



**AGENDA
CITY OF HARRISONVILLE
PUBLIC WORKS COMMITTEE
REGULAR MEETING
CITY HALL
OCTOBER 3, 2013
6:00 PM**

- I. Call to Order**
 - A. Roll Call**
- II. Approval of Minutes**
 - A. Public Works Committee - Regular Meeting - Sep 5, 2013 6:00 PM**
- III. Agenda Items**
 - A. Public Transportation Discussion**
 - B. CIPP on Ann Avenue**
 - C. WATER TREATMENT IMPROVEMENTS**
- IV. Public Works Project Updates**
- V. Airport Reports**
 - A. Airport Report**
- VI. General Discussion**
- VII. Adjourn**

This meeting will be open to the public.

Posted on City Hall Bulletin Board this 26th day of September

Kim Hubbard, City Clerk



DRAFT
MINUTES
CITY OF HARRISONVILLE
PUBLIC WORKS COMMITTEE
REGULAR MEETING
CITY HALL
SEPTEMBER 5, 2013
6:00 PM

I. Call to Order

The meeting was called to order at 6:01 PM by Chair Ivan Stull

Attendee Name	Title	Status	Arrived
Kevin Wood	Member	Present	
Doug Meyer	Alternate	Absent	
Morris Coburn	Member	Present	
David Dickerson	Member	Present	
Ivan Stull	Chair	Present	
Bill Mollenhour	Member	Late	6:15 PM

Others Present: City Administrator Keith Moody, Public Works Director Jerry Gibbs, Assistant Public Works Director Eric Patterson, Airport Manager James Green, Street Superintendent Rodney Jacobs, City Clerk Kim Hubbard and representatives from Burns & McDonnell: Jeff Kline, Nathan Dunahee, and Dennis Haag.

II. Approval of Minutes

A. Public Works Committee - Regular Meeting - Aug 1, 2013 6:00 PM Accepted as Amended

City Clerk Hubbard reviewed the following changes made to the minutes:

III.A. northern driveway was changed to western drive on the north side

included the following "and "safe traffic zone" after the following "driveway would provide for the appropriate turn radius"...

spelling correction of Frank Wetherby to Weatherford

3rd paragraph added Highway after 150

4th paragraph changed south driveway to read east drive on the north side

removed "needs to and replaced" with "would have"

added "for approval" after "Board of Aldermen"

Minutes Acceptance: Minutes of Sep 5, 2013 6:00 PM (Approval of Minutes)

3.D. changed grant to funds
replaced 80% with \$222,700

IV.A. added "plus" in front of "cost of removal"

III. Agenda Items

A. Gas Light Plaza Driveway Scheduled

Mr. Gibbs reviewed MoDot's proposal and noted he would share the information with Mr. Soulis. Mr. Gibbs noted this item was scheduled to go before the Board of Aldermen at their September 23 meeting.

B. 2013 Sidewalk and Curb & Gutter Program Bid Review Recommended

Alderman Mollenhour arrived 6:15 P.M.

Mr. Patterson reviewed that bids were opened today and there were only two companies that submitted. Young's Waterproofing was the low bidder. Staff reviewed with the committee some issues that have occurred with Young's which have been discussed with the company. Staff's recommendation was to move forward with the bid from Young's.

C. Washington Street Water Line Bid Review Scheduled

Mr. Gibbs reviewed and distributed the bid information and stated he had not talked with Hettinger (low bidder) as the bid was over budget by \$30,000. There was discussion regarding options and direction was given to talk with Hettinger regarding areas that could be cut back, rebidding and if they will not negotiate then negotiate with the next lowest bidder and bring back to the Board on September 23.

IV. Public Works Project Updates

A. Public Works Monthly Update

Mr. Patterson reviewed the monthly update and reported that Redzone should have started last month and that he was waiting to hear back from them.

Mr. Gibbs reported there have been seven (7) individuals who have submitted letters of interest regarding the Foundation Drain Removal Program. There was discussion regarding the criteria which allows for only home owner occupied homes to participate in the program.

The motion was made by Mayor Wood to change the policy/criteria to allow those living or who have rental homes to participate in the program but noted that owner occupied homes would be given first priority. The motion was seconded by Alderman Mollenhour and the motion carried by a voice vote of those present. 5-0

Mr. Gibbs distributed information on the Burns & McDonnell presentation given at the Board of Aldermen work session on Monday, September 3. In the information Mr. Gibbs went over the four (4) primary questions, noted what he identified as the four (4) immediate risks that need to be completed and discussed prioritizing the needs to be assigned and blocking them off into yearly projects.

Mayor Wood also asked Mr. Gibbs to compare cost of improvements that need to be done to the cost of the Kansas City Waterline Project.

V. Airport Reports

A. AUGUST AIRPORT REPORT

Airport Manager Green reported the Airport Layout Plan is now scheduled to be presented to the Board of Aldermen at their September 23 meeting along with the Asphalt Taxi Project.

VI. General Discussion

None

VII. Adjourn

Alderman Coburn made a motion to adjourn. The motion was seconded by Alderman Dickerson and approved by a voice vote of those present.

Kevin Wood, Mayor & Ex-Officio
Chairman of the Board of Aldermen

ATTEST:

Kim Hubbard, City Clerk

Minutes Acceptance: Minutes of Sep 5, 2013 6:00 PM (Approval of Minutes)



TO: Public Works Committee
FROM: Keith Moody, City Administrator
DATE: September 26, 2013
SUBJECT: Public Transportation Discussion

Type of Item: *Report*

Sara Davis, Executive Director of Oats Transportation will be in attendance at the October 3, Public Works meeting. We will discuss the Public Transportation Survey which was done earlier this year and the options available for the City and Oats Transportation to work together to provide some of the services desired by our residents.

Attached are the results from the survey.

The results indicate that in-town bus and taxi service as the most desirable. These services are available through OATS and two local Limo services.

The locations in town that people would travel to are common stops offered through the OATS program.

The "Reasonable Cost" answers are in line with the fees charged by OATS.

Comments supporting the idea tend to focus on the elderly and single parents needing the service. Both of these groups can utilize OATS. Actually anyone can use the OATS service.

My reaction to the survey is that many of the respondents are not aware what services are available through OATS or who can access those services. This leads me to believe the City can improve citizen satisfaction in this area by merely helping to raise awareness of the OATS program within our community.

Discussion Item (ID # 1191)

Public Transportation Discussion

Attachments:

Public Transportation Survey Results(PDF)

Public Transportation Survey Results

Surveys Received: 124

Q. 1 If available, I would use the following types of public transportation. (Please check all that apply and indicate how frequently you think you would use the transportation.

Taxi Cab: 2 (did not indicate frequency of use)

Once a week or more:	20
2-3 times monthly	10
Once a month	13
Every 2-3 months	3
1-2 times a year	27

In Town Bus: 1 (did not indicate frequency of use)

Once a week or more	55
2-3 times monthly	16
Once a month	4
Every 2-3 months	5
1-2 times a year	13

Out of Town (Shuttle) Bus:

Once a week or more	20
2-3 times monthly	19
Once a month	9
Every 2-3 months	9
1-2 times a year	22
"Never" (Write in)	1

Q. 2 What local destinations would you want a bus to stop at? (Check all that apply.)

Churches:	42
Post Office/Library	68
Courthouse/Square/City Hall	51
Hospital/Rockhaven Medical Mall	74
Community Center	69
Wal Mart	83
Sutherlands	40
Price Chopper	73
Mill Walk Mall	61
Gaslight Shopping Center	47

Q. 3 What out of town destinations would you want a bus to stop at? (Check all that apply):

KCI Airport	49
Country Club Plaza	39
Union Station/Crown Center	36
Arrowhead Stadium/The K	35

Others: KC Zoo (3); Independence Center (3); Bus Stop in Grandview to link to MTC; Lee's Summit; Greyhound Bus Station in Belton; Ameristar Casino (2); Kemper Arena or Sprint Center

or anywhere there would be a special event I might be interested in; major hospitals and medical offices; Belton V.A., Downtown V.A., Belton; Connect to city-bound Park-n-Rides like the one @ Redbridge Connection to Belton & Grandview; One of the malls/Overland Park or Indep. Ctr.; Sam's Club (2), Raymore, Belton/Raymore; Peculiar Belton & Raymore; Dr. appointments; South of Garden City, Mo (Dayton); Doctor; Hospitals & Dr. Appt. (Specialists), etc.; Power-n-Light; St. Joseph Hospital; Shopping Centers, Casinos; Out of town hospital; V.A. hospital; Hospital, Dr. Visits; Powell Gardens; Foxcroft Sen. Center; Shopping Malls – Independence Center and others; Shopping Centers; The Nelson; Food Pantry; Belton (2), Butler; Lee's Summit (2); Sprint Center; Rockfest; Downtown KC; Belton/Raymore shopping district (2); Harrah's Casino; Lee's Summit Chipman Rd. Shopping Mall

Q. 4. What time of day would you most likely use public transportation?

Morning	48
Early Afternoon	33
Late Afternoon/Evening	27
Throughout the day	57

Q. 5. What do you think is a fair price for public transportation?

Less than \$1 per ride, depending on destination	17
\$1 or \$2 per ride, depending on destination	64
\$3 or more per ride, depending on destination	28

Q. 6. Do you think providing public transportation is a proper function of Harrisonville city government?

Yes	96
No	26
No Answer	2
Comments:	Bus, yes. Taxi, no Yes, why not??

Additional thoughts:

I think that the citizens in this community would greatly benefit from the addition of public transportation – especially a bus!

Transportation is a huge issue of concern for Harrisonville. The lack of public transportation is a huge barrier to individuals in being able to access grocery stores; dr. appts; and community events. This service has greatly benefited other communities and should be very seriously considered for this one.

I think for in-town rides, it should be 1.00 a ride or you could sale a pass for Harrisonville resident at one price. Non-resident a higher price. As for shuttle bus, to reach destination like the airport or Arrowhead, it should be so much a mile or the price it would be to park there.

You are not allowed to drive after some hospital procedures. Repeatedly asking friends, family & neighbors for rides to & from hospital is an inconvenience for all. Something like the OATS bus that you

could schedule ahead of time for scheduled hospital visits. I don't believe I am the only one with this problem of transportation to and from hospital.

I don't view public transportation as a cost effective option in Harrisonville.

If we get a daily shuttle for commuters, that would provide a huge service to our residents and perhaps keep people from moving out of Harrisonville and closer to KC. I think it would be a selling point in deciding where to locate within the metro area.

Coordinate with OATS, Inc., to partnership in providing additional or supplemental routing of its fleet of buses or vans for the citizens of Harrisonville, MO.

I probably won't need to use (taxi) but feel like it would be a great possibility for our city to have and that would be used by many. Be fair with fees! It would be used to go to all of #2.

I think it is a good idea. It helps people save on gas, and people that don't have cars, and its environmentally friendly.

Monthly rate. Rate of discount. Elderly, veterans, disabled. Youth rate.

With this being the "county seat" -- I feel it's extremely important to offer public transportation.

I can't drive to city no more.

I do have a car now, but if I get so I can't drive I would use this transportation at least once a week.

These are services that should be left to private business. The government has no business wasting taxpayer money on things private individuals and/or business can provide if there is a market for it. Government's job is to uphold the law by providing ministerial services, to the people (i.e. Law enforcement, court/judicial services and the promotion of general commerce, not act as a parent or nanny.

This is a great idea! I have only one vehicle and when it's not running well, I have to catch a ride or walk. On several occasions, I have had my car serviced when I was staying in Springfield because they have bus & taxi service. If it was available here, I could use local auto repair shops more often. This service would particularly help our seniors.

I am currently driving my own car but at 84 years old, I am considering giving up my keys in the near future and would appreciate taxi and town bus service to be in place soon.

I don't think providing public transportation for Harrisonville is the job of the city government. My question is how many people in this day and age do not have a car or have a friend or have a church to help them with a ride? The OATS bus is available for the elderly. I would like to see the City of Harrisonville put money into a walking/biking trail. I was at the park on Monday, March 18. There were many people of all ages walking or jogging. No one was at the Skateboard Park that the City spent so much money on. I feel like the Skateboard Park was a lot of money spent on something that was only for a small group of people. FYI, there were many kids playing basketball and tennis.

We had a taxi once, but nobody used it.

Stupid idea.

I drive now, but definitely see a need for a town bus now and for me, looking forward. This would be particularly convenient (and necessary) for seniors in Harrisonville and certainly more economical for those who work locally. Fares should be reasonable and pick up and drop-offs many – but fares would pay for gas, housing and maintenance and may add a few bucks to the city's coffers.

It would be nice if on Fridays it took people to the Food Pantry on Sanders Road that have no way of getting there.

Discount/slide scale payments for the elderly or single moms.

I would like to see a taxi cab or similar. There's been times I needed to go to the doctor's office or hospital therapy and had to find a ride. (If order's were not for me to drive.)

Affordable public transportation is good for single moms, elderly and drunks – especially those who travel to KC, LS & Belton to drink.

Clinton has area transportation bus and it was great, when I lived there. But they did not work on weekends. A lot of people also need transportation on the weekends. Would like to see an area transportation bus here.

Providing public transportation should not be a function of the city government. Providing permits/license for city-regulated transportation is.

Please consider a shuttle bus link to MTC in Kansas City for commuters. And to the new federal facility on 150 Hiway and Botts Rd in Kansas City/Grandview.

Too small of a community to provide public transportation.

I would use public transportation to get my kids to their sports events, which are most in Harrisonville, while I'm at work.

Bike paths and more sidewalks.

If you do not own a car, or if it is so old, you cannot afford to fix it every time. **This service will be outstanding!!**

I believe we need to go back to taxi cabs as before for town area only. As was in the past dr. office, groc. store, hosp. (for tests and dr.) and wherever in town.

This is one of the poorest of the skeletal surveys I have ever seen. Please provide better planning for the survey and please design it so it will obtain good information on times, routes, etc. This one leaves too much to interpretation.

Public transportation should be paid for by rider participation, not taxation!!!

The Oats provides service for seniors – what about ages 20-55? An out of town service would be wonderful as long as it could also return us from where it took us. 😊

Summer is coming, kids and adults would benefit from public transportation.

It would be great if bus service on Sunday morning to take people to church.

Older people on fixed incomes should be able to pay less for rides. All transportation should be easy to enter and leave. Also, handicap accessible.

Mass transit/public transportation will only become viable when the government of the people steps in and makes it happen.

We have needed public transportation for years. We have OATS they have taken us to Dr. appt. Hospital for test, Wal Mart, but leave you 2 hrs. at a time, we need a time for pick up at home and depart from business. Thank you for asking!

We the people need bus service in Harrisonville, MO in worst way. Thank you.

Don't make it so outrageous for senior and people on fixed income to not be able to ride.

Offer a monthly pass @ a slightly reduced fare as incentive to use system. Out-of-town commuters would appreciate the service as long as the system allowed them to get to work on time.

If I need a ride, I ask a neighbor, friend or co-worker. In my opinion, unless this new idea can be fully funded by the people who use it, it should not be pursued.

I didn't realize H'ville had affordable trans. for persons disabled but not on Medicare, SSD or Medicaid! I priced OATS to St. Luke's in Lee's Summit. \$15 ea. way. \$30 for tran. and \$35 for co-pay = \$65 – who could afford to go to Dr. then pick up a Rx and eat for the week! If they weren't supported or backed.

I work with people who have disabilities, one of their biggest barriers to get employed is transportation.

NO!!

We have a lot of elderly and disabled individuals who live in this community.

I am disabled and can no longer drive so this type of transportation would benefit me greatly. Please consider this seriously. There are a lot of disabled in Harrisonville who can no longer drive. I proudly put my name and phone number to this survey. Sharon Leonard 816-527-6188

I recently encountered four individuals in one day that had no form of transportation, yet were trying to maintain their job. Where I would previously offered a ride to such an individual, it is now too unsafe to entertain such a thought. Great idea to explore! Thank you for supporting our community.

Small buses or mini-shuttles run circular routes for shopping areas. 1 or two routes for civic sites (post office, courthouse, library). Designate a "hub (Wal Mart or Millwalk)

Have own car – need for bus people not qualify for OATS or when auto broke.

In town transportation would be a huge plus for this city. It would cut down on in-town traffic, pollution,

Taxi either a city project or have independent taxi. Help a person to start a new business. As a senior I know there is a lot of other seniors that would use a taxi service. The OATS bus is not always able to

meet our needs. I'm not sure if the city should be in charge. But the city should help with someone starting a new business. I have said and others are saying the same about the need for a taxi service ASAP.

I think the city should encourage transportation companies or individuals interested in offering this service to our community.

Harrisonville needs extra transportation (besides OATS). Am glad you are doing this.

I know it would help a lot of people here in Harrisonville.

It would be great for sr. citizens and for people without cars.

At this time, we wouldn't have a need for public transportation. I feel the OATS bus serves Harrisonville well.

Some seniors do not have cars and sidewalks nearer to their homes (Hamilton Court – HV Heights – Ridgewood) especially HV Heights to the stop light. Walk to Casey's – Southland and \$1 Store

Who provides the service doesn't matter to me. It would be nice to have public transportation of some form, throughout the work week, to at least Union Station/Crown Center cause I work near there. The Park & Ride would make a nice pick-up and drop-off point.

Do not wanted here. No Way!

I think we already have the OATS bus which is sufficient for a town our size. I think having a bus that went so far on a daily basis would be a waste of taxpayers' money. I drive up to the city four days week but I don't think others should have to help pay for that, nor do I want to pay for others to go that far.

I am an Employment Specialist with Alternative Opportunities here in Harrisonville. We work with individuals with disabilities to assist them in obtaining/retaining suitable employment in the community. The lack of public transportation is by far the biggest obstacle we face when someone who is unable to drive wants to go to work. A source of public transportation will add \$ back into the local economy and greatly enhance the quality of life for disadvantaged residents.

I work as the Regional Director for a non-profit organization providing employment support to individuals with disabilities. I have completed this form based on the need I know exists for the clients we serve. I would welcome any opportunity for our organization to partner with the city to support this potential program.

Resident of Harrisonville – The's a lot is 45 to 65 and older

When weather is bad people with health issues need help getting to Dr. apt. or hospital. Public transportation would really help. Also some people don't have their own vehicle and have to walk out in the elements. Not Cool.



TO: Public Works Committee
FROM: Eric Patterson, Asst. Director
DATE: September 26, 2013
SUBJECT: CIPP on Ann Avenue

Type of Item: *Report*

BACKGROUND:

Replacement of the Ann Avenue sanitary sewer line from Ann Terrace to James Street is a project identified on the CIP, when we went out for design it was found to be 15' deep and deeper. To replace this line would require excavating half way across Ann Avenue and half way to the houses. This would be extremely expensive and very disruptive to the home owners and would kill several good size trees. The City of Independence does a lot of CIPP (cure in place pipe) as an alternative to digging up and replacing pipe (I have a short video showing the process). This is substantially cheaper than replacement when you get to these deep pipes, because of the way their contract reads we can "piggyback" onto their contract and get their discount.

We have approximately \$130,000 left in this budget item and would like to enter into a contract with Insituform Technologies USA, Inc. Because we do not have to bid this I don't have a cost to repair one of the manholes at this time and this is not a service they provide to Independence, they are supposed to be getting us a price for that and we will bring this back next month for a recommendation at that time.

A. Action Item (ID # 1190)

CIPP on Ann Avenue

Attachments:

282-10 ROA3 CIPP PI - InsituformTech - 1-2013 (PDF)



CITY OF INDEPENDENCE, MISSOURI PRICE AGREEMENT RENEWAL OF AWARD

Water Lines 282-10

Date: January 2, 2013

Phone: 636-530-8000

Vendor: 32271

Insituform Technologies USA, Inc.

17988 Edison Avenue

Chesterfield, MO 63005

Fax: 636-530-8701

E-Mail: dcarroll@insituform.com

Contact: Denise Carroll

Title: Assistant Secretary

Price Agreement Period: February 1, 2013 — January 31, 2014

Renewal Options: One, one-year option remains.

Status of Certificates: *Please remember to keep your certificates current*

Insurance Valid through July 1, 2013

Occupation License Valid through August 31, 2013

Special Conditions:

1. This price agreement contains a Cooperative Clause, which allows use by other governmental agencies.
2. The requirements set forth in Missouri Prevailing Wage Order 19, Increase 3 shall govern all projects assigned during the first year of this agreement.
3. A \$2,500,000 performance/maintenance/payment bond must be provided prior to the start of work under this agreement.

Tom conrow, Buyer of Record, (816) 325-7092

Purchasing Manager
Finance Department, Purchasing Division

Using Departments: Water
Water Pollution Control

Cooperative
File



CITY OF INDEPENDENCE, MISSOURI PRICE AGREEMENT RENEWAL OF AWARD

Water Lines 282-10

1. SUMMARY OF REQUEST

The City of Independence, Missouri (herein referred to the "City") requests sealed bids from qualified firms to provide ongoing sewer line and water main rehabilitation, using the installation of Cured-In-Place-Pipe (CIPP), and to provide for manhole sealing, using a system that stops inflow, infiltration, exfiltration, restores structural integrity and provides protection from corrosion. Said service to be provided to the City in sizeable described work orders called for periodically through the term of the agreement. It is anticipated that the contractor will be primarily in the business of design, manufacture and installation of CIPP. Subcontractors engaged by the primary Contractor and approved the City will be allowed for the cathodic protection, manhole sealing, sewer cleaning, television inspection, lateral rehabilitation and point repairs portions of work requested.

Unit prices for all work are asked for in the tables in Section 1.9. Submissions shall include figures for all unit prices specified. However, the bulk of work executed under this contract is expected to be the placement of CIPP of 8-inch and 10-inch diameter sanitary sewer mains and the masonry rehabilitation of standard sanitary manholes. As such, pricing for those units will carry the greatest weight in determining the best contract value for the City.

2. ASSIGNMENT OF PROJECTS

The City's Project Manager will provide the successful bidder (Contractor) with a written scope of work for each project. The Contractor shall provide a written price quote within five (5) business days, per the firm fixed fees submitted in response to this solicitation. A purchase order and notice to proceed (from the Project Manager) will be issued once the Contractor has executed the standard contract (Attachment 1) and submitted the required bond (Attachment 2). The City's contract and bond documents are provided for **informational purposes only**. **Do not complete the bond or contract and return as part of the bid.** The most current Prevailing Wage Order (16, Increase 2) shall govern the initial term of the agreement.

3. BONDS

The City will require a bond for all projects exceeding \$2,500.00. The City reserves the right to discuss bonding alternatives that would allow for multiple projects under one bond.

4. TERM OF THE AGREEMENT

The firm, fixed prices submitted shall remain firm for the period of February 1, 2010, through January 31, 2011. This bid document contains the option for four, one-year renewal periods. If the Contractor agrees to renewal periods, the right to exercise these options shall be at the sole option of the City.

5. PAYMENT TERMS

The City's payment terms are Net 30 day from the receipt of invoice. The City's Project Manager must approve all invoices prior to payment.

6. PREVAILING WAGE

The most current Prevailing Wage Order at the time of this bid (Order 16, Increase 2) shall govern the initial term of this agreement. If the Contractor agrees to renewal terms, the most current Prevailing Wage Order at the time of the renewals shall govern those terms.



CITY OF INDEPENDENCE, MISSOURI PRICE AGREEMENT RENEWAL OF AWARD

Water Lines 282-10

PROCEDURAL REQUIREMENTS

SECTION 1

1.1 PURPOSE

The City of Independence is seeking responses from qualified firms to undertake video inspection, evaluation and reconstruction of sanitary sewers, storm sewers and water lines by the CIPP process. It is the intent of the City to enter into a contract with a qualified firm selected pursuant to this ITB for the purpose of providing all video inspection, evaluation services, preparatory work, materials and installation necessary for the trenchless reconstruction of deteriorated sections of existing sanitary sewers, storm sewers and water lines located at various locations in the City of Independence.

1.2 TRENCHLESS TECHNOLOGY

The City desires to accomplish the reconstruction project by the CIPP process with minimal social cost, disruption and inconvenience to the community served by the subject sewer system and impact on the surrounding environment.

1.3 CITY-FURNISHED ITEMS

The City will provide to the successful firm:

- A. Assistance to the Contractor by placing at his disposal all available information pertinent to the site of the project, including previous reports and any other data relative to the project.
- B. Guaranteed access to and make all provisions for the Contractor to enter upon public and private lands as required for the Contractor to perform the work under the Agreement.
- C. Written designation of a person to act as Owner's representative, with respect to work to be performed under this Agreement; and such person shall have complete authority to transmit instructions, receive information, interpret and define Owner's policies and decisions with respect to materials, equipment, products, and related components.

1.4 CONTRACTUAL OBLIGATION

The bid submitted by the selected Contractor shall become an attachment to this price agreement. Price quotations and other time-dependent information contained in bids must be valid for a minimum of ninety (90) days from closing date of this Invitation to Bid (ITB). The City of Independence is not liable for any cost incurred by contractors prior to issuance of this agreement.

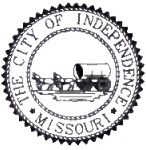
1.5 GENERAL REQUIREMENTS

In responding to the sections detailed below, the offeror should take into account the following:

The City desires to accomplish the reconstruction project by the CIPP process, with the minimum social cost including less disruption and less inconvenience to the community served by the subject sewer, storm, and water system and with less impact on the surrounding environment. In addition, the following performance criteria must be met so as to provide minimal risk in reconstructing the City's sewer and water system:

- The trenchless reconstruction process must be proven technology.
- The process shall be a custom designed pipe that will provide structural repair to the host pipe.
- The process must be a cured-in-place pipe process so as to be the most effective in reducing infiltration.
- There must be independent third-party verification of long-term physical properties and the enhancement factor in pipe design.
- The end pipe product shall not reduce sewer flow after installed in the host pipe.
- An ISO 9001:2000 quality control and assurance program, or equal, must be in place for engineering applications, manufacturing and installation. Independent verification of this program is required.
- A vertically integrated company is an advantage.
- A 24-hour emergency response time is mandatory.
- Pulled-in-Place methods will not be allowed.

The bid should describe the installation procedures including equipment staging area requirements, means of sewer



CITY OF INDEPENDENCE, MISSOURI

PRICE AGREEMENT RENEWAL OF AWARD

Water Lines 282-10

access, means of water line access, methods of maintaining sewerage flow, methods of maintaining potable water flow, and the method used to reactivate sewer service laterals and water service connections.

Documentation demonstrating third-party testing; proven longer histories of successful service; and that the installed reconstruction system, materials, Contractor and manufacturer meets or exceeds desired criteria shall be included with the bid.

The offeror should include any and all video documentation that the offeror may have relating to the evaluation criteria.

1.6 PRICE SCHEDULE(S)

Prices for work completed will be determined by the attached tables of inversion lengths, pipe diameters, and nominal pipe wall thickness and subsequent descriptive discounts listed herein.

NOTE: The prices shown in this table are "not-to-exceed" prices and lower prices may be negotiated based upon project scope of work.



CITY OF INDEPENDENCE, MISSOURI PRICE AGREEMENT RENEWAL OF AWARD

Water Lines 282-10

INVERSION LENGTH
Complete Manhole to Manhole Segments ONLY

Table A – Sewer Main Lines

(Pricing to be per linear foot)	1 to 149 ft.	150 to 249 ft.	250 to 399 ft.	400 to 599 ft.	600 ft. and above
8" Dia. *					
6.0mm@	42.40	32.80	27.30	24.90	24.50
7.5mm@	43.30	33.70	28.20	25.80	25.40
10" Dia. *					
6.0mm@	44.40	34.60	28.90	26.60	26.00
7.5mm@	45.50	35.70	30.00	27.70	27.10
12" Dia. *					
6.0mm@	53.60	41.30	34.10	31.40	30.90
7.5mm@	54.80	42.50	35.30	32.60	32.10
9.0mm@	56.00	43.70	36.50	33.80	33.30
10.5mm@	57.30	45.00	37.80	35.10	34.60
12.0mm@	59.50	47.20	40.00	37.30	36.80
15" Dia. *					
7.5mm@	70.00	54.50	44.00	39.50	38.70
9.0mm@	71.60	56.10	45.60	41.10	40.30
10.5mm@	73.00	57.50	47.00	42.50	41.70
12.0mm@	75.20	59.70	49.20	44.70	43.90
18" Dia.					
9.0mm@	89.30	67.80	55.20	49.10	47.90
10.5mm@	90.90	69.40	56.80	50.70	49.50
12.0mm@	93.70	72.20	59.60	53.50	52.30
13.5mm@	95.50	74.00	61.40	55.30	54.10
21" Dia.					
9.0mm@	103.90	78.10	63.20	55.80	54.40
10.5mm@	106.60	80.80	65.90	58.50	57.10
12.0mm@	108.10	82.30	67.40	60.00	58.60
13.5mm@	110.60	84.80	69.90	62.50	61.10
24" Dia.					

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9.0mm@	<u>111.80</u>	<u>84.50</u>	<u>68.40</u>	<u>60.50</u>	<u>59.10</u>
10.5mm@	<u>114.40</u>	<u>87.10</u>	<u>71.00</u>	<u>63.10</u>	<u>61.70</u>
12.0mm@	<u>116.80</u>	<u>89.50</u>	<u>73.40</u>	<u>65.50</u>	<u>64.10</u>
13.5mm@	<u>119.20</u>	<u>91.90</u>	<u>75.80</u>	<u>67.90</u>	<u>66.50</u>
15.0mm@	<u>121.70</u>	<u>94.40</u>	<u>78.30</u>	<u>70.40</u>	<u>69.00</u>
16.5mm@	<u>124.60</u>	<u>97.30</u>	<u>81.20</u>	<u>73.30</u>	<u>71.90</u>
18.0mm@	<u>127.10</u>	<u>99.80</u>	<u>83.70</u>	<u>75.80</u>	<u>74.40</u>
26" Dia.					
15.0mm@	<u>133.90</u>	<u>103.10</u>	<u>85.50</u>	<u>76.50</u>	<u>75.00</u>
16.5mm@	<u>136.90</u>	<u>106.10</u>	<u>88.50</u>	<u>79.50</u>	<u>78.00</u>
18.0mm@	<u>139.60</u>	<u>108.80</u>	<u>91.20</u>	<u>82.20</u>	<u>80.70</u>
28" Dia.					
15.0mm@	<u>137.90</u>	<u>107.30</u>	<u>89.50</u>	<u>80.60</u>	<u>79.00</u>
16.5mm@	<u>141.10</u>	<u>110.50</u>	<u>92.70</u>	<u>83.80</u>	<u>82.20</u>
18.0mm@	<u>144.00</u>	<u>113.40</u>	<u>95.60</u>	<u>86.70</u>	<u>85.10</u>
30" Dia.					
10.5mm@	<u>136.10</u>	<u>104.50</u>	<u>85.80</u>	<u>76.40</u>	<u>74.10</u>
12.0mm@	<u>138.90</u>	<u>107.30</u>	<u>88.60</u>	<u>79.20</u>	<u>77.50</u>
13.5mm@	<u>142.00</u>	<u>110.40</u>	<u>91.70</u>	<u>82.30</u>	<u>80.60</u>
15.0mm@	<u>144.80</u>	<u>113.20</u>	<u>94.50</u>	<u>85.10</u>	<u>83.40</u>
16.5mm@	<u>148.50</u>	<u>116.90</u>	<u>98.20</u>	<u>88.80</u>	<u>87.10</u>
18.0mm@	<u>151.60</u>	<u>120.00</u>	<u>101.30</u>	<u>91.90</u>	<u>90.20</u>
19.5mm@	<u>154.60</u>	<u>123.00</u>	<u>104.30</u>	<u>94.90</u>	<u>93.20</u>
21.0mm@	<u>157.60</u>	<u>126.00</u>	<u>107.30</u>	<u>97.90</u>	<u>96.20</u>
32" Dia.					
18.0mm@	<u>156.90</u>	<u>125.00</u>	<u>106.10</u>	<u>96.50</u>	<u>94.80</u>
19.5mm@	<u>160.20</u>	<u>128.30</u>	<u>109.40</u>	<u>99.80</u>	<u>98.10</u>
21.0mm@	<u>163.30</u>	<u>131.40</u>	<u>112.50</u>	<u>102.90</u>	<u>101.20</u>
22.5mm@	<u>167.10</u>	<u>135.20</u>	<u>116.30</u>	<u>106.70</u>	<u>105.00</u>
34" Dia.					
19.5mm@	<u>173.10</u>	<u>138.60</u>	<u>117.90</u>	<u>107.30</u>	<u>105.50</u>
21.0mm@	<u>176.60</u>	<u>142.10</u>	<u>121.40</u>	<u>110.80</u>	<u>109.00</u>
22.5mm@	<u>180.30</u>	<u>145.80</u>	<u>125.10</u>	<u>114.50</u>	<u>112.70</u>

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24.0mm@	184. ⁰⁰	149. ⁵⁰	128. ⁸⁰	118. ²⁰	116. ⁴⁰
25.5mm@	188. ¹⁰	153. ⁶⁰	132. ⁹⁰	122. ³⁰	120. ⁵⁰
36" Dia.					
10.5mm@	181. ¹⁰	136. ⁸⁰	110. ¹⁰	96. ³⁰	93. ⁹⁰
12.0mm@	184. ⁹⁰	140. ⁶⁰	113. ⁹⁰	100. ¹⁰	97. ⁷⁰
13.5mm@	188. ⁹⁰	144. ⁶⁰	117. ⁹⁰	104. ¹⁰	101. ⁷⁰
15.0mm@	192. ⁷⁰	148. ⁴⁰	121. ⁷⁰	107. ⁹⁰	105. ⁵⁰
16.5mm@	195. ⁹⁰	151. ⁶⁰	124. ⁹⁰	111. ¹⁰	108. ⁷⁰
18.0mm@	200. ⁰⁰	155. ⁷⁰	129. ⁰⁰	115. ²⁰	112. ⁸⁰
19.5mm@	203. ⁸⁰	159. ⁵⁰	132. ⁸⁰	119. ⁰⁰	116. ⁶⁰
21.0mm@	207. ⁶⁰	163. ³⁰	136. ⁶⁰	122. ⁸⁰	120. ⁴⁰
22.5mm@	211. ⁴⁰	167. ¹⁰	140. ⁴⁰	126. ⁶⁰	124. ²⁰
24.0mm@	215. ¹⁰	170. ⁸⁰	144. ¹⁰	130. ³⁰	127. ⁹⁰
25.5mm@	219. ⁸⁰	175. ⁵⁰	148. ⁸⁰	135. ⁰⁰	132. ⁶⁰
27.0mm@	223. ⁸⁰	179. ⁵⁰	152. ⁸⁰	139. ⁰⁰	136. ⁶⁰
28.5mm@	227. ⁶⁰	183. ³⁰	156. ⁶⁰	142. ⁸⁰	140. ⁴⁰
42" Dia.					
12.0mm@	235. ⁴⁰	176. ⁵⁰	141. ³⁰	122. ⁸⁰	119. ⁷⁰
15.0mm@	243. ⁹⁰	185. ⁰⁰	149. ⁸⁰	131. ³⁰	128. ²⁰
18.0mm@	251. ⁷⁰	192. ⁸⁰	157. ⁶⁰	139. ¹⁰	136. ⁰⁰
21.0mm@	261. ⁰⁰	202. ¹⁰	166. ⁹⁰	148. ⁴⁰	145. ³⁰
44" Dia.					
24.0mm@	286. ²⁰	224. ³⁰	187. ⁴⁰	167. ⁹⁰	164. ⁶⁰
25.5mm@	290. ⁸⁰	228. ⁹⁰	192. ⁰⁰	172. ⁵⁰	169. ²⁰
27.0mm@	295. ⁰⁰	233. ¹⁰	196. ²⁰	176. ⁷⁰	173. ⁴⁰
28.5mm@	299. ³⁰	237. ⁴⁰	200. ⁵⁰	181. ¹⁰	177. ⁷⁰
48" Dia.					
15.0mm@	270. ⁷⁰	207. ⁴⁰	169. ⁸⁰	149. ⁹⁰	146. ⁶⁰
18.0mm@	279. ⁷⁰	217. ⁴⁰	178. ⁸⁰	158. ⁹⁰	155. ⁶⁰
21.0mm@	290. ⁴⁰	227. ¹⁰	189. ⁵⁰	169. ⁶⁰	166. ³⁰
24.0mm@	302. ⁴⁰	239. ¹⁰	201. ⁵⁰	181. ⁶⁰	178. ³⁰
25.5mm@	306. ²⁰	242. ⁹⁰	205. ³⁰	185. ⁴⁰	182. ¹⁰
27.0mm@	311. ⁵⁰	248. ²⁰	210. ⁶⁰	190. ⁷⁰	187. ⁴⁰

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28.5mm@	316. ⁷⁰	253. ⁴⁰	215. ⁸⁰	195. ⁹⁰	192. ⁶⁰
30.0mm@	322. ⁰⁰	258. ⁷⁰	221. ¹⁰	201. ²⁰	197. ⁹⁰
60" Dia.					287. ³⁰ BME
31.5mm@	504. ⁷⁰	392. ⁸⁰	328. ⁰⁰	293. ⁰⁰	297. ⁹⁰ BME
33.0mm@	511. ³⁰	399. ⁴⁰	334. ⁶⁰	299. ⁶⁰	293. ⁹⁰
34.5mm@	516. ⁸⁰	404. ⁹⁰	340. ¹⁰	305. ¹⁰	299. ⁴⁰
36.0mm@	524. ⁵⁰	412. ⁶⁰	347. ⁸⁰	312. ⁸⁰	307. ¹⁰
66" Dia.					
34.5mm@	552. ⁹⁰	437. ³⁰	370. ⁵⁰	334. ⁴⁰	328. ⁵⁰
36.0mm@	560. ¹⁰	444. ⁵⁰	377. ⁷⁰	341. ⁶⁰	335. ⁷⁰
37.5mm@	567. ³⁰	451. ⁷⁰	384. ⁹⁰	348. ⁸⁰	342. ⁹⁰
39.0mm@	574. ⁴⁰	459. ⁰⁰	392. ²⁰	356. ¹⁰	350. ²⁰
40.5mm@	581. ⁸⁰	466. ²⁰	399. ⁴⁰	363. ³⁰	357. ⁴⁰
42.0mm@	588. ⁹⁰	473. ³⁰	406. ⁵⁰	370. ⁴⁰	364. ⁵⁰
43.5mm@	596. ¹⁰	480. ⁵⁰	413. ⁷⁰	377. ⁶⁰	371. ⁷⁰
45.0mm@	603. ³⁰	487. ⁷⁰	420. ⁹⁰	384. ⁸⁰	378. ⁹⁰
46.5mm@	610. ⁵⁰	494. ⁹⁰	428. ¹⁰	392. ⁰⁰	386. ¹⁰
48.0mm@	617. ⁶⁰	502. ⁰⁰	435. ²⁰	399. ¹⁰	393. ²⁰
49.5mm@	624. ⁷⁰	509. ¹⁰	442. ³⁰	406. ²⁰	400. ³⁰
51.0mm@	631. ⁸⁰	516. ²⁰	449. ⁴⁰	413. ³⁰	407. ⁴⁰
52.5mm@	638. ¹⁰	523. ¹⁰	456. ³⁰	420. ²⁰	414. ³⁰
54.0mm@	646. ¹⁰	530. ⁵⁰	463. ⁷⁰	427. ⁶⁰	421. ⁷⁰
55.5mm@	653. ⁷⁰	538. ¹⁰	471. ³⁰	435. ²⁰	429. ³⁰
72" Dia.					
37.5mm@	612. ¹⁰	486. ⁰⁰	413. ²⁰	373. ⁹⁰	367. ⁴⁰
39.0mm@	620. ⁰⁰	493. ⁷⁰	421. ¹⁰	381. ⁸⁰	375. ³⁰
40.5mm@	627. ⁹⁰	501. ⁸⁰	429. ⁰⁰	389. ⁷⁰	383. ²⁰
42.0mm@	635. ⁸⁰	509. ⁷⁰	436. ⁹⁰	397. ⁶⁰	391. ¹⁰
43.5mm@	643. ⁶⁰	517. ⁵⁰	444. ⁷⁰	405. ⁴⁰	398. ⁹⁰
45.0mm@	651. ⁵⁰	525. ⁴⁰	452. ⁶⁰	413. ³⁰	406. ⁸⁰
46.5mm@	659. ³⁰	533. ²⁰	460. ⁴⁰	421. ¹⁰	414. ⁶⁰
48.0mm@	667. ²⁰	541. ¹⁰	468. ³⁰	429. ⁰⁰	422. ⁵⁰
49.5mm@	675. ⁰⁰	548. ⁹⁰	476. ¹⁰	436. ⁸⁰	430. ³⁰

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51.0mm@	680. ⁰⁰	553. ⁹⁰	481. ¹⁰	441. ⁸⁰	435. ³⁰
52.5mm@	682. ⁸⁰	556. ⁷⁰	483. ⁹⁰	444. ⁶⁰	438. ¹⁰
54.0mm@	695. ⁰⁰	568. ⁹⁰	496. ¹⁰	456. ⁸⁰	450. ³⁰
55.5mm@	698. ³⁰	572. ³⁰	499. ⁴⁰	460. ¹⁰	453. ⁶⁰

* Includes bypass pumping costs. All other diameters will be charged at the daily rate.

For the above main line inversion pricing, discounts per LF to the above will be offered for work orders assembled in large quantities in the following amounts:

\$3.25 per LF for work orders over \$250,000 and less than \$500,000
 \$3.25 per LF for work orders over \$500,000 and less than \$1,000,000
 \$3.50 per LF for work orders over \$1,000,000

In order for the Owner to receive the best quantity pricing within the twelve (12) months of each contract year, the total dollar amount of a work order will be added to all previous work orders issued within the previous twelve months. That new accumulated total at the time of a work order issuance will be used as an aggregate amount to determine the pricing shown above regarding large order discounts for that work order. Authorization Releases shall have a minimum value of \$15,000.00 in order to be subject to subsequent descriptive discounts listed herein.

Miscellaneous Items:

Bypass Pumping w/6 in. pump \$ 1,750.⁰⁰ (per pump/per day)
 Bypass Pumping w/8 in. pump \$ 2,900.⁰⁰ (per pump/per day)
 Bypass Pumping w/12 in. pump \$ 3,500.⁰⁰ (per pump/per day)

(All bypass pumping is subject to approval by the Owner as determined by each set of site conditions).

Notes:

A) It is understood that in engaging the Contractor to perform CIPP line rehabilitations under this agreement it will be customary to amass and assemble multiple single-line segments slated for rehabilitation for the sake of efficiency. As such, in the case where a multi-segment contiguous sewer line can be "shot through" and lined with a single mobilization, billing will reflect all such combined lengths as one total length for application to the billing schedule. If, during the execution of a customary work order, a line segment of less than 150 LF is requested to be rehabilitated and it is "stand alone" with regard to setup, it (and any like it) can be combined with longer line segments for billing purposes, except that in this case, its price will be figured at the unit price per the schedule for the average individual line segment length of the whole work order. The unit price column in the price schedule for line segments from 1 to 149 LF shall be intended for use only on single-line segment orders where the Owner has no other sewer main line rehabilitation work to be done as part of the work order release.

B) The lining prices above include normal video inspection and cleaning. Should other video inspection and cleaning (not in conjunction with lining) be needed, the work will be in accordance with Section 2150, the Sewer Cleaning and Television Inspection Specifications.



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Table B - Service Laterals

Item Description	Unit Price
1. Mobilization (each)	\$ 8,952. ⁰⁰
2. Setup per manhole segment (each)	477. ⁰⁰
3. Lateral liner & connection 8" to 12" diameter main, 4" to 6" diameter lateral up to 5' long (each)	6,039. ⁰⁰
4. Lateral liner & connection 15" to 21" diameter main, 4" to 6" diameter lateral up to 5' long (each)	6,674. ⁰⁰
5. Lateral liner & connection 8" to 21" main, 4" to 6" lateral greater than 5' long (per foot)	60. ⁰⁰
6. Sewer lateral terminating in manhole 4" to 6" diameter up to 5' long (each)	3,178. ⁰⁰
7. Sewer lateral terminating in manhole 4" to 6" diameter greater than 5' long (per foot)	60. ⁰⁰
8. In lateral transition from 6" to 4" or 8" to 6" (each)	594. ⁰⁰
9. Mainline manhole drops 8" to 12" (each)	6,039. ⁰⁰

INSTALLATION PRACTICE FOR REHABILITATION OF A SEWER SERVICE LATERAL USING A ONE-PIECE MAIN AND LATERAL CURED-IN-PLACE LINER INSTALLED BY MEANS OF AIR INVERSION

The service lateral lining shall provide a one-piece, homogenous, cured in-place full circle main to lateral connection lining by air inversion with no overlapping materials. The inverted lateral CIPP lining must be able to invert to a minimum distance of seventy-five feet while being able to compromise 4" and 6" lateral connections including lateral diameter changes with main pipe diameters of diameters of 8" through 24". The one-piece CIPP main to lateral lining will incorporate gasket sealing technology and the use of compressible materials in the main CIPP portion. Collar type systems, two-piece systems, systems where the lateral is pulled in-place and CIPP connection systems that are based on adhesion will not be allowed. All main to lateral sewer service lining connections shall comply with ASTM F2561-06 or latest revision.

