



*Measurement and Payment, Special Provisions,  
City Provided Materials Pricing*

**Balch Street (Park St. to Burdick St.)  
Water Main Replacement**

**Bid Reference #: 91244-025.0**

**June 2023**

**CITY OF KALAMAZOO**

**SPECIAL PROVISION**

**FOR**

**Water Main Material Advance Purchase**

City of Kalamazoo

04/11/2023

**a. Description**

**General**

For the unit price per linear foot bid for the various water main, the Contractor shall do all work necessary to construct complete ready for service water main system and test the water main as shown on the plans and as specified, except for work which is specifically included under other contract items. All work shall be done in accordance with section 823 of the 2020 MDOT Standard Specifications for Construction and City of Kalamazoo Standard Specifications for Water Main and Service Installation 2021 available at kalamazoocity.org, unless otherwise specified herein.

**b. Materials**

Ductile Iron pipe, restrained joints, fittings, polyethylene encasement and associated appurtenances listed below shall be supplied new by the City of Kalamazoo from their selected supplier at no cost to the Contractor. The Contractor shall be responsible for coordinating delivery of materials by contacting the City's specified supplier a minimum of 10 working days prior to desired delivery. In advance of material delivery, a centralized delivery yard shall be established by the Contractor and agreed upon with the City and City's material supplier on or adjacent to the project site. The contractor shall supply any materials not explicitly listed below that are necessary to construct the project. These materials shall be incidental to construction. No second hand or salvaged materials shall be allowed or supplied. All supplied products shall be "**Buy American**" unless otherwise specified and shall comply with the conditions of this section.

Contractor shall review the plans and list of City supplied materials during bidding and throughout construction. If Contractor believes additional quantities will be required, Contractor shall immediately notify the City in writing, and the City shall provide the materials at no cost to the Contractor. City shall not be responsible for any downtime or construction delays associated with insufficient materials being available during construction as the Contractor shall notify the City of foreseen insufficient materials during the bid period. Contractor shall be responsible for all delays and downtime associated with Contractor supplied materials, and shall purchase, provide, and install materials not explicitly listed below that are necessary to construct the project as designed.

All City provided materials, not used during construction, shall be returned to the City within one week of water main and service installation completion, unless otherwise directed by the City's project manager. The Contractor shall be responsible for transporting any excess material from the project site to 415 E. Stockbridge Ave., Kalamazoo, MI. This includes, but is not limited to, partial and full sticks of pipe, partial and full rolls of copper (including tag ends of copper services), valves, fittings, gaskets, bolts, etc.

City provided materials shall be used efficiently and waste from cutting pipes, etc. shall be minimized. City provided materials shall be handled with care and protected from damage, vandalism and thievery. City shall not be responsible for providing additional materials due to theft or mishandling by contractor.

Contractor shall wash the inside of all pipe and fittings with chlorinated water (maximum 200 ppm chlorine solution) immediately prior to placement in the trench. Water pressure and velocity during washing shall not exceed manufacture’s recommendations or damage the pipe or fittings.

Contractor shall provide 2 year warranty as described in the City of Kalamazoo Standard Specifications for Water Main and Service Installation. Warranty shall cover all City and Contractor provided parts and materials; and associated contractor labor costs.

Contractor and Engineer shall track City provided material delivery and usage on a daily basis.

Unit pricing is included below for the for the City’s procurement of materials for the Contractor to account for sales and use tax per the Michigan Department of Treasury RAB 2016-18. Sales and use tax pricing shall be included in the major items of work.

ITEM	UNIT	UNIT PRICE	QUANTITY	EXTENDED PRICE
POLYETHYLENE ENCASEMENT, 4 INCH	FT	\$ 5.40	20	\$ 108.00
POLYETHYLENE ENCASEMENT, 6 INCH	FT	\$ 1.12	60	\$ 67.20
POLYETHYLENE ENCASEMENT, 8 INCH	FT	\$ 0.67	100	\$ 67.08
POLYETHYLENE ENCASEMENT, 12 INCH	FT	\$ 4.99	20	\$ 99.80
POLYETHYLENE ENCASEMENT, 16 INCH	FT	\$ 4.99	20	\$ 99.80
POLYETHYLENE ENCASEMENT, 24 INCH	FT	\$ 1.33	1200	\$ 1,590.24
DIP_4 INCH	FT	\$ 32.49	20	\$ 649.80
DIP_6 INCH	FT	\$ 24.98	60	\$ 1,498.80
DIP_8 INCH	FT	\$ 35.25	120	\$ 4,230.00
DIP_12 INCH	FT	\$ 58.18	20	\$ 1,163.60
DIP_16 INCH	FT	\$ 84.18	20	\$ 1,683.60
DIP_24 INCH	FT	\$ 138.59	1300	\$ 180,167.00
4" SOLID SLEEVE	EA	\$ 82.00	2	\$ 164.00
6" SOLID SLEEVE	EA	\$ 122.00	2	\$ 244.00
8" SOLID SLEEVE	EA	\$ 159.00	2	\$ 318.00
16" SOLID SLEEVE	EA	\$ 805.00	2	\$ 1,610.00
24" SOLID SLEEVE	EA	\$ 1,780.00	4	\$ 7,120.00
8" 45 DEG BEND	EA	\$ 162.00	14	\$ 2,268.00
16" 45 DEG BEND	EA	\$ 896.00	3	\$ 2,688.00
24" 45 DEG BEND	EA	\$ 2,023.00	12	\$ 24,276.00
24" 22.5 DEG BEND	EA	\$ 1,952.00	8	\$ 15,616.00
24" 11.25 DEG BEND	EA	\$ 1,796.00	4	\$ 7,184.00
4" CAP	EA	\$ 42.00	2	\$ 84.00
6" CAP	EA	\$ 56.00	2	\$ 112.00

8" CAP	EA	\$ 87.00	4	\$ 348.00
12" CAP	EA	\$ 162.00	4	\$ 648.00
16" CAP	EA	\$ 448.00	1	\$ 448.00
24" CAP	EA	\$ 1,056.00	1	\$ 1,056.00
4" PLUG	EA	\$ 54.00	1	\$ 54.00
6" PLUG	EA	\$ 84.00	1	\$ 84.00
8" PLUG	EA	\$ 118.00	1	\$ 118.00
8"X6" TEE	EA	\$ 251.00	2	\$ 502.00
24"X6" TEE	EA	\$ 2,306.00	3	\$ 6,918.00
24"X8" TEE	EA	\$ 2,492.00	2	\$ 4,984.00
24"X16" TEE	EA	\$ 3,413.00	2	\$ 6,826.00
24"X24" TEE	EA	\$ 4,379.00	1	\$ 4,379.00
8"X4" REDUCER	EA	\$ 125.00	1	\$ 125.00
8"x6" REDUCER	EA	\$ 133.00	1	\$ 133.00
24"X12" REDUCER	EA	\$ 1,636.00	1	\$ 1,636.00
4" MEGA LUGS W/ GASKET AND BOLT KIT	EA	\$ 48.00	10	\$ 480.00
6" MEGA LUGS W/ GASKET AND BOLT KIT	EA	\$ 56.00	30	\$ 1,680.00
8" MEGA LUGS W/ GASKET AND BOLT KIT	EA	\$ 75.00	45	\$ 3,375.00
12" MEGA LUGS W/ GASKET AND BOLT KIT	EA	\$ 141.00	10	\$ 1,410.00
16" MEGA LUGS W/ GASKET AND BOLT KIT	EA	\$ 246.00	5	\$ 1,230.00
24" MEGA LUGS W/ GASKET AND BOLT KIT	EA	\$ 539.00	100	\$ 53,900.00
8" FIELD LOCKING GASKET	EA	\$ 126.70	4	\$ 506.80
24" FIELD LOCKING GASKET	EA	\$ 827.52	60	\$ 49,651.20
6" GATE VALVE	EA	\$ 910.00	5	\$ 4,550.00
8" GATE VALVE	EA	\$ 1,407.00	2	\$ 2,814.00
16" BUTTERFLY VALVE	EA	\$ 4,851.00	1	\$ 4,851.00
24" BUTTERFLY VALVE	EA	\$ 10,459.00	8	\$ 83,672.00
VALVE BOX	EA	\$ 257.83	20	\$ 5,156.60
12x12-INCH TAPPING SADDLE WITH VALVE	EA	\$ 5,804.27	1	\$ 5,804.27
HYDRANT	EA	\$ 3,634.00	5	\$ 18,170.00
6" X 13" SWIVEL X SOLID ADAPTER W/ SWIVEL GLAND	EA		5	\$ 1,000.00
24"X1" SADDLE	EA	\$ 111.83	35	\$ 3,914.05
24"X2" SADDLE	EA	\$ 131.58	2	\$ 263.16
0.75" COPPER	FT	\$ 6.03	1300	\$ 7,839.00
1.25" COPPER	FT	\$ 9.90	1300	\$ 12,870.00
2" COPPER	FT	\$ 19.94	60	\$ 1,196.40
1.25" SERVICE BRASS - STREET REDUCING	EA	\$ 256.61	23	\$ 5,902.03
0.75" SERVICE BRASS - YARD	EA	\$ 107.92	10	\$ 1,079.20
2" SERVICE BRASS	EA	\$ 496.41	2	\$ 992.82
CURB BOX	EA	\$ 124.10	23	\$ 2,854.30
FORD BOX COMPLETE, 0.75 INCH	EA	\$ 818.25	4	\$ 3,273.00
AIR RELEASE VALVE, 2 Inch	EA	\$ 1,208.80	1	\$ 1,208.80

<b>TOTAL PRICE</b>			<b>\$ 561,011.55</b>
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**Item 1.25" SERVICE BRASS – STREET REDUCING:** Shall include one each of the following parts per the Standard Specifications.

<b>Part</b>	<b>Ford #</b>	<b>AY McDonald #</b>
1" CC x 1.25" FC Corporation Stop	FB600-45-NL	74701B - NL, 5142-321
1.25" FCxFIP Curb Stop	B21-555-NL	76102 W - NL, 5142-356
0.75" x 1.25" Bushing	C18-35-NL	72206 D - NL; 5429-036
0.75" MIPxFC	C28-33-NL	74753 - NL, 5120-139

**Item 1.25" SERVICE BRASS – STREET:** Shall include one each of the following parts per the Standard Specifications.

<b>Part</b>	<b>Ford #</b>	<b>AY McDonald #</b>
1" CC x 1.25" FC Corporation Stop	FB600-45-NL	74701B, 5142-013
1.25" FCxFC Curb Stop	B22-555-NL	76100, 5142-340

**Item 0.75" SERVICE BRASS – YARD:** Shall include one each of the following parts per the Standard Specifications.

Part	Ford #	AY McDonald #	Apollo
Angle Valve, 0.75" FC x 5/8" MC	BA23-331W-NL	74642B, 5143-195	-
Meter Connector, 5/8" MC x 0.75" MIP	C38-13-2-188-NL	74620, 5124-065	-
0.75" Ball Valve	-	-	77FLF-104-01

**Item 1.25" SERVICE BRASS – YARD:** Shall include one each of the following parts per the Standard Specifications.

Part	Ford #	AY McDonald #	Apollo
1.25" FCx1"MC Angle Valve	KV23-454W-NL	-	-
Meter Connector, 1" MCx1" MIP	C38-44-2-625-NL	74620, 5124-111	-
1" Ball Valve	-	-	77FLF-105-01

**Item 2" SERVICE BRASS:** Shall include a 2"x5½" brass nipple, tapping valve, and coupling per the Standard Specifications.

**c. Measurement and Payment**

1. Payment for Water Mains shall be measured based on the sizes and trench details required, along the centerline of the pipe, with no deductions for fittings. The unit price of Water Main, DI, includes the cost of the following:
  - a. Excavation and backfill;
  - b. Hydrostatic testing;
  - c. Disinfecting and flushing the water main and bacteriological testing;
  - d. All material **not supplied** by the City, labor and equipment necessary to remedy an unsatisfactory hydrostatic test, including removing and replacing any backfill;
  - e. Installing **compact ductile iron fittings**, gaskets, bracing or sheeting, blocking, **polywrap**, and miscellaneous items for installing pipe and reconnecting to the existing Municipal system
  - f. Preparing and providing as-constructed plans within two weeks of water main completion, including autocad(dwg), shapefile, excel or CSV file(s) with coordinates of valves, valve boxes, fittings, hydrants, taps, curb stops and water main pipe (at 60 foot intervals). Michigan State Plane South Coordinate System shall be used and grid to ground scale shall be noted. Accuracy shall be sub-foot.
2. The City of Kalamazoo may withhold payment and/or final acceptance until the City of Kalamazoo accepts the as-built plans.
3. The cost of excavating, disposing of excess material, and providing, placing, and compacting the backfill, is included in the unit price for related items of work.
4. The cost of removing or abandoning existing water mains, gate valve boxes, and other appurtenances to provide clearance for the proposed water main or roadway, is included in the unit price for relevant items of work.

The Contract Items included under this category of "Water Main and Fittings" and "Water Services" are as follows:

<u>Pay Item</u>	<u>Pay Unit</u>
Water Main, 4 inch, Cut and Cap, Install	Each
Water Main, 6 inch, Cut and Cap, Install	Each
Water Main, 8 inch, Cut and Cap, Install	Each
Water Main, 12 inch, Cut and Cap, Install	Each
Water Main, 16 inch, Cap, Install	Each
Water Main, 24 inch, Cap, Install	Each
Water Main, DI, 4 inch, Tr Det G, Install	Foot
Water Main, DI, 6 inch, Tr Det G, Install	Foot
Water Main, DI, 8 inch, Tr Det G, Install	Foot
Water Main, DI, 16 inch, Tr Det G, Install	Foot
Water Main, DI, 24 inch, Tr Det G, Install	Foot
Gate Valve and Box, 8 inch, Install	Each
Butterfly Valve and Box, 16 inch, Install	Each
Butterfly Valve and Box, 24 inch, Install	Each
Fire Hydrant, Modified, Install	Each
Water Service, Yard, 3/4 inch, Install	Each
Water Service, 1 1/4 inch, Install	Each
Water Service, 2 inch, Install	Each
Copper Water Service Pipe, 3/4 inch, Install	Foot
Copper Water Service Pipe, 1 1/4 inch, Install	Foot
Copper Water Service Pipe, 2 inch, Install	Foot
Curb Stop, 1 1/4 inch, Install	Each
Curb Stop, 2 inch, Install	Each
Water Serv, Private, Install	Each

The cost of excavating, disposing of excess material, and providing, placing and compacting the backfill, is included in the unit price for related items of work.

The cost of removing or abandoning existing water mains, valve boxes, and other appurtenances to provide clearance for the proposed water main or roadway, is included in the unit price for relevant items of work.

Payment for Water Main, \_\_inch, Cut and Cap includes the cost of cutting the existing water main, and placing the required plugs and thrust blocks.

Payment for the installation of Compact Ductile Iron Fittings and Polyethylene Encasement shall be included in the pay item for Water Main, \_in, Tr Det G, Install (see page 6 for additional detail).



CITY OF KALAMAZOO  
SPECIAL PROVISION  
FOR  
**WATER MAIN LINE STOP**

H&S:TAS

1 of 2

11/30/2022

a. **Description.** This work consists of providing, installing and operating a water main line stop (Hydra-Stop) to isolate a section of existing live water main as shown on the plans and described herein.

Work Included Under Other Contract Items:

Water Main and Fittings  
Valves and Boxes  
Connect to Existing Main

b. **Materials.** Provide materials in accordance with section 823 of the 2020 MDOT Standard Specifications for Construction and with the City of Kalamazoo 2021 Standard Specifications for Water Main and Service Installation. Submit catalog cuts to the Engineer for approval prior to ordering line stop materials.

c. **Construction.** Complete all work in accordance with the standard specifications and the City of Kalamazoo 2021 Standard Specifications for Water Main and Service Installation. Verify the material, size, ovality, and condition of the existing water main prior to ordering the line stop materials.

Verify the pressure in the existing main is below the line stop manufacturer's recommendation before installation of the line stop.

Do not attempt to force, reshape, or bend saddle plates by excessive tightening of saddle studs.

