	$ -	$ 188	$ -	$ -	$ -	$ -	$ 188
2783	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
2785	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
2786	Rehab	Low			√					Rehab	√							$ -	$ -	$ -	$ -	$ 573	$ -	$ -	$ -	$ -	$ 573
2788	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
2789	Rehab	Moderate			√								√	√	√			$ -	$ -	$ -	$ -	$ -	$ 1,200	$ 560	$ 100	$ -	$ 1,860
2791	Rehab	Moderate			√										√			$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 660
2793	Rehab	Low			√								√					$ -	$ -	$ -	$ -	$ -	$ 1,200	$ -	$ -	$ -	$ 1,200

Appendix E
Manhole Rehabilitation and Replacement Recommendations

Manhole Identifier	Recommendations																	Costs									
																		per VF	Each	per VF	per VF	per VF	per MH	$70/hr/2-man crew (4 hours)	per MH	per MH	
																		$ 450	$ 50	$ 350	$ 400	$ 125	$ 1,200	$ 560	$ 100	$ 450	
Manhole ID	Recommen-dation	Priority	Field Verify?	Repair Pavement?	Replace Cover?	Replace Frame?	Replace/Rehab Chimney	Chimney Rehab	Chimney Replace	Replace/ Rehab Cone	Cone Rehab	Cone Replace	Rehab Barrel?	Rehab Bench?	Build Trough?	Rehab Invert?	Leaking?	Total Manhole Replacement	Cover Replacement	Frame & Chimney Replacement	Cone or Barrel Replacement	Cone/Chimney Rehab	Barrel Rehab	Bench / Invert / Trough Rehab	Bypass Pumping	Leak Grouting	Total Cost
2794	Rehab	Low			√								√					$ -	$ -	$ -	$ -	$ -	$ 1,200	$ -	$ -	$ -	$ 1,200
2801	Rehab	Low			√		Rehab	√								√		$ -	$ -	$ -	$ -	$ 240	$ -	$ 560	$ 100	$ -	$ 900
2804	Rehab	Moderate	√		√									√				$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ -	$ -	$ 560
2805	Rehab	Low				√	Rehab	√										$ -	$ -	$ 350	$ -	$ 125	$ -	$ -	$ -	$ -	$ 475
2806	Rehab	Low					Rehab	√					√					$ -	$ -	$ -	$ -	$ 125	$ 1,200	$ -	$ -	$ -	$ 1,325
2807	Rehab	Low			√		Rehab	√										$ -	$ -	$ -	$ -	$ 125	$ -	$ -	$ -	$ -	$ 125
2809	Re-inspect	Low	√		√									√		√		$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 660
2811	None																	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
2817	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
2820	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
2821	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
2822	None																	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
2823	None																	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
2824	None																	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
2827	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
2833	None	Low		√	√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
2835	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
2837	Rehab	Low			√		Rehab	√										$ -	$ -	$ -	$ -	$ 146	$ -	$ -	$ -	$ -	$ 146
2839	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
2841	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
2842	Rehab	Low		√	√								√					$ -	$ -	$ -	$ -	$ -	$ 1,200	$ -	$ -	$ -	$ 1,200
2844	Rehab	Moderate			√		Rehab	√		Rehab	√		√					$ -	$ -	$ -	$ -	$ 531	$ 1,200	$ -	$ -	$ -	$ 1,731
2845	Rehab	Low		√	√		Rehab	√										$ -	$ -	$ -	$ -	$ 125	$ -	$ -	$ -	$ -	$ 125
2847	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
2848	Rehab	Moderate			√					Rehab	√		√					$ -	$ -	$ -	$ -	$ 594	$ 1,200	$ -	$ -	$ -	$ 1,794
2852	Partial Replace	Low			√	√												$ -	$ -	$ 350	$ -	$ -	$ -	$ -	$ -	$ -	$ 350
2853	Replace	Moderate			√													$ 4,500	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 4,500
2854	Partial Replace	Low			√	√	Replace		√									$ -	$ -	$ 350	$ -	$ -	$ -	$ -	$ -	$ -	$ 350
2855	Rehab	Moderate													√			$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 660
2856	Rehab	Low			√								√					$ -	$ -	$ -	$ -	$ -	$ 1,200	$ -	$ -	$ -	$ 1,200
2862	None																	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
2863	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
2864	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
2868	Rehab	Moderate			√								√				√	$ -	$ -	$ -	$ -	$ -	$ 1,200	$ -	$ -	$ 450	$ 1,650

