ANALYSIS OF BROWNFIELD CLEANUP ALTERNATIVES

River Point District
Former Junk Yard Area
1050 York Street
Manitowoc, Wisconsin

BRRTS ID: 02-36-585491 (Open ERP); 07-36-583000 (LGU)
ACRES ID: 239718

Harris L. Byers, Ph.D.
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Professional Engineer

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Project QA/QC Manager

Stantec

January 27, 2023
Project Number 193709261

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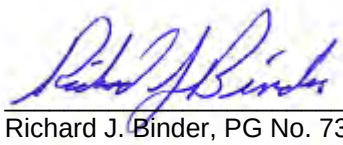
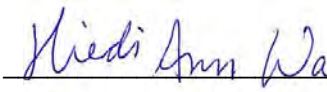
CERTIFICATIONS
ANALYSIS OF BROWNFIELD CLEANUP ALTERNATIVES
RIVER POINT DISTRICT, FORMER JUNK YARD AREA,
1050 YORK STREET
MANITOWOC, WISCONSIN

"I, Richard J. Binder, hereby certify that I am a hydrogeologist as that term is defined in s. NR 712.03 (1), Wis. Adm. Code, am registered in accordance with the requirements of ch. GHSS 2, Wis. Adm. Code, or licensed in accordance with the requirements of ch. GHSS 3, Wis. Adm. Code, and that, to the best of my knowledge, all of the information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wisconsin Administrative Code (WAC)."



Richard J. Binder, PG No. 734-013 — January 27, 2023 Date

"I, Hiedi A. Waller, hereby certify that I am a registered professional engineer in the State of Wisconsin, registered in accordance with the requirements of ch. A-E8, WAC; that this document has been prepared in accordance with the Rules of Professional Conduct in cg. A-E8, WAC; and that to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR700 to 726, WAC."



Hiedi A. Waller, PE No. E-33741 — January 27, 2023 Date

GENERAL INFORMATION
FORMER JUNK YARD AREA, RIVER POINT DISTRICT

FACILITY:	River Point District Former Junk Yard Area 1050 York Street Manitowoc, Wisconsin
PARCEL IDs	173090
SIZE:	2.6 Acres (Site 2)
USEPA ACRES ID:	239718 (Site 2)
WDNR BRRTS NO.:	02-36-585491 (Open ERP); 07-36-583000 (LGU)
PROPERTY LOCATION:	NE 1/4 of the NE 1/4 of Section 30, Township 19 North, Range 24 East, Manitowoc County, Wisconsin
PROPERTY OWNER:	Community Development Authority of the City of Manitowoc City of Manitowoc 900 Quay Street Manitowoc, WI 54220-4543
Contact:	Mr. Adam Tegen Community Development Director City of Manitowoc, Wisconsin 900 Quay Street Manitowoc, WI 54220-4543 Phone: (920)686-6931 Email: ategen@manitowoc.org
CONSULTANT:	Stantec Consulting Services Inc. 12080 Corporate Parkway, Suite 200 Mequon, Wisconsin 53089
Contact:	Harris Byers, Ph.D. Sr. Brownfields Project Manager Phone: 414-581-6476 Email: harris.byers@stantec.com
WDNR OVERSIGHT:	Wisconsin Department of Natural Resources 2984 Shawano Avenue, Green Bay, Wisconsin 54313
Contact:	Mr. Tauren Beggs Hydrogeologist Phone: (920) 662-5178 Email: Tauren.Beggs@wisconsin.gov

1.0 EXECUTIVE SUMMARY

Stantec Consulting Services Inc. (Stantec) completed this Analysis of Brownfields Cleanup Alternatives (ABCA) on behalf of the City of Manitowoc (hereinafter referred to as the City) and the Community Development Authority of the City of Manitowoc (CDA; current owner) for remediation of impacted fill at the former junk yard located at 1050 York Street in the River Point District in the City of Manitowoc, Wisconsin (herein referred to as "the Remediation Area" or "Property"). This ABCA was prepared utilizing the framework provided in ch. NR 722 Wisconsin Administrative Code (WAC) (NR 722) for a Remedial Action Options Report (RAOR) and was completed under a fiscal year (FY) 2022 United States Environmental Protection Agency (USEPA) Brownfield Cleanup Grant awarded to the City under Cooperative Agreement Number BF00E03197.

For continuity with prior work, the Remediation Area consists of the southern 22,300 square feet of the 2.6-acre portion of the River Point District referred to as "Site 2", as described in previous environmental investigations (Stantec 2019, 2020a through 2020e, and 2021a). The USEPA Assessment, Cleanup and Redevelopment Exchange System (ACRES) identification number associated with this Property is 239718.

As documented in previous Stantec reports (2020a through 2020e, and 2021a through 2021c), residual soil/fill and groundwater impacts associated with prior junk yard use and placement of historic fill are present and will complicate redevelopment, as summarized below.

> Soil/Fill. As summarized in work completed to date, volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAH), polychlorinated biphenyls (PCBs) and Resource Conservation and Recovery Act (RCRA) metals were detected in granular fill at concentrations greater than applicable ch. NR 720 WAC (NR 720) Residual Contaminant Levels (RCLs) and/or Background Threshold Values (BTVs) in the Remediation Area.
>
> Groundwater. The potentiometric surface of shallow groundwater decreases in a radial manner towards the Manitowoc River, which serves as a constant head boundary for groundwater. The concentration of dissolved arsenic in the Remediation Area was greater than the ch. NR 140 WAC (NR 140) Enforcement Standard (ES).
>
> Vapor. The Property is currently vacant. Therefore, the vapor intrusion pathway cannot be quantitatively evaluated at this point.

Remedial action activities are warranted to facilitate redevelopment at the Property. Based on the evaluation described herein, the selected remedial approach to be funded under the FY2022 USEPA Brownfield Cleanup Grant includes:

- Excavation and offsite disposal of soil/fill with RCRA metals, VOC, PAH and/or PCB impacts as a source control measure to facilitate commercial redevelopment;
- Post-remediation sampling of the excavation sidewalls for PAH, VOC, PCBs, and RCRA metals;
- Backfilling the excavation to final grade with clean imported structural fill material finished with grass to construct an interim engineered barrier to mitigate the risk for direct contact with impacted soil/fill and reduce the potential for leaching of residual impacts to groundwater;
- Post-remediation groundwater monitoring for dissolved arsenic; and
- Preparation of an interim construction documentation report.

Future work to be completed by a future developer will include:

- Preparation of a Site Investigation Report and a Remedial Action Plan / Material Management Plan
- Installing clay plugs in new utility trenches;
- Installation of a sub-slab depressurization system (SSDS) in newly constructed buildings;
- Post-construction sub-slab vapor sampling, if warranted;
- Establishing institutional controls/continuing obligations and maintenance plans to provide for long-term control of residual soil/fill and groundwater impacts; and
- Establishing additional institutional controls/continuing obligations and maintenance plans to provide for long-term operation of the SSDS, if warranted.

2.0 BACKGROUND INFORMATION

Stantec completed this ABCA on behalf of the City and the CDA for the remediation of impacted fill at the former junk yard utilizing the framework provided in NR 722 for a Remedial Action RAOR. For continuity with prior work, the Remediation Area consists of the southern 22,300 square feet of the 2.6-acre portion of the River Point District referred to as "Site 2", as described in previous environmental investigations (Stantec 2019, 2020a through 2020e, and 2021a). The USEPA ACRES identification number associated with "Site 2" is 239718. The location of the River Point District is outlined in yellow, and the location of the Remediation Area is shaded green relative to regional topography on **Figure 1**. The locations of the River Point District and the Remediation Area are illustrated on the 2021 orthophotograph on **Figure 2**.

It is critical to realize that work proposed under this cleanup grant does not duplicate cleanup work previously completed in the River Point District using funds from a cleanup loan provided to the CDA from the City's FY 2013 USEPA Brownfield Revolving Loan Fund program.

As illustrated on **Figure 3**, the proposed excavation (illustrated as a dashed black line) is located in the Property Identification Number (PIN) 173090. The corresponding Wisconsin Department of Natural Resources (WDNR) Bureau for Remediation and Redevelopment Tracking System (BRRTS) case numbers are: BRRTS ID: 02-36-585491 (Environmental Response and Repair: ERP) and BRRTS ID: 07-36-583000 (Local Governmental Unit ; LGU).

2.1 HISTORIC PROPERTY USE/OCCUPANCY

Past Ownership and Property Uses in the River Point District
As described in the Stantec (2019) Phase I Environmental Site Assessment (ESA), the River Point District consists of a 20.1-acre peninsula bound to the north, south, and west by the Manitowoc River and bound to the east by North 10th Street and North 11th Street (**Figure 1** and **Figure 2**). The River Point District appears undeveloped in 1835; however, the proximity of the peninsula to the Lake Michigan/Great Lakes shipping route facilitated initial large scale industrial transloading development of the River Point District by 1868. Transloading operations on the peninsula in the late 19th Century included largescale coal, lumber/mills, grain, and large warehouses. Although ownership records are not available, a panoramic map drawn in 1883 indicates the River Point District was fully developed and occupied by several large industrial-like buildings and smaller commercial-like buildings.

Historic records indicate the River Point District was transferred from the Manitowoc Terminal Company to the Manitowoc and Western Railroad Company on July 22, 1895, which is consistent with railroad development in the late 19th Century. Assessor records suggest the River Point District was later transferred to the Soo Line Railroad Company and ultimately transferred to Wisconsin Central, Ltd. (WCL) sometime during the latter half of the 20th Century. Railroad use of the River Point District ceased in the 1980s and the River Point District was formally decommissioned by the railroad in the 2000s. The River Point District consists of 23 individual contiguous PINs currently zoned B-4, Central Business with a Planned Unit Development. As summarized in the Stantec (2019) Phase I ESA, the PINs appear to correspond to leases between the previous owner and a variety of historic commercial/industrial tenants/occupants. The previous tenant of the Remediation Area was the Manitowoc Iron and Metal Company (**Figure 3b**).

Historic Uses/Tenants in the Phase I Redevelopment Area
As described in the Stantec (2019) Phase I ESA, the Property appears undeveloped in 1835. The historic uses and occupancies of the Property in the 19th Century and 20th Century are depicted on **Figure 4 and Figure 5,** respectively. For continuity with prior work, historic uses within each PIN summarized below are grouped by Site.

As depicted on **Figure 4**, the Remediation Area (shaded in green) was used for lumber storage ("21") and occupied by a blacksmith shop ("13") by 1893. Per Stantec (2019), the junk yard/metal scrap yard was constructed on and occupied the majority of the northeastern portion of Site 2 by 1900 and appears to have remained in operation through the latter portion of the 20th Century. As depicted on **Figure 5**, identifiable features in the vicinity of the Remediation Area have included numerous scrap piles ("32" and "33"), buildings, and railroad spurs, operating under the name "Manitowoc Iron and Metal Company" ("18"). Orthophotography indicates the junk yard was asphalt paved between 2000 and 2006.

Current Ownership of the River Point District and Property Use

A Phase I ESA was completed by Stantec (2019) per the All Appropriate Inquiries rule detailed in 40 CFR §312.21 utilizing ASTM E1527-13 on behalf of the current owner (CDA) on March 21, 2019. The current owner acquired the River Point District (which includes the Property) on April 12, 2019 for the purpose of blight elimination and subsequently received a LGU Environmental Liability Exemption from WDNR per ch. 292.11(9) WAC on March 18, 2019 under WDNR BRRTS Case Number 07-36-583000. To facilitate redevelopment of the Property, the City is conducting the subsurface investigation in a phased manner (Stantec 2019, 2020a-2020e, and 2021a-2021c). Impacts to soil/fill and groundwater identified in the Remediation Area (outlined in black) are illustrated on **Figure 6**.

Since taking ownership, the CDA has maintained compliance with the required continuing obligations and no records have been identified indicating the CDA is considered potentially liable or known to be affiliated with any other person that is potentially liable for contamination at the Property.

2.2 ENVIRONMENTAL SITE INVESTIGATIONS

Stantec (2019) Phase I ESA. As summarized in the Stantec (2019) Phase I ESA, Stantec identified the following recognized environmental conditions (RECs) associated with the River Point District:

- REC 1: Prior Railroad Use
- REC 2: Prior Industrial Use
- REC 3: Residual Impacts to Soil and Groundwater
- REC 4: Apparent Anthropogenic Fill
- REC 5: Storage/Dumping by Adjacent Property Owners
- REC 6: Residual Impacts to Soil and Groundwater from Nearby Properties

Historic features of specific environmental interest are illustrated on **Figures 4** and **5**.

Phase II ESAs, Construction Documentation Reports and Site Investigations. Stantec completed multiple Phase II ESAs, Construction Documentation Reports and Site Investigations at the River Point District using funds from hazardous substances and petroleum brownfield assessment grants awarded to the City by the USEPA in 2018 under Cooperative Agreement Number BF 00E02377-0 and using funds from three Site Assessment Grants awarded to the City and CDA by the Wisconsin Economic Development Corporation in 2020 and 2021. Results from the Stantec (2020a through 2020e, and 2021a through 2021b) investigations are summarized below and impacts are illustrated on **Figure 6**.

Soil/Fill. VOCs, PAHs, PCBs, and RCRA metals were detected in granular fill in the Remediation Area at concentrations greater than applicable NR 720 RCLs and/or BTVs. The estimated volume of impacted granular fill in the Remediation Area is 2,200 cubic yards.

Groundwater. The potentiometric surface of shallow groundwater grades downward in a radial manner towards the Manitowoc River, which serves as a constant head boundary for groundwater. As illustrated on **Figure 6**, the concentration of arsenic in groundwater at monitoring well MW-92 was greater than the NR140 ES.

Vapor Intrusion. The Property is currently vacant. Therefore, the vapor intrusion pathway cannot be quantitatively evaluated at this point.

3.0 REMEDIAL ACTION OPTIONS EVALUATION

3.1 PROPOSED PROPERTY REDEVELOPMENT – RIVER POINT DISTRICT TARGET AREA

The redevelopment of the River Point District has been part of the vision for the City for well over 20 years. More recently, the 2009 Comprehensive Plan targets redevelopment of the Target Area from Industrial to Planned Mixed Use. Also in 2009, the City adopted the Port of Manitowoc, Downtown & River Corridor Master Plan. Within that plan, the Property was shown as a redevelopment site. A third plan related to the path extension was adopted in 2009, Manitowoc Riverwalk Master Plan and Design Guidelines. The importance of the peninsula portion of the river walk was covered extensively in the document as was the overall site. In 2019, the City adopted a Downtown Master Plan with the peninsula redevelopment identified as one of four catalyst sites for redevelopment. The North Central River District Redevelopment Plan is substantially complete and focuses specifically on redevelopment of the Target Property. The City Council approved moving forward with design and construction documents for the necessary infrastructure to redevelop the peninsula, and the first phase of redevelopment was completed in Spring 2021 with significant infrastructure redevelopment planned for 2023.

It is estimated that the installation of the public improvements will lead to a mix of private investments ranging from residential condominiums and apartments to commercial and mixed-use buildings with a value of up to $150 million. With over 3,500 feet of river frontage, redevelopment of the River Point District also nearly doubles public pedestrian access to the Manitowoc River through trails and key nodes intended to serve as overlooks, trailheads, and river access points to enhance connection to the river and the natural environment. The overall redevelopment also offers the unique distinction of being located immediately adjacent to the existing downtown core furthering the potential economic impact of the project. City support for the project includes acquisition of the property in 2019, infrastructure design and construction that are currently underway, brownfield assessment and cleanup, establishment of a new Tax Incremental Financing District and site preparation.

3.2 PROPOSED PROPERTY REDEVELOPMENT

As illustrated on **Figure 7**, the Remediation Area (illustrated as a dashed black line) is located at the corner of two newly constructed roadways. After removal of the impacted fill, the excavation will be brought to grade to match the surrounding roadways and seeded with grass. It is likely therefore that the area will be used for recreational purposes/greenspace until a future owner/developer is identified.

Given the proximity to road infrastructure and the River North Apartments (to the south), it is likely the Remediation Area will ultimately be redeveloped for commercial use (likely grocery store/food coop or “maker-spaces.”).

3.3 CLEANUP STANDARDS AND APPLICABLE LAWS

Although the City has an LGU exemption granted under ch. 292.11(9) WAC, remedial activities proposed under this ABCA will be completed per the requirements of ch. NR 700 WAC. The WDNR will provide regulatory oversight of the project, including reviewing/approving plans and reports described in Section 4 of this ABCA.

Cleanup soil quality standards are established in ch. NR 720 WAC and groundwater quality standards are established in ch. NR 140 WAC. Criteria for beneficial reuse of soil/fill at the Property are established under ch. NR 718 WAC. Toxicity thresholds specified in 40 CFR 261 will be used to determine proper waste/material management. Excavated soil/fill generated during remedial activities will be managed per ch. NR 600 WAC and ch. NR 500 WAC.

3.4 REMEDIAL ACTION OPTIONS EVALUATION

Based on impacts identified to date, remedial action activities are warranted to facilitate redevelopment at the Property described in Section 3.2. An evaluation of three remedial options conducted utilizing criteria presented in ch. NR 722.07(4) WAC and ch. NR 722.09(2m) WAC to address legacy environmental impacts to facilitate redevelopment for non-industrial purposes. As summarized on **Table 1**, the remedial options evaluated under this ABCA included the following:

1. Natural Attenuation (no action).
2. Spot removal of fill with PCBs impacts greater than direct contact RCLs; construct an engineered barrier; and establish an institutional control to prevent groundwater consumption.
3. Excavate as much impacted soil/fill as safely possible; backfill excavation to proposed final grade with structural fill material and seed with grass; and establish an institutional control to prevent groundwater consumption.

In general, each remedial option is considered technically feasible; however, the short-term and long-term effectiveness of each remedial option's capability to be protective of public health, safety, or welfare or the environment, reasonableness of the alternative, the resilience to address potential adverse impacts caused by extreme weather events, and the cost associated with each approach varies greatly.

Alternative 1. Although the cost to implement remedial Alternative 1 is the least of the three options, constituents associated with residual impacts are considered recalcitrant to natural attenuation. The overall magnitude, mobility, and toxicity of impacts would not decrease, and Property restoration will not occur within a reasonable timeframe. Following redevelopment, impacts would be near sensitive receptors and impacts could be mobilized during extreme weather events. Therefore, Remedial Alternative 1 is not considered a prudent approach.

Alternative 2. Excavation of impacted soil/fill will provide for immediate and permanent reduction in the toxicity, mobility, and volume of PCBs and would protect public health, safety, welfare, and the environment in a short-term time frame. However, significant RCRA metals and petroleum impacts are more widespread; therefore, recalcitrant impacts would remain. Engineered barriers are considered effective to prevent direct contact; however, the barrier must be maintained. An institutional control is considered effective for prevention of groundwater consumption; however, it is unlikely metal impacts would attenuate. Therefore, Alternative 2 is not considered the best option.

Alternative 3. Under Remedial Alternative 3, approximately 2,200 cubic yards of VOC, RCRA metals, PAH and PCB-impacted soil/fill will be excavated and disposed of at a licensed solid waste landfill. Following the removal, clean fill will be placed to raise the grade of the Property and cap remaining impacted soil/fill. Excavation of impacted soil/fill will provide for immediate and permanent reduction in the toxicity, mobility, and volume of contaminants and would protect public health, safety, welfare, and the environment in a short-term time frame. An institutional control is considered effective for prevention of groundwater consumption if residual impacts remain following excavation.

Remedial Alternative 3 is considered the most reasonable and cost-effective approach to facilitate non-industrial redevelopment. Remedial Alternative 3 is the selected remedial alternative based on its short-term and long-term effectiveness, ability to be implemented within the proposed development, restoration time frame, economic feasibility, and sustainability.

4.0 SELECTED REMEDIAL ACTION OPTION

4.1 SELECTED REMEDIAL ACTION OPTION

The selected remedial action option includes up to seven elements described below:

Excavation and Offsite Disposal of Impacted Soil/Fill. Approximately 2,200 cubic yards of impacted fill in the Remediation Area will be excavated and transported to the Waste Management solid waste landfill as a non-hazardous waste for disposal under existing profile ID 136221WI. Excavation work will be completed during dry periods to prevent accumulation of rainwater. If dewatering is warranted, the fluid will be managed appropriately (i.e., drum, sample/characterize, appropriate disposal). Dust suppression methods will be used to control fugitive emissions. The Excavation Plan and Excavation Profiles are illustrated on Sheet C3.00 and Sheet C3.01 of **Appendix A**, respectively. The erosion control plan is provided on Sheets C1.00, C1.01, and C1.02 of **Appendix A.** The excavation will extend vertically approximately 3-inches into underlaying native soil, and as illustrated on **Figure 7**, the excavation will extend horizontally to the north to the existing grassy area and the Property boundary; to the west and south to the adjacent rights-of-ways; and to the east to the Property boundary. Of note, as illustrated on the Excavation Plan, an Occupational Safety and Health Administration (OSHA)-compliant slope (maximum 2 percent) will be maintained at the excavation edge.

Post-Remediation Soil/Fill Sampling of the Excavation Sidewalls. Assessment work has confirmed the targeted granular fill has not impacted underlying native soil. Therefore, sampling of the base of the excavation is not warranted. However, maintaining an OSHA-compliant excavation slope may not result in complete removal of the granular fill from the Remediation Area. If fill remains along the excavation sidewalls, post-excavation samples will be collected and analyzed for RCRA metals, VOCs, PAHs, and PCBs to document remaining impacts. A photoionization detector will be used to screen remaining fill, if present, along the excavation sidewall every 10-linear feet. Samples of the remaining fill, if present, will be collected every 20-liner feet

Backfilling Excavation and Completing with Grass. The excavation will be backfilled to match surrounding final grade with clean imported structural fill material, topped with 4-inches of topsoil and vegetated with grass. The grading plan and cross-sections of the finished excavations are provided on Sheet C3.02 and C3.03, respectively in **Appendix A**. This temporary/interim cap will serve as an engineered barrier to prevent direct contact with remaining impacted fill that could not be removed and will reduce the potential for leaching of remaining fill impacts to groundwater.

Restoration of Adjacent Rights-of-Ways. Select curb and gutter and pavement ties removed during excavation will be repaired. Details are provided on Sheet C8.01 and C8.02 in **Appendix A**.

Post-Remediation Groundwater Monitoring. Monitoring well MW-92 will be reinstalled per the requirements of ch. NR141 WAC after the excavation is backfilled and grass established. The well will be developed, and a sample collected for dissolved (field-filtered) arsenic analysis by Eurofins TestAmerica (Chicago, Illinois). If significant arsenic impacts remain, additional monitoring wells will be installed north and east of monitoring well MW-92 to further evaluate the extent/dynamics of impacts.

Interim Construction Documentation Report. An interim construction documentation report will be prepared to summarize work completed in the Remediation Area and summarize post-remediation soil/fill and groundwater quality. The report will provide a recommendation, if any, for future post-remediation monitoring.

Engineering, Permitting, Program Management, and Community Outreach. Engineering and design services, procurement of necessary permits to complete the proposed cleanup activities, onsite oversight of contractor work, and cooperative agreement/grant management (including project progress reporting to USEPA), and community outreach activities will be performed.

4.2 SCHEDULE

A proposed schedule for the implementation of Remedial Alternative 3 is presented on the table below. The remediation subcontractor is to complete Task 1 through 4 by April 1, 2023.

Schedule for Remedial Alternative 3

Task #	Task Description	Weeks to Complete
1	Excavation and Offsite Disposal of Impacted Soil/Fill	2-3 Weeks
2	Post-Remediation Soil/Fill Sampling of the Excavation Sidewalls	Concurrent with Task 1
3	Backfilling Excavation and Completing with Grass.	1-2 days following completion of Task 1; establishing grass contingent on weather
4	Restoration of Adjacent Rights-of-Ways	1-2 days following completion of Task 1
5	Post-Remediation Groundwater Monitoring.	2 Weeks following Task 3
6	Interim Construction Documentation Report	1-2 Weeks following Task 5
7	Engineering, Permitting and Program Management, and Community Outreach	Duration of Remedial Alternative 3 (Anticipated to be 5 months)

4.3 ESTIMATED COST

Cost Estimate for Remedial Alternative 3

Task #	Item	Estimated or Assumed Value
1, 3, and 4	Excavation and Offsite Disposal of Impacted Soil/Fill (2,200 cubic yards); Backfilling Excavation and Completing with Grass; Restoration of Adjacent Rights-of-Ways	$290,000
2	Post-Remediation Soil/Fill Sampling of the Excavation Sidewalls	$4,000
5	Post-Remediation Groundwater Monitoring.	$4,000
6	Interim Construction Documentation Report	$15,000
7	Engineering, Permitting and Program Management, and Community Outreach	$7,000
	Total remedial cost	**$320,000**

4.4 RESTORATION TIME FRAME

As described in Section 4.2, implementation of Remedial Alternative 3 is anticipated to take up to 5 months to complete.

4.5 PERFORMANCE MEASURES

As described in Task 2 and Task 5, soil/fill and groundwater samples will be collected following remediation to confirm remaining impacts.

4.6 TREATMENT RESIDUALS

No additional treatment of residuals is anticipated as part of the proposed work.

4.7 SUSTAINABLE REMEDIAL ACTION CONSIDERATIONS

Task 3 will create an interim engineered barrier to prevent direct contact with residual fill potentially remaining along the sidewalls of the excavation. This approach allows the Remediation Area to be used as interim greenspace while a developer is identified.

The final engineered barrier will likely consist of hardscaped features (i.e., concrete building slab, parking areas, walkways) to be constructed in the future by a developer.

4.8 ADDITIONAL REMEDIAL ACTIONS

This ABCA evaluated a set of interim remedial actions to be completed at the former junk yard area under the Fiscal Year 2022 USEPA Brownfield Cleanup Grant.

Once a developer is identified, the developer will need to complete the following to facilitate final non-industrial redevelopment of the property:

- Preparation of a Site Investigation Report and a Remedial Action Plan / Material Management Plan
- Installing clay plugs in new utility trenches;
- Installation of a SSDS in newly constructed buildings;
- Post-construction sub-slab vapor sampling, if warranted;
- Establishing institutional controls/continuing obligations and maintenance plans to provide for long-term control of residual soil and groundwater impacts; and
- Establishing additional institutional controls/continuing obligations and maintenance plans to provide for long-term operation of the SSDS, if warranted.

5.0 REFERENCES

Stantec, 2019, 10th Street Railroad Property, Manitowoc, Wisconsin, Phase I Environmental Site Assessment, March 21, 2019.

Stantec, 2020a, Phase II Environmental Site Assessment, Riverpoint District; Manitowoc, Wisconsin, March 23, 2020.

Stantec, 2020b, Phase II Environmental Site Assessment, River Point District; Manitowoc, Wisconsin, 200 North 10th Street (Site 1), August 24, 2020.

Stantec, 2020c, Construction Documentation Report, 200 N 10th Street, Manitowoc, Wisconsin, November 4, 2020.

Stantec, 2020d, Construction Documentation Report for Demolition and Removal of Structural Impediments, River Point District – Site 3, December 11, 2020.

Stantec, 2020e, Phase II Environmental Site Assessment, River Point District; Manitowoc, Wisconsin, Site 3, December 18, 2020.

Stantec, 2021a, NR716 Site Investigation Report, River Point District Phase 1 Construction Area; Manitowoc, Wisconsin, July 18, 2021.

Stantec, 2021b, Supplemental Site Investigation at the River Point District; Manitowoc, Wisconsin, September 10, 2021.

Stantec, 2021c, Fire Department Response During Explosive Demolition of a Former Grain Elevator, 1101 Buffalo Street, River Point District – Phase I Construction Area; Manitowoc, Wisconsin, September 7, 2021.

FIGURES

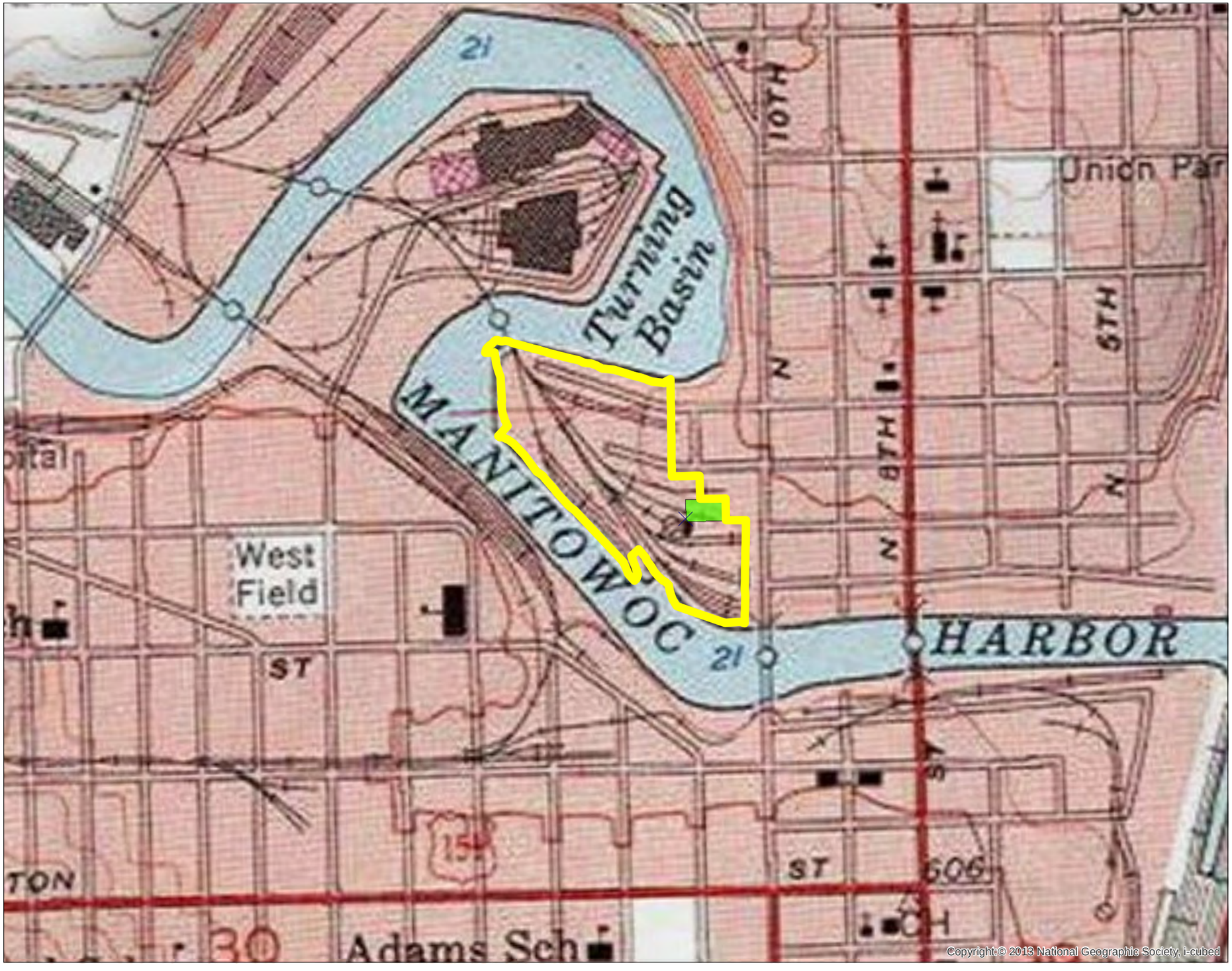


Figure No.
1

Title
Locations of the River Point District and the Proposed Excavation

Client/Project
Former Junk Yard
River Point District
City of Manitowoc

0 395 790 Feet

Prepared by HLB on 1/27/2023

N

Legend

- River Point District
- Proposed Excavation

Notes

1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet
2. Orthophotograph: Manitowoc County, 2017

Stantec

Figure No.
2
Title
Location of the River Point District and the Proposed Excavation

Client/Project
Former Junk Yard Area
River Point District
City of Manitowoc

0 125 250 Feet

Prepared by HLB on 1/27/2023

N

Legend

- River Point District
- Proposed Excavation

Notes

1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet
2. Orthophotograph: Manitowoc County, 2017