Utilize concrete supports and reaction blocking for the line stop fitting per the City of Kalamazoo 2020 Standard Specifications for Water Main and Service Installation.

Complete a pressure test after assembly of the line stop saddle, drain nozzle and fitting.

Install a completion plug, blind flange and check for water tightness prior to abandonment of the line stop fitting. Coat the whole assembly with a coal tar epoxy to a final minimum cured thickness of 0.020 inches.

d. **Measurement and Payment.** The completed work, as described, will be measured and paid for at the contract unit price using the following pay item.

<b>Pay Item</b>	<b>Pay Unit</b>
Water Main Line Stop, __inch.....	Each

Water Main Line Stop, \_\_\_inch includes payment in full for furnishing all material, labor and equipment necessary to perform the work specified herein and shown on the plans.

Perform all work required in conjunction with dewatering operations, without separate payment, and consider it is included in the Water Main Line Stop, \_\_\_inch pay item.

Furnish all labor, equipment and materials for trench excavation, disposal, and backfill and consider it is included in the Water Main Line Stop, \_\_\_inch pay item.

Removal and replacement of pavement, curb, curb and gutter, and sidewalk will be paid for separately, based on actual quantities.

Cutting and capping of the water main in conjunction with the line stop shall be paid separately, under Water Main Cut and Cap, \_\_\_ inch pay item.

CITY OF KALAMAZOO  
SPECIAL PROVISION  
FOR  
**WATER MAIN AIR RELEASE VALVE**

H&S:ARP

1 of 3

04/11/2023

- a. **Description.** This work consists of providing and installing air release valve on the new 24" water main.

Work Included Under Other Contract Items:

Water Main and Fittings  
Valves and Boxes  
Connect to Existing Main

- b. **Materials.** Provide materials in accordance with section 403 and 823 of the 2020 MDOT Standard Specifications for Construction and with the City of Kalamazoo 2021 Standard Specifications for Water Main and Service Installation.

All air release valves shall be manufactured per ANSI/AWWA C512-04. Cla-Val Series 36 Combination Air Valves or approved equal. The valves shall be with a 2" diameter inlet and outlet.

The combination air valve shall combine the operating features of both an air and vacuum valve and an air release valve in one housing. The air and vacuum valve portion shall automatically exhaust large quantities of air during the filling of the pipeline and automatically allow air to reenter the pipeline when the internal pressure of the pipeline approaches a negative value due to column separation, draining of the pipeline, or other emergency. The air release valve portion shall automatically release small amounts of air from the pipeline while it is under pressure.

The inlet and outlet of the valve shall have the same cross section area. The float shall be guided by a stainless-steel guide shaft and seat drip tight against a synthetic rubber seal. 4 inch and larger valves shall have dual guided shafts of hexagonal cross section and a protective discharge hood.

The float shall be of all stainless-steel construction and capable of withstanding maximum system surge pressure without failure. The body and cover shall be concentrically located end of ductile iron and the valve internal parts shall be stainless steel or Buna-N rubber.

All 1-inch and 2-inch valves shall be NPT. All valves 4 inch and larger shall be flanged.

Sign for air release valves shall be installed as specified by the Engineer at each air release chamber using the same materials specified for a hydrant sign. The sign shall be blue with "Water Valve" in white (see picture below).



c. **Construction.** Complete all work in accordance with the standard specifications and the City of Kalamazoo 2021 Standard Specifications for Water Main and Service Installation.

Construct air release valves and vaults in accordance to the attached modified WA-05-Series of the City of Kalamazoo Standard Plans.

When installing the air release valves in conjunction with new water main construction, the contractor shall use ductile iron fittings (tapping saddles are not allowed, unless otherwise directed by the engineer).

d. **Measurement and Payment.** The completed work, as described, will be measured and paid for at the contract unit price using the following pay item.

**Pay Item**

**Pay Unit**

Water Main Air Release Manhole in Roadway .....Each

Water Main Air Release Manhole in Roadway includes payment in full for furnishing all material, labor and equipment necessary to perform the work specified herein and shown on the plans, including all ductile iron fittings and joint restraint.

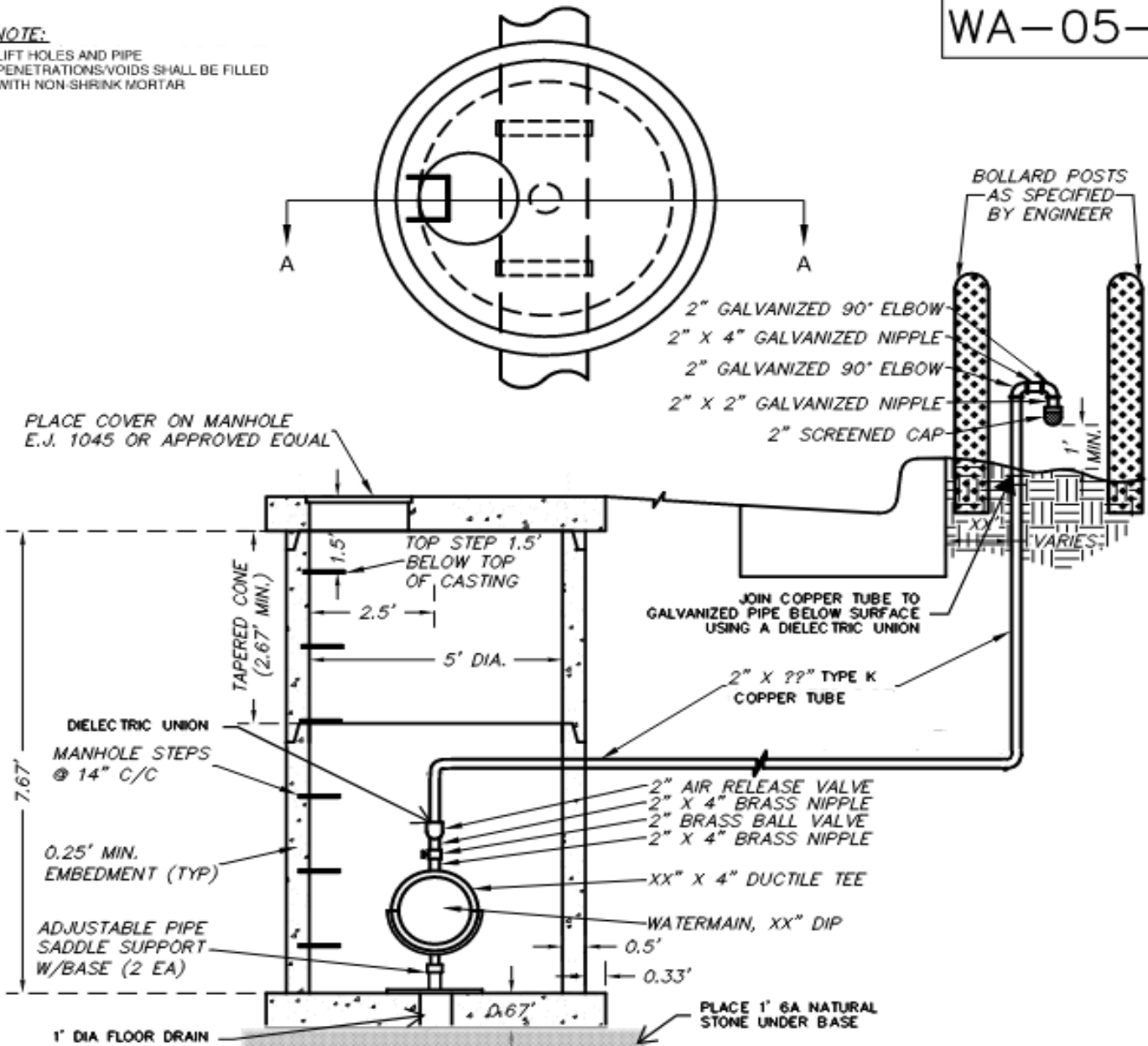
Furnish all labor, equipment and materials for trench excavation, disposal, and backfill and consider it is included in the Water Main Air Release Manhole in Roadway pay item.

Removal and replacement of pavement, curb, curb and gutter, and sidewalk will be paid for separately, based on actual quantities unless otherwise noted.

WA-05-B

**NOTE:**

LIFT HOLES AND PIPE PENETRATIONS/VOIDS SHALL BE FILLED WITH NON-SHRINK MORTAR



**TYPICAL 2" AIR RELEASE MANHOLE**

PRECAST REINFORCED CONCRETE SHOWN (OTHER OPTIONS INCLUDE CONCRETE BLOCK, BRICK OR CAST IN PLACE WALL SECTIONS)

**SCHEDULE OF FITTINGS**

ITEM DESCRIPTION	QUANTITY
AIR RELEASE VALVE, 2"	1
COPPER TUBE 2" X XX"	1
GALVANIZED NIPPLE, 2" X 4"	1
GALVANIZED NIPPLE, 2" X 2"	1
GALVANIZED 90° ELBOW, 2"	2
PIPE SUPPORT BASE	2

ITEM DESCRIPTION	QUANTITY
BRASS BALL VALVE, 2"	1
BRASS NIPPLE, 2" X 4"	2



CITY OF KALAMAZOO  
Department Of Public Services

**AIR RELEASE MANHOLE  
IN ROADWAY**

RECOMMENDED BY \_\_\_\_\_

APPROVED BY \_\_\_\_\_

APPROVED BY \_\_\_\_\_

ACCEPTED BY \_\_\_\_\_

DATE

CITY OF KALAMAZOO

SPECIAL PROVISION  
FOR  
**WATER SERVICES**

H&S:TAS

1 of 4

04/11/2023

a. **Water Services Description.** This work consists of constructing proposed water services from the distribution main to the curb shut off valve, or as directed by the Engineer. The intent of this special provision is to replace all street side water services and connections between the proposed water main and the existing curb stop locations. This Special Provision shall also be used for temporarily relocating services to the existing water main between S. Park St. W. and S. Burdick St. as provided on the plans.

**Non-Copper Water Yard Service Replacement Description.** Under the Michigan Lead Copper Rule, partial lead service line replacements are not allowed. Once the service line is taken out of service for replacement, all non-copper or non-plastic portions of that service line, including the water meter, shall be replaced prior to the service being reconnected and the water turned back on to reduce particulate lead release. This includes replacing any non-copper or non-plastic private water lines from meter pits to the inside of the house. All water services with a meter pit must have the service line material from the meter pit to the house verified. Any non-copper water services that need temporary relocation must be replaced at the time of relocation.

Work Included Under Other Contract Items

Water Main and Fittings  
Valves and Boxes  
Fire Hydrants  
Hydrant, Rem

b. **Materials.** Refer to the Water Main Materials Advance Purchase Special Provision for listing of materials supplied by the City of Kalamazoo for this work. Any materials not provided shall meet the requirements of the City of Kalamazoo 2021 Standard Specifications for Water Main and Service Installation.

c. **Water Service Construction Methods.** This work shall be in accordance with City of Kalamazoo 2021 Standard Specifications for Water Main and Service Installation, this special provision and the 2020 MDOT Standard Specifications for Construction. The Contractor shall notify the City of Kalamazoo's Public Services Department before this work is to begin and follow all City procedures for notifying the residents.

**1. Water Service, Street**

- i. The minimum size for all new services shall be 1 ¼ inch. The property owner may request a larger size if needed.
- ii. When replacing a service that is a ¾ inch service, a new 1 ¼ inch tap will be completed, new 1 ¼ inch street service line installed, and reduced down after the curb shut off.
- iii. Services shall be installed via trenchless installation methods where feasible to minimize pavement removal and open-cut trenches.
- iv. Make all service connections, and transfers. Maintain and protect, at no additional cost, existing service connections requiring transfer, but not shown on the plans, until reconnection or disposal.
- v. If relocating a portion of water service, shut down the water service by method approved by the Engineer or authorized representative.
- vi. Install new street side water services from the proposed main to the curb stop.

Replace curb stop valve and box and connect to existing yard service as shown on the plans or determined by the Engineer.

vii. Existing curb boxes shall be completely removed.

2. **Non-Copper Water Service Replacement Construction Methods.** A City supplied water filter shall be provided once the connection is complete.

i. **Water Service Potholing.** Contractor shall coordinate with Engineer or authorized representative to expose the private line approximately 3' from the meter pit along the private line toward the house until the private line coupling is observed. The pothole shall be backfilled immediately after viewing and data collection.

ii. **Water Service, Yard.** Shall match the size of the existing service and includes the portion of the water service from the curb stop valve to the meter.

iii. **Water Service, Private.** Shall match the size of the existing service and includes the portion of the water service from the meter pit to 18" inside the exterior wall or the first valve, whichever is shorter.

iv. **Plumber.** A plumber licensed in the State of Michigan is required to connect either the meter to the existing private plumbing in the house or to connect the Water Service Private to the existing private plumbing in the house.

v. **Meter Setting.** The old meter shall be removed and provided to the Engineer or authorized representative. Contractor shall install the new meter, ground clamps, ground wire, and meter remote. The new meter and meter remote stickers shall be provided to the Engineer or authorized representative.

3. **Water Service, 2-inch**

i. Service shall be installed via trenchless installation methods where feasible to minimize pavement removal and open-cut trenches.

ii. New service shall be reconnected to existing service with a splice in the area between the curb and sidewalk.

d. **Measurement and Payment.** The completed work, as measured, shall be paid for at the contract unit price for the following contract pay items.

<b>Pay Item</b>	<b>Unit</b>
Water Service, Street, 1 ¼ inch, Install _____	Each
Water Service, Yard, ¾ inch, Install _____	Each
Water Service, 2 inch, Install _____	Each
Copper Water Service Pipe, ¾ inch, Install _____	Foot
Copper Water Service Pipe, 1 ¼ inch, Install _____	Foot
Copper Water Service Pipe, 2 inch, Install _____	Foot
Curb Stop and Box, 1 ¼ inch, Install _____	Each
Meter Pit, Install _____	Each
Water Service Potholing _____	Each
Water Serv, Private, Install _____	Each
Plumber _____	Hour
Water Meter Setting _____	Each

**Water Service, Street, 1 ¼ inch, Install** is payment in full for each water service installed on the proposed water main (or temporarily installed on the existing 12" water main) and reconnected to the existing yard service. The item shall include earth excavation, jacking and boring, tapping the main, installing the service saddle and corporation stop, connecting the proposed street service to the existing yard service and any other required fittings; providing, placing, and compacting backfill and any other miscellaneous materials, equipment and work necessary for the installation of the service as described.

**Water Service, Yard, ¾ inch, Install** is payment in full for each water service installed from the curb stop to the first valve at the meter. The item shall include earth excavation, jacking and boring, connecting the yard service to the meter, and any other required fittings; providing, placing, and compacting backfill, lawn restoration and any other miscellaneous materials, equipment and work necessary for the installation of the service as described.

**Water Service, 2 inch, Install** is payment in full for each water service installed on the proposed water main (or temporarily installed on the existing 12" water main) and reconnected to the existing service. The item shall include earth excavation, jacking and boring, tapping the main, installing the service saddle and valve, connecting the new service to the existing service and any other required fittings; providing, placing, and compacting backfill and any other miscellaneous materials, equipment and work necessary for the installation of the service as described. This work also includes installing a 6-inch valve box on the tapping valve.

**Copper Water Service Pipe, ½ inch, Install** is payment in full for each linear foot water service installed as directed by Engineer.

**Curb Stop and Box, 1 ¼ inch, Install** is payment in full for each curb stop valve and box installed. Complete removal of the existing curb box shall also be included. Adjusting the curb stop to finished grade is considered incidental to the installation.

**Meter Pit, Install** is payment in full for connecting the yard service and private service to the meter setter piece and installing the Meter Pit. Includes adjusting the meter pit casting to finished grade and removing the old meter pit.

**Water Service Potholing** is payment in full for all material, labor, and equipment necessary to expose the water service and backfill the hole as directed by the engineer. Water Service Potholing will be paid once per water service. All removals and replacements required for water service potholing installation shall be considered incidental.

**Water Serv, Private, Install** is payment in full for all labor, and equipment necessary to install the water line from the downstream valve at a meter pit to 18" inside the exterior wall or the first valve regardless of length. The item shall include earth excavation, jacking and boring, connecting the new service to the valve at the meter pit and any other required fittings; providing, placing, and compacting backfill and any other miscellaneous materials, equipment and work necessary for the installation of the service as described. The length of pipe installed shall be paid separately. Lawn restoration is included in this work. Any pavement or sidewalk removal required for this work shall be paid separately.

The hourly rate for **Plumber** shall include all labor and materials required to make the required connections as described.

**Water Meter Setting** is payment in full for all material, labor, and equipment necessary to install the new meter and meter remote.



CITY OF KALAMAZOO  
SPECIAL PROVISION  
FOR  
**CONNECT TO EXISTING MAIN, \_ INCH W/ STANDBY**

H&S:TAS

1 of 1

11/30/2022

a. **Description.** For the unit prices bid for the various connections to existing mains as defined below under the heading "Measurement and Payment", the contractor shall furnish all materials and do all work necessary to connect the proposed mains to the existing mains as shown on the plans and as herein specified.

Work Included Under Other Contract Items

Water Main and Fittings

Valves and Boxes

Fire Hydrants

Hydrant, Rem

Water Services

b. **Materials.** Provide materials in accordance with section 823 of the 2020 MDOT Standard Specifications for Construction and with the City of Kalamazoo 2021 Standard Specifications for Water Main and Service Installation.

c. **Construction.** The work under the various connection items shall include all materials and work required to connect the proposed main to the existing main (ductile iron, cast iron, over-sized cast iron, or plastic) as shown on the plans. Included shall be removing any existing plugs or fittings, furnishing and installing any required fittings, including but not limited to cut-in-tees, cut-in-sleeves, and any other work and materials required to switch over to the new main. The installation of all valves and fittings other than those required to connect to the existing main shall be paid for under their respective bid items.

The existing and required fittings shown on the plans are based upon available information. The contractor shall expose the existing main and fittings at the proposed connection and shall determine the actual fittings required. The contractor shall be responsible with the aid of the owner and the engineer for determining the location of any existing valves necessary to isolate and shut down the existing main for the connections. The contractor shall have all required fittings and equipment ready for installation prior to shutting off the existing main to minimize the shutdown period in accordance with the "Water Main and Fittings" Special Provision. The contractor shall coordinate with the Department of Public Services and the Engineer to determine the timing for the connections. Contractor shall verify each shutdown is sufficient prior to cutting the water main. This may be achieved by tapping the water main within the section of water main that will be removed, or operating a hydrant within the shutdown area. For bidding purposes, assume that one tap will be required for each connection to existing water main. Tapping valves, etc. may be removed and reused for this purpose. **Contractor shall include in their bid, mobilization and standby costs for a line stop contractor to be present for each connection to existing water main. Line stop contractor shall have all necessary equipment on-site and ready to perform a line stop (if required), and shall remain on-site until the contractor confirms that the**

**shutdown is sufficient to perform the connection to the existing water main without needing a line stop. In the event that a line stop is required, the line stop will be performed and paid in accordance with the Line Stop Pay Item.**

Do not disturb or cut into existing in-service water mains without a city employee present. Notify the City of Kalamazoo a minimum of 3 working days in advance. Coordinate scheduling of water main connections with the City of Kalamazoo. Secure the Engineer or authorized representative's approval of the schedule before beginning the work. Water service interruptions (shutdowns) to allow for connections to existing water mains shall occur between the hours of 8:00 AM and 4:00 PM Monday through Friday. Any individual shutdown shall not last more than 8 hours.

d. **Measurement and Payment.** The contractor will be paid the unit price for each proposed water main connected to existing water main, regardless of main material, as shown on the plans. The Contract Items included under this category of "Connection to Existing Mains", are defined as follows:

<b>Pay Item</b>	<b>Pay Unit</b>
Connect to Existing Main, 24 inch .....	Each
Connect to Existing Main, 16 inch .....	Each
Connect to Existing Main, 12 inch .....	Each
Connect to Existing Main, 6 inch .....	Each
Connect to Existing Main, 4 inch .....	Each

CITY OF KALAMAZOO  
SPECIAL PROVISION  
FOR  
**WATER MAIN FIRE HYDRANT EXTENSION**

H&S:TAS

1 of 1

03/14/2023

a. **Description.** This work consists of providing and installing extension kits for water main fire hydrants. The contractor shall furnish all materials and do all work necessary to install standpipe and rod extension kit for fire hydrants, except for work which is specifically included under other contract items. All work shall be done in accordance with section 823 of the 2020 MDOT Standard Specifications for Construction and with the City of Kalamazoo 2021 Standard Specifications for Water Main and Service Installation unless otherwise specified herein.

Work Included Under Other Contract Items

- Valves and Boxes
- Fire Hydrants
- Fire Hydrant, Rem

b. **Materials.** Provide materials in accordance with section 823 of the 2020 MDOT Standard Specifications for Construction and with the City of Kalamazoo 2021 Standard Specifications for Water Main and Service Installation.

Standpipe and rod extension kit (K562) for 5-1/4" Waterous Pacer Traffic models. Traffic 5-1/4" Waterous Pacer 250 PSIG rated working pressure model WB67, or equivalent.

c. **Construction.** Complete all work in accordance with the 2020 MDOT Standard specifications for Construction, the City of Kalamazoo 2021 Standard Specifications for Water Main and Service Installation. Install standpipe and rod extension kit in strict accordance with manufacturers recommendation. Install Water Main Fire Hydrant Extension at locations as directed by the Engineer.

d. **Measurement.** The completed work, as described, will not be paid and measured by a separate pay item. Cost shall be included with Fire Hydrant pay item.

Water Main Fire Hydrant Extension..... Cost shall be included with Fire Hydrant pay item. No additional payment will be allowed for hydrant extensions.

Fire Hydrant includes furnishing all material, labor, and equipment necessary to perform the work specified herein and shown on the plans.

Perform all work required in conjunction with dewatering operations, without separate payment, and consider it is included in the Fire Hydrant pay item.

Furnish all labor, equipment and materials for trench excavation, disposal, and backfill and consider it is included in the Fire Hydrant pay item.

CITY OF KALAMAZOO  
SPECIAL PROVISION  
FOR  
**CONSTRUCTION COORDINATION CLAUSE**

H&S:ARP

1 of 1

04/11/23

In addition to the Water Main Replacement, Balch St. to Burdick St. project, other projects/considerations that may require additional coordination shall be noted.

1. Dewatering activities may require the contractor to adjust the dewatering schedule that conforms to the City of Kalamazoo's Water Reclamation Plants' ability to accept the additional flow created.
2. Dewatering activities may require the contractor to adjust the dewatering schedule to work within the adjacent wellhead backwash schedule.

Cooperation by CONTRACTOR

The City of Kalamazoo and/or Contract Agencies may perform work within or adjacent to the Construction Influence Area (CIA). The above coordination with the Contractor through the engineer to minimize interference. No additional payment will be made to the Contractor for delays to the project schedule associated with these items.

The Contractor shall supply the City with an agreeable construction schedule before commencing work on this contract. This schedule shall detail beginning and completion dates for each major component of the project.

The Contractor shall coordinate and cooperate with all other contractors who may be working on the site in order to allow for the orderly progress of work being done.

The Contractor is required to keep the Project Manager fully informed of any proposed work which will tend to interfere with the existing operations at the site.

The Contractor shall schedule all work to accommodate the City's schedule. In the event Contractor's schedule falls on weekends, nights or overtime work is required, no additional compensation will be allowed. All work shall be part of this contract without regard to when it is done.

The City of Kalamazoo and/or Contract Agencies may perform work within or adjacent to the Construction Influence Area (CIA). The above coordination with the Contractor through the engineer to minimize interference. No additional payment will be made to the Contractor for delays to the project schedule associated with these items.

The contractor shall conduct the operations to interfere as little as possible with those of other contractors, utilities, or any public authority work on or near the work as shown on the plans or in the proposal. The owner reserves the right to perform other work by contract or otherwise, and to permit public utility companies and others to do work on or near the project during progress of the work. The contractor shall conduct the work and shall cooperate with such other parties to cause as little interference as possible with their operations and as the engineer may direct. No additional compensation will be paid to the contractor for any reasonable delay or due to the operations of such other parties doing the work indicated or shown on the plans or in the proposal, or for any reasonable delays on construction due to the encountering of existing utilities that are shown on the plans.

CITY OF KALAMAZOO

SPECIAL PROVISION  
FOR  
**PROGRESS CLAUSE**

H&S:ARP

1 of 2

06/21/2023

After receipt of Notice to Proceed, work shall start within the timeframe agreed upon by the contractor and Project Manager outlined in the table below unless otherwise agreed to by the project manager. The approved low bidder(s) shall commence work at their discretion. Upon commencement of work, substantial completion shall be achieved within the “Work Timeframe Allowance” listed in the table above. In no case, shall any work be commenced prior to receipt of formal notice of award by the City. The project shall be substantially completed and ready for final inspection in accordance with the following table.

<b>Milestone</b>	<b>Schedule</b>
Estimated Award – City Council	August 7, 2023
Commencement of Work	Date Determined by Contractor
Substantial Completion - Final Inspection	October 15, 2024
Final Completion - Restoration Punchlist	November 1, 2024
Work Timeframe Allowance	12 Weeks

The approved low bidder(s) for the work covered by this proposal shall be required to participate in a pre-construction meeting with the City and the Engineer to work out a detailed progress schedule. The schedule of this meeting will be set within two weeks of contract approval.

The named sub-contractor(s) for all items shall also be present at the scheduled meeting and they will be required to sign the Progress Schedule to indicate their approval of the scheduled dates of work set forth in the Progress Schedule.

The progress schedule shall include, as a minimum, the starting and completion dates for major items, and where specified in the bid document the date the project is to be opened to traffic as well as the final project completion date specified in the bid documents. The Progress Schedule shall be coordinated with all aspects of the work occurring at the site.

If the Bidding Proposal specifies other controlling dates, these shall also be included in the Progress Schedule.

Work of a similar nature may be added to this contract if agreed to by the City and the Contractor. In the event that work is added, the progress schedule for the work will remain unchanged. Any contract time added for additional work will be applied to that additional work only, and cannot be added to items in the original contract. Any work done on the items in the original contract past the number of working days stated herein will be subject to liquidated damages regardless of any work that may be added at a later date.

Failure on the part of the Contractor to carry out the provisions of the Progress Schedule, as establish, may be considered sufficient cause to prevent bidding future projects until a satisfactory rate of progress is again established.

The starting date and the contract time to the completion date for this project may be adjusted by Public Services without imposing liquidated damages upon the receipt of satisfactory documented evidence that unforeseen delayed delivery of critical materials will prevent the orderly prosecution of the work.

Once work has begun, the project shall be completed within 12 weeks.

CITY OF KALAMAZOO  
SPECIAL PROVISION  
FOR  
**UTILITY COORDINATION CLAUSE**

H&S:TAS

1 of 2

03/14/2023

The Contractor shall cooperate and coordinate construction activities with the owner of utilities as stated in Section 104.08 of the MDOT 2020 Standard Specifications for Construction. In addition, for the protection of underground utilities, the contractor shall follow the requirements in Section 107.12 of the MDOT 2020 Standard Specifications for Construction. Contractor delay claims, resulting from a utility, will be determined based upon Section 109.05E of the MDOT 2020 Standard Specifications for Construction.

The following Utility Owners have facilities located within the right-of-way.

- Cable: Charter Communications,  
4176 Commercial Avenue  
Portage, MI 49002  
(269) 459-8746  
Bryan.Longcore2@Charter.com
- Electric: Consumers Energy,  
2500 East Cork Street  
Kalamazoo, MI 49001  
(269) 337-2245, Mr. Andre Taylor  
andre.taylor@cmsenergy.com
- Gas: Consumers Energy,  
2500 East Cork Street  
Kalamazoo, MI 49001  
(269) 337-2366, Mr. Kyle Oak  
kyle.oak@cmsenergy.com
- Telephone: AT&T,  
2919 Millcork Street  
Kalamazoo, MI 49001  
(269) 384-4475, Mr. Todd Berghuis  
tb1973@att.com
- Fiber Optic: City of Kalamazoo,  
415 Stockbridge Avenue  
Kalamazoo, MI 49001  
(269) 337-8601, Mr. Ron Ridenour  
ridenourr@kalamazoocity.org



Q3 Technologies, LLC,  
1005 Foster Avenue  
Kalamazoo, MI 49048  
(269) 377-1308, Troy Quakenbush  
tquakenbush@q3-tech.com

CTS Telecom,  
13800 East Michigan Avenue  
Galesburg, MI 49053  
(269) 746-3232, Mr. Tom Cady  
tcady@ctstelecom.com

Water: City of Kalamazoo,  
415 Stockbridge Avenue  
Kalamazoo, MI 49001  
(269) 337-8558, Debbie Jung  
jungd@kalamazoocity.org

Sewer: City of Kalamazoo,  
1415 North Harrison Street  
Kalamazoo, MI 49007  
(269) 337-8551, Mr. Ryan Stoughton  
stoughtonr@kalamazoocity.org

The Contractor shall call "Miss Dig" a minimum of 3 working days prior to beginning construction operations. Saturday, Sundays and Holidays shall not be included as a working day. On all projects:

"3 Days before you Dig - Call Miss Dig - Toll Free" 811.

The owners of existing service facilities that are within grading or structure limits will move them to locations designated by the Engineer or will remove them entirely from the highway right-of-way. Owners of Public Utilities will not be required by the City to move additional poles or structures in order to facilitate the operation of construction equipment unless it is determined by the Engineer that such poles or structures constitute a hazard to the public or are extraordinarily dangerous to the Contractor's operations.

CITY OF KALAMAZOO  
SPECIAL PROVISION  
FOR  
**DEWATERING SYSTEM, EXCAVATION**

H&S:ARP

1 of 3

03/28/2023

**a. Description.** This work consists of lowering the groundwater table to facilitate construction in the area of the excavation for the proposed trench. This work may require the use of pumps for trench dewatering or well points, deep wells, or other measures that are utilized to control groundwater to facilitate installation of underground utilities.

The groundwater removed during the dewatering process shall be discharged to the Kalamazoo Water Reclamation Plant's sanitary sewer system, unless otherwise directed by the engineer. The contractor is responsible to obtain a letter of approval and adhere to the Construction Dewatering Projects Guidelines.

This work also includes the operation and monitoring used for discharge to the Kalamazoo Water Reclamation Plant's sanitary sewer system. The Engineer shall provide all sampling and analysis of any treatment system as deemed necessary by the Kalamazoo Water Reclamation Plant.

**b. Contaminated Ground Water** Areas of groundwater contamination have been identified in the vicinity of the monitoring wells depicted on the plans.

Handle the contaminated water in accordance with the *MIOSHA* Standard for Hazardous Waste Operations and Emergency Response (HAZWOPER). Ensure applicable workers work under the direction of an on-site supervisor and a site-specific safety and health plan (HASP) and are properly trained. Ensure all workers are protected pursuant to the HAZWOPER Standard.

Furnish to the Department, at the preconstruction meeting, sufficient documentation verifying the qualifications of Contractor personnel who are performing the sampling and handling work. In addition, the Contractor must provide a HASP, for review, as required by the *MIOSHA* standard.

Groundwater analytical results at the two test wells depicted on the plans are provided as part of this special provision. The flow required must adequately dewater the trench, as specified above, and yield an effluent concentration that meets the requirements of the sanitary sewer system owner or the NPDES permit. Given the presence of {PFAS}, pumping rates may need to be reduced significantly. Ensure the system is approved by the Engineer prior to starting the work.

**c. Well Points and Deep Wells.** Should groundwater control be performed by deep well and/or well point pumping systems, ensure it is done without damage to property or structures, and without interference with the rights of the public, owners of private property, pedestrians, vehicular traffic, or the work of other contractors. Any pumping methods used for dewatering and control of groundwater and seepage must have properly designed filters. This is to ensure that adjacent soil will not be pumped with the water creating voids underground and around the face of the excavation or under existing structures. Ensure the filter design is reviewed and approved by the Engineer prior to placement.

Perform the dewatering operations in an approved and predetermined sequence with the excavation operation such that the perimeter and face of the excavation is stable. Dewatering

well diameter, pumping rate and well spacing must provide adequate drawdown of the water level. Set wells to intercept groundwater that, otherwise, would enter the excavation and interfere with the work.

**e. Sanitary Sewer** Monitor the volume of untreated water discharged to the Kalamazoo Water Reclamation Plant's sanitary sewer system by using a totalizing turbine type flow meter. Place the flow meter inline on the effluent line and shall be designed for high flow applications and must have a flow totalizing register that is adequately sealed to eliminate fogging and condensation. Ensure the type of meter used is reviewed and approved by the Engineer prior to placement.

Written permission from the Kalamazoo Water Reclamation Plant authority is required prior to discharge to the sanitary sewer system. Furnish a copy of the written authorization to the Engineer prior to discharging any water to the system.

Monitor the volume of flow being discharged to the sanitary sewer system and document daily by reading the register on the flow meter. Furnish this information to the Engineer daily or as otherwise approved. The city shall pay all fees associated with the volumetric discharge to the Kalamazoo Water Reclamation Plant.

**f. Hazardous/Nonhazardous Material Handling.** Load all hazardous and nonhazardous waste and transport using properly trained personnel, onto placarded vehicles and under an approved hazardous or liquid industrial waste manifest, as required. All manifests are to be signed by the Engineer or their representative. The terms hazardous and nonhazardous, as used in this document, are defined in 1994 PA 451, Parts 111 and 121 of the NREPA.

**g. Construction.** The methods and materials required to accomplish this work must be determined by the Contractor, subject to approval by the Engineer, before initiation or installation of the dewatering system.

Ensure the dewatering system for contaminated groundwater is independent of other dewatering operations by a separate installation. Utilize the system for the entirety of the project as determined necessary by the Engineer. Take all appropriate precautions to prevent exacerbation of contamination.

The Engineer may order corrective actions to the dewatering or treatment system at any time to improve the efficiency of the system at no additional cost to the contract.

**h. Measurement and Payment.** The completed work, as described, will be measured and paid for at the contract unit price using the following pay items:

<b>Pay Item</b>	<b>Pay Unit</b>
Dewatering System for Contaminated Groundwater, Site .....	Each
Dewatering System for Contaminated Groundwater, Day .....	Day

**Dewatering System for Contaminated Groundwater, Site** includes the initial setup of all wells, piping, supplies, power, and fuel necessary for the installation, removal and disposal at each dewatering location.

**Dewatering System for Contaminated Groundwater, Day** includes daily operation and maintenance of all wells, piping, supplies, power, and fuel necessary for the dewatering operation.

Disposal of contaminated soil or sediment, excavated or displaced during the installation of this system, will be included in the pay item of **Non-hazardous Contaminated Material Handling and Disposal (LM)**.

Trace Analytical Laboratories, Inc.  
2241 Black Creek Road  
Muskegon, MI 49444-2673



231-773-5998 Phone  
888-979-4469 Fax  
www.trace-labs.com

January 09, 2023

Bobby Glasser  
Michigan Consulting and Environmental  
2800 S. 11th St.  
2800 Kalamazoo, MI 49009

RE: Trace Project 22L0811  
Client Project Balch Street - City of Kalamazoo - 12/20/22

Enclosed are your analytical results. The results of this report relate only to the samples listed in the body of this report.

All reports were examined through Trace's validation process to ensure that requirements for quality and completeness were satisfied. All reported analytical results were obtained in accordance with the methods referenced on the reports. Every practical effort was made to meet the reporting limit specifications for this work, however, some results may have raised reporting limits to correct for percent solids.

For clients that require NELAP Accreditation, Trace certifies that these test results meet all requirements of the NELAP Standard, except for those analytes with a "N" notation. These analytes have not been evaluated by NELAP at Trace's discretion and will not be reported unless requested by client.

If you have questions concerning this report, please contact me at 231.773.5998 or by email at [tbrewer@trace-labs.com](mailto:tbrewer@trace-labs.com).

Sincerely,

A handwritten signature in black ink that reads "Timothy W. Brewer".

Tim Brewer  
Project Manager  
Enclosures



NJDEP Accreditation No. MI008

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### SAMPLE SUMMARY

Trace Project ID: 22L0811  
Client Project ID: Balch Street - City of Kalamazoo - 12/20/22

Trace ID	Sample ID	Matrix	Collected By	Date Collected	Date Received
22L0811-01	TW-2	Ground Water	BG	12/20/22 12:10	12/21/22 11:20
22L0811-02	TW-3	Ground Water	BG	12/20/22 15:15	12/21/22 11:20

### CERTIFICATE OF ANALYSIS

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**AN EXPLANATION OF TERMS AND SYMBOLS WHICH MAY OCCUR IN THIS REPORT**

**DEFINITIONS**

LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MS	Matrix Spike
MSD	Matrix Spike Duplicate
RPD	Relative Percent Difference
DUP	Matrix Duplicate
RDL	Reporting Detection Limit
MCL	Maximum Contamination Limit
TIC	Tentatively Identified Compound
<, ND or U	Indicates the compound was analyzed for but not detected
*	Indicates a result that exceeds its associated MCL or Surrogate control limits
N	Indicates that the laboratory is not accredited by NELAP for this compound
NA	Indicates that the compound is not available.

NOTE: Samples for volatiles that have been extracted with a water miscible solvent were corrected for the total volume of the solvent/water mixture.  
 Solid matrices Method Blanks are at 100% solids as such results are the same wet or dry.

**DATA QUALIFIERS**

Trace ID: 22L0811-01

***Analysis: SM 4500-H+ B-11***

**pH** Note 511 : The sample was received and, therefore, analyzed beyond the established EPA hold time. The result must be considered estimated.

**pH** Note pH : The pH was analyzed at 15:58

***Analysis: SM 5210B-16 + HACH 10360***

**Biochemical Oxygen Demand, Carbonaceous 5-day** Note B-01 : The sample dilutions set-up for the BOD analysis did not meet the oxygen depletion criteria of at least 2 mg/l dissolved oxygen depletion. Therefore the reported limit has been raised .

Trace ID: 22L0811-02

***Analysis: SM 4500-H+ B-11***

**pH** Note 511 : The sample was received and, therefore, analyzed beyond the established EPA hold time. The result must be considered estimated.

**pH** Note pHa : The pH was analyzed at 15:59

***Analysis: SM 5210B-16 + HACH 10360***

**Biochemical Oxygen Demand, Carbonaceous 5-day** Note B-01 : The sample dilutions set-up for the BOD analysis did not meet the oxygen depletion criteria of at least 2 mg/l dissolved oxygen depletion. Therefore the reported limit has been raised .

**CERTIFICATE OF ANALYSIS**

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**ANALYTICAL RESULTS**

Trace Project ID: 22L0811  
 Client Project ID: Balch Street - City of Kalamazoo - 12/20/22

Trace ID: 22L0811-01 Matrix: Ground Water Date Collected: 12/20/22 12:10  
 Sample ID: TW-2 Date Received: 12/21/22 11:20

PARAMETERS	RESULTS UNITS	RDL	DILUTION	PREPARED	BY	ANALYZED	BY	NOTES	MCL
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**METALS, TOTAL**

Analysis Method: EPA 200.8 Rev. 5.4

Batch: T130977

Cadmium	<1.0 ug/L	1.0	1	01/02/23	bjv	01/03/23	acs		40
Chromium	<5.0 ug/L	5.0	1	01/02/23	bjv	01/03/23	acs		4700
<b>Copper</b>	<b>1.5 ug/L</b>	<b>1.0</b>	<b>1</b>	<b>01/02/23</b>	<b>bjv</b>	<b>01/03/23</b>	<b>acs</b>		<b>2200</b>
Lead	<3.0 ug/L	3.0	1	01/02/23	bjv	01/03/23	acs		110
Nickel	<5.0 ug/L	5.0	1	01/02/23	bjv	01/03/23	acs		1600
<b>Zinc</b>	<b>10 ug/L</b>	<b>10</b>	<b>1</b>	<b>01/02/23</b>	<b>bjv</b>	<b>01/03/23</b>	<b>acs</b>		<b>5300</b>

Analysis Method: EPA 245.1 Rev. 3.0

Batch: T130858

Mercury	<0.20 ug/L	0.20	1	12/27/22	bjv	12/28/22	jma	N	0.21
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**WET CHEMISTRY**

Analysis Method: EPA 1664B

Batch: T130945

Oil & Grease (HEM)	<9.6 mg/L	9.6	3.205128	01/02/23	kbc	01/03/23	kbc	N	
Total Petroleum Hydrocarbons (SGT-HEM)	<9.6 mg/L	9.6	3.205128	01/02/23	kbc	01/03/23	kbc	N	

**PESTICIDES/PCBS**

Analysis Method: EPA 608

Batch: T130948

Aroclor-1016	<0.10 ug/L	0.10	1	01/02/23	kbc	01/04/23	ahr	N	
Aroclor-1221	<0.10 ug/L	0.10	1	01/02/23	kbc	01/04/23	ahr	N	
Aroclor-1232	<0.10 ug/L	0.10	1	01/02/23	kbc	01/04/23	ahr	N	
Aroclor-1242	<0.10 ug/L	0.10	1	01/02/23	kbc	01/04/23	ahr	N	
Aroclor-1248	<0.10 ug/L	0.10	1	01/02/23	kbc	01/04/23	ahr	N	
Aroclor-1254	<0.10 ug/L	0.10	1	01/02/23	kbc	01/04/23	ahr	N	
Aroclor-1260	<0.10 ug/L	0.10	1	01/02/23	kbc	01/04/23	ahr	N	

**Surrogates:**

Tetrachloro-m-xylene	89 %	18-105	1	01/02/23	kbc	01/04/23	ahr	N	
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**CERTIFICATE OF ANALYSIS**

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### ANALYTICAL RESULTS

Trace Project ID: 22L0811  
 Client Project ID: Balch Street - City of Kalamazoo - 12/20/22

Trace ID: 22L0811-01 Matrix: Ground Water Date Collected: 12/20/22 12:10  
 Sample ID: TW-2 Date Received: 12/21/22 11:20

PARAMETERS	RESULTS UNITS	RDL	DILUTION	PREPARED	BY	ANALYZED	BY	NOTES	MCL
<b>VOLATILE ORGANIC COMPOUNDS BY GC-MS</b>									
<b>Analysis Method: EPA 624.1</b>									
<i>Batch: T130822</i>									
Benzene	<1.0 ug/L	1.0	1	12/22/22	nw	12/22/22	nw		
Toluene	<1.0 ug/L	1.0	1	12/22/22	nw	12/22/22	nw		
Ethylbenzene	<1.0 ug/L	1.0	1	12/22/22	nw	12/22/22	nw		
Xylenes, total	<3.0 ug/L	3.0	1	12/22/22	nw	12/22/22	nw		
<b>Surrogates:</b>									
1,2-Dichloroethane-d4	121 %	68-133	1	12/22/22	nw	12/22/22	nw		
Toluene-d8	100 %	75-120	1	12/22/22	nw	12/22/22	nw		
4-Bromofluorobenzene	100 %	69-119	1	12/22/22	nw	12/22/22	nw		
1,2-Dichlorobenzene-d4	94 %	72-127	1	12/22/22	nw	12/22/22	nw		
<b>WET CHEMISTRY</b>									
<b>Analysis Method: ASTM D7511-12</b>									
<i>Batch: T130875</i>									
Cyanide (Total)	<5.0 ug/L	5.0	1	12/27/22	mr	12/27/22	mr		250
<b>Analysis Method: EPA 350.1 Rev. 2.0</b>									
<i>Batch: T130877</i>									
Ammonia as N	<0.010 mg/L	0.010	1	12/27/22	ans	12/27/22	ans		18
<b>Analysis Method: SM 2540 D-15</b>									
<i>Batch: T130828</i>									
Total Suspended Solids	18 mg/L	10	1	12/26/22	mr	12/26/22	mr		260
<b>Analysis Method: SM 4500-H+ B-11</b>									
<i>Batch: T130816</i>									
pH	6.94 pH Units		1	12/20/22	ay	12/21/22	kb	511, pH, N	
<b>Analysis Method: SM 5210B-16 + HACH 10360</b>									
<i>Batch: T130789</i>									
Biochemical Oxygen Demand, Carbonaceous 5-day	<4.0 mg/L	4.0	4	12/21/22	ans	12/26/22	ans/drm	B-01, N	240

### CERTIFICATE OF ANALYSIS

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Trace Analytical Laboratories, Inc.  
 2241 Black Creek Road  
 Muskegon, MI 49444-2673



231-773-5998 Phone  
 888-979-4469 Fax  
 www.trace-labs.com

### ANALYTICAL RESULTS

Trace Project ID: 22L0811  
 Client Project ID: Balch Street - City of Kalamazoo - 12/20/22

Trace ID: 22L0811-02 Matrix: Ground Water Date Collected: 12/20/22 15:15  
 Sample ID: TW-3 Date Received: 12/21/22 11:20

PARAMETERS	RESULTS UNITS	RDL	DILUTION	PREPARED	BY	ANALYZED	BY	NOTES	MCL
<b>METALS, TOTAL</b>									
<b>Analysis Method: EPA 200.8 Rev. 5.4</b>									
<i>Batch: T130977</i>									
Cadmium	<1.0 ug/L	1.0	1	01/02/23	bjv	01/03/23	acs		40
Chromium	<5.0 ug/L	5.0	1	01/02/23	bjv	01/03/23	acs		4700
<b>Copper</b>	<b>5.4 ug/L</b>	<b>1.0</b>	<b>1</b>	<b>01/02/23</b>	<b>bjv</b>	<b>01/03/23</b>	<b>acs</b>		<b>2200</b>
Lead	<3.0 ug/L	3.0	1	01/02/23	bjv	01/03/23	acs		110
<b>Nickel</b>	<b>8.6 ug/L</b>	<b>5.0</b>	<b>1</b>	<b>01/02/23</b>	<b>bjv</b>	<b>01/03/23</b>	<b>acs</b>		<b>1600</b>
Zinc	<10 ug/L	10	1	01/02/23	bjv	01/03/23	acs		5300
<b>Analysis Method: EPA 245.1 Rev. 3.0</b>									
<i>Batch: T130858</i>									
Mercury	<0.20 ug/L	0.20	1	12/27/22	bjv	12/28/22	jma	N	0.21
<b>WET CHEMISTRY</b>									
<b>Analysis Method: EPA 1664B</b>									
<i>Batch: T130945</i>									
Oil & Grease (HEM)	<9.7 mg/L	9.7	3.246753	01/02/23	kbc	01/03/23	kbc	N	
Total Petroleum Hydrocarbons (SGT-HEM)	<9.7 mg/L	9.7	3.246753	01/02/23	kbc	01/03/23	kbc	N	
<b>PESTICIDES/PCBS</b>									
<b>Analysis Method: EPA 608</b>									
<i>Batch: T130948</i>									
Aroclor-1016	<0.10 ug/L	0.10	1	01/02/23	kbc	01/04/23	ahr	N	
Aroclor-1221	<0.10 ug/L	0.10	1	01/02/23	kbc	01/04/23	ahr	N	
Aroclor-1232	<0.10 ug/L	0.10	1	01/02/23	kbc	01/04/23	ahr	N	
Aroclor-1242	<0.10 ug/L	0.10	1	01/02/23	kbc	01/04/23	ahr	N	
Aroclor-1248	<0.10 ug/L	0.10	1	01/02/23	kbc	01/04/23	ahr	N	
Aroclor-1254	<0.10 ug/L	0.10	1	01/02/23	kbc	01/04/23	ahr	N	
Aroclor-1260	<0.10 ug/L	0.10	1	01/02/23	kbc	01/04/23	ahr	N	
<b>Surrogates:</b>									
Tetrachloro-m-xylene	68 %	18-105	1	01/02/23	kbc	01/04/23	ahr	N	

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**ANALYTICAL RESULTS**

Trace Project ID: 22L0811  
 Client Project ID: Balch Street - City of Kalamazoo - 12/20/22

Trace ID: 22L0811-02 Matrix: Ground Water Date Collected: 12/20/22 15:15  
 Sample ID: TW-3 Date Received: 12/21/22 11:20

PARAMETERS	RESULTS UNITS	RDL	DILUTION	PREPARED	BY	ANALYZED	BY	NOTES	MCL
<b>VOLATILE ORGANIC COMPOUNDS BY GC-MS</b>									
<b>Analysis Method: EPA 624.1</b>									
<i>Batch: T130822</i>									
Benzene	<1.0 ug/L	1.0	1	12/22/22	nw	12/22/22	nw		
Toluene	<1.0 ug/L	1.0	1	12/22/22	nw	12/22/22	nw		
Ethylbenzene	<1.0 ug/L	1.0	1	12/22/22	nw	12/22/22	nw		
Xylenes, total	<3.0 ug/L	3.0	1	12/22/22	nw	12/22/22	nw		
<b>Surrogates:</b>									
1,2-Dichloroethane-d4	105 %	68-133	1	12/22/22	nw	12/22/22	nw		
Toluene-d8	105 %	75-120	1	12/22/22	nw	12/22/22	nw		
4-Bromofluorobenzene	87 %	69-119	1	12/22/22	nw	12/22/22	nw		
1,2-Dichlorobenzene-d4	96 %	72-127	1	12/22/22	nw	12/22/22	nw		
<b>WET CHEMISTRY</b>									
<b>Analysis Method: ASTM D7511-12</b>									
<i>Batch: T130875</i>									
Cyanide (Total)	<5.0 ug/L	5.0	1	12/27/22	mr	12/27/22	mr		250
<b>Analysis Method: EPA 350.1 Rev. 2.0</b>									
<i>Batch: T130877</i>									
Ammonia as N	1.1 mg/L	0.010	1	12/27/22	ans	12/27/22	ans		18
<b>Analysis Method: SM 2540 D-15</b>									
<i>Batch: T130828</i>									
Total Suspended Solids	* 310 mg/L	13	3.333333	12/26/22	mr	12/26/22	mr		260
<b>Analysis Method: SM 4500-H+ B-11</b>									
<i>Batch: T130816</i>									
pH	6.88 pH Units		1	12/20/22	ay	12/21/22	kb	511, pHa, N	
<b>Analysis Method: SM 5210B-16 + HACH 10360</b>									
<i>Batch: T130789</i>									
Biochemical Oxygen Demand, Carbonaceous 5-day	<4.0 mg/L	4.0	4	12/21/22	ans	12/26/22	ans/drm	B-01, N	240

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Monday, January 09, 2023

Fibertec Project Number: A12842  
Project Identification: 22L0811 /22L0811  
Submittal Date: 12/27/2022

Mr. Tim Brewer  
Trace Analytical Laboratories, Inc.  
2241 Black Creek Road  
Muskegon, MI 49444

Dear Mr. Brewer,

Thank you for selecting Fibertec Environmental Services as your analytical laboratory. The samples you submitted have been analyzed in accordance with NELAC standards and the results compiled in the attached report. Any exceptions to NELAC compliance are noted in the report. These results apply only to those samples submitted. Please note TO-15 samples will be disposed of 7 calendar days after the reporting date. All other samples will be disposed of 30 days after the reporting date.

If you have any questions regarding these results or if we may be of further assistance to you, please contact me at (517) 699-0345.

Sincerely,

By Sue Ricketts at 11:47 AM, Jan 09, 2023

For Daryl P. Strandbergh  
Laboratory Director

Enclosures

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F: (810) 220-3311  
F: (231) 775-8584

Client Identification: <b>Trace Analytical Laboratories, Inc.</b>	Sample Description: <b>TW-2 22L0811-01</b>	Chain of Custody: <b>N/A</b>
Client Project Name: <b>22L0811</b>	Sample No: <b>22L0811-01</b>	Collect Date: <b>12/20/22</b>
Client Project No: <b>22L0811</b>	Sample Matrix: <b>Ground Water</b>	Collect Time: <b>12:10</b>

Sample Comments:

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

**PFAS** Aliquot ID: **A12842-001** Matrix: **Ground Water**  
Method: **EPA 0537.1 (Modified)** Description: **TW-2 22L0811-01**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		
						P. Date	P. Batch	A. Date	A. Batch	Init.
‡ 1. ADONA	U		ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 2.9CI-PF3ONS	U		ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 3.11CI-PF3OUdS	U		ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 4. N-EtFOSAA	U		ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 5. FtS 4:2	U		ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 6. FtS 6:2	U		ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 7. FtS 8:2	U		ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 8. HFPO-DA	U		ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 9. N-MeFOSAA	U		ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 10. PFBA	4.0		ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 11. PFBS	5.1		ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 12. PFBSA	U		ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 13. PFDA	U		ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 14. PFDoA	U		ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 15. PFDS	U		ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 16. PFECHS	U		ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 17. PFHpA	U		ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 18. PFHpS	U		ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 19. PFHxA	U		ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 20. PFHxSA	U		ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 21. PFHxS-Total	3.4		ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 22. PFNA	U		ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 23. PFNS	U		ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 24. PFOA	5.5		ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 25. PFOSA	U		ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 26. PFOS-Total	25		ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 27. PFPeA	U		ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 28. PFPeS	U		ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 29. PFTeA	U		ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 30. PFTriA	U		ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 31. PFUnA	U		ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG

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**Analytical Laboratory Report**  
**Laboratory Project Number: A12842**  
**Laboratory Sample Number: A12842-002**

Order: A12842  
 Date: 01/09/23

Client Identification: <b>Trace Analytical Laboratories, Inc.</b>	Sample Description: <b>TW-3 22L0811-02</b>	Chain of Custody: <b>N/A</b>
Client Project Name: <b>22L0811</b>	Sample No: <b>22L0811-02</b>	Collect Date: <b>12/20/22</b>
Client Project No: <b>22L0811</b>	Sample Matrix: <b>Ground Water</b>	Collect Time: <b>15:15</b>

Sample Comments:

Definitions: Q: Qualifier (see definitions at end of report) NA: Not Applicable ‡: Parameter not included in NELAC Scope of Analysis.

**PFAS** Aliquot ID: **A12842-002** Matrix: **Ground Water**  
 Method: **EPA 0537.1 (Modified)** Description: **TW-3 22L0811-02**

Parameter(s)	Result	Q	Units	Reporting Limit	Dilution	Preparation		Analysis		
						P. Date	P. Batch	A. Date	A. Batch	Init.
‡ 1. ADONA	U	EIS-	ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 2.9CI-PF3ONS	U	EIS-	ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 3.11CI-PF3OUdS	U	EIS-	ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 4. N-EtFOSAA	1.3	EIS-	ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 5. FtS 4:2	U	EIS+	ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 6. FtS 6:2	U	EIS+	ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 7. FtS 8:2	U		ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 8. HFPO-DA	3.1		ng/L	2.0	5.0	01/05/23	PS22L29F	01/05/23	SM23A05A	SKG
‡ 9. N-MeFOSAA	3.3	EIS-	ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 10. PFBA	30	EIS-	ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 11. PFBS	20		ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 12. PFBSA	3.2		ng/L	2.5	5.0	01/05/23	PS22L29F	01/05/23	SM23A05A	SKG
‡ 13. PFDA	U	EIS-	ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 14. PFDoA	U	EIS-	ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 15. PFDS	3.3	EIS-	ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 16. PFECHS	U		ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 17. PFHpA	7.3		ng/L	2.0	5.0	01/05/23	PS22L29F	01/05/23	SM23A05A	SKG
‡ 18. PFHpS	1.6	EIS-	ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 19. PFHxA	57		ng/L	2.0	5.0	01/05/23	PS22L29F	01/05/23	SM23A05A	SKG
‡ 20. PFHxSA	U		ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 21. PFHxS-Total	7.5		ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 22. PFNA	3.3		ng/L	2.0	5.0	01/05/23	PS22L29F	01/05/23	SM23A05A	SKG
‡ 23. PFNS	U	EIS-	ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 24. PFOA	26		ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 25. PFOSA	U	EIS-	ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 26. PFOS-Total	5.2		ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 27. PFPeA	U	EIS-	ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 28. PFPeS	U	EIS-	ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 29. PFTeA	U	EIS-	ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 30. PFTriA	U	EIS-	ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG
‡ 31. PFUnA	U	EIS-	ng/L	1.0	1.0	12/29/22	PS22L29F	01/03/23	SM23A03A	SKG

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 F: (231) 775-8584

Acronym (Param)	Analyte Name	CAS Number
1. ADONA	4,8-dioxa-3H-perfluorononanoic acid	919005-14-4
2. 9Cl-PF3ONS	9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid	756426-58-1
3. 11Cl-PF3OUdS	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	763051-92-9
4. N-EtFOSAA	2-(N-Ethylperfluorooctanesulfonamido) acetic acid	2991-50-6
5. FtS 4:2	Fluorotelomer sulphonic acid 4:2	757124-72-4
6. FtS 6:2	Fluorotelomer sulphonic acid 6:2	27619-97-2
7. FtS 8:2	Fluorotelomer sulphonic acid 8:2	39108-34-4
8. HFPO-DA	Hexafluoropropylene oxide dimer acid	13252-13-6
9. N-MeFOSAA	2-(N-Methylperfluorooctanesulfonamido) acetic acid	2355-31-9
10. PFBA	Perfluorobutanoic acid	375-22-4
11. PFBS	Perfluorobutanesulfonic acid	375-73-5
12. PFBSA	Perfluorobutylsulfonamide	30334-69-1
13. PFDA	Perfluorodecanoic acid	335-76-2
14. PFDoA	Perfluorododecanoic acid	307-55-1
15. PFDS	Perfluorodecanesulfonic acid	335-77-3
16. PFECHS	Perfluoroethylcyclohexane sulfonate	335-24-0
17. PFHpA	Perfluoroheptanoic acid	375-85-9
18. PFHpS	Perfluoroheptanesulfonic acid	375-92-8
19. PFHxA	Perfluorohexanoic acid	307-24-4
20. PFHxSA	Perfluorohexanesulfonamide	41997-13-1
21. PFHxS-Total	Perfluorohexanesulfonic acid	355-46-4
22. PFNA	Perfluorononanoic acid	375-95-1
23. PFNS	Perfluoronanesulfonic acid	68259-12-1
24. PFOA	Perfluorooctanoic acid	335-67-1
25. PFOSA	Perfluorooctanesulfonamide	754-91-6
26. PFOS-Total	Perfluorooctanesulfonic acid	1763-23-1
27. PFPeA	Perfluoropentanoic acid	2706-90-3
28. PFPeS	Perfluoropentanesulfonic acid	2706-91-4
29. PFTeA	Perfluorotetradecanoic acid	376-06-7
30. PFTriA	Perfluorotridecanoic acid	72629-94-8
31. PFUnA	Perfluoroundecanoic acid	2058-94-8

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**Definitions/ Qualifiers:**

- A:** Spike recovery or precision unusable due to dilution.
- B:** The analyte was detected in the associated method blank.
- E:** The analyte was detected at a concentration greater than the calibration range, therefore the result is estimated.
- J:** The concentration is an estimated value.
- M:** Modified Method
- U:** The analyte was not detected at or above the reporting limit.
- X:** Matrix Interference has resulted in a raised reporting limit or distorted result.
- W:** Results reported on a wet-weight basis.
- \*:** Value reported is outside QC limits

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**Exception Summary:**

- EIS-** : The Isotope Dilution/Extracted Internal Standard area exceeds the lower control limit.
- EIS+** : The Isotope Dilution/Extracted Internal Standard area exceeds the upper control limit.

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**Analysis Locations:**

All analyses performed in Holt.

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Accreditation Number(s):

**T104704518-22-14 (TX)**

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11766 E. Grand River  
8660 S. Mackinaw Trail

Holt, MI 48842  
Brighton, MI 48116  
Cadillac, MI 49601

T: (517) 699-0345  
T: (810) 220-3300  
T: (231) 775-8368

F: (517) 699-0388  
F: (810) 220-3311  
F: (231) 775-8584



**QUALITY CONTROL RESULTS**

Trace Project ID: 22L0811

Client Project ID: Balch Street - City of Kalamazoo - 12/20/22

QC Batch: T130977

Analysis Description: Zinc, Total

QC Batch Method: EPA 200.2

Analysis Method: EPA 200.8 Rev. 5.4

**METHOD BLANK: T130977-BLK1**

Parameter	Units	Blank Result	Reporting Limit	Notes
Cadmium	ug/L	<1.0	1.0	
Chromium	ug/L	<5.0	5.0	
Copper	ug/L	<1.0	1.0	
Nickel	ug/L	<5.0	5.0	
Lead	ug/L	<3.0	3.0	
Zinc	ug/L	<10	10	

**LABORATORY CONTROL SAMPLE: T130977-BS1**

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limit	Notes
Cadmium	ug/L	50.0	56.7	113	85-115	
Chromium	ug/L	50.0	49.7	99	85-115	
Copper	ug/L	1600	1560	98	85-115	
Nickel	ug/L	1600	1540	96	85-115	
Lead	ug/L	100	94.1	94	85-115	
Zinc	ug/L	1600	1610	101	85-115	

**MATRIX SPIKE: T130977-MS1**

Original: 22L0811-01

Parameter	Units	Original Result	Spike Conc.	MS Result	MS % Rec	% Rec Unit	Notes
Cadmium	ug/L	0	50.0	54.4	109	70-130	
Chromium	ug/L	0	50.0	50.5	101	70-130	
Copper	ug/L	1.54	1600	1490	93	70-130	
Nickel	ug/L	0	1600	1510	94	70-130	
Lead	ug/L	0	100	90.8	91	70-130	
Zinc	ug/L	10.2	1600	1550	96	70-130	

**MATRIX SPIKE: T130977-MS2**

Original: 22L0811-02

Parameter	Units	Original Result	Spike Conc.	MS Result	MS % Rec	% Rec Unit	Notes
Cadmium	ug/L	0	50.0	52.1	104	70-130	
Chromium	ug/L	0.733	50.0	49.6	98	70-130	
Copper	ug/L	5.44	1600	1450	91	70-130	

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**MATRIX SPIKE: T130977-MS2** Original: **22L0811-02**

Parameter	Units	Original Result	Spike Conc.	MS Result	MS % Rec	% Rec Unit	Notes
Nickel	ug/L	8.62	1600	1460	91	70-130	
Lead	ug/L	0	100	91.6	92	70-130	
Zinc	ug/L	5.28	1600	1490	93	70-130	

Trace Project ID: 22L0811

Client Project ID: Balch Street - City of Kalamazoo - 12/20/22

QC Batch: T130858	Analysis Description: Mercury, Total, EPA 245.1
QC Batch Method: EPA 245.2 Prep	Analysis Method: EPA 245.1 Rev. 3.0

**METHOD BLANK: T130858-BLK1**

Parameter	Units	Blank Result	Reporting Limit	Notes
Mercury	ug/L	<0.20	0.20	

**LABORATORY CONTROL SAMPLE: T130858-BS1**

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limit	Notes
Mercury	ug/L	2.00	1.81	90	85-115	

Trace Project ID: 22L0811

Client Project ID: Balch Street - City of Kalamazoo - 12/20/22

QC Batch: T130945	Analysis Description: Oil and Grease, Gravimetric
QC Batch Method: EPA 1664B	Analysis Method: EPA 1664B

**METHOD BLANK: T130945-BLK1**

Parameter	Units	Blank Result	Reporting Limit	Notes
Oil & Grease (HEM)	mg/L	<3.0	3.0	
Total Petroleum Hydrocarbons (SGT-HEM)	mg/L	<3.0	3.0	

**LABORATORY CONTROL SAMPLE: T130945-BS1**

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limit	Notes
Oil & Grease (HEM)	mg/L	40.0	39.0	97	78-114	

**LABORATORY CONTROL SAMPLE: T130945-BS2**

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limit	Notes
Oil & Grease (HEM)	mg/L	40.0	40.6	102	78-114	

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 Muskegon, MI 49444-2673



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 888-979-4469 Fax  
 www.trace-labs.com

Trace Project ID: 22L0811  
 Client Project ID: Balch Street - City of Kalamazoo - 12/20/22

QC Batch: T130948	Analysis Description: PCBs
QC Batch Method: EPA 3510C Separatory Funnel Liquid-Liquid Extr.	Analysis Method: EPA 608

**METHOD BLANK: T130948-BLK1**

Parameter	Units	Blank Result	Reporting Limit	Notes
Aroclor-1016	ug/L	<0.10	0.10	
Aroclor-1221	ug/L	<0.10	0.10	
Aroclor-1232	ug/L	<0.10	0.10	
Aroclor-1242	ug/L	<0.10	0.10	
Aroclor-1248	ug/L	<0.10	0.10	
Aroclor-1254	ug/L	<0.10	0.10	
Aroclor-1260	ug/L	<0.10	0.10	
Tetrachloro-m-xylene (S)	%	75	18-105	

**LABORATORY CONTROL SAMPLE: T130948-BS1**

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limit	Notes
Aroclor-1016	ug/L	0.800	0.668	84	50-140	
Aroclor-1260	ug/L	0.800	0.545	68	8-140	
Tetrachloro-m-xylene (S)	%	0.0600	0.0457	76	18-105	

Trace Project ID: 22L0811  
 Client Project ID: Balch Street - City of Kalamazoo - 12/20/22

QC Batch: T130822	Analysis Description: 624 BTEX Only
QC Batch Method: EPA 5030B Purge-and-Trap for Aqueous Samples	Analysis Method: EPA 624.1

**METHOD BLANK: T130822-BLK1**

Parameter	Units	Blank Result	Reporting Limit	Notes
Benzene	ug/L	<1.0	1.0	
Toluene	ug/L	<1.0	1.0	
Ethylbenzene	ug/L	<1.0	1.0	
Xylenes, total	ug/L	<3.0	3.0	
1,2-Dichloroethane-d4 (S)	%	117	68-133	
Toluene-d8 (S)	%	103	75-120	
4-Bromofluorobenzene (S)	%	100	69-119	
1,2-Dichlorobenzene-d4 (S)	%	93	72-127	

**LABORATORY CONTROL SAMPLE: T130822-BS1**

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limit	Notes
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**LABORATORY CONTROL SAMPLE: T130822-BS1**

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limit	Notes
Benzene	ug/L	50.0	47.0	94	65-135	
Toluene	ug/L	50.0	53.1	106	70-130	
Ethylbenzene	ug/L	50.0	53.8	108	60-140	
Xylenes, total	ug/L	150	142	95	70-130	
1,2-Dichloroethane-d4 (S)	%	30.0	31.1	104	68-133	
Toluene-d8 (S)	%	30.0	31.5	105	75-120	
4-Bromofluorobenzene (S)	%	30.0	32.8	109	69-119	
1,2-Dichlorobenzene-d4 (S)	%	30.0	29.5	98	72-127	

Trace Project ID: 22L0811

Client Project ID: Balch Street - City of Kalamazoo - 12/20/22

QC Batch: T130875

Analysis Description: Cyanide, Total

QC Batch Method: ASTM D7511-12

Analysis Method: ASTM D7511-12

**METHOD BLANK: T130875-BLK1**

Parameter	Units	Blank Result	Reporting Limit	Notes
Cyanide (Total)	ug/L	<5.0	5.0	

**LABORATORY CONTROL SAMPLE: T130875-BS1**

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limit	Notes
Cyanide (Total)	ug/L	100	106	106	90-110	

Trace Project ID: 22L0811

Client Project ID: Balch Street - City of Kalamazoo - 12/20/22

QC Batch: T130877

Analysis Description: Nitrogen, Ammonia

QC Batch Method: EPA 350.1 Rev. 2.0

Analysis Method: EPA 350.1 Rev. 2.0

**METHOD BLANK: T130877-BLK1**

Parameter	Units	Blank Result	Reporting Limit	Notes
Ammonia as N	mg/L	<0.010	0.010	

**LABORATORY CONTROL SAMPLE: T130877-BS1**

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limit	Notes
Ammonia as N	mg/L	1.00	0.985	98	90-110	

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Trace Project ID: 22L0811  
 Client Project ID: Balch Street - City of Kalamazoo - 12/20/22

QC Batch: T130828	Analysis Description: Total Suspended Solids
QC Batch Method: SM 2540 D-15	Analysis Method: SM 2540 D-15

**METHOD BLANK: T130828-BLK1**

Parameter	Units	Blank Result	Reporting Limit	Notes
Total Suspended Solids	mg/L	<1.0	1.0	

**LABORATORY CONTROL SAMPLE: T130828-BS1**

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limit	Notes
Total Suspended Solids	mg/L	100	99.1	99	85-115	

**LABORATORY CONTROL SAMPLE: T130828-BS2**

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limit	Notes
Total Suspended Solids	mg/L	100	90.0	90	85-115	

**LABORATORY CONTROL SAMPLE: T130828-BS3**

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limit	Notes
Total Suspended Solids	mg/L	100	93.1	93	85-115	

**LABORATORY CONTROL SAMPLE: T130828-BS4**

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limit	Notes
Total Suspended Solids	mg/L	100	91.1	91	85-115	

**LABORATORY CONTROL SAMPLE: T130828-BS5**

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limit	Notes
Total Suspended Solids	mg/L	100	96.1	96	85-115	

Trace Project ID: 22L0811  
 Client Project ID: Balch Street - City of Kalamazoo - 12/20/22

QC Batch: T130816	Analysis Description: pH, SM 4500
QC Batch Method: *** DEFAULT PREP ***	Analysis Method: SM 4500-H+ B-11

Trace Project ID: 22L0811  
 Client Project ID: Balch Street - City of Kalamazoo - 12/20/22

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QC Batch: T130789  
 QC Batch Method: SM 5210B-16 + HACH 10360

Analysis Description: Carbonaceous Biochemical Oxygen Demand  
 Analysis Method: SM 5210B-16 + HACH 10360

**METHOD BLANK: T130789-BLK1**

Parameter	Units	Blank Result	Reporting Limit	Notes
Biochemical Oxygen Demand, Carbonaceous 5-day	mg/L	<1.0	1.0	

**LABORATORY CONTROL SAMPLE: T130789-BS1**

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limit	Notes
Biochemical Oxygen Demand, Carbonaceous 5-day	mg/L	198	180	91	85-115	

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 Muskegon, MI 49444-2673

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 Fax 888.979.4469  
 www.trace-labs.com

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Report Results To:

Company Name: Michigan Consulting & Environmental  
 Report To: Bobby Glasser  
 Mailing Address: 2860 S. 11th Street, Suite #2  
 City, State, Zip Code: Kalamazoo, MI 49009  
 Office Phone: 269-547-5295 Cell Phone: 269-547-5295  
 Email Address: bglasser@michenv.com  
 Billing Email Address: ap@michenv.com

Bill To:

PO #: MEI Project # 51819  
 Contact Name: Jen Baxter  
 Billing Address (if different): 1669 S. Isabella Road  
 City, State, Zip Code: Mt. Pleasant, MI 48858  
 Phone Number: 989-772-2441

Requested Turnaround Times (TAT)

- Standard: 5-10 Business days
  - 3 Business Days\*
  - 1 Business Day\*
- \* Rush TAT Requires Prior Approval

Matrix Key:

- WW = Wastewater
- DW = Drinking Water
- GW = Groundwater
- LW = Liquid Waste
- O = Oil
- WI = Wipes
- S = Solid
- SL = Sludge
- A = Air
- U = Unknown

Analysis Requested

Trace Use: NC  
 Logged By: NC  
 Checked By: VB  
 Soil Volatiles Preserved (circle if applicable):  
 MeOH Low Level Lab  
 Sample Collection Time (Hrs):

Trace ID No. 22L0811

Trace No.	Sample Collection Date	Sample Collection Time	Sample ID/Name	Metals	Field Filter (Y or N)	Matrix - see above →	Number of Containers		Preservation										Remarks/Notes	Possible Health Hazards?
							Cool ≤ 4°C	Hydrochloric Acid (HCl)	Nitric Acid (HNO3)	Sulfuric Acid (H2SO4)	Sodium Thiosulfate	Sodium Hydroxide (NaOH)	Ascorbic Acid	Trizma	Other					
1	12/20/22	12:10	TW-2	N	N	GW	11	X	X	X	X	X	X	X	X	X	X	X		
2	12/20/22	15:15	TW-3	N	N	GW	11	X	X	X	X	X	X	X	X	X	X	X		

City of Kalamazoo  
 Dewatering Parameters  
 (See Attached)

Please Sign

Released By	Received By	Date	Time	Released By	Date	Time
1) Bobby Glasser (mei)	* Rick Kulo cold Storage	12/20/22	15:55	Bobby Glasser (mei)	12/21/22	11:20
2) [Signature]	[Signature]	12/20/22	15:26	[Signature]		
3) [Signature]	[Signature]					

Check this box if you would not like your samples analyzed if received outside of the conditions outlined in the Trace Sample Acceptance Policy at www.trace-labs.com/downloads. Form 70-2-2

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**22L0811**  
 Michigan Consulting and En  
 Project Manager: Tim Brewer

**Sample Log In Checklist**

Date:	12/21/22		Original Observation	Corrected Temperature	IR-9 (CF: +0.1°C)	IR-10 (CF: 0.0°C)	20B12743 (CF: -0.2°C)	Temp Blank	Client Sample
Time:	15:30								
Logged by:	KB								
Package Description:	Cooler								
Package Temp °C	-1.2	-1.2							
Representative Sample Temp °C	3.4	3.2							

**Sample Receipt**

- Yes No
- Received on ice or other coolant
- Ice still present upon receipt
- Custody seals present
- Trace Courier  Client Drop-off
- Yes  No Custody seals intact (if applicable)
- UPS  Fed Ex  US Mail  Other

**Sample Condition**

- Yes No N/A
- All sample containers arrived unbroken and labeled
- Sufficient sample to run requested analyses
- Correct chemical preservative added to samples
- Samples preserved at Trace
- Chemical preservation verified, check EMD pH test strip used (if applicable)
- pH 0-2.5 (Lot: HC291593)  pH 11.0-13.0 (Lot: HC022540)  Other
- Air bubbles absent from VOAs

**Chain of Custody (COC)**

- Yes No
- All bottle labels agree with COC
- COC filled out properly
- COC signed by client

**Notes:**

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CITY OF KALAMAZOO  
SPECIAL PROVISION  
FOR  
**MAINTENANCE GRAVEL, ASPHALT MILLINGS**

H&S:TAS

1 of 1

11/28/2022

**a. Description.** This work consists of providing all labor, materials and equipment necessary to construct and maintain an aggregate surface on a prepared grade to maintain traffic between the interim open to traffic date and final Hot Mix Asphalt (HMA) surfacing as directed by the Engineer. Traffic shall not travel on maintenance surfaces for longer than 7 working days, areas that are required to be opened to traffic greater than 7 working days shall be hand patched, unless otherwise directed by the engineer. Removal and disposal of the aggregate when no longer needed, or has been placed longer than 7 working days, is included in this item of work. Conduct work in accordance with section 306 of the Standard Specifications for Construction except as modified by this special provision.

Work Included Under Other Contract Items

Aggregate Base  
Hand patching

**b. Materials.** Asphalt Millings. Material must not exceed a nominal maximum size of 1 inch.

**c. Construction.** Place asphalt millings on an unfrozen grade at locations shown on the plans or as directed by the Engineer to provide a flush transition to the existing HMA roadway surface or other areas where traffic is to be maintained. Compact asphalt millings to at least 98% of the maximum unit weight.

Maintain the milling surface in a smooth, stable condition until no longer needed for maintaining traffic. When construction operations progress to the point that the maintenance gravel is no longer needed, removal of the maintenance gravel must occur in the same workday as final paving.

Asphalt millings shall not be incorporated into the construction of aggregate base, shoulders or approaches, the Contractor is responsible for removal and disposal of the material in accordance with the standard specifications.

**d. Measurement and Payment.** The completed work, as described, will be measured and paid for at the contract unit price using the following pay item:

<b>Pay Item</b>	<b>Pay Unit</b>
Maintenance Gravel, Asphalt Millings .....	Cubic Yard

CITY OF KALAMAZOO

SPECIAL PROVISION  
FOR  
**COVER, ADJ**

H&S:IJV

1 of 2

03/13/2023

**a. Description.** This work consists of removing and replacing existing City of Kalamazoo owned manhole structure covers or valve boxes during HMA surface operations with City of Kalamazoo standard covers. This operation uses the Mr. Manhole™, Manhole Leveling System, or equivalent. Section references are to the current version of the MDOT Standard Specifications for Construction.

**b. Materials.** Provide materials in accordance with the following:

1. Cover and Casting:
  - a. Supply the City of Kalamazoo standard design cover and casting for Sanitary and Storm sewer per special provision for **DR. STRUCTURE COVER, TYPE \_\_**, **MODIFIED** or water main valve boxes meeting the requirements of section 908.
2. Concrete:
  - a. Use Grade P-NC concrete meeting the requirements of Section 1006.
3. Mortar Type R-2:
  - a. Use mortar meeting the requirement of Section 1005.
4. HMA:
  - a. Use HMA mixtures as specified in the special provisions

**c. Construction.** Remove existing pavement around the drainage structure using the Mr. Manhole™ or equivalent system. Remove the existing drainage structure in a manner to avoid roadway materials from entering the manhole structure. Salvage existing manhole covers and castings if in good condition; otherwise replace the casting and cover. If pickup is needed, notify the Engineer when manhole cover and casting are ready for pickup. Place a steel plate over the manhole structure and fill in the resulting void with the HMA mixture or material approved by the Engineer. Record the location of each structure and use a locating system or GPS record of each structure for finding it following final paving.

Prior to paving, ensure that locations of structures are confirmed & recorded, and any markers or caps used are in place to easily identify and find each structure after final paving. Upon completion of final paving, cut out and remove the pavement around the structure using the Mr. Manhole™ or equivalent system. Avoid roadway materials from entering the manhole structure. Remove the plate and locator cap. Set the new structure cover in a full bed of mortar or using custom adjusting rings built for this purpose. Adjust in accordance with manufacturer's instructions, MDOT Standard Specifications, and best practices. Set the structure cover level with the roadway (nominal offset = 0", maximum offset = +/- 1/8"). Fill in resulting void with concrete meeting the requirements of Section 1006. Assume ownership of excess removed materials and dispose of according to subsection 205.03P.

Any material entering the Sewer system must be removed promptly. If the contractor neglects to remove the material within 7 days for storm or 24 hours for sanitary after receiving written notification from the Engineer, the Engineer may proceed with the removal. The Engineer will deduct the cost of the removal from the monies that are or may become due to the contractor.

**d. Measurement and Payment.** The completed work, as described, will be measured and paid for at the contract unit price using the following pay item:

<b>Pay Item</b>	<b>Pay Unit</b>
Cover, Adj, Modified.....	Each

The unit price for Sewer Cover, Adj includes all labor, equipment, and materials to remove the existing pavement, install the new cover and casting or valve box, and place the concrete collar.

CITY OF KALAMAZOO  
SPECIAL PROVISION  
FOR  
**DR STRUCTURE COVER, TYPE \_\_, MODIFIED**

H&S:TAS

1 of 1

03/13/2023

**a. Description.** This work consists of installing drainage structure castings with City logos in accordance with City of Kalamazoo standards.

**b. Materials.** All materials shall conform with Section 403.02 of the Michigan Department of Transportation 2020 Standard Specifications for Construction with the exception of the following:

Cover B, Modified shall consist of an EJIW 1045ZPT bolted frame with a 1040A non-bolted non-vented cover with 2 inch "STORM SEWER" lettering or approved equal.

Cover K1, Modified shall consist of an EJIW 7045 frame with M1 grate and 7050 T1 back.

Cover Q, Modified shall consist of an EJIW 1045ZPT bolted frame with a 1040A non-bolted cover with 2 inch "SANITARY SEWER" lettering or approved equal.

**c. Construction.** All construction shall conform with Section 403.03 of the Michigan Department of Transportation 2020 Standard Specifications for Construction.

**d. Measurement and Payment.** The completed work, as described, will be measured and paid for at the contract unit price using the following pay item:

<b>Pay Item</b>	<b>Pay Unit</b>
Dr Structure Cover, Type B, Modified.....	Each
Dr Structure Cover, Type K1, Modified.....	Each
Dr Structure Cover, Type Q, Modified.....	Each

CITY OF KALAMAZOO  
SPECIAL PROVISION  
FOR  
**SANITARY SEWER LEAD CONFLICTS**

H&S:TAS

1 of 1

11/28/2022

**a. Description.** This work consists of furnishing and constructing sanitary leads as necessary to adjust sanitary sewer connections from the main sewer to the nearest possible end point in instances of conflict with proposed water main or storm sewer. This includes sewer pipe, fittings, temporary plugs, clearing and grading, dewatering, earth excavation, joint materials, concrete, laying of pipe, backfill, and disposal of excess material; protection of existing structures and utilities, cleanup and other operations necessary to complete the work as shown on the plans and as specified in section 825 of the 2020 MDOT Standard Specifications for Construction.

**b. Materials.** All materials shall conform with section 825 of the 2020 MDOT Standard Specifications for Construction.

**c. Construction.** All construction shall conform with section 825 of the 2020 MDOT Standard Specifications for Construction.

**d. Measurement and Payment.** The completed work, as described, will be measured and paid for at the contract unit price using the following pay item:

<b>Pay Item</b>	<b>Pay Unit</b>
Sanitary Sewer Lead Conflict, ___ inch, Modified.....	Foot

**Sanitary Sewer Lead.** The Engineer will measure **Sanitary Sewer Lead** of the type and size in place for horizontal length from wye to termination. The unit price of **Sanitary Sewer Lead** includes the cost of the following:

1. Excavation and backfill;
2. Dewatering operations (trench and/or pipe);
3. Providing and installing fittings, gaskets, and geotextile fabric;
4. Installing risers as detailed on the plans;
5. Plugging and marking terminations;
6. Testing and televising; and
7. Preparing and providing as-built plans.

The City may withhold payment until the Engineer accepts the as-built plans.

The cost of dewatering of trenches, pipe, or both is included in the unit price for relevant items of work.

The cost of excavating, disposing of excess material, and providing, placing, and compacting the backfill, is included in the unit price for related items of work.

CITY OF KALAMAZOO  
SPECIAL PROVISION  
FOR  
**HMA APPLICATION ESTIMATE**

H&S: TAS

1 of 1

11/28/2022

**a. Description.** This work shall be done in accordance with Division 5 of the 2020 MDOT Standard Specifications for Construction except as herein specified. The Local Agency representative will perform density testing.

**b. Materials.** The HMA application estimate is as follows:

1. HMA, 3C (base) shall have a yield of 275 pounds per square yard
2. HMA, 4EL (leveling) shall have a yield of 220 pounds per square yard
3. HMA, 5EL, (top) shall have a yield of 220 pounds per square yard

Asphalt binder shall be PG 64-28 for HMA, 3C.  
Asphalt binder shall be PG 64-28 for HMA, 4EL.  
Asphalt binder shall be PG 64-28 for HMA, 5EL.

Target air voids shall be designed for 4.0% and field regressed to 3.0% for all HMA mixes.

Aggregate Wear Index for the HMA, 5EL (Top) shall be 260 minimum. HMA Bond Coat shall be type SS – 1h and be applied at the rate of 0.10 gal/syd per Manufacturer’s recommendation.

Hand Patching shall be HMA, 3C, PG 64-28 and HMA, 4EL, PG 64-28 or other mix as approved by the Engineer in writing before placement.

RAP shall not exceed Tier 1 limits as specified in the MDOT Special Provision for Recycled Hot Mix Asphalt Mixture on Local Agency Projects included in this proposal.

**c. Measurement and Payment.** The completed work, as described, will be measured and paid for at the contract unit price using the following pay item:

<b>Pay Item</b>	<b>Pay Unit</b>
HMA, ( <u>type</u> ), Modified .....	Ton

CITY OF KALAMAZOO  
SPECIAL PROVISION  
FOR  
**VOID REDUCING ASPHALT MEMBRANE FOR LONGITUDINAL JOINTS**

H&S:IJV

1 of 3

03/14/2023

a. **Description.** This work consists of applying a void reducing asphalt membrane (VRAM) underneath the longitudinal construction joint of a course of an asphalt pavement. Apply VRAM shall be applied beneath the intended area of the asphalt pavement longitudinal construction joint prior to the installation of the asphalt course.

b. **Materials.** Furnish bituminous material for the VRAM that meets the requirements of Table 1. Add elastomers to base asphalt and include either a styrene-butadiene diblock or triblock copolymer without oil extension, or a styrene-butadiene rubber. Air blown asphalt, acid modification and other modifiers are prohibited.

TEST	TEST REQUIREMENT	TEST METHOD
Dynamic shear @ 88°C (unaged), $G^*/\sin \delta$ , kPa	1.00 min.	AASHTO T 315
Creep stiffness @ -18°C (unaged) Stiffness (S), MPa m-value	300 max. 0.300 min.	AASHTO T 313
Ash, %	1.0 - 4.0	AASHTO T 111
Elastic Recovery, 10 cm elongation, cut immediately, 25°C, %	58 min.	ASTM D6084 method A
Separation test, T 53, Ring and Ball Softening Point °C	3 max.	ASTM D7173

c. **Construction.**

1. Equipment

- a. Provide a pressure distributor that is capable of applying the VRAM at the desired thickness. Equip the distributor with a heating and recirculating system along with a functioning auger agitating system or vertical shaft mixer in the hauling tank to prevent localized overheating.
- b. Use a melter kettle for transporting and/or application of the material. Equip the melter kettle with an oil jacketed double-boiler type with agitating and recirculating systems. Dispense material from the kettle through a pressure feed wand with an applicator shoe or through a pressure feed wand into a thermal hand cart similar to a walk behind thermoplastic paint applicator.

2. Surface Preparation. Prior to the application of the VRAM ensure the area of the intended longitudinal asphalt pavement joint is thoroughly cleaned and free of debris. Clean the area by sweeper/vacuum truck, power broom, air compressor or hand to the satisfaction of the Engineer. Ensure the existing surface is dry and free of moisture.

3. General Placement Operation.

- a. When applying VRAM, center the VRAM application width within 2 inches of the project established centerline or established lane edge.
- b. Apply the VRAM to the existing surface prior to any or all tack coat applications.
- c. Apply the VRAM to the existing surface at the width and minimum thickness as specified in Table 2.

**Table 2: VRAM Application Rate**

<b>Non-SMA Mixtures</b>		
Overlay Thickness, inches	VRAM Width, inches	Application Rate, lb/ft
1	18	0.80
1¼	18	0.88
≥ 1½	18	0.95
<b>SMA Mixtures</b>		
Overlay Thickness, inches	VRAM Width, inches	Application Rate, lb/ft
1½	18	1.26
1¾	18	1.38
≥ 2	18	1.51
<ol style="list-style-type: none"> <li>1. The thickness of the VRAM may taper from the center of the application to a lesser thickness on the edge of the application. Maintain the width and weight per foot.</li> <li>2. In the event of a joint between a SMA and non-SMA mixture, the non-SMA application rate will be used.</li> <li>3. When applying VRAM half-width, apply the application at one-half the prescribed width and rate.</li> </ol>		

- d. Apply the VRAM in a single pass placed by any application method listed in subsection c.1 of this special provision. Do not use excessive material either in thickness or width.
- e. Apply the VRAM at a width of not less or greater than 1.5 inches of the width specified in Table 2. Apply VRAM half-width at not less or greater than 1.5 inches of one-half the width specified in Table 2. If the VRAM flows more than 2 inches from the initial placement width, stop paving and take remedial action subject to the Engineer's approval.
- f. In the event VRAM flushes to the surface of the new lift, remove the excess VRAM to the Engineer's approval.



- g. Apply the VRAM to be suitable for construction traffic to drive on without pick up or tracking of the VRAM within 30 minutes of placement. If pick up or tracking occurs, stop paving and take remedial action subject to the Engineer's approval.
- h. To prevent overlapping of successive applications of VRAM, place suitable release paper or provide other means over the previous applied VRAM.
- i. In the event the intended location of the longitudinal joint falls on the crown or at a location where adjacent pavement passes have differing cross slopes; adjust the application location of the VRAM for an edge of paving offset.
- j. Ensure the existing surface and ambient temperatures are a minimum 40 °F and rising during application of the VRAM.
- k. Prior to start of paving of pavement course, ensure the paver end plate and grade control device is adequately raised above the finished height of the VRAM.
- l. Furnish a quality inspection report showing the source, manufacturer, and the date shipped, for each load of VRAM. When directed by the Engineer, the Contractor must take representative samples of material for testing.

4. **Measurement and Payment.** The completed work, as described, will be measured and paid for at the contract unit price using the following pay item.

<b>Pay Item</b>	<b>Pay Unit</b>
Void Reducing Asphalt Membrane, modified.....	Ft

Void Reducing Asphalt Membrane includes placement of VRAM at the width and rate listed in Table 2 in a single pass. Payment includes all materials, surface preparation and documentation.

CITY OF KALAMAZOO  
SPECIAL PROVISION  
FOR  
**SLOPE RESTORATION, MODIFIED**

H&S:TAS

1 of 1

11/28/2022

**a. Description.** This work consists of preparing all areas disturbed during construction for slope restoration by the contractor or as directed by the Engineer, and applying topsoil, fertilizer, seed, and mulch with mulch anchor, mulch blanket or high velocity mulch blanket to those areas.

**b. Materials.** All materials shall conform with Sections 816 and 917 of the 2020 MDOT Standard Specifications for Construction unless modified by this special provision or as directed by the engineer. All seeding shall use Class "A" Mixture in accordance with Section 816.03.

**c. Construction.** Construction methods shall be in accordance with Section 816.03 of the 2020 MDOT Standard Specifications for Construction.

Mulch Blanket and High Velocity Mulch Blanket shall be placed in large disturbed areas with a 1-on-4 slope or greater as directed by the Engineer.

If an area washes out after this work has been properly completed and approved by the Engineer, Contractor shall make the required restorations and corrections to prevent future washouts and replace the topsoil, fertilizer, seed and mulch. This replacement will be paid for as additional work using the applicable contract items.

If weeds are determined by the Engineer to cover more than ten percent of the total area of slope restoration, the Contractor shall provide weed control in accordance to subsection 816.03.I of the 2020 MDOT Standard Specifications for Construction. Weed control shall be at the Contractor's expense with no additional charges to the project for materials, labor or equipment.

**d. Measurement and Payment.** The completed work as described will be paid for at the contract unit price for the following contract item (pay item):

<b>Pay Item</b>	<b>Pay Unit</b>
Slope Restoration, Modified .....	Lump Sum

**Slope Restoration, Modified** shall be placed in all disturbed areas. All materials, labor and equipment required to install **Slope Restoration, Modified** which includes Topsoil Surface, Furnished or Salvaged; Fertilizer, Chemical Nutrient, Class A; Seeding Mixture; Mulch and Mulch Anchoring; Mulch Blanket and High Velocity Mulch Blanket will not be paid for separately but shall be included in the contract unit price bid for **Slope Restoration, Modified**.

CITY OF KALAMAZOO  
SPECIAL PROVISION  
FOR  
**INSULATION BOARD OVER PROPOSED WATER MAIN**

TAS: H&S

1 of 1

11/28/2022

**a. Description.** This work consists of insulating the proposed water main or proposed service lines at locations shown on the plans, or determined at the time of construction, to protect against the penetration of frost.

This work includes furnishing and placing insulation board to the prepared grade. It also includes excavating, backfilling, shaping and compaction necessary to install the insulation board.

**b. Materials.** The insulation must be rigid, extruded polystyrene board meeting *ASTM C 578, Type V*, having a nominal board thickness of 2 inches, minimum compressive strength of 100 psi and a minimum R-Value of 10. Furnish the board in minimum 4 foot by 8 foot sheets unless otherwise approved by the Engineer, and of the cumulative thickness indicated on the plans or determined at the time of construction and approved by the Engineer. Trim the edges square and must have not more than 1/4 inch bow measured against a straightedge.

**c. Construction.** It is necessary to insulate the water main or service lines wherever indicated on the plans or determined at the time of construction. Place the insulation board on a prepared grade 12 inches above the top of the pipe, where possible and fasten with skewers or other means approved by the Engineer, so that backfill compaction requirements of the trench can be met. Trim the surface of the grade to a smoothness of  $\pm 3/4$  inch per 10 feet. With approval of the Engineer, the specified smoothness may be obtained by the placement of a thin layer of granular material Class II. Where necessary to place more than one layer of insulation board, ensure the joints are staggered.

Install the insulation board using methods and means that will not cause damage. Remove damaged insulation board and replaced at no cost to the City.

Asphalt or other material having a temperature exceeding 150 degrees Fahrenheit must not be placed in direct contact with the insulation board.

**d. Measurement and Payment.** The completed work, as described, will be measured and paid for at the contract unit price using the following pay item:

Pay Item	Pay Unit
Insulation Board, 2 inch .....	Square Foot

**Insulation Board, 2 inch** includes furnishing and installing the insulation board complete including fasteners and any required granular material Class II.

CITY OF KALAMAZOO  
SPECIAL PROVISION  
FOR  
**MAINTAINING TRAFFIC  
PERMANENT PAVEMENT MARKINGS  
AND PERMANENT SIGNING**

H&S:ARP

1 of 9

03/14/2023

**Route:** Balch Street from S. Park St. W. to S. Burdick St. in the City of Kalamazoo.  
**Location:** Kalamazoo County  
**Description:** The scope of work includes water main, pavement, driveway, sidewalk, and curb replacement.

**GENERAL**

Maintain traffic according to subsections 104.07, 104.10, and sections 812 and 922 of the *2020 Standard Specifications for Construction*, including any Supplemental Specifications, and as specified herein. All traffic control devices and their usage shall conform to the *Michigan Manual of Uniform Traffic Control Devices (MMUTCD)*, 2009 edition, as revised and as specified herein, including any supplemental specifications and revisions.

Notify the Project Engineer, City of Kalamazoo Manager, and City officials a minimum of 72 business hours prior to the implementation of any detours, road closures, or lane closures and major traffic shifts.

During work hours, equipment, material and company vehicles may be parked or stored within the right-of-way as directed by the Engineer. All equipment, material and company vehicles to be parked or stored overnight shall be placed 15' from edge of travel way within the Construction Influence Area (CIA) project limits.

Coordinate operations with Contractors performing work on other projects within or adjacent to the CIA, to avoid conflicts in the maintenance of traffic, construction staging, and to provide for the orderly progress of contract work.

Changes and/or adjustments to the maintaining traffic plans and standards may be applied as determined by the Engineer.

Coordinate all lane closures with Kalamazoo Metro Transit to maintain access or provide alternate access for any bus stops within the CIA.

**CONSTRUCTION INFLUENCE AREA (CIA)**

The CIA includes the area within the rights-of-way on Balch St., from the intersection of S. Park St. W. through the intersection of S. Burdick St., including the rights-of-way of any intersecting roads adjacent to the work zone for a distance of approximately 800 feet in advance of Balch St.

**TRAFFIC RESTRICTIONS – GENERAL**

The Contractor shall maintain traffic according to this maintaining traffic special provision, signing typical, and the notes therein.

No work shall be performed during the Memorial Day, Independence Day, and Labor Day holiday periods, as defined by the Engineer. All work shall be done between the hours of 7 a.m. to 7 p.m. (Monday – Friday) unless otherwise specified herein. Work done outside of the times specified herein will be at the discretion of the Engineer and any additional cost for maintaining traffic shall be borne by the Contractor. No work shall be done on Weekends (Saturday and Sunday), unless otherwise specified herein or approved by the Engineer in writing.

During construction, reasonable access shall be maintained to all business and residential drives at all times.

When lane closures are in place, the Contractor shall completely cover or remove existing conflicting warning, regulatory, and guide signs according to Section 812.03 of the *Standard Specifications for Construction, 2020 edition*. Any signs damaged during this project shall be replaced in-kind at the Contractor's expense.

As necessary, HMA Hand Patching shall be placed in any location as directed by the Engineer to transition any differences in grade between transverse or longitudinal joints on paved surfaces.

During the road construction activities, the construction area shall be closed with traffic detoured in three phases as indicated and detailed herein. All detour signage shall be as required by the City of Kalamazoo and MDOT. The following detour routing and traffic modifications are anticipated:

Balch St. shall be closed from S. Burdick St. to S. Park St. W. Type III barricades shall be placed at S. Burdick St., S. Park St. W., S. Park St., and S. Rose St. as detailed in *Sheet C-9 Phase 1 & 3 Maintenance of Traffic Plan*. Close right-turn lane on S Park St. W and thru lane on Balch St. as detailed in *Sheet C-9 Phase 1 & 3 Maintenance of Traffic Plan*.

Balch St. shall be closed from S. Burdick St. to S. Park St. Type III barricades shall be placed at S. Park St. W., S. Park St., and S. Rose St. as detailed in *Sheet C-9 Phase 2 Maintenance of Traffic Plan*. Close right-turn lane on S. Park St. W. and thru lane on Balch St. as detailed in *Sheet C-9 Phase 2 Maintenance of Traffic Plan*. The Balch St. & S. Burdick St. intersection shall be closed. Type III barricades shall be placed at the northern, southern, and western side of the intersection as detailed in *Sheet C-9 Phase 2 Maintenance of Traffic Plan*. Additionally, the western driveway of 1601 S. Burdick St. shall be closed and Type III barricades shall be placed at the drive apron.

Balch St. shall be closed from S. Burdick St. to S. Park St. W. Type III barricades shall be placed at S. Burdick St., S. Park St. W., S. Park St., and S. Rose St. as detailed in *Sheet C-9 Phase 1 & 3 Maintenance of Traffic Plan*. Close right-turn lane on S. Park St. W. and thru lane on Balch St. as detailed in *Sheet C-9 Phase 1 & 3 Maintenance of Traffic Plan*. S. Burdick St. traffic fully open, HMA final paving in water main trench.

Final pavement marking shall be placed upon completion of placement of the base course of HMA.

Temporary signage and barricades shall be placed throughout the project duration until permanent signs and pavement markings are in place. Contractor shall provide access to all businesses along Balch St. at all times

The contractor shall maintain a 12' wide access lane for driveway and emergency access at all times.

The contractor shall maintain pedestrian traffic at all times. Only sidewalks on one side of each intersection shall be closed at a time. Two consecutive intersections shall not have work impacting pedestrian facilities in process on the same side at any time.

Modification of traffic control signs shall require 72 hours prior notification and approval by the Engineer.

All closures, traffic detours, and traffic shifts shall be reviewed and approved by the Engineer prior to implementation or use.

The Contractor shall notify the Engineer at least 72 hours in advance of erection or removal of existing signs.

Continue work that is initiated that includes any lane restrictions until completed. A lack of work activity for more than one week requires the removal and replacement of lane restrictions with all the costs borne by the Contractor.

Restrict access for construction vehicles between traveled lanes and work areas to specific locations. The number of access points and their locations requires the approval of the Engineer.

Restore undercuts or excavations immediately adjacent to active traffic lanes to no less than a one-on-four slope at the end of each working period unless otherwise approved by the Engineer. Require and provide fencing to protect open trenches during non-working hours as part of the trenching item utilized.

Provide transverse and longitudinal HMA tapers at all grade changes caused by cold-milling and overlays. Maintain traffic on the unmilled surface, unless otherwise approved by the Engineer.

### **STAGE CONSTRUCTION**

Base the traffic control required by this Special Provision for work on Balch St. and adjacent roadways on the suggested sequence of operations contained in the staging plans. Use an alternate traffic control plan, subject to review and approval by the Engineer. Require the following brief description of traffic control detailed on the plans during each construction stage.

#### ***PHASE 1 – Close Balch St. at Sta. 0+00 – Sta. 11+00 to thru traffic.***

Eastbound and westbound traffic on Balch St. will be detoured around the project limits and only local traffic will remain open for two-way traffic. On Balch St., maintain a 12' wide access lane

for driveway and emergency access at all times. Utilize maintenance gravel or asphalt millings in water service trenches on Balch St. as directed by the Engineer. Utilize traffic shifts and flag control as necessary. See *Sheet C-9 Phase 1 & 3 Maintenance of Traffic Plan* for more details.

- A. Relocate existing services leads from existing 8" northern water main to existing 12" southern water main. See Sheet C-4 & C-5 for details.

Utilize traffic shifts and flag control as necessary;

1. Utilize attached MDOT typical lane closures 343-SP-ZIP-1LC-(R) to close thru-lane on Balch St. and the right-turn at S. Park St. W. to facilitate traffic control at S. Park St. W. & Balch St. Intersection. Leave gap in Plastic Drums on Balch St. to maintain access to 403 Balch St. Driveway.

***PHASE 2 – Keep Balch St. closed at Sta. 0+00 – Sta. 11+00 to thru traffic. Close Balch St. & Burdick St. Intersection to all traffic.***

Eastbound and westbound traffic on Balch St. will be detoured around the project limits and only local traffic will remain open for two-way traffic. On Balch St., maintain a 12' wide access lane for driveway and emergency access at all times. All traffic will be detoured around Balch St. & Burdick St. Intersection. Pave water main trenches in Balch St. & Burdick St. Intersection as directed by the Engineer. Utilize traffic shifts and flag control as necessary to place final pavement. See *Sheet C-10 Phase 2 Maintenance of Traffic Plan* for more details.

- A. Install 24" water main on Balch St. from Sta. 11+61 to Sta. 11+00 including; water main tap, 12" x 24" reducer, 24" x 24" x 16" tee, 16" WM, 16" Plug, 24" x 24" x 24" tee, 24" Butterfly Valve, 24" Plug, 45° bends, vertical deflections, and 24" WM.

Utilize traffic shifts and flag control as necessary;

1. Utilize attached MDOT typical lane closures 343-SP-ZIP-1LC-(R) to close thru-lane on Balch St. and the right-turn at S. Park St. W. to facilitate traffic control at S. Park St. W. & Balch St. Intersection. Leave gap in Plastic Drums on Balch St. to maintain access to 403 Balch St. Driveway.

***PHASE 3 – Keep Balch St. at Sta. 0+00 – Sta. 11+00 to thru traffic. Open Balch St. & Burdick St. Intersection to full traffic.***

Eastbound and westbound traffic on Balch St. will be detoured around the project limits and only local traffic will remain open for two-way traffic. On Balch St., maintain a 12' wide access lane for driveway and emergency access at all times. Utilize maintenance gravel or asphalt millings in water service trenches on Balch St. as directed by the Engineer. Utilize traffic shifts and flag control as necessary to hand patch. See *Sheet C-9 Phase 1 & 3 Maintenance of Traffic Plan* for more details.

- A. Install 24" water main on Balch St. from Sta. 11+00 to Sta. 0+25 including sewer relocations, service connections, curb and gutter, and sidewalk ramps.

Utilize traffic shifts and flag control as necessary;

1. Utilize attached MDOT typical lane closures 343-SP-ZIP-1LC-(R) to close thru-lane on Balch St. and the right-turn at S. Park St. W. to facilitate traffic control at S. Park St. W. & Balch St. Intersection. Leave gap in Plastic Drums on Balch St. to maintain access to 403 Balch St. Driveway.

### **CHANNELIZING DEVICES**

All channelizing devices used on this project shall be Plastic Drums, Lighted with High Intensity Sheeting.

450 Plastic Drum, High Intensity \_ are included to be used at the discretion of the Engineer. Any additional channelizing devices needed for construction shall be approved by the Engineer prior to delivery and placement.

All channelizing devices shall be supplied from MDOT's approved list. The use of 42" channelizing devices may be allowed as directed by the Engineer.

Channelizing device spacing shall conform to the distances specified in the maintaining traffic typical and/or stage construction plans, unless otherwise directed by the Engineer.

All channelizing devices used on this project will have sufficient ballast to prevent the barrel from moving or tipping. If moving or tipping of plastic drums occurs as the result of wind generated by traffic or occurring naturally, the Contractor will be required to place additional ballast on the plastic drum at no additional cost to the Department.

Lighted Arrows, Type C, shall be used when closing a traffic lane or where lighted arrow panels are called for on the attached typical. The lighted arrow panel for the lane closures shall be located at the beginning of the taper or as close as possible to the beginning of the taper where physical limitation exists.

Placement of High Intensity Type III Barricades, Double Sided, Lighted and High Intensity Type III Barricades, Lighted shall be as directed by the Engineer.

### **TRAFFIC CONTROL DEVICES**

All traffic control devices shall conform to the Traffic and Safety Standard Plan WZD-125 series and the *Michigan Manual of Uniform Traffic Control Devices (MMUTCD)*, 2009 edition, as revised and as specified herein, including any supplemental specifications and revisions.

All traffic control devices used on this project shall be like new at the time of initial deployment. These devices shall meet the acceptable criteria in ATSSA's quality guidelines for *Work Zone Traffic Control Devices* for the remaining life of this project.

All traffic control devices moved to facilitate the Contractor's operation shall be reset by the end of the work day. The Contractor shall routinely maintain all traffic control devices. Routine maintenance includes, but is not limited to, maintaining proper placement, replacing damaged devices and cleaning. The Contractor shall be responsible for reviewing the adequacy and maintenance of all traffic control devices at least once per day everyday for the duration of this project. Replacement and repair of the devices shall be restricted to daylight hours. Weekly Service Reports will need to be submitted to the Engineer for review and payment.



## Temporary Signs

All temporary signs shall be faced with prismatic retroreflective sheeting.

All temporary signs that shall be in place for more than 14 days shall be mounted on driven posts.

Installation of all sign posts shall follow MDOT special detail WZD-100-A.

Place temporary sign spacing and taper lengths as shown on attached Typical 101-GEN-Spacing-Charts

Place ground driven sign supports as shown on attached Traffic and Safety Standard Plan Special Detail WZD-100-A. Refer to Traffic and Safety Standard Plan WZD-125-E for portable supports.

Include 10 – R2-1 (“SPEED LIMIT 25 MPH”) signs in the quantities, to place after intersecting roads and no more than 2 miles apart. Additional locations are to be designated by the Engineer.

Place signing for lane closures as shown on attached Typical 343-SP-ZIP-1LC-(R) and as shown in the phasing sequence and plans.

Include 16 – W8-1 (“BUMP”) signs in the quantities, to place at all milled joints on mainline and side roads.

Mount all temporary signs at a five-foot minimum bottom height in uncurbed areas and seven-foot minimum bottom height in curbed or pedestrian areas.

Consider distances shown between construction warning, regulatory and guide signs shown on the Typical as approximate. Signs may require field adjustment, as the Engineer directs.

Fabricate all temporary signs with legends and symbols flush to the signs face and do not extend beyond the sign borders or edges.

Mount all temporary signs that will be in place for more than 14 days on driven posts. Refer to Traffic and Safety Standard Plan WZD-125-E when installing temporary diamond signs with portable supports. Note that the Type A Warning Light is required.

When a portable construction sign is no longer applicable, remove it or lay it down on its non-reflective side with its feet off.

Use Type C Lighted Arrows (min 48 inch x 98 inch) to merge traffic and secure by elevating the tires above the ground, or use wheel chocks or sandbags.

The Federal Highway Administration (FHWA) requires all signs to be NCHRP 350 crashworthy. For design and configuration refer to their website:

<https://safety.fhwa.dot.gov>

All diamond shaped signs shall be 48" x 48", unless otherwise noted.

Temporary warning, regulatory, and guide signs on portable supports that are not required for a particular work operation, shall be removed or laid down with the legs off as directed by the Engineer. These signs shall not occupy the shoulder of the roadway when laid down nor shall they be placed against attenuators. This work shall be included in the cost of "Sign, Type \_\_, Temp, Prismatic, Oper".

If there are permanent signs that are not applicable during construction, they shall be covered completely with plywood, or removed and then reinstalled at completion of the work. This operation shall be paid for under the item Sign Cover.

All temporary signs shall be installed on driven posts per attached Maintaining Traffic Typical WZD-100A. All other temporary signs may be installed on portable supports with the approval of the Engineer.

### **Portable Changeable Message Signs (PCMS)**

Portable Changeable Message Signs, PCMS, shall be used. The PCMS are intended to be used to warn traffic of upcoming work and changing traffic control during the life of the project. They will be installed and operational a minimum of 14 calendar days prior to the start of work or as directed by the Engineer. The PCMS location are shown on phase 1, 2, & 3 detour plan on sheets C-9 and messages shall have the approval of the Engineer prior to displaying the message to the motoring public.

Suggested messages displayed on the PCMS include:

- ROAD WORK BEGINS XXXXX (Date to be determined)
- ROAD WORK AHEAD, WATCH FOR BACKUPS
- BALCH STREET CLOSED
- BALCH INTERSECTION, CLOSED STARTING XX/XX/XX, (Date to be determined)

### **Permanent Signs**

All permanent signing shall be fabricated and placed according to the current editions of the MMUTCD, Standard Highway Signs Manual and sign support typical, published by the Michigan Department of Transportation as revised and as specified herein, including any supplemental specifications and revisions.

The Contractor and Engineer shall inspect, document, and photograph each sign being covered prior to covering the sign.

Any signs that are damaged during construction shall be replaced at the Contractor's expense.

### **Pedestrian or Non-Motorized Facilities.**

Maintain all facilities in accordance with The Americans with Disability Act (ADA) requirements. Provide facilities equivalent to or better than the route a person would have encountered prior to construction activities.

Within the project limits, all sidewalks and bike paths shall be left in place if no work is impacting the existing sidewalk. All sidewalks and bike paths shall be replaced and opened within four working days once removed for construction. During construction, reasonable access shall be maintained for pedestrians.

In locations where sidewalk is removed and will not be replaced with permanent materials within four working days, temporary facilities must be provided. Temporary facilities must also be provided for all businesses. Temporary facilities may consist of wooden boardwalks or other materials, provided that the temporary facilities meet ADA requirements and a minimum width of 4' is maintained. The Contractor must submit a pedestrian access and temporary facility management plan to the Engineer a minimum of 2 weeks prior to removing sidewalk sections that will require access be maintained.

Close and detour any sidewalk ramps and crosswalk areas to pedestrian traffic that are impacted by the work. Cover pedestrian signal heads when the crosswalk or ramp is affected.

Keep sidewalk areas clear of any equipment or materials at all times the sidewalks are open to pedestrian traffic.

### **Permanent Pavement Markings**

Permanent pavement markings shall be constructed in accordance with Section 811 of the Michigan Department of Transportation *2020 Standard Specifications for Construction*, including any Supplemental Specifications, the most current version of the MDOT Pavement Marking Typical Plans-900 series, and any special provisions in this proposal. Permanent pavement markings shall consist of the following:

- Pavt Mrkg, Polyurea, 12 inch, Crosswalk
- Pavt Mrkg, Polyurea, 24 inch, Stop Bar
- Pavt Mrkg, Polyurea, 4 inch, Yellow
- Pavt Mrkg, Polyurea, 6 inch, White

All permanent pavement markings that are removed for traffic control or obliterated outside the project limits during construction operations shall be replaced with Waterborne for lane and edge lines and Overlay Cold Plastic material for special markings.

Final pavement markings shall be installed prior to opening the road to traffic.

### **MEASUREMENT AND PAYMENT**

The estimate of quantities for maintaining traffic on this project is based on the suggested sequence of operations. Payment shall be in accordance with Sub-Section 812.04 of the *2020 Standard Specifications for Construction* and any supplemental specifications, unless otherwise specified.

Payment for quantities used to maintain traffic will be based on the maximum number of units required by the Engineer at any one time for the entire project and have been estimated based on the attached typical and the plans.

Any additional quantities for traffic control devices not included in the estimate and utilized for the Contractor's convenience shall be provided at the expense of the Contractor.

<b>Contract Item (Pay item)</b>	<b>Pay unit</b>
Barricade, Type III, High Intensity, Double Sided, Lighted, Furn.....	Ea
Barricade, Type III, High Intensity, Double Sided, Lighted, Oper .....	Ea
Pedestrian Type II Barricade, Temp .....	Ea
Lighted Arrow, Type C, Furn.....	Ea
Lighted Arrow, Type C, Oper .....	Ea
Minor Traf Devices .....	LS
Plastic Drum, Fluorescent, Furn .....	Ea
Plastic Drum, Fluorescent, Lighted, Oper .....	Ea
Sign Cover .....	Ea
Sign Portable, Changeable, Message, Furn .....	Ea
Sign Portable, Changeable, Message, Oper .....	Ea
Sign, Type B, Temp, Prismatic, Furn .....	Sft
Sign, Type B, Temp, Prismatic, Oper .....	Sft
Maintaining Traffic, modified .....	LS