1. SIGNIFICANCE AND USE

This specification is for use by designers, engineers who specify, regulatory agencies, owners, and inspection organizations who are involved in the rehabilitation of sewer service laterals through the use of a resin-impregnated tube installed within an existing sewer lateral. As for any specification, modifications may be required for specific job conditions.



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2. INTENT

This specification covers requirements and test methods for the reconstruction of a sewer service lateral pipe and a short section of the main pipe without excavation. The lateral pipe shall be remotely accessed from the main pipe and from a cleanout. This shall be accomplished by the installation of a resin impregnated one-piece main and lateral lining by means of air inflation and inversion. The liner is pressed against the host pipe by pressurizing a bladder that is held in place until the thermo-set resins have cured. When cured, the liner shall extend over a predetermined length of the service lateral and a particular section of the main pipe as a continuous, one-piece, tight fitting, corrosion resistant and verifiable non-leaking cured in-place pipe. The Main/Lateral Lining shall be in accordance with ASTM F2561-06 "Standard Practice for Rehabilitation of a Sewer Service Lateral and its Connection to the Main Using a One-Piece Main and Lateral Cured-in Place Liner"

3. GENERAL

The reconstruction shall be accomplished using a non-woven textile tube of particular length and a thermo-set resin with physical and chemical properties appropriate for the application. The lateral tube located within a translucent inversion bladder is vacuum impregnated with the synthetic resin and is then placed inside of a protective carrying device. The mainline portion of the liner is physically attached to the lateral portion and is affixed around a rigid "T" launching device. The protective "T" launching device is winched into the existing sewer. When the "T" launching device is properly positioned at the lateral connection, the mainline bladder is inflated by pressurized air that presses the main liner against the host pipe. The lateral portion is then, inverted up through the lateral service line by the action of the inversion bladder. Once the resin-saturated liner is cured, the inversion bladder and launching/carrying devices are removed.

4. MATERIAL

4.1 The liner assembly shall be continuous in length and consist of one or more layers of absorbent textile material i.e. needle punched felt, circular knit or circular braid that meet the requirements of ASTM F1216 and ASTM D5813 Sections 6 and 8. The textile tube and sheet shall be constructed to withstand installation pressures, have sufficient strength to bridge missing pipe segments, and flexibility to fit irregular pipe sections. The wet-out textile tube and sheet shall meet ASTM F 1216, 7.2 as applicable, and shall have a uniform thickness and 5% to 10% excess resin distribution that when compressed at installation pressures will meet or exceed the design thickness after cure.

4.2 The outside layer of the textile tube (before inversion) and interior of the textile sheet shall be coated with an impermeable, translucent flexible membrane. The textile sheet before insertion shall be permanently marked as a "Lateral Identification" correlating to the address of the building and the lateral pipe services. The sheet and tube shall be surrounded by a second impermeable, flexible translucent membrane (translucent bladder) that will contain the resin and facilitate vacuum impregnation while monitoring of the resin saturation during the resin impregnation (wet-out) procedure.

4.3 The mainsheet and lateral tube shall be a one-piece assembly formed in the shape of a "T" or WYE. No intermediate or encapsulated elastomeric layers shall be in the textile that may cause de-lamination in the cured in-place pipe. The main sheet will be flat with one end overlapping the second end and sized accordingly to create a circular lining equal to the inner diameter of the main pipe. The lateral tube will be continuous in length and the wall thickness shall be uniform. The lateral tube will be capable of conforming to offset joints, bells, and disfigured pipe sections.

5. RESIN SYSTEM

5.1 The resin/liner system shall conform to ASTM D5813 Section 8.2.2 - 10,000-hour test.

5.2 The resin shall be a corrosion resistant polyester, vinylester, epoxy or silicate resin and catalyst system that when properly cured within the composite liner assembly, meets the requirements of ASTM F1216, the physical properties herein, and those which are to be utilized in the design of the CIPP, for this project.

5.3 The resin shall produce CIPP, which will comply with the structural and chemical resistance requirements of ASTM F1216.



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Table 1 CIPP INITIAL STRUCTURAL PROPERTIES

Property	ASTM Test	Minimum value_____	
		psi	(MPa)
Flexural Strength	D 790	4,500 (31)	
Flexural Modulus	D 790	250,000	(1,724)

6. DESIGN CONSIDERATIONS

6.1 The CIPP shall be designed per ASTM F1216, Appendix X1.

6.2 The CIPP design for the lateral tube shall assume no bonding to the original pipe.

7. INSTALLATION RECOMMENDATIONS

7.1 Access Safety – Prior to entering access areas such as manholes, an excavation pit, performing inspection or cleaning operations, an evaluation of the atmosphere to determine the presence of toxic or flammable vapors or lack of oxygen shall be undertaken in accordance with local, state, or federal safety regulations.

7.2.1 Cleaning and Inspection – As per Section 2150 “Sewer Cleaning and Inspection”.

7.2.2 Accessing the Lateral – A cleanout is required to be located on the exterior of the building for CIPP lateral lengths greater than three feet. The cleanout fitting must be either TEE shaped or back to back WYE shaped where the lateral meets the cleanout riser pipe. The cleanout shall be located no less than within two (2) feet of the finished liner.

7.2.3 Plugging – The upstream side of the cleanout shall be plugged during insertion and curing of the liner assembly ensuring no flows enter the pipe and no air, steam or odors will enter the building. When required, the main pipe flows will be by-passed. The pumping system shall be sized for normal to peak flow conditions. The upstream manhole shall be monitored at all times and an emergency deflating system will be incorporated so that the plugs may be removed at any time without requiring confined space entry.

7.2.4 Inspection of Pipelines – The interior of the pipeline shall be carefully inspected to determine the location of any condition that shall prevent proper installation, such as roots, and collapsed or crushed pipe sections. These conditions shall be noted. Experienced personnel trained in locating breaks, obstacles, and service connections by closed circuit television shall perform inspection of pipelines.

7.2.5 Line Obstructions – The existing service lateral shall be clear of obstructions that prevent the proper insertion and expansion of the lining system. Changes in pipe size shall be accommodated, if the lateral tube is sized according to the pipe diameter and condition. Obstructions may include dropped or offset joints of no more than 20% of inside pipe diameter.

7.3 Resin Impregnation – The lateral tube and mainline sheet shall be encapsulated within the translucent bladder (liner/bladder assembly) shall be vacuum-impregnated with resin (wet-out) under controlled conditions. The volume of resin used shall be sufficient to fill all voids in the textile lining material at nominal thickness and diameter. The volume shall be adjusted by adding 5% to 10% excess resin for the change in resin volume due to polymerization and to allow for any migration of resin into the cracks and joints in the original pipe. No dry or unsaturated area in the mainline sheet or lateral tube shall be acceptable upon visual inspection.

7.4 Liner Insertion – The lateral tube and inversion bladder will be inserted into the carrying device. The mainline liner and bladder shall be wrapped around the “T” launching device and held firmly by placing four (4) hydrophilic O-rings around the main liner. An adhesive sealant 300ml in volume is applied to the main/lateral interface and shall be applied as a two-inch (2”) wide band on the main liner. Both the launching and carrying device are pulled into the pipe using a cable winch. The pull is complete when the open port of the “T” launching device is aligned with the interface of the service connection and mainline pipe. The lateral tube is completely protected during the pull. The mainline liner is supported on a rigid “T” launcher that is elevated above the pipe invert through the use of a rotating skid system. The liner assembly shall not be contaminated or diluted by exposure to dirt, debris, or water during the pull.

7.5 Bladder – The main bladder shall be inflated causing the main sheet to unwrap and expand, embedding the hydrophilic O-rings between the main liner and the main pipe as the main liner is pressed tight against the main pipe. The lateral tube is inverted by the action of the lateral bladder through the center of the main liner as it extends up into the lateral pipe to a termination point that shall be no less than 2-feet from the exterior cleanout. The Main/Lateral bladder assembly shall extend past all ends of the liner, as no cutting shall be required.



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7.6 Curing – After liner placement is complete; pressure is maintained pressing the liner firmly against the inner pipe wall. The liner is chemically cured at ambient temperatures or by a suitable heat source. The heating equipment shall be capable of delivering a mixture of steam and air throughout the liner bladder assembly to uniformly raise the temperature above the temperature required to cure the resin. The curing of the CIPP must take into account the existing pipe material, the resin system, and ground conditions (temperature, moisture level, and thermal conductivity of the soil). The heat source temperatures shall be monitored and logged during the cure and cool down cycles. The manufacturer's recommended cure schedule shall be submitted.

7.7 CIPP Processing – Curing shall be done without pressure interruption with air or a mixture of air and steam for the proper duration of time per the resin manufacturer's recommendations. When the heat source is removed and the temperature on both ends of the CIPP reaches 100 degrees Fahrenheit or less, the processing shall be finished

8. FINISH

8.1 The finished CIPP – Shall be continuous over the entire length of the rehabilitated sewer service lateral and 16" of the main pipe (5" on either side of a 6" lateral or 6" on either side of a 4" lateral connection). The CIPP shall smooth with minimal wrinkling and increase flow rate. The CIPP shall be free of dry spots, lifts, and delaminated portions. The CIPP shall taper at each end providing a smooth transition for accommodating video equipment and maintaining proper flow in the mainline. After the work is completed, the installer will provide the owner with video footage documenting the repair and the visual markings identifying the sewer lateral address as completed work. The finished product must provide an airtight/ watertight verifiable non-leaking connection between the main sewer and sewer service lateral.

9. RECOMMENDED INSPECTION AND TESTING PRACTICES

9.1 Gravity Pipe Leakage Testing – If required by the owner in the contract documents or purchase order, gravity pipes should be tested using an air test method where a test plug is placed adjacent to the upstream and downstream ends of the main sheet CIPP and at the upper most end of the lateral tube. This test should take place after the CIPP has cooled down to ambient temperature. This test is limited to pipe lengths with no service connections. The test pressure shall be 4 PSI for a three-minute) minute test time and during this time the pressure shall not drop below 3.5 PSI.

10. DESIGN CONSIDERATIONS

10.1 General Guidelines – The design of the cured-in-place lateral liner system is largely a function of the condition of the existing pipeline and the loads stipulated by the customer's specification.

11. QUALIFIED BIDDER

The proposed installer for installing a mainline/lateral connection and lateral repair system shall use a Manufactured System that has a minimum of a five-year history of satisfactory performance and the Manufactured System shall have performed a minimum of 10,000 successful installations during this time period in the U.S., including 300,000 feet of lateral lining. Proposed installers shall have installed more than 200 laterals to main connections that meet ASTM 2561-06 and shall submit a list of installation projects, numbers of connections sealed and lateral footage lined providing contact names, addresses, and telephone numbers for reference.

Table B-1 - Service Lateral Cleanout

Item Description	Unit Price
Mobilization (each)	\$ 3,178. ⁰⁰
Locate for cleanout via lateral launch mainline camera (each)	1,165. ⁰⁰
4" to 6" diameter VAC-A-Tee cleanout installation 0' to 6' depth vacuum excavation (each)	2,119. ⁰⁰
4" to 6" diameter VAC-A-Tee cleanout installation 7' to 12' depth vacuum excavation (each)	2,330. ⁰⁰



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Cleanout Installation

The material shall be a one-piece, molded PVC saddle and shall be compatible with the riser pipe and solvent welded to the boss of the saddle. The saddle shall conform to the lateral pipe by a snap fit where the lateral pipe is either four (4") or six (6") in diameter. The riser pipe shall be SDR 35 or SDR 26 PVC. The resin will be a one-part marine grade adhesive/sealant. Description of adhesive/sealant proposed to be used shall be submitted with proposal.

INSTALLATION PROCEDURE

- In grass areas, the sod shall be neatly cut and removed. In pavement areas, the pavement shall be straight-line marked, cut and removed.
- The vacuum excavated borehole shall be approximately sixteen (16") to twenty-four inches (24") in diameter and all spoils shall be deposited in a vacuum truck.
- A riser pipe of an appropriate length is solvent welded to the saddle.
- Then the bonding/sealing adhesive is applied evenly throughout the bottom of the PVC saddle.
- The assembly is then lowered into the hole and the PVC saddle is then snapped over the lateral pipe.
- The vacuum or hydro-excavated bore hole is then filled at the bottom with a minimum of two feet of compactable material.
- A column of water is then introduced into the riser pipe to perform a hydrostatic test.
- Once cured a diamond core bit is introduced to bore through the crown of pipe and to provide access to the service lateral.



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CLEANING & INSPECTION (not in conjunction with lining)

Table C - Sewer Cleaning and Television Inspection

Price per Linear foot	Orders < 2,501 LF			Orders 2,501 to 5,000 LF			Orders > 5,000 LF		
Pipe Size	(1) Light Cleaning (NO CCTV)	(2) Heavy Cleaning (CCTV INCLUDED)	(3) CCTV (CCTV ONLY)	(1) Light Cleaning (NO CCTV)	(2) Heavy Cleaning (CCTV INCLUDED)	(3) CCTV (CCTV ONLY)	(1) Light Cleaning (NO CCTV)	(2) Heavy Cleaning (CCTV INCLUDED)	(3) CCTV (CCTV ONLY)
6" to 10"	1.30	2.30	1.55	1.30	2.25	1.30	1.30	2.05	1.05
12" to 15"	1.55	2.55	1.55	1.55	2.50	1.30	1.55	2.05	1.05
18" to 21"	1.80	3.05	1.55	1.80	2.80	1.30	1.80	2.80	1.05
24"	2.30	5.05	1.55	2.30	4.65	1.30	2.30	3.55	1.05
27"	2.30	5.05	1.55	2.30	4.65	1.30	2.30	4.05	1.05
30"	2.55	5.30	1.55	2.55	5.20	1.30	2.55	5.05	1.05
36"	2.80	6.05	1.55	2.80	5.80	1.30	2.80	5.80	1.05
42"	3.05	7.05	1.55	3.05	6.80	1.30	3.05	6.55	1.05
48"	3.30	7.30	1.55	3.30	7.05	1.30	3.30	6.80	1.05

Light Cleaning: Column No 1 = Total \$ / LF (NO CCTV)

Light Cleaning and CCTV: Column No 1 + Column No 3 = Total \$ / LF

Heavy Cleaning = Column No 1 + Column No 2 = Total \$ / LF (CCTV Included)

VERTICAL FOOTAGE

Table D - Manhole Sealing (48 inch diameter)

(Prices to be per Vertical Foot)	Work Orders up to 50 VF		Work Orders 51 to 200 VF		Work Orders over 200 VF	
	Manholes up to 8 VF deep	Manholes > 8 VF	Manholes up to 8 VF deep	Manholes > 8 VF	Manholes up to 8 VF deep	Manholes > 8 VF
Cementitious	133.35	122.65	103.45	98.20	100.30	94.95
Epoxy	266.70	240.05	240.05	213.40	229.35	202.65
Cementitious & Epoxy	368.05	330.65	357.45	320.05	346.75	309.35

Insituform Technologies USA, Inc.



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Table E – Manhole Sealing (60 inch diameter)

(Prices to be per Vertical Foot)	Work Orders up to 50 VF		Work Orders 51 to 200 VF		Work Orders over 200 VF	
	Manholes up to 8 VF deep	Manholes > 8 VF	Manholes up to 8 VF deep	Manholes > 8 VF	Manholes up to 8 VF deep	Manholes > 8 VF
Cementitious	162. ²⁵	151. ⁵⁵	128. ⁰⁰	122. ⁶⁵	125. ⁹⁰	117. ⁴⁰
Epoxy	330. ⁶⁵	298. ⁷⁵	298. ⁷⁵	266. ⁷⁰	288. ⁰⁵	256. ⁰⁰
Cementitious & Epoxy	453. ⁴⁰	410. ⁷⁰	442. ⁷⁰	400. ⁰⁵	432. ¹⁰	421. ⁴⁰

VERTICAL FOOTAGE

Table F – Manhole Sealing (72 inch diameter)

(Prices to be per Vertical Foot)	Work Orders up to 50 VF		Work Orders 51 to 200 VF		Work Orders over 200 VF	
	Manholes up to 8 VF deep	Manholes > 8 VF	Manholes up to 8 VF deep	Manholes > 8 VF	Manholes up to 8 VF deep	Manholes > 8 VF
Cementitious	185. ⁹⁵	175. ⁷⁵	153. ⁴⁵	148. ³⁵	143. ²⁵	138. ²⁵
Epoxy	377. ¹⁵	346. ⁴⁵	346. ⁴⁵	315. ⁹⁵	336. ³⁵	305. ⁸⁵
Cementitious & Epoxy	518. ¹⁵	488. ⁷⁵	503. ⁹⁵	463. ³⁵	493. ⁷⁵	453. ¹⁵

2.0 BID INCLUSIONS - GENERAL

- Mobilization and setup.
- Closed-circuit color video inspection as directed by the City of Independence.
- Pre-installation video inspection recordings on media specified by the Owner.
- By-passing of existing sewer flows required on all inversions as noted on Table A.
- CIPP wet out, inversion, curing, and finishing per ASTM F-1216 and D 5813.
- Internal reinstatement of live service connections. Note: No service connections will be left sealed with out written direction from the Owner, and, in such event, Owner will indemnify and hold the Contractor harmless from all backup claims arising there from.
- Post-installation video inspection recordings on media specified by the Owner, as well as written report form.
- Traffic control using cones and flashing barricades, as required.
- Complete conformance to O.S.H.A. confined space entry safety regulations.
- Standard three year warranty after completion of project.
- Three-year performance and payment bond.
- Permits, licensing and insurance as required
- Compliance with Division I and Division II Technical Specifications.



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2.1 BID EXCLUSIONS

Not included in the price stated in this bid are costs associated with the items listed below. These items, if applicable, would be at an additional cost or would be furnished at no cost to the Contractor.

- Premiums for special insurance coverage requirements such as OCP, Builders Risk, Railroad, Non-Contributory, etc.
- Point repairs of any collapsed sections of the existing pipe line.
- CIPP Installation access shafts or manhole top cone and barrel section removal, replacement, and restoration.
- Groundwater Dewatering
- Traffic control required beyond the scope described above will be priced at cost plus 5%.
- If any hazardous or toxic materials are encountered during the project, the Owner will be responsible for the removal and disposal of the materials.
- Installation of clean-outs, if required, for special bypass pumping requirements for businesses (None anticipated).
- Construction access easements.

2.2 LIMITED WARRANTY

IN LIEU OF ALL OTHER EXPRESSED OR IMPLIED AND/OR STATUTORY WARRANTIES, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, CONTRACTOR AGREES TO CORRECT ANY DEFECTS IN THE MATERIALS OR SERVICES PROVIDED BY CONTRACTOR WHICH ARE BROUGHT TO THE ATTENTION OF CONTRACTOR WITHIN THREE YEARS FOLLOWING ACCEPTANCE OF CONTRACTOR'S WORK, PROVIDED OWNER AFFORDS CONTRACTOR SUITABLE ACCESS AND WORKING CONDITIONS TO ACCOMPLISH SUCH CORRECTION.

2.3 BID SUBJECT TO NEGOTIATION OF OTHER STANDARD TERMS OF AGREEMENT.

This bid is subject to agreement of the parties on other terms and conditions as are customary in price agreements of this nature.

2.4 STRUCTURAL CRITERIA

A. Design Methodology: See Design Guide

Describe and provide third party test data and documentation of the design calculations of the thickness recommendations of the finished reconstruction system. Include confirmation that the proposed reconstruction system will withstand the external pressures from ground water and any loads (depth, water table, soil type, traffic/non-traffic areas, etc.). Describe the conditions that will constitute partial and fully deteriorated design calculations. Submit the empirical test data verifying the individual design calculations.

B. Structural Properties: See Trenchless Technology Center Report

Submit responsible third party test data to demonstrate compliance with the technical specifications pertaining to the proposed reconstruction system for each of the following properties (NOTE: results shall be of coupons taken from samples obtained after installation):

- | | |
|---|----------------------|
| (1) Flexural Strength | ASTM D-790 |
| (2) Flexural Modulus | ASTM D-790 |
| (3) Tensile Strength | ASTM D-638 |
| (4) Tensile Modulus | ASTM D-638 |
| (5) Corrosion Resistance | ASTM F-1216 |
| (6) Impact Strength | ASTM D-256, method A |
| (7) Shear Strength | ASTM D-732 |
| (8) Hardness (Barcol 33) | ASTM D-2583 |
| (9) Std. Practice for Rehabilitation of existing Pipelines by Inversion and Curing of a Resin Impregnated Tube, (if applicable to the proposed reconstruction system) | ASTM F-1216 |
| (10) Data from any other laboratory tests which demonstrate the properties, including long term properties, of the reconstruction system. | |



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C. Hydraulic Properties:

Describe and provide documentation and third party testing to show the post-installation flow capacity of the proposed process. Reconstruction systems having post-installation flow capacity equal to or greater than the flow capacity of the non-reconstructed pipe segment will receive a materially greater score in this criteria.

2.5 SPECIFICATIONS FOR CIPP

INTENT: It is the intent of this specification to provide for the reconstruction of pipelines and conduits by the installation of a resin-impregnated flexible tube, which is tightly formed to the original conduit. The resin is cured using either hot water under hydrostatic pressure or steam pressure within the tube. The Cured-In-Place Pipe (CIPP) will be continuous and tight fitting

3. REFERENCED DOCUMENTS

This specification references standards from the American Society for Testing and Materials, such as: ASTM F1216 (Rehabilitation of Existing Pipelines and Conduits by the Inversion and Curing of a Resin-Impregnated Tube), ASTM F1743 (Rehabilitation of Existing Pipelines and Conduits by Pulled-in-Place Installation of Cured-in-Place Thermosetting Resin Pipe (CIPP)), ASTM D5813 (Cured-in-Place Thermosetting Resin Sewer Pipe), ASTM D790 (Test Methods for Flexural Properties of Un-reinforced and Reinforced Plastics and Electrical Insulating Materials), and D2990 (Tensile, Compressive, and Flexural Creep and Creep-Rupture of Plastics) which are made a part hereof by such reference and shall be the latest edition and revision thereof. In case of conflicting requirements between this specification and these referenced documents, this specification will govern.

