# MEMORANDUM

**TO:** **Mark Sollenberger, Water and Wastewater Supervisor, City of Craig**

**FROM:** **Chad Paulson, PE**

**DATE:** **September 18, 2020**

**SUBJECT:** **Stout/Steel alley sewer replacement - Update**

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The following updates replacement options and cost for the sewer line in the alley between Steel St. and Stout St., below 9th Street.

In 2018 SGM was tasked with evaluating rehabilitation alternatives for the 8" VCP sewer line running down the alley between Stout St. and Steele St., MHC53 to MHC50. The purpose of this task was to identify and address the unique construction challenges and to provide recommendations with estimated replacements costs.

**MHC53 to MHC50 – 8" VCP Between Stout St. and Steele St.**

The 8" VCP sewer line in the alley between Stout St. and Steele St. is aging and needs rehabilitation. Access to this sewer line for yearly maintenance is limited due to the size of the alley and the encroachment onto the utility easement from the neighboring residences. Figures 1 thru 4 illustrate the difficult access to this segment.

The first option evaluated was replacement through conventional remove and replace. This option, however, is for all intents deemed infeasible. Original construction was possible because no other improvements existed and there was unrestricted access. The alley now, however, is very constricted and burdened with homeowner improvements, utility poles and overhead utilities. Furthermore, because the alley width is so small there is insufficient room for equipment movement and swing, and all excavated materials would have to be fully trucked out of the work area via the opposite end of the alley, then all new pipe, manholes, bedding backfill trucked back in from that opposite end. The slowness of this process would also result in residents being without sewer service for several days on each segment. And, lastly, even if this segment was completely rebuilt the long-term issues with trying to maintain the line with the narrow alley and steep grade (especially in winter) would remain.

**Figure 1. View down the alley from MHC53 on 9th Street.**

**Figure 2. View looking up the alley.**

**Figure 3. View up the alley from MHC51.**


**Figure 4. Access from MHC50 to MHC51. The red lines show the approximate location of the City's utility easement across residential side yard out to Stout Street.**

The second option evaluated was the replacement of the segment of the alley with new sewer lines down Stout St. and Steele St. and reconfiguring services out to the respective streets. Installing new sewer lines down Stout St. and Steele St. would solve the access issues and make the yearly sewer line maintenance much easier for staff. However, the estimated construction cost is significantly higher. The sewer service connections for each of the 22 residences connecting into the existing pipe would have to be rerouted to the front of the houses to connect to the new sewer line. Construction cost estimates for the two alternatives are included in Appendix A. Installing new sewer lines down and Stout St. and Steele St. could be broken up into different years to spread out the costs if desired.

The third option evaluated was rehabilitation by cured-in-place pipe lining (CIPP) on the interior of the pipe, lining the brick manholes and realigning the manhole lids to improve ladder access. CIPP lining the sewer line alone will not address the access issue but would limit the required construction, provide a rehabilitated pipe, and comes at a significantly cheaper cost. If this option is selected, the City should look at acquiring additional easement along the alley and then paving the alley to improve year-round access. Alternately, the City could look for a long-term access agreement with the property owner at the end of the alley to allow access across their lawn from Stout St.; the City has the legal right to this access but doing so in inclement weather will likely destroy the existing lawn and trees, which makes regular use not really feasible as-is.

Based on our evaluation and discussion with staff, the best long-term and financlial solution for the City of Craig is to rehabilitate the existing line and manholes with CIPP. install new sewer lines in Steel St. and Stout St. and realign service connections accordingly.

Attachments:
Sewer Improvement Construction Cost Estimates
Sewer Improvement Figures

## Stout/Steele Street Sewer Replacement

Prepared by: Chad Paulson, PE
Date: September 14, 2020

**Alternative 1: Conventional Remove and Replace**

| | | | | |
|---|---|---|---|---|
| Construction Survey | 1 | LS | $5,500.00 | $5,500.00 |
| Erosion Control | 1 | LS | $2,500.00 | $2,500.00 |
| Remove and Replace 8" VCP with 8" PVC SDR 35 | 1003 | LF | $300.00 | $300,900.00 |
| Sewer Manhole | 2 | EA | $10,000.00 | $20,000.00 |
| Sewer Service Connections | 22 | EA | $850.00 | $18,700.00 |
| Connections to Existing Sewer System | 2 | EA | $1,500.00 | $3,000.00 |
| Bypass Pumping | 30 | Days | $250.00 | $7,500.00 |
| Asphalt Milling | 15 | SY | $5.50 | $82.50 |
| Asphalt Replacement | 15 | SY | $27.00 | $405.00 |
| Restoration | 1 | LS | $50,000.00 | $50,000.00 |
| | | | **Sub Total** | $408,587.50 |

| | | | | |
|---|---|---|---|---|
| **Mobilization/Demobilization** | 5.0% | | | $20,429.38 |
| **Contractor O&P** | 15.0% | | | $61,288.13 |
| **Contingency** | 15.0% | | | $61,288.13 |
| | | | **Total Hard Costs** | $551,593.13 |

