

**ZIONSVILLE WASTEWATER DEPARTMENT
10-YEAR SEWER REHABILITATION REPORT
2013 - 2022**

Town of Zionsville, Indiana

December 19, 2012

PREPARED BY

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**BLN JOB NO.
101041**

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1. EXECUTIVE SUMMARY

The purpose of this report is to provide the Town of Zionsville Wastewater Utility with a comprehensive plan of sewer rehabilitation, lift station rehabilitation, and force main replacements for the next ten years. The report identifies problem areas within the collection system and prioritizes the recommended improvements.

This report was prepared by reviewing the Utility's past rehabilitation efforts, and analyzing the existing conditions of the collection system. An updated map of the current collection system was developed based on previous system maps, records of recent rehabilitation projects, inspection reports, and discussions with Zionsville WWTP personnel. This map is included in **Appendix A**. Additionally, the conditions of several existing lift stations were examined. An analysis of each of these lift stations was conducted in an effort to identify possible capacity or infiltration issues for the lift stations and their respective collection area, and to assess the performance of existing pumps and force mains. Finally, the methods by which collection system data is currently gathered and reported were also examined. For reference, an existing system collection system map, including rehabilitation and pipeline inspections, is included in **Appendix B**.

Based on the aforementioned considerations, a list of recommendations for sewer system rehabilitation was developed. These recommendations address improvements to specific sewer lines within the collection system, the existing lift stations, and the current data collection and management systems.

As detailed in this report, Beam, Longest and Neff, LLC has outlined a phased multi-year sewer rehabilitation program. Phases of the program are intended to be implemented annually for the next ten years, and construction costs for each phase are estimated to adhere to the Town's annual sewer rehabilitation budget of \$300,000. The scope of each of the ten recommended implementation phases is described and illustrated in detail in this report. An overall roadmap of the 10-year rehabilitation program as well as detailed cost estimates for each phase is provided in **Appendix C** and **Appendix D**, respectively.

2. INTRODUCTION (COLLECTION SYSTEM OVERVIEW)

The Town of Zionsville owns and operates an existing sanitary sewer collection system which serves a majority of the residents and businesses within the Town limits. A small portion of sewers in western Zionsville are within the Whitestown service area and a portion of eastern Zionsville is served by the Clay Township Regional Waste District. The Zionsville collection system consists of a network of nearly 70 miles of gravity sewer lines ranging from 6 inches to 24 inches in diameter - approximately 560 inch-miles of pipe overall. A total of 23 municipal lift stations are located throughout this network, and several additional private lift stations discharge into the collection system.

Sanitary sewer flows from the collection system are conveyed to the Town's existing wastewater treatment plant located at 855 Starkey Road. The plant utilizes a modified activated sludge treatment process and has an average daily design capacity of 2.0 million gallons per day (MGD). Three existing lift stations, namely Boone Village, Main, and Sugarbush, currently discharge directly to the wastewater treatment plant.

Boone Village Lift Station receives flows from a majority of western Zionsville. Flows from Spring Knoll, Ford Road, Irishman's Run, Thornhill, Enclave, and Clifden Pond lift stations and their respective sewershed areas are all conveyed to the Boone Village Lift Station. Notable sewer trunk lines within this collection area include the Railroad Interceptor which conveys flow from the Rock Bridge and Spring Knoll development to Ford Road Lift Station, the Cobblestone Interceptor which conveys flow from the Cobbleston Lakes development to Irishman's Run Lift Station, the Hunter's Point Sewer which is the main sewer line from several neighborhoods in southwest Zionsville to the Western Interceptor, and the Western Interceptor which conveys flow from each of the aforementioned trunk lines to Boone Village Lift Station. Another notable feature within this sewershed is the existing low pressure sewer system serving the Oldfields development upstream of Thornhill Lift Station.

The Main Lift Station receives flows from a majority of eastern Zionsville including those from Cedar Bend, Oak Ridge, Ravinia, Northview, Colonial Heights, Clarkston, Willow Road, Lost Run, Raintree, Bloor Woods, Beechwood, Valley View, and Zionsville Road lift stations. Notable sewer trunk lines within this collection area include the Colony Woods Interceptor which conveys flow from several residential developments in northern Zionsville to the Eastern Interceptor, the Willow Road Sewer which conveys flow from several developments between Eagle Creek and Little Eagle Creek to Willow Road Lift Station, the Village Interceptor which is the main sewer line from Zionsville Village to the

Zionsville 10-Year Sewer Rehabilitation Report Section 2 – Introduction (Collection System Overview)

Eastern Interceptor, and the Eastern Interceptor which conveys flow from each of the aforementioned trunk lines to the Main Lift Station.

Sugarbush Lift Station serves the southwest area for Zionsville which includes flows from Woodlands Lift Station and the neighborhoods of Sugarbush Hill, Huntington Woods, and Fox Hollow. An existing low pressure sewer system which serves portions of The Woodlands at Irishman Run Farm development is located upstream of the Woodlands Lift Station.

An updated map of the current collection system is provided in **Appendix A**.

3. COLLECTION SYSTEM EXISTING CONDITIONS

3.1. Sewer Lines

Gravity sanitary sewer lines within the collection system range in size from 6 inches to 24 inches in diameter and primarily consist of vitrified clay, concrete, or polyvinyl chloride (PVC) pipe materials. The Town of Zionsville uses a naming convention which identifies 16 drainage basins within the collection system. Sanitary manholes within each basin are assigned a unique four or five character identification number (e.g. “05-24,” “11-108,” “06-9C,” etc.). The first two digits indicate a specific drainage basin and the last characters indicate a unique manhole number within the basin. These manhole numbers are also used to identify pipe segments immediately downstream of the manhole within the collection system.

3.2. Lift Stations

As summarized in Section 2, the Town owns and operates 23 existing lift stations throughout the collection system. A majority of these stations utilize duplex submersible solids-handling pumps. Notable exceptions include Beechwood Lift Station which is a simplex pump station and the Main Lift Station which uses five dry-well centrifugal pumps (three for normal sanitary flows and two for wet weather). The existing lift station pumps were installed between 1986 and 2005 and include several different models to meet specific capacity and head requirements. Ten of the existing lift stations utilize three-phase power, and 17 of the existing lift stations are currently equipped with back-up power generators. Each lift station discharges into a dedicated force main to convey flows downstream. These force mains range in diameter from 2 to 12 inches and range in length from 100 to 5,800 linear feet.

3.3. Data Gathering & Reporting Methods

The Town of Zionsville uses an existing geographical information system (GIS) to record various spatial data, including several attributes of the existing collection system. Since updates to the existing GIS have been relatively infrequent, the Town’s Wastewater Department currently uses the GIS only for general collection system information. More specific maintenance records, including individual work orders, are typically generated and documented by the Town’s Street and Stormwater Department.

The Wastewater Department has periodically conducted televised inspections to assess the existing conditions of the gravity sewer lines of the collection system. Inspection videos and reports are compiled and stored for reference. Recently, the Town has begun using electronic versions of these files. The results of these inspections are used to identify structural or maintenance issues within individual pipe segments.

Data is also currently gathered for sixteen of the existing lift stations. Influent flow rates are recorded every day at two-hour time intervals for each of these lift stations. Reports of this data are continuously updated and can be accessed online via a secured web-based portal. This online system can also automatically notify designated Zionsville staff of an alarm condition at a particular lift station.

3.4. Recent Improvements and Inspections

Between 2002 and 2011, the Town has implemented several improvements to the existing collection system. Between 2002 and 2005, several existing sewer lines near Zionsville Village (Basin 06) were lined via cured-in-place pipe (CIPP) methods or were replaced entirely. In 2003, a portion of the Western Interceptor was increased in size via pipe bursting. Most recently in 2011, additional lining was completed for many of the remaining original sewer pipes in Zionsville Village as well as the southern portion of the Colony Woods Interceptor.

Several portions of the existing collection system underwent televised inspections in early 2012. These areas include sewers near Bloor Lane/Isenhour Hills Drive (Basin 07), Colony Woods (Basin 10), Hunter's Point (Basin 03 including all of the Hunter's Point Sewer), Raintree Place (Basin 05), Sugarbush (Basin 11) and several miscellaneous segments in Zionsville Village (Basin 06). A map showing these recent improvements and inspections is provided in **Appendix B**.

4. RECOMMENDED REHABILITATION PROGRAM

4.1. Sewer Lines

Results of the 2012 televised sewer inspections were reviewed and used to identify sanitary sewer lines in need of repair or replacement. The pipe inspection contractor (Fluid Waste Services, Inc. of Noblesville, IN) had previously assigned a numerical score to quantify the condition of each pipe segment. For a given pipe segment, each defect is assigned an individual grade to indicate the severity of the problem (1 through 6). The overall score of the pipe segment was the sum of each defect grade within the pipe. This overall score was the primary criterion in identifying rehabilitation candidates. Pipe segments with a score between 0 and 4, 4 to 10, and above 10 were identified as low, medium, and high priority for rehabilitation, respectively.

In addition to quantifying pipe defects, the inspection reports also offered some qualifying data for each segment that assisted in determining which type of rehabilitation method was most appropriate. Each problem condition was either categorized as an operational and maintenance defect (i.e. roots, deposit encrustation, infiltration, etc.) or a structural defect (i.e. cracks, joint separation, pipe deformation, etc.). Generally, sewers with significant operation and maintenance issues or with minor structural issues were identified as candidates for cured-in-place pipe (CIPP) lining. Similarly, sewers with significant structural issues (i.e. pipe collapse, multiple fractures, etc.) were identified as candidates for point repair or pipe replacement.

Constructability issues were also considered when identifying rehabilitation candidates. For example, a point repair would be recommended in lieu of CIPP lining for a pipe with minor operation and maintenance issues if those issues were specific to one small portion of the pipe. Likewise, a point repair may be required to correct structural defects and allow a sewer to be CIPP lined. In some cases, low priority sewers are recommended for CIPP lining because the line is bracketed by sewers with a higher priority. Due to the nature of this type of rehabilitation, it is easier to line the sewer than to pass by it.

Similarly, pipe replacement or pipe bursting would be recommended in lieu of CIPP lining for any existing 6-inch diameter gravity sewers since Indiana Administrative Code requires a minimum diameter of 8 inches for gravity sewers serving multiple users. Finally, the level of service of each pipe segment was

Zionsville 10-Year Sewer Rehabilitation Report Section 4 – Recommended Rehabilitation Program

analyzed. That is, a pipe segment serving a large sewershed area was determined to be more critical for rehabilitation than a segment along a small branch line.

A. Rehabilitation and Repairs

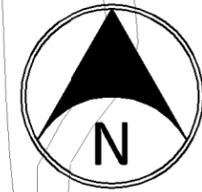
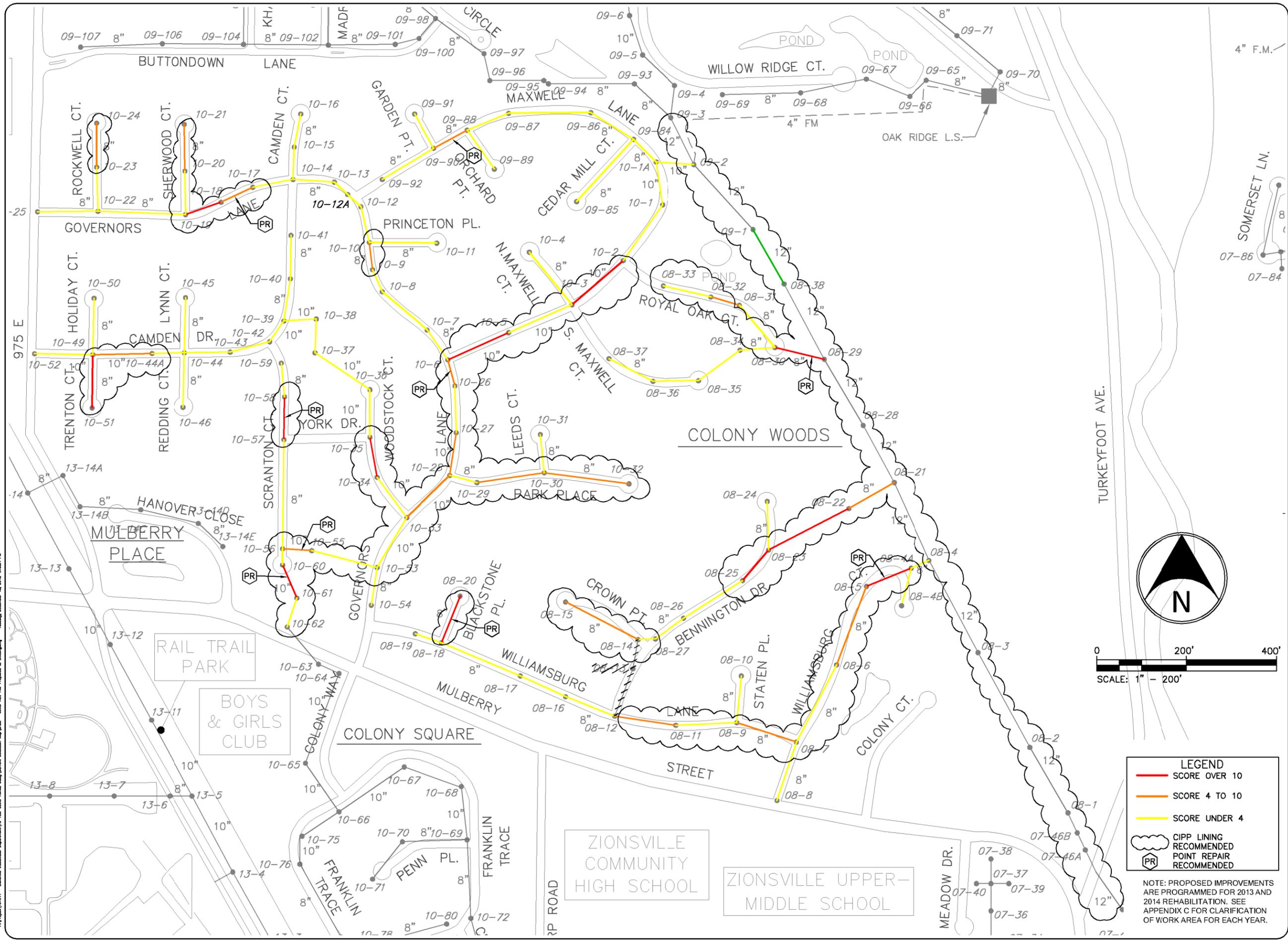
Recommendations for sewer rehabilitation and repairs are organized by neighborhood and are summarized in the following paragraphs:

1. Colony Woods

Approximately 23,300 LF of 8-inch through 12-inch sanitary sewer lines were televised in the Colony Woods neighborhood. After reviewing the inspection reports, it is recommended that 10,400 LF of pipe be rehabilitated via CIPP lining (4,200 LF high priority, 3,000 LF medium priority, and 3,200 LF low priority). Nine point repairs are also recommended.

Although not televised, Zionsville Wastewater staff requested that the remaining original portion of the Colony Woods Interceptor be rehabilitated via CIPP lining. This interceptor serves a significant portion of northern Zionsville and is difficult to access, so emergency repairs would be difficult. The rehabilitation of this interceptor would include an additional 3,900 LF of CIPP lining for 12-inch sewer line between Manhole 07-46 and Manhole 09-3. The proposed improvements for Colony Woods are shown in **Figure 1**.

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LEGEND	
—	SCORE OVER 10
—	SCORE 4 TO 10
—	SCORE UNDER 4
CIPP Lining	CIPP LINING RECOMMENDED
PR	POINT REPAIR RECOMMENDED

NOTE: PROPOSED IMPROVEMENTS ARE PROGRAMMED FOR 2013 AND 2014 REHABILITATION. SEE APPENDIX C FOR CLARIFICATION OF WORK AREA FOR EACH YEAR.