4. PRODUCT, MANUFACTURER/INSTALLER QUALIFICATION REQUIREMENTS

Since sewer products are intended to have a 50-year design life, and in order to minimize the Owner's risk, only proven products with substantial successful long-term track records will be approved.

Products and Installers seeking approval must all of the following criteria to be deemed Commercially Acceptable:

- 4.1 For a Product to be considered Commercially Proven, a minimum of 1,000,000 linear feet or 3,000 line sections of successful wastewater collection system installations in the U.S. must be documented to the satisfaction of the Owner to assure commercial viability. In addition, at least 100,000 linear feet of the product shall have been in successful service within the area of EPA Region 7 for a minimum of three years.
- 4.2 For an Installer to be considered as Commercially Proven, the Installer must satisfy all insurance, financial, and bonding requirements of the Owner, and must have had at least 3 (three) years active experience in the commercial installation of the exact product Proposal. In addition, the Installer must have successfully installed at least 50,000 feet of the product in wastewater collection system. Acceptable documentation of these minimum installations must be submitted to the Owner.
- 4.3 Sewer rehabilitation products submitted for approval must provide Third Party Test Results supporting the long term performance and structural strength of the product and such data shall be satisfactory to the Owner. Test samples shall be prepared so as to simulate installation methods and trauma of the product. No product will be approved without independent third party testing verification.
- 4.4 Both the rehabilitation product and the installer shall have ISO 9001:2000 Certification or equal for its quality control and assurance programs. Proof of certification shall be required for approval.
- 4.5 **MANAGEMENT PLAN Contractor's Project Execution Management Organization**
 - a. **Corporate Organization Chart**
Provide an overall organization chart depicting the essential organizational elements and senior personnel of the proposed Contractor.
 - b. **Engineering and Project Management Chart**



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Provide and organization chart depicting the functions and interrelationships of the personnel proposed to provide design, engineering, technical support, project management and supervision for this project.

Quality Control System

- a. Engineering Applications, Manufacturing and Installation of Reconstruction System. Provide a narrative of the Contractor Quality Control program employed during the manufacture of the reconstruction system components and the installation of the proposed reconstruction system.

Resources

- a. Facility
Provide a narrative description of the proposed base operations facility, the location of stored materials, the equipment, storage facilities and the location and size of administrative, maintenance and other operating facilities.
- b. Equipment and Component Availability
 1. Raw Material Inventory
Submit an inventory list of the individual diameter sizes of the proposed reconstruction system held on hand by Contractor and back-up resupply availability. Include all raw material components of the system necessary for reconstruction, both on hand and available for resupply.
 2. Reconstruction System Installation Equipment Inventory
Submit an inventory list of reconstruction system installation equipment held on hand by Contractor, and back-up availability.

5. PAYMENT

Payment for the work included in this section will be in accordance with the prices set forth in the proposal for the quantity of work performed. Progress payments will be made monthly based on the work performed during that period as specified in Section 1100, "Progress and Payment".

6. CONTRACT PERIOD

Contract shall be a term contract for a period of one (1) year with option to extend annually for four years.

7. OPTION TO EXTEND CONTRACT PERIOD

The work to be performed under this Contract shall be commenced upon notification by the City. The term of this Contract is one year. Contractor agrees to a renewal option of a second and third year at the stated prices, and a fourth and fifth year with increases allowed.



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CIPP WATER LINE - INVERSION LENGTH

Table G – Water Mains
(EXCLUDES Pit excavations, pit backfill/restorations, etc.
– FULL-LENGTH LINING SEGMENTS ONLY)

(Pricing to be per linear foot)	1 to 149 ft.	150 to 249 ft.	250 to 399 ft.	400 to 599 ft.	600 ft. and above
8" Dia.					
6 mm@	\$ 187. ¹⁰	\$ 179. ⁰⁰	\$ 174. ⁵⁰	\$ 171. ⁹⁰	\$ 171. ⁵⁰
7 mm@	191. ⁴⁰	183. ³⁰	178. ⁸⁰	176. ²⁰	175. ⁸⁰
12" Dia.					
7.5 mm@	228. ²⁰	217. ⁷⁰	211. ⁹⁰	208. ⁶⁰	208. ¹⁰
9 mm@	232. ⁵⁰	222. ⁰⁰	216. ²⁰	212. ⁹⁰	212. ⁴⁰
16" Dia.					
8.5 mm@	364. ⁴⁰	352. ⁸⁰	346. ²⁰	342. ⁶⁰	342. ¹⁰
10 mm@	373. ⁰⁰	361. ⁴⁰	354. ⁸⁰	351. ²⁰	350. ⁷⁰
11.5 mm@	381. ⁶⁰	370. ⁰⁰	363. ⁴⁰	359. ⁸⁰	359. ³⁰

WATER LINE – Trench Excavation / restoration – Water Mains - City of Independence [EXCLUDES Pit excavations, pit backfill / restorations, etc. - - FULL LENGTH LINING SEGMENTS ONLY]

Trench Excavation / restoration - - IN PAVEMENT [excludes permits, traffic control, etc]. Includes pipe breaks, reconnections, pressure testing, chlorination, de-chlorination - - -

PRICE PER EACH --- \$ 18,000.-

Trench Excavation / restoration - - NON – PAVEMENT / IN R.O.W. [excludes permits, traffic control, etc]. Includes pipe breaks, reconnections, pressure testing, chlorination, de-chlorination - - -

PRICE PER EACH --- \$ 9,000.-

RE-ESTABLISH LINE SERVICES - INTERNAL METHODS - - -

PRICE PER EACH --- \$ 750.-

RE-ESTABLISH LINE SERVICES - EXTERNAL / EXCAVATED METHODS - - -

PRICE PER EACH --- \$ 7,500.-



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SPECIFICATIONS FOR CURED-IN-PLACE PIPE RECONSTRUCTION OF PRESSURIZED POTABLE WATER PIPING

1. INTENT

It is the intent of this specification to provide for the reconstruction of the designated pressure pipe by installation of a new cured-in-place-pipe (CIPP) within the existing (host) pipe. Due to the condition of the host pipe the new CIPP shall be designed as a fully structural pipe, not relying on the remaining strength of the host pipe to withstand long-term external loading and internal pressure.

As the piping system is intended for the conveyance of potable water, the proposed product shall be certified as complying with the requirements of ANSI/NSF Standard 61.

2. REFERENCED DOCUMENTS

This specification references ASTM F1216 and ASTM F1743 which is made a part hereof by such reference and shall be the latest edition and revision thereof. In case of conflicting requirements between this specification and the ASTM standards, this specification will govern.

3. PRODUCT, MANUFACTURER/INSTALLER QUALIFICATION REQUIREMENTS

3.1 All trenchless rehabilitation products and installers must be pre-approved prior to the formal opening of bids. No later than two weeks before the formal proposal due date, each proposer shall submit to the Owner the required prequalification submittals designated in Section 3.2. After the evaluation of the data, the Owner will notify those firms that have produced acceptable submittal packages that they are qualified to furnish proposals for this project. The Owner's decision shall be final.

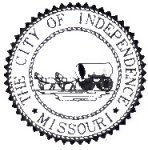
3.2 Two weeks prior to the bid, the following submittals to the Owner are required to meet that which is stated in Section 3.1 above:

3.2.1 To be Commercially Proven, an Installer must satisfy all insurance, financial, and bonding requirements of the Owner, and must have had at least 10 (ten) years active experience and a minimum of 25,000 linear feet of commercial installation of pressure rated CIPP products in pressure pipe applications. Acceptable documentation supporting the above must be submitted to the Owner.

3.2.2 The CIPP tube manufacturer shall operate under a quality management system which is third-party certified to ISO 9001:2000 or other internationally recognized organization standards. If the lining installer is not the CIPP tube manufacturer, the lining installer must be formally licensed by the CIPP tube manufacturer to install the product. Proof of ISO certification and licensing status, as applicable, shall be required for approval.

3.2.3 Design - Detailed design calculations for both the internal and external loading parameters specified in Section 5. Shall be submitted for review and approval. The CIPP shall be designed as per ASTM F1216, Appendix X1.3.2 for the Fully Deteriorated Pressure Pipe condition and shall follow the requirements specified in Section 5.

Attachment: 282-10 ROA3 CIPP PI - InstitutformTech - 1-2013 (CIPP on Ann Avenue)



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3.2.4 Temporary Water Systems – The Contractor shall submit a plan for providing temporary water service for the lining work. The plan shall describe size, material, and location of temporary mains to be laid. It shall also describe the source of water supply for each temporary main and the technique used to provide water service to each residence. The plan shall include documentation confirming that materials selected for temporary service complies with ANSI/NSF Standard 61.

4. MATERIALS

- 4.1 The CIPP tube product shall consist of one or more layers of absorbent woven and/or non-woven synthetic fiber, with or without glass fiber reinforcement, which is fabricated in the USA. The CIPP tube is then impregnated with an epoxy resin system that is compatible with the installation process being used.
- 4.2 The tube shall be fabricated to dimensions such that when installed will fit tightly to the internal circumference of the host pipe being lined, making allowance for stretching during installation.
- 4.3 In the installed state, the inside layer of the tube shall be coated with a translucent, flexible plastic material that acts to separate the curing heat medium from the thermoset resin system undergoing cure.
- 4.4 The tube shall have a uniform thickness that when compressed at installation pressures will meet or exceed the minimum required thickness specified in the design submittals (see Section 3.2.3).
- 4.5 Fabricate tube from materials which, when cured, will be chemically resistant to internal exposure to drinking water treated with common chemical additives.
- 4.6 The tube shall be homogeneous across the entire wall thickness containing no intermediate or encapsulated elastomeric layers. The tube shall contain reinforcement (glass, woven fiber, or equal) in order to withstand the internal pressure design requirements.
- 4.7 The wall color of the interior pipe surface of the CIPP after installation shall be a light reflective color so that a clear detail examination may be made of the final product.
- 4.8 Materials that are defective, damaged or otherwise deemed unacceptable for use prior to installation shall be rejected and replaced at Contractor's expense. Liner materials damaged during installation shall be repaired or replaced as recommended by the Contractor and approved by the Owner.

5. STRUCTURAL REQUIREMENTS

- 5.1 The CIPP shall be designed as per ASTM F1216, Appendix X1.3.2 for the Fully Deteriorated Pressure Pipe condition, and shall be provided as a prequalification submittal (see Section 3.2.3). These detailed calculations shall provide the input data as well as the actual calculation for Eqs X1.1, X1.3, X1.4 and X1.7 of Appendix X1. of ASTM F1216. The design submittal shall also clearly identify the physical properties used for design.
- 5.2 Other than what is allowed in ASTM F1216, the CIPP design shall assume no contribution from the original host pipe.

Attachment: 282-10 ROA3 CIPP PI - InstitutformTech - 1-2013 (CIPP on Ann Avenue)



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- 5.3 The design of the CIPP shall be based on the following parameters:

Diameter	8, 12 & 16 inch
Internal Design Pressure	150 psi
Internal Vacuum, if applicable	N/A
Soil Depth (above invert)	Six Feet
Ground Water Depth (above invert)	Varies in depth
Type of Live Load	Arterial Traffic
Modulus of Soil Reaction	Varies per site
Soil Density	Varies per site

- 5.4 The physical properties used in the design submittal (see Section 3.2.3) shall be clearly identified. At a minimum, the CIPP shall have the following physical properties:

PROPERTY	ASTM TEST METHOD	MINIMUM VALUE*
Initial Flexural Modulus of Elasticity	D790	300,000 psi
Initial Flexural Strength	D790	7,000 psi
Initial Tensile Strength	D638**	6,500 psi

*Values are for design conditions @ 75°F (25°C)

** For materials that do not allow sufficiently accurate hoop/weft testing per ASTM D638, initial tensile strength may also be substantiated by short-term burst testing results.

6. INSTALLATION

6.1 Project Planning

- 6.1.1 The Owner shall ensure access to the existing water mains. The Contractor shall provide adequate notice to the Owner prior to mobilization. The Owner will notify customers and local fire department following receipt of the Contractor's notice.
- 6.1.2 The Owner will operate all water main valves, curb stops, and fire hydrants. The Contractor will provide to the Owner a specific time and date when the individual water services will be transferred from the water main to the temporary bypass piping system.
- 6.1.3 Water necessary for cleaning, disinfection, and flushing will be available, at no cost, from locations (fire hydrants) indicated by the Owner prior to the start of Work. Water source provided shall be in close proximity to lines being worked on. The Contractor shall provide necessary piping or flexible hoses, fittings, and approved reduced pressure zone backflow prevention device for connection between fire hydrant and end of pipe section where water is required. The Owner shall provide a location at no cost to the Contractor (e.g., sanitary sewer, etc.) for proper disposal of water after use.

6.2 Bypassing

As required, water service shall be maintained thru the use of a temporary bypass system during the pipeline renovation process. The bypass mains shall be sized to meet customer demand but in no case less than 2 inch diameter. All service lines shall be a minimum of ¾" in diameter. The Contractor shall perform visual checks for leakage and repair as necessary. The temporary water system will be disinfected and tested before being placed into service.



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6.3 Access, Cleaning and Inspection

- 6.3.1 Prior to entering any permit required confined space the Contractor shall make an evaluation of the atmosphere to determine the presence of toxic or flammable vapors or lack of oxygen. This shall be undertaken in accordance with local, state, or federal safety regulations.
- 6.3.2 The Contractor shall identify the number and location of access points required. The Owner shall provide rights of access to the pipeline. The Contractor or Owner, as specified in the contract documents, shall provide the excavation, pipe work, reconnection and restoration for access points.
- 6.3.3 Immediately upon opening the host main at the access points and prior to installation of liner, the ends of the adjacent existing water main that are not to be lined at the insertion/extraction points shall be covered/plugged by the Contractor so that no debris shall enter into them during reconstruction work.
- 6.3.4 The Contractor shall remove all internal debris out of the pipeline that will interfere with the installation. Pipes shall be cleaned by the Contractor, as needed, with high-velocity jet cleaners, mechanically powered equipment, cable-attached devices or fluid-propelled devices (e.g., pipe pigs). If required the Owner shall provide a dump site for all debris removed from the pipe during the cleaning operation. Unless specified otherwise, this site shall be at or near the project site. Any hazardous waste material encountered during this project shall be considered as a changed condition.
- 6.3.5 Verification of readiness to install liner shall be performed by experienced personnel trained in locating services, breaks, obstacles, etc. This may include pipe mandrels or other devices up to and including closed-circuit television or man entry. The interior of the pipeline shall be carefully inspected to determine the location of any conditions that may prevent proper installation of the impregnated tube. A video tape or suitable log shall be kept for reference. It will be the Owner's responsibility to remove any unforeseen obstructions that may prevent liner installation. Owner may direct Contractor to remove these obstructions and reimburse under the terms of the contract.
- 6.3.6 Any external water leaking back into the existing pipeline shall be kept to a minimum so as not to interfere with the proper installation and cure of the CIPP liner
- 6.3.7 The Contractor shall field verify the length of water main sections to be cleaned and lined.
- 6.3.8 The Contractor shall isolate or remove any air release valves from water main section prior to liner installation.
- 6.3.9 The Contractor shall flush the host pipe with clean water to remove any loose debris from the pipe surface. Where ever practical remove all standing water from the inside surfaces of the cleaned water main by passing a sufficient number of oversized foam swabs through the main or us a progressive expansion method to remove standing water.
- 6.3.10 The Contractor shall remove and dispose of any waste or debris generated by the cleaning operation to a site furnished by the Owner.

6.4 Television Inspection

When required the Contractor shall perform closed circuit television inspection of existing water mains at two intervals: prior to water main lining and upon completion of the lining process. The Contractor shall provide the Owner with a complete set of all DVD's. The picture quality and definition shall be acceptable for viewing and the DVD's shall be compatible with standard DVD equipment. Information on the DVD shall identify the water main section, direction of taping, and the date of inspection. Where applicable, the DVDs shall include voice description of the location of any identified defects.



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6.5 Resin Impregnation

- 6.5.1 The tube shall be impregnated (wet out) with resin under controlled conditions. The quantity of resin used for tube impregnation shall be sufficient to fill the volume of air voids in the tube with additional allowances for polymerization shrinkage and loss of resin through cracks and irregularities in the original pipe wall.
- 6.5.2 The Contractor shall allow the Owner to inspect the materials and procedures used to impregnate the tube.

6.6 Installation

- 6.6.1 The wet out tube shall be inserted through an approved access point by means of a pull-in place method or a direct inversion process, or a combination of the two. The head used to extend the liner tube though the length of pipe being rehabilitated shall be sufficient enough to fully extend the tube both circumferentially and longitudinally.
- 6.6.2 Before the installation begins, the Contractor shall determine the minimum pressure required to hold the tube tight against the existing pipeline, and the maximum allowable pressure so as not to damage the tube. In order to ensure a proper fit of the CIPP tube to the host pipe, the pressure shall be maintained between the minimum and maximum pressures until the installation has been completed.
- 6.6.3 The use of a lubricant during the installation process may be needed to reduce friction. The lubricant used shall be a nontoxic, FDA or NSF certified product.

6.7 Curing

- 6.7.1 After installation is completed, a suitable heat source and related equipment shall be used to circulate heated water or injected steam throughout the pipeline. The equipment shall be capable of delivering hot water or steam throughout the pipeline to uniformly raise the temperature above the temperature required to affect a cure of the resin. Water or steam temperature in the line during the cure period shall be as determined by the Contractor.
- 6.7.2 The heat source shall be fitted with suitable monitors to gauge the temperature of the hot water or steam supply. To determine the temperatures during the cure cycle, a gauge shall be placed at the beginning and termination points of the section being lined. The temperature sensing device shall be placed between the impregnated tube and the invert of the existing pipe.
- 6.7.3 Initial cure will occur during temperature heat-up and is completed when exposed portions of the new pipe appear to be hard and sound and the remote temperature sensor indicates that the temperature is of a magnitude to realize an exotherm or cure in the resin. After initial cure is reached, the temperature shall be held at the post-cure temperature for a period as determined by the Contractor. The curing process shall take into account the existing pipe material, the resin system, and ground conditions (temperature, moisture level, and thermal conductivity of soil).

6.8 Cool-Down

Cool-down shall be accomplished by the introduction of cool water to replace water being drained from the system or by the introduction of air to replace the steam used in a steam cure. Care shall be taken in the release of the internal head so that a vacuum will not be developed which could damage the newly installed CIPP.

7. INSPECTION AND TESTING

- 7.1 After liner has been cooled down and before opening the service laterals, a preliminary television inspection of the newly installed liner may be performed to determine that the liner is properly installed.



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- 7.2 The finished lining shall be continuous over the entire length and be free from visual defects such as foreign inclusions, dry spots, lifts, pinholes and delaminations. The lining shall be impervious and free of any leakage from the pipe to the surrounding ground or from the ground to the inside of the lined pipe.
8. PRESSURE TESTING FOR WATER-TIGHTNESS
- 8.1 Pressure testing for water-tightness shall be provided on all CIPP sections identified by the Owner in the contract documents or purchase order, and shall be completed after inspection but before the reinstatement of service connections.
- 8.2. Perform hydrostatic pressure test on the lined water main, following the guidelines of ASTM F1216, Section 8.3. The test section shall be subjected to a hydrostatic pressure of no more than 1-1/2 times the operating pressure of the rehabilitated line segment.
- 8.3. As noted in ASTM F1216, the allowable leakage during the pressure test shall be 20 U.S. gallons per inch of internal pipe diameter per mile of pipe per day (GIDMD), providing that all the air has been evacuated from the line prior to testing and the structural pipe lining system has cooled down to ambient temperature.
- 8.4 After the one hour test, the quantified make up water shall be extrapolated to the 24-hour rate for comparison purposes. Any visible leakage at termination points shall be eliminated. If not feasible or possible at the time of the test, the termination point leakage shall be kept to a minimum, collected and then deducted from the actual make up water rate. If the loss at test pressure exceeds the allowable, the Contractor shall endeavor to identify the source of the loss and minimize it in a manner acceptable to the Owner. Trapped air can significantly affect internal pressure and may require extensive continued testing until stabilization occurs. The pressure test for water tightness shall be deemed acceptable if that actually measured during the one-hour test (which has been extrapolated to a 24-hour day rate) is equal to or less than the allowable make up water rate of 20 GIDMD.
9. SERVICE CONNECTIONS
- 9.1 Prior to installation of the liner, the Contractor shall locate all existing service connection and plug or prepare the corporation valve connections as recommended by the manufacturer. All plugs shall be sized for the respective water taps. The service plugs used in this process shall be able to withstand the temperatures expected during the cure of up the CIPP.
- 9.2 After the lining is complete, reconnect existing services from the interior of the water main using a television camera directed robotic cutting device that removes a small, circular section of the liner to expose the corporation valve opening. A water-tight seal is provided by direct resin-to-host pipe adhesion.
- 9.3 Reconnections shall be free of burrs, frayed edges, and other restrictions preventing free water flow, and shall be opened to the size of their original diameter and to a depth required to completely open the water service connection to the residence served.
10. WATER MAIN RECONNECTION AND CLEAN-UP
- 10.1 After project completion, the Owner or Contractor, as specified by contract documents, shall return the piping system to service by closure of all access pits with appropriate pipe spools, valves, and other relevant pipe fittings
- 10.2 Upon acceptance of the installation, the Contractor or Owner, as specified by contract documents, shall reinstate, the project area affected by the operations.



