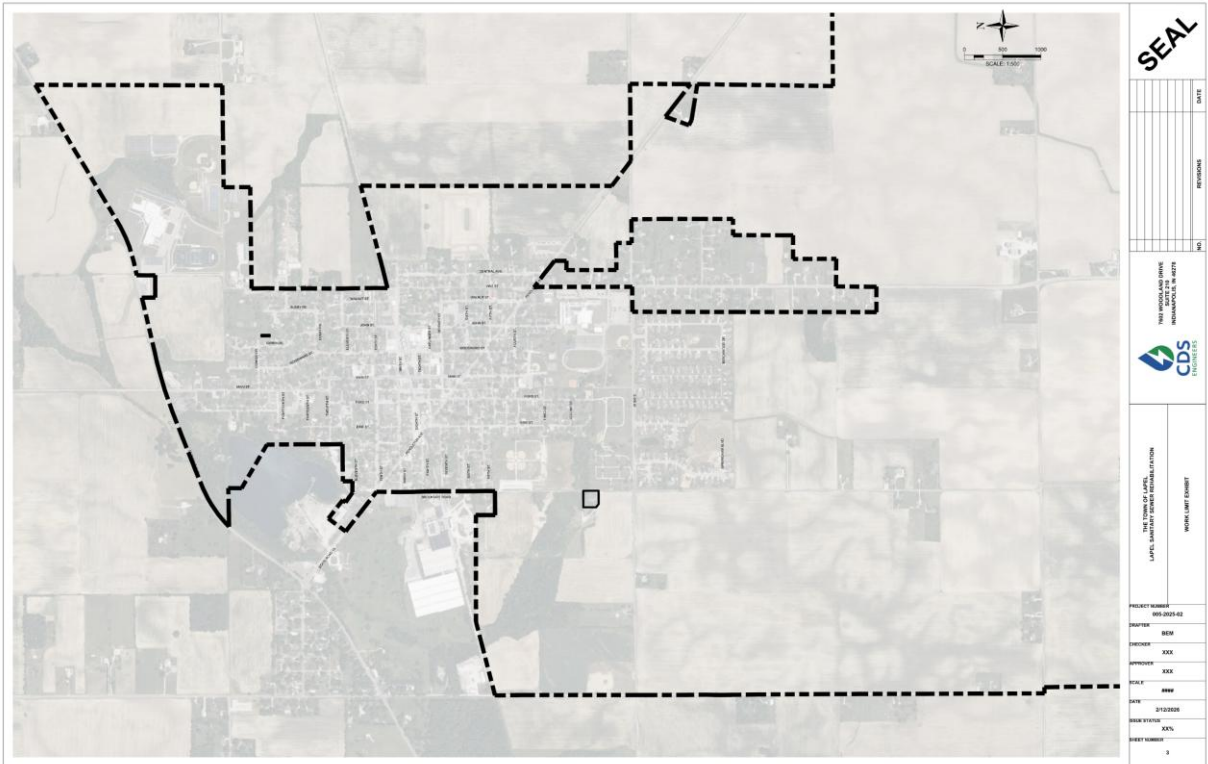


# Town of Lapel, Indiana

## SANITARY SEWER MAIN REHABILITATION



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# 1 INTRODUCTION

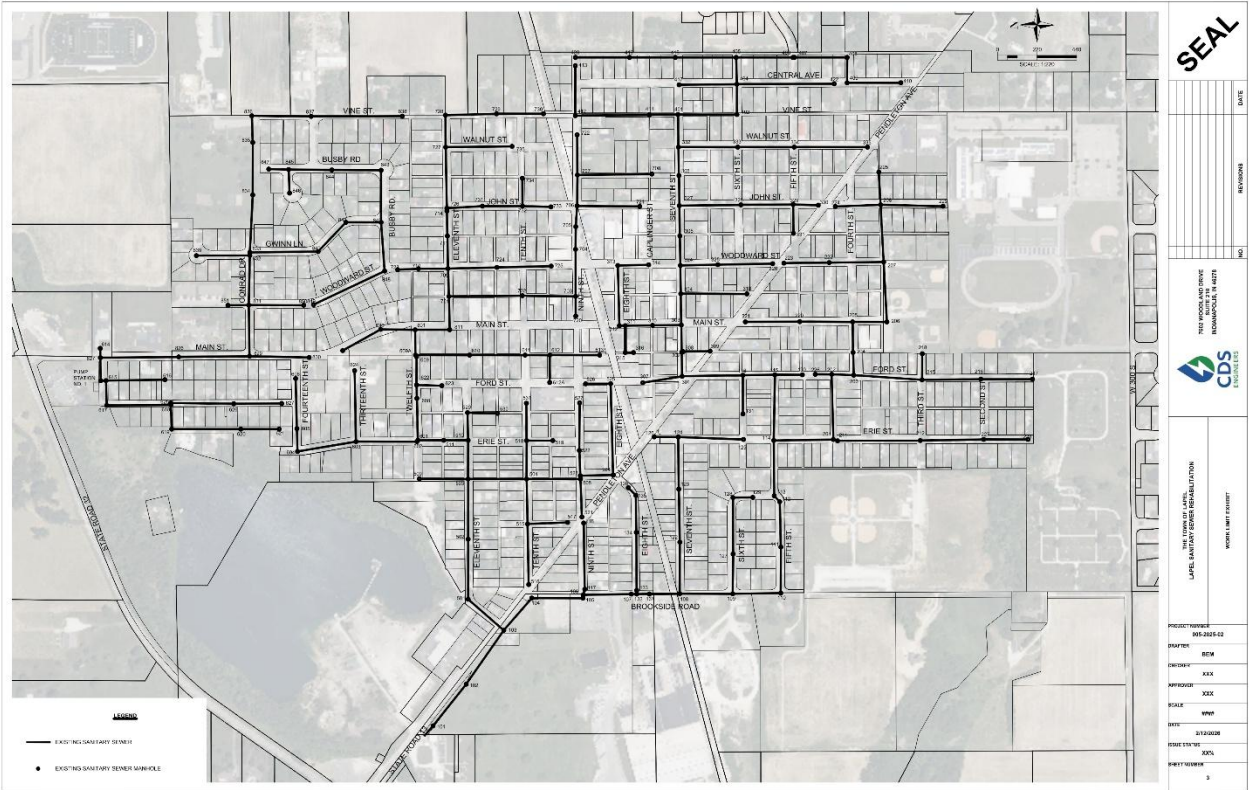
## 1.1 BACKGROUND & PURPOSE

CDS Engineers, Inc. (CDS) was contracted by the Town of Lapel, Indiana to provide engineering services related to the rehabilitation of the sanitary sewer mains. The purpose of this project is to provide a more structural sound system that reduces storm water inflow / infiltration into the sanitary sewer system. This project will benefit those in the project area by reducing basement / crawl space back-ups as well as localized flooding of the streets during rain events.

## 1.2 PROJECT LOCATION

The project is located in the Town of Lapel, Indiana inside their town limits.

Figure 1-1: Sanitary Sewer System Map



## **2 ALTERNATIVES**

### **2.1 EXISTING SANITARY FACILITIES**

Lapel has existing sanitary sewer collection system throughout the Town. They also operate a 0.40 MGD wastewater treatment plant.

### **2.2 ALTERNATIVE 1 – NO ACTION**

This alternative will continue the status quo of basement / crawl space back-ups as well as localized flooding of the streets during rain events. This alternative is not recommended.

#### **2.2.1 EXISTING UTILITIES**

Not applicable

#### **2.2.2 PROPERTY / EASEMENT ACQUISITIONS**

Not applicable.