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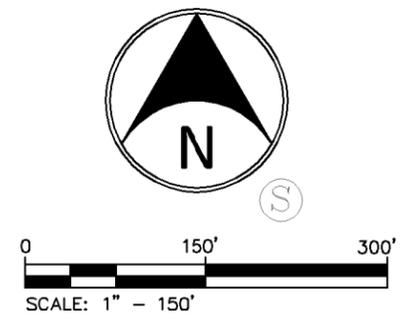
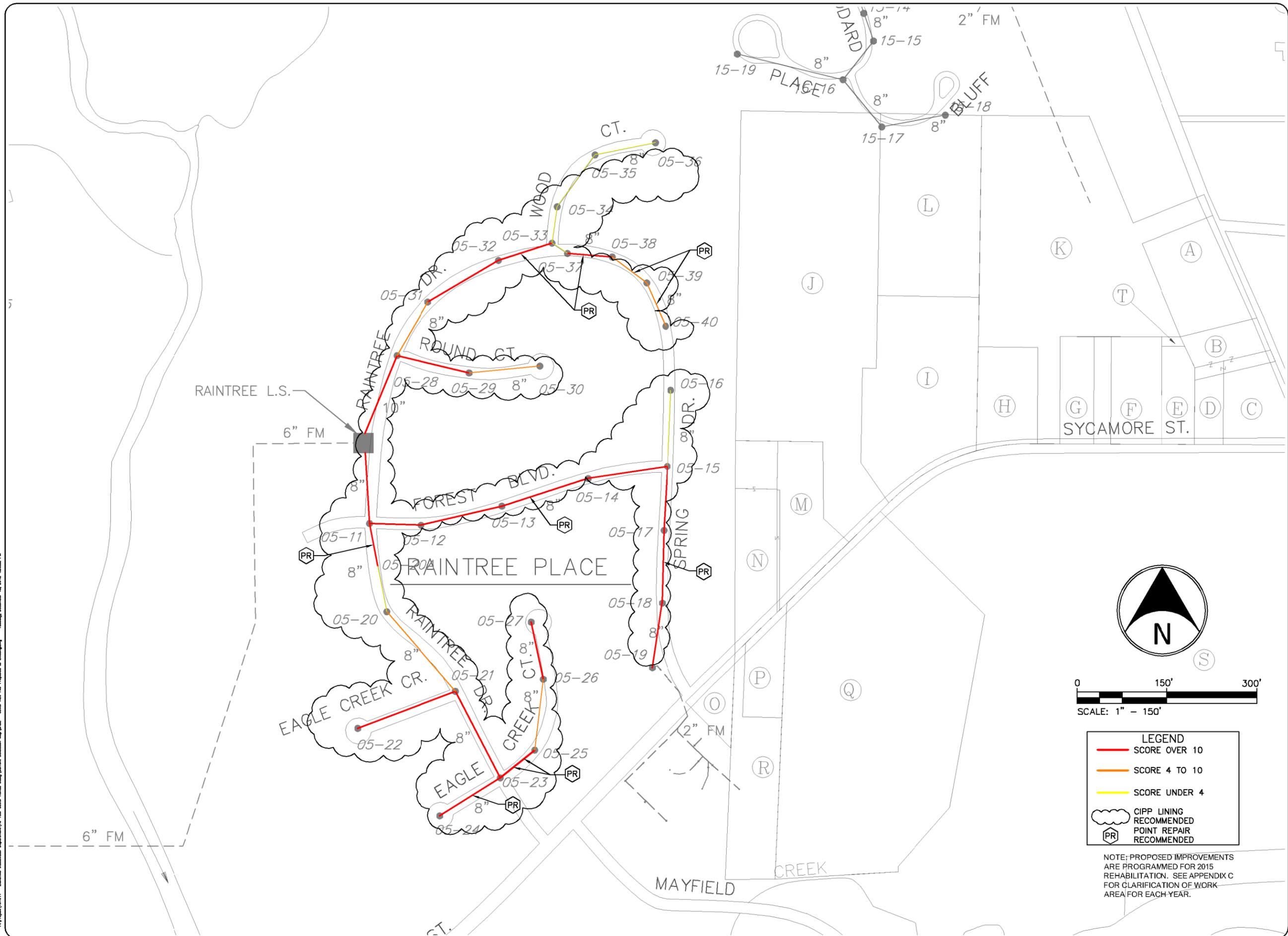
10-YEAR SEWER REHAB PROGRAM
 ZIONSVILLE COLLECTION SYSTEM
 TOWN OF ZIONSVILLE
 1100 W. OAK STREET, ZIONSVILLE, IN 46077
PROPOSED IMPROVEMENTS: COLONY WOODS

PLAN DATE:	12/19/2012
DESIGN:	DEED: DRAWING:
PROJECT NO.:	101041
FRAME NO.:	1

2. Raintree Place

Approximately 7,300 LF of 8-inch and 10-inch existing sewers were televised in Raintree Place. After reviewing the inspection reports, CIPP lining is recommended for all 7,300 LF (5,200 LF high priority, 1,000 LF medium priority, and 1,100 LF low priority). Ten point repairs to allow CIPP lining are also recommended. The Raintree Place proposed sewer improvements are shown in **Figure 2**.

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LEGEND	
—	SCORE OVER 10
—	SCORE 4 TO 10
—	SCORE UNDER 4
	CIPP LINING RECOMMENDED
	POINT REPAIR RECOMMENDED

NOTE: PROPOSED IMPROVEMENTS ARE PROGRAMMED FOR 2015 REHABILITATION. SEE APPENDIX C FOR CLARIFICATION OF WORK AREA FOR EACH YEAR.