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**Table H (EXCLUDES Pit excavations, pit backfill/restorations, etc.
FULL-LENGTH CATHODIC PROTECTION SEGMENTS ONLY)**

(Pricing to be per linear foot)	1 to 1000 ft.	1001 to ½ mile	½ mile to 1 mile	1 mile to 3 miles	3 miles to 5 miles
Mobilization – per Line Segment Project – per each	11,700.-	4,800.-	5,200.-	6,750.-	8,300.-
STEEL WATER MAIN - CATHODIC PROTECTION	9.92	8.90	4.53	4.50	2.50
STEEL SEWER MAIN / FORCE MAIN - CATHODIC PROTECTION	9.92	8.90	4.53	4.50	2.50

TASK LIST FOR EXTERNAL CORROSION ASSESSMENT OF STEEL WATER MAIN & STEEL SEWER MAIN/FORCE MAIN

Task 1 - Document Review & Project Management

This task consists of all the preparatory work proceeding the detailed testing in the field. The specific elements of Task 1 are as follows:

- The pipeline construction drawings will be reviewed at our office location. The purpose of the review will be to determine air release and blow off valve locations, foreign pipeline crossing locations and other possible locations to conduct field testing.
- The Principal Engineer will define the project requirements and meet with the Senior Corrosion Specialist to develop the field test work plan.
- Also under this task, the Technician will assemble all of the test equipment and confirm proper calibration and operation of all instrumentation.

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Task 2 – Field Survey

The Senior Corrosion Specialist and Technician will perform the field tests. We request the right of ingress and egress to the proposed pipeline rights-of-way during all daylight hours during the time of the fieldwork. The work schedule will be as mutually agreed. Field survey work will include the following:

- If soil resistivity data is not available from a previous survey, soil resistivity measurements will be recorded in accordance with ASTM G57-95. Measurements will be performed from grade to depths of five, ten and fifteen feet. Measurements will be obtained at the air release and blow off valve locations.
- Testing for pipeline continuity will be conducted at selected locations. Pipe-to-soil potential measurements will be obtained at a point between blow off or air release valve locations with the negative connection to the pipeline established at two locations.
- Pipeline alignment will be surveyed with respect to crossings of foreign pipelines and paralleling utility systems. Testing will be conducted at the foreign pipeline locations to determine possible effects on the waterline caused by foreign pipeline cathodic protection systems.
- Pipeline alignment will be surveyed for possible induced AC interference. AC pipe-to-soil potential measurements will be obtained at blow off and air release valve locations.
- Sites for the possible installation of sacrificial anodes will be noted.

Task 3 – Data Analysis and Report Preparation

All data will be processed and analyzed. Included under this task are all of the following:

- Soil resistivity test data will be evaluated including the use of Barnes Layer techniques for determining resistivities of the soil layer where the pipe is installed.
- AC and DC interference test data will be tabulated and analyzed
- All data will be compiled and an overall analysis of the conditions for galvanic and electrolytic corrosion at the blow off and air release valve locations will be performed.

Following the analysis of the data and the test results, corrosion protection and AC/DC interference mitigation requirements, if any will be defined for the AWWA C303 bar-wrapped concrete cylinder pipe. Specific deliverables will include recommendations for:

- Cathodic Protection
- Stray Current Interference Mitigation at Foreign Pipeline Crossings
- AC Interference Mitigation



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SCOPE OF SERVICES AND SPECIFICATIONS CURED-IN-PLACE PIPE

DIVISION I - GENERAL REQUIREMENTS

SECTION 1000 - SUMMARY OF THE WORK

SECTION 1100 - PROGRESS AND PAYMENT

SECTION 1200 - PROJECT MEETINGS

SECTION 1300 - SUBMITTALS AND SUBSTITUTIONS

SECTION 1310 - PROJECT SURFACE VIDEO TAPE RECORDING

SECTION 1400 - PROJECT INTERNAL VIDEO TAPE RECORDING

SECTION 1500 - PROJECT CLOSEOUT

DIVISION II - SITE WORK

SECTION 2000 - CURED-IN-PLACE PIPE

SECTION 2005 - CIPP SERVICE LATERAL RECONSTRUCTION

SECTION 2100 - MANHOLE SEALING

SECTION 2150 SEWER CLEANING AND TELEVISION INSPECTION

SECTION 2200 - RESTORATION

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DIVISION I - GENERAL REQUIREMENTS SECTION 1000 - SUMMARY OF WORK

1.1 CONTRACT SPECIFICATIONS:

The detailed specifications, which follow and which shall govern the materials furnished and work performed in the construction of the work covered by this contract, are divided, classified, designated, and arranged as follows:

DIVISION I - GENERAL REQUIREMENTS DIVISION II - SITE WORK

No attempt has been made in the foregoing designated specifications to segregate work to be performed by any trade, subcontract, or bid item, under any one section of the specifications. Any segregation between trade or craft jurisdiction limits, and the establishment of subcontract limits, will be solely a matter of agreement between the Contractor and his employees and his Subcontractors. The specifications will govern the construction of the entire work, and the provisions thereof shall govern each item and unit of work to which such provisions apply.

1.2 APPLICABLE CODES AND STANDARDS:

- A. Reference to standard specifications of any technical society, organization, or association or to codes of local or state authorities shall mean the latest standard, code, specification or tentative specification adopted and published at the date of taking Bids, unless specifically stated otherwise.
- B. Applicable codes and standards referred to in these specifications shall establish minimum requirements for equipment, materials, and construction, and shall be superseded by more stringent requirements of drawings and specifications when and where they occur.
- C. Any conflicts between drawings and specifications and applicable codes and standards shall be referred to the Owner for a decision thereon.

END OF SECTION 1000

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SECTION 1100 - PROGRESS AND PAYMENT

1.1 CONSTRUCTION PROCEDURE:

Contractor shall follow established policies of the industry to give quality of construction in accordance with the contract requirements and best modern practice.

1.2 CONSTRUCTION SCHEDULE:

A. General:

Before work is started, the Contractor shall prepare a detailed schedule of all construction operations that shall indicate the sequence of the work and also the time of starting and completing each part. The schedule shall be submitted to the Owner for approval.

B. Working Hours, Sunday, Holiday, And Night Work:

No work shall be done between 5:00 p.m. and 7:30 a.m., nor on Saturdays, Sundays or legal holidays without the written approval of the Owner. Night work may be established by the Contractor as a regular procedure with the written permission of the Owner; such permission, however, may be revoked at any time by the Owner if the Contractor fails to maintain adequate equipment and supervision for the proper prosecution and control of the work at night.

C. Work Schedule:

1. Prepare a detailed weekly work schedule and submit the schedule to the Owner on the Thursday before the schedule is to take effect.
2. Contractor shall update the weekly work schedule on a daily basis so as to advise the Owner where and on what the Contractor will be working.
3. Work schedule shall include, but not be limited to, a listing of repair numbers that will be worked on a daily basis.

1.3 DIMENSIONS AND ELEVATIONS:

Contractor shall verify in the field all work order dimensions and elevations which are required.

1.4 LOSSES FROM NATURAL CAUSES:

All loss or damage arising out of the nature of the work to be done, or from the action of the elements, or from floods or overflows, or from ground water, or from unusual obstructions or difficulties, or any other natural or existing circumstances either known or unforeseen, which may be encountered in the prosecution of the said work shall be sustained and borne by the Contractor at his own cost and expense.

1.5 UNFAVORABLE CONSTRUCTION CONDITIONS:

During unfavorable weather, or other unfavorable conditions for construction operations, the Contractor shall pursue only such portions of the work as will not create damage to the homeowner's property. No portions of the work, the satisfactory quality or efficiency of which will be affected by any unfavorable conditions, shall be constructed while these conditions exist, unless by special means or precautions approved by the Owner's Representative, the Contractor shall be able to perform the work in a proper and satisfactory manner.



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1.6 PROTECTION AND MAINTENANCE OF PUBLIC AND PRIVATE PROPERTY:

- A. The Contractor shall be held responsible for all damage to roads, highways, shoulders, ditches, bridges, culverts, and other property, caused by him or his subcontractors in transporting materials to or from the site of work, regardless of the location of such damage, and shall pay for or replace such damaged property to the satisfaction of the Owner of such property.
- B. The Contractor will exercise care to prevent damage to existing trees, grass, foliage, roadways, highways, ditches, shoulders, structures, and underground utilities adjacent to construction. Any damage resulting from Contractor's operations or operations of subcontractors shall be restored or replaced at the Contractor's expense.

1.7 CLEARING AND CLEANING UP:

The Contractor shall not allow the site of the work to become littered with trash and waste material but shall maintain same in a neat and orderly condition during the process of the work to completion.

1.8 CONTROL OF CONSTRUCTION SITE

A. Traffic Control

- 1. The Contractor shall notify the Owner at least three work days in advance of starting any construction work which might inconvenience or endanger traffic, and submit to the Owner, a detailed traffic control plan approved by the jurisdictional agency. The Contractor shall at all times conduct the work in such a manner as to insure least obstruction to vehicular and pedestrian traffic while paying particular attention to avoid inconvenience in hospital and school zones. The convenience of the general public and of residents along the roadway shall be provided for in an adequate and satisfactory manner.

B. Equipment Operation

- 1. Where the Contractor's equipment is operated on any portion of a traveled surface or structures used by traffic on or adjacent to the section under construction, the Contractor shall clean the traveled surface of all dirt and debris at the end of each day's operations. The cost of this work shall be included in the unit price Bid and no additional compensation will be allowed.
- 2. All equipment used in the performance of the work shall comply with legal loading limits established by the statutes of State or local regulations when moved over or operated on any traveled surface or structure unless permission in writing has been issued by the Owner. Before using any equipment which may exceed the legal loading, the Contractor shall secure a permit, allowing ample time for an analysis of stresses to determine whether or not the proposed loading is within safe limits. The Owner will not be responsible for any delay in construction operations or for any costs incurred by the Contractor as a result of compliance with the above requirements.

C. Water

- 1. Contractor shall supply water to be used for cleaning, inversion, and other work items requiring water.
- 2. Contractor shall use utility approved water meters and backflow preventers.

D. Pumping and Bypassing

- 1. Where flow control is required to perform a specified repair or replacement operation, plugging or blocking shall be used wherever possible. Where plugging is used for flow control, the Contractor shall monitor upstream manholes for excessive surcharge conditions.



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2. Where plugging is not feasible pumping shall be used for flow control. It may be necessary to divert all or a portion of the wastewater flow to a downstream manhole. No bypassed wastewater from the sanitary sewer shall be allowed to discharge to natural or manmade surface drainage. Defective bypass hose shall be replaced when leaks are noted.

E. Work Site Communications

1. Contractor shall provide adequate on-site communications between Owner and Contractor's Superintendent.

F. Accident Reporting

1. Notification. All accidents occurring on the job which damage public or private property, or result in injury to workers or other persons, shall also be promptly reported to the Owner.
2. Utilities. Accidents involving utilities shall also be reported to the appropriate utility. This applies to all accidents, including, but not limited to, traffic accidents, broken pipe lines, power and telephone facilities and damage to adjacent properties.

1.9 MEASUREMENT AND PAYMENT:

- A. Payment shall be to the Contractor for work completed in accordance with the Agreement terms.
- B. The construction cost of all work included in this contract, as defined in these Detailed Specifications, shall be included in the Contractor's unit prices set forth in the Bid. The unit price for each of the several items in the bid shall include its prorated share of overhead so that the sum of the products obtained by multiplying the unit prices so set forth by the amount of work as actually constructed shall constitute full payment to the Contractor for performance of the work included in this section of the specifications.
- C. The Contractor shall accept the compensation, as provided in the Contract, in full payment for furnishing all materials, labor, tools and equipment necessary to the completed work and for performing all work contemplated and embraced under the Contract.
- D. Quantities used for progress estimates shall be considered only as approximate and provisional, and shall be subject to recalculation, adjustment and correction by the Owner in current and subsequent progress estimates and in final estimates. Inclusion of any quantities in progress estimates, or failure to disapprove the work at the time of progress estimates, shall not be construed as acceptance of such work or materials.
- E. Measurement and payment for each work item shall be in accordance with the following:

ITEM A 1) CIPP: The unit costs set forth in the Contractor's bid for CIPP shall be used as compensation for each repair identified by the Owner. The Bid price shall include all labor, materials, equipment, mobilization and setup and all incidentals necessary to complete the work, including internal camera inspection before and after repair; surface video inspection; line cleaning prior to liner installation; bypass pumping, liner installation; service reinstatement; fences removed and replaced; traffic control; site restoration; and other incidental construction.

2) Manhole Sealing: The unit Bid price shall include all labor, material, equipment, mobilization and setup, and all incidentals necessary to complete the work.

3) Cleaning and Televising: The unit Bid price shall include labor, material, equipment, mobilization and setup, supervision, disposal of debris, and all materials necessary to complete the work.



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4) Open Cut Point Repairs: If required prior to trenchless installation of liner pipe due to blockage or collapsed host pipe, shall be negotiated by the Owner and successful Proposer.

If directed by the Owner to complete the necessary open-cut point repair(s), the successful Proposer shall attempt to obtain three (3) written quotes from qualified subcontractors to complete the work. The Owner shall provide the information necessary for the successful Proposer to obtain the quotes from subcontractors. The quotes shall be submitted to the Owner for approval of the subcontractor prior to beginning work. The repair shall be made in accordance with the Owner's standard specifications.

END OF SECTION 1100

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DIVISION I - GENERAL REQUIREMENTS SECTION 1200 - PROJECT MEETINGS

PART I - GENERAL

1.1 DESCRIPTION:

- A. Work included: To enable orderly review during progress of the Work, and to provide for systematic discussion of problems, the Owner will conduct project meetings throughout the construction period.
- B. Related work described elsewhere: The Contractor's relations with his subcontractors and materials suppliers and discussions relative thereto, are the Contractor's responsibility and are not part of project meetings content.

1.2 QUALITY ASSURANCE: Persons designated by the Contractor to attend and participate in the project meetings shall have all required authority to commit the Contractor to solutions agreed upon in the project meetings.

1.3 SUBMITTALS:

- A. Agenda items: To the maximum extent practicable, advise the Owner at least 24 hours in advance of project meetings regarding all items to be added to the agenda.
- B. Minutes: The Owner will compile minutes of each project meeting and will furnish one copy to the Contractor. The Contractor shall furnish copy of minutes to the other parties not in attendance at the meeting if necessary.

PART 2 - EXECUTION

2.1 MEETING SCHEDULE: Except as noted below for Preconstruction Meeting, project meetings as needed. Coordinate as necessary to establish mutually acceptable schedule for meetings.

2.2 MEETING LOCATIONS: The Preconstruction Meeting and progress meetings will be held at a location determined by Owner. The date and time will be announced through invitations emailed to all of the interested parties.

2.3 PRECONSTRUCTION MEETING:

- A. Preconstruction meeting will be scheduled prior to each Notice to Proceed. Provide attendance by authorized representatives of the Contractor and all major subcontractors. The Owner will advise the interrelated parties and request their attendance.
- B. Minimum agenda: Distribute data on, and discuss:
 1. Questions, comments, locations and notifications regarding utilities affected by the project.
 2. Concerns of the cities affected by the project, including permits, traffic control, notification of emergency/police/fire, and night work.
 3. Contractual issues including contract time, sales tax exemption and notice to proceed date.
 4. Preconstruction issues including notification of property owners, project video, construction schedule and schedule of values.
 5. Processing of submittals and other data submitted to the Owner for review.
 6. Payment estimates.



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7. Project representatives from the Owner and Contractor.
8. Cleanup, seeding and sodding requirements.

2.4 PROJECT MEETINGS:

- A. Attendance: To the maximum extent practicable, assign the same person or persons to represent the Contractor at project meetings throughout progress of the Work. Subcontractors, materials suppliers, and others may be invited to attend those project meetings in which their aspects of the Work are involved.
- B. Minimum agenda:
 1. Review, revise as necessary, and approve minutes of previous meeting.
 2. Review progress of the Work since last meeting, including status of submittals for approval.
 3. Identify problems which impede planned progress.
 4. Develop corrective measures and procedures to regain planned schedule.
 5. Review payment estimates.
 6. Complete other current business.

END OF SECTION 1200

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DIVISION I - GENERAL REQUIREMENTS SECTION 1310 - PROJECT SURFACE VIDEO RECORDING

PART 1 - GENERAL

1.1 DESCRIPTION:

- A. Work Included: Creating of high quality project video recording of surface conditions prior to the beginning of construction.

1.2 QUALITY ASSURANCE:

- A. The project videoing shall be performed by a qualified commercial or individual company who is familiar with video equipment.

PART 2 - EXECUTION

2.1 PROJECT VIDEO RECORDING: A high quality project video recording of existing surface conditions shall be created and updated by the Contractor prior to beginning construction and at critical times during the construction process. The following location information shall be provided on color audio-video recordings:

- A. Audio: Each recording shall begin with a verbal description of the current date, project name and municipality and be followed by the general location, i.e. name of the street, viewing side and direction of progress.
- B. Video: Transparent information must appear on the viewing screen. This information will consist of the date and time of recording. The date information will contain the month, day and year.
- C. Digital: To preclude the possibility of tampering or editing in any manner, all video recordings must, by electronic means, display continuously and simultaneously generated transparent digital information to include the date and time of recording. The date information will contain the month, day and year.
- D. The recorded coverage shall include all surface features located within the zone of influence of construction supported by appropriate audio description. Audio description shall be made simultaneously with video coverage. Such coverage's shall include, but not be limited to, all existing driveways, sidewalks, fences, curbs, ditches, roadways, landscaping, trees, culverts, headwalls, retaining walls, or buildings located within such zones of influence. Particular and detailed attention shall be given to any defects noted, such as cracks, disturbed areas, damaged items, or as may be required by the Owner. It is the intent of this coverage to accurately and clearly document pre-existing, post-construction or construction conditions and especially any items that could result in construction claims. The excavation areas shall be physically marked with high visibility fluorescent paint prior to video recordings.
- E. The zone of influence shall be defined as an area within the temporary construction easement as indicated on the plans or within 35 feet of the proposed work, and an additional 20 feet of supplemental coverage shall be provided in residential areas.
- F. The Contractor shall obtain permission from the property owner prior to entering private property for the purpose of video recording.
- G. To produce the proper detail and perspective, adequate lighting will be required to fill in the shadow area caused by trees, utility poles, road signs and other such objects in residential areas or as directed by the Owner.
- H. Houses and buildings shall be identified visually by house number, when visible, in such a manner that structures of the proposed system, i.e. manholes on a sewer system, can be located by reference.



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- I. The rate of speed in the general direction of travel of the conveyance used during taping shall not exceed 48 feet per minute in residential areas, nor exceed 100 feet per minute in non-residential areas. Panning rates and zoom-in and zoom-out rates shall be controlled sufficiently such that during playback picture shall be in focus and shall maintain clarity at all times.
- J. All recording shall be done during times of good visibility. No recording shall be done during periods of visible precipitation, or when more than 10% of the ground area is covered with snow, unless otherwise authorized by the Owner.
- K. The Owner shall have the authority to designate what areas may be omitted or added for audio-video coverage.
- L. All recordings (media and cases) shall be properly identified by media number, location, project name and municipality in a manner acceptable to the Owner.
- M. A record of the contents of each recording shall be supplied by a run sheet identifying each segment in the recording by location, i.e., roll number, street or road viewing, recording counter number, viewing slide, point starting from, traveling direction and ending destination point.
- N. Conventional wheeled vehicles cannot be used.
- O. All recordings shall be DVD format.
- P. Video output from camera(s) used must be capable of producing NTSC-525 lines/60 fields. Resolution shall have a minimum 260 TV lines at center, for optimum color imagery and minimum lag through ten (10) foot candles, with Geometric Distortion not to exceed 1.5% of picture height at any point in picture area.
- Q. Any portion of the video recording not conforming to specifications shall be rejected.
- R. If the recording is performed by a sub-Contractor, a project representative of the Contractor shall be present during the recording unless otherwise approved by owner. All recording shall be reviewed by the Contractor for quality and completeness prior to submittal to the Owner.
- S. Any recorded coverage not acceptable to the Owner shall be re-recorded at no additional charge. The Contractor shall reschedule unacceptable coverage five (5) days after being notified.
- T. One original and one copy are to be provided. Original to Owner, one copy to the Contractor.
- U. Compensation for record videos shall be subsidiary to other contract items.

END OF SECTION 1310

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DIVISION I - GENERAL REQUIREMENTS SECTION 1400 - PROJECT INTERNAL TELEVISION INSPECTION

PART 1 - GENERAL

1.1 DESCRIPTION:

- A. Work Included: Work under this item shall consist of closed circuit televising and concurrent video recording of the existing sewer line segments included in the purchase order. Contractor will provide the Owner with a high quality internal color video recording showing both the before-lined and after-lined conditions, including the restored connections. Video format to be DVD.

1.2 QUALITY ASSURANCE:

- A. The project internal video shall be performed by a qualified commercial or individual company who is familiar with television inspection equipment.

PART 2 - EXECUTION

- 2.1 **PROJECT VIDEO RECORDING:** A high quality project video recording of existing internal conditions shall be created and updated by the Contractor prior to beginning construction and after construction is complete. The following location information shall be provided on color audio-video tape recordings:

- A. Audio: Each recording shall begin with a verbal description of the current date, project name and municipality and be followed by the site number, general location, i.e. project street address, upstream and downstream manhole and direction of progress. Audio should also include location of all pipe defects and conditions, and service connections with addresses.
- B. Video: Transparent information must appear on the viewing screen at all times. This information shall contain the site number, upstream manhole number, downstream manhole number, month, day, year, and continuous footage. All pipe conditions, service connections with addresses shall be noted at the appropriate locations.
- C. All video, including cases, shall be properly identified by recording number, location, project name and municipality in a manner acceptable to the Owner (currently DVD).
- D. Any portion of the video recording not conforming to specifications shall be rejected.
- E. Allowable Flow Depth: When depth of flow in the upstream manhole of the line segment being inspected is above the maximum allowable level for television inspection, the flow shall be reduced. The depth of flow shall not exceed the levels shown below for the respective pipe sizes, as measured in the manhole at the time of inspection:

Pipe Dia. (inches)	Max Flow Depth (% of Dia.)
≤ 10	20
12 - 24	25
≥ 27	30

2.2 TELEVISION INSPECTION EQUIPMENT:

- A. Camera: A pan and tilt camera shall be used on Pre- and Post-televising of all line segments. The camera shall be used to pan and view service connections before and after segment has been lined. Camera speed shall not exceed 30 feet per minute.
- B. Lighting: Lighting for the camera shall be suitable to allow a clear picture of the entire periphery of the pipe. The camera shall be operative in 100% humidity conditions. The camera and other components of the video system shall produce a color picture quality to the reasonable satisfaction of the Owner; and if unsatisfactory, the equipment shall be replaced with equipment producing satisfactory quality.



