ARCADIS Design & Consultancy for natural and built assets

Revitalizing Auto Communities Environmental Response Trust

PLANT 3
STORM SEWER MODIFICATIONS COMPLETION REPORT

Lansing Industrial Land
Lansing, Michigan

January 25, 2019

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STORM SEWER MODIFICATIONS COMPLETION REPORT

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Our Ref.:

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Date:

January 25, 2019

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FIGURES

APPENDICES

ACRONYMS AND ABBREVIATIONS

bgs	below ground surface
CLSM	controlled low strength material
cm/s	centimeters per second
CSM	Conceptual Site Model
CTS	Construction Testing Services
HNV	Human Non-Cancer Screening Value
IGMP	Interim Groundwater Monitoring Program
IM	interim measure
JSA	Job Safety Analysis
MDEQ	Michigan Department of Environmental Quality
ng/L	nanograms per liter
OWS	oil-water separator
PFAS	poly- and perfluoroalkyl substances
PFOS	perfluorooctanesulfonic acid
Psi	pounds per square inch
PVC	polyvinyl chloride
QAPP	Quality Assurance Project Plan
RACER	Revitalizing Auto Communities Environmental Response
Report	Plant 3 Storm Sewer Modifications Construction Completion Report
Rule 57 Criteria	MDEQ Rule 57 Human Non-Cancer Screening Value (HNV) for Surface Water from a Non-Drinking Water Source
Site	RACER Lansing Industrial Land
TGI	Technical Guidance Instructions

1 INTRODUCTION

Arcadis of Michigan, LLC is pleased to present this Completion Report (Report) on behalf of the Revitalizing Auto Communities Environmental Response (RACER) Trust to outline the modifications made to the storm sewer system on the Plant 3 portion of the RACER Lansing Industrial Land (the Site) located in Lansing, Michigan (**Figures 1 and 2**). These modifications were enacted as approved by the Michigan Department of Environmental Quality (MDEQ) and the City of Lansing as an interim measure (IM) to address poly- and perfluoroalkyl substances (PFAS) off-site discharge in the storm water outfall and will be part of the final corrective measure to address PFAS at the Site.

This Report details modifications to the Plant 3 storm sewer system to eliminate the Site's PFAS-impacted storm water discharges to an off-site storm sewer owned by the City of Lansing. The scope of work included abandonment of the two primary stormwater mains draining the Site, bulkheading two potential connections to an Ingham County sewer, and capping selected catch basins to reduce inflow into the abandoned system. All work was conducted in accordance with the Plant 3 Storm Sewer Modifications IM Work Plan (Work Plan) dated May 24, 2018 and approved by the MDEQ on June 1, 2018 and the City of Lansing. Construction began on October 1, 2018, substantially concluding on October 31, 2018.

1.1 Perched PFAS Overview

The perched PFAS at Plant 3 originates in the former plating area in the north-central portion of Plant 3. PFAS in groundwater was initially detected in December 2016, when sampling for PFAS was conducted due to emerging concerns that vapor suppressants containing PFAS could have potentially been used in former plating operations at the Site. Following the initial detection of PFAS during groundwater sampling in December 2016, Arcadis conducted several field investigations throughout 2017 and 2018 to characterize and define the extent of contamination (Arcadis 2018b).

Analytical results from these investigations indicate PFAS impacts centered in the former plating area and radiating in all directions (**Figure 3**). Perched groundwater in the PFAS area is concentrated in relatively higher-permeability sand lenses at elevations between 840 and 859 feet (approximately 4 to 23 feet below ground surface [bgs]). This is coincident with the depth of the RACER storm sewers and Ingham County storm main; therefore, infiltration of PFAS impacts into the sewers is a concern. More detailed descriptions of the geologic setting in the PFAS-impacted area are provided in the Plant 3 PFAS Conceptual Site Model (CSM) and Potential Corrective Measures Report (Arcadis 2017a).

1.2 Storm Sewer Sampling

Stormwater at Plant 3 drained through a storm sewer system consisting of catch basins, manholes, and sewer mains. A camera survey conducted in September of 2017 revealed groundwater infiltration into the two main interceptors on the Site: the East Main and the West Main. Sampling conducted in 15 manholes during dry weather in September and October of 2017 confirmed perfluorooctanesulfonic acid (PFOS) concentrations exceeding the MDEQ Rule 57 Human Non-Cancer Screening Value (HNV) for Surface Water from a Non-Drinking Water Source criteria (Rule 57 criteria) of 12 nanograms per liter (ng/L) in 12

manholes. Descriptions of these investigations and the Plant 3 storm sewer system layout are provided in the Plant 3 Storm Sewer Modifications Interim Measures Work Plan (Arcadis 2018a).

1.3 Corrective Action Objectives

The corrective action objective of this IM was to eliminate off-site storm sewer discharge containing impacts at levels exceeding the Rule 57 criteria of 12 ng/L for PFOS. The point of compliance is the Plant 3 outfall (manhole P3-MH-NE; **Figure 2**).

2 STORM SEWER MODIFICATIONS

The primary tasks completed under this scope of work included the following:

1. Capping of selected catch basins to minimize inflow to the abandoned storm system after rain events in order to reduce the possibility of impacted sewer water daylighting and to minimize buildup of water pressure behind the bulkheads and monoliths
2. Bulkheading two potential connection points between the RACER system and Ingham County storm main to eliminate alternate pathways for impacted storm water to discharge from the Site
3. Blocking the East and West Mains to prevent impacted storm water from reaching the outfall at Willow Street. This included excavation and installation of two controlled low strength material (CLSM; i.e., flowable fill) monoliths to block the sewer mains and pipe bedding.

Details provided by the contractor on all materials to be used in the bulkheading, monolith, and capping process were reviewed to ensure that PFAS-containing materials were not present. Contractor personnel followed appropriate protocols to minimize potential PFAS contamination of materials. City of Lansing water was used in the concrete and CLSM mixes to minimize the risk of PFAS contamination.

2.1 Capping of Selected Catch Basins and Drainage Structures

Before the installation of the bulkheads and monoliths, selected site catch basins were capped to minimize surface water inflow into the portion of the sewer system to be deactivated. Installation of caps on select catch basins began on October 2, 2018. To cap the catch basins, personnel caulked a polyvinyl chloride (PVC) liner onto the existing grate or cover. A steel sheet was caulked on top of this liner, and a foot of 21AA aggregate placed on top of that. Details of the catch basin caps are provided on **Figure 4,** and a photo of a completed cap is presented in **Appendix C.** For catch basins that were missing a cover, a steel sheet was caulked to the rim before following the normal procedure. The crew began by capping structures that drained into the bulkheading locations to mitigate flows into those work zones, and capped the rest while the bulkheads and monoliths were installed. A total of 157 catch basins were capped.

In addition, three subgrade structures were filled in place with CLSM to mitigate runoff into the storm sewer system. The first of these was a floor drain sump located on the eastern part of the Site (**Figure 2**). The second was a collapsed catch basin where the normal capping method would be ineffective. The third location was an oil-water separator (OWS) that had previously been covered by a heavy steel sheet (**Figure 2**). The oily water present in this separator was pumped out and containerized, and it will be disposed following waste characterization. Pictures of the floor drain sump and OWS are provided in **Appendix C**. These activities concluded by October 26, 2018.

2.2 Bulkhead Installations

A 54-inch-diameter Ingham County storm main flows through the western portion of Plant 3 (**Figure 2**). Based on the proximity of the Ingham County storm drain to the RACER storm sewer system and available site sewer maps, there was a potential for connection points between the Ingham County storm main and the RACER storm sewer system. Blocking of the East and West Mains presented the possibility, although unlikely, that impacted sewer water could back up into the Ingham County main

during major storm events. To eliminate this possible pathway for PFAS-impacted storm water discharges, concrete bulkheads were installed in the downstream inverts of two manholes.

Starting October 4, 2018, concrete bulkheads (**Figure 4**) were installed in two pipes that could have been potential connection points to a 54-inch-diameter Ingham County Main on the western side of the Site. Located in manholes P3-MH-1-7 and P3-MH-1-10 (**Figure 3**), these bulkheads will prevent stormwater in the PFAS-impacted area of the Site from potentially backing up into the Ingham County system.

Temporary inflatable plugs were installed at five manholes or catch basins identified as contributing to the flow in the manholes in which work would be conducted (**Appendix C**). After verifying that flows were mitigated, water was pumped out of the manholes to prepare the pipes for the bulkheads. As work continued, bypass pumps with float switches were configured to continually pump any infiltrating water from the manholes into downstream structures, with the approval of MDEQ per the email dated September 25, 2018.

Bulkheading began by performing confined space entries to clean and roughen the interior of the specified pipes. These entries were made in accordance with appropriate contractor health and safety standards. Once the pipe interior was suitable for bulkhead installation, personnel cut a rear wooden sacrificial form tailored to the shape of the pipe, fit it into the pipe, and braced it with 2-inch-by-4-inch wooden beams. With the form in place, holes were drilled into the concrete for rebar to be installed. This rebar was secured in the holes with epoxy. With the rebar in place, a waterstop ring was installed around the circumference of the pipe to create a more watertight seal (**Figure 4**). A photo of this configuration is provided in **Appendix C**.

A minor design change (**Figure 4**) was implemented to create a more effective bulkhead and ease the installation process. Following cleaning and roughing of the sewer pipes, the interior surfaces of the concrete pipes were still uneven, and it was decided that creating a watertight concrete seal would be difficult with the original design. As a result, to create a more effective bulkhead (which is shown on **Figure 4**)**,** the outer wooden form was moved approximately 6 inches out of the pipe and into the manhole. This outer form extended above and below the pipe so that concrete could completely envelop the invert (**Figure 4**). Pouring the concrete around the entirety of the pipe opening reduces the possibility of leakage. Extending the outer form into the structure also made it safer to pour the concrete, as it could be directed into the form directly from the surface. The concrete was poured into the forms on October 10, 2018. As a result of the design change, it was determined that the polyurethane grout injections were unnecessary and would risk damaging the unreinforced concrete portion of the bulkhead seal.

Slump and strength testing were performed on the concrete, and the results are provided in **Appendix B**. The bulkheads met or exceeded the design specifications including the design strength of 5,000 pounds per square inch (psi), and the temporary plugs were removed on October 26.

2.3 Blocking East and West Mains: CLSM Monoliths

Two CLSM monoliths were constructed to block flow through the East and West Mains (**Figure 3**). The advantage of monoliths is that they block flow through both the pipes and through the permeable pipe bedding material. Based on a pre-construction site walk, it was determined that both excavations should take place north of the existing internal property fence for ease of equipment access, downstream of P3-

MH-1-1N and P3-MH-2-1N for the West and East Mains, respectively (**Figure 3**). Monoliths in these locations prevent the flow of impacted water from approaching the northern property boundary.

Excavation began on October 16, 2018, using the benching method to expose the mains where the monoliths were to be installed. Dewatering was not necessary at any point during the excavation, and no evidence of impacted soil or groundwater was noted. After the pipes were located (each was at about 20 feet bgs) and the majority of site catch basins were capped, temporary inflatable plugs were installed in manholes P3-MH-1-1N and P3-MH-2-1N to block the flow of water into the excavation areas (**Appendix C**). As expected, some water was observed collecting in these manholes behind the temporary plugs, so in order to mitigate water that could endanger personnel and excavation stability in the case of plug failure, bypass pumping was implemented to the property outfall during the intrusive work, with approval from the MDEQ in their email dated September 25, 2018.

Once the pipes were exposed and water flow was adequately managed, the exposed storm mains were severed, and pipe sections were removed from each. Plywood sacrificial forms were constructed and reinforced with sandbags. With these forms in place, the excavation was continued to 3 feet lower than the protruding pipes (**Figure 5**). On October 22, flowable fill (i.e., CLSM) was poured into the excavation 3 feet below and above the pipes (**Appendix C**). This fill was consolidated with a vibrator wand to minimize air formation of bubbles.

Flowable fill samples were collected and tested for strength, flow consistency, unit weight, cement content, air content, and hydraulic conductivity. Both monoliths met their design strength of 100 psi within 7 days (**Appendix B**). The average hydraulic conductivity results of 2.01E-05 and 1.32E-05 centimeters per second (cm/s) for the East and West monoliths, respectively, are lower than the expected conductivity of the native silty sand soil (**Appendix B**). Following an inspection to look for signs of cracking, settling, or imperfect seals, the monoliths were backfilled by compacting the native soil in 6-inch lifts. Native topsoil was used for surface restoration. The excavation areas were hydroseeded and covered with hay the following week. After verifying that flow from the two main interceptors had been stopped by visual inspection, the property outfall manhole was power-washed, and stormwater remaining in the manhole was pumped out.

3 MONITORING

This section describes the monitoring to verify the effectiveness of the storm sewer modifications in meeting remediation objectives and minimizing unwanted chemistry, hydraulic, or drainage impacts. This includes water quality monitoring, evaluations of runoff to adjacent properties, and groundwater elevation measurements. Water chemistry in the groundwater in the area will continue to be monitored in accordance with the MDEQ-approved Interim Groundwater Monitoring Plan (IGMP; Arcadis 2017b).

3.1 Performance Monitoring

The property Outfall P3-MH-NE manhole will be inspected quarterly for the first year following installation to evaluate remedy effectiveness. The Work Plan specified confirmatory sampling for PFAS in manhole P3-MH-NE approximately 3 months following construction to verify that impacted storm water is not reaching this manhole. The first quarterly inspection is scheduled for the end of January 2018, and the outfall will be sampled if discharge is observed.

The following preliminary inspections, observations, and sampling were completed at the property outfall manhole P3-MH-NE in late 2018 and early 2019 following heavy rains and snowmelt:

- November 7, 2018 - a visual inspection was completed. Observations included minor inflow from a 2-inch-diameter pipe connected to the demolished clarifier structure and minor off-site discharge through the 54-inch main.
- November 13, 2018 - a visual inspection was completed. Observations included minor inflow from the 2-inch-diameter clarifier pipe and minor off-site discharge through the 54-inch main.
- December 4, 2018 - a visual inspection was completed. Observations included minor inflow from the 2-inch-diameter clarifier pipe and the East Main and minor off-site discharge through the 54-inch main. The West Main cannot be observed from the ground surface. A preliminary sample for PFAS was collected from the manhole sump. Sample results were 21.9 ng/L PFOS and 1.6 ng/L PFOA (**Appendix D**).
- January 9, 2019 - a visual inspection was completed. Observations included minor inflow from the East Main and minor discharge off site through the 54-inch main.

Pictures of the property outfall following construction are provided in **Appendix E**.

Additional sampling will be completed when dry weather conditions occur based on the results of the January 2019 sampling event and based on review of the data from the next sampling event, but at a minimum, one PFAS sample will be collected from P3-MH-NE per year during the next 3 years if discharge from the outfall is observed. All sampling data will be collected in accordance with the Site-specific Quality Assurance Project Plan (QAPP; Arcadis 2011), the Arcadis Technical Guidance Instructions (TGI) for PFAS Sampling (Arcadis 2017c), and the Arcadis Job Safety Analysis (JSA) for storm sewer manhole sampling.

3.2 Runoff Monitoring

Increased surface ponding was expected on the Site following construction because the catch basins were capped, and the concrete slab allows limited infiltration. Post-construction runoff monitoring was performed to ensure that modifications did not create unacceptable runoff onto neighboring properties. Field personnel mobilized to the Site on November 7 and November 13, 2018 to assess site conditions following significant precipitation events. While increased ponding was evident at low points on the Site, unacceptable runoff was not noted on the RACER property or leaving the RACER property and entering adjacent properties. Photos of these inspections are provided in **Appendix E**. Based on the inspections, runoff mitigation measures are not required at this time. Per the IM Workplan (Arcadis 2018a), two more runoff inspections will be performed to document drainage conditions following rainfall events.

3.3 Water Level and Chemistry Monitoring

The overall expected rise in groundwater level (or potentiometric surface) at Plant 3 due to bulkheading will be monitored. Pre-construction gauging of monitoring wells in the plume area was completed on October 1, 2018. These monitoring wells will be gauged periodically to evaluate changes in water levels over time.

Five shallow monitoring wells were installed in the former plating area and near property boundaries as part of the MDEQ-approved delineation scope of work completed in June 2018. The results, outlined in the RACER Lansing Plant 3 PFAS Summary Report (Arcadis 2018b), led to the recommendation of installation of 16 monitoring wells around the perimeter of the PFAS groundwater impacts. These monitoring wells, mostly installed in December 2018, will be used for sentinel monitoring and to evaluate PFAS plume stability, including water level changes and PFAS concentration trends. Monitoring wells within the impacted areas will also be used to evaluate geochemical and hydraulic conditions as part of remedy evaluation.

4 CONCLUSION

In November 2018, RACER completed modifications to the Plant 3 storm sewer system to eliminate PFAS-impacted storm water discharges to an off-site storm sewer owned by the City of Lansing. Modifications included capping of catch basins and filling of drainage structures, installation of two bulkheads, and installation of two CSLM monoliths. Initial site inspections indicate that the modifications have been effective at significantly mitigating the volume and concentration of discharge of PFAS-impacted water off site through the site storm sewer system. No adverse stormwater runoff to the surrounding properties has been observed. Post-implementation performance monitoring will continue into 2019 to verify that the IM objective continues to be met.

5 REFERENCES

Arcadis. 2011. Quality Assurance Project Plan – Lansing Plants 2, 3, and 6, Industrial Land, Lansing, Michigan. August 2011.

Arcadis 2017a. Plant 3 PFAS CSM and Potential Corrective Measures. January 28.

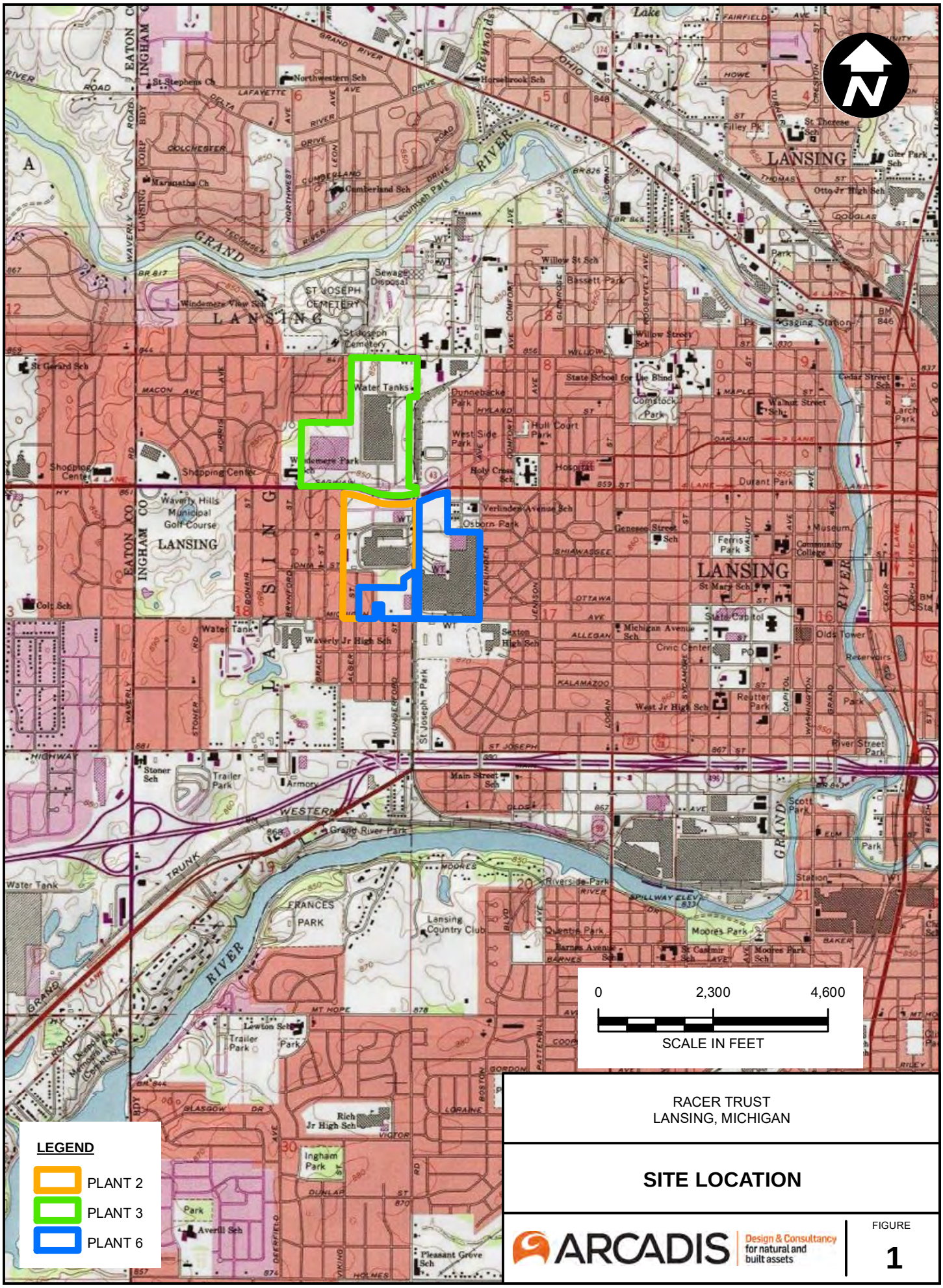
Arcadis 2017b. Revised Interim Groundwater Monitoring Work Plan, RACER Trust Plants 2, 3, & 6, Lansing, Michigan. January 30.

Arcadis, 2017c. Poly- and Perfluorinated Alkyl Substance (PFAS) Field Sampling Guidance. April 27

Arcadis, 2018a. Plant 3 Storm Sewer Modifications Interim Measures Work Plan. May 24.

Arcadis, 2018b. Plant 3 PFAS Summary Report. November 2.

FIGURES



RACER TRUST
LANSING, MICHIGAN

SITE LOCATION

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FIGURE
1

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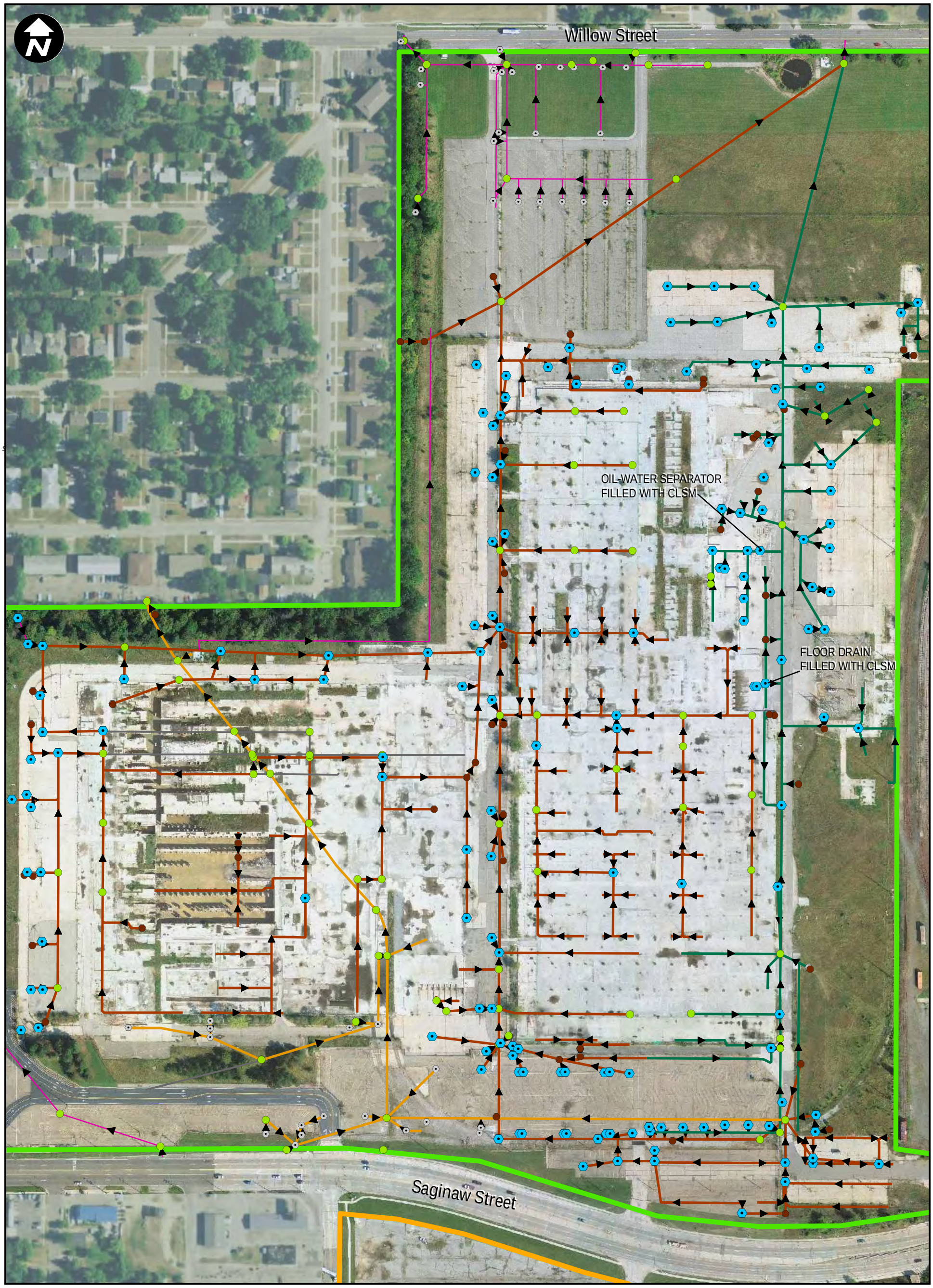

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STRUCTURE TYPE
- MANHOLE
- CATCH BASIN NOT CAPPED (1)
- CATCH BASIN NOT CAPPED (2)
- CAPPED CATCH BASIN

DRAINAGE NETWORKS
- ABANDONED
- OTHER
- COUNTY MAIN
- EAST MAIN
- WEST MAIN
- PLANT 2
- PLANT 3

0 100 200
SCALE IN FEET

NOTES:
ALL PIPE AND STRUCTURE LOCATIONS ARE APPROXIMATE
DRAINAGE NETWORKS DISPLAY PRIMARY
LATERALS AND ALL INTERCEPTORS
ARROWS DENOTE FLOW DIRECTION

CLSM: CONTROLLED LOW-STRENGTH MATERIAL

(1) CATCH BASIN FLOWS INTO STORM INTERCEPTOR
UNAFFECTED BY PROJECT SCOPE
(2) STRUCTURE WAS NOT LOCATED, WAS A TYPE
OTHER THAN A CATCH BASIN, OR WAS ALREADY PLUGGED

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Site Layout and Catch Basin Cap Locations

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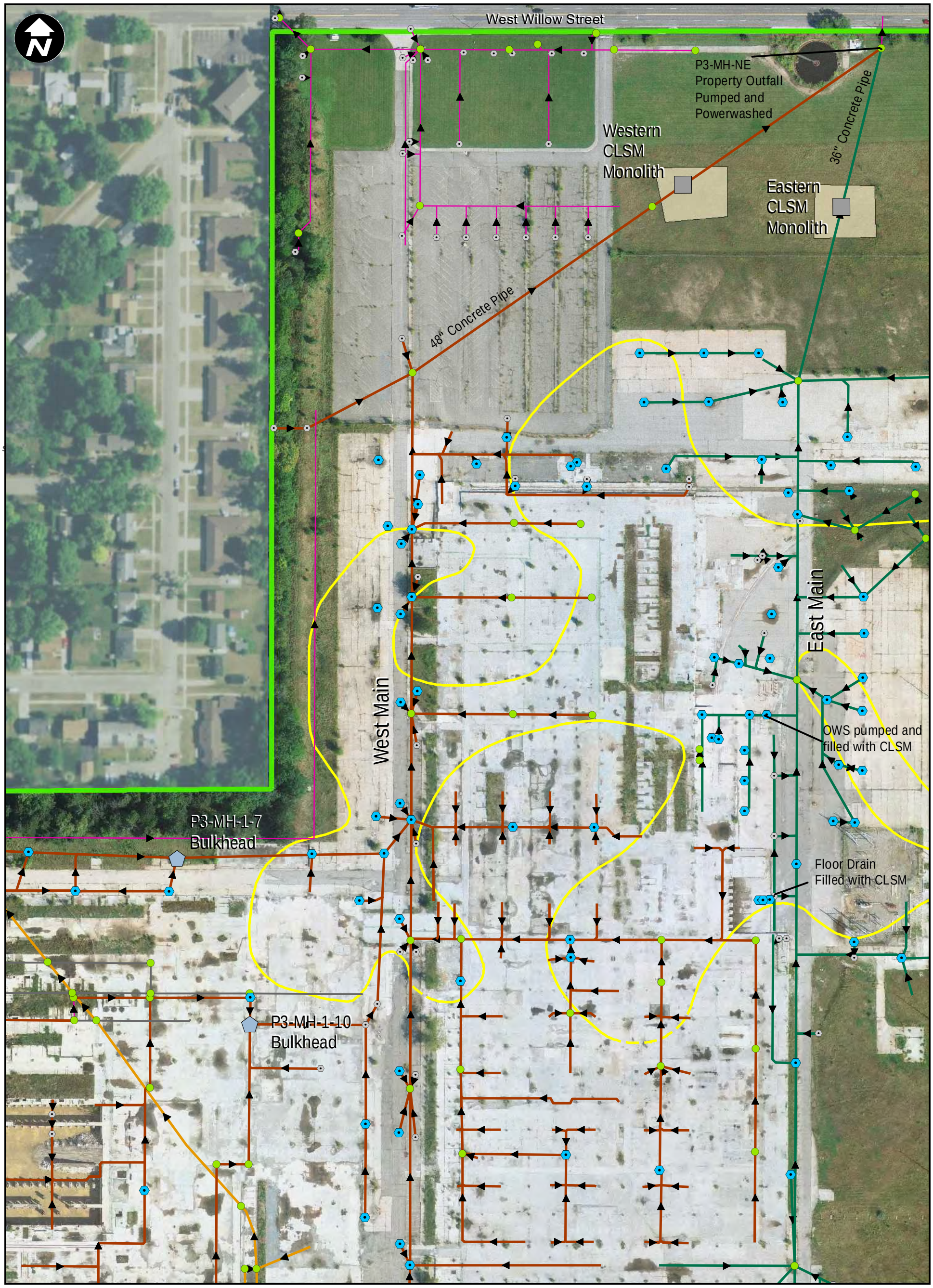
FIGURE 2



MODIFICATION TYPE
- CLSM MONOLITH
- BULKHEAD

STRUCTURE TYPE
- MANHOLE
- CATCH BASIN NOT CAPPED
- CAPPED CATCH BASIN

DRAINAGE NETWORKS
- ABANDONED
- OTHER
- COUNTY MAIN
- EAST MAIN
- WEST MAIN

- PFOS 12ng/L Contour
- PFOS 12ng/L Inferred
- APPROXIMATE EXCAVATION BOUNDARIES
- PLANT 3

NOTES:
ALL PIPE AND STRUCTURE LOCATIONS ARE APPROXIMATE
DRAINAGE NETWORKS DISPLAY PRIMARY
LATERALS AND ALL INTERCEPTORS
ARROWS DENOTE FLOW DIRECTION
CLSM: CONTROLLED LOW STRENGTH MATERIAL (FLOWABLE FILL)
OWS: OIL-WATER SEPARATOR

0 200 400
SCALE IN FEET

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Site Layout for Plant 3
Storm Sewer Modifications

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FIGURE
3

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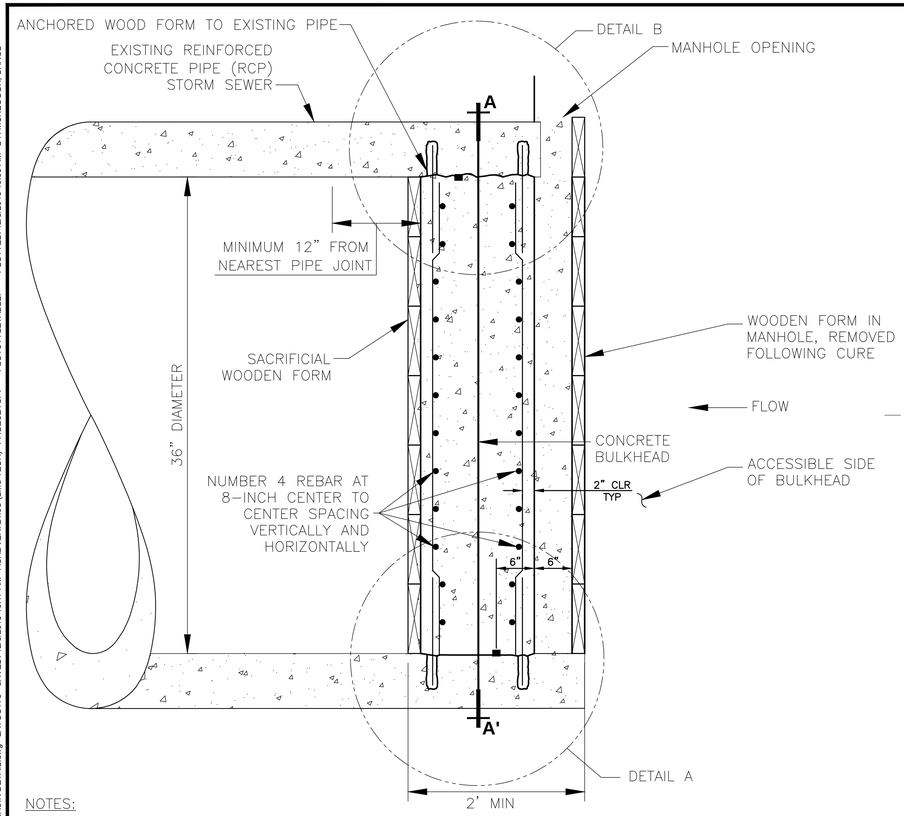
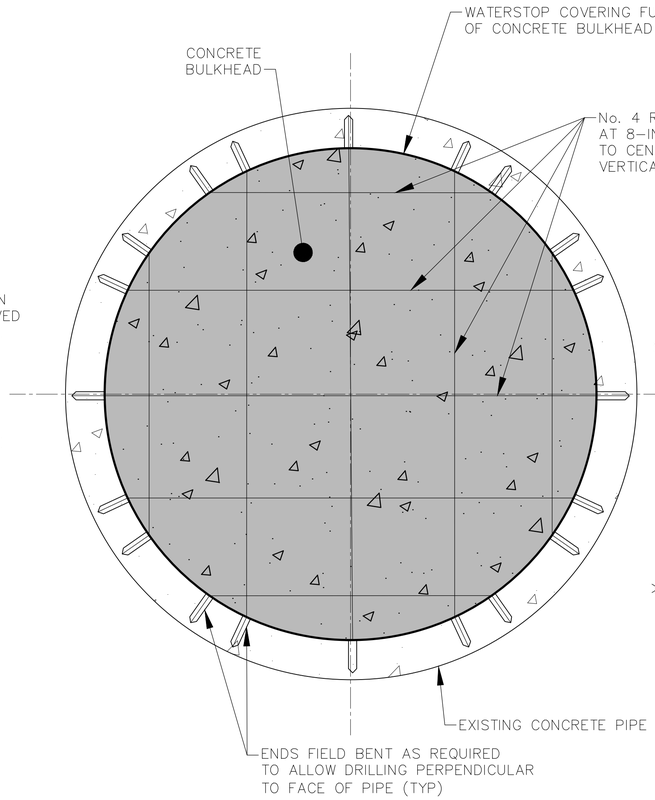


NOTES:

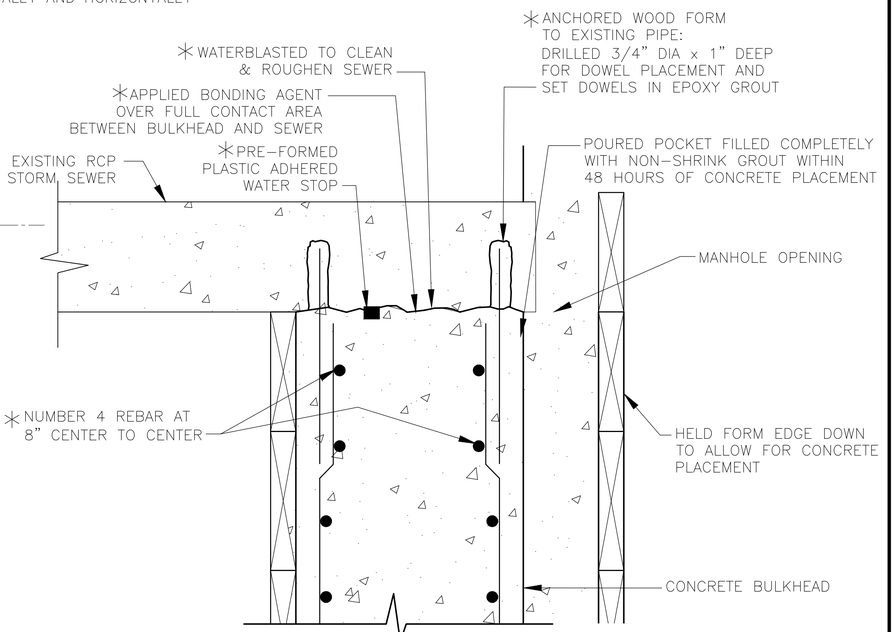
✳ FULL CIRCUMFERENCE OF BULKHEAD.

TYPICAL BULKHEAD SECTION FOR UP TO 66" PIPE

1/2" = 1'-0"

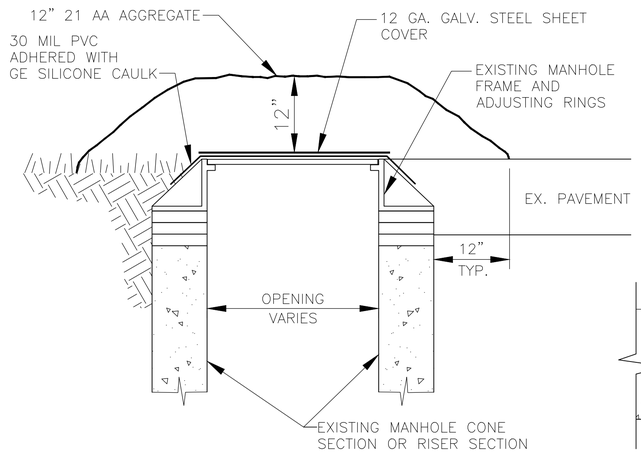


SECTION A-A'



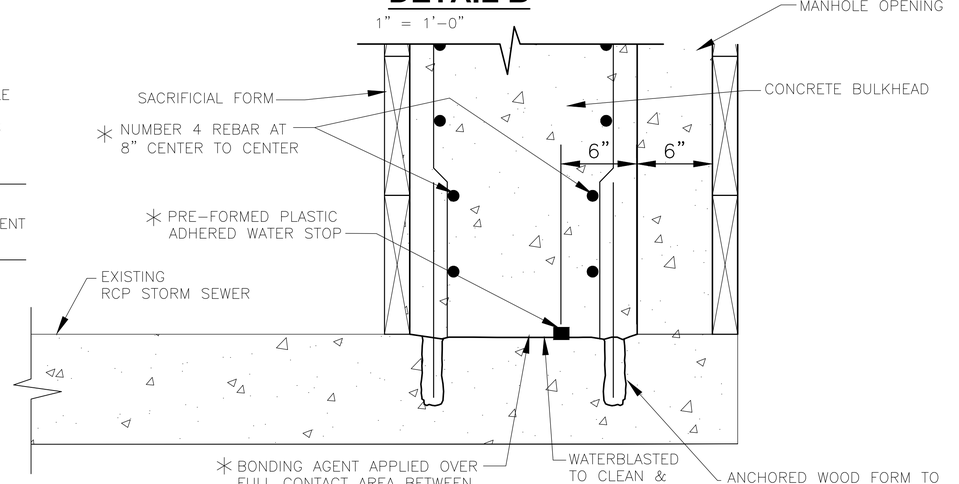
DETAIL B

1" = 1'-0"



CATCH BASIN CAP DETAIL "A"

1/2" = 1'-0"



DETAIL A

1" = 1'-0"

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No.	Date	Revisions	By	Ckd

Professional Engineer's Name

Professional Engineer's No.

State	Date Signed	Project Mgr.
MI		R.CHRISTENSEN
Designed by R.CHRISTENSEN	Drawn by A.SANCHEZ	Checked by

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ARCADIS OF MICHIGAN, LLC.

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RCP BULKHEAD SECTION AND CATCH BASIN CAP DETAILS

ARCADIS Project No.
B0064479.2018.03600

Date
NOVEMBER 2018

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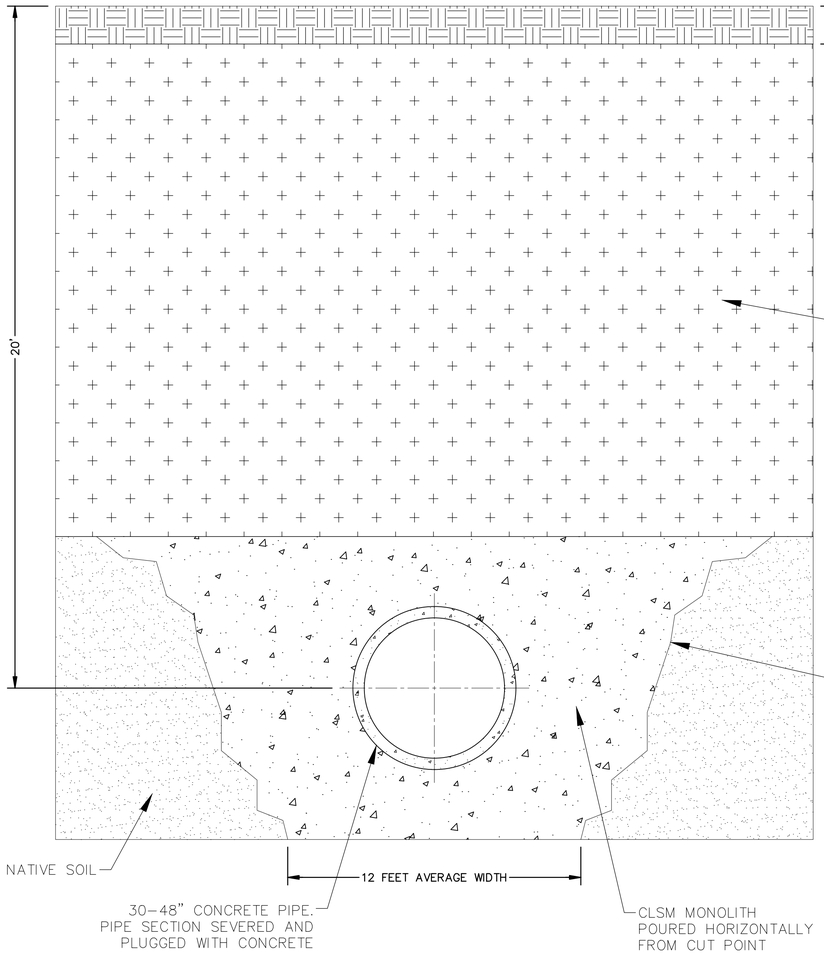
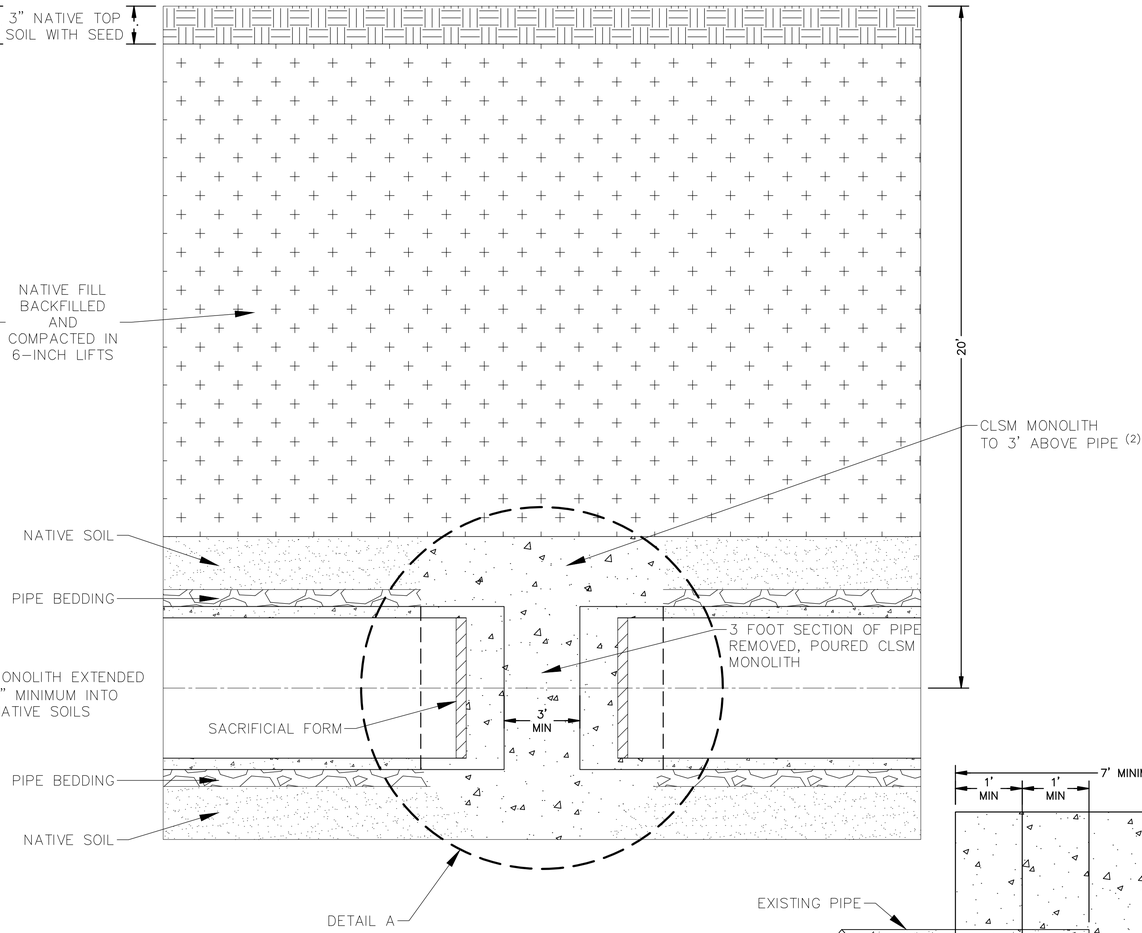


FRONT VIEW



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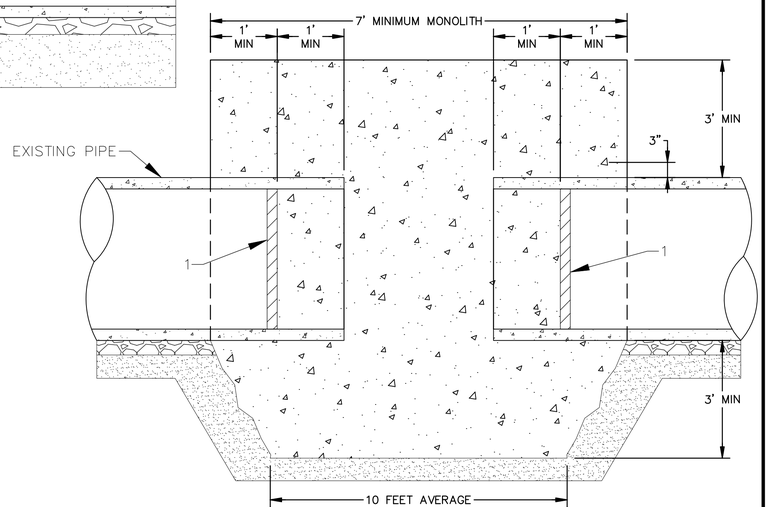

1. SACRIFICIAL FORM

DETAIL A

NOTES:

1. DRAWING NOT TO SCALE.
2. CLSM = CONTROLLED LOW STRENGTH MATERIAL (FLOWABLE FILL).

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name		
Professional Engineer's No.		
State: MI	Date Signed	Project Mgr.: R.CHRISTENSEN
Designed by: J. SALING	Drawn by: A.SANCHEZ	Checked by

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CLSM MONOLITH DETAILS

ARCADIS Project No.
B0064479.2018.03600

Date
NOVEMBER 2018

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5

APPENDIX A

Field Notes

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Daily Log

Project No.: B0064479.2018.03600 Page 1 of 1

Site Location: Lansing, MI

Prepared By: Daniel Stockard

Date	Time	Description of Activities
10/1/18	8:40	Arcadis: D. Stockard, M. Samp, A. Lorenz. Purpose: Bulkheading kickoff PPE: Level D, rain gear. Equipment: Geotech WLM. Weather: Lots of rain, 50s
	9:00	Began site walk-through to review work plan and schedule.
	10:30	Wrapped up site walk, A. Lorenz off site. Headed to baggage shed to check on system.
	11:15	JSS moving sand that had been dumped erroneously by Consumers Energy delivery truck.
	12:45	Prepped for gauging.
	13:00	Began gauging.
	14:30	Finished gauging. Headed over to where JSS was staging equipment for capping.
	14:45	Sealed up CB125B, CB123A, & MH243.
	15:30	Sealed up CB123, MH-245. Have not added gravel to any of them yet.
	17:00	Finished up bags, gravel on CBs. Locked up Arcadis off site.

10/1/18

Document Control Number:TGM - _____

TGM + project number plus date as follows: xxxxxxxx.xxxx.xxxxx - dd/mm/year

ARCADIS Design & Consultancy for natural and built assets

TAILGATE HEALTH & SAFETY MEETING FORM

This form documents the tailgate meeting conducted in accordance with the Project HASP. Personnel who perform work operations on-site during the day are required to attend this meeting and to acknowledge their attendance, at least daily

Project Name: RACER Lansing			**Project Location:** Lansing MI
Date: 10/2/18	**Time:** 10:00	**Conducted by:** D. Stockard	**Signature/Title:** Daniel Stockard
Client: RACER		**Client Contact:** D. Favero	**Subcontractor companies:** JSS

TRACKing the Tailgate Meeting

Think through the Tasks (list the tasks for the day):

1 Kickoff	3	5
2 Plug installation	4	6

Other Hazardous Activities - Check the box if there are any other Arcadis, Client or other party activities that may pose hazards to Arcadis operations ☐ If there are none, write "None" here: None

If yes, describe them here: _____

How will they be controlled? _____

Prework Authorization - check activities to be conducted that require permit issuance or completion of a checklist or similar before work begins:

	Doc #		Doc #		Doc #
☒ Not applicable		☐ Working at Height		☐ Confined Space	
☐ Energy Isolation (LOTO)		☐ Excavation/Trenching		☐ Hot Work	
☐ Mechanical Lifting Ops		☐ Overhead & Buried Utilities		☐ Other permit	

Discuss following questions (for some review previous day's post activities). **Check if yes :**

☐ Incidents from day before to review?	☐ Lessons learned from the day before?	☐ Topics from Corp H&S to cover?
☐ Any corrective actions from yesterday?	☐ Will any work deviate from plan?	☐ Any Stop Work Interventions yesterday?
☒ JSAs or procedures are available?	☒ Field teams to "dirty" JSAs, as needed?	☐ If deviations, notify PM & client
☒ Staff has appropriate PPE?	☒ Staff knows Emergency Plan (EAP)?	☒ All equipment checked & OK?
		☒ Staff knows gathering points?

Comments: _____

Recognize the hazards (check all those that are discussed) (Examples are provided) and **Assess** the Risks (Low, Medium, High - circle risk level) - Provide an overall assessment of hazards to be encountered today and briefly list them under the hazard category.

☒ Gravity (i.e., ladder, scaffold, trips) (L M H) slab	☒ Motion (i.e., traffic, moving water) (L M H) construction equip.	☐ Mechanical (i.e., augers, motors) (L M H)
☐ Electrical (i.e., utilities, lightning) (L M H)	☐ Pressure (i.e. gas cylinders, wells) (L M H)	☒ Environment (i.e., heat, cold, ice) (L M H) rain
☐ Chemical (i.e., fuel, acid, paint) (L M H)	☒ Biological (i.e., ticks, poison ivy) (L M H) ticks	☐ Radiation (i.e., alpha, sun, laser) (L M H)
☒ Sound (i.e. machinery, generators) (L M H)	☐ Personal (i.e. alone, night, not fit) (L M H)	☒ Driving (i.e. car, ATV, boat, dozer) (L M H) to/from site

Continue TRACK Process on Page 2

TAILGATE HEALTH & SAFETY MEETING FORM - Pg. 2

Control the hazards (Check all and discuss those methods to control the hazards that will be implemented for the day): Review the HASP, applicable JSAs, and other control processes. Discuss and document any additional control processes.

- [x] **STOP WORK AUTHORITY** (Must be addressed in every Tailgate meeting - (*See statements below*)
- [ ] Elimination
- [ ] Engineering controls
- [x] General PPE Usage
- [x] Personal Hygiene
- [x] Emergency Action Plan (EAP)
- [x] JSA to be developed/used ***(specify)***
- [ ] Substitution
- [ ] Administrative controls
- [ ] Hearing Conservation
- [ ] Exposure Guidelines
- [ ] Fall Protection
- [ ] TIP conducted ***(specify job/JSA)***
- [ ] Isolation
- [ ] Monitoring
- [ ] Respiratory Protection
- [x] Decon Procedures
- [x] Work Zones/Site Control
- [ ] Traffic Control
- [ ] Other ***(specify)***

Signature and Certification Section - Site Staff and Visitors

Name/Company/Signature	Initial & Sign in Time	Initial & Sign out Time	I have read and understand the HASP
Daniel Stockard / Arcadis	DS 1010		✓
Maria Samp / Arcadis	MRS 1000		✓

Important Information and Numbers

All site staff should arrive fit for work. If not, they should report to the supervisor any restrictions or concerns.

In the event of an injury, employees will call WorkCare at **1.888-449-7787** and then notify the field supervisor who will then notify the Project or Task Manager.

In the event of a motor vehicle accident, employees will notify the field supervisor who will then notify the Project or Task Manager.

In the event of a utility strike or other damage to property of a client or 3rd party, employees will immediately notify the field supervisor, who will then immediately notify the Project or Task Manager.

Visitor Name/Co - not involved in work

	In	Out

I will STOP the job any time anyone is concerned or uncertain about health & safety or if anyone identifies a hazard or additional mitigation not recorded in the site, project, job or task hazard assessment.

I will be alert to any changes in personnel, conditions at the work site or hazards not covered by the original hazard assessments.

If it is necessary to STOP THE JOB, I will perform TRACK, and then amend the hazard assessments or the HASP as needed.

I will not assist a subcontractor or other party with their work unless it is absolutely necessary and then only after I have done TRACK and I have thoroughly controlled the hazard.

Post Daily Activities Review - Review at end of day or before next day's work (Check those applicable and explain:)

- [ ] Lessons learned and best practices learned today:
- [ ] Incidents that occurred today:
- [ ] Any Stop Work interventions today?
- [ ] Corrective/Preventive Actions needed for future work:
- [ ] Any other H&S issues:

Keep H&S 1st in all things

WorkCare - 1.888.449.7787

ARCADIS

Water-Level Measurement Form

Project No.: B0064479 2018.00603
Site Location: Lansing, MI
Instrument Model: —

Field Personnel: D. Stockard, M. Samp
Date: 10/1/18
Instrument Serial No.: —

Well Number	Time	W.L. Measurements TD (feet)	DTW (feet)	DTP (feet)	Comments Well Locked	Lock Condition	Other Comments
MW-18-92	1300	30.12	20.77	—	Y	G	—
P3-SB-07	1310	19.04	8.12	—	Y	G	—
MW-18-89	1315	15.65	6.05	—	Y	G	—
MW-18-90	1320	23.28	10.25	—	Y	G	—
CH-14-RO	1335	14.84	6.45	—	Y	G	—
UNK-15	1400	15.44	2.72	—	Y	G	—
MW-04	1410	15.72	5.21	—	Y	G	—
MW-05	1415	15.21	5.04	—	Y	G	—
MW-06	1430	11.55	4.03	—	Y	G	—
UNK-9	1425	15.28	2.33	—	U	B	no [redacted] cover
UNK-10	1430	15.35	2.88	—	U	B	no [redacted] cover or cap
MW-18-91	1350	15.04	3.59	—	Y	G	—
P3-SB-28	1345	10.36	3.69	—	Y	G	—
MW-14-65	1340	13.33	6.35	—	Y	G	—
MW-12-19	—	—	—	—	—	—	could not locate - dirt pile
MW-18-88	1435	15.03	5.19	—	Y	G	—

W.L. Water Level
TD Total Depth
DTW Depth To Water
DTP Depth To Product

ARCADIS Design & Consultancy for natural and built assets

Daily Log

Project No.: B0064479.2018.03600 Page 1 of 3

Site Location: Lansing, MI

Prepared By: Daniel Stockard

Date	Time	Description of Activities
10/2/18	6:45	D. Stockard on site, JSS arriving. Unlocked gate, checked in w/ Aaron.
		Purpose: Bulkheading work (capping catch basins, bypass pumping, temporary plug installation.)
	6:50	Conducted H&S tailgate. Weather: Overcast, drizzling (rained heavily last night), PPE: Level D Contractor: JSS.
	7:15	JSS finished up their H&S meeting. They're waiting on pumps to be delivered for bypass pumping.
	7:20	Headed to biosparge system to address power failure alarm.
	8:30	Back on plant 3. Frac tank has been delivered. Crew is waiting on supplies for capping.
	8:45	Moved to get aggregate over CB123A
	9:00	While inspecting the previously installed caps, noticed a slight sheen on the water around them. Headed to stockpile, and noticed sheen on water pooled up down from it (see pictures), got closer to pile and noticed strong odor emanating from it. Informed Aaron w/ JSS, they inspected it and concured it was anomalous. JSS confirmed the sheen was not coming from the skid steer. Developed a plan to contain impacts and remedy the situation. Informed Andrew Lorenz and agreed that the course of action

ARCADIS | Design & Consultancy for natural and built assets

Daily Log

Project No.: B0064479.2018.03600 Page 2 of 3

Site Location: Lansing, MI

Prepared By: Daniel Stockard

Date	Time	Description of Activities
		Will include booms around the piles, vacuuming impacted water (that w/ sheen), removing the ~~impacts~~ gravel from the site.
	10:00	Headed to Geotech to pick up a PID.
	10:45	Back on site, got reading on fill. No hits on the PID. Informed A. Lorenz, and discussed situation w/ R. Christensen as well. Sam Solomon stopped by to check on what JSS was doing. I let him know we'd be out here for the next month or so.
	11:00	S. Solomon off site.
	11:40	JSS has booms around the limestone piles, will set tarps on them if rain appears in the forecast. Brought loader on site waiting for truck and vac truck to remove stone and impacted water, respectively. Waiting on those to show up.
	13:40	Vac truck (Environmental waste & Recovery) Barry, on site to vac up water around caps.
	14:00	Sucked water down by the capped catch basins.
		Truck arrived on site and they've began loading it.
	14:30	Updated A. Lorenz on progress

ARCADIS | Design & Consultancy for natural and built assets

Daily Log

Project No.: B0064479.2018.03600 Page 3 of 3

Site Location: Lansing, MI

Prepared By: Daniel Stockard

Date	Time	Description of Activities
	15:00	Vac truck off site, will have to unload and come back for more. Crew is working on removing gravel that was already placed on caps.
	16:00	Vac truck back on site. Sprayed down and vacuumed up sheen areas around where piles of 21AA were. Then moved to area where caps were to spray it down and vac it up. No sheen visible in areas anymore
	17:30	D. Stockard off site.

Daniel Stockard
10/2/18

Document Control Number:TGM - _____
TGM + project number plus date as follows: xxxxxxxx.xxxx.xxxxx - dd/mm/year

ARCADIS Design & Consultancy for natural and built assets

TAILGATE HEALTH & SAFETY MEETING FORM

This form documents the tailgate meeting conducted in accordance with the Project HASP. Personnel who perform work operations on-site during the day are required to attend this meeting and to acknowledge their attendance, at least daily.

Project Name: RACER Lansing			**Project Location:** Lansing MF
Date: 10/2/18	**Time:** 6:50	**Conducted by:** D. Stockard	**Signature/Title:**
Client: RACER		**Client Contact:** D. Favero	**Subcontractor companies:** JSS

TRACKing the Tailgate Meeting

Think through the Tasks (list the tasks for the day):

1 Cap catch basins
2 Construction observation
3 _____
4 _____
5 _____
6 _____

Other Hazardous Activities - Check the box if there are any other Arcadis, Client or other party activities that may pose hazards to Arcadis operations ☐ If there are none, write "None" here: None

If yes, describe them here: _____

How will they be controlled? _____

Prework Authorization - check activities to be conducted that require permit issuance or completion of a checklist or similar before work begins:

	Doc #		Doc #		Doc #
☒ Not applicable		☐ Working at Height		☐ Confined Space	
☐ Energy Isolation (LOTO)		☐ Excavation/Trenching		☐ Hot Work	
☐ Mechanical Lifting Ops		☐ Overhead & Buried Utilities		☐ Other permit	

Discuss following questions (for some review previous day's post activities). **Check if yes :**

☐ Incidents from day before to review?	☐ Lessons learned from the day before?	☐ Topics from Corp H&S to cover?
☐ Any corrective actions from yesterday?	☐ Will any work deviate from plan?	☐ Any Stop Work Interventions yesterday?
☒ JSAs or procedures are available?	☒ Field teams to "dirty" JSAs, as needed?	☒ If deviations, notify PM & client
☒ Staff has appropriate PPE?	☒ Staff knows Emergency Plan (EAP)?	☒ All equipment checked & OK?
		☒ Staff knows gathering points?

Comments: _____

Recognize the hazards (check all those that are discussed) (Examples are provided) and **A**ssess the Risks (Low, Medium, High - circle risk level) - Provide an overall assessment of hazards to be encountered today and briefly list them under the hazard category.

☒ Gravity (i.e., ladder, scaffold, trips) (L (M) H) Open manholes	☒ Motion (i.e., traffic, moving water) (L) M H)	☐ Mechanical (i.e., augers, motors) (L M H)
☐ Electrical (i.e., utilities, lightning) (L M H)	☐ Pressure (i.e. gas cylinders, wells) (L M H)	☒ Environment (i.e., heat, cold, ice) (L M H) rain
☒ Chemical (i.e., fuel, acid, paint) (L) M H) PFAS	☐ Biological (i.e., ticks, poison ivy) (L M H)	☐ Radiation (i.e., alpha, sun, laser) (L M H)
☒ Sound (i.e., machinery, generators) (L) M H) Construction equipment	☐ Personal (i.e. alone, night, not fit) (L M H)	☒ Driving (i.e. car, ATV, boat, dozer) (L M (H)

Continue TRACK Process on Page 2

TAILGATE HEALTH & SAFETY MEETING FORM - Pg. 2

Control the hazards (Check all and discuss those methods to control the hazards that will be implemented for the day): Review the HASP, applicable JSAs, and other control processes. Discuss and document any additional control processes.

- [x] **STOP WORK AUTHORITY** (Must be addressed in every Tailgate meeting - (*See statements below*)
- [ ] Elimination
- [ ] Engineering controls
- [x] General PPE Usage
- [x] Personal Hygiene
- [x] Emergency Action Plan (EAP)
- [x] JSA to be developed/used ***(specify)***
- [ ] Substitution
- [ ] Administrative controls
- [ ] Hearing Conservation
- [ ] Exposure Guidelines
- [ ] Fall Protection
- [ ] TIP conducted ***(specify job/JSA)***
- [x] Isolation
- [ ] Monitoring
- [ ] Respiratory Protection
- [x] Decon Procedures
- [x] Work Zones/Site Control
- [ ] Traffic Control
- [ ] Other ***(specify)***

Signature and Certification Section - Site Staff and Visitors

Name/Company/Signature	Initial & Sign in Time	Initial & Sign out Time	I have read and understand the HASP
Dasie/Stockard/Arcadis/Daniel Stockard	DS 6:50		✓

Important Information and Numbers

All site staff should arrive fit for work. If not, they should report to the supervisor any restrictions or concerns.

In the event of an injury, employees will call WorkCare at **1.888-449-7787** and then notify the field supervisor who will then notify the Project or Task Manager.

In the event of a motor vehicle accident, employees will notify the field supervisor who will then notify the Project or Task Manager.

In the event of a utility strike or other damage to property of a client or 3rd party, employees will immediately notify the field supervisor, who will then immediately notify the Project or Task Manager.

Visitor Name/Co - not involved in work

	In	Out

I will STOP the job any time anyone is concerned or uncertain about health & safety or if anyone identifies a hazard or additional mitigation not recorded in the site, project, job or task hazard assessment.

I will be alert to any changes in personnel, conditions at the work site or hazards not covered by the original hazard assessments.

If it is necessary to **STOP THE JOB, I** will perform **TRACK**; and then amend the hazard assessments or the HASP as needed.

I will not assist a subcontractor or other party with their work unless it is absolutely necessary and then only after I have done TRACK and I have thoroughly controlled the hazard.

Post Daily Activities Review - Review at end of day or before next day's work (Check those applicable and explain:)

- [ ] Lessons learned and best practices learned today: _____
- [ ] Incidents that occurred today: _____
- [ ] Any Stop Work interventions today? _____
- [ ] Corrective/Preventive Actions needed for future work: _____
- [ ] Any other H&S issues: _____

Keep H&S 1st in all things

WorkCare - 1.888.449.7787

ARCADIS Design & Consultancy for natural and built assets

Daily Log

Project No.: B0064479.2018.03600 Page 1 of 2

Site Location: Lansing, MI

Prepared By: Daniel Stockard

Date	Time	Description of Activities
10/3/18	6:50	Arrived on site, D. Stockard, unlocked gate and let JSS on site. Purpose: Project Representat PPE: Level D Weather: Overcast, 50s Equipment: Geotech PID & 4-gas meter. Contractors: JSS.
	7:00	Conducted H&S tailgate. Checked in w/ Aaron and discussed plan for the day.
	7:20	JSS is going to return loader back to rental place. Headed to Home Depot for supplies.
	8:10	Back on site, JSS returning loader, Aaron w/ JSS assessing water levels in temporary plug manholes.
	8:30	JSS prepping for confined space entry
	8:50	JSS went into CB 168 to install plug, but something was wrong w/ their quick connects. Troubleshooting underway.
	9:30	Installed temp plug @ CB 168.
	10:20	Installed temp plug @ P3-MH-1-14
	10:30	Moved to plug P3-MH-1-11 (temporary plug)
	11:00	Installed plug, but had to troubleshoot leaky valve.
	11:30	Plug is fixed & holding air, moved to P3-MH-1-12.
	11:50	JSS entered manhole to install temporary plug.
	12:10	Done installing plug, headed to P3-MH-1-

ARCADIS | Design & Consultancy for natural and built assets

Daily Log

Project No.: B0064479.2018.03600 Page 2 of 2

Site Location: Lansing, MI

Prepared By: Daniel Stockard

Date	Time	Description of Activities
	12:15	Installed temporary plug @ P3-MH-1-13
	12:30	JSS off site for lunch.
	13:10	JSS back on site.
	13:30	Working on putting caps on temp plugs and re-caulking catch basins whose caps were dismantled yesterday. Plan is to begin bulkheading tomorrow.
	14:30	Began marking catch basins that need to be capped.
	15:30	Wrapped up marking around 20 catch basins. Crew wrapped up applying silicone to Pvc liners & steel sheets disturbed by yesterday's events.
	15:40	D. Stockard confirmed no Consumers employees were on site, locked up gate, and mobilized out.

Daniel Stockard
10/3/18

TAILGATE HEALTH & SAFETY MEETING FORM

This form documents the tailgate meeting conducted in accordance with the Project HASP. Personnel who perform work operations on site during the day are required to attend this meeting and to acknowledge their attendance, at least daily.

Project Name: RACER Lansing			**Project Location:** Lansing, MI
Date: 10/3/18	**Time:** 7:06	**Conducted by:** D. Stockard	**Signature/Title:** Daniel Stockard
Client: RACER		**Client Contact:** D. Favero	**Subcontractor companies:** JSS

TRACKing the Tailgate Meeting

Think through the Tasks (list the tasks for the day):

1 Plug upstream manholes
2 materials delivery
3
4
5
6

Other Hazardous Activities - Check the box if there are any other Arcadis, Client or other party activities that may pose hazards to Arcadis operations ☐ If there are none, write "None" here: None

If yes, describe them here:

How will they be controlled?

Prework Authorization - check activities to be conducted that require permit issuance or completion of a checklist or similar before work begins:

	Doc #		Doc #		Doc #
☒ Not applicable		☐ Working at Height		☐ Confined Space	
☐ Energy Isolation (LOTO)		☐ Excavation/Trenching		☐ Hot Work	
☐ Mechanical Lifting Ops		☐ Overhead & Buried Utilities		☐ Other permit	

Discuss following questions (for some review previous day's post activities). **Check if yes :**

☐ Incidents from day before to review?	☐ Lessons learned from the day before?	☐ Topics from Corp H&S to cover?
☐ Any corrective actions from yesterday?	☐ Will any work deviate from plan?	☐ Any Stop Work Interventions yesterday?
☒ JSAs or procedures are available?	☒ Field teams to "dirty" JSAs, as needed?	☒ If deviations, notify PM & client
☒ Staff has appropriate PPE?	☒ Staff knows Emergency Plan (EAP)?	☒ All equipment checked & OK?
		☒ Staff knows gathering points?

Comments:

Recognize the hazards (check all those that are discussed) (Examples are provided) and **Assess** the Risks (Low, Medium, High - circle risk level) - Provide an overall assessment of hazards to be encountered today and briefly list them under the hazard category.

☒ Gravity (i.e., ladder, scaffold, trips) (L (M) H) manholes	☒ Motion (i.e., traffic, moving water) (L M H) skid-steer	☐ Mechanical (i.e., augers, motors) (L M H)	
☐ Electrical (i.e., utilities, lightning) (L M H)	☐ Pressure (i.e. gas cylinders, wells) (L M H)	☒ Environment (i.e., heat, cold, ice) (L) M H	
☒ Chemical (i.e., fuel, acid, paint) (L) M H) PFAS	☐ Biological (i.e., ticks, poison ivy) (L M H)	☐ Radiation (i.e., alpha, sun, laser) (L M H)	
☐ Sound (i.e., machinery, generators) (L M H)	☐ Personal (i.e. alone, night, not fit) (L M H)	☒ Driving (i.e. car, ATV, boat, dozer) (L M (H)	

Continue TRACK Process on Page 2

TAILGATE HEALTH & SAFETY MEETING FORM - Pg. 2

Control the hazards (Check all and discuss those methods to control the hazards that will be implemented for the day): Review the HASP, applicable JSAs, and other control processes. Discuss and document any additional control processes.

- [x] **STOP WORK AUTHORITY** (Must be addressed in every Tailgate meeting - (*See statements below*)

[ ] Elimination	[ ] Substitution	[x] Isolation
[ ] Engineering controls	[ ] Administrative controls	[ ] Monitoring
[x] General PPE Usage	[ ] Hearing Conservation	[ ] Respiratory Protection
[x] Personal Hygiene	[ ] Exposure Guidelines	[x] Decon Procedures
[x] Emergency Action Plan (EAP)	[ ] Fall Protection	[x] Work Zones/Site Control
[x] JSA to be developed/used ***(specify)***	[ ] TIP conducted ***(specify job/JSA)***	[ ] Traffic Control
[ ]	[ ]	[ ] Other ***(specify)***
[ ]	[ ]	[ ]

Signature and Certification Section - Site Staff and Visitors

Name/Company/Signature	Initial & Sign in Time	Initial & Sign out Time	I have read and understand the HASP
Daniel Stockard/ Arcadis Daniel Stockard	DS 7:00		✓

Important Information and Numbers

All site staff should arrive fit for work. If not, they should report to the supervisor any restrictions or concerns.

In the event of an injury, employees will call WorkCare at **1.888-449-7787** and then notify the field supervisor who will then notify the Project or Task Manager.

In the event of a motor vehicle accident, employees will notify the field supervisor who will then notify the Project or Task Manager.

In the event of a utility strike or other damage to property of a client or 3rd party, employees will immediately notify the field supervisor, who will then immediately notify the Project or Task Manager.

Visitor Name/Co - not involved in work

In	Out
In	Out
In	Out
In	Out

I will STOP the job any time anyone is concerned or uncertain about health & safety or if anyone identifies a hazard or additional mitigation not recorded in the site, project, job or task hazard assessment.

I will be alert to any changes in personnel, conditions at the work site or hazards not covered by the original hazard assessments.

If it is necessary to **STOP THE JOB, I will perform TRACK**; and then amend the hazard assessments or the HASP as needed.

I will not assist a subcontractor or other party with their work unless it is absolutely necessary and then only after I have done TRACK and I have thoroughly controlled the hazard.

Post Daily Activities Review - Review at end of day or before next day's work (Check those applicable and explain:)

- [ ] Lessons learned and best practices learned today: _____
- [ ] Incidents that occurred today: _____
- [ ] Any Stop Work interventions today? _____
- [ ] Corrective/Preventive Actions needed for future work: _____
- [ ] Any other H&S issues: _____

Keep H&S 1st in all things | **WorkCare - 1.888.449.7787**

ARCADIS | Design & Consultancy for natural and built assets

Daily Log

Project No.: B0064479.2018.03600 Page 1 of 2

Site Location: Lansing, MI

Prepared By: Daniel Stockard

Date	Time	Description of Activities
10/4/18	6:50	D. Stockard on site. Unlocked gate.
		Purpose: Bulkheading oversight Weather: Overcast
		60's PPE: Level D Contractors: JSS
		Equipment: Geotech PID & 4 gas meter
	7:00	Conducted a H_2S tailgate.
	7:15	JSS prepping for bulkheading.
	7:30	Mobilized equipment over to P3-MH-1-10
		to begin bulkheading work. Prepped for
		confined space entry (JSS).
	8:00	Matt (JSS) entered P3-MH-1-10 to
		begin bulkheading work
	8:30	Load of 21AA delivered to the site. Checked
		it w/ PID & 4-gas meter, no hits.
	8:45	Talked w/ Aaron about condition of pipe in
		manhole. He proposed we bring the bulkead out
		of the pipe by 6" to form a better
		seal around the pipe itself, and to ease
		the process of pouring it. He assured me
		we can still do the grout injections.
		Talked w/ A. Lorenz about the amendment,
		and he agreed it would be acceptable.
	9:10	Steel plates delivered to the site.
	10:00	Representative from Xylem (pump vendor) stopped by
		site to see how bypass pumps were working
	10:30	Work continues on sacrificial form placement.
	11:00	Checked on plugs, saw they were losing PSI. Informed
		Aaron, who filled them up.

ARCADIS Design & Consultancy for natural and built assets

Daily Log

Project No.: B0064479.2018.03600 Page 2 of 2

Site Location: Lansing, MI

Prepared By: Daniel Stockard

Date	Time	Description of Activities
	12:30	Off site briefly to get food.
	13:00	Back on site, checked on progress. Form installation & rebar installation continues.
	13:30	Began marking up catch basins to be capped. Will need to reference pictures for MH50 to locate due to activity from consumers. and double check MH48's location in photo log.
	16:00	Finished tagging catch basins. Came back to bulkheading area realized they were ~~forming~~ building it in upstream invert, despite ~~instructions earlier~~ guidance earlier in the day. Informed them they would have to re-set forms. Informed A. Lorenz of update.
	16:30	Crew is taking out rebar and the sacrificial form.
	17:30	Crew wrapping up for the day.
	17:45	D. Stockard off site, locked gate
		Daniel Stockard

Document Control Number:TGM - _____
TGM + project number plus date as follows: xxxxxxxx.xxxx.xxxxx - dd/mm/year

ARCADIS Design & Consultancy for natural and built assets

TAILGATE HEALTH & SAFETY MEETING FORM

This form documents the tailgate meeting conducted in accordance with the Project HASP. Personnel who perform work operations on-site during the day are required to attend this meeting and to acknowledge their attendance, at least daily.

Project Name: RACER Lansing			**Project Location:** Lansing, MI
Date: 10/1/18	**Time:** 7:00	**Conducted by:** D. Stockard	**Signature/Title:** David Stockard
Client: RACER		**Client Contact:** D. Favero	**Subcontractor companies:** JSS

TRACKing the Tailgate Meeting

Think through the Tasks (list the tasks for the day):

1 Bulkheading oversight
2 Capping catch basins
3 _____
4 _____
5 _____
6 _____

Other Hazardous Activities - Check the box if there are any other Arcadis, Client or other party activities that may pose hazards to Arcadis operations ☐ If there are none, write "None" here: None

If yes, describe them here: _____

How will they be controlled? _____

Prework Authorization - check activities to be conducted that require permit issuance or completion of a checklist or similar before work begins:

	Doc #		Doc #		Doc #
☒ Not applicable		☐ Working at Height		☐ Confined Space	
☐ Energy Isolation (LOTO)		☐ Excavation/Trenching		☐ Hot Work	
☐ Mechanical Lifting Ops		☐ Overhead & Buried Utilities		☐ Other permit	

Discuss following questions (for some review previous day's post activities). **Check if yes :**

☐ Incidents from day before to review?	☐ Lessons learned from the day before?	☐ Any Stop Work Interventions yesterday?
☐ Any corrective actions from yesterday?	☐ Will any work deviate from plan?	☐ If deviations, notify PM & client
☒ JSAs or procedures are available?	☒ Field teams to "dirty" JSAs, as needed?	☒ All equipment checked & OK?
☒ Staff has appropriate PPE?	☒ Staff knows Emergency Plan (EAP)?	☒ Staff knows gathering points?

Comments: _____

Recognize the hazards (check all those that are discussed) (Examples are provided) and **Assess** the Risks (Low, Medium, High - circle risk level) - Provide an overall assessment of hazards to be encountered today and briefly list them under the hazard category.

☒ Gravity (i.e., ladder, scaffold, trips) (L M H) open manholes	☒ Motion (i.e., traffic, moving water) (L M H)	☐ Mechanical (i.e., augers, motors) (L M H)	
☐ Electrical (i.e., utilities, lightning) (L M H)	☐ Pressure (i.e. gas cylinders, wells) (L M H)	☒ Environment (i.e., heat, cold, ice) (L M H)	
☒ Chemical (i.e., fuel, acid, paint) (L M H) PFAS	☒ Biological (i.e., ticks, poison ivy) (L M H) bugs	☐ Radiation (i.e., alpha, sun, laser) (L M H)	
☐ Sound (i.e., machinery, generators) (L M H)	☐ Personal (i.e. alone, night, not fit) (L M H)	☒ Driving (i.e. car, ATV, boat, dozer) (L M H)	

Continue TRACK Process on Page 2

TAILGATE HEALTH & SAFETY MEETING FORM - Pg. 2

Control the hazards (Check all and discuss those methods to control the hazards that will be implemented for the day): Review the HASP, applicable JSAs, and other control processes. Discuss and document any additional control processes.

- [x] **STOP WORK AUTHORITY** (Must be addressed in every Tailgate meeting - (*See statements below*)

[ ] Elimination	[ ] Substitution	[ ] Isolation
[/] Engineering controls	[ ] Administrative controls	[ ] Monitoring
[/] General PPE Usage	[ ] Hearing Conservation	[ ] Respiratory Protection
[/] Personal Hygiene	[ ] Exposure Guidelines	[/] Decon Procedures
[/] Emergency Action Plan (EAP)	[ ] Fall Protection	[/] Work Zones/Site Control
[/] JSA to be developed/used ***(specify)***	[ ] TIP conducted ***(specify job/JSA)***	[/] Traffic Control
[ ]	[ ]	[ ] Other ***(specify)***
[ ]	[ ]	[ ]

Signature and Certification Section - Site Staff and Visitors

Name/Company/Signature	Initial & Sign in Time	Initial & Sign out Time	I have read a understand t HASP
Daniel Stockard/Arcadis/Daniel Stockard	DS 7:00		✓

Important Information and Numbers

All site staff should arrive fit for work. If not, they should report to the supervisor any restrictions or concerns.

In the event of an injury, employees will call WorkCare at **1.888-449-7787** and then notify the field supervisor who will then notify the Project or Task Manager.

In the event of a motor vehicle accident, employees will notify the field supervisor who will then notify the Project or Task Manager.

In the event of a utility strike or other damage to property of a client or 3rd party, employees will immediately notify the field supervisor, who will then immediately notify the Project or Task Manager.

Visitor Name/Co - not involved in work

In	Out
In	Out
In	Out
In	Out

I will STOP the job any time anyone is concerned or uncertain about health & safety or if anyone identifies a hazard or additional mitigation not recorded in the site, project, job or task hazard assessment.

I will be alert to any changes in personnel, conditions, the work site or hazards not covered by the original hazard assessments.

If it is necessary to **STOP THE JOB,** I will perform **TRACK**; and then amend the hazard assessments or t HASP as needed.

I will not assist a subcontractor or other party with the work unless it is absolutely necessary and then only af I have done TRACK and I have thoroughly controlled t hazard.

Post Daily Activities Review - Review at end of day or before next day's work (Check those applicable and explain:)

- [ ] Lessons learned and best practices learned today: _____
- [ ] Incidents that occurred today: _____
- [ ] Any Stop Work interventions today? _____
- [ ] Corrective/Preventive Actions needed for future work: _____
- [ ] Any other H&S issues: _____

Keep H&S 1st in all things

WorkCare - 1.888.449.7787

ARCADIS Design & Consultancy for natural and built assets

Daily Log

Project No.: B0064479.2018.03600 Page 1 of 2

Site Location: Lansing, MI

Prepared By: Daniel Stockard

Date	Time	Description of Activities
10/5/18	6:45	D. Stockard arrived on site, unlocked gate. Purpose: Bulkheading oversight PPE: Level D Weather: Partly sunny cloudy, 50s. Equipment: Geotech PID & 4-gas meter Contractor: J55
	7:00	Conducted H&S tailgate, checked w/ J55 on ~~progress~~ f: DS plan for the day. They will focus on finishing the form & rebar in P3-MH-1-10, then move into P3-MH-1-7.
	7:35	J55 entered the manhole and got to work.
	8:30	Bulkheading work continues. Asked Aaron if we could get 3 55-gallon drums from J55, and he said they could bring them next week. Told him I would follow up ~~for~~ DS w/ Tom Holdeman. Drums are for biosparge system.
	9:00	Re-labeled GW sampling purge water drums that were no longer readable in Plant 2.
	9:20	Back by bulkheading work area, work on sacrificial form continues.
	10:15	Truck on site to deliver PVC liners
	10:30	Bulkheading work continues.
	11:00	Brought M. Samp up to speed on

ARCADIS Design & Consultancy for natural and built assets

Daily Log

Project No.: B0064479.2018.03600 Page 2 of 2

Site Location: Lansing, MI

Prepared By: Daniel Stockard

Date	Time	Description of Activities
		Plan for next week.
	11:30	Aaron informed me they're applying waterstop, then will install rebar. Then they will finish up for the week.
	12:15	Crew took break for quick lunch
	12:45	Crew continues to install rebar.
	13:30	Rebar installation coming along smoothly.
	14:30	Crew began wrapping up the site for the day.
	14:45	√Crew & D. Stockard off site. Talked w/ consumers and they will close gate.

Daniel Stockard
10/5/18

Document Control Number:TGM - _____
TGM + project number plus date as follows: xxxxxxxx.xxxx.xxxxx - dd/mm/year

ARCADIS Design & Consultancy for natural and built assets

TAILGATE HEALTH & SAFETY MEETING FORM

This form documents the tailgate meeting conducted in accordance with the Project HASP. Personnel who perform work operations on-site during the day are required to attend this meeting and to acknowledge their attendance, at least daily.

Project Name: RACER Lansing			**Project Location:** Lansing, MI
Date: 10/5/18 **Time:** 2:00	**Conducted by:** D. Stockard		**Signature/Title:** Daniel Stockard
Client: RACER	**Client Contact:** D. Favero		**Subcontractor companies:** JSS

TRACKing the Tailgate Meeting

Think through the Tasks (list the tasks for the day):

1 Construction Oversight 3 _____ 5 _____

2 _____ 4 _____ 6 _____

Other Hazardous Activities - Check the box if there are any other Arcadis, Client or other party activities that may pose hazards to Arcadis operations ☐ If there are none, write "None" here: None

If yes, describe them here: _____

How will they be controlled? _____

Prework Authorization - check activities to be conducted that require permit issuance or completion of a checklist or similar before work begins:

	Doc #		Doc #		Doc #
☑ Not applicable		☐ Working at Height		☐ Confined Space	
☐ Energy Isolation (LOTO)		☐ Excavation/Trenching		☐ Hot Work	
☐ Mechanical Lifting Ops		☐ Overhead & Buried Utilities		☐ Other permit	

Discuss following questions (for some review previous day's post activities). **Check if yes :**

☐ Incidents from day before to review?	☐ Lessons learned from the day before?	☐ Topics from Corp H&S to cover?
☐ Any corrective actions from yesterday?	☐ Will any work deviate from plan?	☐ Any Stop Work Interventions yesterday?
☑ JSAs or procedures are available?	☑ Field teams to "dirty" JSAs, as needed?	☐ If deviations, notify PM & client
☑ Staff has appropriate PPE?	☑ Staff knows Emergency Plan (EAP)?	☑ All equipment checked & OK?
		☑ Staff knows gathering points?

Comments: _____

Recognize the hazards (check all those that are discussed) (Examples are provided) and **A**ssess the Risks (Low, Medium, High - circle risk level) - Provide an overall assessment of hazards to be encountered today and briefly list them under the hazard category.

☑ Gravity (i.e., ladder, scaffold, trips) (L M H) open manholes	☑ Motion (i.e., traffic, moving water) (L M H)	☐ Mechanical (i.e., augers, motors) (L M H)
☐ Electrical (i.e., utilities, lightning) (L M H)	☑ Pressure (i.e. gas cylinders, wells) (L M H) pumps	☑ Environment (i.e., heat, cold, ice) (L M H)
☐ Chemical (i.e., fuel, acid, paint) (L M H)	☐ Biological (i.e., ticks, poison ivy) (L M H)	☑ Radiation (i.e., alpha, sun, laser) (L M H)
☐ Sound (i.e., machinery, generators) (L M H)	☐ Personal (i.e. alone, night, not fit) (L M H)	☑ Driving (i.e. car, ATV, boat, dozer) (L M H)

Continue TRACK Process on Page 2

TAILGATE HEALTH & SAFETY MEETING FORM - Pg. 2

Control the hazards (Check all and discuss those methods to control the hazards that will be implemented for the day): Review the HASP, applicable JSAs, and other control processes. Discuss and document any additional control processes.

☒ **STOP WORK AUTHORITY** (Must be addressed in every Tailgate meeting - (*See statements below*)

☐ Elimination	☐ Substitution	☐ Isolation
☐ Engineering controls	☐ Administrative controls	☑ Monitoring
☑ General PPE Usage	☐ Hearing Conservation	☐ Respiratory Protection
☑ Personal Hygiene	☐ Exposure Guidelines	☑ Decon Procedures
☑ Emergency Action Plan (EAP)	☑ Fall Protection	☑ Work Zones/Site Control
☑ JSA to be developed/used ***(specify)***	☐ TIP conducted ***(specify job/JSA)***	☐ Traffic Control
☐	☐	☐ Other ***(specify)***
☐	☐	☐

Signature and Certification Section - Site Staff and Visitors

Name/Company/Signature	Initial & Sign in Time	Initial & Sign out Time	I have read and understand the HASP
Daniel Stockard / Arcadis / Daniel Stockard	DS 7:00		✓

Important Information and Numbers

All site staff should arrive fit for work. If not, they should report to the supervisor any restrictions or concerns.

In the event of an injury, employees will call WorkCare at **1.888-449-7787** and then notify the field supervisor who will then notify the Project or Task Manager.

In the event of a motor vehicle accident, employees will notify the field supervisor who will then notify the Project or Task Manager.

In the event of a utility strike or other damage to property of a client or 3rd party, employees will immediately notify the field supervisor, who will then immediately notify the Project or Task Manager.

Visitor Name/Co - not involved in work

In	Out
In	Out
In	Out
In	Out

I will STOP the job any time anyone is concerned or uncertain about health & safety or if anyone identifies a hazard or additional mitigation not recorded in the site, project, job or task hazard assessment.

I will be alert to any changes in personnel, conditions at the work site or hazards not covered by the original hazard assessments.

If it is necessary to **STOP THE JOB,** I will perform **TRACK**; and then amend the hazard assessments or the HASP as needed.

I will not assist a subcontractor or other party with their work unless it is absolutely necessary and then only after I have done TRACK and I have thoroughly controlled the hazard.

Post Daily Activities Review - Review at end of day or before next day's work (Check those applicable and explain:)

- ☐ Lessons learned and best practices learned today: _____
- ☐ Incidents that occurred today: _____
- ☐ Any Stop Work interventions today? _____
- ☐ Corrective/Preventive Actions needed for future work: _____
- ☐ Any other H&S issues: _____

Keep H&S 1st in all things

WorkCare - 1.888.449.7787

Document Control Number.TGM - _____
TGM + project number plus date as follows: xxxxxxxx.xxxx.xxxxx - dd/mm/year

ARCADIS

TAILGATE HEALTH & SAFETY MEETING FORM

This form documents the tailgate meeting conducted in accordance with the Project HASP. Personnel who perform work operations on-site during the day are required to attend this meeting and to acknowledge their attendance, at least daily.

Project Name: RACER Lansing			**Project Location:** Lansing, MI
Date: 10/8/18	**Time:** 0700	**Conducted by:** Marina Samp	**Signature/Title:** Marina R Samp / Env Spec.
Client: RACER		**Client Contact:** D. Favero	**Subcontractor companies:** JSS

TRACKing the Tailgate Meeting

Think through the Tasks (list the tasks for the day):

1 Plug Manholes 3 _____ 5 _____

2 _____ 4 _____ 6 _____

Other Hazardous Activities - Check the box if there are any other Arcadis, Client or other party activities that may pose hazards to Arcadis operations ☐ If there are none, write "None" here: None

If yes, describe them here: _____

How will they be controlled? _____

Prework Authorization - check activities to be conducted that require permit issuance or completion of a checklist or similar before work begins:

	Doc #		Doc #		Doc #
☒ Not applicable		☐ Working at Height		☐ Confined Space	
☐ Energy Isolation (LOTO)		☐ Excavation/Trenching		☐ Hot Work	
☐ Mechanical Lifting Ops		☐ Overhead & Buried Utilities		☐ Other permit	

Discuss following questions (for some review previous day's post activities). **Check if yes :**

☐ Incidents from day before to review?	☐ Lessons learned from the day before?	☐ Topics from Corp H&S to cover?
☐ Any corrective actions from yesterday?	☐ Will any work deviate from plan?	☐ Any Stop Work Interventions yesterday?
☒ JSAs or procedures are available?	☒ Field teams to "dirty" JSAs, as needed?	☐ If deviations, notify PM & client
☒ Staff has appropriate PPE?	☒ Staff knows Emergency Plan (EAP)?	☒ All equipment checked & OK?
		☒ Staff knows gathering points?

Comments: _____

Recognize the hazards (check all those that are discussed) (Examples are provided) and **A**ssess the Risks (**L**ow, **M**edium, **H**igh - circle risk level) - Provide an overall assessment of hazards to be encountered today and briefly list them under the hazard category.

☒ Gravity (i.e., ladder, scaffold, trips) (L (M) H) Manholes	☒ Motion (i.e., traffic, moving water) (L) M H) skid steer	☐ Mechanical (i.e., augers, motors) (L M H)	
☐ Electrical (i.e., utilities, lightning) (L M H)	☐ Pressure (i.e. gas cylinders, wells) (L M H)	☒ Environment (i.e., heat, cold, ice) ((L) M H)	
☒ Chemical (i.e., fuel, acid, paint) (L) M H) PFAS	☐ Biological (i.e., ticks, poison ivy) (L M H)	☐ Radiation (i.e., alpha, sun, laser) (L M H)	
☐ Sound (i.e., machinery, generators) (L M H)	☐ Personal (i.e. alone, night, not fit) (L M H)	☒ Driving (i.e. car, ATV, boat, dozer) ((L) M H)	

Continue TRACK Process on Page 2

TAILGATE HEALTH & SAFETY MEETING FORM - Pg. 2

Control the hazards (Check all and discuss those methods to control the hazards that will be implemented for the day): Review the HASP, applicable JSAs, and other control processes. Discuss and document any additional control processes.

- [x] **STOP WORK AUTHORITY** (Must be addressed in every Tailgate meeting - (*See statements below*)
- [ ] Elimination
- [ ] Engineering controls
- [x] General PPE Usage
- [x] Personal Hygiene
- [x] Emergency Action Plan (EAP)
- [x] JSA to be developed/used ***(specify)***
- [ ] Substitution
- [ ] Administrative controls
- [ ] Hearing Conservation
- [ ] Exposure Guidelines
- [ ] Fall Protection
- [ ] TIP conducted ***(specify job/JSA)***
- [ ] Isolation
- [ ] Monitoring
- [ ] Respiratory Protection
- [x] Decon Procedures
- [x] Work Zones/Site Control
- [ ] Traffic Control
- [ ] Other ***(specify)***

Signature and Certification Section - Site Staff and Visitors

Name/Company/Signature	Initial & Sign in Time	Initial & Sign out Time	I have read and understand the HASP
Marina Scumaglia/Arcadis/Marina Scumaglia	URS 0700		✓

Important Information and Numbers

All site staff should arrive fit for work. If not, they should report to the supervisor any restrictions or concerns.

In the event of an injury, employees will call WorkCare at **1.888-449-7787** and then notify the field supervisor who will then notify the Project or Task Manager.

In the event of a motor vehicle accident, employees will notify the field supervisor who will then notify the Project or Task Manager.

In the event of a utility strike or other damage to property of a client or 3rd party, employees will immediately notify the field supervisor, who will then immediately notify the Project or Task Manager.

Visitor Name/Co - not involved in work

In	Out
In	Out
In	Out
In	Out

I will STOP the job any time anyone is concerned or uncertain about health & safety or if anyone identifies a hazard or additional mitigation not recorded in the site, project, job or task hazard assessment.

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I will not assist a subcontractor or other party with their work unless it is absolutely necessary and then only after I have done TRACK and I have thoroughly controlled the hazard.

Post Daily Activities Review - Review at end of day or before next day's work (Check those applicable and explain:)

- [ ] Lessons learned and best practices learned today: _____
- [ ] Incidents that occurred today: _____
- [ ] Any Stop Work interventions today? _____
- [ ] Corrective/Preventive Actions needed for future work: _____
- [ ] Any other H&S issues: _____

Keep H&S 1st in all things

WorkCare - 1.888.449.7787

ARCADIS Design & Consultancy for natural and built assets

Daily Log

Project No.: B0064479.2018.03600 Page 1 of 1

Site Location: Lansing, MI

Prepared By: ~~Daniel Stoddard~~ M. Samp

Date	Time	Description of Activities
10/8/18	0700	Onsite, unlock gate, H&S Tailgate
	0715	Discuss plan for day/week w/ JSS - prep
	0725	JSS Prep for work on P3-MH-1-10 Bulkhead
	—	- equipment set-up, confined space entry set-up
	0805	JSS Enter P3-MH-1-10
	0815	Install rebar
	0945	Construct 2×4 braces
	1110	Offsite for lunch
	1130	onsite
	1140	place Ply wood for concrete pour
	1315	Clean up and mobilize to P3-MH-1-7
	1340	Place hoses for storm sewer diversion, pump water
	1420	JSS Enter manhole
	—	- Prep for sacrificial form, drill bits all broken (1530)
	1610	Place plywood for sacrificial form ↳ A Mosinski (JSS) offsite to buy drill bits
	1620	A. Mosinski back onsite, holes for rebar all drilled
	1750	First layer of rebar installed
	—	- weather seal and rest of layers not installed yet
	—	- begin clean up from day
↓	1820	Lock gate, offsite

NRS

ARCADIS Design & Consultancy for natural and built assets

Daily Log

Project No.: B0064479.2018.03600 Page 1 of 2

Site Location: Lansing, MI

Prepared By: ~~Daniel Stockard~~ M. Samp

Date	Time	Description of Activities
10/9/18	0650	Arrive onsite for Bulkheading Oversight
	—	- H&S Tailgate, open gate for JSS
	0705	Check in w/ JSS regarding plan for the day
	—	- finish prepping P3-MH-1-7 for concrete pour
	—	and cap catch basins on the agenda
	0710	Set up at P3-MH-1-7
	0715	JSS found equipment that fell off truck on ground
	—	by hose to dewater P3-MH-1-7 (PID)
	0740	Continue set up, for confined space entry
	0800	JSS Enter manhole, continue rebar installation
	0915	rebar installed, start construction of form for concrete
	1040	K. Pearson onsite to work on biosparge system
	—	- moved three 55 gal drums over to system
	1120	Form complete
	1140	Offsite for lunch (pick-up)
	—	- JSS offsite for lunch, ~~shower after~~ clean up after being in manhole
	1200	M. Samp back onsite, break to eat lunch
	1300	JSS Back on site, finish clean-up of supplies at
	—	P3-MH-1-7, prep for capping
	1315	K. Pearson offsite
	1410	Unable to locate MH-239, MH-230, called Dan no answer
	1415	MH-229 Capping - Liner & metal sheet
	—	- CB125, MH249, CB 127, CB129
	—	- MH-239 does not exist (per D. Stockard)
	—	- MH-230 not found by D. Stockard, A. Mosinski
	—	- JSS use tile probe to attempt to locate

ARCADIS Design & Consultancy for natural and built assets

Daily Log

Project No.: B0064479.2018.03600 Page 2 of 2

Site Location: Lansing, MI

Prepared By: ~~Daniel Stockard~~ M. Samp

Date	Time	Description of Activities
10/9/18	1435	CB127 made of brick, possible leaks w/in manhole
	1440	CB130, CB131, place liner, metal sheet
	1455	CB13, CB15, CB12, MH22 - Liner, metal sheet
	—	- skip CB17 until P3 MH 1-7 bulkheading complete
	1520	Place gravel on CB13, CB15, CB12, MH22
	1530	Place gravel on MH229, MH246, CB125, MH249,
	—	CB127, CB129, CB131, CB130
	1600	Leave binder in trailer for A Lorenz, leave key w/
		JSS for 10/10 entry
	1605	Offsite

MRS

RACER LANSING Bulkheading
B0064479.0018.03600 10/10/18

1215 A. Lorenz arrived onsite. check in with Aaron (JSS crew chief). CTS concrete testing also onsite - Adam
Aaron asked where concrete company can place washout.
1230 Cross Concrete of Melvindale arrived. Foreman: Chad. DOT 502840.
Decided to place washout in floor drains to be filled.
1245 Discussed concrete strength tests w/ Adam: 7 day, 14 day, 21 day, and 2 x 28 day tests.
JSS/Cross begin setting up conduit piping into 1st bulkhead - bulkhead at MH P3-MH-1-7.
1300 Dan Stockard arrives onsite
1330 Begin pooring concrete for P3-MH-1-7
Weather: 65°, cloudy, raining
1345 D. Stockard and A. Lorenz inspected completed caps and terminated bioreactor electrical service box at plant 2.
14:30: JSS began pouring concrete in P3-MH-1-10 for bulkhead.
15:10: Concrete is poured, samples collected for strength testing. Raining significantly now, crew will wrap up. A. Lorenz off site.
15:45: D. Stockard and all crew off site, locked gate.

Daniel Stockard
10/10/18

ARCADIS | Design & Consultancy for natural and built assets

Daily Log

Project No.: B0064479.2018.03600 Page 1 of 1

Site Location: Lansing, MI

Prepared By: Daniel Stockard

Date	Time	Description of Activities
10/11/18	6:50	D. Stockard arrived on site, unlocked gate.
	7:05	Reviewed plan w/ Aaron. Discussed a number of questions about which catch basins need to be capped.
	7:45	Started capping catch basins. Decided CB141 did not need to be capped because it is obviously not draining at all, but CB148 (previously unmarked) will have to be. Also discovered new CB to be capped: CB39B.
	8:15	Worked on capping CB39B, CB39, CB29. Capped many catch basins (see maps)
	9:00	Capping continues, checked catch basins that were capped on Monday and Tuesday.
	12:15	Crew breaked for lunch.
	12:45	Crew back on site, continued capping catch basins. Updated running list of capped catch basins.
	15:00	Accessed southern parking lot area and secured gate w/ new lock (2035) and chain, continued capping. Inspected structures that had been capped already.
	16:30	Touched base w/ Aaron on progress, talked about structures that need more attention
	17:00	Touched base w/ A. Lorenz on progress, D. Stockard off site.

ARCADIS Design & Consultancy for natural and built assets

Daily Log

Project No.: B0064479.2018.03600 Page 1 of 1

Site Location: Lansing, MI

Prepared By: Daniel Stockard

Date	Time	Description of Activities
10/12/18	7:25	D. Stockard arrived on site, unlocked gate for JSS. Purpose - Bulkheading oversight. PPE: Level D Weather: Overcast, 40s, awful Equipment: None Contractors: JSS
	7:40	JSS got to work moving bypass pumps to bulkhead manholes for the weekend dewatering.
	8:00	JSS entered P3-MH-1-7 to add extra cement to pipe annulus. Pipe itself is sealed, but slight area around the top of the invert needs more cement. Tied in w/ 6
	8:30	Out of manhole, seal looks solid now.
	9:00	Capped CBs in southern parking lot, helped identify which ones needed to be capped.
	10:30	Highlighted CBs that drain into the courtesy drain and instructed them to leave those alone.
	12:00	Verified layouts for piping on maps.
	12:00	Moved to slab / to cap those CBs. Found an old sump w/ oil sheen on water, strong hydrocarbon smell. Called A. Lorenz, will pump out and dispose of it.
	13:00	Touched base w/ Aaron on # of caps installed, we will both update our lists.
	13:45	D. Stockard off site, locked gate.

Document Control Number:TGM - B00[illegible]4 79 2018. 05600 10/10/2018

TGM + project number plus date as follows: xxxxxxxx.xxxx.xxxxx - dd/mm/year

ARCADIS Design & Consultancy for natural and built assets

TAILGATE HEALTH & SAFETY MEETING FORM

This form documents the tailgate meeting conducted in accordance with the Project HASP. Personnel who perform work operations on-site during the day are required to attend this meeting and to acknowledge their attendance, at least daily.

Project Name: RACER Lansing			**Project Location:** Lansing, MI
Date: 10/10/18	**Time:** 0730	**Conducted by:** Marina Sump	**Signature/Title:** Marina R Sump / Env. Spec
Client: RACER		**Client Contact:** D Favero	**Subcontractor companies:** JSS

Initial Site Walk Comments:

TRACKing the Tailgate Meeting

Think through the Tasks (list the tasks for the day):

1 Manhole Excavation 3 _____ 5 _____

2 _____ 4 _____ 6 _____

Other Hazardous Activities - Check the box if there are any other Arcadis, Client or other party activities that may pose hazards to Arcadis operations ☐ If there are none, write "None" here: None

If yes, describe them here: _____

How will they be controlled? _____

Prework Authorization - check activities to be conducted that require permit issuance or completion of a checklist or similar before work begins:

	Doc #		Doc #		Doc #
☒ Not applicable		☐ Working at Height		☐ Confined Space	
☐ Energy Isolation (LOTO)		☐ Excavation/Trenching		☐ Hot Work	
☐ Mechanical Lifting Ops		☐ Overhead & Buried Utilities		☐ Other permit	

Discuss following questions (for some review previous day's post activities). **Check if yes :**

☐ Incidents from day before to review?	☐ Lessons learned from the day before?	☐ Topics from Corp H&S to cover?
☐ Any corrective actions from yesterday?	☐ Will any work deviate from plan?	☐ Any Stop Work Interventions yesterday?
☒ JSAs or procedures are available?	☒ Field teams to "dirty" JSAs, as needed?	☒ If deviations, notify PM & client
☒ Staff has appropriate PPE?	☒ Staff knows Emergency Plan (EAP)?	☒ All equipment checked & OK?
		☒ Staff knows gathering points?

Comments: _____

Recognize the hazards (check all those that are discussed) (Examples are provided) and **A**ssess the Risks (Low, Medium, High - circle risk level) - Provide an overall assessment of hazards to be encountered today and briefly list them under the hazard category.

☒ Gravity (i.e., ladder, scaffold, trips) (L (M) H) open manholes	☒ Motion (i.e., (traffic) moving water) (L M H)	☐ Mechanical (i.e., augers, motors) (L M H)
☐ Electrical (i.e., utilities, lightning) (L M H)	☐ Pressure (i.e. gas cylinders, wells) (L M H)	☒ Environment (i.e., heat, (cold), ice) (L M H)
☒ Chemical (i.e., fuel, acid, paint) (L M H) PFAS	☒ Biological (i.e., ticks, poison ivy) (L M H) bugs	☐ Radiation (i.e., alpha, sun, laser) (L M H)
☐ Sound (i.e., machinery, generators) (L M H)	☐ Personal (i.e. alone, night, not fit) (L M H)	☒ Driving (i.e. (car) ATV, boat, dozer) (L (M) H)

Continue TRACK Process on Page 2

TAILGATE HEALTH & SAFETY MEETING FORM - Pg. 2

Control the hazards (Check all and discuss those methods to control the hazards that will be implemented for the day): Review the HASP, applicable JSAs, and other control processes. Discuss and document any additional control processes.

- [X] **STOP WORK AUTHORITY** (Must be addressed in every Tailgate meeting - (*See statements below*)
- [ ] Elimination
- [ ] Engineering controls
- [X] General PPE Usage
- [X] Personal Hygiene
- [X] Emergency Action Plan (EAP)
- [X] JSA to be developed/used ***(specify)***
- [ ] Substitution
- [ ] Administrative controls
- [ ] Hearing Conservation
- [ ] Exposure Guidelines
- [ ] Fall Protection
- [ ] TIP conducted ***(specify job/JSA)***
- [ ] Isolation
- [ ] Monitoring
- [ ] Respiratory Protection
- [X] Decon Procedures
- [X] Work Zones/Site Control
- [ ] Traffic Control
- [ ] Other ***(specify)***

Signature and Certification Section - Site Staff and Visitors

Name/Company/Signature	Initial & Sign in Time	Initial & Sign out Time	I have read and understand the HASP
Marina Samp / Arcadis / Marina R Samp	MRS 0730	MRS 1710	✓

Important Information and Numbers

All site staff should arrive fit for work. If not, they should report to the supervisor any restrictions or concerns.

In the event of an injury, employees will call WorkCare at 1.800.455.6155 and then notify the field supervisor who will then notify the Project or Task Manager.

In the event of a motor vehicle accident, employees will notify the field supervisor who will then notify the Project or Task Manager.

In the event of a utility strike or other damage to property of a client or 3rd party, employees will immediately notify the field supervisor, who will then immediately notify the Project or Task Manager.

Visitor Name/Co - not involved in work

	In	Out

I will STOP the job any time anyone is concerned or uncertain about health & safety or if anyone identifies a hazard or additional mitigation not recorded in the site, project, job or task hazard assessment.

I will be alert to any changes in personnel, conditions at the work site or hazards not covered by the original hazard assessments.

If it is necessary to **STOP THE JOB,** I will perform **TRACK**; and then amend the hazard assessments or the HASP as needed.

I will not assist a subcontractor or other party with their work unless it is absolutely necessary and then only after I have done TRACK and I have thoroughly controlled the hazard.

Post Daily Activities Review - Review at end of day or before next day's work (Check those applicable and explain:)

- [ ] Lessons learned and best practices learned today:
- [ ] Incidents that occurred today:
- [ ] Any Stop Work interventions today?
- [ ] Corrective/Preventive Actions needed for future work:
- [ ] Any other H&S issues:

Keep H&S 1st in all things

WorkCare - 1.800.455.6155

49B
SE

ARCADIS Design & Consultancy for natural and built assets

Daily Log

Project No.: B0064479.2018.03600 Page 1 of 2

Site Location: Lansing, MI

Prepared By: ~~Daniel Stockard~~ M. Samp

Date	Time	Description of Activities
10/16/18	0730	Arrive Onsite
	—	- H&S Tailgate, JSS Prep for day
	0745	JSS excavate for Monolith (west location)
	—	- Create bench for machinery, excavator ~~became~~ functional, can't go full speed, technician called
	0850	A Mosinski (JSS) offsite to get fuel for excavator
	0920	A Mosinski back onsite
	0940	Bench finished, excavate ~~around pipe~~ second bench
	1050	M Samp offsite to get Lunch
	1110	M Samp back onsite
	1145	R Christensen, J Barrett onsite
	1150	Change plan due to impaired machinery
	—	- West monolith excavated to pipe w/ benches
	—	- tape off and fence excavation
	—	- move on to east excavation location
	1200	JSS Lunch, H&S w/ R Christensen, J Barrett
	1230	JSS Return, view MH 49B
	—	- tour Plant 3, view bulkheads
	—	- tour Plant 2
	—	- view excavation
	1400	R. Christensen, J Barrett offsite
	—	- JSS put up snow fences, started marking out eastern monolith excavation
	—	- Technician onsite to service excavator
	1430	Check Marked out location of eastern excavation
		- manhole plug pipe appears to run further west of figure line (RS-MH-2-IN)

ARCADIS Design & Consultancy for natural and built assets

Daily Log

Project No.: B0064479.2018.03600 Page 2 of 2

Site Location: Lansing, MI

Prepared By: ~~Daniel Stockard~~ M. Samp

Date	Time	Description of Activities
10/16/18	1440	Verify excavation location with P3 MH-NE pipe
	1455	Mobilize to Eastern monolith
	1510	Start Eastern monolith excavation
	1605	Locate pipe for Eastern Monolith, 19' deep
	1630	Place snow fence around eastern excavation
	1645	Clean up for day
	1655	Lock gate
	1710	Offsite

MRS

ARCADIS Design & Consultancy for natural and built assets

Daily Log

Project No.: B0064479.2018.03600 Page 1 of 2

Site Location: Lansing, MI

Prepared By: Daniel Stockard

Date	Time	Description of Activities
10/17/18	8:45	D. Stockard arrived on site. Purpose: excavation oversight. PPE: Level D. Weather: Overcast, 40s Equipment: Geotech generator, submersible pump, WLM (for biosparge activities). Contractors: JSS (Aaron Dean). Crew is excavating down to pipes and area around it.
	9:00	Conducted H&S tailgate.
	10:00	Crew continues clearing area around pipes, but waiting for fully operational excavator to be delivered to the site. Got pictures of bulkheads to send to A. Lorenz.
	10:20	To Plant 2 for biosparge activities.
	11:30	Had to run to Geotech for new tubing.
	11:45	Back on site, realized generator wasn't working, called Geotech and they're going to bring a new one out.
	12:30	Geotech stopped by to drop off alternate generator.
13:00		JSS back from lunch, still waiting on replacement excavator.
	13:15	Received call from Christine Matlock at the MDEQ; they plan to be on site in 20-30 minutes.
	13:50	MDEQ on site. Showed them the progress

ARCADIS Design & Consultancy for natural and built assets

Daily Log

Project No.: B0064479.2018.03600 Page 2 of 2

Site Location: Lansing, MI

Prepared By: Daniel Stockard

Date	Time	Description of Activities
		made so far and the next steps that will be taken. They said it appeared to be progressing "as advertised".
	14:30	MDEQ off site. JSS is cutting into western ~~#~~ interceptor.
	14:50	JSS getting temporary plug installed in manhole before cutting all the way through the pipe.
	15:40	JSP setting up bypass pumping.
	15:50	Spartan Barricading on site to drop off sand bags for monolith pouring.
	16:30	Crew prepped for tomorrow, headed off site. To Plant 2.
	17:45	D. Stockard headed offsite, locked gate.

Daniel Stockard
10/17/18

Document Control Number:TGM - _____

TGM + project number plus date as follows: xxxxxxxx.xxxx.xxxxx - dd/mm/year

ARCADIS Design & Consultancy for natural and built assets

TAILGATE HEALTH & SAFETY MEETING FORM

This form documents the tailgate meeting conducted in accordance with the Project HASP. Personnel who perform work operations on-site during the day are required to attend this meeting and to acknowledge their attendance, at least daily.

Project Name: RACER Lansing			**Project Location:** Lansing, MI
Date: 10/17/18	**Time:** 9:00	**Conducted by:** D. Stakard	**Signature/Title:** Daniel Stakard
Client: RACER		**Client Contact:** D. Favero	**Subcontractor companies:** JSS

TRACKing the Tailgate Meeting

Think through the Tasks (list the tasks for the day):

1 Excavation oversight 3 _____ 5 _____

2 Running purge water 4 _____ 6 _____

Other Hazardous Activities - Check the box if there are any other Arcadis, Client or other party activities that may pose hazards to Arcadis operations ☐ If there are none, write "None" here: None

If yes, describe them here: _____

How will they be controlled? _____

Prework Authorization - check activities to be conducted that require permit issuance or completion of a checklist or similar before work begins:

	Doc #		Doc #		Doc #
☒ Not applicable		☐ Working at Height		☐ Confined Space	
☐ Energy Isolation (LOTO)		☐ Excavation/Trenching		☐ Hot Work	
☐ Mechanical Lifting Ops		☐ Overhead & Buried Utilities		☐ Other permit	

Discuss following questions (for some review previous day's post activities). **Check if yes :**

☐ Incidents from day before to review?	☐ Lessons learned from the day before?	☐ Topics from Corp H&S to cover?
☐ Any corrective actions from yesterday?	☐ Will any work deviate from plan?	☐ Any Stop Work Interventions yesterday?
☒ JSAs or procedures are available?	☒ Field teams to "dirty" JSAs, as needed?	☒ If deviations, notify PM & client
☒ Staff has appropriate PPE?	☒ Staff knows Emergency Plan (EAP)?	☒ All equipment checked & OK?
		☒ Staff knows gathering points?

Comments: _____

Recognize the hazards (check all those that are discussed) (Examples are provided) and **A**ssess the Risks (Low, Medium, High - circle risk level) - Provide an overall assessment of hazards to be encountered today and briefly list them under the hazard category.

☒ Gravity (i.e., ladder, scaffold, trips) (L M H) open excavation	☒ Motion (i.e., traffic, moving water) (L M H)	☐ Mechanical (i.e., augers, motors) (L M H)
☐ Electrical (i.e., utilities, lightning) (L M H)	☐ Pressure (i.e. gas cylinders, wells) (L M H)	☒ Environment (i.e., heat, cold, ice) (L M H)
☒ Chemical (i.e., fuel, acid, paint) (L M H) contaminants	☐ Biological (i.e., ticks, poison ivy) (L M H)	☐ Radiation (i.e., alpha, sun, laser) (L M H)
☒ Sound (i.e., machinery, generators) (L M H)	☐ Personal (i.e. alone, night, not fit) (L M H)	☒ Driving (i.e. car, ATV, boat, dozer) (L M H)

Continue TRACK Process on Page 2

TAILGATE HEALTH & SAFETY MEETING FORM - Pg. 2

Control the hazards (Check all and discuss those methods to control the hazards that will be implemented for the day): Review the HASP, applicable JSAs, and other control processes. Discuss and document any additional control processes.

- [x] **STOP WORK AUTHORITY** (Must be addressed in every Tailgate meeting - (*See statements below*)

[ ] Elimination	[ ] Substitution	[ ] Isolation
[ ] Engineering controls	[ ] Administrative controls	[ ] Monitoring
[✓] General PPE Usage	[✓] Hearing Conservation	[ ] Respiratory Protection
[✓] Personal Hygiene	[ ] Exposure Guidelines	[✓] Decon Procedures
[✓] Emergency Action Plan (EAP)	[ ] Fall Protection	[✓] Work Zones/Site Control
[✓] JSA to be developed/used ***(specify)***	[ ] TIP conducted ***(specify job/JSA)***	[ ] Traffic Control
[ ]	[ ]	[ ] Other ***(specify)***
[ ]	[ ]	[ ]

Signature and Certification Section - Site Staff and Visitors

Name/Company/Signature	Initial & Sign in Time	Initial & Sign out Time	I have read and understand the HASP
Daniel Stockard / Arcadis / Daniel Stockard	DS 7:00		✓

Important Information and Numbers

All site staff should arrive fit for work. If not, they should report to the supervisor any restrictions or concerns.

In the event of an injury, employees will call WorkCare at **1.888-449-7787** and then notify the field supervisor who will then notify the Project or Task Manager.

In the event of a motor vehicle accident, employees will notify the field supervisor who will then notify the Project or Task Manager.

In the event of a utility strike or other damage to property of a client or 3rd party, employees will immediately notify the field supervisor, who will then immediately notify the Project or Task Manager.

Visitor Name/Co - not involved in work

John McCabe / 2.30	In	Out
	In	Out
	In	Out
	In	Out

I will STOP the job any time anyone is concerned or uncertain about health & safety or if anyone identifies a hazard or additional mitigation not recorded in the site, project, job or task hazard assessment.

I will be alert to any changes in personnel, conditions at the work site or hazards not covered by the original hazard assessments.

If it is necessary to **STOP THE JOB, I** will perform **TRACK**; and then amend the hazard assessments or the HASP as needed.

I will not assist a subcontractor or other party with their work unless it is absolutely necessary and then only after I have done TRACK and I have thoroughly controlled the hazard.

Post Daily Activities Review - Review at end of day or before next day's work (Check those applicable and explain)

- [ ] Lessons learned and best practices learned today: _____
- [ ] Incidents that occurred today: _____
- [ ] Any Stop Work interventions today? _____
- [ ] Corrective/Preventive Actions needed for future work: _____
- [ ] Any other H&S issues: _____

Keep H&S 1st in all things | **WorkCare - 1.888.449.7787**

ARCADIS Design & Consultancy for natural and built assets

Daily Log

Project No.: B0064479.2018.03600 Page 1 of 2

Site Location: Lansing, MI

Prepared By: Daniel Stockard

Date	Time	Description of Activities
10/18/18	7:30	D. Stockard arrived on site. Purpose: Excavation and pipe cutting oversight. PPE: Level D Weather: Clear, 30s Contractors: JSS (Aaron, Don, Justin). Equipment: None.
	7:50	JSS worked on setting up bypass pumping from plugged manhole to outfall to get water levels down before working on pipe.
	8:10	Manhole is pumped down and there is snow fence around outfall manhole. JSS begins to cut out pipe.
	9:30	Pipe cutting continues. Called into meeting w/ R. Christensen, A. Lorenz, J. Seling.
	10:00	Instructed to forego polyurethane grout injections, to pump oily sump into drums, and peel back concrete around collapsed structure to determine void space.
	10:20	Crew ended up cutting through pipe and pulling it out at northern joint. Excavator headed to other pipe to begin cutting it away.
	10:40	Reminded Aaron they need to plug eastern interceptor prior to breaking the pipe. He informed the crew.
	10:45	Crew mobilized to install plug.
	12:00	Plugs installed and bypass pumping set up.
	12:15	Crew working on cutting out the eastern interceptor.

12:50: D. Stockard headed offsite to pick up supplies for nutrient injection.

13:30: Back on site. A. Villhauer on site to sign manifests for GW pickup.

14:30: Crew has cut through eastern interceptor and is setting form for western monolith.

15:30: D. Stockard off site for more parts.

16:30: D. Stockard back on site, crew is wrapping up for the evening. Finished form for western monolith, will finish eastern monolith form tomorrow.

16:55 D. Stockard ensured gate was locked, headed off site.

Daniel Stockard
10/18/18

ARCADIS Design & Consultancy for natural and built assets

gallons
517-5182-6-70

Daily Log

Project No.: B0064479.2018.03600 Page 1 of 1

Site Location: Lansing, MI

Prepared By: Daniel Stockard

Date	Time	Description of Activities
10/19/18	7:30	D. Stockard on site. Purpose: Monolith excavation oversight, nutrient injection. PPE: Level D. ~~Contractors~~: JSS Equipment: Geotech submersible pump, generator, WLM. Weather: Partly cloudy, 40s.
	8:00	M. Samp on site. Conducted H&S tailgate. Headed to biosparge system to work on getting water for nutrient injection.
	9:00	M. Samp off site to get water.
	9:30	JSS working on setting forms.
	10:00	D. Arnett on site for biosparge maintenance. Aaron estimated volume of void space around collapsed catch basin to be around 45 cu. yd, but that's likely an overestimate.
	11:06	D. Arnett off site, M. Samp having issues w/ getting appropriate fitting.
	11:30	JSS wrapped up getting form put into eastern main, crew worked on prepping bypass pumping & ensuring temporary plugs are secured over weekend.
	12:00	M. Samp back on site, D. Stockard joined to get ~~biosparge~~ nutrient injection water
	12:30	JSS off site, Plant 3 gate locked. Worked on getting water for nutrient injections.
	16:00	D. Stockard & M. Samp off site, ensured Plant 2 gate was locked.

Daniel Stockard 10/19/18

Document Control Number:TGM - _____
TGM + project number plus date as follows: xxxxxxxx.xxxx.xxxxx - dd/mm/year

ARCADIS Design & Consultancy for natural and built assets

TAILGATE HEALTH & SAFETY MEETING FORM

This form documents the tailgate meeting conducted in accordance with the Project HASP. Personnel who perform work operations on-site during the day are required to attend this meeting and to acknowledge their attendance, at least daily.

Project Name: RACER Lansing			Project Location: Lansing MI
Date: 10/19/18	Time:	Conducted by: D. Stockard	Signature/Title: Daniel Stockard
Client: RACER		Client Contact: D. Favero	Subcontractor companies: JSS
Initial Site Walk Comments: Looks like a concrete slab			

TRACKing the Tailgate Meeting

Think through the Tasks (list the tasks for the day):

1 Monolith exc. oversight
2 Getting water for nutrients
3 Nutrient injection
4 _____
5 _____
6 _____

Other Hazardous Activities - Check the box if there are any other Arcadis, Client or other party activities that may pose hazards to Arcadis operations ☐ If there are none, write "None" here: None

If yes, describe them here: _____

How will they be controlled? _____

Prework Authorization - check activities to be conducted that require permit issuance or completion of a checklist or similar before work begins:

	Doc #		Doc #		Doc #
☒ Not applicable		☐ Working at Height		☐ Confined Space	
☐ Energy Isolation (LOTO)		☐ Excavation/Trenching		☐ Hot Work	
☐ Mechanical Lifting Ops		☐ Overhead & Buried Utilities		☐ Other permit	

Discuss following questions (for some review previous day's post activities). **Check if yes :**

☐ Incidents from day before to review?	☐ Lessons learned from the day before?	☐ Topics from Corp H&S to cover?
☐ Any corrective actions from yesterday?	☐ Will any work deviate from plan?	☐ Any Stop Work Interventions yesterday?
☑ JSAs or procedures are available?	☑ Field teams to "dirty" JSAs, as needed?	☐ If deviations, notify PM & client
☑ Staff has appropriate PPE?	☑ Staff knows Emergency Plan (EAP)?	☑ All equipment checked & OK?
		☑ Staff knows gathering points?

Comments: _____

Recognize the hazards (check all those that are discussed) (Examples are provided) and **A**ssess the Risks (Low, Medium, High - circle risk level) - Provide an overall assessment of hazards to be encountered today and briefly list them under the hazard category.

☑ Gravity (i.e., ladder, scaffold, trip) (L M H) open excavation	☑ Motion (i.e., cars, moving water) (L M H)	☐ Mechanical (i.e., augers, motors) (L M H)
☐ Electrical (i.e., utilities, lightning) (L M H)	☐ Pressure (i.e. gas cylinders, wells) (L M H)	☑ Environment (i.e., heat, cold, ice) (L M H)
☑ Chemical (i.e., fuel, acid, paint) (L M H) contaminants	☐ Biological (i.e., ticks, poison ivy) (L M H)	☑ Radiation (i.e., alpha, sun, laser) (L M H)
☑ Sound (i.e. machinery, generators) (L M H)	☐ Personal (i.e. alone, night, not fit) (L M H)	☑ Driving (i.e. car, ATV, boat, dozer) (L M H)

Continue TRACK Process on Page 2

TAILGATE HEALTH & SAFETY MEETING FORM - Pg. 2

Control the hazards (Check all and discuss those methods to control the hazards that will be implemented for the day): Review the HASP, applicable JSAs, and other control processes. Discuss and document any additional control processes.

- [x] **STOP WORK AUTHORITY** (Must be addressed in every Tailgate meeting - *(See statements below)*
- [ ] Elimination
- [ ] Engineering controls
- [x] General PPE Usage
- [x] Personal Hygiene
- [x] Emergency Action Plan (EAP)
- [x] JSA to be developed/used *(specify)*
- [ ] Substitution
- [ ] Administrative controls
- [ ] Hearing Conservation
- [ ] Exposure Guidelines
- [ ] Fall Protection
- [ ] TIP conducted *(specify job/JSA)*
- [ ] Isolation
- [ ] Monitoring
- [ ] Respiratory Protection
- [x] Decon Procedures
- [ ] Work Zones/Site Control
- [ ] Traffic Control
- [ ] Other *(specify)*

Signature and Certification Section - Site Staff and Visitors

Name/Company/Signature	Initial & Sign in - Time	Initial & Sign out Time	I have read and understand the HASP
Daniel Stockard / Arcadis	DS 0800		✓
Marina Samp / Arcadis	MRS 0800		✓

Important Information and Numbers

All site staff should arrive fit for work. If not, they should report to the supervisor any restrictions or concerns.

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In the event of a motor vehicle accident, employees will notify the field supervisor who will then notify the Project or Task Manager.

In the event of a utility strike or other damage to property of a client or 3rd party, employees will immediately notify the field supervisor, who will then immediately notify the Project or Task Manager.

Visitor Name/Co - not involved in work

In ____ Out ____

In ____ Out ____

In ____ Out ____

In ____ Out ____

I will STOP the job any time anyone is concerned or uncertain about health & safety or if anyone identifies a hazard or additional mitigation not recorded in the site, project, job or task hazard assessment.

I will be alert to any changes in personnel, conditions at the work site or hazards not covered by the original hazard assessments.

If it is necessary to **STOP THE JOB,** I will perform **TRACK;** and then amend the hazard assessments or the HASP as needed.

I will not assist a subcontractor or other party with their work unless it is absolutely necessary and then only after I have done TRACK and I have thoroughly controlled the hazard.

Post Daily Activities Review - Review at end of day or before next day's work (Check those applicable and explain:)

- [ ] Lessons learned and best practices learned today: ____
- [ ] Incidents that occurred today: ____
- [ ] Any Stop Work interventions today? ____
- [ ] Corrective/Preventive Actions needed for future work: ____
- [ ] Any other H&S issues: ____

Keep H&S 1st in all things

WorkCare - 1.800.455.6155

Document Control Number: TGM - B0064479.2018.04400.036000-22/10/2018
TGM + project number plus date as follows: xxxxxxxx.xxxx.xxxxx - dd/mm/year

ARCADIS Design & Consultancy for natural and built assets

TAILGATE HEALTH & SAFETY MEETING FORM

This form documents the tailgate meeting conducted in accordance with the Project HASP. Personnel who perform work operations on-site during the day are required to attend this meeting and to acknowledge their attendance, at least daily.

Project Name: RACER Lansing			**Project Location:** Lansing, MI
Date: 10/22/18	**Time:** 0700	**Conducted by:** Marina Samp	**Signature/Title:** Marina K. Samp / Env. Spec.
Client: RACER		**Client Contact:** D. Favero	**Subcontractor companies:** JSS

TRACKing the Tailgate Meeting

Think through the Tasks (list the tasks for the day):

1 Monolith excavating
2 Monolith concrete pour
3 hauling water tank
4
5
6

Other Hazardous Activities - Check the box if there are any other Arcadis, Client or other party activities that may pose hazards to Arcadis operations ☐ If there are none, write "None" here: None

If yes, describe them here:

How will they be controlled?

Prework Authorization - check activities to be conducted that require permit issuance or completion of a checklist or similar before work begins:

	Doc #		Doc #		Doc #
☒ Not applicable		☐ Working at Height		☐ Confined Space	
☐ Energy Isolation (LOTO)		☐ Excavation/Trenching		☐ Hot Work	
☐ Mechanical Lifting Ops		☐ Overhead & Buried Utilities		☐ Other permit	

Discuss following questions (for some review previous day's post activities). **Check if yes :**

☐ Incidents from day before to review?	☐ Lessons learned from the day before?	☐ Topics from Corp H&S to cover?
☐ Any corrective actions from yesterday?	☐ Will any work deviate from plan?	☐ Any Stop Work Interventions yesterday?
☒ JSAs or procedures are available?	☒ Field teams to "dirty" JSAs, as needed?	☒ If deviations, notify PM & client
☒ Staff has appropriate PPE?	☒ Staff knows Emergency Plan (EAP)?	☒ All equipment checked & OK?
		☒ Staff knows gathering points?

Comments:

Recognize the hazards (check all those that are discussed) (Examples are provided) and **A**ssess the Risks (Low, Medium, High - circle risk level) - Provide an overall assessment of hazards to be encountered today and briefly list them under the hazard category.

☒ Gravity (i.e., ladder, scaffold, trips) (L (M) H)	☒ Motion (i.e. traffic, moving water) (L (M) H)	☐ Mechanical (i.e., augers, motors) (L M H)	
☐ Electrical (i.e., utilities, lightning) (L M H)	☐ Pressure (i.e. gas cylinders, wells) (L M H)	☐ Environment (i.e., heat, cold, ice) (L M H)	
☒ Chemical (i.e., fuel, acid, paint) (L M H) PFAS	☐ Biological (i.e., ticks, poison ivy) (L M H)	☐ Radiation (i.e., alpha, sun, laser) (L M H)	
☒ Sound (i.e., machinery, generators) (L M H)	☐ Personal (i.e. alone, night, not fit) (L M H)	☒ Driving (i.e. car, ATV, boat, dozer) (L (M) H)	

TAILGATE HEALTH & SAFETY MEETING FORM - Pg. 2

Control the hazards (Check all and discuss those methods to control the hazards that will be implemented for the day): Review the HASP, applicable JSAs, and other control processes. Discuss and document any additional control processes.

- [x] **STOP WORK AUTHORITY** (Must be addressed in every Tailgate meeting - (*See statements below*)

[ ] Elimination	[ ] Substitution	[ ] Isolation
[ ] Engineering controls	[ ] Administrative controls	[ ] Monitoring
[x] General PPE Usage	[ ] Hearing Conservation	[ ] Respiratory Protection
[x] Personal Hygiene	[ ] Exposure Guidelines	[x] Decon Procedures
[x] Emergency Action Plan (EAP)	[ ] Fall Protection	[x] Work Zones/Site Control
[ ] JSA to be developed/used ***(specify)***	[ ] TIP conducted ***(specify job/JSA)***	[ ] Traffic Control
		[ ] Other ***(specify)***

Signature and Certification Section - Site Staff and Visitors

Name/Company/Signature	Initial & Sign in Time	Initial & Sign out Time	I have read and understand the HASP
Marina Samp / Arcadis / Marina R Samp	MRS 0700	MRS 1630	✓

Important Information and Numbers

All site staff should arrive fit for work. If not, they should report to the supervisor any restrictions or concerns.

In the event of an injury, employees will call WorkCare at **1.888-449-7787** and then notify the field supervisor who will then notify the Project or Task Manager.

In the event of a motor vehicle accident, employees will notify the field supervisor who will then notify the Project or Task Manager.

In the event of a utility strike or other damage to property of a client or 3rd party, employees will immediately notify the field supervisor, who will then immediately notify the Project or Task Manager.

Visitor Name/Co - not involved in work

In	Out
In	Out
In	Out
In	Out

I will STOP the job any time anyone is concerned or uncertain about health & safety or if anyone identifies a hazard or additional mitigation not recorded in the site, project, job or task hazard assessment.

I will be alert to any changes in personnel, conditions a the work site or hazards not covered by the original hazard assessments.

If it is necessary to **STOP THE JOB,** I will perform **TRACK**; and then amend the hazard assessments or HASP as needed.

I will not assist a subcontractor or other party with th work unless it is absolutely necessary and then only I have done TRACK and I have thoroughly controlled hazard.

Post Daily Activities Review - Review at end of day or before next day's work (Check those applicable and explain:)

- [ ] Lessons learned and best practices learned today: _____
- [ ] Incidents that occurred today: _____
- [ ] Any Stop Work interventions today? _____
- [ ] Corrective/Preventive Actions needed for future work: _____
- [ ] Any other H&S issues: _____

ARCADIS Design & Consultancy for natural and built assets

Daily Log

Project No.: 30064479.2018.03600 Page 1 of 2

Site Location: Lansing, MI

Prepared By: M. Samp

Date	Time	Description of Activities
10/22/18	0700	Arrive onsite, H&S Tailgate
	—	- skype in for other project meeting
	0725	JSS onsite (one individual)
	0755	JSS onsite (A. Mosinski), D. Stockard onsite
	0800	JSS plan for day
	—	- generator dead, for pump, troubleshoot
	—	- finish digging around pipes
	—	- concrete pour at 1230
	0805	Mob. to Plant 2 to get water for
	—	biosparge nutrient injections
	1020	Return to Plant 3 monolith excavation (4 JSS onsite)
	1025	Water from pipe, check hoses, pumps
	—	- finish digging out around pipe of
	—	eastern monolith
	1040	both excavations ready for concrete pour
	1100	Offsite to get lunch
	1120	Onsite
	1150	TNT on site for concrete pour
	1230	Confirm new spec for slump
	—	- verify w/ A. Lorenz, 8"-12"
	1245	CS (concrete tester onsite)
	1300	Start western monolith pour

ARCADIS Design & Consultancy for natural and built assets

Daily Log

Project No.: B006479.2018.03600 Page 2 of 2

Site Location: Lansing, UI

Prepared By: U Sump

Date	Time	Description of Activities
10/22/18	1420	Finish western monolith concrete pour
	—	- mob to eastern monolith
	1440	Start concrete pour
	—	- southern pipe portion sagging, pipe joint
	—	at edge of excavation
	—	- excavator ~~use~~ bucket used to hold pipe in
	—	place during concrete pour
	1515	Call A. Lorenz to ok backup plan to use
	—	clay to plug pipe if flowable fill enters
	—	pipe when excavator is moved
	1520	Remove excavator hold on pipe
	—	- Concrete fill does not appear to show
	—	signs of pipe shifting out of place
	1530	D. Stockard noted collection pit is an oil-
	—	water separator, has sheen
	—	- will need to be pumped before filled
	—	- J. Saling & A. Lorenz approved
	1540	Fill floor drain with last concrete truck
	—	- MH-78A as well, filled to cover invert,
	1550	Use last of concrete on eastern monolith
	1600	Clean up for day
	1630	TNT, JSS, U Sump Offsite, Plant 3 gate locked

ARCADIS Design & Consultancy for natural and built assets

Daily Log

Project No.: B0064479.2018.0010 Page 1 of 1

Site Location: Lansing, MI

Prepared By: D. Stockard

Date	Time	Description of Activities
10/23/18	7:45	D. Stockard on site. Purpose: Construction oversight. PPE - Level D. Contractors: JSS Equipment: None. Weather: Clear, 40s.
	8:00	Discussed plan for day w/ Aaron, they plan to remove forms from bulkheads and get excavation areas a bit cleaned up.
	8:15	Checked temporary plug locations and noticed sheen on water in P3-MH-I-1N. Told Aaron they needed to stop pumping it, which they turned the pump off. Informed A. Lorene, who agreed we would have to stop bypass pumping and come up w/ a gameplan on how to get the temporary plug out later.
	8:45	D. Stockard headed back to Nori office to pick up NSZD study equipment.
	12:45	D. Stockard back on site. Informed Aaron we would not be pumping out the oily sump we found earlier, but that we need to get a volume estimate on the water in the OWS found yesterday (noted as a collection pit on field documents before). Estimated 350 gallons.
	13:00	Aaron headed off site, rest of crew is cleaning up equipment or adding about 6" of clay on top of monoliths to help cure it.
	13:30	D. Stockard to Plant 2.

Dani Stockard 10/23/18

ARCADIS | Design & Consultancy for natural and built assets

Daily Log

Project No.: B0064479.2018.03600 Page 1 of 1

Site Location: Lansing, MI

Prepared By: D. Stockard

Date	Time	Description of Activities
10/24/18	7:40	Purpose: Monolith construction oversight. PPE: Level D
		Arcadis: D. Stockard Weather: Clear, 30s
		Equipment: None.
		Discussed plan for day w/ Aaron. They plan to begin backfill the 4/8" monolith excavation today, have to wait for 36".
	8:00	Informed A. Lorenz, he wanted to see what strength they reached before beginning backfill. Aaron: it was 117 PSI for a spec of 100 PSI, so that one is good to backfill. On 36" it was 47 PSI, so they will wait on that. They plan to backfill w/ one 2' lift, then in increments of 6".
	10:00	Met w/ Sam Solomon @ sinkhole, he said they would probably want to flowable fill it.
	12:20	Checked on backfilling progress, it's satisfactory
	17:00	Back to check on backfill, they're almost done getting it up to grade.
	17:30	D. Stockard off site.

David Stockard
10/24/18

ARCADIS Design & Consultancy for natural and built assets

Daily Log

Project No.: B0064479.2018.03600 Page 1 of 1

Site Location: Lansing, MI

Prepared By: D. Stockard

Date	Time	Description of Activities
10/25/18	7:40	D. Stockard on site. Purpose: monolith construction oversight. PPE: Level D Equipment: None Contractors: JSS
	7:50	Checked w/ Aaron on plan for day. They will finish backfill for western monolith and start it for the eastern monolith. Got break test back for eastern monolith and it was at 116 PSI, so it's good to go.
	10:00	Backfilling of western excavation continues. At request of Aaron marked up the seven catch basins that still need to be capped. One on the north party one that's being bypass pumped into, 0 4 that have bulkheads or temporary plugs, and one that's in the southern parking lot.
	12:30	Backfilling coming along smoothly. Team has moved to Eastern excavation.
	14:20	Crew continues backfill, and is applying topsoil spread before work to western excavation. Plugs have been removed from bulkheading locations. Headed to Plant 2.
	15:30	Aaron is off site, rest of crew will finish off the backfilling.
	19:00	Crew backfilling, D. Stockard off site.
		Daniel Stockard 10/25/18

ARCADIS Design & Consultancy for natural and built assets

Daily Log

Project No.: B0064479.2018 - 03600 Page 1 of 2

Site Location: Lansing, MI

Prepared By: D. Stockard

Date	Time	Description of Activities
10/26/18	7:50	D. Stockard on site. Purpose: Construction oversight. PPE: Level D Weather: Overcast, 40s Contractors: JSS Equipment: None
	8:00	Checked w/ Aaron on plan for the day. They plan to finish backfilling, pull all temp. plugs, get the remaining catch basins capped, and get pumps off Frac tanks off site. Currently working on backfilling.
	8:40	Aaron informed that they're having 8 drums delivered today, and will fill the OWS.
	9:15	Crew rolling up hose, removed temp plugs from monolith installations.
	10:00	Got water for power washer.
	10:30	Drums delivered to site.
	10:45	Crew pumped out OWS, but there was not enough capacity in the 10 drums that were on site.
	11:50	Called A. Lorenz to see if we could use old storage totes on site to store water that we could transfer into drums later. He said that would be okay.
	12:30	After trying to pump into one of the storage totes, realized it had holes drilled into it. Immediately stopped pumping. They power-washed the water back into the OWS, and headed to tractor supply for a tank.

ARCADIS Design & Consultancy for natural and built assets

Daily Log

Project No.: B0064479.2018.03600 Page 2 of 2

Site Location: Lansing, MI

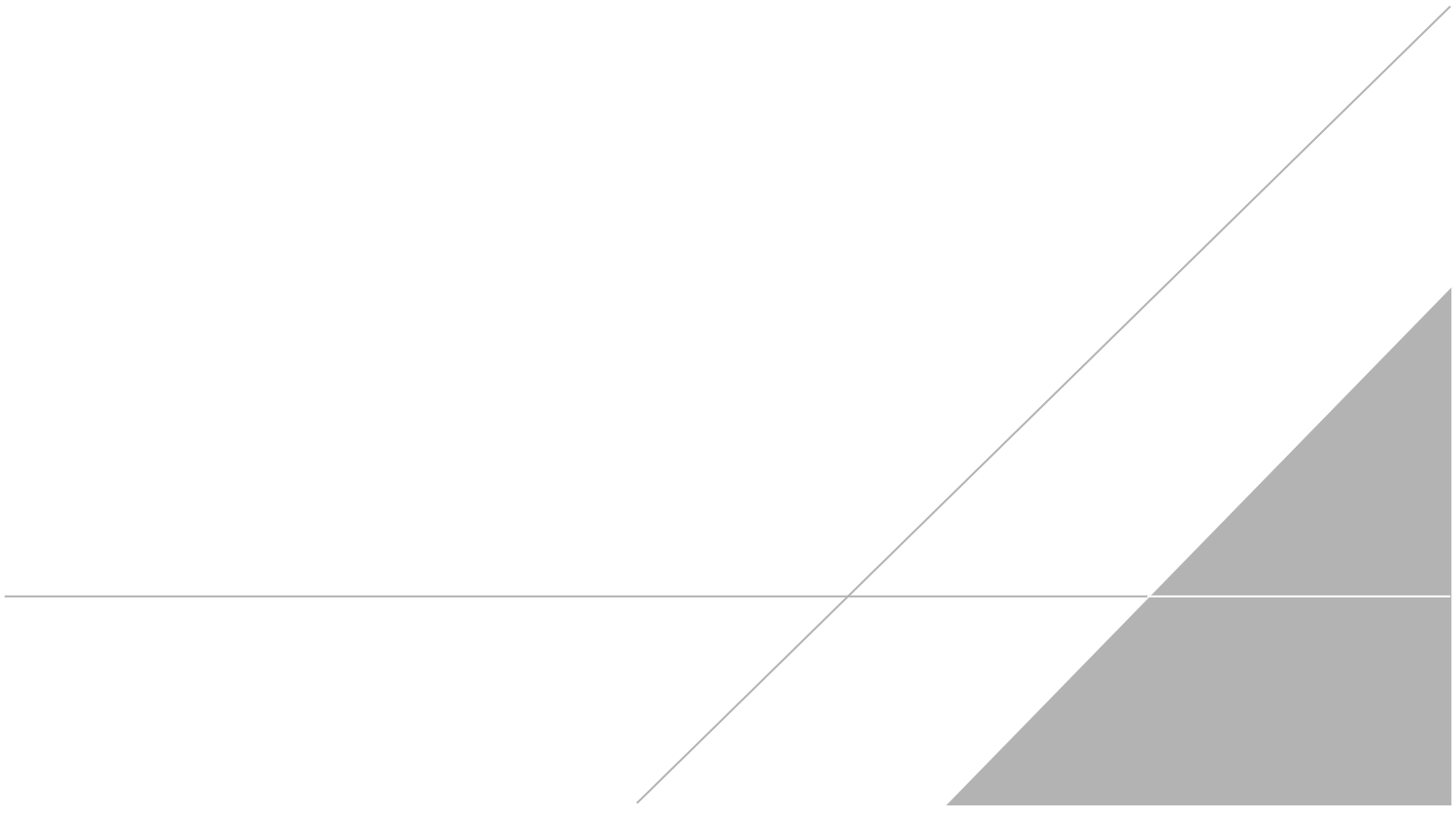
Prepared By: D. Stockard

Date	Time	Description of Activities
	12:55	Aaron informed me that the last job the concrete crew was on had [redacted] colored concrete, so the flow fill might have a slight pink tinge to it.
	13:10	Flowable fill ~~delivered~~ delivered, they filled up the sinkhole (Sam coordinated w/ Tom). Waiting on new tank to finish pumping down OWS.
	14:00	New tank on site, pumped into it. Began adding flow fill into OWS.
	14:40	Still need a bit more flow fill to top the OWS off.
	15:05	Crew moved to powerwash and pump out the property outfall manhole.
	15:30	Crew began powerwashing and pumping out the property outfall manhole. Another flowable fill truck on site.
	15:45	Finished up filling OWS w/ flowable fill. There are a total of [redacted] drums and about 90 gallons in a storage tote that will need to be picked up later.
	16:15	Crew getting equipment wrapped up. Walked over area that would need to be seeded w/ Aaron.
	16:30	JSS wrapping up equipment, D. Stockard off site.

David Stockard
10/26/18

APPENDIX B

Concrete and CLSM Testing Results



Construction Testing Services

3300 E. Bristol Rd.
Burton, MI 48529
(810)603-0766 (810)603-0786 (Fax)
www.constructiontesting.net

Daily Concrete Inspection Report

Client: **Job Site Services** **Date:** 10/10/18

Project: 2699 W Willow, Lansing MI (Former GM Plant 3) **CTS Job #** **18-293**

Architect: Client Job #:

Concrete Supplier: Builder's Redi-Mix

MATERIALS	SOURCE	TYPE:	DESIGN	% MOISTURE	BATCH
CEMENT		I	526		1320
FINE AGGREGATE		2NS	1313		3380
COARSE AGGREGATE (A)		26A Limestone	1688		4220
COARSE AGGREGATE (B)		FlyAsh	132		330
COARSE AGGREGATE (C)					
WATER			242		492
ADMIXTURE		C-260 Master Air AE 200	0.6 oz		9.0 oz
		C-494A Master Polyhead 997	7.0 oz		148 oz
		C-494E Master rheobuild 1000	9.0 oz		116 oz

DESIGN	TON 11229	C.F.	7.0					W/C	0.37	
		SLUMP	MAX.	7	MIN.	5		AIR	5.0 - 8.0	%
28 DAY STRENGTH (PSI)	5000	UNIT WEIGHT	144.1					YIELD		P.C.F.

TIME	1:28P									REMARKS
SLUMP	6.0								INCHES	
AIR %	5.0								%	
UNIT WEIGHT	144.04								LBS./CU. FT.	
YIELD	27.1								CU. FT.	
AIR TEMP.	71								°F	
MIX TEMP.	77								°F	
SAMPLE #	1-5									
Truck	1439									

AREA OF PLACEMENT: Sewer plug on MH 1 - 7
Drains = MH 1 - 90

WEATHER:	Overcast	# OF YDS. PLACED:	2.5
# OF YDS. REJECTED:	0	TOTAL:	2.5

CYLINDER NO.		AGE	DATE MOLDED	DATE TESTED	CURING METHOD		TOTAL LOAD	PSI	TYPE OF BREAK
4 x 8 ☑ 6 x 12 ☐					FIELD	LAB			
7740	1	7	10/10/18	10/17/18	1	6	63,380	5,050	A
7741	2	14	10/10/18	10/24/18	1	13	73,410	5,840	A
7742	3	21	10/10/18	10/31/18	1	20	79,140	6,300	A
7743	4	28	10/10/18	11/7/18	1	27	80,230	6,390	A
7744	5	28	10/10/18	11/7/18	1	27	80,390	6,400	A

TYPE OF BREAK LEGEND

A  B  C  D 

Field Technician Adam Barton

SHEET 1 of 1

Construction Testing Services

3300 E. Bristol Rd.
Burton, MI 48529
(810)603-0766 (810)603-0786 (Fax)
www.constructiontesting.net

Daily Concrete Inspection Report

Client: **Job Site Services** **Date:** 10/22/18

Project: 2699 W Willow, Lansing MI (Former GM Plant 3) **CTS Job #** **18-293**

Architect: Client Job #:

Concrete Supplier: Builders

MATERIALS	SOURCE	TYPE:	DESIGN	% MOISTURE	BATCH
CEMENT		I	300		
FINE AGGREGATE		2NS	2386		
COARSE AGGREGATE (A)					
COARSE AGGREGATE (B)					
COARSE AGGREGATE (C)					
WATER			300		
ADMIXTURE		Master Air	10 oz/c		
		Master Cell 25	1 bag/yd		
		Chloride	174 oz/yd		
DESIGN F301 000H	C.F.	3.2	W/C		
	SLUMP	MAX. 12 MIN. 8	AIR		%
28 DAY STRENGTH (PSI) 100	UNIT WEIGHT		YIELD		P.C.F.

TIME	12:50P	2:50P							REMARKS
FLOW	8	8.75						INCHES	
AIR %								%	
UNIT WEIGHT								LBS./CU. FT.	
YIELD								CU. FT.	
AIR TEMP.	56	57						°F	
MIX TEMP.	66	67						°F	
SAMPLE #	1-7	8-14							
Truck									

AREA OF PLACEMENT: Flowable fill at location: P3-MH-1-1N, P3-MH-2-1N
Flowable fill plugs at: P3-MH-2-1N, P3-MH-2-1N

WEATHER: # OF YDS. PLACED: 100

OF YDS. REJECTED: 0 TOTAL: 100

CYLINDER NO. 4 x 8 ☐ 6 x 12 ☑		AGE	DATE MOLDED	DATE TESTED	CURING METHOD		TOTAL LOAD	PSI	TYPE OF BREAK
					FIELD	LAB			
7865	1	1	10/22/18	10/23/18	1	0	3,300	114	
7866	2	2	10/22/18	10/24/18	1	1	4,241	150	
7867	3	3	10/22/18	10/25/18	1	2	5,200	184	
7868	4	7	10/22/18	10/29/18	1	6	8,060	285	
7869	5	14	10/22/18	11/5/18	1	13	8,550	303	
7870	6	28	10/22/18	11/19/18	1	27	10,140	359	
7871	7	28	10/22/18	11/19/18	1	27	10,290	364	
7872	8	1	10/22/18	10/23/18	1	0	1,330	47	
7873	9	2	10/22/18	10/24/18	1	1	2,300	81	
7874	10	3	10/22/18	10/25/18	1	2	3,280	116	
7875	11	7	10/22/18	10/29/18	1	6	4,560	161	
7876	12	14	10/22/18	11/5/18	1	13	4,800	170	
7877	13	28	10/22/18	11/19/18	1	27	5,800	205	
7878	14	28	10/22/18	11/19/18	1	27	5,880	208	

TYPE OF BREAK LEGEND A  B  C  D 

Field Technician Sean McCarley

SHEET 1 of 1

CONCRETE
MIX DESIGN

Technical Services Dept.
30701 W. 10 Mile Rd.
Suite 500
Farmington Hills, MI 48336

Builders' REDI-MIX
Finish First With Builders®

MIX ID: F301000H 100 PSI 9/25/2018

CONTRACTOR:	JOB SITE SERVICES INC.
PROJECT:	RAZOR PARK 3
SOURCE OF CONCRETE:	PLANT 14 - LANSING
CONSTRUCTION TYPE:	FLOWABLE FILL
PLACEMENT:	DIRECT

	(SSD WEIGHT)			(YIELD, FT^3)
A.S.T.M. C-150 TYPE I CEMENT	300	lb.		1.53
A.S.T.M. C-33 2NS SAND	2389	lb.		14.34
WATER (gallons)	300	lb.	36.0	4.81
TOTAL AIR	24.0%			6.53
			TOTAL	27.20

A.S.T.M. C-260 (MasterAir)	10.0	oz/yd	
A.S.T.M. C-260 (MasterCell 25)	1.0	bag/yd	
CALCIUM CHLORIDE	174.0	oz/yd	(accelerator)

WATER/CEMENT RATIO		1.00		
SLUMP		3.0	in.	(water slump)
	(+/- 1")	10.0	in.	(after water reducers)
CONCRETE UNIT WEIGHT, PCF		109.9	lbs/ft^3	

All testing must adhere to ASTM Standards. ASTM C-94 states the supplier is to receive all concrete test reports. Mail to above address or e-mail to **mpball@superiormaterials.net.**

PREPARED BY:
Nancy Donahue

FALLING HEAD PERMEABILITY
ASTM D5084

PROJECT INFORMATION

Project: Racer Lansing Storm Sewer	Project Number:	080271.00	
Location: Lansing, MI	Date Started:	October 25, 2018	Permeameter Cell Number
	Engineer:		Sample #: 1

SAMPLE IDENTIFICATION

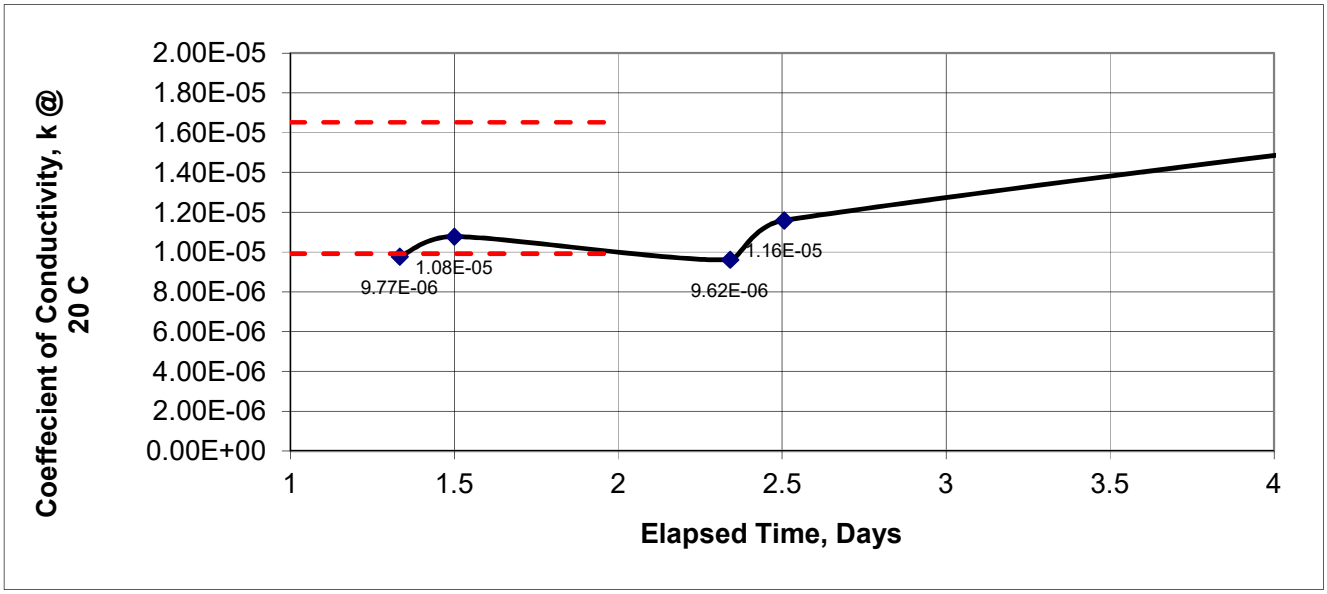
Sample Location	Type of Sample	Description
1	4"x8" Cylinder	Flowable Fill

SAMPLE PREPARATION

Dry Unit Weight Maximum, pcf	Moisture Content Optimum, %	Actual Sample Compaction, %	Method of Compaction
---	---	---	---

TEST CONDITIONS

Initial Head Height (inches)	Permeant Liquid	Initial Stone & Resevoir Water Conditions
95.75	Tap Water	Moist Stones with 5 psi confining pressure



	Initial	Final
Void Ratio, e	0.70	0.70
Saturation, S%	47	67
Porosity, n%	41	41
Water Content, w%	13	18
Wet Unit Weight	107	112
Dry Unit Weight	94	94
Specific Gravity	2.58	2.58

Coefficient of Conductivity, k@20C, cm/sec
Average of last 4 test cycles
0.0000132159
1.32E-05

FALLING HEAD PERMEABILITY
ASTM D5084

PROJECT INFORMATION

Project: Racer Lansing Storm Sewer	Project Number:		080271.00
Location: Lansing, MI	Date Started:	October 25, 2018	Permeameter Cell Number
	Engineer:		Sample #: 2

SAMPLE IDENTIFICATION

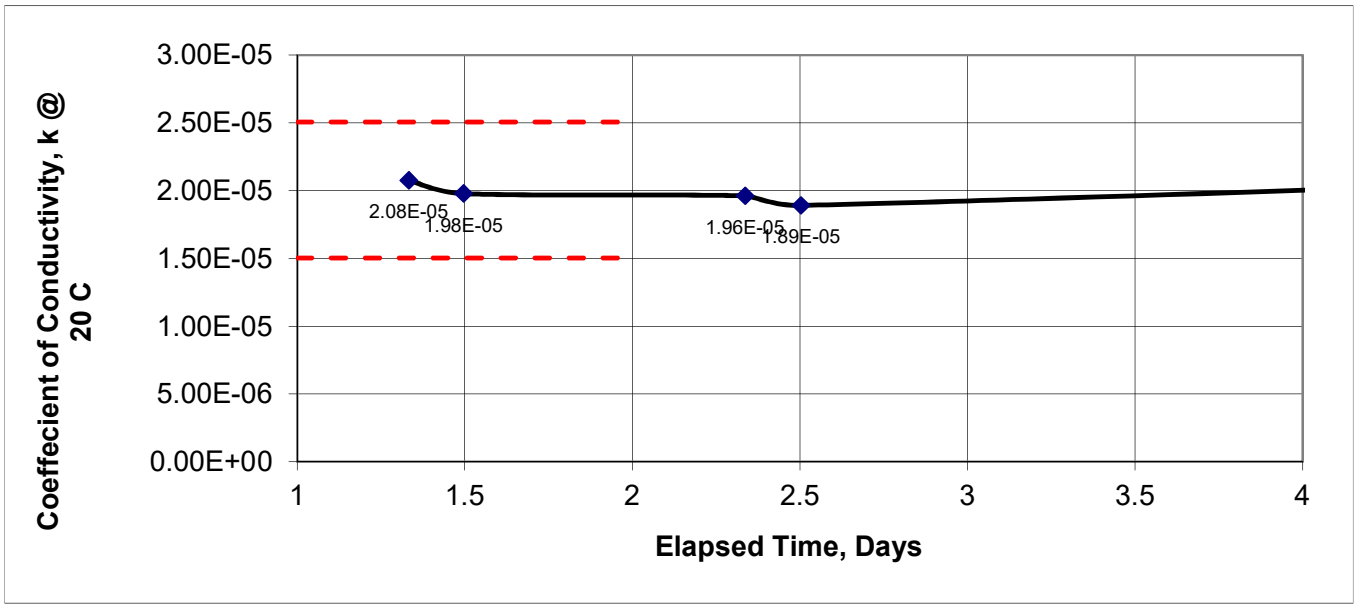
Sample Location	Type of Sample	Description
2	4"x8" Cylinder	Flowable Fill

SAMPLE PREPARATION

Dry Unit Weight Maximum, pcf	Moisture Content Optimum, %	Actual Sample Compaction, %	Method of Compaction
---	---	---	---

TEST CONDITIONS

Initial Head Height (inches)	Permeant Liquid	Initial Stone & Resevoir Water Conditions
97.82	Tap Water	Moist Stones with 5 psi confining pressure



	Initial	Final
Void Ratio, e	0.64	0.64
Saturation, S%	48	70
Porosity, n%	39	39
Water Content, w%	12	17
Wet Unit Weight	110	115
Dry Unit Weight	98	98
Specific Gravity	2.58	2.58

Coefficient of Conductivity, k@20C, cm/sec
Average of last 4 test cycles
0.0000200506
2.01E-05

APPENDIX C

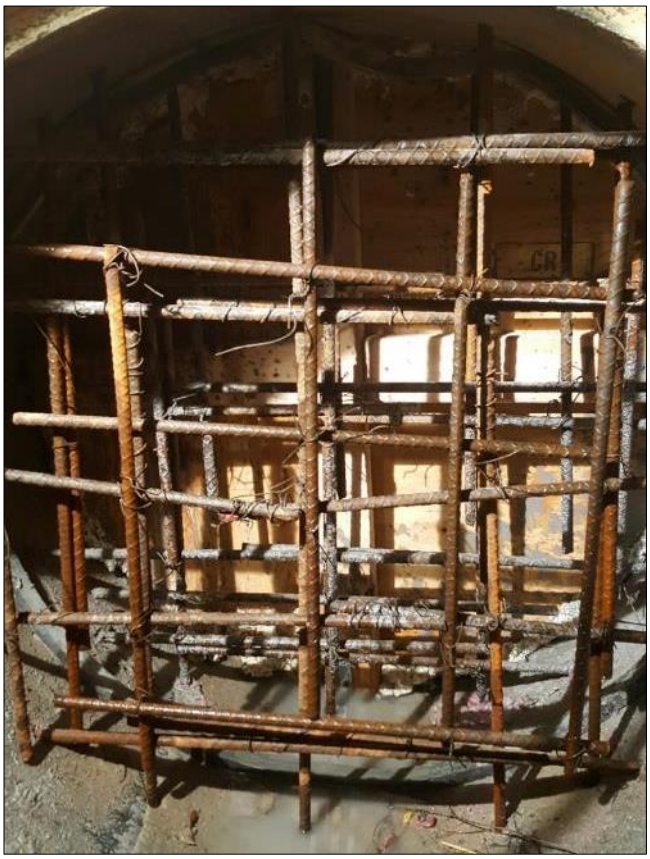
Construction Photo Log

RACER Lansing Storm Sewer Modifications
Photo Log

1: The crew mobilized and prepared for a day of constructing the bulkheads and capping catch basins.

2 and 3: Temporary plugs were installed in five upstream catch basins or manholes to block water from flowing into the manholes in which bulkheads were installed.

4: The crew capped 157 catch basins on the Site. A PVC liner was applied and caulked over the rim. A steel sheet was caulked on top of the liner, and 21AA aggregate placed over that.



5: The crew began the bulkheading construction by cleaning and roughening the inner circumference of the existing pipe. They then constructed a sacrificial wooden inner form (pictured here behind the rebar). They then drilled holes around circumference of the pipe, inserted the rebar, and secured it with epoxy. A waterstop ring was also installed to prevent waterflow at the concrete interface.

6: The crew directs concrete into the bulkhead form in manhole P3-MH-1-7

7: The freshly poured bulkhead sets in P3-MH-1-10. Also pictured is the bypass pump hose that would pump infiltrating water out of the sump

8: The concrete bulkhead sets in P3-MH-1-7. Also pictured is the bypass pump hose that would pump infiltrating water out of the sump

9: The outer wooden form was removed and rough surfaces on the bulkhead were grouted several days after the bulkheads reached their design strength. Pictured here is the bulkhead in P3-MH-1-7.

10: The outer wooden form was removed and rough surfaces on the bulkhead were grouted several days after the bulkheads reached their design strength. Pictured here is the bulkhead in P3-MH-1-10.

11: The crew excavates down to the western interceptor. The excavation was benched for stability.

12: Once the pipe was exposed, the crew cut through the pipe so sacrificial forms could be installed.

13: The crew successfully cut through the western interceptor.

14: Sacrificial forms were installed in both of the exposed pipe ends. Note that the sacrificial form in the pipe on the right was placed beyond the separated pipe seam.

15: Wide view of the western excavation. A snow fence was placed around the excavation to secure it.

16: Stormwater upgradient of the work areas was bypass-pumped into the property outfall manhole while the pipes were prepared for monolith installation.

17: The crew excavated and daylighted the eastern storm interceptor.

18: Sacrificial forms were installed into the ends of the exposed pipes.

19: Controlled low-strength material (CLSM, or flowable fill) is poured into the excavation around the western storm interceptor, up to the red lines on the excavation walls

20: Western CLSM monolith after pouring was complete

21: Eastern CLSM monolith being poured

22: The floor drain on the eastern part of the Site was also filled with CSLM. It was graded smooth after this photo was taken.

23: The western monolith after setting for a few days

24: The eastern monolith after setting for a few days

25: After the western monolith reached its design strength, the excavation was backfilled and compacted.

26: After the eastern monolith reached its design strength, the excavation was backfilled and compacted.

27: Western excavation area after backfilling was complete. The original topsoil was used for restoration.

28: Eastern excavation area after backfilling was complete. The original topsoil was used for restoration.

29: The oil-water separator (OWS) was pumped out and filled with CLSM to mitigate runoff into the decommissioned eastern storm main.

30: The former OWS after being filled with CLSM

31: The property outfall manhole was pumped and power-washed after the monoliths were successfully installed.

32: Excavation areas were seeded and covered with hay during restoration.

APPENDIX D

Storm Sewer Sampling Laboratory Report

The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report

Technical Report for

Arcadis

Racer Lansing PFAS Delineation; Lansing, MI

B0064479.2018.03700

SGS Job Number: FA60008

Sampling Dates: 12/04/18 - 12/07/18

Report to:

Arcadis
300 S Washington Sq Suite 315
Lansing, MI 48933
alex.villhauer@arcadis.com; christine.gregg@arcadis.com

ATTN: Alex Villhauer

Total number of pages in report: **68**

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

Caitlin Brice, M.S.
General Manager

Client Service contact: Andrea Colby 407-425-6700

Certifications: FL(E83510), LA(03051), KS(E-10327), IL(200063), NC(573), NJ(FL002), NY(12022), SC(96038001) DoD ELAP(ANAB L2229), AZ(AZ0806), CA(2937), TX(T104704404), PA(68-03573), VA(460177), AK, AR, IA, KY, MA, MS, ND, NH, NV, OK, OR, UT, WA, WV

Report of Analysis

Client Sample ID:	P3-MH-NE_120718		
Lab Sample ID:	FA60008-13	**Date Sampled:**	12/07/18
Matrix:	AQ - Ground Water	**Date Received:**	12/08/18
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	2Q25693.D	1	12/27/18 18:03	NAF	12/26/18 12:00	OP73191	S2Q397
Run #2							

	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2		

PFAS List

CAS No.	Compound	Result	RL	MDL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS						
375-22-4	Perfluorobutanoic acid	0.00289	0.0080	0.0020	ug/l	J
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0015	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	0.00163	0.0040	0.0010	ug/l	J
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0015	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
PERFLUOROALKYLSULFONATES						
375-73-5	Perfluorobutanesulfonic acid	0.00148	0.0040	0.0010	ug/l	J
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.00161	0.0040	0.0010	ug/l	J
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0219	0.0040	0.0015	ug/l	B
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid [b]	ND	0.0040	0.0010	ug/l	
PERFLUOROOCTANESULFONAMIDES						
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS						
2355-31-9	MeFOSAA	ND	0.020	0.0040	ug/l	
2991-50-6	EtFOSAA	ND	0.020	0.0040	ug/l	
FLUOROTELOMER SULFONATES						
757124-72-4	4:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	P3-MH-NE_120718		
Lab Sample ID:	FA60008-13	**Date Sampled:**	12/07/18
Matrix:	AQ - Ground Water	**Date Received:**	12/08/18
Method:	EPA 537M BY ID EPA 537 MOD	**Percent Solids:**	n/a
Project:	Racer Lansing PFAS Delineation; Lansing, MI		

PFAS List

CAS No.	Compound	Result	RL	MDL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	90%		30-140%
	13C5-PFPeA	91%		40-140%
	13C5-PFHxA	98%		50-150%
	13C4-PFHpA	101%		50-150%
	13C8-PFOA	112%		50-150%
	13C9-PFNA	105%		50-150%
	13C6-PFDA	90%		50-150%
	13C7-PFUnDA	80%		50-150%
	13C2-PFDoDA	75%		50-150%
	13C2-PFTeDA	81%		40-150%
	13C3-PFBS	90%		50-150%
	13C3-PFHxS	90%		50-150%
	13C8-PFOS	72%		50-150%
	13C8-FOSA	91%		30-140%
	d3-MeFOSAA	68%		50-150%
	13C2-4:2FTS	90%		50-150%
	13C2-6:2FTS	99%		50-150%
	13C2-8:2FTS	83%		50-150%

(a) Insufficient sample for re-extraction.
(b) Associated BS recovery outside control limits.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

APPENDIX E

Post-Construction Stormwater Inspections Photo Log

RACER Lansing Storm Sewer Modifications
Post-Construction Stormwater Inspection Photo Log
November 7 and 13, 2018

1: Minor ponding present near the plugged floor drain on November 7, 2018

RACER Lansing Storm Sewer Modifications
Post-Construction Stormwater Inspection Photo Log
November 7 and 13, 2018

2: Ponding present in the northeastern area of the Site on November 7, 2018

3: Oil-Water Separator (OWS) filled with CLSM. Pictured November 7, 2018

RACER Lansing Storm Sewer Modifications
Post-Construction Stormwater Inspection Photo Log
November 7 and 13, 2018

4: Ponding noted near the northeastern fence on November 7, 2018. Relief of the concrete prevents flow off site.

5: Ponding noted near the northeastern fence on November 13, 2018. A capped catch basin can be seen in the middle of the standing water

RACER Lansing Storm Sewer Modifications
Post-Construction Stormwater Inspection Photo Log
November 7 and 13, 2018

6 and 7: Water noted to run east near the western property boundary.

8: Minor ponding noted in southern parking lot area. No runoff noted to Saginaw Street.

9: Property outfall manhole P3-MH-NE with water accumulation in the sump

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