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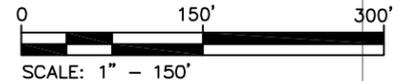
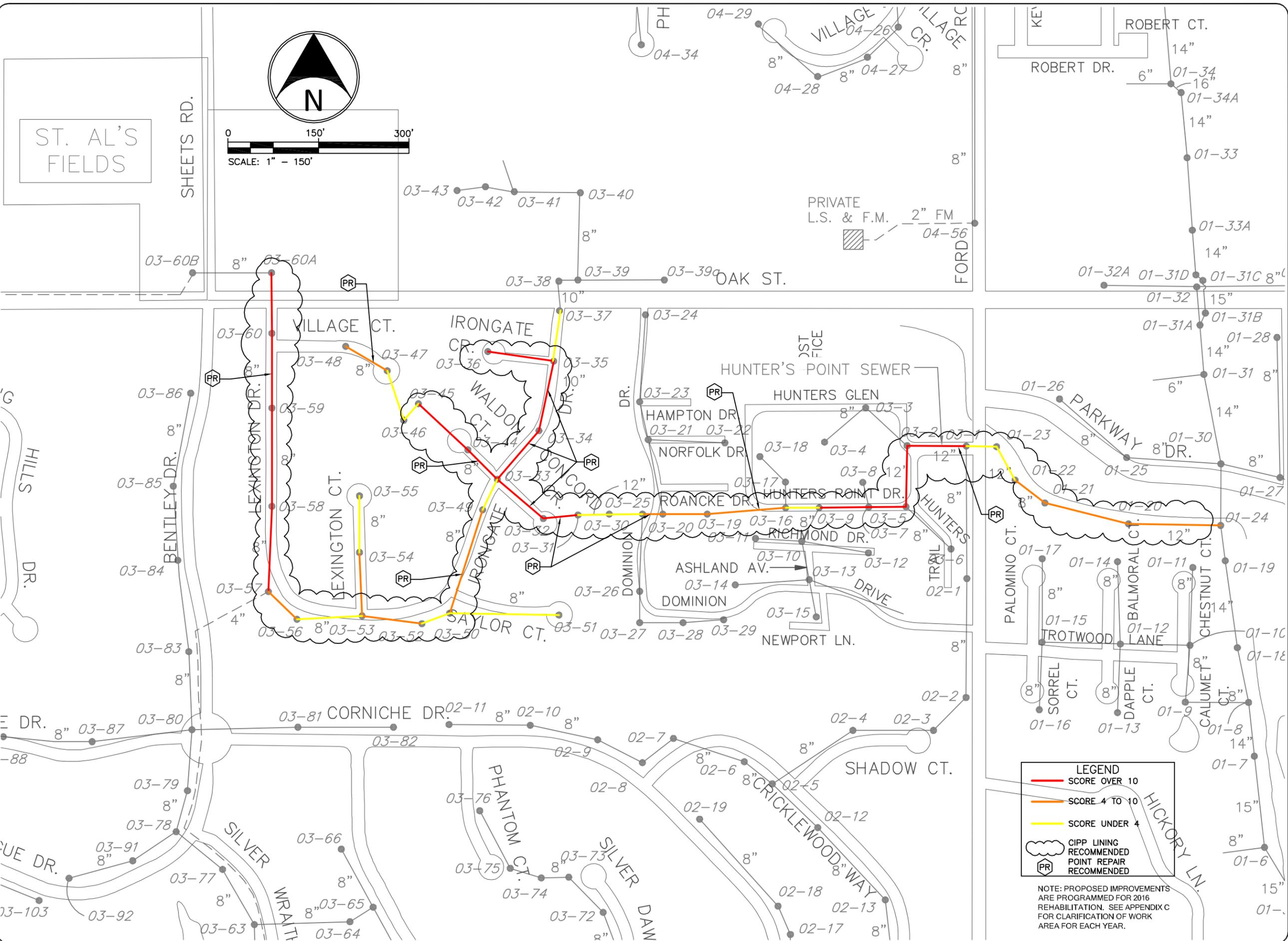
PROPOSED IMPROVEMENTS: RAIN TREE

PLAN DATE:	12/19/12
DESIGN:	DEED: ZONE:
PROJECT NO.:	101041
FRAME NO.:	2

3. Irongate and Hunter's Point

Over 7,700 LF of 8-inch through 12-inch sewers were televised in this area. Nearly 6,200 LF of CIPP lining (4,100 LF high priority, 1,300 LF medium priority, and 800 LF low priority) and eleven point repairs are recommended. Proposed improvements for this service area are shown in **Figure 3**.

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 1100 W. OAK STREET, ZIONSVILLE, IN 46077

PROPOSED IMPROVEMENTS: IRONGATE

PLAN DATE:	12/19/2012
DESIGN:	DEED:
PROJECT NO.:	101041
PIRE NO.:	3

LEGEND

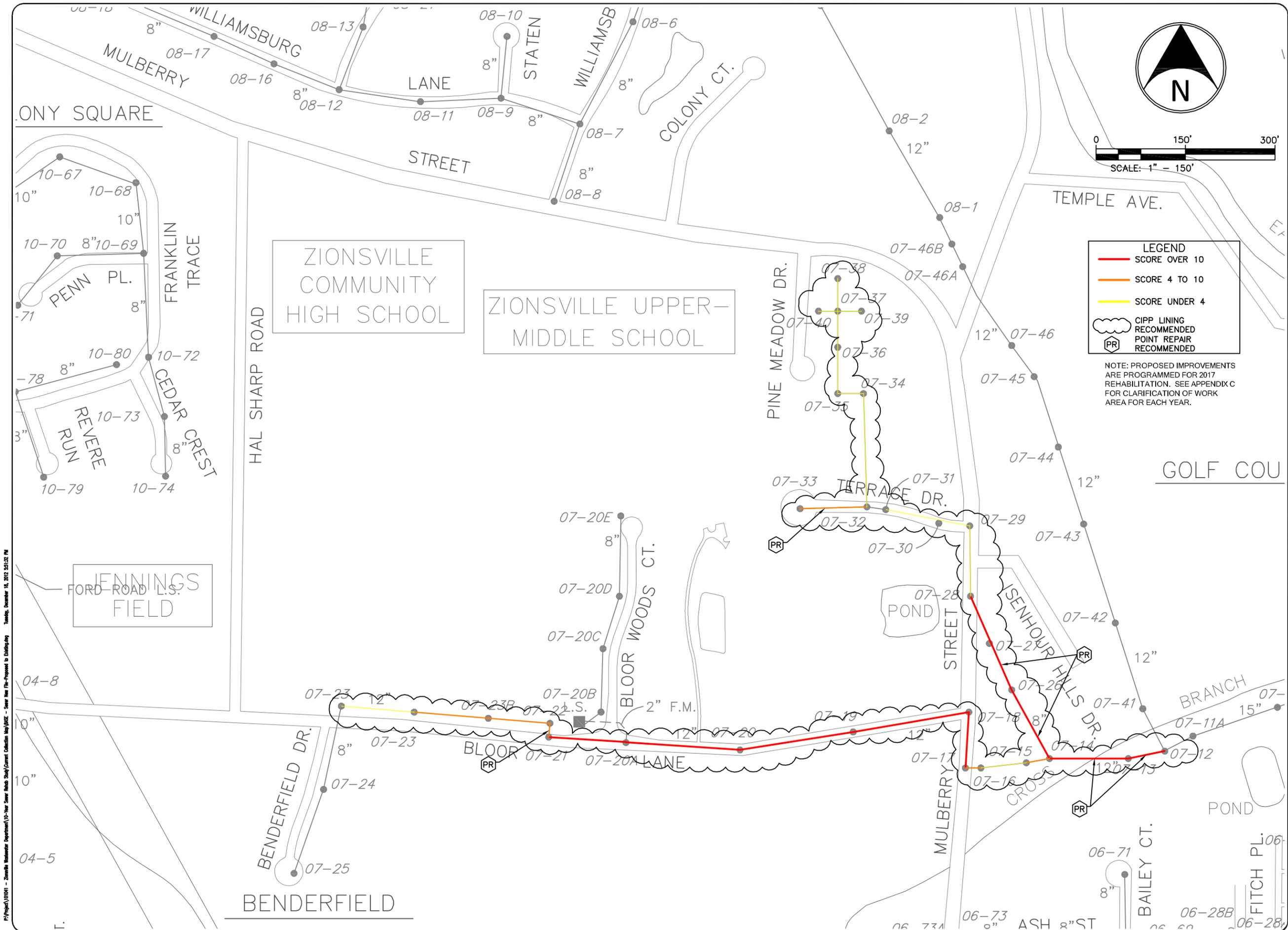
- SCORE OVER 10
- SCORE 4 TO 10
- SCORE UNDER 4
- CIPP LINING RECOMMENDED
- POINT REPAIR RECOMMENDED

NOTE: PROPOSED IMPROVEMENTS ARE PROGRAMMED FOR 2016 REHABILITATION. SEE APPENDIX C FOR CLARIFICATION OF WORK AREA FOR EACH YEAR.

Zionsville 10-Year Sewer Rehabilitation Report Section 4 – Recommended Rehabilitation Program

4. Bloor Lane and Isenhour Hills Drive

Approximately 5,800 LF of 8-inch through 12-inch sewers were televised in these neighborhoods. Over 4,500 LF of these sewers are recommended for CIPP lining (2,100 LF high priority, 1,400 LF medium priority, and 1,000 LF low priority). Six point repairs are also recommended. These proposed improvements are shown in **Figure 4**.



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 ZIONSVILLE COLLECTION SYSTEM
 TOWN OF ZIONSVILLE
 1100 W. OAK STREET, ZIONSVILLE, IN 46077
PROPOSED IMPROVEMENTS: BLOOR LANE

PLAN DATE:	12/19/2012
DESIGN:	CHECK:
PROJECT NO.:	101041
FRAME NO.:	4

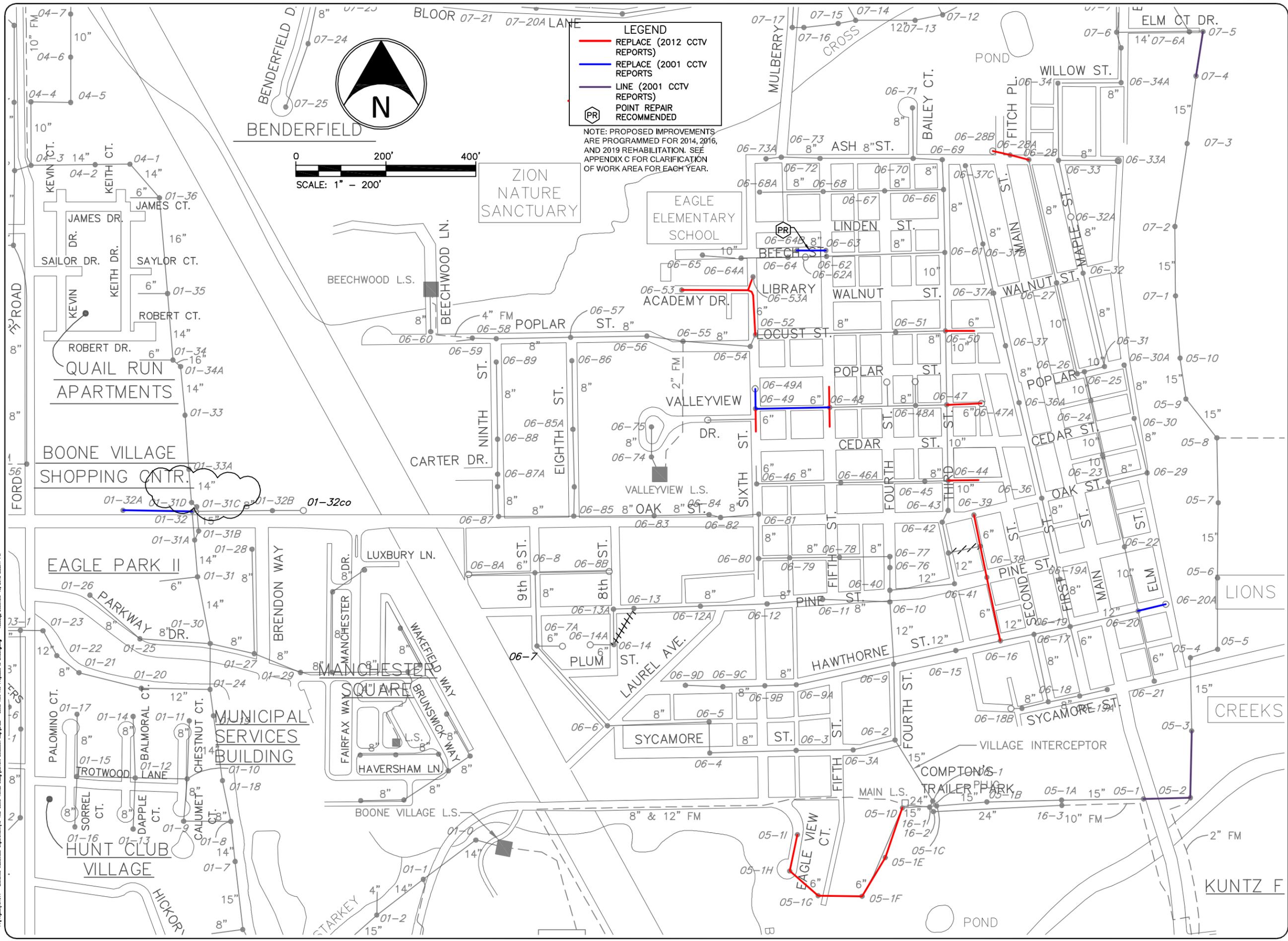
5. Sugarbush Hill

8,100 LF of 8-inch sewer lines were televised in the Sugarbush Hill subdivision. The inspection reports revealed approximately 2,300 LF of sewers which are recommended for CIPP rehabilitation (0 LF high priority, 300 LF medium priority, and 2,000 LF low priority). Zero point repairs are recommended for this service area. The proposed improvements for Sugarbush Hill are shown in **Figure 5**. Refer to Section 4.B for additional televised inspection recommendations in the adjacent Fox Hollow subdivision.

6. Miscellaneous Village Sewers

Approximately 5,400 LF of 6-inch through 15-inch sewers were televised throughout the Zionsville Village area. 4,300 LF of 6-inch sewers are recommended to be replaced with new 8-inch lines. Another 800 LF of the 15-inch Eastern Interceptor between Manhole 05-1 and Manhole 05-3 is recommended for CIPP rehabilitation. One point repair is also recommended on the 8-inch line between Manhole 06-64B and 06-63. The proposed improvements for this area are shown in **Figure 6**.

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PROPOSED IMPROVEMENTS: DOWNTOWN

PLAN DATE:	12/19/2012
DESIGN:	DATE:
PROJECT NO.:	101041
FIGURE NO.:	6

B. Video Inspections

1. Short Term Televising Recommendations

Results of the 2012 televised inspections of sewers in Sugarbush Hill revealed that the sewers in this area are in relatively good condition – only 28% of the lines televised in this area are recommended for CIPP lining rehabilitation. However, Zionsville Wastewater Department staff members have reported experiencing excessive infiltration at the Sugarbush Lift Station. These reports are consistent with flow data recorded at this lift station during wet weather events. In an effort to identify possible sources of infiltration, it is recommended that approximately 12,500 LF of sewer lines within the Fox Hollow subdivision and along Irishman’s Run Lane be televised. The proposed televised lines are shown in **Figure 5**.

2. Long Term Televising Recommendations

Over the last decade, the Town of Zionsville has made significant progress in inspecting and rehabilitating its collection system. These efforts have focused primarily on the older, downstream sewer basins of the overall collection system. It is recommended that the Town continue this systematic rehabilitation approach further upstream, again focusing on relatively old sewers. Upstream collection areas recommended for future televised inspection include the following:

- West (18,700 LF): Clifden Pond, Thornhill, and Olde Dominion
- Northwest (29,700 LF): Village Walk, Colony Square, and the Railroad Interceptor
- North (30,800 LF): Oak Ridge, Buttondown Farms, Smith Meadows, and Cedar Bend
- Northeast (15,400 LF): North Hills, Northern Meadows, Century Oaks, Colonial Heights, Northview, and Ravinia

Results of this future televising work will help in developing a subsequent rehabilitation program.

4.2. Lift Stations

Each lift station was researched in an effort to identify any issues regarding operation and maintenance, pump performance, or the force mains. These issues were identified by interviewing Wastewater Department personnel, by conducting head loss calculations of each pumping system, and by reviewing available data from Zionsville's GIS. Wastewater Department personnel have recently updated lift station flow instruments throughout the collection system. As such, it is recommended that data from these flow instruments be reanalyzed in the near future to identify pumping performance issues.

A. Operation and Maintenance Recommendations

Currently, Beechwood Lift Station is the only simplex municipal pump station in the entire collection system. While the sewershed area associated with this lift station is relatively small, it is still recommended that this lift station be rehabilitated to include a duplex pump configuration.

B. Pump Rehabilitation

The pumps at several lift stations within the collection system are operating very inefficiently; namely those at Cedar Bend, Clifden Pond, and Oak Ridge lift stations. It is recommended that the pumps at each of these lift stations be replaced with pumps capable of meeting the system demands at a more efficient operating point. Furthermore, the pumps in each of these three lift stations were all installed between 1993 and 1994 and are approaching the end of their useful service life.

An examination of the system curves also revealed that some pumps, namely those at Clarkston and Thornhill lift stations, appear to have inadequate head to meet system demands. It is recommended that the pumps at these lift stations also be replaced.

C. Force Main Rehabilitation

Several of the existing lift station force mains appear to be causing significant head losses; this is especially true for relatively long force main lines. It is recommended that the existing 3.5-inch (plastic pipe) force main from Enclave Lift Station and the existing 4-inch force mains from Lost Run and Woodlands lift stations each be replaced with new 6-inch lines. The length of these existing force mains are 5,800 LF, 3,400 LF, and 2,600 LF, respectively.

4.3. Data Gathering & Reporting Methods

As the Town's collection system continues to expand, it is recommended that methods for collecting and managing gravity sewer inspection data become standardized and integrated with the Town's GIS. Televised inspections of gravity sewer lines will continue to be a valuable assessment strategy; however it is recommended that inspecting contractors be required to report their findings utilizing a scoring system consistent with the industry standard Pipeline Assessment and Certification Program (PACP). This will simplify the decision making process for identifying future candidates for rehabilitation or replacement. Regarding integration, it is recommended that each pipe segment in the GIS be linked to actual televised digital inspection videos for that line (or the GIS should indicate that televised inspection data is not available for a particular line). A licensed user of the Town's GIS would then be able to efficiently view the condition of a line and its service laterals.

5. 10-YEAR SEWER REHAB PROGRAM

5.1. Implementation Schedule

The previous section identified several recommendations for rehabilitating or replacing various components of the existing collection system. Based on the severity of the issues for each of these recommendations as well as input from Zionsville Wastewater Department staff, BLN has prioritized a systematic approach for effectively addressing the needs of the collection system. It is recommended that this approach be implemented as the Town's 10-Year Sewer Rehabilitation Program, scheduled to begin in 2013. An overall representation of the program is provided in **Appendix C**.

The proposed scope of upgrades for each of the ten years is detailed in the following paragraphs:

A. 2013 Scope

Perform CIPP lining and point repair for approximately 3,900 LF of the 12-inch Colony Woods Interceptor and 4,200 LF of 8-inch gravity sewer lines within a portion of the Colony Woods neighborhood. The remaining portion of sewer rehabilitation within this neighborhood will be performed in 2014.

B. 2014 Scope

Perform CIPP lining and point repair for approximately 2,600 LF of 8-inch and 3,600 LF of 10-inch gravity sewer within the Colony Woods neighborhood. Additionally, replace approximately 1,100 LF of existing 6-inch gravity sewer with 8-inch pipe along Eagle View Court near the south side of Zionsville Village.

C. 2015 Scope

Perform CIPP lining and point repair for approximately 6,100 LF of 8-inch and 1,200 LF of 10-inch gravity sewer within the Raintree Place development.

D. 2016 Scope

Replace approximately 600 LF of existing 6-inch gravity sewer with new 8-inch pipe near the Boone Village Shopping Center. Additionally, perform

Zionsville 10-Year Sewer Rehabilitation Report Section 5 – 10-Year Sewer Rehab Program

CIPP lining and point repair within the Hunter's Point and Irongate neighborhoods. This work shall include rehabilitation for approximately 3,000 LF of 8-inch, 700 LF of 10-inch, and 2,600 LF of 12-inch gravity sewer lines.

E. 2017 Scope

Perform CIPP lining and point repair for approximately 1,800 LF of 8-inch, 500 LF of 10-inch, and 2,200 LF of 12-inch gravity sewer near Bloor Lane and Isenhour Hills Drive. Additionally, perform CIPP lining and point repairs for approximately 2,300 LF of 8-inch sewer within the Sugarbush Hill neighborhood.

F. 2018 Scope

Conduct televised inspections for approximately 12,500 LF of gravity sewer lines in the Fox Hollow neighborhood and along Irishman's Run Lane. Once televised, it is assumed that approximately 55% of the inspected lines will require rehabilitation via CIPP lining and/or point repairs. This percentage is consistent with the average ratios (LF rehabilitated per LF televised) observed elsewhere in the collection system. As such, the scope includes CIPP lining and point repair for approximately 6,900 LF of 8-inch gravity sewer.

G. 2019 Scope

Replace approximately 2,600 LF of existing 6-inch gravity sewer with new 8-inch pipe in various locations throughout Zionsville Village. Additionally, perform CIPP lining and point repairs for approximately 800 LF of a portion of the 15-inch Eastern Interceptor near Creekside Park.

H. 2020 Scope

Replace approximately 5,800 LF of 4-inch force main from Enclave Lift Station and 2,600 LF of 4-inch force main from Woodlands Lift Station with new 6-inch lines.

I. 2021 Scope

Replace approximately 3,400 LF of 4-inch force main from Lost Run Lift Station with new 6-inch line. Additionally, replace the existing pumps and local control panels at the Cedar Bend, Clarkston, Clifden Pond, Oak Ridge,

and Thornhill lift stations. Finally, provide a duplex pump configuration at the Beechwood Lift Station.

J. 2022 Scope

Perform televised inspections for approximately 70,100 LF of the existing gravity sewers for the West (18,700 LF), Northwest (29,700 LF), and North (21,700 LF – excludes Cedar Bend) areas of the collection system. Due to budgetary restrictions, not all of the sewers recommended for televised inspection are included in this year's scope. It may be prudent to bid the additional 24,500 LF of recommended televising work as an alternate; competitive bid rates may reveal cost savings over the conservative unit price estimates included in this report that would allow additional televising to be done within the budget.

5.2. Estimated Project Costs

On average, estimated construction costs for the scope outlined in this section are anticipated to fall within the Town's annual budget of \$300,000. **Table 1** summarizes the construction cost estimates for each year of the program. As shown, an inflated estimated cost is also included for each year – an inflation factor of 3% per year was applied to each of these estimates. Detailed cost estimates for each year of the rehabilitation program are also included in **Appendix D**.

**Zionsville 10-Year Sewer Rehabilitation Report
Section 5 – 10-Year Sewer Rehab Program**

Calendar Year	2012 Estimated Cost	Inflation Factor	Inflated Estimated Cost
2013	\$260,185	1.03	\$267,991
2014	\$290,013	1.06	\$307,674
2015	\$242,378	1.09	\$264,853
2016	\$292,186	1.13	\$328,858
2017	\$234,704	1.16	\$272,086
2018	\$265,614	1.19	\$317,157
2019	\$239,507	1.23	\$294,564
2020	\$234,052	1.27	\$296,490
2021	\$229,680	1.30	\$299,680
2022	\$227,405	1.34	\$305,613

Table 1: 10-Year Sewer Rehab Program Construction Cost Estimates