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From:
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Date:
September 2, 2021

Arcadis Project No.:
30043300.03300

Subject:
Outfall 010 Storm Sewer PFAS Remedy Work Plan
Buick City Site, Flint, MI

Introduction

This remedy work plan for the Outfall 010 Bulkhead (Work Plan) was prepared by Arcadis on behalf of Revitalizing Auto Communities Environmental Response Trust (RACER) for the Buick City Site (Site) located in Flint, Michigan. This Work Plan includes installing bulkheads and concrete plugs at select locations along the Outfall 010 sewer to minimize or eliminate the Site's contribution to the storm sewer system as a continuation of the Outfall 010 Storm Sewer PFAS Reduction Options (March 2, 2021). The proposed plug locations are presented on **Figure 1**.

Background Information

As part of the Buick City PFAS investigation, elevated PFAS concentrations were detected in the Outfall 010 storm sewer system and at the outfall discharge to the Flint River. Previous PFAS reduction activities include filling Manhole 10-5 with concrete. Following those activities additional sampling was completed in June and August 2021 and the results are presented in **Table 1**.

Manhole Requiring Bulkheading

One bulkhead will be installed at manhole location 10-2 on the downgradient side of the structure. The bulkhead will be installed to eliminate contribution from Outfall 010 as shown on **Figure 1**.

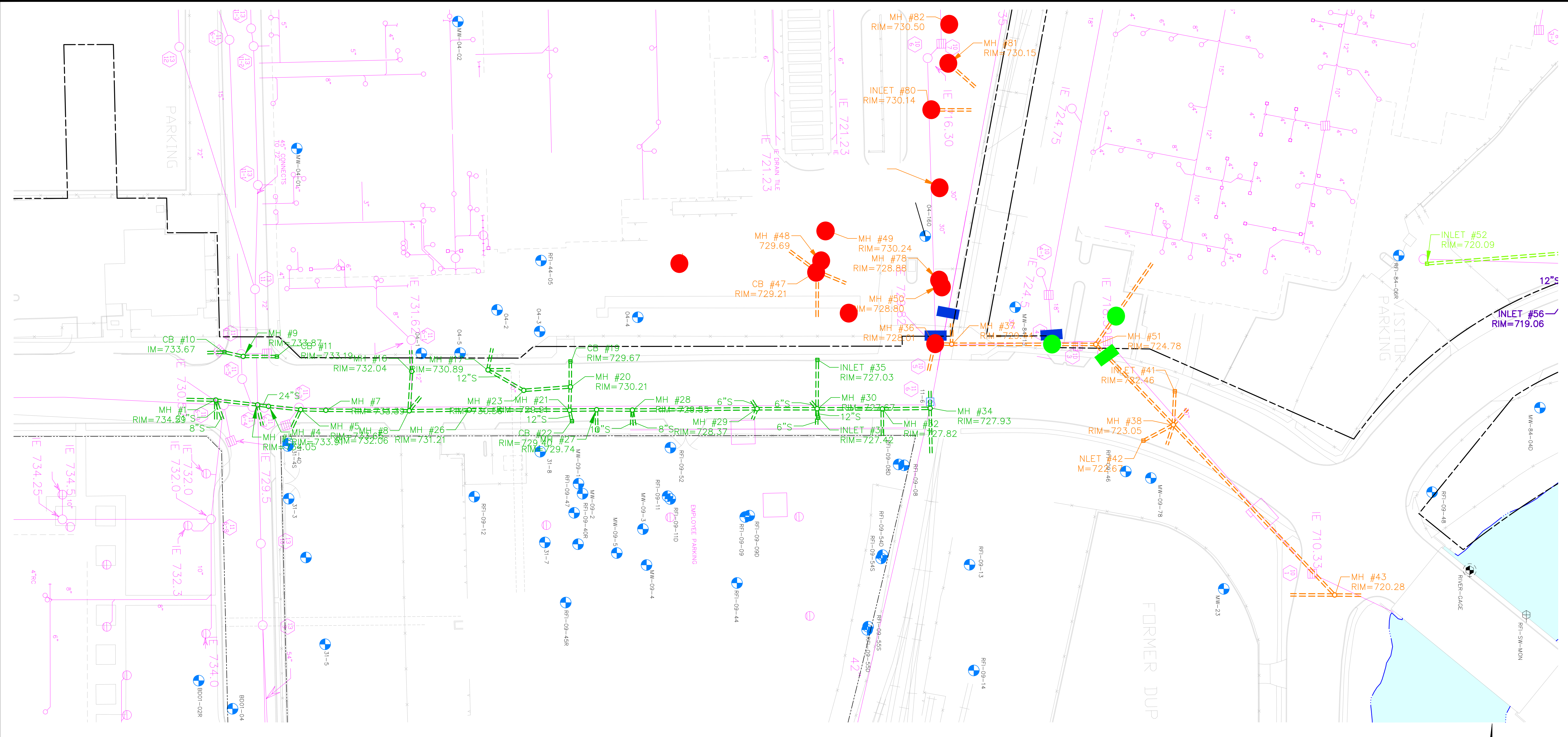
MEMO

Bulkhead installations will be completed in accordance with **Figures 2**. The sewer walls shall be prepared for the plug installations by cleaning and roughing the surface. The concrete plugs will create a hydraulic seal upon completion utilizing a preformed plastic water stop and epoxy bonding agent around the full circumference.

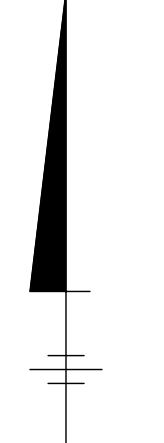
Manholes Requiring Concrete Filling

Multiple concrete plugs will be installed to eliminate head pressure off bulkhead at manhole 10-2. Upgradient locations 10-4 and a manhole upgradient of manhole 10-3 will be filled with concrete to surface level. Locations are identified in **Figure 1**.

CITY: SYRACUSE DIV: GROUP: ENV DB: A SANCHEZ ID: ALSIGMS PIC: C.S. PETERS LVR: ON-OFF-REF- C:\Users\alsanchez\OneDrive - ARCADIS\BIM 360 Docs\RACER TRUST\BUICK CITY RCRA\2019\10-DWG\RTBC-F-HAMILTON STORM SEWER.dwg LAYOUT: 2. SAVED: 1/7/2019 6:14 PM ACADVER: 21.05 (LMS TECH) PAGES: 10 PLOT: 1/7/2019 6:17 PM BY: SANCHEZ, ADRIAN

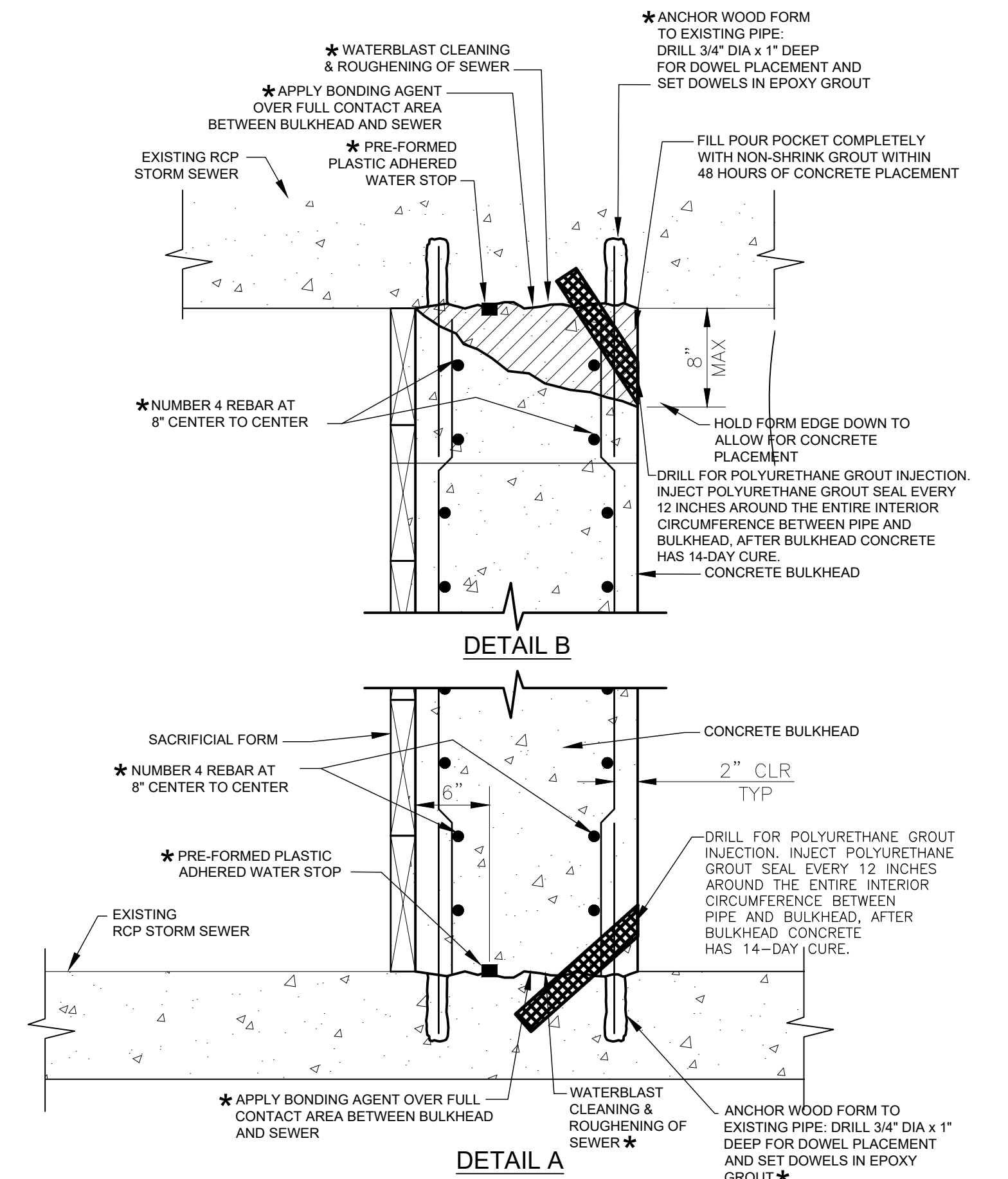
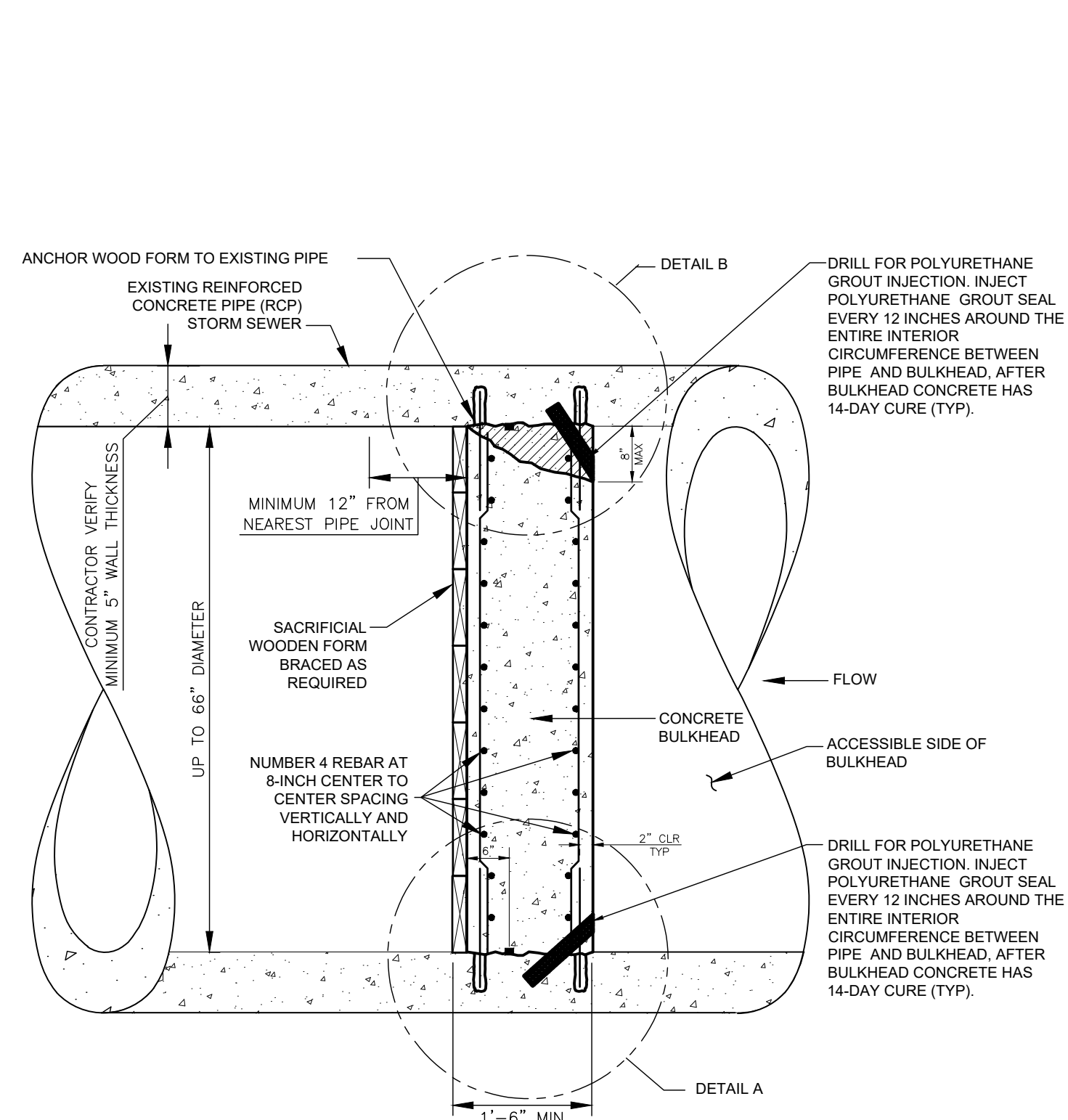


- LEGEND:**
- MONITORING WELL (ACTIVE)
 - ⊕ PIEZOMETER
 - ⊙ RECOVERY WELL
 - SURVEYED STORM SEWER LINE (OUTFALL 010)
 - SURVEYED STORM SEWER LINE (OUTFALL 011)
 - HISTORIC STORM SEWER LINE
 - EXISTING BULKHEAD
 - MANHOLE PREVIOUSLY FILLED
 - PROPOSED MANHOLE TO BE FILLED
 - PROPOSAL BULKHEAD



RACER TRUST BUICK CITY FLINT, MICHIGAN	
OUTFALL 010 STORM SEWER PFAS REDUCTION	
ARCADIS	Design & Consultancy for natural and built assets
FIGURE 1	

CITY OF BUICK CITY, DIVISION OF PUBLIC WORKS, 2800 Cabot Drive, Buick City, Michigan 48304
 C:\Users\adrian.sanchez\OneDrive\Documents\Projects\2019\2019-05-07-07-07-07.dwg
 LAYOUT, D-3, SAVED: 11/08/2019 1:41 PM, ACADVER: 23.05 (LMS TECH), PAGES: 1, PLOTTED: 11/08/2019 2:27 PM, BY: SANCHEZ, ADRIAN



NOTES:

1. PROVIDE 2" RESILIENT SEAT PLUG VALVE EQUAL TO USABUEBOOK.COM ME-26421. PROVIDE LEVEL OPERATOR EXTENSION TO 6" BELOW MANHOLE COVER.
 2. CONTRACTOR MUST STOP ALL PIPE FLOW IN ORDER TO CLEAN AND PREPARE SEWER FOR BONDING AGENT. MAINTAIN ZERO FLOW UNTIL CONCRETE HAS 28 DAY CURE.
 3. ASSUMES PIPE IS CONCRETE. IF PIPE MATERIAL IS DIFFERENT OR IN UNACCEPTABLE CONDITION, CONTACT ENGINEER.
 4. POLYURETHANE GROUT PER NOTES PAGE.
- * FULL CIRCUMFERENCE OF BULKHEAD.

TYPICAL BULKHEAD SECTION FOR UP TO 66" PIPE 1

NOT TO SCALE

DRAWING NOT TO SCALE	Professional Engineer's Name		Professional Engineer's No.		State		Date Signed		Project Mgr.	
			6201050540		MI				TM	
THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING.	USE TO VERIFY FIGURE REPRODUCTION SCALE		1 11.2019 REVISED PIPE TYPE PO BMS No. Date Revisions By Ckd		Designed by GG/KG/OH Drawn by ALS Checked by BMS		RACER TRUST • BUICK CITY, FLINT, MICHIGAN		ARCADIS Project No. B0064410.2019.01903 Date MAY 2019 ARCADIS OF MICHIGAN, LLC 28550 CABOT DRIVE SUITE 500 NOVI, MICHIGAN 48377 TELEPHONE: 248.994.2240	
	THIS DRAWING IS THE PROPERTY OF THE ARCADIS ENTITY IDENTIFIED IN THE TITLE BLOCK AND MAY NOT BE REUSED OR ALTERED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF SAME.								BULKHEAD DETAILS	



ARCADIS OF MICHIGAN, LLC.

BULKHEAD DETAILS

Table 1 - Outfall 010 Data
RACER Trust, Buick City Site, Flint, Michigan

Location ID: Date Collected:	Units	Outfall 010 06/15/21	MH 10-1 06/15/21	MH 10-1A 06/15/21	MH 10-2 06/15/21	Outfall 010 08/09/21	MH 10-2 08/09/21
Perfluorohexanesulfonic acid (PFHxS)	ng/L	950	830	710	390	800	330
Perfluorooctane sulfonic acid	ng/L	2500	830	890	140	2600	150
Perfluorooctanoic acid	ng/L	73	70	55	36	78	43

Notes:

ng/L - nanograms per liter

U - The compound was analyzed for but not detected. The associated value is the compound quantitation limit.