

MACOMB INTERCEPTOR DRAIN
INTRA-COUNTY DRAINAGE BOARD
AUGUST 08, 2022
10:45 A.M.
AGENDA

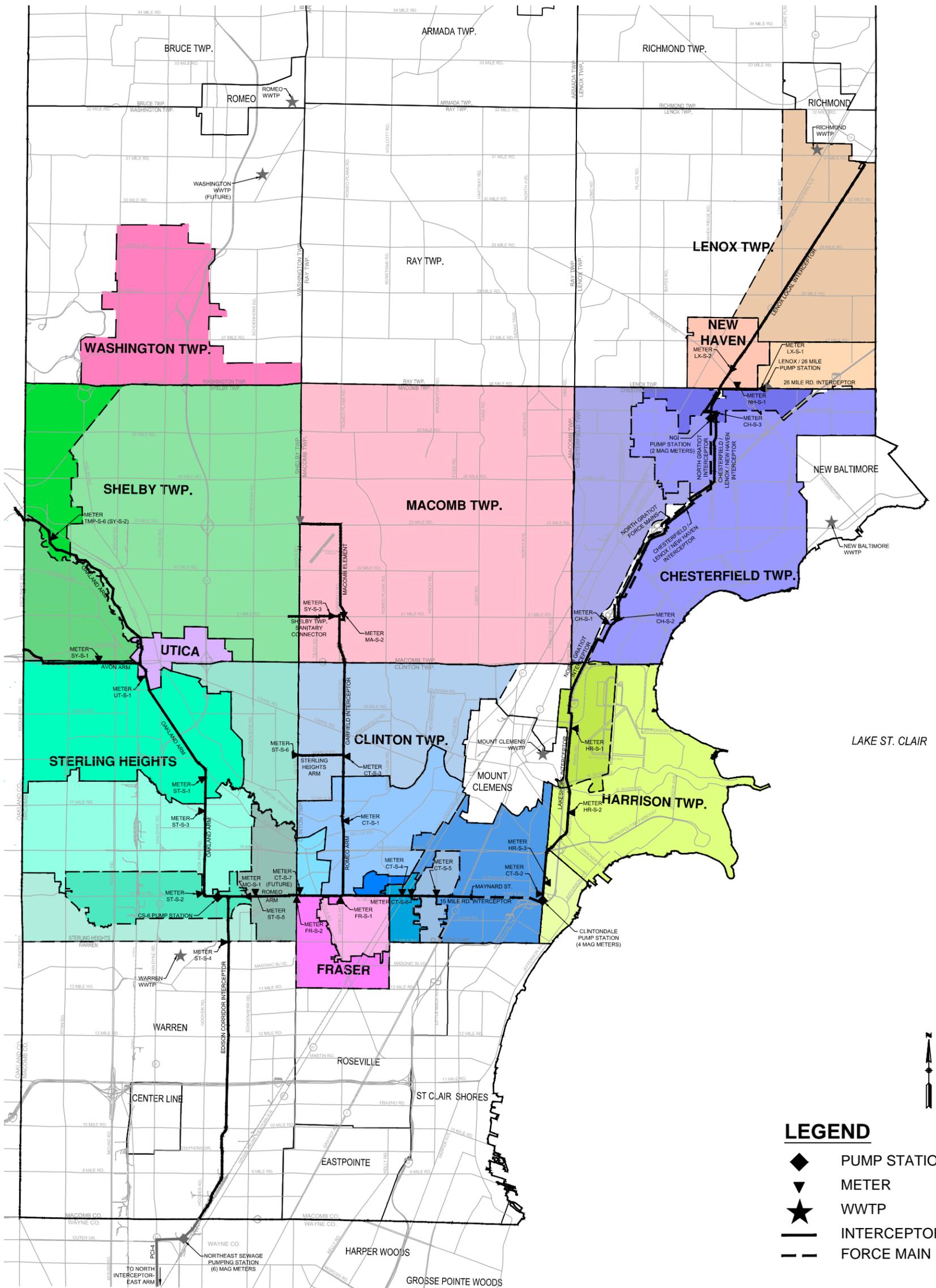
**NOTE: THIS MEETING WILL BE HELD IN PERSON WITH TELECONFERENCE
OPTION FOR PUBLIC**

**Call in Number: 1-318-935-0311
Access Code: 118 069 190**

	Page
1. Call of meeting to order and roll call	
2. Approval of Agenda for August 08, 2022	
3. Approval of Minutes for July 11, 2022	4
4. Public Participation	
5. Project Updates – Stephen Downing	8
6. Drop Shaft Rehabilitation Contract Change Orders - Inland & AEW – Stephen Downing	53
Motion: To approve Change Order #1 with a net decrease of \$204,121.84 to the Inland Waters Pollution Control Drop Shaft Rehabilitation construction contract.	
Motion: To approve Change Order #1 with a net increase of \$168,703.30 to the Anderson Eckstein & Westrick (AEW) Drop Shaft Rehabilitation engineering services contract.	
7. Garfield Interceptor Lining Project - Construction - Vince Astorino	71
Motion: To approve the proposal from SAK Construction, LLC for an amount not to exceed \$2,394,385 for lining repairs to the Garfield Interceptor.	
8. Garfield Interceptor Lining Project - Construction Contract Administration – Vince Astorino	89
Motion: To approve the proposal from Anderson, Eckstein & Westrick for an amount not to exceed \$127,873.50 to provide construction contract administration services for the Garfield Interceptor lining project.	

9. Consideration for approval of invoices (see attached)	96
10. Financial Report – Bruce Manning	97
11. Adjourn	

MACOMB INTERCEPTOR DRAIN DRAINAGE DISTRICT



LEGEND

- ◆ PUMP STATION
- ▼ METER
- ★ WWTP
- INTERCEPTOR
- - - FORCE MAIN



Candice S. Miller

MACOMB COUNTY PUBLIC WORKS COMMISSIONER

frch

UPDATED: FEBRUARY 2017

An adjourned meeting of the Intra-County Drainage Board for the **MACOMB INTERCEPTOR DRAIN** was held in the Office of the Macomb County Public Works Commissioner, 21777 Dunham Clinton Township, Michigan on July 11, 2022, at 10:21 A.M.

PRESENT: Candice S. Miller, Chair
Don VanSyckel, Member

EXCUSED: Bryan Santo, Member

ALSO PRESENT: Vince Astorino, Operations & Flow Manager; Brian Baker, Chief Deputy; Steve Downing, Construction & Maintenance Manager; Bruce Manning, Financial Manager; Pam Sonnenberg, Administrative Assistant

PRESENT VIA TELECONFERENCE: Mary Shepard, Environmental and Safety Services Supervisor City of Sterling Heights

The meeting was called to order by the Chair, Candice Miller. A motion was made by Mr. VanSyckel supported by Ms. Miller to approve the agenda as presented.

Adopted: YEAS: 2
NAYS: 0

Minutes of the meeting of June 13, 2022 were presented. A motion was made by Mr. VanSyckel, supported by Ms. Miller to approve the minutes as presented.

Adopted: YEAS: 2
NAYS: 0

The meeting was opened to public participation, then closed, there being no comments from the public.

Mr. Downing presented the Project Update on Segment 5. He showed photos and stated they are making excellent progress with the shaft. Down the road they are working on the spraylining. Photos were presented showing the de-watering and spraylining process. One picture showed the T-Grid mesh being installed in the pipe and Ms. Miller asked what the mesh is made out of. Mr. Downing stated that the mesh is a carbon fiber material. Mr. Downing said he will get some video of the process to present for next month's board meeting. Mr. VanSyckel asked if the part of the pipe that is always submerged deteriorates less than the exposed area of the pipe. Mr. Downing said yes because that part is always wet and it doesn't get the H2S degradation. Mr. Downing reiterated that we are adamant about inspecting the pipe and cleaning the sediment out due to a prior sinkhole. So we want to make sure that there is no infiltration or major cracks.

Mr. Downing said that Oscar Renda requested we try a new product called an FWC Coupling Hobas Pipe instead of the Bell and Spicket that we usually use. They said it was cheaper and they have had a high success rate with it. Mr. Downing declined because we have never used it and we do not want to experiment. Hobas has charged Oscar Renda \$2.3 million in extra costs for escalation of Hobas pipe costs and also for trucking. He wanted the Board to be aware of this situation, but the Hobas delivery is on schedule.

Phase II Grouting is just about wrapped up in all of the critical areas. We looked into the Garfield and Metro Parkway Interceptor because it was initially identified as a critical area strictly because of its location. We are awaiting to hear the result from the team, although there was no infiltration. We have standard areas, Garfield and Lakeshore; that require attention and are non-critical. Garfield will require night work or a modified afternoon shift because of all of the other work going on in the system. Once we get the results from Saturday's inspection into the system at 16 Mile Road, we'll know where we are going to go next. It's difficult to get that work done right now because everyone is struggling for resources. The good news is that we are almost wrapped up with the work in the critical areas and we will continue on to the less critical areas.

The Meter Facility Rehab punch list has been completed. There was some infiltration of one of the manholes there. They were struggling to get it sealed up. Weiss is doing a good job and that is the only open issue right now.

The Segment 6 Rehab construction project continues on the CS13 Shaft. They finished demolition of the interceptor and installed the temporary flume this past month. They have poured the base slab and are in the process of installing rebar and form work. The project is moving along. We had a slight problem with the base slab, there was a defect, some honeycombing and we are working with the contractor and continue to move forward on the project. The insurance carrier has assigned a forensic engineer to the claim to assess the loss. We have provided their engineer with all of the data requested. They are currently reviewing the Builders Risk Claim and at this time Mr. Downing has no reason to believe it will not be approved. It sounds like that this a known Hobas issue with this type of joint when they are jacking it. When this claim is settled, the insurance carrier may go after Hobas and subrogate.

The last reach of the Romeo Arm from CS-2 moving north 2,000 linear feet was completed on Saturday for the Interceptor Inspection Program. The last bit remaining is manhole scanning. They are approximately 40% complete with that and then inspection of 8 junction chambers and 8 drop shaft/connecting sewers will be performed. It will all be performed at night. Fishbeck now has all data available. Mr. Baker said that we have not been billed since November and the job was supposed to be completed in May. He said he'd like to have a meeting as to what is going on and when the job will be completed. Mr. Downing stated that they have approximately 3 weeks left of work. Mr. VanSyckel asked if their staffing is local and Mr. Downing replied that it is, however they have jobs all over the country. Mr. Baker questioned if there was any chance that we are at risk that they may have found something critical that we are not aware of. Mr. Downing said that Maria from Fishbeck has gone through everything and has indicated that we are not at risk, besides 21 and Garfield which we are already aware of. Ms. Miller asked what we are doing at 21 and Garfield where we found severe degradation. Mr. Astorino stated that he will be meeting with Mr. Baker this week to go over the different options to remedy the degradation. He said that he would like to go with Spiral Wound Pipe Lining and would like to have a decision by August. If we use Spiral Wound it would be completed in 3 months and can be done in certain flow conditions. Mr. Downing added that he thinks it is a good opportunity to try something different.

Mr. Downing added that he just received a text from Mr. Lumma and said that everything at 16 Mile and Garfield is good to go. So they will continue working in the area of Garfield and the other non-critical areas. The Odor and Corrosion project was posted again to MITN on Friday. Bids will come in September 8th and we will bring it to the board hopefully in October with a recommendation to award. Ms. Miller asked what we ended up doing for the area in Sterling Heights. Mr. Downing said he is working on it and it will hopefully be ready for Sterlingfest as we are waiting on carbon media for the fan. We have been getting some complaints of odor on Rougewood Dr. and up and down Dodge Park Road. Mr. Downing said that when there's a sudden surge of rain, it causes the odor issues.

A motion was made by Mr. VanSyckel, supported by Ms. Miller to receive and file the project updates.

Adopted: YEAS: 2
NAYS: 0

Mr. Downing referenced the OCIP Administration fees that were discussed earlier in the Eight and One Half Mile Relief Meeting.

A motion was made by Mr. VanSyckel, supported by Ms. Miller to approve Amendment #1 to the Owner Controlled Insurance Program agreement with Meadowbrook Insurance for an increase and one-time payment.

Adopted: YEAS: 2
NAYS: 0

Change Order #4 to Oscar Renda Segment 5 Project for added scope of just over \$1 million was presented. This change order was added at the direction of the owner and includes rehabilitation of the drop shaft and connecting sewers at the FR-S-2 and CT-S-7 metering facilities and the spray lining of the manholes upstream of Segment 5 that were not coated during the 2016 Interceptor Collapse project. Both are slated for rehabilitation in the near future so we wanted to complete this maintenance while we are already there working. Also, for Work Change Directives #1 and #5 we did the permanent electrical design and the task required relocation of the dewatering system's settling tank to accommodate the new concrete electrical pad and associated conduit. There is an additional cost for the survey of the OMID's PCI-7 reach of the Interceptor. The last two cost items are the RFI #42 and #43 related to the temporary power installed by Oscar Renda at the site for construction activities to be turned over to the MID as permanent power for future use.

A motion was made by Mr. VanSyckel, supported by Ms. Miller to approve Change Order #4 to the Oscar Renda Contract for the net increase of \$1,030,286.46 and the addition of 88 days to the construction schedule.

Adopted: YEAS: 2
NAYS: 0

Mr. Astorino updated on Control Structure 3 (CS-3) Hydraulic Cylinder which is the flow control sluice gates. We have recently replaced one of the two hydraulic cylinders which had failed and it took almost a year to get that cylinder delivered. The plan was to rehab the bad one we pulled out, unfortunately, it was not worth repairing. So we pursued pricing on a new cylinder, we even switched manufacturers to get a better lead time and paid a little more, however the pricing is reasonable. The lead time is 10-12 weeks which is much better than what we had before.

A motion was made by Mr. VanSyckel, supported by Ms. Miller to approve the recommendation to authorize the purchase of a replacement hydraulic cylinder for CS-3 with HESCO for \$38,828.13.

Adopted: YEAS: 2
NAYS: 0

The Chair presented the invoices totaling \$9,729,314.15 to the board for review and approval.

A motion was made by Mr. VanSyckel, supported by Ms. Miller to approve the invoices as presented.

Adopted: YEAS: 2
NAYS: 0

A motion to receive and file the financial report given by Mr. Manning was made by Mr. VanSyckel and supported by Ms. Miller.

Adopted: YEAS: 2
NAYS: 0

There being no further business, it was moved by Mr. VanSyckel, supported by Ms. Miller, that the meeting of the Macomb Interceptor Drain Board be adjourned.

Adopted: YEAS: 2
NAYS: 0

The meeting was adjourned at 10:58 A.M.



Candice S. Miller, Chair
Macomb County Public Works Commissioner

STATE OF MICHIGAN
COUNTY OF MACOMB

I certify that the foregoing is a true and correct copy of proceedings taken by the Intra-County Drainage Board for the Drainage District shown on the attached set of minutes, on July 11, 2022 the original of which is on file in the Public Works Commissioner's Office. Public notice of the meeting was given pursuant to Act No. 267, Public Acts of Michigan, 1975, including, in the case of a special or rescheduled meeting or a meeting secured for more than 36 hours, notice by posting at least 18 hours prior to the time set for the meeting.



Candice S. Miller, Chair
Macomb County Public Works Commissioner

DATED: 07/11/22



Candice S. Miller

Public Works Commissioner
Macomb County

To: Macomb Interceptor Drain Drainage District Board Members

CC: File

From: Stephen Downing, Construction & Maintenance Manager

Date: August 8, 2022

Subject: Construction Projects Status Updates for August 2022 Board Meeting

The following provides a status update for construction work performed within the Macomb Interceptor Drain Drainage District for the previous month.

Segment 5 Rehabilitation

Contractor: Oscar Renda

Engineering Consultant: FK Engineering

Project Description:

The Segment 5 reach of the Romeo Arm Interceptor is approximately 8,300 linear feet; it runs along 15 Mile Road starting at the ITC Corridor and extends east to approximately Hayes Road. The first 7,000 linear feet is 11-foot diameter non-reinforced concrete pipe, and the next 1,300 linear feet is 8-foot diameter steel reinforced concrete pipe. The rehabilitation consists of debris removal, cleaning, and inspection of the pipe's invert. Next, HOBAS pipe will be used to slip line 7,000 linear feet of the 11-foot diameter sewer and the 1,300 linear feet section of 8-foot diameter pipe will be coated with a corrosion resistant geo-polymer spray applied coating. To facilitate this work, a new control structure and access shaft is under construction in the ITC Corridor. The new control structure will provide the contractor access to the sewer to facilitate the work and will also serve as a dewatering pump station to draw down the upstream water level in the sewer.

Significant project tasks that have occurred over the past month:

1. Continued development, review, and approval of the required construction submittals.
2. Ground dewatering well maintenance and monitoring.
3. The Motor Control Center (MCC) for the CS-12 PS was delivered and set in place.
4. Continued spray-lining the 8-foot diameter interceptor (PCI-37).
5. Continued construction of the CS-12 permanent structure, which includes:
 - a. Rebar installation for the walls and gate columns

- b. Concrete formwork removal/installation
- c. Concrete placement of the fourth column and wall lift.

Construction Costs:

	Date (if applicable)	
Original Contract Amount	10/21/2020	\$28,807,500.00
Current Contract Amount	7/31/2022	\$31,702,534.88
Total Spent to Date	7/31/2022	\$13,488,477.93
Remaining Budget	7/31/2022	\$18,214,056.95

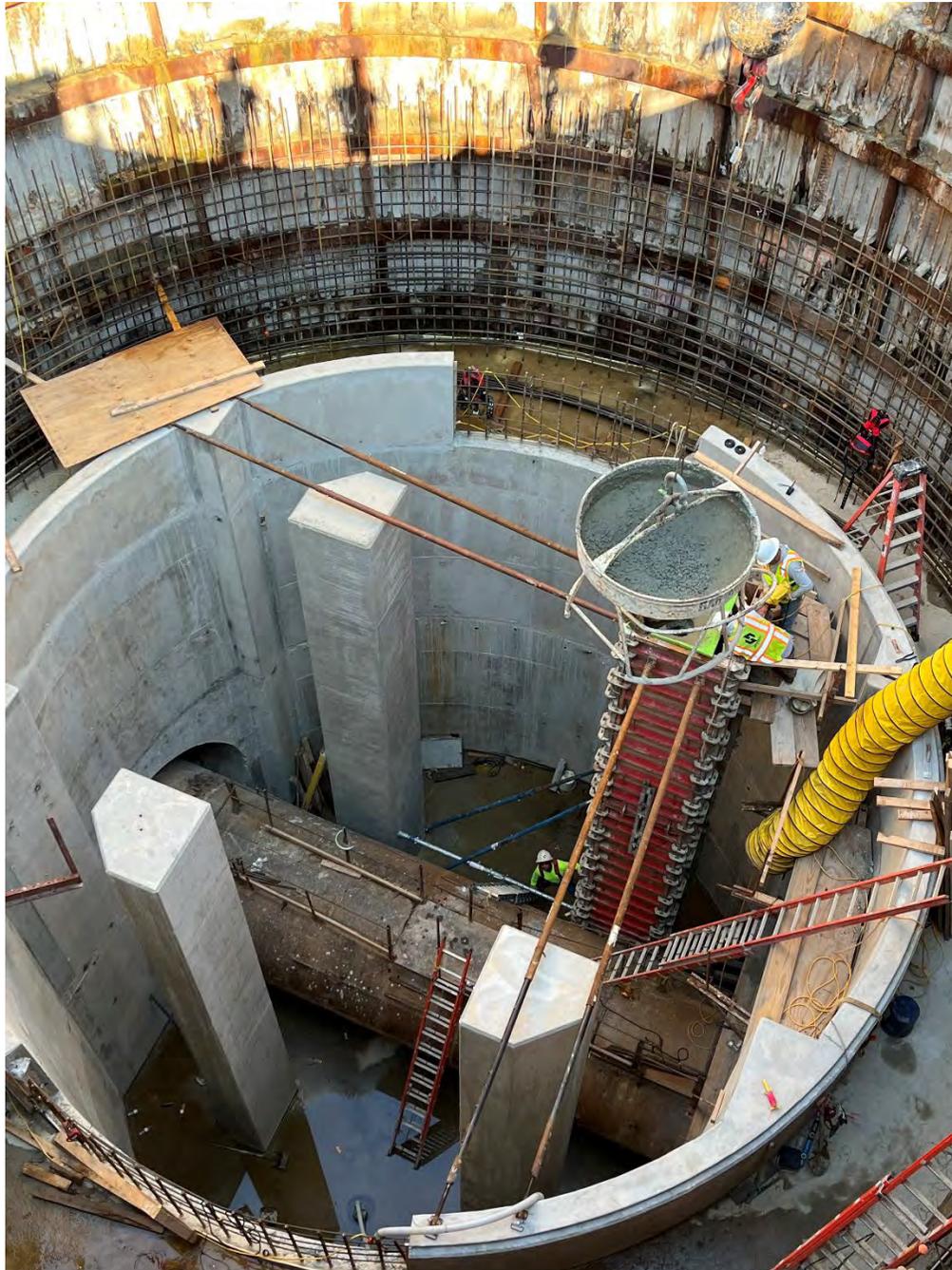


Figure 1 – CS-12 Concrete Placement for Column 4



Figure 2 - CS-12 Concrete Placement for Column 4



Figure 3 – CS-12 Post Column 4 Form Removal



Figure 4 – CS-12



Figure 5 – CS-12

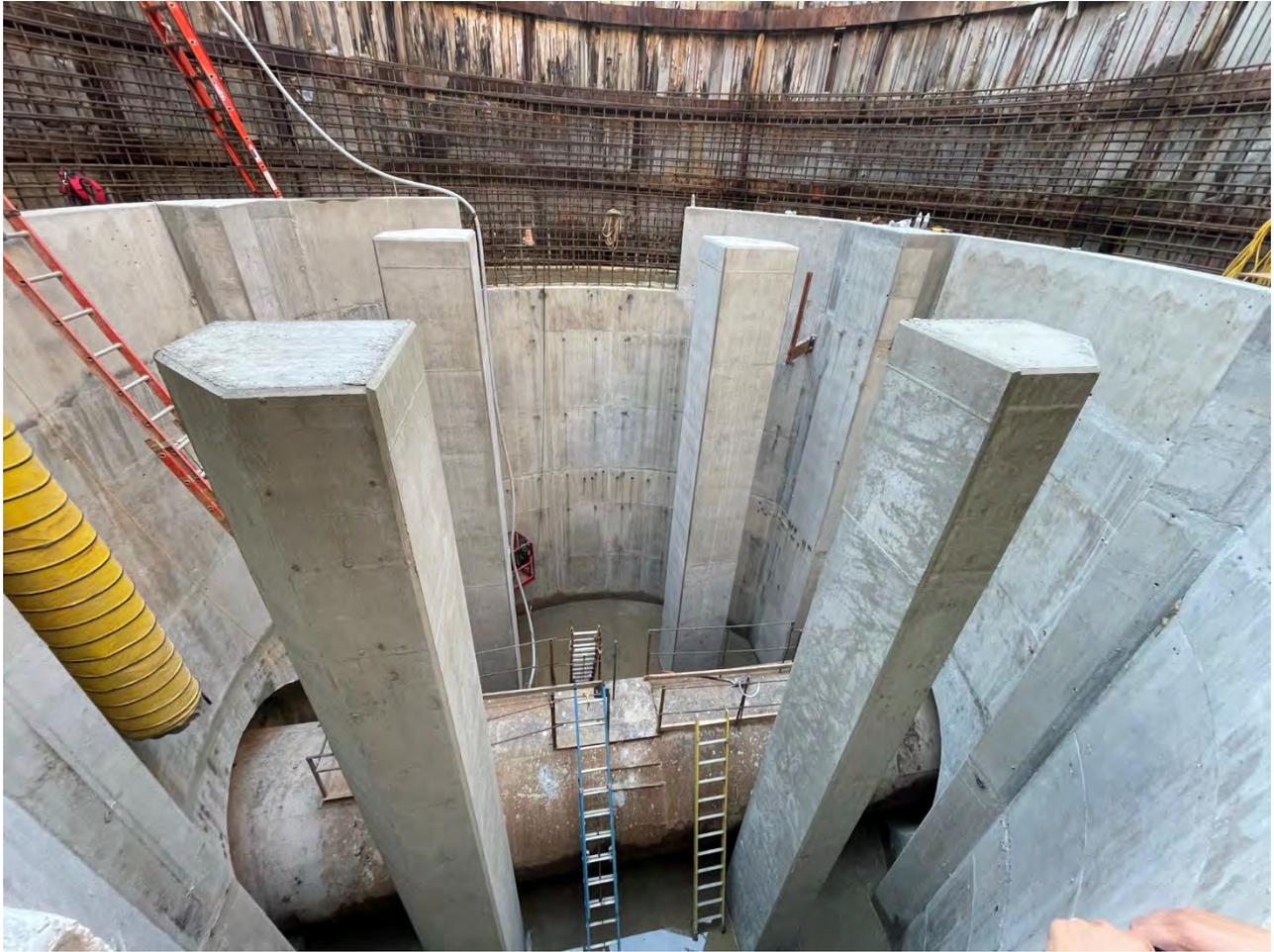


Figure 6 - CS-12



Figure 7 - Spray-Lining Base Layer



Figure 8 - Installation of C-Grid



Figure 9 - Spray-Lining Outer Layer



Figure 10 - Spray-Lining Outer Layer

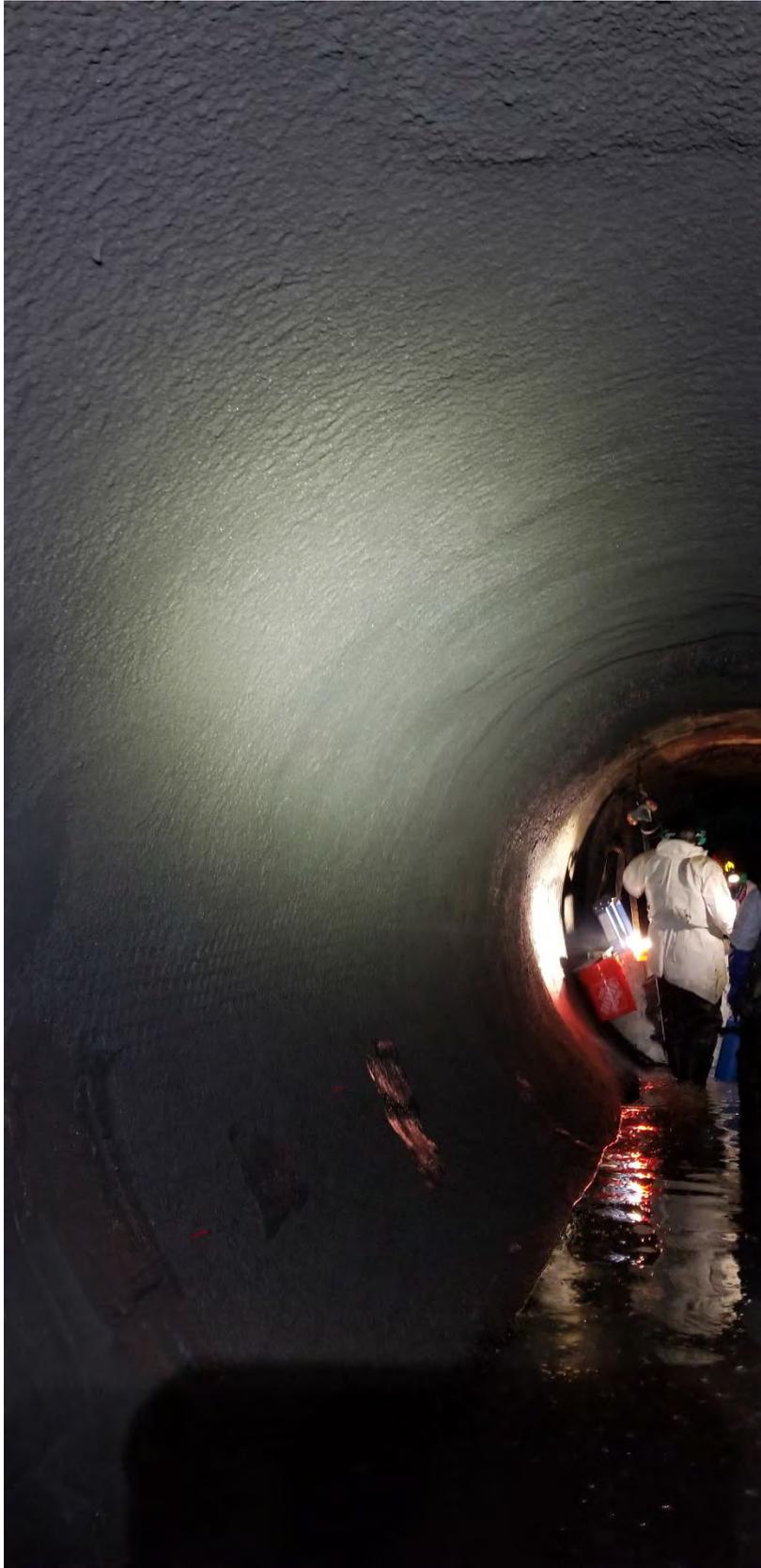


Figure 11 - Spray-Lining Finished



Figure 12 - CS-12 Pump Station MCC Enclosure



Figure 13 - CS-12 Pump Station MCC Enclosure

Phase II Grouting

Contractor: Doetsch Environmental Services, Inc.

Engineering Consultant: AEW

Project Description:

The Phase II Grouting project was awarded to Doetsch Environmental during summer 2020. The work includes chemical grouting of the sewer and manholes where infiltration is present. The work is planned in all reaches of the system not included in the Segment 5 or portion of the Romeo Arm rehabilitated during the 2016 Interceptor Collapse. The main areas of work include the Romeo Arm along Garfield Road between 15 Mile and Clinton River Roads, the Garfield Interceptor between Clinton River and 21 Mile Roads, and the Lakeshore Interceptor between the Clintondale Pump Station at 15 Mile and Union Lake and Joy Boulevard in Harrison Township. The chemical grouting is aimed to stop all active infiltration within the system in advance of future rehabilitation and maintenance projects.

Significant project tasks that have occurred over the past month:

1. The crew completed work in the Garfield Interceptor near M-59 and Garfield Road.
2. AEW, Doetsch and MCPWO personnel are currently evaluation where the crew will move to next which is dependent upon the flow control needs and coordination with other projects. This coordination will require grouting to occur on afternoons or nights based on where in the system they are working.
3. On Saturday July 9, 2022 the Doetsch crew assessed the Garfield Interceptor near 16 Mile Road. This area was initially identified as critical strictly based on the location, not due to any known defects. There was not any infiltration or defects identified during this inspection
4. There was not an invoice submitted for June or July 2022.

Construction Costs:

	Date (if applicable)	
Original Contract Amount	6/24/2020	\$3,000,000.00
Change Order No. 1	3/14/2022	\$3,000,000.00
Current Contract Amount	3/14/2022	\$6,000,000.00
Total Spent to Date	5/28/2022	\$4,235,435.20
Remaining Budget	5/28/2022	\$1,764,564.80

Meter Facility Rehabilitation

Contractor: Weiss Construction

Engineering Consultant: HRC

Project Description:

The project includes the rehabilitation of three sewerage meter facilities; work includes removal and application of concrete surface repairs and protective coatings, televising, cleaning, and spray-lining the existing influent and effluent connecting sewers; rehabilitation existing adjacent sanitary manholes; improving access and safety features for maintenance personnel; and replacing existing electrical systems.

The sites, SY-S-1 and SY-S-2 are in Shelby Township and WA-S-1 is in Washington Township. The meter facilities are the point of transition of sewerage flow from the local systems into the MIDDD Interceptors. Each of the metering facilities provides the critical flow data required to allocate the billing apportionment for each of the MIDDD member communities.

The Shelby Township meter facilities, originally constructed by DWSD, have reached the end of their useful life and are need of rehabilitation. The MCPWO previously rehabilitated several of the older metering facilities in the system, which were also constructed by DWSD.

The Washington Township meter facility is currently owned by Washington Township, which is a unique situation in the MIDDD system. Typically, the MIDDD assumes ownership of the billing meter facilities, which includes operation and maintenance activity. As such, the MCPWO negotiated a transfer agreement with Washington Township to transfer ownership of this asset to the MIDDD. The two entities agreed to equitable cost sharing terms within the agreement.

The project was designed by Hubbell, Roth and Clark and the construction contract was awarded to Weiss Construction. The total construction cost for the project is \$857,159.00. The work started in April 2021.

Significant project tasks that have occurred over the past month:

1. The Contractor is finalizing the closeout documents.
2. The final balancing change order will be presented to the Board in September 2022.
3. This project will then be removed from future reports.

Construction Costs:

	Date (if applicable)	
Original Contract Amount	12/3/2020	\$857,159.00
Current Contract Amount	3/30/2022	\$863,168.85
Total Spent to Date	3/30/2022	\$770,291.64
Remaining Budget	3/30/2022	\$92,877.21

Segment 6 Rehabilitation

Contractor: Ric-Man Construction

Engineering Consultant: FK Engineering

Project Description:

The Segment 6 Rehab project includes the rehabilitation of these main elements:

1. Cleaning and slip-lining (Hobas) of the 5-foot diameter 15 Mile Interceptor from MH-01 at Garfield Road and 15 Mile to MH-04 approximately 2200 feet east along 15 Mile.
2. Cleaning and slip-lining (Hobas) the 1400 linear feet 11-foot diameter Romeo Arm Interceptor sewer between CS-3 on 15 Mile Road and CS-2 on Garfield north of 15 Mile Road.
3. Rehabilitation of the Meter Facility FR-S-1 on Garfield south of 15 Mile Road.
4. Rehabilitation and spray-lining of the CS-2 and CS-3 control structure facilities. These concrete structures have been damaged by H2S damage over time and need repair.
5. Installation of an air-jumper to be incorporated into the existing Biofilter facility. This is being done to address the high level of odor issues that have resulted over the years from the intersection of 15 Mile and Garfield.
6. Installation of a new gate control structure on the 15 Mile Interceptor. This will allow for the rehabilitation of the MH-01 structure and provide future storage options within that interceptor.

The project started in September 2021 and is scheduled to be completed in March 2023.

Significant project tasks that have occurred over the past month:

1. The Contractor continues to develop and submit the required submittals to the Engineer & Owner for review.
2. The Project team is working with the insurance carrier on a Builder's Risk Claim to determine if a claim condition exists for the damaged HOBAS pipe and installation of the remaining 240 feet of pipe.
 - a. The cost estimates for the repair, additional work and Engineering CCA were finalized and submitted to the insurance carrier.
3. The construction of the permanent CS-13 Shaft continued with the concrete placement of wall lift #1
4. Performed utility locating along the FAD alignment.

Construction Costs:

	Date (if applicable)	
Original Contract Amount	5/1/2021	\$13,541,545.00
Change Order No. 1	8/1/2021	\$132,664.70
Total Contract Amount	7/31/2022	\$13,674,209.70
Total Spent to Date	7/31/2022	\$3,719,782.64
Remaining Budget	7/31/2022	\$9,954,427.06

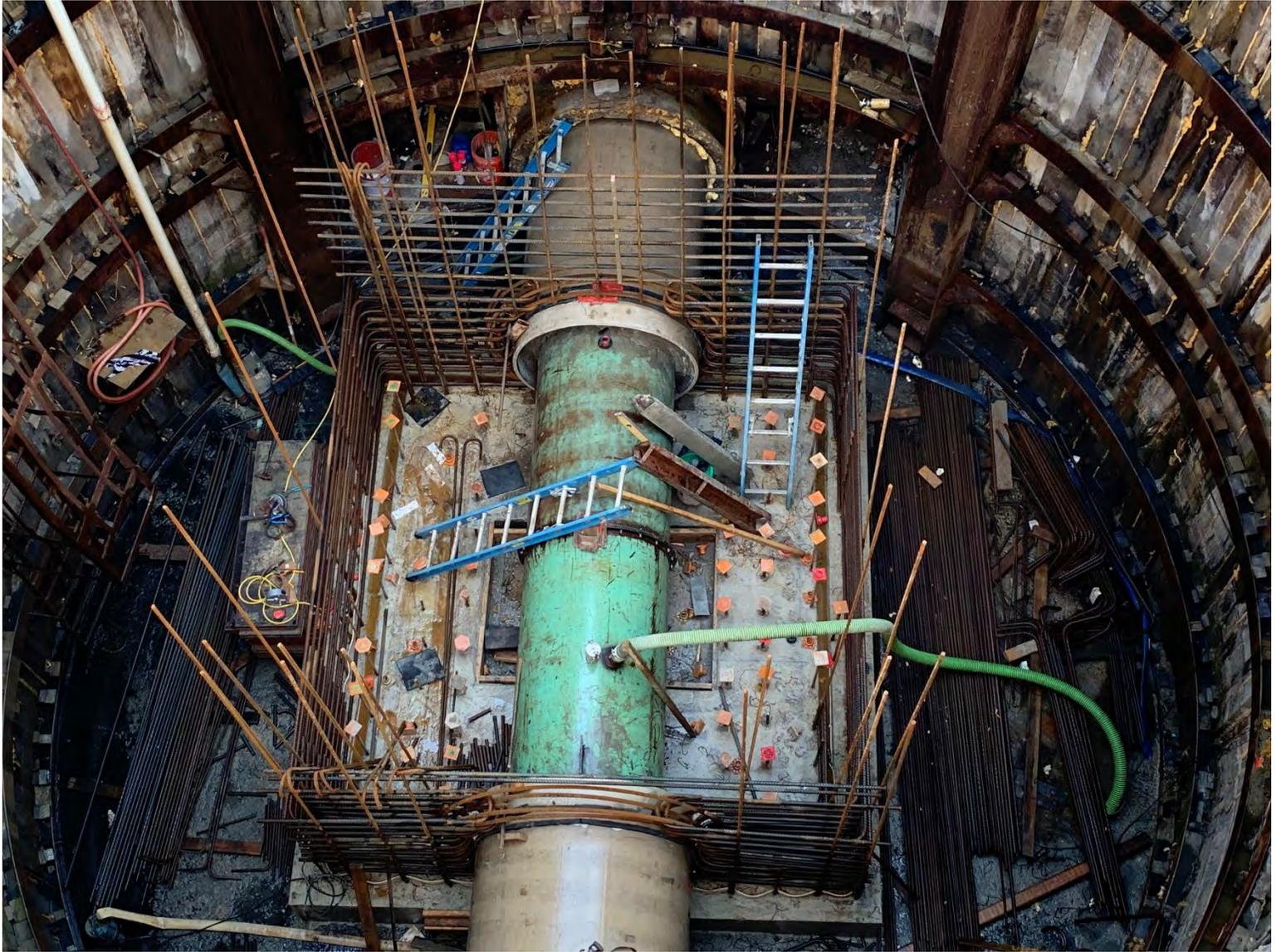


Figure 14 – CS-13 Construction – Wall Lift #1 Rebar Installation



Figure 15 - CS-13 Construction - Wall Lift #1 Rebar Installation



Figure 16 - CS-13 Construction - Wall Lift #1 Rebar Installation



Figure 17 - CS-13 Construction - Wall Lift #1 Concrete Formwork

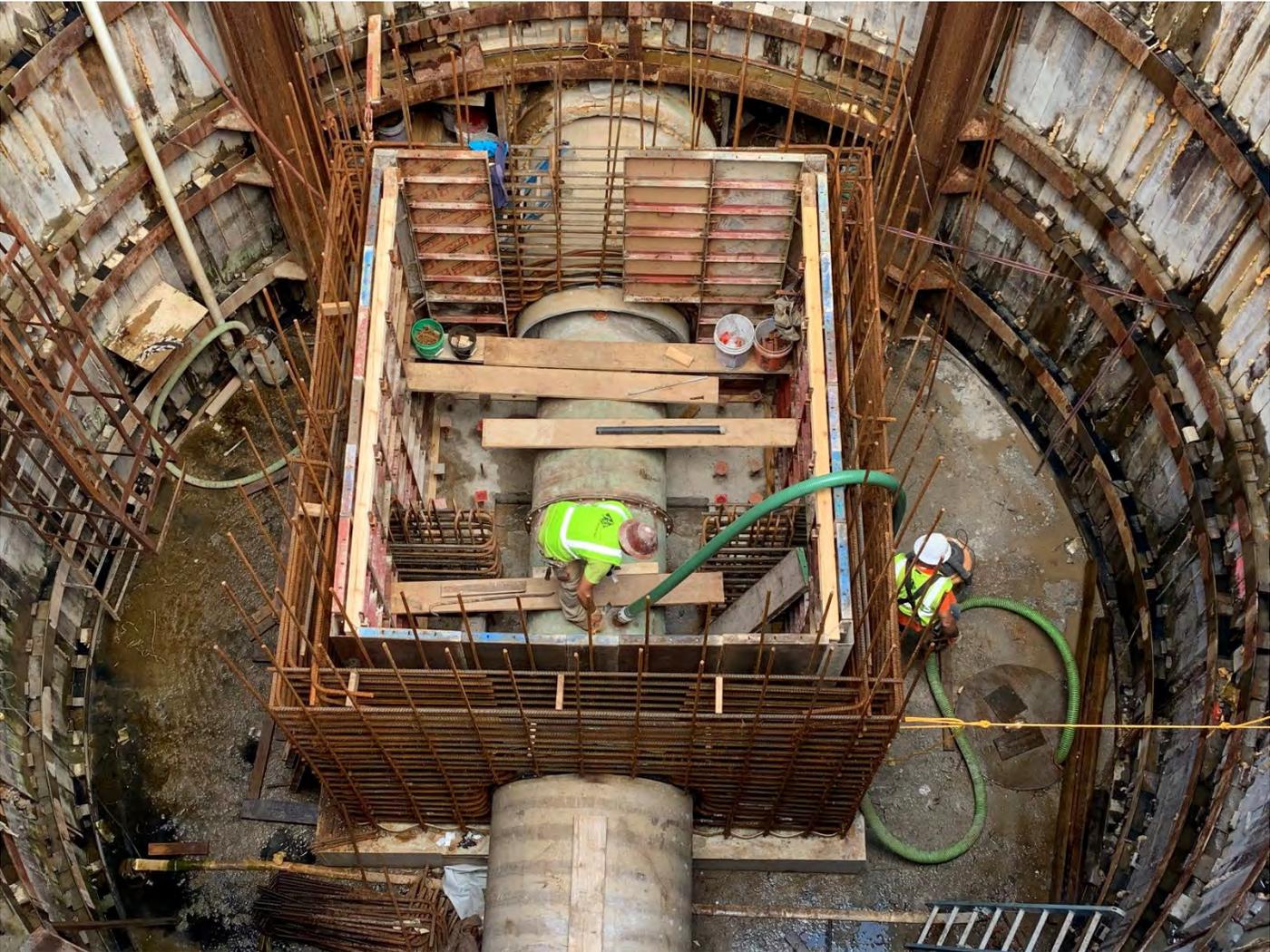


Figure 18 - CS-13 Construction - Wall Lift #1 Concrete Formwork

Interceptor Inspection Program

Contractor: Doetsch Environmental Services, Inc.

Engineering Consultant: Fishbeck

Project Description:

The 2020 sewer inspection program was awarded to Doetsch Environmental Services in November 2020. The inspection program includes inspection of approximately 26 miles of sanitary sewer, 360 manholes and other aspects of the sanitary sewage infrastructure across multiple drainage districts, including the MIDDD.

The MIDDD portion of the inspection program includes 101,335 linear feet (19.25 miles) of pipe ranging in diameter from 24" to 132" and 145 manhole structures. Additionally, inspection of 8 junction chambers and 8 Drop Shaft/Connecting sewers will be performed.

The inspection interval for the entire system is based on a 3-year cycle, where non-reinforced concrete pipe is inspected every 3 years and reinforced concrete pipe is inspected every 6 years. The 2020 inspection program is the largest ever performed by the Macomb County Public Works Office. The project started in May 2021 and is expected to be completed in May of 2022.

Significant project tasks that have occurred over the past month:

1. The Contractor did not submit a pay application for the months of December, January, February, March, April, May, June or July.
2. The Consultant is reviewing the data and preparing inspection reports.
3. The Owner's Representatives, Engineering Consultant and Contractor are coordinating completion of the remaining areas to be inspected, which included:
 - a. 8 Drop Shaft and Connecting Sewers
4. Review of the data has not revealed any additional areas of concern.

Construction Costs:

	Date (if applicable)	
Original Contract Amount	1/19/2021	\$280,034.00
Total Spent to Date	11/1/2021	\$62,703.85
Remaining Budget	11/1/2021	\$217,330.15

***This Table reflects the MIDDD costs only.**

Macomb Interceptor Drain Drainage District Romeo Arm Interceptor Segment 5 Lining & Segment 6 Rehabilitation Construction Update

8-1-2022



Romeo Arm Interceptor Segment 5 Lining

Purpose of Presentation – Summary of Work

- ▶ Romeo Arm Interceptor Segment 5 Lining
 - ▶ Work Completed to Date:
 - ▶ CS-12 Temporary Earth Retention System
 - ▶ Flume Romeo Arm Flow with Shaft
 - ▶ Work in Progress:
 - ▶ CS-12 Finished Structure
 - ▶ CS-12 Drop Pipe Connections
 - ▶ CS-12 Pumping Components
 - ▶ Romeo Arm Spray Lining
 - ▶ Romeo Arm Debris Removal
 - ▶ Work Pending:
 - ▶ Romeo Arm Slip Lining
 - ▶ FR-S-2/CT-S-7 Lining



Work Completed

CS-12 Temporary Earth Retention System (TERS)

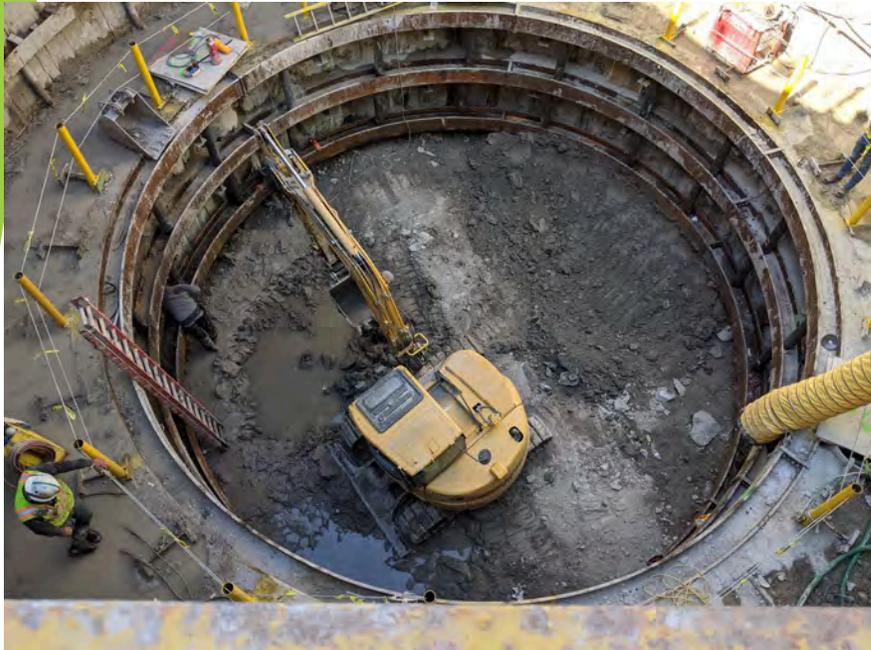
- Upper portion consisted of steel ribs and wood lagging boards that had an inside diameter of 45-ft.
- Upper excavation within the rib and board system was 40-ft deep.



Work Completed

CS-12 TERS

- Lower portion consisted of concrete secant piles that were each 1-meter in diameter. 60 piles in total. Inside diameter of secant piles was approximately 34.5-ft.
- Lower excavation within the pile ring was 28-ft deep.
- Primary piles had I-beam reinforcement and were 51-ft deep.
- Secondary piles had no reinforcement and were 38-ft deep.



Work Completed

Romeo Arm Flume

- Installed (2) two 8-ft diameter, 25-ft long sections of steel pipe.
- Welded together within the shaft to make a 50-ft long section.
- Bulkheaded the annular space on each end for flow to go through flume pipe and to allow TERS bottom to be dry during finished structure work.



Work In Progress

CS-12 Finished Structure

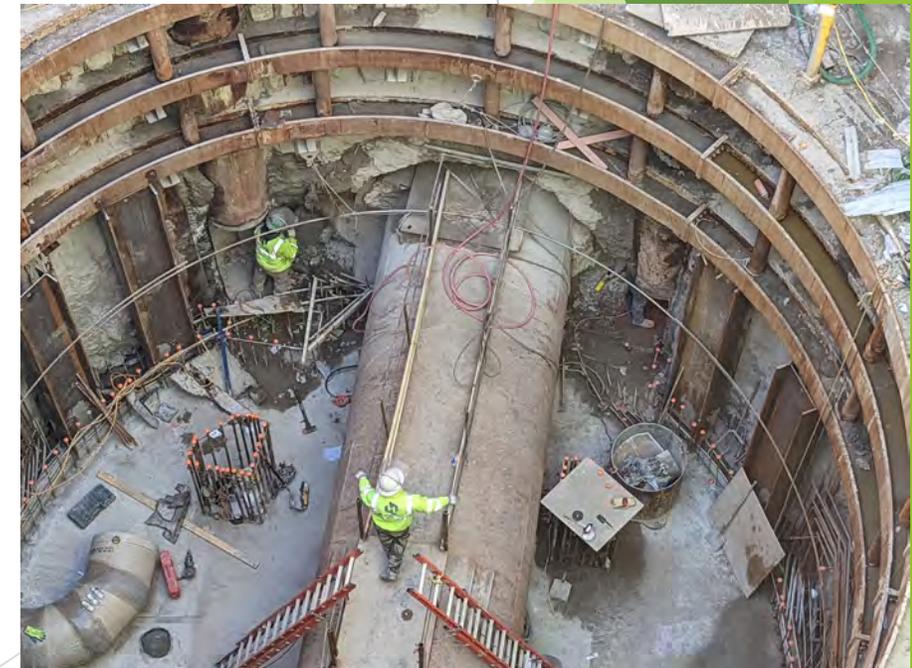
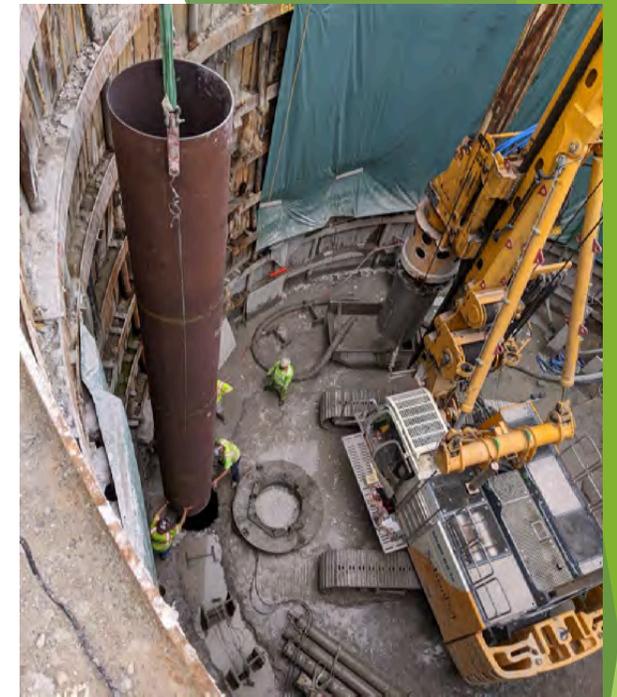
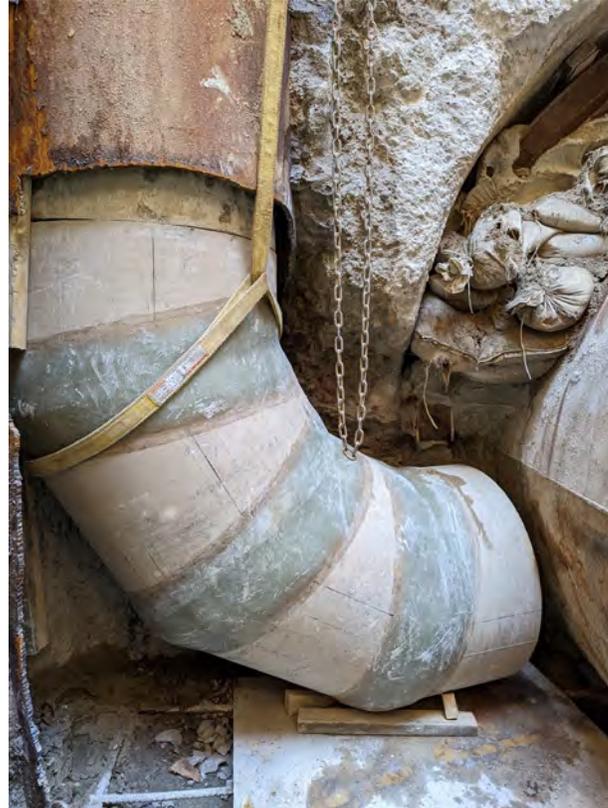
- Lower portion of the finished structure has been poured.
- Base slab is 4-ft thick with two large sumps for pumps to be placed.
- Columns to be used for stoplog gate placed are approximately 3.3-ft x 3.3-ft and 30-ft tall. Four columns in total.
- Lower wall is 21-in thick, 31-ft inside diameter, and 23-ft tall.
- Concrete bench for bypass pumping is placed.



Work In Progress

CS-12 Drop Pipe Connections

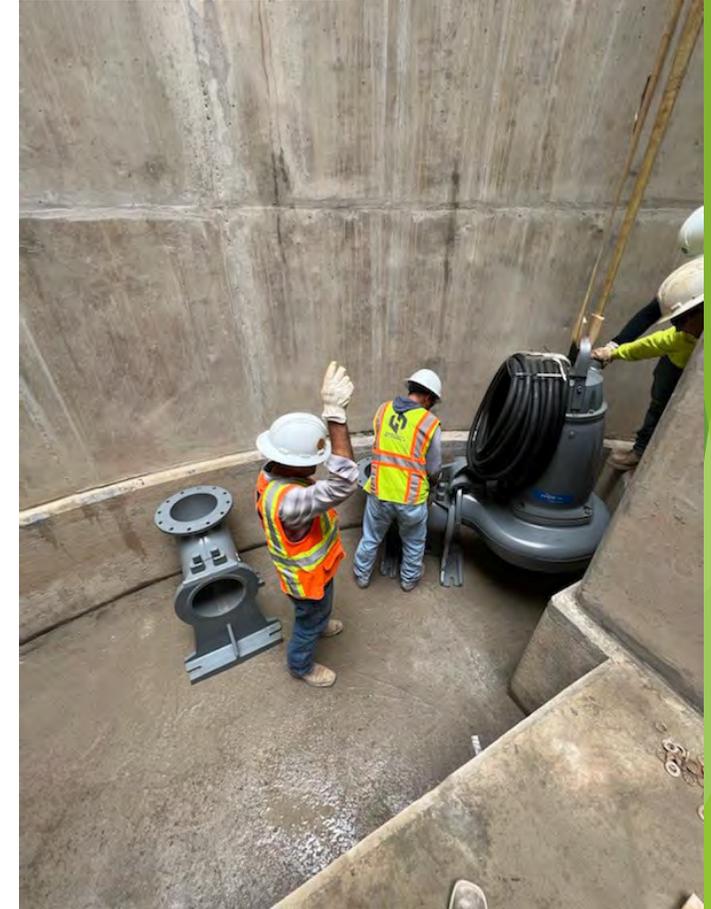
- Three secant piles installed had a 3-ft diameter steel pipe instead concrete. Two were installed on the downstream side of shaft and one was installed on the upstream side. These will be used for bypass pumping.
- Within these steel pipes, a vertical section on Hobas pipe was place.
- With the TERS, a Hobas elbow was installed for a future connection to the Romeo Arm at a later date.



Work In Progress

CS-12 Pumping Components

- 6 pumps in total will be placed within the finished structure. Have been delivered to the site.
- Motor Control Center was delivered on 7/27.
- Portions of electrical components have been installed.



Work In Progress

Romeo Arm Debris Removal

- Approximately 6,000 tons of debris is planned to be removed from the Romeo Arm.
- Portions of the Romeo Arm between RAI-MH-005 and RAI-MH-007 have had debris removed to facilitate spray lining activities.



Work In Progress

Romeo Arm Spray Lining

- Rehabilitation for the 8-ft diameter portion of the Romeo Arm consists for spray lining.
- Spray lining consists of 2.5-in of GeoKrete geopolymer with a layer of carbon fiber reinforcing grid.
- As of 7/27, approximately 280-ft of spray lining has been completed



Work In Planning

Romeo Arm Slip Lining

- Once debris have been removed from the Romeo Arm, the 11-ft diameter portion will be slip lined with 9-ft, 2-in Hobas pipe.

FR-S-2/CT-S-7 Lining

- Portions of both FR-S-2 and CT-S-7 will be rehabilitated with cured-in-place-pipe (CIPP) and GeoKrete spray lining.

Segment 6 Rehabilitation

Purpose of Presentation – Summary of Work

▶ Segment 6 Rehabilitation

▶ Work Completed to Date:

- ▶ CS-13 Temporary Earth Retention System
- ▶ Flume PCI-15C Flow with Shaft
- ▶ PCI-15C Debris Removal

▶ Work in Progress:

- ▶ CS-13 Finished Structure
- ▶ PCI-15C Slip Lining

▶ Work Pending:

- ▶ Foul Air Duct
- ▶ MH-1 Modification
- ▶ FR-S-1 Spray Lining
- ▶ Romeo Arm Debris Removal
- ▶ Romeo Arm Slip Lining
- ▶ CS-2 and CS-3 Spray Lining



Work Completed

CS-13 TERS

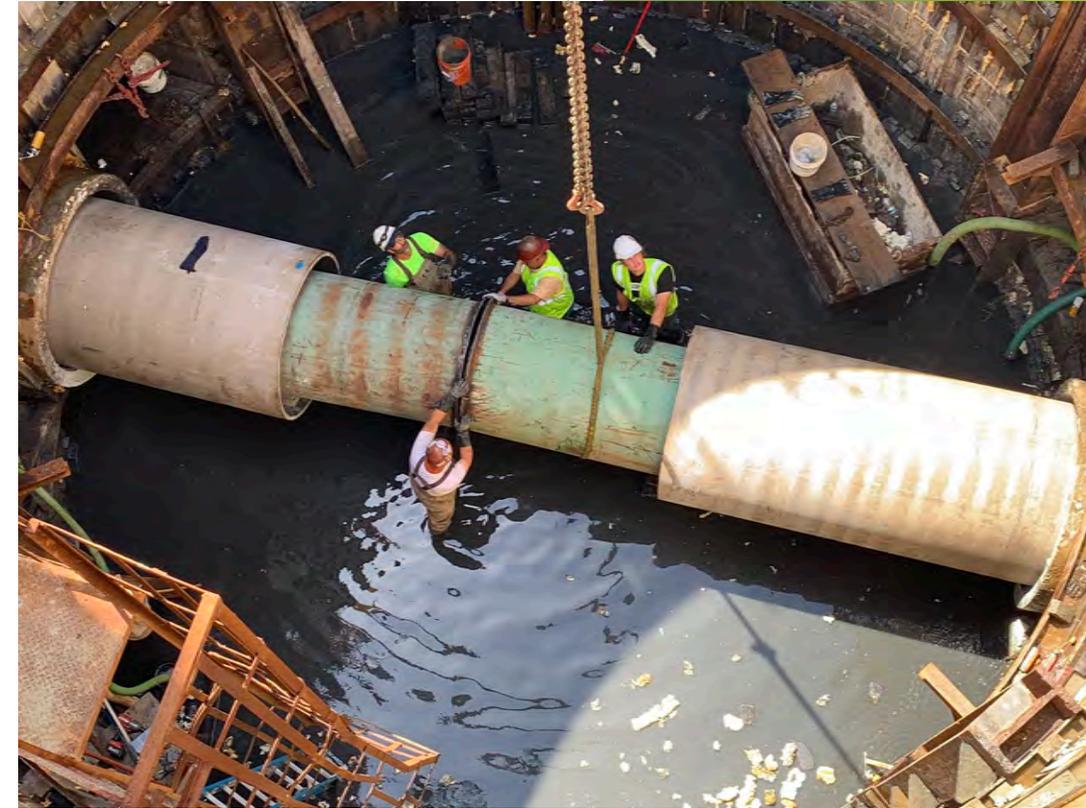
- Upper portion consisted of steel ribs and wood lagging boards that had an inside diameter of 45-ft.
- Upper excavation within the rib and board system was 40-ft deep.



Work Completed

PCI-15C Flume

- Installed two sections of 42-in diameter steel pipe.
- Bolted together within the shaft.
- Bulkheaded the annular space on each end for flow to go through flume pipe and to allow TERS shaft bottom to be dry during finished structure work.



Work Completed

PCI-15C Debris Removal

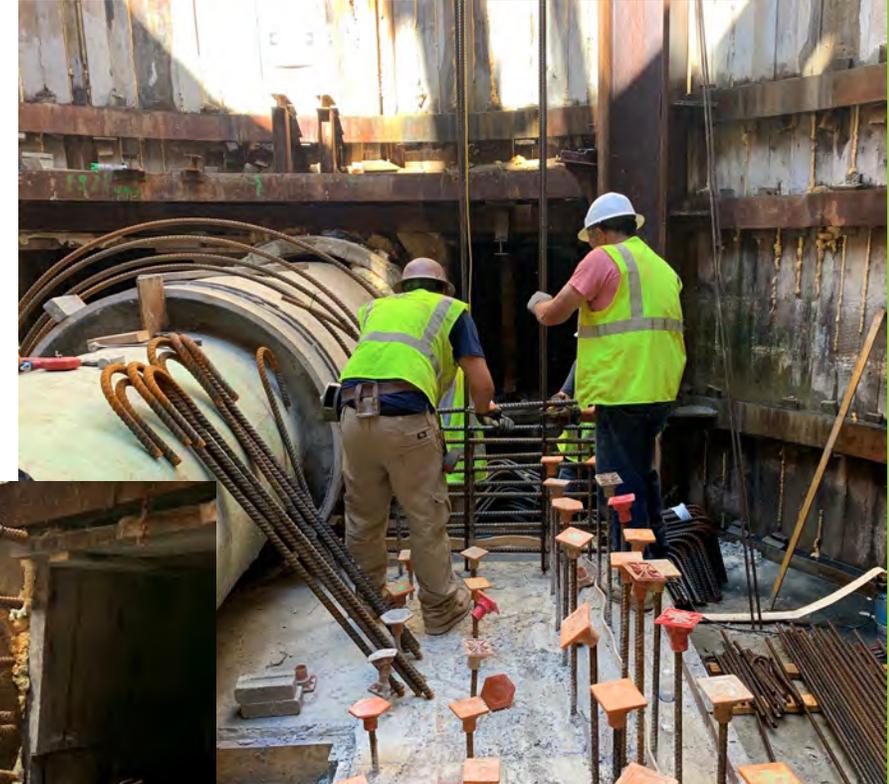
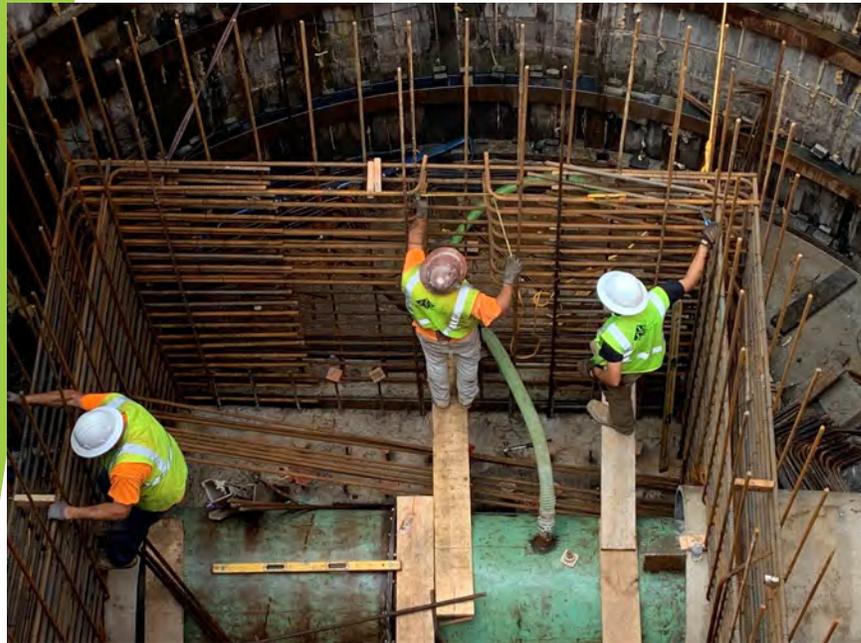
- Ran a pressure jet to remove any debris or loose material in PCI-15C prior to slip lining.



Work In Progress

CS-13 Finished Structure

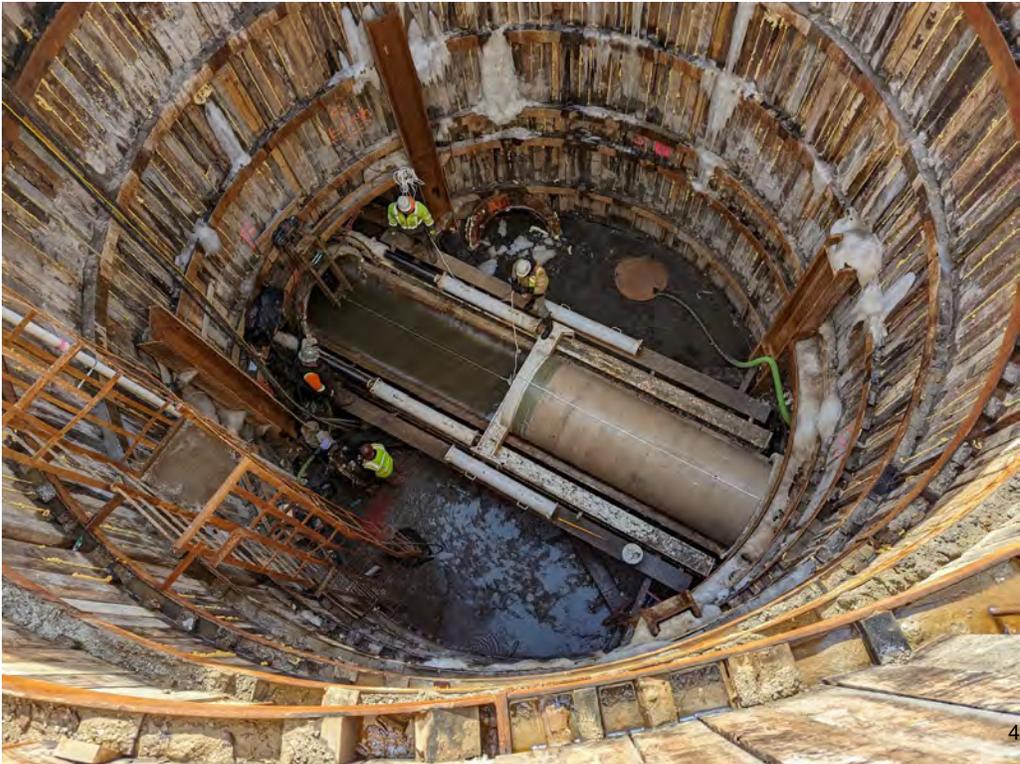
- Base slab is 18-in thick and is approximately 15-ft x 13-ft.
- Side walls are 18-in thick and rebar has been placed.



Work In Progress

PCI-15C Slip Lining

- After debris was removed from PCI-15C it was slip lined with 57-in Hobas pipe. Approximately 1,740-ft of the planned 2,141-ft has been placed so far.



Work In Planning

Foul Air Duct (FAD)

- A 30-in inside diameter pipe will be installed along the north side of 15 Mile Road to connect 15MI-MH-001 to CS-3. This will be used to minimize odor issues.

MH-1 Modification

- A temporary earth retention system will be built over 15MI-MH-001 to allow for the connection to the FAD to be made and make the manhole riser a consistent 6-ft diameter.

FR-S-1 Lining

- Portions of FR-S-1 will be rehabilitated with geopolymer and epoxy spray lining products.

Work In Planning

Romeo Arm Debris Removal

- Approximately 1,200 tons of debris is planned to be removed from the Romeo Arm between CS-2 and CS-3.

Romeo Arm Slip Lining

- Once debris have been removed from the Romeo Arm between CS-2 and CS-3, it will be slip lined with 9-ft, 2-in Hobas pipe.

CS-2 and CS-3 Spray Lining

- Portions of both CS-2 and CS-3 will be rehabilitated with geopolymer and epoxy spray lining products.

Questions?



FKE



Anderson, Eckstein and Westrick, Inc.



Engineers | Architects | Scientists | Constructors



Applied Science, Inc.



Candice S. Miller

Public Works Commissioner
Macomb County

To: Macomb Interceptor Drain Drainage District Board Members

CC: FILE

From: Stephen Downing, Construction & Maintenance Manager

Date: August 8, 2022

Subject: Drop Shaft Rehabilitation Change Order Request – Inland & AEW

On November 18, 2019, the Board authorized entering a contract with Inland Waters Pollution Control for the lump sum of \$1,157,147 for the rehabilitation of the ST-S-4, ST-S-5 and UT-S-1 Drop Shafts and Connecting Sewers designed by AEW. The project was originally scheduled to start in February of 2020 which coincides with the beginning of the COVID-19 Pandemic. As a result, this project experienced multiple delays for various reasons related to the COVID-19 Pandemic. The Contractor achieved substantial completion in June 2021 which was approximately 1-year after the originally schedule date. The Contractor was further delayed in providing the required close-out documentation due to severe flooding in their Detroit Office.

The IWPC Change Order No. 1 is a deduct change order to zero out unused allowances. The attached change order and contract modification form summarizes the deducts which total \$204,121.84.

The AEW Change Order No. 1 is an add change order in the amount of \$168,703.30 which stems from the extended construction schedule and added scope during the design phase related to the Drop Bowls. The attached AEW Memo provides a detailed breakdown of the additional costs incurred.

At the time of award for this project the NTH and the AEW designed project we were a combined \$3,233,403.00 under the budgeted amount. The recommended change orders result in a net decrease in cost to the MID of \$35,418.54.

The recommendation is that the Macomb Interceptor Drain Drainage District Board approve Inland Waters Pollution Control Change Order No. 1 for the net decrease of \$204,121.84.

The recommendation is that the Macomb Interceptor Drain Drainage District Board approve AEW Consultants Change Order No. 1 for the net increase of \$168,703.30.

Attachments: Drop Shaft Rehabilitation Award Recommendation Memo 11-18-19
IWPC Change Order No. 1
AEW Change Order No. 1

CHANGE ORDER NO.: 1

Owner: Macomb Interceptor Drain Drainage District Owner's Project No.: WWS-2019-020
 Engineer: AEW Engineer's Project No.: 0211-0193
 Contractor: Inland Waters Pollution Control Contractor's Project No.:
 Project: Metering Facility Drop Shaft and Connecting Sewer Rehabilitation
 Contract Name:
 Date Issued: August 3, 2022 Effective Date of Change Order: August 3, 2022

The Contract is modified as follows upon execution of this Change Order:

Description: **Revision of Contract Price to final balance the unused items in contract as described in the attached contract modification prepared by AEW.**

Attachments: N/A

N/A Change in Contract Price	Change in Contract Times [State Contract Times as either a specific date or a number of days]
Original Contract Price: \$ <u>1,157,147.00</u>	Original Contract Times: Substantial Completion: _____ Ready for final payment: _____
Increase /Decrease from previously approved Change Orders No. 0 to No. 1: \$ <u>0.00</u>	[Increase] [Decrease] from previously approved Change Orders No.1 to No. [Number of previous Change Order] : Substantial Completion: _____ Ready for final payment: _____
Contract Price prior to this Change Order: \$ <u>1,157,147.00</u>	Contract Times prior to this Change Order: Substantial Completion: _____ Ready for final payment: _____
Decrease from this Change Order: \$ <u>204,121.84</u>	[Increase] [Decrease] this Change Order: Substantial Completion: _____ Ready for final payment: _____
Contract Price incorporating this Change Order: \$ <u>953,025.17</u>	Contract Times with all approved Change Orders: Substantial Completion: _____ Ready for final payment: _____

Recommended by Engineer (if required)	Authorized by Owner
By: <u>Chris Frayer</u>	_____
Title: <u>Principal Engineer</u>	_____
Date: <u>August 3, 2022</u>	_____
Authorized by Owner	Approved by Funding Agency (if applicable)
By: <u>Candice Miller</u>	_____
Title: <u>Board Chair</u>	_____
Date: <u>August 8, 2022</u>	_____



Contract Modification

Anderson, Eckstein and Westrick, Inc.

10/28/2021 3:43 PM

FieldManager 5.3c

Contract: .0211-0193, Drop Shaft & Connecting Sewer Rehab

Cont. Mod. Number 1	Revision Number	Cont. Mod. Date 10/28/2021	Net Change \$-204,121.84	Awarded Contract Amount \$1,157,147.00
Route				Entered By Michelle Ankawi
Contract Location Macomb Interceptor Drain Drainage District				

Short Description

Final Balancing

Description of Changes

- A. Original Contract Amount: \$1,157,147.00
- B. Current Contract value (including this revision): \$953,025.17
- C. Net Total Change (B-A): -\$204,121.84
- D. Net Percent Change (C/A*100): -17.64 %

Increases / Decreases

Project: 0211-0193, Drop Shaft & Connecting Sewer Rehab

XMPT

Category: 0001, Task 02: ST-S-4

Item Description	Item Code	Prop.Ln.	Item Type	Unit	Quantity Chg.	Unit Price	Dollar Value
_ Deconstruct MH, Cone, Remove	2047050	0010	Original	Ea	-1.000	4,800.00000	\$-4,800.00
_ Deconstruct MH, F&C, Remove	2047050	0015	Original	Ea	-1.000	1,800.00000	\$-1,800.00
_ Sanitary Sewer, Post-Construction, CCTV, 48 Inch	4027001	0035	Original	Ft	-210.000	13.00000	\$-2,730.00
_ Sanitary Sewer, Pre-Construction, Clean and CCTV	4027001	0040	Original	Ft	-8.900	15.00000	\$-133.50
_ Trenchless Installation, 12 HDPE DR11	4027001	0045	Original	Ft	5.000	190.00000	\$950.00



Contract Modification

Anderson, Eckstein and Westrick, Inc.

10/28/2021 3:43 PM

FieldManager 5.3c

Increases / Decreases

Project: 0211-0193, Drop Shaft & Connecting Sewer Rehab

XMPT

Category: 0001, Task 02: ST-S-4

Item Description	Item Code	Prop.Ln.	Item Type	Unit	Quantity Chg.	Unit Price	Dollar Value
_ MH, 48 Dia, Pre-Construction, Clean and CCTV	4037001	0050	Original	Ft	4.300	100.00000	\$430.00
_ MH, 72 Dia, Pre-Construction, Clean and CCTV	4037001	0055	Original	Ft	-6.600	100.00000	-\$660.00
_ MH, Post-Construction, CCTV	4037001	0060	Original	Ft	-70.000	10.00000	-\$700.00
_ Reconstruct MH, F&C	4037050	0070	Original	Ea	-1.000	2,800.00000	-\$2,800.00
_ Reconstruct MH, Flat Top	4037050	0075	Original	Ea	-1.000	25,000.00000	-\$25,000.00
_ Reconstruct MH, Precast Riser	4037050	0085	Original	Ea	-1.000	9,000.00000	-\$9,000.00
Topsoil Surface, Furn, 4 inch	8160062	0105	Original	Syd	-1,038.100	3.00000	-\$3,114.30
_ Seeding	8167011	0110	Original	Syd	-1,038.100	1.25000	-\$1,297.63
_ MH, Liner, Epoxy, Full Circumference	8507010	0120	Original	Sft	12.678	32.00000	\$405.70
_ Sanitary Sewer, Liner, Epoxy, Full Circumference	8507010	0125	Original	Sft	23.300	65.00000	\$1,514.50



Contract Modification

Anderson, Eckstein and Westrick, Inc.

10/28/2021 3:43 PM

FieldManager 5.3c

Increases / Decreases

Project: 0211-0193, Drop Shaft & Connecting Sewer Rehab

XMPT

Category: 0001, Task 02: ST-S-4

Item Description	Item Code	Prop.Ln.	Item Type	Unit	Quantity Chg.	Unit Price	Dollar Value
_ Steel Reinforcement Preparation and Repairs, Including Patching	8507010	0130	Original	Sft	-100.000	25.00000	\$-2,500.00
_ Chemical Grout	8507022	0135	Original	Gal	140.000	125.00000	\$17,500.00
_ Audio-Visual Record of Construction Influence Area	8507051	0140	Original	LS	-1.000	500.00000	\$-500.00
_ Permit Allowance	8507060	0155	Original	Dir	250.000	1.00000	\$250.00

Subtotal for Category 0001: \$-33,985.23

Category: 0002, Task 04: ST-S-5

Item Description	Item Code	Prop.Ln.	Item Type	Unit	Quantity Chg.	Unit Price	Dollar Value
Sidewalk, Rem	2040055	0165	Original	Syd	-3.440	16.00000	\$-55.04
_ Deconstruct MH, Cone, Remove	2047050	0170	Original	Ea	-1.000	4,800.00000	\$-4,800.00
_ Deconstruct MH, F&C, Remove	2047050	0175	Original	Ea	-1.000	1,800.00000	\$-1,800.00
_ Sanitary Sewer, Post-Construction, CCTV, 36 Inch	4027001	0195	Original	Ft	-105.000	26.00000	\$-2,730.00
_ Sanitary Sewer, Pre-Construction, Clean and CCTV, 36 Inch	4027001	0200	Original	Ft	-25.700	28.00000	\$-719.60



Contract Modification

Anderson, Eckstein and Westrick, Inc.

10/28/2021 3:43 PM

FieldManager 5.3c

Increases / Decreases

Project: 0211-0193, Drop Shaft & Connecting Sewer Rehab

XMPT

Category: 0002, Task 04: ST-S-5

Item Description	Item Code	Prop.Ln.	Item Type	Unit	Quantity Chg.	Unit Price	Dollar Value
_ Trenchless Installation, 12 HDPE DR11	4027001	0205	Original	Ft	-15.000	190.00000	\$-2,850.00
_ MH, 48 Dia, Pre-Construction, Clean and CCTV	4037001	0210	Original	Ft	-2.200	100.00000	\$-220.00
_ MH, 72 Dia, Pre-Construction, Clean and CCTV	4037001	0215	Original	Ft	0.400	115.00000	\$46.00
_ MH, Post-Construction, CCTV	4037001	0220	Original	Ft	-90.000	10.00000	\$-900.00
_ Reconstruct MH, F&C	4037050	0230	Original	Ea	-1.000	2,600.00000	\$-2,600.00
_ Reconstruct MH, Flat Top	4037050	0235	Original	Ea	-1.000	25,000.00000	\$-25,000.00
_ Reconstruct MH, Precast Riser	4037050	0240	Original	Ea	-1.000	9,000.00000	\$-9,000.00
Sidewalk, Conc, 4 inch	8030044	0255	Original	Sft	-28.000	28.00000	\$-784.00
Topsoil Surface, Furn, 4 inch	8160062	0265	Original	Syd	-791.110	3.00000	\$-2,373.33
_ Seeding	8167011	0270	Original	Syd	-791.110	1.25000	\$-988.89



Contract Modification

Anderson, Eckstein and Westrick, Inc.

10/28/2021 3:43 PM

FieldManager 5.3c

Increases / Decreases

Project: 0211-0193, Drop Shaft & Connecting Sewer Rehab

XMPT

Category: 0002, Task 04: ST-S-5

Item Description	Item Code	Prop.Ln.	Item Type	Unit	Quantity Chg.	Unit Price	Dollar Value
_ MH, Liner, Epoxy, Full Circumference	8507010	0280	Original	Sft	62.800	32.00000	\$2,009.60
_ Sanitary Sewer, Liner, Epoxy, Full Circumference	8507010	0285	Original	Sft	-242.800	65.00000	\$-15,782.00
_ Steel Reinforcement Preparation and Repairs, Including Patching	8507010	0290	Original	Sft	-60.000	35.00000	\$-2,100.00
_ Chemical Grout	8507022	0295	Original	Gal	-50.000	125.00000	\$-6,250.00
_ Audio-Visual Record of Construction Influence Area	8507051	0300	Original	LS	-1.000	500.00000	\$-500.00
_ Permit Allowance	8507060	0310	Original	Dir	-5,000.000	1.00000	\$-5,000.00
Subtotal for Category 0002:							<u>\$-82,397.26</u>

Category: 0003, Task 04: UT-S-1

Item Description	Item Code	Prop.Ln.	Item Type	Unit	Quantity Chg.	Unit Price	Dollar Value
Sidewalk, Rem	2040055	0320	Original	Syd	-9.000	16.00000	\$-144.00
_ Deconstruct MH, Cone, Remove	2047050	0325	Original	Ea	-1.000	4,800.00000	\$-4,800.00
_ Deconstruct MH, F&C, Remove	2047050	0330	Original	Ea	-1.000	1,800.00000	\$-1,800.00



Contract Modification

Anderson, Eckstein and Westrick, Inc.

10/28/2021 3:43 PM

FieldManager 5.3c

Increases / Decreases

Project: 0211-0193, Drop Shaft & Connecting Sewer Rehab

XMPT

Category: 0003, Task 04: UT-S-1

Item Description	Item Code	Prop.Ln.	Item Type	Unit	Quantity Chg.	Unit Price	Dollar Value
_ Sanitary Sewer, Post-Construction, CCTV, 36 Inch	4027001	0345	Original	Ft	-15.000	95.00000	\$-1,425.00
_ Sanitary Sewer, Pre-Construction, Clean and CCTV, 36 Inch	4027001	0350	Original	Ft	-2.900	75.00000	\$-217.50
_ MH, 48 Dia, Pre-Construction, Clean and CCTV	4037001	0355	Original	Ft	-3.400	150.00000	\$-510.00
_ MH, Post-Construction, CCTV	4037001	0360	Original	Ft	-38.000	30.00000	\$-1,140.00
_ Reconstruct MH, F&C	4037050	0365	Original	Ea	-1.000	2,800.00000	\$-2,800.00
_ Reconstruct MH, Flat Top	4037050	0370	Original	Ea	-1.000	25,000.00000	\$-25,000.00
_ Reconstruct MH, Precast Riser	4037050	0375	Original	Ea	-1.000	9,000.00000	\$-9,000.00
Sidewalk, Conc, 4 inch	8030044	0390	Original	Sft	-75.000	28.00000	\$-2,100.00
Topsoil Surface, Furn, 4 inch	8160062	0400	Original	Syd	-2,473.350	3.00000	\$-7,420.05
_ Seeding	8167011	0405	Original	Syd	-2,473.600	1.25000	\$-3,092.00



Contract Modification

Anderson, Eckstein and Westrick, Inc.

10/28/2021 3:43 PM

FieldManager 5.3c

Increases / Decreases

Project: 0211-0193, Drop Shaft & Connecting Sewer Rehab

XMPT

Category: 0003, Task 04: UT-S-1

Item Description	Item Code	Prop.Ln.	Item Type	Unit	Quantity Chg.	Unit Price	Dollar Value
_ Site Restoration	8167051	0410	Original	LS	-0.500	5,000.00000	\$-2,500.00
_ MH, Liner, Epoxy, Full Circumference	8507010	0415	Original	Sft	-35.150	32.00000	\$-1,124.80
_ Sanitary Sewer, Liner, Epoxy, Full Circumference	8507010	0420	Original	Sft	-34.300	120.00000	\$-4,116.00
_ Steel Reinforcement Preparation and Repairs, Including Patching	8507010	0425	Original	Sft	-5.000	35.00000	\$-175.00
_ Chemical Grout	8507022	0430	Original	Gal	-5.000	125.00000	\$-625.00
_ Audio-Visual Record of Construction Influence Area	8507051	0435	Original	LS	-1.000	500.00000	\$-500.00
_ Permit Allowance	8507060	0445	Original	Dir	-14,250.000	1.00000	\$-14,250.00

Subtotal for Category 0003: \$-82,739.35

Subtotal for Project 0211-0193: \$-199,121.84



Contract Modification

Anderson, Eckstein and Westrick, Inc.

10/28/2021 3:43 PM

FieldManager 5.3c

New Items

Project: 0211-0193, Drop Shaft & Connecting Sewer Rehab

Category: 0000,

Item Description	Item Code	Prop.Ln.	ItemType	Unit	Proposed Qty.	Unit Price	Dollar Value
_ Penalty for Incomplete Restoration	1077051	0455	Extra	LS	1.000	-5,000.00000	\$-5,000.00

Reason: Restoration not completed

Subtotal for Category 0000: \$-5,000.00

Subtotal for Project 0211-0193: \$-5,000.00

If authorized, the contractor agrees to do the work outlined above under the direction of the Engineer, and to accept as payment in full the basis of payment as indicated. Prime Contractor, you are authorized and instructed as the contractor to do the work described herein in accordance with the terms of your contract.			
Christopher R. Frayer, AEW		Construction Engineer, MCPWO	
_____	11/5/2021	_____	_____
Signature	Date	Signature	Date
Inland Waters Pollution Control, Inc.		Construction & Maintenance Manager, MCPWO	
	11/5/2021	_____	_____
Signature	Date	Signature	Date

Date of Issuance: 8/3/2022
Owner: Macomb Interceptor Drain
Drainage District
Engineer: AEW

Effective Date: 8/3/2022
Owner's Contract No.: WWS-2018-005A
Engineer Contract No.: N/A
Contract Name: Drop Shaft Rehabilitation

The Contract is modified as follows upon execution of this Change Order:

Increase the contract value by \$168,703.30 because delays to the construction schedule and additional design related scope additions. The cost is summarized in the attached AEW memo.

The original Contract Sum was:	<u>\$ 297,000.00</u>
The net change from previously approved Change Orders No.1 to No. 1:	<u>\$ 0</u>
The Contract Sum prior to this Change Order:	<u>\$ 297,000.00</u>
The Contract Sum prior to this Change Order will be increased by:	<u>\$ 168,703.30</u>
The new Contract Sum, including this Change Order, will be:	<u>\$ 465,703.30</u>
The Contract Time will be unchanged by:	0 (days)
The date of Substantial Completion as of the date of this Change Order, therefore, is: N/A	

ACCEPTED:

ACCEPTED:

By: _____
Owner (Authorized Signature)

By: _____
Engineer (Authorized Signature)

Title _____
Date _____

Title _____
Date _____



ANDERSON, ECKSTEIN & WESTRICK, INC.

CIVIL ENGINEERS - SURVEYORS - ARCHITECTS

51301 Schoenherr Road, Shelby Township, MI 48315

586.726.1234 | www.aewinc.com

MEMORANDUM

TO: Stephen Downing – MCPW Construction & Maintenance Manager

FROM: Louis Urban, PE and Chris Frayer

DATE: 7/7/2022

SUBJECT: **Summary of Budget Review**
Metering Facility Drop Shaft Rehab at ST-S-4, ST-S-5 & UT-S-1
WWS-2019-019 / AEW No. 0211-0193

This memorandum is intended to summarize issues contributing to budget overruns experienced by the Anderson, Eckstein, and Westrick, Inc. (AEW) and their sub-consultants during the design and construction phases of this project. The overruns were discussed as the project progressed and were memorialized in earlier memorandums and meetings. With the work ongoing, it was determined that we would revisit the costs near the end of construction.

The project reached final completion November 5, 2021 and the final pay estimate was approved by AEW in May. We appreciate your willingness to resume discussions on this topic in accordance with our meeting of March 18, 2021. At this meeting we discussed AEW efforts we believe were above the original scope of services and normal assumptions made by both parties for a project of this nature. We also discussed additional work required of both Owner and Engineer due to performance of the Contractor. Finally, we shared that while the engineering services resulted in budget exceedance by the Design Team, these efforts appear to be resulting in a total construction cost that is at or less than the overall contract amount.

The following is a general narrative of the additional time and manpower resulting in the cost overruns:

Design Phase

- At the request of the MCPWO, AEW reduced our cost due to the decision to split engineering services into two separate contracts between NTH and AEW. AEW's attempt to provide value to the MCPWO resulted in an underestimation of how much the actual cost would be for design and CCA.
- Dropbox implementation. This was an unanticipated cost for the program and the time associated with uploading and downloading files into the county file structure. This also impacted construction phase with significant time associated with the daily report and photo uploads.



- New MCPWO CAD Standards issued after the topographic survey and the design layout was complete required AEW to reconfigure the drawings.
- Additional coordination to pause and accelerate design work (of three firms) at various stages of the process to accommodate keeping both Drop Shaft projects on the same review/bid/construction schedule.
- Owner's legal counsel implementation of new procurement & bidding documents and general conditions delayed bidding & required significant internal review. AEW assisted in vetting the documents and made suggestions on where there may be deficiencies or needed clarifications.

Construction Phase

- The Contractor changed the project manager more than three times and settled on a project manager with little pertinent experience. This project manager offered little to no support of their site superintendent. The lack of contractor management involvement required additional AEW support. AEW assigned a professional engineer instead of a field technician to the site to assist with project management and site supervision. Some examples of where AEW project management subsidized contractor inadequacies and averted potential additional cost to the Owner are as follows:
 - AEW Field Engineer assisted with coordination of Contractor's field staff, subcontractors' schedules & Contractor's Flow Control responsibilities. These efforts aided in no reported safety violations or communication failures impacting other's working within the MIDD system. No one was injured or worse.
 - Prevented directional drilling prior to pre-location of existing utilities & then made field adjustments in real time, without delay.
 - Proposed cost-effective method (subsequently utilized by Contractor) to pre-locate critical utility crossings using hydro-excavation. This included GLWA's 48-inch PCCP transmission water main and Consumers Energy 16-inch HP gas main. AEW coordinated and attended site meetings with GLWA, MCDR and Consumers Energy. At ST-S-4, these AEW efforts minimized disruptions to traffic and expedited "open-to-traffic" saving further schedule 'creep'.
 - Pre-location at ST-S-5 (utilizing same hydro-excavation method) located existing 12-inch Sterling Heights water main preventing potential excavation damage to older water main. AEW coordinated with Sterling Heights DPW Water Division and HDD subcontractor to provide approval and construction of permanent bypass sewer at optimized depth, alignment and permanent structure locations.
 - Direct coordination with MCDR District Inspector, St. Lawrence Catholic Parish & School, Utica DPW (Water & Sewer Department), and Sterling Heights Engineering.
 - AEW staff continuously provided advice and recommendations to Contractor regarding critical path and site operations.
- Contractor delays, performance and efficiency issues created additional effort for AEW.



July 7, 2022

- AEW provided additional services to supplement construction observation and documentation requested by MCPWO (i.e. video documentation of energy dissipation unit at MH-9 during ST-S-4 normal flow conditions) and MCDR (i.e. survey elevation shots to document no settling associated with trenchless road crossing).
- AEW assisted in locating and marking of MCPWO-owned site utilities at UT-S-1, ST-S-4 and ST-S-5 sites. (Electrical services)
- Original contract specified 120 days for substantial completion (June 3, 2020) and 150 days for final completion (July 3, 2020). Substantial completion informally extended to September 1, 2020. Final completion was November 5, 2021.
- Task 2 & 4 bid included 560 hours of construction observation [seventy (70) 8-hour days]. The additional amount of observation time due to contractor inefficiencies and delays was not anticipated.
- One hundred eleven (111) DFR's were generated, including days requiring multiple observers. Again, this time and effort could not be anticipated.
- Owner removal of bypass pumping subcontractor (for cause) resulted in delay and required a return to the submittal process.
- Contractor delays/duration of this project led to flow control conflicts with other work that required Saturday and ultimately Sunday work. (Contractor originally proposed working M-F)
- AEW plans for bypass pumping flow control option at ST-S-4 provided for "Temporary Bulkhead, If Necessary" which was not initially utilized by Contractor. This was to allow for work to proceed without being impacted by system flow control variables. Subsequent to repeated recommendations by AEW, this option was later used, but modified by use of pneumatic sewer plug, at the plan location in the adit sewer connection to OMID. This localized flow control was authorized by MCPWO in subsequent SESR and prevented unnecessary damage to uncured cementitious sewer lining during the ECOCAST operations. All of this effort took additional coordination and time by the AEW field engineer.
- AEW maintained professional relationship with Contractor and acted as intermediary to follow-up with Owner, diffuse situations, and obtain modified approvals to keep the project moving forward as a result of contractor to inadequacies.
- AEW prepared the record plans, which was contractually the Contractor's responsibility.
- The contract provided 30 days from substantial completion to final completion. Substantial completion was achieved on May 14, 2021. The final pay estimate for \$0.00 was signed by the Contractor May 26, 2022. AEW spent over a year coordinating with the Contractor to obtain sworn statements, consent of surety and final waivers from sub-contractors and suppliers to protect the Owner's interests.



ANDERSON, ECKSTEIN & WESTRICK, INC.
CIVIL ENGINEERS SURVEYORS ARCHITECTS
 51301 SCHOENHERR RD. SHELBY TOWNSHIP, MI 48315
 www.aewinc.com p(586)726-1234

INVOICE

June 29, 2022
 Project No: 0211-0193-0
 Invoice No: <Draft>

MACOMB COUNTY PUBLIC WORKS COMM.
 ATTN: STEVE DOWNING
 21777 DUNHAM ROAD
 CLINTON TWP., MI 48036

Project 0211-0193-0 MIDD DROPSHAFT & CONNECTING SEWER REHAB
 WO18330, PROJECT #WWS 18-005A

Professional Services from July 5, 2021 to June 29, 2022

Phase 01 DESIGN DEVELOPMENT & ENGINEERING

Professional Personnel

	Hours	Rate	Amount	
RECORD PLANS				
TEAM LEADER	2.50	114.50	286.25	
ENGINEERING AIDE III	9.50	94.50	897.75	
EASEMENTS				
ENGINEERING AIDE III	3.00	94.50	283.50	
SENIOR PROJECT SURVEYOR	14.00	152.50	2,135.00	
RESEARCH/REVIEW				
GRADUATE ENG/SUR/ARC	5.00	114.50	572.50	
PRINTS				
ENGINEERING AIDE II	.20	94.50	18.90	
ENGINEERING AIDE TRAINEE	.20	94.50	18.90	
CONSTRUCTION PLAN DRAFT				
ENGINEERING AIDE III	22.50	94.50	2,126.25	
SPECIFICATIONS				
SENIOR PROJECT ENGINEER	3.00	152.50	457.50	
MEETINGS				
GRADUATE ENG/SUR/ARC	.50	114.50	57.25	
MECHANICAL/ELECTRICAL DESIGN				
SENIOR PROJECT ENGINEER	.30	152.50	45.75	
Totals	60.70		6,899.55	
Total Labor				6,899.55

Reimbursable Expenses

REIMB. MISC. EXPENSE				
3/26/2019	APPLIED SCIENCE	Invoice #7219		7,282.00
3/26/2019	FK ENGINEERING	Invoice #18-048-006		1,148.50
3/26/2019	APPLIED SCIENCE	Invoice #7293		2,514.00
5/21/2019	OAKLAND COUNTY WATER RESOURCES COMM	PERMIT REVIEW		250.00
6/18/2019	CITY OF STERLING HEIGHTS	ENGINEERING PLAN REVIEW		250.00
12/5/2019	FK ENGINEERING ASSOCIATES	Invoice# 18-048-009		399.50
3/19/2020	FK ENGINEERING ASSOCIATES	Invoice# 18-048-008		2,030.25

Project	0211-0193-0	MIDDD DROPSHAFT & CONNECTING SEWER REHAB	Invoice	<Draft>
3/19/2020	FK ENGINEERING ASSOCIATES	Invoice# 18-048-010	990.75	
4/21/2020	FK ENGINEERING ASSOCIATES		255.50	
9/8/2020	FK ENGINEERING ASSOCIATES	Invoice# 18-048-013	1,246.50	
11/3/2020	NTH CONSULTANTS, LTD.	Invoice# 623989	2,237.10	
11/3/2020	FK ENGINEERING ASSOCIATES	Invoice# 18-048-015	1,004.50	
12/1/2020	FK ENGINEERING ASSOCIATES	Invoice# 18-048-016	179.00	
Total Reimbursables			19,787.60	19,787.60
Unit Billing				
2 PERSON CREW-RECORD PLAN		2.5 HOURS @ 223.00	557.50	
Total Units			557.50	557.50
Billing Limits				
		Current	Prior	To-Date
Total Billings		27,244.65	31,900.00	59,144.65
Limit				31,900.00
Adjustment				(27,244.65)
Total this Phase				

Phase 02 CONSTRUCTION ADMINISTRATION

Professional Personnel

	Hours	Rate	Amount	
CONSTRUCTION STAKEOUT				
TEAM LEADER	2.50	114.50	286.25	
RECORD PLANS				
SENIOR PROJECT ENGINEER	20.00	152.50	3,050.00	
PRINTS				
ENGINEERING AIDE TRAINEE	.50	94.50	47.25	
CONTRACT ADMINISTRATION				
LICENSED ENG/SUR/ARC	5.50	138.00	759.00	
GRADUATE ENG/SUR/ARC	81.60	114.50	9,343.20	
ENGINEERING AIDE III	4.50	94.50	425.25	
SENIOR PROJECT ENGINEER	47.00	152.50	7,167.50	
MEETINGS				
SENIOR PROJECT ENGINEER	4.50	152.50	686.25	
CONSTRUCTION OBSERVATION				
LICENSED ENG/SUR/ARC	359.50	138.00	49,611.00	
ENGINEERING AIDE III	45.50	94.50	4,299.75	
SENIOR PROJECT ENGINEER	91.00	152.50	13,877.50	
CONSTRUCTION DOCUMENTS				
LICENSED ENG/SUR/ARC	3.00	138.00	414.00	
CONSTRUCTION ADMINISTRATION				
SENIOR PROJECT ENGINEER	18.50	152.50	2,821.25	
ADDITIONAL SERVICES				
SENIOR PROJECT ENGINEER	3.00	152.50	457.50	
FIELD SERVICES				
ENGINEERING AIDE II	2.50	94.50	236.25	
SENIOR PROJECT ENGINEER	2.50	152.50	381.25	
Totals	691.60		93,863.20	
Total Labor				93,863.20

Unit Billing

2 PERSON CREW-CONSTRUCTION STAKEOUT	1.5 HOURS @ 223.00	334.50	
Total Units		334.50	334.50

Billing Limits

	Current	Prior	To-Date	
Total Billings	94,197.70	55,052.05	149,249.75	
Limit			55,100.00	
Adjustment				(94,149.75)
			Total this Phase	\$47.95

Phase 03 DESIGN DEV & ENG - 2 ADD'L DROP SHAFT

Professional Personnel

	Hours	Rate	Amount	
RECORD PLANS				
TEAM LEADER	.50	114.50	57.25	
SECRETARIAL				
SECRETARIAL	1.70	45.00	76.50	
PRINTS				
ENGINEERING AIDE II	.80	94.50	75.60	
ENGINEERING AIDE I	.80	94.50	75.60	
ENGINEERING AIDE TRAINEE	6.60	94.50	623.70	
CONSTRUCTION PLAN DRAFT				
ENGINEERING AIDE III	8.00	94.50	756.00	
PRELIMINARY ENGINEERING				
GRADUATE ENG/SUR/ARC	251.40	114.50	28,785.30	
CONTRACT ADMINISTRATION				
GRADUATE ENG/SUR/ARC	.50	114.50	57.25	
SENIOR PROJECT ENGINEER	1.00	152.50	152.50	
MEETINGS				
GRADUATE ENG/SUR/ARC	6.00	114.50	687.00	
FIELD SERVICES				
ENGINEERING AIDE III	2.00	94.50	189.00	
Totals	279.30		31,535.70	
Total Labor				31,535.70

Unit Billing

2 PERSON CREW-CONSTRUCTION STAKEOUT	1.5 HOURS @ 223.00	334.50	
Total Units		334.50	334.50

Billing Limits

	Current	Prior	To-Date	
Total Billings	31,870.20	83,987.85	115,858.05	
Limit			84,000.00	
Adjustment				(31,858.05)
			Total this Phase	\$12.15

Phase 04 CONSTRUCTION ADMIN - 2 ADD'L DROP SHAFT

Professional Personnel

	Hours	Rate	Amount
RECORD PLANS			
ENGINEERING AIDE III	1.00	94.50	94.50
EASEMENTS			
SENIOR PROJECT SURVEYOR	3.00	152.50	457.50

Project	0211-0193-0	MIDDD DROPSHAFT & CONNECTING SEWER REHAB	Invoice	<Draft>		
CONTRACT ADMINISTRATION						
	GRADUATE ENG/SUR/ARC		58.80	114.50	6,732.60	
	ENGINEERING AIDE III		4.00	94.50	378.00	
	ENGINEERING AIDE II		.50	94.50	47.25	
	SENIOR PROJECT ENGINEER		20.60	152.50	3,141.50	
CONSTRUCTION OBSERVATION						
	SENIOR PROJECT ENGINEER		3.50	152.50	533.75	
CONSTRUCTION ADMINISTRATION						
	SENIOR PROJECT ENGINEER		7.50	152.50	1,143.75	
	Totals		98.90		12,528.85	
	Total Labor					12,528.85
Reimbursable Expenses						
REIMB. MISC. EXPENSE						
	5/18/2021	NTH CONSULTANTS, LTD.			2,902.00	
	5/18/2021	FK ENGINEERING ASSOCIATES	Invocie# 18-048-021		169.75	
		Total Reimbursables			3,071.75	3,071.75
Billing Limits						
			Current	Prior	To-Date	
	Total Billings		15,600.60	125,877.25	141,477.85	
	Limit				126,000.00	
	Adjustment					(15,477.85)
				Total this Phase		\$122.75
				Total this Invoice		\$182.85

email to: Stephen Downing stephen.downing@macombgov.org

Send report: billings 0211-0193-0

**AEW is respectfully requesting compensation for the increased cost.
The total additional consultant CCA cost to the contract is \$168,703.30**

MACOMB COUNTY PUBLIC WORKS OFFICE



CANDICE S. MILLER

MACOMB COUNTY PUBLIC WORKS COMMISSIONER

Garfield Interceptor Pilot Project

Presented on: August 8, 2022

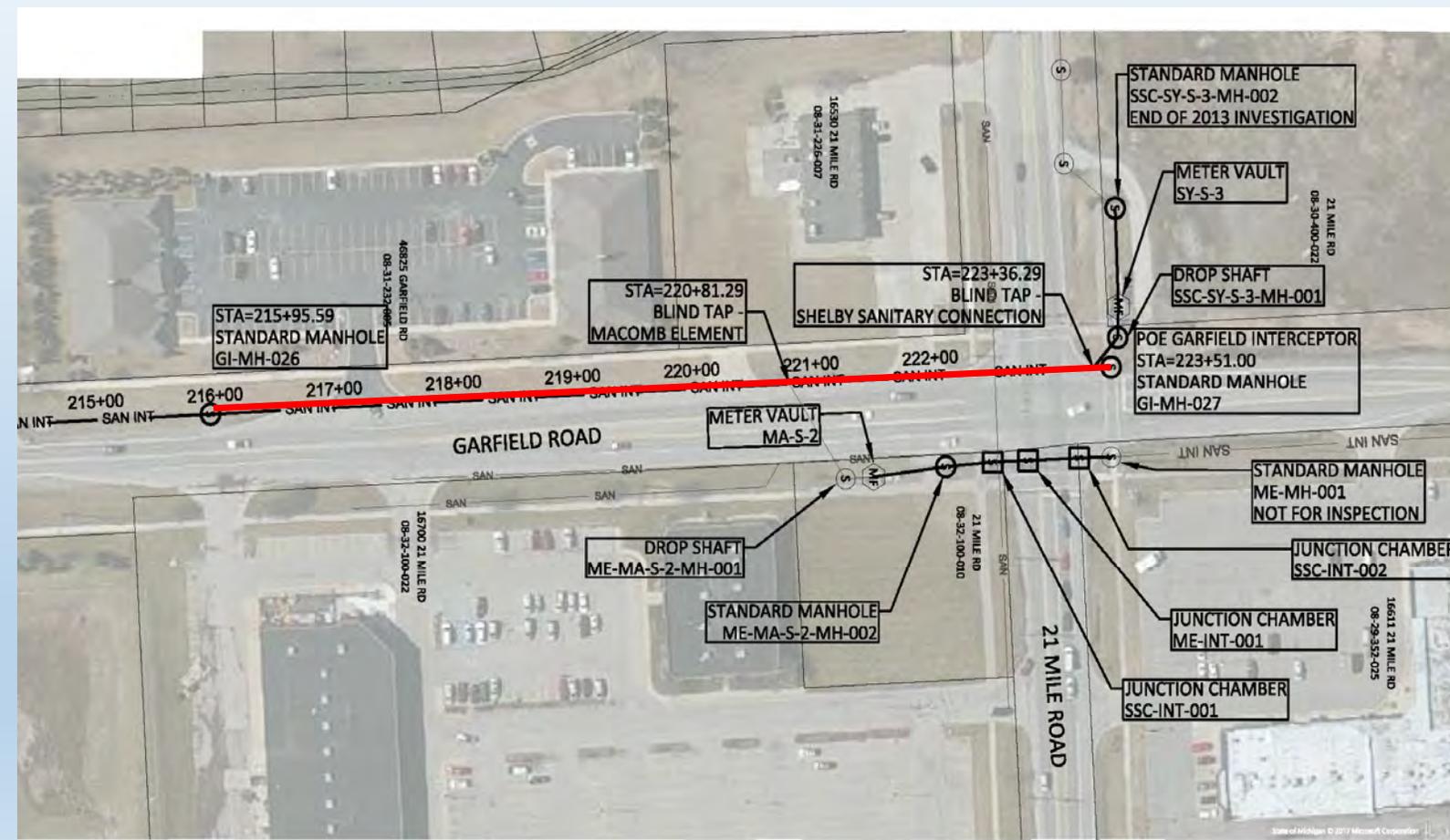
Project Area

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- 7' Diameter RCP
- 755' Rehab Length



Inspection Comparison

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2017 Inspection Image

2022 Inspection Image



Current Condition

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- DWSD lining which went in around 2008 has failed.
- Rebar is exposed.
- Degradation has begun to accelerate and therefore must be repaired quickly to prevent a catastrophic failure.



- Unique opportunity to evaluate and test a different rehabilitation method.
- Key Design Parameters
 - Looking for a solution to minimize community impacts.
 - Want ability to maintain flows in the pipe.
 - Minimal bypass required around MA-S-2 & SY-S-3.
 - Structural rehabilitation.
 - Corrosion resistance required.

Rehabilitation Methods Evaluated

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- Spray lining systems require full bypass and they are only anticipated to have a 20-year service life.
- CIPP Lining would require full bypass and will be a difficult installation due to the size of the pipe.
- Slip-Lining Products such as Hobas and Thompson require large access shafts to install the pipe. Large community impacts and higher cost due to shaft construction.
- Spiral Wound PVC Liner Systems
 - Product can be installed through a manhole.
 - Minimal community impact.
 - Long-service life.

Spiral Wound PVC Liner

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- Reached out to three manufacturers which have similar products.
 - Sekisui – SPR
 - Contech – SPR
 - Danby
- Contech SPR
 - Would not provide a price as they felt they could not be cost competitive due to no material in the USA.
- Danby Grout in Place Liner
 - Would not provide a firm price for the project. They claimed they did not have enough information to bid the project which we disagree with.
- Sekisui SPR
 - Cost provided through installer SAK.
 - Reference check was nothing but positive.

Spiral Wound PVC Liner

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Macomb County Public Works Commissioner



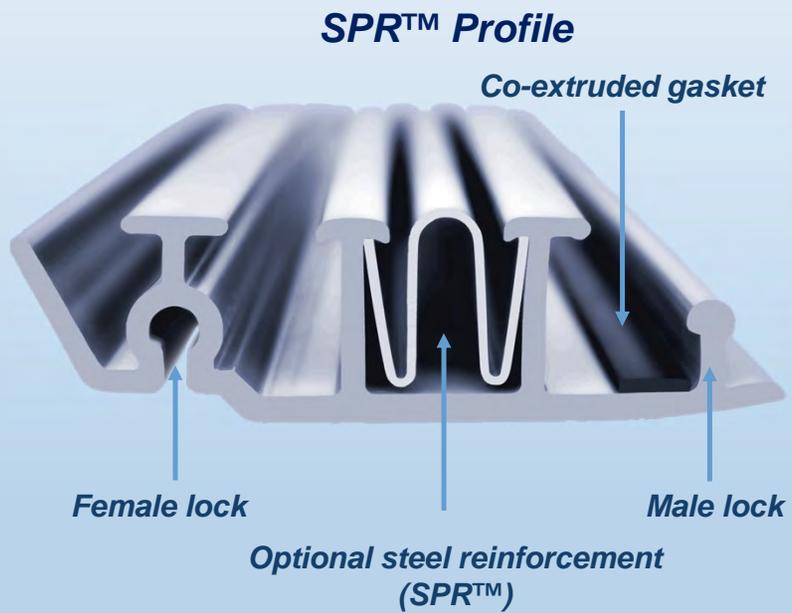
- Sekisui SPR – SAK
 - Met all design parameters for the project.
 - Over 4 million feet of product installed in the US.
 - Minimum 50-year design life.
 - Pipe Diameter will only be reduced down to 78” compared to 72” for Hobas. No hydraulic impact looking at 2045 Hydraulic Model scenarios.
 - 3 months installation for this product.



Spiral Wound PVC Liner

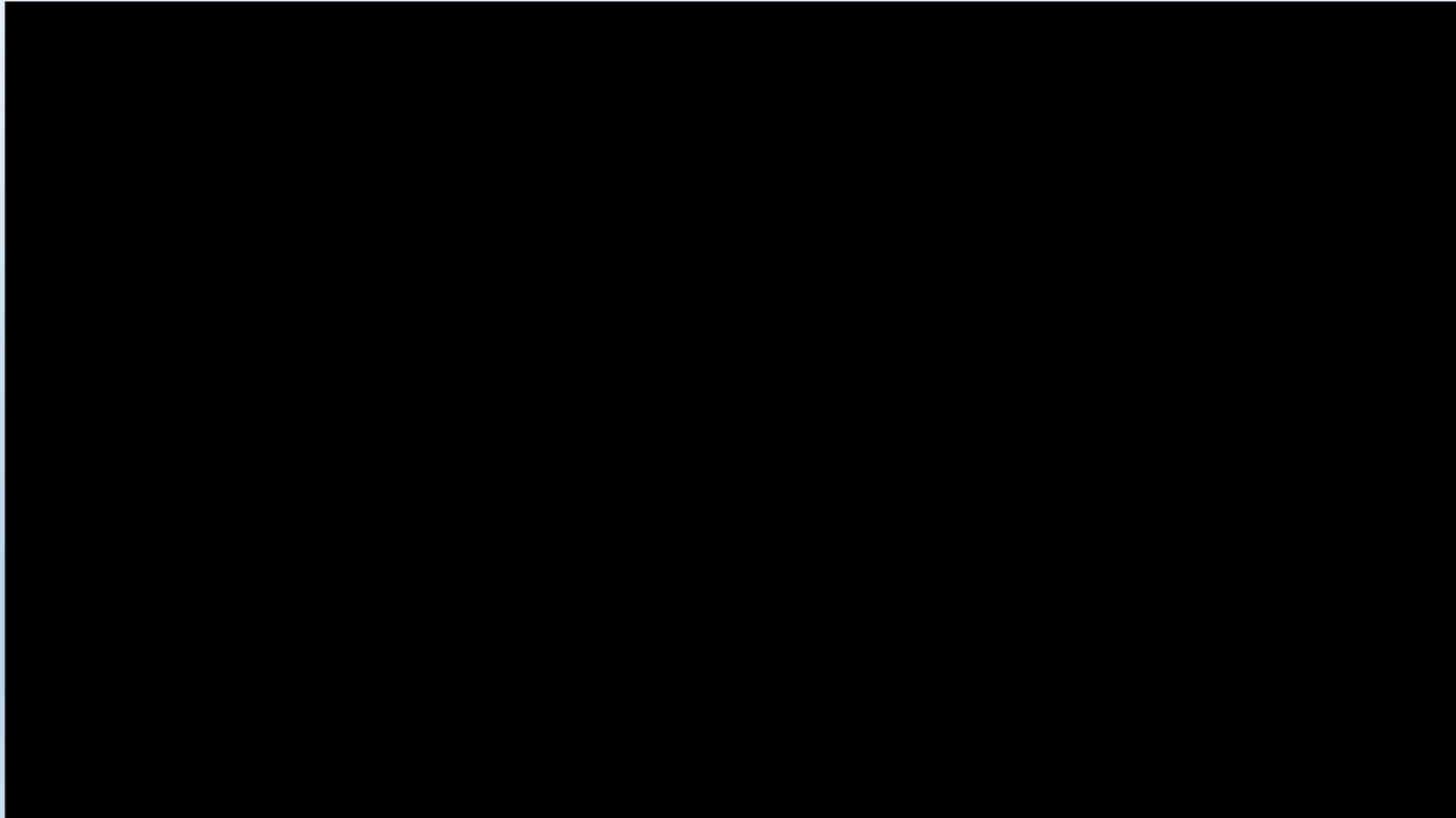
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Installation in Minneapolis, MN

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Cost Comparison

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	HOBAS Pricing	Spiral Wound Pricing
Product (HOBAS/SPR)	\$1,370,778	\$1,916,190
Design Engineering	\$400,000	\$5,000
Shaft	\$2,000,000	\$0
Cleaning	\$67,195	\$67,195
Bypass	\$300,000	\$300,000
Mob/Demob	\$106,000	\$106,000
Total	\$4,243,973	\$2,394,385
Cost Per Foot	\$5,621	\$3,171



Candice S. Miller

Public Works Commissioner
Macomb County

To: Macomb Interceptor Drain Drainage District Board Members

From: Vincent Astorino, Operations & Flow Manager

Date: August 8, 2022

Subject: Garfield Interceptor Lining Pilot Project – Construction Contract Recommendation

Project Background

During routine inspection of the large-diameter interceptors that comprise the MIDDD collection system it was discovered that a portion of the 7-foot diameter Garfield Interceptor (GI) is experiencing significantly accelerated degradation. The relatively localized pipe damage is consistent with Hydrogen Sulfide (H₂S) attack that is exacerbated by the turbulence created as the local municipality flows enter the interceptors. Repairing this reach of pipe is of the utmost importance to maintain uninterrupted service to the communities it serves. MCPWO staff have been working diligently to present a solution to this urgent matter.

The approximately 755-foot long reach of damaged pipe is at the farthest upstream end of the GI at the intersection of 21 Mile Road and Garfield Road. The 2017 inspection of this pipe noted minor concrete spalling, visible aggregate, deposits/encrustation, and the starting of a failure of a previously installed liner material (installed when the pipe was under DWSD control). All these noted defects required attention but at the time did not warrant an immediate repair. The course of action recommended in the 2018 MIDDD SAW Grant Project Plan was to perform preventative rehabilitation of the upper reaches of the GI (Segment 10). This rehab effort was proposed to predominantly consist of grouting to seal cracks and prevent infiltration. MCPWO subsequently engaged a contractor to perform this work and chemical grouting has been occurring nearly continuously throughout the MIDDD over the last two years. MCPWO also took steps to reduce the H₂S present within the sewer headspace of the Garfield Interceptor by moving forward with the design of the MIDDD Odor & Corrosion Control Improvements Project. This project is currently out to bid and once constructed will help extend the useful life of the remaining Garfield Interceptor.

The key design parameters for this urgent repair identified by MCPWO staff were as follows:

- 1) Minimize community impacts. This includes zero interruption in sewer service (a given in the MIDDD system), minimal top-side disruptions in the form of lane closures/shifts, and shortest practical duration of the project.
- 2) Implement a long-term solution in the form of a structural, corrosion-resistant product. Design must also meet all hydraulic parameters contained in the 2045 Hydraulic Model scenarios.

Rehabilitation Approach

Numerous options were considered for this rehabilitation and included cementitious spray lining, cured-in-place pipe lining, slip-lining, metal liner plates, and spiral wound PVC. Several options were eliminated because of their requirement of full bypass pumping; an expensive and disruptive exercise.

Ultimately, two rehabilitation methods were most strongly considered; slip-lining with a polymer mortar pipe (similar to what has been recently prescribed in the Romeo Arm and 15 Mile Interceptor) and spiral wound PVC. Using price data from recently bid projects, current vendor quotes, and installer costs, MCPWO staff determined that a spiral wound PVC product will satisfy all of the established design parameters and is anticipated to cost approximately 45% less than the slip-lining option. The largest advantage of the spiral wound product in the opinion of MCPWO staff is that it can be installed through an existing manhole and does not require the installation of a shaft.

There is also a significant time savings realized by forgoing the typical design-bid-build convention that MCPWO typically utilizes. With that format and for a project of this scale we would expect no fewer than 12 months from consultant award to start of construction. With this researched and pre-qualified approach we believe we'll be able to execute a contract and have material on order before the end of August. It is anticipated that once the order for material is placed that it will take 90 days to arrive and once the material is on-site we expect a three-month installation window.

MCPWO contacted several spiral wound manufacturers and the results of these discussions are summarized in the table below:

Table 1.

Manufacturer	Summary
Sekisui – SPR	Turnkey cost proposal provided from product installer, SAK Construction. Very positive reference checks indicating successful, similar projects. Consistent with reference checks, MCPWO has also had positive interaction with Sekisui/SAK and feel they have a good grasp of the project. Assembled team of local subcontractors with intimate knowledge of system.
Contech – SPR	No material available in USA. Did not feel they would be competitive on cost (and subsequently elected not to submit a proposal)
Danby	Would only provide estimates and not true proposal. Although significant background info was provided they claimed they didn't have enough to provide firm pricing. Product may have a place in other portions of MCPWO-controlled systems but did not appear to be right fit in this application.

MCPWO staff feels that although this is a new-to-Macomb product, it has been proven successful in similar applications elsewhere. Perhaps equally as important, the successful implementation of this product will represent a major second option for future MIDD rehabilitation efforts. Slip-lining with polymer mortar pipe has been the most specified product for decades and, although it has performed well, more rehab options for our engineering team and more contractor competition during the bidding process will always be a benefit to the District. As such, we have included "Pilot" in the name of this project to further denote our expectation that it will be a demonstration of a viable long-term design option for not only the MIDD but other MCPWO-controlled pipes and perhaps the regional sewer system as a whole.

MCPWO is recommending that the Board award this work to SAK Construction, LLC in the total not-to-exceed amount of \$2,394,385.00. Upon approval, MCPWO will prepare an agreement with SAK that formalizes the cost proposal, drawings & specifications, insurance requirements, and any other necessary contractual matters. MCPWO will also engage a consultant (presented to the board under separate cover) to provide construction contract administration (CCA) services.

As is typical of linear projects such as this, the rehabilitation work will be performed on a unit price, per-foot basis.

Attachments: SAK Proposal dated 06/24/2022

June 24, 2022

Macomb County Public Works
Mr. Vincent Astorino
Operations and Flow Manager
21777 Dunham Road
Clinton Township, MI 48036
Vincent.astorino@macombgov.org

CC: Mr. Steve Rozycki, steve.rozycki@macombgov.org
Mr. Steven Wagner, steven.wagner@macombgov.org
Mr. Louis Urban, lurban@aewinc.com

VIA EMAIL

RE: Garfield Interceptor SPR Rehabilitation
Scope of Work and Price Proposal

Dear Mr. Astorino,

SAK Construction, LLC (SAK) is pleased to present the following proposal for the above referenced project:

Macomb County Public Works 24-Jun-22 Garfield Interceptor					
755 LF of 84" Pipeline Rehabilitation					
Item #	Item Description	Unit	Qty	Unit Price	Total Price
1	Mobilization	LS	1	\$ 71,000.00	\$ 71,000.00
2	Engineering	LS	1	\$ 5,000.00	\$ 5,000.00
3	Clean and Televiser	LS	755	\$ 89.00	\$ 67,195.00
4	Bypass and Flow Control	LS	1	\$ 300,000.00	\$ 300,000.00
5	Spiral Wound Rehabilitation (SPR)	LF	755	\$ 2,538.00	\$ 1,916,190.00
6	Demobilization	LS	1	\$ 35,000.00	\$ 35,000.00
Total					\$ 2,394,385.00

SCOPE:

SAK Construction, LLC proposes to furnish all necessary materials, labor, tools, equipment, supplies, and supervision necessary to install the Spiral Wound Liner (SPR) system in accordance with the plans and specifications provided and the Inclusions, Exclusions, Notes, and Terms presented in this proposal.

1. GENERAL CONDITIONS

○ INCLUSIONS

- Mobilization / demobilization
 - SAK plans for one mobilization and setup with continuous operations
 - Additional mobilizations will be negotiated separately
- Bypass pumping, flow control, and diversion valve operations
- Pipe preparation that includes CCTV and cleaning.
- Debris disposal
- Maintenance of traffic, traffic control, traffic control plans or devices, flaggers, arrow boards, signs, etc.
- Certificate of Insurance, with coverage per project specifications
- Prevailing wage rates per project specifications
- Performance and payment bonds
- Sales tax on materials
- Anticipated duration is up to three (3) continuous months, a detailed WBS will be provided at the preconstruction meeting.

○ EXCLUSIONS

- Manhole rehabilitation
- Permits or special insurance required (e.g., railroad protective insurance)
- Federal, State, or local permits, or other associated third-party requirements
- Temporary and permanent fencing
- Local water supply-hydrant access.
- Secure work zone for laydown, storage and parking for materials and equipment near site location.
- Specialized training or specialized safety compliance to meet any Owner-specific requirements
 - If needed, the cost of acquiring these provisions will be negotiated separately
- HAZMAT operations

2. SPIRAL WOUND LINER SYSTEM (SPR)

○ INCLUSIONS:

- Installation of SPR-TM-PVC 78-in. dia. OD liner in the 84-in. dia. RCP sanitary sewer using PVC with steel reinforcement within profile & cementitious grout in accordance with 3rd Party Engineer's design. Final diameter to be determined up survey of the line.
- Installation will meet current hydraulic capacity and meeting 50-year design life for a fully deteriorated or partially deteriorated pipe condition per plans and specifications.
- Liner design in accordance with project specifications.
- Design will be certified/stamped by MI licensed 3rd party professional engineer

- EXCLUSIONS:
 - Excavated repairs to facilitate installation of SPR
 - Excavation to retrieve equipment due to pipe condition
 - Demolition, structural repairs, and restoration of any affected manholes, vaults, or similar structures
 - This proposal does not include installation of any new, permanent, or temporary manholes or structures. SAK will utilize only those shown on the plans.
 - No removal or relocation of any utility conduits or piping that may be within structures or the sewer pipe. GC will provide clear access within MH structures
 - Manhole or structure removal, renovation, repair or rehabilitation.
 - Assumes access to pipe through existing manhole structure needs to be available and use of area adjoining manhole for truck traffic.
 - No surface restoration.
 - Assumes no control of infiltration to maintain safe, workable conditions
 - Point repairs or excessive infiltration remediation per results of pre-installation CCTV inspections and pipeline surveys (e.g. stopping “gushers” as defined by NASSCO’s pipeline defect coding system)
 - These repairs, if needed, will be negotiated separately.
 - This proposal does not include standby time.
 - Should the Owner halt work temporarily or if work is stopped due to circumstances beyond SAK’s control, standby time will be invoiced as an extra, based on actual cost + 15%
 - Excavation to retrieve equipment due to pipe condition

3. GENERAL NOTES:

- Price proposal based on SAK performing all pipeline rehabilitation work
- SAK reserves the right to adjust scope and/or pricing based on actual conditions and/or changes to the scope, plans, and/or specifications
- Work performed during standard shift work (up to 24 hours)
- Macomb County to provide laydown and parking area in the project vicinity for SAK’s operations
- Mutually agreed upon schedule-
- Contractor to maintain ‘Lock-out Tag-out’ system for all bypass and flow diversion operations.

4. PAYMENT TERMS:

- Net 30 days after receipt of invoice,
- Final Payment in full within 30 days of completion of SAK work
- This proposal assumes that the lengths of pipe segments described in the plans and specifications are accurate
- If the actual length of a segment to be lined is greater than 5% of plan quantities, SAK shall be paid based on the unit price provided in the table below.
- The proposed work will be completed per a mutually agreed schedule between SAK and Macomb County.

- This proposal is valid for 30 days

Thank for the opportunity to provide a proposal for the Garfield Interceptor SPR pilot. Please do not hesitate to contact me at 651.263.0498 should you have any questions.

Sincerely,
SAK Construction, LLC



Anthony A. Aderhold, PE
Business Development Leader

Accepted By: _____
On behalf of Macomb County Public Works

Date: _____

CC: Tim Bussen – General Manager
Cory Street – Sr. PM and SPR Specialist



Candice S. Miller

Public Works Commissioner
Macomb County

To: Macomb Interceptor Drain Drainage District Board Members

From: Vincent Astorino, Operations & Flow Manager

Date: August 8, 2022

Subject: Garfield Interceptor Lining Pilot Project – Consultant CCA Recommendation

During routine inspection of the large-diameter interceptors that comprise the MIDDD collection system it was discovered that a portion of the 7-foot diameter Garfield Interceptor (GI) is experiencing significantly accelerated degradation. The relatively localized pipe damage is consistent with Hydrogen Sulfide (H₂S) attack that is exacerbated by the turbulence created as the local municipality flows enter the interceptors. Repairing this reach of pipe is of the utmost importance to maintain uninterrupted service to the communities it serves. MCPWO staff have been working diligently to present a solution to this urgent matter.

Under separate cover, MCPWO staff have recommended awarding this rehabilitation project to SAK Construction, LLC. The merits of this recommendation are fully outlined in that letter. An added benefit of the SAK proposal is that the engineering is performed in-house by Sekisui. As such, a fully-engineered design package can be omitted and the project will move immediately to the construction phase. However, a project of this magnitude and importance will require a full-time inspection and project oversight.

MCPWO staff engaged Anderson, Eckstein & Westrick (AEW) during the product review period as part of their MIDDD Grouting Program contract. AEW assisted MCPWO staff with the review of different rehabilitation methods for this project. Since AEW has been part of this pilot project with MCPWO staff since the beginning it would be preferred to keep them on to manage the construction contract administration (CCA). AEW, specifically Mr. Louis J. Urban, has been involved in numerous rehabilitation projects throughout the MIDDD system and is highly qualified to act as the project manager. Additionally, several supporting staff committed to this project by AEW have significant roles on current MIDDD projects. This includes Mr. Chris Frayer (Segment 6 Resident Project Representative) and Mr. Chris Birkett (MIDDD Grouting Program In-Pipe Inspector).

AEW has submitted a proposal to perform oversight and administer this work from start to finish. Their not-to-exceed amount is in line with our office's estimates for this scope of work. They have agreed to not charge overtime rates for this work which is estimated as 10 hour days. Additionally, as another good faith gesture, AEW is also not charging for vehicle usage or mileage.

MCPWO is recommending that the Board award this contract to Anderson, Eckstein & Westrick, Inc. in the total not-to-exceed amount of \$127,873.50 to provide construction contract administration services as outlined in their proposal.

MCPWO staff is confident that AEW will be able to perform the work for the proposed fee. Upon approval, MCPWO will prepare an agreement with AEW that formalizes their cost proposal and project expectations.

Attachments: AEW Proposal Letter Dated 07/29/2022



ANDERSON, ECKSTEIN & WESTRICK, INC.
CIVIL ENGINEERS SURVEYORS ARCHITECTS

51301 Schoenherr Road
Shelby Township, MI 48315

586.726.1234
www.aewinc.com

July 29, 2022

Vince Astorino, Operations and Flow Manager
Macomb County Public Works
21777 Dunham Road
Clinton Township, MI 48036

Reference: MIDDD Rehabilitation Segment 10, GI-MH-026 STA to GI-MH-027

Dear Mr. Astorino,

As you are aware during the MIDDD grouting program it was revealed that approximately 755 lineal feet of 7' diameter reinforced concrete pipe in Segment 10 between GI-MH-026 and GI-MH-027 showed severe H₂S attack. The previously spray lined sewer segment has degraded resulting in section loss and exposed reinforcing steel. AEW was engaged to research products to rehabilitate the sewer that could be installed through the manhole openings and without the construction of large diameter shafts.

The types of products meeting the limited access manhole opening considered were liner plate and spiral wound. The liner plate materials were dismissed due to the Corrugated Metal Pipe (CMP) material and the Polyvinyl Chloride (PVC) panel products not being cost effective nor readily available in the United States.

Suppliers for both PVC and HDPE spiral wound products were contacted for pricing and availability. Contech advertises a steel reinforced HDPE reinforced SPR PE liner but after investigation it was revealed that the product is not owned by Contech, there is no inventory in the United States available, the manufacturer in Australia could not provide the supply and the cost was reportedly prohibitive compared to PVC.

The Sekisui SPR PVC steel reinforced spiral wound liner product is available and the contractor, SAK Construction LLC. has provided a cost quote for installation. The Sekisui SPR PVC steel reinforced spiral wound liner cost is less when compared to Hobas slip lining due to the need for large diameter shafts, utility relocation, traffic control, duration of the project and impacts to the community utilizing a slip lining product.

The MCPWO proactively requested a quote from SAK Construction LLC. While other products were being assessed by AEW. The MCPWO also asked that AEW investigate the SAK provided references for the viability of the Sekisui SPR PVC steel reinforced spiral wound liner product and proficiency of the SAK Construction LLC. as an installation contractor. The following are excerpts from the responses:

"SAK is a good contractor and we use them for all types of rehabilitation work. Have an annual contract with them. CIPP/etc.

Quality and longevity of the product? Great we went back 5 years and SPR is still working as designed.

Ease of installation and daily production rate? In Combination sewer. Installed during dry weather. Small footprint on job site.

Diameter of sewer lined and with or without bypass? Lined 114-inch combination sewer. With bypass pumping. Bulkhead dam installed upstream.

Professionalism of the contractor? Very professional



Macomb County Public Works
July 29, 2022
Page 2

Project completed on schedule and within budget? *Yes. We added addition lining with Change Order at city's request*
Any reservations with the product or contractor? *No. will use again in large lining projects.*

Matt Thomas, P.E., Engineering Division, KC WATER 816-513-0288

"SAK is currently installing 102" diameter Sekisui SPR PVC steel reinforced spiral wound liner at a production rate of approximately 60 feet per day. They are very organized and the project manager Bob Quackenbush is very professional. They are doing a great job and the product is very good."

WSSC: Collins Njoku - 240-882-2742

The City of Atlanta Department of Watershed Management did use the SEKISUI SPR Spiral Wound product; however, our Contractor was Ruby-Collins.

Quality and longevity of the product? No issues with the product to date.

Ease of installation and daily production rate? Contractor built a mock sewer truck line above ground to train prior to starting which made the installation process easier and daily production rate varied 25LF to 100LF a day.

Diameter of sewer lined and with or without bypass? A 90-inch arched concrete sewer. Bypass pumping and flow diversion was used. Unable to completely divert flow or bypass, this product allowed the contractor to work with active flow.

Professionalism of the contractor? Ruby-Collins was great contractor to partner with on this project.

Project completed on schedule and within budget? Yes

Any reservations with the product or contractor? No reservations with the SPR Spiral Wound product or Ruby-Collins.

Rodney B. Blount, City of Atlanta 404-546-3236

From our research and as indicated above the Sekisui SPR PVC steel reinforced spiral wound liner appears to be a viable product and SAK a qualified professional installer.

Louis J. Urban, P.E.
Project Manager



ANDERSON, ECKSTEIN & WESTRICK, INC.
CIVIL ENGINEERS SURVEYORS ARCHITECTS

51301 Schoenherr Road
Shelby Township, MI 48315

586.726.1234
www.aewinc.com

July 29, 2022

Vincent Astorino, Operations and Flow Manager
Macomb County Public Works
21777 Dunham Road
Clinton Township, MI 48036

Reference: MIDDD Rehabilitation Segment 10, GI-MH-026 STA to GI-MH-027
Request for Proposal Response

Dear Mr. Astorino,

It is with great interest that we submit our proposal to provide for Professional Engineering Services for the MIDDD Rehabilitation Segment 10, GI-MH-026 STA to GI-MH-027. AEW has assembled a team of personnel with the experience and expertise to make this project a success. We have comprehensive knowledge of the interceptor system, rehabilitation techniques, PACP/MACP trained personnel, rehabilitation specialists, community relationships, and the communication skills necessary ensure success.

As requested we are providing an estimated cost based on a three-month project construction duration. The assumptions and personnel are included in our engineer's estimate of probable cost as attached. The MCPWO is very familiar with the AEW staff, welcome any preferences you may have and will gladly assign tasks accordingly.

Established in 1968, Anderson, Eckstein and Westrick, Inc. (AEW) has provided municipal engineering services for over 50 years, we currently serve over 33 southeast Michigan municipalities. The Macomb County office of Public Works is one of our earliest and most valued clients. We are honored by your consideration of Anderson, Eckstein and Westrick and if selected look forward to serving you once again.

Respectfully,

Louis J. Urban, P.E.
Senior Project Engineer

Enclosures:

Estimated Staff Hours by Classification – Costing Spreadsheet/Assumptions/Comments

MIDDD Rehabilitation Segment 10, GI-MH-026 STA to GI-MH-027 Opinion of Probable Cost	Estimated Staff Hours By Classification															Total Cost	Commentary / Assumptions	
	AEW Services																	
	Principal Engineer Scott Lockwood	Senior Project Engineer Louis Urban	Senior Project Engineer Kevin Zauel Mohammed Lutfi	Graduate Engineer / Team Leader Jeff Allegoet	Drafter / Technician Mike Sopczynski	Licensed Engineer Pat Marcus Joe Eberle	Licensed Surveyor Mike Truax Craig Arney	Licensed Engineer Sydney Kanan	Project Manager Frank Varicalli	Confined Space Entry Crew	Senior Project Engineer Paul Guinmane	Project Engineer Chris Frayer	Engineer Aid III Mike Harrington Chris Birkett	Clerical	Equipment & Expenses			
Engineering Sub-Task	174	159	159	117	98	143	143	143	159	228	159	143	98	47				
Task 1 – WWS-2022-006 - GI Lining Pilot Project																		
Sub-task A – Construction Documents																		
MIDDD Rehabilitation Segment 10, GI-MH-026 STA to GI-MH-027																		
1	Prepare drawings in AutoCAD 2017 in accordance with the MCPWO standards that include plan and profile, traffic control, soil erosion sheets, temporary construction easements.	1	8	4	2	24	32	24		2				4			\$ 13,564.00	Recent aerial imagery will be utilized. Field work is not deemed necessary and therefore not included in this proposal. AEW will utilize Macomb County Geographic Information System (GIS) base maps to indicate road rights-of-way (ROW) and any recorded easements necessary for the Contractor to successfully complete the project.
2	Submit documents at the 100% milestone and meet with MCPWO for review.		2											2			\$ 603.00	Revised contract documents submitted electronically hard copy for MCPWO review
3	100% MCPWO review comment revisions & Final Document Preparation	1				2								1			\$ 512.50	Assumed the comments will be minor
4	Prepare the necessary permit applications and assist MCPWO in securing permits.		2											8		4	\$ 1,646.00	Permit fees will be the responsibility of the contractor.
	Task 1 Sub-Total SUB TASK A	2	12	4	2	26	32	24	0	2	0	0	15	0	4	0	\$16,325.50	
Sub-task B – Contractor / Contract Coordination																		
1	Meet with the contractor to discuss the project prepared as part of Sub-task A		2											2			\$ 603.00	
2	Answer contractor questions / concerns and negotiate costs if necessary		4											4		2	\$ 1,300.00	
	TASK 1 Sub-Total SUB TASK B	0	6	0	0	0	0	0	0	0	0	0	6	0	2	0	\$1,903.00	
Sub-task C – Construction Contract Administration																		
1	Conduct and summarize a preconstruction / kick-off meeting with Owner, Community Representatives and Contractor		4											4	4		\$ 1,598.00	Kickoff meeting held at the MCPWO for convenience
2	Review all submittals, shop drawings, traffic control plans, flow control plans, etc.		4	16										12	12		\$ 6,798.00	
3	Review Requests for Information		4				4							8	8		\$ 3,620.00	
4	Review Contractor's periodic Applications for Payment		2											8	12		\$ 2,022.00	Assumed 3 months duration
5	Conduct and memorialize regular progress meetings.		24											24			\$ 7,236.00	Assume weekly site meetings or via zoom
6	Perform full-time construction observation and daily reporting by a PACP certified engineer.		8							16				16	600		\$ 66,000.00	Assume 60 work days total project at 10 hours per day as provided in the Contractors quote.
7	Contract Administration, DFR review and Processing	2	24						2					100	24		\$ 19,860.00	Daily involvement in the CCA process
8	Conduct contract close-out		2				4		2					8	2		\$ 2,511.00	CCTV video of large diameter pipe and manholes, NEXGEN
	Task 1 Sub-Total SUB TASK C	2	72	16	0	0	8	0	2	2	16	20	180	606	36	0	\$109,645.00	
	Total TASK 1	4	90	20	2	26	40	24	2	4	16	20	201	606	42	0	\$127,873.50	

Additional Comments & Assumptions:

- 1 The MCPWO is very familiar with AEW staff. We will adjust personnel based on MCPWO preferences.
- 2 The estimate of effort provided is based on our understanding of the project and available MCPWO supporting documents. If the assumptions are erroneous the cost would be adjusted accordingly.
- 3 Flow control management is assumed to be a cooperative between AEW, MCPWO and the contractor. No bypassing of the interceptor system is anticipated. However it is anticipated that bypassing or temporary plugging of local sewers is required to facilitate sewer rehabilitation equipment and personnel. The bulk of this effort is assumed to be by the contractor in the submittal process.

EXHIBIT "A"

DISCOUNTED HOURLY CHARGE RATES

<u>EMPLOYEE CLASSIFICATION</u>	<u>HOURLY CHARGE RATE</u>
PRINCIPAL ENGINEER / SURVEYOR / ARCHITECT	\$ 174.00
SENIOR PROJECT ENGINEER / SURVEYOR / ARCHITECT	159.00
LICENSED ENGINEER / SURVEYOR / ARCHITECT	143.00
GRADUATE ENGINEER / SURVEYOR / ARCHITECT	117.00
TEAM LEADER	117.00
ENGINEERING AIDE III	98.00
ENGINEERING AIDE II	88.00
ENGINEERING AIDE I	79.00
ENGINEERING AIDE TRAINEE	57.00
SECRETARIAL (Special Projects)	48.00
SURVEY FIELD (3 PERSON CREW)	237.00
SURVEY FIELD (2 PERSON CREW)	198.00
SURVEY FIELD (1 PERSON CREW)	154.00
CONFINED SPACE ENTRY CREW	228.00
CONFINED SPACE ENTRY (EACH ADDITIONAL PERSON)	77.00
DATA COLLECTOR (SURVEY CREW)	33.00
GPS SURVEY EQUIPMENT	82.00

LEGAL MATTERS BILLED AT 1.5 TIMES ABOVE RATES.

EFFECTIVE JANUARY 2022 AND
UPDATED ANNUALLY TO REFLECT CPI.

<u>Funding Source</u>	<u>Apportionment</u>	<u>Manager</u>	<u>Vendor</u>	<u>Amount</u>	<u>Invoice Detail</u>	<u>Project Summary</u>	<u>Project Balance</u>	
Macomb Interceptor Drain	Chapter 20 Chesterfield – 7.3432% Clinton – 21.3460% Fraser – 4.1370% Harrison – 6.4221% Lenox – 1.0652% Macomb – 13.9284% New Haven – .8271% Shelby – 9.7757% Sterling Heights – 30.7833% Utica – 1.6268% Washington – 2.7451%							
		Baker	Aloia & Associates	\$ 551.00	Invoice #26443 - 06.01.22	Sale of 45345 Garfield Road - May 2022		
		Astorino	American Car Care	\$ 658.02	Invoice #7675 - 07.08.22	Brakes/Rotors - 2014 Ford Explorer (Pool Vehicle)		
		Downing	Anderson, Eckstein & Westrick	\$ 13,742.05	Invoice #138241 - 07.11.22	MID Grouting Program - 06.06.22 - 07.03.22	\$ 208,701.65	
		Downing	Anderson, Eckstein & Westrick	\$ 168,703.40	Invoice #138387 - 07.14.22	MID Dropshaft & Sewer Rehab - 7/2021 - 7/2022		
		Astorino	CDW Government	\$ 1,475.94	Invoice #BB21831 - 06.23.22	Router - SCADA		
		Astorino	Cortis Brothers Trucking	\$ 19,250.00	Invoice #9217 - 07.07.22	Garfield & Millar Emergency Repair - Manhole		
		Astorino	DTE Energy	\$ 1,074.07	Invoice #22-257 - 06.30.22	Monthly Electric 06.01.22 - 06.29.22		
		Astorino	Fishbeck	\$ 2,363.00	Invoice #413151 - 07.08.22	MID Metering	\$ 28,207.36	
		Astorino	Fishbeck	\$ 13,828.00	Invoice #413141 - 07.13.22	Wastewater Master Plan 06.11.22 - 07.08.22	\$ 312,597.49	
		Astorino	Fishbeck	\$ 948.00	Invoice #413132 - 07.11.22	GLWA Assistance 06.11.22 - 07.11.22		
		Downing	FK Engineering Associates	\$ 76,691.82	Invoice #22-058-025 - 07.14.22	MCPWO Segment 6 Rehabilitation 05.29.22 - 07.09.22	\$ 1,020,984.54	
		Downing	FK Engineering Associates	\$ 138,696.62	Invoice #20-152-019 - 07.14.22	Romeo Arm Lining Segment 5 CCA - June 2022	\$ 593,174.06	
		Baker	KHVPF	\$ 1,375.00	Invoice #48504 - 07.01.22	Highland Park Review		
		Downing	Oscar Renda Contracting	\$ 356,564.54	Invoice #WO19024 Est #23 - 08.01.22	Romeo Arm Segment 5 Lining 07.01.22 - 07.31.22	\$ 18,214,056.95	
		Downing	Ric-Man Construction	\$ 174,987.55	Invoice #WO21026 Est #11 - 08.01.22	Segment 6 Services 07.01.22 - 07.31.22	\$ 9,954,427.06	
		Downing	Tetra Tech, Inc.	\$ 7,222.50	Invoice #51921929 - 07.15.22	Odor & Corrosion Design 04.02.22 - 07.01.22	\$ 39,471.72	
		Astorino	Verizon	\$ 2,732.97	Invoice #9907225495 - 05.23.22	Monthly Cellular - 04.24.22 - 05.23.22 (Eq. Fund)		
		Astorino	Verizon	\$ 1,496.50	Invoice #9907225495 - 05.23.22	Monthly Cellular - 04.24.22 - 05.23.22		
		<u>Biofilter</u>		Astorino	City of Fraser	\$ 698.18	Invoice #22-272 - 07.15.22	Monthly Utilities 05.16.22 - 06.16.22
		Astorino	De-Cal, Inc.	\$ 556.20	Invoice #WO90022085-2 - 06.28.22	2nd Quarter HVAC Preventive Maintenance		
<u>CPS</u>		Astorino	Clinton Township Treasurer	\$ 3,131.61	Invoice #22-266 - 07.06.22	Monthly Water - 05.23.22 - 06.28.22		
		Astorino	Cummins Sales and Service	\$ 2,294.77	Invoice #S6-91571 - 04.12.22	Block Heater Replacement		
		Astorino	De-Cal, Inc.	\$ 2,086.20	Invoice #WO90022091-2 - 07.14.22	2nd Quarter HVAC Preventative Maintenance		
		Astorino	DTE Energy	\$ 23,440.26	Invoice #SW1X5-KOYV7 - 06.11.22	Monthly Electric 05.03.22 - 06.01.22		
		Astorino	DTE Energy	\$ 18,942.15	Invoice #22-269 - 07.12.22	Monthly Electric 06.02.22 - 07.04.22		
<u>CS-3</u>		Astorino	HESCO	\$ 5,000.00	Invoice #2213606 - 05.02.22	Hydraulic Cylinder Installation		
<u>METERS</u>		Astorino	Detection Instruments Corp	\$ 7,702.46	Invoice #2698-52414 - 07.14.22	Odor Logger		
<u>NGI</u>		Astorino	De-Cal, Inc.	\$ 8,341.01	Invoice #WO9221053 - 06.28.22	Remove and Rebuild Wedge Valve		
		Astorino	Fishbeck	\$ 9,557.80	Invoice #413169 - 07.13.22	Interceptor Inspection Program 06.11.22 - 07.08.22	\$ 95,875.69	
		Astorino	National Industrial Maintenance	\$ 1,232.14	Invoice #42989 - 06.09.22	Jet Vac Cleaning		
<u>OMID</u>		Baker	KHVPF	\$ 687.50	Invoice #48503 - 07.01.22	Lock Out Procedure		
		Downing	Oakland County Treasurer	\$ 4,259,286.67	Invoice #C1003592 - 07.01.22	Sewer Disposal - June 2022		
Total				\$ 5,325,317.93				

Budget to Actual
MIDDD
As of July 31, 2022 = 8%

DESCRIPTION	2023 FINAL BUDGET	ENCUMBERED	ACTUAL	REMAINING BUDGET	PCT UTILIZED
REVENUE ACCOUNTS					
GLWA-OMID	48,014,249		4,001,584	44,012,665	8.3%
OMID O&M	4,358,913		363,243	3,995,670	8.3%
Settlement	100,000			100,000	0.0%
Reimbursements	225,000		915	224,085	0.4%
PY Revenue-Fund Balance	16,738,220			16,738,220	0.0%
Reimb-Local Communities	17,159,080			17,159,080	0.0%
COVID Grant	-		189,170		
Interest	50,000			50,000	0.0%
<i>Total Revenue Accounts</i>	86,645,462	-	4,554,912	82,279,720	5.3%
EXPENSE ACCOUNTS					
GLWA-OMID	48,014,249		4,001,584	44,012,665	8.3%
OMID O&M	4,358,913		363,243	3,995,670	8.3%
Public Works Wastewater Disposal Division	1,889,760			1,889,760	0.0%
Office Operations/Insurance	343,100		5,441	337,659	1.6%
SCADA	461,990		4,851	457,139	1.1%
<u>Engineering</u>					
Replenish reserve from CPS refunding	618,680			618,680	0.0%
Drop shaft rehab Design	1,600,000		177,965	1,422,035	11.1%
METCO As Needed	75,000		8,219	66,781	11.0%
Data Review-Aquasight	58,000			58,000	0.0%
Annual Meter Dye Testing	50,000			50,000	0.0%
As Needed Engineering	250,000			250,000	0.0%
Odor and Corrosion Construction/CCA	3,280,000			3,280,000	0.0%
GLWA Assistance	30,000			30,000	0.0%
General Construction/Engineering Contingency-All Projects	450,000			450,000	0.0%
As Needed Applied Science	25,000			25,000	0.0%
As Needed Metco	60,000			60,000	0.0%
Level Sensors/Pressure/H2S-Meters	214,200			214,200	0.0%
Odor and Control-Construction	7,010,000			7,010,000	0.0%
Segment 6 Construction Administration	685,530		91,127	594,403	13.3%
SY-S-1, SY-S-2, & WA-S-1 Meter Const Admin/Rehab	927,790		1,620	926,170	0.2%
Segment 5 Construction Admin	972,500			972,500	0.0%
COVID Grant	-		189,170	(189,170)	100.0%
Segment 5 Construction	611,240			611,240	0.0%
Legal Services	75,000		3,842	71,158	5.1%
Clintondale PS O&M	870,000		30,423	839,577	3.5%
NGI O&M	307,500		1,677	305,823	0.5%
Meters O&M	228,400		8,297	220,103	3.6%
Control Structures and Pump Station O&M	281,370		23,448	257,923	8.3%
Biofilter O&M	25,500			25,500	0.0%
Contribution Life Cycle Reserve	184,300			184,300	0.0%
Interceptor O&M	9,898,300		40,005	9,858,295	0.4%
Stormwater Pump Stations	131,000			131,000	0.0%
Sewage Disposal Charges - Mt. Clemens	200,000		23,217	176,783	11.6%
Debt Service - Revenue Bonds	2,458,140		204,845	2,253,295	8.3%
<i>Total Expense Accounts</i>	86,645,462	-	5,178,974	81,466,488	6.0%

	O&M Balance 6/30/2022	O&M	Total 7/31/2022
Cash - Operating	30,647,265	(624,062)	30,023,204
Accounts Receivable			0
Assets			0
Liabilities			0
Revenues		4,554,912	4,554,912
Expenditures		5,178,974	5,178,974
			0
Equity*	30,647,265		30,023,204

Detail of 2022 Equity*

Projected reserve at 6/30/2022	10,724,789
Projected Construction/ Engineering Reserve	18,754,871
Life Cycle Reserve	1,167,605
Estimated. Invoices for 6/30 still arriving	