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- 2.3 INSPECTION LOG:** A television inspection log, approved by the Owner, shall be kept by the Contractor to document all defects and service connections found during television inspection. This log sheet will identify the project street address, site number, upstream and downstream manhole numbers, date, time, location of defects and conditions, service connections with addresses, and any other relevant data. These log sheets will be presented along with the video to the Owner prior to the inversion of liner.
- 2.4 QUALITY:** Any video recording not acceptable to the Owner shall be refilmed (start to finish) at no additional charge. The Contractor shall reschedule unacceptable coverage five (5) days after being notified.
- 2.5 QUANTITY:** One original and one copy of the tape log sheet are to be provided. Original to Owner and one copy to the Contractor.

END OF SECTION 1400

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DIVISION I - GENERAL REQUIREMENTS SECTION 1500 - PROJECT CLOSEOUT

PART 1 - GENERAL

1.1 DESCRIPTION:

- A. Final tests and inspections shall be conducted with the Contractor and Owner in accordance with the contract documents prior to final payment to determine compliance of the completed work with the contract requirements.

1.2 REQUIREMENTS:

- A. The Contractor shall submit pre and post video recordings with inspection logs to the Owner. All video recordings and logs shall be submitted in the order shown in the work order. Final payment will not be issued until pre and post tapes and logs are submitted and approved by Owner.
- B. CIPP samples shall be prepared and physical properties tested in accordance with ASTM F1216. The flexural properties must meet or exceed the values listed in Table 1 of the applicable ASTM standard. Wall thickness of samples shall be determined as described in Section 8 of ASTM F1216. The minimum wall thickness at any point shall not be less than the minimum design wall thickness as calculated in ASTM F1216. Visual inspection of the CIPP shall be in accordance with ASTM F1216, Section 8.6.
- C. Final restoration and clean-up shall be completed prior to project close-out.
- D. Final lien waivers from subcontractors and equipment suppliers shall be provided to the Owner.
- E. Conduct a substantial completion walk-through of all work conducted by the Contractor and a representative of the Owner.
- F. Following completion of the substantial completion punch list, the Contractor shall request in writing for final inspection. Final inspection shall be scheduled with the Contractor and Owner present.

PART 2 - EXECUTION

2.1 ACCEPTANCE:

- A. The Contractor shall file with the Owner, in duplicate, a certification of completion when all contract requirements are completed, simultaneously requesting final inspections and tests. Final inspections and tests will be conducted by the Owner, and the Contractor if he so desires. Date of such inspections and tests will be at a time convenient to all parties required to be present, and will be subject to the availability of other facilities necessary to its operation if such are required.
- B. Failure of the completed work furnished hereunder or any component thereof to pass inspections or tests shall be cause for initial rejection of the work or component. Final acceptance of the entire work will not be made until the rejected portions are corrected and re-inspected or re-tested. Total cost of re-test and inspections will be borne by the Contractor. Subsequent failures of the work or component to pass inspection and test may, at the Owner's option, result in final rejection, or in acceptance with assessment of damages for such failure.
- C. Following final tests and inspections, the Owner will notify the Contractor if the work is acceptable, in total or in part, in compliance with contract requirements.



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- D. Acceptance of the work furnished hereunder will be signified by Owner's payment of the Contractor's final estimate. Contractor's acceptance of payment of final estimate, or a payment offered as final payment, shall operate as a release to the Owner and every officer and agent thereof from all claims and liability to the Contractor for anything done or furnished, or relating to the work, or for any act or neglect of the Owner or of any person relating to or affecting the Contract.
- E. Performance Bond, Statutory Bond and Maintenance Bond, or any combination of these three, shall remain in full force and effect until final acceptance and throughout the guarantee period.

END OF SECTION 1500

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DIVISION II - SITE WORK SECTION 2000 - CURED-IN-PLACE PIPE

1.1 SCOPE:

This Section governs all work, materials and testing for installation of Cured-In-Place Pipe (CIPP). A flexible polyester felt liner, saturated with a thermosetting resin, shall be inverted into the existing pipeline utilizing hydrostatic head. Curing shall be accomplished by circulating hot water to cure the resin into a hard impermeable pipe. When cured, the hardened liner should extend from end to end of the section being lined in a continuous tight fitting watertight pipe-within-a-pipe.

1.2 GENERAL:

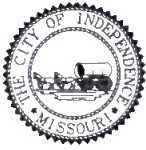
- A. Description: This specification references ASTM F-1216, which describes the requirements for the installation of cured-in-place pipe. Liner installation shall consist of furnishing all labor, materials and equipment for the complete installation of cured-in-place pipe in accordance with Contract Drawings, General Conditions and these specifications.
- B. Specification Modifications: It is understood that throughout this section these Specifications may be modified by appropriate items in the Modifications to Detailed Specifications or notes on the Contract Drawings.
- C. Revisions of Standards: When reference is made to a Standard Specification, i.e., ASTM, ANSI, AWWA, the Specification referred to shall be understood to mean the latest revision of said specification as amended at the time of the Notice to Proposers, except as noted on the Drawings or in the Modifications to Detailed Specifications.
- D. Submittals: The Contractor shall provide certifications, shop drawing or samples on all materials provided under these specifications.

1.3 MATERIAL REQUIREMENTS:

- A. General: This section governs materials that may be required to complete cured-in-place liner installation, as provided for in the Modifications to Detailed Specifications.
- B. Liner Length: The length of the liner shall be that deemed necessary by the Contractor to effectively carry out the inversion and seal the liner at the inlet and outlet points. Unless indicated otherwise on the drawings, the liner shall terminate at manholes and not within the pipe. The Contractor shall verify the lengths in the field before cutting the liner to length. Individual inversion runs can be made over one or more access points as determined in the field by the Contractor and approved by the Owner.
- C. Liner Material and Cured Lining: The lining material shall be a polyester fiber felt tubing, lined on one side with polyethylene and fully impregnated with a liquid thermosetting resin as specified. Minimum finished lining thickness shall be 6.0 mm (0.236 inches). The polyester felt tubing, including the polyethylene covered felt and thermosetting resin, shall meet the liner's manufacturer's standards. The cured lining material shall conform to the minimum structural standards as listed below.

Cured Liner	Standard	Results
Flexural Stress	ASTM D-790	4,000 psi
Modulus of Elasticity	ASTM D-790	400,000 psi

- D. Manufacturer: Refer to General Requirements section of RFP.
- E. Installer: Refer to General Requirements section of RFP.



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- F. **Inspection and Testing:** Inspection and testing shall be performed by the Manufacturer's quality control personnel in conformance with applicable standards. Testing may be witnessed by Owner, or approved independent testing laboratory. The Contractor shall provide three (3) copies of certified test reports indicating that material does conform to the specifications.
- G. **Handling:** The Manufacturer and Contractor shall use equipment and methods adequate to protect the pipe, joint elements and prevent shock contact of adjacent units during moving or storage. Damaged sections that cause reasonable doubt as to their structural strength or water-tightness will be rejected.
- H. **Requirements:** The liner tube shall meet the requirements of ASTM F-1216, Section 5.1
 - 1. The tubes shall have a uniform thickness that when compressed at installation pressures will equal the specified nominal tube thickness.
 - 2. The tube shall be fabricated to a size that when installed will tightly fit the internal circumference and length of the original pipe. Allowance shall be made for circumferential stretching during inversion.
 - 3. The outside layer of the tube (before inversion) shall be plastic coated with a translucent flexible material that clearly allows inspection of the resin impregnation (wet out) procedure. The plastic coating shall not be subject to delamination after curing of the cured-in-place pipe (CIPP).
 - 4. The tube shall be homogeneous across the entire wall thickness containing no intermediate or encapsulated elastomeric layers. No material shall be included in the tube that are subject to delamination in the cured CIPP. No dry or unsaturated layers shall be evident.
 - 5. The wall color of the interior pipe surface of the CIPP after installation shall be a light reflective color so that a clear detailed examination with closed circuit television inspection equipment can be made.
 - 6. The resin system shall meet the requirements of ASTM F-1216.
 - 7. The CIPP shall be designed as per ASTM F-1216, Appendix XI. The CIPP design shall assume no bonding to the original pipe wall. In no case shall CIPP be installed where the host pipe ovality is less than 80%, unless prior approval is given by the Owner.
 - 8. The layers of the cured CIPP shall be uniformly bonded. It shall not be possible to separate any two layers with a probe or point of a knife blade so that layers separate cleanly or the probe or knife blade moves freely between the layers; nor shall separation of the layer occur during testing performed under the requirements of this specification.
- I. **Warranty:** The manufacturer shall warranty the installed material for a period of 3 years from Owner's acceptance against any defects.

1.4 PRE-INSTALLATION:

- A. **Safety:** The Contractor shall carry out his operations in strict accordance with all OSHA and manufacturers' safety requirements. Particular attention is drawn to those safety requirements involving working with scaffolding and entering confined spaces.
- B. **Notice to Public:** The Contractor shall notify the affected public at least 7 days, but no more than 14 days prior to televising, cleaning, or prepping a line segment in which they may be affected. This notification, approved by Owner, should be in the form of door hangers and shall make the residents aware of the upcoming project and how it might affect them. This notice shall include a local telephone number of the Contractor. This notice should also inform them if it will be necessary to access their backyard, and should instruct the homeowner to put their toilet lids down to reduce cleanup if their stool overflows during line cleaning. Also, the Contractor shall notify the public 24 hours before the actual inversion will take place so that the public can be prepared for this temporary disruption of service as well as the possible odors



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(styrene, etc.) associated with the installation of the liner. The notifications shall be distributed to all homeowners affected by repair, as well as resident's one segment upstream and downstream of the repair location. The Contractor shall personally contact any home or business which cannot be reconnected within the time stated on the written notice.

- C. **Cleaning of Pipelines:** Prior to any lining of a pipe so designated, it shall be the responsibility of the Contractor to remove internal deposits from the pipeline using accepted sewer cleaning techniques. The Contractor shall remove all internal debris out of the sewer line that will interfere with the installation of CIPP. The Contractor shall be responsible for disposal of all debris removed from the sewers during the cleaning operation. The Contractor will also be responsible for cutting any protruding taps which inhibit the proper installation of the liner. If an open cut repair is required prior to installation of the liner due to a protruding tap, the Owner shall negotiate with the successful Proposer as to a reasonable cost for the repair.
- D. **Inspection of Pipelines:** Inspection of pipelines shall be performed by experienced personnel trained in locating breaks, obstacles and service connections by closed circuit television. The interior of the pipeline shall be carefully inspected to determine the location and extent of any structural failures. The location of any conditions which may prevent proper installation of lining materials into the pipelines shall be noted so that these conditions can be corrected. A video recording and suitable log shall be kept for later reference by the Owner.
- E. **Bypassing Flow:** The Contractor, when required, shall provide for the transfer of flow around the section or sections of pipe that are to be lined. The bypass shall be made by diversion of the flow at an existing upstream access point and pumping the flow into a downstream access point or adjacent system. The pump and bypass lines shall be of adequate capacity and size to handle the flow. All bypass lines shall be of appropriate quality and allow no leakage throughout the length of the bypass. Any defective bypass hose shall be replaced when leaks are noted. The proposed bypassing system shall be reviewed in advance by the Owner. The review by the Owner of the bypassing system shall in no way relieve the Contractor of his responsibility and/or public liability.
- F. **Line Obstructions:** It shall be the responsibility of the Contractor to clear the line of all obstructions that will prevent the proper installation of the liner. Obstructions which cannot be removed by conventional cleaning methods may require an open cut point repair prior to liner installation. Open cut point repairs, if required prior to trenchless installation of liner pipe due to blockage or collapsed host pipe, shall be negotiated by the Owner and successful Proposer.
- G. **Protective Measures:** In order to reduce homeowner complaints of burnt grass, the Contractor shall provide protective measures (e.g. felt, blocks of wood) to create a barrier between the boiler hoses and the grass for each inversion. In addition, all crews shall carry a supply of styrene suppresser to reduce the odor associated with the resin from the liner.

1.5 INSTALLATION

Installation shall be performed by the same crew who conducted the project internal television inspection and cleaning, unless otherwise approved by the Owner.

- A. **"Wet Out."** The Contractor shall designate a location where the uncured resin in the original containers and the unimpregnated liner will be serial vacuum impregnated prior to installation. The Contractor shall allow the Owner to inspect the materials and "wet out" procedure. A resin and catalyst system compatible with the requirement of this method shall be used. The quantity of resin used for the tube impregnation shall be sufficient to fill the volume of air voids in the tube with additional allowances for polymerization shrinkage and the loss of resin through cracks and irregularities in the original pipe wall. A serial vacuum impregnation process shall be used. A roller system shall be used to uniformly distribute the resin throughout the tube.



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- B. Inversion: The "wet out" liner shall be inserted through an existing manhole or other approved access by means of an inversion process and the application of a hydrostatic head or air pressure sufficient to fully extend the liner to the next designated access point. The impregnated liner materials shall be inserted into the inversion tube with the impermeable plastic membrane side out. At the lower end of the inversion tube, the liner tube shall be turned inside out and attached to the inversion tube so that a leak-proof seal is created. The inversion head / pressure will be adjusted to be sufficient to invert the liner to the next access point designated and to hold the liner snug to the pipe wall and to produce dimples at side connections and flared ends at the entrance and exit access points. The use of a lubricant is recommended and if used, such lubricant shall be as approved by the liner manufacturer's standards. The liner manufacturer's standards shall be closely followed during the elevated curing temperature so as not to overstress the felt fiber and cause damage or failure of the liner prior to curing
- C. Liner Curing: After inversion is completed, the Contractor shall supply a suitable heat source by utilizing hot water under hydrostatic pressure or steam pressure in accordance with the manufacturer's recommended cure schedule. The equipment shall be capable of delivering hot water or steam to the far end of the liner through a hose, which has been perforated per the liner manufacturer's recommendations, to uniformly raise the water / air temperature in the entire liner above the temperature required to effect a cure of the resin. This temperature shall be determined by the resin/catalyst system employed.

The heat source shall be fitted with suitable monitors to gauge the temperature of the incoming and outgoing heat exchanger circulating water / steam. Water / steam temperature in the line during the cure period shall not be less than 180 degrees F or more than 200. Degrees F as measured at the heat exchanger return line.

Initial cure shall be deemed to be completed when inspection of the exposed portions of the liner appear to be hard and sound. The cure period shall be of the duration recommended by the resin manufacturer, as modified for the inversion lining process, during which time the re-circulation of the water / steam and cycling of the heat exchanger to maintain the temperature in the liner continues.

- D. Cool-Down: The Contractor shall cool the hardened liner to a temperature below 100 degrees F before relieving the static head or air pressure in the inversion tube. Cool-down may be accomplished by the introduction of cool water or air into the inversion. Care shall be taken in the release of the static head or air pressure such that a vacuum will not be developed that could damage the newly installed liner.
- E. Finish: The finished lining shall be continuous over the entire length of an insertion run and be as free as commercially practicable from visual defects such as foreign inclusions, dry spots, pinholes and delamination. The lining shall be impervious and free of any leakage from the pipe to the surrounding ground or from the ground to the inside of the lined pipe.

Any defects which will affect the integrity or strength of the lining shall be repaired at the Contractor's expense, in a manner mutually agreed by the Owner and the Contractor.

1.6 POST-INSTALLATION

- A. Sealing Liner at Ends: If due to broken or misaligned pipe at the access point, the lining fails to make a tight seal, the Contractor shall apply a seal at that point. The seal shall be of a resin mixture compatible with the liner.
- B. Branch or Service Connections: After the liner has been cured, the Contractor shall reconnect the existing active service connections. This shall be done without excavation and in the case of non-man entry pipes, from the interior of the pipeline by means of a television camera and a cutting device that re-establishes them to not less than 90 percent capacity. The Contractor shall certify he has a minimum of 2 complete working cutter units plus spare key components on the site before each inversion. No additional payment will be made for excavations for the purpose of reopening connections and the Contractor will be responsible for all costs and liability associated with such excavation and restoration work. The Contractor



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shall be responsible for insuring the liner that has been cut out for service reconnection is removed and does not proceed down the line.

- C. **Liner Trimming:** After the liner has been cured, the liner should be trimmed entering and exiting the manhole, so that it is nearly flush with the manhole wall. Also, a V-notch should be cut in the crown of the liner in the downstream manhole, so as to reduce future wear on television cables or cleaning equipment. For each inversion of 2 or more line segments using a single liner, the liner should be cut flush with the trough at the intermediate manhole(s), so that there is no ponding on the bench of the manhole(s). If additional line segments enter these intermediate manhole(s), the liner should not obstruct the flow from these lines.
- D. **Liner Testing:** The water-tightness of the liner shall be gauged while the liner is curing and under a positive head or air pressure. After the work is completed, the Contractor will provide the Owner with a video recording showing both the before-lined and after-lined conditions, including the restored connections.
- E. **Restoration:** Upon completion of the installation work and after required testing indicates the lining is acceptable; the Contractor shall clean up the project area affected by the work. The Contractor shall restore the project site to conditions not less than those existing prior to his entry thereon, unless otherwise required by these specifications.
 - 1. The Contractor shall coordinate surface restoration work with the affected private property owners.
 - 2. Private property over which the Owner has prior rights (i.e., utility easement, sewer easement) and/or has obtained rights-of-way, licenses and/or agreements from the property owner to allow construction of a sanitary sewer pipeline and appurtenances, shall be restored in conformance with these Contract Documents.
 - 3. Public property shall be restored with strict adherence to the requirements of the public body having jurisdiction therein. The municipalities in which work will be performed will have varying requirements for materials and testing on restoration work. The Contractor will be responsible for coordinating with each City regarding their requirements. The municipality's requirement shall govern except that the materials and workmanship shall not be less than required by the plans and specifications

END OF SECTION 2000

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DIVISION II - SITE WORK SECTION 2100 - MANHOLE SEALING

1.1 INTENT

It is the intent of this specification to provide a system for manhole reconstruction that stops inflow, infiltration, exfiltration, restores structural integrity and provides protection against corrosion.

1.2 SCOPE

This specification shall govern all work, materials and equipment required for substrate rehabilitation for the purpose of eliminating infiltration, providing corrosion protection, repair of voids and restoration of the structural integrity of the manhole as a result of applying a monolithic fiber-reinforced structural/structurally enhanced cementitious liner to the wall and bench surfaces of brick, concrete or other masonry construction material. An epoxy liner, when specified by Owner, will be applied for corrosion protection.

Described are procedures for cleaning, preparation, application and testing. The applicator, approved and trained by the manufacturer, shall furnish all labor, equipment and materials for applying a cementitious mix to form a monolithic liner of a minimum of 1/2 inch thickness, with machinery designed for the application. All aspects of the installation shall be in accordance with the manufacturer's recommendation and per the following specifications, which include:

- A. The removal of any loose and unsound material.
- B. Cleaning of the area to be sprayed with high pressure water.
- C. The repair and filling of voids.
- D. The repair and sealing of inverts and benches.
- E. The elimination of active infiltration prior to making the application.
- F. The spray application of a cementitious mix to form a structural/structurally enhanced monolithic liner.

1.3 MATERIALS

A. Patching Material

A quick-setting, corrosion-resistant cementitious material shall be used as a patching material and is to be mixed and applied according to the manufacturer's recommendations and shall have the following minimum requirements:

- | | |
|-------------------------|------------------------------|
| 1. Compressive Strength | ASTM C-109, 1400 psi, 6 hrs. |
| 2. Bond | ASTM C-321, 145 psi, 28 days |
| 3. Cement | Sulfate Resistant |
| 4. Applied Density | 105 lbs. + 5 lbs.pcf |
| 5. Shrinkage | ASTM C-596, 0% at 90% R.H. |

B. Infiltration Control Material:

A rapid- setting, cementitious product, specifically formulated for leak control, shall be used to stop minor water infiltration and shall be mixed and applied according to the manufacturer's recommendations and shall have the following minimum requirements:

- | | |
|-------------------------|--|
| 1. Compressive Strength | ASTM C-109, 400-600 psi, 1 hr.
1800 - 2400 psi, 24 hrs. |
| 2. Expansion | ASTM C-827, 0.10% |
| 3. Sulfate Resistance | ASTM C-267, No Weight Loss |

After 15 cycles, 2000 ppm; test continuing

- | | |
|----------------------|-----------------------------------|
| 4. Freeze/Thaw | ASTM C-666, 100 cycles "Method A" |
| 5. Pull-Out Strength | ASTM C-234, 1,400 lbs. |
| 6. Placement Time | <1.0 Minute |



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C. Grouting Material:

A cementitious grout, shall be used for stopping very active infiltration and filling voids and shall be mixed and applied according to manufacturer's recommendations. The cementitious grout shall be volume stable and have a minimum 28-day compressive strength of 250 psi. Chemical grouts may be used for stopping very active infiltration and shall be mixed and applied, per manufacturer's recommendations.

D. Cementitious Liner Material:

1. A cementitious product shall be used to form a structural/structurally enhanced monolithic liner covering all interior substrate surfaces and shall have the following minimum requirements at 28 days:

a. Compressive Strength	ASTM C-109, >3000 psi
b. Tensile Strength	ASTM C-496, >300 psi
c. Flexural Strength	ASTM C-78, >600 psi
d. Shrinkage @ 90% R.H.	ASTM C-596, 0%
e. Bond	ASTM C-952, >130 psi
f. Density, when Applied	105 pcf + 5 pcf
2. The material shall be made with Type I or Type III Portland Cement and shall be used according to manufacturer's recommendations.
3. The material shall be factory-blended, requiring only the addition of water at the job site. The bag weight shall be 50-51 pounds. The cement content shall be 50%-60% of total bag weight. The content shall have a dry bulk density of 54-56 pounds per cubic foot and when mixed with the manufacturer's recommended amount of water shall have a wet density not to exceed 105 pcf +/- 5 pounds and shall yield a minimum of 0.63 cubic foot per bag.
4. The material shall be reinforced with alkaline resistant fiberglass rods not less than 1/2-inch in length, nor greater than 5/8 inches.
5. The material shall meet or exceed industry standards and shall not have any basic ingredient that exceeds the EPA maximum allowable limit for any heavy metal.

E. Water

Water used to mix the product shall be clean and potable. Questionable water shall be tested by a laboratory in accordance with ASTM C-94 procedures. Potable water need not be tested.

F. Other Materials

No other material shall be used with the mixes described in Sections A, B, C, and D without prior approval or recommendation of the material supplier.

G. History

The product must have a minimum of five (5) years' history of being used for reconstruction of sanitary sewer system manholes. The manufacturer must provide a list of at least thirty (30) projects completed during the past three (3) years.

H. Applicator Certification

The applicator must be factory-trained and provide a copy of a certificate acknowledging status as an approved applicator.

1.4 EQUIPMENT

- A. The applicator must use equipment designed and manufactured by the material supplier specifically for the application of cementitious liners in sanitary sewer system manholes.



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- B. The manufacturer must provide a list of at least twenty (20) customers using the equipment for application of a cementitious liner in sanitary sewer system manholes.

1.5 APPLICATION

A. Preparation

1. Place covers over invert to prevent extraneous material from entering sewer lines.
2. All foreign material shall be removed from the manhole wall and bench using a high pressure water spray (minimum 1,200 psi). Loose and protruding brick, mortar and concrete shall be removed using a mason's hammer and chisel and/or scraper. Fill any large voids with quick setting patching mix as specified in Section 4-3, A. At this time, if the existing steps in the manhole are deemed unsuitable, Owner will be the only authority empowered to grant approval to have the steps removed as part of the preparatory process.
3. Active leaks shall be stopped by using quick setting, specially formulated mixes as specified in Sections 4-3, A and B, according to the manufacturer's recommendations. Some leaks may require weep holes to localize the infiltration during the application, after which the weep holes shall be plugged with the quick setting mix specified in Section 4-3, B, prior to the final liner application. When severe infiltration is present, drilling may be required in order to pressure grout using a cementitious or chemical grout. Manufacturer's recommendations shall be followed when pressure grouting is required.

B. Invert Repair

1. After all preparations have been completed, remove all loose material and wash wall again.
2. Any bench, invert or service line repairs shall be made at this time using the quick setting patching mix specified in Section 4-3, A, and shall be used per the manufacturer's recommendations.
3. Invert repair shall be performed on all inverts with visible damage or infiltration. After blocking flow through the manhole and thoroughly cleaning the invert, the quick setting patch mix shall be applied to the invert in an expeditious manner. The mix shall be troweled uniformly onto the damaged invert at a minimum thickness of 1/2 inch extending out onto the base of the manhole sufficiently to tie into the structural/structurally enhanced monolithic liner to be applied. The finished invert surfaces shall be smooth and free of ridges. The flow may be reestablished in the manhole within thirty (30) minutes after placement of the mix.

C. Mixing of Liner Material

1. For each bag of product, use the amount of water or water settings required per the manufacturer's recommendations following mixing procedures noted on product bag and using the approved equipment for mixing and application.
2. Prepared mix shall be discharged into a hopper and mixing shall continue to occur in such a manner as to allow spraying continuously without interruption until each application is complete.

D. Spraying

1. The liner material is to be applied in a minimum of two (2) coats. The first coat is to be applied at a thickness sufficient to cover substrate and is rough troweled to "set" bond. The following coat(s) are applied to assure complete coverage at a minimum 1/2 inch thickness.
2. Prior to starting application of the base coat, the bench shall be covered. The interior surface of the manhole shall be clean and free of all foreign material and shall be damp without noticeable free water droplets or running water, but totally saturated, just prior to application of each coat. Materials shall be spray applied from the bottom of the wall to the top, using as many passes as necessary, but each application shall not exceed 1/2 inch. The surface is to be rough troweled after each pass. The light troweling is performed to assure that material penetrates the voids and sets the bond.

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3. The final application is applied after the base coat applications have begun to take an initial set (disappearance of surface sheen). The final application shall be applied to ensure a minimum total thickness of 1/2 inch. Again, application shall be made from the bottom up. The surface is then troweled to relatively smooth finish being careful not to over trowel. A brush finish is then applied to the troweled surface. Manufacturer's recommendations shall be followed whenever more than twenty-four (24) hours have elapsed between applications.

Second Coating When More Than 24- Hours Have Elapsed

- The surface must be cleaned. If the surface has become contaminated, it must be washed.
 - The initial coat must be wet (saturated without visible running water)
 - The initial coat must have texture (brushed) surface, not troweled perfectly smooth.
4. The benches shall be uncovered at this time and the bench sprayed in such a manner that a gradual slope is produced from the walls to the invert. The thickness at the edge of the invert shall be no less than 1/2 inch. The wall/bench intersection shall be rounded to a uniform radius the full circumference of the intersection.

1.6 CURING

- A. Caution should be taken to minimize exposure of applied product to sunlight and air movement. If application of a second coat is to be longer than fifteen (15) minutes after completion of the first coat, the substrate shall be covered. At no time should the finished product be exposed to sunlight or air movement for longer than fifteen (15) minutes before replacing the manhole cover. In extremely hot and arid climates, the manhole should be shaded while reconstruction is in process.
- B. The final application shall have a minimum of four (4) hours cure time before being subjected to active flow.
- C. Traffic shall not be allowed over substrates for 24 hours after reconstruction has been completed.

1.7 WEATHER

No application shall be made to frozen surfaces or if freezing is expected to occur inside the substrate within twenty-four (24) hours after application. If ambient temperatures are in excess of ninety-five (95) degrees F., precautions should be taken to keep the temperature of the mixture at the time of application below ninety (90) degrees F. Mix water temperature shall not exceed eighty-five (85) degrees F.

1.8 PRODUCT TESTING

Four (4), two (2)-inch cubes shall be cast each day from every fifty (50) bags of product used, and shall be properly labeled and sent to the manufacturer for testing in accordance with the City's or manufacturer's directions, for compression strength testing as described in ASTM C-109 procedures.

1.9 FINAL ACCEPTANCE TESTING

At the direction of the City, the rehabilitated manholes shall be tested by one of the following methods:

- A. Visual inspection to verify the absence of leaks.
- B. Perform an exfiltration test. For manholes zero to six (0-6) feet deep, if the water loss is one (1) inch or less in five (5) minutes, the manhole is acceptable. For manholes over six (6) feet deep, if water loss is one (1) inch or less plus 1/8 inch per additional foot of depth in five minutes, the manhole is acceptable.
- C. The vacuum test apparatus shall be placed inside or on top of the casting and the seal inflated according to manufacturer's directions as appropriate. A vacuum of 10 inches of mercury shall be drawn and then the vacuum pump shall be shut off. With valves closed, the time shall be measured for the vacuum to drop to 9 inches of mercury. The manhole shall be acceptable if the time for the vacuum to drop from 10 inches to 9 inches is greater than 60 seconds for 4-foot diameter, 75 seconds for 5-foot diameter, 90 seconds for 6-foot diameter manholes, 105 seconds for 7-foot diameter manholes and 120 seconds for 8-foot diameter manholes. If the manhole fails the initial test, necessary repairs shall be made. Retesting and resealing shall be performed until the manhole passes the test.



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1.10 EPOXY LINER

- A. The product shall be 100% solids, two-part, ultra-build epoxy system as provided by Citadel Technologies, Inc., SLS-30, Chemtron International, Inc., or approved equal.
- B. The epoxy lining shall be applied using temperature controlled, plural component spray equipment. The applicator shall be certified by the epoxy lining manufacturer. Surfaces shall be prepared for application in accordance with epoxy manufacturer's recommendation. Application procedures shall conform to the recommendations of the epoxy lining manufacturer, including material handling, mixing, environmental controls during application, safety, and spray equipment.
- C. The material shall be applied with a minimum wet film thickness of not less than 250 mils. During application, a mil thickness gage as designated by the epoxy manufacturer shall be used to ensure monolithic lining and uniform thickness during application. Measurement of bond strength of the protective coating to the substrate can be measured in accordance with ASTM D4541. Any areas detected to have inadequate bond strength shall be repaired by Applicator in strict accordance with manufacturer's recommendations.

1.11 PRICE SCHEDULE

Price for compliance with the manhole sealing requirements requested here will be on a per vertical foot basis. Measured quantities shall be used for final payment for manhole sealing. Measurement will be made from the bottom of the invert, at its lowest point to the top of the ring seat. Payment will be made at the contract unit price, which shall include the cost of furnishing all labor, equipment, tools, materials and the performance of all work necessary to complete this item.

1.12 MANHOLE SEALING CONTRACTOR DESCRIPTION

Name of Proposed Manhole Sealing System/Product: Cementitious: Strong-Seal, Quadex, or approved equal.
Epoxy: Citadel Technologies, Inc., Chemtron International, Inc., or approved equal.

END OF SECTION 2100

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DIVISION II – SITE WORK SECTION 2150 - SEWER CLEANING AND TELEVISION INSPECTION

1.1 SCOPE

The work required shall consist of furnishing all labor, materials, equipment, and supervision, disposal of debris, and performing all work necessary to clean and internally televise the designated sewer lines in accordance with these Technical Specifications. The work shall consist of performing the following work tasks where specified:

- A. Manhole Cleaning
- B. Sewer Line Cleaning
- C. Television Inspection

1.2 GENERAL

- A. Sewer line cleaning shall be performed with hydraulically propelled high velocity jet, or mechanical powered equipment. Selection of equipment shall be based on field conditions such as access to manholes, type and quantity of debris to be removed, size of sewer, and depth of flow. Selected equipment shall be capable of cleaning spans up to 1,000 feet. Selected equipment shall be evaluated and approved by Owner.

Water necessary for the performance of work is expected to be taken from the fire hydrant nearest to the work site within the city. Site safety considerations and/or directives from the supplying water authority may preempt this expectation. It is the responsibility of the Contractor to properly apply for, secure and provide for all water needed to perform the functions of the work described. Contractor shall use utility approved water meters and backflow preventers.

When it is necessary to expose manholes, the owner shall expose the manholes in order to have access for line or manhole cleaning.

If Contractor's equipment becomes stuck in the sewer line, it is the Contractor's responsibility to remove the equipment at no additional cost to the Owner.

- B. Television inspection shall be required to reveal and document sewer line conditions and/or cleaning results. CCTV shall be completed in accordance with Section 1400.

1.3 SEWER AND MANHOLE CLEANING

- A. Intent: The intent of sewer cleaning is to remove foreign materials from the line segments and manhole walls, benches and inverts. It is recognized that there are some conditions such as broken pipe and major blockages that prevent adequate cleaning from being accomplished or where additional damage would result if cleaning were attempted or continued. Should such conditions be encountered, the Contractor will not be required to clean those specific sections as directed by the Owner.

Foreign matter including but not limited to grease, debris, mud, rock and sand shall be removed from the pipelines and manholes. High-velocity hydraulic cleaning equipment may be used to remove the foreign material from the manhole walls.

- B. Cleaning Equipment: All equipment used by the Contractor for cleaning of sewer lines must be inspected by the Owner. The Contractor must submit with Bid, a composite list of all equipment available.

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1. **High-Velocity Jet (hydro cleaning) Equipment:** All high-velocity sewer cleaning equipment shall be constructed for ease and safety of operation. The Contractor shall have a selection of two or more high-velocity nozzles. The nozzles shall be capable of producing a scouring action from 10 to 45 degrees in all size lines designated to be cleaned. The equipment shall carry its own water tank, auxiliary engines, pumps, and hydraulically driven hose reel. For normal cleaning of sewers from 6 inches to 15 inches in diameter, pumps shall be capable of maintaining a minimum operating pressure of 1,500 psi. For sewers 18 inches in diameter or greater a minimum operating pressure of 2,000 psi is required. Equipment shall also include a high-velocity gun for washing and scouring manhole walls and floor. The gun shall be capable of producing flow from a fine spray to a solid stream.
 2. **Hydraulically Propelled Equipment:** The equipment used shall be of a movable dam type and be constructed in such a way that a portion of the dam may be collapsed at any time during the cleaning operation to protect against flooding of the sewer. The movable dam shall be equal in diameter to the pipe being cleaned and shall provide a flexible scraper around the outer periphery to ensure removal of grease. If sewer cleaning balls or other equipment that cannot be collapsed are used, special precautions to prevent flooding of the sewers and public or private property shall be taken by the Contractor. Damages or claims resulting from backups and flooding shall be the responsibility of the Contractor.
 3. **Mechanically Powered Equipment:** Bucket machines shall be in pairs with sufficient power to perform the work in an efficient manner. Machines will be belt operated or have an overload device. Machines with direct drive that could cause damage to the pipe will not be allowed. A power rodding machine shall be either sectional or continuous rod type capable of holding a minimum of 750 feet of rod. The rod shall be specifically heat-treated steel. To ensure safe operation the machine shall be fully enclosed and have an automatic safety clutch or relief valve. Mechanically powered equipment shall only be used when authorized by the Owner and shall be done only when other cleaning methods are shown to be ineffective.
- C. **Light Sewer Cleaning:** For light cleaning the designated sewer line segment shall be cleaned using hydraulically propelled, high-velocity jet equipment. Cleaning shall be accomplished by making one (1) to three (3) passes through the line. Manholes at each end of the line segments being cleaned shall also be cleaned and all debris shall be removed. Selection of the equipment used shall be based on the conditions of lines at the time the work commences. The equipment and methods selected shall be satisfactory to the owner. The equipment shall be capable of removing dirt, grease, rocks, sand, and other materials. If light cleaning is not satisfactory, the Owner may direct the Contractor to perform heavy cleaning. If successful cleaning cannot be performed without risk of damage to the pipe or the equipment fails to traverse the entire line segment, cleaning efforts shall be temporarily suspended and the Owner shall be notified. Before cleaning can resume the segment shall be televised and evaluated in order to determine if segment can be adequately cleaned. The Contractor shall clean the upstream manhole prior to cleaning the line segment.
- D. **Heavy Cleaning:** Segments that contain heavier than normal amounts of debris, or that cannot be adequately cleaned using the light cleaning method may be selected for heavy cleaning. Segments selected for heavy cleaning shall be approved by the Owner. The Owner may also select segments for heavy cleaning.

Heavy cleaning shall be a supplemental means of removing debris and cleaning, and shall be used in addition to light cleaning. The method of heavy cleaning for each segment shall be based on site conditions and shall be approved by the Owner. The equipment and methods selected shall be satisfactory to the Owner. The equipment shall be capable of removing dirt, grease, rocks, sand, and other materials and obstructions from the sewer lines and manholes.

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- E. **Root Removal:** Roots shall be removed in designated sections where root intrusion is a problem and shall be considered part of heavy cleaning procedures. Special attention should be given during the cleaning operations to ensure complete removal of roots from the joints. Procedures may include the use of mechanical equipment such as rodding machines, bucket machines and winches using root cutters and porcupines, and equipment such as high-velocity jet cleaners. TV inspection during root removal at Contractor's request is subsidiary to heavy cleaning, and no additional payment will be allowed.
- F. **Grease Removal:** Grease shall be removed in designated sections where grease is a known problem and shall be considered part of heavy cleaning procedures. Special attention should be given during the cleaning operations to ensure complete removal of grease from the top of the pipe. Procedures may include the use of mechanical equipment such as rodding machines, bucket machines and winches using root cutters and porcupines, and equipment such as high-velocity jet cleaners, hot water, and EPA approved chemical degreasers. TV inspection during grease removal at Contractor's request is subsidiary to heavy cleaning, and no additional payment will be allowed.
- G. **Material Removal:** All sludge, dirt, sand, rocks, grease, and other solid or semi-solid material resulting from the cleaning operation shall be removed at either the upstream or downstream manhole of the section being cleaned. Passing material from line segment to line segment shall not be permitted.
- H. **Disposal of Materials:** All solids or semi-solids resulting from the cleaning operations shall be removed by the Contractor from the sewer and will be the Contractor's responsibility to dispose of properly. All materials shall be removed from the site no less often than at the end of each workday. Under NO circumstances will the Contractor be allowed to accumulate disposal material on the site of work, except in totally enclosed containers and as approved by the Owner. No additional payment will be made for disposal of materials.
- I. **Final Acceptance:** Acceptance of sewer line cleaning shall be made upon the successful completion of cleaning and shall be to the satisfaction of the owner. If CCTV inspection shows the cleaning to be unsatisfactory, the Contractor shall be required to reclean and CCTV inspect the line segment until the cleaning is shown to be satisfactory, at no cost to the Owner. Heavy cleaning may be authorized by the Owner where normal cleaning methods specified herein have been proved inadequate. Final acceptance of manholes cleaned by the Contractor shall be made by the Owner based on visual inspection of the manholes.
- J. **Television Inspection (CCTV):** After cleaning, all line segments shall be visually inspected by means of a closed circuit color television camera. CCTV shall be completed in accordance with Section 1400.

END OF SECTION 2150

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DIVISION II - SITE WORK SECTION 2200 - RESTORATION

SECTION 2201

1.1 SCOPE

This section covers all work required in surface restoration on private and public properties which are disturbed by sanitary sewer system rehabilitation work.

1.2. DESCRIPTION

The Contractor shall restore the project site to conditions not less than those existing prior to his entry thereon, unless otherwise required by these specifications, Permits and/or Licenses, or shown on the Drawings.

- A. The Contractor shall coordinate surface restoration work with the affected private property owners.
- B. Private property over which the Owner has prior rights (i.e., utility easement, sewer easement) and/or has obtained rights-of-way, licenses and/or agreements from the property owner to allow construction of a sanitary sewer pipeline and appurtenances, shall be restored in conformance with these Contract Documents.
- C. Public property shall be restored with strict adherence to the requirements of the public body having jurisdiction therein. The municipalities in which work will be performed will have varying requirements for materials and testing on restoration work. The Contractor will be responsible for coordinating with each City regarding their requirements. The municipality's requirement shall govern except that the materials and workmanship shall not be less than required by the plans and specifications.

1.3. REFERENCE STANDARDS

Surface restoration with respect to pavement, driveways, sidewalks, curb and gutters, bushes, shrubs, trees and sodding shall be in accordance with Division II of the "Standard Specifications and Design Criteria" as prepared by Kansas City Metropolitan Chapter of the American Public Works Association and the additional requirements specified herein.

SECTION 2202 MATERIALS

2.1. TOPSOIL

- A. Topsoil shall be free from large roots, sticks, weeds, brush, or stones larger than one inch in diameter or other litter and waste products. It shall be a loamy mixture having at least 90 percent passing the No. 10 sieve. A sample, free from extraneous materials, shall comply with the following requirements:
 - 1. Contain not less than 1.0 percent organic matter as determined by the test for organic matter in accordance with AASHTO T 194.
 - 2. Contain not less than 12 percent clay as determined in accordance with AASHTO T 83.
 - 3. Sand content shall not exceed 55 percent as determined in accordance with AASHTO T 88.
 - 4. The pH of the sample shall not be lower than 5.0 nor higher than 8.0. The pH shall be determined with a calibrated pH meter, on that portion of the sample passing the No. 10 sieve in accordance with the "Suggested Methods of Tests for Hydrogen Ion concentration (pH) of Soils" included in the procedures for Testing Soil issued December 1964, by ASTM.



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2.2. FERTILIZER

Fertilizer shall be a standard commercial 10-8-6 or 10-6-4 grade, uniform in composition, free flowing and suitable for application with manufacturer's recommended equipment, delivered to the site in bags or other convenient containers, each fully labeled, conforming to applicable State laws.

2.3. SOD

- A. Sod shall be nursery or field grown grass. Sod shall be well rooted in soil of such consistency that it will not break, crumble, or tear during handling and placing. Sod shall be free of noxious weeds and other objectionable plants and shall not contain substances injurious to growth. Sod shall be rolled after placement and joints filled between section with screened soil.
- B. Grass shall be between 1-1/2 and 4 inches in length when the sod is cut. The sod shall be placed within 48 hours of cutting in rectangular pieces not less than 12 inches in width and not less than one inch in soil thickness. Keep sod in a moist condition between the initiation of cutting and the completing of placing and protect against exposure to the sun, wind, freezing during transportation to the site, and during storage prior to placing.
- C. Perform only in seasons when satisfactory results can be expected; these are between March 15 and June 1 or between August 15 and November 1.

2.4. SEED

Seeding shall be performed only in seasons when satisfactory results can be expected; these are between March 15 and May 15 or between August 15 and October 15.

Grass seeds shall be fresh and made of the following mixture:

<u>Seeds</u>	<u>Application Rate (lbs/acre)</u>
Kentucky bluegrass	50
Perennial Ryegrass	20
Creeping Red Fescue	10
Ladino or White Dutch Clover	5

2.5 TREES

- A. Trees to be replaced shall be replaced with Sugar Maple, Norway Maple, Schwedler Maple, Crimson King Maple, Scarlet (red) Maple, Sycamore Maple, Busman Elm, Red Oak, Pin Oak, Burr Oak, Scarlet Oak, American Linden, European Linden, Sycamore Tree, Hackberry Tree, Sweet Gum Tree, Beech Tree, Ironwork, Thornless Honey or any thorn less, poodles, patented locust, as specified by the Owner.
- B. Trees shall be replaced with the same diameter tree, up to a maximum of four (4) inches in diameter measured four (4) feet above the ground. Trees shall be first class nursery grown stock and shall be typical of their species or variety. They shall have average or normal well-developed branches, together with vigorous root systems. The root systems shall have been pruned at least once prior to final planting. Trees shall be sound, healthy, vigorous, free from defects, disfiguring knots, abrasion of the bark, borers, and other forms of infections. Trees shall be nursery grown, and without gathered materials. Trees shall be free of branches no higher from the ground line than one-half of the total height of the tree, shall have single leaders, be well branched and with reasonably straight stems. Plants shall have been growing under the same climatic conditions as the climate of the area for a minimum of two years prior to the date of planting. The Contractor is to certify that said trees are free from disease.



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- C. In preparing trees for moving and transport, take precautions customary in good trade practice. Workmanship that fails to meet the highest standards will not be accepted. Dig trees to retain as many fibrous roots as possible.
- D. Balled and burlapped trees shall have a solid ball of soil a minimum of 24 inches in diameter and a minimum depth of 16 inches held in place securely by burlap and a stout rope. Mudded-in or peat balls will not be allowed. Broken or loose balls will not be allowed.
- E. Prepare planting mix in accordance with accepted practice of the American Nurseryman's Association. Planting soil shall be good quality loam topsoil, mixed with a 6-24-24 fertilizer at the rate of ten pounds per cubic yard of topsoil.
- F. Plant materials used shall be true to name and size in conformity with the following standards of the American Joint Committee on Horticulture Nomenclature, 1942 Edition of Standard Plant Names. (Published by Mount Pleasant Press, J. Horace McFarland and Company, Harrisburg, Pa.) and American Standard for Nursery Stock, copyright 1973 (Published by the American Association of Nurserymen, Inc., 230 Southern Building, Washington, D.C. 20005).