| **Soft Costs** | **Percentage** | | | **Cost** |
|---|---|---|---|---|
| Design Engineering | 10.0% | | | $55,159.31 |
| SUE Engineering | 2.5% | | | $13,789.83 |
| Bid and Construction Support | 2.0% | | | $11,031.86 |
| CDPHE Permitting | 0.0% | | | $0.00 |
| Construction Management | 0.0% | | | $0.00 |
| | | | **Total Soft Costs** | $79,981.00 |
| | | | **Total Cost** | **$631,574.13** |

| | | |
|---|---|---|
| **AACE Class 4 Construction Cost Ranges =** | **-15%** | **$536,838.01** |
| | **30%** | **$821,046.37** |

## Stout/Steele Street Sewer Replacement

Prepared by: Chad Paulson, PE
Date: September 14, 2020

**Alternative 2: New Sewer lines Down Stout and Steele Streets**

| | | | | |
|---|---|---|---|---|
| Construction Survey | 1 | LS | $5,500.00 | $5,500.00 |
| Erosion Control | 1 | LS | $1,500.00 | $1,500.00 |
| New 8" PVC SDR 35 SS, Stout Street | 926 | LF | $100.00 | $92,600.00 |
| New 8" PVC SDR 35 SS, Steele Street | 977 | LF | $100.00 | $97,700.00 |
| Sewer Manhole | 7 | EA | $5,500.00 | $38,500.00 |
| Sewer Service Connections | 22 | EA | $10,000.00 | $220,000.00 |
| Connections to Existing Sewer System | 4 | EA | $1,500.00 | $6,000.00 |
| Asphalt Milling | 514 | SY | $5.50 | $2,827.00 |
| Asphalt Replacement | 543 | SY | $27.00 | $14,661.00 |
| Restoration | 1 | LS | $50,000.00 | $50,000.00 |
| | | | **Sub Total** | $529,288.00 |

| | | | | |
|---|---|---|---|---|
| **Mobilization/Demobilization** | 5.0% | | | $26,464.40 |
| **Contractor O&P** | 15.0% | | | $79,393.20 |
| **Contingency** | 15.0% | | | $79,393.20 |

| | |
|---|---|
| **Total Hard Costs** | $714,538.80 |

| **Soft Costs** | **Percentage** | | | **Cost** |
|---|---|---|---|---|
| Design Engineering | 10.0% | | | $71,453.88 |
| SUE Engineering | 4.0% | | | $28,581.55 |
| Bid and Construction Support | 1.5% | | | $10,718.08 |
| CDPHE Permitting | 0.0% | | | $0.00 |
| Construction Management | 0.0% | | | $0.00 |

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|---|---|
| **Total Soft Costs** | $110,753.51 |
| **Total Cost** | **$825,292.31** |

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| **AACE Class 4 Construction Cost Ranges =** | **-15%** | **$701,498.47** |
| | **30%** | **$1,072,880.01** |

## Stout/Steele Street Sewer Replacement

Prepared by: Chad Paulson, PE
Date: September 14, 2020

**Alternative 3: CIPP Line Existing 8" SS**

| | | | | |
|---|---|---|---|---|
| Construction Survey | 1 | LS | $5,000.00 | $5,000.00 |
| Erosion Control | 1 | LS | $1,500.00 | $1,500.00 |
| CIP Line Existing 8" SS | 1003 | LF | $60.00 | $60,180.00 |
| CIP Line Prep | 1003 | LF | $5.00 | $5,015.00 |
| Sewer Manhole lining and lid replacement | 2 | EA | $15,000.00 | $30,000.00 |
| Sewer Service Connections | 22 | EA | $2,000.00 | $44,000.00 |
| Connections to Existing Sewer System | 2 | EA | $1,500.00 | $3,000.00 |
| Bypass Pumping | 14 | Days | $250.00 | $3,500.00 |
| Restoration | 1 | LS | $50,000.00 | $50,000.00 |
| | | | **Sub Total** | $202,195.00 |

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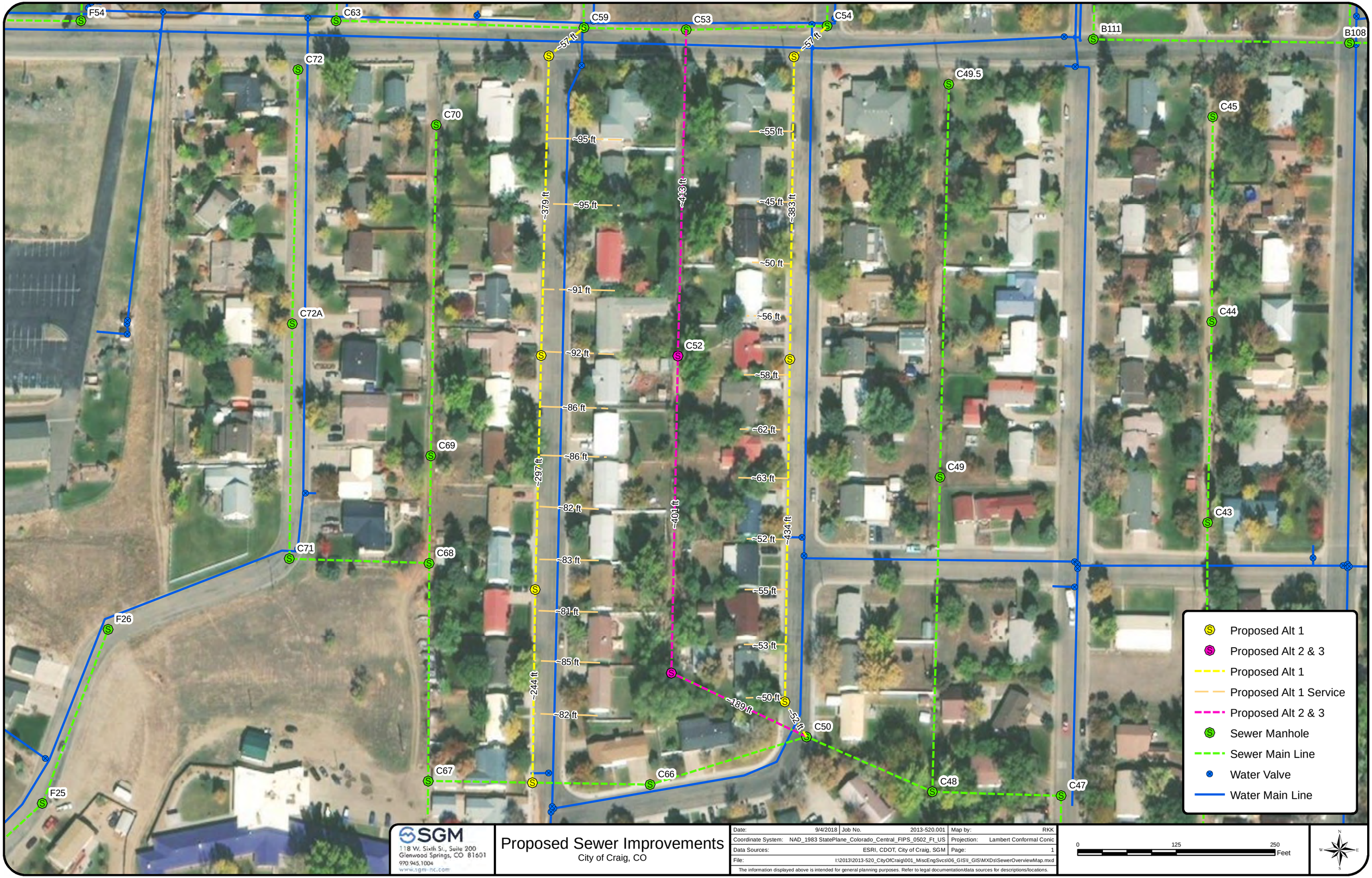
|---|---|---|---|---|
| **Mobilization/Demobilization** | 5.0% | | | $10,109.75 |
| **Contractor O&P** | 15.0% | | | $30,329.25 |
| **Contingency** | 15.0% | | | $30,329.25 |
| | | | **Total Hard Costs** | $272,963.25 |

| **Soft Costs** | **Percentage** | | | **Cost** |
|---|---|---|---|---|
| Design Engineering | 10.0% | | | $27,296.33 |
| SUE Engineering | 2.0% | | | $5,459.27 |
| Bid and Construction Supporty | 4.0% | | | $10,918.53 |
| CDPHE Permitting | 0.0% | | | $0.00 |
| Construction Management | 0.0% | | | $0.00 |
| | | | **Total Soft Costs** | $43,674.12 |
| | | | **Total Cost** | **$316,637.37** |

| | | |
|---|---|---|
| **AACE Class 4 Construction Cost Ranges =** | **-15%** | **$269,141.76** |
| | **30%** | **$411,628.58** |

*Notes: Costs based on 2017 Bid Tab for similar project in Palisade, CO; scaled up to reflect current construction market. CIP estimates based on quotes from CIP manufacturer*

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# Proposed Sewer Improvements

City of Craig, CO

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|---|---|---|---|
| Date: | 9/4/2018 | Job No. | 2013-520.001 |
| Coordinate System: | NAD_1983 StatePlane_Colorado_Central_FIPS_0502_Ft_US | Map by: | RKK |
| Data Sources: | ESRI, CDOT, City of Craig, SGM | Projection: | Lambert Conformal Conic |
| File: | I:\2013\2013-520_CityOfCraig\001_MiscEngSvcs\06_GIS_GIS\MXDs\SewerOverviewMap.mxd | Page: | 1 |

The information displayed above is intended for general planning purposes. Refer to legal documentation/data sources for descriptions/locations.

0 125 250 Feet

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