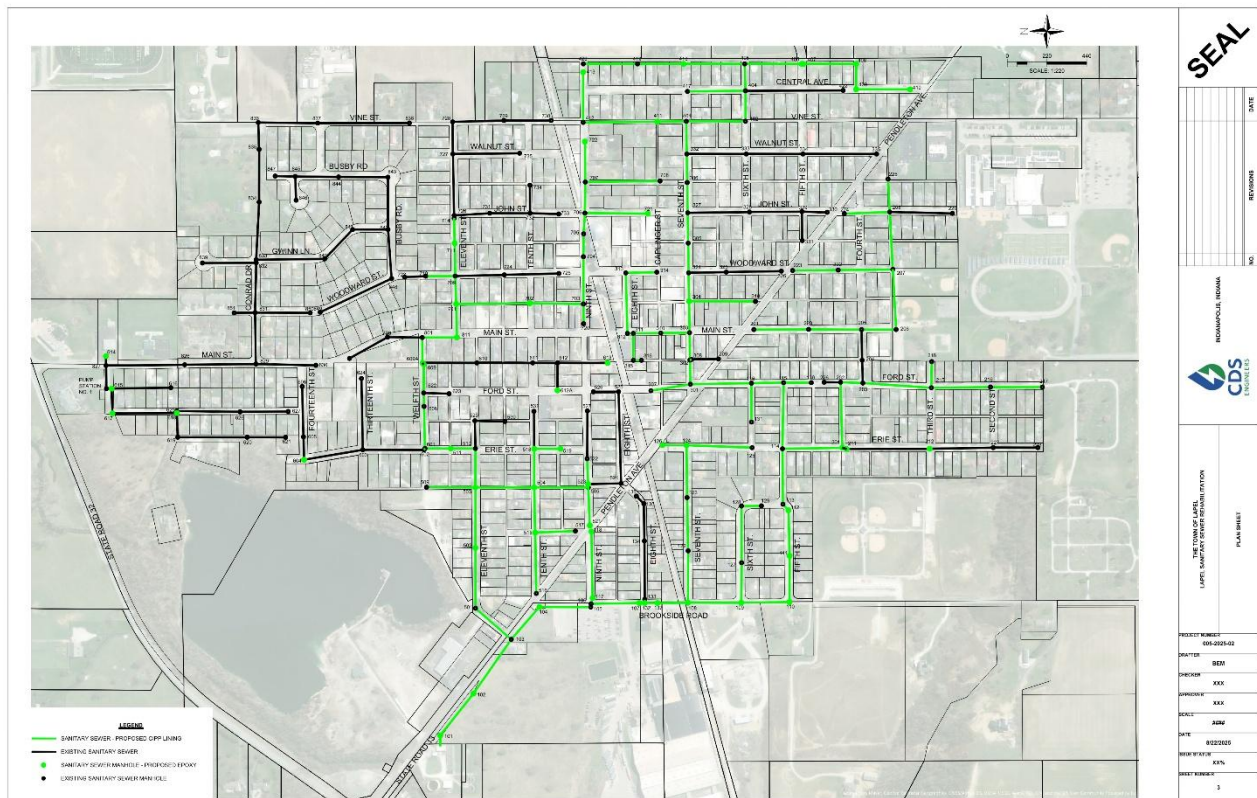
#### **2.2.3 COST ESTIMATE**

Not applicable.

## 2.3 ALTERNATIVE 2 – REHAB ENTIRE SEWER COLLECTION SYSTEM

This alternative will provide a high degree by reducing basement / crawl space back-ups as well as localized flooding of the streets during rain events. All lines and manholes that require it would be rehabilitated. However, the cost to complete this project will create a high monthly sewer bill to every customer in Lapel which will become a large burden to customers.

Figure 2-1: Alternative 2 - Entire System Rehabilitation