2.6. FENCING

- A. Chain Link Fence Fabric: Chain link fence fabric to be repaired or replaced shall be no less than the following:
 - 1. For fences less than 72 inches, it shall consist of two inch uniform square mesh and shall be knuckled at both selvages.
 - 2. The wire shall be 11 gage (.120 inch) for 36 and 42 inch fencing, 9 gage (.148 inch) for 48 and 60 inch fencing, and 6 gage (.192 inch) for 72 and 84 inch fencing.
 - 3. The fabric shall be zinc coated or aluminum C. coated steel wire. Zinc coated steel fabric shall conform to the requirements of ASTM A 392, Class I with the fabric galvanized after weaving. Aluminum coated fence fabric shall conform to the requirements of ASTM A 491.
- B. Woven Wire Fence Fabric: Woven wire fence fabric to be repaired or replaced shall be no less than the following and shall be zinc coated or aluminum coated steel wire. The design shall be the same as that removed or remaining. Zinc coated woven wire fabric shall conform to the requirements of ASTM A 116 with Class 3 coating. Aluminum coated woven wire fabric shall conform to ASTM A 584 with Class II coating. Wire shall not be less than number 11 gage.
- C. Wood Fencing: Wood for wood fencing to be repaired or replaced shall be of the same type as that used in the fence removed or remaining and shall be of equal or better quality and of the same dimensions as the material used in the original installation.
- D. Posts
 - 1. Steel posts shall be comparable in size and weight as to those originally installed in the fence system. Posts removed may be reinstalled if sound and undamaged by this construction. All new steel posts shall be galvanized by the hot dip process with the zinc coating averaging not less than 1.80 ounces per square foot of surface area, with no individual specimen having less than 1.60 ounces per square foot. Steel top rails shall be the same diameter and material as line posts and installed with proper fittings.
 - 2. Wood posts shall be of the same type, quality and dimension as used in the original fence installation. Posts removed may be reinstalled if sound and undamaged by this construction. New wood posts shall be preservative treated material.



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SECTION 2203 EXECUTION

3.1. CLEANUP

The Contractor, upon completion of installation and backfill operations, shall cause the work area to be cleaned and dressed up ready for final grading including but not limited to the following items.

- A. Construction debris and litter shall be promptly hauled off the worksite to a dump site or landfill approved by the Owner.
- B. Excess excavation material including rock, gravel and excess granular backfill material, shall be removed from the site including material which has washed into stream beds, storm water facilities, streets, culverts, etc. The site shall be left clean.
- C. Tools, equipment and construction materials shall be removed except in designated storage areas along the pipeline route, and then shall be stored in a neat appearing manner.
- D. Restore surface and subsurface drainage and provide drainage wash checks necessary to prevent soils from being washed downstream.
- E. Machine grade the area in preparation of final grading, seeding, sodding, pavement replacement, etc.
- F. Restore all street signs and mail boxes.
- G. Maintain adequate safety signs, barricades and lights until final restoration of work area is completed.
- H. Where ordered by the Owner, dust control over temporary surfaces shall be accomplished with a 77 percent calcium chloride solution, periodic wetting, or by some other appropriate method. Costs for dust control shall be considered incidental.
- I. If in the opinion of the Owner, bituminous concrete cannot be installed due to weather conditions, then cold patch asphalt shall be installed and maintained as a temporary surface until, in the opinion of the Owner, weather conditions will allow installation of a permanent bituminous concrete surface pavement.

3.2 FINISH GRADING

The Contractor shall finish grade the area with top soil to lines and grades which existed prior to the area being disturbed, with special attention directed to proper surface drainage, and the refilling of settled excavations with earth compacted to densities required. The area shall be smoothed by raking or dragging. All flower and vegetable gardens in existence prior to this project shall have the separately stored top soils restored unless otherwise required.

3.3 FENCES

All existing fencing damaged and/or removed shall be restored to a condition equivalent to or better than that which existed prior to construction.

It shall be the responsibility of the Contractor to survey and record the location of all existing fence corners with a minimum of three ground ties prior to removal of the fences. Copies of all ties to fence corners shall be given to the Owner. The erection of the new fences shall be performed by a certified fence erector. The fence erectors must be approved by the Owner prior to the start of the fence installation.

All fencing damaged in removal, by construction or otherwise unsuitable for reinstallation shall be repaired or replaced with like materials of equal or better quality than the material used in the original installation but the minimum quality shall be as specified in "Materials" or as noted on the plans. Height and style shall match the remaining fence or that removed. All wood fences shall be painted to match existing fence where applicable. All steel posts shall be set in concrete, plumb, and true to line and grade. Spacing shall be uniform and comparable



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to that in the existing fence system. All line posts shall be embedded two feet six inches; corner and end posts embedded three feet six inches. Wood posts may be driven or set in prebored holes.

Prebored holes shall be backfilled and thoroughly compacted to secure the post. Any posts damaged by driving will be rejected. Wood line posts shall be embedded a minimum of two feet six inches; corner and end posts embedded three feet six inches.

3.4. WALLS

Retaining and architectural walls, if disturbed or damaged, shall be restored architecturally and structurally to conditions not less than those existing prior to construction.

3.5. CONCRETE LINED DITCHES AND OTHER TYPES OF DITCHES

- A. All ditches damaged or removed, existing prior to construction, shall be restored to a condition not less than that which existed prior to construction.
- B. All concrete ditch lining shall be reinforced using 6x6 - W2.9xW2.9 welded wire fabric placed uniformly at mid-slab.

3.6. SODDING

- A. Remove and replace sod, as required, in accordance with the reference standard.
- B. Place 6 inches of black dirt top soil over trenched areas and 3 inches over areas disturbed by construction equipment prior to final grading.
- C. Before placing sod, apply fertilizer to the top soil surface at the rate of 30 lbs/1,000 sf and work into the top one inch of the top soil. Rake to a smooth even surface. Lay sod so that no voids occur, with tight joints and staggered seams. Perform sodding operations so that workmen walk only on the laid sod. Immediately after placing sod, roll with a 200-lb roller to obtain a smooth, firm surface. Brush or rake screened top soil over the joints in the sodded area and water thoroughly. The completed sodded surface shall be true to finished grade, even and firm over the entire area. The sod shall be watered until rooted.
- D. Zoysia grass shall be peeled back and repositioned after backfilling and compaction.

3.7. TREE, BUSH, AND HEDGE PLANTING, TRANSPLANTING AND REPLACEMENT

- A. Existing trees, bushes, and hedges which cannot be tied back or trimmed to prevent damage and must be removed in the opinion of the Owner due to the proposed construction shall be removed by the Contractor. The Contractor shall remove the stump and roots to a depth of 12 inches below grade and haul the spoil material away. The cost for removal of bushes and shrubbery will be considered as incidental. Transplanting shall be at the location directed by the Owner. After digging the plants, they shall be properly stored until they can be planted. Replacement plants shall not be delivered until they can be planted. Short tunneling techniques shall be utilized to avoid removing and damaging trees unless the trees are specifically indicated to be removed or removed and replaced on the drawings. Short tunneling shall be performed from an excavation which shall be outside the drip line of the tree whenever possible.
- B. All trees to be planted shall be like species as the tree removed unless otherwise directed by the Owner or by the local jurisdictional Forester.
- C. All planting shall be done during the proper seasons. No planting shall be done in frozen soil or during unfavorable weather conditions. Tree pits shall be dug of such size as to provide ample space for the entire root system, as the tree comes from the nursery, without crowding or bending the roots. The pits shall be 12 inches wider than the ball diameter, shall have vertical sides, and be six inches deeper than the

Attachment: 282-10 ROA3 CIPP PI - InstitutormTech - 1-2013 (CIPP on Ann Avenue)



CITY OF INDEPENDENCE, MISSOURI PRICE AGREEMENT RENEWAL OF AWARD

Water Lines 282-10

thickness of the ball. The soil in the bottom of the pit shall be thoroughly loosened by spading to a depth of six inches. Holes shall be dug immediately before planting.

- D. All trees shall be set at a depth slightly below finished grade, and the hole shall be half-filled with planting soil and thoroughly watered. The upper half of the burlap shall then be loosened and folded down and the hole filled with planting soil and thoroughly watered. This process shall continue until a 2-inch deep watering basin remains around the tree. The watering basin shall be brought to grade with two inches of well-rotted mulch.
- E. After planting, the branches shall be pruned in proportion to the amount of root system lost in the transplanting operations but in such a manner as to retain the form typical of the tree. In general, approximately one-third of the branch structure shall be removed. All pruning shall be done by expert workmen in such a manner as to insure healthy and symmetrical growth of new wood. Spoil earth dug from the tree pits shall be disposed of by the Contractor.

After planting, trunks of all trees planted after October 15 shall be wrapped with special tree wrap from the crotch of the first major branches down to the ground. Wrapping shall be tied with cotton twine to keep the wrapping in place.

All trees shall be planted vertically. Trees found leaning during the guarantee period shall immediately be staked with two 2-inch by 3-inch wood stakes, eight feet long, pointed on one end. The stake shall be of sound and durable oak or cedar. The stakes must be long enough to properly support the tree. The stakes shall be driven to a depth of 18 inches below the bottom of the tree pit. The stakes shall be located one on the north side and one on the south side of the tree, and 12 inches to 18 inches from the trunk. Stakes shall not be driven into the ball and burlap. The trees shall be guyed using a figure eight hitch consisting of No. 14 gauge wire encased in a section of rubber hose.

3.8. BLACK DIRT TOPSOIL

- A. The black dirt topsoil used for surface restoration shall be pulverized and come from a material supplier which is subject to the review of the Owner.
- B. If the Contractor desires to use topsoil from the construction site, it shall be stripped and stockpiled separately for future use, subject to the approval of the Owner.
- C. Topsoil shall be provided by the Contractor to bring the area to be sodded to the proper grade. The minimum depth of topsoil shall be six (6) inches in grassed areas.
- D. Fertilizer nutrients shall be spread over the area at a rate of 160 pounds per acre (nutrient weight only) or as recommended by the manufacturer.
- E. The ground limestone, when required by the Owner, shall be distributed over the area at the rate of one-half ton per acre. The ground limestone shall contain not less than 85 percent of total carbonates and shall ground to such fineness that 50 percent will pass through a 100 mesh sieve and 90 percent will pass a 20-mesh sieve.

3.9. PROGRESS OF CLEAN-UP OPERATIONS

If clean-up work is not following the installation of CIPP satisfactorily, installation will be suspended until clean-up work is completed.

END OF SECTION 2200

Attachment: 282-10 ROA3 CIPP PI - InstitutumTech - 1-2013 (CIPP on Ann Avenue)



CITY OF INDEPENDENCE, MISSOURI PRICE AGREEMENT RENEWAL OF AWARD

Water Lines 282-10

RENEWAL OPTIONS

- A. Renewal Option 1 - Offeror agrees to Renewal Option 1 (February 1, 2011, through January 31, 2012).
- B. Renewal Option 2 - Offeror agrees to Renewal Option 2 (February 1, 2012, through January 31, 2013).
- C. Renewal Option 3- Offeror agrees to Renewal Option 3 (February 1, 2013, through January 31, 2014) at unit prices increase not to exceed by more than 12.0%. (No increase per Brian McCrary e-mail to Tom Conrow 11/14/12)
- D. Renewal Option 4 - Offeror agrees to Renewal Option 2 (February 1, 2014, through January 31, 2015) at unit prices increase not to exceed by more than 5.0%.

If agreed, renewal options will be at the sole option of the City. Offeror agrees to submit firm unit prices sixty (60) days prior to the date of the renewal option. The prices shall be in accordance with the most current Prevailing Wage Order at the time of the renewal. The offeror agrees to hold the unit prices firm for the period of the renewal option.

- E. Offeror does not agree to renewal options: _____

Attachment: 282-10 ROA3 CIPP PI - InstitutormTech - 1-2013 (CIPP on Ann Avenue)



TO: Public Works Committee
FROM: Jerry Gibbs, Director
DATE: September 25, 2013
SUBJECT: WATER TREATMENT IMPROVEMENTS

Type of Item: *Presentation*

Background

Infrastructure - Our raw water infrastructure is 40 years old. Much of it is in need of maintenance, rehabilitation or replacement. There are a few components that could have catastrophic impacts if they fail before rehabilitation or replacement. Other components are reaching the end of their useful life or outdated and need to be replaced. The infrastructure can be rehabilitated or updated without solving the taste and odor issues. To optimize our current treatment process requires additional improvements. Capacity improvements are dependent on increase demand and growth. Any improvements should take into consideration expanding capacity. Cost to replace or repair the high risk infrastructure can be spread out over the next few years and allowing completion of the necessary engineering studies and designs to better define projects and costs.

Water Quality - Our drinking water complies with all of the primary drinking water standards of the EPA and MDNR. There are issues with secondary standards such as taste and odor. The misperception is if the water taste funny or smells, there is something wrong with the water. New residence comparing our water quality to their former community may raise doubts. Perception becomes reality to many. Another issue is water quality requirements are becoming more stringent. If planning and construction of improvements are not made in advance of changes, compliance will dictate the timing without regard to cost.

Immediate Needs - There is a general consensus among staff the highest priority water projects are:

- Reroute electrical service over land to the intake structure
- Repair and rehabilitate the overflow spillway at Lake Harrisonville
- Replace the high service wetwell and pumps to allow operations to continue when taking a pump out of service.

- Enlarge and increase the number of emergency connections w/ PWD 9

The first three projects are estimated to cost \$300,000 to \$400,000 each and could be completed over the next three years.

Discussion -

How would you rank the importance of making improvements based on cost or water quality?

- Costs (keep water rates at current levels)
 - Pay as you go (Schedule based on risk & need)
 - Use current WTP allocation of \$300 to \$400 K per year to bond a larger project (Revenue or SRF may generate \$4 to \$6 M depending on interest rate.)
 - Rate increase to pay for specific improvements (A five cent increase per thousand will generate \$50,000 to \$75,000 annually)
- Water quality
 - Pay as you go (customer would not notice a significant change in quality)
 - Upgrade plant to optimize treatment process (noticeable difference in water quality, does not solve taste and odor)
 - Solve taste and odor
 - PAC (Frequency of taste & odor events will be reduced)
 - Ozone (Solves taste and odor issues)

There are five approaches to consider in taking the next steps. Each step requires much of the same engineering effort to implement.

1. Maintain the current treatment system (Do only what is necessary allowing for optimization and capacity in improvements) \$300 to \$400 K/ year
2. Optimize the treatment operations (Improve chemical process) \$3.2 M
3. Powder activated carbon - taste and odor enhancements (Requires treatment optimization) \$4 M
4. Ozone - taste and odor enhancements (Requires treatment optimization) \$6 M
5. Add Capacity (Demand driven) improvements to raw water intake & new

transmission water line

Jeff Klein with Burns & McDonnell will be in attendance to answer questions.

B. Discussion Item (ID # 1188)

WATER TREATMENT IMPROVEMENTS

Attachments:

Water System Facility Plan (PDF)

Water System Facility Plan Harrisonville, MO

OCTOBER 2, 2013



Water System Questions

1. How does our water compare to others?
2. Are you satisfied with our water quality?
3. Would you pay more for higher quality water?

Water System Facility Plan – Primary Goals

1. Eliminate Taste & Odor Complaints
2. Improve/Optimize Treatment Process
3. Assure Future Regulatory Compliance
4. Increase Capacity to 3 MGD (Not 5 MGD)

Existing Water System

Supply

- Lake Harrisonville
- Potential Yield = 1.4 MGD
- Intake Limitations
- Power Cable in Lake
- Single Raw WM

WTP

- Capacity = 2.4 MGD
- Process Opportunities
- OSHA & Code Issues
- Structural Concerns
- T&O

Distribution

- Solid Network
- Clearwell & Elevated Storage
- Connections to PWSD#4 & 9

Findings

- WTP can be utilized/improved/refurbished
- Much less cost than KCMO or New WTP
- With improvements, meets future 3 MGD demand
- Many improvements could be phased
- All aspects of the water system need improvements:
 - Supply
 - Treatment
 - Distribution

Supply Improvements

Lake

- Spillway Barrel Repair
- Sediment Study
- Bathometric Survey
- Install BMPs
- Landowner Access
- Sluice Gates?
- Dredging?

Intake

- Power Supply
- Pump/VFD Replacement
- Sluice Gates

Raw WM

- Booster Pump Station
- Raw 16" WM Routing/Easement
- New 16" WM

Interconnections

- Maximize Ex. PWSD#9
- New PWSD#9 near 291 & Hospital
- Hydraulic Model Update

Reuse of Infrastructure

- Intake Structure
- Basin 1
- Basin 2
- Filter Building
- Clearwell
- Chemical Building?

Payment Options

1. Pay As You Go

- Limits improvements
- Extends time required to complete improvements
- Does not solve WQ issues
- Less efficient approach

2. Bonding

- Fix Priorities/optimization WTP at one time
- Limits funds for other system improvements for 20 years without a rate increase
- Efficient approach
- Customers reap benefits immediately

Priorities / Funding Challenges

No.	Project	Driver	Cost \$M	Year 1	Year 2	Year 3	Year 4	Year 5
1	Replace Intake Power	Avoid Sys Failure	0.4	0.4				
2	Spillway Improvement	Avoid Sys Failure	0.4		0.4			
3	Fix WTP Pumping	Avoid Sys Failure	1.0			0.5	0.6	
4	PWSD9 Emergency Connections	Avoid Sys Failure	<0.23					0.3
5	Optimize WTP Process Imp	Optimize, growth, reduce costs	3.8					
6	Filter Imp	WQ imp, growth	TBD					
7	Taste & Odor Imp	Improve WQ Reg protection	PAC = 0.7 O3 = 3.5					
8	Intake Pump / Raw WM BPS	Growth	0.9					
9	Lake Dredging/BMPs	Growth	TBD					

Funding Strategy

- Available \$400K to \$500K / year
- Debt Service at 3% for 20 years
 - \$6M payments are \$400K
 - \$7.5M payments are \$500K
- **WTP Improvements – Fix / Optimization / Expand**
 - \$3.8M (2013 dollars)
- **Other Critical Improvements**
 - \$2.0M (2013 dollars)
- Taste & Odor Not Directly Addressed

Updated Priorities?

1. Fix & Expand as Needed
2. Optimize Process
3. Taste & Odor – PAC* or – Ozone*

*Requires Item 2. Optimize Process

Next Step

1. Board of Alderman Decision on Path Forward
2. Capital Facilities Plan (WTP Conceptual Design) Implementation Plan sets CIP <\$75K
3. Filter Evaluation <\$40K
4. Lake Sediment Study \$25K
5. Bathymetric Study \$50K
6. Source Water Assessment \$75K
7. Update Hydraulic Model:
 - a. System Hydraulic Modeling \$50K
 - b. Additional PWSD#9 Interconnection(s) TBD
8. Raw WM Routing Study \$20K

Water System Questions

1. How does our water compare to KCMO water?
2. Are you satisfied with our water quality?
3. Would you pay more for higher quality water?

Questions





TO: Public Works Committee
FROM: Jerry Gibbs, Director
DATE: September 26, 2013
SUBJECT: Airport Report

Type of Item: *Report*

Airport report provided by James Green, Laurence Smith Airport Manager

A. Discussion Item (ID # 1189)

Airport Report

Attachments:

September, 2013 (DOCX)

September 2013 Potential Jet Fuel Sales (XLS)

LAWRENCE SMITH MEMORIAL AIRPORT REPORT

For the month of September, 2013

Hangar and Tie Down Space:

- No Hangars are available, 8 confirmed people on the waiting list
- 6 Tie down spots available

Fuel:

- Potential jet fuel sales – approx. 200 gallons
- 100LL – our current price is \$5.70 per gallon
- Fuel prices in our service area:

Lee's Summit	\$5.58 per gal.
Ottawa	\$5.89 per gal.
Grain Valley	\$5.52 per gal.
Johnson County	\$6.30 per gal.
Butler	\$5.95 per gal.

AVGAS Sales: (August 28 to Sept. 26)

- | | |
|----------------|-------------------|
| ▪ Price | \$5.70 per gallon |
| ▪ Gallons Sold | 904.76 |
| ▪ Revenue | \$5,157.16 |
| ▪ Profit | \$633.33 |

Airport Projects:

Both agreements were approved at the September 23rd Board of Alderman meeting. Once the signed agreements and grant are in place staff will issue a NTP for the ALP & AGIS project.

Airport Appraisal:

Staff has met with the adjacent land owner to discuss the appraisal. Every party believes the land west of the airport has been undervalued and the appraiser has defended his conclusion. The largest obstacle to getting a higher land value is the lack of comparable land, and access to the property. When land is donated to the city, the value of the land at the time of donation is the price the city can expect to use for “land as match” funds, so it is in our best interest to see it evaluated at the highest possible amount. Unfortunately the ultimate access goals and comparable real estate might not be available for quite some time.

The land on the east side of the airport has similar infrastructure obstacles and even worse access issues but has value to the airport. Having this land appraised may be the best prospect in getting a land donation to pay for the construction portion of the hangar area project.

POTENTIAL JET FUEL SALES

(in gallons)

													ANNUAL
	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	<u>TOTAL</u>
2003	?	?	1,700	2,300	2,300	2,500	2,000	2,500	1,800	1,500	1,200	1,400	19,200
2004	1,800	2,500	3,500	2,500	1,500	1,500	3,000	2,800	2,000	2,000	3,200	3,400	29,700
2005	2,100	1,400	1,200	2,200	2,400	2,000	1,500	1,000	2,000	1,500	1,000	1,300	19,600
2006	1,000	1,500	1,800	1,800	1,000	1,300	1,000	1,200	1,500	1,000	1,100	800	15,000
2007	500	1,000	1,000	1,200	1,000	1,200	1,000	500	600	500	300	200	9,000
2008	200	200	200	100	100	200	300	400	200	250	150	100	2,400
2009	150	100	100	150	200	250	150	250	150	150	100	100	1,850
2010	250	350	250	150	150	100	100	150	100	0	200	250	2,050
2011	350	300	250	200	250	200	250	350	200	200	250	200	3,000
2012	150	250	150	200	400	300	200	200	300	200	350	100	2,800
2013	350	250	150	200	250	300	450	250	200				2,400