Stantec

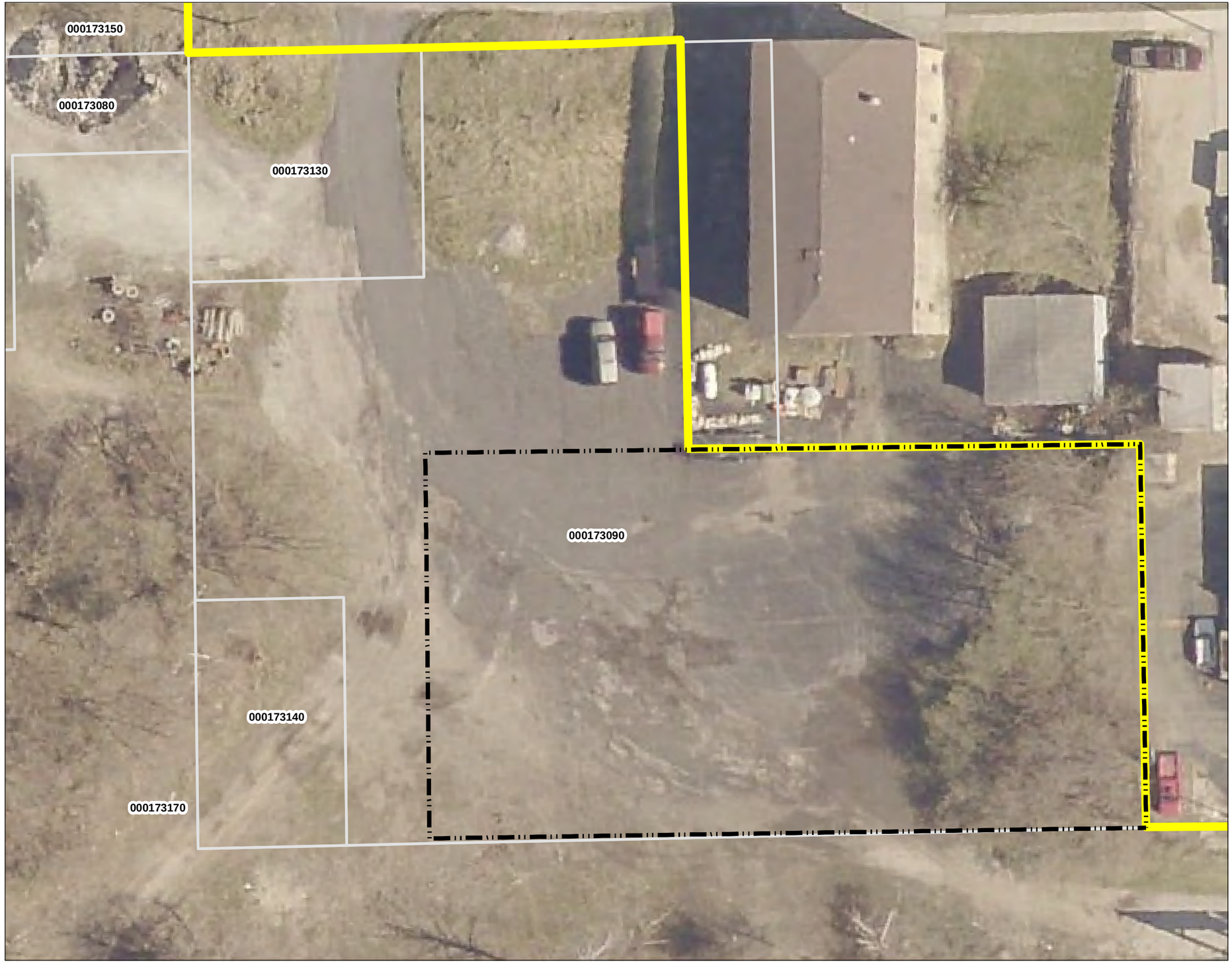


Figure No.
3A
Title

Proposed Excavation and Property Identification Numbers

Client/Project
Former Junk Yard Area
River Point District
City of Manitowoc

0 20 40 Feet

Prepared by HLB on 1/27/23

N

Legend

- Proposed Excavation
- River Point District
- Parcel Identification Numbers

NOTE:
1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet
2. Orthophotograph: Manitowoc County, 2017

Stantec

Figure No.
3B
Title

Proposed Excavation and Prior Tenants

Client/Project
Former Junk Yard Area
River Point District
City of Manitowoc

0 40 80 Feet

Prepared by HLB on 1/27/2023

N

Legend

- Proposed Excavation
- Prior Tenants
- River Point District

NOTE:
1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet
2. Orthophotograph: Manitowoc County, 2017

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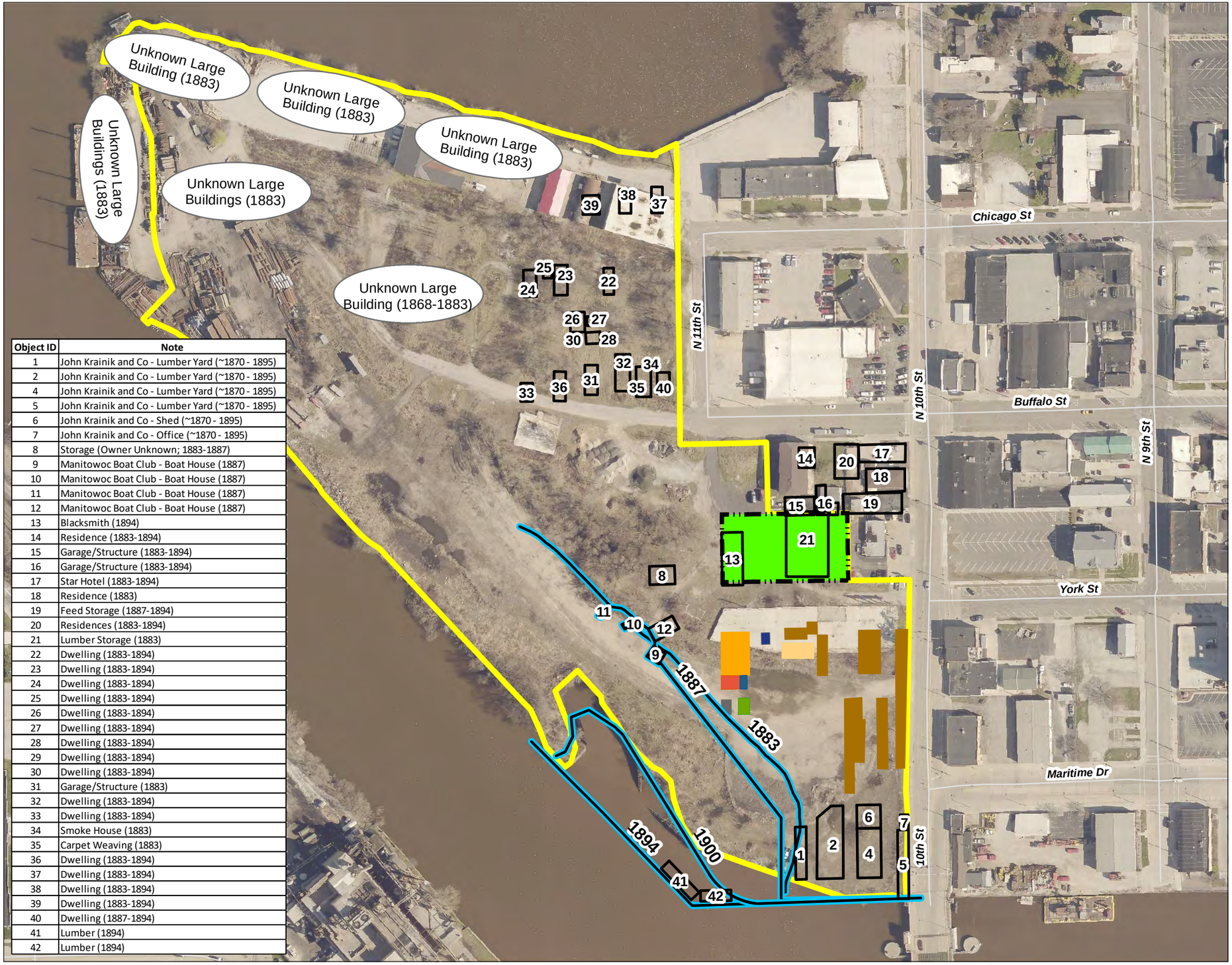

Object ID	Note
1	John Krainik and Co - Lumber Yard (~1870 - 1895)
2	John Krainik and Co - Lumber Yard (~1870 - 1895)
4	John Krainik and Co - Lumber Yard (~1870 - 1895)
5	John Krainik and Co - Lumber Yard (~1870 - 1895)
6	John Krainik and Co - Shed (~1870 - 1895)
7	John Krainik and Co - Office (~1870 - 1895)
8	Storage (Owner Unknown; 1883-1887)
9	Manitowoc Boat Club - Boat House (1887)
10	Manitowoc Boat Club - Boat House (1887)
11	Manitowoc Boat Club - Boat House (1887)
12	Manitowoc Boat Club - Boat House (1887)
13	Blacksmith (1894)
14	Residence (1883-1894)
15	Garage/Structure (1883-1894)
16	Garage/Structure (1883-1894)
17	Star Hotel (1883-1894)
18	Residence (1883)
19	Feed Storage (1887-1894)
20	Residences (1883-1894)
21	Lumber Storage (1883)
22	Dwelling (1883-1894)
23	Dwelling (1883-1894)
24	Dwelling (1883-1894)
25	Dwelling (1883-1894)
26	Dwelling (1883-1894)
27	Dwelling (1883-1894)
28	Dwelling (1883-1894)
29	Dwelling (1883-1894)
30	Dwelling (1883-1894)
31	Garage/Structure (1883)
32	Dwelling (1883-1894)
33	Dwelling (1883-1894)
34	Smoke House (1883)
35	Carpet Weaving (1883)
36	Dwelling (1883-1894)
37	Dwelling (1883-1894)
38	Dwelling (1883-1894)
39	Dwelling (1883-1894)
40	Dwelling (1887-1894)
41	Lumber (1894)
42	Lumber (1894)

Figure No.
4

Title
Historic Site Features (19th Century)
and Proposed Excavation

Client/Project
Former Junk Yard Area
River Point District
City of Manitowoc

0 125 250 Feet

Prepared by HLB on 1/27/2023

Legend

- Additional Site Features (see table)
- Proposed Excavation
- Bank of the Manitowoc River

Carl Zander Planing Mill and Factory (~1870s-1895)

- Drying House
- Engine Room
- Lumber
- Planing Mill
- Warehouse
- Shavings
- Shed
- Steam Boxes
- River Point District

N

Notes

1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet
2. Historic Site features illustrated on this figure were digitized from multiple historic maps/sources, including City Assessor files, WDNR files, and Sanborn (R) Fire Insurance Maps. These features are provided for illustration purposes only; Stantec makes no warranty as to the accuracy of these features.
3. Orthophotograph: Manitowoc County, 2017

Stantec

Figure No.
5

Title
Historic Site Features (20th Century)
and Proposed Excavation

Client/Project
Former Junk Yard Area
River Point District
City of Manitowoc

0 65 130
Feet

Legend

- Historic Site Features (see table for details)
- Proposed Excavation
- River Point District

Prior Site Features (City Records)

- Oil House (2)
- Oil Tank (AST) (10)
- Pump House (1)
- Railroad Spurs

N

Object ID	Notes
2	Railroad Depot
3	Railroad Freight House
4	Cinder Pit
7	Coal Shed
17	Unknown Building
22	Railroad Tool House
23	Railroad Wash House
6	Railroad Turntable
5	Railroad Roundhouse
32	Shredded Metal
33	Shredded Metal

Notes
1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet
2. Historic Site features illustrated on this figure were digitized from multiple historic maps/sources, including City Assessor files, WDNR files, and Sanborn (R) Fire Insurance Maps. These features are provided for illustration purposes only; Stantec makes no warranty as to the accuracy of these features.
3. Orthophotograph: Manitowoc County, 2017

Stantec

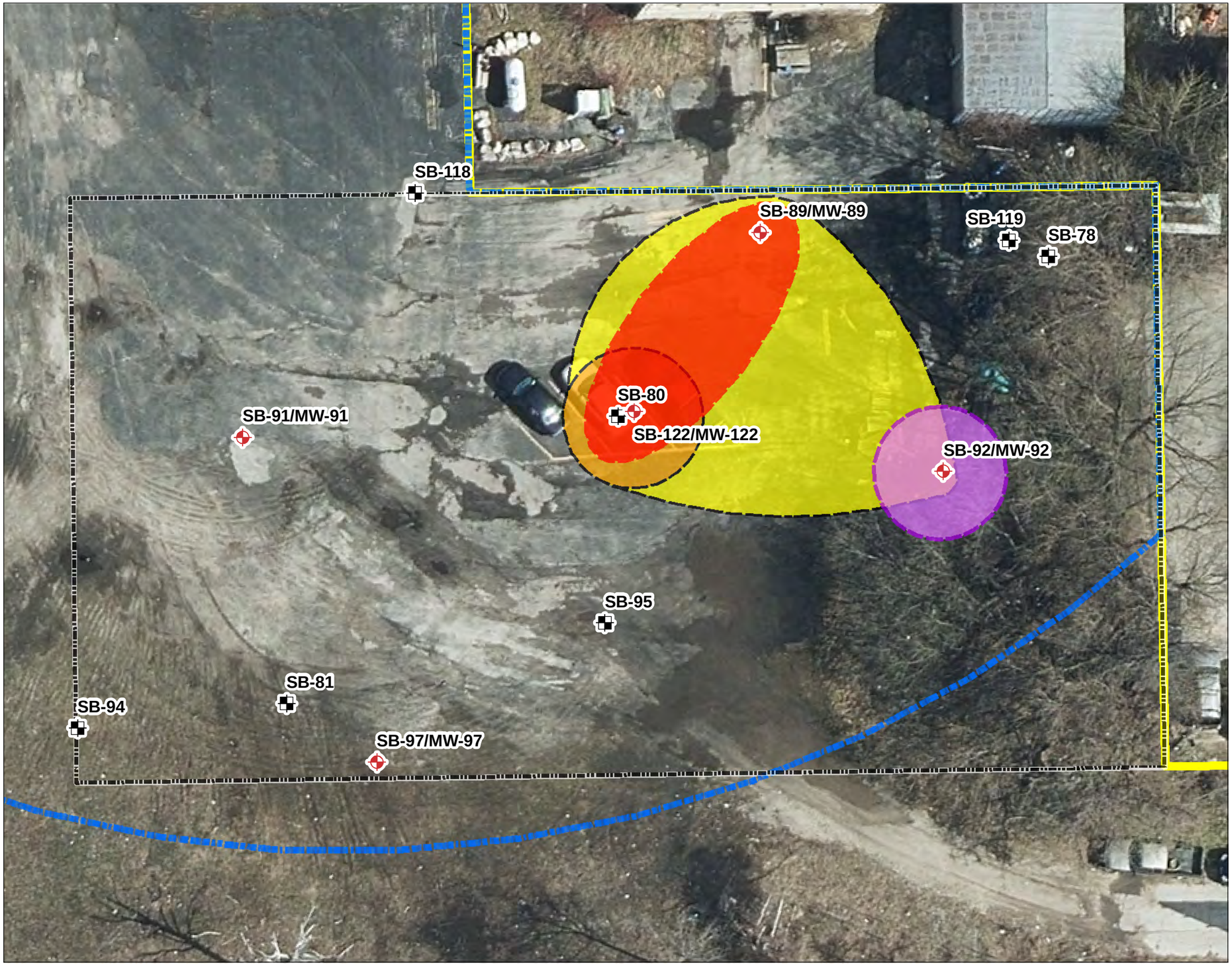

Figure No.
6

Title
Sample Locations, Proposed Excavation, and Impacts to Soil and Groundwater

Client/Project
Former Junk Yard
River Point District
City of Manitowoc

0 12.5 25 Feet

Prepared by HLB on 1/27/2023

N

Legend

- River Point District
- Proposed Excavation

Sample Locations

- Soil Boring/Monitoring Well
- Soil Boring

Impacts to Groundwater

- Arsenic > Enforcement Standard

Extents of Soil Impacts

- PCBs > Soil to Groundwater RCL
- PCBs > Industrial DC RCL
- PCB > Non-Industrial DC RCL
- PVOC and PAH > Ind. and Non-Ind. DC RCL

Notes

1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet
2. Orthophotograph: Manitowoc County, 2017
3. PCB = polychlorinated biphenyl; PAH = polycyclic aromatic hydrocarbon; PVOC = petroleum volatile organic compounds; RCL = residual contaminant level per ch. NR 720 of the Wisconsin Administrative Code; DC = direct contact

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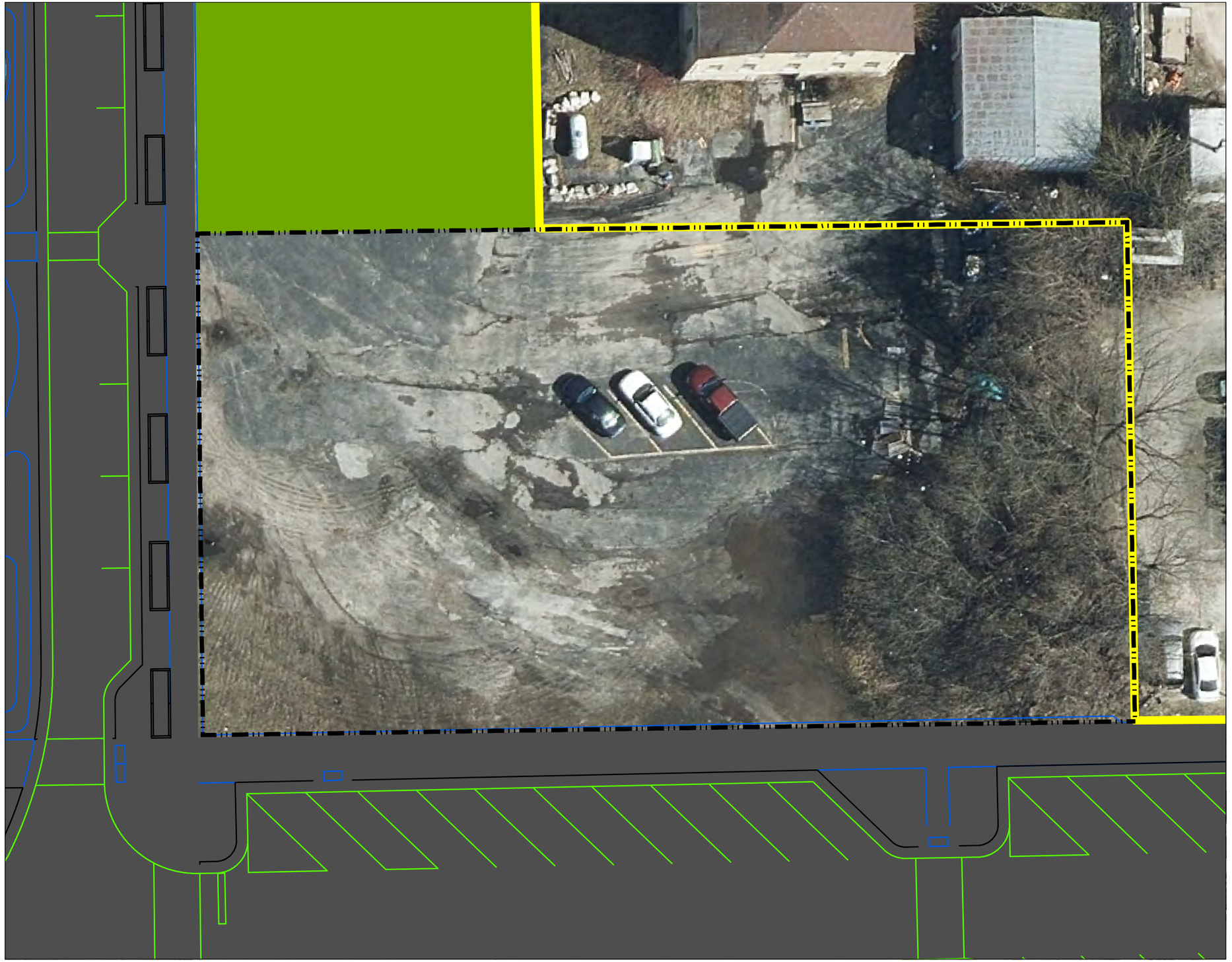

Figure No.
7
Title
Proposed Excavation and Adjacent Reuse Features

Client/Project
Former Junk Yard
River Point District
City of Manitowoc

0 15 30 Feet

Prepared by HLB on 1/27/2023

N

Legend

- Proposed Excavation
- River Point District

Temporary Landscape Cover (2022) Pending Future Development

- Temporary Landscape Cover (2022) Pending Future Development

Constructed Rights-of-Way

- Roadways

Notes

1. Coordinate System: NAD 1983 StatePlane Wisconsin South FIPS 4803 Feet
2. Orthophotograph: Manitowoc County, 2017

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TABLE

Table 1
Analysis of Brownfields Cleanup Alternatives
Former Junk Yard Area
River Point District
Manitowoc, Wisconsin

Remedial Action Area Description:	The target remedial area consists of vacant land formerly operated for junk/salvage yard operations. Residual heavy metal, petroleum and polychlorinated biphenyl (PCB) impacts are present in soil/fill across the remedial area at concentrations greater than health-based ch. NR 720 WAC non-industrial direct contact and/or ch. NR 720 soil to groundwater residual contaminant levels (RCLs). In addition, residual heavy metal impacts to groundwater remain at concentrations that exceed ch. NR 140 WAC groundwater enforcement standards (ES) and/or preventive action limits (PAL).											
Exposure Routes of Concern (*Check Boxes As Applicable*):	**Soil**				**Groundwater**		**Sub-Slab Vapor**		**Building Materials**			
	Direct Contact	*Yes*	Soil to Groundwater	*Yes*	Consumption	*Yes*	Vapor Intrusion	*Possibly; VOCs detected in soil/groundwater*	Lead Paint	*No*	Asbestos	*No*

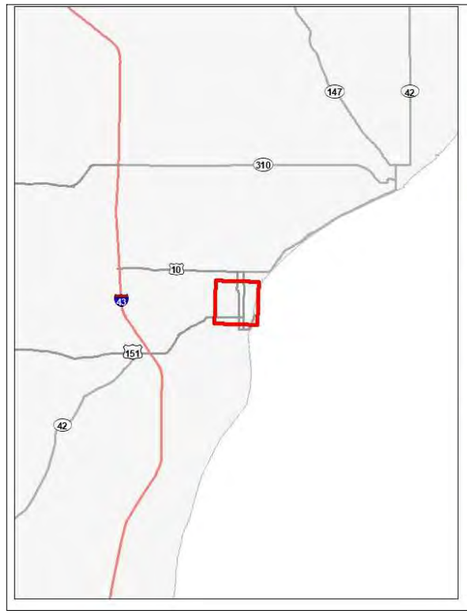
Media	**Remedial Alternative**	**Remedial Action Options Evaluation**					
		Technical Feasibility - ch. NR 722.07(4)(a)				**Economic Feasibility ch. NR 722.07(4)(b)**	**Sustainability ch. NR 722.09(2m)**
		Long-Term Effectiveness	*Short Term Effectiveness*	*Implementability*	*Restoration Time Frame*		
Soil and Groundwater	Alt 1 - Natural Attenuation	Natural attenuation of residual petroleum and solvent impacts to soil and groundwater is possible. However, heavy metal and PCB impacts in soil are considered recalcitrant to natural attenuation. Therefore natural attenuation would not reduce the overall heavy metal/PCB toxicity, mobility, and volume of impacts. Natural attenuation would not be protective of public health, safety, or welfare or the environment in the short-term or long-term time periods.		Implementation of Alt 1 is technically feasible; however, monitoring the effectiveness of the remedial action is impractical. Redevelopment potential would be impeded.	As heavy metal and PCB constituents associated with residual impacts are considered recalcitrant, the overall magnitude, mobility, and toxicity of impacts would not decrease and Site restoration will not occur within a reasonable timeframe.	Initial and capital costs to implement Alt 1 are minimal; however, future potential costs associated with monitoring natural attenuation could be significant as constituents are recalcitrant to natural attenuation.	The carbon footprint and energy use associated with Alt 1 is considered minimal. However, Alt 1 is not considered to be protective of health/safety/env. within a reasonable timeframe.
	Alt 2 - Spot removal of soil with PCBs > direct contact RCLs; construct engineered barrier; establish an institutional control to prevent groundwater consumption	Excavation of impacted soil/fill will provide for immediate and permanent reduction in the toxicity, mobility, and volume of PCBs and would protect public health, safety, welfare and the environment in a short-term time frame. However, heavy metal and petroleum impacts are more widespread; therefore, recalcitrant impacts would remain. Engineered barriers are considered effective to prevent direct contact; however, the barrier must be maintained. An institutional control is considered effective for prevention of groundwater consumption; however, it is unlikely metal impacts would attenuate.		Alt 2 is technically feasible and technology is available for implementation. Waste disposal approval will be needed from the landfill.	The Property would be restored concurrent with redevelopment. Institutional controls will be needed to provide for long-term control of residual impacts.	Source removal capital includes excavation and offsite disposal of a 700 cubic yards of soil (700 cubic yards @ $81 per yard =$56,700). Establishing the institutional control to control groundwater consumption will occur with final closure ($10,000).	Limited energy and fuel use will be incurred with offsite disposal of building materials and backfilling the excavation; however low sulfur diesel can be used and a no-idle policy will reduce the carbon footprint.
	Alt 3 - Excavate all impacted soil; backfill excavation to proposed final grade; establish an institutional control to prevent groundwater consumption	Excavation of impacted soil/fill will provide for immediate and permanent reduction in the toxicity, mobility, and volume of contaminants and would protect public health, safety, welfare and the environment in a short-term time frame. An institutional control is considered effective for prevention of groundwater consumption, if residual impacts remain following excavation.		Alt 3 is technically feasible and technology is available for implementation. Waste disposal approval will be needed from the landfill.	The Property would be restored concurrent with redevelopment. Institutional controls will be needed to provide for long-term control of residual impacts.	Source removal capital includes excavation and offsite disposal of fill (2,200 cubic yards) and backfilling the excavation to final grade (4,600 cubic yards) with imported fill is estimated to cost $230,000. Establishing the institutional control to control groundwater consumption will occur with final closure ($10,000).	Significant energy and fuel use will be incurred with offsite disposal of building materials and backfilling the excavation; however low sulfur diesel can be used and a no-idle policy will reduce the carbon footprint. Alternative 3 allows for maximum reuse of the Property.

APPENDIX A
Cleanup Plan Set

RIVER POINT JUNK YARD GRADING

CITY OF MANITOWOC

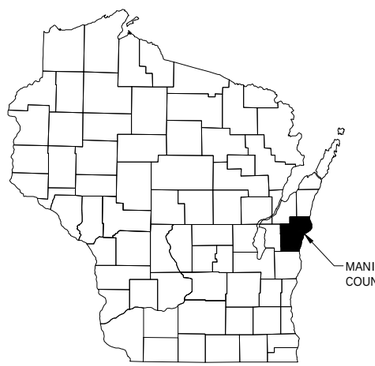
MANITOWOC COUNTY, WISCONSIN



Sheet List Table	
Sheet Number	Sheet Title
G0.01	TITLE SHEET AND PROJECT LOCATION
G0.02	GENERAL NOTES
C0.01	EXISTING CONDITIONS AND REMOVALS
C1.00	EROSION CONTROL PLAN - EXCAVATION
C1.01	EROSION CONTROL PLAN - GRADING
C1.02	EROSION CONTROL DETAILS AND NOTES
C3.00	EXCAVATION PLAN
C3.01	EXCAVATION PROFILES
C3.02	GRADING PLAN
C3.03	PROPOSED GRADING PROFILES
C8.01	CONSTRUCTION DETAILS
C8.02	CONSTRUCTION DETAILS

VICINITY MAP

NO SCALE



LOCATION MAP

NO SCALE

N

DIGGERS HOTLINE

Call 811 3 Work Days Before You Dig
Or Toll Free (800) 242-8511
Hearing Impaired TDD (800) 542-2289
www.DiggersHotline.com

PROJECT TEAM:

ENGINEERING DEPARTMENT:

MANITOWOC ENGINEERING DEPARTMENT
900 QUAY STREET
MANITOWOC, WI 54220

Contact:
GREG MINIKEL
TEL. 920.686.6910
gminikel@manitowoc.org

MPU ELECTRIC:

MANITOWOC PUBLIC UTILTIES
1303 S. 8TH STREET
PO BOX 1090
MANITOWOC, WI 54221

Contact:
STEVE BACALZO
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sbacalzo@mpu.org

MPU WATER:

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Contact:
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rmichaelson@mpu.org

COMMUNITY DEVELOPMENT DEPARTMENT:

MANITOWOC COMMUNITY DEVELOPMENT DEPARTMENT
TEL. 920.686.6930
900 QUAY STREET
MANITOWOC, WI 54220

Contact:
ADAM TEGAN
TEL. 920.686.6931
ategan@manitowoc.org

OWNER:

CITY OF MANITOWOC
900 QUAY STREET
MANITOWOC, WI 54220

Contact:
NICHOLAS MUELLER
TEL. 920.686.6930
nmueller@manitowoc.org

CIVIL ENGINEER:

STANTEC CONSULTING
SERVICES, INC.
12075 CORPORATE PARKWAY,
SUITE 200
MEQUON, WI

Contact:
MICHAEL BACH
TEL. 262.643.9150
michael.bach@stantec.com

WISCONSIN
JACOB WOELMER
E-46672
URBANDALE
IA
PROFESSIONAL ENGINEER

JACOB A. WOELMER, P.E.
NO. 46672-6

The locations of existing utility installations as shown on this plan are approximate. There may be other underground utility installations within the project area that are not shown.

Stantec assumes no responsibility for damages, liability or costs resulting from changes or alterations made to this plan without written consent of Stantec.

These drawings have been prepared based on information provided by others. Stantec has not verified the accuracy and/or completeness of this information and shall not be responsible for any errors or omissions which may be incorporated herein as a result.

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Mequon, WI 53092
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TITLE SHEET AND PROJECT LOCATION
RIVER POINT JUNK YARD GRADING
CITY OF MANITOWOC
MANITOWOC COUNTY, WISCONSIN

DATE OF ISSUANCE
December 14, 2022

NO	REVISION	DATE

SURVEY	XXXXXXX
DRAWN	XXX
DESIGNED	XXX
CHECKED	MAB
APPROVED	JAW
PROJ. NO.	193708490

SHEET NUMBER
G0.01

Plot Date: 12/14/2022 - 11:58am
Drawing name: C:\pw_stn_bh_int\d01\d0162326\193808490G100.dwg
XREFs loaded:

STANTEC ASSUMES NO RESPONSIBILITY FOR DAMAGES, LIABILITY OR COSTS RESULTING FROM CHANGES OR ALTERATIONS MADE TO THIS PLAN WITHOUT THE EXPRESSED WRITTEN CONSENT OF STANTEC.

GENERAL

1. THE CONTRACTOR SHALL NOTIFY THE OWNER AND THE MUNICIPALITY FORTY-EIGHT HOURS PRIOR TO THE START OF CONSTRUCTION.
2. THE CONTRACTOR SHALL INDEMNIFY THE OWNER, THE ENGINEER, AND THE MUNICIPALITY, THEIR AGENTS, ETC., FROM ALL LIABILITY INVOLVED WITH THE CONSTRUCTION, INSTALLATION, AND TESTING OF THE WORK ON THIS PROJECT.
3. SITE SAFETY SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
4. THE BIDDER WILL BE SOLELY RESPONSIBLE FOR DETERMINING QUANTITIES AND SHALL STATE SUCH QUANTITIES IN HIS OR HER PROPOSAL. HE OR SHE SHALL BASE THEIR BID ON HIS OR HER OWN ESTIMATE OF THE WORK REQUIRED AND SHALL NOT RELY ON THE ENGINEER'S ESTIMATE.
5. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING SOIL CONDITIONS PRIOR TO COMMENCEMENT OF CONSTRUCTION. A GEOTECHNICAL REPORT MAY BE AVAILABLE FROM THE OWNER. THE CONTRACTOR SHALL ABIDE BY THE RECOMMENDATIONS FO THE GEOTECHNICAL ENGINEER.
6. THE CONTRACTOR IS RESPONSIBLE FOR EXAMINING ALL SITE CONDITIONS PRIOR TO COMMENCEMENT OF CONSTRUCTION AND SHALL COMPARE FIELD CONDITIONS WITH DRAWINGS.
7. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS REQUIRED FOR EXECUTION OF THE WORK. THE CONTRACTOR SHALL CONDUCT HIS WORK ACCORDING TO THE REQUIREMENTS OF THE PERMITS.
8. THE CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING ALL UTILITY INFORMATION SHOWN ON THE PLANS PRIOR TO THE START OF CONSTRUCTION. THE CONTRACTOR SHALL CALL DIGGER'S HOTLINE AT 1-800-242-8511 TO NOTIFY THE UTILITIES OF HIS OR HER INTENTIONS, AND TO REQUEST FIELD STAKING OF EXISTING UTILITIES.
9. CONTRACTOR IS ADVISED THAT ALL MUD AND DEBRIS MUST NOT BE DEPOSITED ONTO THE ADJACENT ROADWAYS PER THE REQUIREMENT OF THE MUNICIPALITY OR OTHER APPROPRIATE GOVERNMENT AGENCIES.
10. ANY ADJACENT PROPERTIES OR ROAD RIGHTS-OF-WAY WHICH ARE DAMAGED DURING CONSTRUCTION MUST BE RESTORED BY THE CONTRACTOR. THE COST OF THE RESTORATION IS CONSIDERED INCIDENTAL AND SHOULD BE INCLUDED IN THE BID PRICES.

MAINTENANCE, INSPECTIONS AND REPORTING

1. EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE INSTALLED BEFORE CONSTRUCTION ACTIVITIES BEGIN IN EACH REPRESENTATIVE PROJECT PHASE. PRACTICES SHALL BE CHECKED FOR EFFECTIVENESS WEEKLY AND FOLLOWING RAINFALL EVENTS 0.5 INCHES OR GREATER. ANY DEVICES NEEDING REPAIR SHALL BE ADDRESSED IMMEDIATELY.
2. STORM DRAIN INLET PROTECTION SHALL BE REPLACED WHEN SEDIMENT COLLECTED IN THE DEVICE HAS REDUCED THE CAPACITY BY HALF. ACCUMULATED SEDIMENT SHALL BE DEPOSITED IN A SUITABLE AREA AND STABILIZED.
3. SILT FENCES SHALL BE REPAIRED WHEN SEDIMENT HAS REACHED HALF THE HEIGHT OF THE FENCE. SILT FENCES HAVE A LIFE SPAN OF ONE YEAR, AND SHALL BE REPLACED WHEN WORN OUT. DAMAGED OR DECOMPOSED FENCES, UNDERCUTTING, OR FLOW CHANNELS AROUND THE END OF BARRIERS SHALL BE REPAIRED OR CORRECTED.
4. SEEDED AREAS SHALL BE FERTILIZED, RESEEDED AND MULCHED AS NECESSARY. INSPECT SEEDED AREAS WEEKLY AFTER PLANTING TO ENSURE THAT VEGETATION IS ADEQUATELY ESTABLISHED. LIMIT VEHICLE TRAFFIC AND OTHER FORMS OF COMPACTION IN AREAS THAT ARE SEEDED.
5. MULCH THAT IS DISPLACED SHALL BE REAPPLIED AND PROPERLY ANCHORED. MAINTENANCE SHALL BE COMPLETED AS SOON AS POSSIBLE WITH CONSIDERATION TO SITE CONDITIONS.
6. EROSION MATTING, SILT FENCES, STRAW WATTLES, TEMPORARY DITCH CHECKS, STONE OUTLET PROTECTION, ETC. SHALL BE REPLACED AS NECESSARY.
7. STONE TRACKING PAD SHALL BE SCRAPED OR TOP DRESSED WHEN EXISTING STONE BECOMES BURIED OR IF SEDIMENT IS NOT BEING REMOVED EFFECTIVELY FROM TIRES. SEDIMENT THAT IS TRACKED ONTO THE PUBLIC ROADWAY MUST BE REMOVED IMMEDIATELY. A MINIMUM 12-INCH THICK PAD SHALL BE MAINTAINED.

THE FOLLOWING CONSTRUCTION SITE INSPECTIONS SHALL BE PERFORMED BY THE CONTRACTOR, AND ARE REQUIRED PER THE WPDES GENERAL PERMIT:

1. CONDUCT WEEKLY INSPECTIONS OF IMPLEMENTED EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES, AND REPORTING.
2. INSPECTIONS OF EROSION AND SEDIMENT CONTORL WITHIN 24 HOURS AFTER A PRECIPITATION EVENT OF 0.5 INCHES OR GREATER, AND REPORTING.
3. REPAIR OR REPLACE EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES AS NECESSARY WITHIN 24 HOURS OF AN INSPECTION OR DEPARTMENT NOTIFICATION THAT A REPAIR OR REPLACEMENT IS NEEDED.
4. MAINTAIN WEEKLY WRITTEN REPORTS OF ALL INSPECTIONS CONDUCTED AT THE CONSTRUCTION SITE. WEEKLY INSPECTION REPORTS SHALL INCLUDE ALL OF THE FOLLOWING:
   - A. DATE, TIME AND LOCATION OF THE CONSTRUCTION SITE INSPECTION.
   - B. NAME OF THE INDIVIDUAL WHO PERFORMED THE INSPECTION.
   - C. ASSESSMENT OF THE CONDITION OF EROSION AND SEDIMENT CONTROLS.
   - D. DESCRIPTION OF ANY EROSION AND SEDIMENT CONTORL BEST MANAGEMENT PRACTICE IMPLEMENTATION AND MAINTENANCE PERFORMED.
   - E. DESCRIPTION OF THE PRESENT PHASE OF LAND DISTURBING ACTIVITY AT THE CONSTRUCTION SITE.

GRADING

1. THE PROPOSED IMPROVEMENTS SHALL BE CONSTRUCTED ACCORDING TO THE WISCONSIN D.O.T. STANDARD SPECIFICATIONS, LOCAL ORDINANCES AND SPECIFICATIONS, AND RECOMMENDATIONS IN THE GEOTECHNICAL REPORT.
2. THE CONTRACTOR SHALL MAINTAIN SITE DRAINAGE THROUGHOUT CONSTRUCTION. THIS MAY INCLUDE THE EXCAVATION OF TEMPORARY DITCHES OR PUMPING TO ALLEVIATE WATER PONDING.
3. SILT FENCE AND OTHER EROSION CONTROL FACILITIES MUST BE INSTALLED PRIOR TO CONSTRUCTION OR ANY OTHER LAND DISTURBING ACTIVITY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING ALL EROSION CONTROL FACILITIES ONCE THE THREAT OF EROSION HAS PASSED WITH THE APPROVAL OF THE GOVERNING AGENCY.
4. THE CONTRACTOR SHALL ASSUME SOLE RESPONSIBILITY FOR THE COMPUTATIONS OF ALL GRADING AND FOR ACTUAL LAND BALANCE, INCLUDING UTILITY TRENCH SPOIL. THE CONTRACTOR SHALL IMPORT OR EXPORT MATERIAL AS NECESSARY TO COMPLETE THE PROJECT.
5. GRADING SHALL CONSIST OF CLEARING AND GRUBBING EXISTING VEGETATION, STRIPPING TOPSOIL, REMOVAL OF THE EXISTING PAVEMENT OR FOUNDATIONS, IMPORTING OR EXPORTING MATERIAL TO ACHIEVE AN ON-SITE EARTHWORK BALANCE, GRADING THE PROPOSED BUILDING PADS AND PAVEMENT AREAS, SCARIFYING AND FINAL COMPACTION OF THE PAVEMENT SUBGRADE, AND PLACEMENT OF TOPSOIL.
6. NO FILL SHALL BE PLACED ON A WET OR SOFT SUBGRADE. THE SUBGRADE SHALL BE PROOF-ROLLED AND INSPECTED BY THE GEOTECHNICAL ENGINEER BEFORE ANY MATERIAL IS PLACED.
7. ALL FILL SHALL BE CONSIDERED STRUCTURAL FILL AND SHALL BE PLACED IN ACCORDANCE WITH THE GEOTECHNICAL REPORT.
8. ALL SIDEWALKS SHALL HAVE A MAXIMUM 2.0% CROSS SLOPE. SEE TYPICAL DETAIL.

EROSION CONTROL NOTES

1. EROSION CONTROL MEASURES MUST BE INSPECTED AND REPAIRED WEEKLY AND AFTER EACH RAIN TOTALING ONE-HALF INCH OR MORE. THE INSPECTIONS SHALL BE RECORDED AND KEPT ON FILE ONSITE WITH THE STORMWATER POLLUTION PREVENTION PLAN.
2. ANY SEDIMENT REACHING A PUBLIC OR PRIVATE ROAD OR SIDEWALK SHALL BE REMOVED BY STREET CLEANING, OTHER THAN FLUSHING, IMMEDIATELY.
3. CONTRACTOR SHALL KEEP A COPY OF THE EROSION CONTROL PLANS AT THE PROJECT SITE AND PROVIDE COMPLETED INSPECTION FORMS TO THE CITY OF MANITOWOC. THE CITY OF MANITOWOC AND WDNR MAY REQUEST INSPECTION REPORTS AT ANY TIME.
4. ALL EROSION CONTROL METHODS SHALL BE IN ACCORDANCE WITH WDNR TECHNICAL STANDARDS AND CITY OF MANITOWOC REQUIREMENTS AND STANDARDS.
5. ALL EXPOSED SOIL AREAS NOT DISTURBED FOR UP TO SEVEN DAYS SHALL BE IMMEDIATELY RESTORED WITH SEED AND MULCH.
6. COPIES OF THE INSPECTION REPORTS SHALL BE KEPT AT THE PROJECT SITE FOR CITY OF WDNR ACCESS.
7. TEMPORARY GRADING METHODS SHALL BE USED TO DIRECT WATER TO THE TEMPORARY STABILIZED CONVEYANCE SWALES.
8. DEWATERING AS NEEDED TO BE DONE ACCORDING TO WDNR STANDARD 1061.
9. DISTURBED AREAS THAT CANNOT BE STABILIZED WITH A DENSE GROWTH OF VEGETATION BY SEEDING AND MULCHING DUE TO TEMPERATURE (WINTER) OR TIMING OF CONSTRUCTION, SHALL BE STABILIZED BY APPLYING ANIONIC POLYACRYLAMIDE (PAM) IN ACCORDANCE WITH WDNR TECHNICAL STANDARD 1051.
10. CONTRACTOR IS RESPONSIBLE FOR EROSION CONTROL MEASURES AND PERFORMING MAINTENANCE THROUGHOUT THE DURATION OF CONSTRUCTION ACTIVITIES.

Stantec
12075 N. Corporate Parkway, Suite 200
Mequon, WI 53092
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GENERAL NOTES

RIVER POINT JUNK YARD GRADING
CITY OF MANITOWOC
MANITOWOC COUNTY, WISCONSIN

DATE OF ISSUANCE	
December 14, 2022	

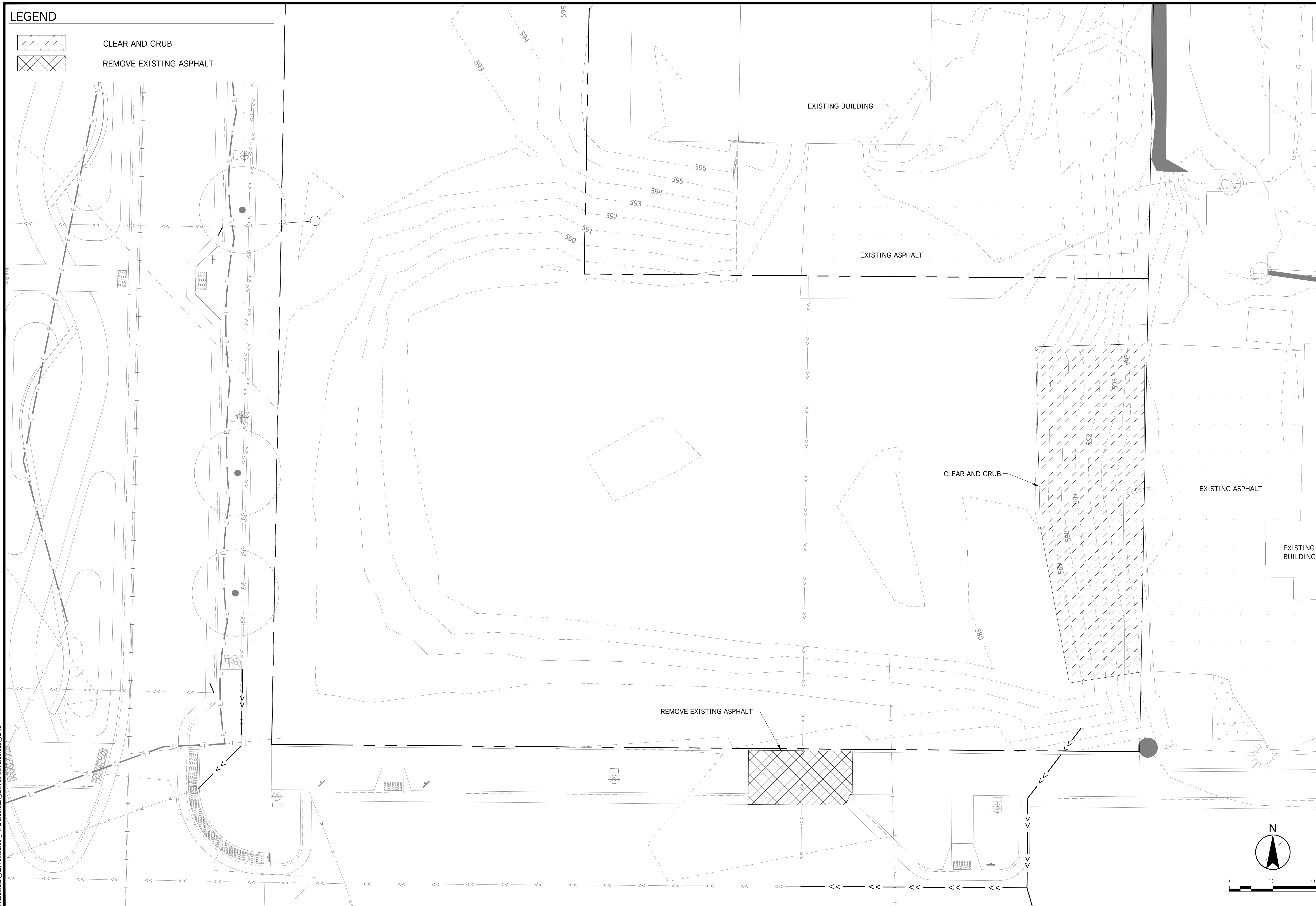
NO	REVISION	DATE

SURVEY	XXXXXXXX
DRAWN	XXX
DESIGNED	XXX
CHECKED	MAB
APPROVED	JAW
PROJ. NO.	193708490

SHEET NUMBER
G0.02

Plot Date: 12/14/2022 - 11:58am
Drawing name: C:\pw_stn_bh_infra01\d0162326\193808490G100.dwg
Xrefs:, Border

THE CONTRACTOR SHALL VERIFY AND BE RESPONSIBLE FOR ALL DIMENSIONS. DO NOT SCALE THE DRAWING - ANY ERRORS OR OMISSIONS SHALL BE REPORTED TO STANTEC WITHOUT DELAY.



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12075 N. Corporate Parkway, Suite 200
Mequon, WI 53092
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EXISTING CONDITIONS AND REMOVALS

RIVER POINT - WATERFRONT
CITY OF MANITOWOC
MANITOWOC, WISCONSIN

DATE OF ISSUANCE
12/14/2022

NO	REVISION	DATE

SURVEY	XXXXXXXX
DRAWN	XXX
DESIGNED	XXX
CHECKED	###
APPROVED	###
PROJ. NO.	193805824

SHEET NUMBER
C0.01

Plot Date: 12/14/2022 - 11:59am
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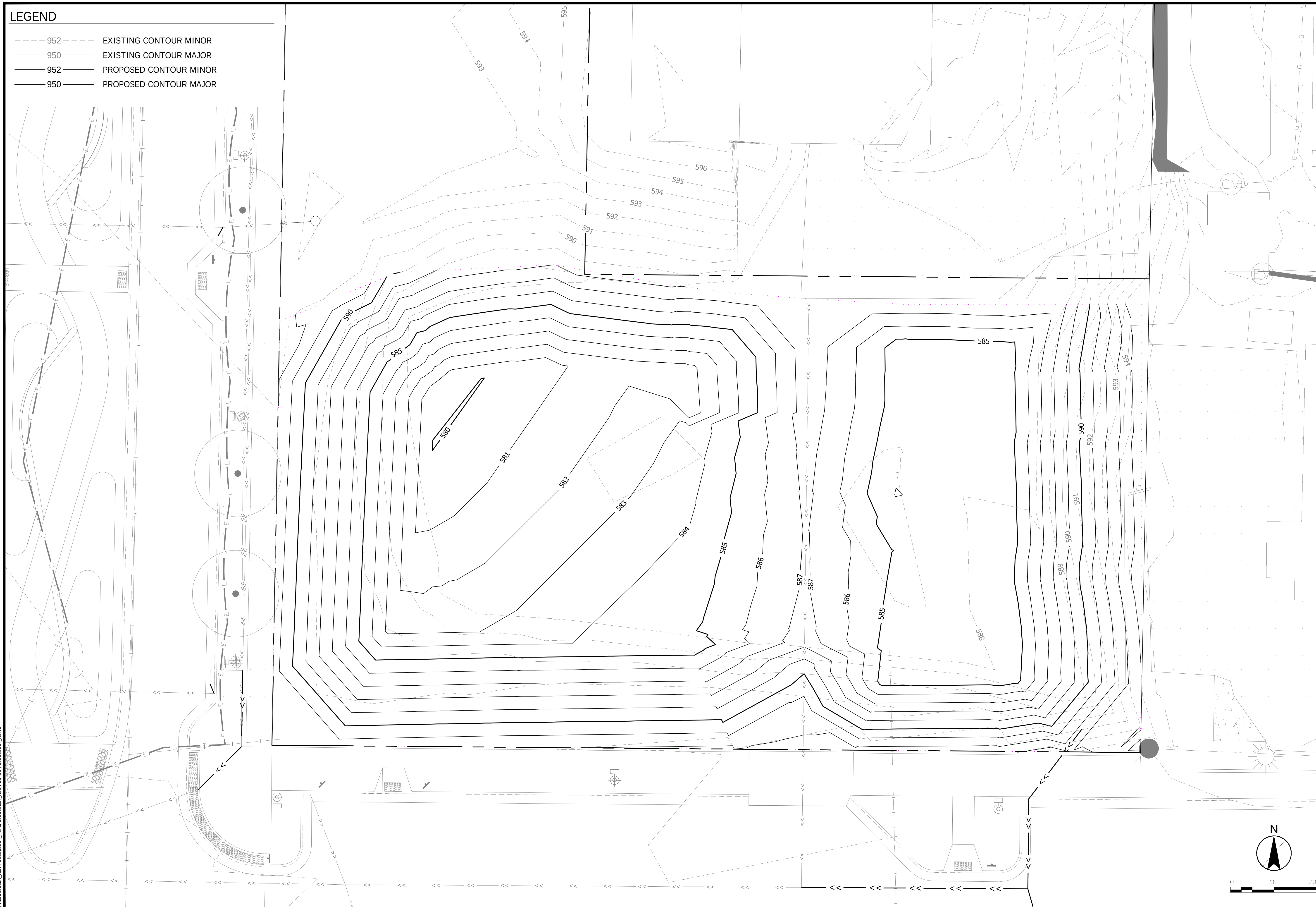

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EROSION CONTROL PLAN - EXCAVATION

RIVER POINT - WATERFRONT
CITY OF MANITOWOC
MANITOWOC, WISCONSIN

DATE OF ISSUANCE
12/14/2022

NO	REVISION	DATE

SURVEY	XXXXXXXX
DRAWN	XXX
DESIGNED	XXX
CHECKED	###
APPROVED	###
PROJ. NO.	193805824

SHEET NUMBER
C1.00

Plot Date: 12/14/2022 - 12:00pm
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LEGEND

	FABRIC FENCE (1056)	1 / C1.02
	INLET PROTECTION (1060)	2 / C1.02
	TRACKING PAD (1057)	3 / C1.02
	EROSION MATTING	

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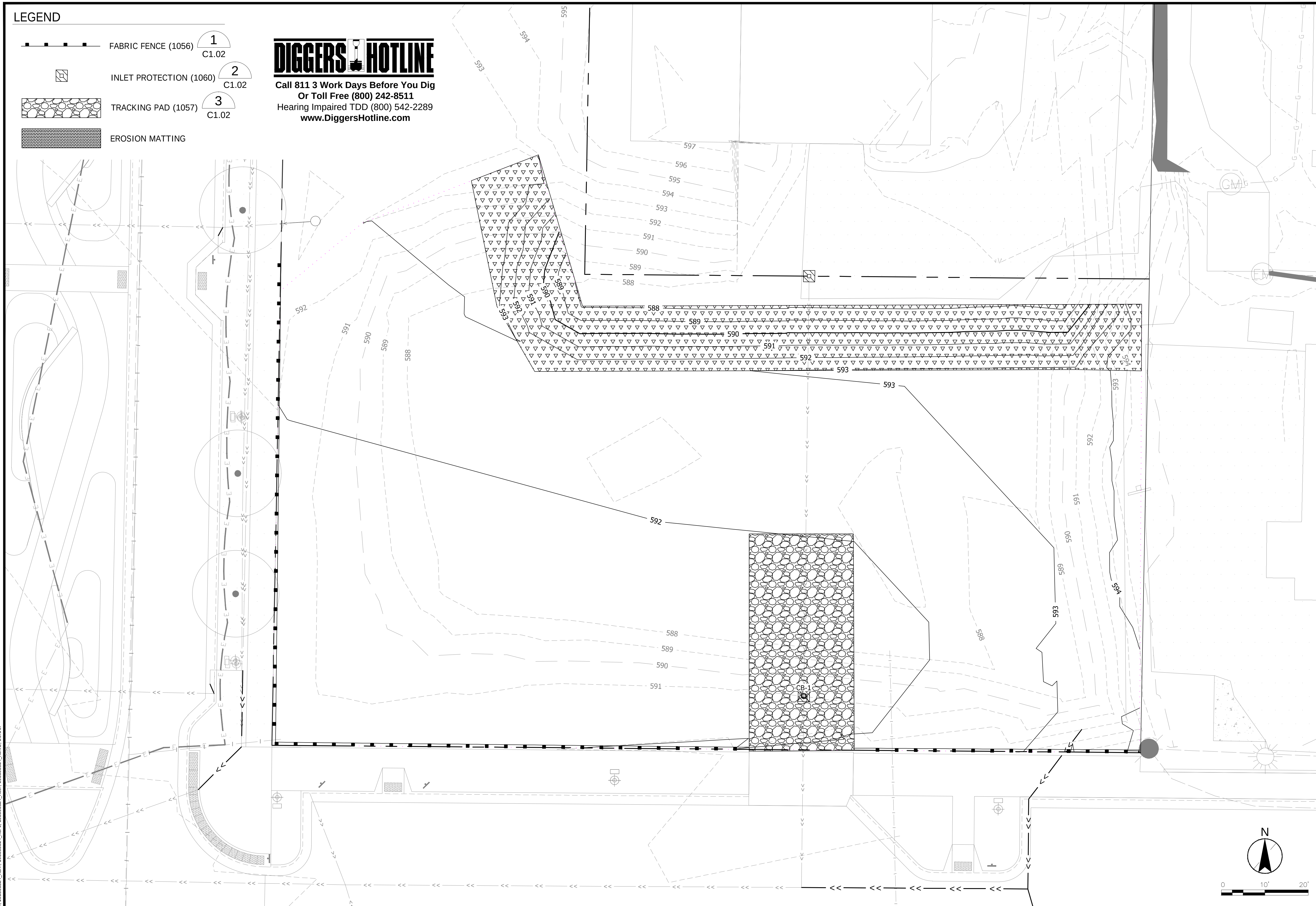

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EROSION CONTROL PLAN - GRADING

RIVER POINT JUNK YARD GRADING
CITY OF MANITOWOC
MANITOWOC COUNTY, WISCONSIN

DATE OF ISSUANCE		
December 14, 2022		
NO	REVISION	DATE

SURVEY	XXXXXXXX
DRAWN	XXX
DESIGNED	XXX
CHECKED	###
APPROVED	###
PROJ. NO.	193708490

SHEET NUMBER
C1.01

Plot Date: 12/14/2022 - 12:00pm
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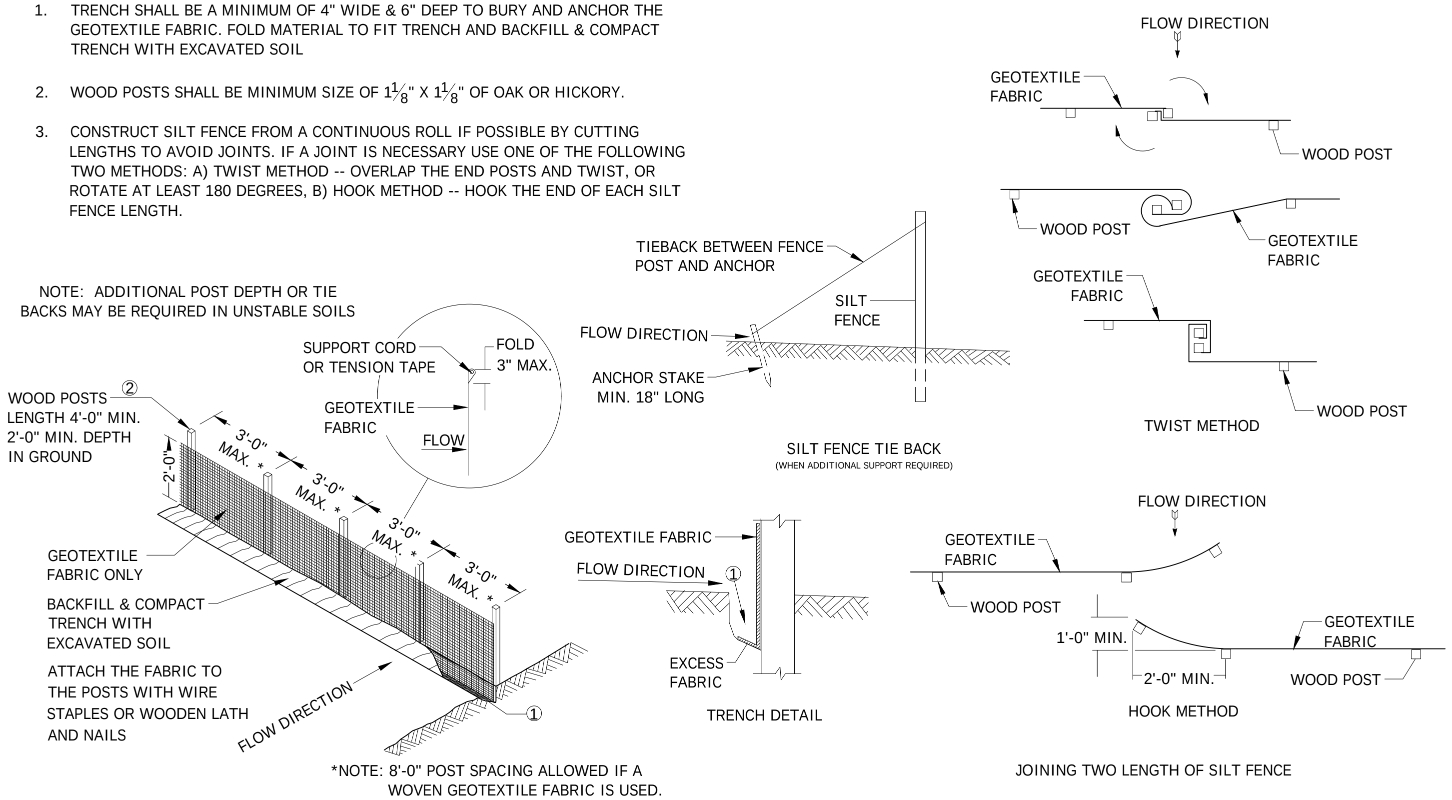
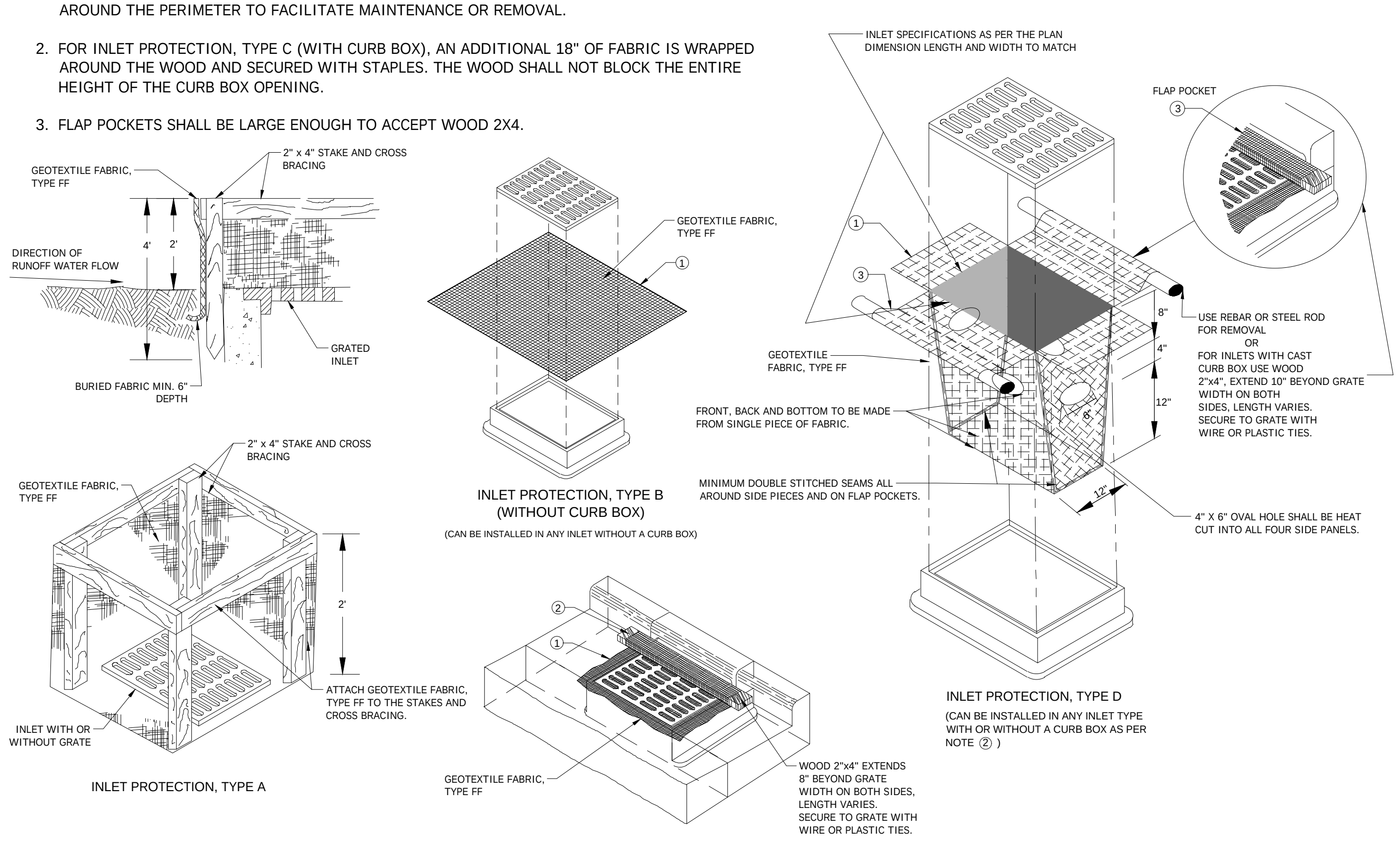
1. TRENCH SHALL BE A MINIMUM OF 4" WIDE & 6" DEEP TO BURY AND ANCHOR THE GEOTEXTILE FABRIC. FOLD MATERIAL TO FIT TRENCH AND BACKFILL & COMPACT TRENCH WITH EXCAVATED SOIL
2. WOOD POSTS SHALL BE MINIMUM SIZE OF 1 1/8" X 1 1/8" OF OAK OR HICKORY.
3. CONSTRUCT SILT FENCE FROM A CONTINUOUS ROLL IF POSSIBLE BY CUTTING LENGTHS TO AVOID JOINTS. IF A JOINT IS NECESSARY USE ONE OF THE FOLLOWING TWO METHODS: A) TWIST METHOD -- OVERLAP THE END POSTS AND TWIST, OR ROTATE AT LEAST 180 DEGREES, B) HOOK METHOD -- HOOK THE END OF EACH SILT FENCE LENGTH.

NOTE: ADDITIONAL POST DEPTH OR TIE BACKS MAY BE REQUIRED IN UNSTABLE SOILS



1 SILT FENCE (TYP)
NTS

1. FINISHED SIZE, INCLUDING FLAP POCKETS WHERE REQUIRED, SHALL EXTEND A MINIMUM OF 10" AROUND THE PERIMETER TO FACILITATE MAINTENANCE OR REMOVAL.
2. FOR INLET PROTECTION, TYPE C (WITH CURB BOX), AN ADDITIONAL 18" OF FABRIC IS WRAPPED AROUND THE WOOD AND SECURED WITH STAPLES. THE WOOD SHALL NOT BLOCK THE ENTIRE HEIGHT OF THE CURB BOX OPENING.
3. FLAP POCKETS SHALL BE LARGE ENOUGH TO ACCEPT WOOD 2X4.



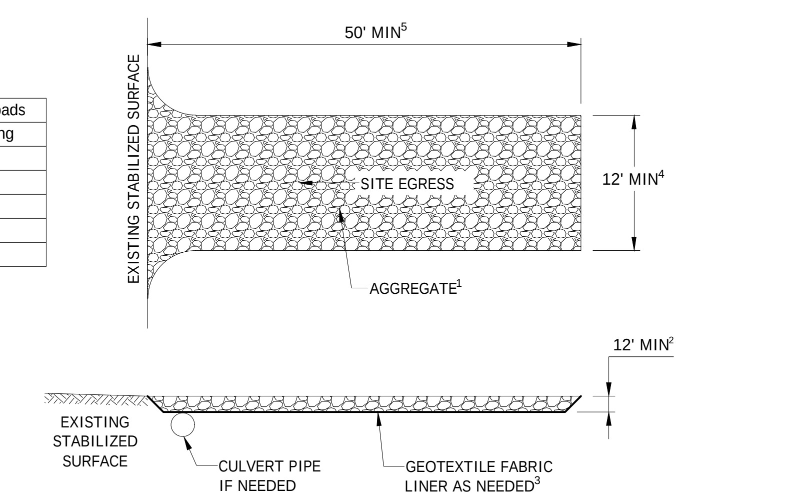
2 INLET PROTECTION (TYP)
NTS

NOTES

1. USE HARD, DURABLE, ANGULAR STONE OR RECYCLED CONCRETE MEETING THE GRADATION IN TABLE 1. WHERE THIS GRADATION IS NOT AVAILABLE, MEET THE GRADATION IN WISCONSIN DEPARTMENT OF TRANSPORTATION (DOT) 2018 STANDARD SPECIFICATIONS, SECTION 312, SELECT CRUSHED MATERIAL.
2. SLOPE THE STONE TRACKING PAD IN A MANNER TO DIRECT RUNOFF TO AN APPROVED TREATMENT PLACE.
3. SELECT FABRIC TYPE BASED ON SOIL CONDITIONS AND VEHICLES LOADING.
4. INSTALL TRACKING PAD ACROSS FULL WIDTH OF THE ACCESS POINT, OR RESTRICT EXISTING TRAFFIC TO A DEDICATED EGRESS LAND A LEAST 12 FEET WIDE ACROSS THE TOP OF THE PAD.
5. IF A 50' PAD LENGTH IS NOT POSSIBLE DUE TO SITE GEOMETRY, INSTALL THE MAXIMUM LENGTH PRACTICABLE AND SUPPLEMENT WITH ADDITIONAL PRACTICES AS NEEDED.

Table 1. Gradation for stone tracking pads

Sieve Size	Percent by weight passing
3"	100
2-1/2"	90-100
1-1/2"	25-60
3/4"	0-20
3/8"	0-5



3 TRACKING PAD (TYP)
NTS

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EROSION CONTROL DETAILS AND NOTES

RIVER POINT JUNK YARD GRADING
CITY OF MANITOWOC
MANITOWOC COUNTY, WISCONSIN

DATE OF ISSUANCE
December 14, 2022

NO	REVISION	DATE

SURVEY	XXXXXXXX
DRAWN	XXX
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SHEET NUMBER
C1.02

Plot Date: 12/14/2022 - 12:01pm
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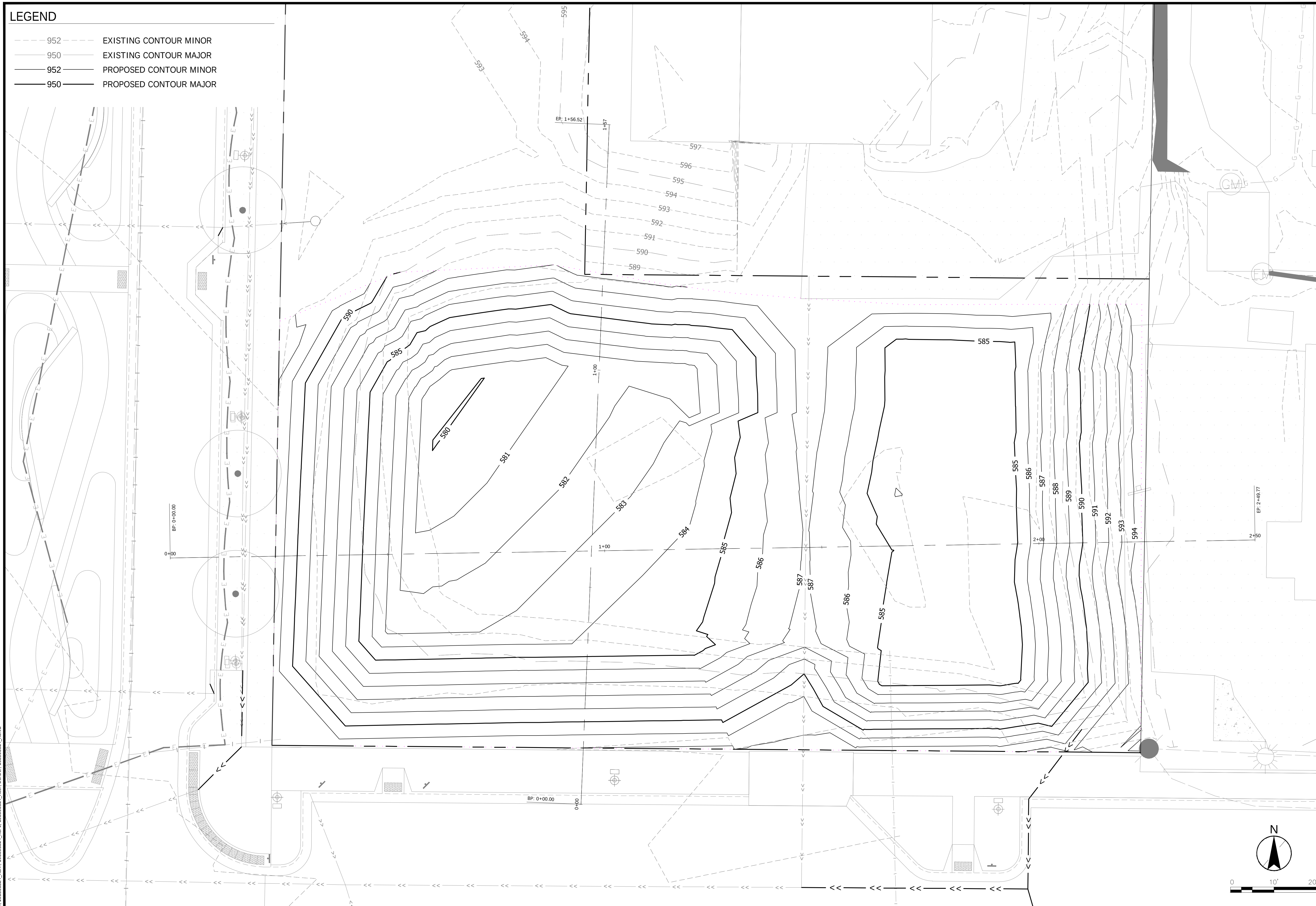
THE CONTRACTOR SHALL VERIFY AND BE RESPONSIBLE FOR ALL DIMENSIONS. DO NOT SCALE THE DRAWING - ANY ERRORS OR OMISSIONS SHALL BE REPORTED TO STANTEC WITHOUT DELAY.



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EXCAVATION PLAN

RIVER POINT - WATERFRONT
CITY OF MANITOWOC
MANITOWOC, WISCONSIN

DATE OF ISSUANCE
12/14/2022

NO	REVISION	DATE

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DRAWN	XXX
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APPROVED	###
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SHEET NUMBER
C3.00

Plot Date: 12/14/2022 - 12:01pm
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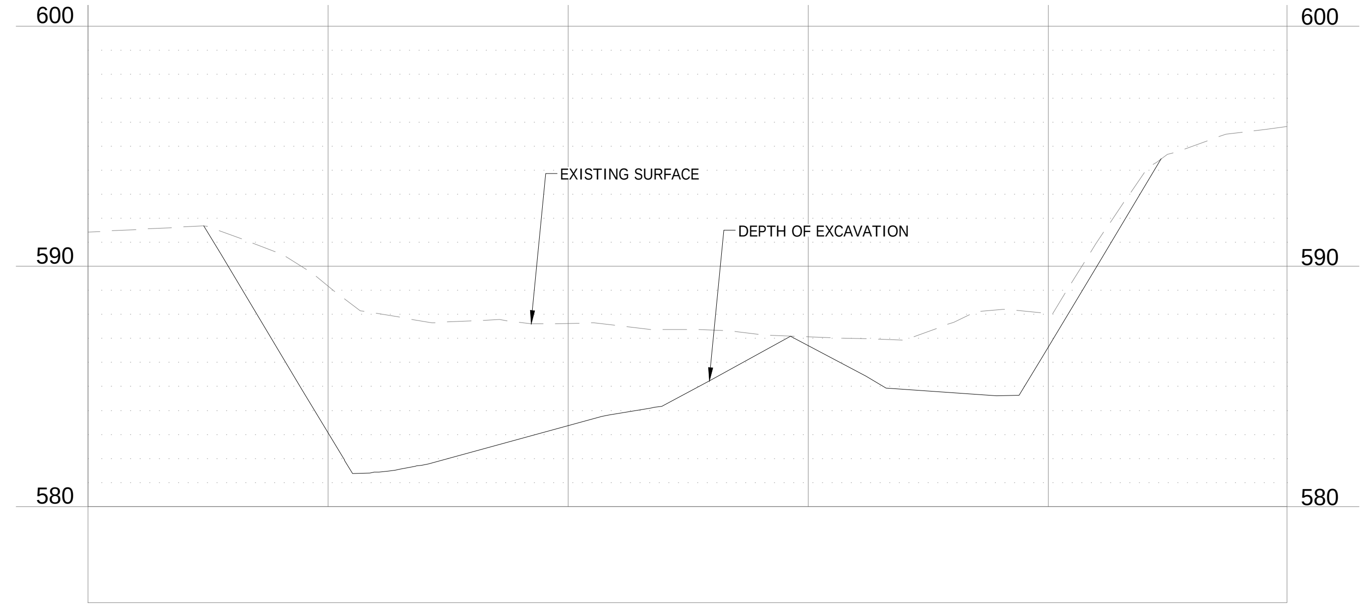
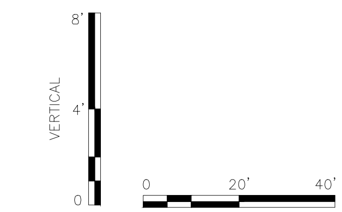
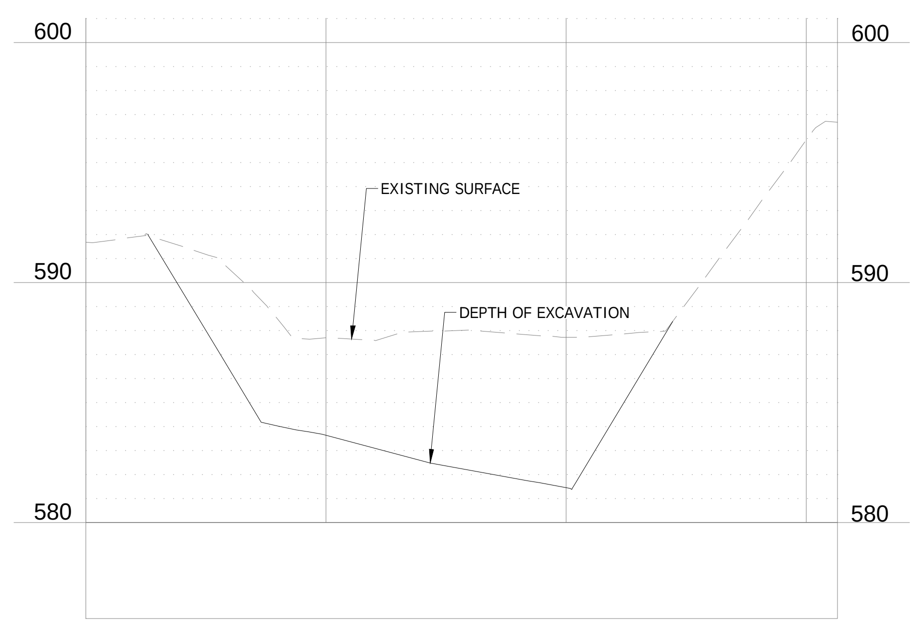
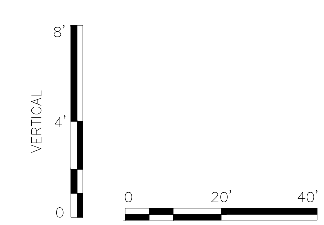




EAST-WEST EXCAVATION PROFILE





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EXCAVATION PROFILES

RIVER POINT - WATERFRONT
CITY OF MANITOWOC
MANITOWOC, WISCONSIN

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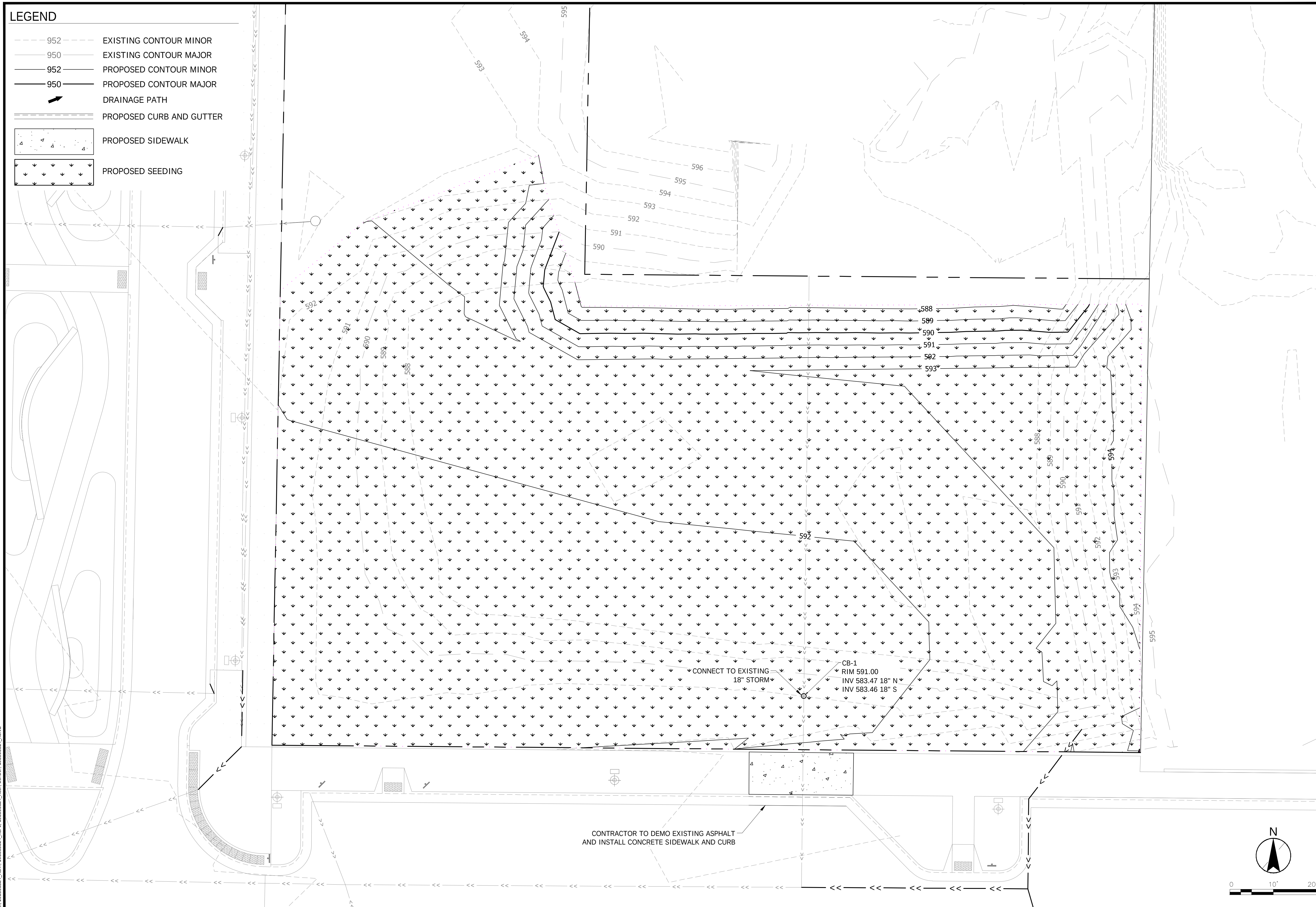
PROJ. NO.	193805824

SHEET NUMBER
C3.01

LEGEND

952	EXISTING CONTOUR MINOR
950	EXISTING CONTOUR MAJOR
952	PROPOSED CONTOUR MINOR
950	PROPOSED CONTOUR MAJOR
	DRAINAGE PATH
	PROPOSED CURB AND GUTTER
	PROPOSED SIDEWALK
	PROPOSED SEEDING



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GRADING PLAN

RIVER POINT - WATERFRONT
CITY OF MANITOWOC
MANITOWOC, WISCONSIN

DATE OF ISSUANCE
12/14/2022

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SURVEY	XXXXXXXX
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PROJ. NO.	193805824

SHEET NUMBER
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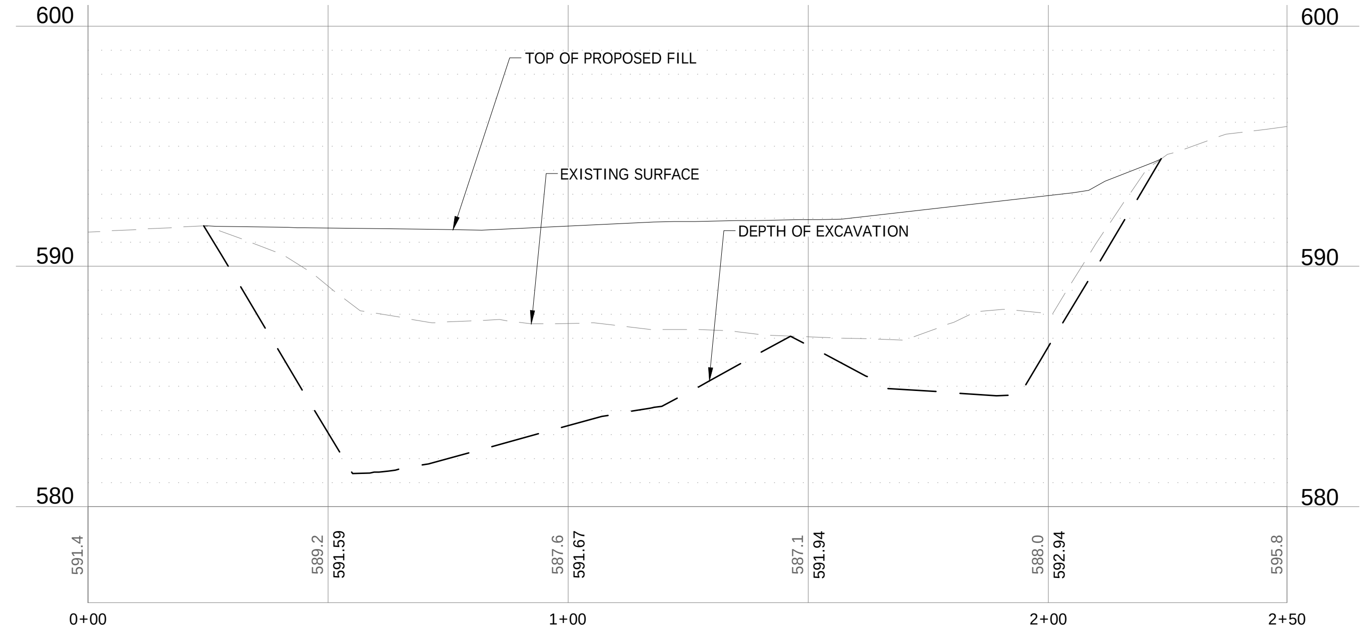
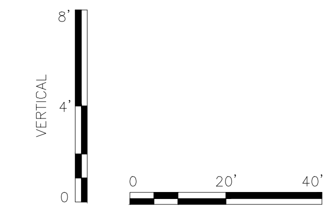
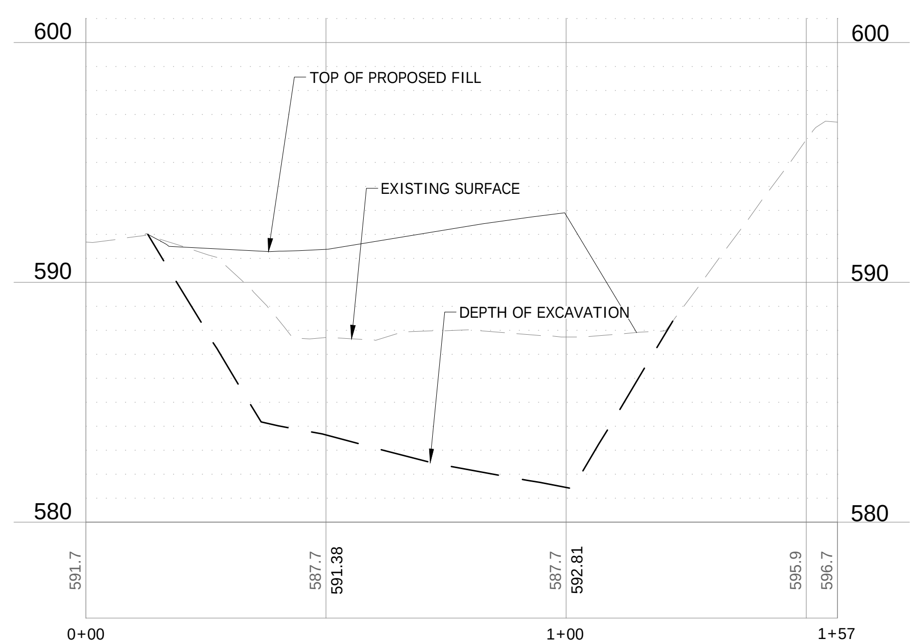
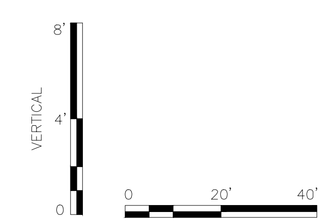




EAST-WEST EXCAVATION PROFILE





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PROPOSED GRADING PROFILES

RIVER POINT - WATERFRONT
CITY OF MANITOWOC
MANITOWOC, WISCONSIN

DATE OF ISSUANCE
12/14/2022

NO	REVISION	DATE

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DESIGNED	XXX
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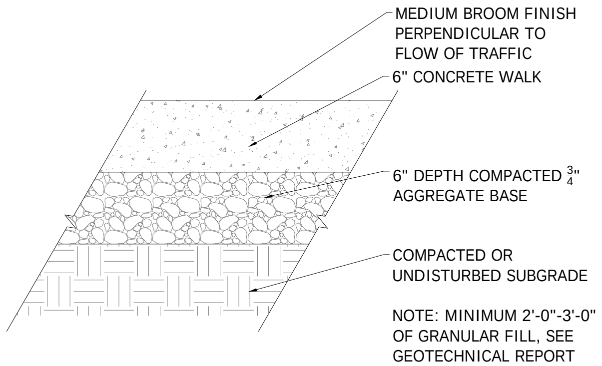
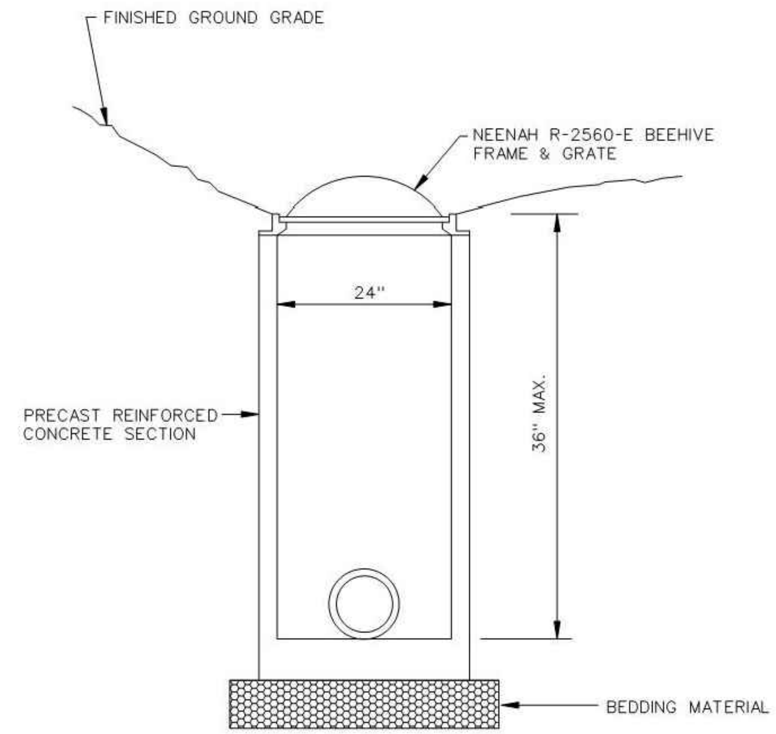
APPROVED	###
PROJ. NO.	193805824

SHEET NUMBER
C3.03



NOTE: MINIMUM 2'-0"-3'-0" OF GRANULAR FILL, SEE GEOTECHNICAL REPORT



NOTES:

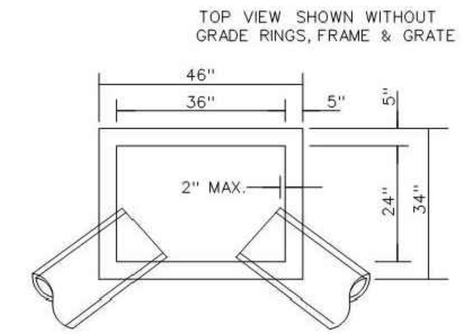
1. THE MAXIMUM DEPTH OF THE STRUCTURE SHALL BE THREE (3') FEET.

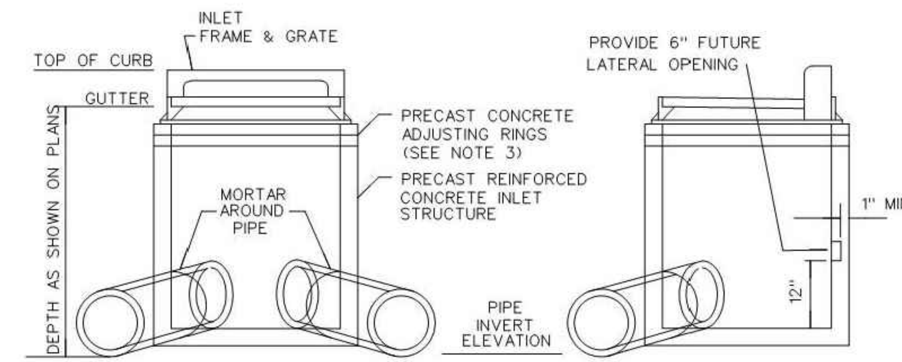
NO SCALE

TYPE 1
FIELD CATCH BASIN / INLET

City of Manitowoc
ENGINEERING DEPARTMENT

Rev. 4/05 | FORM NO. 411





NOTES

1. CATCH BASIN AND INLET STRUCTURES SHALL BE PLACED ON AT LEAST 8" OF BEDDING MATERIAL CONFORMING TO WSWS.8.43.2 FOR DRY SUBGRADE AND WSWS 8.43.6 FOR WET SUBGRADE.

2. CONCRETE AND STEEL REINFORCEMENT SHALL CONFORM TO ASTM C-478 REQUIREMENTS.

3. PRECAST REINFORCED CONCRETE ADJUSTING RINGS SHALL BE USED TO ADJUST THE FRAME TO THE REQUIRED GRADE. A MINIMUM OF 4" A MAXIMUM OF 10" OF ADJUSTING RINGS AND MORTAR SHALL BE USED FOR THE ADJUSTMENT. MORTAR OR FLEXIBLE SEAL SHALL BE ⅜" MINIMUM THICKNESS BETWEEN EACH RING, RING AND STRUCTURE, AND RING AND FRAME. THE THICKNESS OF EACH GRADE RING SHALL RANGE FROM 2" MINIMUM TO 6" MAXIMUM. USE NO MORE THAN TWO (2) OF THE 2" SIZE OF GRADE RINGS PER STRUCTURE. GRADE RINGS SHALL BE REINFORCED WITH AT LEAST ONE RING OF STEEL REBAR CENTERED WITHIN THE RING. SPLIT RINGS ARE NOT ALLOWED.

4. THE HEIGHT OF INDIVIDUAL RISER SECTIONS SHALL BE SELECTED TO MINIMIZE THE NUMBER OF RISER JOINTS LOCATED BETWEEN THE TOP OF THE STRUCTURE AND THE BOTTOM OF THE COLUMN OF GRADE RINGS.

5. THE ENTIRE SPACE BETWEEN THE PIPE LEADS AND THE PRECAST CATCH BASIN OR INLET SHALL BE MORTARED OR CONCRETED IN PLACE BY THE CONTRACTOR. SOLID CONCRETE BRICKS MAY BE USED AS A FILLER.

6. THE FRAME OF THE CATCH BASIN (OR INLET) SHALL NOT EXTEND MORE THAN 1 1/2" BEYOND THE INNER OR OUTER EDGES OF THE CATCH BASIN (OR INLET) STRUCTURE.

NO SCALE

TYPE 3
STANDARD PRECAST INLET

City of Manitowoc
ENGINEERING DEPARTMENT

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CONSTRUCTION DETAILS

RIVER POINT - WATERFRONT
CITY OF MANITOWOC
MANITOWOC, WISCONSIN

DATE OF ISSUANCE	
12/14/2022	

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SURVEY	XXXXXXXX
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PROJ. NO.	193805824

SHEET NUMBER
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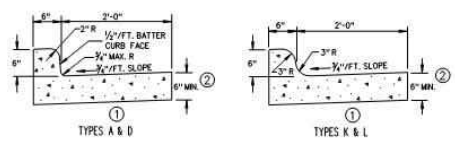
Plot Date: 12/14/2022 - 12:02pm
Drawing name: C:\pw_stn_bh_infra01\d0162326\193708490_C800.dwg
Xrefs:, Border, Concrete Walk Section

CONCRETE CURB & GUTTER AND PAVEMENT TIES



GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE CONTRACT.

PAVEMENT TIES AND TIE BARS SHALL BE EPOXY COATED IN CONFORMANCE WITH SUBSECTION 505.2.6.2 OF THE STANDARD SPECIFICATIONS.

INTEGRAL CURB & GUTTER SHALL CONFORM TO THE DETAILS SHOWN FOR CONCRETE CURB & GUTTER INCLUDING THE TRANSVERSE GUTTER SLOPE. A LONGITUDINAL CONSTRUCTION JOINT IS NOT REQUIRED WITH INTEGRAL CURB AND GUTTER.

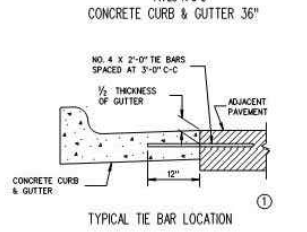
WHERE THE TRANSVERSE JOINTS IN THE PAVEMENT ARE REQUIRED TO BE SEALED, THE JOINTS IN THE INTEGRAL CURB AND GUTTER SHALL BE SEALED TO THE FACE OF CURB WITH THE SAME TYPE OF SEALANT. THE COST OF FURNISHING AND INSTALLING THIS SEALANT SHALL BE INCIDENTAL TO THE ITEM CONCRETE CURB AND GUTTER.

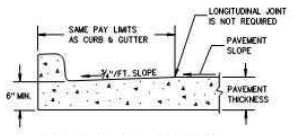
UNLESS OTHERWISE SHOWN ON THE TYPICAL CROSS SECTIONS, THE BASE COURSE AND UNCLASSIFIED EXCAVATION LIMITS ARE 2'-0" BEHIND THE BACK OF CURBS.

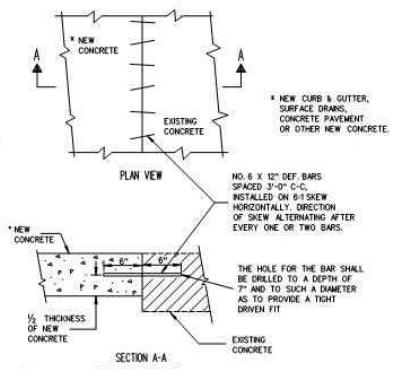
① TIE BARS ARE REQUIRED FOR CURB AND GUTTER TYPES A, G AND K.

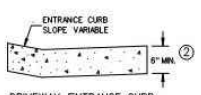
② THE BOTTOM OF CURB AND GUTTER MAY BE CONSTRUCTED EITHER LEVEL OR PARALLEL TO THE SLOPE OF THE SUBGRADE OR BASE COURSE PROVIDED A 6" MINIMUM GUTTER THICKNESS IS MAINTAINED.

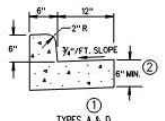
③ WHEN REVERSE SLOPE GUTTER IS REQUIRED, THE LOCATION(S) WILL BE SHOWN ELSEWHERE IN THE PLAN.

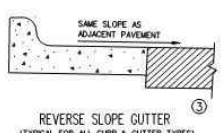


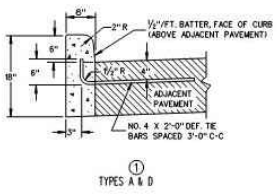


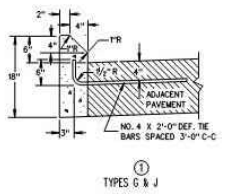












CONCRETE CURB

NO SCALE

FORM NO. 501

Rev. 4/05

City of Manitowoc
ENGINEERING DEPARTMENT

SHEET NUMBER C8.02

PROJ. NO.	193805824
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CONSTRUCTION DETAILS

RIVER POINT - WATERFRONT
CITY OF MANITOWOC
MANITOWOC, WISCONSIN

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