### 2.3.1 EXISTING UTILITIES

Not applicable due to utilizing trenchless technology.

### 2.3.2 PROPERTY / EASEMENTS ACQUISITIONS

Not applicable due to utilizing trenchless technology. In addition, all gravity sanitary sewer mains are located in existing right-of-way.

### 2.3.3 COST ESTIMATES

The cost estimate below was created by using market prices and past bid results. An effort was made to include construction progress per day as a pricing factor. The opinion of probable project cost is \$6,450,000.

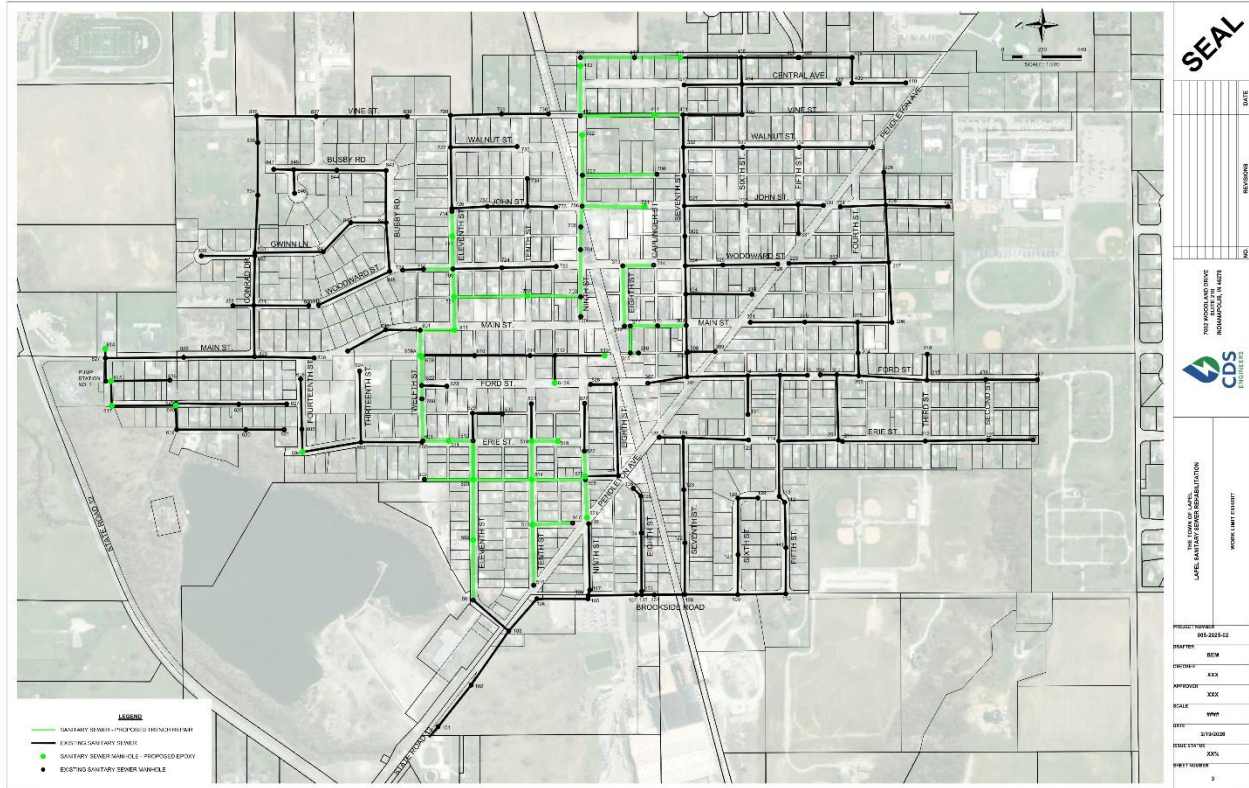
**Table 2-1: Alternative 2 - Preliminary Cost Estimate**

Item	Description	Quantity	Unit	Unit Price	Total Price
<b>Construction Contract Costs</b>					
1	Mobilization, Demobilization, Bonds, & Insurance	1	LSUM	\$ 243,000	\$ 243,000
2	Construction Management	1	LSUM	\$ 316,000	\$ 316,000
3	Erosion & Sediment Control	1	LSUM	\$ 49,000	\$ 49,000
4	Maintenance of Traffic	1	LSUM	\$ 36,000	\$ 36,000
5	Final Cleanup & Restoration	1	LSUM	\$ 49,000	\$ 49,000
<b>Sanitary Sewer Rehabilitation - Cured-in-Place-Pipe</b>					
6	8-inch CIPP liner including by-pass pumping, pre-televising, pre-cleaning, hydrophilic gaskets, post-televising, reporting, labor, materials, equipment and appurtenances	14,000	LF	\$ 50.00	\$ 700,000
7	10-inch CIPP liner including by-pass pumping, pre-televising, pre-cleaning, hydrophilic gaskets, post-televising, reporting, labor, materials, equipment and appurtenances	3500	LF	\$ 55.00	\$ 193,000
8	12-inch CIPP liner including by-pass pumping, pre-televising, pre-cleaning, hydrophilic gaskets, post-televising, reporting, labor, materials, equipment and appurtenances	9000	LF	\$ 72.00	\$ 648,000
9	Service lateral connection liner ("Top Hat", T-Liner, or Equal) including lateral reinstatement, labor, material and appurtenances	400	EACH	\$ 3,600.00	\$ 1,440,000
10	Heavy sewer pipe cleaning including labor, materials and appurtenances	4000	LF	\$ 7.00	\$ 28,000
11	Root intrusion cutting and removal including labor, materials and appurtenances	70	EACH	\$ 175.00	\$ 12,000
12	Point repair services for 8-inch sanitary line at a depth of 0-12 feet, up to 15 feet in length including trench safety, excavation, trench dewatering, bedding, backfill, surface restoration, labor, materials, equipment and appurtenances	7	EACH	\$ 12,000.00	\$ 84,000
13	Point repair services for 8-inch sanitary line at a depth of 12-24 feet, up to 15 feet in length including trench safety, excavation, trench dewatering, bedding, backfill, surface restoration, labor, materials, equipment and appurtenances	3	EACH	\$ 30,000.00	\$ 90,000
14	Point repair services for 10-inch sanitary line at a depth of 0-12 feet, up to 15 feet in length including trench safety, excavation, trench dewatering, bedding, backfill, surface restoration, labor, materials, equipment and appurtenances	2	EACH	\$ 15,000.00	\$ 30,000
15	Point repair services for 10-inch sanitary line at a depth of 12-24 feet, up to 15 feet in length including trench safety, excavation, trench dewatering, bedding, backfill, surface restoration, labor, materials, equipment and appurtenances	1	EACH	\$ 35,000.00	\$ 35,000
16	Extended point repair services for 8-inch sanitary line at a depth of 0-12 feet, including trench safety, excavation, trench dewatering, bedding, backfill, surface restoration, labor, materials, equipment and appurtenances	100	LF	\$ 700.00	\$ 70,000
17	Provide, install and Maintain a sanitary bypass pumping system for point repair(s) including labor, materials, equipment and appurtenances	12	EACH	\$ 2,250.00	\$ 27,000
18	Completion of internal obstruction removal including materials, labor and equipment necessary for protruding service lateral correction, foreign object, brick, concrete and large flow limiting debris removal	8	EACH	\$ 400.00	\$ 3,000
19	Service Lateral Replacement including materials, labor and appurtenances (Under Pavement)	20	EACH	\$ 25,000.00	\$ 500,000
20	Service Lateral Replacement including materials, labor and appurtenances (Not Under Pavement)	30	EACH	\$ 17,000.00	\$ 510,000
21	Manhole Rehabilitation by epoxy lining including manhole bench, pipe penetrations, barrel sections, cone section, chimney sections, materials, labor, equipment and appurtenances	1200	VF	\$ 350.00	\$ 420,000
22	Manhole Casting adjustment up to 6-inches including materials, labor and appurtenances	21	EACH	\$ 2,500.00	\$ 53,000
23	Manhole Casting Replacement including materials, labor and appurtenances	5	EACH	\$ 2,700.00	\$ 14,000
<b>Subtotal</b>					\$ 5,550,000
10% Construction Contingency					\$ 555,000
<b>Total Probable Construction Costs</b>					<b>\$ 6,105,000</b>
<b>Non-Construction Costs<sup>(1)</sup></b>					
Item	Description				Total Price
2	Engineering Design, Bid, & Construction Administration - CDS Engineers, Inc.				\$ 150,000
3	Construction Inspection - CDS Engineers, Inc.				\$ 50,000
4	Geotechnical Investigation				\$ -
5	Land Easements				\$ -
6	Asset Management Plan (Wastewater) - CDS Engineers, Inc.				\$ -
7	Asset Management Plan (Wastewater) - Krohn & Associates				\$ -
8	Financial Advisory Services - Krohn & Associates				\$ 50,000
9	Wastewater Cost of Service Study - Krohn & Associates				\$ -
10	Bond Council				\$ -
11	Legal Council				\$ 25,000
12	Grant Administrative fee				\$ 60,000
13	Environmental Review				\$ 5,000
14	Wage & Labor Standards Compliance				\$ 5,000
<b>Total Probable Non-Construction Costs</b>					<b>\$ 345,000</b>
<b>Total Probable Project Costs</b>					<b>\$ 6,450,000</b>

## 2.4 ALTERNATIVE 3 – REPLACE SELECTED AREAS

This alternative will completely replace a selected section of piping through excavation. This will result in a moderate degree of reducing basement / crawl space back-ups as well as localized flooding of the streets during rain events. This project would be very impactful to traffic through the town due to significant road closures. The cost to complete this project, despite the smaller area, will create a high monthly sewer bill for every customer in Lapel which will become a large burden to customers.

Figure 2-2: Alternative 3 - Replacement of Selected Area



### 2.4.1 EXISTING UTILITIES

This project would require utility coordination as it will involve trenching through the town's roads. There would likely be significant disturbance to the town's utilities. Utilities include Lapel Water, stormwater, gas as well as telephone, fiber optic and cable TV.

### 2.4.2 PROPERTY / EASEMENTS ACQUISITIONS

All gravity sanitary sewer mains are located in existing right-of-way. It is likely that there will not be permanent property or easement acquisition required.

### 2.4.3 COST ESTIMATES

The cost estimate below was created by using market prices and past bid results. An effort was made to include construction progress per day as a pricing factor. The opinion of probable project cost is \$7,800,000.

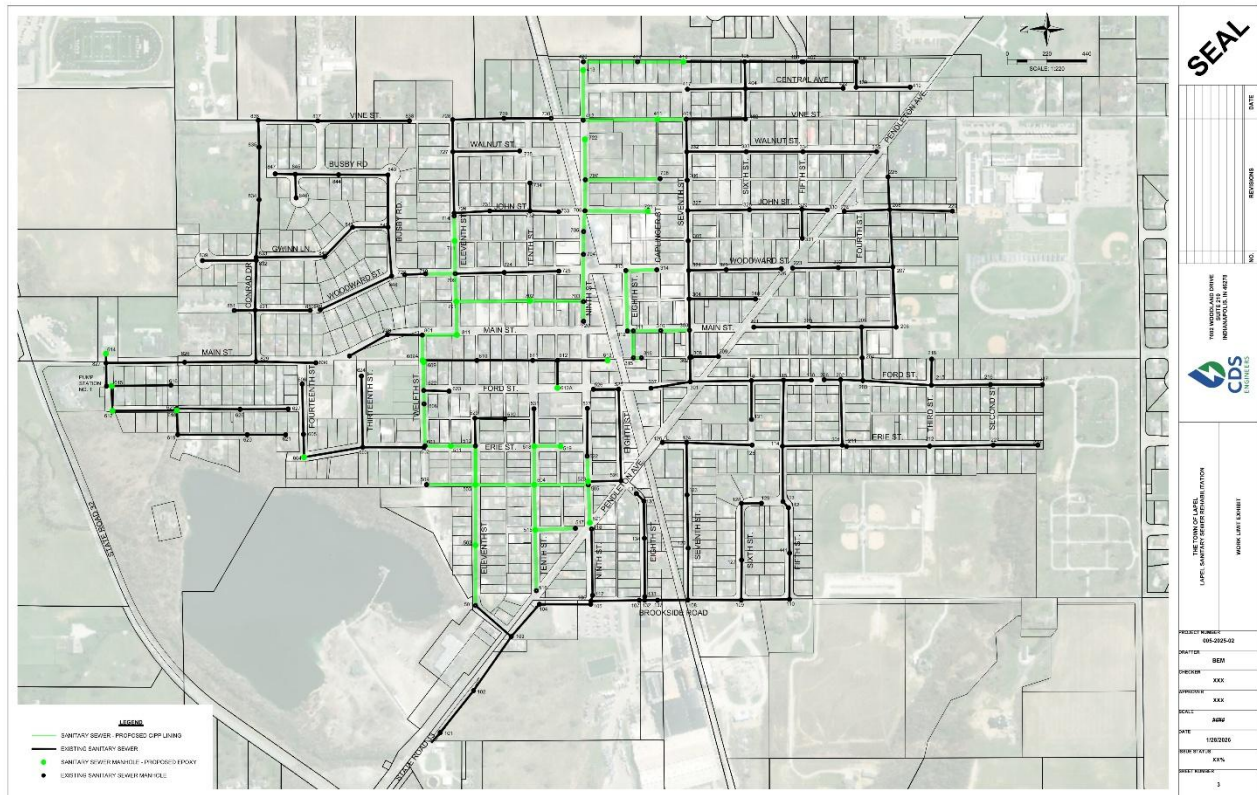
**Table 2-2: Alternative 3 - Preliminary Cost Estimate**

Item	Description	Quantity	Unit	Unit Price	Total Price
<b>Construction Contract Costs</b>					
1	Mobilization, Demobilization, Bonds, & Insurance	1	LSUM	\$ 297,000	\$ 297,000
2	Construction Management	1	LSUM	\$ 386,000	\$ 386,000
3	Erosion & Sediment Control	1	LSUM	\$ 60,000	\$ 60,000
4	Maintenance of Traffic	1	LSUM	\$ 44,000	\$ 44,000
5	Final Cleanup & Restoration	1	LSUM	\$ 60,000	\$ 60,000
<b>Sanitary Sewer Rehabilitation - Cured-in-Place-Pipe</b>					
6	8-inch trenched replacement including by-pass pumping, hydrophilic gaskets, post-televising, reporting, labor, materials, hma pavement, equipment and appurtenances	6,025	LF	\$ 300.00	\$ 1,808,000
7	10-inch trenched replacement including by-pass pumping, hydrophilic gaskets, post-televising, reporting, labor, materials, hma pavement, equipment and appurtenances	3760	LF	\$ 400.00	\$ 1,504,000
8	12-inch trenched replacement including by-pass pumping, hydrophilic gaskets, post-televising, reporting, labor, materials, hma pavement, equipment and appurtenances	2270	LF	\$ 500.00	\$ 1,135,000
9	Service lateral connection liner ("Top Hat", T-Liner, or Equal) including lateral reinstatement, labor, material and appurtenances	200	EACH	\$ 3,600.00	\$ 720,000
10	Heavy sewer pipe cleaning including labor, materials and appurtenances	2000	LF	\$ 7.00	\$ 14,000
11	Root intrusion cutting and removal including labor, materials and appurtenances	50	EACH	\$ 175.00	\$ 9,000
12	Point repair services for 8-inch sanitary line at a depth of 0-12 feet, up to 15 feet in length including trench safety, excavation, trench dewatering, bedding, backfill, surface restoration, labor, materials, equipment and appurtenances	3	EACH	\$ 12,000.00	\$ 36,000
13	Point repair services for 8-inch sanitary line at a depth of 12-24 feet, up to 15 feet in length including trench safety, excavation, trench dewatering, bedding, backfill, surface restoration, labor, materials, equipment and appurtenances	1	EACH	\$ 30,000.00	\$ 30,000
14	Point repair services for 10-inch sanitary line at a depth of 0-12 feet, up to 15 feet in length including trench safety, excavation, trench dewatering, bedding, backfill, surface restoration, labor, materials, equipment and appurtenances	1	EACH	\$ 15,000.00	\$ 15,000
15	Point repair services for 10-inch sanitary line at a depth of 12-24 feet, up to 15 feet in length including trench safety, excavation, trench dewatering, bedding, backfill, surface restoration, labor, materials, equipment and appurtenances	1	EACH	\$ 35,000.00	\$ 35,000
16	Extended point repair services for 8-inch sanitary line at a depth of 0-12 feet, including trench safety, excavation, trench dewatering, bedding, backfill, surface restoration, labor, materials, equipment and appurtenances	100	LF	\$ 700.00	\$ 70,000
17	Provide, Install and Maintain a sanitary bypass pumping system for point repair(s) including labor, materials, equipment and appurtenances	6	EACH	\$ 2,250.00	\$ 14,000
18	Completion of internal obstruction removal including materials, labor and equipment necessary for protruding service lateral correction, foreign object, brick, concrete and large flow limiting debris removal	8	EACH	\$ 400.00	\$ 3,000
19	Service Lateral Replacement including materials, labor and appurtenances (Under Pavement)	6	EACH	\$ 25,000.00	\$ 150,000
20	Service Lateral Replacement including materials, labor and appurtenances (Not Under Pavement)	7	EACH	\$ 17,000.00	\$ 119,000
21	Manhole Rehabilitation by epoxy lining including manhole bench, pipe penetrations, barrel sections, cone section, chimney sections, materials, labor, equipment and appurtenances	600	VF	\$ 350.00	\$ 210,000
22	Manhole Casting adjustment up to 6-inches including materials, labor and appurtenances	10	EACH	\$ 2,500.00	\$ 25,000
23	Manhole Casting Replacement including materials, labor and appurtenances	10	EACH	\$ 2,700.00	\$ 27,000
<b>Subtotal</b>					\$ 6,771,000
10% Construction Contingency					\$ 677,000
<b>Total Probable Construction Costs</b>					<b>\$ 7,448,000</b>
<b>Non-Construction Costs<sup>(1)</sup></b>					
Item	Description	Total Price			
2	Engineering Design, Bid, & Construction Administration - CDS Engineers, Inc.	\$ 150,000			
3	Construction Inspection - CDS Engineers, Inc.	\$ 50,000			
4	Geotechnical Investigation	\$ -			
5	Land Easements	\$ -			
6	Asset Management Plan (Wastewater) - CDS Engineers, Inc.	\$ -			
7	Asset Management Plan (Wastewater) - Krohn & Associates	\$ -			
8	Financial Advisory Services - Krohn & Associates	\$ 50,000			
9	Wastewater Cost of Service Study - Krohn & Associates	\$ -			
10	Bond Council	\$ -			
11	Legal Council	\$ 32,000			
12	Grant Administrative Fee	\$ 60,000			
13	Environmental Review	\$ 5,000			
14	Wage & Labor Standards Compliance	\$ 5,000			
<b>Total Probable Non-Construction Costs</b>					<b>\$ 352,000</b>
<b>Total Probable Project Costs</b>					<b>\$ 7,800,000</b>

## 2.5 ALTERNATIVE 4 – REHAB SELECTED AREAS - RECOMMENDED

This alternative will most specifically benefit those residents in the project area by reducing basement / crawl space back-ups as well as localized flooding in the streets. In addition, by using trenchless technology, the disruption to residents in the area will be minimal. The cost to complete this project is inside the rate increase that has already passed by the Town of Lapel Town Council. The boundaries of the project are Seventh St. to the south extended toward Pendelton Ave. heading west to Brookside Road extended, on the west by Brookside Road extended to the north, on the north by Twelfth St. and to the east on the alley one half block east of Central Ave. as shown on the below map (North is to the left).

Figure 2-3: Alternative 4 – Selected Area of Rehabilitation



### 2.5.1 EXISTING UTILITIES

Not applicable due to utilizing trenchless technology.

### 2.5.2 PROPERTY / EASEMENTS

Not applicable due to utilizing trenchless technology. In addition, all gravity sanitary sewer mains are located in existing right-of-way.

### 2.5.3 COST ESTIMATES

The cost estimate below was created by using market prices and past bid results. An effort was made to include construction progress per day as a pricing factor. The opinion of probable project cost is \$3,050,000.

**Table 2-3: Alternative 4 – Selected Areas of Rehab - Preliminary Cost Estimate**

Item	Description	Quantity	Unit	Unit Price	Total Price
<b>Construction Contract Costs</b>					
1	Mobilization, Demobilization, Bonds, & Insurance	1	LSUM	\$ 108,000	\$ 108,000
2	Construction Management	1	LSUM	\$ 140,000	\$ 140,000
3	Erosion & Sediment Control	1	LSUM	\$ 22,000	\$ 22,000
4	Maintenance of Traffic	1	LSUM	\$ 16,000	\$ 16,000
5	Final Cleanup & Restoration	1	LSUM	\$ 22,000	\$ 22,000
<b>Sanitary Sewer Rehabilitation - Cured-in-Place-Pipe</b>					
6	8-inch CIPP liner including by-pass pumping, pre-televising, pre-cleaning, hydrophilic gaskets, post-televising, reporting, labor, materials, equipment and appurtenances	6,025	LF	\$ 50.00	\$ 301,000
7	10-inch CIPP liner including by-pass pumping, pre-televising, pre-cleaning, hydrophilic gaskets, post-televising, reporting, labor, materials, equipment and appurtenances	3760	LF	\$ 55.00	\$ 207,000
8	12-inch CIPP liner including by-pass pumping, pre-televising, pre-cleaning, hydrophilic gaskets, post-televising, reporting, labor, materials, equipment and appurtenances	2270	LF	\$ 72.00	\$ 163,000
9	Service lateral connection liner ("Top Hat", T-Liner, or Equal) including lateral reinstatement, labor, material and appurtenances	200	EACH	\$ 3,600.00	\$ 720,000
10	Heavy sewer pipe cleaning including labor, materials and appurtenances	2000	LF	\$ 7.00	\$ 14,000
11	Root intrusion cutting and removal including labor, materials and appurtenances	50	EACH	\$ 175.00	\$ 9,000
12	Point repair services for 8-inch sanitary line at a depth of 0-12 feet, up to 15 feet in length including trench safety, excavation, trench dewatering, bedding, backfill, surface restoration, labor, materials, equipment and appurtenances	3	EACH	\$ 12,000.00	\$ 36,000
13	Point repair services for 8-inch sanitary line at a depth of 12-24 feet, up to 15 feet in length including trench safety, excavation, trench dewatering, bedding, backfill, surface restoration, labor, materials, equipment and appurtenances	1	EACH	\$ 30,000.00	\$ 30,000
14	Point repair services for 10-inch sanitary line at a depth of 0-12 feet, up to 15 feet in length including trench safety, excavation, trench dewatering, bedding, backfill, surface restoration, labor, materials, equipment and appurtenances	1	EACH	\$ 15,000.00	\$ 15,000
15	Point repair services for 10-inch sanitary line at a depth of 12-24 feet, up to 15 feet in length including trench safety, excavation, trench dewatering, bedding, backfill, surface restoration, labor, materials, equipment and appurtenances	1	EACH	\$ 35,000.00	\$ 35,000
16	Extended point repair services for 8-inch sanitary line at a depth of 0-12 feet, including trench safety, excavation, trench dewatering, bedding, backfill, surface restoration, labor, materials, equipment and appurtenances	100	LF	\$ 700.00	\$ 70,000
17	Provide, Install and Maintain a sanitary bypass pumping system for point repair(s) including labor, materials, equipment and appurtenances	6	EACH	\$ 2,250.00	\$ 14,000
18	Completion of internal obstruction removal including materials, labor and equipment necessary for protruding service lateral correction, foreign object, brick, concrete and large flow limiting debris removal	8	EACH	\$ 400.00	\$ 3,000
19	Service Lateral Replacement including materials, labor and appurtenances (Under Pavement)	6	EACH	\$ 25,000.00	\$ 150,000
20	Service Lateral Replacement including materials, labor and appurtenances (Not Under Pavement)	7	EACH	\$ 17,000.00	\$ 119,000
21	Manhole Rehabilitation by epoxy lining including manhole bench, pipe penetrations, barrel sections, cone section, chimney sections, materials, labor, equipment and appurtenances	600	VF	\$ 350.00	\$ 210,000
22	Manhole Casting adjustment up to 6-inches including materials, labor and appurtenances	10	EACH	\$ 2,500.00	\$ 25,000
23	Manhole Casting Replacement including materials, labor and appurtenances	10	EACH	\$ 2,700.00	\$ 27,000
<b>Subtotal</b>					\$ 2,456,000
10% Construction Contingency					\$ 245,600
<b>Total Probable Construction Costs</b>					<b>\$ 2,701,600</b>
<b>Non-Construction Costs<sup>(1)</sup></b>					
Item	Description	Total Price			
2	Engineering Design, Bid, & Construction Administration - CDS Engineers, Inc.	\$ 150,000			
3	Construction Inspection - CDS Engineers, Inc.	\$ 50,000			
4	Geotechnical Investigation	\$ -			
5	Land Easements	\$ -			
6	Asset Management Plan (Wastewater) - CDS Engineers, Inc.	\$ -			
7	Asset Management Plan (Wastewater) - Krohn & Associates	\$ -			
10	Financial Advisory Services - Krohn & Associates	\$ 50,000			
12	Wastewater Cost of Service Study - Krohn & Associates	\$ -			
13	Bond Council	\$ -			
14	Legal Council	\$ 28,400			
15	Grant Administrative Fee	\$ 60,000			
16	Environmental Review	\$ 5,000			
15	Wage & Labor Standards Compliance	\$ 5,000			
<b>Total Probable Non-Construction Costs</b>					<b>\$ 348,400</b>
<b>Total Probable Project Costs</b>					<b>\$ 3,050,000</b>

## **3 SUMMARY**

After the evaluation of all four (4) alternatives for existing projects. We are recommending Alternative 4 for the following reasons:

- This alternative fits inside a recommended rate increase by the Town Council already in effect.
- This alternative will reduce basement / crawl space back-ups as well as localized flooding of the streets during rain events in the selected area.
- This alternative will reduce disruption due to the use of trenchless technology.