Appendix E
Manhole Rehabilitation and Replacement Recommendations

Manhole Identifier	Recommendations																	Costs									
																		per VF	Each	per VF	per VF	per VF	per MH	$70/hr/2-man crew (4 hours)	per MH	per MH	
																		$ 450	$ 50	$ 350	$ 400	$ 125	$ 1,200	$ 560	$ 100	$ 450	
Manhole ID	Recommen-dation	Priority	Field Verify?	Repair Pavement?	Replace Cover?	Replace Frame?	Replace/Rehab Chimney	Chimney Rehab	Chimney Replace	Replace/ Rehab Cone	Cone Rehab	Cone Replace	Rehab Barrel?	Rehab Bench?	Build Trough?	Rehab Invert?	Leaking?	Total Manhole Replacement	Cover Replacement	Frame & Chimney Replacement	Cone or Barrel Replacement	Cone/Chimney Rehab	Barrel Rehab	Bench / Invert / Trough Rehab	Bypass Pumping	Leak Grouting	Total Cost
2869	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
2870	Rehab	Moderate		√	√									√	√			$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 660
2871	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
2873	None																	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
2874	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
2875	None																	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
2878	Rehab	Low		√	√								√					$ -	$ -	$ -	$ -	$ -	$ 1,200	$ -	$ -	$ -	$ 1,200
2881	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
2882	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
2885	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
2913	Rehab	Low	√		√											√		$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 660
2921	Rehab	Moderate			√	√								√		√		$ -	$ -	$ 350	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 1,010
2923	Rehab	With street reconstruction.			√	√	Replace		√									$ -	$ -	$ 350	$ -	$ -	$ -	$ -	$ -	$ -	$ 350
2925	Rehab	With street reconstruction.	√		√	√	Replace		√	Replace		√		√				$ -	$ -	$ 350	$ 1,600	$ -	$ -	$ 560	$ -	$ -	$ 2,510
2931	Partial Replace	Moderate			√		Replace		√					√		√		$ -	$ -	$ 350	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 1,010
3015	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
3026	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
3028	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
3035	Rehab	Low			√		Replace		√									$ -	$ -	$ 554	$ -	$ -	$ -	$ -	$ -	$ -	$ 554
3037	Re-inspect	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
3044	Rehab	Low			√		Rehab	√										$ -	$ -	$ -	$ -	$ 167	$ -	$ -	$ -	$ -	$ 167
3115	Rehab	Low			√											√		$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 660
3119	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
3127	Rehab	Low		√	√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
3174	Rehab	Low			√	√								√				$ -	$ -	$ 350	$ -	$ -	$ -	$ 560	$ -	$ -	$ 910
3215	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
3260	Partial Replace	Low		√	√	√												$ -	$ -	$ 350	$ -	$ -	$ -	$ -	$ -	$ -	$ 350
3301	Replace	Moderate			√													$ 3,105	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 3,105
3306	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
3316	Partial Replace	Low			√	√												$ -	$ -	$ 350	$ -	$ -	$ -	$ -	$ -	$ -	$ 350
3335	Rehab	With street reconstruction.			√	√	Replace		√	Rehab	√							$ -	$ -	$ 350	$ -	$ 594	$ -	$ -	$ -	$ -	$ 944
3340	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
3342	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
3343	Rehab	With street reconstruction.											√					$ -	$ -	$ -	$ -	$ -	$ 1,200	$ -	$ -	$ -	$ 1,200

Appendix E
Manhole Rehabilitation and Replacement Recommendations

Manhole Identifier	Recommendations																	Costs									
																		per VF	Each	per VF	per VF	per VF	per MH	$70/hr/2-man crew (4 hours)	per MH	per MH	
																		$ 450	$ 50	$ 350	$ 400	$ 125	$ 1,200	$ 560	$ 100	$ 450	
Manhole ID	Recommen-dation	Priority	Field Verify?	Repair Pavement?	Replace Cover?	Replace Frame?	Replace/Rehab Chimney	Chimney Rehab	Chimney Replace	Replace/ Rehab Cone	Cone Rehab	Cone Replace	Rehab Barrel?	Rehab Bench?	Build Trough?	Rehab Invert?	Leaking?	Total Manhole Replacement	Cover Replacement	Frame & Chimney Replacement	Cone or Barrel Replacement	Cone/Chimney Rehab	Barrel Rehab	Bench / Invert / Trough Rehab	Bypass Pumping	Leak Grouting	Total Cost
3344	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
3345	Rehab	With street reconstruction.			√		Rehab	√										$ -	$ -	$ -	$ -	$ 125	$ -	$ -	$ -	$ -	$ 125
3347	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
3349	Rehab	Low			√		Rehab	√										$ -	$ -	$ -	$ -	$ 146	$ -	$ -	$ -	$ -	$ 146
3350	Partial Replace	Low			√		Replace		√	Rehab	√							$ -	$ -	$ 350	$ -	$ 552	$ -	$ -	$ -	$ -	$ 902
3351	Rehab	Moderate	√		√	√								√				$ -	$ -	$ 350	$ -	$ -	$ -	$ 560	$ -	$ -	$ 910
3352	Rehab	Low			√		Rehab	√					√					$ -	$ -	$ -	$ -	$ 125	$ 1,200	$ -	$ -	$ -	$ 1,325
3375	Rehab	Low			√		Rehab	√		Rehab	√							$ -	$ -	$ -	$ -	$ 583	$ -	$ -	$ -	$ -	$ 583
3381	Partial Replace	Low			√	√												$ -	$ -	$ 350	$ -	$ -	$ -	$ -	$ -	$ -	$ 350
3383	Rehab	Low			√	√				Rehab	√		√					$ -	$ -	$ 350	$ -	$ 563	$ 1,200	$ -	$ -	$ -	$ 2,113
3392	None																	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
3398	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
3399	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
3402	Rehab	Moderate			√										√			$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 660
3403	Rehab	Low			√		Rehab	√										$ -	$ -	$ -	$ -	$ 167	$ -	$ -	$ -	$ -	$ 167
3404	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
3408	Partial Replace	Low			√		Replace		√	Replace		√						$ -	$ -	$ 350	$ 1,600	$ -	$ -	$ -	$ -	$ -	$ 1,950
3420	Rehab	Low			√								√					$ -	$ -	$ -	$ -	$ -	$ 1,200	$ -	$ -	$ -	$ 1,200
3485	Rehab	Low			√	√	Rehab	√										$ -	$ -	$ 379	$ -	$ 135	$ -	$ -	$ -	$ -	$ 515
3486	Rehab	Moderate	√							Rehab	√		√					$ -	$ -	$ -	$ -	$ 531	$ 1,200	$ -	$ -	$ -	$ 1,731
3487	Rehab	Moderate			√		Rehab	√						√	√			$ -	$ -	$ -	$ -	$ 125	$ -	$ 560	$ 100	$ -	$ 785
3489	Rehab	Moderate					Rehab	√		Rehab	√		√		√			$ -	$ -	$ -	$ -	$ 656	$ 1,200	$ 560	$ 100	$ -	$ 2,516
3490	Replace	Moderate											√				√	$ 2,088	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,088
3492	Rehab	With street reconstruction.			√					Rehab	√							$ -	$ -	$ -	$ -	$ 604	$ -	$ -	$ -	$ -	$ 604
3511	Partial Replace	Low		√	√		Replace		√									$ -	$ -	$ 379	$ -	$ -	$ -	$ -	$ -	$ -	$ 379
3512	Partial Replace	Low			√		Replace		√									$ -	$ -	$ 467	$ -	$ -	$ -	$ -	$ -	$ -	$ 467
3513	Rehab	Low			√		Rehab	√										$ -	$ -	$ -	$ -	$ 125	$ -	$ -	$ -	$ -	$ 125
3514	Rehab	Low		√	√		Rehab	√										$ -	$ -	$ -	$ -	$ 146	$ -	$ -	$ -	$ -	$ 146
3515	Partial Replace	Low		√	√		Replace		√									$ -	$ -	$ 379	$ -	$ -	$ -	$ -	$ -	$ -	$ 379
3516	Rehab	Low		√	√		Rehab	√										$ -	$ -	$ -	$ -	$ 125	$ -	$ -	$ -	$ -	$ 125
3517	Partial Replace	Low		√	√		Replace		√									$ -	$ -	$ 350	$ -	$ -	$ -	$ -	$ -	$ -	$ 350
3518	Partial Replace	Moderate			√	√	Replace		√	Rehab	√		√					$ -	$ -	$ 350	$ -	$ 594	$ 1,200	$ -	$ -	$ -	$ 2,144
3520	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
3540	Rehab	Moderate	√		√	√								√		√		$ -	$ -	$ 350	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 1,010

Appendix E
Manhole Rehabilitation and Replacement Recommendations

Manhole Identifier	Recommendations																	Costs									
																		per VF	Each	per VF	per VF	per VF	per MH	$70/hr/2-man crew (4 hours)	per MH	per MH	
																		$ 450	$ 50	$ 350	$ 400	$ 125	$ 1,200	$ 560	$ 100	$ 450	
Manhole ID	Recommen-dation	Priority	Field Verify?	Repair Pavement?	Replace Cover?	Replace Frame?	Replace/Rehab Chimney	Chimney Rehab	Chimney Replace	Replace/ Rehab Cone	Cone Rehab	Cone Replace	Rehab Barrel?	Rehab Bench?	Build Trough?	Rehab Invert?	Leaking?	Total Manhole Replacement	Cover Replacement	Frame & Chimney Replacement	Cone or Barrel Replacement	Cone/Chimney Rehab	Barrel Rehab	Bench / Invert / Trough Rehab	Bypass Pumping	Leak Grouting	Total Cost
3541	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
3542	Rehab	Low			√		Rehab	√										$ -	$ -	$ -	$ -	$ 125	$ -	$ -	$ -	$ -	$ 125
3543	Rehab	Low			√		Rehab	√										$ -	$ -	$ -	$ -	$ 167	$ -	$ -	$ -	$ -	$ 167
3547	Rehab	Low			√		Rehab	√										$ -	$ -	$ -	$ -	$ 125	$ -	$ -	$ -	$ -	$ 125
3548	None																	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
3549	Replace	Moderate			√													$ 3,600	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 3,600
3558	Partial Replace	Low			√	√	Replace		√									$ -	$ -	$ 350	$ -	$ -	$ -	$ -	$ -	$ -	$ 350
3559	None																	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
3560	Rehab	Low	√											√		√		$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 660
3561	Rehab	Low			√					Rehab	√							$ -	$ -	$ -	$ -	$ 708	$ -	$ -	$ -	$ -	$ 708
3562	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
3563	Partial Replace	Low		√			Replace		√				√					$ -	$ -	$ 350	$ -	$ -	$ 1,200	$ -	$ -	$ -	$ 1,550
3564	Rehab	Low			√		Rehab	√										$ -	$ -	$ -	$ -	$ 125	$ -	$ -	$ -	$ -	$ 125
3565	Rehab	Low	√		√		Rehab	√										$ -	$ -	$ -	$ -	$ 125	$ -	$ -	$ -	$ -	$ 125
3566	Rehab	Low		√	√		Rehab	√										$ -	$ -	$ -	$ -	$ 125	$ -	$ -	$ -	$ -	$ 125
3567	Partial Replace	Low			√		Replace		√	Rehab	√							$ -	$ -	$ 350	$ -	$ 594	$ -	$ -	$ -	$ -	$ 944
3568	Rehab	Low		√	√		Rehab	√										$ -	$ -	$ -	$ -	$ 135	$ -	$ -	$ -	$ -	$ 135
3570	Partial Replace	Low		√	√		Replace		√									$ -	$ -	$ 904	$ -	$ -	$ -	$ -	$ -	$ -	$ 904
3580	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
3581	Re-inspect	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
3584	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
3600	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
3651	Rehab	Moderate			√	√									√			$ -	$ -	$ 350	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 1,010
3652	Rehab	Low		√	√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
3653	Rehab	Moderate				√									√			$ -	$ -	$ 350	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 1,010
3655	Rehab	Low			√		Replace		√								√	$ -	$ -	$ 379	$ -	$ -	$ -	$ -	$ -	$ 450	$ 829
3658	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
3659	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
3660	Rehab	Low		√	√	√												$ -	$ -	$ 350	$ -	$ -	$ -	$ -	$ -	$ -	$ 350
3676	Rehab	Moderate	√		√										√			$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 660
3677	Partial Replace	Low			√	√												$ -	$ -	$ 583	$ -	$ -	$ -	$ -	$ -	$ -	$ 583
3678	None	Low		√	√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
3680	None	Low		√	√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
3681	None																	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -

Appendix E
Manhole Rehabilitation and Replacement Recommendations

Manhole Identifier	Recommendations																	Costs									
																		per VF	Each	per VF	per VF	per VF	per MH	$70/hr/2-man crew (4 hours)	per MH	per MH	
																		$ 450	$ 50	$ 350	$ 400	$ 125	$ 1,200	$ 560	$ 100	$ 450	
Manhole ID	Recommen-dation	Priority	Field Verify?	Repair Pavement?	Replace Cover?	Replace Frame?	Replace/Rehab Chimney	Chimney Rehab	Chimney Replace	Replace/ Rehab Cone	Cone Rehab	Cone Replace	Rehab Barrel?	Rehab Bench?	Build Trough?	Rehab Invert?	Leaking?	Total Manhole Replacement	Cover Replacement	Frame & Chimney Replacement	Cone or Barrel Replacement	Cone/Chimney Rehab	Barrel Rehab	Bench / Invert / Trough Rehab	Bypass Pumping	Leak Grouting	Total Cost
3691	Rehab	Low		√	√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
3692	Rehab	Moderate			√										√			$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 660
3703	Re-inspect	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
3718	Rehab	Low			√								√			√		$ -	$ -	$ -	$ -	$ -	$ 1,200	$ 560	$ 100	$ -	$ 1,860
3750	Re-inspect	Moderate																$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
3754	Re-inspect	Moderate			√										√			$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 660
3815	Rehab	Moderate			√								√		√			$ -	$ -	$ -	$ -	$ -	$ 1,200	$ 560	$ 100	$ -	$ 1,860
3833	Rehab	High	√		√	√				Rehab	√						√	$ -	$ -	$ 350	$ -	$ 604	$ -	$ -	$ -	$ 450	$ 1,404
3835	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
3838	Rehab	Moderate			√										√			$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 660
3846	Rehab	Moderate	√		√									√	√			$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 660
3939	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
3944	Rehab	Moderate			√		Rehab	√						√				$ -	$ -	$ -	$ -	$ 125	$ -	$ 560	$ -	$ -	$ 685
4017	Rehab	Low	√		√								√				√	$ -	$ -	$ -	$ -	$ -	$ 1,200	$ -	$ -	$ 450	$ 1,650
4157	None																	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
4420	Re-inspect	Moderate																$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
4499	Re-inspect	Low			√												√	$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ 450	$ 500
4500	Partial Replace	Low			√		Replace		√									$ -	$ -	$ 438	$ -	$ -	$ -	$ -	$ -	$ -	$ 438
4501	Rehab	Moderate		√	√		Rehab	√						√	√			$ -	$ -	$ -	$ -	$ 292	$ -	$ 560	$ 100	$ -	$ 952
4506	Rehab	Moderate			√										√			$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 660
4507	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
4511	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
4595	Rehab	Moderate		√	√		Replace		√	Rehab	√							$ -	$ -	$ 350	$ -	$ 542	$ -	$ -	$ -	$ -	$ 892
4608	Rehab	Low			√								√					$ -	$ -	$ -	$ -	$ -	$ 1,200	$ -	$ -	$ -	$ 1,200
4609	Replace	Moderate			√													$ 6,300	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 6,300
4610	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
4612	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
4613	Rehab	Low			√											√		$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 660
4622	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
4623	Partial Replace	With street reconstruction.			√		Replace		√									$ -	$ -	$ 350	$ -	$ -	$ -	$ -	$ -	$ -	$ 350
4631	Rehab	Low			√		Rehab	√										$ -	$ -	$ -	$ -	$ 125	$ -	$ -	$ -	$ -	$ 125
4662	Re-inspect	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
4718	Rehab	Moderate		√	√										√			$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 660
4719	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50

Appendix E
Manhole Rehabilitation and Replacement Recommendations

Manhole Identifier	Recommendations																	Costs									
																		per VF	Each	per VF	per VF	per VF	per MH	$70/hr/2-man crew (4 hours)	per MH	per MH	
																		$ 450	$ 50	$ 350	$ 400	$ 125	$ 1,200	$ 560	$ 100	$ 450	
Manhole ID	Recommen-dation	Priority	Field Verify?	Repair Pavement?	Replace Cover?	Replace Frame?	Replace/Rehab Chimney	Chimney Rehab	Chimney Replace	Replace/ Rehab Cone	Cone Rehab	Cone Replace	Rehab Barrel?	Rehab Bench?	Build Trough?	Rehab Invert?	Leaking?	Total Manhole Replacement	Cover Replacement	Frame & Chimney Replacement	Cone or Barrel Replacement	Cone/Chimney Rehab	Barrel Rehab	Bench / Invert / Trough Rehab	Bypass Pumping	Leak Grouting	Total Cost
4720	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
4728	Rehab	Moderate	√		√		Rehab	√		Rehab	√					√		$ -	$ -	$ -	$ -	$ 698	$ -	$ 560	$ 100	$ -	$ 1,358
4760	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
4761	Rehab	Low	√											√				$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ -	$ -	$ 560
5011	Rehab	Moderate	√											√	√			$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 660
5049	Rehab	Low			√		Rehab	√										$ -	$ -	$ -	$ -	$ 125	$ -	$ -	$ -	$ -	$ 125
5051	Rehab	Low	√		√	√	Rehab	√										$ -	$ -	$ 583	$ -	$ 208	$ -	$ -	$ -	$ -	$ 792
5121	Rehab	Moderate													√			$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 660
5171	Rehab	Moderate													√			$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 660
5206	None																	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
5239	Rehab	Moderate		√	√									√		√		$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 660
5274	Rehab	Moderate					Replace		√					√	√			$ -	$ -	$ 671	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 1,331
5289	Rehab	Low			√		Rehab	√										$ -	$ -	$ -	$ -	$ 260	$ -	$ -	$ -	$ -	$ 260
5290	None	Low		√	√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
5296	Rehab	Low			√		Rehab	√										$ -	$ -	$ -	$ -	$ 156	$ -	$ -	$ -	$ -	$ 156
5303	None																	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
5310	Rehab	Low			√									√		√		$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 660
5311	None																	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
5312	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
5355	Rehab	Moderate																$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
5365	None																	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
5367	None																	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
5463	Partial Replace	Low			√	√												$ -	$ -	$ 350	$ -	$ -	$ -	$ -	$ -	$ -	$ 350
5485	Re-inspect	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
5486	Partial Replace	Low			√		Replace		√									$ -	$ -	$ 350	$ -	$ -	$ -	$ -	$ -	$ -	$ 350
5487	Rehab	Low			√		Rehab	√										$ -	$ -	$ -	$ -	$ 125	$ -	$ -	$ -	$ -	$ 125
5488	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
5489	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
5537	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
5538	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
5539	Rehab	Low			√								√					$ -	$ -	$ -	$ -	$ -	$ 1,200	$ -	$ -	$ -	$ 1,200
5541	Partial Replace	Low			√		Replace		√									$ -	$ -	$ 350	$ -	$ -	$ -	$ -	$ -	$ -	$ 350
5542	Replace	Moderate			√		Replace		√									$ 4,991	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 4,991
5548	Rehab	Moderate			√		Rehab	√		Rehab	√		√					$ -	$ -	$ -	$ -	$ 583	$ 1,200	$ -	$ -	$ -	$ 1,783

Appendix E
Manhole Rehabilitation and Replacement Recommendations

Manhole Identifier	Recommendations																	Costs									
																		per VF	Each	per VF	per VF	per VF	per MH	$70/hr/2-man crew (4 hours)	per MH	per MH	
																		$ 450	$ 50	$ 350	$ 400	$ 125	$ 1,200	$ 560	$ 100	$ 450	
Manhole ID	Recommen-dation	Priority	Field Verify?	Repair Pavement?	Replace Cover?	Replace Frame?	Replace/Rehab Chimney	Chimney Rehab	Chimney Replace	Replace/ Rehab Cone	Cone Rehab	Cone Replace	Rehab Barrel?	Rehab Bench?	Build Trough?	Rehab Invert?	Leaking?	Total Manhole Replacement	Cover Replacement	Frame & Chimney Replacement	Cone or Barrel Replacement	Cone/Chimney Rehab	Barrel Rehab	Bench / Invert / Trough Rehab	Bypass Pumping	Leak Grouting	Total Cost
5550	Partial Replace	With street reconstruction.	√	√	√	√	Replace		√	Rehab	√		√	√				$ -	$ -	$ 350	$ -	$ 552	$ 1,200	$ 560	$ -	$ -	$ 2,662
5560	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
5561	Rehab	Low			√		Rehab	√										$ -	$ -	$ -	$ -	$ 156	$ -	$ -	$ -	$ -	$ 156
5583	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
5634	Rehab	Moderate			√		Rehab	√		Rehab	√							$ -	$ -	$ -	$ -	$ 542	$ -	$ -	$ -	$ -	$ 542
5645	Rehab	Low	√		√									√				$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ -	$ -	$ 560
5776	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
5779	None																	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
5781	Rehab	Low			√		Rehab	√					√					$ -	$ -	$ -	$ -	$ 125	$ 1,200	$ -	$ -	$ -	$ 1,325
5785	Rehab	Moderate			√								√	√				$ -	$ -	$ -	$ -	$ -	$ 1,200	$ 560	$ -	$ -	$ 1,760
5852	Rehab	Low			√		Rehab	√										$ -	$ -	$ -	$ -	$ 229	$ -	$ -	$ -	$ -	$ 229
5867	Rehab	Low	√		√									√				$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ -	$ -	$ 560
5868	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
5869	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
5870	Rehab	Low			√								√					$ -	$ -	$ -	$ -	$ -	$ 1,200	$ -	$ -	$ -	$ 1,200
5883	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
5892	Rehab	Low	√		√	√	Rehab	√										$ -	$ -	$ 408	$ -	$ 146	$ -	$ -	$ -	$ -	$ 554
5895	Rehab	Moderate			√		Rehab	√					√		√			$ -	$ -	$ -	$ -	$ 208	$ 1,200	$ 560	$ 100	$ -	$ 2,068
5899	Partial Replace	Low		√			Replace		√									$ -	$ -	$ 1,167	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,167
6913	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
8201	Rehab	Moderate	√		√		Rehab	√							√			$ -	$ -	$ -	$ -	$ 156	$ -	$ 560	$ 100	$ -	$ 816
8205	Rehab	Moderate					Rehab	√							√			$ -	$ -	$ -	$ -	$ 188	$ -	$ 560	$ 100	$ -	$ 848
8843	Rehab	Moderate													√			$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 660
9161	None																	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
10126	None	Low			√													$ -	$ 50	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 50
11731	Re-inspect	Moderate																$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
12359	Rehab	With street reconstruction.			√										√			$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 660
13966	Rehab	Low			√		Rehab	√								√		$ -	$ -	$ -	$ -	$ 125	$ -	$ 560	$ 100	$ -	$ 785
14280	None																	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
17511	Partial Replace	Moderate			√		Replace		√						√			$ -	$ -	$ 350	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 1,010
19125	None																	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
19215	Rehab	Moderate	√				Rehab	√					√			√	√	$ -	$ -	$ -	$ -	$ 125	$ 1,200	$ 560	$ 100	$ 450	$ 2,435
19237	Rehab	Moderate												√	√			$ -	$ -	$ -	$ -	$ -	$ -	$ 560	$ 100	$ -	$ 660
19299	None																	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -

Appendix E

Manhole Rehabilitation and Replacement Recommendations

Manhole Identifier	Recommendations																	Costs									
																		per VF	Each	per VF	per VF	per VF	per MH	$70/hr/2-man crew (4 hours)	per MH	per MH	
																		$ 450	$ 50	$ 350	$ 400	$ 125	$ 1,200	$ 560	$ 100	$ 450	
Manhole ID	Recommen-dation	Priority	Field Verify?	Repair Pavement?	Replace Cover?	Replace Frame?	Replace/Rehab Chimney	Chimney Rehab	Chimney Replace	Replace/ Rehab Cone	Cone Rehab	Cone Replace	Rehab Barrel?	Rehab Bench?	Build Trough?	Rehab Invert?	Leaking?	Total Manhole Replacement	Cover Replacement	Frame & Chimney Replacement	Cone or Barrel Replacement	Cone/Chimney Rehab	Barrel Rehab	Bench / Invert / Trough Rehab	Bypass Pumping	Leak Grouting	Total Cost
19300	None																	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -