CITY OF BERKLEY PUBLIC NOTICE
REGULAR CITY COUNCIL MEETING
Monday, February 2, 2026
7:00 P.M. – City Hall
248-658-3300

CALL 41st COUNCIL TO ORDER
APPROVAL OF AGENDA
MAYOR-LED MOMENT OF REFLECTION
PLEDGE OF ALLEGIANCE
PUBLIC COMMENT
Comments are invited on each Agenda item when that item comes up for consideration. Matters not listed on the Agenda may be addressed at this time. Please state your name and residential city. Each speaker's remarks are a matter of public record, and the Council will not engage in a back-and-forth discussion. Any person speaking at a City Council Meeting may be called to order by the Mayor or any Council Member for failure to be germane to the business of the City or for disruptive or disorderly behavior which prevents the Council from conducting its business. There is a three-minute limit per speaker.
ORDER OF BUSINESS

Consent Agenda

1. Minutes of the Regular City Council meeting on Monday, January 26, 2026, Special City Council meeting on Friday, January 23, 2026, and Special City Council meeting on Monday, January 26, 2026.

2. Utilize Oakland County Cooperative Contract 011677/011678 with DVM Utilities for Sewer Lining Services.

Regular Agenda

1. Recognitions or presentations from the Consent Agenda.

2. Legislative update from State Rep. Natalie Price.

3. SMART Specialized Services – FY26.

COMMUNICATIONS

ADJOURN

Note: The City of Berkley will provide necessary reasonable auxiliary aids and services, such as signers for the hearing impaired and verbal representations of printed materials being considered at the meeting, to individuals with disabilities at the meeting upon four working days' notice to the City. Individuals with disabilities requiring auxiliary aids or services should contact the City by writing or calling: Victoria Mitchell, ADA Contact, Berkley City Hall, 3338 Coolidge Highway, Berkley, MI 48072 (1-248-658-3310).

Note: Official minutes of City Council Meetings and supporting documents for Council packets are available for public review in the City Clerk's Office during normal working hours. Anyone wishing to submit correspondence to the Council before the meeting may send an email to comment@berkleymi.gov by noon on the day of the meeting. Emails sent prior to the deadline will be a part of the meeting record but will not be read during the Council meeting.

THE REGULAR MEETING OF THE FORTY-FIRST COUNCIL OF THE CITY OF BERKLEY, MICHIGAN WAS CALLED TO ORDER AT 7:00 PM ON MONDAY, JANUARY 26, 2026 BY MAYOR DEAN

PRESENT: Councilmember Steve Baker
Councilmember Gary Elrod
Councilmember Dennis Hennen
Councilmember Gregory Patterson
Mayor Bridget Dean

ABSENT: Councilmember Clarence Black
Mayor Pro Tem Ross Gavin

OTHER STAFF PRESENT:
City Manager Crystal VanVleck
City Attorney Matthew Zalewski
Deputy City Manager of Public Services Shawn Young
Parks & Recreation Director Dan McMinn
Deputy City Clerk Rachel Patterson
Lieutenant Andrew Hadfield

APPROVAL OF AGENDA
Councilmember Baker moved to approve the agenda
Seconded by Councilmember Hennen
Ayes: Elrod, Hennen, Patterson, Baker and Dean
Nays: None
Absent: Gavin, Black
Motion Approved.

PUBLIC COMMENT

Andrew McIndoo, Berkley, spoke regarding the updated Five-Year Recreation Master Plan.

CONSENT AGENDA
Councilmember Hennen moved to approve the following Consent Agenda
Seconded by Councilmember Baker

Minutes of the Regular City Council meeting on Monday, January 5, 2026.

Warrant List No. 1418.

Design services proposal from Spalding DeDecker for the Library Parking Lot Rehabilitation Project.

Resolution establishing the policy and guidelines for granting an exemption from payment of property taxes.

Ayes: Elrod, Hennen, Patterson, Baker and Dean
Nays: None
Absent: Gavin, Black
Motion Approved.

Regular Agenda

RECOGNITIONS/PRESENTATIONS: Matter of receiving any recognitions or presentations from the Consent Agenda.

None.

Presentation: 2025 Board & Commission Achievements.

Deputy City Clerk Rachel Patterson presented the 2025 achievements of city boards and commissions:

- Beautification Advisory Committee
  - Cleaned up garden beds outside the Public Safety building, Friends Park and the Community Center.
  - Walked in the Holiday Lights Parade and orchestrated a beautiful luminary display at Bacon Park.
- Environmental Advisory Committee
  - Very active at community events, operating their popular bike corral to promote clean air in Berkley and use of alternative transportation.
  - Organized several opportunities for residents to recycle and reduce waste.
- Historical Committee
  - Continued to attract visitors, with an average of 11/week plus large numbers during events (many of these were new visitors coming to purchase our immensely popular 3D Santa ornaments, designed and 3D printed by a committee member).
  - Provided informational historical displays, newsletters, answers to resident questions and research requests as well as popular social media posts all devoted to Berkley history.
- Library Board
  - Reviewed and updated several policies as well as their bylaws.
  - Created opportunities for members to engage with local groups that provide support and professional development for board members.
- P&R Advisory Board
  - Amplified P&R programming and accomplishments.
  - Diligently worked on the 5-year plan including multiple community engagement meetings.
- Tree Board
  - Planted thirty 2024 DTE grant awarded trees in the spring of 2025 as well as two Sweetgum trees at Oxford Park in celebration of Arbor Day.
  - Participated in many community events, including Street Art Fest, Touch-a-Truck, Boolkley Monster Mash and the Holiday Lights Parade.

Presentation: 2025 Strategic Framework Annual Report.

City Manager VanVleck presented regarding the report:

- Vision, Mission, Values
  - Mission: Berkley will strive to enhance economic vitality, preserve neighborhoods, and foster progress to implement the City's vision and values.
  - Vision: Berkley will be a thriving 21st-century municipality, rooted in strong neighborhoods and a walkable design, supported by a caring community that helps every resident, business, and visitor to flourish.
  - Values: Caring, Innovative, Welcoming, Active
- Priority Area 1: Organizational Effectiveness
  - Objective: Cultivate a strong organizational culture
    - The Human Resources Director has created and implemented a robust performance appraisal process, and provided a thorough training to all supervisors to assist them in completing effective evaluations.
    - The City Manager and Human Resources Director completed a citywide tour, meeting with every department/employee to discuss the Strategic Framework, the functions and future of HR, and open enrollment (including the introduction of a Flexible Spending Account benefit).
    - We have held three all-staff trainings this year, one with a focus on fostering a resilient, growth mindset, one on the Freedom of Information Act, and one on Emergency Management
    - Professional development has been a high priority this year. In addition to the all-staff training, the Human Resources Director implemented several leadership training

opportunities and resources, and staff have attended a wide range of training, certification programs, and continued education.

- Leadership Staff: Getting Comfortable with Conflict Training
- Leadership Staff: LinkedIn Learning pilot program with assigned Leadership curriculum
- Leadership Staff: Michigan Municipal League risk management met with leadership to conduct Workers Compensation training and a Q&A session
- Matt Wells and Adam Wozniak, both from DPW, attended a NASSCO recertification class and successfully completed and passed the PACP, LACP, and MACP. These certifications allow us to camera and rate our sewer system internally.
- Two BDPS staff attended training to become Child Passenger Safety (CPS) technicians. Five BDPS PSOs attended OakTac High Risk Unified Command training.
- Facilities Manager, Alex Brown, earned the Certified Facility Manager (CFM) credential.
- All 40 Summer Camp Counselors were provided in-depth training before the start of camp.
- The City Clerk attended the Michigan Association of Municipal Clerks conference and the State of Michigan Bureau of Elections training in Lansing.
- City Manager and Deputy City Manager attended the ICMA (International City County Manager's Association) annual conference.
- The Human Resources Director attended the MPELRA (Michigan Public Employer Labor Relations Association) Conference
- Community Development staff (Kristen and Kim) both attended the Michigan Association of Planning conference.
- The Community Development Director attended the Michigan Economic Development Association Basic Course.
- The IT Director attended the GrrCON Michigan Cybersecurity Conference and the annual BS&A conference.
- The Deputy City Treasurer attended the Michigan Municipal Treasurers Association Conference.
- Public Safety employees continue to complete mandatory and voluntary training and professional development in law enforcement, firefighting, emergency medical service and dispatch.

- Objective: Optimize organization, structure, staffing, policies/procedures, and level of service
  - The Treasury and Finance Departments consolidated shared responsibilities and created greater efficiency.
  - Parks and Recreation, Facilities, and Public Works were consolidated under Berkley Public Services. This has created shared resources and responsibilities of multiple departments that consistently work together to deliver various services.
  - Standard Operating Procedures (SOPs) have been developed citywide.
  - Clerk's office staff and Community Development staff have completed cross-training with Treasury.
  - The Clerk's office spearheaded the transformation of the Board and Commissions appointment process and Boards and Commissions handbook. The first phase has been completed, and they are now gearing up to work with the Ad Hoc Committee on Phase 2.
  - Human Resources has seen a transformation this year under the leadership of our HR Director. She has successfully engineered a comprehensive recruitment and onboarding infrastructure. This effort focused on three key areas: standardizing hiring procedures (from job postings to interviewing), updating essential compliance paperwork (including background checks and registration forms), and creating formal workflows for personnel management.
  - An audit of personnel files was completed by the Human Resources Department to ensure all forms have been properly documented.

- Successfully transitioning to new providers for several key services—including the city attorney, engineering firm, assessing firm, and healthcare benefits administrator—was achieved through the release of RFPs, and a thorough interview and onboarding process. These changes are already helping to significantly enhance the overall effectiveness and efficiency of the organization.
- Cross department collaborations:
    - Community Development and DPW have been meeting weekly with the new Engineering consultant, Spalding DeDecker to establish and update processes for performance guarantees, private site inspections, pre-construction, engineering construction plan review, site plan review, and residential grading and as-built review. With the help of the IT Director, Stan Lisica, they have been working on GIS services set-up and expansion.
    - The staff Parking Committee (CD, DPW, City Manager's Office, Public Safety) is working towards implementation of the recently updated and approved Overnight Parking Policy, including the issuance of overnight parking passes for municipal lots.
    - Community Development, the City Manager and the Deputy City Manager of Public Services recently met to address short and long-term plans for snow removal in commercial districts.
    - Community Development, DPW and Public Safety have been working on a revamp of the code process, including nuisance abatement updates.
- City Administration, led by the Clerk's office, have processed 159 general FOIA requests this year. In addition, the City Manager processed ten FOIA appeals. While the Freedom of Information Act is a fundamental right that upholds accountability and trust, we also have a responsibility to ensure that the City's limited resources are serving the entire community. I'm incredibly proud of our team for accomplishing so many of our key objectives this year, even under the strain that the frequent FOIA requests and appeals can have on our most finite resource - time.

- Objective: Foster stronger relationships with community and regional partners
    - The Human Resources Director attended the OAKMAC-SHRM/PSHRA roundtable discussion with other HR professionals.
    - The Clerk's office entered into a partnership with Oakland County and other neighboring communities to create a regional Early Voting Center, staff attended the City of Ferndale's all-day FOIA training, and the City Clerk worked the Clawson May election gaining strategies to help strengthen the City's election process.
    - The Communications Director has attended several SEMCOG Communicators Network meetings, and several SOCRRA networking events, including a tour of the SOCRRA Material Recovery Facility. She recently worked with community engagement/communications representatives from Royal Oak, Clawson, Berkley Schools, Clawson Schools, and Royal Oak Schools to plan the annual MLK Day of Service. Additionally, she worked with Berkley Cares Food Pantry leadership to create a partnership between the pantry and the City as well as fostering engagement with Vibe Credit Union in Downtown Berkley. This partnership means that donation boxes for the pantry will be available year-round at City Hall, the Library, the Community Center, the Public Safety building, and the Vibe Credit Union lobby to create easy opportunities for residents to donate to the pantry.
    - The Communications Department and Community Development represented Berkley at the Southeast Oakland Safety Plan Communications Training to strategize how to promote safe streets in our community and neighboring communities.
    - The Community Development Director and the City Manager each attended M-1 Corridor Plan Meetings led by the Michigan Department of Transportation (MDOT). These meetings are attended by communities along the Woodward Corridor, MDOT, and a consultant to refine specific design options for each segment of the corridor.
    - The Downtown Development Authority (DDA) Director attended several Michigan Downtown Association's (MDA) workshops, all Main Street Oakland County Manager meetings, and the Main Street Oakland County Main event

        - Berkley DPS personnel continue to lead regional cooperation in training, preparation, response, and recovery to major incidents. Several City departments planned and successfully implemented several major events, including CruiseFest and the Woodward Dream Cruise. Under the leadership of Berkley DPS personnel, there was unprecedented interagency cooperation during these events. Additionally, BDPS assisted several other municipalities throughout the region with their events.
        - Members of the City Council and the City Manager attended quarterly meetings with representatives from the Berkley School District. These meetings ensure communication and collaboration between the two organizations.
    - Objective: Identify and implement innovative operational solutions
        - We are near completion with BS&A system enhancements, including the automation of the accounts payable process, bond/escrow payments and equipment rental streamlining.
        - We have almost completed the CivicPlus migration for agenda management and Boards and Commission Program
        - Finance Department made large strides in innovating processes this year:
            - The Finance Department created a master miscellaneous receivables tracker and a monthly billing checklist.
            - The Treasury Department updated its processes by uploading supporting documentation for miscellaneous cash receipts, which has eliminated paper copies.
        - The City has made large strides in digitizing processes and documents.
            - The Community Development Department has made all permitting, except those that require a detailed plan review, available online.
            - The Public Safety Department has implemented the parking permit portal and is almost a paperless department.
            - The Clerk's Office and the IT Department have been working diligently to scan all documents within the retention schedule
            - The Clerk's office has digitized its peddler application process and digitizing contracts.
            - Community Development has created QR codes for common permits so residents can access them on the BS&A online or fillable PDFs of permit applications.
            - Library staff are continuing to tag and program the Library's Collection with Radio Frequency Identification tags (RFID) to help with checking out and returning materials.
- Priority Area 2: Economic Sustainability
    - Objective: Identify, prioritize, and deploy economic development tools
        - The Community Development Director and the City Manager introduced the PILOT Workforce Housing ordinance to City Council, which was ultimately adopted. The City has received the first application, with the Community Development Department reviewed and brought to City Council.
        - After the release of an RFP, a consultant (Better City) was chosen, and an agreement was approved for the Economic Development Strategy. The Community Development Director, City Manager, and DDA Director have bi-monthly meetings scheduled with the Better City team throughout the six-month process.
        - The Community Development Director and the City Manager met with the Michigan Economic Development Corporation (MEDC) for project-specific questions, and to identify tools available for current and potential development projects in the City. The City Manager submitted a letter of support to the MEDC for a low-interest loan opportunity for The Columbia.
        - Community Development has received and reviewed policy write-ups for payment in lieu of parking and leasing of municipal parking spaces from Carlisle Wortman.
        - The updated overnight parking policy includes opportunities for leased municipal passes for properties adjacent to municipal parking.

- Objective: Expand economic recruitment and retention efforts strengthening the City's economic portfolio
  - The Community Development Director and Communications Director have met to identify the needs of the Marketing Plan, which will be completed once the City's Economic Development Strategy is finalized, with priority sites identified. This is one of the last pieces of the City's Redevelopment Ready Community certification.
- Objective: Implement Master Plan updates and development process improvements
  - A complete rewrite of the City's Zoning Ordinance was implemented this year, a cover-to-cover reexamination of all zoning regulations.
  - Community Development has created a webpage on our website to connect homeowners to Oakland County home improvement resources and resources on universal design and energy-efficient opportunities.
  - Community Development worked with Finance to update the City's escrow policy.
- Objective: Improve City/DDA strategic alignment
  - In collaboration with the DDA, the Dorothea Pocket Park was activated for the BOO!kley season, with many of the DDA's Halloween events taking place there as well as a Parks & Recreation program and a community picnic spearheaded by the Communications Director.
  - The DDA, Community Development and DPW worked with the Berkley Theater owners on several aspects of the theater renovation, including a municipal parking agreement for their parking lot, and coordination with Berkley First Church on a potential agreement for their adjacent lot.

- Priority Area 3: Community Assets
  - Objective: Complete comprehensive asset needs inventory and management plan
    - Led by the Facilities Manager, an assessment of all municipal buildings was completed in the first quarter of this year. The assessment provides an analysis of our long-term maintenance needs and lifecycles of our facilities, and will guide us in a proactive approach to strategically invest in our assets.
    - Led by the Facilities Manager, a Space Utilization study of City Hall was completed to better understand our future needs.
    - The Parks and Recreation Superintendent led the process, with the assistance of Johnson Hill Land Ethics Studio to update the City's 5-year Parks and Recreation Master Plan. The Plan will guide the expansion and development of the City's parks and programs.
    - The City was awarded a grant to fund Lead Service Line verifications and a contract has been approved by City Council. Field work started in the fourth quarter.
    - The City contracted with Coldwell Banker, Richard Ellis (CBRE), to acquire an appraisal of City Hall and associated properties.
  - Objective: Develop sustainable asset investment strategy that supports funding for the City's capital improvement plan
    - The Finance Department implemented an overhaul of the City's Capital Improvement Plan process to ensure a thorough, well-thought-out, long-term plan to address our capital needs.
    - The Public Improvement Fund was created to strategically invest in and fund the City's capital needs.
    - We re-outfitted our sewer camera inspection truck with an emphasis on cost savings and replacing the equipment on an existing chassis.
  - Objective: Improve community resiliency
    - The Community Development Department completed the engineering Design Standards, which includes a comprehensive guide to developing and redeveloping property. This focuses on non-residential and large-scale residential projects and includes current and future standards from Oakland County, MDOT, and other regulatory agencies. With the transition to a new engineering firm, these standards are being reviewed with small adjustments recommended based on best practices.
  - Objective: Improve facility/staff security and safety

        - A full scope of the camera and access security upgrades budgeted for this year has been solidified, and will be presented to Council in the new year.
        - The Clerk's Office is working with Jack Blanchard to update and revise the Elections Security Plan for the upcoming November election.
        - ● The City Clerk is also working with the school district to ensure safety and compliance at all precincts amidst the school district construction.
        - ● The Clerk's Office has created a comprehensive election security plan with Jack Blanchard and the Berkley School District.
- Priority Area 4: Open Communications
    - Objective: Identify community audiences and most effective City "voice(s)"
        - The Communications Director released a community survey regarding communication preferences, which provided helpful insight into the best ways to engage our residents.
        - The Clerk's office worked with the Communications Director to communicate their election communications plan, which helps to instill knowledge and confidence in the election process. This information is shared in the Election Worker Training Program, instilling these important messages in election workers so they can also share the message. The Clerk's office collaborated with the Communications Director to develop and distribute an election communications plan. This initiative is designed to build public knowledge and confidence in the election process. Key messages from this plan are integrated into the Election Worker Training Program, empowering election workers to effectively convey this essential information to the public.
        - The Clerk's Office organized a City Council candidate forum with the League of Women Voters.
    - Objective: Identify and implement priority communication strategies within human and financial resources
        - In a collaboration between the Communications Director, the Library and Parks and Recreation, the City produced updated program guides via postcard sent to all households with direct link to digital guide.
        - In response to feedback received from the communications community survey, and in an effort to identify and utilize the most effective communication channels, the Communications Director launched a bi-weekly e-newsletter, which includes important and timely information.
        - The Communications Director spearheaded the launch of the updated City website, and has spent the year working with the website company and the IT Department to work through any bugs, and make the site more user-friendly based on feedback from residents, staff, and City Council.
        - The Communications Director has sent eleven press releases to the media for many events and initiatives this year and coordinated media coverage of CruiseFest and the retirement of K9 Bear/PSO Anderson.
        - The Communications Director has worked diligently to provide community members robust information including important updates, Council meeting recaps, election information, important public services information, engagement opportunities, and city-hosted events and programs via social media, email, and specialized mailers.
    - Objective: Foster meaningful community engagement and genuine relationships
        - The Clerk's office and the City Manager's office facilitated two Ad Hoc Committee meetings and one meeting with Board and Commission chairs to discuss the Board and Commission policy updates and appointment process.
        - The Dorothea Pilot Pocket Park planning was led in large part by a volunteer group of residents and business owners who met numerous times to plan its implementation. It was launched in June, with various events throughout a month-long period. Events were well attended, and the park was well throughout that period. A survey was available during implementation, and the Communications Director reported on the feedback provided during the August 18 Council Meeting. Survey results showed that many people utilized the space passively, and would like to see it permanently

converted into a public space. This feedback informed the Boolkley activation of the space during the month of October.
        - Volunteers for the 2024-2025 Fiscal year were recognized by the City Council at the annual Berkley Board and Commission Appreciation Luncheon. Jack Blanchard was awarded the 'Handling Berkley Business' award for his service to the City. Lisa Kempner was awarded with '2025 Volunteer of the Year' award by her fellow volunteers for her service to the City.
        - The Library hosted Rogers Elementary while school was in session as a part of the Berkley Community Walk. The Library annual Summer Reading Kickoff partnered with Clark's Ice Cream and was a well-attended success.
        - The Clerk's office attended the Berkley Pride Block party and provided education to teens on their right to vote and pre-register to vote.
        - The Berkley City Council attended several new business ribbon cuttings throughout the year.
        - The Department of Public Works and Public Safety Department held the annual Touch-A-Truck event at the Community Center.
        - The gazebo outside City Hall was dedicated to former Mayor Maybelle Fraser in recognition of her efforts in building it. A dedication ceremony was held along with a special exhibit on Mayor Fraser's life at the Historical Museum.
        - With the help of Johnson Hill Land Ethics Studio, Parks and Recreation Superintendent hosted two stakeholder meetings, and a public hearing as part of the update of the Parks and Recreation Master Plan.
        - Parks and Recreation has spent the year building on our existing programs, to provide the community with a variety of classes, camps, trips, and programs for all ages within the confines of our Community Center space.
            - 68 Youth Classes and Trips - 566 attendance
            - 70 Adult Classes and Trips - 579 attendance
            - 12 Senior Classes - 303 attendance
            - 61 Senior Trips- 1,052 attendance
            - 20 Specialty Camps - 203 attendance
            - Summer Camp for 4 age groups - 164 attendance
        - The Library continues to be a vital community asset that provides shared resources, inclusive spaces and opportunities for engagement with and between community members. Programs continue to evolve and expand, and circulation has stayed strong, and library visits and use of Library resources remains high.
            - 222,686 items borrowed
            - 47,876 digital downloads
            - 134 Youth Programs - 4,854 attendance
            - 32 Teen Programs - 223 attendance
            - 56 Adult Programs - 945 attendance
            - 222 Total programs - 6,022 total attendance
- Priority Area 5: Fiscal Stewardship
    - Objective: Clearly define and articulate the City's long-term fiscal realities
        - In May 2025, City Council approved a 3-year budget (Fiscal Year 2025/26 - Fiscal Year 2027/28), including the 6-year Capital Improvement Plan forecast for the city. The budget document was transformed into a more user-friendly version that tells the story of the City's budget forecast, through the hard work of the Communications Director and Finance Department. The FY 2026/27 budget process began in the fourth quarter.
    - Objective: Identify additional funding strategies and partnerships
        - The City Manager's Office submitted requests to federal and state agencies for four projects for the 2025-2026 fiscal year, which resulted in $385,000 in Federal funding for the City's new fire engine, and possibly $1 million in Federal funding for lead service line replacement.

        - While the City did not receive the award, the Facilities Manager and the Historical Museum submitted a grant application for the Community Museum Grant Program.
        - The City Clerk's Office conducted an audit of the Fee Schedule and worked to create a new, efficient format.
        - While the city did not receive either, grant applications were submitted for the SEMCOG planning grant for Coolidge and Safe Streets for all Southeast Oakland County communities.
        - Parks and Recreation completed a sponsorship guide for 2026 events. The goal is to engage more businesses and encourage sponsorships for city events and programs.
    - Objective: Investigate new shared services opportunities
        - The Clerk's Office attends quarterly meetings with the Oakland County Clerks Association, creating potential partnership opportunities.
        - The Community Development Director met with all other Eleven Mile communities to begin discussing joint grant applications for the streetscape concept plan.
    - Objective: Update financial policies and procedures
        - The Finance Department has worked with our tax payment vendor to allow residents to pay via ACH and make partial payments.
        - The Finance Department has made large strides in updating internal financial policies and procedures.
        - BS&A will be on site Q1 of 2026 to implement a streamlined accounts payable process.

Resolution adopting the updated Five-Year Recreation Master Plan for the period of 2026-2030 as a guideline for improving recreation for the residents of the City of Berkley.
Councilmember Hennen moved to approve Motion No. M-08-26
Seconded by Councilmember Patterson
Ayes: Hennen, Patterson, Baker, Elrod and Dean
Nays: None
Absent: Gavin, Black
Motion Approved.

Public Comment:
Joshua Hunter, Berkley, spoke regarding the Plan.

Accept the memo and Ms. Mannarino's correspondence attached hereto as the formal advisory opinion as requested by City Code Ordinance, Section 2-40(f)(1).
Councilmember Patterson moved to approve Motion No. M-09-26
Seconded by Councilmember Elrod
Ayes: Patterson, Baker, Elrod, Hennen and Dean
Nays: None
Absent: Black, Gavin
Motion Approved.

Public Comment:
Joshua Hunter, Berkley, spoke regarding his complaint.

Request City Council to deem it unnecessary for the administrative office of city attorney to take the City's Oath of Office.
Councilmember Hennen moved to approve Motion No. M-10-26
Seconded by Councilmember Patterson
Ayes: Baker, Elrod, Hennen, Patterson and Dean
Nays: None
Absent: Black, Gavin
Motion Approved.

Public Comment:

Joshua Hunter, Berkley, spoke regarding the city attorney's oath.

COMMUNICATIONS:

COUNCILMEMBER ELROD

- The Environmental Advisory Committee met this month and the key takeaway was their goals for 2026. Highlighted for the two members newly appointed that their goals fall into four key categories: continued focus on green infrastructure, recycling, transportation, and energy efficiency. He said that this means feet-on-the-ground solutions, but also providing advisory opinions to Council and other departments based on ongoing projects and where improvements can be made in adopting green infrastructure or reducing energy use. There are a number of items the group is considering, but the meeting effectively served as their kickoff.
    - Their next meeting will be Tuesday, February 17, at 6:30 PM in the second-floor conference room of the Public Safety building.
- The Beautification Advisory Committee's first meeting of the year will be on Wednesday, February 25th, in the second-floor conference room of the Public Safety building.

COUNCILMEMBER HENNEN

- The Tree Board met at the same time as Council, updates to come.
- The Planning Commission meeting this month was cancelled, so more to come in February.

COUNCILMEMBER BAKER

- The Historical Committee met on Tuesday, January 13th; welcomed the new members who were appointed, Jim and Kevin. He said that they look forward to their energy, new thoughts, and efforts to continue capturing our city's history and sharing it so we can all learn and enjoy it.
    - Thanked the City of Berkley and residents beyond the city for helping them sell more than 350 holiday ornaments. People came into the museum saying, "I would like seven, please," and had them mailed them all over the country. They received orders from other states from people saying, "I grew up in Berkley and want one of these." It was a fantastic operation.
    - The committee is ramping up work on a history-filled lecture series and is preparing updated marketing materials, brochures, and bookmarks as part of the new year's plan. For more information on our city's history, visit berkleyhistory.com.
- The Downtown Development Authority met the following day, Wednesday, January 14th.
    - They discussed upcoming statewide changes to TIF funding rules. They revisited their TIF plan about five years ago, which runs for twenty years, so they are in the fifteen-year window and have time to think about options. He said that he is pleased the board is reviewing this now as part of the budget process.
    - They also recognized that repairs are needed on Coolidge, which many residents may have noticed, and discussed placemaking opportunities. They are reaching out to Oakland County to partner on capital project funding ideas.
    - For updates, visit downtownberkley.com.
- Benjamin Franklin once said, "For every minute spent organizing, an hour is earned." January is National Get Organized Month. Getting organized helps bring a sense of calm, reduce background stress, reclaim time for family, hobbies, and rest, save money, and create space for new ideas to take root.
- Please stay warm, do not slip on the ice, and hug someone you love.

COUNCILMEMBER PATTERSON

- The Parks and Recreation Advisory Board met and discussed the master plan. They had visitors present; he strongly encouraged residents to attend boards and commission meetings to share their voices. They will meet again on February 12th.
- The Zoning Board of Appeals has no cases scheduled yet for February.
- Stated that he has been thinking about Councilmember Black and hopes he is safe and well.

CITY MANAGER VANVLECK

- Thanked all city staff, especially the Department of Public Works. She said that we have had a challenging winter, including salt supply issues, and crews have been out overnight multiple times responding to winter events. If you see them, please thank them.
- Gave kudos to Public Safety for bringing back the Citizens Academy. It is an incredible opportunity for residents to connect with staff and learn firsthand how departments operate.
- Please note Winterfest will be February 7th from 12 to 2 PM at the Community Center.

CITY ATTORNEY ZALEWSKI

- No updates.

MAYOR DEAN

- Stated that Mayor Pro Tem Gavin regrets he could not attend due to a burst pipe at his home.
- Acknowledged the Department of Public Works for their continued efforts during difficult winter weather.
- The Citizen's Academy has returned through Public Safety. She and City Manager Van Vleck attended the first night. The last time it ran was in 2018, before COVID. She said that it is exciting to see residents take part in learning firsthand about what our Public Safety does. She said that she appreciates the efforts, time and energy of those attending.
- Congratulated Deputy Clerk Rachel Patterson on celebrating her third year with the City of Berkley.
- Acknowledged Congresswoman Haley Stevens for securing more than one million dollars in funding for Berkley to be applied toward lead line replacement. She said that this is an unfunded mandate, and said that she appreciates her prioritizing our community.
- Her last Meet Your Mayor event was at Republica, where she had wonderful conversations with residents and visitors. Her next stop will be at Casa Amado on Wednesday, February 25th from 5 to 7 PM.

ADJOURNMENT:

Councilmember Patterson moved to adjourn the Regular Meeting at 8:28 PM
Seconded by Councilmember Elrod
Ayes: Hennen, Patterson, Baker, Elrod and Dean
Nays: None
Absent: Gavin, Black
Motion Approved.

_____
Bridget Dean, Mayor

ATTEST:

_____
Victoria Mitchell, City Clerk

THE SPECIAL MEETING OF THE FORTY-FIRST COUNCIL OF THE CITY OF BERKLEY, MICHIGAN WAS CALLED TO ORDER AT 3:32 PM ON FRIDAY, JANUARY 23, 2026 BY MAYOR DEAN

PRESENT: Councilmember Clarence Black (attending remotely due to military duty)
Councilmember Gary Elrod
Mayor Pro Tem Ross Gavin
Councilmember Dennis Hennen
Councilmember Gregory Patterson
Mayor Bridget Dean

ABSENT: Councilmember Steve Baker

OTHER STAFF PRESENT:
City Manager Crystal VanVleck

APPROVAL OF AGENDA
Mayor Pro Tem Gavin moved to approve the agenda
Seconded by Councilmember Patterson
Ayes: Black, Elrod, Gavin, Hennen, Patterson and Dean
Nays: None
Absent: Baker
Motion Approved.

PUBLIC COMMENT
None.

CLOSED SESSION: Matter of considering whether to meet in closed session per Crystal VanVleck's request to consider the City Manager's periodic performance evaluation per MCL 15.268(1)(a).
Mayor Pro Tem Gavin moved to convene in closed session.
Seconded by Councilmember Patterson
Ayes: Elrod, Gavin, Hennen, Patterson, Black and Dean
Nays: None
Absent: Baker
Motion Approved.

THE CLOSED SESSION MEETING OF THE FORTY-FIRST COUNCIL OF THE CITY OF BERKLEY, MICHIGAN WAS CALLED TO ORDER AT 3:35 PM ON FRIDAY, JANUARY 23, 2026 BY MAYOR DEAN

PRESENT: Councilmember Clarence Black (attending remotely due to military duty)
Councilmember Gary Elrod
Mayor Pro Tem Ross Gavin
Councilmember Dennis Hennen
Councilmember Gregory Patterson
Mayor Bridget Dean

ABSENT: Councilmember Steve Baker

OTHER STAFF PRESENT:
City Manager Crystal VanVleck

Members of Council met in closed session to consider the City Manager's periodic performance evaluation per MCL 15.268(1)(a).

ADJOURNMENT:
Mayor Pro Tem Gavin moved to adjourn the Closed Session Meeting at 4:42 PM
Seconded by Councilmember Hennen
Ayes: Elrod, Gavin, Hennen, Patterson, Black and Dean
Nays: None
Absent: Baker
Motion Approved.

THE REGULAR MEETING OF THE FORTY-FIRST COUNCIL OF THE CITY OF BERKLEY, MICHIGAN WAS CALLED BACK TO ORDER AT 4:43 PM ON FRIDAY, JANUARY 23, 2026 BY MAYOR DEAN

PRESENT: Councilmember Clarence Black (attending remotely due to military duty)
Councilmember Gary Elrod
Mayor Pro Tem Ross Gavin
Councilmember Dennis Hennen
Councilmember Gregory Patterson
Mayor Bridget Dean

ABSENT: Councilmember Steve Baker

OTHER STAFF PRESENT:
City Manager Crystal VanVleck

ADJOURNMENT:
Councilmember Patterson moved to adjourn the Special Meeting at 4:45 PM
Seconded by Councilmember Elrod
Ayes: Black, Elrod, Gavin, Hennen, Patterson and Dean
Nays: None
Absent: Baker
Motion Approved.

_____
Bridget Dean, Mayor

ATTEST:

_____
Crystal VanVleck, City Manager

THE SPECIAL MEETING OF THE FORTY-FIRST COUNCIL OF THE CITY OF BERKLEY, MICHIGAN WAS CALLED TO ORDER AT 5:30 PM ON MONDAY, JANUARY 26, 2026 BY MAYOR DEAN

PRESENT: Councilmember Steve Baker
Councilmember Gary Elrod
Councilmember Dennis Hennen
Councilmember Gregory Patterson
Mayor Bridget Dean

ABSENT: Councilmember Clarence Black
Mayor Pro Tem Ross Gavin

OTHER STAFF PRESENT:
City Manager Crystal VanVleck
City Clerk Victoria Mitchell
Deputy City Clerk Rachel Patterson
Library Director Matt Church

APPROVAL OF AGENDA
Councilmember Patterson moved to approve the Agenda
Seconded by Councilmember Baker
Ayes: Elrod, Hennen, Patterson, Baker and Dean
Nays: None
Absent: Black and Gavin
Motion Approved.

PUBLIC COMMENT

None.

REGULAR AGENDA

Board and Commission candidate interviews for new appointments.

City Manager Crystal VanVleck and City Clerk Victoria Mitchell provided a brief description of the new board and commission interview process and how the evening would run.

The following candidates were interviewed:
Nicole Burguess, Environmental Advisory Committee
James Weidman, Historical Committee

City Council appointments to Boards and Commissions.

Motion to Appoint Nicole Burguess to the Environmental Advisory Committee for a term ending February 2029 and James Weidman to the Historical Committee for a term ending February 2029.
Councilmember Hennen moved to approve Motion No. M-05-26
Seconded by Councilmember Patterson

Ayes: Elrod, Hennen, Patterson, Baker and Dean
Nays: None
Absent: Black, Gavin
Motion Approved.

Motion to amend the previous motion - to appoint Nicole Burguess to the Environmental Advisory Committee for a term ending February 2029 and James Weidman to the Historical Committee for a term ending February 2029 – to also include appointing Katie Carano to the Environmental Advisory Committee for a term ending February 2029 and Kevin McDaid to the Historical Committee for a term ending February 2029.
Councilmember Hennen moved to approve Motion No. M-05-26
Seconded by Councilmember Baker
Ayes: Baker, Elrod, Hennen, Patterson and Dean
Nays: None
Absent: Black, Gavin
Motion Approved.

ADJOURNMENT:
Councilmember Patterson moved to adjourn the special meeting at 6:06 PM.
Seconded by Councilmember Baker
Ayes: Elrod, Hennen, Patterson, Baker and Dean
Nays: None
Absent: Black and Gavin
Motion Approved.

_____
Bridget Dean, Mayor

ATTEST:

_____
Victoria Mitchell, City Clerk

M-11-26

February 2, 2026 Council Meeting

Moved by Councilmember_____and seconded by Councilmember _____ to (approve/deny/postpone) utilizing Oakland County Cooperative Contract 011677/011678 with DVM Utilities for Sewer Lining Services.

Ayes:
Nays:
Absent:
Motion:

CITY OF BERKLEY
DEPARTMENT OF PUBLIC WORKS
3238 BACON AVE, BERKLEY, MICHIGAN 48072

MEMORANDUM

To: Mayor Dean and City Council
From: Adam Wozniak, Superintendent of Public Works AW

Date: January 23, 2026
Subject: Approval to utilize Oakland County Cooperative Contract #011677/#011678 with DVM Utilities for Sewer Lining Services.

Madam Mayor and Members of City Council,

Background
As you may already know the City of Berkley has been structurally lining existing sewer pipes for over 30 years. This lining activity maintains the integrity of the existing sewer mains and greatly extends their service life. This work has historically been a cost-effective method that minimizes impact to the residents. For the next round of sewer lining, we are recommending the use of an Oakland County Cooperative Contract with DVM Utilities for Lining Services.

Summary

- Utilization of the Oakland County Cooperative Contract #011677/#011678 with DVM Utilities is being recommended

- Several key members of the DVM Utilities, Inc team have had several years of successful experience performing lining work in our city.

- Funds for this work are budgeted in account 592-902-971-150 (Sewer Improvements) In the amount of $600,000. With carry over money from the previous fiscal year in the amount of $164,666. We plan to utilize the full amount for our Sewer Lining Program in the amount of $764,666.

Recommendation
It is my recommendation that City Council approves the proposal and authorize the city manager to enter into an agreement upon final review of the city attorney utilizing the Oakland County Cooperative Contract #011677/#011678 with DVM Utilities for the Fiscal Year 25/26 Sewer Lining Program.

WRC: Sewage Disposal System Maint. & Repairs
Bid Solicitation Oak0000000971
Addendum 1

Issued: 7/31/2025

This Addendum is issued to provide certain changes and clarification to specifications to bid solicitation Oak0000000971 – Sewage Disposal System Maint. & Repairs and hereby made a part of the bid documents and shall be taken into consideration in preparing the Proposal.

The following lists the extent of this Addendum.

Response to Questions from Bidders:

Q1: Is there a general budget allocated for the first year?

A1: There are no guarantees on the volume of work that will be awarded to the selected vendor(s). This fiscal year, the Water Resources Commissioner (WRC) has approximately $1.3 million budgeted for trenchless pipe repair throughout various sewer disposal systems. Additionally, WRC has approximately $1 million budgeted for manhole lining.

Q2: **Can you please confirm if there are any DBE Requirement or good faith efforts for this project?**

A2: There are no Disadvantaged Business Enterprise (DBE) requirements for this solicitation. While Oakland County cannot legally mandate preferences, our RFP documents encourage participation from minority-owned, women-owned, and veteran-owned businesses.

Questions & Answers - 1

Solicitation Oak-0000000971 - WRC: Sewage Disposal System Maint. & Repairs
Buying Organization Oakland County

No	Question/Answer	Question Date
Q1	**Question: Engineers Estimate** Is there a general budget allocated for the first year. **Answer:** There are no guarantees on the volume of work that will be awarded to the selected vendor(s). This fiscal year, the Water Resources Commissioner (WRC) has approximately $1.3 million budgeted for trenchless pipe repair throughout various sewer disposal systems. Additionally, WRC has approximately $1 million budgeted for manhole lining.	07/25/2025
Q2	**Question: DBE Requirements** Can you please confirm if there are any DBE Requirements or good faith efforts for this project? **Answer:** Dependent on project.	07/25/2025
Q3	**Question: Cementitious Liner** Question: Would you consider Quadex QM-1s an acceptable structural build back/resurfacing layer for this project? Cementitious Resurfacer: QM-1s Restore is a Portland cement based, single component, high strength, fiber reinforced, shrinkage compensated cement mortar enhanced with a monocrystalline quartz aggregate. QM-1s Restore was designed to structurally repair deteriorated metal, concrete, and masonry structures. QM-1s Restore delivers a monolithic one pass vertical surface application up to three inches in thickness by low pressure spraying or centrifugally casting. **Answer:** Upon award of a contract the vendor could be requested to provide services for a variety of projects. Any materials proposed for use on any project will need to include submission of product material specifications and installation instructions and require approval before use.	08/01/2025
Q4	**Question: Epoxy Lining** Question: Would you consider Quadex Structure Guard an acceptable epoxy protective layer for this project? Epoxy Liner: Quadex Structure Guard is a 100% solids high-build epoxy, that can be spray-applied up to 250 mils thickness. Structure Guard's formulation that we have designed eliminates the need for a primer which makes applications less labor-intensive. This is a single component lining system that provides structural enhancement and long-term corrosion protection. This product has passed the F1216 and SWAT analysis and conforms to the chemical resistance (Pickle Jar) Greenbook testing requirements. These are viewed as some of the most rigorous tests for corrosion resistance, which further substantiates that Structure Guard is suitable for this project. Structure Guard has been installed on over 100,000 VF of manholes across the US for over 10 years. **Answer:** See answer to question 3.	08/01/2025

No	Question/Answer	Question Date
Q5	**Question: Geopolymer Lining** Question: Would you consider GeoKrete Geopolymer an alternative one-step coating system and acceptable product for this project? Geopolymer Liner: GeoKrete is an advanced geopolymer mortar (essentially a synthetic stone) that has exceptional corrosion and abrasion resistance properties and can be used in the structural replacement/rehabilitation of manholes, structures, pipes, culverts, tunnels, and other common storm, sewer, and raw water infrastructure. This product is a fully structural and highly corrosion-resistant liner that creates an impervious barrier completely sealing out infiltration while also bonding/forming a shear interface with the host structure. GeoKrete is a one-step solution that is cost-effective and less labor-intensive when compared to composite or multi-layered systems. To further show GeoKrete 's superior corrosion resistance, please refer to the submittal packet attached on page 62 (Table 2) ASTM C 267 – 12 weeks without loss when submerged in a sulfuric acid solution with a pH of 1.0. This is significantly more extreme than one would expect to encounter in a sewer system, so in practice represents a very accelerated long-term performance test. Address I&I, exfiltration, roots, and off-joint connections without the hassle and expense of a complete reline. United Point Repair - UV (UPRUV) uses clean ultraviolet light cure technology for reliable mainline point repair. Its no-shrink design anchors itself within the pipe and averages just 0.13" thick after curing. UPR-UV features highly chemical resistant, styrenefree UV resin with an extremely high glass Transition temperature of 266°F | 130°C **Answer:** See answer to question 3.	08/01/2025
Q6	**Question: Can the Owner provide a bid form** To provide consistency amongst bidders, can the Owner provide a bid form for each scope of work? **Answer:** This solicitation is seeking contractors to pre-qualify as vendors to provide sewer system maintenance and repairs. The prospective bidder must submit information as described in the solicitation section 2.0. There is no bid form. Please utilize Attachment A – Pricing Sheet.	08/01/2025
Q7	**Question: Previous bid tabulations** Can the Owner previous bid tabulations from similarly structed bids? **Answer:** The prospective bidder must submit information as described in the solicitation section 2.0. Due to the nature of the information submitted a bid tab is not prepared. The bids will be evaluated according to Section 3.0 of the solicitation.	08/01/2025
Q8	**Question: Owners budget** What is the Owners Budget? **Answer:** There are no guarantees on the volume of work that will be awarded to the selected vendor(s). This fiscal year, the Water Resources Commissioner (WRC) has approximately $1.3 million budgeted for trenchless pipe repair throughout various sewer disposal systems. Additionally, WRC has approximately $1 million budgeted for manhole lining.	08/01/2025

DVM UTILITIES, INC.

6045 Sims Rd., Suite #2
Sterling Heights, MI 48313
Phone: 586-979-0402
www.dvmutilities.com

2.2 References

1. Reference List:

   Fleis & Vandenbrink Engineering, Inc.
   Midland, MI
   Gary Bartow, P.E.
   Phone: 989-837-3280
   Email: gbartow@fveng.com

   Giffels Webster
   Birmingham, MI
   Scott Ringler, P.E.
   Phone: 248-821-5552
   Email: sringler@giffelswebster.com

   NTH Consultant
   Northville, MI
   Saju Sachidanandan, P.E.
   Phone: 248-553-6300
   Email: ssachidanandan@nthconsultants.com

   Hubbell, Roth & Clark, Inc.
   Bloomfield Hills, MI
   James Surhigh, P.E.
   Phone: 248-454-6300
   Email: jsurhigh@hrcengr.com

Project Name	Owner	Engineer	Contact	Description	Start	Completion	Contract Amount
2024 Sewer Cleaning & CCTV Investigation	City of Mt. Clemens	Anderson, Eckstein & Westrick	John Miller, P.E. (586) 726-1234	Cleaning and CCTV inspection of 11,700 lf of 6"-48" combined sewers	Jun-24	Aug-24	$[illegible]
2023 Sanitary Sewer Evaluation Study	City of South Lyon	Hubbell, Roth & Clark	Michael Borgo, P.E. (517) [illegible]	Cleaning and CCTV inspection of 8,[illegible] lf of 8" & 10" sanitary sewers	Nov-23	Dec-23	$31,[illegible]
2023 Catch Basin Cleaning Program	City of Birmingham		Melissa Coatta, P.E. (248) 530-1839	Cleaning of 2,[illegible] catch basins throughout the city	Nov-23	Ongoing	$[illegible]
2023-2025 Huntington Woods CIPP Lining Project	City of Huntington Woods		SC Lanes Construction Company	Cleaning and CCTV inspection of 11,475 lf of 8" - 24" combined sewers	Jan-23	Dec-23	$[illegible]
2022 Sewer Cleaning and TV Inspection Project	City of Hazel Park	Nowak and Fraus	[illegible] Findley, P.E. (313) [illegible]	Cleaning and CCTV inspection of 16,[illegible] lf of 10" - 36" combined sewers	Jun-22	Nov-22	$[illegible]
2021 to 2025 Sewer Rehabilitation Program	City of Birmingham		Melissa Coatta, P.E. (248) 530-1839	Cleaning and CCTV inspection of [illegible] lf of 8" - 72" combined sewers, inspection of 1,200 lf of sewer laterals, and minor sewer repairs via trenchless methods	Oct-21	Ongoing	$1,[illegible]
2021 Sewer & Catch Basin Cleaning & Televising Inspection Project	City of Oak Park		Sanford Samuel (248) [illegible]	Cleaning and CCTV inspection of 127,000 lf of 8" - 36" sanitary and storm sewers, and cleaning of 700 Catch Basin Structures	Sep-21	Dec-21	$[illegible]
2021 Storm & Sanitary CCTV Program	City of Rochester	Anderson, Eckstein & Westrick	[illegible] (586) 726-1234	Cleaning and CCTV inspection of [illegible] lf of 8" - 36" sanitary sewers	Aug-21	Dec-21	$121,[illegible]
2020 Sanitary Sewer Cleaning and CCTV Investigation	Chesterfield Township	Anderson, Eckstein & Westrick	Frank [illegible] (586) 726-1234	Cleaning and CCTV inspection of 100,[illegible] lf of 8" - 48" sanitary sewers	Apr-21	Jul-21	$[illegible]
2020 SAW Grant Sanitary Sewer Cleaning and CCTV Investigation Contract 1	Clinton Township	Anderson, Eckstein & Westrick	Frank [illegible] (586) 726-1234	Cleaning and CCTV inspection of 270,000 lf of 8" - 48" sanitary sewers and inspection of 600 sanitary sewer manholes.	Jun-20	Jul-21	$[illegible]
2020 SAW Grant Sanitary Sewer Cleaning and CCTV Investigation Contract 2	Clinton Township	Anderson, Eckstein & Westrick	Frank [illegible] (586) 726-1234	Cleaning and CCTV inspection of 270,000 lf of 8" - 36" sanitary sewers and inspection of 600 sanitary sewer manholes.	Jun-20	Jul-21	$[illegible]
Sewer Cleaning & CCTV Investigation	Utica Community Schools	Anderson, Eckstein & Westrick	Frank [illegible] (586) 726-1234	Cleaning and CCTV inspection of 17,[illegible] lf of 6" - 36" sewers and 60 catch basins	Jul-20	Nov-20	$[illegible]
2019 Sanitary Sewer Cleaning & CCTV Inspection	Charter Township of Shelby	Anderson, Eckstein & Westrick	Gordon Wilson (586) 726-1234	Cleaning & CCTV inspection of approx. 200,000 lf of 8" thru 36" sanitary sewer pipe. Rebuild, reconstruct, and adjust sanitary approx. 300 sewer manholes	Aug-19	Mar-20	$1,[illegible]
2018 Sanitary Sewer Cleaning & CCTV Investigation, SAW Grant No. 1377-01	City of Sterling Heights	Anderson, Eckstein & Westrick	Frank [illegible] (586) 726-1234	Cleaning and CCTV investigation of 270,000 lf of 8"-60" sanitary sewers	Mar-19	Jun-20	$1,1[illegible]
2018 SAW Grant Sewer Cleaning & Television Inspection Program	City of Lincoln Park	Hennessey Engineers	Ryan [illegible] (734) 759-5500	Cleaning & CCTV inspection of approx. 66,000 lf of 8" thru 42" sanitary sewer pipe	Jul-18	Dec-18	$[illegible]
Clean, Televise & Assess Storm Sewer Systems	Huron-Clinton Metropolitan Authority		Andrew [illegible] (810) [illegible]	Cleaning & CCTV inspection of approx. 60,000 lf of 8" thru 48" storm sewer pipe	Jul-18	Nov-18	$[illegible]
2017 Sanitary Sewer Cleaning & CCTV Investigation	City of Roseville	Anderson, Eckstein & Westrick	Frank [illegible] (586) 726-1234	Cleaning and CCTV investigation of 111,000 lf of 8"-48" sanitary sewers	Oct-17	May-18	$[illegible]
2016 Sanitary Sewer Collection System CCTV Project	Bay County Department of Water & Sewer, Bay City		Tim Fitzgerald (989) [illegible]	CCTV inspection of approx. [illegible] lf of 8" to 48" gravity sanitary sewer collection system and additional sewer cleaning as required	Jun-16	May-17	$[illegible]
2016 Sanitary Sewer TV & Cleaning Program	Clinton Township	Giffels Webster	Scott Chabot, P.E. (586) [illegible]	Clean & televise approx. 330,000 lf of 8" thru 42" sanitary sewer including laterals	Dec-15	Dec-16	$[illegible]
Riverbank Storm Sewer Project	City of Lincoln Park		John [illegible], DPS Director (313) [illegible]	Clean and televise approx. 2,000 lf of 36" & 42" Storm Sewer, Install 2 EA storm sewer manholes and cleaning of pump stations	Dec-16	Apr-17	$[illegible]
[illegible] Hubbard Road Reconstruction, Work Order [illegible], [illegible] Project No. [illegible]	University of Michigan, Ann Arbor, MI	[illegible] Corporation	[illegible]	Televise approx. [illegible] lf of up to 24" storm sewer, [illegible] and CCTV inspection of manholes	Mar-14	Mar-14	$[illegible]
Sanitary Sewer System Improvements - Sewer Cleaning & Televising, Contract 2	Village of Breckenridge	Fleis & Vandenbrink Engineering	[illegible] (989) [illegible]	Clean & televise 8", 10" & 12" sanitary sewer including laterals approximately [illegible] lf. Also, includes sewer rehabilitation to reduce inflow & infiltration by CIPP lining of 8" & 10" pipe approx. [illegible] lf, MH grouting & point repairs.	May-11	Feb-12	$[illegible]
2011 Annual Emergency Excavation, Water & Sewer Repairs	City of Warren		[illegible] (586) [illegible]	Performing water main & sewer repairs on an as needed basis. Also, included as part of the contract is CCTV Sewer Inspection and Cleaning of Sanitary Sewer Main including laterals	Apr-11	Apr-12	$[illegible]

[illegible]
Sterling Heights, MI 48313
[illegible]

Project Name	Prime Consultant(s)	Sub-Contractor	Owner	Engineer	Contact	Description	Year	Completion	Contract Amount
City of Auburn Maple Grove Sanitary Sewer Rehabilitation	x		City of Auburn	James & Penny Engineers	Tony Andrews, P.E. (412) 476-3511	Cured-in-CCTV 4,000 LF 8"-12" sanitary sewers, Bypass pumping of 4,000 LF 8"-12" CIPP Liners, 30 Manhole and Wye/Tee Lining	TBD	Ongoing	$324,210.00
4,000 LF 8-Inch Sanitary Sewer Cured-In-Place Pipe Lining	x		Lincoln Park	Hennessey Engineers	Brian Hanna, P.E. (734) 555-1900	Cured-in-CCTV 4,000 LF 8" CIPP sanitary sewers, Bypass pumping of 12,000 LF 8" CIPP Liners	TBD	Ongoing	$648,976.00
CIPP 8" Sanitary Sewer Cured-In-Place Pipe Lining	x		Lincoln Park	Hennessey Engineers	Brian Hanna, P.E. (734) 555-1900	Cured-in-CCTV 5,000 LF 8" CIPP sanitary sewers, Bypass pumping of 5,000 LF 8" CIPP Liners	TBD	Ongoing	$675,234.50
Harper Woods 2025 Sewer Rehabilitation by Full Length CIPP Lining	x		Harper Woods	Anderson, Eastman & Wiewiora	Haley Williams, P.E. (586) 778-6126	Cured-in-CCTV 1,800 LF of 12" sanitary sewers, Bypass pumping of 1,800 LF of 12" CIPP Liners	TBD	Ongoing	$85,000
Village of Novi - Spot Lining Project	x		Village of Novi	Orchard Hiltz & McCliment	Jeff Tyler P.E. 810-494-4105	Cured-in-CCTV 2,100 LF 8"-10" sanitary sewers, Bypass pumping of 2,100 LF 8"-10" CIPP Liners, Chemical rehabilitation of 60 manholes.	TBD	Ongoing	$210,511.00
Township of Grosse Ile - Sanitary Sewer Point and Manhole Rehabilitation Project	x		Township of Grosse Ile	R.E. Nielsen Company	Scott Park, P.E.	Cured-in-CCTV 16,000 LF 8"-12" sanitary sewers, Bypass pumping of 16,000 LF 8"-12" Liners, 45 Sewer Spot Repairs, 6" Wye Cuts, Sanitary sewer manhole rehabilitation.	TBD	Ongoing	$1,890,000.00
Manistee Township 2025 Sanitary Sewer CIPP Project	x		Manistee Township	Water Trim Associates, Inc.	Jason Schram, P.E. (231) 723-8555	Cured-in-CCTV 1,400 LF 12" sanitary sewers, Bypass pumping of 1,400 LF 12" CIPP Liners, Point Repair of Manhole Rehabilitation	TBD	Ongoing	$165,000.00
CIPP Culvert Liner Project RFP Point	x		Road Commission for Oakland County		Travis Hill (248) 645-2000 ext. 6700	Cured-in-CCTV 600 LF 18" Corrugated Metal Pipe, Installation of 600 LF 18" CIPP Liner	TBD	Ongoing	$90,000.00
City of Southgate Sanitary Sewer Lining Program	x		City of Southgate	Hennessey Engineers	Jason Hiller (734) 555-8100	Cured-in-Place 7,200 LF of 12"-24" concrete sewers, Bypass pumping of 7,200 LF 12"-24" CIPP Liners	TBD	Ongoing	$720,000.00
2025 Sewer & Force Main Sewer Rehabilitation Contract CIPP	x		City of Ferndale	Wade Trim Associates	Brian Hartigan, P.E. (248) 555-0119	Cured-in-CCTV 5,870 LF of 8"-15" sanitary sewers, Bypass pumping of 5,870 LF of 8"-15" CIPP Liners	TBD	Ongoing	$847,247.50
2025 Sanitary Sewer Lining	x		Saginaw Charter Township	Spicer Group	Mark Bowen, P.E. (989) 555-4567	Cured-in-CCTV 3,000 LF 8"-10" sanitary sewers, Bypass pumping of 3,000 LF 8"-10" CIPP Liners	TBD	June-26	$518,000.00
2025 CIPP Sewer Lining Contract Rehabilitation	x		City of Ferndale	Amy Whitehouse	Jon Washington, P.E. (248) 555-0176	Cured-in-CCTV 12,000 LF 8"-15" sanitary sewers, Bypass pumping of 12,000 LF 8"-15" CIPP Liners	TBD	June-26	$648,000.00
Public Sewer Rehabilitation Program	x		Village of Beverly Hills	Hubbell, Roth & Clark	Maria Corona, P.E. (248) 555-0100	Cured-in-CCTV 1,200 LF 8"-10" sanitary sewers, Bypass pumping of 1,200 LF 8"-10" CIPP Liners	TBD	Ongoing	$647,870.40
Sewer Liner Contract No.	x		Huntington Excavating		Duke Dunn (810) 555-0200	Cured-in-CCTV 1,200 LF of 8"-12" sanitary sewers, 4" Pipe Fusion 12"	June-26	June-26	$53,000.00
MDOT I-94 Lot 8 - I-696 to Gratiot County		x	Michigan Department of Transportation		Rodney Wilcox (Tonkin Construction) (248) 555-7500	Cured-in-CCTV 4,000 LF 12"-24" sanitary sewers, Bypass pumping of 4,000 LF 12"-24" CIPP Liners, 1,200 LF of 24" RCP Lining, 340 PLF SS, Structure Connection Coating, 85 ea. SS structure mechanical coating, 45 - 1.5 in Ø CIPP sewer to culvert pipe, 54,000 lb of 12x24" UN Structure Lean Grouting, 1,200 linear footing strips, 14" reinforcing bars.	TBD	Ongoing	$3,400,387.00
MDOT I-94 Lot 6 - Wayne County to Mandarin Rd.		x	Michigan Department of Transportation		Mark Anderson (MI Infrastructure) (248) 555-8900	Cured-in-CCTV 2,800 LF 12"-24" sanitary sewers, Bypass pumping of 2,800 LF 12"-24" CIPP Liners	TBD	Ongoing	$921,250.00
2026 - 8,000 Linear Feet Relining		x	Macomb Intermediate School District Drainage District	TG Engineering Associates	Adam Carr (MC 1, CVAgents & Events) (586) 783-6000	Cured-in-CCTV 720 LF 24"-36" sanitary sewers, Bypass pumping of 720 LF of 24"-36" CIPP Liners	Fall 26	Ongoing	$321,750.00
Lake Club Sanitary Rehabilitation	x		Charter Township of Commerce	OHM Advisors	Louis Plaza (248) 555-0100	Cured-in-CCTV 5,000 LF 8" sanitary sewers, Bypass pumping of 400 LF of 8" CIPP Liners, cement & joint grouting, chemical sewer grouting, CIPP point repairs (wyes), 100 sewer & cleanout manhole, Wye Point Lining, sewer chemical grout	TBD	Ongoing	$780,500.00
Evergreen Farmington Sanitary Main Sewer Lining and Manhole Rehabilitation	x		Oakland County Water Resources Commissioner	Hubbell, Roth & Clark	Phillip Hu, P.E. (248) 258-3282	Cured-in-CCTV 800 LF of 8" sanitary sewers, Bypass pumping of 800 LF of 8" CIPP Liners, chemical joint grouting	TBD	August	$200,000.00
Wolverine Lake Improvements Project, Contract 1 - Spot Lining	x		Village of Sylvan	Wightman	Andrew Todd, P.E. (269) 673-8833	Cured-in-CCTV 7,040 LF of 8"-12" sanitary sewers, Installation of 7,040 LF of 8"-12" CIPP Liners, manhole lining	TBD	Ongoing	$716,200.00
Wolverine Lake Improvements Rehabilitation Program	x		Oakland County Water Resources Commissioner	Hubbell, Roth & Clark	Brian Kunkemoeller, P.E. (248) 858-0958	Cured-in-CCTV 5,800 LF of 8" CIPP sanitary sewers, Installation of 5,800 LF of 8" CIPP Liners, chemical joint grouting, 3 manhole cone replacements	August	August	$1,600,000.75
2026 Sanitary Sewer Rehabilitation by Full Length CIPP Lining	x		City of Troy	Anderson, Eckstrand & Associates	Frank Nickolai (586) 555-0000	Cured-in-CCTV 9,200 LF of 8"-12" sanitary sewers, Bypass pumping of 9,200 LF of 8"-12" CIPP Liners	TBD	Ongoing	$920,000.00
Stormwater System Rehabilitation	x		Township of Bloomfield	Hubbell, Roth & Clark	Patience Babatunde, P.E. (248) 555-0000	Cured-in-CCTV 3,200 LF 8"-36" storm sewers, Installation of 3,200 LF 8"-36" CIPP Liners, Bio-Retention Lining, Storm structure rehab	August	Ongoing	$250,000.00
St. Clair Township Lift Station	x		St. Clair Township		Captain Hendershot (810) 329-0000	Cured-in-CCTV 800 LF 8" sanitary sewer, Bypass pumping of 800 LF 8" CIPP Liner	March	March	$44,000.00
2026 Sewer Rehabilitation by Full Length CIPP Lining	x		City of Saginaw	Anderson, Eckstrand & Associates	Patrick Marcus, P.E. (586) 726-1234	Cured-in-CCTV 5,000 LF of 12"-24" sanitary sewers, Installation of 5,000 LF of 12"-24" CIPP Liners	June 26	Ongoing	$650,000.00
MDOT Dort's Excavating - I-475 Electrical		x	Michigan Department of Transportation	DTE - Dort's Excavating	Eric Ruiz (586) 234-5000	Cured-in-CCTV 4,200 LF of 8"-36", Installation of 4,500 LF of 12" CIPP Liners, 3,000 LF of Pressure Grout Set	Q1 '27	Ongoing	$490,375.00
Farmington - Main Street Sanitary Sewer Rehabilitation Program	x		Oakland County Water Resources Commissioner	Hubbell, Roth & Clark	Maria Corona, P.E. (248) 555-0100	Cured-in-CCTV 10,400 LF of 8"-15" sanitary sewers, Installation of 10,400 LF of 8"-15" CIPP Liners	August	October	$712,500.00
2026 Sanitary Sewer Rehabilitation by Full Length CIPP	x		Ortonville Township	Anderson, Eckstrand & Associates	Frank Nickolai (586) 555-0000	Cured-in-CCTV 12,000 LF 8"-24" sanitary sewer, Installation of 12,000 LF 8"-24" CIPP Liner	October	Ongoing	$975,000.00
Bleecker Metropolitan District	x		Genesee County	Fleis & VandenBrink	Steven Nagy, P.E. (313) 555-4130	Cured-in-CCTV 16,340 LF 8"-48" sanitary sewers, Installation of 16,340 LF 8"-48" CIPP Liners	June 26	Ongoing	$775,000.00
Sanitary Metropolitan Lining Project - CIPP Lining	x		Troy Township	Hayes Hamilton Engineering	Mohsen Mostafavi, P.E. (586) 754-9261	Cured-in-CCTV 8,400 LF 12"-24" Sanitary Sewer, Installation of 8,400 LF 12"-24" CIPP Liner	April 26	June 26	$612,000.00
2026 Sanitary Sewer Improvements - CIPP Lining		x	Clay Township	Fleis & VandenBrink	Mohsen Mostafavi, P.E. (586) 754-9261	Cured-in-CCTV 22,500 LF 8"-42" Sanitary Sewer, Installation of 22,500 LF 8"-42" CIPP Liner	TBD	Ongoing	$980,000.00
Chesterfield Township Sewer Lining - Phase 3	x		Township of Chesterfield	Anderson, Eckstrand & Associates	Peter O'Connor, P.E. (586) 949-0000	Cured-in-CCTV 18,000 LF of 8"-15" Sanitary Sewer, Rehabilitation of 18,000 LF of 8"-15" CIPP Liner	June 26	Ongoing	$1,540,000.00
Village of Romeo 2026 Local Streets Resurfacing		x	Village of Romeo	Lindhout, Roth & Clark	Brian Sharp (307 Flow) (no Asphalt) (586) 752-4700	Cured-in-CCTV 3,200 LF 8" CIPP sanitary sewers, Installation of 3,200 LF 8" CIPP Liners, and Installation of 1.8" CIPP over Storm	June 26	November	$822,450.00

Sewer Lining for Columbia Street Road Project	x		City of Cary		Tom Rivers (919) 972-6021	Cleaned & CCTV 5,000 lf of 10" sanitary sewer and installation of 5,000 lf of 10" CIPP Liners	Aug-24	Dec-24	$130,000.00
2024 Sanitary Sewer Rehabilitation	x		Bridgeport Township	Spicer Group	Aaron Swanson, P.E. (517) 3216877	Cleaned & CCTV 4800 lf 10"&12" sanitary sewer and installation of 4,800 lf 10"&12" CIPP Liner	Jun-24	Dec-24	$240,000.00
Dropbox Culvert	x		Oakland County Water Resources Commissioner		Dan Manning, P.E. (248) 858-0954	Pipe Bursting, Point Repair, and Lining Rigid Pipe Technologies	May-24	Jun-24	$90,375.00
Storm Conduit Rehab Project	x		Oakland County Water Resources Commissioner		Geoff Wilson, P.E. (248) 858-1133	Case Study Storm Conduit Rehabilitation: a. Lahser Road 30" x 22mm (270) b. W Long Lake 18" x 10.5mm (270') Other Storm Conduit Rehabilitation c. Northlight Rd. 18" x 13.5mm (160ft) Formac Inside the Order Rehabilitation a. Webster Lane (6" x 7.5mm (480 ft) Oakland County Rehabilitation a. Yankee Creek 36" x 5.2" (240 ft) b. [illegible] x 24.9mm CIPP Liner[illegible] Private Storm Sewer a. Lakeville Rd (8" x 7.5mm (1,680 ft) Tribute Storm Rehabilitation a. N. Wilson Rd (12" x 7.5mm (1,110 ft)	Jun-24	Ongoing	$214,280.00
WCCP Project [illegible]		x	Oakland County Water Resources Commissioner	Hubbell, Roth & Clark	Mitchell Bonjour (ref. Norris Contracting) (248) 969-2021	Cleaned & CCTV 5,400 lf of 8"&10" sanitary sewer and installation of 5,400 lf of 8"&10" CIPP liners, 20 End Wyeflange	Aug-24	Jan-24	$451,674.00
2024 Sanitary Sewer Rehabilitation by Full Length CIPP	x		Macomb Township	Anderson, Eckstein & Westrick	Frank Kleinschmidt (248) 852-4500	Cleaned & CCTV 14,000 lf 8"&10"&12" sanitary sewers, Flash & CCTV 240 lf of 12" storm sewers, installation of 14,000 lf of 8"&10" CIPP liner	May-24	Ongoing	$1,307,227.00
2024 Sewer Rehabilitation Program	x		City of Birmingham	City of Birmingham	Melissa Cossey, P.E. (248) 530-1850	Cleaned & CCTV 5,700 lf of 8" sanitary sewers and installation of 5,700 lf of 8" CIPP liners	Summer	Ongoing	$650,000.00
2024 Water and Wastewater System Improvements Project	x		Village of Decatur	Williamson	Andrew Kuhl, P.E. (269) 372-8450	Cleaning and CCTV 16,561 lf of 8"&12" sanitary sewers and installation of 8,561 lf of 8"&12" CIPP liners, 200 Manhole Part Liners	TBD	Ongoing	$3,00,000.00
2024 Orchard Drive Sanitary Lining	x		City of Northville	DBR Engineering	Caleb Hunter, P.E. (734) 469-6683	Cleaned & CCTV 1,800 lf of 8" – 12" sanitary sewer and installation of 1,800 lf of 8"-12" CIPP liners	April-24	May-24	$87,000.00
2024 Dry Lining Project	x		City of Wayne	City of Wayne	Khalil Hardy, P.E. (734) 729-6139	Cleaned & CCTV 14,000 lf of 8" HDF sanitary sewers, installation of 14,000 lf of 8" HDF CIPP liners	August	Ongoing	$700,700.00
2024 Sewer Rehabilitation Program	x		City of Utica	Hubbell, Roth & Clark	James Kellogg, P.E. (248) 4[illegible]	Cleaned & CCTV 8,270 lf of 8"&10" sanitary sewers, then lined CCTV of 8,270 lf of 8" and 10" approx. installation of 8,270 lf of 8"&10" CIPP Liners, with the initial grouting of 50 laterals where noted	Planned	Ongoing	$968,870.10
2024 Sewer Lining Project, NCRC	x		City of Oak Park	City of Oak Park	Dominic Samuel (248) 691-7402	Cleaning and CCTV Inspection of 5,800 lf of 8" – 24" sanitary sewer and installation of 5,800 lf of 8"-24" CIPP Liners	Planned	2024	$581,247.00
2023 Sanitary Sewer Lining	x		Northern Oakland County Utilities Authority		Scott Westerman, P.E. (734) 464-4600	Cleaned & CCTV 10,400 lf of 8"&10" sanitary sewer and installation of 10,400 lf of 8"&10" CIPP Liners	Nov-23	Feb-24	$498,575.00
2023 Sanitary Sewer Rehabilitation by Full Length CIPP Lining	x		Clinton Township	Anderson, Eckstein & Westrick	Scott Chalmers, P.E. (586) 726-1234	Cleaned & CCTV 30,000 lf of 10"-18" sanitary sewers and installation of 30,000 lf of 10"-18" CIPP liners	Sept-23	Dec-23	$1,161,813.00
2023 Sewer Rehabilitation Project	x		Washington Township	Hubbell, Roth & Clark	Matthew Hogue, P.E. (586)	Cleaned & CCTV 11,000 lf of 8"&10" sanitary sewers, installation of 11,000 lf of 8"&10" CIPP liners, and chemical grouting of 50 service lateral seals	Nov-23	Jun-24	$400,000.00
2023 Sanitary Sewer Lining (City Project 19-01PW)	x		City of Warren		Carol Wirth, P.E. (586) 759-9300	Cleaned & CCTV 12,000 lf 12"-48" sanitary sewers, 12,000 lf of 12"–48" CIPP Liners and installation of 50 Nyoflow (4" liners)	Oct-23	Ongoing	$2,364,132.00
Village of Romeo 2023 Local Streets Resurfacing		x	Village of Romeo	Fricano, Roth & Clark	Ryan Mary (86- Precision Asphalt (586) 752-7100	Cleaned & CCTV 5,200 lf of 8" and 10" sanitary sewers, installation of 5,200 lf of 8" and 10" CIPP liners, and reinstatement 1.5" CIPP cast liner	Sept-23	Unkwn	$2,00,186.25
Michigan Work Progressive Contractors Association Rehabilitation, PH 3		x	City of Farmington Hills	Hubbell, Roth & Clark	Mark Vitello 586 Fenton Company (810) 534-0100	Cleaned & CCTV 1,4700 lf of 8&10" sanitary sewers, installation of 1,4700 lf of 8"-10" CIPP Liners	May-23	May-23	$3,33,000.00
Wixom City Wide Lake St Subdivision Mill & Road Improvements		x	City of Wixom	Hubbell, Roth & Clark	Chris Wallace (OC Paving Contracting) (248) 887-4100	Cleaned & CCTV 972 lf of 8" sanitary sewers, installation of 972 lf of 8" CIPP Liners	Jun-23	Jun-23	$45, 360.00
South Lyon 2023 Road Improvement Project		x	City of South Lyon	Hubbell, Roth & Clark	Chris Wallace (OC Paving Contracting) (248) 887-4100	Cleaned & CCTV 5,0[illegible] of 8" sanitary sewers, installation of 5,0[illegible] of 8" CIPP Liners	Aug-23	Aug-23	$125,748.00
Many Shalom Drain Repairs	x		Oakland County Water Resources Commissioner		Geoff Wilson, P.E. (248) 858-1133	Clean, prep, concrete repairs and large diameter storm sewer grouting in the city of Troy.	Sept-23	Ongoing	$800,288.00
Sewer and Manhole Rehabilitation Phase 1	x		Washington Charter Township	Orbit Wallace	Jon Haworth, P.E. (586) 750-9300	Cleaned & CCTV 9,000 lf of 8" sanitary sewer and installation of 1,000 lf of 10" CIPP liner, manhole sewer grouting, and grease point relining at 10 manholes	Jun-23	Sept-23	$400,288.00
SAW Wastewater Improvements, Segment 3	x		City of Burton	Stantec	Spencer Cole, P.E. (734) 234-1096	Cleaned & CCTV 28,000 lf of 8"&12" sanitary sewer, installation of 28,000 lf of 8"&12" CIPP Liners, grouting of 1,07 sewer laterals, 20 CIPP lateral liners, misc. open cut sewer repairs, pavement restoration and top dressing, and rehabilitation of 26 manholes	Jun-23	Sept-24	$3,233,861.80
23-08 Bristol C Outlets Phase 1	x		City of Toledo	Stantec	Dan Gradeski, P.E. (734) 849-9330	Test and Seal 198.00" Corrugate steel Conduit, including and CCTV Inspection of 2,400 lf of 96" combined sewers, and 2,400 lf of 96" CIPP Lining	Jun-23	Ongoing	$960,000.00
2023 Sewer Rehabilitation Program	x		City of Birmingham		Eric Gallagh, P.E. (248) 530-1850	Cleaning and CCTV Inspection of 10,000 lf of 8"-12" sanitary sewer, 10,000 lf of 8"-12" CIPP Liners, 50 Lateral Seals, and 1,000 lf of 8" lining, 10 CIPP Manhole	Jun-23	Dec-23	$1,592,333.00
Wolverine Road Sewer Rehabilitation	x		Chesterfield Township Water Sewage Disposal System No. 1	Fleis & VandenBrink	Timothy Kolaitis, P.E. (313) 965-0100	Cleaning and CCTV Inspection of 1,440 lf of 12" sanitary sewer, 1,440 lf of 12" CIPP Lining of 1,440 lf of 12" sanitary sewer, and spray rehabilitation of 4 sanitary sewer manholes	Jun-23	Nov-23	$867,150.00
City of Novi 10 Mile Road Sewer Crossing	x		Oakland County Water Resources Commissioner		Phil Morey, P.E. (248) 858-0958	Rehabilitation of 450 lf of 96" sanitary sewer by manhole sewer grouting	Jun-23	Jul-23	$45,000.00
MDOT 22084A1(3A) Upper Road Reconstruction		x	MDOT & St. Clair County Road Commission		Greg Elert, OC Superior Contracting (313) 967-0100	Rehabilitation of 240 lf of 24" storm sewer as CIPP Lining	Jun-23	Jun-23	$27,720.00

East Clinton 2023 Sanitary Sewer Improvement Project – CIPP Lining	x		Clinton Township	Project Control Engineering	William Heideman, P.E. (810) 756-9910	Cleaned & CCTV-inspected ~6,800 LF of 8"–12" vitrified clay sewers; installation of 6,847 LF of 8"–12" CIPP liner; manhole rehabilitation and replacement; patching of 128 sewer laterals	Bond Ct	Ongoing	$1,550,000.00
Centerville Township 2023 Sanitary System Improvement Project	x		Centerville Township	Project Control Engineering	William Heideman, P.E. (810) 756-9910	Cleaned & CCTV-inspected 9,200 LF of 8"–15" vitrified clay sewers; installation of 8,947 LF of 8"–12" CIPP liner; replacement of 214 LF of 8" thick concrete and transport 187 sewers laterals	Bond Ct	Ongoing	$1,870,000.00
Gateway 9 North Infrastructure Channel Reimprovement Assembly Sanitary Sewer Rehabilitation Clearwater (Willow Run Airport)		x	Wayne County Airport Authority		Andrew Washburn & ARC Trenton Construction (248) 349-4700	Cleaned & CCTV, and installation of 4,800 LF of 8" storm sewer CIPP liner, and reline & CCTV and installation of 4,800 LF of 8" storm sewer CIPP liner	Jun-22	Jan-23	$980,875.00
2023 Cured-in-Place Pipe Sewer Relining	x		Lathrup Village		Scott Bridges, P.E. (248) 557-3420 ext. 1004	Cleaned & CCTV 11,100 LF of 8"-12" sanitary sewer; installation of 11,100 LF of 8"-12" CIPP liner, and removal/replacement 134 sewer laterals	Aug-22	Oct-23	$790,123.00
2022 City of Livonia Sewer Rehabilitation (Districts 4&5) Project No. 4104-22-SS	x		City of Livonia	Anderson, Eckstein & Westrick	Frank Perrelli (586) 419-8925	Acquisition, grout installation, CIPP sewer lining, CCTV, Clean, and Inspection of 1,200 LF of 12" CIPP liner	Jun-22	Sept-22	$574,870.00
Project CCTV-2022 Addition Group E		x	City of New Orleans, LA		Sue Sagasta (DC Bond Rock Construction) (504) 834-1180	Rehabilitation of 2,100 SLF of 8"-12" CIPP liner	Jun-22	Aug-22	$724,134.00
Sanitary Sewer Investigation & Design Assessing, Wadsworth North	x		Wayland County Water Resources Commissioner		George P. Yedlicka, P.E. (248) 858-0958	Cleaned & CCTV 9,400 LF of 8"-12" sanitary sewer; installation of 9,400 LF of 8"-12" CIPP Liner, 2,100 linear point grout installations, and 38 mainline sewer grout installations	Aug-22	Jan-23	$845,760.00
Pontiac Cut & Grout (CCTV/RC Project #2204)	x		Oakland County Water Resources Commissioner		Brian Graham, P.E. (248) 858-0958	Rehabilitation of 7,900 LF of 8"-42" sanitary sewers by cut and removal of root masses, and mainline sewer grouting	Aug-22	Aug-22	$268,600.00
Commerce Crossings Sanitary Sewer and Manhole Rehabilitation	x		Oakland County Water Resources Commissioner		Bryan Peters, P.E. (248) 858-0958	Rehabilitation of 6,200 LF of 8" CIPP Liner, and grout point rehabilitation of 1 Manhole	Aug-22	Sept-22	$649,100.00
Romeo Offset Sewer & Outlet Relief Valves & Repairs	x		Oakland County Water Resources Commissioner		Geoff Wilson, P.E. (248) 858-0133	Stop water infiltration between 48 joints of 72" RCP pipe with a combination of hydrophilic polyurethane grout, and hydrogel compound	June-22	Nov-22	$510,200.00
Main Street and Van Hoosen Sanitary Sewer Repair & Lining Project	x		City of Northville	ROWE Professional Services Co.	Jack Wheatly, P.E. (810) 924-6111	Install 350 LF of 10" dia. CIPP liner, chemical grout sealing, 10" sanitary sewer manhole to be taken out of service, and new pavement removal and replacement	Jun-22	Aug-22	$359,250.00
2021 Cassens Creek Dams Project		x	A-S Energy		Jason Henry (DC Rehabilitation Consulting)	Approx. 1,000 LF of 24" main C.I.P. sec. encasement	Jan-22	Jan-22	$1,090,900.10
Clinton Township Sewer Manhole Rehabilitation	x		Clinton Township	Anderson, Eckstein & Westrick	Brian Chatoe, P.E. (586) 726-1248	Rehabilitation of 43 manholes with cementitious liner, resinous/coating valve, MH cover & channel repair, and chemical grout injection for small leaks	June-22	Aug-22	$149,800.00
Clinton Township Emergency Storm Sewer Manhole Repair & Ridgewood Crossing, Project No. 2022-SS-01	x		Clinton Township	Anderson, Eckstein & Westrick	Scott Chaton, P.E. (586) 726-1248	Remove and permanent and maintain storm manhole and 2 sump, Remove and replacement of 6' section of 36" CSP, Cut out one storm sewer pipe, Install CIP Cone, Pipe Grout Pipe Plug Hole Liner at the manhole	Aug-22	Sept-22	$536,210.11
Collection System Upgrades – Island Township	x		Island Township, Lake Lindero	Dowling Cooke	Thomas L. Wood, P.E. (313) 964-0831	Install 336 LF of 10"-18" SDR 35 sewer, structural sealing and spot liner installation, & chemical grouting to seal joints	Aug-22	Jun-23	$183,600.00
Pearl Beach Pump Station Rehabilitation Project	x		County of St. Clair		Erik Wasson, (810) 364-7410	Rehabilitation of pump station one wet/dry CIPP/SS, wash room endless grade concrete and Division Millgate (2) SMPS #7948/50	Jun-22	Jan-23	$45,000.00
2017 Sewer Rehabilitation – Mining Chain Hills Park	x		Huron-Clinton Metroparks		Andrew Green, P.E. (810) 494-8030	Install 1 manhole with drop CIPP downstream receiving work pits to avoid traffic interruptions, & sanitary sewer CIPP structural rehabilitation	Oct-22	Dec-22	$68,100.00
Whipple Lake Painting, Control & Valve Pit, Renton, MI	x		Oakland County Water Resources Commissioner		Rick Jackson, P.E. (248) 858-1988	Stop water infiltration between 48 joints of 72" RCP pipe with a combination of hydrophilic polyurethane grout, cement base, hydrogel compound and calcium chloride. Restrain the joints with Quick Dry CIPP epoxy paste.	Aug-22	Dec-22	$63,000.00
Clinton Township Sewer Sanitary Sewer Liner Cost Participation Location: S&RD Crossroad & Hwy (Harlan Heights Relocation)	x		Clinton Township	Safety Solutions	Scott Chaton, P.E. (586) 726-1248	Perform open excavation by removing sewer, point repairs, install 12" CIPP sewer liner with cleaning and pre & post CCTV inspection (approximately 500 ft.) and chemical grouting with Multi-Line grout to stop infiltration	Nov-22	Sept-23	$461,298.00
Sanitary Sewer System Improvements – Area H Relining & Televising, Contract 2	x		Village of Beverly Hills	Rick & Associates Inc.	Gary Barlow (989) 835-7381	Clean & televise approx. 58,000 LF of 8", 10" & 12" sanitary sewer and lining laterals and installation of 2,000 LF of 8" and 10" CIPP liners. Additional unidentified work indicated, Wet grouting & point repairs	May-22	Feb-23	$982,951.00
Sanitary Sewer System Improvements Contract 4c Section 8 (Phase 2)	x		Hampton Township	Rick & Associates Inc.	Gary Barlow (989) 835-7381	CCTV Sewer inspection & cleaning of approx. 400,000 LF of sewers, manhole rehabilitation and 5,200 LF of 12"x18" CIPP sewer and 8" CIPP lat liners	Nov-21	Dec-22	$4,090,218.20
Trenchless Technologies Services Term Contract Contract No. 4004(2)	x		Oakland County Water Resources Commissioner		Rick Jackson, P.E. (248) 858-1988	Provide design-build services to perform water and sewer installations by various trenchless technology methods in Oakland County, MI. Construction methods include: pipe bursting, CIPP lining, pilot tube (PTT), directional boring (12"–36"), manhole section point repair, epoxy grouting, Fold-N-Form sewer inspection and cleaning, film installation, slip lining, and other trenchless technologies	Jun-14	Jun-99	Ongoing

DVM UTILITIES, INC.

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Phone: 586-979-0402
www.dvmutilities.com

2. D.V.M. Utilities, Inc., does not have any contracts that have been terminated.

3. D.V.M. Utilities, Inc. – Current Pending Litigation

D.V.M. Utilities, Inc. v. City of Saginaw
Saginaw County Circuit Court

Suit brought by DVM Utilities for breach of contract related to the installation of the Portsmouth Transmission Main Auxiliary Loop C-1673 Project. DVM claims that the owner and its project engineer failed to timely apply for and obtain all necessary permits for DVM to install the Project and, as a result, DVM was forced to work through winter conditions, at an accelerated pace, to attempt to complete the Project within the specified timeframe. Trial is expected to begin in fall 2025.

D.V.M. Utilities, Inc. v. City of Ecorse
Wayne County Circuit Court

Suit brought by DVM Utilities for breach of contract and, in the alternative, contract abandonment related to the City of Ecorse 2020 Sewer Rehabilitation by Pipe Burst and Open Cut Project. DVM claims that the owner and its project engineer deliberately overstated bid quantities, provided defective and/or incomplete drawings, interfered with DVM's means and methods, repeatedly forced DVM off its Project work to address emergency sinkholes, and changed nearly 40% of the Project's construction methodology. DVM further alleges that it experienced COVID-related material shortages for which the owner and its engineer failed to timely address, and that all the aforementioned breaches caused DVM to work through winter months at a significant cost increase, and caused the project to run ten (10) months longer than the contract anticipated. There are no counterclaims. Trial is expected to begin in fall 2025.

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1. The proposals must include the firm's letterhead their Equal Employment Opportunity (EEO) Affirmative Action policy, a description of there Diversity, Equity and Inclusion efforts, and the organization's pro bono activities.

Equal Employment Opportunity & Americans with Disabilities Act

It is the policy of the Company to provide equal employment opportunities to all employees and employment applicants without regard to unlawful considerations of race, religion, creed, color, national origin, sex, pregnancy, sexual orientation, gender identity, age, ancestry, physical or mental disability, genetic information, marital status, or any other classification protected by applicable local, state, or federal laws. This policy prohibits unlawful discrimination based on the perception that anyone has any of those characteristics, or is associated with a person who has or is perceived as having any of those characteristics. This policy applies to all aspects of employment, including, but not limited to, hiring, job assignment, working conditions, compensation, promotion, benefits, scheduling, training, discipline, and termination.

The Company expects all employees to support our equal employment opportunity policy, to take all steps necessary to maintain a workplace free from unlawful discrimination and harassment and to accommodate others in line with this policy to the fullest extent required by law. For example, the Company will make reasonable accommodations for employees' observance of religious holidays and practices unless the accommodation would cause an undue hardship on the Company's operations. If you desire a religious accommodation, you are required to make the request in writing to your manager as far in advance as possible. You are expected to strive to find co-workers who can assist in the accommodation (e.g., trade shifts) and cooperate with the Company in seeking and evaluating alternatives.

Moreover, in compliance with the Americans with Disabilities Act (ADA), the Company provides reasonable accommodations to qualified individuals with disabilities to the fullest extent required by law. The Company may require medical certification of both the disability and the need for accommodation. Keep in mind that the Company can only seek to accommodate the known physical or mental limitations of an otherwise qualified individual. Therefore, it is your responsibility to come forward if you are in need of accommodation. The Company will engage in an interactive process with the employee to identify possible accommodations if any will help the applicant or employee perform the job.

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2. Bidder must submit a Certificate of Good Standing from the State in which its business is domiciled or certify that it is not required to obtain such a certificate or otherwise register with that State

UNITED STATES OF AMERICA

The State of Michigan

Department of Licensing and Regulatory Affairs

Lansing, Michigan

This is to certify:

Entity Name: D. V. M. UTILITIES, INC.
Entity ID#: 800063274
Entity Type: Domestic Profit Corporation
Initial Filing Date: 10/20/1981
Delayed Effective Date:
Formation Jurisdiction: Michigan
Act Formed Under: 284-1972 Business Corporation Act

That the above referenced entity was validly incorporated and said corporation is validly in existence under the laws of this state.

This certificate is issued in conformity with the Act it is formed under, to attest to the fact that the company is in good standing in Michigan as of this date and is duly authorized to transact business and for no other purpose.

This certificate is in due form, made by me as the proper officer, and is entitled to have full faith and credit given it in every court and office within the United States.

LICENSING AND REGULATORY AFFAIRS
Corporations, Securities & Commercial Licensing Bureau

In testimony whereof, I have hereunto set my hand, in the City of Lansing, on August 4, 2025.

Linda Clegg

Linda Clegg, Director
Corporations, Securities & Commercial Licensing Bureau

Certificate Number: 18148
Verify this certificate at: www.michigan.gov/corpverifycertificate

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3. The proposal must include a description of the Bidder's demonstrated efforts in sustainability, including but not limited to greenhouse gas reduction goals, decarbonization, environmental social and governance (ESG) goals, corporate social responsibility (CSR) goals, or similar sustainable accounting frameworks, and other sustainable purchasing and procurement practices and attach as an

Appendix if a formal policy is in effect.

D.V.M. Utilities, Inc. Sustainability Statement and Goals

D.V.M. Utilities, Inc. demonstrates efforts in sustainability by using alternatives to open cut replacement. Our trenchless rehabilitation methods (CIPP, pipe bursting, HDD) keep hundred of thousands of linear feet of pipe and thousands of tons of construction debris year from landfills in the State of Michigan. Additionally, our trenchless construction methods result in significant reductions in use of aggregates, asphalt and concrete pavements.

Because of our array of capabilities we are able to overcome the challenges that can emerge and offer numerous options to the Owner to complete the project in the most beneficial way for all that are involved.

D.V.M. Utilities, Inc. trenchless and trenchfree construction methods is doing our part to protect the environment by lowering CO2 emissions including using Tier 4 construction equipment on all projects.

In addition, D.V.M. Utilities, Inc. trenchless methods provide several thousands of gallons of fuel use and savings yearly by keeping hundreds of trucks off of the road

NOTE: DVM UTILITIES, INC. IS CURRENTLY DEVELOPING CORPORATE SOCIAL RESPONSILITY GOALS, SUSTAINABLE ACCOUNTING, AND SUSTAINABLE PROCUREMENT PRACTICES

DVM
UTILITIES, INC.

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Phone: 586-979-0402
www.dvmutilities.com

4. On Firms letterhead bidders shall submit confirmation that they meet each of the minimum qualifications listed in section 1.4.

D.V.M. Utilities, Inc. hereby confirms that we meet each of the minimum qualifications Listed in section 1.4.

Daniel A. DiLeggo
President

DVM UTILITIES, INC.

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5. On Firms Letterhead bidders shall submit a summary that they meet each of the preferred qualifications listed in section 1.4 and if not an alternative explanation

1.4 Qualifications

Minimum Qualifications

Proposals will only be accepted by the County from Bidders that possess:

A. Key personnel that would be assigned to WRC projects documenting their certifications, licenses and other qualifications.

FIRST NAME	LAST NAME	OSHA 10	OSHA 30	PACP/MACP/LACP	EXP. DATE	CONFINED SPACE	CPR/FIRST AID TRAINING	TRENCH SAFETY
PAUL	TORRES	X	X	P0037788-052022	5/16/2028	X	X	X
JASON	MCCOY	X	X	P0037789-052022	5/16/2028	X	X	X
RICO	SILVA SR.	X	X	P0054975-052025	6/6/2028	X	X	X
JESUS	OCHOA	X		U-615-07004573	8/6/2028	X	X	X
ARMANDO	OCHOA	X				X	X	X
JUSTINO	LUEVANOS	X				X	X	X
MARIO	TRIBUZIO	X	X	P0047811-052024	5/3/2027	X	X	X
DALTON	BROWN	X		P0039688-102022	8/6/2028	X	X	X
ALEX	DE LA TORRE	X				X	X	X
NEFTALI	AGUILAR	X	X			X	X	X
FELIPE	OCHOA	X	X			X	X	X
TYLER	BROWN	X				X	X	X
IVAN	GORDILLO	X				X	X	X
RUBY	WALKER	X				X	X	X
CARLO	TORRES	X		P0043119-062023	6/28/2026	X	X	X
RICO	SILVA JR.	X		P0054480-052025	5/15/2028	X	X	X
ALEJANDRO	GODINEZ	X	X			X	X	X
MARK	LEBEAU	X	X			X	X	X
ORLANDO	MORGAN	X				X	X	X
MARCO	VILLAGOMEZ	X		P0046281-022024	2/23/2027	X	X	X
ULYSES	MEDINA	X		P0039321-082022	8/6/2028	X	X	X
KEVIN	MATTHIS	X				X	X	X
CLAUDIO	RAMIREZ	X		P0054469-052025	5/15/2028	X	X	X
JOHN	ECKRIDGE	X				X	X	X
AARON	PENA	X		P0054458-052025	5/15/2028	X	X	X
CHRIS	SILVA	X				X	X	X
ANDREW	ROGERS	X				X	X	X
WILL	FUQUA	X				X	X	X
JUSTIN	PHILIPS	X				X	X	X

B. Ability to work flexible hours, including nights and four (4) ten (10) hour days.

D.V.M. Utilities, Inc. understands with the scope of work there will be a need for flexibility. With a team of thirty plus field personnel and high-quality equipment, D.V.M. Utilities, Inc. has the capabilities to meet the demands of the project scope.

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C. Certified at the State and Federal level for services performed in Section 1.3 – Scope of Work.

GRETCHEN WHITMER
Governor

STATE OF MICHIGAN
DEPARTMENT OF TRANSPORTATION
Lansing

BRADLEY C. WIEFERICH, P.E.
Director

June 12, 2025

D. V. M. Utilities, Inc.
6045 Sims Dr Suite 2
Sterling Heights MI 48313-3711

Vendor ID: 06385

Dear Contractor:

Thank you for your interest in doing business with the Michigan Department of Transportation (MDOT) as a prequalified construction contractor. This is to inform you that the application submitted for prequalification by **D. V. M. Utilities, Inc. has been approved.**

In accordance with our Administrative Rules, an **overall financial rating of $108,931,000.00** has been established which covers numerical ratings in the classifications(s) listed below:

400	($400,000.00)	Ba	Concrete Pavement Patching And Widening
1000	($1,000,000.00)	Cb	Hot Mix Asphalt/Bituminous Paving
4000	($4,000,000.00)	Ea	Grading, Drainage Structures & Agg. Cons
2000	($2,000,000.00)	Fd	Pumphouses
2000	($2,000,000.00)	I	Sodding And Seeding/Turf Establishment
400	($400,000.00)	J	Concrete C, C&G, Driveways, Sidewalks
10000	($10,000,000.00)	K	Sewers and Watermains
7000	($7,000,000.00)	Ka	Tunneling And Jacking
2000	($2,000,000.00)	L	Electrical Construction
6000	($6,000,000.00)	N94A	Sewer Cleaning
6000	($6,000,000.00)	N94B	Sewer Inspection
200	($200,000.00)	N96N	Paving Brick

This prequalification rating is effective until January 31, 2027; a renewal application must be submitted by this date to prevent removal of prequalification.

If the assigned rating is not satisfactory, the Prequalification Committee must be notified in writing within 15 days of having been advised of the rating granted. MDOT may declare a prequalified bidder ineligible to bid at any time because of developments subsequent to prequalification which, in its opinion, would affect the responsibility of the bidder or their ability to perform the contract work.

If you have any questions or need additional information, please use the following contacts:

Construction Prequalification: MDOTPrequal@michigan.gov, Prequalification Website
Bid Letting (electronic bidding process): MDOT-BidLetting@michigan.gov, Bid Letting Website

Congratulations on your status as an MDOT Construction Prequalified Contractor. MDOT's Construction Prequalification team looks forward to working with you!

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CIPP Procedure Overview

NOTIFICATION AND PREPARATION

A. D.V.M. Utilities will notify all residents affected by this construction at least 24 hours prior to any service disruption affecting their service connection.

B. D.V.M. Utilities will perform cleaning, video, and inspection prior to installation of the CIPP.

C. D.V.M. Utilities will notify the Owner of line obstructions, offset joints or collapsed pipe that will prevent the insertion of the tube or significantly reduce the capacity of the sewer. The Owner, with input from D.V.M. Utilities, Inc., will determine the method of pipe repair required and will address these concerns on a case-by-case basis.

D. Protruding laterals or services will be trimmed flush with the inside of the main sewer wall prior to installation of the CIPP.

BYPASS PUMPING

A. D.V.M. Utilities will provide bypass provisions for the flow of sewage around the section or sections of pipe designated for repair. The pump and bypass lines will be of adequate capacity and size to handle the flow.

INSTALLATION

A. The CIPP will be installed in accordance with the practices given in *ASTM F1216* (for direct inversion installations). The quantity of resin used for the tube's impregnation will be sufficient to fill the volume of air voids in the CIPP tube with additional allowances being made for polymerization shrinkage and the loss of any resin through cracks and irregularities in the original pipe wall. A vacuum impregnation process will be used in conjunction with a roller conveyor system to achieve a uniform distribution of the resin throughout the CIPP tube.

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B. **IF REQUIRED**, A NON-BENTONITE, modified chloroprene rubber seal with adhesive backing will be applied to the host pipe at the penetration point of each MH. The Sika Hydrotite CJ 1020 will be utilized and is in accordance with liner manufacturer recommendations.

C. The resin-impregnated CIPP tube will be installed into the host pipe by methods specified in ASTM F1216. Air pressure/Water will be used to inflate the CIPP tube and mold it against the walls of the host pipe.

D. Temperature gauges will be placed between the CIPP tube and the host pipe's invert position to monitor the temperatures during the cure cycle.

CURING

A. After the CIPP tube installation is completed, D.V.M. Utilities will supply a suitable heat source and recirculation equipment. The equipment will be capable of delivering steam/hot water throughout the section to uniformly raise the temperature above the temperature required to affect a cure of the resin.

B. The heat source shall be fitted with suitable monitors to gauge the temperature of the outgoing heat supply (for water/steam cure). Temperature in the pipe during the cure period shall be as recommended by the resin manufacturer.

C. Initial cure will be deemed to be completed when inspection of the exposed portions of the CIPP appears to be hard and sound and the remote temperature sensor(s) indicate that the temperature is of magnitude to realize an exotherm. The cure period shall be of a duration recommended by the resin Manufacturer, as modified for the installation process, during which time the cycling of the heat exchanger to maintain the temperature is continued.

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COOL DOWN & FINISH

A. Cool down may be accomplished by the introduction of external ambient air to replace pressurized air being relieved. Care shall be taken in the release of the hydrostatic head so that a vacuum will not be developed.

B. At the end of the cool down process, the excess material at the inversion point and tail end will be cut flush with the face of the existing host pipe.

REINSTATE LATERALS AND SERVICES (if necessary)

A. The accurate location of the lateral and service connections shall be made by inspection of the pre-installation video tape or sewer walk.

B. After the CIPP has been installed, all existing active lateral sewers and services will be reinstated unless otherwise indicated by the Owner or on the plans. The reinstatement of laterals and services will be done without excavation unless otherwise specified by the Engineer. Reinstatement of laterals and services will be accomplished from the interior of the CIPP by means of a video camera directed cutting device or by direct man entry when feasible.

C. All cut lateral and service connections shall be free of burrs, frayed edges, or any restriction preventing free flow of wastewater. Laterals shall be reinstated to a minimum of 90% of their original diameter and no more than 100% of their minimum diameter.

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Additional Inversion and Curing Information

The air inversion and steam cure installation can be accomplished by two different methods. Typically, in smaller diameters, the resin impregnated tube is inverted into the pipeline using air instead of water. In larger diameters (especially in culvert applications), the tube is pulled or winched into place and a thin-walled calibration hose is inverted with air into the liner. This calibration hose provides the required pressure and containment for the steam during the curing process.

- *Diameter Range* – Typically, the method of inverting the liner is utilized in diameters of 6"-48". Diameters of 36" – 72" can be accommodated by pulling/winching the liner in place and inverting a calibration hose inside the liner with air pressure.

- *Level of Pipeline Deterioration:* Air inversion is not recommended for pipelines with excessive infiltration. The pull-in method with calibration hose is acceptable for high infiltration levels; however it should not be applied in situations where the deteriorated pipe could possibly collapse due to the forces of the pull-in.

- *Equipment/Support Requirements:* Compressor capacity must meet the required volumes and pressures to invert the liner. Winch or pulling mechanisms should have more than adequate power to pull-in large (36"-72") diameter liners.

- *Limitations of Air Inversion Method:* Air inversion should not be utilized in lines with significant uphill grades. Pull-in forces of larger diameter liners should not exceed the maximum allowable stresses on the tube.

- *Recommended Cure Schedule Variations:* The typical cure schedule may be modified in the field based on local conditions consisting of, but not limited to:

- Quantity and temperature of groundwater in the surrounding soils,
- Level of catalyzation applied to the resin system,
- Ambient air and soil temperatures,
- Tube thickness,
- Tube length.

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TYPICAL CURE SCHEDULE (6"-72" DIAMETERS)

1. Once the tube is fully inverted (or pulled-in-place), apply internal pressure between 7 – 10 psi and transition the source of pressure to steam/hot air. The output of the air at the heat source should remain between 170 –175 degrees Fahrenheit.

2. Maintain heat source output temperature at 170 – 175 degrees until exotherm is observed in the liner.

3. Following exotherm, increase the heat source temperature to attain and hold the interface temperature at the downstream end of the liner for either of the following durations:

	HEATING DURATION	
DOWNSTREAM TEMP.	**(6"-30" dia.)**	**(36"-72" dia.)**
> 175 degrees	30 min.	60 min.
> 156 degrees	60 min.	100 min.
> 140 degrees	90 min.	120 min.
> 125 degrees	135 min.	180 min.

4. Continue to maintain internal pressure and cool liner with ambient or chilled air at a rate no greater than 30 degrees per hour. Cooling shall continue until interface temperature is below 100 degrees Fahrenheit.

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A. Quality Assurance / Quality Control (QA/QC) for Sewer Rehabilitation Utilizing the CIPP Process

1. Overall QA/QC Objectives

D.V.M Utilities, Inc. follows all aspects of ASTM F1216 with respect to the rehabilitation of sewers and conduits with resin-impregnated tubes. In addition to ASTM F1216, the critical components of our Quality Assurance and Quality Control (QA/QC) plan to reasonably ensures the installed Cured-In-Place Pipe Liner will meet the contract specifications and design life objectives and include:

- Proper review and documentation of the CIPP technical specifications in the contract documents
- Development of CIPP liner design(s)
- Installation monitoring and records
- Pre-lining, post-lining CCTV inspections using PACP certified technicians
- Wet-out summary and associated reports (ie. Mix Sheets, and Filled Resin Calculator)
- "Real Time" Fiber Optic Monitoring using Vera Cure technology during installation and completion of boiler logs
- Post installation testing per the contract specifications or industry standards

- Confirmation of ASTM 1216 design objectives (results of thickness, flexural and tensile testing) contained in the contract specifications
- Service lateral reinstatement and final CCTV inspection to confirm successful CIPP rehabilitation

2. Proper Documentation of Design Requirements

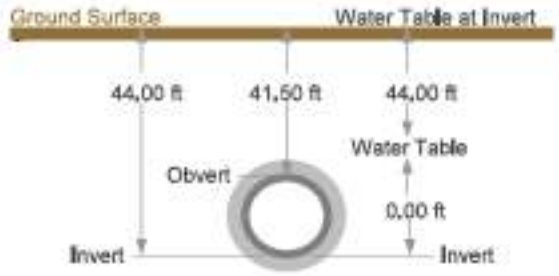
It is important to understand the design requirements for each specific liner design. Depth of cover, height of water table, assumed or actual host pipe ovality, type of loading, and soil conditions are critical components of an accurate CIPP design. Most liner designs are carried out using software or company developed calculation forms, and it is not only important that the resulting design be computationally correct but that it also provides a summary that is clear and concise in terms of documenting all relevant design assumptions, the factors that govern in design, and the computational methods used so that it can be readily checked by the owner or owner's agent for accuracy and completeness. An example of Vortex CIPP design calculator is attached below.

PROJECT INFORMATION **Design Date:** Aug 28, 2024

2024 MIDDD DROP SHAFT
REHABILITATION

CH-S-2 30"

Long-Term Retention Factor is 50%



Existing Pipe: 30 in ID; Ovality: 2%
Fully Deteriorated Design
Required Liner Thickness: 16.8 mm

EXISTING PIPE PARAMETERS	ENTERED
Existing Pipe Condition	Fully Det.
Inside Diameter, D	30 in
Depth to Invert	44 ft
Water Table below Surface	44 ft
Ovality of Existing Pipe, Δ	2.0%
Soil Density, w	130 lb/ft3
Soil Modulus, E's	1,500 psi
Live Load, Ws	HS-20
Other Load	0 psi
CIPP LINER PARAMETERS	ENTERED
Design Life	50 Years
Flexural Modulus Short-term Test, Es	400,000 psi
% of Es used for 50 Year Design E	50%
Flexural Strength Short-term Test, σs	4,500 psi
% of σs used for 50 Year Design σ	50%
Enhancement Factor, K	7
Poisson's Ratio, v	0.3
Safety Factor, N	2
DESIGN BY ASTM F1216 VERSION	F1216-16

CIPP liner design by ASTM F1216-16 Appendix X1 Method

KEY FACTORS: FULLY DETERIORATED CONDITION DESIG		
Flexural Modulus, E, 50 Year Design	200,000 psi	50% of Es
Flexural Strength, σ, 50 Year Design	2,250 psi	50% of σs
Minimum Diameter for Existing Pipe	29.40 in	For 2% ovality
Maximum Diameter for Existing Pipe	30.60 in	For 2% ovality
Ovality Reduction Factor, C	0.836	For 2% ovality
Water Buoyancy Factor, Rw	1.000	Upper Limit
Coeffecient of Elastic Support, B'	0.7877	
Water Pressure, Invert	0.00 psi	0.00 ft Head
Total Design Pressure, P, Invert	**0.00 psi**	**For X1.1 & X1.2**
Water Pressure, Obvert	0.00 psi	0.00 ft Head
Soil Pressure, Obvert	37.47 psi	41.50 ft Cover
Live Load Pressure Ws, Obvert	0.00 psi	Note 1
Other Load Pressure, Obvert	0.00 psi	
Total Design Pressure, qt, Obvert	**37.47 psi**	**For X1.3**

NOTES: E and σ correspond with E_L and σ_L in F1216 Appendix X1
Note 1: AASHTO HS-20. Refer AWWA M11, M23, M55.
Note 2: t based on providing DR ≤ 100. See F1216 Note X1.2
Note 3: There is no ground water load on liner.

FULLY DETERIORATED DESIGN REQUIRES CIPP THICKNESS SATISFY F1216-X1 EQUATIONS X1.1, X1.2, X1.3 & X1.4

Equation		Required t mm	Required t in	Required DR
X1.1: P = [2KE/(1-v^2)] x [1/(DR-1)^3] x [C/N]		7.6 mm	0.300 in	100.0
For load at invert due to groundwater hydrostatic pressure		Note 2	Note 2	Note 2
X1.2: (1.5Δ/100)(1+Δ/100)(DR)^2 = 0.5(1+Δ/100)DR=σ/(PN)		0.0 mm	0.000 in	NA
For minimum thickness for ovality		Note 3	Note 3	Note 3
X1.3: qt=[1/N] x [32 x Rw x B' x E's x C x (E x I/D^3)]^(1/2)	Governs	16.8 mm	0.661 in	45.4
For load at obvert due to groundwater, soil & live loads				
X1.4: (Es x I)/D^3 = Es/[12(DR^3)] ≥ 0.093		10.7 mm	0.423 in	70.9
For minimum CIPP liner stiffness				
Required in Place Liner Thickness - Fully Deteriorated		**16.8 mm**	**0.661 in**	**45.4**

t in is rounded-up to 3 decimal places; t mm = t in x 25.4; DR = (Inside Diameter in)/(t in) NA - Not Available/Applicable

Liner Sample Test Requirements Are: Es ≥ 400000 psi (ASTM D790); σs ≥ 4500 psi (ASTM D790); Thickness ≥ 16.8 mm (ASTM D5813).
If test results are at variance, other combinations of properties and thickness can provide required liner performance. Reconcile design.

PARAMETERS FOR FLOW COMPARISON	
Liner Thickness for flow comparison	16.8 mm
Manning n used for before lining	0.0120
Manning n used for after lining	0.0100

FLOW COMPARISON FOR 16.8 mm LINER	
Inside Diameter before Lining	30.00 in
Inside Diameter after Lining	28.68 in
Flow Capacity after Lining	106% of before lining flow

COMMENTS

ASTM F1216 APPENDIX X1 CALCULATION DETAILS: FULLY DETERIORATED DESIGN **F1216-16**

Fully deteriorated design requires satisfying 4 F1216 equations: X1.1, X1.2, X1.3 and X1.4

Check Equation X1.1

$P = [2KE/(1-\nu^2)] \times [1/(DR-1)^3] \times [C/N]$ Note: E corresponds with E_L in F1216 Appendix X1

P is the maximum allowed external pressure on the liner from groundwater (or any external hydrostatic pressure)

Determine P for liner thickness of: t = 0.661 in = 16.8 mm t is from summary page

K = Enhancement factor = 7 As entered

E = Design Flexural Modulus = (Flexural Modulus Short-term Test, Es) x (% of Es used for 50 Year Design E)
E = 400000 x 50% = 200000 psi

v = Poisson's ratio = 0.3 As entered

DR = D/t = 30/0.661 = 45.39 where D = inside diameter of existing pipe as entered

C = Ovality Reduction Factor = $([1-\Delta/100]/[1+\Delta/100]^2)^3$, where Δ is existing pipe % ovality Ovality = 2%
C = ([1- 2/100]/[1+2/100]^2)^3 = 0.836

N = Safety Factor = 2 As entered.

$P = [2KE/(1-\nu^2)] \times [1/(DR-1)^3] \times [C/N]$
P = [(2 x 7 x 200000)/(1-0.3^2)] x [1/(45.39-1)^3] x [0.836/2] = 14.71 psi

Determine actual external pressure on liner, Pa

Pa = Ground water pressure, Pgw

Pgw = 0.433 x H = 0.433 x 0 ft = 0 psi. Where H is height of water over invert.

Pa = Pgw = 0 psi

Compare Pa to P

Pa, Actual external pressure on liner = 0 psi

P, Allowed external pressure on 0.661 in liner by Eq. X1.1= 14.71 psi

Is P ≥ Pa? Yes. Equation X1.1 is satisfied by 0.661 in liner thickness

Check for DR ≤ 100 as per F1216 Appendix X1 Note X1.2

DR = 45.39 as calculated above

Is DR ≤ 100? Yes. Note X1.2 is satisfied by liner DR of 45.4

Check Equation X1.2

$[(1.5 \times \Delta/100) \times (1+\Delta/100) \times DR^2] + [0.5 \times (1+\Delta/100) \times DR] = (\sigma)/(P \times N)$ Note: σ corresponds with σ_L in F1216 Appendix X1

Check X1.2 for liner thickness of: t = 0.661 in = 16.8 mm t is from summary page

Δ = 2 As entered.

DR, calculated above for X1.1 = 45.39

σ = Design Flexural Strength = (Flexural Strength Short-term Test, σs) x (% of σs used for 50 Year Design σ) =4500 x 50% = 2250 psi

P = External pressure on liner = Pa = 0 psi Calculated above for X1.1

N = safety factor = 2

Solve Eq. X1.2 for liner thickness, t. Where DR = (Liner OD)/(t)

$t = [3 \times (\Delta/100) \times D] / [0.5 + \{0.25 + (6 \times (\Delta/100)) \times [\sigma/(P \times N \times (1+(\Delta/100)))]\}^{.5}]$ Note:σ corresponds with σ_L in F1216 Appendix X1

t = [3 x (2/100) x 30] / [0.5 + {0.25 + (6 x (2/100)) x [2250/(0 x 2 x (1+(2/100))))]}^0.5] = 0 in

Compare liner t to t required by Equation X1.2

Liner t:	0.661 in	t is from summary page
Required t:	0.000 in	By Equation X1.2
Is Liner t ≥ Required t?		Yes. Equation X1.2 is satisfied by 0.661 in liner thickness.

Fully Deteriorated calculation details continued on next page

FULL FLOW CAPACITY COMPARISON BEFORE & AFTER LINING FOR 16.8 mm LINER

Flow = Q = Area x Velocity = $[(Pi \times D^2)/4] \times [(1.486/n) \times R^{2/3} \times S^{1/2}]$ Manning formula, Imperial units. 16.8 mm liner

S = Slope = same before & after lining; R = Hydraulic Radius = D/4 for full flow (D in ft) D1 = 30 in = 2.5 ft

$Q2/Q1 = \{[(Pi \times (D_2^2)/4] \times [(1.486/n_2)] \times (D_2/4)^{2/3}\} / \{[(Pi \times (D_1^2)/4] \times [(1.486/n_1)] \times (D_1/4)^{2/3}\}$ D2 = 28.68 in = 2.39 ft

= {[(3.142 x (2.39^2)/4] x [(1.486/0.01)] x (2.39/4)^(2/3)} / {[(3.142 x (2.5)^2)/4] x [(1.486/0.012)] x (2.5/4)^(2/3) = 1.06

Q1 is existing (before lining). Q2 is after lining. Lined capacity is 106% of before lining capacity.

ASTM F1216 APPENDIX X1 FULLY DETERIORATED CALCULATION DETAILS CONT'D **F1216-16**

Check Equation X1.3

$q_t = [C/N] \times [32R_w B'E'_s(EI/D^3)]^{1/2}$ F1216-07a

$q_t = [1/N] \times [32R_w B'E'_s C(EI/D^3)]^{1/2}$ F1216-16 **Using this equation**

Note: E corresponds with E_L in F1216 Appendix X1

Note: E corresponds with E_L in F1216 Appendix X1

Design is by F1216-16

Where q_t is the maximum allowed external pressure on the liner from cover, live loads and other loads

Determine q_t for liner thickness of: t = 0.661 in = 16.8 mm t is from summary page

C = Ovality Reduction Factor = 0.836 (calculated on page 1)

N = Safety Factor = 2

Rw = Water Bouyancy Factor (Min 0.67, Max 1.0) = 1-0.33(Hw/H) = 1-0.33(0/41.5) = 1 Upper Limit

Where Hw and H are height of water and height of soil over top of pipe. See F1216 X1.2.2

B' = Coefficent of elastic support = 1/(1+4e^[-0.065H]) = 0.7877 Where H = 41.5 and e = 2.718

E's = Modulus of soil reaction = 1500 psi. As entered.

E = Design Flexural Modulus = 200000 psi. See calculation on previous page. Note: E corresponds with E_L in F1216 Appendix X1

I = Moment of inertia for liner = (t^3)/12 = (0.661^3)/12 = 0.02406707

D = Inside diameter of existing pipe = mean OD of liner = 30 in

qt=[1/N] x [32 x Rw x B' x E's x C x (E x I/D^3)]^(1/2) Note: E corresponds with E_L in F1216 Appendix X1

qt = [1/2] x [32 x 1 x 0.7877 x 1500 x 0.836 x (200000 x 0.02406707/30^3)]^(1/2) = 37.53 psi

Determine actual external pressure on liner, qa, due to existing pipe conditions

qa = Ww + W + Ws + Wo

Ww = Water load = 0.433 x Hw = 0.433 x 0 = 0 psi Hw is water height over top of pipe.

W = Soil Load = (w x H x Rw)/144 = (130 x 41.5 x 1)/144) = 37.47 psi H is soil height over top of pipe

Ws = Live load = 0 psi Note 1: AASHTO HS-20. Refer AWWA M11, M23, M55.

Wo = Other load = 0 psi, entered

qa = 0 + 37.47 + 0 + 0 = 37.47 psi

Compare qa to qt

qa =	37.47 psi	Actual external pressure on liner
qt =	37.53 psi	Allowed external pressure for 0.661 mm liner by Equation X1.3
Is qt ≥ qa?	Yes. Equation X1.3 is satisfied by 0.661 in liner thickness.	

Check Equation X1.4

$(Es \times I)/D^3 = Es/(12 \times (DR^3)) \geq 0.093$ Note Es corresponds with initial modulus in F1216 Appendix X1

Determine for liner thickness t of: t = 0.661 in = 16.8 mm t is from summary page

Es = Flexural Modulus Short-term Test = 400000 psi Note Es corresponds with initial modulus in F1216 Appendix X1

DR = liner dimension ratio = D/t = 30 / 0.661 = 45.39

Es / (12 x (DR^3)) = 400000/(12 x 45.39^3) = 0.3564

Is Es / (12 x (DR^3)) ≥ 0.093? Yes. Equation X1.4 is satisfied by 0.661 in liner thickness

Summary for Fully Deteriorated Design

Fully Deteriorated design requires satisfying Eqs X1.1, X1.2, X1.3, X1.4

Eq X1.1	Satisfied by 0.661 in liner thickness
Eq X1.2	Satisfied by 0.661 in liner thickness
Eq X1.3	Satisfied by 0.661 in liner thickness
Eq X1.4	Satisfied by 0.661 in liner thickness

Required liner thickness for fully deteriorated is: 0.661 in 16.8 mm

3. QA/QC during the Installation of Cured-In-Place Liners

3A. Pre and Post-Lining Inspections

Pre-lining CCTV inspection of a sewer that is intended for CIPP rehabilitation occurs after cleaning and preparation of the sewer for lining. This inspection confirms that all necessary cleaning and pipe preparation work has been satisfactorily completed, and provides a means to confirm that the condition of the pipe is consistent with the specified design conditions and the assumptions made by the owner or consultant. This is the final opportunity to communicate any discrepancies that may affect either long or short-term performance of the liner. Post-lining inspection occurs after installation of the CIPP liner and reinstatement of all service laterals. It confirms the finish and fit of the liner, confirms a tight-fit has been achieved, and confirms the adequacy and accuracy of connection lateral reinstatements.

3B. CIPP Liner Tube Wet-Out/Resin Impregnation Checks and Documentation

Cured-In-Place Liner tube wet-outs/resin-impregnation are a critical component of the CIPP process. Proper inspection checks should be undertaken and the entire process should be properly documented. Key components of the liner tube wet-out/resin impregnation process include:

- Tube inspections and dimensional checks
- Documenting pinch roller gap settings
- Confirmation of resin type, volume, and expiration date
- Secure resin samples for testing per the contract documents
- Ensure catalyst and res/in temperature monitoring in-place
- Check for even distribution of resin during wet-out

3B.1. Resin Impregnation Summary

The CIPP liner tube wet-out itself should be documented in a resin impregnation summary, outlining the following:

- Resin impregnation procedure (including catalyst type and dose)
- Location of the designated wet-out facility
- Documentation of the Resin Manufacturer's expiration date for the proposed resin
- Completion of resin mix worksheet, the filled resin calculator, and the Wet Out Report
    - See below for examples of each
- Volume of resin to be impregnated into each liner section (as per ASTM F1216) including the proposed excess allowance for polymerization and migration into cracks and joints of the host pipe (typically 5-7%)
- Roller gap setting required to provide the final installed CIPP thickness based on the volume of resin proposed
- Any repairs carried out to the liner
- During the wet-out, the resin impregnation process should be monitored and recorded, including a summary of the volume of resin supplied, excess quantity of resin added to account for polymerization and migration into the host pipe, roller gap setting, catalyst(s) used, time and location of the wet out, and means taken to store and transport the impregnated liner from the wet out facility to the job site. Additional quality assurance/quality control checks include visual tube inspections, dimensional

checks, catalyst and resin temperature monitoring, and visual checks for even distribution of resin.

INTERPLASTIC CORPORATION

2015 Broadway Street Northeast
Minneapolis, MN 55413-1714
651.481.6860 Fax 612.331.4634

COR72-AT-470HT Cured-in-Place Pipe Resin

This packet contains information typically required when submitting a resin designed for the CIPP process to a municipality. Included is the following information for COR72-AT-470HT:

- **Technical Data Sheet**
  - Includes product specifications
  - Includes typical physical properties of the resin
  - Includes typical physical properties of a felt impregnated composite
- **Fourier Transform Infrared (FTIR) Spectrum on the Liquid Resin**
- **Safety Data Sheet (SDS)**
- **Corrosion Test Data**
  - A summary of the data as it relates to ASTMs D543, D5813, F1216, and F1743
  - Raw data for 1 month and 12 month testing performed by a third party test laboratory
- **ASTM D2990 Flexural Creep Modulus Data**

If additional information is required, or for any specific questions regarding this resin, please contact one of the following individuals:

Jason Schiro
CIPP Product Manager
651.757.3961 (office)
612.356.3343 (cell)
jschiro@interplastic.com

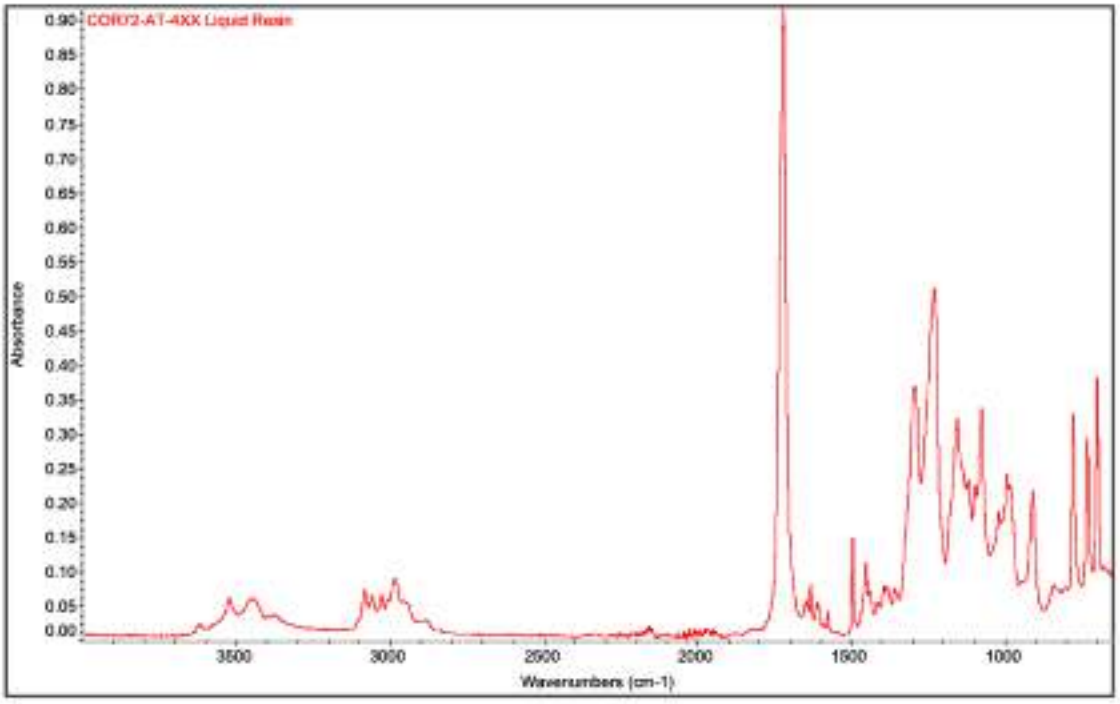
OR

Kaleel Rahaim
Business Manager-Remediation Polymers
281.687.8617 (cell)
krahaim@interplastic.com

INTERPLASTIC CORPORATION

2015 Northeast Broadway Street
Minneapolis, Minnesota 55413-1775
(651) 481-6860 Fax (612) 331-4235

COR72-AT-4XX Type Liquid Resin Sample



SAFETY DATA SHEET

CIPP ISO RESIN

Section 1. Identification

GHS product identifier : CIPP ISO RESIN

Product code : COR72-AT-470HT

Other means of identification : Unsaturated Polyester Resin

Product type : Liquid.

Material uses

Product use : Industrial applications.

Supplier's details : INTERPLASTIC CORPORATION
1225 Willow Lake Boulevard
St. Paul, MN 55110-5145
651.481.6860

Emergency telephone number (with hours of operation) : CHEMTREC 24-Hour Emergency Telephone 800.424.9300

Section 2. Hazards identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture : FLAMMABLE LIQUIDS - Category 3
ACUTE TOXICITY: INHALATION - Category 4
SKIN CORROSION/IRRITATION - Category 2
SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2A
CARCINOGENICITY - Category 2

Percentage of the mixture consisting of ingredient(s) of unknown toxicity: 65.7%

GHS label elements

Hazard pictograms :

Signal word : Warning

Hazard statements : Flammable liquid and vapor.
Harmful if inhaled.
Causes serious eye irritation.
Causes skin irritation.
Suspected of causing cancer.

Precautionary statements

Section 2. Hazards identification

Prevention : Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use personal protective equipment as required. Wear protective gloves. Wear eye or face protection. Keep away from heat, sparks, open flames and hot surfaces. - No smoking. Use explosion-proof electrical, ventilating, lighting and all material-handling equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Keep container tightly closed. Use only outdoors or in a well-ventilated area. Avoid breathing vapor. Wash hands thoroughly after handling.

Response : IF exposed or concerned: Get medical attention. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or physician if you feel unwell. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. IF ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing. If skin irritation occurs: Get medical attention. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention.

Storage : Store containers in a safe place. Store in a well-ventilated place. Keep cool.

Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.

Hazards not otherwise classified : None known.

Section 3. Composition/information on ingredients

Substance/mixture : Mixture

Other means of identification : Unsaturated Polyester Resin

CAS number/other identifiers

CAS number : Not applicable.

Product code : COR72-AT-470HT

Ingredient name	%	CAS number
Styrene	30.0 - 33.0	100-42-5

Any concentration shown as a range is to protect confidentiality or is due to batch variation. Any concentration shown as exact is based on formula.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention.

Section 4. First aid measures

Inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If necessary, call a poison center or physician. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Skin contact : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Continue to rinse for at least 10 minutes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : Causes serious eye irritation.

Inhalation : Harmful if inhaled.

Skin contact : Causes skin irritation.

Ingestion : Irritating to mouth, throat and stomach.

Over-exposure signs/symptoms

Eye contact : Adverse symptoms may include the following:
pain or irritation
watering
redness

Inhalation : No specific data.

Skin contact : Adverse symptoms may include the following:
irritation
redness

Ingestion : No specific data.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments : No specific treatment.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Use dry chemical, CO_2, water spray (fog) or foam.

Unsuitable extinguishing media : Do not use water jet.

Specific hazards arising from the chemical : Flammable liquid and vapor. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. The vapor/gas is heavier than air and will spread along the ground. Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back. Runoff to sewer may create fire or explosion hazard.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
metal oxide/oxides

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Section 6. Accidental release measures

Large spill : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Avoid exposure - obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not ingest. Avoid breathing vapor or mist. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Take precautionary measures against electrostatic discharges. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities : Do not store above the following temperature: 38°C (100.4°F). Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
Styrene	**ACGIH TLV (United States, 4/2014).** TWA: 20 ppm 8 hours. TWA: 85 mg/m³ 8 hours. STEL: 40 ppm 15 minutes. STEL: 170 mg/m³ 15 minutes. **OSHA PEL 1989 (United States, 3/1989).** TWA: 50 ppm 8 hours. TWA: 215 mg/m³ 8 hours. STEL: 100 ppm 15 minutes. STEL: 425 mg/m³ 15 minutes.

Section 8. Exposure controls/personal protection

	OSHA PEL Z2 (United States, 2/2013). TWA: 100 ppm 8 hours. CEIL: 200 ppm AMP: 600 ppm 5 minutes. **NIOSH REL (United States, 10/2013).** TWA: 50 ppm 10 hours. TWA: 215 mg/m³ 10 hours. STEL: 100 ppm 15 minutes. STEL: 425 mg/m³ 15 minutes.

Appropriate engineering controls : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles.

Skin protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. When there is a risk of ignition from static electricity, wear anti-static protective clothing. For the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

Appearance

Physical state : Liquid.

Color : Various

Odor : Characteristic. Aromatic.

Odor threshold : 0.1 ppm

pH : Not applicable.

Melting point : Not available.

Boiling point : 145.2°C (293.4°F)

Flash point : Closed cup: 31.1°C (88°F)

Burning time : Not applicable.

Burning rate : Not applicable.

Evaporation rate : >1 (ether (anhydrous) = 1)

Flammability (solid, gas) : Not available.

Lower and upper explosive (flammable) limits : Lower: 1.1%
Upper: 6.1%

Vapor pressure : 0.57 kPa (4.3 mm Hg) [room temperature]

Vapor density : 3.6 [Air = 1]

Relative density : 1.24 to 1.27

Solubility : Not available.

Solubility in water : Not applicable.

Partition coefficient: n-octanol/water : Not available.

Auto-ignition temperature : Not available.

Decomposition temperature : Not available.

SADT : Not applicable.

Viscosity : Not available.

Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Hazardous reactions or instability may occur under certain conditions of storage or use.

Conditions to avoid : Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Do not allow vapor to accumulate in low or confined areas.

Incompatible materials : Reactive or incompatible with the following materials:
oxidizing materials

Reactive or incompatible with the following materials: acids and alkalis.
Keep away from oxidizing agents. Incompatible with alkali metals. Incompatible with some strong acids.

Section 10. Stability and reactivity

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Styrene	LC50 Inhalation Gas. LC50 Inhalation Vapor LD50 Oral	Rat Rat Rat	2770 ppm 11800 mg/m³ 2650 mg/kg	4 hours 4 hours -

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
Styrene	Eyes - Mild irritant	Human	-	50 parts per million	-
	Eyes - Moderate irritant	Rabbit	-	24 hours 100 milligrams	-
	Eyes - Severe irritant	Rabbit	-	100 milligrams	-
	Skin - Mild irritant	Rabbit	-	500 milligrams	-
	Skin - Moderate irritant	Rabbit	-	100 Percent	-

Sensitization

Not available.

Mutagenicity

Not available.

Carcinogenicity

Not available.

Conclusion/Summary : Styrene manufacturers vary on their determination that the GHS hazard classification criteria for carcinogenicity has been met.

Styrene is listed by IARC as a possible carcinogen to humans (Group 2B) based on "limited evidence" in humans, "limited evidence" in animals and "other relevant data". The United States NTP listed styrene as reasonably anticipated to be a human carcinogen based on "limited evidence" from studies in humans, "sufficient evidence" from studies in experimental animals, and supporting data on mechanisms of carcinogenesis. The significance of these results for humans has not been established through risk assessment.

Classification

Product/ingredient name	OSHA	IARC	NTP
Styrene	-	2B	Reasonably anticipated to be a human carcinogen.

Reproductive toxicity

Not available.

Teratogenicity

Not available.

Specific target organ toxicity (single exposure)

Section 11. Toxicological information

Not available.

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on the likely routes of exposure : Not available.

Potential acute health effects

Eye contact : Causes serious eye irritation.

Inhalation : Harmful if inhaled.

Skin contact : Causes skin irritation.

Ingestion : Irritating to mouth, throat and stomach.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : Adverse symptoms may include the following:
pain or irritation
watering
redness

Inhalation : No specific data.

Skin contact : Adverse symptoms may include the following:
irritation
redness

Ingestion : No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

Not available.

General : No known significant effects or critical hazards.

Carcinogenicity : Suspected of causing cancer. Risk of cancer depends on duration and level of exposure.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Section 11. Toxicological information

Numerical measures of toxicity

Acute toxicity estimates

Route	ATE value
Oral	2705.8 mg/kg
Inhalation (gases)	2923,2 ppm
Inhalation (vapors)	12.45 mg/l

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
Styrene	Acute EC50 1400 µg/l Fresh water	Algae - Pseudokirchneriella subcapitata	72 hours
	Acute EC50 720 µg/l Fresh water	Algae - Pseudokirchneriella subcapitata	96 hours
	Acute EC50 4700 µg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 52000 µg/l Marine water	Crustaceans - Artemia salina - Nauplii	48 hours
	Acute LC50 4020 µg/l Fresh water	Fish - Pimephales promelas	96 hours
	Chronic NOEC 63 µg/l Fresh water	Algae - Pseudokirchneriella subcapitata	96 hours

Persistence and degradability

Not available.

Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
Styrene	0.35	13.49	low

Mobility in soil

Soil/water partition coefficient (K_{OC}) : Not available.

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapor from product residues may create a highly flammable or explosive atmosphere

Section 13. Disposal considerations

inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

	DOT Classification	Mexico Classification	IMDG	IATA
UN number	UN1866	UN1866	UN1866	UN1866
UN proper shipping name	RESIN SOLUTION (styrene)	RESIN SOLUTION (styrene)	RESIN SOLUTION (styrene)	RESIN SOLUTION (styrene)
Transport hazard class(es)	3 	3 	3 	3 
Packing group	III	III	III	III
Environmental hazards	Yes.	Yes.	Yes.	No.
Additional information	**Reportable quantity** 3078.7 lbs / 1397.7 kg [294.22 gal / 1113.7 L] Package sizes shipped in quantities less than the product reportable quantity are not subject to the RQ (reportable quantity) transportation requirements.	-	-	-

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code : Not available.

Section 15. Regulatory information

U.S. Federal regulations : **TSCA 8(a) PAIR**: 4-tert-butylpyrocatechol
TSCA 8(a) CDR Exempt/Partial exemption: Not determined
United States inventory (TSCA 8b): All components are listed or exempted.
Clean Water Act (CWA) 307: Naphthenic acids, copper salts
Clean Water Act (CWA) 311: styrene; styrene

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs) : Listed

Clean Air Act Section 602 Class I Substances : Not listed

Clean Air Act Section 602 Class II Substances : Not listed

SARA 302/304

Composition/information on ingredients

No products were found.

SARA 304 RQ : Not applicable.

SARA 311/312

Classification : Fire hazard
Immediate (acute) health hazard
Delayed (chronic) health hazard

SARA 313

	Product name	CAS number	%
Form R - Reporting requirements	styrene	100-42-5	32.48
Supplier notification	styrene	100-42-5	32.48

State regulations

Massachusetts : The following components are listed: STYRENE MONOMER; STYRENE MONOMER

New York : The following components are listed: Styrene; Styrene

New Jersey : The following components are listed: STYRENE MONOMER; BENZENE, ETHENYL-; STYRENE MONOMER; BENZENE, ETHENYL-

Pennsylvania : The following components are listed: BENZENE, ETHENYL-; BENZENE, ETHENYL-

International regulations

International lists : **Australia inventory (AICS)**: All components are listed or exempted.
China inventory (IECSC): All components are listed or exempted.
Japan inventory: Not determined.
Korea inventory: All components are listed or exempted.
Malaysia Inventory (EHS Register): Not determined.
New Zealand Inventory of Chemicals (NZIoC): All components are listed or exempted.
Philippines inventory (PICCS): Not determined.
Taiwan inventory (CSNN): All components are listed or exempted.

Canada inventory : All components are listed or exempted.

Section 16. Other information

Hazardous Material Information System (U.S.A.)

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks Although HMIS® ratings are not required on SDSs under 29 CFR 1910. 1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.)

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Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

History

Date of printing	:	6/5/2015.
Date of issue/Date of revision	:	6/5/2015.
Date of previous issue	:	6/1/2015.
Version	:	5
Prepared by		Health, Safety and Environmental Department
Email	:	For questions regarding the SDS contact: iasafety@ip-corporation.com
Key to abbreviations	:	ATE = Acute Toxicity Estimate BCF = Bioconcentration Factor GHS = Globally Harmonized System of Classification and Labelling of Chemicals IATA = International Air Transport Association IBC = Intermediate Bulk Container IMDG = International Maritime Dangerous Goods LogPow = logarithm of the octanol/water partition coefficient MARPOL 73/78 = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution) UN = United Nations
References	:	OSHA Hazard Communication Standard, March 2012 (29 CFR 1910.1200)

Indicates information that has changed from previously issued version.

Notice to reader

Section 16. Other information

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

INTERPLASTIC CORPORATION

2015 Broadway Street Northeast
Minneapolis, MN 55413-1714
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COR72-AT-4XX Series
Corrosion Summary

ASTM F1216 & D543 (CIPP) Corrosion Data @ 73.4 +/- 3.6°F (23 +/- 2°C)

Immersion Media	Flexural Strength Retention, % Months		Flexural Modulus Retention, % Months	
	1	12	1	12
100% Tap Water (pH 6-9)	97	89	96	97
5% Nitric Acid	97	85	99	90
10% Phosphoric Acid	98	90	96	98
10% Sulfuric Acid	95	98	97	97
100% Gasoline	98	92	100	98
0.1% Detergent	100	96	99	97
0.1% Soap Solution	100	99	98	99
100% Vegetable Oil	94	98	100	100

ASTM D5813, F1743, & D543 (CIPP) Corrosion Data @ 73.4 +/- 3.6°F (23 +/- 2°C)

Immersion Media	Flexural Strength Retention, % Months		Flexural Modulus Retention, % Months	
	1	12	1	12
1% Nitric Acid	100	96	100	96
5% Sulfuric Acid	100	96	97	95
100% Gasoline	98	92	100	98
0.1% Detergent	100	96	99	97
0.1% Soap Solution	100	99	98	99
100% Vegetable Oil	94	98	100	100

Note: Non-shaded regions are the applicable test durations as they relate to achievement of the minimum acceptable retentions.

**All testing was conducted by HTS Pipe Consultants, Inc.

SUMMARY OF TEST DATA
RESISTANCE OF CIPP TO CHEMICAL REAGENTS

SAMPLE ID: COR72-AT Duration: 30 Days Date Tested: 11/13/2008

Chemical Reagent (Concentration)	Mechanical Property	Test Method ASTM D	Unit	Control Sample	30 Days	
					Value	% Change
Tap water (100%)	Observation	543		N/A	No Change	pH 7.6
	Weight	543	g	143.2	143.4	0.14
	Hardness	2583		90.6	90.6	0.00
	Thickness	2122	in.	0.276	0.276	0.00
			mm.	7.0	7.0	0.00
	Max. Flexural	790	psi	9520.2	9234.8	-3.00
	Modulus	790	psi	679890	650263	-4.36
Nitric Acid (5%)	Observation	543		N/A	Spot of cloud	pH 0.6
	Weight	543	g	132.3	132.6	0.23
	Hardness	2583		90.6	90.6	0.00
	Thickness	2122	in.	0.262	0.262	0.00
			mm.	6.7	6.7	0.00
	Max. Flexural	790	psi	9520.2	9197.8	-3.39
	Modulus	790	psi	679890	671493	-1.24
Phosphoric Acid (10%)	Observation	543		N/A	Spot of cloud	pH 1.0
	Weight	543	g	143.7	143.8	0.07
	Hardness	2583		90.6	90.6	0.00
	Thickness	2122	in.	0.281	0.281	0.00
			mm.	7.1	7.1	0.00
	Max. Flexural	790	psi	9520.2	9313.3	-2.17
	Modulus	790	psi	679890	652410	-4.04
Sulfuric Acid (10%)	Observation	543		N/A	Spot of cloud	pH 0.2
	Weight	543	g	137.4	137.5	0.07
	Hardness	2583		90.4	90.4	0.00
	Thickness	2122	in.	0.266	0.266	0.00
			mm.	6.8	6.8	0.00
	Max. Flexural	790	psi	9520.2	9024	-5.21
	Modulus	790	psi	679890	656742	-3.40

HTS, INC. Consultants

SUMMARY OF TEST DATA
RESISTANCE OF CIPP TO CHEMICAL REAGENTS

SAMPLE ID: COR72-AT **Duration:** 30 Days **Date Tested:** 11/13/2008

Chemical Reagent (Concentration)	Mechanical Property	Test Method ASTM D	Unit	Control Sample	30 Days	
					Value	% Change
Gasoline (100%)	Observation	543		N/A	No Change	pH-NA
	Weight	543	g	134.4	134.5	0.07
	Hardness	2583		90.8	90.8	0.00
	Thickness	2122	in.	0.266	0.266	0.00
			mm.	6.8	6.8	0.00
	Max. Flexural	790	psi	9520.2	9321	-2.09
	Modulus	790	psi	679890	681894	0.29
Vegetable Oil (100%)	Observation	543		N/A	No Change	pH-NA
	Weight	543	g	130.2	130.3	0.08
	Hardness	2583		90.4	90.4	0.00
	Thickness	2122	in.	0.263	0.263	0.00
			mm.	6.7	6.7	0.00
	Max. Flexural	790	psi	9520.2	8961.0	-5.87
	Modulus	790	psi	679890	688215	1.22
Detergent (0.1%)	Observation	543		N/A	No Change	pH 6.8
	Weight	543	g	124.4	124.8	0.32
	Hardness	2583		90.4	90.4	0.00
	Thickness	2122	in.	0.256	0.256	0.00
			mm.	6.5	6.5	0.00
	Max. Flexural	790	psi	9520.2	10051.0	5.58
	Modulus	790	psi	679890	669962	-1.46
Soap (0.1%)	Observation	543		N/A	No Change	pH 5.4
	Weight	543	g	136.0	136.4	0.29
	Hardness	2583		90.8	90.8	0.00
	Thickness	2122	in.	0.262	0.262	0.00
			mm.	6.7	6.7	0.00
	Max. Flexural	790	psi	9520.2	9508.3	-0.12
	Modulus	790	psi	679890	669561	-1.52

HTS, INC. Consultants

SUMMARY OF TEST DATA
RESISTANCE OF CIPP TO CHEMICAL REAGENTS

SAMPLE ID: COR72-AT **Duration:** 30 Days **Date Tested:** 11/13/2008

Chemical Reagent (Concentration)	Mechanical Property	Test Method ASTM D	Unit	Control Sample	30 Days	
					Value	% Change
Nitric Acid (1%)	Observation	543		N/A	No Change	pH 1.2
	Weight	543	g	134.9	135.3	0.30
	Hardness	2583		90.6	90.6	0.00
	Thickness	2122	in.	0.268	0.268	0.00
			mm.	6.8	6.8	0.00
	Max. Flexural	790	psi	9520.2	9554.6	0.36
	Modulus	790	psi	679890	680468	0.09
Sulfuric Acid (5%)	Observation	543		N/A	Spot of cloud	pH 0.5
	Weight	543	g	129.7	129.9	0.15
	Hardness	2583		91.0	91.0	0.00
	Thickness	2122	in.	0.259	0.259	0.00
			mm.	6.6	6.6	0.00
	Max. Flexural	790	psi	9520.2	9988.7	4.92
	Modulus	790	psi	679890	662814	-2.51

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FLEXURAL PROPERTIES OF PLASTICS (ASTM D790)

SUPPORT SPAN = 4"

Flexural 3 point bend

Instron Corporation
Series IX Automated Materials Testing System 6.06

Operator name: E. CARRILLO

Test Date: 12 Nov 2008

Sample Identification: 8F55-4CC

Sample Type: ASTM

Interface Type: 42/43/4000 Series

Machine Parameters of test:

Sample Rate (pts/sec): 10.000

Crosshead Speed (in/min): .1100

Humidity (%): 50

Temperature (deg. F): 71

Dimensions:

	Spec. 1	Spec. 2	Spec. 3	Spec. 4	Spec. 5
Width (in)	.55700	.55700	.55600	.55300	.57500
Depth (in)	.23490	.24600	.25800	.27700	.27600
Span (in)	4.0000	4.0000	4.0000	4.0000	4.0000

Out of 5 specimens, 0 excluded.

Sample comments: COR72-AT, CONTROL

Specimen Number	Displacement at Yield (in)	Strain at Yield (in/in)	Load at Yield (lbs)	Stress at Yield (psi)	Modulus Of Elasticity (psi)
1	.5776	.0507	51.4	10119.6	642175
2	.5294	.0492	58.1	10174.1	653616
3	.3701	.0358	56.4	9156.8	686340
4	.3424	.0356	51.3	8971.4	688241
5	.5798	.0393	67.0	9179.2	708781
Mean:	.4399	.0421	59.3	9520.2	679890.
Standard Deviation:	.1060	.0072	6.1	578.0	32031.
Minimum:	.3424	.0356	51.4	8971.4	653616.
Maximum:	.5776	.0507	67.0	10174.1	708781.

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FLEXURAL PROPERTIES OF PLASTICS (ASTM D790)

SUPPORT SPAN = 4"

Flexural 3 point bend

Instron Corporation
Series IX Automated Materials Testing System 6.05

Operator name: K. PHOUANGSAVANH

Test Date: 13 Nov 2009

Sample Identification: SP55-4-1

Sample Type: ASTM

Interface Type: 42/43/4400 Series

Machine Parameters of test:

Sample Rate (pts/sec): 10.000

Crosshead Speed (in/min): .1100

Humidity (%): 50

Temperature (deg. F): 72

Dimensions:

	Spec. 1	Spec. 2	Spec. 3	Spec. 4	Spec. 5
Width (in)	.56500	.56000	.56100	.55400	.55400
Depth (in)	.26100	.27000	.27600	.27900	.28700
Span (in)	4.0000	4.0000	4.0000	4.0000	4.0000

Out of 5 specimens, 0 excluded

Sample comments: CORTA-AT, SAMPLE SOAKED IN TAP WATER-pH6-9 (100%) FOR 30 DAYS

Specimen Number	Displacement at Yield (in)	Strain at Yield (in/in)	Load at Yield (lbs)	Stress at Yield (psi)	Modulus Of Elasticity (psi)
1	.5078	.0497	60.9	9479.7	623467
2	.4463	.0452	65.2	9587.0	603428
3	.3859	.0399	66.6	9347.9	675385
4	.4259	.0445	65.6	9232.8	684403
5	.2958	.0322	65.6	8626.8	664731
Mean:	.4123	.0423	64.9	9234.8	650283.
Standard Deviation:	.0775	.0065	2.3	379.9	35045.
Minimum:	.2958	.0322	60.9	8626.8	603428.
Maximum:	.5078	.0497	66.6	9587.0	684403.

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FLEXURAL PROPERTIES OF PLASTICS (ASTM D790)

SUPPORT SPAN = 4"

Flexural 3 point bend

Instron Corporation
Series IX Automated Materials Testing System 6.05

Operator name: E. CARRILLO

Test Date: 13 Nov 2008

Sample Identification: SF55-4-2

Sample Type: ASTM

Interface Type: 62/63/6400 Series

Machine Parameters of test:

Sample Rate (pts/sec): 10.000

Crosshead Speed (in/min): .1100

Humidity (%): 50

Temperature (deg. F): 71

Dimensions:

	Spec. 1	Spec. 2	Spec. 3	Spec. 4	Spec. 5
Width (in)	.56300	.56700	.56400	.56600	.55200
Depth (in)	.24700	.25700	.26400	.27100	.23500
Span (in)	4.0000	4.0000	4.0000	4.0000	4.0000

Out of 5 specimens, 0 excluded.

sample comments: COR72-AT, SAMPLE SOAKED IN NITRIC ACID (5%) FOR 30 DAYS

Specimen Number	Displacement at Yield (in)	Strain at Yield (in/in)	Load at Yield (lbs)	Stress at Yield (psi)	Modulus Of Elasticity (psi)
1	.4456	.0413	54.0	9439.8	664801
2	.3750	.0359	58.1	9303.7	683607
3	.3146	.0311	60.5	9231.6	676030
4	.3433	.0349	62.3	8985.7	690621
5	.5759	.0507	65.8	9024.3	642506
Mean:	.4105	.0388	56.1	9197.8	671493.
Standard Deviation:	.1046	.0076	6.5	183.9	18814.
Minimum:	.3146	.0311	48.8	8985.7	642506.
Maximum:	.5759	.0507	62.3	9439.8	690621.

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FLEXURAL PROPERTIES OF PLASTICS (ASTM D790)

SUPPORT SPAN = 4"

Flexural 3 point bend

Instron Corporation
Series IX Automated Materials Testing System 8.05

Operator name: K. PROGRESSIVE

Test Date: 13 Nov 2008

Sample Identification: SP55-4-3

Sample Type: ASTM

Interface Type: 42/43/4400 Series

Machine Parameters of test:

Sample Rate (pts/sec): 10.000

Humidity (%): 50

Crosshead speed (in/min): .1100

Temperature (deg. F): 71

Dimensions:

	Spec. 1	Spec. 2	Spec. 3	Spec. 4	Spec. 5
Width (in)	.56600	.56300	.57000	.56500	.56900
Depth (in)	.27200	.28200	.28400	.28900	.29200
Span (in)	4.0000	4.0000	4.0000	4.0000	4.0000

Out of 5 specimens, 0 excluded.

Sample comments: CDR72-AT, SAMPLE SOAKED IN PHOSPHORIC ACID (10%) FOR 30 DAYS

Specimen Number	Displacement at Yield (in)	Strain at Yield (in/in)	Load at Yield (lbs)	Stress at Yield (psi)	Modulus Of Elasticity (psi)
1	.4984	.0508	67.7	9700.2	669847
2	.3930	.0422	58.1	9127.6	644873
3	.3767	.0401	57.4	8801.5	633348
4	.4319	.0468	70.9	9173.3	637348
5	.4607	.0508	78.9	9763.9	664560
Mean:	.4333	.0461	70.6	9313.3	652410.
Standard Deviation:	.0484	.0048	4.9	408.9	11343.
Minimum:	.3767	.0401	57.4	8801.5	633348.
Maximum:	.4984	.0508	78.9	9763.9	664560.

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FLEXURAL PROPERTIES OF PLASTICS (ASTM D790)

SUPPORT SPAN = 4"

Flexural 3 point bend

Instron Corporation
Series IX Automated Materials Testing System 8.05

Operator name: K. PHOUANGSAVANH

Test Date: 13 Nov 2008

Sample Identification: SF55-4-4

Sample Type: ASTM

Interface Type: 42/43/4400 Series

Machine parameters of test:

Sample Rate (pts/sec): 10.000

Crosshead Speed (in/min): .1100

Humidity (%): 50

Temperature (deg. F): 71

Dimensions:

	Spec. 1	Spec. 2	Spec. 3	Spec. 4	Spec. 5
Width (in)	.56800	.55600	.57000	.57000	.56200
Depth (in)	.24500	.25700	.26500	.27600	.28400
Span (in)	4.0000	4.0000	4.0000	4.0000	4.0000

Out of 5 specimens, 0 excluded.

Sample comments: CORTI-RT. SAMPLE SOAKED IN SULFURIC ACID (10%) FOR 30 DAYS

Specimen Number	Displacement at Yield (in)	Strain at Yield (in/in)	Load at Yield (lbs)	Stress at Yield (psi)	Modulus Of Elasticity (psi)
1	.5512	.0606	64.7	9633.3	638948
2	.3689	.0355	54.1	8837.6	630719
3	.3332	.0335	63.3	9281.5	673735
4	.3562	.0369	66.4	9181.0	676968
5	.4094	.0435	61.8	8186.9	663360
Mean:	.4036	.0460	60.1	9024.0	656742.
Standard Deviation:	.0969	.0070	5.4	547.2	20837.
Minimum:	.3332	.0335	54.1	8186.9	630719.
Maximum:	.5512	.0606	66.4	9633.3	676968.

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FLEXURAL PROPERTIES OF PLASTICS (ASTM D790)

SUPPORT SPAN = 4"

Flexural 3 point band

Instron Corporation
Series IX Automated Materials Testing System 8.05

Operator name: K. PHOUANGSAVANH

Test Date: 13 Nov 2008

Sample Identification: SP55-4-5

Sample Type: ASTM

Interface Type: 42/43/4400 Series

Machine Parameters of test:

Sample Rate (pts/sec): 10.000

Humidity (%): 50

Crosshead Speed (in/min): .1100

Temperature (deg. F): 71

Dimensions:

	Spec. 1	Spec. 2	Spec. 3	Spec. 4	Spec. 5
Width (in)	.56800	.56800	.57200	.56400	.56900
Depth (in)	.25200	.25600	.27500	.25000	.28400
Span (in)	4.0000	4.0000	4.0000	4.0000	4.0000

Out of 5 specimens, 0 excluded.

Sample comments: CORTZ-AT, SAMPLE SOAKED IN GASOLINE (100%) FOR 30 DAYS

Specimen Number	Displacement at Yield (in)	Strain at Yield (in/in)	Load at Yield (lbs)	Stress at Yield (psi)	Modulus Of Elasticity (psi)
1	.4784	.0452	69.6	9940.6	676869
2	.4229	.0422	64.4	9511.5	651736
3	.3919	.0404	69.3	9610.8	689896
4	.3676	.0388	67.9	9212.2	700233
5	.2959	.0316	59.8	8230.0	691735
Mean:	.3913	.0396	64.9	9321.0	681896.
Standard Deviation:	.0676	.0051	3.8	662.3	18993.
Minimum:	.2959	.0316	59.8	8230.0	651736.
Maximum:	.4784	.0452	69.3	9940.6	700233.

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FLEXURAL PROPERTIES OF PLASTICS (ASTM D790)

SUPPORT SPAN = 4"

Flexural 3 point bend

Instron Corporation
Series IX Automated Materials Testing System 6.05

Operator name: K. PHOUNGSAVASH

Test Date: 13 Nov 2008

Sample Identification: RF55-4-6

Sample Type: ASTM

Interface Type: 62/63/4400 Series

Machine Parameters of test:

Sample Rate (pts/sec): 10.000

Crosshead Speed (in/min): .1100

Humidity (%): 50

Temperature (deg. F): 71

Dimensions:

	Spec. 1	Spec. 2	Spec. 3	Spec. 4	Spec. 5
Width (in)	.56600	.57000	.56900	.57200	.55700
Depth (in)	.26600	.26400	.27200	.27900	.27700
Span (in)	4.0000	4.0000	4.0000	4.0000	4.0000

Out of 5 specimens, 0 excluded.

Sample comments: COR72-AT, SAMPLE SOAKED IN VEGETABLE OIL (100%) FOR 30 DAYS

Specimen Number	Displacement at Yield (in)	Strain at Yield (in/in)	Load at Yield (lbs)	Stress at Yield (psi)	Modulus Of Elasticity (psi)
1	.4668	.0448	62.2	10025.7	691028
2	.4388	.0432	60.5	9131.4	695875
3	.3197	.0325	56.9	8104.2	685546
4	.2953	.0309	60.7	8182.4	665598
5	.4856	.0504	66.7	9361.2	703026
Mean:	.4006	.0404	61.4	8961.0	686215.
Standard Deviation:	.0876	.0084	3.6	816.0	14183.
Minimum:	.2953	.0309	56.9	8104.2	665598.
Maximum:	.4856	.0504	66.7	10025.7	703026.

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FLEXURAL PROPERTIES OF PLASTICS (ASTM D790)

SUPPORT SPAN = 4".

Flexural 3 point bend

Instron Corporation
Series IX Automated Materials Testing System 6.05

Operator name: K. PHOUANGSAVANH

Test Date: 13 Nov 2008

Sample Identification: SF55-4-7

Sample Type: ASTM

Interface Type: 43/43/4400 Series

Machine Parameters of test:

Sample Rate (pts/sec): 10.000

Crosshead Speed (in/min): .1100

Humidity (%): 50

Temperature (deg. F): 71

Dimensions:

	Spec. 1	Spec. 2	Spec. 3	Spec. 4	Spec. 5
Width (in)	.56200	.56900	.57100	.57400	.57000
Depth (in)	.23800	.24900	.25900	.26700	.27100
Span (in)	4.0000	4.0000	4.0000	4.0000	4.0000

Out of 5 specimens, 0 excluded.

Sample comments: CON72-AT. SAMPLE SOAKED IN DETERGENT (0.1%) FOR 30 DAYS

Specimen Number	Displcment at Yield (in)	Strain at Yield (in/in)	Load at Yield (lbs)	Stress at Yield (psi)	Modulus Of Elasticity (psi)
1	.5406	.0483	52.6	9917.7	674132
2	.5336	.0498	59.5	10117.8	660040
3	.4936	.0479	64.2	10062.8	650873
4	.5085	.0509	68.2	10001.5	671459
5	.4838	.0492	70.8	10155.0	693313
Mean:	.5121	.0493	63.1	10051.0	669963.
Standard Deviation:	.0247	.0012	7.3	94.0	16029.
Minimum:	.4838	.0479	52.6	9917.7	650873.
Maximum:	.5406	.0509	70.8	10155.0	693313.

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FLEXURAL PROPERTIES OF PLASTICS (ASTM D790)

SUPPORT SPAN = 4".

Flexural 3 point bend

Instron Corporation
Series IX Automated Materials Testing System 6.05

Operator name: K. SHOUMAKERVANN

Test Date: 13 Nov 2008

Sample Identification: 8755-4-5

Sample Type: ASTM

Interface Type: 62/63/5400 Series

Machine Parameters of test.

Sample Rate (pts/sec): 10.000

Humidity (%): 50

Crosshead Speed (in/min): .1100

Temperature (deg. F): 71

Dimensions:

	Spec. 1	Spec. 2	Spec. 3	Spec. 4	Spec. 5
Width (in)	.56600	.56300	.57600	.56600	.56600
Depth (in)	.24600	.25600	.26500	.27200	.27900
Span (in)	4.0000	4.0000	4.0000	4.0000	4.0000

Out of 5 specimens, 0 excluded.

Sample comments: COR72-AT, SAMPLE SOAKED IN SOAP (.1%) FOR 30 DAYS

Specimen Number	Displcment at Yield (in)	Strain at Yield (in/in)	Load at Yield (lbs)	Stress at Yield (psi)	Modulus Of Elasticity (psi)
1	.5549	.0513	56.3	9862.2	646741
2	.5226	.0502	58.8	9569.9	666470
3	.4179	.0414	63.6	9417.6	678520
4	.4050	.0413	64.7	9270.5	690123
5	.4369	.0426	69.2	9431.2	665953
Mean:	.4613	.0453	62.6	9508.3	669561
Standard Deviation:	.0718	.0049	5.1	224.6	16174.
minimum	.4050	.0413	56.3	9270.5	646741.
Maximum:	.5549	.0513	69.2	9862.2	690123.

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FLEXURAL PROPERTIES OF PLASTICS (ASTM D790)

SUPPORT SPAN = 4".

Flexural 3 point bend

Instron Corporation
Series IX Automated Materials Testing System 6.05
Test Date: 13 Nov 2008

Operator name: K. PRODAPPSAVARU

Sample identification: 6755-4-5
Sample Type: ASTM
Interface Type: 42/43/4400 Series
Machine Parameters of test:
Sample Rate (pts/sec): 10.000
Crosshead Speed (in/min): .1100
Humidity (%): 50
Temperature (deg. F): 71

Dimensions:

	Spec. 1	Spec. 2	Spec. 3	Spec. 4	Spec. 5
Width (in)	.57000	.57200	.56900	.56200	.56300
Depth (in)	.26300	.26300	.27200	.27700	.28000
Span (in)	4.0000	4.0000	4.0000	4.0000	4.0000

Out of 5 specimens, 0 excluded
Sample comments: CORT2-A2, SAMPLE SOAKED IN NITRIC ACID (1%) FOR 30 DAYS

Specimen Number	Displacement at Yield (in)	Strain at Yield (in/in)	Load at Yield (lbs)	Stress at Yield (psi)	Modulus Of Elasticity (psi)
1	.5339	.0507	61.4	10100.6	670889
3	.5158	.0509	63.1	9575.2	682443
3	.4545	.0486	66.2	9428.2	685685
4	.3814	.0396	64.0	8905.0	674603
5	.4333	.0455	71.7	9763.8	699710
Mean:	.4838	.0466	65.3	9554.6	690468.
Standard Deviation:	.0621	.0046	4.0	461.6	7506.
Minimum:	.3814	.0396	61.4	8905.0	670889.
Maximum:	.5339	.0509	71.7	10100.5	699710.

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FLEXURAL PROPERTIES OF PLASTICS (ASTM D790)

SUPPORT SPAN = 4".

Flexural 3 point bend

Instron corporation
Series IX Automated Materials Testing System 6.05

Operator name: K. PHOUMMIRAVANH

Test Date: 13 Nov 2008

Sample Identification: 8958-410

Sample Type: ASTM

Interface Type: 62/63/6400 Series

Machine Parameters of test:

Sample Rate (pts/sec): 10.000

Humidity (%): 50

Crosshead Speed (in/min): .1100

Temperature (deg. F): 71

Dimensions:

	Spec. 1	Spec. 2	Spec. 3	Spec. 4	Spec. 5
Width (in)	.54600	.56600	.56400	.57000	.56500
Depth (in)	.23800	.25100	.26000	.26900	.27300
Span (in)	4.0000	4.0000	4.0000	4.0000	4.0000

Out of 5 specimens, 0 excluded.

Sample comments: CON73-AT, SAMPLE SOAKED IN SULFURIC ACID (5%) FOR 30 DAYS

Specimen Number	Displacement at Yield (in)	Strain at Yield (in/in)	Load at Yield (lbs)	Stress at Yield (psi)	Modulus Of Elasticity (psi)
1	.4783	.0427	53.3	10344.1	644336
2	.5415	.0510	58.5	9851.8	649180
3	.5055	.0493	63.5	10307.6	670155
4	.5070	.0511	56.9	9739.2	644336
5	.4193	.0432	68.1	9700.6	684105
Mean:	.4903	.0474	62.5	9988.7	662814
Standard Deviation:	.0486	.0043	6.3	313.1	16186.
Minimum:	.4193	.0427	53.3	9700.6	644336
Maximum:	.5415	.0511	68.1	10344.1	684105

SUMMARY OF TEST DATA
RESISTANCE OF CIPP TO CHEMICAL REAGENTS

SAMPLE ID: COR72-AT Duration: 1 Year Date Tested: 10/14/2009

Chemical Reagent (Concentration)	Mechanical Property	Test Method ASTM D	Unit	Control Sample	1 Year	
					Value	% Change
Tap water (100%)	Observation	543		N/A	No Change	pH 7.7
	Weight	543	g	131.0	131.7	0.53
	Hardness	2583		91	91	0.00
	Thickness	2122	in.	0.254	0.254	0.00
			mm.	6.4	6.4	0.00
	Max. Flexural	790	psi	9520.2	8497.0	-10.75
	Modulus	790	psi	679890	661296	-2.73
Nitric Acid (5%)	Observation	543		N/A	Spot of cloud	pH 0.4
	Weight	543	g	132.7	133.0	0.23
	Hardness	2583		90	90	0.00
	Thickness	2122	in.	0.262	0.262	0.00
			mm.	6.7	6.7	0.00
	Max. Flexural	790	psi	9520.2	8098.5	-14.93
	Modulus	790	psi	679890	615084	-9.53
Phosphoric Acid (10%)	Observation	543		N/A	Spot of cloud	pH 0.4
	Weight	543	g	134.8	135.0	0.15
	Hardness	2583		90	90	0.00
	Thickness	2122	in.	0.262	0.262	0.00
			mm.	6.7	6.7	0.00
	Max. Flexural	790	psi	9520.2	8582.4	-9.85
	Modulus	790	psi	679890	665352	-2.14
Sulfuric Acid (10%)	Observation	543		N/A	Spot of cloud	pH 0.1
	Weight	543	g	135.5	135.7	0.15
	Hardness	2583		91	91	0.00
	Thickness	2122	in.	0.267	0.267	0.00
			mm.	6.8	6.8	0.00
	Max. Flexural	790	psi	9520.2	9323.9	-2.06
	Modulus	790	psi	679890	661643	-2.68

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SUMMARY OF TEST DATA
RESISTANCE OF CIPP TO CHEMICAL REAGENTS

SAMPLE ID: COR72-AT Duration: 1 Year Date Tested: 10/14/2009

Chemical Reagent (Concentration)	Mechanical Property	Test Method ASTM D	Unit	Control Sample	1 Year	
					Value	% Change
Gasoline (100%)	Observation	543		N/A	No Change	pH-NA
	Weight	543	g	131.6	132.2	0.46
	Hardness	2583		91	91	0.00
	Thickness	2122	in.	0.268	0.268	0.00
			mm.	6.8	6.8	0.00
	Max. Flexural	790	psi	9520.2	8738.6	-8.21
	Modulus	790	psi	679890	663947	-2.34
Vegetable Oil (100%)	Observation	543		N/A	No Change	pH-NA
	Weight	543	g	133.5	133.6	0.07
	Hardness	2583		90	90	0.00
	Thickness	2122	in.	0.262	0.262	0.00
			mm.	6.7	6.7	0.00
	Max. Flexural	790	psi	9520.2	9302.7	-2.28
	Modulus	790	psi	679890	710166	4.45
Detergent (0.1%)	Observation	543		N/A	No Change	pH 6.8
	Weight	543	g	128.6	129.4	0.62
	Hardness	2583		90	90	0.00
	Thickness	2122	in.	0.255	0.255	0.00
			mm.	6.5	6.5	0.00
	Max. Flexural	790	psi	9520.2	9120.6	-4.20
	Modulus	790	psi	679890	661283	-2.74
Soap (0.1%)	Observation	543		N/A	No Change	pH 4.6
	Weight	543	g	127.9	128.6	0.55
	Hardness	2583		91	91	0.00
	Thickness	2122	in.	0.255	0.255	0.00
			mm.	6.5	6.5	0.00
	Max. Flexural	790	psi	9520.2	9415.1	-1.10
	Modulus	790	psi	679890	672379	-1.10

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SUMMARY OF TEST DATA
RESISTANCE OF CIPP TO CHEMICAL REAGENTS

SAMPLE ID: COR72-AT Duration: 1 Year Date Tested: 10/14/2009

Chemical Reagent (Concentration)	Mechanical Property	Test Method ASTM D	Unit	Control Sample	1 Year	
					Value	% Change
Nitric Acid (1%)	Observation	543		N/A	Spot of cloud	pH 1.0
	Weight	543	g	142.6	143.0	0.28
	Hardness	2583		90	90	0.00
	Thickness	2122	in.	0.266	0.266	0.00
			mm.	6.8	6.8	0.00
	Max. Flexural	790	psi	9520.2	9161.3	-3.87
	Modulus	790	psi	679890	649823	-4.42
Sulfuric Acid (5%)	Observation	543		N/A	Spot of cloud	pH 0.4
	Weight	543	g	127.9	128.0	0.08
	Hardness	2583		90	90	0.00
	Thickness	2122	in.	0.256	0.256	0.00
			mm.	6.5	6.5	0.00
	Max. Flexural	790	psi	9520.2	9179.4	-3.58
	Modulus	790	psi	679890	645949	-4.99

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FLEXURAL PROPERTIES OF PLASTICS (ASTM D790)

SUPPORT SPAN = 4".

Flexural 3 point bend

Instron Corporation
Series IX Automated Materials Testing System 8.05

Operator name: K. PHOUANGSAVANH

Test Date: 14 Oct 2009

Sample Identification: 9555Y-41

Sample Type: ASTM

Interface Type: 42/43/4400 Series

Machine Parameters of test:

Sample Rate (pts/sec): 10.000

Humidity (%): 50

Crosshead Speed (in/min): .1100

Temperature (deg. F): 71

Dimensions:

	Spec. 1	Spec. 2	Spec. 3	Spec. 4	Spec. 5
Width (in)	.56500	.56300	.56400	.56500	.56000
Depth (in)	.24000	.25200	.26200	.27000	.27500
Span (in)	4.0000	4.0000	4.0000	4.0000	4.0000

Out of 5 specimens, 0 excluded.

Sample comments: CON72-AT, SAMPLE SOAKED IN WATER-pH6-9 (100%) FOR 1 YEAR

Specimen Number	Displacement at Yield (in)	Strain at Yield (in/in)	Load at Yield (lbs)	Stress at Yield (psi)	Modulus Of Elasticity (psi)
1	.5222	.0470	48.9	9013.6	642717
2	.4766	.0460	54.0	9060.6	649934
3	.3640	.0338	52.7	8310.0	649626
4	.3277	.0332	54.9	8137.0	676283
5	.3199	.0330	56.2	7963.6	687918
Mean:	.3981	.0384	53.3	8497.0	661296.
Standard Deviation:	.0943	.0070	2.8	508.3	19646.
Minimum:	.3199	.0330	48.9	7963.6	642717.
Maximum:	.5222	.0470	56.2	9060.6	687918.

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PLEXURAL PROPERTIES OF PLASTICS (ASTM D790)

SUPPORT SPAN = 4".

Flexural 3 point bend

Instron Corporation
Series IX Automated Materials Testing System 6.05

Operator name: K. PHOUANGSAVANH

Test Date: 14 Oct 2009

Sample Identification: 9FSSY4-2

Sample Type: ASTM

Interface Type: 42/43/4400 Series

Machine Parameters of test:

Sample Rate (pts/sec): 10.000

Crosshead Speed (in/min): .1100

Humidity (%): 59

Temperature (deg. F): 71

Dimensions:

	Spec. 1	Spec. 2	Spec. 3	Spec. 4	Spec. 5
Width (in)	.55500	.56300	.56300	.55400	.57600
Depth (in)	.26800	.26000	.27000	.27800	.28100
Span (in)	4.0000	4.0000	4.0000	4.0000	4.0000

Out of 5 specimens, 0 excluded.

Sample comments: COR72-A7, SAMPLE SOAKED IN NITRIC ACID (5%) FOR 1 YEAR

Specimen Number	Displcment at Yield (in)	Strain at Yield (in/in)	Load at Yield (lbs)	Stress at Yield (psi)	Modulus Of Elasticity (psi)
1	.4322	.0402	50.5	8880.1	627168
2	.2357	.0230	50.1	7906.2	621782
3	.2351	.0238	55.4	8104.7	610695
4	.2262	.0236	58.0	8129.3	608593
5	.2147	.0226	56.6	7472.0	607222
Mean:	.2588	.0266	54.2	8098.5	615084.
Standard Deviation:	.0917	.0076	3.6	610.3	8866.
Minimum:	.2147	.0226	50.1	7472.0	607222.
Maximum:	.4322	.0402	58.0	8880.1	627168.

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FLEXURAL PROPERTIES OF PLASTICS (ASTM D790)

SUPPORT SPAN = 4".

Flexural 3 point bend

Instron Corporation
Series IX Automated Materials Testing System 8.05

Operator name: K. PHOUANGSAVANH

Test Date: 14 Oct 2009

Sample Identification: 9F55Y-43

Sample Type: ASTM

Interface Type: 42/43/4400 Series

Machine Parameters of test:

Sample Rate (pts/sec): 10.000

Humidity (%): 50

Crosshead Speed (in/min): .1100

Temperature (deg. F): 71

Dimensions:

	Spec. 1	Spec. 2	Spec. 3	Spec. 4	Spec. 5
Width (in)	.56700	.56600	.56000	.56500	.56300
Depth (in)	.23400	.24900	.26100	.27100	.27800
Span (in)	4.0000	4.0000	4.0000	4.0000	4.0000

Out of 5 specimens, 0 excluded.

Sample comments: CON72-AT, SAMPLE SOAKED IN PHOSPHORIC ACID (10%) FOR 1 YEAR

Specimen Number	Displacement at Yield (in)	Strain at Yield (in/in)	Load at Yield (lbs)	Stress at Yield (psi)	Modulus Of Elasticity (psi)
1	.5776	.0507	49.6	9577.8	683629
2	.4472	.0418	51.9	8877.1	690564
3	.3549	.0347	53.8	8457.1	662109
4	.3621	.0368	57.9	8240.7	659486
5	.2151	.0224	56.3	7759.4	630971
Mean:	.3914	.0373	53.7	8502.4	665352.
Standard Deviation:	.1333	.0103	3.1	686.9	23634.
Minimum:	.2151	.0224	49.6	7759.4	630971.
Maximum:	.5776	.0507	57.9	9577.8	690564.

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FLEXURAL PROPERTIES OF PLASTICS (ASTM D790)

SUPPORT SPAN = 4".

Flexural 3 point bend

Instron Corporation
Series IX Automated Materials Testing System 6.05

Operator name: K. PRODANOSAVANH

Test Date: 14 Oct 2009

Sample Identification: SF55Y4-4

Sample Type: ASTM

Interface Type: 42/43/4400 Series

Machine Parameters of test:

Sample Rate (pts/sec): 10.000

Crosshead Speed (in/min): .1100

Humidity (%): 50

Temperature (deg. F): 71

Dimensions:

	Spec. 1	Spec. 2	Spec. 3	Spec. 4	Spec. 5
Width (in)	.56600	.55800	.56200	.56000	.55800
Depth (in)	.26100	.25500	.26700	.27800	.28400
Span (in)	4.0000	4.0000	4.0000	4.0000	4.0000

Out of 5 specimens, 0 excluded.

Sample Comments: CORT2-AT, SAMPLE SOAKED IN SULFURIC ACID (10%) FOR 1 YEAR

Specimen Number	Displacement at Yield (in)	Strain at Yield (in/in)	Load at Yield (lbs)	Stress at Yield (psi)	Modulus Of Elasticity (psi)
1	.5594	.0506	52.7	9622.2	639608
2	.4476	.0447	55.7	9210.7	673498
3	.4602	.0469	63.0	9602.7	691397
4	.4639	.0473	57.1	9308.0	655621
5	.3553	.0378	66.6	9876.1	648093
Mean:	.4609	.0455	61.0	9323.9	661643.
Standard Deviation:	.0725	.0047	6.6	308.3	20604.
Minimum:	.3553	.0378	52.7	9876.1	639608.
Maximum:	.5594	.0506	67.1	9622.2	691397.

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FLEXURAL PROPERTIES OF PLASTICS (ASTM D790)

SUPPORT SPAN = 4".

Flexural 3 point bend

Instron Corporation
Series IX Automated Materials Testing System 6.06

Operator name: K. PHOUMMASAVANH

Test Date: 14 Oct 2003

Sample Identification: 9F5574-5

Sample Type: ASTM

Interface Type: 62/63/4600 Series

Machine Parameters of test:

Sample Rate (pts/sec): 10.000

Crosshead Speed (in/min): .1100

Humidity (%): 50

Temperature (deg. F): 71

Dimensions:

	Spec. 1	Spec. 2	Spec. 3	Spec. 4	Spec. 5
Width (in)	.55800	.56100	.55700	.56200	.56100
Depth (in)	.26200	.26400	.27600	.28200	.28700
Span (in)	4.0000	4.0000	4.0000	4.0000	4.0000

Out of 5 specimens, 0 excluded.

Sample comments: CORTS-AT, SAMPLE SOAKED IN GASOLINE (100%) FOR 1 YEAR

Specimen Number	Displacement at Yield (in)	Strain at Yield (in/in)	Load at Yield (lbs)	Stress at Yield (psi)	Modulus Of Elasticity (psi)
1	.3931	.0371	56.1	9331.4	647403
2	.3788	.0375	58.2	8931.1	657013
3	.1319	.0137	59.6	8423.8	655201
4	.1214	.0128	61.4	8249.7	682624
5	.1284	.0138	67.4	8754.7	677597
Mean:	.2307	.0230	60.4	8738.5	663947.
Standard Deviation:	.1418	.0131	4.6	426.3	15246.
Minimum:	.1214	.0128	55.1	8249.7	647403.
Maximum:	.3931	.0375	67.4	9331.4	682624.

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FLEXURAL PROPERTIES OF PLASTICS (ASTM D790)

SUPPORT SPAN = 4".

Flexural 3 point bend

Instron Corporation
Series IX Automated Materials Testing System 6.05

Operator name: K. PHOUAKOUAVANH

Test Date: 14 Oct 2009

Sample Identification: 3F55Y6-6

Sample Type: ASTM

Interface Type: 42/43/4400 Series

Machine Parameters of test:

Sample Rate (pts/sec): 10.000

Crosshead Speed (in/min): .1100

Humidity (%): 50

Temperature (deg. F): 71

Dimensions:

	Spec. 1	Spec. 2	Spec. 3	Spec. 4	Spec. 5
Width (in)	.66100	.66900	.66600	.66500	.67400
Depth (in)	.26300	.26200	.26900	.27400	.27400
Span (in)	4.0000	4.0000	4.0000	4.0000	4.0000

Out of 5 specimens, 0 excluded.

Sample comments: CORTT-AT, SAMPLE SOAKED IN VEGETABLE OIL (100%) FOR 1 YEAR

Specimen Number	Displcment at Yield (in)	Strain at Yield (in/in)	Load at Yield (lbs)	Stress at Yield (psi)	Modulus Of Elasticity (psi)
1	.4268	.0405	56.7	9477.3	712766
2	.3883	.0382	59.9	9369.3	696740
3	.4512	.0455	66.3	9731.4	708571
4	.3178	.0327	66.4	9390.8	720676
5	.3371	.0346	61.4	8544.7	720079
Mean:	.3843	.0383	62.1	9302.7	710166.
Standard Deviation:	.0569	.0051	4.2	447.5	11043.
Minimum:	.3178	.0327	56.7	8544.7	696740.
Maximum:	.4512	.0455	66.4	9731.4	720676.

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FLEXURAL PROPERTIES OF PLASTICS (ASTM D790)

SUPPORT SPAN = 4".

Flexural 3 point bend

Instron Corporation
Series IX Automated Materials Testing System 6.09

Operator name: K. PRODANGSAVADI

Test Date: 14 Oct 2009

Sample Identification: SFSSY4-7

Sample Type: ASTM

Interface Type: 62/41/6400 Series

Machine Parameters of test:

Sample Rate (pts/sec):	10.000	Humidity (%):	50
Crosshead Speed (in/min):	.1100	Temperature (deg. F):	71

Dimensions:

	Spec. 1	Spec. 2	Spec. 3	Spec. 4	Spec. 5
Width (in)	.57800	.56500	.56600	.56900	.56600
Depth (in)	.22600	.24100	.26200	.26300	.26900
Span (in)	4.0000	4.0000	4.0000	4.0000	4.0000

Out of 5 specimens, 0 excluded.

Sample comments: CORTF-AT. SAMPLE SOAKED IN DETERGENT (0.1%) FOR 1 YEAR

Specimen Number	Displacement at Yield (in)	Strain at Yield (in/in)	Load at Yield (lbs)	Stress at Yield (psi)	Modulus Of Elasticity (psi)
1	.5998	.0508	44.8	9094.9	641697
2	.5486	.0496	51.0	9321.1	663822
3	.4425	.0418	55.5	9267.9	673547
4	.4951	.0489	59.0	8991.5	679759
5	.4988	.0501	60.9	8927.6	647581
Mean:	.5171	.0483	54.3	9120.6	661209.
Standard Deviation:	.0696	.0037	6.6	170.7	16353.
Minimum:	.4425	.0418	44.8	8927.6	641697.
Maximum:	.5998	.0508	60.9	9321.1	679759.

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Excellence in Engineering, Consulting, Testing and Inspection

FLEXURAL PROPERTIES OF PLASTICS (ASTM D790)

SUPPORT SPAN = 4".

Flexural 3 point bend

Instron Corporation
Series IX Automated Materials Testing System 6.05

Operator name: K. PHOUANGSAVANH

Test Date: 14 Oct 2009

Sample Identification: 9P55Y4-6

Sample Type: ASTM

Interface Type: 42/43/4400 Series

Machine Parameters of test:

Sample Rate (pts/sec): 10.000

Crosshead Speed (in/min): .1100

Humidity (%): 50

Temperature (deg.-F): 71

Dimensions:

	Spec. 1	Spec. 2	Spec. 3	Spec. 4	Spec. 5
Width (in)	.56100	.57100	.56600	.56600	.57000
Depth (in)	.26400	.26500	.26300	.26800	.27000
Span (in)	4.0000	4.0000	4.0000	4.0000	4.0000

Out of 5 specimens, 0 excluded.

Sample comments: CCR72-AT, SAMPLE SOAKED IN SOAP (0.1%) FOR 1 YEAR

Specimen Number	Displacement at Yield (in)	Strain at Yield (in/in)	Load at Yield (lbs)	Stress at Yield (psi)	Modulus of Elasticity (psi)
1	.5486	.0506	54.3	9486.3	674638
2	.5393	.0506	59.1	9944.0	673230
3	.5135	.0506	59.8	9171.0	661868
4	.4743	.0477	65.6	9698.0	661351
5	.4871	.0493	63.6	9186.3	690808
Mean:	.5106	.0498	60.5	9415.1	672379.
Standard Deviation:	.0303	.0013	4.4	228.1	12016.
Minimum:	.4743	.0477	54.3	9171.0	661351.
Maximum:	.5486	.0506	65.6	9698.0	690808.

HTS, Inc. Consultants
416 Pickering Street, Houston, TX 77091
www.htshouston.com

Phone 713-692-8373
Fax 713-692-8602
Toll Free 1-800-692-TEST

Excellence in Engineering, Consulting, Testing and Inspection

FLEXURAL PROPERTIES OF PLASTICS (ASTM D790)

SUPPORT SPAN = 4".

Flexural 3 point bend

Instron Corporation
Series IX Automated Materials Testing System 4.05

Operator Name: K. PHOUMMSAVADH

Test Date: 14 Oct 2009

Sample Identification: SPSSY4-9

Sample Type: ASTM

Interface Type: 62/63/6400 Series

Machine Parameters of test:

Sample Rate (pts/sec): 10.000

Crosshead Speed (in/min): .1100

Humidity (%): 50

Temperature (deg. F): 71

Dimensions:

	Spec. 1	Spec. 2	Spec. 3	Spec. 4	Spec. 5
Width (in)	.56900	.55900	.56700	.56400	.55900
Depth (in)	.25600	.26500	.27300	.28200	.28600
Span (in)	4.0000	4.0000	4.0000	4.0000	4.0000

Out of 5 specimens, 0 excluded.

Sample comments: CORT2-AT, SAMPLE SOAKED IN NITRIC ACID (1%) FOR 1 YEAR

Specimen Number	Displacement at Yield (in)	Strain at Yield (in/in)	Load at Yield (lbs)	Stress at Yield (psi)	Modulus Of Elasticity (psi)
1	.4991	.0477	57.0	9238.6	632265
2	.5015	.0498	62.9	9618.5	650446
3	.4134	.0423	63.2	8972.0	651511
4	.4387	.0464	60.3	9139.5	657430
5	.3351	.0359	56.0	8787.9	667464
Mean:	.4375	.0444	63.7	9151.3	649823.
Standard Deviation:	.0680	.0065	4.4	333.3	10341.
Minimum:	.3351	.0359	57.0	8787.9	632265.
Maximum:	.5015	.0498	68.3	9618.5	667464.

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Excellence in Engineering, Consulting, Testing and Inspection

PLEXURAL PROPERTIES OF PLASTICS (ASTM D790)

SUPPORT SPAN = 4".

Flexural 3 point bend

Instron Corporation
Series IX Automated Materials Testing System 8.05

Operator name: K. PHOCHANGSAVANH

Test Date: 14 Oct 2009

Sample Identification: 9P55Y410

Sample Type: ASTM

Interface Type: 42/43/4400 Series
Machine Parameters of test:
Sample Rate (pts/sec): 10.000
Crosshead Speed (in/min): .1100

Humidity (%): 80
Temperature (deg. F): 72

Dimensions:

	Spec. 1	Spec. 2	Spec. 3	Spec. 4	Spec. 5
Width (in)	.57100	.57100	.56400	.56600	.56200
Depth (in)	.23800	.24700	.25600	.26200	.24700
Span (in)	4.0000	4.0000	4.0000	4.0000	4.0000

Out of 5 specimens, 0 excluded.
Sample comments: CORT2-AT, SAMPLE SOAKED IN SULFURIC (5%)FOR 1 YEAR

Specimen Number	Displacement at Yield (in)	Strain at Yield (in/in)	Load at Yield (lbs)	Stress at Yield (psi)	Modulus Of Elasticity (psi)
1	.4365	.0390	58.1	9289.6	632528
2	.4925	.0438	56.5	9733.0	658343
3	.5279	.0507	59.4	9535.8	658771
4	.4196	.0412	56.6	8739.2	639163
5	.4129	.0413	56.7	8491.3	628942
Mean:	.4539	.0432	55.9	9179.4	645949.
Standard Deviation:	.0476	.0045	3.4	546.8	11656.
Minimum:	.4129	.0390	50.1	8491.3	628942.
Maximum:	.5279	.0507	59.4	9733.0	658771.

INTERPLASTIC CORPORATION

2015 Broadway Street Northeast
Minneapolis, MN 55413-1714
651.481.6860 Fax 612.331.4634

COR72-AT-4XX Series
ASTM D-2990 10,000-Hour Flexural Modulus Creep Data
(260 psi Stress Load)

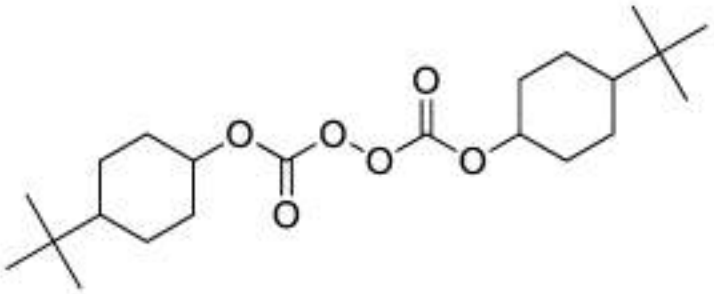
Test Time, hours	Flexural Modulus, psi
0.017	467,106
0.1	460,029
0.2	456,570
0.5	454,860
1	449,806
2	446,499
5	435,296
20	424,642
50	405,908
100	399,499
200	375,999
500	343,073
700	330,021
1,000	327,352
6,200	277,278
10,000	257,369
438,000	**236,486**

Note: *The results in bold were calculated from the equation obtained from the trendline from the graphs.*

NOROX®600

Di-4-*tert*-butylcyclohexyl peroxydicarbonate
CAS#15520-11-3
Powder, technically pure

Structural Formula



Description

NOROX®600 is a white, free-flowing powder, consisting of technically pure di-4-*tert*-butylcyclohexyl peroxydicarbonate. This cycloaliphatic peroxydicarbonate is used as an initiator in the curing of unsaturated polyester resins.

Technical Data

Appearance	white, free-flowing powder
Peroxide content	approx.95.0 % w/w
Active oxygen (AO)	approx.3.81 % w/w
Bulk density	approx.0.50 kg/m^3
Melting point	approx.82 °C / 180 °F
Critical temperature (SADT)	approx.45 °C / 113 °F
"Kick-off" temperature	> 50 °C / 122 °F
Maximum transport temperature	25 °C / 77 °F
Recommended storage temperature	below 20 °C / 68 °F
Storage stability as from date of delivery	6 months

Standard Packaging

EMEAI: 20 kg (4 x 5 kg PE bags) in a cardboard box
USA: 44 lb (4 x 11 lb PE bags) in a cardboard box

Half-life Data

10 h / 1 h / 1 min (benzene, 0.1 mol/L)	48 °C / 64 °C / 82 °C 118 °F / 147 °F / 180 °F

Application

CURING CHARACTERISTICS:

In the range of 50 °C / 122 °F ("kick-off" temperature) curing rate is not very high unless there is a reaction exotherm (*e.g.* within a heat retaining mould). For good final curing properties, additional thermally more stable peroxides are usually required (*e.g.* TBPIN, TBPEHC, TBPB).

POLYESTER CURING:

Curing agent for unsaturated polyester resins in combination with thermally more stable peroxides
Usage level: 0.5 - 2 %
"Shelf-life" (gel time of resin + peroxide): some weeks at ambient temperature, depending on resin type, fillers, pigments
"Pot-life" (gel time of resin + peroxide): in combination with more stable peroxides (perester) several days, depending on temperature and dosage
Shelf life and pot life can be prolonged considerably by adding 0.1 - 0.3 % Inhibitor BC 500.

PROCESSING METHODS:

Mainly pultrusion, hot press moulding, wet press moulding, CIPP (cured-in-place-pipes).

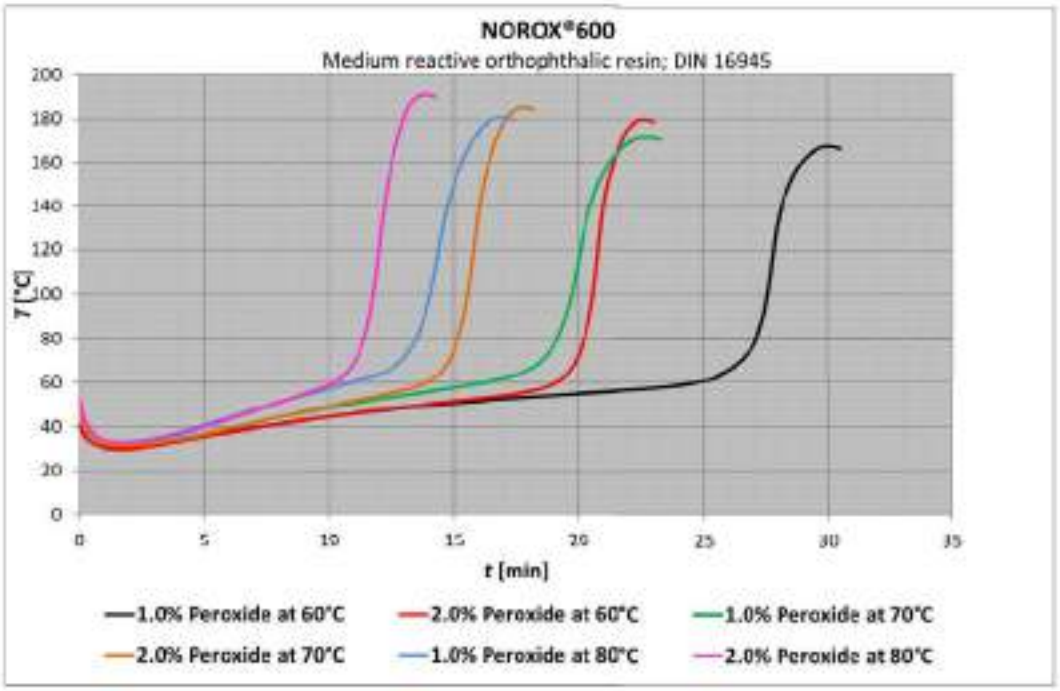
Decomposition Products

Possible detectable decomposition products: carbon dioxide, aliphatic alcohol

Storage

Avoid any source of heat, light, humidity and protect the product from impurities. Keep within safe temperature limits.

Measurements



Formulation (parts per weight)							
Resin		100	100	100	100	100	100
Temperature	[°C]	60	60	70	70	80	80
NOROX®600	[Vol-%]	1.0	2.0	1.0	2.0	1.0	2.0
Curing Data							
Gel time 5 °C above start t_{gel}	[min]	26.0	19.7	18.9	15.0	13.7	11.5
Gel time 10 °C above start t_{gel}	[min]	26.5	19.9	19.2	15.2	13.8	11.6
Curing time t_{max}	[min]	30.0	22.7	22.7	17.8	16.9	13.9
Peak temperature T_{max}	[°C]	168	180	172	185	181	191

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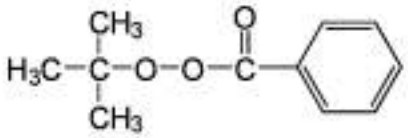
Technical Data Sheet

UNITED INITIATORS
driving your success

TBPB

Tert.Butylperoxybenzoate
CAS#614-45-9
Liquid, technical pure

Structural Formula



Description

Yellowish, mobile liquid, consisting of technically pure tert.butylperoxy benzoate. This aromatic perester is used as an initiator (radical source) in the curing of unsaturated polyester resins. Main application: hot press moulding of SMC or BMC at 130-160°C.

Technical Data

Appearance	Yellowish liquid
Peroxide content	Ca. 99 % w/w
Active oxygen	Ca. 8.16 % w/w
De-sensitising agent	None
Density at 20°C	Ca. 1.04 g/cm^3
Viscosity at 20°C	Ca. 8 mPa.s
Refractive index at 20°C	Ca. 1.499
Miscibility	Immiscible with water, soluble in alcohols, phthalates
Critical temperature (SADT)	Ca. 60°C
Cold storage stability	Freezing point below 10°C
Kick-off temperature	Ca. 90°C
Recommended storage temperature	10 to 40°C (104°F)
Storage stability as from date of delivery	6 months

This product is in compliance with the ElektroG (EU-Directives: RoHS 2002/95/EG, WEEE 2002/96/EG)

Half-life Data

10h/1h/1min (0.1 m / benzene): 104°C / 124°C / 165°C

Application

POLYESTER CURING:
Curing agent for UP resins, Suitable for all resin types, Temperature range: 130-160°C. Usage level: 1-2% as supplied. "Shelf life" (gel time of resin + peroxide) several months at ambient temperature, depending on resin type.

Sensitive to some fillers and pigments as well as to cobalt salts or tertiary aromatic amines. Shelf life can be prolonged considerably by adding 0.1-0.3% Inhibitor BC 500.

CURING CHARACTERISTICS:
In the range of 85-95°C ("kick-off" temperature) the curing rate is not very high, unless there is a reaction exotherm (e.g. within a heat-retaining mould). Really short cure times of 1-3 minutes can be achieved only above 120°C. The optimum temperature range for hot press moulding therefore is 130-160°C.

PROCESSING METHODS:
Mainly hot press moulding of sheet moulding compounds (SMC) or bulk moulding compounds (BMC), as well as impregnation, dipping of wire windings.

Measurements

Activity

Influence of temperature and peroxide dosage [1] on curing performance and degree of cure. Hot press moulding of 16 mm thick SMC pellets and 3 mm thick SMC sheets.

Temperature of mould	130°C	130°C	140°C	140°C	150°C	150°C	160°C	160°C
Formulation (parts of weight)								
Standard SMC (resin proportion)	100	100	100	100	100	100	100	100
TBPB	1	2	1	2	1	2	1	2
Curing performance (SMC pellets)								
Flow time (min)	1.50	1.35	1.15	1.00	0.95	0.80	0.75	0.70
Time to peak tmax (min)	2.70	2.40	1.90	1.60	1.40	1.30	1.20	-
Peak exotherm Tmax (°C)	171	170	174	174	178	178	185	183
Degree of cure (SMC sheets[2])								
Barcol (934) hardness	20	20	25	25	30	30	30	30
Residual styrene content (%)	2,6	1,7	0,8	0,6	0,5	0,2	<0,1	<0,1

[1]) The amounts added are equivalent to 1% or 2% w/w techn. pure t-butyl perbenzoate
[2]) The press cycles for the SMC sheets are equal to the tmax. of the corresponding SMC pellets.
Further information on suitable curing agents for unsaturated polyester resins is given in our application brochures on this subject.

Packaging

The standard packaging of Norox TBPB is 25 kg.

Disclaimer

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www.united-initiators.com

Revision number: 1.1. Date: 24.02.17. Device M: TDS.

CIPP Project Information

Project Information		Project Parameters			
Project Name		8	Tube Diameter (in)	400	Wet Out Length (ft)
		6.0	Tube Thickness (mm)	7%	% Resin Excess
Installation Date		Resin:		Optional Adjustments	
		COR72-AT-470HT Filled Polyester			Static Mixer WPG Factor
Customer		Initiators:		Custom Initiator Levels:	
		Norox 600	Primary		Primary % (Adjusted)
Shot Identification		TBPB	Secondary		Secondary % (Adjusted)
			Tertiary		Tertiary % (Adjusted)
		10.0	lbs of Primary per Batch	Inhibitor:	
		1.5	lbs Styrene / lb of Powder		% Inhibitor
Resin Estimates:		1,090	Estimated Total Resin (lbs)	2.7	Estimated Resin (lbs/ft)

Initiator Information

Initiators	Name	%	Total Lbs*	Lbs / Batch
Primary	Norox 600	1.000	8.1	10.0
Secondary	TBPB	0.500	4.0	5.0
Tertiary	-	0.000	-	-
Styrene	Styrene	1.500	12.1	15.0
Inhibitor		0.000	-	-

* The total lbs for filled resins is based on the resin content

0.81 Number of Initiator Batches

Resin and Initiator Injection Rates

Resin Injection Rate (lbs/min)	Initiator Rate (gm/min)	Resin Injection Rate (lbs/min)	Initiator Rate (gm/min)
75	757	300	3029
100	1010	350	3534
125	1262	400	4039
150	1515	450	4544
175	1767	500	5049
200	2019	550	5553
250	2524	600	6058

Instructions:

All **yellow boxes** should be filled in. If an initiator is not showing up, check to make sure the correct resin is selected

White boxes contain automatically calculated data. They may not be adjusted.

Orange boxes are optional. They should only be used in special circumstances. They are used for calculation purposes only and do not constitute a recommendation.

Static Mixer WPG Factor is used when a static mixer measures resin flow by volume/minute and calculates the weight/minute using a set WPG. If this WPG factor is different than the WPG of the resin used, the catalyst rate needs to be adjusted. Enter the weight per gallon that the mixer uses and this adjustment will automatically be calculated.

Custom Initiator Levels are used when a known factor requires an increase or decrease in the percent initiator. Enter the percent of each initiator that you will be using. The initiator amount and injection rates will be recalculated with this new percent.

% Inihbitor is used when adding an inhibitor. Enter the percent of inhibitor you are using, and it will automatically be calculated.

Wet Out Request

Job Number:	16451
Job Name:	Clay Twp.
Completed By:	Paul Torres

Shot #	Install Date	Start MH	End MH	Diameter (in.)	Thickness (mm.)	Wet Length (Ft.)	Dry Column (Ft.)	Dry Tail (Ft.)	Cure Method	Manufactured End	Crew Foreman	Comments
1	6/16/2025	808	806	10	6mm	635	20	20	Steam	N	Shortie	
2	6/17/2025	806	804	10	6mm	570	20	20	Steam	N	Shortie	
3	6/18/2025	804	362	10	6mm	525	20	20	Steam	N	Shortie	
4	6/19/2025	362	359R	10	6mm	625	20	20	Steam	N	Shortie	
5	6/20/2025	359R	357A	10	6mm	435	25	25	Steam	N	Shortie	
6	6/23/2025	355	354	10	6mm	235	20	20	Steam	N	Shortie	
7	6/23/2025	892	890	15	7.5mm	315	25	25	Steam	N	Shortie	

Comments:

3C. Choosing Proper Installation Process

Determination of the proper CIPP installation method is critical to a successful CIPP installation. Whether utilizing hydrostatic head (water) or hot air (steam) to install and cure a CIPP liner tube, the proper amount of water, or pressure, needed for successful inversion must be determined based on liner thickness and diameter of the felt tube, as well as the proper head of water, or air, needed to keep adequate pressure on the liner to ensure the liner is in full contact with the host pipe and produces noticeable indentations at service lateral connections. The installation plan must account for the ideal, minimum and maximum amount of pressure needed to initiate inversion and complete inversion, and also must account to the minimum and maximum temperatures of the curing (water or air) medium. Liner tube manufacturers generally provide this information, and is typically referred to as a Head Installation Chart.

RECOMMENDED INVERSION AND HEAD CURING CHART

Heat-Welded Seams

PIPE DIAMETER (IN)	CIPP TUBE THICKNESS (MM)	IDEAL CURING HEAD		MINIMUM INSTALLATION HEAD		MAXIMUM HOT HEAD		MAXIMUM COLD HEAD	
		(FT)	(PSI)	(FT)	(PSI)	(FT)	(PSI)	(FT)	(PSI)
6	4,5	23,4	10,2	18,0	7,8	26,2	11,4	30,0	13,0
6	5,5	28,6	12,4	21,9	9,5	32,0	13,9	36,7	15,9
6	6	31,2	13,6	23,9	10,4	34,9	15,2	40,0	17,4
8	4,5	16,8	7,3	12,8	5,6	19,7	8,5	22,5	9,8
8	5,5	20,5	8,9	15,7	6,8	24,0	10,4	27,5	11,9
8	6	22,3	9,7	17,1	7,4	26,2	11,4	30,0	13,0
8	7,5	27,9	12,1	21,4	9,3	32,8	14,2	37,5	16,3
10	4,5	13,0	5,7	10,0	4,3	15,7	6,8	18,0	7,8
10	5,5	15,9	6,9	12,2	5,3	19,2	8,3	22,0	9,6
10	6	17,4	7,5	13,3	5,8	21,0	9,1	24,0	10,4
10	7,5	21,7	9,4	16,6	7,2	26,2	11,4	30,0	13,0
10	9	26,1	11,3	20,0	8,7	31,5	13,7	36,0	15,6
12	6	13,1	5,7	10,0	4,3	17,5	7,6	20,0	8,7
12	6,5	14,1	6,1	10,8	4,7	18,9	8,2	21,7	9,4
12	7	15,2	6,6	11,7	5,1	20,4	8,9	23,3	10,1
12	7,5	16,3	7,1	12,5	5,4	21,8	9,5	25,0	10,9
12	9	19,5	8,5	15,0	6,5	26,2	11,4	30,0	13,0
12	10,5	22,8	9,9	17,5	7,6	30,6	13,3	35,0	15,2
15	6	10,4	4,5	8,0	3,5	14,0	6,1	16,0	7,0
15	7,5	13,1	5,7	10,0	4,3	17,5	7,6	20,0	8,7
15	9	15,7	6,8	12,0	5,2	21,0	9,1	24,0	10,4
15	10,5	18,3	7,9	14,0	6,1	24,5	10,6	28,0	12,2
15	12	20,9	9,1	16,0	7,0	28,0	12,1	32,0	13,9
15	13,5	23,5	10,2	18,0	7,8	31,5	13,7	36,0	15,6
18	6	8,7	3,8	6,7	2,9	11,6	5,1	13,3	5,8
18	7,5	10,9	4,7	8,3	3,6	14,6	6,3	16,7	7,2
18	9	13,1	5,7	10,0	4,3	17,5	7,6	20,0	8,7
18	10,5	15,2	6,6	11,7	5,1	20,4	8,9	23,3	10,1
18	12	17,4	7,6	13,3	5,8	23,3	10,1	26,7	11,6
18	13,5	19,6	8,5	15,0	6,5	26,2	11,4	30,0	13,0
18	15	21,8	9,4	16,7	7,2	29,1	12,6	33,3	14,5
21	6	7,5	3,2	5,7	2,5	10,0	4,3	11,4	5,0
21	7,5	9,3	4,0	7,1	3,1	12,5	5,4	14,3	6,2
21	9	11,2	4,9	8,6	3,7	15,0	6,5	17,1	7,4
21	10,5	13,1	5,7	10,0	4,3	17,5	7,6	20,0	8,7
21	12	14,9	6,5	11,4	5,0	20,0	8,7	22,9	9,9
21	13,5	16,8	7,3	12,9	5,6	22,5	9,8	25,7	11,2
21	15	18,7	8,1	14,3	6,2	25,0	10,8	28,6	12,4
21	16,5	20,5	8,9	15,7	6,8	27,5	11,9	31,4	13,6
21	18	22,4	9,7	17,1	7,4	30,0	13,0	34,3	14,9
21	19,5	24,2	10,5	18,6	8,1	32,5	14,1	37,2	16,1

RECOMMENDED INVERSION AND HEAD CURING CHART

Heat-Welded Seams

PIPE DIAMETER (IN)	CIPP TUBE THICKNESS (MM)	IDEAL CURING HEAD		MINIMUM INSTALLATION HEAD		MAXIMUM HOT HEAD		MAXIMUM COLD HEAD	
		(FT)	(PSI)	(FT)	(PSI)	(FT)	(PSI)	(FT)	(PSI)
24	7.5	8.2	3.5	6.3	2.7	10.9	4.7	12.5	5.4
24	9	9.8	4.3	7.5	3.3	13.1	5.7	15.0	6.5
24	10.5	11.4	5.0	8.8	3.8	15.3	6.6	17.5	7.6
24	12	13.1	5.7	10.0	4.3	17.5	7.6	20.0	8.7
24	13.5	14.7	6.4	11.3	4.9	19.7	8.5	22.5	9.8
24	15	16.3	7.1	12.5	5.4	21.8	9.5	25.0	10.9
24	16.5	18.0	7.8	13.8	6.0	24.0	10.4	27.5	11.9
24	18	19.6	8.5	15.0	6.5	26.2	11.4	30.0	13.0
24	19.5	21.2	9.2	16.3	7.1	28.4	12.3	32.5	14.1
24	21	22.8	9.9	17.5	7.6	30.6	13.3	35.0	15.2
24	22.5	24.5	10.6	18.8	8.1	32.8	14.2	37.5	16.3
27	7.5	7.3	3.1	5.6	2.4	9.7	4.2	11.1	4.8
27	9	8.7	3.8	6.7	2.9	11.6	5.1	13.3	5.8
27	10.5	10.2	4.4	7.8	3.4	13.6	5.9	15.6	6.8
27	12	11.6	5.0	8.9	3.9	15.5	6.7	17.8	7.7
27	13.5	13.1	5.7	10.0	4.3	17.5	7.6	20.0	8.7
27	15	14.5	6.3	11.1	4.8	19.4	8.4	22.2	9.6
27	16.5	16.0	6.9	12.2	5.3	21.4	9.3	24.5	10.6
27	19	18.4	8.0	14.1	6.1	24.6	10.7	28.2	12.2
27	19.5	18.9	8.2	14.5	6.3	25.2	11.0	28.9	12.5
27	21	20.3	8.8	15.6	6.8	27.2	11.8	31.1	13.5
27	22.5	21.8	9.4	16.7	7.2	29.1	12.6	33.3	14.5
27	24	23.2	10.1	17.8	7.7	31.1	13.5	35.6	15.4
30	7.5	6.5	2.8	5.0	2.2	8.7	3.8	10.0	4.3
30	9	7.8	3.4	6.0	2.6	10.5	4.6	12.0	5.2
30	10.5	9.1	4.0	7.0	3.0	12.2	5.3	14.0	6.1
30	12	10.4	4.5	8.0	3.5	14.0	6.1	16.0	6.9
30	13.5	11.8	5.1	9.0	3.9	15.7	6.8	18.0	7.8
30	15	13.1	5.7	10.0	4.3	17.5	7.6	20.0	8.7
30	16.5	14.4	6.2	11.0	4.8	19.2	8.3	22.0	9.6
30	18	15.7	6.8	12.0	5.2	21.0	9.1	24.0	10.4
30	19.5	17.0	7.4	13.0	5.6	22.7	9.9	26.0	11.3
30	21	18.3	7.9	14.0	6.1	24.5	10.6	28.0	12.2
30	22.5	19.6	8.5	15.0	6.5	26.2	11.4	30.0	13.0
30	24	20.9	9.1	16.0	6.9	28.0	12.1	32.0	13.9
30	27	23.5	10.2	18.0	7.8	31.5	13.7	36.0	15.6

MADE IN AMERICA

RECOMMENDED INVERSION AND HEAD CURING CHART

Heat-Welded Seams

PIPE DIAMETER (IN)	CIPP TUBE THICKNESS (MM)	IDEAL CURING HEAD (FT)	IDEAL CURING HEAD (PSI)	MINIMUM INSTALLATION HEAD (FT)	MINIMUM INSTALLATION HEAD (PSI)	MAXIMUM HOT HEAD (FT)	MAXIMUM HOT HEAD (PSI)	MAXIMUM COLD HEAD (FT)	MAXIMUM COLD HEAD (PSI)
36	10,5	7,8	3,3	5,8	2,5	10,2	4,4	11,7	5,1
36	12	8,7	3,8	6,7	2,9	11,6	5,1	13,3	5,8
36	13,5	9,8	4,3	7,5	3,3	13,1	5,7	15,0	6,5
36	15	10,9	4,7	8,3	3,6	14,6	6,3	16,7	7,2
36	16,5	12,0	5,2	9,2	4,0	16,0	7,0	18,3	8,0
36	18	13,1	5,7	10,0	4,3	17,5	7,6	20,0	8,7
36	19,5	14,1	6,1	10,8	4,7	18,9	8,2	21,7	9,4
36	21	15,2	6,6	11,7	5,1	20,4	8,8	23,3	10,1
36	22,5	16,3	7,1	12,5	5,4	21,8	9,5	25,0	10,9
36	24	17,4	7,6	13,3	5,8	23,3	10,1	26,7	11,6
36	27	19,6	8,5	15,0	6,5	26,2	11,4	30,0	13,0
42	13,5	8,4	3,6	6,4	2,8	11,2	4,9	12,9	5,6
42	15	9,3	4,0	7,1	3,1	12,5	5,4	14,3	6,2
42	16,5	10,3	4,5	7,9	3,4	13,7	6,0	15,7	6,8
42	18	11,2	4,9	8,6	3,7	15,0	6,5	17,1	7,4
42	19,5	12,1	5,3	9,3	4,0	16,2	7,0	18,6	8,1
42	21	13,1	5,7	10,0	4,3	17,5	7,6	20,0	8,7
42	22,5	14,0	6,1	10,7	4,7	18,7	8,1	21,4	9,3
42	24	14,9	6,5	11,4	5,0	20,0	8,7	22,9	9,9
42	27	16,8	7,3	12,9	5,6	22,5	9,8	25,7	11,2
42	28,5	17,7	7,7	13,6	5,9	23,7	10,3	27,2	11,8
48	13,5	7,3	3,2	5,6	2,4	9,8	4,3	11,3	4,9
48	15	8,2	3,5	6,3	2,7	10,9	4,7	12,5	5,4
48	16,5	9,0	3,9	6,9	3,0	12,0	5,2	13,8	6,0
48	18	9,8	4,3	7,5	3,3	13,1	5,7	15,0	6,5
48	19,5	10,6	4,6	8,1	3,5	14,2	6,2	16,3	7,1
48	21	11,4	5,0	8,8	3,8	15,3	6,6	17,5	7,6
48	22,5	12,2	5,3	9,4	4,1	16,4	7,1	18,8	8,1
48	24	13,1	5,7	10,0	4,3	17,5	7,6	20,0	8,7
48	27	14,7	6,4	11,3	4,9	19,7	8,5	22,5	9,8
48	28,5	15,5	6,7	11,9	5,2	20,8	9,0	23,8	10,3
48	30	16,3	7,1	12,5	5,4	21,8	9,5	25,0	10,9
48	33	18,0	7,8	13,8	6,0	24,0	10,4	27,5	11,9
48	36	19,6	8,5	15,0	6,5	26,2	11,4	30,0	13,0
48	42	22,8	9,9	17,5	7,6	30,6	13,3	35,0	15,2

MADE IN AMERICA

RECOMMENDED INVERSION AND HEAD CURING CHART

Heat-Welded Seams

PIPE DIAMETER (IN)	CIPP TUBE THICKNESS (MM)	IDEAL CURING HEAD		MINIMUM INSTALLATION HEAD		MAXIMUM HOT HEAD		MAXIMUM COLD HEAD	
		(FT)	(PSI)	(FT)	(PSI)	(FT)	(PSI)	(FT)	(PSI)
54	15	7,3	3,1	5,6	2,4	9,7	4,2	11,1	4,8
54	16,5	8,0	3,5	6,1	2,7	10,7	4,6	12,2	5,3
54	18	8,7	3,8	6,7	2,9	11,6	5,1	13,3	5,8
54	19,5	9,4	4,1	7,2	3,1	12,6	5,5	14,5	6,3
54	21	10,2	4,4	7,8	3,4	13,6	5,9	15,6	6,8
54	22,5	10,9	4,7	8,3	3,6	14,6	6,3	16,7	7,2
54	24	11,6	5,0	8,9	3,9	15,5	6,7	17,8	7,7
54	27	13,1	5,7	10,0	4,3	17,5	7,6	20,0	8,7
54	28,5	13,8	6,0	10,6	4,6	18,4	8,0	21,1	9,2
54	30	14,5	6,3	11,1	4,8	19,4	8,4	22,2	9,6
54	33	16,0	6,9	12,2	5,3	21,4	9,3	24,5	10,6
54	36	17,4	7,6	13,3	5,8	23,3	10,1	26,7	11,6
54	42	20,3	8,8	15,6	6,8	27,2	11,8	31,1	13,5
54	48	23,2	10,1	17,8	7,7	31,1	13,5	35,6	15,4
54	54	26,1	11,3	20,0	8,7	34,9	15,2	40,0	17,4
54	60	29,0	12,6	22,2	9,6	38,8	16,9	44,5	19,3
60	18	7,8	3,4	6,0	2,6	10,5	4,6	12,0	5,2
60	19,5	8,5	3,7	6,5	2,8	11,4	4,9	13,0	5,6
60	21	9,1	4,0	7,0	3,0	12,2	5,3	14,0	6,1
60	22,5	9,8	4,3	7,5	3,3	13,1	5,7	15,0	6,5
60	24	10,4	4,5	8,0	3,5	14,0	6,1	16,0	6,9
60	27	11,8	5,1	9,0	3,9	15,7	6,8	18,0	7,8
60	28,5	12,4	5,4	9,5	4,1	16,6	7,2	19,0	8,2
60	30	13,1	5,7	10,0	4,3	17,5	7,6	20,0	8,7
60	33	14,4	6,2	11,0	4,8	19,2	8,3	22,0	9,6
60	36	15,7	6,8	12,0	5,2	21,0	9,1	24,0	10,4
60	42	18,3	7,9	14,0	6,1	24,5	10,6	28,0	12,2
60	48	20,9	9,1	16,0	6,9	28,0	12,1	32,0	13,9
60	54	23,5	10,2	18,0	7,8	31,5	13,7	36,0	15,6
60	60	26,1	11,3	20,0	8,7	34,9	15,2	40,0	17,4

MADE IN AMERICA

RECOMMENDED INVERSION AND HEAD CURING CHART

Heat-Welded Seams

PIPE DIAMETER (IN)	CIPP TUBE THICKNESS (MM)	IDEAL CURING HEAD		MINIMUM INSTALLATION HEAD		MAXIMUM HOT HEAD		MAXIMUM COLD HEAD	
		(FT)	(PSI)	(FT)	(PSI)	(FT)	(PSI)	(FT)	(PSI)
63	18	7,5	3,2	5,7	2,5	10,0	4,3	11,4	5,0
63	19,5	8,1	3,5	6,2	2,7	10,8	4,7	12,4	5,4
63	21	8,7	3,8	6,7	2,9	11,6	5,1	13,3	5,8
63	22,5	9,3	4,0	7,1	3,1	12,5	5,4	14,3	6,2
63	24	9,9	4,3	7,6	3,3	13,3	5,8	15,2	6,6
63	27	11,2	4,9	8,6	3,7	15,0	6,5	17,1	7,4
63	28,5	11,8	5,1	9,1	3,9	15,8	6,9	18,1	7,9
63	30	12,4	5,4	9,5	4,1	16,6	7,2	19,1	8,3
63	33	13,7	5,9	10,5	4,5	18,3	7,9	21,0	9,1
63	36	14,9	6,5	11,4	5,0	20,0	8,7	22,9	9,9
63	42	17,4	7,6	13,3	5,8	23,3	10,1	26,7	11,6
63	48	19,9	8,6	15,2	6,6	26,6	11,6	30,5	13,2
63	54	22,4	9,7	17,1	7,4	30,0	13,0	34,3	14,9
63	60	24,9	10,8	19,1	8,3	33,3	14,4	38,1	16,5
69	18	6,8	3,0	5,2	2,3	9,1	4,0	10,4	4,5
69	19,5	7,4	3,2	5,7	2,5	9,9	4,3	11,3	4,9
69	21	7,9	3,4	6,1	2,6	10,6	4,6	12,2	5,3
69	22,5	8,5	3,7	6,5	2,8	11,4	4,9	13,0	5,7
69	24	9,1	3,9	7,0	3,0	12,2	5,3	13,9	6,0
69	27	10,2	4,4	7,8	3,4	13,7	5,9	15,7	6,8
69	30	11,4	4,9	8,7	3,8	15,2	6,6	17,4	7,6
69	33	12,5	5,4	9,6	4,2	16,7	7,3	19,1	8,3
69	36	13,6	5,9	10,4	4,5	18,2	7,9	20,9	9,1
69	42	15,9	6,9	12,2	5,3	21,3	9,2	24,4	10,6
69	48	18,2	7,9	13,9	6,0	24,3	10,6	27,8	12,1
69	54	20,4	8,9	15,7	6,8	27,4	11,9	31,3	13,6
69	57	21,6	9,4	16,5	7,2	28,9	12,5	33,1	14,3
69	61	23,1	10,0	17,7	7,7	30,9	13,4	35,4	15,4
69	63	23,8	10,3	18,3	7,9	31,9	13,8	36,5	15,9

MADE IN AMERICA

RECOMMENDED INVERSION AND HEAD CURING CHART

Heat-Welded Seams

PIPE DIAMETER (IN)	CIPP TUBE THICKNESS (MM)	IDEAL CURING HEAD		MINIMUM INSTALLATION HEAD		MAXIMUM HOT HEAD		MAXIMUM COLD HEAD	
		(FT)	(PSI)	(FT)	(PSI)	(FT)	(PSI)	(FT)	(PSI)
72	19,5	7,1	3,1	5,4	2,4	9,5	4,1	10,8	4,7
72	21	7,6	3,3	5,8	2,5	10,2	4,4	11,7	5,1
72	22,5	8,2	3,5	6,3	2,7	10,9	4,7	12,5	5,4
72	24	8,7	3,8	6,7	2,9	11,6	5,1	13,3	5,8
72	27	9,8	4,3	7,5	3,3	13,1	5,7	15,0	6,5
72	28,5	10,3	4,5	7,9	3,4	13,8	6,0	15,8	6,8
72	30	10,9	4,7	8,3	3,6	14,6	6,3	16,7	7,2
72	33	12,0	5,2	9,2	4,0	16,0	7,0	18,3	8,0
72	36	13,1	5,7	10,0	4,3	17,5	7,6	20,0	8,7
72	42	15,2	6,6	11,7	5,1	20,4	8,8	23,3	10,1
72	48	17,4	7,6	13,3	5,8	23,3	10,1	26,7	11,6
72	54	19,6	8,5	15,0	6,5	26,2	11,4	30,0	13,0
72	57	20,7	9,0	15,8	6,9	27,7	12,0	31,7	13,7
72	61	22,1	9,6	17,0	7,4	29,6	12,9	33,9	14,7
72	63	22,8	9,9	17,5	7,6	30,6	13,3	35,0	15,2
78	21	7,0	3,1	5,4	2,3	9,4	4,1	10,8	4,7
78	22,5	7,5	3,3	5,8	2,5	10,1	4,4	11,5	5,0
78	24	8,0	3,5	6,2	2,7	10,8	4,7	12,3	5,3
78	27	9,0	3,9	6,9	3,0	12,1	5,3	13,9	6,0
78	28,5	9,5	4,1	7,3	3,2	12,8	5,5	14,8	6,3
78	30	10,0	4,4	7,7	3,3	13,4	5,8	15,4	6,7
78	33	11,0	4,8	8,5	3,7	14,8	6,4	16,9	7,3
78	36	12,1	5,2	9,2	4,0	16,1	7,0	18,5	8,0
78	42	14,1	6,1	10,8	4,7	18,8	8,2	21,5	9,4
78	48	16,1	7,0	12,3	5,3	21,5	9,3	24,6	10,7
78	54	18,1	7,8	13,9	6,0	24,2	10,5	27,7	12,0
78	57	19,1	8,3	14,6	6,3	25,5	11,1	29,2	12,7
78	61	20,4	8,9	15,6	6,8	27,3	11,9	31,3	13,6
78	63	21,1	9,2	16,2	7,0	28,2	12,3	32,3	14,0

MADE IN AMERICA

RECOMMENDED INVERSION AND HEAD CURING CHART

Heat-Welded Seams

PIPE DIAMETER (IN)	CIPP TUBE THICKNESS (MM)	IDEAL CURING HEAD		MINIMUM INSTALLATION HEAD		MAXIMUM HOT HEAD		MAXIMUM COLD HEAD	
		(FT)	(PSI)	(FT)	(PSI)	(FT)	(PSI)	(FT)	(PSI)
84	21	6,5	2,8	5,0	2,2	8,7	3,8	10,0	4,3
84	22,5	7,0	3,0	5,4	2,3	9,4	4,1	10,7	4,7
84	24	7,5	3,2	5,7	2,5	10,0	4,3	11,4	5,0
84	27	8,4	3,6	6,4	2,8	11,2	4,9	12,9	5,6
84	28,5	8,9	3,8	6,8	2,9	11,9	5,1	13,6	5,9
84	30	9,3	4,0	7,1	3,1	12,5	5,4	14,3	6,2
84	33	10,3	4,5	7,9	3,4	13,7	6,0	15,7	6,8
84	36	11,2	4,8	8,6	3,7	15,0	6,5	17,1	7,4
84	42	13,1	5,7	10,0	4,3	17,5	7,6	20,0	8,7
84	48	14,9	6,5	11,4	5,0	20,0	8,7	22,9	9,9
84	54	16,8	7,3	12,9	5,6	22,5	9,8	25,7	11,2
84	57	17,7	7,7	13,8	5,9	23,7	10,3	27,2	11,8
84	61	19,0	8,2	14,5	6,3	25,4	11,0	29,1	12,6
84	63	19,6	8,5	15,0	6,5	26,2	11,4	30,0	13,0
84	65	20,2	8,8	15,5	6,7	27,0	11,7	31,0	13,4

Warranty Disclaimer: *The above chart provides the estimated installation and curing pressures of polyester felt inversion liners. Many factors can affect the outcome of a cured-in-place pipe installation. This table assumes proper installation techniques, type of equipment, and resin impregnation of the tube diameter. It is important to note that these and other factors associated with the installation of cured-in-place pipe will vary greatly between installations; each installation is unique. There is no warranty of merchantability or fitness for any particular purpose. Under no circumstances shall Applied Felts Inc., be liable for incidental, punitive special, indirect or consequential damages or for lost profits or labor costs, and in no event shall damages exceed the purchase price paid for the products.*

MADE IN AMERICA

RECOMMENDED INVERSION AND HEAD CURING CHART

Stitched Seams

PIPE DIAMETER (IN)	CIPP TUBE THICKNESS (MM)	IDEAL CURING HEAD		MINIMUM INSTALLATION HEAD		MAXIMUM HOT HEAD		MAXIMUM COLD HEAD	
		(FT)	(PSI)	(FT)	(PSI)	(FT)	(PSI)	(FT)	(PSI)
6	4.5	19.5	8.4	15.5	6.7	33.9	14.7	65.4	28.4
6	5.5	23.8	10.3	18.9	8.2	41.4	18.0	79.9	34.7
6	6	26.0	11.3	20.7	9.0	45.2	19.6	87.2	37.8
8	4.5	14.6	6.3	11.6	5.0	25.4	11.0	49.0	21.3
8	5.5	17.8	7.7	14.2	6.2	31.1	13.5	59.9	26.0
8	6	19.5	8.4	15.5	6.7	33.9	14.7	65.4	28.4
8	7.5	24.3	10.6	19.4	8.4	42.4	18.4	81.7	35.5
10	4.5	11.7	5.1	9.3	4.0	20.3	8.8	39.2	17.0
10	5.5	14.3	6.2	11.4	4.9	24.9	10.8	47.9	20.8
10	6	15.6	6.8	12.4	5.4	27.1	11.8	52.3	22.7
10	7.5	19.5	8.4	15.5	6.7	33.9	14.7	65.4	28.4
10	9	23.4	10.1	18.8	8.1	40.7	17.7	78.4	34.0
12	6	13.0	5.6	10.3	4.5	22.6	9.8	43.6	18.9
12	6.5	14.1	6.1	11.2	4.9	24.5	10.6	47.2	20.5
12	7	15.1	6.6	12.1	5.2	26.4	11.4	50.8	22.1
12	7.5	16.2	7.0	12.9	5.6	28.2	12.3	54.5	23.6
12	9	19.5	8.4	15.5	6.7	33.9	14.7	65.4	28.4
12	10.5	22.7	9.9	18.1	7.8	39.5	17.2	76.3	33.1
15	6	10.4	4.5	8.3	3.6	18.1	7.8	34.9	15.1
15	7.5	13.0	5.6	10.3	4.5	22.6	9.8	43.6	18.9
15	9	15.6	6.8	12.4	5.4	27.1	11.8	52.3	22.7
15	10.5	18.2	7.9	14.5	6.3	31.6	13.7	61.0	26.5
15	12	20.8	9.0	16.5	7.2	36.2	15.7	69.7	30.3
15	13.5	23.4	10.1	18.6	8.1	40.7	17.7	78.4	34.0
18	6	8.7	3.8	6.9	3.0	15.1	6.5	29.1	12.6
18	7.5	10.8	4.7	8.6	3.7	18.8	8.2	36.3	15.8
18	9	13.0	5.6	10.3	4.5	22.6	9.8	43.6	18.9
18	10.5	15.1	6.6	12.1	5.2	26.4	11.4	50.8	22.1
18	12	17.3	7.5	13.8	6.0	30.1	13.1	58.1	25.2
18	13.5	19.5	8.4	15.5	6.7	33.9	14.7	65.4	28.4
18	15	21.8	9.4	17.2	7.5	37.7	16.3	72.6	31.5

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UNITED FELTS

RECOMMENDED INVERSION AND HEAD CURING CHART

Stitched Seams

PIPE DIAMETER (IN)	CIPP TUBE THICKNESS (MM)	IDEAL CURING HEAD		MINIMUM INSTALLATION HEAD		MAXIMUM HOT HEAD		MAXIMUM COLD HEAD	
		(FT)	(PSI)	(FT)	(PSI)	(FT)	(PSI)	(FT)	(PSI)
21	6	7,4	3,2	5,9	2,6	12,9	5,6	24,9	10,8
21	7,5	9,3	4,0	7,4	3,2	16,1	7,0	31,1	13,5
21	9	11,1	4,8	8,9	3,8	19,4	8,4	37,4	16,2
21	10,5	13,0	5,6	10,3	4,5	22,6	9,8	43,6	18,9
21	12	14,8	6,4	11,8	5,1	25,8	11,2	49,8	21,6
21	13,5	16,7	7,2	13,3	5,8	29,1	12,6	56,0	24,3
21	15	18,5	8,0	14,8	6,4	32,3	14,0	62,3	27,0
21	16,5	20,4	8,9	16,2	7,0	35,5	15,4	68,5	29,7
21	18	22,2	9,7	17,7	7,7	38,7	16,8	74,7	32,4
21	19,5	24,1	10,5	19,2	8,3	42,0	18,2	80,9	35,1
24	7,5	8,1	3,5	6,5	2,8	14,1	6,1	27,2	11,8
24	9	9,7	4,2	7,7	3,4	16,9	7,4	32,7	14,2
24	10,5	11,4	4,9	9,0	3,9	19,8	8,6	38,1	16,6
24	12	13,0	5,6	10,3	4,5	22,6	9,8	43,6	18,9
24	13,5	14,6	6,3	11,6	5,0	25,4	11,0	49,0	21,3
24	15	16,2	7,0	12,9	5,6	28,2	12,3	54,5	23,6
24	16,5	17,8	7,7	14,2	6,2	31,1	13,5	59,9	26,0
24	18	19,5	8,4	15,5	6,7	33,9	14,7	65,4	28,4
24	19,5	21,1	9,2	16,8	7,3	36,7	15,9	70,8	30,7
24	21	22,7	9,9	18,1	7,8	39,5	17,2	76,3	33,1
24	22,5	24,3	10,6	19,4	8,4	42,4	18,4	81,7	35,5

Warranty Disclaimer: *The above chart provides the estimated installation and curing pressures of polyester felt inversion liners. Many factors can affect the outcome of a cured-in-place pipe installation. This table assumes proper installation techniques, type of equipment, and resin impregnation of the tube diameter. It is important to note that these and other factors associated with the installation of cured-in-place pipe will vary greatly between installations; each installation is unique. There is no warranty of merchantability or fitness for any particular purpose. Under no circumstances shall United Felts be liable for incidental, punitive special, indirect or consequential damages or for lost profits or labor costs, and in no event shall damages exceed the purchase price paid for the products.*

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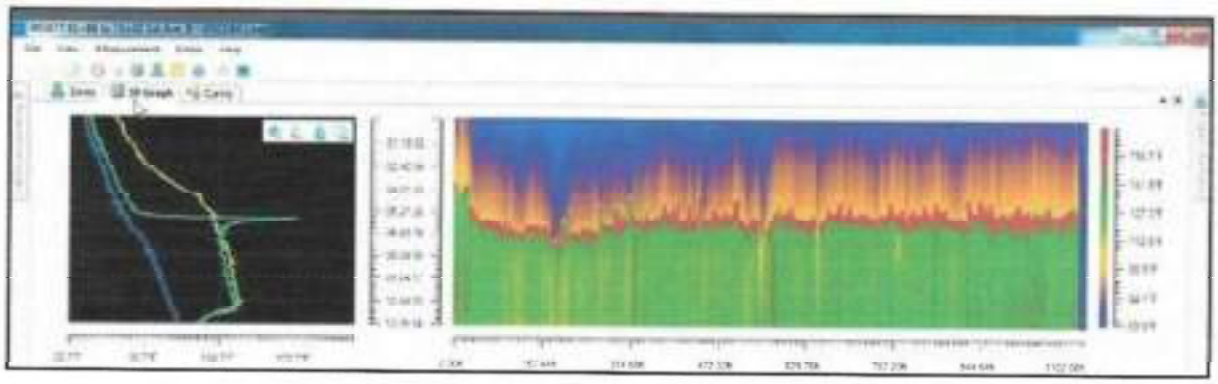
3D. Installation of Vera Cure System

After completion of the pre-lining cleaning and CCTV inspection, the Vera Cure system will be installed and secured in the invert of the pipe to be rehabilitated from inversion manhole to “tail” manhole. The Vera Cure system consists of a small fiber optic cable which are connected to laptops with the Vera Cure software program, which are located within the on-site boiler trucks. This system allows D.V.M. Utilities, Inc. installation crews, and owners, real time information on the CIPP curing process through thermal imaging technology. The end result of utilizing this QA/QC procedure is to ensure consistent, measurable quality on every installation. This process can also be viewed remotely via smart phone, tablet, or computer from any location.



3E. Monitoring Required During Installation

During liner installation detailed records should be kept of several parameters as detailed below for quality control purposes.

3E.1 Water Column Height and Pressure During Curing

In order to ensure that the required curing pressure is maintained throughout the curing process, a continuous log of pressure should be kept for the entire liner curing period. See example below:

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DVM UTILITIES INC. LINER CURE LOG

Job Number:	13746	**MHA:**	SAN106	**Diameter:**	24 In.
Job Name:	UTICA	**MHB:**	SAN107	**Thickness:**	12 mm.
		Install Type:	Inversion / Steam	**Wet Length:**	65 Ft.
	VAN DYKE PARKING LOT			**Dry Length:**	37 Ft.
				Total Length:	102 Ft.

Cure Schedule

Water Cure: If **ANY** of these temps can not be reached, contact the project supervisor.

1. Start cure time when far end & return water temp is ≥ 180°F (82C°) and the minimum of all interface temps is: 180 °F 82 °C
2. Hold the cure time for: 3 hour(s) while maintaining these temps.

Steam Cure: If **ANY** of these temps can not be reached, contact the project supervisor.

1. Start cure time when far end & return water temp is ≥ 210°F (99°C) and the minimum of all interface temps is: 150 °F 66 °C
2. Hold the cure time for: 1.5 hour(s) while maintaining these temps.

Extended Cure: If **ANY** of these temps can not be reached, contact the project supervisor.

1. Extend cure time for 1 hour for every 10° below the min interface. For any interface below 115°F (46°C) the supervisor must determine the next steps.
2. Extend the cure time for 1 hour when sags or dips are present.
3. Extend the cure time by 50% for deep installs (>12ft/3.7m) and when adding water to ABC.

Cool Down: For Steam Cure: Maintain recommended head and cool down until all interface temps are ≤ 100°F (40°C)
For Water Cure: Maintain recommended head and cool down until the internal water temp is ≤ 100°F (40°C)

Inversion & Cure Log

Install Date: ______________________

Boiler Number: ______________________

Boiler Operator: ______________________

Weather (Circle): Rain Snow Hot Cold Normal

Type of Cure (Circle): Water Steam

US/DS Cure (Circle): Upstream Downstream

	Ft.	PSI.
Recommended Head:	13.1	5.7
Min Head (Cold):	10.0	4.3
Max Head (Cold):	20.0	8.7
Max Head (Hot):	17.5	7.6

Tubes greater than 10.5mm in thickness, log pressures and temperatures every 15 minutes during warm up and cool down & every 60 minutes during the cure.

For tubes 10.5mm or less in thickness, log pressures and temperatures every 15 minutes during the warm up, cure, and cool down.

If using a continuous temperature monitoring system, the supervisor must be notified to assist with cure time decisions. The cure time is complete when an exothermic release is detected.

Step (Warm Up, start Cure, Cooldown)	Boiler Operators Initials	Time	Head or Manifold Pressure	Water Pump Pressure	Far End Pressure (Remote Gauge)	Temp of Return Water Into Boiler or Steam at Manifold	Temp of Discharge Water From Boiler	Inversion Interface Temp	Middle MH Interface Temp	Middle MH Interface Temp	Middle MH Interface Temp	Far End Interface Temp (1st Wire)	Far End Interface Temp (2nd Wire)	Far End Water or Air/Steam Temp (Internal Wire)

DVM UTILITIES, INC.

Step (Warm Up, start Cure, Cooldown)	Boiler Operators Initials	Time	Head or Manifold Pressure	Water Pump Pressure	Far End Pressure (Remote Gauge)	Temp of Return Water into Boiler or Steam at Manifold	Temp of Discharge Water From Boiler	Inversion Interface Temp	Middle MH Interface Temp	Middle MH Interface Temp	Middle MH Interface Temp	Far End Interface Temp (1st Wire)	Far End Interface Temp (2nd Wire)	Far End Water or Air/Steam Temp (Internal Wire)

3E.2 Curing Schedule

The installed properties of the liner are dependent on the curing process, it is essential that the curing process be monitored in its entirety. The full cure time normally consist of three stages:

1. Heating water to the exotherm temperature.
2. Cooking the liner for a specified time at exotherm temperature.
3. Cool down.

NOTE: Each stage of curing time is different for each CIPP system, depending on the resin type, liner thickness, sewer host pipe size & length.

- In most liner installations a stepped heating process may/should be employed to reach exotherm temperature.
- If proper cool down is not exercised, the liner could develop cracks due to thermal shock and also the released water into sewer after curing could generate odor problems in the case of polyester resin. Cool down times vary on method of installation and size and length of the liner.
- The actual curing process is continuously monitored via Vera Cure on site by the installation crews, and can be viewed remotely. This real-time data results in our installation crews ability address changing or unfavorable conditions immediately and results in a consistent end result on each installation.

3G. Sewer Connections/Service Lateral Instatement

When reinstating sewer connections the liner should be cut to restore the full diameter of the existing connection. The finish of the cut should be reviewed during the post-lining inspection to ensure that a smooth transition is provided from the connection to the liner. Generally, sewer diameters from 8" to 24" should be cut robotically by a PACP trained technician. Sewers 24" and above generally require man entry provisions to relieve service lateral connections. Special Confined Space provisions should be followed in these situations.

3F. Post Lining CCTV Inspection

Upon completion of the installation and curing processes, a post-lining inspection (see Section 3.A) should be conducted to ensure conformance of the completed workmanship with Clause 6.2 of ASTM D5813. In addition to meeting the requirements of the above-noted specification, the cured liner is checked for a tight fit with the host pipe at the termination point and at any sewer connections. If a tight fit has not been achieved in localized areas the annular space should be filled with a resin mixture that is compatible with the liner system. If a tight or close fit was not achieved for the entire length of the liner or for substantial lengths, the design basis should be revisited.

4. Liner Testing

Note: Testing will be completed per the contract specifications

4A. Confined Pipe Samples

If confined or restrained pipe samples are required, they typically consist of a section of cured liner that has been inverted through a like-diameter form, maintained in a heat sink similar to

the installed liner, and are cut out at an intermediate manhole or termination point, subject to the following requirements:

- The minimum required sample size is usually 200 mm in length by the full diameter for sewer lining in diameters up to and including 450 mm,
- For sewer lining larger than 450 mm diameter, the sample may be cut to coincide with the multi-piece form if used, to facilitate removal from the manhole,
- The liner sample should be tested to confirm the flexural strength and flexural modulus in accordance with the requirements of ASTM D5813 and D790, and
- The liner thickness is measured in accordance with the requirements of ASTM D5813 and ASTM D3567.

Confined samples are generally noted as the most representative of actual wet-out and installation conditions. While they do not perfectly represent the actual conditions that CIPP experiences within the host pipe (curing liner end segment by poking bleed-off holes, heat loss to the environment outside of PVC pipe), it is the method of testing that best represents in-field conditions among the available testing options that do not involve destructive testing methods.

4B. Test Plates

If the contract documents require physical liner samples obtained from test plates prepared on site from the actual liner and cured in a clamped mould placed in the downtube or silencer, can be used subject to the following conditions:

- The test plate sample should be tested to confirm the flexural strength and flexural modulus in accordance with the requirements of ASTM D5813 and D790,
- Physical strength results obtained from test plates are reduced by the maximum percentage difference of the confined pipe and test plate samples prepared from the same liner system for at least three previous inversions using the same resin,
- The liner thickness is measured in accordance with the requirements of ASTM D5813 and ASTM D3567, and
- Liner thickness results taken from test plates or unconfined samples should be treated as less representative of actual thickness than in-place observations of thickness.

4C. Confirmation of Design Objectives

4C.1 Post-Installation Testing Results Review

Following installation and curing of the liner, it is prudent to perform a post-installation review of the testing results to ensure that the installed liner meets the 50 year design life structural requirements from the contract documents. The testing review should be jointly conducted by the owner (owner's agent) and the contractor, utilizes the measured values for flexural strength, flexural modulus, and liner thickness from the confined pipe sample testing, or in cases where confined pipe samples cannot be secured, the reduced strength/modulus values obtained from the test plate testing. In assessing the suitability of the liner to meet the 50 year design life requirements, the design strength values are further reduced to account for creep based on the creep reduction values as determined by ASTM D2990 testing. The use of full

enhancement factors in this analysis is limited to liners that are visually confirmed to be close- fit liners based on the post-lining sewer inspection.

4C.2 Supplemental Testing (if required)

Any identified discrepancies between the constructed liner and the design requirements should be investigated further to confirm whether the installed liner will comply with the design life objectives. Supplemental testing can include confirmation of actual ovality (as opposed to assumed design values), determination of a more representative groundwater elevation locally through extended monitoring, further strength testing and thickness measurements, etc.

5. Warranty Inspections (if required)

CCTV inspection can be completed, per the contract documents, after installation to confirm acceptable performance of the installed liner. The following should be confirmed by visual observation:

- no liner material degradation
- no composite structure degradation
- unbonding of liner layers
- performance of grout, if applicable, at service laterals
- tight fit

A. Misc. Repairs for Defects in CIPP Liners

Introduction

The following list summarizes the most common defects in CIPP liners. For each defect, a method of repair has been established. The established repair method is the basis for any action to be taken and should, whenever necessary, be communicated to the client prior to the repair.

The following standard repair methods are industry supported.

1. Standard Short-Liner Repair

- Corrective Action - Standard Short-Liner Repair(s)

  - Typically used for removal of fins, wrinkles, lifts, uncured liner sections, "over-cut lateral reinstatements.
  - Cut, grind or shave flow restrictions and/or uncured sections of liner.
  - Prepare a CIPP tube with a design thickness that is consistent with the existing CIPP in the host pipe.
  - The repair tube will be designed with a length that will overlap a minimum of 12", or a length equal to that of the original diameter of the host pipe, whichever is greater. This minimum overlap will occur on each side of the repair area.

- The resin in the repair tube will be catalyzed to cure completely with or without the use of applied heat, depending on the conditions of the pipe and repair to be completed.
- Once prepared, the tube and bladder will be winched into position with the appropriate overlap on each side of the repair area, (minimum overlap to be as stated in the second paragraph above).
- Proper positioning will be monitored with CCTV. After positioning, the tube will be inflated with the use of air, water, or steam to a minimum of 5 psi or 1 psi greater than the pressure produced by groundwater in that area, whichever is greater. Once the resin is fully cured, the bladder is removed.
- The repaired CIPP, along with the complete line segment, will be CCTV inspected for final approval.
- If the repair is over that of an improperly cut lateral, the lateral connection will be reinstated prior to the final CCTV inspection.

A. Large Diameter Patch Repair

- Filling in a wrongly installed service lateral hole with resin will make this repair compatible with that in the existing liner.
- The resin will be thickened to a paste and catalyzed to cure completely, with or without the use of applied heat, depending on the conditions of the pipe and repair to be completed. Man-Entry is required for this repair, therefore confines space permit and entry procedures must be followed.
- The repaired CIPP, along with the complete line segment, will be CCTV inspected for final approval.

B. Small Diameter Patch Repair

- United Felts Point Repair With Robotics
- The repaired CIPP, along with the complete line segment, will be CCTV inspected for final approval.

2. Failed to Invert Properly

➢ **Corrective Action**

- Determine problem:
  a. Twist in the liner. Take liner out of the pipe, and disconnect from the elbow. Reinstall making sure that there is no twist in the liner.
  b. Air trapped in the tube. Make sure that the vent tube is not restricted, if so remove restriction and proceed with the installation.
  c. Air trapped between multi layers Inversion column. Make small incisions in the column on the outer and inner layers.

3. Lift/Sag

➢ **Corrective Action**

- Plug liner down stream with a sewer plug, and reheat liner.
- Invert a calibration hose, a removable hose, or a dry liner tube into the liner and reheat

4. Lined Over Debris

➢ **Corrective Action**

- Cut out and remove debris from the line with mechanical equipment then follow procedure for "Standard Short-Liner Repair: Corrective Action".

5. Pinholes

- **Corrective Action:**
  - **NOTE: Applies to pressure lines only.**
    - Repair pin holes with P.U. film and THF.

6. PU Delamination

- **Corrective Action**

A. Large Diameter

- Man Entry is generally required. Remove PU with knives or electric powered cutters.

B. Small Diameter

- Cut or grind loose PU from liner using mechanical means (Schwalm, Cutter, etc.).
- The repaired CIPP, along with the complete line segment, will be CCTV inspected for final approval.

7. Soft Liners

- **Corrective Action**
  - Review Lift/Sag and/or plug down stream pipe and reheat with steam.

8. Taps Didn't Dimple

- **Corrective Action**

NOTE: Do not poke holes in liner in search of taps.

- Re-examine pre-CCTV video and count joints.

- Try to locate cleanout.
- Search for possible clues above ground and measure distance from manhole.
- Push light head or flashlight through cleanout and look for light shining through the liner with a camera located in the line.
- Use electronic locater to locate service

9. Thin Liners

➢ Corrective Action

- Ultrasonic testing of liner thickness.
- If liner is proven thin from ultrasonic testing, the line segment may be re-lined with the felt tube being impregnated with an epoxy or vinyl ester resin, or a fiberglass reinforced liner with polyester resin.
- Thoroughly clean line before inserting CIPP liner into pipe.
- CCTV inspect host pipe.
- Cool down slowly at 8 - 10 deg F. per hour.

10. Flow Reducing Wrinkles

➢ Corrective Action

- Cut, grind or shave flow restrictions with mechanical devices and/or uncured sections of liner.
- Review Section 10.8.1.1, "Corrective Action - Standard Short-Liner Repair".

11. Wrong Diameter

➢ Corrective Action

A. If liner diameter is greater than host pipe diameter:

1. REMOVE LINER, IF POSSIBLE

2. LINER CANNOT BE REMOVED:

    a. Determine if liner is fully cured the entire length of line segment.

    b. Determine if any obstructions or restrictions are in installed liner.

    c. Determine if thickness of liner installed is within specifications of liner thickness of line segment lined.

    d. Once liner fully cured, the complete line segment should be CCTV inspected.

    e. If repair is necessary, proceed to appropriate Corrective Action listed in this appendix.

B. If liner diameter is less than host pipe diameter:

1. If diameter difference is noted **BEFORE** installation, do not install wet out liner in segment, consult with owner on how to proceed.

C. If diameter difference is noted **AFTER** installation: Determine if liner is cured or will cure in a reasonable amount of time.

1. If it is determined that the liner is not cured pull liner out of line. If it is determined that the liner cannot be removed from the line segment, proceed with cook schedule. Once the liner is fully cured, the complete line segment will be CCTV inspected.

2. If it is determined that there are problems in the liner, proceed to proper corrective action listed in this appendix.

12. Wrongly Re-instated Service Connection

- **Corrective Action**

A. Large Diameter:

- Repair per the contract documents, or
- Structural Grout - Fill the improperly cut service with structural grout, approved by the owner.
- Resin - This repair should be made by filling in the improperly cut service with a resin consistent with that in the existing liner.
    - The resin will be thickened to a paste and catalyzed to cure completely with or without the use of applied heat depending on the conditions of the pipe and repair to be completed. Man-Entry is necessary, therefore confined space procedures must be implemented.
- The repaired CIPP along with the complete line segment should be CCTV inspected for final approval.

B. Small Diameter:

- Repair per the contract documents, or
- Robotically-applied structural grout, approved by the owner.
- Installation of a part liner, per Short Liner section.
- The repaired CIPP along with the complete line segment will be CCTV inspected for final approval.

13. Tap Cut Over Size

- **Corrective Action**

A. Large Diameter:

- Repair per the contract documents, or:
- Structural Grout - Fill the improperly cut service with structural grout, approved by the owner.
- Resin - This repair should be made by filling in the improperly cut service with a resin consistent with that in the existing liner.
    - The resin will be thickened to a paste and catalyzed to cure completely with or without the use of applied heat depending on the conditions of the pipe and repair to be completed. Man-Entry is necessary, therefore confined space procedures must be implemented.
- The repaired CIPP along with the complete line segment should be CCTV inspected for final approval.

B. Small Diameter:

- Repair per the contract documents, or
- Utilize chemical or structural grout and following industry standards for Packer Injection Grouting.
- Installation of a lateral seal, such as a “T-Liner”.
- The repaired CIPP along with the complete line segment should be CCTV inspected for final approval.

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Phone 586-979-0402

7. The proposal shall include a company overview, number of full-time employees, and key staff member experience and directly related to the services identified in section 1.3 Scope of Work

Founded in 1981, D.V.M. Utilities, Inc., is a nationally recognized trenchless technology contractor and innovator. Throughout our history, we have been committed to providing our clients with solid project performance and management, which has evolved the firm into one of the most respected trenchless contractors in the Midwest. Innovation, experience, and exemplary customer service make D.V.M. Utilities, Inc. a leader in the underground infrastructure industry and has allowed our team to construct some of the most challenging and complex trenchless construction projects in Michigan and surrounding states. The DVM team has earned a solid reputation as a first-class contractor that constructs projects successfully, on time, and within or under budget.

The DVM philosophy is to approach each project uniquely and to perpetuate our corporate vision as one which continually strives to maintain optimum attention, dedication, and professional service while being mindful of our client's budgets and parameters.

Our state-of-the-art equipment, management experience, and skilled labor force deliver unmatched results for our clients regardless of the complexities of any project. We, also, realize the immeasurable benefits for our leadership to have hands-on experience, technical training and to provide continuous encouragement, while leading our team members.

D.V.M. Utilities, Inc. is a **TOTAL TRENCHLESS SOLUTIONS** provider. The company is MDOT prequalified for $82 million in yearly project construction, has $80 million bonding capacity, employs more than 130 construction field personnel, and built approximately 3,200 projects in 2023, as well as installing more than **184,000 lf** of Full Length CIPP liners in the last 30 months.

D.V.M. Utilities, Inc. Trenchless & Trench-Free Construction Expertise

Horizontal Directional Drilling	**CIPP Full Length Lining**
Pilot Tube Guided Auger Boring	**CIPP Part Length Lining**
Tunneling (Hand-Mine & TBM)	**RIGIDSEAL Full Length Lining**
Horizontal Auger Boring	**UV CIPP Lining**
Pipe Bursting	**ALT-LINER CIPP Manhole Rehabilitation**
Pipe Ramming	**Epoxy & Cementitious Manhole Rehabilitation**
Sliplining	**Mainline Sewer Grouting**
Pump Station Rehabilitation	**Mainline and Lateral Sewer Cleaning & CCTV Inspection**

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MAINLINE SEWER RENEWAL CERTIFICATIONS

D.V.M. Utilities, Inc. is a member of **NASSCO** (National Association of Sewer Service Companies) and **NASTT** (National American Society for Trenchless technology). D.V.M. Utilities is a member of **CIPP Corp**, a certified installer of mainline CIPP for **MTC Liner Products, Fast Pipelining Products, and JRG Materials**. Our sewer renewal teams are also certified installers of CIPP lining products from **Perma-Liner, Maxliner** and structural sewer point repair materials from **Quick Loc** and **Source One Environmental**. D.V.M. Utilities, Inc. is also the only certified regional installer of **RIGIDSEAL™** Technologies Pipelining System.

SEWER LATERAL RENEWAL CERTIFICATION

D.V.M. Utilities is a certified installer of **LMK Technologies T-Liner CIPP** lateral lining system. The T-Liner System can renew sewer lateral from 6" to 200' from the mainline sewer.

MANHOLE RENEWAL CERTIFICATION

D.V.M. Utilities, Inc. is a certified installer of epoxy, calcium aluminate, and geopolymer rehabilitation products from **Quadex, Cemtec, Sherman Williams, and Tnemec**. The company is also the only regional approved and certified installer of **Alt-Liner Cured-In-Place Manhole Liners.**

References:

Gary Bartow, P.E.
Fleis & Vandenbrink Engineering, Inc.
(989) 837-3280

Joel Brown
Oakland County Water Resources Commissioner – Director of Construction
(248)858-0958

Saju Sachidanandan, P.E.
Sr. Principal Engineer/Vice President
NTH Consultants
(248)553-6300

James Surhigh, P.E./William West, P.E.
Hubbell Roth, and Clark, Inc.
(248)454-6300

D.V.M. Utilities, Inc. Equipment

Jetter/Vac Trucks

- (2) 2019 VACTOR HYDROEXCAVATOR Plus
- 2018 VACTOR 2100 Plus PD Tandem Combo
- 2014 VACTOR 2100 Plus PD Tandem Combo
- 2019 VACTOR 2100i
- 2004 VAC-CON V312 Combo

Easement Machine

- Rear-yard Sewer Easement Machine

Water Boiler Units

- (2) 7MM (Propane) BTU Water Boiler Platform Truck Unit
- 13MM BTU Water Boiler Platform Truck Unit

Steam Boiler Units

- (2) 4M BTU Rush Steam Boiler Truck Unit
- 2 ea Wolverine 2M BTU Steam Units

Air/Water Inversion Units

- 8”-18” “The Shooter” Air Inversion Unit
- 18”-48” Fast Pipelining 48 Series Shooter “Air Inverter”
- 36” TryTek EZ 2 Liner Inversion Unit “CHIPP”

Refrigeration Trucks “Reefer”

- Kenworth Reefer Truck (3)

Lateral Launch Systems

- 2021 CUES K2 Summit System with Lateral Launch
- CUES Lateral Launching System

CCTV Trucks/Equipment

- CUES Steerable Pipe Ranger
- CUES Ultra Shorty Transporter
- CAMERA MODEL: CUES OZ II
- 2018 CUES K2 Summit System

Robotic Cutting Equipment

- Schwalm Robotics Lateral Reinstatement System (2)
- ITS Sewer Reinstatement System
- Bowman Sewer Reinstatement System

Grouting Truck/Equipment

- 2016 CUES PRO DATA 2000 with CUES Seal/Grout system
- 2018 CUES PRO DATA 2000 with CUES Seal/Grout system

Manhole Rehab/Cellular Grout

- Prestige Silent 300 Concrete Pump
- Graco ER 50 Epoxy Pump
- Richway CF-CT30 Cellular Grout Pump

Bypass Equipment

- Miscellaneous Sewer Plugs Solid and Flow Through

CIPP Part Liner

- Part Liner Packers 8”-36”

REHABILITATION TEAM EXPERIENCE

NAME	ROLE	EMPLOYMENT HISTORY	FOOTAGE
Karl Bates	Director	IPR GREAT LAKES (2012-2015) KENNY CONSTRUCTION COMPANY (2015-2019) SAK CONSTRUCTION (2019-2020) DVM UTILITIES, INC. (2020-)	<675,000
Paul Torres	Operations Manager	LANZO CONSTRUCTION (2016-2022) D.V.M. UTILITIES, INC. (2022-)	<1,000,000
Liz Mitchell	Project Administrator	LANZO CONSTRUCTION (2007-2024) D.V.M. UTILITIES, INC. (2024-)	<2,000,000
Rigo Silva	Superintendent	INLAND WATERS POLLUTION CONTROL (2011 – 2024) D.V.M. UTILITIES, INC. (2024 -)	<3,000,000
Jason McCoy	Superintendent	INLAND WATERS POLLUTION CONTROL (1992-2005/2010-2013) AQUA GROUP (2005-2010) LANZO CONSTRUCTION (2013-2024) DVM UTILITIES, INC. (2024-)	<3,000,000
Alejandro Godinez	CIPP Foreman	LANZO CONSTRUCTION (2008-2018 and 2020 – 2023 INLAND WATERS POLLUTION CONTROL/IPR (2018-2020) DVM UTILITIES, INC. (2023-)	<2,000,000
Mario Tribuzio	Rehab Foreman	INLAND WATERS POLLUTION CONTROL (2011 – 2024) D.V.M. UTILITIES, INC. (2024 -)	<500,000
Neftali Alfaro	CIPP Foreman	LANZO CONSTRUCTION (1996-2021 and 2022- 2024) INLINER SOLUTIONS/IPR (2021 - 2022) DVM UTILITIES, INC. (2024-)	<4,000,000
Felipe Ochoa	Foreman	LANZO CONSTRUCTION (2012-2013) INLAND WATERS POLLUTION CONTROL (2014-2024) DVM UTILTIES, INC. (2024-)	<1,000,000
Carlo Torres	Lead Lateral Reinstatement Tech	LANZO CONSTRUCTION (2018-2022) D.V.M. UTILITIES, INC. (2022-)	<350,000
Jesus Ochoa	Lead TV Tech	INLAND WATERS POLLUTION CONTROL (2018-2024) DVM UTILITIES, INC. (2024-)	<400,000
Armando Ochoa	Lead Vactor Operator	LANZO CONSTRUCTION (2007-2014) UNITED RESOURCES (2014-2018) INLAND WATERS POLLUTION CONTROL (2018-2024) DVM UTILITIES, INC. (2024-)	<1,000,000

NASSCO - PACP, MACP, LACP Certifications:

Paul Torres – P0037788-052022 (PACP, MACP, LACP)
Jason McCoy - P0037789-052022 (PACP, MACP, LACP)
Carlo Torres – P0043119-06203 (PACP, MACP, LACP)
Jesus Ochoa - U-816-07004573 (PACP, MACP, LACP)
Mario Tribuzio – P0047811-0522024 (PACP, MACP, LACP)
Dalton Brown – P0039688-102022 (PACP, MACP, LACP)
Ulyses Medina – P0039321-092022 (PACP, MACP, LACP)
Aaron Pena – P005458-052025 (PACP, MACP, LACP)
Claudio Remierez – P0054469-052025 (PACP, MACP, LACP)

WINCAN

D.V.M. Utilities, Inc. is a certified user of WinCan, a NASSCO PACP certified inspection software. We currently have 6 licenses.

COMPLIANCE OFFICE
PURCHASING

SOLICITATION EVENT #000971 – PROPOSAL FORM

VENDOR NAME: D.V.M. Utilities, Inc.

VENDOR CONTACT: Karl J. Bates III

CONTACT PHONE: 248-930-8524

CONTACT EMAIL: Kbates@dvmutilities.com

DIRECTIONS: PLEASE SUBMIT YOUR RESPONSE TO EACH CATEGORY BELOW IN RED. SAVE THIS FILE IN THE FORMAT OF "000XXX ATT A - YOUR ENTITY NAME" AND UPLOAD TO THE BIDNET/MITN SYSTEM. VENDORS MUST SUBMIT ONLY ONE COMPLETE FILE FOR THIS PROPOSAL FORM (MULTIPLE FILES OF THE PROPOSAL WILL NOT BE ACCEPTED; IT MUST BE JUST ONE FILE). UPLOADED FILE MUST BE EITHER IN WORD FORMAT OR ADOBE PDF FORMAT.

RESPONSE:

Compensation rates – The rate list shall be submitted in a clear and organized format, in an Excel Spreadsheet for the years 2025, 2026, and 2027.

Note: All rates shall include mobilization, including drive time from the Contractor's ship to the job site, unless otherwise stipulated in the bidder's proposal.

Invoices will be based on agreed upon quantities between Contractor and WRC. All billable items including labor, equipment, materials, supplies, and subcontractor expense shall be authorized by WRC prior to invoicing. Rates shall include all necessary expenses to perform the work, including personal protective equipment and all safety equipment. No payment will be made for personal protective equipment items such as work gloves, boots, safety glasses, fall protection, gas detectors, clothing and any other personal protective equipment.

No additional payment will be made for any items needed to adhere to all local, State, and Federal Safety Standards.

1. Hourly Labor Rates: Supply a job classification rate sheet for all positions including shop, field and office that may be utilized for this contract. Regular, overtime, weekend, and holiday rates for each classification shall be provided, as applicable. If WRC determines the need to work 4 days, ten hours per day work weeks, overtime will not be considered for 10-hour workdays. The WRC staff

work schedule is generally Monday to Thursday from 6 AM to 4 PM for March to September and Monday to Friday from 7 AM to 3 PM for October to February.

See Attached Labor Rates

2. Equipment Rates: The rates shall include a tabulation of daily, weekly, and monthly rates for all Contractor supplied equipment. For bypass pumping, standby and online rates shall be provided. Fuel costs for pumping equipment shall be considered as part of the unit rate, unless otherwise indicated in the proposal. For bypassing piping, the total fee for any particular project should not exceed the original cost of said piping. As such, WRC will have the option of negotiating a buyback price or credit for long duration rentals of bypassing piping. The markup rate for equipment rented by the Contractor, along with a list of any anticipated rental equipment shall also be provided in the proposal.

See Attached Equipment Rates

3. Materials & Supplies: Fixed costs for materials and supplies shall be listed and tabulated in the proposal. Anticipated variable rate or project specific materials and supplies, including freight, shall also be listed in the proposal with the bidder's mark-up rate.

See Attached Materials & Supplies Rates

4. Subcontractor Expense and Rental Equipment: The mark-up rate for subcontractor expense, along with a list of any anticipated subcontractor activities.

Subcontractor: Mersino for Bypass Pumping, 5% mark-up rate.

5. Traffic Control: Provide daily, weekly, and monthly rates for traffic control.

See Attached Traffic Control Rates

6. Indicate whether they are willing to provide a discount for prompt payment of X% discount Net XX days.

.5% discount Net 15 days

CONTRACTOR: D.V.M. UTILITIES, INC.
PROJECT NAME: SEWER MAINTENANCE & REPAIR
OWNER: OAKLAND COUNTY WATER RESOURCES COMMISSION
WATERFORD, MI

DVM UTILITIES, INC.

LABOR RATES

15% MARKUP (INCLUDES OVERHEAD & PROFIT) APPLICABLE TO ALL RATES BELOW

Year 1 (2025-2026)

	CLASSIFICATION	Straight Time (ST)/Hr	Overtime (OT)/Hr	Double Time (DT)-Sunday & Holidays/Hr
Labor	Flagger/Traffic Control	$57.00	$74.00	$95.00
Labor	Sewer Rehabilitation Laborer	$59.00	$76.50	$98.50
Labor	Vactor/Jetter Operator	$69.00	$85.50	$107.00
Labor	Boiler Truck Operator	$70.00	$89.00	$108.00
Labor	CCTV Truck Operator	$71.50	$91.50	$110.00
Labor	Grout Truck Operator	$70.00	$90.00	$108.50
Labor	Sewer Rehab Foreman	$79.00	$106.00	$130.00
Labor	Heavy Equipment Mechanic	$94.00	$104.50	$136.00
Labor	Heavy Equipment Operator	$94.00	$104.50	$136.00
Labor	General Laborer	$62.50	$78.00	$95.50
Labor	Low-Boy Driver	$61.00	$77.00	$100.00
Labor	Field Supervisor	$100.00	$115.00	$155.00
Labor	Project Manager	$125.00	$140.00	$175.00

Year 2 (2025-2026)

	CLASSIFICATION	Straight Time (ST)/Hr	Overtime (OT)/Hr	Double Time (DT)-Sunday & Holidays/Hr
Labor	Flagger/Traffic Control	$59.00	$76.50	$99.75
Labor	Sewer Rehabilitation Laborer	$61.00	$79.00	$103.50
Labor	Vactor/Jetter Operator	$72.00	$89.00	$112.50
Labor	Boiler Truck Operator	$74.00	$93.50	$113.50
Labor	CCTV Truck Operator	$76.50	$95.00	$115.50
Labor	Grout Truck Operator	$75.00	$94.00	$114.00
Labor	Sewer Rehab Foreman	$83.00	$112.00	$148.00
Labor	Heavy Equipment Mechanic	$98.75	$110.00	$141.00
Labor	Heavy Equipment Operator	$98.75	$110.00	$141.00
Labor	General Laborer	$66.00	$82.00	$98.00
Labor	Low-Boy Driver	$64.00	$82.00	$105.00
Labor	Field Supervisor	$105.00	$121.00	$160.00
Labor	Project Manager	$130.00	$147.00	$180.00

Year 3 (2027-2028)

	CLASSIFICATION	Straight Time (ST)/Hr	Overtime (OT)/Hr	Double Time (DT)-Sunday & Holidays/Hr
Labor	Flagger/Traffic Control	$62.00	$78.00	$104.50
Labor	Sewer Rehabilitation Laborer	$64.00	$82.50	$109.00
Labor	Vactor/Jetter Operator	$75.00	$93.50	$118.00
Labor	Boiler Truck Operator	$78.00	$96.00	$119.00
Labor	CCTV Truck Operator	$79.50	$98.50	$121.00
Labor	Grout Truck Operator	$78.00	$97.00	$119.50
Labor	Sewer Rehab Foreman	$87.25	$118.00	$152.00
Labor	Heavy Equipment Mechanic	$104.00	$115.50	$148.00
Labor	Heavy Equipment Operator	$104.00	$115.50	$148.00
Labor	General Laborer	$60.50	$86.00	$103.00
Labor	Low-Boy Driver	$67.00	$89.25	$110.00
Labor	Field Supervisor	$110.00	$125.00	$165.00
Labor	Project Manager	$133.00	$150.00	$185.00

CONTRACTOR: D.V.M. UTILITIES, INC.
PROJECT NAME: SEWER MAINTENANCE & REPAIRS
OWNER: OAKLAND COUNTY WATER RESOURCES COMMISSIONER,
WATERFORD, MI

UTILITIES, INC.

EQUIPMENT RATES

HOURLY EQUIPMENT RATES (MAX CHARGE OF 8 HOURS)				
Make	Equipment Description	Year 1 (2025-2026)	Year 2 (2026-2027)	Year 3 (2027-2028)
15% MARKUP (INCLUDES OVERHEAD & PROFIT) APPLICABLE TO ALL RATES BELOW				
SEWER LINING, MANHOLE REHAB, GROUTING AND CLEANING EQUIPMENT				
Confined Space Entry Kit (Standard)	Sala Tripod, Blower & (4) gas monitor	$ 18.00	$ 19.00	$ 20.00
Misc. Bypass Equipment	Misc Sewer Plugs	$ 7.00	$ 8.00	$ 9.00
2" Gasoline Pump	Bypass/Re-Circulation	$ 17.00	$ 22.00	$ 26.00
4" Diesel Pump	Bypass/Re-Circulation	$ 45.00	$ 69.00	$ 55.00
6" Diesel Pump	Bypass/Re-Circulation	$ 55.00	$ 64.00	$ 69.00
8" Diesel Pump	Bypass/Re-Circulation	$ 90.00	$ 96.50	$ 100.00
CIPP Part Liner Packers	CIPP Sectional Liner Packers (4-10")	$ 20.00	$ 24.00	$ 27.00
Box Van	CIPP Lining Tool Support Truck/Trailer	$ 48.00	$ 50.50	$ 52.00
Vermeer PDM850	Trailer Mounted Vac	$ 50.00	$ 52.50	$ 55.00
Manhole Rehab	Trailer Mounted MH Rehab	$ 165.00	$ 173.25	$ 180.00
Sewer Equipment of America	Jetter Truck	$ 72.00	$ 75.00	$ 78.00
Vactor HXX	Hydro-Excavator	$ 170.00	$ 180.00	$ 190.00
Vactor 2100	SuperVac	$ 150.00	$ 157.50	$ 209.50
Cues	Standard Mainline CCTV	$ 130.00	$ 136.50	$ 145.00
Rush Overland 7M BTU	Water Boiler Truck	$ 175.00	$ 183.75	$ 188.00
Rush Overland 10M BTU	Water Boiler Truck	$ 175.00	$ 183.75	$ 188.00
Rush Overland 4M BTU	Steam Boiler Truck	$ 170.00	$ 178.50	$ 185.00
Rush Overland 8M BTU	Steam Boiler Truck w/ 375 Air Compressor	$ 175.00	$ 183.75	$ 188.00
CIPP Trailer Unit	2MM BTU Trailer Mounted Mobile Boiler	$ 140.00	$ 147.00	$ 160.00
Cues	Lateral Tap Cutter (Schwalm)	$ 150.00	$ 157.50	$ 164.00
Cues	Lateral Launch CCTV	$ 170.00	$ 178.50	$ 15.00
Cues	Grout Truck Mainline (With Packers)	$ 167.00	$ 189.00	$ 200.00
Telehandler	10,000 LB JCB Telehandler	$ 67.00	$ 70.00	$ 73.50
Telehandler	12,000 LB JCB Telehandler	$ 74.00	$ 78.00	$ 81.00
Foreman Truck	F-150/F-250	$ 20.00	$ 23.50	$ 26.00
EQUIPMENT ATTACHMENTS				
Allied	Hoepack for Mini Excavator	$ 18.00	$ 19.00	$ 20.00
Allied	Hammer for Mini Excavator	$ 18.00	$ 19.00	$ 20.00
AMI	18' Extendable Stick for Liebherr 245 Excavator	$ 48.00	$ 50.50	$ 53.00
MISC. EQUIPMENT				
Morbark Model 15	Wood Chipper	$ 50.00	$ 52.50	$ 55.00
Vermeer BC1000XL	Wood Chipper	$ 48.00	$ 50.50	$ 53.00
Godwin 6VSD	Chipper Truck	$ 48.00	$ 50.50	$ 53.00
Miller Bobcat 250	Welder	$ 7.00	$ 7.50	$ 8.00
McElroy TK80	Fusion Machine	$ 150.00	$ 157.50	$ 165.50
Finn 1500 G	Hydroseeder 1500 Gal	$ 102.00	$ 107.00	$ 112.50
Hydromax 500 G	Hydroseeder 1500 Gal	$ 18.00	$ 19.00	$ 20.00
EZ Screen 12000L	Topsoil Screen	$ 48.00	$ 50.50	$ 53.00
Less Than 5 KW	Generator	$ 6.00	$ 6.50	$ 7.00
25 KW	Generator	$ 22.00	$ 23.00	$ 24.50
60KW	Generator	$ 35.00	$ 36.00	$ 38.00
2" Centrifugal Pump	Gas powered water pump	$ 6.00	$ 6.50	$ 7.00
3" Centrifugal Pump	Gas powered water pump	$ 8.00	$ 8.50	$ 9.00
Wanco 25L/3T	Arrow Board	$ 10.00	$ 10.50	$ 11.00
Ingersoll Rand	185 CFM Air Compressor	$ 25.00	$ 26.25	$ 27.50
Ingersoll Rand	375 CFM Air Compressor	$ 28.00	$ 32.00	$ 34.50
Grove 28 Ton	Rough Terrain Crane	$ 150.00	$ 157.50	$ 165.50
Grove 30 Ton	Rough Terrain Crane	$ 160.00	$ 168.00	$ 177.00
JCB 550	Material Handler	$ 52.50	$ 56.00	$ 60.00
SHORING				
Pro Tec 8x10	Trench Box	$ 12.00	$ 12.50	$ 13.00
Pro Tec 6x8	Trench Box	$ 10.00	$ 10.50	$ 11.00
Pro Tec Man Hole 8x12	Trench Box	$ 12.00	$ 12.50	$ 13.00
Pro Tec 8 x20	Trench Box	$ 14.00	$ 15.00	$ 15.75
14'	Steel Sheeting	$ 1.00	$ 1.00	$ 1.05
20'	Steel Sheeting	$ 1.50	$ 1.50	$ 1.75
8'x10'	Steel Plate	$ 3.00	$ 3.00	$ 3.25
8'x20'	Steel Plate	$ 5.00	$ 5.00	$ 5.25
PZC 18	Steel Sheeting	$ 6.00	$ 6.00	$ 6.25
13' Diameter Ring Shaft	Ring Shaft Various Depths	$1.00 per vertical foot/day	$1.00 per vertical foot/day	$1.00 per vertical foot/day
HYDRO-EXCAVATION & POTHOLING EQUIPMENT				
Vactor HXX	Hydro-Excavator	$ 170.00	$ 180.00	$ 190.00
Vactor 2100	SuperVac	$ 150.00	$ 157.50	$ 209.50
CONCRETE/GROUT PUMPS				
Inter Shotcrete Pump	Cementitious/Geopolymer Pump	$ 80.00	$ 84.00	$ 90.00
Ridgway Cement Pump	Cellular Cement/Grout Pump	$ 100.00	$ 105.00	$ 110.25
LOADERS				
CAT 289D3	Skidsteer	$ 40.00	$ 42.00	$ 44.00
Case 580	Backhoe	$ 48.00	$ 50.50	$ 53.00
Caterpillar 420 D	Backhoe	$ 48.00	$ 50.50	$ 53.00
Caterpillar 420 F	Backhoe	$ 52.00	$ 54.50	$ 57.25
Caterpillar 924 G	Front End Loader	$ 72.00	$ 75.50	$ 79.25
Caterpillar 930 G	Front End Loader	$ 90.00	$ 94.50	$ 99.25

Caterpillar 950	Front End Loader	$ 100.00	$ 105.00	$ 110.25
Caterpillar 966	Front End Loader	$ 105.00	$ 110.25	$ 115.75
Ingersoll Rand W1 8X3	Front End Loader	$ 52.00	$ 54.50	$ 57.25
Komatsu WA 150	Front End Loader	$ 65.00	$ 68.25	$ 72.00
Komatsu WA 200	Front End Loader	$ 72.00	$ 76.00	$ 80.00
Komatsu WA 320	Front End Loader	$ 100.00	$ 105.00	$ 110.25
Komatsu WA 380	Front End Loader	$ 105.00	$ 110.25	$ 115.75
EXCAVATORS				
Caterpillar 301.7	Mini Excavator	$ 41.00	$ 43.00	$ 45.25
Caterpillar 304	Mini Excavator	$ 45.00	$ 47.25	$ 49.50
Caterpillar 305	Mini Excavator	$ 47.00	$ 49.00	$ 51.50
Caterpillar 305.5	Mini Excavator	$ 50.00	$ 52.50	$ 55.00
John Deere 35 ZTS	Mini Excavator	$ 45.00	$ 47.25	$ 49.50
Case 210	Excavator	$ 125.00	$ 131.25	$ 138.00
LinkBelt 80 Spin Ace	Excavator	$ 90.00	$ 94.50	$ 99.50
LinkBelt 135 Spin Ace	Excavator	$ 96.00	$ 102.00	$ 107.00
LinkBelt 145 Spin Ace	Excavator	$ 105.00	$ 110.25	$ 116.00
LinkBelt 160 X3	Excavator	$ 120.00	$ 126.00	$ 132.00
LinkBelt 235 X3	Excavator	$ 165.00	$ 173.25	$ 182.00
LinkBelt 330 LX	Excavator	$ 198.00	$ 208.00	$ 218.50
CAT 330	Excavator	$ 225.00	$ 236.25	$ 248.00
CAT 349	Excavator	$ 270.00	$ 283.50	$ 300.00
VARIOUS EQUIPMENT TRAILERS				
10 Ton	Equipment Trailer	$ 23.50	$ 25.00	$ 26.25
20-25 Ton	Equipment Trailer	$ 31.00	$ 32.50	$ 34.50
Rolling Star	Fiber Optic Trailer	$ 72.00	$ 76.00	$ 80.00
Less Than 8 Ton	Equipment Trailer	$ 16.00	$ 17.00	$ 18.00
VARIOUS TRUCKS				
3/4 T Pick Up	Pick Up Truck	$ 22.00	$ 28.00	$ 30.00
Rhodes Steel Quad w/ Tractor	Steel Quad 28 CYD	$ 138.00	$ 145.00	$ 152.25
Tandem Axle Dumptruck	End Dump	$ 108.00	$ 113.50	$ 120.00
Tri Axle Dumptruck	End Dump	$ 115.00	$ 120.75	$ 127.00
Mac Aluminum Train w/ Tractor	Gravel Train Alcoa	$ 162.00	$ 170.00	$ 178.50
Ford F550	2 CYD End Dump	$ 45.00	$ 47.25	$ 50.00
Ford F550	Mechanic Service Truck	$ 55.00	$ 57.75	$ 60.50
Altec	Digger Derrick	$ 92.00	$ 96.50	$ 101.50
Lowboy w/ Tractor	55T Lowboy	$ 150.00	$ 157.50	$ 165.50
Ford 9000	4000 Gallon Water Truck	$ 78.00	$ 82.00	$ 86.00
Altec T40	40' Aerial Cable Placement Truck	$ 96.00	$ 101.00	$ 106.00
Altec/Terex	Bucket Truck	$ 66.00	$ 70.00	$ 73.50
HORIZONTAL DIRECTIONAL DRILLING EQUIPMENT				
DigiTrak F5/F2	Utility Locator	$ 18.00	$ 19.00	$ 20.00
Ditch Witch Utility Guard	Utility Locator	$ 6.00	$ 7.00	$ 7.50
Vermeer CT750 w/ Truck	Mixing System	$ 75.00	$ 78.75	$ 83.00
KernTron Tango 350	Mixing Plant	$ 90.00	$ 94.50	$ 100.00
American Augers MP3 6080	600 GPM Mud Recycling Plant	$ 390.00	$ 409.50	$ 430.00
American Augers D09	Directional Drill	$ 180.00	$ 189.00	$ 200.00
American Augers D025	Directional Drill	$ 120.00	$ 126.00	$ 132.50
American Augers D0110	Directional Drill	$ 270.00	$ 283.50	$ 300.00
American Augers D0220	Directional Drill	$ 540.00	$ 567.00	$ 595.00
Ditch Witch JT9	Directional Drill	$ 96.00	$ 101.00	$ 106.00
Vermeer 10x15	Directional Drill	$ 100.00	$ 105.00	$ 110.25
Vermeer 20x22	Directional Drill	$ 108.00	$ 113.50	$ 120.00
Vermeer 23x30	Directional Drill	$ 115.00	$ 120.75	$ 127.00
Vermeer 24x40	Directional Drill	$ 120.00	$ 126.00	$ 132.50
Vermeer 36x50	Directional Drill	$ 180.00	$ 189.00	$ 198.50
Vermeer 40x55	Directional Drill	$ 200.00	$ 210.00	$ 220.50
Vermeer 60x90	Directional Drill	$ 218.00	$ 230.00	$ 241.50
Vermeer 80x120	Directional Drill	$ 234.00	$ 246.00	$ 257.25
8" Water Transfer Pump	Directional Drill	$ 54.00	$ 57.00	$ 60.00
DOZERS				
Caterpillar D4 II XL	Bulldozer	$ 75.00	$ 78.75	$ 83.00
John Deere 450E	Bulldozer	$ 70.00	$ 73.50	$ 78.00
PAVING EQUIPMENT				
Carlson Paver	8' Asphalt Paver	$ 85.00	$ 89.25	$ 94.00
Bruce RC 350 Sweeper	Broom Tractor	$ 46.50	$ 49.00	$ 51.50
Ingersoll Rand	Asphalt Roller	$ 45.00	$ 47.25	$ 50.00
GH Industries KM8000	Asphalt Hotbox	$ 30.00	$ 31.50	$ 33.00
Bobcat	24" Road Planer	$ 40.00	$ 42.00	$ 44.00
PILOT TUBE GUIDED AUGER BORING				
Akkerman	Akkerman 4800 Pilot Tube Guided Boring Package	$ 480.00	$ 504.00	$ 529.00
Akkerman	Akkerman 3000 Pilot Tube Guided Boring Package	$ 420.00	$ 441.00	$ 460.00
Akkerman	24" GPS Cutting Head	$ 50.00	$ 52.50	$ 55.00
Mincon	Mincon Rock Hammer	$ 50.00	$ 52.50	$ 55.00
PIPE JACKING EQUIPMENT				
Akkerman	Akkerman 4800 Pilot Tube Guided Boring Package	$ 480.00	$ 504.00	$ 529.00
Akkerman	36" GPS Cutting Head	$ 85.00	$ 89.25	$ 95.00
PIPE BURSTING & RAMMING				
Hammerhead Mole	HB 100XT (100 Ton Static Pipe Burst Machine)	$ 200.00	$ 210.00	$ 220.50
Hammerhead Mole	20" Pipe Ramming Package	$ 175.00	$ 183.75	$ 193.00
TUNNEL BORING MACHINE				
Akkerman	Akkerman TBM Model 5300	$ 1,000.00	$ 1,050.00	$ 1,100.00

CONTRACTOR: D.V.M. UTILITIES, INC.
PROJECT NAME: SEWAGE DISPOSAL SYSTEM MAINT. & REPAIRS
OWNER: OAKLAND COUNTY WATER RESOURCES COMMISSIONER, WATERFORD, MI

DVM UTILITIES, INC.

MANHOLE REHABILITATION

Geopolymer Mortars

Product	Packaging	Unit Price
Corrosion Resistant Geopolymer Mortar	50lb bags, 56 bags per pallet, 728 bags/truckload qty	$ 47.00

Hybrid Cements

Product	Packaging	Unit Price
Manhole Liner Cement-Based Mortar	50lb bags, 56 bags per pallet, 728 bags/truckload qty	$ 30.25
Calcium aluminate Manhole Liner Material	50lb bags, 56 bags per pallet, 728 bags/truckload qty	$ 52.25

Cement Patching Materials

Product	Packaging	Unit Price
Rapid Set Patching Cement	50lb bags, 56 bags per pallet, 728 bags/truckload qty.	$ 46.25
Rapid Set Patching Cement	50lb pails, 36 pails per pallet, 828 pails/truckload qty.	$ 52.00
Accelerated Rapid Set Patching Cement	50lb pails, 36 pails per pallet, 828 pails/truckload qty.	$ 53.50
Hydraulic Water Stop Cement	50lb pails, 36 pails per pallet, 828 pails/truckload qty.	$ 48.00
High-Strength, Quick Setting Street Rehabilitation Mortar	1000lb bags, 2 bags per pallet, 42 bags/truckload qty.	$ 345.25
Hydraulic Water Stop Cement	50lb pails, 36 pails per pallet, 828 pails/truckload qty.	$ 56.75
Fiber-reinforced Calcium Aluminate	50lb pails, 36 pails per pallet, 828 pails/truckload qty.	$ 59.25

100% Solids Epoxy Coatings

Product	Packaging	Unit Price
100% Solids Protective Epoxy Coating 156 Gallon Kit	55 gallon drums (Note: unit price per gallon)	$ 85.75
100% Solids NSF-61 Approved Epoxy Coating	55 gallon drums (Note: unit price per gallon)	$ 93.50
100% Solids Epoxy Urethane Hybrid Coating Flexible Coating	55 gallon drums (Note: unit price per gallon)	$ 110.00
100% Solids, Quick Spray Epoxy	4 gallon kit	$ 390.50

Grout

Product	Packaging	Unit Price
AV-202, Hydrophilic Polyurethane Foam (Crack Injection and Pipe Penetrations)	(Note: Unit price per gallon, 5 gallon minimum)	$ 138.00
Oakum, Oakum Jute Rope	(Note: Units price per foot, 25 foot minimum)	$ 3.50

CONTRACTOR: D.V.M. UTILITIES, INC.
PROJECT NAME: SEWAGE DISPOSAL SYSTEM MAINT. & REPAIRS
OWNER: OAKLAND COUNTY WATER RESOURCES COMMISSIONER, WATERFORD, MI

MAINLINE SEWER GROUTING

Product	Unit Price/Gallon Pumped
AV-100/AV-101/AV-102	$25.00

CONTRACTOR: D.V.M. UTILITIES, INC.
PROJECT NAME: SEWAGE DISPOSAL SYSTEM MAINT. & REPAIRS
OWNER: OAKLAND COUNTY WATER RESOURCES COMMISSIONER, WATERFORD, MI

CIPP MH LINING

Brand	Product	DIA	Unit Price/VFT.
Alt-Liner	CIPM 58 Series Liner	48"	$ 320.00
Alt-Liner	CIPM 58 Series Liner	60"	$ 380.00
Alt-Liner	CIPM 58 Series Liner	70"	$ 550.00

CONTRACTOR: D.V.M. UTILITIES, INC.
PROJECT NAME: SEWAGE DISPOSAL SYSTEM MAINT. & REPAIRS
OWNER: OAKLAND COUNTY WATER RESOURCES COMMISSIONER, WATERFORD, MI

DVM UTILITIES, INC.

CIPP END SEALS

Brand	Product	Diameter Inches	Description	Unit Price/Ea.
LMK Technologies	Insigna End Seals	6	360 Degree Swelling Gasket	$ 155.00
LMK Technologies	Insigna End Seals	8	360 Degree Swelling Gasket	$ 186.00
LMK Technologies	Insigna End Seals	10	360 Degree Swelling Gasket	$ 210.00
LMK Technologies	Insigna End Seals	12	360 Degree Swelling Gasket	$ 233.00
LMK Technologies	Insigna End Seals	15	360 Degree Swelling Gasket	$ 264.00
LMK Technologies	Insigna End Seals	18	360 Degree Swelling Gasket	$ 295.00
LMK Technologies	Insigna End Seals	21	360 Degree Swelling Gasket	$ 412.00
LMK Technologies	Insigna End Seals	24	360 Degree Swelling Gasket	$ 443.00
LMK Technologies	Insigna End Seals	27	360 Degree Swelling Gasket	$ 513.00
LMK Technologies	Insigna End Seals	30	360 Degree Swelling Gasket	$ 551.00
LMK Technologies	Insigna End Seals	33	360 Degree Swelling Gasket	$ 583.00
LMK Technologies	Insigna End Seals	36	360 Degree Swelling Gasket	$ 614.00
LMK Technologies	Insigna End Seals	42	360 Degree Swelling Gasket	$ 715.00
LMK Technologies	Insigna End Seals	48	360 Degree Swelling Gasket	$ 814.00
LMK Technologies	Insigna End Seals	54	360 Degree Swelling Gasket	$ 1,095.00
Sika	Hydrotite CJ		Hydrophilic Strip Applied Waterstop - Note: Unit Price per 32ft roll.	$ 400.00

CONTRACTOR: D.V.M. UTILITIES, INC.
PROJECT NAME: SEWAGE DISPOSAL SYSTEM MAINT. & REPAIRS
OWNER: OAKLAND COUNTY WATER RESOURCES COMMISSIONER, WATERFORD, MI

VERICURE CIPP CURING MONITORING SYSTEM

Product	Description	Unit Price
VeriCure	Curing monitoring system built around fiber optic distriputed temperature sending technology.	$1.50
		Note- Unit Price per Foot

CONTRACTOR: D.V.M. UTILITIES, INC.
PROJECT NAME: SEWAGE DISPOSAL SYSTEM MAINT. & REPAIRS
OWNER: OAKLAND COUNTY WATER RESOURCES COMMISSIONER, WATERFORD, MI

UTILITIES, INC.

Filled Polyester Resin Wet Liner

Inches | Filled Resin

Estimated Finished (mm)	4.5	6	7.5	9	10.5	12	13.5	15	16.5	18	19.5	21	22.5	24	25.5	27	28.5	30.0
Diameter (in)																		
6"	$10.75																	
8"	$12.25	$14.75	$17.50															
10"	$15.00	$18.25	$21.25	$23.75														
12"		$21.50	$24.75	$28.00	$31.50													
15"		$27.50	$31.00	$35.00	$38.75	$44.25	$48.75											
18"			$38.50	$44.00	$48.25	$54.25	$59.25	$65.50	$71.00									
21"				$52.75	$58.25	$64.75	$70.00	$76.75	$84.00	$89.75	$97.75							
24"				$62.50	$69.00	$74.75	$81.25	$87.75	$94.75	$101.00	$108.25	$116.50	$124.25					
27"					$77.25	$83.50	$93.00	$99.50	$107.00	$114.25	$121.75	$128.75	$138.00	$145.50	$155.00			
30"					$86.75	$93.50	$102.50	$109.25	$119.00	$125.50	$134.50	$142.00	$151.25	$161.75	$170.00	$182.50	$187.50	$190.00
33"					$95.50	$100.75	$111.00	$121.50	$130.25	$138.25	$148.00	$156.25	$165.75	$176.25	$186.00	$195.75	$199.25	$208.00
36"					$104.00	$112.00	$123.75	$133.25	$141.50	$152.00	$160.50	$170.75	$180.00	$189.50	$204.00	$211.75	$216.00	$223.00

CONTRACTOR: D.V.M. UTILITIES, INC.

PROJECT NAME: SEWAGE DISPOSAL SYSTEM MAINT. & REPAIRS

OWNER: OAKLAND COUNTY WATER RESOURCES COMMISSIONER, WATERFORD, MI

DVM UTILITIES, INC.

Envirocure CIPP Liner

Filled Resin

Estimated Finished (mm)	4.5	6	7.5	9	10.5	12	13.5	15	16.5	18	19.5	21	22.5	24	25.5	27	28.5
Diameter (in)																	
6"	$12.00																
8"	$13.75	$16.00	$18.50														
10"	$16.75	$20.50	$23.75	$26.50													
12"		$24.00	$27.50	$31.25	$35.25												
15"		$30.75	$34.75	$39.00	$43.25	$49.50	$54.50										
18"			$44.00	$49.00	$55.75	$60.75	$66.25	$79.25	$79.25								
21"				$58.75	$69.00	$72.20	$78.25	$85.75	$94.00	$100.25	$108.25						
24"				$69.75	$77.33	$82.25	$90.75	$98.00	$109.75	$122.75	$121.00	$130.00	$138.50				
27"					$86.25	$93.25	$103.50	$121.00	$119.90	$127.50	$134.00	$148.75	$154.00	$160.50	$170.00		
30"					$97.00	$104.50	$114.25	$123.00	$133.00	$141.25	$150.25	$158.50	$169.00	$180.50	$194.25	$200.75	$210.00
33"					$106.50	$112.25	$126.25	$135.50	$145.50	$155.50	$165.00	$174.50	$185.00	$196.75	$207.75	$218.50	$228.75
36"					$116.25	$125.00	$138.25	$148.75	$158.00	$169.50	$180.25	$190.75	$201.00	$211.50	$224.50	$236.50	$249.00

CONTRACTOR: D.V.M. UTILITIES, INC.
PROJECT NAME: SEWAGE DISPOSAL SYSTEM MAINT. & REPAIRS
OWNER: OAKLAND COUNTY WATER RESOURCES COMMISSIONER'S, PONTIAC, MI

6"	$15.00	$18.00								
8"	$18.00	$20.00								
10"	$22.00	$27.00								
12"	$29.00	$32.00	$37.00							
15"	$38.00	$39.00	$50.00							
18"	$48.00	$47.00	$65.00							
21"	$58.00	$57.00	$80.00							
24"		$68.00	$95.00	$97.00						
27"		$78.00	$110.00	$112.00						
30"		$88.00	$125.00	$128.00						
33"		$98.00	$140.00	$143.00						
36"		$108.00	$155.00	$158.00	$161.00					
39"		$118.00	$170.00	$173.00	$176.00					
42"		$128.00	$185.00	$188.00	$191.00					
45"		$138.00	$200.00	$203.00	$206.00					
48"		$148.00	$215.00	$218.00	$221.00	$224.00	$227.00			
51"		$158.00	$230.00	$233.00	$236.00	$239.00	$242.00			
54"		$168.00	$245.00	$248.00	$251.00	$254.00	$257.00	$260.00		
60"		$188.00	$275.00	$278.00	$281.00	$284.00	$287.00	$290.00	$293.00	
66"		$208.00	$305.00	$308.00	$311.00	$314.00	$317.00	$320.00	$323.00	$326.00
72"		$228.00	$335.00	$338.00	$341.00	$344.00	$347.00	$350.00	$353.00	$356.00

SHAFT AND QUANTITY INFORMATION			
Diameter	Pipe Length	Shafts / Shafts Size	Shafts Feet
6"	100'	36" Standard (84" x 36" x 48")	3600.00
8"	100'	48" Standard (84" x 36" x 48")	3600.00
8"	100'	Super Crane (84" wide x 4.5'	3600.00
10"	100'	48" Standard (84" x 48" x 48")	3600.00
10" (with 8" liner)	100'	36" Standard (84" x 36" x 48")	3600.00
12" (with 10" liner)	100'	72" Circle (84" x 72" x 48"	3675.75
12"	100'	72" Circle (84" x 72" x 48"	3675.75
15"	100'	72" Circle (84" x 72" x 48"	3675.75
18"	100'	72" Circle (84" x 72" x 48"	3675.75
21"	100'	72" Circle (84" x 72" x 48"	3675.75
24"	100'	72" Circle (84" x 72" x 48"	3675.75
27"	100'	72" Circle (84" x 72" x 48"	3675.75
30"	100'	72" Circle (84" x 72" x 48"	3675.75

CONTRACTOR: D.V.M. UTILITIES, INC.
PROJECT NAME: SEWAGE DISPOSAL SYSTEM MAINT. & REPAIRS
OWNER: OAKLAND COUNTY WATER RESOURCES COMMISSIONER, WATERFORD, MI

CIPP SECTIONAL LINER

Ambient Cure
Resin Definitions - Ambient Cure
Pre-Measured Two Part: (A) Water Glass and (B) Ambient Cure Silicate Resin System

Length	24"	48"
Diameter		
3"	$297.00	$385.00
4"	$330.00	$429.00
6"	$396.00	$594.00
8"	$462.00	$660.00
10"	$528.00	$726.00
12"	$660.00	$792.00
15"	$858.00	$990.00
18"	$935.00	$1,045.00
24"	$1,100.00	$1,320.00
30"		$1,486.00
36"		$1,650.00
42"		$1,787.00
48"		$2,007.00
60"		$2,750.00
72"		$3,355.00

CONTRACTOR: D.V.M. UTILITIES, INC.
PROJECT NAME: SEWER MAINTENANCE & REPAIRS
OWNER: OAKLAND COUNTY WATER RESOURCES COMMISSIONER,
WATERFORD, MI

UTILITIES, INC.

TRAFFIC CONTROL EQUIPMENT & LABOR

EQUIPMENT RATES (LIMITED TO 8 HOURS PER DAY)				
Make	Equipment Description	Year 1 (2025-2026)	Year 2 (2026-2027)	Year 3 (2027-2028)
15% MARKUP (INCLUDES OVERHEAD & PROFIT) APPLICABLE TO ALL RATES BELOW				
SEWER LINING, MANHOLE REHAB, GROUTING AND CLEANING EQUIPMENT				
Traffic Control Truck	F-150/F-250	$ 20.00	$ 23.50	$ 26.00
Flat Bed Truck	Stake Body Flat Bed	$ 35.00	$ 38.00	$ 41.00
Wanco Three Line Message Sign	Portable Chargeable Message Sign	$ 35.00	$ 38.00	$ 42.50
Wanco 35LGT	Arrow Board	$ 10.00	$ 10.50	$ 11.00
Misc. Traffic Control Devices	Barrels, Barrel Cones, Signs (PER DAY)	$ 500.00	$ 515.00	$ 525.00

NOTE: SEE DVM LABOR RATES FOR TRAFFIC CONTROL TECHNICIANS

#0000000971 - Sewage Disposal System Maint. & Repairs	Supplier #1	Advanced Rehabilitation	Supplier #2	Advanced Underground	Supplier #3	DVM Utilities	Supplier #4	Dukes Root	Supplier #5	J & J Environmental	Supplier #6	Pipeline Management	Supplier #7	SAK Construction	Supplier #8	Smiths Waterproofing
Required Forms and Information Pass/Fail	YES/NO	Notes:	YES/NO	Notes:	YES/NO	Notes:	YES/NO	Notes:	YES/NO	Notes:	YES/NO	Notes:	YES/NO	Notes:	YES/NO	Notes:
1) Completed Supplier Profile																
2) Signed Act 517 Form																
3) References Provided																
Requirements Met?																
Minimum Qualifications Pass/Fail																
Minimum Qualifications Met?																
Preferred Qualifications Pass/Fail																
Preferred Qualifications Met?																
Pre-Proposal Conference Site Visit																
Attend Mandatory Pre-Proposal Conference Site Visit (If Applicable)																
Other Required Forms/Documentation																

#00000000971 - Sewage Disposal System Maint. & Repairs

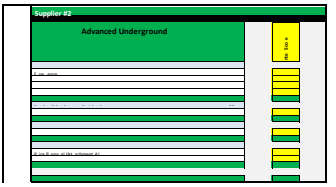
References

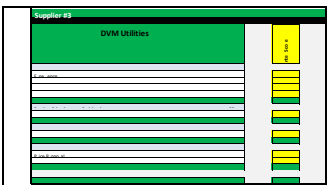
	Reference 1	Reference 2	Reference 3	Reference 4	Reference 5
Advanced Rehabilitation					
Advanced Underground					
DVM Utilities					
Dukes Root					
J & J Environmental					
Pipeline Management					
SAK Construction LLC					
Smiths Waterproofing					

Supplier #1

Evaluation Criteria	Weight	Score
Advanced Rehabilitation		Enter Score
Scoring Criteria from Solicitation	**25**	
Experience		3.00
		0.00
		0.00
		0.00
	Subtotal	**3.00**
Scoring Criteria from Solicitation	**25**	
References (Section 2.2)		1.00
	Subtotal	**1.00**
Scoring Criteria from Solicitation	**25**	
Qualifications		3.00
	Subtotal	**3.00**
Additional Point, if Applicable	**25**	
Price Proposal		3.00
		0.00
	Subtotal	**3.00**
	Supplier Totals	**10.00**

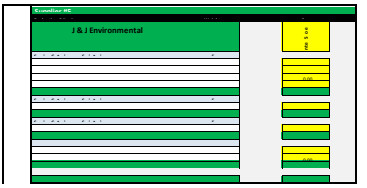
Description	Rating
Understood request and excellent response	5
Understood request and good response	4
Understood request and reasonable response	3
Understood request and poor response	2
Misunderstood request and wrong response	1
No Response	0

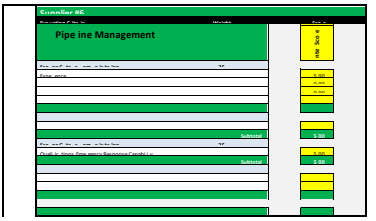

Supplier #2
Advanced Underground


Supplier #3
DVM Utilities

Supplier #4		
Evaluation Criteria	Weight	Score
Dukes Root		Enter Score
Scoring Criteria from Solicitation	25	
Experience		5.00
		0.00
		0.00
		0.00
Subtotal:		5.00
Scoring Criteria from Solicitation	25	
References		5.00
Subtotal:		5.00
Scoring Criteria from Solicitation	25	
Qualifications/Emergency Response Capability		5.00
Subtotal:		5.00
Additional Point, If Applicable	25	
Price Proposal		5.00
		0.00
Subtotal:		5.00
Supplier Totals		20.00

Description	Rating
Understood request and excellent response	5
Understood request and good response	4
Understood request and reasonable response	3
Understood request and poor response	2
Misunderstood request and wrong response	1
No Response	0


J & J Environmental


Example #6
Pipe ine Management

Supplier #7

SAK Construction		[illegible] Score
Experience		5.00
		0.00
		0.00
	Subtotal	5.00
Qualifications Emergency Response Capability		4.00
	Subtotal	4.00

[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]

Supplier #8		
Evaluation Criteria	Weight	Enter Score
Smiths Waterproofing		
Scope Criteria from Solicitation	25	
Experience		
		0.00
Subtotal		5.00
Scope Criteria from Solicitation	25	
References		5.00
Subtotal		5.00
Scope Criteria from Solicitation	25	
Qualifications Emergency Response Capability		5.00
Subtotal		5.00
Price Proposal		4.00
		19.00

Description	Rating
	5
Understood request and reasonable response	3
	2
Misunderstood request and wrong response	1
No Response	0

#00000000971 - Sewage Disposal System Maint. & Repai		Advanced Rehabilitation		Advanced Underground	
Evaluation Criteria	**Weight**				
		Points	**Score**	**Avg. Pts.**	**Score**
Scoring Criteria from Solicitation	**25**	3.00	18.75	3.00	18.75
Experience					
	Totals	**Points**	**Score**	**Avg. Pts.**	**Score**
Scoring Criteria from Solicitation	**25**	1.00	6.25	3.00	18.75
References (Section 2.2)					
	Totals	**Points**	**Score**	**Avg. Pts.**	**Score**
Scoring Criteria from Solicitation	**25**	3.00	18.75	3.00	18.75
Qualifications/Emergency Response Capability					
	Totals	**Points**	**Score**		**Score**
Additional Point, if Applicable	**25**	3.00	18.75	3.00	18.75
Price Proposal					
Total Points 100			**62.50**		**75.00**

OAKLAND COUNTY MICHIGAN
PURCHASING

OAKLAND COUNTY EXECUTIVE DAVID COULTER

Aaron F. Wagner, Chief Procurement Officer
(248) 858-5484 | wagneraf@oakgov.com

Bid Event #: 0000000971 Event Title: Sewage Disposal System Maint. & Repair

Internal County Employee or Official Evaluation Team Member Confidentiality Agreement and Declaration of Impartiality

I understand that the County considers the bid evaluation process to be confidential. I agree not to discuss or disclose information regarding the bid solicitation or any content within the bid documents, except to fairly and impartially review the bids.

I declare that, to the best of my knowledge, I can evaluate the bid responses in an unbiased, independent, and impartial manner.

- There is no real or apparent conflict of interest between me and any of the bid respondents that would interfere with my ability to objectively review, evaluate, and make recommendations regarding the bids submitted.
- I do not have business, family or financial interests, or connections with any of the bid respondents.
- I will not derive any tangible personal benefits from the bid respondents.
- My immediate family members and/or my partner do not work for, have a financial or other interest in, or derive tangible personal benefits from any of the bid respondents.
- My personal opinions will not impair my ability to impartially evaluate the proposal for the work solicited in this event.

I have read ***Standards of Conduct for Oakland County Officers and Employees*** and the ***Request for Proposal (RFP) Evaluation Team Handbook.*** I will conform to the standards when evaluating the bid responses.

If, during the bid evaluation process, I become aware of new information that would cause me or others to question my impartiality or to breach confidentiality, I will report the issue to the Buyer assigned to this event.

Evaluator's Name: Karen Warren

Signature: K Warren Date 8/19/25

Department: Sewer Operations & Maintenance

Email: warrenk@oakgov.com Phone #: 248-431-3828

Information for Evaluation Team Members

Evaluation Team members should review the ***Request for Proposal (RFP) Evaluation Team Handbook.*** The Handbook provides an overview of the evaluation process and your role.

The Evaluation Team is responsible for the fair and impartial evaluation of bid responses to select the vendor(s) who will perform services for the County. The Team is responsible for following and documenting County procedures.

Process Reminders (See the RFP Evaluation Team Handbook for the detailed procedure)

- Limit discussions of the bids and evaluation process to fellow Evaluation Team members during the evaluation process.
- Do not discuss bids or the evaluation process with the vendor.
- The Buyer is the chair of the Evaluation Team, and the facilitator of the bid evaluation process.
- All questions about the process should be directed to the Buyer.
- Questions from vendors about the bid solicitation should be directed to the Buyer to ensure a fair and competitive process. Under no circumstance should an Evaluation Team Member speak to a vendor about a bid that has not been awarded.
- The scoring criteria and weights were determined by the Buyer and requesting department before the RFP was released. These cannot be changed. The criteria and weights are included in any evaluation forms you are provided.
- The evaluation process – scoring methodology, pre-qualifying bidders, interview process, etc. – was established by the Buyer and the requesting department before the RFP was released, and cannot be changed during the evaluation process.
- Score each bid response against the scoring criteria rather than against other bid responses.
- All documents generated by the evaluation process, including the Evaluation Team's scoring matrices and your personal notes are subject to Freedom of Information Act requests.
- A Team Member may be replaced if he or she has a conflict of interest or cannot be impartial.
- A Team Member may ask to be replaced at any time if he/she cannot fulfill the responsibilities and obligations of the Evaluation Team.

#00000000971 - Sewage Disposal System Maint. & Repairs	Supplier #1	Advanced Rehabilitation	Supplier #2	Advanced Underground	Supplier #3	DVM Utilities	Supplier #4	Dukes Root	Supplier #5	J & J Environmental	Supplier #6	Pipeline Management	Supplier #7	SAK Construction	Supplier #8	Smiths Waterproofing
Required Forms and Information Pass/Fail	YES/NO	Notes:	YES/NO	Notes:	YES/NO	Notes:	YES/NO	Notes:	YES/NO	Notes:	YES/NO	Notes:	YES/NO	Notes:	YES/NO	Notes:
1) Completed Supplier Profile	NO		YES		YES		YES		YES		YES		YES		YES	
2) Signed Act 517 Form	NO		YES		YES		YES		YES		YES		YES		YES	
3) References Provided	NO	Are we missing pages from them?	YES		YES		YES		YES		YES		YES		YES	
Requirements Met?	NO	I'd really like to have another lining contractor	YES		YES		YES		YES		YES		YES		YES	
Minimum Qualifications Pass/Fail																
Minimum Qualifications Met?																
Preferred Qualifications Pass/Fail																
Preferred Qualifications Met?																
Pre-Proposal Conference Site Visit																
Attend Mandatory Pre-Proposal Conference Site Visit (If Applicable)																
Other Required Forms/Documentation																

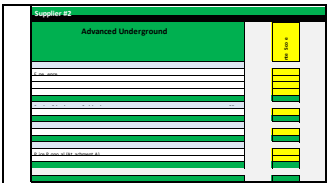
#00000000971 - Sewage Disposal System Maint. & Repairs

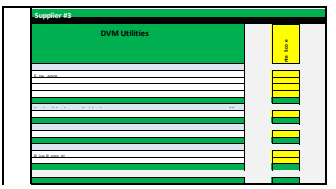
References

	Reference 1	Reference 2	Reference 3	Reference 4	Reference 5
Advanced Rehabilitation					
Advanced Underground					
DVM Utilities					
Dukes Root					
J & J Environmental					
Pipeline Management					
SAK Construction LLC					
Smiths Waterproofing					

Supplier #1		
Evaluation Criteria	**Weight**	**Score**
Advanced Rehabilitation		Enter Score
Scoring Criteria from Solicitation	**25**	
Experience		0.00
		0.00
		0.00
		0.00
Subtotal		**0.00**
Scoring Criteria from Solicitation	**25**	
References (Section 2.2)		0.00
Subtotal		**0.00**
Scoring Criteria from Solicitation	**25**	
Qualifications		2.00
Subtotal		**2.00**
Additional Point, if Applicable	**25**	
Price Proposal		4.00
		0.00
Subtotal		**4.00**
Supplier Totals		**6.00**

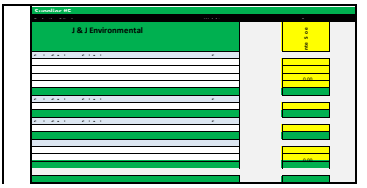
Description	Rating
Understood request and excellent response	5
Understood request and good response	4
Understood request and reasonable response	3
Understood request and poor response	2
Misunderstood request and wrong response	1
No Response	0

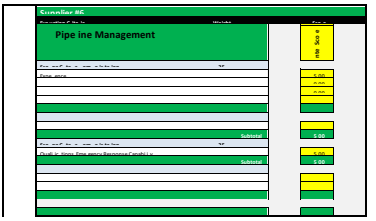

Supplier #2
Advanced Underground


Supplier #3
DVM Utilities

Supplier #4		
Evaluation Criteria	Weight	Score
Dukes Root		Enter Score
Scoring Criteria from Solicitation	25	
Experience		5.00
		0.00
		0.00
		0.00
Subtotal:		5.00
Scoring Criteria from Solicitation	25	
References		5.00
Subtotal:		5.00
Scoring Criteria from Solicitation	25	
Qualifications/Emergency Response Capability		5.00
Subtotal:		5.00
Additional Point, If Applicable	25	
Price Proposal		4.00
		0.00
Subtotal:		4.00
Supplier Totals		19.00

Description	Rating
Understood request and excellent response	5
Understood request and good response	4
Understood request and reasonable response	3
Understood request and poor response	2
Misunderstood request and wrong response	1
No Response	0


J & J Environmental


Example #6
Pipe ine Management

Supplier #7

[illegible]	[illegible]	[illegible]
SAK Construction		[illegible] Sco[illegible]e
[illegible]	[illegible]	
Exp[illegible]ence		5.00
		0.00
		0.00
	Subto[illegible]al	5.00
[illegible]	[illegible]	
Qual[illegible]cations Eme[illegible]ency Response Cap[illegible]b[illegible]l[illegible]ty		5.00
	Subto[illegible]al	5.00

[illegible]	[illegible]
Unde[illegible] [illegible] [illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]

Supplier #8		
Evaluation Criteria	Weight	
Smiths Waterproofing		Enter Score
Scope Criteria from Solicitation	25	
Experience		
		0.00
	Subtotal	4.00
Scope Criteria from Solicitation	25	
References		4.00
	Subtotal	4.00
Scope Criteria from Solicitation	25	
Qualifications Emergency Response Capability		5.00
	Subtotal	5.00
Price Proposal		4.00
		17.00

Description	Rating
	5
Understood request and reasonable response	3
	2
Misunderstood request and wrong response	1
No Response	0

#00000000971 - Sewage Disposal System Maint. & Repai		Advanced Rehabilitation		Advanced Underground	
Evaluation Criteria	**Weight**				
		Points	**Score**	**Avg. Pts.**	**Score**
Scoring Criteria from Solicitation	**25**	0.00	0.00	4.00	25.00
Experience					
	Totals	**Points**	**Score**	**Avg. Pts.**	**Score**
Scoring Criteria from Solicitation	**25**	0.00	0.00	3.00	18.75
References (Section 2.2)					
	Totals	**Points**	**Score**	**Avg. Pts.**	**Score**
Scoring Criteria from Solicitation	**25**	2.00	12.50	3.00	18.75
Qualifications/Emergency Response Capability					
	Totals	**Points**	**Score**		**Score**
Additional Point, if Applicable	**25**	4.00	25.00	4.00	25.00
Price Proposal					
Total Points 100			**37.50**		**87.50**

OAKLAND COUNTY MICHIGAN
PURCHASING

Purchasing
(248) 858-0511 | purchasing@oakgov.com

Buyer: JED **CONTRACT NUMBER: 011677** **Event # 971D**

CONTRACT between the **COUNTY OF OAKLAND** and **CONTRACTOR**

Not To Exceed Amount: $150,000.00	**Effective Date: 10/1/2025**	**Expiration Date:9/30/2027**

Contract Description:	WRC Sewage Disposal System Maintenance and Repair

Contractor Address:	**Contract Administrator Information:**
DVM Utilities Inc 6045 Sims Dr Ste 2 Sterling Heights, MI 48313 **Vendor No:** 17497	Daniel Dilegge (586) 979-0402 daniel.dvm@sbcglobal.net
Buyer and Purchasing Information:	**County Contract Administrator and Using Department:**
Joan Daniels OAKLAND COUNTY PURCHASING 2100 Pontiac Lake Rd 41W Waterford, MI 48328-2762 248-858-0511 purchasing@oakgov.com	Gary Nigro Manager Oakland County Water Resources Commissioner One Public Works Drive Waterford, MI 48328 nigrog@oakgov.co

The County and the Contractor may be referred to individually as a "Party" or collectively as the "Parties." The Parties agree to the attached terms and conditions:

FOR THE CONTRACTOR:

SIGN: Dan Dilegge

FOR THE COUNTY:

SIGN: Gary Nigro
Contract Administrator

SIGN: Alycia Williams
Aaron F. Wagner, Chief Procurement Officer
or
Alycia M. Williams, Manager

cmk

Purchasing
(248) 858-0511 | purchasing@oakgov.com

This Contract is organized and divided into the following Sections for the convenience of the Parties.

§1. CONTRACT DEFINITIONS

The following words when printed with the first letter capitalized shall be defined and interpreted as follows, whether used in the singular or plural, nominative or possessive case, and with or without quotation marks:

1.1. "**Amendment**" means any change, clarification, or modification to this Contract.

1.2. "**Business Day**" means Monday through Friday from 8:00 a.m. to 5:00 p.m., excluding County designated holidays.

1.3. "**Claims**" means any loss; complaint; demand for relief or damages; lawsuit; cause of action; proceeding; judgment; penalty; costs or other liability of any kind which is imposed on, incurred by, or asserted against the County or for which the County may become legally or contractually obligated to pay or defend against, whether commenced or threatened, including, but not limited to, reimbursement for reasonable attorney fees, mediation, facilitation, arbitration fees, witness fees, court costs, investigation expenses, litigation expenses, or amounts paid in settlement.

1.4. "**Confidential Information**" means all information and data that the County is required or permitted by law to keep confidential, which includes computer software, cybersecurity assessments and plans and measures to protect the County's security.

1.5. "**Contract**" means this document and any other documents expressly incorporated herein.

1.6. "**Contractor**" means the entity or person listed under "Contractor" on the first page of this Contract and Contractor Employee.

1.7. "**Contractor Employee**" means any employee; officer; director; member; manager; trustee; volunteer; attorney; licensee; contractor; subcontractor; independent contractor; subsidiary; joint venture; partner

or agent of Contractor; and any persons acting by, through, under, or in concert with any of the above, whether acting in their personal, representative, or official capacities. Contractor Employee shall also include any person who was a Contractor Employee at any time during the term of this Contract but, for any reason, is no longer employed, appointed, or elected in that capacity.

1.8. "**Contract Documents**" mean the following documents, which this Contract includes and incorporates:

Exhibits (Applicable if Checked)

1.8.1. ☒ Exhibit I: Contractor Insurance Requirements

1.8.2. ☐ Exhibit II: Business Associate Agreement (Health Insurance Portability and Accountability Act Requirements)

1.8.3. ☐ Exhibit III: Requirements for Contractors with Access to County PII (Personally Identifiable Information)

1.8.4. ☐ Exhibit IV: Requirements for Contractors with Access to Criminal Justice Information

1.8.5. ☒ Exhibit V: Federally Funded Contract Requirements

1.8.6. ☐ Exhibit VI: Software License(s)

1.8.7. ☐ Exhibit VII: License for Use of County Servicemark

1.8.8. ☐ Exhibit VIII: Acknowledgement of Independent Employment Status

1.8.9. ☒ Exhibit IX: Scope of Contractor Deliverables/Financial Obligations

1.9. "**County**" means the County of Oakland, a Municipal and Constitutional Corporation, its departments, divisions, authorities, boards, committees, and "County Agents" as defined below.

1.10. "**County Agent**" means any elected and appointed officials; directors; board members; council members; commissioners; employees; and volunteers of the County; whether acting in their personal, representative, or official capacities. "County Agent" shall also include any person who was a "County Agent" anytime during the term of this Contract but, for any reason, is no longer employed, appointed, or elected and in that capacity.

1.11. "**County Data**" means information or data collected, used, processed, stored, or generated in any format, by or on behalf of the County, in connection with the Deliverables, which shall include, but not be limited to: (a) personal health information (PHI) as defined under the Health Insurance Portability and Accountability Act (HIPAA) and Exhibit II, (b) personally identifiable information (PII) as defined in Exhibit III, and (c) Criminal Justice Information defined in Exhibit IV if the Exhibit(s) are incorporated into the Contract. County Data includes Confidential Information as defined in this Contract.

1.12. "**County Network**" means County owned, leased, or licensed equipment, hardware, and software that is interconnected via fiber optic, wireless, or other communication mediums for the purposes of County hosting, processing, using, sharing, and/or transporting data, video, voice, or any other form of information.

1.13. "**Day**" means any calendar day, which shall begin at 12:00:00 a.m. and end at 11:59:59 p.m.

1.14. "**Deliverables**" means goods and/or services provided under this Contract, whether tangible or intangible, and may be more specifically described in the Exhibits.

1.15. "**Effective Date**" means midnight on the date listed on the first page of this Contract.

1.16. "**Expiration Date**" means 11:59.59 p.m. on the date listed on the first page of this Contract.

1.17. "**E-Verify**" means an Internet based system operated by the Department of Homeland Security (DHS) in partnership with the Social Security Administration (SSA) that allows participating employers to electronically verify the employment eligibility of their newly hired employees. Information and the registration process are found at the E-Verify website: https://e-verify.uscis.gov/enroll.

1.18. "**Intellectual Property**" means any developments, improvements, designs, innovations, and materials that may be the subject of a trademark/servicemark, copyright, patent, trade secret, which includes ideas, concepts, inventions, and processes related to the development and operation of computer software and systems.

1.19. "**Iran-Linked Business**" is defined in the Michigan Compiled Laws (MCL), specifically MCL 129.312, being Section 2 of Public Act 517 of 2012.

1.20. "**Not to Exceed Amount**" means the dollar amount listed on the first page of this Contract, unless amended. The "Not to Exceed Amount" is not the County's financial obligation under this Contract, but the maximum amount that can be paid to Contractor during the term of this Contract.

1.21. "**Proposal**" means Contractor's response or bid to the County's Request for Proposal, Request for Qualifications, or Request for Quotes.

1.22. "**Purchase Order**" means the County's written request to Contractor for Deliverables pursuant to this Contract. The Purchase Order may include terms regarding delivery schedule, payment, and transportation.

1.23. "**Purchasing**" means the Purchasing Division of Oakland County.

§2. CONTRACT TERM AND RENEWAL

2.1. **Contract Term.** This Contract shall begin on the Effective Date and shall end on the Expiration Date.

2.2. **Contract Renewal.** Unless otherwise provided herein, the Parties are under no obligation to renew or extend this Contract after the Expiration Date. This Contract may only be extended by an Amendment.

2.3. **Legal Effect.** This Contract shall be effective and binding when all of the following occur: (a) this Contract is signed by a Contractor Employee, legally authorized to bind Contractor; (b) this Contract is signed by an authorized County Agent; (c) all Contractor certificates of insurance, required by this Contract, are submitted and accepted by Purchasing; and (d) any other conditions precedent to this Contract have been met.

§3. CONTRACT ADMINISTRATION AND AMENDMENTS

3.1. **Contract and Purchase Order Issuance.** Purchasing shall issue this Contract and any Purchase Orders that may be required. Purchasing is the sole point of contact in the County regarding all procurement and contractual matters relating to this Contract and any Purchase Orders. Purchasing is the only County office/department authorized to make any Amendments to this Contract or Purchase Orders.

3.2. **Purchase Orders.** Purchase Orders issued under this Contract are governed by the terms and conditions of this Contract and are included and incorporated herein.

3.3. **Project Managers.** Each Party may designate an employee or agent to act as a Project Manager. If Project Managers are selected, they shall be listed, along with their duties, in Exhibit IX. Unless otherwise stated in Exhibit IX, the County's Project Manager has no authority to amend this Contract.

3.4. **Contract Administrators.** The County shall designate an employee or agent to act as Contract Administrator(s). Contractor may designate its employee or agent to act as Contract Administrator(s). The Contract Administrators shall be listed on the first page of this Contract. The County's Contract Administrator(s) shall be responsible for monitoring and coordinating day-to-day activities under this Contract, reviewing Deliverables and invoices, and submitting requests for Amendments to Purchasing. The County's Contract Administrator(s) have no authority to amend this Contract.

3.5. **Contract Amendments.** All Amendments to this Contract must be in writing. This Contract shall not be amended by any packing slip, Purchase Order, invoice, click through license agreement, or Contractor policies or agreements published on Contractor's website or otherwise. Amendments to this Contract shall be issued only by Purchasing. The Amendment shall be effective when signed by an authorized Contractor Employee and an authorized County Agent.

3.6. **Unauthorized Changes.** Contract changes shall not be effective until an Amendment containing the change is executed according to the procedures described in this Contract. If the Contractor is directed to perform work that Contractor believes is a change in the Contract/Deliverables, then Contractor must notify Purchasing that it believes the requested work is a change to the Contract before performing the requested work. If Contractor fails to notify Purchasing before beginning the requested work, then Contractor waives any claims for additional compensation for performing the requested work. If Contractor begins work that is outside the scope of this Contract or begins work before an Amendment is executed and then stops performing that work, Contractor must, at the request of the County, undo any out-of-scope work that the County believes would adversely affect the County.

3.7. **Precedence of Contract Documents.** In the event of a conflict, the terms and conditions contained in Sections 1 through 13 of this Contract shall prevail and take precedence over any allegedly conflicting provisions in all Contract Documents, Exhibits, Purchase Orders, and other documents expressly incorporated herein. Terms and conditions contained in Contractor invoices, packing slips, receipts, acknowledgments, click-through licenses, and similar documents shall not change the terms and conditions of this Contract.

§4. CONTRACT TERMINATION

4.1. **County Termination.** In addition to any other legal rights the County may have to terminate or cancel this Contract, the County may terminate the Contract as follows:

4.1.1. **Immediate Termination.** The County may terminate or cancel this Contract, in whole or in part, immediately, upon notice to Contractor, if any of the following occur: (a) Contractor, officer of Contractor, or an owner of a 25% or greater share of Contractor is convicted of a felony criminal offense or a criminal offense involving or related to Contractor's business; or (b) if any third-party funding for this Contract is reduced or terminated.

4.1.2. **Termination for Convenience.** The County may terminate or cancel this Contract, in whole or part, at any time, upon ninety (90) Days' notice to Contractor, for any reason, including convenience without incurring obligation or penalty of any kind. The effective date for termination or cancellation shall be clearly stated in the notice.

4.2. **Contractor Termination.** Contractor may terminate or cancel this Contract, in whole or part, upon one hundred and eighty (180) Days' notice to the County, if the County materially breaches any duty or obligation contained herein and within such notice period has failed or has not reasonably attempted to cure the breach. The effective date of termination or cancellation and the specific alleged default shall be clearly stated in the notice to the County.

4.3. **County's Obligations Upon Termination.** The County's sole obligation in the event of termination or cancellation of this Contract is for payment of the actual Deliverables provided to the County before the effective date of termination. Under no circumstances shall the County be liable for any future loss of income, profits, any consequential damages, any loss of business opportunities, revenues, or any other economic benefit Contractor may have realized but for the termination or cancellation of this Contract. The County shall not be obligated to pay Contractor any cancellation or termination fee if this Contract is cancelled or terminated as provided herein. If the County chooses to terminate the Contract in part, then the charges payable under this Contract must be equitably adjusted to reflect those Deliverables that are terminated.

4.4. **Contractor's Obligations Upon Termination.** If this Contract terminates for any reason, then Contractor must do the following: (a) at County's sole request and discretion, cease providing all Deliverables as specified at the time stated in the notice of termination; (b) take any action necessary, or as the County may direct, to preserve and protect Deliverables or other property derived or resulting from the Contract that is in Contractor's possession; (c) return all materials and property provided to Contractor by the County; (d) unless otherwise directed by the County, transfer title in and deliver to the County all Deliverables in the possession of Contractor (which Deliverables are transferred to the County "As-Is", except to the extent the amounts paid by the County for these Deliverables include warranties or warranty services and, in that situation, the Deliverables will be transferred with the warranty or warranty services and not "As-Is"); and (e) take any action to mitigate and limit any potential damages, including terminate or limit, as applicable, those subcontracts and outstanding orders for materials and supplies connected with or related to this Contract.

4.5. **Assumption of Subcontracts.** If Contractor is in breach of this Contract and the County terminates this Contract, then the County may assume, at its option, any subcontracts and agreements for Deliverables provided under the Contract and may pursue completion of the Deliverables by replacement Contract or otherwise as the County, in its sole judgment, deems expedient.

§5. SCOPE OF DELIVERABLES AND FINANCIAL/PAYMENT OBLIGATIONS

5.1. **Performance of Deliverables.** Contractor shall provide all Deliverables identified in and as set forth in Exhibit IX, any Purchase Orders, and/or any Amendments to this Contract.

5.2. **Software License(s).** If Contractor requires County to comply with a software license or any other third-party terms, the software license or other third-party terms must be attached to this Contract in Exhibit VI, and the Parties shall follow the terms and conditions therein. County is not obligated to follow or comply with any software license or other third-party terms that are not attached to or included in this Contract. Unless specifically agreed to by County in writing, if County Agents are required to accept click through license terms or any other terms not included in this Contract to access or use any of the Deliverables in this Contract, the terms and conditions of those click through licenses and other terms are without force and effect.

5.3. **Financial Obligations.** Except as otherwise set forth in this Contract, the County's sole financial obligation under this Contract shall be set forth in Exhibit IX. The amount and manner of payment of the financial obligation shall be set forth in Exhibit IX and may be in the Software License Exhibit VI, if applicable, or a Purchase Order.

5.4. **Payment Procedure.** Except as otherwise set forth in the Exhibits, Contractor shall submit an invoice to the County's Contract Administrator itemizing amounts due and owing under this Contract, as of the date of the invoice, within sixty (60) days of Contractor's performance of the Deliverables listed in the invoice. Invoices shall contain the following information: (a) County Contract Number; (b) dates of Deliverables; (c) itemized list of Deliverables; (d) Contractor Tax ID Number (federal and State); (e) licenses; and (f) any other information reasonably requested by Purchasing. Unless otherwise set forth in the Exhibits, the County will pay undisputed invoices, which comply with this section (5.4), within sixty (60) days after receiving the invoice. Unless otherwise set forth in the Exhibits, the County shall only pay Contractor for Deliverables under this Contract and not any subcontractors or assignees of Contractor.

5.5. **Not to Exceed Amount.** The amount due and owing to Contractor, under this Contract, shall not exceed the "Not to Exceed Amount." If Contractor can reasonably foresee that the total financial obligation for the Contract will exceed the "Not to Exceed Amount," then Contractor shall provide Purchasing with notice of this fact as soon as possible, but no later than ten (10) days before this event.

5.6. **County Not Obligated for Penalties/Costs/Fines.** The County shall not be responsible or liable for any cost, fee, fine, penalty, or other assessment of any kind that is incurred or suffered by Contractor in connection with or resulting from Contractor's performance of this Contract under any circumstances.

5.7. **Set-Off of County Costs.** If the County incurs any costs (not specified in this Contract), loss, or damage that is caused by or results from Contractor, then the County has the right to set-off those costs, loss, and/or damage from any amounts due and owing Contractor. This set-off includes, but is not limited to, withholding payment in an amount equal to the cost of any County-provided equipment, supplies, badges, or other property that are not returned by Contractor upon completion, termination, or cancellation of this Contract. County also reserves the right at any time to set-off any amounts it owes to Contractor under this Agreement against any amounts that Contractor owes to County.

5.8. **In-Kind Services.** Unless expressly provided herein, this Contract does not authorize any in-kind services by either Party.

§6. CONTRACTOR'S WARRANTIES AND ASSURANCES

6.1. **Full Knowledge of Contract Expectations.** Contractor warrants that before submitting its Proposal and/or entering into this Contract, it had a full opportunity to review all County requirements and/or expectations for this Contract. Contractor is responsible for being adequately and properly prepared to execute this Contract. Contractor has satisfied itself in all material respects that it will be able to perform the Contract as specified herein.

6.2. **Complete and Accurate Representations.** Contractor certifies that all statements, assurances, records, and materials submitted to the County in connection with seeking and obtaining this Contract have been truthful, complete, and accurate.

6.3. **Access to Contractor Policies.** If the Parties agree in this Contract to follow any Contractor policies, such as acceptable use or privacy policies, then Contractor shall retain each version of such policy with the effective dates and shall promptly provide such to the County, if requested.

6.4. **Grant Compliance.** If any part of this Contract is supported or paid for with any State, federal, or other third-party funds granted to the County, then Contractor shall comply with all applicable grant requirements. Upon request of Contractor, the County shall provide Contractor with a copy of the applicable grant requirements.

6.5. **Contractor Incidental Expenses.** Except as otherwise expressly provided in this Contract, Contractor shall be solely responsible and liable for all costs and expenses associated or needed to perform this Contract, including, but not limited to, any professional dues, association fees, license fees, fines, taxes, and penalties.

6.6. **Equipment and Supplies.** Contractor is responsible for providing all equipment and supplies to perform this Contract, which are not expressly required to be provided by the County.

6.7. **Contractor Employees.**

6.7.1. **Number and Qualifications of Contractor Employees.** Contractor shall employ and assign qualified Contractor Employees as necessary and appropriate to perform this Contract. Contractor shall ensure all Contractor Employees have the knowledge, skill, and qualifications to perform this Contract and possess any necessary licenses, permits, certificates, and governmental authorizations as may be required by law.

6.7.2. **Control and Supervision of Contractor Employees.** Contractor shall solely control, direct, and supervise all Contractor Employees with respect to all Contractor obligations under this Contract. Contractor will be solely responsible for and fully liable for the conduct and supervision of any Contractor Employees.

6.7.3. **Removal or Reassignment of Personnel at the County's Request.** Contractor shall remove a Contractor Employee performing work under this Contract at the County's request provided that the County's request is based on legitimate, good-faith reasons. Replacement personnel for the removed person must be fully qualified for the position. If the removal of a Contractor Employee results in an unanticipated delay, which is attributable to the County, then this delay shall not be considered a breach of the Contract and the terms and conditions of this Contract effected by the removal will be adjusted accordingly.

6.7.4. **Contractor Employee Identification.** If requested by the County, Contractor Employees shall wear and display a County-provided identification badge at all times while working on County premises. In order to receive a County identification badge, a Contractor Employee shall sign the "Acknowledgement of Independent Contractor Status" form, Exhibit VIII to this Contract. Contractor shall return all County-provided identification(s) upon completion of Contractor's obligations under this Contract.

6.7.5. **Background Checks.** At the County's request, Contractor Employees performing work under this Contract shall be subject to a background check by the County. The scope of the background check is at the discretion of the County and the results will be used to determine Contractor Employee's eligibility to perform work under this Contract. Any request for background checks will be initiated by the County and will be reasonably related to the type of work requested. Contractor and Contractor Employees shall provide all information or documents necessary to perform the background check.

6.7.6. **Contractor Employee Expenses.** All Contractor Employees shall be employed at the Contractor's sole expense (including employment-related taxes and insurance). Contractor warrants that all Contractor Employees shall fully comply with and adhere to the terms of this Contract. Contractor shall be solely liable for all applicable Contractor Employees' federal, state, or local payment withholdings or contributions and/or all Contractor Employee related pension or welfare benefits plan contributions

under federal or state law. Contractor shall indemnify, defend, and hold the County harmless for all Claims against the County by any Contractor Employee, arising out of any contract for hire or employer-employee relationship between Contractor and any Contractor Employee including, but not limited to, Worker's Compensation, disability pay, or other insurance of any kind.

6.7.7. **Contractor's Compliance with the Patient Protection and Affordable Care Act.** If Contractor is subject to the Patient Protection and Affordable Care Act ("ACA"), PL 111-148, 124 Stat 119, then Contractor shall ensure that all Contractor Employees, under assignment to the County, and their dependents, as defined by the ACA, are provided with or have access to insurance as required by the ACA. If Contractor is subject to the ACA, Contractor warrants it offers group health coverage to Contractor Employees and their dependents that is affordable, that provides minimum essential coverage and value, and that each offer of coverage meets the timing requirements of the ACA. Contractor warrants, whether or not it is subject to the ACA, that it will pay all applicable fees, taxes, or fines, as set forth in the employer mandates of the ACA under Tax Code §4980H and related regulations for any Contractor Employee, whether the fee, tax, or fine is assessed against the Contractor or the County.

6.8. **Acknowledgment of Independent Contractor Status.**

6.8.1. **Independent Contractor.** Nothing in this Contract is intended to establish an employer-employee relationship between the County and Contractor or any Contractor Employee. In no event, shall Contractor Employees be deemed employees, agents, volunteers, or subcontractors of the County. Contractor shall ensure that Contractor Employees are apprised of their status and the limitations independent contractors have of this status.

6.8.2. **Contractor/Contractor Employee Representations.** Contractor and/or Contractor Employees shall not represent themselves as County employees. Contractor shall ensure that Contractor Employees do not represent themselves as County employees.

6.8.3. **County Benefits and Plans.** Contractor and Contractor Employees shall not be entitled to participate in any County employee benefit plans and programs, including but not limited to, retirement, deferred compensation, insurance (including without limitation, health, disability, dental, and life), and vacation pay. This limitation includes access to benefit plans and programs that are not described by a written plan. However, Contractor Employees who are retired County Employees may receive vested post-employment benefits such as retiree health care and pension benefits from Oakland County.

6.8.4. **County Reliance.** The County entered into this Contract in reliance of the representations made by Contractor regarding its understanding of the role of independent contractors, its stated relationship to Contractor Employees, and other representations Contractor has made regarding the management and performance oversight of Contractor Employees.

6.8.5. **Independent Employment Status.** If Contractor provides Contractor Employees for staffing and/or leasing services to County, those Contractor Employees shall sign Exhibit VIII, Acknowledgement of Independent Employment Status, prior to performing services for the County.

6.9. **Permits and Licenses.** Contractor shall be responsible for obtaining and maintaining, throughout the term of this Contract, all licenses, permits, certificates, governmental authorizations, and business/professional licenses necessary to perform this Contract. Upon request by the County, Contractor shall furnish copies of any permit, license, certificate, or governmental authorization necessary to perform this Contract.

6.10. **E-Verify.** In accordance with Miscellaneous Resolution No.09116 (BOC Minutes, July 30, 2009, pp 37-38), unless otherwise exempted, all service contractors who wish to contract with the County to provide services must first certify they have registered with, will participate in, and continue to utilize, once registered, the E-Verify Program (or any successor program implemented by the federal government or its departments or agencies) to verify the work authorization status of all newly hired employees employed by the Contractor. Breach of this term or condition is considered a material breach of this Contract. Contractor's execution of this Contract constitutes a certification that they are authorized to certify on behalf of Contractor and do hereby certify on behalf of Contractor that the Contractor has registered with, has and will participate in, and does and will continue to utilize once registered and throughout the term of this Contract and any permissible extension hereof, the E-Verify Program (or any successor program implemented by the federal government or its departments or agencies) to verify the work authorization status of all newly hired employees employed by the Contractor.

6.11. **Iran-Linked Business Certification.** Contractor certifies that it is not an Iran-Linked Business. Contractor further certifies that it was not an Iran-Linked Business at the time it submitted its Proposal for this Contract. Contractor must promptly notify the County, if Contractor becomes an Iran-Linked Business at any time during this Contract.

6.12. **Foreign Adversary Certification.** If Contractor supplies technology or equipment to County, Contractor certifies that the technology and/or equipment was not produced, assembled, or manufactured by a foreign adversary, as defined, and as prohibited by the federal government.

6.13. **Taxes.**

6.13.1. **Contractor Taxes.** Contractor shall collect and pay its local, state, and federal taxes, including but not limited to, all employment taxes, sales taxes, personal property taxes, and real property taxes. The County shall not be liable to or required to reimburse Contractor for any local, state, or federal tax of any kind.

6.13.2. **County Tax-Exempt.** The County is exempt from state and local sales tax, personal property tax, and real property tax. Prices under this Contract shall not include taxes, unless the County is not tax-exempt for a specific Deliverable. Exemption certificates for sales tax will be furnished upon request.

6.14. **Warranty for Services.** Contractor warrants that all Deliverables that are services shall be performed in compliance with all applicable laws, statutes, regulations, ordinances, requirements and specifications in the Exhibits, industry best practices and care, professional standards, and in a diligent, workmanlike, and expeditious manner. Contractor acknowledges and agrees that time is of the essence for all Deliverables that are services.

6.15. **Warranty for Goods.** All Deliverables that are goods shall be subject to the following warranties:

6.15.1. **Warranty of Merchantability.** Goods provided by Contractor pursuant to this Contract shall: (a) be merchantable; (b) be of good quality; (c) be fit for their ordinary purpose; (d) be adequately contained and packaged; and (e) conform to the specifications and descriptions contained in this Contract. Contractor acknowledges and agrees that time is of the essence for providing all Deliverables that are goods.

6.15.2. **Warranty of Fitness for a Particular Purpose.** If Contractor knows or has reason to know that the goods will be used for a particular purpose and the County is relying on Contractor's skill or judgment to select or furnish the goods, then there is a warranty that the goods are fit for a particular purpose.

6.15.3. **Warranty of Title.** All goods provided to the County shall be provided: (a) with good title; (b) free from any security interest, lien, or encumbrance that the County did not have knowledge of when the Contract was executed; and (c) free of any rightful claim of infringement or similar claim by a third-party.

6.16. **ADA and Section 508 Compliance.** If Contractor is providing a Deliverable that requires County Agents or the public to use a software application or to access a website, Contractor warrants that end users can utilize the software or access the website in accordance with the accessibility requirements of the ADA and the Rehabilitation Act of 1973. Contractor's Deliverable will conform, where relevant, to level AA of the World Wide Web Consortium (W3C) Web Content Accessibility Guidelines (WCAG) 2.1. Any additional compliance requirements shall be specified in the Scope of Contractor's Deliverables Exhibit IX.

§7. LIABILITY

7.1. **CONTRACTOR INDEMNIFICATION.** CONTRACTOR SHALL INDEMNIFY, DEFEND, AND HOLD THE COUNTY HARMLESS FROM ALL CLAIMS, INCURRED BY OR ASSERTED AGAINST THE COUNTY BY ANY PERSON OR ENTITY, WHICH ARE ALLEGED TO HAVE BEEN CAUSED DIRECTLY OR INDIRECTLY FROM THE ACTS OR OMISSIONS OF CONTRACTOR OR CONTRACTOR'S EMPLOYEES. THE COUNTY'S RIGHT TO INDEMNIFICATION IS IN EXCESS AND ABOVE ANY INSURANCE RIGHTS/POLICIES REQUIRED BY THIS CONTRACT.

7.2. **NO INDEMNIFICATION FROM THE COUNTY.** CONTRACTOR SHALL HAVE NO RIGHTS OR CLAIMS AGAINST THE COUNTY FOR INDEMNIFICATION, CONTRIBUTION, SUBROGATION, OR ANY OTHER SIMILAR RIGHT TO BE REIMBURSED BY THE COUNTY.

7.3. **COUNTY LIMITATION OF LIABILITY.**

7.3.1. COUNTY SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, INDIRECT, RELIANCE, REMOTE, SPECULATIVE, PUNITIVE, EXEMPLARY, LIQUIDATED, TREBLE, OR SPECIAL DAMAGES, INCLUDING, BUT NOT LIMITED TO, LOSS OF PROFIT, OPPORTUNITY, USE, REVENUE, DATA, OR GOODWILL, WHETHER BASED IN WHOLE OR IN PART IN CONTRACT, TORT, EQUITY, STRICT LIABILITY, UNDER STATUTE, OR ANY OTHER THEORY OF LIABILITY, REGARDLESS OF WHETHER SUCH DAMAGES WERE FORESEEABLE OR CONTEMPLATED AND EVEN IF COUNTY WAS ADVISED OR AWARE OF THE POSSIBILITY OF SUCH DAMAGES.

7.3.2. COUNTY SHALL NOT BE LIABLE IN CONTRACT, TORT, EQUITY, STRICT LIABILITY, UNDER STATUTE, OR ANY OTHER THEORY OF LIABILITY, FOR TOTAL AGGREGATE DAMAGES IN EXCESS OF COUNTY'S PAYMENT OBLIGATIONS TO CONTRACTOR FOR THE DELIVERABLES PROVIDED UNDER THIS CONTRACT.

§8. INSURANCE AND BOND REQUIREMENTS

8.1. **Contractor Provided Insurance.** At all times during this Contract, Contractor shall obtain and maintain insurance according to the requirements listed in Exhibit I.

8.2. **Contractor Provided Bonds.** Pursuant to Public Act 213 of 1963, if the Contract Not to Exceed Amount exceeds fifty thousand dollars ($50,000.00) and the Contract is for the construction, alteration, or repair of any public building or public work or improvement of the County, then the Contractor shall furnish, at its sole cost, a performance bond and a payment bond to the County, which shall become binding upon execution of the Contract. Each bond shall be in an amount fixed by the County, as set forth in Exhibit IX, but in no event shall each bond be less than 25% of the Contract Not to Exceed Amount.

§9. INTELLECTUAL PROPERTY

9.1. **Contractor Use of County Licensed Software.** In order for Contractor to perform this Contract, the County may permit Contractor to access certain Software licensed to the County. Contractor shall not transfer, remove, use, copy, or otherwise provide or make available such Software or documentation to any other person or entity, for any purpose, without the prior written consent of the County and/or the licensor. Furthermore, neither Contractor nor Contractor Employee shall produce a source listing, decompile, disassemble, or otherwise reverse engineer any Software. Neither Contractor nor Contractor Employee shall use any Software contrary to the provisions of any applicable Software license agreement or state or federal law.

9.2. **Contractor License to Use County Servicemarks.** If this Contract involves the use of County servicemarks, then Contractor is granted a license to use the servicemarks subject to the terms listed in Exhibit VII. Contractor shall only use the servicemarks as directed by the County in Exhibit VII. If Exhibit VII is not selected and attached to this Contract, Contractor shall not and has no right to use County servicemarks.

9.3. **Assignment of Rights.** In consideration for the performance of this Contract and the fees paid to Contractor, Contractor agrees to the following: (a) Contractor shall have no copyright, patent, trademark, or trade secret rights in County Intellectual Property; (b) any and all programs, inventions, and other work or authorship developed by Contractor while providing Deliverables to the County are works made for hire, created for, and owned exclusively by the County, unless otherwise specified in the Contract; (c) Contractor assigns to the County all rights and interest in County Intellectual Property, which Contractor has made or conceived or may make and conceive, either solely or jointly with others, either on or off County premises while performing this Contract or with the use of the time, material, or facilities of the County; and (d) Contractor and its applicable Contractor Employees shall sign any documents necessary for the County to register patents, copyrights, or trademarks with federal or state agencies. Contractor shall ensure Contractor Employees assign their rights and interests in County Intellectual Property to the County.

9.4. **Infringement Remedies.** If, in either Party's opinion, any of the services or Deliverables supplied by Contractor are likely to become the subject of a copyright, patent, trademark, or trade secret infringement claim, Contractor shall at its own expense: (a) procure for County the right to continue using the services or Deliverables, or if this option is not reasonably available to Contractor; (b) replace or modify the same so that it becomes non-infringing; or (c) accept its return by County with appropriate credits or refund to County and reimburse County for any losses or costs incurred as a consequence of County ceasing its use and returning it.

§10. CONFIDENTIAL INFORMATION

10.1. **Contractor Use of Confidential Information.** Contractor and Contractor Employees shall use appropriate safeguards to protect the confidentiality and integrity of Confidential Information. Contractor shall not reproduce, provide, disclose, or give access to Confidential Information to any Contractor Employee or third party not having a legitimate need to know. Contractor and Contractor Employees shall only use the Confidential Information for performance of this Contract. Notwithstanding the foregoing, Contractor may disclose the Confidential Information, if required by law, statute, or other legal process; provided that Contractor: (a) gives the County prompt written notice of the impending disclosure; (b) provides reasonable assistance to the County in opposing or limiting the disclosure; and (c) makes only such disclosure as is compelled or required. This Contract imposes no obligation upon Contractor with respect to any Confidential Information which Contractor can establish by legally sufficient evidence: (a) was in

possession of or was known by Contractor, prior to its receipt from the County, without any obligation to maintain its confidentiality; or (b) is obtained by Contractor from a third-party having the right to disclose it, without an obligation to keep such information confidential.

10.2. **County Confidentiality Obligations.** County has no obligation to Contractor to keep confidential any information or records that are required to be disclosed by County under the Michigan Freedom of Information Act, 1976 PA 442, as amended (the "FOIA") nor shall County be obligated to inform or provide notice to Contractor regarding the disclosure of information or records that are required to be disclosed under the FOIA. Furthermore, County may disclose Confidential Information to third parties if required by law, statute, subpoena, court order, or other legal process.

§11. COUNTY DATA. If Contractor uses or possesses County Data in the performance of this Contract, then the following provisions contained in this section apply:

11.1. **Use of County Data.** Contractor and Contractor Employees shall have a limited license to County Data, including a license to collect, process, store, generate, and display County Data but only to the extent necessary to provide services under this Contract. Contractor and Contractor Employees may not use, sell, rent, share, transfer, distribute, or otherwise disclose or make available County Data to any third-party, for Contractor's own purposes, or for the benefit of anyone other than the County, without the County's prior written consent, unless otherwise provided for within an Exhibit to this Contract.

11.2. **Unauthorized Access/Disclosure or Theft of County Data.** Contractor shall notify the County's Chief Information Officer as soon as practicable but no later than forty-eight (48) hours of "Discovery" of suspected unauthorized access, acquisition, disclosure, or theft of County Data (a "Security Breach"). "Discovery" means the first day on which the Security Breach is known to Contractor. Upon Discovery of a Security Breach, Contractor shall do the following: (a) take reasonable measures to promptly cure the deficiencies relating to the Security Breach in order to secure County Data; (b) cooperate with the County in investigating the occurrence, including making available all relevant records, logs, files, and data reporting materials required upon request by the County; and (c) comply with all applicable federal or state laws and regulations pertaining to unauthorized disclosures or as otherwise directed by the County. If Contractor uses or possesses County Data described in Exhibit II (HIPAA), Exhibit III (PII), or Exhibit IV (CJIS), Contractor shall follow the procedures in the applicable Exhibits governing the unauthorized access/disclosure or theft of County Data.

11.3. **Storage of County Data.** Contractor shall only possess, access, store, host, and/or process County Data at and from data centers located within the United States of America (the "U.S."). Contractor shall not permit Contractor Employees to possess, access, store, host, and/or process County Data on portable devices, including, but not limited to, personal computers, tablets, laptops, and phones, except for portable devices that encrypt County Data at rest, have up-to-date firewall and antivirus protection, require multi-factor authentication to access, and are used and kept within the U.S. Contractor may permit its Contractor Employees to access County Data remotely within the U.S. but only as required to provide the Deliverables.

11.4. **Requirements for PCI Data.** If Contractor possesses, accesses, stores, hosts, processes, or transmits County Data that is considered Payment Card Industry (PCI) Data by the PCI Security Standards Council, Contractor shall comply with PCI Data Security Standard (DSS) and shall provide the County with a copy of its PCI DSS Attestation of Compliance and its Certificate of Compliance with PCI Data Security Standard on or before the Effective Date. Contractor warrants that it will keep its Certification of Compliance with PCI Data Security Standard current and will provide evidence that the Certification of Compliance is current to County upon request.

11.5. **Response to Legal Request for County Data.** If the County receives a Court Order, a Freedom of Information Act (FOIA) request, or other legal request to provide County Data held by Contractor, then Contractor shall provide County Data to the County, in a format directed by the County, within the time frame required by law.

11.6. **Obligations upon Expiration, Termination or Cancellation of Contract.** At the County's sole discretion, upon expiration, termination, or cancellation of this Contract, Contractor shall return County Data in a mutually agreeable format in a prompt and orderly manner or provide for the secure disposal of County Data as directed by County.

§12. INFORMATION TECHNOLOGY STANDARDS. If Contractor provides a technology application or requires the use of the Internet to access a Deliverable, the following sections apply:

12.1. **County Standards.** If Contractor or Contractor Employees will be given access to the County Network, Contractor and Contractor Employees shall comply with the County Electronic Communications and Use of Technology Policy.

12.2. **Implementation of Security Measures.** Contractor shall implement and maintain appropriate administrative, technical, and organizational security measures to safeguard against unauthorized access to the County Network, County Data, and Contractor's network/system(s) used to access County Data. Such measures shall be in accordance with security industry best practice and not less stringent than the measures Contractor applies to protect its own data of a similar kind. The County shall have the right to audit, inspect, and test Contractor's network and system security.

12.3. **Security Reporting.** Contractor shall provide County with its SOC2 Type 2 report, which must be assessed by an independent auditor, or provide County with a completed County security questionnaire if Contractor does not have a SOC2 Type 2 report. Contractor shall provide County with Contractor's SOC2 Type 2 report or the completed County security questionnaire, on or prior to the Effective Date of this Contract, and within five (5) Business Days of a written request by County during the duration of this Contract. County will not make more than one request per year for the Contractor's SOC2 Type 2 report or for the Contractor to provide County with a completed County security questionnaire, unless County has reasonable cause to do so. If Contractor has a SOC2 Type 2 report, Contractor shall keep its SOC2 Type 2 report up to date for the duration of this Contract.

§13. GENERAL TERMS AND CONDITIONS

13.1. **Access to County Property or Facilities.** As set forth in this Contract, Contractor has access to and the right to use County property and facilities necessary to perform this Contract. Unless otherwise provided in this Contract or Contractor receives prior written permission from the County's Director responsible for the department requiring access outside of Business Days, Contractor may only access and use County property and facilities for performance of this Contract on Business Days.

13.2. **Signs on County Property or Facilities.** Contractor shall not place any signs or advertisements on County property or facilities without the prior written permission of the County's Director of Facilities Management, successor, or designee.

13.3. **Use of County Property or Facilities.** While performing this Contract, Contractor shall keep County property or facilities, and anything stored thereon in a clean, safe, sanitary, responsible, and healthful

condition and shall keep the property and facilities in a manner that will not prevent or interfere with the County's performance of its functions.

13.4. **Removal of Contractor's Personal Property.** At the expiration or termination of this Contract, Contractor shall leave County property or facilities in the same condition that Contractor found them and clean of all rubbish. Contractor shall remove all of its personal property within thirty (30) Days of expiration or termination of this Contract. If Contractor does not remove its personal property within the thirty (30) Day period, then the County may, at County's sole discretion, dispose of the personal property and bill Contractor for any costs associated with the removal and disposal or keep, have all rights to, and be the owner of the personal property.

13.5. **Damage to County Property or Facilities.** Contractor shall be responsible for any damage to any County property or a facility that is caused by Contractor. If damage occurs, the County shall make the necessary repairs and/or replacements or cause a third-party to make the necessary repairs or replacements, provided, however, that Contractor shall reimburse the County for all costs associated with repairing and/or replacing the damaged property or facilities. Without limiting any of County's other setoff rights in this Contract, County has the right to set-off those costs and/or damages from any amounts due and owing Contractor.

13.6. **Damage to Contractor's Property.** Contractor shall be solely liable and responsible for any loss or damage to Contractor's personal property located, kept, or stored on or at County property or facilities during performance of this Contract.

13.7. **County's Right to Suspend Contract Performance.** Upon written notice, the County may require Contractor to suspend performance of this Contract if Contractor has failed to comply with any federal, state, or local laws or any requirements contained in this Contract. The right to suspend performance of this Contract is in addition to the County's right to terminate and/or cancel this Contract. The County shall incur no penalty, expense, or liability to Contractor if the County suspends performance of this Contract under this Section.

13.8. **Discrimination.** Contractor, and its subcontractors under this Contract, shall not discriminate against an employee or an applicant for employment in hiring, any terms and conditions of employment or matters related to employment regardless of race, color, religion, sex, sexual orientation, gender identity or expression, national origin, age, genetic information, height, weight, disability, veteran status, familial status, marital status or any other reason, that is unrelated to the person's ability to perform the duties of a particular job or position, in accordance with applicable federal and state laws.

13.9. **Conflict of Interest.** Pursuant to Public Act 317 and 318 of 1968, as amended (MCL 15.301, *et seq.* and MCL 15.321, *et seq.*), no contracts shall be entered into between the County and any County Agent. To avoid any real or perceived conflict of interest, Contractor shall disclose to the County the identity of all Contractor Employees and all Family Members of Contractor Employees who: a) are employed by the County on the date the Contract is executed; and b) become employed by the County during the term of the Contract. Contractor shall also disclose to the County the identity of all County Agents and all Family Members of County Agents who: a) are employed by Contractor on the date the Contract is executed; and b) become employed by Contractor during the term of the Contract. For the purposes of this section, "Family Member" means a person's spouse or spouse's sibling or child; a person's sibling or sibling's spouse or child; a person's child or child's spouse; or a person's parent or parent's spouse, and includes these relationships as created by adoption, marriage, or law.

13.10. **Access and Records.** Contractor will maintain accurate books and records in connection with performance of this Contract for thirty-six (36) months after the end of this Contract and Contractor shall provide the County with reasonable access to such books and records, upon request.

13.11. **Audit.** The County or an independent auditor hired by the County may perform contract audits (in its sole discretion) and shall have the authority to access all pertinent records and data and to interview any Contractor Employee during the term of this Contract and for a period of three years after final payment. Contractor shall explain any audit findings, questioned costs, or other Contract compliance deficiencies to the County within thirty (30) Business Days of receiving the draft audit report. Contractor's written response shall include all necessary documents and information that refute the draft audit report and an action plan to resolve the audit findings. A copy of Contractor's response will be included in the final report. Failure by Contractor to respond in writing within thirty (30) Business Days shall be deemed acceptance of the draft audit report and will be noted in the final report.

13.12. **Assignments/Delegations/Subcontracts.**

13.12.1. **Prior Written Consent Required.** Except by operation of law, neither Party may assign, delegate, or subcontract any of its duties, obligations, or rights under this Contract without the prior written consent of the other Party; provided, however, Contractor may assign, delegate, or subcontract this Contract to an affiliate or subsidiary as long as the affiliate or subsidiary is adequately capitalized and can provide adequate written assurances to the County that the affiliate or subsidiary can perform this Contract. The County may withhold consent, if the County determines that the assignment, delegation, or subcontract would impair performance of this Contract or the County's ability to recover damages under this Contract. Contractor shall also provide the County with adequate information to allow the County to make a determination regarding the assignment, delegation, or subcontract.

13.12.2. **Flow Down Clause Required.** Any assignment, delegation, or subcontract by Contractor must include a requirement that the assignee, delegee, or subcontractor will comply with the terms and conditions of this Contract. The assignment, delegation, or subcontract shall in no way diminish or impair performance of any term or condition of this Contract.

13.12.3. **Contractor Responsibility for Assigns/Delegates/Subcontractors.** If Contractor assigns, delegates, or subcontracts this Contract, in whole or in part, Contractor shall remain the sole point of contact regarding all matters under this Contract and shall remain liable for performance of this Contract. Contractor is solely responsible for the management of assignees, delegees, and subcontractors.

13.12.4. **Performance Required.** If an assignee, delegee, or subcontractor fails to perform as required under this Contract, Contractor shall contract with another entity for such performance. Any additional costs associated with securing another assignee, delegee, or subcontractor shall be the sole responsibility of Contractor.

13.12.5. **Reseller Responsibility.** If Contractor is reselling Deliverables to the County for another entity (the other entity is referred to as the "Supplier"), then in addition to and without limiting any of Contractor's other obligations or responsibilities under this Contract, Contractor shall be: (i) responsible for and ensure that the Supplier complies with all terms and conditions in this Contract; (ii) responsible and liable for the performance of this Contract, including the Deliverables, regardless if all or part of the Deliverables are performed by the Supplier; and (iii) liable and responsible for all Claims (as defined in the Contract) brought against the County, which are alleged to have been caused by the acts or omissions of Supplier that concern or relate to this Contract, including the Deliverables.

13.13. **Non-Exclusive Contract.** This Contract is a non-exclusive agreement. No provision in this Contract limits or is intended to limit, in any way, Contractor's right to offer and provide its services to the general public, other business entities, municipalities, or governmental agencies during or after the term of this Contract. Similarly, the County may freely engage other persons to perform the same work that Contractor performs. Except as expressly stated in this Contract, this Contract does not promise or guarantee Contractor or any Contractor Employee any fixed or certain number of orders, purchases, or Deliverables.

13.14. **No Third-Party Beneficiaries.** Except as expressly provided for the benefit of the Parties, this Contract does not and is not intended to create any obligation, duty, promise, contractual right or benefit, right to be indemnified, right to be subrogated to the Parties' right in this Contract, or any other right in favor of any other person or entity.

13.14.1. **Survival of Terms and Conditions.** The following terms and conditions shall survive and continue in full force beyond the termination or cancellation of this Contract (or any part thereof) until the terms and conditions are fully satisfied or expire by their nature: **Section 1**. Contract Definitions, **Section 5.** Scope of Deliverables and Financial/Payment Obligations, **Section 6**. Contractor's Warranties and Assurances, **Section 7.** Liability, **Section 8.** Insurance and Bond Requirements, **Section 9**. Intellectual Property, **Section 10.** Confidential Information, **Section 11.** County Data, **Section 13.** General Terms and Conditions; and if incorporated into this Contract, Exhibit II: Business Associate Agreement (Health Insurance Portability and Accountability Act Requirements), Exhibit III: Requirements for Contractors with Access to County PII (Personally Identifiable Information) and Exhibit IV: Requirements for Contractors with Access to CJIS Data (Criminal Justice Information Security.

13.15. **Reservation of Rights.** This Contract does not, and is not intended to impair, divest, delegate, or contravene any constitutional, statutory, or other legal right, privilege, power, obligation, duty, or immunity of the County.

13.16. **Compliance with Laws.** Contractor shall comply with all federal, state, and local laws, statutes, ordinances, regulations, executive orders, insurance policy requirements, and requirements applicable to its activities under this Contract. Contractor shall comply with all applicable laws and regulations related to the import, export, re-export, transfer, shipping, sale, re-sale, and/or use of goods, services, information, data, and equipment involving or related to this Contract.

13.17. **Force Majeure.** Notwithstanding any other term or condition of this Contract, neither Party shall be liable for failure to perform contractual duties or obligations caused by events beyond their reasonable control, including but not limited to: (a) acts of public enemies; (b) natural disasters; (c) terrorism; (d) war; (e) insurrection or riot; (f) natural disasters; (g) strikes, lockouts, work stoppages, or other labor difficulties; or (h) compliance with law. Reasonable notice shall be given to the affected Party of such event. Contractor is expected, through insurance or alternative temporary or emergency service arrangements, to continue its contractual duties or obligations if a reasonably anticipated, insurable business risk, such as business interruption or any insurable casualty or loss occurs.

13.18. **Notices.**

13.18.1. **Written Notice.** All notices required under this Contract shall be in writing. Notices shall be effective: (a) the next Business Day, if personally delivered; (b) the third Business Day, if sent by U.S. mail, postage prepaid, return receipt requested; (c) the next Business Day, if sent by a nationally recognized overnight express courier with a reliable tracking system; or (d) the next Business Day with a written response or receipt of confirmation, if sent by e-mail or fax.

13.18.2. **Notice to Contractor.** Unless otherwise specified, Notice to Contractor shall be addressed to the Contract Administrator listed on the first page of this Contract.

13.18.3. **Notice to County.** Unless otherwise specified herein, Notice to the County shall be addressed to Purchasing, the County Project Manager (if applicable), and the County Contract Administrator(s) listed on the first page of this Contract.

13.19. **Captions.** Section and subsection numbers, captions, and any index to sections or subsections contained in this Contract are intended for the convenience of the reader and are not intended to have any substantive meaning and shall not be interpreted to limit or modify any substantive provisions of this Contract. In this Contract, for any noun or pronoun, use of the singular or plural form, use of the nominative, possessive, or objective case, and any reference to gender (masculine, feminine, and neuter) shall mean the appropriate form, case, or gender as the context requires.

13.20. **Waiver.** Waiver of any term or condition under this Contract must be in writing and notice given pursuant to this Contract. No written waiver, in one or more instances, shall be deemed or construed as a continuing waiver of any term or condition of this Contract. No waiver by either Party shall subsequently affect its right to require strict performance of this Contract.

13.21. **Cumulative Remedies.** A Party's exercise of any remedy shall not preclude the exercise of any other remedies, all of which shall be cumulative. A Party shall have the right, in its sole discretion, to determine which remedies are to be exercised and in which order.

13.22. **Severability.** If a court of competent jurisdiction finds a term or condition of this Contract to be illegal or invalid, then the term or condition shall be deemed severed from this Contract. All other terms or conditions shall remain in full force and effect. Notwithstanding the above, if Contractor's promise to indemnify or hold the County harmless is found illegal or invalid, Contractor shall contribute the maximum it is permitted to pay by law toward the payment and satisfaction of any Claims against the County.

13.23. **Dispute Resolution.** All disputes arising under or relating to the execution, interpretation, performance, or nonperformance of this Contract involving or affecting the Parties may first be submitted to the respective Project Manager (if applicable) and Contract Administrators for possible resolution.

13.24. **Governing Laws/Consent to Jurisdiction and Venue.** This Contract shall be governed, interpreted, and enforced by the laws of the State of Michigan, excluding Michigan's conflict of law principles. Except as otherwise required by law or court rule, any action, complaint, lawsuit, or other legal or equitable proceeding brought to enforce, interpret, or decide any Claim, matter, provision, dispute, or issue arising under or related to this Contract shall be brought in the Sixth Judicial Circuit Court of the State of Michigan, the 50th District of the State of Michigan, or the United States District Court for the Eastern District of Michigan, Southern Division, as dictated by the applicable jurisdiction of the court. Except as otherwise required by law or court rule, venue is proper in the courts set forth above. The choice of forum set forth above shall not be deemed to preclude the enforcement of any judgment obtained in such forum or taking action under this Contract to enforce such judgment in any appropriate jurisdiction.

13.25. **Entire Contract.** This Contract represents the entire agreement and understanding between the Parties. This Contract supersedes all other prior oral or written understandings, communications, agreements, or contracts between the Parties regarding the subject matter of this Contract. The language of this Contract shall be construed as a whole according to its fair meaning and not construed strictly for or against any Party.

Purchasing
(248) 858-0511 | purchasing@oakgov.com

EXHIBIT I
CONTRACTOR INSURANCE REQUIREMENTS

During this Contract, the Contractor shall provide and maintain, at Contractor's expense, all insurance as set forth and marked below, protecting the County against any Claims, as defined in this Contract. The insurance shall be written for not less than any minimum coverage herein specified. Limits of insurance required in no way limit the liability of the Contractor.

Primary Coverages

Commercial General Liability Occurrence Form including: (a) Premises and Operations; (b) Products and Completed Operations (including On and Off Premises Coverage); (c) Personal and Advertising Injury; (d) Broad Form Property Damage; (e) Broad Form Contractual including coverage for obligations assumed in this Contract;
$1,000,000 – Each Occurrence Limit

$1,000,000 – Personal & Advertising Injury

$2,000,000 – Products & Completed Operations Aggregate Limit

$2,000,000 – General Aggregate Limit

$ 100,000 – Damage to Premises Rented to You (formally known as Fire Legal Liability)

Workers' Compensation Insurance with limits statutorily required by any applicable Federal or State Law and Employers Liability insurance with limits of no less than $500,000 for each accident, $500,000 for a disease for each employee, and $500,000 for a disease policy limit. Contractor must comply with the following:

1. ☒ Be a Fully Insured or State approved self-insurer;
2. ☐ Sole Proprietors must submit a signed Sole Proprietor form; or
3. ☐ Exempt entities, Partnerships, LLC, etc., must submit a State of Michigan form WC-337 Certificate of Exemption.

Evidence of workers' compensation insurance is not necessary if neither Contractor nor any Contractor Employees come onsite to any County real property, land, premises, buildings, or other facilities in the performance of this Contract.

Commercial Automobile Liability Insurance covering bodily injury or property damage arising out of the use of any owned, hired, or non-owned automobile with a combined single limit of $1,000,000 each accident. This requirement is waived if there are no company owned, hired or non-owned automobiles utilized in the performance of this Contract.

Commercial Umbrella/Excess Liability Insurance with minimum limits of $2,000,000 each occurrence. This coverage shall be in excess of the scheduled underlying General Liability, Automobile Liability, and Employer's Liability Insurance policies with exclusions that are not broader than those contained in the underlying policies. This Umbrella/Excess requirement may be met by increasing the primary Commercial General Liability limits to meet the combined limit requirement.

Supplemental Coverages. The following supplemental coverages are required if selected (checked):

1. ☐ **Professional Liability/Errors & Omissions Insurance** (i.e., Consultants, Technology Vendors, Architects, Engineers, Real Estate Agents, Insurance Agents, Attorneys, etc.) with minimum limits of $1,000,000 per claim and $1,000,000 aggregate.

2. ☐ **Cyber Liability Insurance** with minimum limits of $1,000,000 per claim and $1,000,000 aggregate.

3. ☐ **Commercial Property Insurance**. The Contractor shall be responsible for obtaining and maintaining insurance covering their equipment and personal property against all physical damage.

4. ☐ **Liquor Legal Liability Insurance** with a limit of $1,000,000 each occurrence.

5. ☐ **Pollution Liability Insurance** with minimum limits of $1,000,000 per claim and $1,000,000 aggregate.

6. ☐ **Medical Malpractice Insurance** with minimum limits of $1,000,000 per claim and $1,000,000 aggregate.

7. ☐ **Garage Keepers Liability Insurance** with minimum limits of $1,000,000 per claim and $1,000,000 aggregate.

8. ☐ **Other Insurance Coverages** as may be dictated by the provided product/service and deemed appropriate by the County Risk Management Department.

General Insurance Conditions

The aforementioned insurance shall be endorsed, as applicable, and shall contain the following terms, conditions, and/or endorsements. All certificates of insurance shall provide evidence of compliance with all required terms, conditions and/or endorsements.

1. All policies of insurance shall be on a primary, non-contributory basis with any other insurance or self-insurance carried by the County;
2. The insurance company(s) issuing the policy(s) shall have no recourse against the County for subrogation (policy endorsed written waiver), premiums, deductibles, or assessments under any form. All policies shall be endorsed to provide a written waiver of subrogation in favor of the County;
3. Any and all deductibles or self-insured retentions shall be assumed by and be at the sole risk of the Contractor;
4. Contractor shall be responsible for their own property insurance for all equipment and personal property used and/or stored on County property;
5. The Commercial General Liability and Commercial Automobile Liability policies along with any required supplemental coverages shall be endorsed to name the County of Oakland and it officers, directors, employees, appointees, and commissioners as additional insured where permitted by law and policy form;
6. If the Contractor's insurance policies have higher limits than the minimum coverage requirements stated in this document the higher limits shall apply and in no way shall limit the overall liability assumed by the Contractor under contract.
7. The Contractor shall require its contractors or sub-contractors, not protected under the Contractor's insurance policies, to procure and maintain insurance with coverages, limits, provisions, and/or clauses equal to those required in this Contract;
8. Certificates of insurance must be provided prior to the County's execution of the Contract and must bear evidence of all required terms, conditions and endorsements; and provide thirty (30) days' written notice of cancellation/material change endorsement to the insurance coverages required by this Exhibit.
9. All insurance carriers must be licensed and approved to do business in the State of Michigan along with the Contractor's state of domicile and shall have and maintain a minimum A.M. Best's rating of A- unless otherwise approved by the County Risk Management Department.

EXHIBIT II

BUSINESS ASSOCIATE AGREEMENT
(Health Insurance Portability and Accountability Act Requirements)

Exhibit II is a Business Associate Agreement between Contractor ("Business Associate") and the County ("Covered Entity"). This Exhibit is incorporated into the Contract and shall be hereinafter referred to as "Agreement." The purpose of this Agreement is to facilitate compliance with the Privacy and Security Rules and to facilitate compliance with HIPAA and the HITECH Amendment to HIPAA.

§1. **DEFINITIONS.** The following terms have the meanings set forth below for purposes of the Agreement, unless the context clearly indicates another meaning. Terms used but not otherwise defined in this Agreement have the same meaning as those terms in the Privacy Rule.

1.1 **Business Associate.** "Business Associate" means the Contractor.

1.2 **CFR.** "CFR" means the Code of Federal Regulations.

1.3 **Contract.** "Contract" means the document with the Purchasing Contract Number.

1.4 **Contractor.** "Contractor" means the entity or individual defined in the Contract and listed on the first page of this Contract.

1.5 **Covered Entity.** "Covered Entity" means the County of Oakland as defined in the Contract.

1.6 **Designated Record Set.** "Designated Record Set" is defined in 45 CFR 164.501.

1.7 **Electronic Health Record.** "Electronic Health Record" means an electronic record of health-related information on an individual that is created, gathered, managed, and consulted by authorized health care clinicians and staff.

1.8 **HIPAA.** "HIPAA" means the Health Insurance Portability and Accountability Act of 1996.

1.9 **HITECH Amendment.** "HITECH Amendment" means the changes to HIPAA made by the Health Information Technology for Economic and Clinical Health Act.

1.10 **Individual.** "Individual" is defined in 45 CFR 160.103 and includes a person who qualifies as a personal representative in 45 CFR 164.502(g).

1.11 **Privacy Rule.** "Privacy Rule" means the privacy rule of HIPAA as set forth in the Standards for Privacy of Individually Identifiable Health Information at 45 CFR part 160 and part 164, subparts A and E.

1.12 **Protected Health Information.** "Protected Health Information" or "PHI" is defined in 45 CFR 160.103, limited to the information created or received by Business Associate from or on behalf of Covered Entity.

1.13 **Required By Law.** "Required By Law" is defined in 45 CFR 164.103.

1.14 **Secretary.** "Secretary" means the Secretary of the Department of Health and Human Services or his or her designee.

1.15 **Security Incident.** "Security Incident" is defined in 45 CFR 164.304.

1.16 **Security Rule.** "Security Rule" means the security standards and implementation specifications at 45 CFR part 160 and part 164, subpart C.

§2. **OBLIGATIONS AND ACTIVITIES OF BUSINESS ASSOCIATE.** Business Associate agrees to perform the obligations and activities described in this Section.

2.1 Business Associate understands that pursuant to the HITECH Amendment, it is subject to the HIPAA Privacy and Security Rules in a similar manner as the rules apply to Covered Entity. As a result, Business Associate shall take all actions necessary to comply with the HIPAA Privacy and Security Rules for business associates as revised by the HITECH Amendment, including, but not limited to, the following: (a) Business Associate shall appoint a HIPAA privacy officer and a HIPAA security officer; (b) Business Associate shall establish policies and procedures to ensure compliance with the Privacy and Security Rules; (c) Business Associate shall train its workforce regarding the Privacy and Security Rules; (d) Business Associate shall enter into a privacy/security agreement with Covered Entity; (e) Business Associate shall enter into privacy/security agreements with its subcontractors that perform functions relating to Covered Entity involving PHI; (f) Business Associate shall conduct a security risk analysis; and (g) Business Associate shall provide documentation upon request in relation to performance under this section.

2.2 Business Associate shall not use or disclose PHI other than as permitted or required by this Agreement or as required by law.

2.3 Business Associate shall use appropriate safeguards to prevent use or disclosure of the PHI. Business Associate shall implement administrative, physical, and technical safeguards (including written policies and procedures) that reasonably and appropriately protect the confidentiality, integrity, and availability of PHI that it creates, receives, maintains, or transmits on behalf of Covered Entity as required by the Security Rule.

2.4 Business Associate shall mitigate, to the extent practicable, any harmful effect that is known to Business Associate of a use or disclosure of PHI by Business Associate in violation of law or this Agreement.

2.5 Business Associate shall report to Covered Entity any known Security Incident or any known use or disclosure of PHI not permitted by this Agreement.

2.6 Effective September 23, 2009 or the date this Agreement is signed, if later, Business Associate shall do the following in connection with the breach notification requirements of the HITECH Amendment:

2.6.1 If Business Associate discovers a breach of unsecured PHI, as those terms are defined by 45 CFR 164.402, Business Associate shall notify Covered Entity without unreasonable delay but no later than ten (10) calendar days after discovery. For this purpose, "discovery" means the first day on which the breach is known to Business Associate or should have been known by exercising reasonable diligence. Business Associate shall be deemed to have knowledge of a breach if the breach is known or should have been known by exercising reasonable diligence, to any person, other than the person committing the breach, who is an employee, officer, subcontractor, or other agent of Business Associate. The notification to Covered Entity shall include the following: (a) identification of each individual whose unsecured PHI has been breached or has reasonably believed to have been breached, and (b) any other available information in Business Associate's possession that the Covered Entity is required to include in the individual notice contemplated by 45 CFR 164.404.

2.6.2 Notwithstanding the immediate preceding subsection, Business Associate shall assume the individual notice obligation specified in 45 CFR 164.404 on behalf of Covered Entity where a breach of unsecured PHI was committed by Business Associate or its employee, officer, subcontractor, or other agent of Business Associate or is within the unique knowledge of Business Associate as opposed to Covered Entity. In such case, Business Associate shall prepare the notice and shall provide it to Covered Entity for review and approval at least five (5) calendar days before it is required to be sent to the affected individual(s). Covered Entity shall promptly review the notice and shall not unreasonably withhold its approval.

2.6.3 Where a breach of unsecured PHI involves more than five hundred (500) individuals and was committed by the Business Associate or its employee, officer, subcontractor, or other agent or is within the unique knowledge of Business Associate as opposed to Covered Entity, Business Associate shall provide notice to the media pursuant to 45 CFR 164.406. Business Associate shall prepare the notice and shall provide it to Covered Entity for review and approval at least five (5) calendar days before it is required to be sent to the media. Covered Entity shall promptly review the notice and shall not unreasonably withhold its approval.

2.6.4 Business Associate shall maintain a log of breaches of unsecured PHI with respect to Covered Entity and shall submit the log to Covered Entity within thirty (30) calendar days following the end of each calendar year, so that the Covered Entity may report breaches to the Secretary in accordance with 45 CFR 164.408. This requirement shall take effect with respect to breaches occurring on or after September 23, 2009.

2.7 Business Associate shall ensure that any agent or subcontractor to whom it provides PHI, received from Covered Entity or created or received by Business Associate on behalf of Covered Entity, agrees in writing to the same restrictions and conditions that apply to Business Associate with respect to such information. Business Associate shall ensure that any such agent or subcontractor implements reasonable and appropriate safeguards to protect Covered Entity's PHI.

2.8 Business Associate shall provide reasonable access, at the written request of Covered Entity, to PHI in a Designated Record Set to Covered Entity or, as directed in writing by Covered Entity, to an Individual in order to meet the requirements under 45 CFR 164.524.

2.9 Business Associate shall make any amendment(s) to PHI in a Designated Record Set that the Covered Entity directs in writing or agrees to pursuant to 45 CFR 164.526.

2.10 Following receipt of a written request by Covered Entity, Business Associate shall make internal practices, books, and records reasonably available to the Secretary in order to determine Covered Entity's compliance with the Privacy Rule. The afore mentioned materials include policies and procedures and PHI relating to the use and disclosure of PHI received from Covered Entity or created or received by Business Associate on behalf of Covered Entity.

2.11 Business Associate shall document disclosures of PHI and information related to such disclosures, to permit Covered Entity to respond to a request by an Individual for: (a) an accounting of disclosures of PHI in accordance with 45 CFR 164.528 or (b) effective January 1, 2011 or such later effective date prescribed by regulations issued by the U.S. Department of Health and Human Services, an accounting of disclosures PHI from an Electronic Health Record in accordance with the HITECH Amendment.

2.12 Following receipt of a written request by Covered Entity, Business Associate shall provide to Covered Entity or an Individual information collected in accordance with Section 2 to permit Covered Entity to respond to a request by an Individual for: (a) an accounting of disclosures of PHI in accordance with 45 CFR 164.528 or (b) effective as of January 1, 2011 or such later effective date prescribed by regulations issued by the U.S. Department of Health and Human Services, an accounting of disclosures of Protected Health Information from an Electronic Health Record in accordance with the HITECH Amendment.

§3. **PERMITTED USES AND DISCLOSURES BY BUSINESS ASSOCIATE.** Business Associate may use and disclose PHI as set forth in this Section.

3.1 Except as otherwise limited in this Agreement, Business Associate may use or disclose PHI to perform functions, activities, or services for or on behalf of Covered Entity as specified in the underlying service agreement between Covered Entity and Business Associate, provided that such use or disclosure shall not violate the Privacy Rule if done by Covered Entity or the minimum necessary policies and procedures of

the Covered Entity. If no underlying service agreement exists between Covered Entity and Business Associate, Business Associate may use or disclose PHI to perform functions, activities, or services for or on behalf of Covered Entity for the purposes of payment, treatment, or health care operations as those terms are defined in the Privacy Rule, provided that such use or disclosure shall not violate the Privacy Rule if done by Covered Entity or the minimum necessary policies and procedures of the Covered Entity.

3.2 Except as otherwise limited in this Agreement, Business Associate may use PHI for the proper management and administration of the Business Associate or to carry out the legal responsibilities of the Business Associate.

3.3 Except as otherwise limited in this Agreement, Business Associate may disclose PHI for the proper management and administration of the Business Associate or to carry out the legal responsibilities of the Business Associate, provided that disclosures are Required by Law or Business Associate obtains reasonable assurances in writing from the person to whom the information is disclosed that: (a) the disclosed PHI will remain confidential and will be used or further disclosed only as Required by Law or for the purpose for which it was disclosed to the person and (b) the person notifies the Business Associate of any known instances in which the confidentiality of the information has been breached.

3.4 Except as otherwise limited in this Agreement, Business Associate may use PHI to provide data aggregation services to Covered Entity as permitted by 45 CFR 164.504(e)(2)(i)(B).

3.5 Business Associate may use PHI to report violations of law to appropriate federal and state authorities, consistent with 45 CFR 164.502(j)(1).

§4. OBLIGATIONS OF COVERED ENTITY.

4.1 Covered Entity shall notify Business Associate of any limitation(s) of Covered Entity in its notice of privacy practices in accordance with 45 CFR 164.520, to the extent that such limitation may affect Business Associate's use or disclosure of PHI.

4.2 Covered Entity shall notify Business Associate of any changes in or revocation of permission by an Individual to use or disclose PHI, to the extent that such changes may affect Business Associate's use or disclosure of PHI.

4.3 Covered Entity shall use appropriate safeguards to maintain and ensure the confidentiality, privacy and security of PHI transmitted to Business Associate pursuant to this Agreement, the Contract, and the Privacy Rule, until such PHI is received by Business Associate, pursuant to any specifications set forth in any attachment to the Contract.

4.4 Covered Entity shall manage all users of the services including its qualified access, password restrictions, inactivity timeouts, downloads, and its ability to download and otherwise process PHI.

4.5 The Parties acknowledge that Covered Entity owns and controls its data.

4.6 Covered Entity shall provide Business Associate with a copy of its notice of privacy practices produced in accordance with 45 CFR Section 164.520, as well as any subsequent changes or limitation(s) to such notice, to the extent such changes or limitations may affect Business Associate's use or disclosure of PHI. Covered Entity shall provide Business Associate with any changes in or revocation of permission to use or disclose PHI, to the extent the changes or revocation may affect Business Associate's permitted or required uses or disclosures. To the extent that the changes or revocations may affect Business Associate's permitted use or disclosure of PHI, Covered Entity shall notify Business Associate of any restriction on the use or disclosure of

PHI that Covered Entity has agreed to in accordance with 45 CFR Section 164.522. Covered Entity may effectuate any and all such notices of non-private information via posting on Covered Entity's web site.

§5. EFFECT OF TERMINATION.

5.1 Except as provided in Section 5, upon termination of this Agreement or the Contract, for any reason, Business Associate shall return or destroy (at Covered Entity's request) all PHI received from Covered Entity or created or received by Business Associate on behalf of Covered Entity. This provision shall apply to PHI that is in the possession of subcontractors or agents of Business Associate. Business Associate shall retain no copies of PHI.

5.2 If Business Associate determines that returning or destroying the PHI is infeasible, Business Associate shall provide to Covered Entity written notification of the conditions that make return or destruction infeasible. Upon receipt of written notification that return, or destruction of PHI is infeasible, Business Associate shall extend the protections of this Agreement to such PHI and shall limit further uses and disclosures of such PHI to those purposes that make the return or destruction infeasible, for so long as Business Associate maintains such PHI, which shall be for a period of at least six (6) years.

§6 MISCELLANEOUS.

6.1 This Agreement is effective when the Contract is executed or when Business Associate becomes a Business Associate of Covered Entity and both Parties sign this Agreement, if later. However, certain provisions have special effective dates, as set forth herein or as set forth in HIPAA or the HITECH Amendment.

6.2 **Regulatory References.** A reference in this Agreement to a section in the Privacy Rule or Security Rule means the section as in effect or as amended.

6.3 **Amendment.** The Parties agree to take action to amend this Agreement as necessary for Covered Entity to comply with the Privacy and Security requirements of HIPAA. If the Business Associate refuses to sign such an amendment, this Agreement shall automatically terminate.

6.4 **Survival.** The respective rights and obligations of Business Associate and Covered Entity under this Agreement shall survive the termination of this Agreement and/or the Contract.

EXHIBIT III
REQUIREMENTS FOR CONTRACTORS WITH ACCESS TO COUNTY PII
(Personally Identifiable Information)

Exhibit III governs the requirements for Contractors with Access to Personally Identifiable Information (PII).

1. DEFINITIONS

1.1 **Security Breach** means the unauthorized access, acquisition, theft, or disclosure of PII by or from Contractor.

1.2 **PII** (Personally Identifiable Information) means information that can be used to identify an individual, either alone or when combined with other personal or identifying information. PII includes, but is not limited to, a name, number, address, telephone number, driver's license or state personal identification card number, social security number, place of employment, employee identification number, employer or taxpayer identification number, government passport number, health insurance identification number, mother's maiden name, demand deposit account number, savings account number, financial transaction device account number or the person's account password, any other account password in combination with sufficient information to identify and access the account, automated or electronic signature, biometrics, stock or other security certificate or account number, credit card number, vital record, or medical records or information as well as the first name or first initial and last name linked to a social security number, driver's license or state personal identification card or financial account number in combination with a code or password that would permit access to a person's financial account(s) and as otherwise may be defined by state or federal laws governing the unauthorized access to personal information, or other information that is used for the purpose of identifying a specific person or providing access to a person's financial accounts.

2. OBLIGATIONS

2.1 Contractor shall not use or disclose PII other than as permitted or required by this Contract or as required by law.

2.2 Contractor shall implement administrative, physical, and technical safeguards (including written policies and procedures) that reasonably and appropriately protect the confidentiality, integrity, and availability of PII that it creates, receives, maintains, or transmits on behalf of the County.

2.3 Contractor shall mitigate, to the extent practicable, any harmful effect known to Contractor of the use or disclosure of PII in violation of law or this Contract.

2.4 If Contractor discovers a Security Breach, Contractor shall notify the County without unreasonable delay, but no later than within forty-eight (48) hours of discovery. For this purpose, "discovery" means the first day on which the Security Breach is known to Contractor. The notification to the County shall include the following: (a) describe the Security Breach in general terms; (b) describe the type of personal information that is the subject of the Security Breach; (c) identify each individual whose PII has been breached or has reasonably believed to have been breached; (d) describe in general terms, what Contractor has done to prevent additional Security Breaches; and (e) provide any other available information in Contractor or subcontractor's possession that may be necessary to comply with Security Breach notification laws.

2.5 If the County determines it will provide the notice of the Security Breach to the affected individuals and/or to governmental authorities, Contractor shall reimburse the County for: (a) its costs in notifying the affected individuals; (b) the cost of third-party credit and identify monitoring services to each of the affected individuals with compromised PII for no less than twenty-four (24) months following the date of notification to each individual; and (c) costs associated with the Security Breach, including but not limited to any costs

incurred by the County in investigating and resolving the Security Breach, including reasonable fees associated with such investigation and resolution. Without limiting Contractor's obligations of indemnification as described in the Contract, Contractor shall indemnify, defend, and hold harmless the County for any and all Claims, including reasonable attorneys' fees, costs, and incidental expenses, which may be suffered by, accrued against, charged to, or recoverable from the County in connection with the Security Breach. Contractor shall reimburse County for the applicable costs described above within thirty (30) days of receipt of an itemization of costs incurred by the County because of the Security Breach.

2.6 Within ten (10) calendar days of its discovery of the Security Breach, Contractor shall provide the County with a detailed plan describing the measures Contractor will undertake to prevent a future Security Breach. The County shall have the right to audit, inspect and test Contractor's new safeguards put in place because of the Security Breach. Contractor shall be responsible for recreating lost County Data in the manner and on the schedule set by the County without charge to the County.

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EXHIBIT IV
REQUIREMENTS FOR CONTRACTORS WITH ACCESS TO CJIS DATA
(Criminal Justice Information Security)

Exhibit IV governs the requirements for Contractors with Access to Criminal Justice Information governed by the CJI Security Policy of the FBI.

1. Definitions

1.1 **Criminal Justice Information (CJI)** means data or information governed by the CJIS Security Policy.

1.2 **Criminal Justice Information Services (CJIS)** means the Criminal Justice Information Services, a division in the Federal Bureau of Investigation (FBI) that sets a minimum standard of security requirements to protect and safeguard CJI.

1.3 **CJIS Security Policy** means the Policy that governs the security of CJI. The CJIS Security Policy provides guidance for the creation, viewing, modification, transmission, dissemination, storage, and destruction of CJI. This Policy applies to every individual—contractor, private entity, noncriminal justice agency representative, or member of a criminal justice entity—with access to, or who operate in support of, criminal justice services and information.

2. Obligations

Contractor shall comply with the current version of the CJIS Security Policy, which may be amended from time to time by the CJIS Advisory Policy Board of the FBI. A link to the current FBI standards is available at: https://www.fbi.gov/services/cjis/cjis-security-policy-resource-center

EXHIBIT V
FEDERALLY FUNDED CONTRACT REQUIREMENTS

Exhibit V sets forth additional provisions for all federally funded contracts. To the extent that this Contract is funded, in whole or in part, by any federal award, the following provisions apply:

1. **Termination.** In addition to the termination rights set forth in Section 4 of this Contract, the County may terminate this Contract, in whole or in part, for cause upon notice to Contractor if Contractor breaches any duty or obligation in the Contract and fails to cure the breach, to the County's satisfaction, if applicable.

1.1 **Right to Cure.** If the Contractor breaches this Contract, and the County, in its sole discretion, determines that the breach is curable, then the County must provide the Contractor with written notice of the breach and a time period (not less than thirty (30) Days) to cure the breach. The notice of breach and opportunity to cure do not apply in the following circumstances: (1) for successive or repeated breaches; (2) if the County determines in its sole discretion that the breach poses a serious and imminent threat to the health or safety of any person or the imminent loss, damage, or destruction of any real or tangible personal property; or (3) if the County terminates the Contract under this Section or Section A above. The effective date for termination or cancellation shall be clearly stated in the written notice.

1.2 **Termination Deemed for Convenience.** If the County terminates the Contract for cause and it is determined, for any reason, that Contractor was not in breach of Contract, then the termination for cause shall be deemed a termination for convenience, effective as of the same date specified in the notice of breach.

2. **Contractor's Obligations Upon Termination for Cause.** If the Contract is terminated for cause, the County may require Contractor to pay all costs incurred by the County in terminating the Contract, including but not limited to, administrative costs, reasonable attorneys' fees, court costs, and any reasonable additional costs the County may incur to procure the Deliverables required by the Contract from other sources. Re-procurement costs are not consequential, indirect or incidental damages and cannot be excluded by any other terms included in this Contract; however, such costs shall not exceed 50% of the County's financial obligation under this Contract.

3. **Compliance with Laws.** Contractor shall comply with the following, if applicable:

3.1 The Davis-Bacon Act (40 U.S.C. 3141-3148) as supplemented by Department of Labor regulations (29 CFR Part 5, "Labor Standards Provisions Applicable to Contracts Covering Federally Financed and Assisted Construction");

3.2 The Copeland "Anti-Kickback" Act (40 U.S.C. 3145 *et seq.*), as supplemented by Department of Labor regulations (29 CFR Part 3, "Contractors and Subcontractors on Public Building or Public Work Financed in Whole or in Part by Loans or Grants from the United States");

3.3 The Contract Work Hours and Safety Standards Act (40 U.S.C. 3701-3708) as supplemented by Department of Labor regulations (29 CFR Part 5);

3.4 The requirements of 37 CFR Part 401, "Rights to Inventions Made by Nonprofit Organizations and Small Business Firms Under Government Grants, Contracts and Cooperative Agreements," and any implementing regulations issued by the awarding agency;

3.5 All applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401-7671q) and the Federal Water Pollution Control Act as amended (33 U.S.C. 1251-1387);

3.6 All mandatory standards and policies relating to energy efficiency which are contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act (42 U.S.C. 6201 *et seq.*); and

3.7 The Byrd Anti-Lobbying Amendment (31 U.S.C. 1352 *et seq.*)

3.8 The requirements of 2 CFR 200.323 (Procurement of recovered materials), including, but not limited to, section 6002 of the Solid Waste Disposal Act, as amended, and 40 CFR Part 247.

3.9 The requirements of 2 CFR 200.216 (Prohibition on certain telecommunications and video surveillance services or equipment).

3.10 The requirements of 2 CFR 200.322 (Domestic preferences for procurements).

3.11 The requirements and obligations imposed on contractors in 2 CFR Appendix II to Part 200 (Contract Provisions for Non-Federal Entity Contracts Under Federal Awards).

4. **Debarment and Suspension.** Contractor certifies that it is not listed on the government-wide Excluded Parties List System in the System for Award Management (SAM). Contractor must promptly notify the County, if Contractor is listed in SAM at any time during the term, renewal, or extension of this Contract. If Contractor is listed in SAM, the County may terminate or cancel this Contract, in whole or in part, immediately, upon notice to Contractor.

5. **Equal Employment Opportunity.** If this Contract meets the definition of "Federally Assisted Construction Contract" under 41 CFR Part 60-1.3, then during the performance of this Contract, Contractor agrees as follows:

5.1 The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following: Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

5.2 The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive considerations for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.

5.3 The contractor will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the contractor's legal duty to furnish information.

5.4 The Contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the Contractor's commitments under this Section and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

5.5 The Contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

5.6 The Contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

5.7 In the event of the Contractor's noncompliance with the nondiscrimination clauses of this Contract or with any of the said rules, regulations, or orders, this Contract may be cancelled, terminated, or suspended in whole or in part and the Contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

5.8 The Contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (8) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance: *Provided, however,* that in the event a Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

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EXHIBIT VII
LICENSE FOR USE OF COUNTY SERVICEMARK

County grants to Contractor the non-exclusive right to use its Servicemark (hereinafter "Mark"), described and listed in the Servicemark Guidelines (below), for programs and activities that are directly related to the Deliverables and governmental services provided by Oakland County.

The Mark may be used on: (Applicable if Checked):

☐ Printed materials

☐ Electronic materials

☐ Contractor's website: [insert website address].

Contractor shall not use the Mark for any other purpose.

The Mark must be used by Contractor as shown in the Servicemark Guidelines, with no variations of color, font or proportion. Contractor acknowledges that the County has intellectual property rights in the Mark. Nothing in this Contract gives Contractor any right, title, or interest in the Mark. Contractor may not take any action that will interfere with County's rights in the Mark.

The County may terminate Contractor's rights under this Exhibit, if County notifies Contractor it has breached the terms of this Exhibit and Contractor fails to cure the breach within ten (10) business days of notice of breach. Following termination of this Exhibit, Contractor shall have ten (10) business days to remove the Mark from the materials and/or website authorized for use above. Contractor shall provide County with written confirmation that such actions have been taken. Upon termination of the Contract, Contractor shall cease all use of the Mark.

Servicemark Guidelines

The Guidelines for proper use of the Mark provided to the Contractor are as follows:

OAKLAND COUNTY, MICHIGAN

SERVICEMARK BRAND STANDARDS

PRIMARY LOGO

Oakland County has two logos that can be used interchangeably. Use the Horizontal Two Trees logo as your default choice. This is our primary logo. The Stacked Logo can be used whenever space or size is a consideration in your publication. Either logo is acceptable for all Oakland County publications.

However, **only one style of logo may be used per publication.** For instance, if you have the horizontal logo on the front of a publication, you can't use the stacked logo elsewhere in the document.

Pick one logo style for each publication and use it throughout, do not mixed styles.

HORIZONTAL "TWO TREES" LOGO

STACKED LOGO

LOGO VARIATIONS

Logos should appear in full color when used in a full color design, whenever possible. However, if the publication requires a single color version of the logo, choose either all-black or all-white. No other color is acceptable.

BRAND COLORS

The primary Oakland County logos use the following brand colors.

Accent colors for the brand are pulled from two other major servicemarks for Oakland County. These colors may be used as secondary colors in publications.

WHITE SPACE

A prescribed amount of space around the logo must be maintained at all times.

QUESTIONS

For questions or clarification on these brand standards, please contact:

Department of Public Communications
(248) 858-0140 | dpc@oakgov.com

Adobe Swatch Exchange

Do not provide copies to a third-party of any artwork provided to you by County and referenced in this Exhibit without the express consent of County.

EXHIBIT VIII

ACKNOWLEDGEMENT OF INDEPENDENT EMPLOYMENT STATUS

I,_____, acknowledge that I am an employee or subcontractor of (*Name of Contractor's Company*):_____ (hereinafter "Company") under *Contract #*:_____, and

- At all times during my assignment at Oakland County, I will remain an employee or subcontractor of the Company
- I am not an employee of Oakland County; and,
- I may not represent myself as an employee of Oakland County.

I understand that:

- Company is responsible for establishing the conditions of my assignment to Oakland County; and
- Company is solely responsible for compensating me for my services; and
- I understand and agree that as an employee or subcontractor of Company, I am not eligible to participate in or accrue any benefits under any of Oakland County's employee benefits or benefit plans, including retirement, deferred compensation, insurance (including without limitation: health, disability dental and life insurance), vacation pay, and any other similar plans and programs. However, if I am a retired County employee, I may receive vested post-employment benefits such as retiree healthcare and pension benefits from Oakland County. I understand that the post-retirement benefits I receive from the County cannot be enhanced by my work for the above Contractor.

I acknowledge that:

- I have no copyright, patent, trademark or trade secret rights to any Oakland County Intellectual Property or any work developed by me while providing services to Oakland County; and,
- If I will be given access to the County Network, I will comply with the Oakland County Electronic Communications and Use of Technology Policy.
- I will comply with and sign the FBI Criminal Justice Information Services Security Addendum if I will have access to CJIS Data.

Signed: _____ **Date**: _____

Print Name: _____

Witness: _____ **Date**: _____

Print Name: _____

**Contractor or Contractor Employee must provide a copy of completed form to the Purchasing Division at Purchasing@oakgov.com to receive a County Identification badge.*

EXHIBIT IX
SCOPE OF CONTRACTOR DELIVERABLES/FINANCIAL OBLIGATIONS

DVM Utilities (DVM) will provide as needed maintenance and rehabilitation services for cleaning, closed circuit television, inspection, and sewage repairs, to various Oakland County sewage systems.
Oakland County Water Resources Commissioner (WRC) anticipates numerous maintenance and rehabilitation projects will be performed during the duration of this contract.
The scope and duration of each project will be developed prior to being assigned to DVM. Based on scope developed, for any individual project, WRC may request a project estimate based on the rates/unit price or lump sum amounts. The project estimate may be used as a not to exceed amount for that particular project, as agreed upon between WRC and DVM. Project assignments will be made at the sole discretion of WRC. Any materials proposed for use on any project will need to include submission of product material specifications and installation instructions and will require approval from WRC staff before use.
DVM Utilities shall be capable of providing one or more of the services detailed below. All work shall be performed in a professional manner and shall be consistent with the practices of the trade and the attached specifications in Attachment B – WRC Sewage System Maintenance & Rehabilitation Specs for each operation.

1. Thermal (Hot Water or Steam) Cured in Place Pipe Liner – Provide for the reconstruction of sewer pipes using Cure-in-Place-Pipe (C.I.P.P.) process. This process utilized the trenchless method of installation of a resin-impregnated, flexible, tube which is inverted into the existing sewer with hydrostatic head or steam and cured by means of thermally heated water and steam. Full length pipe liners, spot liners, and lateral liners could be requested. When cured, the finished sewer lining shall be tight fitting and continuous from end to end. Options for resin materials can include styrenated, non-styrenated, use of a styrene gas barrier or another approved equal. This operation shall be performed in accordance with the attached Thermal Cured in Place Pipe Specifications (Attachment B) or as otherwise agreed upon by WRC.
2. Thermal (Hot Water or Steam) Cured in Place Pipe Liner - Provide for the reconstruction of sewer pipes using the Cured-in-Place Pipe (C.I.P.P.) process. This process utilizes the trenchless method of installation of a resin-impregnated, flexible tube which is inverted into the existing sewer by hydrostatic head or steam and cured by means of thermally heated water or steam. Full length pipe liners, spot liners and lateral liners could be requested. When cured, the finished sewer lining shall be tight fitting and continuous from end to end. Options for resin materials can include styrenated, non-styrenated, use of a styrene gas barrier or another approved equal. This operation shall be performed in accordance with the attached Thermal Cured in Place Pipe Specification or as otherwise agreed upon by WRC.
3. UV Cured in Place Pipe Liner - Provide for the reconstruction of sewer pipes using the Cured-in-Place Pipe (C.I.P.P.) process utilizing the trenchless method of installation of a resin-impregnated, flexible tube which is inverted into the existing sewer by hydrostatic head or steam pressure and cured by means of ultraviolet light. When cured the finished sewer lining shall be tight fitting and continuous from end to end. This operation shall be performed in accordance with the attached UV Cured in Place Pipe Specification or as otherwise agreed upon by WRC.
4. By-Pass Pumping and Dewatering - Provide bypass pumping and dewatering services as determined necessary and agreed upon between WRC and the Contractor.

5. Manhole and Pipe Rehabilitation by Spray Lining - Provide for the reconstruction of manholes and sewer pipes by the use of the Spray Lining Rehabilitation process, spraying a cementitious lining, epoxy lining or another approved material into an existing host manhole and/or pipe. This operation shall be performed in accordance with the attached Manhole and Pipe Rehabilitation and Spray Lining Specification or as otherwise agreed upon by WRC
6. Manhole Rehabilitation - Provide for the reconstruction of manholes by the use of trowel or otherwise manually applied material rehabilitation process, applying a cementitious lining, epoxy lining, polyurea, polyurethane, or another approved material into an existing host manhole. This operation shall be performed in accordance with the material manufacturer specification or as otherwise agreed upon by WRC.
7. Sewer Cleaning - The cleaning of small, moderate and large diameter sewers, complete with removal and disposal of debris resultant from the cleaning operation. Cleaning shall include, but not limited to, the removal of dirt, grease, rocks, roots, also other foreign solid or semi-solid material and obstructions from designated sewer lines and structures, including disposal of the materials. The work of this section shall conform to the applicable portions of the National Association of Sewer Service Companies (NASSCO) and performed in accordance with the attached Sewer Cleaning Specifications, or as otherwise approved by WRC.
8. Sewer Pipe Joint Testing and Sealing - Sewer pipe joint testing is used to test the integrity (tightness or leakage) of individual pipe joints. The intent of pipe joint testing is to identify those sewer pipe joints that are defective (allowing groundwater to enter the sewer system) and that can be successfully sealed by the internal pipe joint sealing process. Testing of joints which are visibly leaking (infiltrating) is unnecessary because the intent of testing is obviously attained. Testing cannot be performed and will not be required on cracked or broken pipe, building sewers, or sections of pipe between joints. Sealing is done by grouting internal joints of sewer pipes which have failed the joint test criteria described in Sewer Pipe Joint Testing Specification. All grout shall contain root inhibitors unless specified otherwise
9. CCTV / Sewer Inspection - Sewer inspection shall include Closed Circuit TV (CCTV) and/or Walk through Inspections of large diameter sewers. Personnel viewing the live video feed in the televising van must be NASSCO certified and have at least three years of certified NASSCO grading experience. All work must be in PACP format. WRC uses GraniteNet software. The work of this section shall conform to the applicable portions of the National Association of Sewer Service Companies (NASSCO) and performed in accordance with the attached CCTV Inspection Specifications. All videos, databases, and reports shall be submitted on a file transfer site, Owner-approved cloud-based platform, portable hard drive or thumb drive and shall include work order numbers, footage and video log. DVD's will not be accepted. Contractor shall keep copies of video and reports for one (1) year on a separate dedicated WRC hard drive. Video and reports shall be submitted with any payment request for WRC review prior to issuance of payment.
10. Other As Needed Services - Other maintenance and rehabilitation services not identified in this RFP may be included in the Contractor's proposal. For these services the Contractor's proposal

shall include a clear description of the proposed service, including applicable specifications and applicable pricing.

It is desired that DVM Utilities be available for emergency services, with the ability to mobilize on site and be ready to work within 2 hours of being notified for any emergency maintenance or repair. DVM does have the ability to work flexible hours, including nighttime hours, and 4-day ten hour per day work weeks, as deemed necessary

WRC, or designated representative, shall provide full-time inspection, during the duration of each project. No operation(s) shall commence without WRC inspection, unless otherwise approved by WRC.

DVM Utilities will notify all residents affected by the construction at least 24 hours prior to any service disruption affecting their service connection.

DVM Utilities will perform cleaning, video, and inspection prior to installation of the CIPP.

DVM Utilities will notify the Owner of line obstructions, offset joints or collapsed pipe that will prevent the insertion of the tube or significantly reduce the capacity of the sewer. The Owner, with input from DVM Utilities, Inc., will determine the method of repair required and will address these concerns on a case-by-case basis.

WRC will have complete discretion to cancel work due to weather and/or other circumstances with no penalty to WRC. WRC will strive to provide reasonable notification of cancelled work.

DVM shall be responsible for identifying and obtaining all local and state permits, unless otherwise agreed upon by WRC. Permit costs will be an acceptable charge to WRC with no additional mark up. The WRC will be responsible for obtaining permits from the Michigan Department of Environment, Great Lakes, and Energy (EGLE) when required. For projects within Michigan Department of Transportation (MDOT) or Road Commission for Oakland County (RCOC) rights of way, DVM Utilities may use the annual construction permits that the WRC holds with the MDOT and RCOC depending upon the scope of the specific project. Use of these permits must be authorized by the WRC on a project-by-project basis.

Invoicing shall be performed monthly or a mutually agreed upon schedule between WRC and DVM. Invoicing shall be itemized in accordance with Attachment A – DVM Utilities Inc. Rates and segregated by the type of work and associated WRC work order. For each project, the Contractor may bill only one mobilization charge and shall provide back-up information such as purchase orders, invoices, delivery receipts and subcontractor invoices for all subcontracted services and purchased material and supplies. Non-productive time due to equipment failure or other determined causes will not be included in the Contractor's monthly invoice.

Certain projects may have grant eligibility which will be provided by DVM at no cost to WRC, unless otherwise agreed upon.

DVM Utilities shall be responsible for adhering to all local, State, and Federal Safety Standards. No additional payment will be made for any items needed to adhere to all local, State, and Federal Safety Standards.

WRC does not guarantee a volume of work. Work will be on an as needed basis.

Attachments
Attachment A – DVM Utilities Inc. Rates

PART 1 General

1.01 SUMMARY

It is the intent of this scope of work to provide for the reconstruction of sewer pipes by the use of the Cured-in-Place Pipe (C.I.P.P.) process utilizing the trenchless method of installation of a resin- impregnated, flexible tube which is inverted into the existing sewer by hydrostatic head or air pressure and cured by means of heated water or air (WRC approval only). When cured, the finished sewer lining shall be tight fitting and continuous from end to end.

1.01.01 Referenced Specifications:

1.01.01.01 CCTV Inspection Sewer
1.01.01.02 Sewer Cleaning
1.01.01.03 Sewer Pipe Joint Testing
1.01.01.04 Sewer Pipe Joint Sealing
1.01.01.05 Chemical Sealing (Grout) Material
1.01.01.06 By-Pass Pumping
1.01.01.07 Manhole and Pipe Rehabilitation and Spray Lining

1.02 QUALITY CONTROL

1.02.01 All work for this section shall conform to the applicable portions of the latest Standard Specifications:

1.02.01.01 ASTM D 5813 – 04 (2018)
1.02.01.02 ASTM F 1216 – 24a (including Appendix X1)
1.02.01.03 ASTM F 2019-22
1.02.01.04 ASTM F 1743 – 25

1.02.02 However, where the requirements of ASTM D 5813, ASTM F 1216, ASTM F 2019 or ASTM D 1743 conflict with the requirements of this section, this section shall govern.

1.03 SUBMITTALS

1.03.01 CCTV Inspection Sewer.

1.03.01.01 A CCTV inspection of the sewer before conditions and after conditions including the restored connections shall be completed per the CCTV Inspection Sewer specifications and turned over to the Owner and become their property.

1.03.02 Material Test

1.03.02.01 Material test shall be furnished to the Owner for review and approval prior to beginning the rehabilitation work, satisfactory written guarantee of compliance with the standards specifications for all materials, techniques, and installation methods being used in the rehabilitation process.

1.03.03 CURE PLAN

1.03.04 BY-PASS PUMPING PLAN

1.03.04.01 Submit a detailed sewer bypass pumping plan to WRC for review fifteen (15) days prior to the beginning of work per the By-Pass Pumping specifications.

1.03.05 Request for Deviation

1.03.05.01 Any deviation in this specification or reference specifications must have prior approval from WRC.

1.04 DESIGN CONSIDERATIONS

1.04.01 Treat the pipe as full deteriorated host pipe always for your design.

1.04.02 Minimum CIPP Physical Properties:

1.04.03 Poisson's ratio = 0.30
1.04.04 Safety Factor = 2.0
1.04.05 Soil Density = 130 lbs./cft
1.04.06 Soil Modulus
1.04.06.01 700 psi for pipe inverts up to and including 15 feet deep.
1.04.06.02 1,000 psi for pipe inverts greater than 15 feet deep.
1.04.07 Surcharged Loading of HS-20 when any part of the sewer is under any roadway and E-80 when under any railroad.

Property	Test Method	Material			
		Polyester	Enhanced Polyester	Vinyl Ester	Epoxy
Short Term Modulus of Elasticity	ASTM D790	350,000 psi	400,000 psi	350,000 psi	350,000 psi
Long Term Modulus of Elasticity	ASTM D790	150,000 psi	200,000 psi	125,000 psi	150,000 psi
Creep Retention Factor	ASTM D790	50%	50%	50%	50%
Flexural Stress	ASTM D790	4,500 psi	4,500 psi	4,500 psi	4,500 psi

1.05 The CONTRACTOR shall determine the liner thickness and resin quantity per ASTM F 1216, Appendix X1.3.2 for the Fully Deteriorated Pressure Pipe condition and shall follow the requirements specified in this section. These detailed calculations shall provide the input data as well as the actual calculation for equations X1.1, X1.3, X1.4 and X1.7 of Appendix X1. of ASTM F1216. The design submittal shall also clearly identify the physical properties used for design and be sealed by a licensed Professional Engineer. These physical properties shall be the basis for acceptance of the final product.

PART 2 PRODUCTS

2.01 FELT LINER TUBE

2.01.01 The Tube shall consist of one or more layers of flexible, needled felt or an equivalent nonwoven material. The material shall be capable of carrying the specified resin, be able to withstand installation pressures and curing temperatures, and be compatible with the resin used.

2.01.02 The outer Tube coating shall consist of a translucent elastomer that allows for visual inspection and verification of proper resin impregnation. To help with this visual inspection a dye shall be placed in the resin and the color should be uniform and must be approved by WRC. The plastic coating shall hold the resin inside the

Tube without leakage, accommodate installation, and stretch to the size and shape of the existing sewer, and shall not delaminate before, during, or after curing.

2.01.03 The Tube shall have a uniform thickness that when compressed at installation pressure will meet or exceed the design thickness. The thickness of the Tube shall be calculated based upon the resin system values given in this Section. The minimum roller gap shall be two times the design thickness plus the felt thickness.

2.01.04 The CIPP wall thickness shall be calculated from the equation in ASTM F 1216, Appendix X1, based upon the parameters given in this Section. The minimum CIPP wall thickness shall be not less than the value calculated by the equation. Any layers of the tube that are not saturated with resin and totally cured shall not be included in the CIPP wall thickness. The Tube shall be fabricated to a size that when installed will tightly fit the internal circumference of the conduit to be lined as specified by the Engineer. Allowance for circumferential stretching of the pipe during insertion shall be made as per manufacturer's recommendations.

2.01.05

The Tube shall be homogeneous across the entire wall thickness containing no intermediate or encapsulated elastomeric layers. No material shall be included in the Tube that may cause delamination in the cured CIPP. No dry or unsaturated layers shall be evident. The tube shall be constructed to withstand installation pressures and have sufficient strength to bridge missing pipe while meeting or exceeding the design wall thickness at all pipe location during installation conditions and pressures.

2.01.06 The wall color of the interior pipe surface of the CIPP after installation shall be a light reflective color so that a clear detail examination with closed circuit television inspection equipment may be made.

2.01.07 Seams in the Tube shall be stronger than the unseamed felt. Where the length requires joining along the circumference of the Tube, the sewer joint shall not be perpendicular to the long axis but spirally formed and sewn.

2.01.08 The outside of the Tube shall be marked for the distance at regular intervals along its entire length, not to exceed five (5) feet. Such markings shall include the manufacturer's name and identifying symbol.

2.01.09 The length of the Tube shall be deemed necessary by the CONTRACTOR to effectively carry out the insertion and seal the pipe at the inlet and outlet points. The CONTRACTOR shall verify the lengths in the field before cutting the Tube to length. Lengths of sewer can be lined over one or more access points as determined in the field by the CONTRACTOR and approved by the ENGINEER.

2.02 RESIN

2.02.01 Resin shall be enhanced polyester, vinyl ester, or epoxy. Resin selected shall be resistant to the chemical composition of the sewage.

2.02.02 Resin with higher than minimum physical properties may be required for CONTRACTOR to meet minimum field cured physical properties of the completed liner.

2.02.03 The resin shall be thermosetting resin that is compatible with the lining process and shall meet the requirements of ASTM F 1216 except as otherwise specified in this section. The resin shall be able to cure in water with an initiation temperature for cure of not less than 120º F. The cured resin/felt system shall be suitable for the expected conditions within the existing sanitary sewer.

2.02.04 If an epoxy resin is used and there is water present in the pipe a pre-liner must be used.

2.02.05 Fiberglass reinforced system should be about 50% resin and 50% fiberglass by volume where the rest are about 85% resin to 15% fabric by volume.

2.02.06 Alternate resins shall only be allowed per 1.03.05 of this specification.

2.03 FIELD CURED LINER

2.03.01 The completed liner as installed and fully cured in place shall meet the following minimum physical properties for short term flexural modulus and flexural strength given per 1.04.02 of this specification.

2.03.02 The layers of the cured CIPP shall be uniformly bonded. It shall not be possible to separate any two layers with a probe or point of a knife blade so that the layers separate cleanly or the probe or knife blade moves freely between the layers. If separation of the layers occurs during testing of field samples, new samples will be cut from the work. Any reoccurrence may cause rejection of the work.

PART 3 EXECUTION

3.01 SAFETY

3.01.01 The CONTRACTOR shall carry out his operations in strict accordance with all OSHA, MIOSHA, traffic and manufacturer's safety requirements.

3.02 CLEANING OF PIPELINES

3.02.01 The CONTRACTOR shall follow WRC's Sewer Cleaning specification.

3.03 PRE-REHABILITATION INSPECTION OF PIPELINE

3.03.01 The CONTRACTOR shall follow WRC's CCTV Inspection Sewer specification. The location of any conditions which may prevent proper installation of the lining materials into the pipelines shall be noted and reported immediately to WRC and corrected by section 3.05.

3.04 BY-PASS PUMPING

3.04.01 The CONTRACTOR shall follow WRC's By-Pass Pumping specification.

3.05 LINE OBSTRUCTIONS

3.05.01 It shall be the responsibility of the CONTRACTOR to clear the line of any obstructions such as solids, dropped joints, protruding branches, roots, or broken pipe that will prevent proper insertion of the liner. If inspection reveals an obstruction that cannot be removed by conventional cleaning equipment, then the obstruction shall be removed by equipment operating with the pipeline.

3.05.02 Services shall not protrude more than ¼ inch on any size sewer line. Anything protruding more than that shall be ground down as flush as possible with the wall of the sanitary sewer. Grinding shall be done with equipment operation inside of the sewer and shall not cause damage to the sewer or the service being ground.

3.05.03 If the protruding service is in such condition that grinding is not possible or in condition that such a repair cannot be done from the inside, then the CONTRACTOR shall inform WRC that a spot repair is necessary and provide all the details. Once WRC gives its approval the CONTRACTOR shall make a spot repair excavation, to uncover, remove, and repair the obstruction. The use of a flail type reamer to remove protruding services is not allowed.

3.06 INSTALLATION OF RESIN IMPREGNATED TUBE

The CONTRACTOR shall designate a location where the uncured resin in the original containers and the un-impregnated liner will be resin impregnated prior to installation. The CONTRACTOR shall allow WRC's personnel to inspect all materials and procedures and will not commence with any work without WRC's personnel on site unless given written permission by WRC. A resin and catalyst system compatible with the requirement of section 02.02 shall be used. The quantities of the liquid thermosetting materials shall be per manufacturer's standards to

provide the cured liner properties specified. Sufficient resin shall be used to fill the volume of air voids in the liner with additional allowance for polymerization, shrinkage and loss of resin through cracks and irregularities in host pipe wall. The CONTRACTOR shall ensure that the proper amount of resin is uniformly distributed throughout the entire length of the Tube.

3.06.01 The wetting out, installation, and curing of the resin impregnated tube shall be in accordance with ASTM F 1216. The Tube shall be inserted through an existing manhole or other approved access by means of an inversion process, the application of a hydrostatic head sufficient to fully extend the liner to the next designated access point, or any other means approved by WRC.

3.06.02 The process will be adjusted as necessary to ensure a complete lining without over stressing or tearing the lining; and with sufficient pressure to hold the liner snug to the pipe wall and to produce dimples at side connection and flared ends at the entrance and exit access points. The use of a lubricant is recommended and if used, such lubricant shall be compatible with the rehabilitation process.

3.06.03 The manufacturer's standards shall be closely followed during the elevated curing temperature so as not over stress the felt fiber and cause damage or failure of the liner prior to cure.

3.07 CURING

3.07.01 The CONTRACTOR shall submit a cure plan for approval by WRC. No work shall commence until the CONTRACTOR gets WRC's approval.

3.07.02 Hot water or heat cured liners are required for the full length of the liner. Ambient cure liners may be used for spot repair liners or can be substituted for a full-length liner only with approval by WRC.

3.07.03 After installation of the resin impregnated liner is completed the CONTRACTOR shall supply a suitable heat source and water recirculation equipment when necessary to cure the liner. The equipment shall be capable of delivering hot water to the far end of the liner through a hose, which has been perforated per manufacturer's recommendations, to uniformly raise the water temperature in the entire pipe above the temperature required to affect a cure of the resin. This temperature shall be determined by the resin/catalyst system employed.

3.07.04 The heat source shall be fitted with suitable monitors to gauge the temperature of the incoming and outgoing circulating water/air. Thermocouples shall be placed at the end of the Tube and between the Tube and existing pipe at the access points to determine the temperature of the cure. Temperature in the line during the cure period shall not be less than 150º F or more than 200º F as measured at the heat exchanger return line.

3.07.05 Initial cure shall be deemed to be completed when inspection of the exposed portions of the liner appears to be hard, and sound and the thermocouples indicate that an exotherm has occurred. The cure period shall be of a duration recommended by the resin manufacturer, as modified for the lining process, during which time the recirculation of the water/air and cycling of the heat exchanger to maintain the temperature in the liner continues.

3.08 COOL-DOWN

3.08.01 The CONTRACTOR shall cool the CIPP to a temperature below 90º F before relieving the static pressure in the liner. Cool-down may be accomplished by the introduction of cool water into the liner to replace water being drained from the downstream end. Care shall be taken in the release of the static head such that a vacuum will not be developed that could damage the newly installed liner.

3.09 FINISH

3.09.01 The cured liner shall be continuous over the entire length of an insertion run and be as free as commercially practicable from visual defects such as excessive wrinkling, foreign inclusions, dry spots, pinholes and delamination. The lining shall be impervious and free of any leakage.

3.09.02 Any defects which will affect the integrity of the liner, or any deficiencies in required strengths or thicknesses, shall be repaired or removed and replaced at the AWARDED VENDOR(S)'S expense, in a manner acceptable to WRC.

3.10 SEALING LINER AT THE ENDS

3.10.01 If the lining fails to make a tight seal, the CONTRACTOR shall apply a seal at that point. The seal shall be of a resin mixture compatible with the installed liner.

3.11 BRANCH OR SERVICE CONNECTIONS

3.11.01 After the liner has been cured, the CONTRACTOR shall reconnect the existing service connections. This shall generally be done without excavation and in the case of non-man entry pipes, from the interior of the pipeline by means of a television camera and cutting device that re-establishes them to operational capacity. After cutting open the service connections, the CONTRACTOR shall use a brushing device from the interior of the pipeline by means of a television camera that touches-up the full circumference of the service connection to a minimum of 95% open and to eliminate any rough or jagged edges plus be smooth in the flow line.

3.11.02 Reconnection of services shall begin immediately after curing of the CIPP has been completed. No service shall be interrupted for more than 12 hours unless otherwise approved by WRC.

3.12 POST REHABILITATION TELEVISION INSPECTION

3.12.01 The completed sewer shall be television inspected per the CCTV Inspection Sewer specification by the CONTRACTOR after completion of the service connections.

3.13 CIPP PIP TESTING

3.13.01 Testing in accordance with ASTM F 1216 (including appendixes), ASTM D 790, ASTM F 1743, ASTM F 2019 and ASTM D 5813 will be conducted and must be witnessed by WRC. Air test or hydrostatic tests must be done prior to re-establishing service connections, and all other tests shall be done within a month of the installation by the CONTRACTOR at no additional cost to WRC.

3.13.02 The CONTRACTOR shall prepare samples of the liner for each section of sewer lined in accordance with Section 8 of ASTM F 1216. Samples shall be labeled for date, diameter, section of sewer, and delivered to WRC for future testing. When tested, each sample shall meet the physical properties for flexural modulus and flexural strength used in the design calculations.

3.13.03 Air testing on isolated sections of sewer (2-3 feet in length) shall be required if post-rehabilitation inspection indicates leaks in the liner. The CONTRACTOR shall remove and replace or repair any defects in the installed liner to the satisfaction of WRC at no additional cost.

3.14 TRAFFIC CONTROL

3.14.01 During the entire rehabilitation process, the CONTRACTOR shall provide all necessary barricades, signs, flagmen, minor traffic devices, etc., to maintain both vehicular and pedestrian traffic and if not possible all necessary barricades, signs, minor traffic devices, etc. for the road and sidewalk closure per the Michigan Manual of Uniform Traffic Control Devices.

3.15 CLEAN UP

3.15.01 Upon completion of the installation work and after required testing indicates the lining(s) are acceptable, the CONTRACTOR shall restore the project area affected by his operation to its original condition.

END OF SECTION

PART 1 General

1.01 SUMMARY

It is the intent of this specification to provide for the reconstruction of sewer pipes by the use of folded/formed Poly Vinyl Chloride (PVC) pipe process. When cured, the finished sewer lining shall be tight fitting and continuous from end to end.

1.02 REFERENCED SPECIFICATIONS

1.02.01.01 CCTV Inspection Sewer
1.02.01.02 Sewer Cleaning
1.02.01.03 Sewer Pipe Joint Testing
1.02.01.04 Sewer Pipe Joint Sealing
1.02.01.05 Chemical Sealing (Grout) Material
1.02.01.06 By-Pass Pumping
1.02.01.07 Manhole and Pipe Rehabilitation and Spray Lining

1.03 QUALITY CONTROL

1.03.01 All work for this section shall conform to the applicable portions of the latest Standard Specifications:
1.03.01.01 ASTM D 3567
1.03.01.02 ASTM D 790
1.03.01.03 ASTM D 2990
1.03.01.04 ASTM D 256
1.03.01.05 ASTM D 638
1.03.01.06 ASTM D 2122
1.03.01.07 ASTM 2152
1.03.01.08 ASTM 2444
1.03.01.09 ASTM F 1057
1.03.01.10 ASTM D 1784-20
1.03.01.11 ASTM F 1867
1.03.01.12 ASTM F 1871
1.03.01.13 ASTM F 1947-21a
1.03.01.14 ASTM F 1504-21e1

1.03.02 However, where the requirements of the aforementioned standards conflict with this specification the requirements of this section shall govern.

1.03.03 Submittals

1.03.03.01 CCTV Inspection Sewer.

1.03.03.01.01 A CCTV inspection of the sewer before conditions and after conditions including the restore connections shall be completed per the CCTV Inspection Sewer specifications and turned over to the Owner and become their property.

1.03.03.02 Material Test

1.03.03.02.01 Material test shall be furnished to the Owner for review and approval prior to beginning the rehabilitation work, satisfactory written guarantee of compliance with the standards specifications for all materials, techniques, and installation methods being used in the rehabilitation process.

1.03.03.03 By-Pass Pumping Plan

1.03.03.03.01 Submit a detailed sewer bypass pumping plan to WRC for review fifteen (15) days prior to the beginning of work per the By-Pass Pumping specifications.

1.03.03.04 Request for Deviation

1.03.03.04.01 Any deviation in this specification or reference specifications must have prior approval from WRC.

1.03.03.05 Design considerations

1.03.03.06 Treat the pipe as a fully deteriorated host pipe always for your design.

1.03.03.07 Minimum PVC Physical Properties:

Property	Test Method	Value
Modulus of Elasticity	ASTM D790	360,000 psi
Tensile Strength	ASTM D638	3,600 psi
Creep Retention Factor	ASTM D790	50%
Flexural Stress	ASTM D790	7,500 psi
Izod Impact, notched	ASTM D256	0.65 ft-lb/in

1.03.03.08 Enhancement factor (K) = 7.0

1.03.03.09 An ovality (q) = 3%

1.03.03.10 Poisson's (v) ratio = 0.30

1.03.03.11 Safety Factor = 2.0

1.03.03.12 Soil Density = 130 lbs./cft

1.03.03.13 Soil Modulus

1.03.03.13.01 700 psi for pipe inverts up to and including 15 feet deep. 1.03.04.08.02 1,000 psi for pipe inverts greater than 15 feet deep.

1.03.03.14 Surcharged Loading of HS-20 when any part of the sewer is under any roadway and E-80 when under any railroad.

1.03.04.15 The design shall assume no bonding to the original pipe wall.

1.03.04 The CONTRACTOR shall determine the liner thickness. The design submittal shall also clearly identify the physical properties used for design and be sealed by a licensed Professional Engineer. These physical properties shall be the basis for acceptance of the final product.

PART 2 PRODUCTS

2.01 POLY VINYL CHLORIDE LINER

2.01.01 The liners shall produce a product that meets the requirements of ASTM F 1867 Appendix X1 and ASTM F1871.

2.01.02 The Liner shall have a uniform thickness that will meet or exceed the design thickness.
2.01.03 The Liner shall be fabricated to a size that when installed will tightly fit the internal circumference of the conduit to be lined as specified by WRC. Allowance for circumferential stretching of the pipe during insertion shall be made as per manufacturer's recommendations.
2.01.04 The wall color of the interior pipe surface after installation shall be a light reflective color so that a clear detail examination with closed circuit television inspection equipment may be made.
2.01.05 The outside of the Tube shall be marked for the distance at regular intervals along its entire length, not to exceed five (5) feet. Such markings shall include the manufacturer's name and identifying symbol.
2.01.06 The length of the Liner shall be deemed necessary by the CONTRACTOR to effectively carry out the insertion and seal the pipe at the inlet and outlet points. The CONTRACTOR shall verify the lengths in the field before cutting the Tube to length. Lengths of sewer can be lined over one or more access points as determined in the field by the CONTRACTOR and approved by the ENGINEER.

PART 3 EXECUTION

3.01 SAFETY

3.01.01 The CONTRACTOR shall carry out his operations in strict accordance with all OSHA, MIOSHA, traffic and manufacturer's safety requirements.

3.02 CLEANING OF PIPELINES

3.02.01 The CONTRACTOR shall follow WRC's Sewer Cleaning specification.

3.03 PRE-REHABILITATION INSPECTION OF PIPELINE

3.03.01 The CONTRACTOR shall follow WRC's CCTV Inspection Sewer specification. The location of any conditions which may prevent proper installation of the lining materials into the pipelines shall be noted and reported immediately to WRC and corrected by section 3.05.

3.04 BY-PASS PUMPING

3.04.01 The CONTRACTOR shall follow WRC's By-Pass Pumping specification.

3.05 LINE OBSTRUCTIONS

3.05.01 It shall be the responsibility of the CONTRACTOR to clear the line of any obstructions such as solids, dropped joints, protruding branches, roots, or broken pipe that will prevent proper insertion of the liner. If the inspection reveals an obstruction that cannot be removed by conventional cleaning equipment, then the obstruction shall be removed by equipment operating with the pipeline.
3.05.02 Services shall not protrude more than ¼ inch on any size sewer line. Anything protruding more than that shall be ground down as flush as possible with the wall of the sanitary sewer. Grinding shall be done with equipment operation inside of the sewer and shall not cause damage to the sewer or the service being ground.
3.05.03 If the protruding service is in such condition that grinding is not possible or in condition that such a repair cannot be done from the inside, then the CONTRACTOR shall inform WRC that a spot repair is necessary and provide all the details. Once WRC gives its approval the CONTRACTOR shall make a spot repair excavation, to uncover, remove, and repair the obstruction. The use of a flail type reamer to remove protruding services is not allowed.

3.06 INSTALLATION FOR PVC PIPE LINER

3.06.01 The CONTRACTOR shall allow WRC's personnel to inspect all materials and procedures and will not commence with any work without WRC's personnel on site unless given written permission by WRC.

3.06.02 The method of installation shall be compatible with the manufacturer's recommended practices and shall meet ASTM F1867.

3.06.03 The Liner shall be inserted through an existing manhole by means approved by WRC.

3.06.04 The awarded Vendor shall supply steam source equipment. The equipment shall be capable of delivering steam through the lining section to uniformly raise the temperature to effectively form the PVC liner.

3.06.05 The heat source shall be fitted with monitoring equipment to observe the pressure of the outgoing steam supply. Pressure should also be monitored within the manhole during the forming process. Awarded Vendor shall perform monitoring per manufacturer's recommendation

.3.06.06 The liner pipe shall be expanded until it is pressed tightly against the existing pipe wall. If the liner fails to form, the Vendor shall remove the failed liner and replace it with a new liner. Owner is not responsible for cost associated with the replacement of failed liners.

3.06.07 The process will be adjusted as necessary to ensure a complete lining without over stressing or tearing the lining; and with sufficient pressure to hold the liner snug to the pipe wall and to produce dimples at side connections and flared ends at the entrance and exit access points.

3.06.08 The manufacturer's standards shall be closely followed during the installation so as not to over stress the liner and cause damage or failure of the liner prior to cure.

3.07 FINISH

3.07.01 The cured liner shall be continuous over the entire length of an insertion run and be as free as commercially practicable from visual defects such as foreign inclusions and pinholes. The lining shall be impervious and free of any leakage.

3.07.02 Any defects which will affect the integrity of the liner, or any deficiencies in required strengths or thicknesses, shall be repaired or removed and replaced at the AWARDED VENDOR(S)'S expense, in a manner acceptable to WRC.

3.08 SEALING LINER AT THE ENDS

3.08.01 If due to a broken or misaligned pipe at the access point, the lining fails to make a tight seal, the CONTRACTOR shall apply a seal at that point. The seal shall be compatible with the installed liner.

3.09 BRANCH OR SERVICE CONNECTIONS

3.09.01 After the liner has been formed in place, the CONTRACTOR shall reconnect the existing service connections. This shall generally be done without excavation and in the case of non-man entry pipes, from the interior of the pipeline by means of a television camera and cutting device that re-establishes them to operational capacity. After cutting open the service connections, the CONTRACTOR shall use a brushing device from the interior of the pipeline by means of a television camera that touches-up the full circumference to a minimum of 95% open and to eliminate any rough or jagged edges plus be smooth in the flow line.

3.09.02 The reconnection of services shall begin immediately after forming has been completed. No service shall be interrupted for more than 12 hours unless otherwise approved by WRC.

3.10 POST REHABILITATION TELEVISION INSPECTION

3.10.01 The completed sewer shall be television inspected per the CCTV Inspection Sewer specification by the CONTRACTOR after completion of the service connections.

3.11 CIPP PIP TESTING

3.11.01 Testing in accordance with ASTM F 1871, ASTM D 256, ASTM D 638, ASTM D 790, ASTM D 2122, ASTM D 2152, ASTM D 2412, ASTM D 2444 and ASTM D 1057
will be conducted and must be witnessed by WRC. Air test or hydrostatic tests must be done prior to re-establishing service connections, and all other tests shall be done within a month of the installation by the CONTRACTOR at no additional cost to WRC.
3.11.02 The CONTRACTOR shall prepare samples of the liner for each section of sewer lined. Samples shall be labeled for date, diameter, section of sewer, and delivered to WRC for future testing. When tested, each sample shall meet the physical properties for flexural modulus and flexural strength used in the design calculations.
3.11.03 Air testing on isolated sections of sewer (2-3 feet in length) shall be required if post-rehabilitation inspection indicates leaks in the liner. The CONTRACTOR shall remove and replace or repair any defects in the installed liner to the satisfaction of WRC at no additional costs.

3.12 TRAFFIC CONTROL

3.12.01 During the entire rehabilitation process, the CONTRACTOR shall provide all necessary barricades, signs, flagmen, minor traffic devices, etc., to maintain both vehicular and pedestrian traffic and if not possible all necessary barricades, signs, minor traffic devices, etc. for the road and sidewalk closure per the Michigan Manual of Uniform Traffic Control Devices.

3.13 CLEAN UP

3.13.01 Upon completion of the installation work and after required testing indicates the lining(s) are acceptable, the CONTRACTOR shall restore the project area affected by his operation to its original condition.

PART 1 General

1.1 SUMMARY

1.1.1 Section includes By-Pass Pumping

1.1.1.1 It is the intent of this specification to implement a temporary pumping system for the purpose of diverting the existing flow around a work area for the duration of the work.

1.1.2 Referenced Specifications:

1.1.2.1 CCTV Inspection Sewer

1.1.2.2 Sewer Cleaning

1.1.2.3 Sewer Pipe Joint Sealing

1.1.2.4 Sewer Pipe Joint Testing

1.1.2.5 Chemical Sealing (Grout) Material

1.1.2.6 Thermal Cured in Place Pipe

1.1.2.7 UV Cured in Place Pipe

1.1.2.8 Manhole Rehabilitation and Spray Lining

1.1.2.9 Soil Erosion and Sedimentation Control

1.2 QUALITY CONTROL

1.2.1 All work for this section shall conform to the applicable portions of the latest Standard Specifications:

1.2.1.1 ASTM F 714

1.2.1.2 ASTM D 1248

1.2.1.3 ASTM D 2321

1.2.1.4 ASTM D 2657

1.2.1.5 APS Water Porosity Standard

1.2.2 However, where the requirements of ASTM F 714, ASTM D 1248, ASTM D 2321, ASTM D 2657, and APS Water Porosity Standards conflict with the requirements of this section, this section shall govern.

1.2.3 CONTRACTOR shall perform a leakage and pressure test on the entire system using clean water, before beginning the operation. This operation will not commence without a WRC inspector on site to witness it.

1.2.4 Maintain and inspect the bypass pumping system every two hours. A qualified and certified operator from the CONTRACTOR shall be on-site the entire time when the pumps are operating.

1.2.5 CONTRACTOR shall have a redundant back-up system, shall be on-site, tested, and ready to be in operation the entire time when the pumps are operating.

1.2.6 CONTRACTOR shall keep and maintain standard typical spare parts for the pumps and piping on-site for emergency repairs.

1.2.7 All pumps and generators shall have the maximum sound suppression units installed on them to minimize the disturbance to the surrounding area.

1.3 SUBMITTALS

1.3.1 CONTRACTOR shall submit a detailed plan and description of the proposed bypass pumping system with the following:

1.3.1.1 Bypass pump sizes, capacity, number of each size to be on site and power requirements.

1.3.1.1.1 Provide pipeline plugs and pumps of adequate size to handle peak flow, and temporary discharge piping to ensure total flow of main can be safely diverted around section to be repaired.

1.3.1.2 Backup bypass pumps, power and piping equipment with a detailed operation plan with layout.

1.3.1.3 Indicate number, size, material, location and method of installation of suction and discharge of the piping.

1.3.1.4 Indicate the staging area, site access point, and expected flow.

1.3.1.5 Size and location of manhole or access points for suction and discharge hose and/or piping.

1.3.1.6 Cross sections showing suction and discharge pipe depth, embedment, select fill and special backfill, if buried.

1.3.1.7 Temporary pipe support and anchoring required.

1.3.1.8 Cross sections and details of any temporary crossing entrances, driveways, and pedestrian/bikes/etc.

1.3.1.9 Thrust and restraint block sizes and location or alternative methods with calculations.

1.3.1.10 Sewer plugging method and type of plugs.

1.3.1.11 Calculations of static lift, friction losses, and flow velocity. Pump curves showing pump operating range.

1.3.1.12 Calculations for selection of bypass pumping pipe size.

1.3.1.13 Method of noise control for each pump and/or generator.1.3.1.14 Method of protection discharge manholes or structures from erosion and damage.

1.3.1.15 Schedule for installation and maintenance of bypass pumping system.

1.3.1.16 Procedures to monitor upstream mains for back up impacts.

1.3.1.17 Procedures for setup and breakdown of pumping operation.

1.3.1.18 Emergency plan detailing procedures to be followed in the event of a pump(s) failure(s), sewer overflow, service back-ups, and sewage spillage.

1.3.1.18.1 Maintain a copy of the emergency plan on site for the duration of the project.

1.3.1.19 Certify the bypass pumping system will meet the requirements of codes, Soil Erosion and Sedimentation Control and regulatory agencies of the MDEQ, WRC, or any other agency having jurisdiction.

1.3.2 Request for Deviation

1.3.2.1 Any deviation in this specification or reference specifications must have prior approval from WRC.

1.4 RESPONSIBILITY FOR OVERFLOWS AND SPILLS

1.4.1 CONTRACTOR is fully responsible for any overflow(s), spill(s), clean-up(s) and claim(s). There will be no compensation by WRC for these operations.

1.4.1.1 The CONTRACTOR shall immediately clean-up(s) all resultant debris from sewer backups caused by the bypass pumping operation and shall not proceed with the operation, unless the backup system is fully functioning and issues are solved, until the clean- up(s) is resolved to the satisfaction of WRC.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Discharge and Suction Pipes material must be approved by WRC

2.1.1.1 Polyethylene Plastic Pipe

2.1.1.1.1 High density solid wall and following ASTM F 714 Polyethylene (PE| Plastic Pipe (SDR-DR) based on Outside Diameter, ASTM D 1248.

2.1.1.1.2 Homogenous throughout, free of visible cracks, discoloration, pitting, varying wall thickness, holes, foreign material, blisters, or other deleterious faults.

2.1.1.2 High-Density Polyethylene (HDPE)

2.1.1.2.1 Homogenous throughout, free of visible cracks, discoloration, pitting, varying wall thickness, holes, foreign material, blisters, or other deleterious faults.

2.1.1.2.1.2 Defective areas of pipe shall be cut out and joint fused as stated herein.

2.1.1.2.2 Assembled and joined at site using coupling, flanges, or butt-fusion method to provide leak proof joint. Follow manufacturer's instruction and ASTM D 2657.

2.1.1.2.2.2 Threaded or solvent joints and connections are not permitted.

2.1.1.2.3 Fusing shall be conducted by a personal that has been at least three (3) years of experience as a certified fusion technician by the manufacturer of HDPE pipe and/or the fusing equipment.

2.1.1.2.4 Butt-fused joint shall be done by True alignment and uniform roll- back beads resulting from use of proper temperature and pressure.

2.1.1.2.4.2 Allow adequate cooling time before removal of pressure. 2.01.01.02.04.02Watertight and have tensile strength equal to that of the pipe.

2.01.01.02.04.03Acceptance by WRC before insertion.

2.1.1.2.5 Use in streams, storm water culverts and environmentally sensitive areas.

2.1.1.3 Flexible Hoses and Associated Coupling and Connectors 2.01.01.03.01 Abrasion resistant

2.1.1.3.2 Suitable for intended service

2.1.1.3.3 Rated for external and internal loads anticipated, including test pressure.

2.01.01.03.03.01External loading design shall incorporate anticipated traffic loadings, including traffic impact loading. Use H-20 loading requirements.

2.1.1.4 Valves and Fittings

2.1.1.4.1 Determined according to flow calculations, pump sizes previously determined, and system operation pressures.

2.1.1.5 Plugs

2.1.1.5.1 Select and installed according to size of line to be plugged, pipe and manhole configurations, and based on specific site.

2.1.1.5.1.2 Additional plugs shall be installed in the event of a single failure.

2.1.1.5.1.2 Additional plugs shall be on-site in the event of a plug failure.

2.1.1.5.1.2 Plug will be inspected before use for defects which may lead to failure.

2.1.1.6 Aluminum "irrigation type" piping or glued PVC piping will not be permitted.

2.1.1.7 Discharge hose will only be allowed in short sections when approved by WRC.

2.1.1.8 All discharges shall have a 90 elbow on the end directing the flow into the channel/pipe of the discharge manhole.

2.1.1.9 The total rental cost of the bypass pumping pipe shall not exceed the total cost of the pipe.

2.1.1.9.1 When the rental cost of the pipe equals the total cost of the pipe WRC will have the option to keep the pipe in their possession after the operation is completed or negotiate a buy back price with the AWARDED VENDOR(S).

2.2 EQUIPMENT

2.2.1 Pumps

2.2.1.1 Fully automatic self-priming units that do not require the use of foot-valves or vacuum pumps in priming system.

2.2.1.2 Electric or diesel powered

2.2.1.3 Constructed to allow dry running for long periods of time to accommodate cyclical nature of effluent flows.

2.2.1.4 Necessary stop/start controls for each pump

2.2.1.5 One standby pump for each on-site pump shall be maintained on site.

2.2.1.5.1 On-line, isolated from primary system by a valve.

2.2.1.6 Sound suppression with a maximum of 55 decibels is desired by WRC.

PART 3 EXECUTION

3.1 PREPARATION

3.1.1 Determining location of bypass pumps and pipelines.

3.1.1.1 Minimal disturbance to existing utilities.

3.1.1.1.1 Field locates existing utilities in proposed bypass area.

3.1.2 Obtain approval for placement within public or private property.

3.1.3 Obtain WRC approval of locations.

3.2 INSTALLATION AND REMOVAL

3.2.1 The CONTRACTOR shall remove manhole sections or make connection to existing sewer and construct temporary by-pass pumping structures at access location indicated on the approved drawings and required to provide adequate suction conduit.

3.2.2 Plugging or blocking of sewage flows shall incorporate a primary and secondary plugging device. When plugging or blocking is no longer needed for performance and acceptance of work, remove in a manner that permits the sewage flow to slowly return to normal without surge, to prevent surcharging or causing other major disturbances downstream.

3.2.3 When working inside manhole or force main, exercise caution. Follow OSHA, Federal, State, WRC, and local requirements. Take required measures to protect workforce against sewer gases and/or oxygen deficient atmosphere. Take required measures to ensure the public's safety and access to the work site.

3.2.4 During by-pass pumping operation, protect the piping from damage inflicted by equipment and all construction or public crossings.

3.3 EMERGENCIES AND LOW FLOWS

3.3.1 In specific situations a Vactor Truck(s) can be utilized along with plugs to create by-pass pumping.

3.3.1.1 There must be enough trucks on site to handle the flows and not adversely affect the upstream or downstream sewer flows and flooding of connections.

3.3.1.2 Extra caution must use to prevent spillage when depositing the sewage in an appropriate downstream manhole.

3.4 TRAFFIC CONTROL

3.4.1 During the entire rehabilitation process, the CONTRACTOR shall provide all necessary barricades, signs, flagmen, minor traffic devices, etc., to maintain both vehicular and pedestrian traffic and if not possible all necessary barricades, signs, minor traffic devices, etc. for the road and sidewalk closure per the Michigan Manual of Uniform Traffic Control Devices.

3.5 CLEAN UP

3.10.01 Upon completion of the installation work and after the liner is acceptable, the CONTRACTOR shall restore the project area affected by the operation. Any disturbed areas shall be replaced with like materials and substantially match the original conditions.

END OF SECTION

PART 1 General

1.1 SUMMARY

1.1.1 Section includes Dewatering

1.1.1.1 It is the intent of this specification to implement the removal of surface water and ground water as necessary to perform the construction required.

1.1.2 Referenced Specifications:

1.1.2.1 By-Pass Pumping

1.1.2.2 CCTV Inspection Sewer

1.1.2.3 Sewer Cleaning

1.1.2.4 Sewer Pipe Joint Sealing

1.1.2.5 Sewer Pipe Joint Testing
1.1.2.6 Chemical Sealing (Grout) Material
1.1.2.7 Thermal Cured in Place Pipe
1.1.2.8 UV Cured in Place Pipe
1.1.2.9 Manhole Rehabilitation and Spray Lining
1.1.2.10 Trenching, backfilling, and compacting
1.1.2.11 Soil Erosion and Sedimentation Control

1.2 QUALITY CONTROL

1.2.1 All work for this section shall conform to the applicable portions of the latest Standard Specifications:
1.2.1.1 ASTM D 5981
1.2.1.2 ASTM D 6170-17
1.2.1.3 ASTM D 5978-16(2024)
1.2.2 However, where the requirements of ASTM D 5981, ASTM D6170-17 and ASTM D 5978-16(2024) conflict with the requirements of this section, this section shall govern.

1.2.3 Quality Assurance

1.2.3.1 The CONTRACTOR shall have at least 10 years of experience in specializing in the design of dewatering systems and dewatering work.
1.2.3.2 Comply with all governing local, county, state and EPA regulations.
1.2.3.3 Well Points
1.2.3.3.1 The CONTRACTOR shall engage a qualified surveyor to perform all layouts and measurements.
1.2.3.3.2 The surveyor shall layout the work to the lines and grades required before installation and shall determine the location of each well point, piezometer and other data as required.
1.2.3.3.3 The surveyor shall record and maintain all information pertinent to each well point and piezometer.
1.2.3.4 The operation will not commence without a WRC inspector on site.
1.2.3.5 Maintain and inspect the pumping system once a day. A qualified and certified operator from the CONTRACTOR shall be on-call the entire time when the pumps are operating.
1.2.3.6 CONTRACTOR shall have a redundant back-up system that shall be on- site, tested, and ready to be in operation the entire time when the pumps are operating if required by WRC.
1.2.3.7 CONTRACTOR shall keep and maintain standard typical spare parts for the pumps and piping on-site for emergency repairs if required by WRC.
1.2.3.8 All pumps and generators shall have the maximum sound suppression units installed on them to minimize the disturbance to the surrounding area.

1.3 SUBMITTALS

1.3.1 CONTRACTOR shall submit a detailed plan and description of the proposed dewatering system with the following:
1.3.1.1 Shop Drawings of the proposed type of dewatering system and design shall include relief of hydrostatic head and maintenance of the work area in a dewatered and in a hydrostatically relieved condition.

1.3.1.2 The temporary dewatering system as specified in these specifications shall be the minimum system required for controlling groundwater, regardless of source

1.3.1.3 The installed system shall be capable of lowering and maintaining the groundwater level or hydrostatic head to at least 3-feet below the bottom of the utilities that are being repaired or replace so to prevent seepage of water into the work area and permit installation of all utilities "in the dry".

1.3.1.4 Within these limits, the CONTRACTOR shall be responsible for the design of the entire temporary dewatering system and shall make whatever modifications and additions to the system as may be required for the system to fulfill its requirements.

1.3.1.5 Arrangement, location and depths of the components of the system.

1.3.1.6 A complete description of equipment to be used with installation, operation, and maintenance procedures.

1.3.1.7 Standby equipment and emergency power supply if required by WRC.

1.3.1.8 Location and size of sumps and discharge lines, including their relation to water disposal sites, wetlands or body of water.

1.3.1.9 Types and sizes of filters.

1.3.1.10 Location, types and depths of wells, well points and/or observation wells.

1.3.1.11 Design submittals with calculations demonstrating adequacy of the selected system, pump curves and equipment plus proof that this will be accomplished without damaging existing building, structures and site improvements adjacent to the work area.

1.3.1.11.1 Design submittal must be signed and sealed by a qualified professional engineer responsible for their preparation.

1.3.1.12 The periphery of the entire work area shall be suitably diked and the dikes maintained to prevent surface water from entering the work area.

1.3.1.13 Coordination within the work area so the dewatering system does not interfere with the operations in and around the work area.

1.3.1.14 Soil Erosion and Sedimentation Control plan.

1.3.1.15 Discharge permit and all other regulatory agencies including EGLE, WRC, or other agency jurisdiction permits.

1.3.2 Review of dewatering and recharge system by the WRC shall not relieve the CONTRACTOR from the responsibility for the adequacy of these systems to achieve the specified results.

1.3.3 Request for Deviation

1.3.3.1 Any deviation in this specification or reference specifications must have prior approval from WRC.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 All Discharge and Transmission Pipe material must be approved by WRC

2.1.1.1 Polyethylene Plastic Pipe

2.1.1.1.1 High density solid wall and following ASTM F 714 Polyethylene (PE) Plastic Pipe (SDR-DR) based on Outside Diameter, ASTM D 1248.

2.1.1.1.2 Homogenous throughout, free of visible cracks, discoloration, pitting, varying wall thickness, holes, foreign material, blisters, or other deleterious faults.

2.1.1.2 High-Density Polyethylene (HDPE)

2.1.1.2.1 Homogenous throughout, free of visible cracks, discoloration, pitting, varying wall thickness, holes, foreign material, blisters, or other deleterious faults.

2.1.1.2.1.2 Defective areas of pipe shall be cut out and joint fused as stated herein.

2.1.1.2.2 Assembled and joined at site using coupling, flanges, or butt- fusion method to provide leak proof joint. Follow manufacturer's instruction and ASTM D 2657.

2.1.1.2.2.2 Threaded or solvent joints and connections are not permitted.

2.1.1.2.3 Fusing shall be conducted by a personal that has at least three (3) years of experience as a certified fusion technician by the manufacturer of HDPE pipe and/or the fusing equipment.

2.1.1.2.4 Butt-fused joint shall be done by True alignment and uniform roll- back beads resulting from use of proper temperature and pressure.

2.1.1.2.4.2 Allow adequate cooling time before removal of pressure. 2.1.1.2.4.2 Watertight and have tensile strength equal to that of the pipe.

2.1.1.2.4.3 Acceptance by WRC before insertion.

2.1.1.2.5 Use in streams, storm water culverts and environmentally sensitive areas.

2.1.1.3 Wil-loc Pipe

2.1.1.4 Ductile Iron Pipe

2.1.1.5 PVC Pipe

2.1.1.5.1 Any mechanical locking joint will need to be approved by WRC.

2.1.1.5.2 Glued joints will only be allowed on Wellpointing Dewatering.

2.1.1.6 Flexible or Lay-Flat Hoses and Associated Coupling and Connectors

2.1.1.6.1 Can only be used for short transitions, repairs and short discharge runs.

2.1.1.6.1.1 Abrasion resistant 2.1.1.6.1.2 Suitable for intended service

2.1.1.6.1.3 Rated for external and internal loads anticipated, including test pressure.

2.1.1.7 Valves and Fittings

2.1.1.7.1 Determined according to flow calculations, pump sizes previously determined, and system operation pressures.

2.1.1.8 Aluminum "irrigation type" piping or glued PVC piping will not be permitted unless approved by WRC.

2.1.1.9 External loading design on all pipes must incorporate anticipated traffic loadings, including traffic impact loading unless otherwise directed by WRC. Use H-20 loading requirements.

2.1.2 Pumps

2.1.2.1 Types of Pumps

2.1.2.1.1 Rotary

2.1.2.1.2 Vacuum

2.1.2.1.3 Piston

2.1.2.1.4 Trash

2.1.2.1.5 Submersible, Electric and Hydraulic

2.1.2.1.6 Other

2.1.2.2 Fully automatic self-priming units that do not require the use of foot- valves or vacuum pumps in priming system are preferred.

2.1.2.2.1 For small or surface dewatering a trash pump or similar type of pump can be used.

2.1.2.3 Electric, gas or diesel powered

2.1.2.4 Constructed to allow dry running for long periods of time to accommodate cyclical nature of effluent flows.

2.1.2.5 Necessary stop/start controls for each pump

2.1.2.6 One standby pump for each on-site pump shall be maintained on site if required by WRC.

2.1.2.6.1 On-line, isolated from primary system by a valve.

2.1.2.7 Sound suppression with a maximum of 55 decibels is desired by WRC.

2.1.3 Discharge Filters

2.1.3.1 Dewatering Bag

2.1.3.2 Dewatering Tubes

2.1.3.3 Dewatering Socks

PART 3 EXECUTION

3.1 TYPES OF DEWATERING

3.1.1 Surface Water

3.1.2 Wellpoint Dewatering

3.1.3 Sock Dewatering

3.1.4 Deep Well

3.1.5 Slurry Walls

3.1.6 Educator Dewatering

3.1.7 Ground Freezing

3.2 PREPARATION

3.2.1 Determining location of dewatering pumps and pipelines.

3.2.1.1 Minimal disturbance to existing utilities.

3.2.2 Field locates existing utilities in proposed dewatering and work area.

3.2.3 The CONTRACTOR shall call Miss Dig at least 72 hours before any dewatering system and/or well is put in.

3.2.4 Obtain approval for placement within public or private property.

3.2.5 Obtain WRC approval of locations.

3.3 INSTALLATION

3.3.1 All water seeping, falling or running into the excavation as it is dug, and until the temporary dewatering system is removed as specified, shall be promptly pumped out.

3.4 PROTECTION AND DAMAGE

3.4.1 The CONTRACTOR shall be fully responsible for the failure of all components of the temporary dewatering work and for all damages to work in the work area caused by the failure to provide, maintain, and operate the temporary dewatering system, as specified.

3.4.1.1 The CONTRACTOR shall protect structures, utilities, sidewalks, pavements and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by temporary dewatering system installation and operation.

3.4.1.2 CONTRACTOR shall restore all damaged work, including failed components of the work in this specification to a condition as good as or better than existed prior to failure of components.

3.5 TRAFFIC CONTROL

3.5.1 During the entire rehabilitation process, the CONTRACTOR shall provide all necessary barricades, signs, flagmen, minor traffic devices, etc., to maintain both vehicular and pedestrian traffic and if not possible all necessary barricades, signs, minor traffic devices, etc. for the road and sidewalk closure per the Michigan Manual of Uniform Traffic Control Devices.

3.6 CLEAN UP

3.6.1 Upon completion of the installation work within the work area, the CONTRACTOR shall restore the project area affected by the operation shall be replaced with like materials and to match in thickness to its substantially the original conditions.

END OF SECTION

PART 1 GENERAL

1.01 SUMMARY

Section includes sewer line cleaning, manhole cleaning and internal obstruction removal.

1.01.01.01 The cleaning of small, moderate and large diameter sewers, complete with removal and disposal of debris resultant from the cleaning operation. Cleaning shall include, but not limited to, the removal of dirt, grease, rocks, roots, and all other foreign solid or semi-solid material and obstructions from the sewer lines and structures.

Reference Specifications

1.01.02.01 CCTV Inspection Sewer
1.01.02.02 Sewer Pipe Joint Sealing
1.01.02.03 Sewer Pipe Joint Testing
1.01.02.04 Chemical Sealing (Grout) Material
1.01.02.05 By-Pass Pumping
1.01.02.06 Thermal Cured in Place Pipe
1.01.02.07 UV Cured in Place Pipe
1.01.02.08 Manhole Rehabilitation and Spray Lining
1.01.02.09 Quality assurance
1.01.03.01 The work of this section shall conform to the applicable portions of the National Association of Sewer Service Companies (NASSCO) guidelines.

Request for Deviation

1.01.04.01 Any deviation in this specification or reference specifications must have prior approval from WRC.

PART 2 PRODUCTS

2.01 EQUIPMENT

Hydraulically Propelled Equipment:

2.01.01.01 The equipment used shall be of a movable dam type and be constructed in such a way that a portion of the dam may be collapsed at any time during the cleaning operation to protect against flooding of the sewer.

2.01.01.02 The movable dam shall be equal in diameter to the pipe being cleaned and shall provide a flexible scraper around the outer periphery to ensure removal of grease.

2.01.01.03 If sewer cleaning balls or other equipment which cannot be collapsed is used, special precautions to prevent flooding of the sewers and public or private property shall be taken.

High-Velocity Jet (Hydro-cleaning) Equipment:

2.01.02.01 All high-velocity sewer cleaning equipment shall be constructed for ease and safety of operation.

2.01.02.02 The equipment shall have a selection of two or more high-velocity nozzles.

2.01.02.03 The nozzles shall be capable of producing a scouring action from 15 to 45 degrees in all size lines designated to be cleaned.

2.01.02.04 Equipment shall also include a high-velocity gun for washing and scouring manhole walls and floor. The gun shall be capable of producing flows from a fine spray to a solid stream. Combination Unit Pump should be capable of pumping at least 80 gallons per minute (300 liters per minute) at 2,000 psi (13.8 MPa), measured at beginning of hose reel.

2.01.02.05 Water Pumps should be able to run at 2,000 psi (13.8 MPa) while pulling full vacuum, completely independent from vacuum system, with ability to vary vacuum without affecting water pressure.

2.01.02.06 The equipment shall carry its own water tank, auxiliary engines, pumps and hydraulically driven hose reel.

2.01.03 Mechanically Powered Equipment

2.01.03.01 Bucket machines shall be in pairs with sufficient power to perform the work in an efficient manner.

2.01.03.02 Machines shall be belt operated or have an overload device. Machines with direct drive that could cause damage to the pipe will not be allowed.

2.01.03.03 A power rodding machine shall be either a sectional or continuous rod type capable of holding a minimum of 750 feet of rod.

2.01.03.04 The rod shall be specifically heat-treated steel.

2.01.03.05 To ensure safe operation, the machine shall be fully enclosed and have an automatic safety clutch or relief valve.

2.02 When water from fire hydrants is used as an additional source of water during the cleaning operation all proper permits must be pulled.

2.02.02 Provide temporary piping, valves, certified reduced pressure backflow preventors, equipment, and other items form handing portable water and wastewater.

2.02.03 Do not utilize water source units, it has been approved by WRC.

PART 3 EXECUTION

3.01 EXAMINATION

Perform CCTV inspection if necessary and will be performed in accordance with the TV Inspection Sewer Specification.

3.02 The WRC shall provide full-time inspection.

No work shall commence without the designated WRC inspector present on site. The CONTRACTOR shall supply a person to assist the inspector when the inspector visually checks the cleanliness of the sewer lines.

3.03 APPLICATION

Clean the designated sewer lines, manhole, and associated structures using approved methods and equipment.

3.03.01.01 The cleaning shall be in an orderly manner beginning at the high point in the line and proceeding to the low point.

3.03.01.02 The equipment selected for cleaning shall be capable of removing dirt, grease, rocks, roots, sludge buildup, sand and any other deleterious materials and obstructions for the sewer lines, manholes, diversion chambers, drop connections and other associated structures.

Line Obstruction

3.03.02.01 It shall be the responsibility of the CONTRACTOR to clear the line of any obstructions such as solids, dropped joints, protruding branches, roots, or broken pipe that will prevent proper insertion of the liner. If the inspection reveals an obstruction that cannot be removed by conventional cleaning equipment, then the obstruction shall be removed by equipment operating with the pipeline.

3.03.02.02 Services

3.03.02.01.01 Services shall not protrude more than ¼ inch on any size sewer line. Anything protruding more than that shall be ground down as flush as possible with the wall of the sanitary sewer.

Grinding shall be done with equipment operation inside of the sewer and shall not cause damage to the sewer or the service being ground. 3.03.02.02.02 If the protruding service is in such condition that grinding is not possible or in condition that such a repair cannot be done from the inside then the CONTRACTOR shall inform WRC that a spot repair is necessary and provide all the details. Once WRC gives its approval the CONTRACTOR shall make a spot repair excavation, to uncover, remove, and repair the obstruction.

The use of a flail type reamer to remove protruding services is not allowed.

3.03.02.02.03 Roots shall be removed where root intrusion is found by the use of mechanical devices, hydraulic procedures, or chemical root treatment.

3.03.02.02.04 Special precautions shall be used during the cleaning operation to assure removal of visible roots from the joint area, which could prevent the proper mechanical seal, or application of chemical sealants.

3.03.02.02.05 Use of Chemical root treatment for removal shall be subject to approval from WRC. The handling and application of herbicide shall be in strict accordance with the manufacturer's recommendation and in such a manner to preclude any damage to surrounding vegetation. Any damaged vegetation shall be replaced at the expense of the AWARDED VENDOR(S).

Blockage

3.03.03.01 In cases where the condition of the pipe is such as it is badly broken or eroded pipe or major blockages which prevents the completion of the cleaning operation, or additional damage to the sewer line would be made if cleaning is attempted or continued.

3.03.03.01.01 The CONTRACTOR shall immediately notify the WRC inspector.

3.03.03.01.02 The equipment shall be reset on the other structure of the line and cleaning of the segment is to resume. If again the equipment fails to transverse the entire segment the CONTRACTOR shall immediately notify the WRC inspector and stop the cleaning operation. The CONTRACTOR shall note the exact location of the blockage.

3.03.03.01.03 The CONTRACTOR shall make suggestions to remedy the situation or to make repairs. Upon approval by WRC the CONTRACTOR shall continue to remedy the situation or make the repairs performed in accordance with those operations specifications.

3.04 PRECAUTIONS

Pressurized water or other cleaning tools that retard water flow shall be used in a manner to ensure that pressure within the sewer line does not cause flooding to public or private property served by the sewer being cleaned.

The CONTRACTOR shall immediately clean up all resultant debris from sewer backups caused by said cleaning operation and shall not proceed with the cleaning operation until those clean-ups are resolved to the satisfaction of WRC.

If sewer cleaning balls/plugs or other such equipment, which cannot be collapsed instantly, is used, special precautions against flooding of the sewers and public property shall be taken.

The existing flow within the sewer line shall be utilized to provide the necessary pressures for hydraulic cleaning devices whenever possible. Passing of debris between sewer line segments, which could cause line stoppages, accumulations of sand in wet wells, or damage to pumping equipment will not be permitted.

3.05 DEBRIS DISPOSAL AND CLEAN-UP

All debris resultant of the cleaning operation shall be removed at the downstream structure of the sewer line segment and removed from the system.

Debris shall be removed from the sewer system and placed directly into containers for disposal and/or containers suitable for hauling to the designated disposal site.

For all work done under this contract the designated disposal site shall be the Oakland County Septage Unloading Facility located at 1235 Cesar E. Chavez, Pontiac, Michigan.

Once all work is completed the area where the work occurred shall be restored and replaced with like materials and to matching thickness as substantially as possible to preexisting conditions.

END OF SECTION

General

1.1 SUMMARY

1.1.1 Section includes sewer pipe joint testing.

1.1.1.1 Sewer pipe joint testing is used to test the integrity (tightness or leakage) of individual pipe joints. Testing cannot be performed and will not be required on cracked or broken pipe, building sewers, or sections of pipe between joints.

1.1.1.2 The intent of pipe joint testing is to identify those sewer pipe joints that are defective (allowing groundwater to enter the sewer system) and that can be successfully sealed by the internal pipe joint sealing process.

1.1.2 Reference Specifications:
1.1.2.1 CCTV Inspection Sewer
1.1.2.2 Sewer Cleaning
1.1.2.3 Sewer Pipe Joint Sealing
1.1.2.4 Chemical Sealing (Grout) Material
1.1.2.5 Thermal Cured in Place Pipe
1.1.2.6 UV Cured in Place Pipe
1.1.2.7 By-Pass Pumping
1.1.2.8 Manhole and Pipe Rehabilitation and Spray Lining

1.2 SUBMITTALS

1.2.1 Joint Test Records: During the joint testing work, records shall be kept which include:
1.2.1.1 Calibration test results including PSI & time duration.
1.2.1.2 Identification of the manhole section tested.
1.2.1.3 The test pressure used and duration of test.
1.2.1.4 Location (footage) of each joint tested and location of any joints not tested and reason for not testing.
1.2.1.5 An indication of pass/fail on all joints.
1.2.1.6 Test pressure achieved and maintained for each joint passing the air test.
1.2.1.7 Depth of pipe to surface.
1.2.1.8 Amount of grout per joint used. (Can be based on levels measured for tank or stroke count.)
1.2.2 Request for Deviation
1.2.2.1 Any deviation in this specification or reference specifications must have prior approval from WRC.

PRODUCTS

1.3 EQUIPMENT

1.3.1 The basic equipment used shall consist of a television camera, joint testing device (known as a packer), and test monitoring equipment. The equipment shall be constructed in such a way to provide means for introducing a controlled test medium, under pressure, into the VOID area created by the expanded ends of the joint-testing device. The packer will simultaneously permit the flow of sewage. The equipment will also provide a means for continuously measuring the actual static pressure of the test medium within the VOID area created by the inflation of the packer. All pressure measurements shall be made at the void area.

EXECUTION

1.4 GENERAL

1.4.1 All pipe joints within a manhole run will be tested unless otherwise noted within this specification section.

1.04.01.01 Testing of joints which are visibly leaking (infiltrating) is unnecessary because the intent of testing is obviously attained.

1.4.2 Application: Sewer pipe joint testing is used to test the integrity of individual pipe joint. Testing should not be performed and will not be required on longitudinally cracked or broken pipe. Testing of structurally sound sections of pipe barrel between joints in, however, used as a control test to simulate a good joint.

1.4.3 After entering each manhole section with the test equipment, but prior to the commencement of joint air testing, the test equipment shall be positioned on a section of sound sewer pipe between pipe joints, and a demonstration performed as described in Section 3.02.This procedure will demonstrate the accuracy and dependability of the Packer Bladders and Void Sensing Devices, as no joint will test in excess of the pipe capability. If such a test is not positive, leakage from the testing device may be indicated, and may make joint testing invalid. Re-cleaning may be required. In concrete pipe, leakage may also be caused by erosion/ roughness at the crown or porosity of the pipe itself. Should it be found that the barrel of the sewer pipe will meet the joint test requirements, then the requirements will be modified to within the pipe integrity limits. In some cases, joint testing (and sealing) cannot be performed.

1.4.3.1 Void pressure data shall be transmitted electronically from the VOID to the monitoring equipment or video picture of a pressure gauge mounted on the packer and connected to the void area. Example: via an electrical pressure transducer located at the VOID.

1.4.3.2 All test monitoring shall be above ground and, in a location, to allow for simultaneous and continuous observation of the television monitor and test monitoring equipment by the WRC Inspector.

1.4.4 Test Pressure: Joint test pressure shall be 3 PSI greater than the groundwater pressure outside the pipe or a minimum of 5 PSI, whichever is greater.

1.4.5 Groundwater pressure may be determined by positioning the testing device on a visibly infiltrating joint and measuring the resulting VOID pressure with the VOID pressure monitoring equipment.

1.5 CONTROL TEST PROCEDURE

1.5.1 Before any testing commences, an equipment verification test of Packer Bladders and Void Sensing Devices should take place. See Figure 1 for a graphical representation of the testing equipment. This procedure will demonstrate that the equipment is functioning properly, the packer is capable of developing a proper seal against the pipe walls, and the packer is capable of isolation a joint.

1.5.2 To ensure the accuracy, integrity, and performance capabilities of the testing equipment, a demonstration test will be performed in an aboveground test cylinder constructed in such a manner that a minimum of two know leak sizes can be simulated (see Figure 1). This technique will apply to pipe sized of 12-inches and smaller to leakage of the test medium from the system or other equipment defects that could affect the joint testing results. For pipe greater than 72" inside testing should be performed in a representation pipe section. If this test cannot be performed successfully, the CONTRACTOR shall be instructed to repair or otherwise modify this equipment and perform the test again until the results are satisfactory to the WRC Engineer. This test may be required at any other time during the joint testing work if requested by the WRC Inspector to verify the testing equipment is not functioning properly.

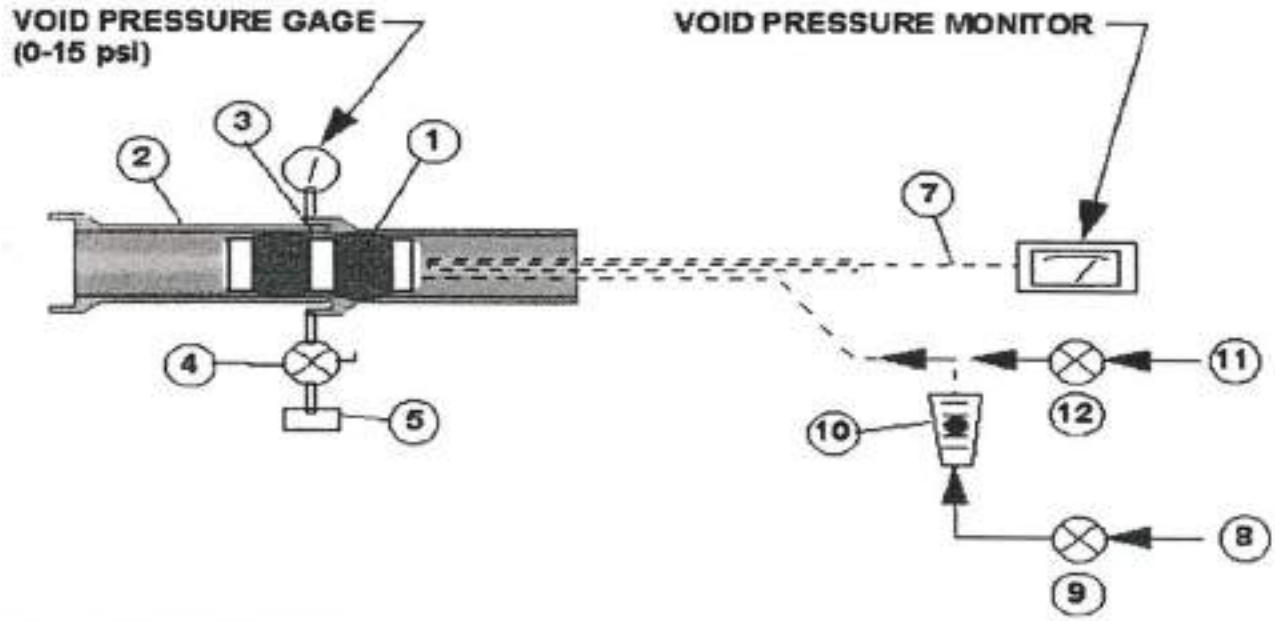
1.5.3 After entering each manhole section with the test equipment, but prior to commencement of joint testing, the test equipment shall be positioned on a section of sound sewer pipe between pipe joints, and pipe barrel test shall be performed as specified, above. Should it be found that the barrel of the sewer pipe will not meet the joint test requirements, the requirements will be modified to within the pipe integrity limits.

Figure 1: PIPE JOINT TESTING EQUIPMENT & CONTROL TEST SETUP

1. Joint Testing Device Void
2. Test Cylinder (PVC pipe of appropriate diameter) Liquid supply
3. Void between expanded ends of testing device.

4. 1/4 – Turn Stopcock
5. Simulated Leak (.062, .094, .125-inch diameter holes)
6. Air/Water/ Sealant hoses & electrical transmission line.
7. Electrical transmission of void pressure from the
8. Transmission of void pressure from void test
9. Test liquid regulation valve
10. Test liquid flow meter (¼ GPM to 1 GPM)
11. Air supply
12. Air shut-off valve

****Note: Void Pressure Reading on Test Cylinder gage must be the same as that observed on the void pressure monitoring equipment at all times during control test.



1.6 AIR TEST PROCEDURE

1.6.1 The testing devices shall be positioned within the line in such a manner as to straddle the pipe joint to be tested. It should be noted that a specific cable or change length is designed for the packer size. This specific cable length between the packer and TV camera is what allows each size to be positioned with the TV camera onto a joint.

1.6.2 The testing device end elements (bladders) shall be expanded so as to isolate the joint from the remainder of the line and create a VOID area between the testing device and the pipe joint. The ends of the testing device shall be expanded against the pipe with sufficient pressure to contain the air within tin VOID without leakage past the expanded ends.

1.6.3 Air shall then be introduced into the VOID area until a pressure equal to or greater than the required test pressure (3 PSI greater than the groundwater pressure outside the pipe or 5 PSI, whichever is greater) is observed

with the VOID pressure monitoring equipment. If the required test pressure cannot be developed (due to joint leakage), the joint will have failed the test and shall be sealed as specified (see Sewer Pipe Joint Sealing).

1.6.4 After the VOID pressure is observed to be equal to or great than the required test pressure, the airflow shall be stopped and the air test line & device vented. If the VOID pressure begins to drop within 30 seconds (due to joint leakage), the joint will have failed the test and shall be sealed as specified (see Sewer Pipe Joint Sealing).

1.6.5 Upon completing the testing of each individual joint, the packer shall be deflated with the void pressure meter drop ±½ PSI of initial zero pressure. Should the void pressure meter fail to drop to zero (±½ PSI), the CONTRACTOR shall be instructed to clean his equipment of residual grout material or make the necessary equipment repairs to provide for an accurate Void Pressure reading. All joints that fail to meet the specified test criteria shall be re- tested and/ or sealed until the test criteria can be met in order to receive payment.

1.6.6 Any joint failing the air test prior to grouting shall be sealed as specified herein and retested by the same void pressure method and procedures following sealing to verify the effectives of the sealing. This procedure will be repeated until the joint passes the test. Additional sealing after the initial sealing and retesting shall be at no cost to the WRC.

1.7 LIQUID (WATER) TEST PROCEDURE

1.7.1 The testing device shall be positioned within the line in such a manner as to straddle the pipe joint to be tested.

1.7.1.1 The testing device and elements (sleeves) shall be expanded so as to isolate the joint from the remainder of the line and create a VOID area between the testing device and the pipe joint. The ends of the testing device shall be expanded against the pipe with sufficient inflation pressure to contain the test liquid within the VOID without leakage past the expanded ends.

1.7.1.2 Water or an equivalent liquid shall then be introduced into the VOID area until a pressure equal to or great than the required test pressure is observed with the VOID pressure monitoring equipment. If the required test pressure cannot be developed (due to join leakage), the joint will have failed the test and shall be sealed as specified (see Sewer Pipe Joint Sealing Specification).

1.7.1.3 The flow rate of the test liquid shall then be regulated to a rate at which the VOID pressure is observed to be the required test pressure. A reading of the test liquid flow meter shall then be taken if the flow rate exceeds ¼-gallon per minute (due to joint leakage); the joint will have failed the test and shall be sealed as specified (see Sewer Pipe Joint Sealing Specification).

END OF SECTION

PART 1 GENERAL

1.1 DESCRIPTION

1.1.1 Referenced Sections:

1.1.1.1 CCTV Inspection Sewer

1.1.1.2 Sewer Cleaning

1.1.1.3 Sewer Pipe Joint Testing

1.1.1.4 Chemical Sealing (Grout) Material

1.1.1.5 By-Pass Pumping

1.1.1.6 Manhole and Pipe Rehabilitation and Spray Lining
1.1.1.7 UV Cured in Place Pipe
1.1.1.8 Thermal Cured in Place Pipe

1.2 SUBMITTALS

1.2.1 Joint Sealing Records: Included in the records for join sealing shall be:
1.2.1.1 The test pressure before and after sealing and the duration of the test per the Sewer Pipe Join Testing specification.
1.2.1.2 Location/Footage of each joint sealed.
1.2.1.3 The volume of grout material used to seal each joint.
1.2.1.4 The volume of grout placed per section.
1.2.1.5 The gel time verified every two hours and noted.
1.2.1.6 The calibration test results in PSI and time duration.

1.3 QUALITY ASSURANCE

1.3.1 Prior to commencement of work the WRC inspector and personnel will be given the opportunity to inspect the equipment to be used. Specifically, the WRC inspector may measure the internal dimensions of the tanks from which the sealing materials will be pumped and witness the technique for measuring the volume of sealing materials pumped.
1.3.2 Prior to the Contract startup, the Contractor shall perform test demonstration to verify accuracy of calibrations of pump pressures and liquid amounts injected per pump revolution or per pump stroke prior to commencing sealing operations. If this test demonstration fails to show that readings are consistent and accurate, the Contractor shall be required to make the required repair or adjustments to the equipment and gauges, and retest until the results are satisfactory to WRC. This test demonstration may be required at any time during the sealing operation.
1.3.2.1 See equipment test criteria and pressure reactions after seal (see Sewer Pipe Joint Testing Main Sewers Specification).
1.3.3 Related standards: ASTM F2454-05 (2022)
1.3.4 Request for Deviation
1.3.4.1 Any deviation in this specification or reference specifications must have prior approval from WRC.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Grouting materials shall be specified in Chemical Sealing (Grouting) Materials Specification.

2.2 EQUIPMENT

2.2.1 Equipment: The following basic equipment is necessary for completion of the work described in this section:
2.2.1.1 A closed-circuit television system (CCTV
2.2.1.2 Necessary chemical sealant container
2.2.1.3 Pumps
2.2.1.4 Regulators
2.2.1.5 Valves, hoes, etc.

2.2.1.6 Joint sealing packers for the various sizes of sewer pipes

2.2.1.7 Packer Pipes: The packer shall be cylindrical, have a diameter less than the pipe size, and have cables attached at each end to pull it through the line in conjunction with a CCTV.

PART 3 EXECUTION

3.1 JOINT SEALING

3.1.1 Joint Sealing Procedures: Joint showing visible leakage or joints that have failed the joint test specified (see Sewer Pipe Joint Testing Main Sewers Specification) shall be sealed as specified. When bell cracks or chips are evident from pipe section joint offsets, sealing may be undertaken where the offset is small enough to allow proper seating of the sealing packers on both sides of the joint to be sealed. Joint sealing shall be accomplished by forcing chemical sealing materials into or through faulty joints by a system of pumps, hoses, and sealing packers. The grout must be injected beyond the joint interface into the soil surrounding the pipe joint. The Core shall be taken when grouting from surface to pipe so that dames or undermining of the pipeline does not occur.

The packer shall be positioned over the failed joint by means of a measuring device and the CCTV in the line. It is important that the procedure used by the Contractor for positioning the packer be accurate to avoid overpulling the packer and thus not effectively isolating the intended joint. The packer ends (end element sleeves) shall be expanded (as per packer manufacturer recommendations) using controlled pressure. Expansion shall be regulated by precise pressure gauges and controls.

The expanded ends shall seal against the inside periphery of the pipe to form a void area around the failed joint and is completely isolated from the remainder of the pipeline. A tight seal shall be obtained before the grouting process begins. If a tight seal is not obtained, the CONTRACTOR shall remove the equipment and make such adjustments as are required to obtain a tight seal. Into this isolated area, through hose lines leading from above ground, the chemical sealant materials shall be pumped through the hose system with instant reading, metered flow controlled proportioning pumps at controlled pressures, which are in excess of 3 PSI greater than the groundwater pressure outside the pipe or 5 PSI, whichever is greater or by one of the following two methods:

3.1.1.1 No joint shall be considered sealed unless, while under continual pressure, an attempt is made to pump a minimum of ¼-gallon per inch of pipe diameter has been applied (i.e. 2 gallons for 8" pipe). This is to ensure that sufficient chemicals have been dispersed into the soil surrounding the joint and that temporary seal has not been made by applying a minimum amount of chemical to the void and joint areas inside the pipe.

3.1.1.2 Refusal shall be defined as the point of blow-by on the packer bladders or by continuous spikes in the void pressure.

3.1.1.3 At WRC discretion it may direct the CONTRACTOR to seal non- failed joints as a preventive measure.

3.1.2 Gel Times: Gel times shall not be less than 20 sec. unless approved by the Owner Representative. The chemical mixing ratios shall be adjusted and set as determined by the Owners Representative. But, in general, the 'gelatin," or gel set time shall never be less than 20 seconds. The following factors must be taken into account when determining an appropriate gel time: void volume (volume between packer and pipe), pumping rate, during the sealing operations. The television, grout pumping, and air pressure monitoring equipment shall be integrated so that proportions, quantities, and void pressures for materials and sealing can be instantly monitored and regulated in accordance with type and size of the leak being sealed.

3.1.3 It is intended that no chemical grouting shall be performed on any sanitary sewer line that has been scheduled for point repair, replacement or other work involving excavation or new connections until the scheduled work has been completed, or as otherwise authorized by the WRC Engineer.

3.1.4 The WRC Inspector and Engineer shall have access to observe the television screen and all other operations at all times.

3.2 PERFORMANCE REQUIREMENTS

3.2.1 Joint Testing Verification Procedure: Upon achieving a seal at each joint, the packer shall be deflated to break away the doughnut of gel informed by the packer VOID. The contractor shall clean the gel ring sufficiently enough to facilitate a retest by moving the grouting device one packer length. If necessary, the injection port on the packer shall be cleared with a quick burst of pressure test medium, such that the VOID pressure meter reads zero pressure ±0.5 psi. Should the VOID pressure meter not read zero ±0.5 psi, the Contractor shall clean his equipment of residual grout material or make the necessary equipment repairs/adjustments to produce accurate VOID pressure readings. The packer should then be re-inflated and the joint retested (at a pressure 1.5 times greater than the initial test pressure) as specified in the Sewer Pipe Joint Testing Specification. Joints that fail to meet the specified test criteria shall be resealed and retested until the test criteria can be met in order to receive payment.

3.2.2 Residual Sealing Material: Residual sealing materials that extend into the pipe, reduce the pipe diameter, or restrict the flow shall be removed from the joint. The sealed joints shall be left reasonably "flush" with the existing pipe surface. If excessive residual sealing materials accumulate in the line (and/or directed by the WRC Inspector) the manhole section shall be cleaned to remove the residual materials. In no case shall excess grout material from a succeeding section be allowed to accumulate and be flushed down the sewer.

3.3 WARRANTY

3.3.1 Terms: All sewer pipe joint sealing work performed shall be guaranteed against faulty workmanship and/or materials for a period of 5 years after the completion of the work.

3.3.1.1 Prior to the expiration of the guaranty period, the Owner shall select initial retest are consisting of specific manhole sections. Manhole sections to be warranty tested shall be randomly selected throughout the project area and shall be representative of the majority of the sealing work originally performed. The initial test area shall consist of 5% of the sealed joints contained in the original project.

3.3.1.2 Within the initial warranty test area, the Contractor shall retest all previously sealed joint as specified (see Sewer Pipe Joint Testing Main Sewers Specification). Any joints failing the warranty test shall the resealed. If the failure rate of the retested joints is less than 5 % of the joints retested, the work shall be considered satisfactory, and no further warranty testing will be required.

3.3.1.3 If, in the initial warranty test area, the failure rate of the retested joints exceeds 5% of the joint retested, an additional retest area of equivalent size shall be selected, and all previously sealed joints shall be retested. This additional warranty testing and sealing, if necessary, will continue until a failure rate of less than 5% is met for each additional warranty test area. If a joint fails, the initial re-test it will not be paid for under the testing item.

3.3.1.4 Any additions testing/ sealing required beyond the initial warranty test area shall be accomplished at no cost to the Owner. The initial warranty testing shall be paid for under the unit bid items for cleaning and testing.

3.3.1.5 Should as much as 25% of the original project be warranty tested and fail to meet the 5% requirement; the Contractor will be required to provide the same number of crews as utilized in the original project so that the warranty testing will proceed at a more rapid rate.

3.4 FINAL ACCEPTANCE

3.4.1 Upon completion, the installer will deliver the digital recordings and report to the owners. The WRC will review the documentation and the site to determine that the scope of work is complete, and the work is satisfactory.

END OF SECTION

PART 1 General

1.1 SUMMARY

1.1.1 Section includes Chemical Sealing (Grouting) Materials

1.1.1.1 Material properties of grout used in internal joint sealing of sewer pipe joints (See Sewer Joint Sealing Main Sewers Specification) which have failed the joint test criteria described in Sewer Pipe Joint Testing Specification.

1.1.2 Referenced Sections:

1.1.2.1 CCTV Inspection Sewer

1.1.2.2 Sewer Cleaning

1.1.2.3 Sewer Pipe Joint Testing

1.1.2.4 Sewer Pipe Joint Sealing

1.1.2.5 By-Pass Pumping

1.1.2.6 Manhole and Pipe Rehabilitation and Spray Lining

1.1.2.7 UV Cured in Place Pipe

1.1.2.8 Thermal Cured in Place

1.1.3 Request for Deviation

1.1.3.1 Any deviation in this specification or reference specifications must have prior approval from WRC.

1.2 QUALITY CONTROL

1.2.1 All chemical sealing materials used in the performance of the work specified should possess properties as described in American Public Works Associates (APWA) publication "Assessment of Sewer Sealants" (September 1980, office of R & D, U.S. EPA, Cincinnati, OH 45268).

1.2.2 Related standards: ASTM F 2454-05 (2022)

1.2.3 Request for Deviation

1.2.3.1 Any deviation in this specification or reference specifications must have prior approval from WRC.

PART 2 PRODUCTS

2.1 CHEMICAL SEALING MATERIALS

2.1.1 Chemical Sealing Materials: The following is a generic listing of chemical sealing materials currently in use and the basic requirements, properties and characteristics of each. It is recognized that new chemical sealing materials may become available from time to time. Sources, manufacturers, and product names of chemical

sealing materials may also change. Each chemical sealing material listed in Paragraph 3 has discrete properties and may or may not be interchangeable with another material for a particular application or purpose. Since each application of that material may present differing ambient conditions (i.e., temperature, soil type and condition, presence of water, etc.) it is important that the engineer/ applicator carefully considers the properties of each material to choose the appropriate chemical sealing material to be used to produce the desired results. In every case, mixing and handling chemical sealing materials shall be in accordance with the manufacturer's recommendations.

2.1.2 Acrylamide base gel sealing material:

2.1.2.1 A minimum of 10% acrylamide base material by weight in the total sealant mix. A higher concentration (%) of acrylamide base material may be used to increase strength or offset dilution injections.

2.1.2.2 The ability to tolerate some dilution and react in moving water during injection.

2.1.2.3 A viscosity of approximately 2 centipoise which can be increased with additives.

2.1.2.4 A constant viscosity during reaction period.

2.1.2.5 A controllable reaction time from 10 seconds to 1 hour.

2.1.2.6 A reaction (curing) which produces a homogeneous, chemically stable, non- biodegradable, firm flexible gel.

2.1.2.7 The ability to increase mix viscosity, density and gel strength by the use of additives.

2.1.3 Acrylic base gel chemical sealing material:

2.1.3.1 A minimum of 10 % acrylic base material by volume in the total sealant mix. A higher concentration (%) of acrylic base material may be used to increase strength or offset dilution during injection.

2.1.3.2 The ability to tolerate some dilution and react in moving water during injection.

2.1.3.3 A viscosity of approximately 2 centipoise which can be increased with additives.

2.1.3.4 A constant viscosity during the reaction period.

2.1.3.5 A controllable reaction time from 5 seconds to 6 hours.

2.1.3.6 A reaction (curing) which produces a homogeneous, chemically stable, non- biodegradable, flexible gel.

2.1.3.7 The ability to increase mixed viscosity, density and gel strength by the use of additives.

2.1.4 Acrylic base gel chemical sealing material:

2.1.4.1 A minimum of 12% * acrylate base material by weight in the total sealant mix. A higher concentration (%) of acrylate base material may be used to increase strength or offset dilution during injection. (*Note: if the acrylate base material is in a 40% solution, it must comprise 30% by weight of the total sealant mix to have 12% base material. The total mixed gallons shall not exceed 57 gallons.)

2.1.4.2 The ability to tolerate some dilution and react in moving water during injection using a low void packer.

2.1.4.3 A viscosity of approximately 2 centipoise which can be increased with additives.

2.1.4.4 A constant viscosity during the reaction period.

2.1.4.5 A controllable reaction time from 10 seconds to 1 hour. A reaction (curing) which produces a homogeneous, chemically stable, non-biodegradable, flexible gel.

2.1.4.6 The ability to increase mix viscosity, density and gel strength by the use of additives

.2.1.5 Urethane base gel chemical sealing material:

2.1.5.1 1 part urethane pre-polymer thoroughly mixed with between 5 and 10 parts of water by weight. The recommended mix ration is 1 part urethane per polymer to 8 parts water (11% pre-polymer).

2.1.5.2 A liquid pre-polymer having a solids content of 77% to 83%, specific gravity of 1.04 (8.65 pounds per gallon), and a flash point of 20 F.

2.1.5.3 A liquid pre-polymer having a viscosity of 600-1200 centipoise at 70º F that can be pumped through 500 feet of ½-inch hose with a 1000n psi head at a flow rate of 1 ounce per second.

2.1.5.4 The water used to react to the pre-polymer should have a pH of 5 to 9.

2.1.5.5 A cure of 80 seconds at 40º F, 55 seconds at 60º F, and 30 seconds at 80º F when 1 part pre-polymer is reacted with 8 pars of water only. Higher water ratios give longer cure times.

2.1.5.6 A cure time that can be reduced to 10 seconds for water temperatures of 40º F to 80º F when 1-part pre polymer is reacted with 8 parts of water containing a sufficient amount of gel controls agent additive.

2.1.5.7 A relatively rapid viscosity increase of the pre-polymer/water mix. Viscosity increases from about 10-60 centipoise in the first minute for 1 to 8 pre-polymer/ water ration at 50 F.

2.1.5.8 A reaction (curing) which produces a chemically stable and non- biodegradable, tough, flexible gel.

2.1.5.9 The ability to increase mix viscosity, density, gel strength and resistance to shrinkage by the use of additives to the water.

2.1.6 Urethane base foam chemical sealing material:

2.1.6.1 Approximately 1 part of urethane pre-polymer thoroughly mixed the 1 parts of water by weight (50% pre-polymer).

2.1.6.2 A liquid per-polymer having a solids content of 82% to 88%, specific gravity of 1.1 (9.15 pounds per gallon), and a flash point of 20º F.

2.1.6.3 A liquid pre polymer having a viscosity of 300-500 centipoise at 72º F that can be pumped through 500 feet of ½- inched house with a 500-psi head at flow rate of 1 ounce per second.

2.1.6.4 A cure time of 15 minutes at 40º F, 8.2 minutes at 70º F and 4.6 minutes at 100º F when the pre-polymer is reacted with water containing 0.4% accelerator.

2.1.6.5 A cure time of 5.5 minutes at 40º F, 8.2 minutes at 70º F and 2.6 minutes at 100º F when the pre-polymer is reacted with water containing 0.4% accelerator.

2.1.6.6 During injection, foaming, expansion, and viscosity increase occur.

2.1.6.7 Physical properties of the cured foam of approximately: 14 pounds per cubic foot density, 80-90 psi tensile strength, and 700% to 800% elongation when a mixture of 50% pre-polymer and 50% water undergoes a confined expansion to five times its initial liquid volume.

PART 3 EXECUTION

See Sewer Pipe Joint Sealing Specification

END OF SECTION

Part 1 GENERAL

1.01 SUMMARY

1.01.01 Section includes internal close-circuit television (CCTV) inspection of sewers.

1.01.01.01 Inspect sewer interior using color CCTV camera, and document inspection on a WRC approved storage device(s)/area with location and date information, title information, and continuous footage counter in a NASSCO PACP database. Provide a hard copy of summary inspection log(s).

1.01.02 Related Sections: Refer to the following sections for related work:

1.01.02.01 Sewer Pipe Joint Testing
1.01.02.02 Sewer Pipe Joint Sealing
1.01.02.03 Chemical Sealing (Grout) Material
1.01.02.04 Sewer Cleaning
1.01.02.05 Thermal Cured in Place Pipe
1.01.02.06 UV Cured in Place Pipe
1.01.02.07 Manhole and Pipe Rehabilitation and Spray Lining
1.01.02.08 By-Pass Pumping

1.02 SUBMITTALS

1.02.01 Quality Assurance: Submit one sample NASSCO PACP database of previous sewer inspection work that shows operational and structural defects in sewers and summary inspection log(s).

1.02.01.01 NASSCO PACP database and summary inspection log(s) will be reviewed to determine if quality of CCTV image is acceptable and if defects were properly identified and documented according to NASSCO and WRC requirements.

1.02.01.02 Modify equipment and/or inspection procedures to achieve report material of acceptable quality.

1.02.01.03 Do not commence Work prior to approval of report material quality by WRC Representative. Upon acceptance, report material shall serve as standard for remaining Work.

1.02.01.04 Request for Deviation

1.02.01.04.01 Any deviation in this specification or reference specifications must have prior approval from WRC.

1.02.02 Summary Inspection Log(s): Unless otherwise indicated, submit inspection log(s) that include the following as a minimum:

1.02.02.01 Header Containing
1.02.02.01.01 Project Title
1.02.02.01.02 Contractors Name
1.02.02.01.03 Operator name(s)
1.02.02.01.04 Locale(s)
1.02.02.01.05 City and Street(s)
1.02.02.02 Table of Pipe Run Summary 1.02.02.02.01 Columns Required
1.02.02.02.01.01 Date
1.02.02.02.01.02 WRC CAMS pipe asset id number 1.02.02.02.01.03 WRC CAMS standard Work Order number 1.02.02.02.01.04 WRC CAMS heavy cleaning Work Order number
1.02.02.02.01.05 WRC Upstream Legacy Manhole numbers 1.02.02.02.01.06 WRC Downstream Legacy Manhole numbers 1.02.02.02.01.07 Pipe segment length surveyed 1.02.02.02.01.08 WRC CAMS pipe segment length 1.02.02.02.01.09 Check box if there was a reversal done or the survey was abandoned.

1.02.03 NASSCO PACP database must include all of the minimum required fields per NASSCO PACP.

1.02.04 Maintain copy of all inspection documentation (media/area, databases, and summary logs) for duration of Work and one (1) year period after WRC accepts the invoice.

Part 2 PRODUCTS

2.01 MATERIALS AND EQUIPMENT

2.01.01 WRC Storage Device/area

2.01.01.01 Storage shall be in the manufacture's recommendations for position, temperature range and in an appropriate case to prevent damage.

2.01.01.02 Identify each storage device/area with proper labeling/folders showing:

2.01.01.02.01 Project Title

2.01.01.02.02 Contractor Name

2.01.01.02.03 Operator name(s)

2.01.01.02.04 Locale(s)

2.01.01.02.05 City and Street(s)

2.01.02 Television Inspection Camera(s) (TIC): Equipped with rotating head, capable of 90-degree rotation from horizontal and 360-degree rotation about its centerline and should be suitable for viewing the full perimeter of the proposed pipe diameter.

2.01.02.01 Minimum Camera Resolution: High Definition 720p (1280x720)

2.01.02.02 Camera Lens: Not less than 140 degree viewing angle, with automatic or remote focus and iris controls.

2.01.02.03 Focal Distance: Adjustable through range of 6 inches (152 mm) to infinity.

2.01.02.04 Camera(s) shall be intrinsically safe and operative in 100 percent humidity conditions.

2.01.02.05 Lighting Intensity: Remote-controlled and adjusted to minimize reflective glare.

2.01.02.06 Lighting and Camera Quality: Provide clear, in-focus picture of entire inside periphery of sewer.

2.01.03 A winch and cable through the pipeline shall tow the TIC or it shall be mounted on a crawler. All winches shall be stable during the entire TIC inspection. All TIC cables and lines used to measure the camera's location within the pipeline shall be maintained in a taut manner and set at right angles, where it is possible to run through or over the measuring equipment.

2.01.04 The inspection shall be conducted at such a speed as to allow proper analysis of the pipes condition. The camera shall stop at each house lead for a minimum of 5 seconds.

2.01.05 Footage Counter: Measures distance traveled by camera in sewer, accurate to plus or minus 2 feet (0.6 m) in 1,000 feet (305 m). Lighting and Camera Quality: Provide clear, in-focus picture of entire inside periphery of sewer.

2.01.05.01 Accuracy of the distance meter shall be checked by use of a walking meter, roll-a-tape, or other suitable device, and the accuracy shall be satisfactory to the WRC Inspector.

Part 3 EXECUTION

3.01 SEWER FLOW REQUIREMENTS

3.01.01 Do not exceed depth of flow shown in Table 1 for respective pipe sizes as measured in manhole when performing TV inspection.

3.01.02 When depth of flow at upstream manhole of sewer line section being worked is above maximum allowable for TV inspection, reduce flow to level shown in Table 1, by plugging or blocking of flow, or by pumping and bypassing of flow as specified.

TABLE 1

Maximum Depth of Flow for TV Inspection

Nominal Pipe Diameter	Maximum Depth of Flow
6" - 10"	20 percent of pipe diameter
12" - 24"	25 percent of pipe diameter

3.01.03 If the camera is submerged under water in the pipe (bullied pipe) then every attempt must be made to clear the water from that section. If the water cannot be cleared and proper camera inspection cannot be made then the WRC inspector shall be notified, the segment reported, and the Contractor shall wait for further directions on that section.

3.02 SEQUENCE OF WORK

3.02.01 Perform Work in the following sequence:

3.02.01.01 Clean sewer lines and manholes in accordance with requirements of Sewer Cleaning Specification.

3.02.01.02 Perform TV inspection to comply with requirements of this specification.

3.03 INSPECTION REQUIREMENTS

3.03.01 Access: The WRC shall provide full-time inspection. WRC inspector shall have access to observe monitor and other operations at all times. No inspections shall commence without the designated WRC inspector present at the site of the inspection operations.

3.03.02 CONTRACTOR'S personnel viewing the live video feed in the televising van must be NASSCO certified and have at least three years of certified NASSCO grading experience.

3.03.03 Sewer Identification: WRC approved storage device(s)/area and inspection documentation shall include sewer line and manhole identifiers shown on Drawings provided by WRC.

3.03.04 Image Perspective: Camera image shall be down center axis of pipe when camera is in motion.

3.03.04.01 Provide 360-degree sweep of pipe interior at points of interest, to more fully document existing condition of sewer.

3.03.04.02 Points of interest may include, but are not limited to the following: defects, cracks, voids, connections, encrustations, mineral deposits, debris, sediment, and any location determined not to be clean or part of an improper previous liner installation, and defects in liner that include, but are not limited to bumps, folds, tears, dips, bellies, and dimples.

3.03.04.03 Manual winches, power winches, TV cable and powered rewinds or other devices should not obstruct the camera view or interfere with proper documentation of the pipe or its movement within the pipe.

3.03.05 Sewer Reach Length: Physically measure and record length of each sewer reach from centerline of its terminal manholes.
3.03.06 Inspection Rate: Camera shall be pulled through sewer in either direction, but both inspections are to be in the same direction. The maximum rate of travel shall be 15 feet per minute when recording.

3.04 FIELD QUALITY CONTROL

3.04.01 WRC will review video and summary inspections log(s) to ensure compliance with requirements listed in this specification and Sewer Cleaning specification.
3.04.02 If sewer line, in sole opinion of WRC, is not adequately clean, it shall be re-cleaned and CCTV-inspected by Contractor at no additional cost.

END OF SECTION

PART 1 General

1.01 SUMMARY

1.01.01 Section includes manhole rehabilitation and spray lining.
1.01.01.01 It is the intent of this specification to provide for the reconstruction of manholes and sewer pipes by the use of the Spray Lining Rehabilitation process utilizing spaying a cementitious lining, epoxy lining or another WRC approved material into an existing host manhole and/or pipe.
1.01.02 Referenced Specifications:
1.01.02.01 CCTV Inspection Sewer
1.01.02.02 Sewer Cleaning
1.01.02.03 Sewer Pipe Joint Testing
1.01.02.04 Sewer Pipe Joint Sealing
1.01.02.05 Chemical Sealing (Grout) Material
1.01.02.06 Bypass Pumping

1.02 QUALITY CONTROL

1.02.01 All work for this section shall conform to the applicable portions of the latest Standard Specifications:
1.02.01.01 ASTM F2251
1.02.01.02 ASTM D2584
1.02.01.03 ASTM D695
1.02.01.04 ASTM D4541
1.02.01.05 ASTM D543
1.02.01.06 ASTM G20
1.02.01.07 ASTM D4787
1.02.01.08 ASTM D638-22
1.02.01.09 ASTM D790
1.02.01.10 ASTM D3039
1.02.01.11 ASTM D635
1.02.01.12 APS Water Porosity Standard

1.02.02 However, where the requirements of ASTM F2251, ASTM D2584, ASTM D695, ASTM D4541, ASTM D543, ASTM G20, ASTM D4787, ASTM D638-22, ASTM D790, ASTM D3039, ASTM D635 or APS Water Porosity Standard conflict with the requirements of this section, this section shall govern.

1.02.03 Submittals

1.02.03.01 CCTV Inspection Sewer.

1.02.03.01.01 A CCTV inspection of the sewer before conditions and after conditions including the restore connections shall be completed per the CCTV Inspection Sewer specifications and turned over to the Owner and become their property.

1.02.03.02 Material Test

1.02.03.02.01 Material test shall be furnished to WRC for review and approval prior to beginning the rehabilitation work, satisfactory written guarantee of compliance with the standards specifications for all materials, techniques, and installation methods being used in the rehabilitation process.

1.02.03.03 By-Pass Pumping Plan

1.02.03.04 Submit a detailed sewer bypass pumping plan to WRC for review fifteen (15) days prior to the beginning of work per the By-Pass Pumping specifications.

1.02.03.05 Request for Deviation

1.02.03.05.01 Any deviation in this specification or reference specifications must have prior approval from WRC.

1.02.03.06 Certification: Applicators to perform coating installation work, including spray operators as applicable, shall be certified by the manufacturer and submitted to WRC.

1.02.04 Design considerations

1.02.04.01 Follow the manufacturer's specifications for the materials design and applications.

PART 2 PRODUCTS

2.01 GENERAL

2.01.01 The materials used shall be designed, manufactured, and intended for sewer systems, manholes and pipe rehabilitation and the specific application in which they are used.

2.02 CEMENTITIOUS RESTORATION

2.02.01 Spray applied or centrifugally cast lightweight structural reinforced cement material applied to the surface of the manhole or pipe shall be a blend of acid-resistant binders, siliceous aggregates, non-metallic fibers and other additives for construction a line that is impervious to the flow of water, is resistant to sulfide attack and restores structural integrity to existing manhole or pipe walls.

2.03 CEMENTITIOUS COATING MATERIALS

2.03.01 CONTRACTOR shall install cementitious coating materials that shall be specifically designed for the rehabilitation of manholes, pipes, and related structures. Liner materials shall be mixed with water per manufacturer's specifications and applied using equipment specifically designed for either low- pressure spray or centrifugal spin casting application of cement mortars. All cement liner materials must be capable of a placement thickness of ½" to 2" in one pass monolithic applications.

2.03.02 Cementitious coating materials shall have the following 28-day minimum characteristics

2.03.02.01 Compressive Strength: 8000 psi

2.03.02.02 Flexural Strength: 1000 psi

2.03.02.03 Bonding Strength: Substrate failure
2.03.02.04 Permeability: Not to exceed 400 coulombs
2.03.02.05 Freeze-Thaw: No damage in 3000 cycles (min)
2.03.02.06 Material Wet Density: 130 lbs./ft3
2.03.03 Material Design: Cementitious coating materials shall be designed based upon the following conditions:
2.03.03.01 Extremely Harsh Hydrogen Sulfide Environment (pH<2.0): 2.03.03.01.01 Cementitious coating materials shall be manufactured from 100% calcium aluminates-based cements, shrinkage compensated and enhanced with high-density chemically stable aggregates.
2.03.03.01.02 Materials shall contain poly fiber reinforcement and chemical admixtures.
2.03.03.01.03 The coating manufacture should be contacted for a recommendation of specific project applications.
2.03.04 Subject to meeting the above requirements, manufacturers with acceptable products may include the following:
2.03.04.01 Strong Seal Systems
2.03.04.02 Permacast Mortars
2.03.04.03 Mainstay
2.03.04.04 Sauereisen
2.03.04.05 Fosroc
2.03.04.06 SewperCoat
2.03.04.07 LaFarge

2.04 SPRAY-ON LINER

2.04.01 Repair and Resurfacing Products:
2.04.01.01 Repair products shall be used to fill voids, bug holes, and/or smooth transitions between components prior to the installation of the coating product(s). Repair materials must be compatible with the specified coating product(s) and shall be used and applied in accordance with the manufacturer's recommendations.
2.04.01.02 Resurfacing products shall be used to fill large voids, lost mortar in masonry structures, smooth deteriorated surfaces and rebuild severely deteriorated structures.
2.04.01.03 The following products may be accepted and approved as compatible repair and resurfacing products for use within the specifications:
2.04.01.03.01 100% solids, solvent-free epoxy grout specifically formulated for epoxy top-coating compatibility.
2.04.01.03.02 Factory blended, rapid setting, high early strength, fiber reinforced, non-shrink repair mortar that can be troweled or pneumatically spray applied may be approved if specifically formulated to be suitable for epoxy top-coating with the specified product. The length of resurfacing material cure required before epoxy top-coating shall be as recommended by the manufacturer.
2.04.01.04 Coating Products:
2.04.01.04.01 One-hundred percent solids, solvent-free ultra-high- build epoxy system exhibiting the following characteristics:
2.04.01.04.01.01 Product Type: Amine-cured Epoxy 2.04.01.04.01.02 VOC Content (ASTM D2584): 0%
2.04.01.04.01.03 Compressive Strength (ASTM D695): 13,000 psi (min)

2.04.01.04.01.04 Tensile Strength (ASTM D638): 6,500 psi (min)
2.04.01.04.01.05 Flexural Strength (ASTM D790): 12,500 psi (min)
2.04.01.04.01.06 Adhesion to Concrete, mode of failure (ASTM D4541): Substrate (concrete) failure
2.04.01.04.01.07 Chemical Resistance (ASTM D543/G20) all types of service for:
2.04.01.04.01.07.00 Municipal sanitary sewer environment
2.04.01.04.01.07.01 Sulfuric acid, 30%
2.04.01.04.01.07.02 Sodium hydroxide, 5%
2.04.01.04.02 Polyurea
2.04.01.04.02.01 Tensile Strength: 3,000 psi minimum
2.04.01.04.02.02 Ultimate Elongation: 200% minimum
2.04.01.04.02.03 Tear Strength 400 PLI minimum
2.04.01.04.02.04 Minimum 80 mil thickness

2.05 MANHOLE STEP

All existing steps will be removed.

PART 3 EXECUTION

3.01 SAFETY

3.01.01 The CONTRACTOR shall carry out this operation in strict accordance with all OSHA, MIOSHA, traffic and manufacturer's safety requirements.

3.02 MANHOLE PREPARATION

3.02.01 The CONTRACTOR is advised that the manholes are affected by severe hydrogen sulfide corrosion and are considered permit required confined spaces. The CONTRACTOR shall comply with all federal, state, local, and WRC requirements applicable to the work.

3.02.02 Flow Control

3.02.02.01 The CONTRACTOR shall follow WRC's By-Pass Pumping specification.

3.02.03 Cleaning of Pipelines

3.02.03.01 The CONTRACTOR shall follow WRC's Sewer Cleaning specification.

3.02.04 Pre-rehabilitation inspection of pipeline

3.02.04.01 The CONTRACTOR shall follow WRC's CCTV Inspection Sewer specification. The location of any conditions which may prevent proper installation of the lining materials into the pipelines shall be noted and reported immediately to WRC and corrected by section 3.05.

3.02.05 Line obstructions

3.02.05.01 It shall be the responsibility of the CONTRACTOR to clear the line of any obstructions such as solids, dropped joints, protruding branches, roots, or broken pipe that will prevent proper insertion of the liner. If the inspection reveals an obstruction that cannot be removed by conventional cleaning equipment, then the obstruction shall be removed by equipment operating with the pipeline.

3.02.05.02 Services shall not protrude more than ¼ inch on any size sewer line. Anything protruding more than that shall be ground down as flush as possible with the wall of the sanitary sewer. Grinding shall be done with equipment operation inside of the sewer and shall not cause damage to the sewer or the service being ground.

3.02.05.03 If the protruding service is in such condition that grinding is not possible or in condition that such a repair cannot be done from the inside, then the CONTRACTOR shall inform WRC that a spot repair is necessary and provide all the details. Once WRC gives its approval the CONTRACTOR shall make a spot repair excavation, to uncover, remove, and repair the obstruction. The use of a flail type reamer to remove protruding services is not allowed.

3.02.06 Patching and Sealing of Active Leaks

3.02.06.01 The CONTRACTOR shall follow WRC's Sewer Pipe Joint Testing, Sewer Pipe Sealing, and Chemical Sealing (Grouting Materials).

3.02.06.01.01 Larger Diameter Pipe

3.02.06.01.01.01 Large holes or voids round step, joints or pipe, spalled areas and holes caused by missing or cracked brick shall be patched and missing mortar repointed using a non-shrink patching mortar.

3.02.06.01.01.02 Cracked or disintegrated material shall be removed from the area to be patched or repointed, exposing a sound sub-base. Cracks not subject to movement and greater than 1/16 inch in width shall be routed out to a minimum width and depth of ½ inch and patched with non-shrink patching mortar.

3.03 STRUCTURAL REINFORCED CEMENTITIOUS RESTORATION

3.03.01 Preparation

3.03.01.01 The lining system shall be installed in accordance with the manufacturer's recommendation to withstand groundwater pressure. For Manhole less than 12 feet in depth, the lining shall withstand the pressures associated with a groundwater depth equal to 12 feet of depth. Measure the groundwater depth from the manhole bench to the top of the ground surface.

3.03.01.02 Before starting any patch work or liner application a perforated device, catch bucket or other straining device must be installed to prevent construction debris from entering the downstream system.

3.03.01.03 If ambient temperatures are in excess of 95□ Fahrenheit, precautions shall be taken to keep the mixed temperature at the time of application below 90□ Fahrenheit.

3.03.01.04 No application shall be made to frozen surfaces. Material shall not be applied during freezing weather conditions. Material shall not be placed when the ambient temperature is 37□ Fahrenheit and falling or when the temperature is anticipated to fall below 32□ Fahrenheit within 24 hours.

3.03.01.05 Material shall be applied to a specified uniform minimum thickness of ½ inch, or ½ inch over exposed reinforcing bars, whichever is greater. Material shall be applied to the bench area in such a manner as to provide for proper drainage without ponding of the flow in the manhole.

3.03.01.06 Troweling of materials shall begin immediately following the application. Initial troweling shall be in an upward motion, to compress the material into voids and solidify manhole wall. Precautions should be taken no to over-trowel.

3.03.01.07 Curing will take place once the manhole cover has been replaced. It is important that the manhole cover is replaced no more that 10-20 minutes after troweling is completed to avoid moisture loss in the material due to sunlight and winds.

3.03.02 Spray Application

3.03.02.01 Material specified herein shall be applied and finished, by the AWARDED VENDOR(S), using equipment recommended by the manufacturer.

3.03.02.01.01 Material hose shall be coupled to a low-velocity spray application nozzle. Pumping of the material shall commence and the material shall be atomized by the introduction of air at the nozzle, creating a low-velocity spray pattern for material application.

3.03.02.01.02 Spaying shall be performed by starting at the manhole invert and progressing up the wall to the corbel and chimney areas or from the downstream pipe up to the upstream pipe.

3.03.03 Spin Casting Application

3.03.03.01 Material specified herein shall be applied and finished, by the AWARDED VENDOR(S), using equipment recommended by the manufacturer.

3.03.03.01.01 Material hose shall be coupled to a high-speed rotation applicator device.

3.03.03.01.01.01 The rotating casting applicator shall then be positioned within the center of the manhole at either the top of the manhole chimney or the lowest point elevation corresponding to the junction of the manhole bench and walls.

3.03.03.01.01.02 The rotating casting applicator shall then be positioned at the center of the pipe on the downstream end.

3.03.03.01.02 The high-speed rotation applicator shall then be initialized and pumping of the material shall commence. As the mortar begins to be centrifugally cast evening around the interior of the manhole or pipe, the rotating applicator head shall be moved at a controlled retrieval speed conducive to providing a uniform material thickness on the manhole or pipe walls.

3.03.03.01.03 Controlled multiple passes are then made until the specified minimum finished thickness is attained. If the procedure is interrupted for any reason, simply stop the retrieval of the applicator head until flows are recommended.

3.03.03.01.03.01 Material thickness may be verified at any point with a depth gauge. If additional material is required at any level, the rotation applicator head shall be placed at that point and application shall recommence until that area is thickened.

3.03.03.01.04 Material shall be applied only when the manhole or pipe is in a damp state, with no visible water dripping or running over the manhole or pipe walls.

3.03.03.01.05 The low-velocity spry nozzle and the centrifugal spin casting head may be used in conjunction to facilitate uniform application of the mortar material to irregularities in the counters of the manhole walls and bench areas.

3.04 EPOXY LINING

3.04.01 Preparation

3.04.01.01 Standard Portland cement or new concrete (not quick setting high strength cement) must cure a minimum of 28 days prior to application of the epoxy coating product(s).

3.04.01.02 Remove existing coatings prior to application of the coating product(s) which may affect the performance and adhesion of the coating product(s).

3.04.01.03 Thoroughly clean and prepare products to not to affect a seal with the coating product(s).

3.04.01.04 Place covers over all pipe openings to prevent extraneous material from entering the sewer system.

3.04.01.05 The use of acid for cleaning purposes, no matter how diluted, will not be allowed.

3.04.01.06 No application shall be made when the ambient temperatures are less than 40□ Fahrenheit and when freezing is expected within 24 hours unless specific recommendations are made by the manufacturer. Ambient temperatures of the mixture shall not exceed 90□ Fahrenheit.

3.04.02 Spray-on Epoxy Liner

3.04.02.01 The epoxy liner shall be manually sprayed on to all surfaces by a trained technician who is experienced in the application of a spray applied liner and has been certified by the manufacturer.

3.04.02.02 Appropriate personal protection equipment shall be utilized in every case when applying the liner, the sprayer and personnel in direct contact with the spray atmosphere, will always be protected by supplied air.

3.04.02.03 Material shall be spray applied to a minimum uniform thickness to ensure that all voids and crevices are filled, and a smooth surface remains. Minimum thickness of the material applied is 125 mils.

3.04.02.04 Application of the spray applied material shall be completed in one mobilization in order to minimize the flow disruption and cost of excessive bypass pumping, pipeline plugging, traffic control and all other support services.

3.05 FINISH

3.05.01 The cured liner shall be continuous over the entire length of the run or manhole and be as free as commercially practicable from visual defects such as foreign inclusions, dry spots, pinholes and delamination. The lining shall be impervious and free of any leakage.

3.05.02 Any defects which will affect the integrity of the liner, or any deficiencies in required strengths or thicknesses, shall be repaired or removed and replaced at the AWARDED VENDOR(S)'S expense, in a manner acceptable to WRC.

3.05.03 Manhole steps shall be driven into pre-cast or drilled holes. Steps shall be installed no more than 16 inches apart vertically on the interior of the manhole wall at a point 4 inches below the base flange of the manhole casting.

3.06 SEALING LINER AT THE ENDS

3.06.01 If due to a broken or misaligned pipe at the access point, the lining fails to make a tight seal, the CONTRACTOR shall apply a seal at that point.

3.07 BRANCH OR SERVICE CONNECTIONS

3.07.01 After the liner has been cured, the CONTRACTOR shall reconnect the existing service connections. This shall generally be done without excavation and in the case of non-man entry pipes, from the interior of the pipeline by means of a television camera and cutting device that re-establishes them to operational capacity. After cutting open the service connections, the CONTRACTOR shall use a brushing device from the interior of the pipeline by means of a television camera or by hand that touches-up the full circumference of the service connection to eliminate any rough or jagged edges.

3.07.02 Reconnection of services shall begin immediately after curing of the liner has been completed. No service shall be interrupted for more than 12 hours unless otherwise approved by WRC.

3.08 POST REHABILITATION TELEVISION INSPECTION

3.08.01 The completed sewer shall be television inspected per the WRC's CCTV Inspection Sewer specification by the CONTRACTOR after completion of the service connections.

3.09 TRAFFIC CONTROL

3.09.01 During the entire rehabilitation process, the CONTRACTOR shall provide all necessary barricades, signs, flagmen, minor traffic devices, etc., to maintain both vehicular and pedestrian traffic and if not possible all necessary barricades, signs, minor traffic devices, etc. for the road and sidewalk closure per the Michigan Manual of Uniform Traffic Control Devices.

3.10 CLEAN UP

3.10.01 Upon completion of the installation work and after the liner is acceptable, the CONTRACTOR shall restore the project area affected by the operation shall be replaced with like materials and to match in thickness to its substantially the original conditions.

END OF SECTION

Invoices will be based on agreed upon quantities between Contractor and WRC. All billable items including labor, equipment, materials, supplies, and subcontractor expense shall be authorized by WRC prior to invoicing. Rates shall include all necessary expenses to perform the work, including personal protective equipment and all safety equipment. No payment will be made for personal protective equipment items such as work gloves, boots, safety glasses, fall protection, gas detectors, clothing and any other personal protective equipment.

No additional payment will be made for any items needed to adhere to all local, State, and Federal Safety Standards.

1. Hourly Labor Rates: Supply a job classification rate sheet for all positions including shop, field and office that may be utilized for this contract. Regular, overtime, weekend, and holiday rates for each classification shall be provided, as applicable. If WRC determines the need to work 4 days, ten hours per day work weeks, overtime will not be considered for 10-hour workdays. The WRC staff. See Appendix A
2. Equipment Rates: The rates shall include a tabulation of daily, weekly, and monthly rates for all contractor supplied equipment. For bypass pumping, standby and online rates shall be provided. Fuel costs for pumping equipment shall be considered as part total of the unit rate, unless otherwise indicated in the proposal. For bypassing piping, the fee for any particular project should not exceed the original cost of said piping. As such, WRC will have the option of negotiating a buyback price or credit for long duration rentals of bypassing piping. The markup rate for equipment rented by the Contractor, along with a list of any anticipated rental equipment shall also be provided in the proposal.
   See Appendix A

3. Materials & Supplies: Fixed costs for materials and supplies shall be listed and tabulated in the proposal. Anticipated variable rate or project specific materials and

supplies, including freight, shall also be listed in the proposal with the bidder's markup rate. See Appendix A

4.Subcontractor Expense and Rental Equipment: The mark-up rate for subcontractor expense, along with a list of any anticipated subcontractor activities. See Appendix A

5. Traffic Control: Provide daily, weekly, and monthly rates for traffic control. See Appendix A

6.Discount for prompt payment .5% discount on payment made within 15 days of invoice date.

APPENDIX A

CONTRACTOR: D.V.M. UTILITIES, INC.
PROJECT NAME: SEWER MAINTENANCE & REPAIR
OWNER: OAKLAND COUNTY WATER RESOURCES COMMISSION
WATERFORD, MI

DVM UTILITIES, INC.

LABOR RATES

15% MARKUP (INCLUDES OVERHEAD & PROFIT) APPLICABLE TO ALL RATES BELOW

Year 1 (2025-2026)

	CLASSIFICATION	Straight Time (ST)/Hr	Overtime (OT)/Hr	Double Time (DT)-Sunday & Holidays/Hr
Labor	Flagger/Traffic Control	$57.00	$74.00	$96.00
Labor	Sewer Rehabilitation Laborer	$59.00	$76.50	$98.50
Labor	Vactor/Jetter Operator	$69.00	$85.50	$107.00
Labor	Boiler Truck Operator	$70.00	$89.00	$108.00
Labor	CCTV Truck Operator	$71.50	$91.50	$110.00
Labor	Grout Truck Operator	$70.00	$90.00	$108.50
Labor	Sewer Rehab Foreman	$79.00	$106.00	$130.00
Labor	Heavy Equipment Mechanic	$94.00	$104.50	$136.00
Labor	Heavy Equipment Operator	$94.00	$104.50	$136.00
Labor	General Laborer	$62.50	$78.00	$95.50
Labor	Low-Boy Driver	$61.00	$77.00	$100.00
Labor	Field Supervisor	$100.00	$115.00	$155.00
Labor	Project Manager	$125.00	$140.00	$175.00

Year 2 (2025-2026)

	CLASSIFICATION	Straight Time (ST)/Hr	Overtime (OT)/Hr	Double Time (DT)-Sunday & Holidays/Hr
Labor	Flagger/Traffic Control	$59.00	$76.50	$99.75
Labor	Sewer Rehabilitation Laborer	$61.00	$79.00	$103.50
Labor	Vactor/Jetter Operator	$72.00	$89.00	$112.50
Labor	Boiler Truck Operator	$74.00	$93.50	$113.50
Labor	CCTV Truck Operator	$76.50	$96.00	$115.50
Labor	Grout Truck Operator	$75.00	$94.00	$114.00
Labor	Sewer Rehab Foreman	$83.00	$112.00	$148.00
Labor	Heavy Equipment Mechanic	$98.75	$110.00	$141.00
Labor	Heavy Equipment Operator	$98.75	$110.00	$141.00
Labor	General Laborer	$66.00	$82.00	$98.00
Labor	Low-Boy Driver	$64.00	$82.00	$105.00
Labor	Field Supervisor	$105.00	$121.00	$160.00
Labor	Project Manager	$130.00	$147.00	$180.00

Year 3 (2027-2028)

	CLASSIFICATION	Straight Time (ST)/Hr	Overtime (OT)/Hr	Double Time (DT)-Sunday & Holidays/Hr
Labor	Flagger/Traffic Control	$62.00	$79.00	$104.50
Labor	Sewer Rehabilitation Laborer	$64.00	$82.50	$109.00
Labor	Vactor/Jetter Operator	$75.00	$93.50	$118.00
Labor	Boiler Truck Operator	$78.00	$96.00	$119.00
Labor	CCTV Truck Operator	$79.50	$98.50	$121.00
Labor	Grout Truck Operator	$78.00	$97.00	$119.50
Labor	Sewer Rehab Foreman	$87.25	$118.00	$152.00
Labor	Heavy Equipment Mechanic	$104.00	$115.50	$148.00
Labor	Heavy Equipment Operator	$104.00	$115.50	$148.00
Labor	General Laborer	$60.50	$86.00	$103.00
Labor	Low-Boy Driver	$67.00	$89.25	$110.00
Labor	Field Supervisor	$110.00	$125.00	$165.00
Labor	Project Manager	$133.00	$150.00	$185.00

APPENDIX A

CONTRACTOR: D.V.M. UTILITIES, INC.
PROJECT NAME: SEWER MAINTENANCE & REPAIRS
OWNER: OAKLAND COUNTY WATER RESOURCES COMMISSIONER,
WATERFORD, MI

UTILITIES, INC.

EQUIPMENT RATES

HOURLY EQUIPMENT RATES (MAX CHARGE OF 8 HOURS)				
Make	Equipment Description	Year 1 (2026-2026)	Year 2 (2026-2027)	Year 3 (2027-2028)
15% MARKUP (INCLUDES OVERHEAD & PROFIT) APPLICABLE TO ALL RATES BELOW				
SEWER LINING, MANHOLE REHAB, GROUTING AND CLEANING EQUIPMENT				
Confined Space Entry Kit (Standard)	Side Tripod, Blower & Hi/gas monitor	$ 16.00	$ 18.00	$ 20.00
Misc. Bypass Equipment	Misc Sewer Plugs	$ 7.00	$ 8.00	$ 9.00
2" Gasoline Pump	Bypass/Re-Circulation	$ 22.00	$ 22.00	$ 26.00
4" Diesel Pump	Bypass/Re-Circulation	$ 45.00	$ 49.00	$ 55.00
6" Diesel Pump	Bypass/Re-Circulation	$ 59.00	$ 64.00	$ 69.00
8" Diesel Pump	Bypass/Re-Circulation	$ 90.00	$ 94.50	$ 100.00
CIPP Part Liner Packers	CIPP Sectional Liner Packers (4-10")	$ 20.00	$ 24.00	$ 27.00
Box Van	CIPP Lining Tool Support Truck/Trailer	$ 46.00	$ 50.50	$ 52.00
Vermeer PD660	Trailer Mounted Vac	$ 50.00	$ 52.50	$ 55.00
Manhole Rehab	Trailer Mounted MH Rehab	$ 165.00	$ 173.25	$ 180.00
Sewer Equipment of America	Jetter Truck	$ 72.00	$ 75.00	$ 78.00
Vactor HXX	Hydro-Excavator	$ 170.00	$ 180.00	$ 190.00
Vactor 2100	Super Vac	$ 150.00	$ 157.50	$ 309.50
Cues	Standard Mainline CCTV	$ 130.00	$ 136.50	$ 145.00
Rush Overland 7M BTU	Water Boiler Truck	$ 175.00	$ 183.75	$ 188.00
Rush Overland 10M BTU	Water Boiler Truck	$ 175.00	$ 183.75	$ 188.00
Rush Overland 8M BTU	Steam Boiler Truck	$ 170.00	$ 178.50	$ 185.00
Rush Overland 8M BTU	Steam Boiler Truck w/ 375 Air Compressor	$ 175.00	$ 183.75	$ 188.00
CIPP Trailer Unit	2MM BTU Trailer Mounted Mobile Boiler	$ 140.00	$ 147.00	$ 160.00
Cues	Lateral Tap Cutter (Schwalm)	$ 150.00	$ 157.50	$ 164.00
Cues	Lateral Launch CCTV	$ 170.00	$ 178.50	$ 15.00
Cues	Grout Truck Mainline (With Packers)	$ 187.00	$ 189.00	$ 200.00
Telehandler	10,000 LB JCB Telehandler	$ 67.00	$ 70.00	$ 73.50
Telehandler	12,000 LB JCB Telehandler	$ 74.00	$ 78.00	$ 81.00
Foreman Truck	F-150/F-250	$ 20.00	$ 21.00	$ 26.00
EQUIPMENT ATTACHMENTS				
Allied	Hoyauck for Mini Excavator	$ 18.00	$ 19.00	$ 20.00
Allied	Hammer for Mini Excavator	$ 18.00	$ 19.00	$ 20.00
Unit	20' Extendable Stick for Gradall 215 Excavator	$ 48.00	$ 50.50	$ 53.00
MISC. EQUIPMENT				
Morbark Model 15	Wood Chipper	$ 50.00	$ 52.50	$ 55.00
Vermeer BC1000XL	Wood Chipper	$ 48.00	$ 50.50	$ 53.00
Kodiak 6590	Chipper Truck	$ 48.00	$ 50.50	$ 53.00
Miller Bobcat 250	Welder	$ 7.00	$ 7.50	$ 8.00
McElroy TM8	Fusion Machine	$ 150.00	$ 157.50	$ 165.50
Finn 1500 G	Hydroseeder 1500 Gal	$ 167.00	$ 107.00	$ 112.50
Hydromax 500 G	Hydroseeder 1500 Gal	$ 18.00	$ 19.00	$ 20.00
12 Screen 1200XL	Topsoil Screen	$ 48.00	$ 50.50	$ 53.00
Less Than 5 KW	Generator	$ 6.00	$ 6.50	$ 7.00
25 KW	Generator	$ 22.00	$ 23.00	$ 24.50
45KW	Generator	$ 35.00	$ 36.00	$ 38.00
2" Centrifugal Pump	Gas powered water pump	$ 6.00	$ 6.50	$ 7.00
3" Centrifugal Pump	Gas powered water pump	$ 8.00	$ 8.50	$ 9.00
Wanco 35LGT	Arrow Board	$ 10.00	$ 10.50	$ 11.00
Ingersoll Rand	185 CFM Air Compressor	$ 25.00	$ 26.25	$ 27.50
Ingersoll Rand	375 CFM Air Compressor	$ 78.00	$ 82.00	$ 84.50
Grove 28 Ton	Rough Terrain Crane	$ 150.00	$ 157.50	$ 165.50
Grove 30 Ton	Rough Terrain Crane	$ 160.00	$ 168.00	$ 177.00
JCB 550	Material Handler	$ 52.50	$ 56.00	$ 60.00
SHORING				
Pro Tec 8x20	Trench Box	$ 12.00	$ 12.50	$ 13.00
Pro Tec 6x8	Trench Box	$ 10.00	$ 10.50	$ 11.00
Pro Tec Man Hole 8x12	Trench Box	$ 12.00	$ 12.50	$ 13.00
Pro Tec 8 x20	Trench Box	$ 14.00	$ 15.00	$ 15.75
14'	Steel Sheeting	$ 1.00	$ 1.00	$ 1.05
20'	Steel Sheeting	$ 1.50	$ 1.50	$ 1.75
8'x10'	Steel Plate	$ 3.00	$ 3.00	$ 3.25
8'x20'	Steel Plate	$ 5.00	$ 5.00	$ 5.25
40C 18	Steel Sheeting	$ 6.00	$ 6.00	$ 6.25
18' Diameter Ring Shaft	Ring Shaft Various Depths	$1.00 per vertical foot/day	$1.30 per vertical foot/day	$1.00 per vertical foot/day
HYDRO-EXCAVATION & POTHOLING EQUIPMENT				
Vactor HXX	Hydro-Excavator	$ 170.00	$ 180.00	$ 190.00
Vactor 2100	Super Vac	$ 150.00	$ 157.50	$ 309.50
CONCRETE/GROUT PUMPS				
Wet Shotcrete Pump	Cementitious/Geopolymer Pump	$ 80.00	$ 84.00	$ 90.00
Putzmeister Concrete Pump	Cellular Cement/Grout Pump	$ 100.00	$ 105.00	$ 110.25
LOADERS				
CAT 289D3	Skidsteer	$ 40.00	$ 42.00	$ 44.00
Case 580	Backhoe	$ 48.00	$ 50.50	$ 53.00
Caterpillar 420 D	Backhoe	$ 48.00	$ 50.50	$ 53.00
Caterpillar 420 F	Backhoe	$ 51.00	$ 54.50	$ 57.25
Caterpillar 930 G	Front End Loader	$ 72.00	$ 75.50	$ 79.25
Caterpillar 938 G	Front End Loader	$ 90.00	$ 94.50	$ 99.25

APPENDIX A

Caterpillar 950	Front End Loader	$ 100.00	$ 105.00	$ 110.25
Caterpillar 966	Front End Loader	$ 105.00	$ 110.25	$ 115.75
Ingersoll Rand W1 35B	Front End Loader	$ 52.00	$ 54.50	$ 57.25
Komatsu WA 250	Front End Loader	$ 65.00	$ 68.25	$ 72.00
Komatsu WA 200	Front End Loader	$ 72.00	$ 76.00	$ 80.00
Komatsu WA 320	Front End Loader	$ 100.00	$ 105.00	$ 110.25
Komatsu WA 380	Front End Loader	$ 105.00	$ 110.25	$ 115.75
	EXCAVATORS			
Caterpillar 301.7	Mini Excavator	$ 43.00	$ 45.00	$ 45.25
Caterpillar 304	Mini Excavator	$ 48.00	$ 47.25	$ 49.50
Caterpillar 305	Mini Excavator	$ 47.00	$ 49.00	$ 51.50
Caterpillar 305.5	Mini Excavator	$ 50.00	$ 52.50	$ 55.00
John Deere 35 ZTS	Mini Excavator	$ 45.00	$ 47.25	$ 49.50
Case 210	Excavator	$ 125.00	$ 131.25	$ 138.00
Link Belt 80 Spin Ace	Excavator	$ 90.00	$ 94.50	$ 98.50
Link Belt 135 Spin Ace	Excavator	$ 96.00	$ 102.00	$ 107.00
Link Belt 145 Spin Ace	Excavator	$ 105.00	$ 110.25	$ 116.00
Link Belt 160 X3	Excavator	$ 120.00	$ 126.00	$ 132.50
Link Belt 210 X3	Excavator	$ 165.00	$ 173.25	$ 182.00
Link Belt 330 LX	Excavator	$ 198.00	$ 208.00	$ 218.50
CAT 330	Excavator	$ 225.00	$ 236.25	$ 248.00
CAT 349	Excavator	$ 270.00	$ 283.50	$ 300.00
	VARIOUS EQUIPMENT TRAILERS			
10 Ton	Equipment Trailer	$ 33.50	$ 35.00	$ 36.25
20-25 Ton	Equipment Trailer	$ 33.00	$ 32.50	$ 34.50
Rolling Box	Fiber Optic Trailer	$ 72.00	$ 76.00	$ 80.00
Less Than 8 Ton	Equipment Trailer	$ 16.00	$ 17.00	$ 18.00
	VARIOUS TRUCKS			
3/4 T Pick Up	Pick Up Truck	$ 22.00	$ 28.00	$ 30.00
Rhodes Steel Quad w/ Tractor	Steel Quad 28 CYD	$ 138.00	$ 145.00	$ 152.25
Tandem Axle Dumptruck	End Dump	$ 108.00	$ 113.50	$ 120.00
Tri-Axle Dumptruck	End Dump	$ 115.00	$ 120.75	$ 127.00
Mac Aluminum Train w/ Tractor	Gravel Train Alloyd	$ 162.00	$ 170.00	$ 178.50
Ford F550	1 CYD End Dump	$ 65.00	$ 67.75	$ 50.00
Ford F550	Mechanic Service Truck	$ 55.00	$ 57.75	$ 60.50
Altec	Digger Derrick	$ 92.00	$ 96.50	$ 101.50
Lowboy w/ Tractor	SST Lowboy	$ 150.00	$ 157.50	$ 165.50
Ford 9000	4000 Gallon Water Truck	$ 78.00	$ 82.00	$ 86.00
Altec 140	40' Aerial Cable Placement Truck	$ 96.00	$ 101.00	$ 106.00
Altec/Terex	Bucket Truck	$ 66.00	$ 70.00	$ 73.50
	HORIZONTAL DIRECTIONAL DRILLING EQUIPMENT			
Digitrak F5/F2	Utility Locator	$ 18.00	$ 19.00	$ 20.00
Ditch Witch Utility Guard	Utility Locator	$ 6.00	$ 7.00	$ 7.50
Vermeer DT750 w/ Truck	Mixing System	$ 75.00	$ 78.75	$ 83.00
KemTron Tango 950	Mixing Plant	$ 90.00	$ 94.50	$ 100.00
American Augers MPE 6000	600 GPM Mud Recycling Plant	$ 390.00	$ 409.50	$ 430.00
American Augers DD4	Directional Drill	$ 180.00	$ 189.00	$ 200.00
American Augers DD25	Directional Drill	$ 120.00	$ 126.00	$ 132.50
American Augers DD100	Directional Drill	$ 270.00	$ 283.50	$ 300.00
American Augers DD220	Directional Drill	$ 540.00	$ 567.00	$ 595.00
Ditch Witch JT9	Directional Drill	$ 96.00	$ 101.00	$ 106.00
Vermeer 10X15	Directional Drill	$ 100.00	$ 105.00	$ 110.25
Vermeer 20x22	Directional Drill	$ 108.00	$ 113.50	$ 120.00
Vermeer 20x30	Directional Drill	$ 115.00	$ 120.75	$ 127.00
Vermeer 36x40	Directional Drill	$ 120.00	$ 126.00	$ 132.50
Vermeer 36x50	Directional Drill	$ 180.00	$ 189.00	$ 198.50
Vermeer 40x50	Directional Drill	$ 200.00	$ 210.00	$ 220.50
Vermeer 60x80	Directional Drill	$ 228.00	$ 230.00	$ 241.50
Vermeer 80x120	Directional Drill	$ 234.00	$ 246.00	$ 257.25
8" Water Transfer Pump	Directional Drill	$ 54.00	$ 57.00	$ 60.00
	DOZERS			
Caterpillar D4 (LGP)	Bulldozer	$ 75.00	$ 78.75	$ 83.00
John Deere 450	Bulldozer	$ 70.00	$ 73.50	$ 78.00
	PAVING EQUIPMENT			
Carlson Paver	8' Asphalt Paver	$ 85.00	$ 89.25	$ 94.00
Bruce RC 350 Sweeper	Broom Tractor	$ 46.50	$ 48.00	$ 51.50
Ingersoll Rand	Asphalt Roller	$ 45.00	$ 47.25	$ 50.00
[illegible]	Asphalt Hotbox	$ 30.00	$ 31.50	$ 33.00
Bobcat	24" Road Planer	$ 40.00	$ 42.00	$ 44.00
	PILOT TUBE GUIDED AUGER BORING			
Akkerman	Akkerman 4800 Pilot Tube Guided Boring Package	$ 480.00	$ 504.00	$ 529.00
Akkerman	Akkerman 3900 Pilot Tube Guided Boring Package	$ 420.00	$ 441.00	$ 460.00
Akkerman	24" GPS Cutting Head	$ 50.00	$ 52.50	$ 55.00
Akkerman	Akkerman Rock Hammer	$ 50.00	$ 52.50	$ 55.00
	PIPE JACKING EQUIPMENT			
Akkerman	Akkerman 4800 Pilot Tube Guided Boring Package	$ 480.00	$ 504.00	$ 529.00
Akkerman	30" GPS Cutting Head	$ 85.00	$ 89.25	$ 95.00
	PIPE BURSTING & RAMMING			
Hammerhead Mole	HD 1600T (100 Ton Static Pipe Burst Machine)	$ 200.00	$ 210.00	$ 220.50
Hammerhead Mole	20" Pipe Ramming Package	$ 175.00	$ 183.75	$ 193.00
	TUNNEL BORING MACHINE			
Akkerman	Akkerman TBM Model S200	$ 1,000.00	$ 1,050.00	$ 1,100.00

APPENDIX A

CONTRACTOR: D.V.M. UTILITIES, INC.
PROJECT NAME: SEWAGE DISPOSAL SYSTEM MAINT. & REPAIRS
OWNER: OAKLAND COUNTY WATER RESOURCES COMMISSIONER, WATERFORD, MI

MANHOLE REHABILITATION

Geopolymer Mortars

Product	Packaging	Unit Price	
Corrosion Resistant Geopolymer Mortar	60lb bags, 56 bags per pallet, 728 bags/truckload qty	$	47.30

Hybrid Cements

Product	Packaging	Unit Price	
Manhole Liner Cement-Based Mortar	60lb bags, 56 bags per pallet, 728 bags/truckload qty	$	39.25
Calcium aluminate Manhole Liner Material	60lb bags, 56 bags per pallet, 728 bags/truckload qty	$	52.25

Cement Patching Materials

Product	Packaging	Unit Price	
Rapid Set Patching Cement	60lb bags, 56 bags per pallet, 728 bags/truckload qty	$	46.25
Rapid Set Patching Cement	50lb pails, 36 pails per pallet, 828 pails/truckload qty	$	53.90
Accelerated Rapid Set Patching Cement	50lb pails, 36 pails per pallet, 828 pails/truckload qty	$	63.50
Hydraulic Water Stop Cement	50lb pails, 36 pails per pallet, 828 pails/truckload qty	$	48.80
High-Strength, Quick Setting Invert Rehabilitation Mortar	3000 lb bags, 2 bags per pallet, 42 bags/truckload qty	$	365.25
Hydraulic Water Stop Cement	50lb pails, 36 pails per pallet, 828 pails/truckload qty	$	56.75
Fiber-reinforced Calcium Aluminate	50lb pails, 36 pails per pallet, 828 pails/truckload qty	$	89.25

100% Solids Epoxy Coatings

Product	Packaging	Unit Price	
100% Solids Protective Epoxy Coating 150 Gallon Kit	55 gallon drums (Note: unit price per gallon)	$	65.75
100% Solids NSF-61 Approved Epoxy Coating	55 gallon drums (Note: unit price per gallon)	$	89.50
100% Solids Epoxy Urethane Hybrid Coating Flexible Coating	55 gallon drums (Note: unit price per gallon)	$	110.80
100% Solids, Quick Spray Epoxy	4 gallon kit	$	306.50

Grout

Product	Packaging	Unit Price	
FS-202, Hydrophilic Polyurethane Foam (Crack Injection and Pipe Penetrations)	(Note: Unit price per gallon, 5 gallon minimum)	$	138.90
Oakum, Oakum Jute Rope	(Note: Unit price per foot, 25 foot minimum)	$	2.50

APPENDIX A

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MAINLINE SEWER GROUTING

Product	Unit Price/Gallon Pumped
AV-100/AV-101/AV-102	$25.00

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DVM UTILITIES, INC.

CIPP MH LINING

Brand	Product	DIA	Unit Price/VFT.
All-Liner	CIPN 58 Series Liner	48"	$ 320.00
All-Liner	CIPN 58 Series Liner	66"	$ 380.00
All-Liner	CIPN 58 Series Liner	78"	$ 550.00

APPENDIX A

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CIPP END SEALS

Brand	Product	Diameter Inches	Description	Unit Price/Ea.
LMK Technologies	Insignia End Seals	6	360 Degree Swelling Gasket	$ 155.00
LMK Technologies	Insignia End Seals	8	360 Degree Swelling Gasket	$ 186.00
LMK Technologies	Insignia End Seals	10	360 Degree Swelling Gasket	$ 210.00
LMK Technologies	Insignia End Seals	12	360 Degree Swelling Gasket	$ 253.00
LMK Technologies	Insignia End Seals	15	360 Degree Swelling Gasket	$ 364.00
LMK Technologies	Insignia End Seals	18	360 Degree Swelling Gasket	$ 295.00
LMK Technologies	Insignia End Seals	21	360 Degree Swelling Gasket	$ 412.00
LMK Technologies	Insignia End Seals	24	360 Degree Swelling Gasket	$ 443.00
LMK Technologies	Insignia End Seals	27	360 Degree Swelling Gasket	$ 513.00
LMK Technologies	Insignia End Seals	30	360 Degree Swelling Gasket	$ 551.00
LMK Technologies	Insignia End Seals	33	360 Degree Swelling Gasket	$ 583.00
LMK Technologies	Insignia End Seals	36	360 Degree Swelling Gasket	$ 614.00
LMK Technologies	Insignia End Seals	42	360 Degree Swelling Gasket	$ 715.00
LMK Technologies	Insignia End Seals	48	360 Degree Swelling Gasket	$ 814.00
LMK Technologies	Insignia End Seals	54	360 Degree Swelling Gasket	$ 1,095.00
Sika	Hydrotite CI		Hydrophilic Strip Applied Watertop - Note: Unit Price per 32ft roll.	$ 400.00

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VERICURE CIPP CURING MONITORING SYSTEM

Product	Description	Unit Price
VeriCure	Curing monitoring system built around fiber optic distributed temperature sending technology.	$1.50
		Note- Unit Price per Foot

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OWNER: OAKLAND COUNTY WATER RESOURCES COMMISSIONER, WATERFORD, MI

UTILITIES, INC.

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Thickness (mm)	4.5	6	7.5	9	10.5	12	13.5	15	16.5	18	19.5	21	22.5	24	25.5	27	28.5	[illegible]
Diameter (in)																		
6"	[illegible]																	
8"	[illegible]	[illegible]	$27.50															
10"	[illegible]	[illegible]	[illegible]	$25.75														
12"		[illegible]	[illegible]	[illegible]	$31.50													
15"		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	$48.75											
18"			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	$71.00									
21"				[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	$90.75	$97.75							
24"				[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]					
27"					[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]			
30"					[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
33"					[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
36"					[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

APPENDIX A

CONTRACTOR: D.V.M. UTILITIES, INC.
PROJECT NAME: SEWAGE DISPOSAL SYSTEM MAINT & REPAIRS
OWNER: OAKLAND COUNTY WATER RESOURCES COMMISSIONER, WATERFORD, MI

DVM UTILITIES, INC.

[illegible] CIPP Liner

Estimated Finished (mm)	4.5	6	7.5	9	10.5	12	13.5	15	16.5	18	19.5	21	22.5	24	25.5	27	28.5
Diameter (in)																	
6"	$12.00																
8"	$13.75	$18.00	$19.50														
10"	$16.25	$20.50	$23.75	$24.50													
12"		$26.00	$27.50	$31.25	$35.25												
15"		$32.75	$36.75	$39.00	$43.25	$48.50	$54.50										
18"			$40.00	$49.00	$53.75	$60.75	$66.25	$73.25	$79.25								
21"				$58.75	$65.00	$72.25	$79.25	$85.75	$94.00	$100.25	$109.25						
24"				$69.75	$77.25	$88.25	$95.75	$99.00	$120.75	$132.75	$131.00	$138.00	$154.50				
27"					$88.25	$95.25	$102.00	$112.00	$131.50	$137.50	$150.00	$149.75	$154.00	$163.50	$173.00		
30"					$97.00	$100.50	$114.25	$123.00	$135.00	$141.25	$150.25	$158.50	$169.00	$169.50	$194.25	$204.75	$215.50
33"					$105.50	$112.25	$126.25	$135.50	$149.50	$155.50	$165.00	$174.50	$183.00	$195.75	$207.75	$220.50	$228.75
36"					$116.25	$125.00	$138.25	$148.75	$156.00	$168.40	$180.25	$190.75	$201.00	$211.50	$224.50	$236.50	$249.00

APPENDIX A

6"										
8"										
10"										
12"										
14"										
16"										
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24"										
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32"										
34"										
36"										
38"										
40"										
42"										
44"										
46"										
48"										

APPENDIX A

CONTRACTOR: D.V.M. UTILITIES, INC.
PROJECT NAME: SEWAGE DISPOSAL SYSTEM MAINT. & REPAIRS
OWNER: OAKLAND COUNTY WATER RESOURCES COMMISSIONER, WATERFORD, MI

CIPP SECTIONAL LINER

Ambient Cure
Resin Definitions - Ambient Cure
Pre-Measured Two Part: (A) Water Glass and (B) Ambient Cure Silicate Resin System

Length	24"	48"
Diameter		
3"	$297.00	$385.00
4"	$330.00	$429.00
6"	$396.00	$594.00
8"	$462.00	$660.00
10"	$528.00	$726.00
12"	$660.00	$792.00
15"	$858.00	$990.00
18"	$935.00	$1,045.00
24"	$1,100.00	$1,320.00
30"		$1,485.00
36"		$1,650.00
42"		$1,787.00
48"		$2,007.00
60"		$2,750.00
72"		$3,355.00

APPENDIX A

CONTRACTOR: D.V.M. UTILITIES, INC.
PROJECT NAME: SEWER MAINTENANCE & REPAIRS
OWNER: OAKLAND COUNTY WATER RESOURCES COMMISSIONER,
WATERFORD, MI

UTILITIES, INC.

TRAFFIC CONTROL EQUIPMENT & LABOR

EQUIPMENT RATES (LIMITED TO 8 HOURS PER DAY)				
Make	Equipment Description	Year 1 (2025-2026)	Year 2 (2026-2027)	Year 3 (2027-2028)
15% MARKUP (INCLUDES OVERHEAD & PROFIT) APPLICABLE TO ALL RATES BELOW				
SEWER LINING, MANHOLE REHAB, GROUTING AND CLEANING EQUIPMENT				
Traffic Control Truck	F-150/F-250	$ 20.00	$ 28.50	$ 26.00
Flat Bed Truck	Stake Body Flat Bed	$ 35.00	$ 38.00	$ 41.00
Wanco Three Line Message Sign	Portable Changeable Message Sign	$ 35.00	$ 38.00	$ 42.50
Wanco 35LED	Arrow Board	$ 10.00	$ 30.50	$ 33.00
Misc. Traffic Control Devices	Barrels, Barrel Cones, Signs (PER DAY)	$ 500.00	$ 515.00	$ 525.00

NOTE: SEE DVM LABOR RATES FOR TRAFFIC CONTROL TECHNICIANS

Purchasing
(248) 858-0511 | purchasing@oakgov.com

Cooperative Purchasing Program

Current Contract Holder Opt In

The Oakland County Purchasing Unit has developed an intergovernmental Cooperative Purchasing Program for use by other Michigan government entities and school districts, for the procurement of goods and/or services.

The purpose of this program is to obtain an overall lower cost for all participants by combining volumes, increasing purchasing power, and realizing efficiencies. Oakland County requires that the vendor awarded the contract will authorize it's availability on the County's Cooperative program website.

All purchasing requests by government entities will be conducted between that entity and the contract holder; purchase orders should be submitted & invoiced directly. Payments will be remitted by the ordering government entities on a direct and individual basis with the contracted vendor, in accordance with the contract pricing and terms.

By signing this Opt In Form; the vendor agrees to supply the goods and/or services, scheduled in the below mentioned contract, at the established County contract pricing to other Michigan government entities and school districts.

CONTRACT NUMBER: CON00011678

Vendor/Company Name (printed): D.V.M. Utilities , Inc.

Contact Person's Name (printed): Karl J Bates III

Email: kbates@dvmutilities.com Phone: [redacted]

Signature: Karl J Bates III Digitally signed by Karl J Bates III Date: 2025.10.22 11:07:59 -04'00' Date: 10/22/2025

Completed form should be emailed back to the person that emailed it to you.
Otherwise, please email to: scianc@oakgov.com

CITY OF BERKLEY
DEPARTMENT OF PUBLIC WORKS
3238 BACON AVE, BERKLEY, MICHIGAN 48072

MEMORANDUM

To: Mayor Dean and City Council
From: Adam Wozniak, Superintendent of Public Works AW

Date: January 23, 2026
Subject: Approval to utilize Oakland County Cooperative Contract #011677/#011678 with DVM Utilities for Sewer Lining Services.

Madam Mayor and Members of City Council,

Background
As you may already know the City of Berkley has been structurally lining existing sewer pipes for over 30 years. This lining activity maintains the integrity of the existing sewer mains and greatly extends their service life. This work has historically been a cost-effective method that minimizes impact to the residents. For the next round of sewer lining, we are recommending the use of an Oakland County Cooperative Contract with DVM Utilities for Lining Services.

Summary

- Utilization of the Oakland County Cooperative Contract #011677/#011678 with DVM Utilities is being recommended

- Several key members of the DVM Utilities, Inc team have had several years of successful experience performing lining work in our city.

- Funds for this work are budgeted in account 592-902-971-150 (Sewer Improvements) In the amount of $600,000. With carry over money from the previous fiscal year in the amount of $164,666. We plan to utilize the full amount for our Sewer Lining Program in the amount of $764,666.

Recommendation
It is my recommendation that City Council approves the proposal and authorize the city manager to enter into an agreement upon final review of the city attorney utilizing the Oakland County Cooperative Contract #011677/#011678 with DVM Utilities for the Fiscal Year 25/26 Sewer Lining Program.

DVM UTILITIES, INC.

Portfolio of Projects: CCTV Cleaning

6045 Sims Rd., Suite #2
Sterling Heights, MI 48313
586-979-0402

Project Name	Owner	Engineer	Contact	Description	Start	Completion	Contract Amount
2024 Sewer Cleaning & CCTV Investigation	City of Mt. Clemens	Anderson, Eckstien & Westrick	Jake Miller, P.E. (586) 726-1234	Cleaning and CCTV Inspection of 11,700 lf of 6"-48" combined sewers	Jan-25	Jan-25	$193,642.50
2023 Sanitary Sewer Evaluation Study	City of South Lyon	Hubble, Roth & Clark	Michael Darga, P.E. (517) 292-1485	Cleaning and CCTV Inspection of 9,582 lf of 8" & 10" sanitary sewers	Nov-23	Dec-23	$33,370.00
2023 Catch Basin Cleaning Program	City of Birmingham		Melissa Coata, P.E. (248) 530-1839	Cleaning of 2,100 catch basins throughout the city	Nov-23	Ongoing	$168,000.00
2021-2022 Huntington Woods CIPP Lining Project	City of Huntington Woods		GC Lanzo Construction Company	Cleaning and CCTV Inspection of 17,471 lf of 8" – 24" combined sewers	Jan-23	Dec-23	$92,564.00
2022 Sewer Cleaning and TV Inspection Project	City of Hazel Park	Nowak and Fraus	Chad Findley, P.E. (313) 965-2444	Cleaning and CCTV Inspection of 10,515 lf of 10" – 36" combined sewers	Jan-23	Nov-23	$151,745.00
2021-2023 Sewer Rehabilitation Program	City of Birmingham		Melissa Coata, P.E. (248) 530-1839	Cleaning and CCTV Inspection of 90,000 lf of 8" – 72" combined sewers, inspection of 1,200 lf of sewer laterals, and misc. sewer repairs via trenchless methods	Oct-21	Ongoing	$1,505,323.00
2021 Sewer & Catch Basin Cleaning & Televising Inspection Project	City of Oak Park		Danfred Samuel (248) 691-7452	Cleaning and CCTV Inspection of 127,000 lf of 8" – 54" sanitary and storm sewers, and cleaning of 700 Catch Basin Structures	Sep-21	Dec-22	$281,247.50
2021 Storm & Sanitary CCTV Program	City of Rochester	Anderson, Eckstien & Westrick	Aseel Putros (586) 726-1234	Cleaning and CCTV Inspection of 135,000 lf of 6" – 36" sanitary sewers	Aug-21	Dec-21	$121,487.50
2020 Sanitary Sewer Cleaning and CCTV Investigation	Chesterfield Township	Anderson, Eckstien & Westrick	Frank Varicalli (586) 726-1234	Cleaning and CCTV Inspection of 105,100 lf of 6" – 36" sanitary sewers	Apr-21	Jul-21	$213,505.00
2020 SAW Grant Sanitary Sewer Cleaning and CCTV Investigation Contract 1	Clinton Township	Anderson, Eckstien & Westrick	Frank Varicalli (586) 726-1234	Cleaning and CCTV Inspection of 270,000 lf of 6" – 36" sanitary sewers and inspection of 600 sanitary sewer manholes.	Jun-20	Jul-21	$732,770.75
2020 SAW Grant Sanitary Sewer Cleaning and CCTV Investigation Contract 2	Clinton Township	Anderson, Eckstien & Westrick	Frank Varicalli (586) 726-1234	Cleaning and CCTV Inspection of 270,000 lf of 6" – 36" sanitary sewers and inspection of 600 sanitary sewer manholes.	Jun-20	Jul-21	$659,532.50
Sewer Cleaning & CCTV Investigation	Utica Community Schools	Anderson, Eckstien & Westrick	Frank Varicalli (586) 726-1234	Cleaning and CCTV Inspection of 17,000 lf of 6" – 36" sewers and 82 catch basins	Jun-20	Nov-20	$99,034.00
2018 Sanitary Sewer Cleaning & CCTV Inspection	Chater Township of Shelby	Anderson, Eckstien & Westrick	Gordon Wilson (586) 726-1234	Cleaning & CCTV inspection of approx. 230,000 lf of 8" thru 36" sanitary sewer pipe. Rebuild, reconstruct, and adjust sanitary approx. 200 sewer manholes	Aug-18	Mar-20	$1,600,000.00
2018 Sanitary Sewer Cleaning & CCTV Investigation, SAW Grant No. 1377-01	City of Sterling Heights	Anderson, Eckstien & Westrick	Frank Varicalli (586) 726-1234	Cleaning and CCTV investigation of 277,500 lf of 6"-60" sanitary sewers	Mar-19	Jan-20	$1,196,301.10
2018 SAW Grant Sewer Cleaning & Television Inspection Program	City of Lincoln Park	Hennessey Engineers	Ryan Kern (734) 759-1600	Cleaning & CCTV inspection of approx. 66,000 lf of 8" thru 48" sanitary sewer pipe	Jul-18	Dec-18	$178,362.50
Clean, Televise & Assess Storm Sewer Systems	Huron-Clinton Metropolitan Authority		Andrew Caulk (810) 623-3555	Cleaning & CCTV inspection of approx. 65,000 lf of 6" thru 48" storm sewer pipe	Jul-18	Nov-18	$168,379.00
2017 Sanitary Sewer Cleaning & CCTV Investigation	City of Roseville	Anderson, Eckstien & Westrick	Frank Varicalli (586) 726-1234	Cleaning and CCTV investigation of 111,500 lf of 6"-48" sanitary sewers	Oct-17	May-18	$232,975.00
2016 Sanitary Sewer Collection System CCTV Project	Bay County Department of Water & Sewer, Bay City		Tim Fitzgerald (989) 684-3888	CCTV inspection of approx. 230,000 lf of 8" to 60" gravity sanitary sewer collection system and additional sewer cleaning as required	Jun-16	May-17	$219,131.97
2015 Sanitary Sewer TV & Cleaning Program	Clinton Township	Giffels Webster	Scott Chabot, P.E. (586) 781-8950	Clean & televise approx. 230,000 lf of 6" thru 42" sanitary sewer including laterals	Dec-15	Dec-16	$431,360.30
Riverbank Storm Sewer Project	City of Lincoln Park		John Kozuh, DPS Director (313) 386-9000	Clean and televise approx. 2,000 lf of 36" & 42" Storm Sewer, install 2 EA storm sewer manholes and cleaning of pump stations	Dec-16	Apr-17	$89,472.50
UofM Hubbard Road Reconstruction, Work Order #237-1, URS Project No. - 12944297.56520.00000	University of Michigan, Ann Arbor, MI	URS Corporation	Leo Davies (616) 681-1233	Televise approx. 1300 lf of up to 24" storm sewer, televise & locate storm sewer leads and CCTV inspection of manholes	Mar-14	Mar-14	$3,500.00
Sanitary Sewer System Improvements - Sewer Cleaning & Televising, Contract 2	Village of Breckenridge	Fleis & Vandenbrink Engineering	Gary Bartow (989) 837-3280	Clean & televise 8", 10" & 12" sanitary sewer including laterals approximately 35,000 lf. Also, includes sewer rehabilitation to reduce inflow & infiltration by CIPP lining of 8" &10" pipe approx. 2,500 lf,, MH grouting & point repairs.	May-11	Feb-13	$362,911.00
2011 Annual Emergency Excavation, Water & Sewer Repairs	City of Warren		Danuta Dordeski (586) 759-9300	Perform water main & sewe repairs on as needed basis. Also, included as part of the contract is CCTV Sewer Inspection and Cleaning of Sanitary Sewer Main including laterals	Apr-11	Apr-12	$160,000.00

6045 Sims Rd., Suite #2
Sterling Heights, MI 48313
586-979-0452

Project Name	Prime Contractor	Subcontractor	Owner	Engineer	Contact	Description	Start	Completion	Contract Amount
City of Battle Creek - WWTP I&E Building and Headworks Improvement		x	Battle Creek	Jones & Henry Engineers	Alex Lantz (GC Advanced Rehabilitation Technology) (419) 799-1308	Clean & CCTV 60lf of 54" sanitary sewer, Install 60lf of 54" CIPP Liner	TBD	Ongoing	$123,500.00
Oak Park - 2026 Sewer Lining Project, M-791	x		Oak Park	Oak Park	Danfred Samuel (248) 691-7452	Clean & CCTV 3,362lf of 8"-30" sanitary/storm sewer, Install 3,362lf of 8"-30" CIPP Liners	TBD	Ongoing	$296,797.00
Wastewater System Improvements, Contract No. 2 - Sprinkle Road CIPP Lining	x		Village of Vicksburg	Prein & Newhof	Michael Presta, P.E. (616) 364-8491	Clean & CCTV 2,605lf of 27"-30" sanitary sewers, Install 2,604lf of 27"-30" CIPP Liners.	TBD	Ongoing	$518,546.00
City of Chelsea - Sewer Main Lining	x		City of Chelsea	City of Chelsea	Jason Freeman (734) 492-6127	Clean & CCTV 2,185lf of 8" sanitary sewers, Install 2,185lf of 8" CIPP Liners	TBD	Ongoing	$103,755.00
East China Township - 2025 Sewer Grouting	x		East China Township	Anderson, Eckstien & Westrick	Patrick Marcus, P.E. (586) 726-1234	Test and Seal 310 8"-15" Sewer Joints	TBD	Ongoing	$128,128.00
Department of Corrections Woodland Center Correctional Utility Improvements 9036 M-36		x	State of Michigan	NF Engineers	Ryan DeLaca (GC DeLaca Group LLC) (734) 751-1759	Clean & CCTV 3,947lf of 3"-10" sanitary sewers, Install 3,947lf of 3"-10" CIPP Liners	TBD	Ongoing	$610,000.00
DWS-970 Sewer Reconfiguration Project near Riverside Park		x	City of Detroit	City of Detroit	Aaron Carr (GC L. D'Agostini & Sons) (586) 781-5800	Clean & CCTV 3,402lf of 10"-36" sanitary sewers, Install 7,483lf of 10"-36" CIPP Liners.	TBD	Ongoing	$599,959.00
Bridgeport Township- 2025 Sanitary Sewer Rehabilitation	x		Bridgeport Township	Spicer Group	Austin Alexander, P.E. (517) 325-9977	Clean & CCTV 7,483lf of 8"-10" sanitary sewers, Install 7,483lf of 8"-10 CIPP Liners.	TBD	Ongoing	$339,198.25
Farmington Hills - 2025 Sanitary Sewer Rehabilitation Program	x		Oakland County Water Resources Commissioner	Hubbel, Roth & Clark	Maria Corona, P.E. (248) 326-5036	Clean & CCTV 25,800lf of 8"-15" sanitary sewers, Installation of 25,800lf of 8"-15" CIPP Liners, Chemical Joint Grouting	Sep-25	Ongoing	$1,049,386.21
City of Hudson - Maple Grove Sanitary Sewer Rehabilitation	x		City of Hudson	Jones & Henry Engineers	Troy Brehmer, P.E. (419) 473-7611	Clean & CCTV 4,000lf of 8"-12" sanitary sewers, Installation of 4,000lf of 8"-12" CIPP Liners, 25 Manholes w/Polymer Lining	TBD	Ongoing	$324,213.00
CDBG-DR Area 2 Sanitary Sewer Cured In Place Pipelining	x		Lincoln Park	Hennessey Engineers	Khal Hanna, P.E. (734) 759-1600	Clean & CCTV 14,000lf of 8"-36" sanitary sewers, Installation of 14,000lf of 8"-36" CIPP Liners	Aug-25	Ongoing	$944,370.00
CDBG-DR Sanitary Sewer Cured In Place Pipelining	x		Lincoln Park	Hennessey Engineers	Khal Hanna, P.E. (734) 759-1600	Clean & CCTV 9,308lf of 8"-36" sanitary sewers, Installation of 9,308lf of 8"-36" CIPP Liners	Aug-25	Ongoing	$870,134.00
Harper Woods - 2025 Sewer Rehabilitation by Full Length C.I.P.P. Lining	x		Harper Woods	Anderson, Eckstien & Westrick	Holly Wilson, P.E. (586) 726-1234	Clean & CCTV 1,650lf of 12" sanitary sewers, Installation of 1,650lf of 12" CIPP Liners	TBD	Nov-25	$92,360
Village of Beulah - Pipe Lining Project	x		Village of Beulah	Gosling Czubak	Jeff Cypert (231) 882-4451	Clean & CCTV 2,313lf of 8"-10" sanitary sewers, Installation of 2,313lf of 8"-10" CIPP Liners. Manhole rehabilitation of 94 manholes.	TBD	Ongoing	$210,511.00
Township of Grosse Ile - Sanitary Sewer Pipes and Manhole Rehabilitation Project	x		Township of Grosse Ile	C.E. Raines Company	Ken Marx, E.I.T., (734) 285-7510	Clean & CCTV 10,341lf of 8"-30" sanitary sewers, Installation of 10,341lf 8"-30" CIPP Liners. 61 Sewer Spot Repairs of 8"-18". Sanitary sewer manhole rehabilitation.	TBD	Ongoing	$1,688,281.00
Harrison Township 2025 Sanitary Sewer CIPP Project	x		Harrison Township	Wade Trim Associates, Inc.	John Tanner, P.E. (231) 923-5955	Clean & CCTV 1,800lf of 10" sanitary sewers, Installation of 1,800lf of 10" CIPP Liners. 50vft of Manhole Rehabilitation	Jul-25	Nov-25	$155,100.00
CMP Culvert Liner Under GM Road	x		Road Commission for Oakland County		Tracy McDonald (248) 858-4796	Clean & CCTV 60lf of 18" Courregated Metal Pipe, Installation of 60lf of 18" CIPP Liner	TBD	Oct-25	$60,500.00
City of Southgate - Sanitary Sewer Lining Program	x		City of Southgate	Hennessey Engineers	John Miller (734) 759-1600	Clean & Televise 7,145lf of 12"-27" sanitary sewers, Installation of 7,145lf of 12"-27" CIPP Liners.	Aug-25	Ongoing	$735,355.00
2025 Cured In Place Pipe Sewer Rehabilitation Contract CIPP	x		City of Ferndale	Giffels Webster	Scott Ringler, P.E. (248) 852-3100	Clean & CCTV 5,875 lf of 15"-33" sanitary sewers, Installation gof 5,875 lf of 15"-33" CIPP Liners	Jun-25	Jul-25	$661,047.00
2025 Sanitary Sewer Lining	x		Saginaw Charter Township	Spicer Group	Jean Inman, P.E. (989) 529-6067	Clean & CCTV 3,665 lf of 8"-15" sanitary sewers, Installation of 3,665 lf of 8"-15" CIPP Liners	Aug-25	Oct-25	$181,635.00
2025 CIPP Sewer Lining, Contract 2025-SS-1	x		City of Richmond	City of Richmond	Jim Goetzinger, P.E. (586)727-7575	Clean & CCTV 10,500 lf of 6"-15" sanitary sewers, Installation of 10,500 lf of 6"-15" CIPP Liners	May-25	Sep-25	$435,000.00
FY25 Sewer Rehabilitation Program	x		Village of Beverly Hills	Hubbel, Roth & Clark	Maria Corona, E.I.T. (248) 326-5036	Clean & CCTV 1,242 lf of 8"-18" sanitary sewers, Installation of 1,242 lf of 8"-12" CIPP Liners	Mar-25	May-25	$107,675.00
Library Lane - Commerce Twp.	x		Raymond Excavating		Duke Durst (810) 355-5226	Clean & CCTV 3,500 lf of 8"-12" sanitary sewers, 4' Pipe Patch - 12"	Jan-25	Jan-25	$15,500.00
MDOT #2411-001 I-696 Oakland County		x	Michigan Department of Transportation		Rodney Will (GC Toebe Construction) (248)349-7500	Cleand & CCTV 6,430 lf of 12"-24" sanitary sewers, Installation of 6,430 lf of 12"-24" CIPP Liners, 2,164 lf of CIPP MH Lining, 541 lf of DR. Structure Cementious Coating, 68 ea. DR. Structure Chemcial Grouting, 41,175 lf of CCTV sewer & culvert pipe. 54,230 lf of 12"-24" DR. Structure Lead Cleaning, 120 lf Steel Casing Pipe, 14" Jacked in place.	Jul-25	Ongoing	$3,485,350.50
MDOT #2411-056 Monroe County - Raisinville Rd.		x	Michigan Department of Transporation		Kevin Anderson (GC Z-Contractors) (586) 625-8899	Clean & CCTV 1,883 lf of 24" sanitary sewer, Installation of 1,883 lf of 24" CIPP Liners.	TBD	Ongoing	$221,252.50
2024 MIDDD Drop Shaft Rehabilitation		x	Macomb Intermediate Drain Drainage District	FK Engineering Associates	Aaron Carr (GC L. D'Agostini & Sons) (586) 781-5800	Clean & CCTV 720 lf of 24"-36" sanitary sewers, Installation of 720 lf of 24"-36" CIPP Liners.	Feb-25	Ongoing	$321,750.00
Island Club Sanitary Rehabilitation	x		Charter Township of Commerce	Giffels Webster	Jason Mayer (248) 852-3100	Clean & CCTV 1,656 lf of 8" sanitary sewers, Installation of 431 lf of 8" CIPP Liners, chemical joint grouting, chemcial barrel grouting, CIPP point patch repair, MH bench & channel rebuild, directional drilling, pavement restoration	TBD	Ongoing	$366,536.50
Evergreen-Farmington Sanitary Drain Quarton Lake Area Sewer Rehabilitation	x		Oakland County Water Resources Commissioner	Hubbel, Roth & Clark	Phil Kerby, P.E. (248) 296-1262	Clean & CCTV 100 lf of 27" sanitary sewer, Installation of 100 lf of Envirocure Liner, chemical joint grouting.	May-25	May-25	$200,060.00
Wastewater System Improvements Project, Contract C - Pipe Lining	x		Village of Bellvue	Wightman	Andrew Rudd, P.E. (269) 673-8403	Clean & CCTV 7,040 lf of 8"-12" sanitary sewers, installation of 7,040 lf of 8"-12" CIPP Liners, manhole lining	TBD	Ongoing	$774,300.00
2024 Sanitary Disposal System Rehabilitation Program	x		Oakland County Water Resources Commissioner	Hubbel, Roth & Clark	Drew Sandahl, P.E. (248) 410-4908	Clean & CCTV 5,840 lf of 8"- 48" sanitary sewers, installation of 5,840 lf of 8"- 48" CIPP Liners, chemical joint grouting, 2 sanitary sewer point repairs	Feb-25	May-25	$1,339,332.75
2025 Sanitary Sewer Rehabilitation by Full Length CIPP Ling	x		City of Fraser	Anderson, Eckstien & Westrick	Frank Varicalli (586) 855-9555	Clean & CCTV 5,500 lf of 10"-24" sanitary sewers, Installation of 5,500 lf of 10"-24" CIPP Liners.	Mar-25	May-25	$338,575.00
Stormwater System Rehabilitation	x		Township of Bloomfield	Hubbel, Roth & Clark	Fatemeh Babakhani, P.E. (248) 454-6300	Clean & CCTV 4,963 lf of 8" – 36" storm sewer, installation of 4,963 lf of 8" – 36" CIPP Liners, Sectional Lining, Storm structure rehab	Feb-25	Jun-25	$793,661.90
St. Clair Township Lift Station	x		St. Clair Township		Daniel Gershenberger (810) 329-9042	Clean & CCTV 80lf of 8" sanitary sewer, Installation of 80lf of 8" CIPP Liner	Mar-25	Mar-25	$14,000.00
2024 Sewer Rehabilitation by Full Length CIPP Lining	x		City of Eastpointe	Anderson, Eckstien & Westrick	Patrick Marcus, P.E. (586) 726-1234	Clean & CCTV 5,000 lf of 12"-18" sanitary sewers, installation of 5,000 lf of 12"-18" CIPP Liners	Oct-24	Jul-25	$403,420.00
MDOT/Dan's Excavating M-46 Sandusky		x	Michigan Department of Transportation	GC - Dan's Excavating	Eric Rau (586) 254-2040	Clean & CCTV 4,501 lf of 10"-36, installation of 4,501 lf of 10"-36" CIPP Liners. 2,867 lf storm sewer clean out	Oct-24	May-25	$478,573.50
Farmington Hills - 2024 Sanitary Sewer Rehabilitation Program	x		Oakland County Water Resources Commissioner	Hubbel, Roth & Clark	Maria Corona, E.I.T. (248) 326-5036	Clean & CCTV 18,415 lf of 8"-15" sanitary sewers, Installation of 18,415 lf of 8"-15" CIPP Liners	Aug-24	Dec-24	$713,205.00
2024 Sanitary Sewer Rehabilitation by Full Length CIPP	x		Clinton Township	Anderson, Eckstien & Westrick	Frank Varicalli (586) 855-9555	Clean & CCTV 13,100 lf of 10"-24" sanitary sewers, Installation of 13,100 lf of 10"-24" CIPP Liners	Sep-24	Ongoing	$787,462.50

Beecher Metropolitan District	x		Genesee County	Fleis & Vandenbrink	Steven Nagy, P.E. (810) 743-9120	Clean & CCTV 18,345 lf of 8"-18 sanitary sewers, installation of 18,345 lf of 8"-18" CIPP Liners	Feb-25	Ongoing	$779,638.55
Sanitary Interceptor Lining Project - CIPP Lining	x		Clay Township	Project Control Engineering	William Meidrum, P.E. (810) 794-1931	Clean & CCTV 8,440 lf of 27"-30" Sanitary Sewer, Installation of 8,440 lf of 27"-30" CIPP Liner	Apr-25	Jun-25	$3,249,684.30
2024 Sanitary System Improvements-CIPP Lining		x	Clay Township	Project Control Engineering	William Meidrum, P.E. (810) 794-1931	Clean & CCTV 22,140 lf of 8"-12" Sanitary Sewer, Installation of 22,140 lf of 8"-12" CIPP Liner.	TBD	Ongoing	$880,744.50
Chesterfield Interceptor Sewer Lining, Phase 2	x		Township of Chesterfield	Anderson, Eckstien & Westrick	Mitch O'Conner, P.E. (586) 854-3493	Clean & CCTV 15,300 lf of 27" Sanitary Sewer, Installation of 15,300 lf of 27" CIPP Liner	Jan-25	Ongoing	$2,945,500.00
Village of Romeo 2024 Local Streets Resurfacing		x	Village of Romeo	Hubbel, Roth & Clark	Ryan Sharp (GC Pro-Line Asphalt) (586) 752-7730	Clean & CCTV 5,058 lf of 8" and 10" sanitary sewers, installation of 5,058 lf of 8" and 10" CIPP Liners, and installation of 1 8" CIPP part liners	Jul-24	Dec-24	$521,419.00
Sewer Lining for Columbia Street Road Project	x		City of Caro		Tom Reese (989) 673-2571	Clean & CCTV 2,000 lf of 12" sanitary sewer and installation of 2,000 lf of 12" CIPP Liner.	Aug-24	Oct-24	$126,698.00
2024 Sanitary Sewer Rehabilitation	x		Bridgeport Township	Spicer Group	Austin Alexander, P.E. (517) 325-9977	Clean & CCTV 4660 lf of 8"-10" sanitary sewer and installation of 4,660 lf of 8"-10" CIPP Liner	Jul-24	Oct-24	$238,530.25
Spyglass Culvert	x		Oakland County Water Resources Commissioner		Kyle Breining, P.E. (248) 858-4804	50' of 57" x 38" CMP Arch Culvert Rehab utilizing RigidSeal Technologies.	May-24	Jun-24	$50,375.00
Storm Conduit Rehab Project	x		Oakland County Water Resources Commissioner		Geoff Wilson, P.E. (248) 858-1213	Oak Knob Drain Conduit Rehabilitation a. Lahser Road 20" x 12mm (17 ft) b. W. Long Lake 18" x 10.5mm (170 ft) Otter Drain Conduit Rehabilitation a. Candlestick Dr. 18" x 10.5mm (150 ft) Pontiac Creek Ext. Drain Rehabilitation a. Watkins Lake 15" x 7.5mm (485 ft) Caddell Drain Rehabilitation a. Valley Creek 36" x 22" (340 ft) b. ***30" x 16.5mm CIPP Liner*** Prince Drain 1 & 2 a. Lakeville Rd 16" x 7.5mm (785 ft) b. Lakeville Rd 16" x 7.5mm (1,001 ft) Tribute Drain Rehabilitation a. N. Wixom Rd 12" x 7.5mm (141 ft)	Jul-24	Ongoing	$314,250.00
MDOT Project #63000-214217		x	Oakland County Water Resources Commissioner	Hubbel, Roth & Clark	Clint McDonald (GC Dan's Excavating) (248) 867-2021	Clean & CCTV 3,465 lf of 20"-24" sanitary sewer and installation of 3,465 lf of 20"-24" CIPP liners. 251 lf of MH Rehab	Apr-24	Jul-24	$621,074.00
2024 Sanitary Sewer Rehabilitation by Full Length CIPP	x		Macomb Township	Anderson, Eckstien & Westrick	Frank Varicalli (586) 855-0655	Clean & CCTV 14,350 lf of 10"-24" sanitary sewer, Clean & CCTV 140 lf of 12" storm sewer, installation of 14,490 lf of 10"-24 CIPP liner	May-24	Ongoing	$1,987,227.00
2024 Sewer Rehabilitation Program	x		City of Birmingham	City of Birmingham	Melissa Coatta, P.E. (248) 530-1839	Clean & CCTV 5,798 lf of 8 = sanitary sewer and installation of 5,798 lf of 8" CIPP liners. Sewer point repairs	Sep-24	Ongoing	$458,456.50
2024 Water and Wastewater System Improvements Project	x		Village of Decatur	Wightman	Andrew Rudd, P.E. (269) 673-8465	Clean and CCTV 6,307 lf of 8"-15" sanitary sewers and installation of 6,307 lf of 8"-15" CIPP liners. MH Rehab and Part Liners	TBD	Aug-25	$538,669.00
2024 Orchard Drive Sanitary Lining	x		City of Northville	OHM-Advisors	Claire Martine, P.E. (734)466-4502	Clean & CCTV 1,830 lf of 8" – 12" sanitary sewer and installation of 1,830 lf of 8"-12" CIPP liners	Apr-24	May-24	$87,651.00
2024 Slip Lining Project	x		City of Wayne	City of Wayne	Kevin Hardy, P.E. (734) 728-9100	Clean & CCTV 13,660 lf of 8" – 24" sanitary sewers, installation of 13,660 lf of 8"-24" CIPP liners	Apr-24	Jan-25	$839,745.00
2023 Sewer Rehabilitation Program	x		City of Utica	Hubbel, Roth & Clark	James Surhigh, P.E. (248) 454-6300	Clean & CCTV 6,917 lf of 8"-24" sanitary sewers, clean and CCTV of 457 lf of 8" and 10" siphons, installation of 6,917 lf of 8"-24" CIPP Liners, and chemical grouting of 21 sanitary sewer joints	Mar-24	Ongoing	$696,972.75
2024 Sewer Lining Project, M-763	x		City of Oak Park	City of Oak Park	Danfred Samuel (248) 691-7452	Cleaning and CCTV inspection of 3,802 lf of 8" – 24" sanitary sewer and installation of 3,802 8" – 24" CIPP liners	Mar-24	Jul-24	$281,247.50
2023 Sanitary Sewer Lining	x		Ypsilanti Community Utilities Authority		Scott Westover, P.E. (734) 484-4600	Clean & CCTV 10,810 lf of 6"-15" sanitary sewer and installation of 10,810 lf of 6"-15" CIPP liners	Dec-23	Feb-24	$496,975.00
2023 Sanitary Sewer Rehabilitation by Full Length CIPP Lining	x		Clinton Township	Anderson, Eckstien & Westrick	Scott Chabot, P.E. (586) 726-1234	Clean & CCTV 15,000 lf of 10"-18" sanitary sewers and installation of 15,000 lf of 10"-18" CIPP liners	Sep-23	Dec-23	$1,161,912.50
2023 Sewer Rehabilitation Project	x		Township of Bloomfield	Hubbel, Roth & Clark	Matthew Hujes, P.E. (248)	Clean & CCTV 11,514 lf of 8"-21" sanitary sewers, installation of 7,596 lf of 8"-12" CIPP liners, and chemical grouting of 56 sanitary sewer joints	Dec-23	Jun-24	$429,288.50
2023 Sanitary Sewer Lining (City Project SL-23-784)	x		City of Warren		David Wirth, P.E. (586) 759-9300	Clean & CCTV 11,000 lf of 12"-36" sanitary sewers, 11,000 lf of 12" – 36" full length CIPP liners and installation of 30 Sectional CIPP liners	Oct-23	Ongoing	$1,284,125.00
Village of Romeo 2023 Local Streets Resurfacing		x	Village of Romeo	Hubbel, Roth & Clark	Ryan Sharp (GC Pro-Line Asphalt) (586) 752-7730	Clean & CCTV 5,058 lf of 8" and 10" sanitary sewers, installation of 5,058 lf of 8" and 10" CIPP Liners, and installation of 1 8" CIPP part liner	Jul-23	Oct-23	$246,568.25
Heritage Hills & Wedgewood Commons Subdivision Rehabilitation, PH 3		x	City of Farmington Hills	Hubbel, Roth & Clark	Nick Oeller (GC Fenson Company) (810) 231-5188	Clean & CCTV 1,172 lf of 12-18" sanitary sewers, installation of 1,172 lf of 12"-18" CIPP Liners	May-23	May-23	$118,586.00
Howell's Walled Lake Subdivision WM & Road Improvement		x	City of Novi	Hubbel, Roth & Clark	Chris Maltese (GC DiPonio Contracting) (586) 997-4150	Clean & CCTV 672 lf of 8" sanitary sewers, installation of 672 lf of 8" CIPP Liners	Jun-23	Jun-23	$41,160.00
South Lyon 2023 Road Improvement Project		x	City of South Lyon	Hubbel, Roth & Clark	Chris Maltese (GC DiPonio Contracting) (586) 997-4150	Clean & CCTV 3,054 lf of 8" sanitary sewers, installation of 3,054 lf of 8" CIPP Liners	Aug-23	Aug-23	$123,748.00
Henry Graham Drain Repairs	x		Oakland County Water Resources Commissioner		Geoff Wilson, P.E. (248) 858-1213	Clean, prep, concrete repairs and large diameter storm sewer grouting in the city of Troy.	Dec-23	Ongoing	$509,288.00
Sewer and Manhole Rehabilitation Phase 1	x		Washington Charter Township	Giffels Webster	Joe Paquette, P.E. (586) 781-8950	Clean & CCTV 2,964 lf of 10"-18" sanitary sewer and installation of 1,223 lf of 10" CIPP liner, mainline sewer grouting, and geopolymer lining of 23 manholes	Jun-23	Sep-23	$408,386.00
SRF Wastewater Improvements, Segment 3	x		City of Burton	Stantec	Spencer Cain, P.E. (734)214-1858	Clean & CCTV 29,887 lf of 8"-21" sanitary sewer, installation of 29,887 lf of 8"-21" CIPP Liners, grouting of 107 sewer laterals, 10 CIPP lateral liners, misc. open cut sewer repairs, pavement removal and replacement, and rehabilitation of 15 manholes	Jun-23	May-24	$2,223,960.50
21-06 Inkster E. Outfalls Phase 1	x		City of Inkster	Benesch	Dan Guastella, P.E. (734) 649-2505	Test and Seal 376 30" sanitary sewer joints, cleaning and CCTV inspection of 2,442 lf of 30" combined sewers, and 2,442 lf of 30" CIPP lining	Jun-23	Ongoing	$889,669.00
2021 Sewer Rehabilitation Program	x		City of Birmingham		Jim Surhigh, P.E. (248) 530-1839	Cleaning and CCTV inspection of 90,000 lf of 8" – 72" combined sewers, inspection of 1,200 lf of sewer laterals, and 8,208 lf of 8-21" CIPP lining, 31 CIPP Sectional	Oct-21	Dec-23	$1,503,323.00

6045 Sims Rd., Suite #2
Sterling Heights, MI 48313
586-979-0462

Hathaway Road Sewer Rehabilitation	x		Harbor Springs Area Sewage Disposal Authority	Gosling Czubak	Timothy Korsen, P.E. (231) 933-5113	Cleaning and CCTV inspection of 1,440 lf of 21" sanitary sewer, CIPP Lining of 1,440 lf of 21" sanitary sewer, and epoxy rehabilitation of 5 sanitary sewer manholes	Oct-22	Dec-22	$581,016.00
City of Novi 10 Mile Road Sewer Grouting	x		Oakland County Water Resources Commissioner		Phil Kerby, P.E. (248) 296-1262	Rehabilitation of 250 lf of 36" sanitary sewer by mainline sewer grouting	Oct-22	Oct-22	$29,031.00
MDOT 22004-009 (Lapeer Road Reconstruction)		x	MDOT & St. Clair County Road Commission		Mary Zink (GC Superior Contracting) (810)673-3192	Rehabilitation of 180 lf of 24" storm sewer by CIPP Lining	Jan-23	Jan-23	$47,700.00
East China 2022 Sanitary System Improvement Project-CIPP Lining	x		East China Township	Project Control Engineering	William Meldrum, P.E. (810) 794-1931	Clean & CCTV 6,887 lf of 8"-12" sanitary sewer, installation of 6,887 lf of 8"-12" CIPP Liner, manhole rehabilitation and replacement, and lining of 129 sewer laterals	Nov-22	Ongoing	$1,554,295.50
Cottrellville Township 2022 Sanitary System Improvement Project	x		Cottrellville Township	Project Control Engineering	William Meldrum, P.E. (810) 794-1931	Clean & CCTV 9,807 lf of 8"-12" sanitary sewer, installation of 9,807 lf of 8"-12" CIPP Liner, installation of 33 CIPP Point Liners and lining of 187 sewer laterals	Nov-22	Ongoing	$1,970,395.00
Taxiway Y North Construction (Detroit Metropolitan Airport)/Yankee Air Museum Connector (Willow Run Airport)		x	Wayne County Airport Authority		Andrew Standhardt (GC Toebe Construction) (248) 349-7500	Clean & CCTV, and installation of 300 lf 15" storm sewer CIPP liner, and clean & CCTV and installation of 185 lf of 36" storm sewer CIPP liner	Jul-22	Jul-22	$88,875.00
2022 Cured-in-Place Pipe Sewer Rehab	x		Lathrup Village		Scott Ringler, P.E. (248) 852-3100	Clean & CCTV 11,060 lf of 8"-21" sanitary sewer, installation of 11,060 lf of 8"-21" CIPP Liner, and reconnection of 144 lateral services	Aug-22	Dec-22	$795,113.00
2020 City of Ecorse Sewer Rehabilitation (Sallotte Ave), Project No. 0244-0009	x		City of Ecorse	Anderson, Eckstien & Westrick	Frank Varricalli (586) 853-9655	Acrylamide grout installation in 57 sewer joints, CCTV, Clean, and installation of 1,550 lf of 12" CIPP liner	Jul-22	Sep-22	$174,675.00
Project K21-1016 Audubon Group B		x	City of New Orleans, LA		Stan Bugusky (GC Hard Rock Construction) (504) 835-1050	Installation of 6,388 lf of 8-12" CIPP liner	Jul-22	Aug-22	$214,194.00
Sanitary Sewer Cured-in-Place Lining & Grouting, Pontiac - North	x		Oakland County Water Resources Commissioner		George P. Nichols, P.E. (248) 858-0958	Clean & CCTV 9,450 lf of 8"-21" sanitary sewer, installation of 9,450 lf of 8"-21" CIPP Liner, 116 lateral joint grout installations, and 96 mainline sewer grout installations	Aug-21	Jul-22	$561,732.00
Pontiac Cut & Grout (OCWRC Project 1-3394)	x		Oakland County Water Resources Commissioner		Rick DeVisch, P.E. (248) 858-0958	Rehabilitation of 7806 lf of 8"-18" sanitary sewers by root and mineral deposit removal, and mainline sewer grouting.	Aug-21	Aug-22	$269,975.00
Commerce Crossings Sanitary Sewer and Manhole Rehabilitation	x		Oakland County Water Resources Commissioner		Karen Warren, P.E. (248) 858-0958	Installation of 922 lf of 21" CIPP Liner, and geopolymer rehabilitation of 1 Manhole	Aug-21	Sep-21	$346,525.00
Rummell Relief Drain & Outlet Rehabilitation & Repairs	x		Oakland County Water Resources Commissioner		Geoff Wilson, P.E. (248) 858-1213	Stop water infiltration between 40 joints of 72" RCP pipe with a combination of hydrophobic polyurethane grout, and hydraulic cement	Jun-20	Nov-20	$110,202.50
Main Street and Novi Road Sanitary Sewer Repair & Lining Project	x		City of Northville	ROWE Professional Services Co.	Jack Wheatly, P.E. (810) 869-5121	Install 926 lf of 12" dia. CIPP Liner, chemical grout sealing, 12" sanitary sewer installation via open cut methods, and misc. pavement removal and replacement	Jun-20	Aug-20	$193,253.50
DTE Conners Creek Demo Project		x	DTE Energy		Adam Mocny (GC Independence Excavating)	Abandon 1000 lf of 20' wide X 7' tall box culvert	Jan-20	Jan-20	$1,096,000.00
Clinton Township Zone 6 Manhole Rehabilitation	x		Clinton Township	Anderson, Eckstien & Westrick	Scott Chabot, P.E. (586) 726-1234	Rehabilitation of 40 manholes with cementitious liner, repointing & sealing joints, MH bench & channel repair, and chemical grout injection to seal leaks	Apr-18	Mar-20	$149,600.00
Clinton Township Emergency Storm Sewer Manhole Repair at Ridgewood Condos, Project No. 0242-0013	x		Clinton Township	Anderson, Eckstien & Westrick	Scott Chabot, P.E. (586) 726-1234	Removal and replacement of 5' diameter storm manhole #36 with 2' sump. Removal and replacement of (1) section of 36" C76 CLII concrete storm sewer pipe. Install SW Dura-Plate 6100 Epoxy Manhole Liner on the manhole	Aug-19	Sep-19	$106,219.11
Collection System Upgrades - Leland Township	x		Leland Township, Lake Leelanau	Gosling Czubak	Gwenna L. Wood, P.E. (231) 946-9191	Install 180 lf of 10" CIPP liner, structural manhole rehabilitation, & chemical grouting to seal leaks	Apr-18	Jun-18	$159,590.00
Pearl Beach Pump Station Rehabilitation Project	x		County of Saint Clair		Kirk Weston (810) 364-5720	Rehabilitation of pump station wet well with CEMTEC rapid cure vertical grade mortar and Sherwin Williams DURA PLATE-6100	Jul-18	Jul-18	$55,000.00
2017 Sewer Rehabilitation - Stoney Creek Metro Park	x		Huron-Clinton Metroparks		Andrew Storer, P.E. (810) 494-6064	Install 1,948 lf of 8" dia. CIPP liner with cleaning and pre & post CCTV investigation, & sanitary sewer MH structure Adjustment	Oct-17	Dec-17	$64,136.00
OMID Pipe Leak Patching - Conner & State Fair, Detroit, MI	x		Oakland County Water Resources Commissioner		Sid Lockhart, P.E. (248) 858-0958	Stop water infiltration between 4 joints of 72" steel pipe with a combination of hydrophobic polyurethane grout, oakum rope, hydraulic cement and patch the joints. Hand seal the joints with EpoxyTec CPP epoxy paste	Aug-17	Oct-17	$15,000.00
Clinton Township Zone 6 Sanitary Sewer Open Cut Point Repairs Location: 34250 Groesbeck Hwy (Harbor House Resturant)	x		Clinton Township	Giffels Webster	Scott Chabot, P.E. (586) 726-1234	Perform open cut sanitary sewer point repairs, Install 10" CIPP sewer liner with cleaning and pre & post CCTV inspection approximately 305 lf, and chemical grouting of infiltration prior to liner installation	Dec-15	Sep-16	$591,209.50
Sanitary Sewer System Improvements - Sewer Cleaning & Televising, Contract 2	x		Village of Breckenridge	Fleis & Vandenbrink	Gary Bartow (989) 837-3280	Clean & televise approx.. 35,000 lf of 8", 10" & 12" sanitary sewer including laterals and installation of 2,500 lf 8" and 10" CIPP liners. Additional project work included, MH grouting & point repairs.	May-11	Feb-13	$362,911.00
Sanitary Sewer System Improvements - Contract 1- Section B (Phase 2)	x		Hampton Township	Fleis & Vandenbrink	Gary Bartow (989) 837-3280	CCTV Sewer inspection & cleaning of approx. 100,000 lf, of sewers, manhole rehabilitation and 2,300 lf of 12"-21" CIPP Liners and CIPP Part Liners	Jan-11	Dec-12	$1,082,116.28
Trenchless Technologies Services Term Contract (Contract No. 005432)	x		Oakland County Water Resources Commissioner		Sid Lockhart, P.E. (248) 858-0958	Provide design build service to perform water and sewer installation by various trenchless technology methods in Oakland County, MI. Construction methods include pipe bursting, CIPP lining, pilot tube GBM, directional boring (2" – 36"), trenchless section point repairs, pipeline grouting, PACP certified sewer inspection and cleaning, MH rehabilitation, slip lining, and other trenchless technologies	Jul-23	Jun-26	Ongoing

UTILITIES, INC.

6045 Sims Dr., Suite 2,
Sterling Heights, MI 48313
Direct: 248-930-8524
Ph: 586-979-0402
Fax: 586-979-8295
Email: kbates@dvmutilities.com

PROPOSAL

January 12, 2026

To: City of Berkley, MI
Attn: Adam Wozniak, Superintendent of Public Works

Project: 2026 Sewer Lining
OCWRC CONTRACT NO: 011677 (WRD Sewage Disposal System Maintenance and Repair)

ITEM	QTY	DESCRIPTION	UNIT PRICE	UNIT MEASURE	LINE TOTAL
001	12777	Sewer Cleaning 10-24"	$5.00	LF	$63,885.00
002	834	Sewer, CIPP Lining, 10"	$56.00	LF	$46,704.00
003	4900	Sewer, CIPP Lining, 12"	$47.00	LF	$230,300.00
004	6169	Sewer, CIPP Lining, 15"	$54.50	LF	$336,210.00
005	603	Sewer, CIPP Lining, 18"	$72.00	LF	$43,416.00
006	271	Sewer, CIPP Lining, 24"	$122.00	LF	$33,062.00
007	1	Bonds/Insurance	$9,800.00	LS	$9,800.00
LEGEND: LS= Lump Sum, LF=Linear Feet, EA=Each,				SUBTOTAL	T.B.D.

General Notes & Conditions

- THERE IS NO ADDITIONAL CHARGE FOR LATERAL REINSTATEMENTS
  - Lateral Reinstatement time and cost is included in the CIPP Lining price.
- DVM UTILITIES is a MDOT Pre-Qualified Contractor
- DVM UTILITIES, INC is a member and certified installer for CIPP Corporation.
- DVM UTILITIES will supply post CIPP inspection reports in Wincan Software Format by CUES.
- Proposal DOES include preparatory cleaning and CCTV inspection.
- CIPP Lining does NOT include incidental grouting prior to installation of liner.
- CIPP Lining does NOT include repairs to host pipe prior to liner installation.
- Proposal DOES Include Bypass of NORMAL sewer flows, but will be completed during dry weather conditions.
- Proposal DOES INCLUDE Traffic Control.
- Proposal Does include post CCTV inspection.
- Disposal of contaminated material is NOT included.
- Proposal DOES include PE Stamped liner designs and CIPP testing.
- Proposal assumes:
  - Conduit is in a condition suitable for CIPP Lining
  - Conduit is to be rehabilitated full length (structure to structure)
  - Conduit is NOT under pressure of any kind
- Cost includes MOB/DEMOB
- Permits are NOT included

- Price assumes City of Berkley will allow access to all hydrants for all operations at no cost to D.V.M. Utilities.
- Erosion and sediment control is NOT included.
- Site restoration is included.

Submitted by: KARL J BATES III

Acceptance of this proposal will bind each party into an agreement. Authorized representative from both parties will sign and date this agreement to abide by the above said terms and conditions. This proposal expires 30 days after the date indicated above, and D.V.M. Utilities reserves the right to increase pricing based on current market conditions.

D.V.M. Utilities, Inc.

Authorized signature: _____ Authorized signature: _____

Printed: Karl J Bates III Printed: _____

Title: Director Title: _____

Date: 1/12/2026 Date: _____

PROPOSAL ADDENDUM: ***D.V.M. Utilities, Inc. is a non-union company and will not enter into any type of Project Labor Agreement. This proposal, even if it includes a breakout estimate of Operator hours (whether requested by a prospective prime contractor or otherwise), is nonetheless expressly conditioned on: (i) the understanding that by submitting its bid, D.V.M. Utilities, Inc. is not, does not intend to be, and will not agree to be, bound by any memorandum, letter of understanding, amendment or written instrument relating to the execution or adoption, or any portion, of any labor agreement, (ii) the inclusion of this provision in its entirety in the subcontract as a condition precedent to D.V.M. Utilities, Inc. accepting and executing the subcontract, (iii) the understanding that any attempt in the subcontract documents to vary from the terms of this provision will be null and void, and (iv) the understanding that in the event of a conflict between this provision any part, term or provision of any contract document, this provision will control.***

M-12-26

February 2, 2026 Council Meeting

Moved by Councilmember_____and seconded by Councilmember _____ to (approve/deny/postpone) the SMART Specialized Services – FY26 contract subject to resolution of the City Attorney's concerns regarding Section 11.

Ayes:
Nays:
Absent:
Motion:

CITY OF BERKLEY
PARKS & RECREATION
2400 ROBINA AVE, BERKLEY, MICHIGAN 48072

MEMORANDUM

To: Mayor Dean and City Council
CC: Crystal VanVleck, City Manager
Carl Johnson, Finance Director
From: Dan McMinn, Parks and Recreation Superintendent

Date: January 22, 2026
Subject: FY 2026 SMART Specialized Services Contract

Madam Mayor and Members of City Council,

Background
Berkley Parks and Recreation, in partnership with SMART Transportation, offers van transportation service for Berkley residents over the age of 50, retired or semi-retired in an effort to get riders to doctors appointments, the grocery store, salons and more. The contract provided is a renewal for Fiscal Year 2025 and will allow the city to receive $23,202, the same level of funding as last year, to help offset costs of this beneficial service.

Summary
- Renewal contract for Fiscal Year 2026 – October 1, 2025 to September 30, 2026.
- The City of Berkley would be eligible to receive up to $23,202, which is the same amount of funding as last year.
- The Senior Transportation service provided by Berkley Parks and Recreation is an invaluable program that allows seniors in Berkley the ability to get to and from appointments, shopping trips and other miscellaneous errands.
- The program services anyone over the age of 50, retired or semi-retired, with a lot of our riders coming from the Oxford Park Towers senior living community. The service is primarily designed for senior citizens and persons who are handicapped.

Recommendation
I recommend the signing of the attached contract to help continue to fund this wonderful service.

Matter of authorizing the Mayor to execute a third-party Specialized Services Operating Assistance contract between SMART and the City of Berkley for public transportation services primarily designed for senior citizens and persons who are handicapped. The contract period for this program is from October 1, 2025 to September 30, 2026.

SPECIALIZED SERVICES OPERATING ASSISTANCE PROGRAM
THIRD-PARTY CONTRACT- FY 2026

THIS AGREEMENT ("Agreement" or "Contract") is made and entered between the Suburban Mobility Authority for Regional Transportation (hereinafter referred to as "**AUTHORITY"**), whose address is 535 Griswold Suite 600, Detroit, Michigan 48226, and City of Berkley (hereinafter referred to as "**SUBRECIPIENT"**), whose address is 2400 Robina, Berkley, MI 48072.

SECTION 1. - DEFINITIONS

PROGRAM	Means the Michigan Specialized Services Operating Assistance Program designed primarily for seniors and persons with disabilities as defined under Section 10e(4)(c)(i) of Act 51, of the Public Acts of 1951, as amended; MCL 247.660e(4)(c)(i).
DEPARTMENT	Means the Michigan Department of Transportation.
BUREAU	Means the Bureau of Urban and Public Transportation of the Michigan Department of Transportation.
AUTHORITY	Means the Suburban Mobility Authority for Regional Transportation (SMART).
PROJECT	Means the providing of SPECIALIZED SERVICES.
SPECIALIZED SERVICES	Means public transportation services primarily designed for persons with disabilities or who are sixty-five (65) years of age or older.
STATE	Means the State of Michigan.
SUBRECIPIENT	Means City of Berkley, which will provide the transit services with funds received under this Contract.
APPLICATION	Means the AUTHORITY's application, submitted in cooperation with the SUBRECIPIENT, for funding from this PROGRAM for the period from October 1, 2025, to September 30, 2026.

SECTION 2. - PURPOSE

The purpose of this Contract is to pass through operating assistance funding received from the DEPARTMENT PROGRAM, to the SUBRECIPIENT. The transit services provided shall be as described in the APPLICATION submitted by the SUBRECIPIENT through the AUTHORITY and approved for funding by the DEPARTMENT.

SECTION 3. - FUNDING

The AUTHORITY is only obligated to provide funds under this Contract to the extent that funds for the PROGRAM are made available to it and approved by the DEPARTMENT as outlined in the Contract Authorization provided to us by the DEPARTMENT.

The SUBRECIPIENT is eligible for contract costs in the amount of $ **23,202,** ***plus a one time supplemental allocation of $17,778.***

The maximum amount of the AUTHORITY funds to be given the SUBRECIPIENT shall not be increased without a prior written amendment to this Contract. DEPARTMENT funds made available to the AUTHORITY, through legislative appropriation, are based on projected revenue estimates. In the event that revenue actually received is insufficient to support the appropriation, it may necessitate a reduction in the maximum amount of said funds available to the SUBRECIPIENT. In such event, the AUTHORITY reserves the right, without notice, to reduce the maximum obligation of funds for the SUBRECIPIENT by the amount of any reduction by the DEPARTMENT to the AUTHORITY.

SECTION 4. - BUDGET ADJUSTMENTS

Budget adjustments must be requested in writing by the SUBRECIPIENT. Upon receipt of the request, the AUTHORITY shall have thirty-five (35) business days to provide written approval or disapproval of the budget adjustment. If no action is taken within thirty-five (35) working days, the budget adjustment shall be deemed approved. Expenditure of funds in excess of any line-item will not be considered an eligible PROJECT cost. The addition of any new line-item, or any line-item changes which represent a deviation from the PROJECT as described in the APPLICATION, shall require a prior written amendment to this Contract.

SECTION 5. - PROJECT COSTS AND REVENUES

The SUBRECIPIENT shall complete and submit to the AUTHORITY the information required by the DEPARTMENT, on the quarterly reporting form (available online at SMARTbus.org), within ten (10) days after the end of each state of Michigan fiscal year quarter. Failure to provide the quarterly report within thirty (30) days after the end of each state of Michigan fiscal year quarter, may result in a loss of a portion of or all funding. The AUTHORITY reserves the right to withhold payment of PROJECT funds if the SUBRECIPIENT fails to file reports as required in this paragraph.

If the SUBRECIPIENT also receives funding under 1951 P.A. 51, Section 10e(4)(a); MCL 247.660e(4)(a), as amended as its cost allocation plans must be submitted to the BUREAU for approval. Any PROJECT costs in excess of revenues reported on the quarterly reporting form will **not** be eligible under any other state and federal program administered by the AUTHORITY or the DEPARTMENT.

Section 6. - BILLING, PAYMENTS AND QUARTERLY REPORTS

Notwithstanding the provisions set-forth in Section 3 of this Contract, the AUTHORITY shall provide to the SUBRECIPIENT the STATE funds designated for the eligible project costs incurred in performance of this Contract within ten (10) business days of the receipt of said funds from the DEPARTMENT.

The AUTHORITY may appropriately reduce payments if written reports submitted by the SUBRECIPIENT as required under this section indicate that the level of service described in the APPLICATION has been reduced.

Actual reimbursement shall be based on a rate per mile, or one-way passenger trips of SPECIALIZED SERVICES up to the maximum amount provided for herein.

The actual reimbursement method selected by the SUBRECIPIENT is $1.76 per mile, but subject to change.

Should the per-mile rate method be selected by SUBRECIPIENT, actual reimbursement may be subject to change, per DEPARTMENT and/or BUREAU reimbursement rate modifications.

SECTION 7. - TERMINATION OR SUSPENSION

For any violation of this Contract or legislative change, the AUTHORITY may, by thirty (30) days written notice, suspend any and all of the rights and obligations under this Contract until such time as the event or condition resulting in such suspension has ceased or been corrected, or the AUTHORITY may, by thirty (30) days written notice to the SUBRECIPIENT, terminate any and all of the rights and obligations under this Contract.

SECTION 8. - ACCOUNTING RECORDS, AUDITS, AND DOCUMENTATION

(a) Establishment and Maintenance of Accounting Records

The SUBRECIPIENT shall maintain books, records, documents, and other accounting records in accordance with generally accepted governmental accounting principles. Said records shall be sufficient to properly reflect all costs of whatever nature claimed to have been incurred or anticipated to be incurred in the performance of the identified PROJECT. To facilitate the administration of the PROJECT, separate records shall be established and maintained. The SUBRECIPIENT shall assure that the records to support the miles traveled and the passengers carried as reported pursuant to Section 6 of this Contract are established and maintained.

(b) Audit

The SUBRECIPIENT shall permit the AUTHORITY and/or the DEPARTMENT or the authorized representatives of the AUTHORITY to audit all data and records relating to the performance of this contract. The SUBRECIPIENT shall retain and allow access to, and require its contractors to retain and allow access to all data and records pertaining to the PROJECT for a period of not less than six (6) years after the final payment by the AUTHORITY pursuant to the Contract.

The period of access, examination, and retention of data and records which relate to litigation or the settlement, of claims arising out of the performance of this Contract, or costs of this Contract as to which exception has been taken by the AUTHORITY or the DEPARTMENT or the authorized representative of the AUTHORITY or the DEPARTMENT, shall continue until such litigation, claims, or exceptions have been disposed of.

(c) Costs Supported by Documentation

PROJECT costs shall be supported by properly executed canceled checks, invoices or vouchers evidencing the nature and propriety of the charges.

(d) Accuracy of Financial Documentation

If a third-party contract is required for rendering of the services herein, then the SUBRECIPIENT is responsible for the accuracy of the financial and non-financial data and reports submitted for reimbursement.

(e) Revenue Expense Guidelines

If the SUBRECIPIENT also receives funding under 1951 P.A. 51, Section 10e(4)(a); MCL 247.660e(4)(a), as amended, determination of PROJECT costs shall be in conformity with the criteria set forth in the DEPARTMENT'S Office of Passenger Transportation's "Local Public Transit Revenue and Expense Manual." All other providers of service shall use the "Specialized Services Manual" (effective October 1, 2015, and any subsequent revisions, amendments and replacements).

SECTION 9. - THIRD-PARTY CONTRACT PROCEDURE

The SUBRECIPIENT shall **not** enter into contracts with third parties for provision of services herein without prior written approval from the AUTHORITY; notice of potential third-party contracts shall be submitted to the AUTHORITY for approval in writing. Approval or denial of said third-party contract will be submitted, in writing, to SUBRECIPIENT by the AUTHORITY. The AUTHORITY shall approve any third-party contracts at its sole discretion.

Approval does not constitute an assumption of liability, a waiver or an estoppel to enforce any of the requirements of this Contract, nor shall any such approval by the AUTHORITY be construed as a warranty of the third-party's qualifications, professional standards, ability to perform the work being subcontracted, or financial integrity.

SECTION 10 - ACCESS

SUBRECIPIENT agrees to provide, and will require its contractors to provide, access by the AUTHORITY and/or the DEPARTMENT to all technical data, reports, documents and work in progress pertaining to the PROJECT. Copies of technical data and reports shall be provided by the SUBRECIPIENT or its contractors to the AUTHORITY upon request.

SECTION 11. - INDEMNIFICATION

Notwithstanding any other provision in this Agreement, SUBRECIPIENT shall indemnify, defend and save harmless AUTHORITY, its officers, agents, employees, and members of its Board of Directors from any and all claims, losses and damages, including costs and attorney fees, occurring or resulting from any act or omission the SUBRECIPIENT or its officers, agents, employees, subcontractors, successors or assigns arising out of and/or pursuant to this Agreement without regard to the negligence of the SUBRECIPIENT.

This Agreement is not intended to alter or increase SMART or SUBRECIPIENT's liability for tort claims, to other third-parties. Nor is this indemnity provision intended to be a third-party beneficiary contract, and therefore it confers no rights or third-party status on anyone other than the parties hereto.

SECTION 12. - ENTIRE AGREEMENT

This Contract, along with any exhibits, addendums, schedules, and amendments hereto, merges and concludes the entire agreement of SUBRECIPIENT and the AUTHORITY. Any previous communications, whether oral or written, are superseded through by this document. The SUBRECIPIENT and AUTHORITY acknowledge, by executing this document that said parties have not relied on any representation, assertion, guarantee, warranty, ancillary contract or other assurance, except those set out in this AGREEMENT. SUBRECIPIENT hereby waives all rights and remedies, at law or in equity, which may arise as the result of said party's reliance on such representation, assertion, guarantee, warranty, ancillary contract or other assurance, provided that no clause herein shall be construed as a restriction or limitation of said party's right to remedies associated with the gross negligence, willful misconduct or fraud of any person or party taking place prior to, or contemporaneously with, the execution of this Agreement.

SECTION 13. - PROHIBITED DISCRIMINATION

The SUBRECIPIENT shall not discriminate against any passenger because of race, color, sex, age, handicap, religion, ancestry, marital status, national origin, place of birth or sexual orientation in accordance with the State of Michigan provisions for "Prohibition of Discrimination in State Contracts", dated August of 1985, which is hereby incorporated by reference.

The SUBRECIPIENT shall not discriminate based upon race, color, creed, national origin, sex, age, disability, height, weight, familial status, marital status, or sexual orientation, in accordance

with Civil Rights Act of 1964, being P.L. 88-352, 78 Stat. 241, as amended, being Title 42 U.S.C. Sections 1971, 1975a-1975d, and 2000a-2000h-6, Section 303 of the Age Discrimination Act of 1975, Section 202 of the Americans with Disabilities Act of 1990, 49 U.S.C. Section 5332, the Michigan Elliot-Larsen Civil Rights Act, MCLA 37.2101 et seq., and SMART policy.

The SUBRECIPIENT shall comply with FTA Circular C 9070.1G, as may be amended or updated, with respect to all provisions on Civil Rights and discrimination including, but not limited to, Chapter VIII, §9.

The SUBRECIPIENT shall require similar covenants on the part of any contractor or subcontractor employed in the performance of the PROJECT for which this Contract is made.

SECTION 14. - MBE/WBE

In accordance with 1980 P.A. 278, MCL 423.321 at seq; MCL 445.901 et seq, the SUBRECIPIENT, in the performance of this Agreement, shall not enter into a Contract with a subcontractor, manufacturer, or supplier listed in the register maintained by the STATE, Department of Labor, of employers who have been found in contempt of court by a federal court of appeals, on not less than three (3) occasions involving different violations during the preceding seven (7) years, for failure to correct an unfair labor practice, as prohibited by Section 8 of Chapter 372 of the National Labor Relations Act, 29 U.S.C. 158. The AUTHORITY may void this Contract if the name of the SUBRECIPIENT, or the name of a subcontractor, manufacturer, or supplier utilized by the SUBRECIPIENT in the performance of this Contract subsequently appears in the register during the performance period of this Contract.

SECTION 15. - MISCELLANELOUS PROVISIONS

(a) If any provision of this contact is held invalid, the remainder of this Contract shall not be affected, if any such remainder continues to conform to the provisions and requirements of applicable law.

(b) The SUBRECIPIENT shall commence, carry on, and complete the PROJECT in accordance with all applicable laws. Nothing in this Contract shall require the SUBRECIPIENT to observe, comply, or do any other thing in contravention of any STATE, Local or Federal law.

(c) The SUBRECIPIENT warrants that it has no interest and shall not acquire any interest, direct or indirect, which would conflict in any manner or degree with the performance of SPECIALIZED SERVICES required to be performed under this Contract. The SUBRECIPIENT further warrants that in the performance of this Contract, no person having any such interest shall be employed.

(d) None of the funds, materials, property, or services obtained by the AUTHORITY or the SUBRECIPIENT under this Contract shall be used for any partisan political activity, or to further the election or defeat of any political activity or candidate for public office.

(e) The SUBRECIPIENT shall not assign any interest in this Contract without the prior written approval of the AUTHORITY, however, that compensation due to the SUBRECIPIENT under

this Contract may be assigned to a bank, trust company, or other financial institution without such approval. Notice of any such assignment shall be furnished promptly to the AUTHORITY in writing. Any such assignment does not relieve the SUBRECIPIENT of its obligations under this Contract.

(f) If the SUBRECIPIENT enters into any contracts with other governmental agencies for the purposes of providing SPECIALIZED SERVICES outside of its jurisdictional boundaries, as defined and provided by law, it shall immediately provide the BUREAU with a copy of any contracts and true copies of any resolutions passed by its governing board which relate to the providing of service under such contracts.

SECTION 16. - TERM OF CONTRACT

Upon execution, this Contract shall cover the period commencing October 1, 2025, and extending through September 30, 2026.

The SUBRECIPIENT agrees to notify the AUTHORITY of any event which may have significant potential impact on PROJECT progress, direction, control or cost.

SECTION 17. - EXECUTION

This Contract shall become binding on the parties hereto upon the execution thereof by the duly authorized official(s) for the SUBRECIPIENT and the AUTHORITY; and upon the adoption of a resolution approving said Contract and authorizing the signatures thereto of the respective official(s) of the SUBRECIPIENT, a certified copy of which resolution shall be attached to this Contract.

The Parties acknowledge and agree that this Agreement may be executed by electronic signature, which shall be considered as an original signature for all purposes and shall have the same force and effect as an original signature. The Parties agree that the electronic signatures appearing on this Agreement are the same as handwritten signatures for the purposes of validity, enforceability and admissibility. Without limitation, “electronic signature” shall include faxed versions of an original signature or electronically scanned and transmitted versions (e.g., via pdf) of an original signature.

THE PARTIES HEREBY ACKNOWLEDGE that they have read and understand this Agreement and that the signatories below have affixed their signatures and affirmed that they are authorized to execute this Agreement, for the purpose of binding their respective Parties.

SUBURBAN MOBILITY AUTHORITY FOR REGIONAL TRANSPORTATION	**CITY OF BERKLEY**
Signature	Signature
Printed Name	Printed Name
Title	Title
Date	Date

Suburban Mobility Authority for Regional Transportation

EEO COMPLIANCE REPORT A

COMMUNITY PARTNERSHIP FORM

Agency/Community Information		
Program Type: Community Partnership Program (CPP) ☐ Specialized Service ☐ New Freedom ☐ JARC ☐ 5310 ☐		
Name of Agency/Community:		
Address:		
City:	State:	Zip:
Agency/Community Data		
1) Has your agency/community completed in excess of $1,000,000 in DOT federally-funded contracts from SMART in the past year?		Yes ☐ No ☐
2) Does your agency/community employ over fifty (50) transit related employees?		Yes ☐ No ☐
If the answers to the previous two questions were both "Yes", Please forward your agency's/community's Affirmative Action plan to the address below: Buhl Building 535 Griswold Street, Suite 600 Detroit, MI 48226 Attn: EEO Coordinator		
Have all subcontractors been informed of their responsibility to file an EEO Compliance Report A form? Yes☐No☐N/A ☐		
Drug and Alcohol Testing Program Requirements		
Does your agency/community have a DOT Drug and Alcohol testing program for Safety-sensitive employees? (Vehicle operators, dispatchers, mechanics and armed security) Yes ☐ No ☐		
Name of drug and alcohol testing manager?		Title:
Phone Number:	Ext:	Email:
Please Proceed to Employment Data Section Below		

Suburban Mobility Authority for Regional Transportation

EEO COMPLIANCE REPORT A

COMMUNITY PARTNERSHIP FORM

Employment Data

Report **ONLY** employees directly involved in the operation of your non-emergency transportation program. Including permanent, temporary, or part-time employees. Enter the appropriate figures in the spaces below relating to each employee's race and gender.

Job Classification	Total				Race													
						Minority												
					White		African American		Hispanic		Asian		Pacific Islander		American Indian		Multi Race	
	Employees	Male	Female	Minority	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Officials/Managers																		
Professionals																		
Technicians																		
Office and Clerical Staff																		
Craftsmen (Skilled)																		
Operators (Semi-Skilled)																		
Laborers (Unskilled)																		
Service Workers																		
Journey Workers																		
Apprentices																		
Total																		

Certification

How was this information obtained? Visual Survey: Yes ☐ No ☐ Employment Records: Yes ☐ No ☐

Name of Authorizing Official (Print): Title:

Signature: Date:

Contact person for report: Title:

Telephone: Ext: Email: