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Grant Report

SECTION 319 NONPOINT SOURCE POLLUTION CONTROL PROGRAM WATERSHED PROJECT FINAL REPORT

Hickory Creek Green Infrastructure Phase 1 Implementation
Will/Cook County

October 18, 2018
File No. 81.0220157.03

PREPARED FOR:
Hickory Creek Watershed Planning Group
New Lenox, IL

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Via Email

Date: October 18, 2018

Scott Ristau
Illinois Environmental Protection Agency
Bureau of Water, Watershed Management Section
1021 N. Grand Ave. East
Springfield, Illinois 62702

Re: Section 319 NPS Control Program Watershed Project Final Report
Hickory Creek Green Infrastructure Phase 1 Implementation
Hickory Creek Watershed Planning Group
1 Veterans Pkwy
Joliet, IL 60451

Dear Scott Ristau,

The Hickory Creek Watershed Planning Group (HCWPG) is herein submitting a Clean Water Act Section 319 Nonpoint Source Pollution Control Program Watershed Project Final Report. The Hickory Creek Green Infrastructure Phase 1 Implementation project included three streambank stabilization and sustainable design projects within Hickory Creek Watershed.

The proposed Best Management Practices (BMPs) aligned with the recommendations cited in the 2011 Hickory Creek Watershed Plan including incorporating streambank restoration and bioswales to improve habitat for aquatic life and HCWPG's broader goal of improving water quality.

Enclosed is the final report and supporting documentation, including photo logs and final engineering plans. On behalf of HCWPG, thank you for the funding support for implementing BMPs in Hickory Creek Watershed to reduce nonpoint source pollution and achieve water quality goals.

Sincerely,

Will Nash, President of HCWPG

wnash@newlenox.net

Dr. Lindsay Birt, Watershed Coordinator

Lindsay.birt@gza.com

SECTION 319 NONPOINT SOURCE POLLUTION CONTROL PROGRAM

WATERSHED PROJECT FINAL REPORT

Hickory Creek Green Infrastructure Phase 1 Implementation

by

Hickory Creek Watershed Planning Group

October 18, 2018

This project was conducted in cooperation with the State of Illinois and the United States Environmental Protection Agency, Region 5.

Agreement # (Grant Program): 3191606 (Section 319)

October 18, 2018
Hickory Creek Watershed Planning Group (HCWPG)
81.0220157.03

EXECUTIVE SUMMARY

PROJECT TITLE:	New Lenox VFW Streambank Stabilization	East Branch of Marley Creek Streambank Stabilization	Washington Street Streambank Stabilization
PROJECT START DATE	2/1/2017	1/5/2018	4/20/2018
PROJECT COMPLETION DATE	6/20/2018	10/15/2018	6/29/2018
FUNDING			
TOTAL BUDGET	$167,746.00	$126,071.00	$234,738.00
BUDGET REVISIONS	+ $9,010.60		+ $94,427.00
TOTAL EPA GRANT	$100,647.60	$49,560.00	$61,959.00
TOTAL EXPENDITURES OF EPA FUNDS	$100,647.60	$49,560.00	$61,959.00
TOTAL MATCH SECURED	$76,109.00	$76,511.00	$267,206.00
TOTAL EXPENDITURES	$176,756.00	$126,071.00	$329,165.00
GRAND TOTAL	**$631,992.00**		

SUMMARY OF ACCOMPLISHMENTS

Hickory Creek Watershed Planning Group (HCWPG) administered the implementation of three projects under the Illinois Environmental Protection Agency (EPA) 319 grant agreement. A summary of the accomplishments is included below.

New Lenox VFW Streambank Stabilization

The Veterans of Foreign Wars (VFW) Post No. 9545 is located at 232 Old Hickory Road in New Lenox, Will County, Illinois 60451. The VFW property includes the building, parking lot, lawn, picnic shelter, and approximately 475 feet of streambank along Hickory Creek. The Best Management Practices (BMPs) implemented include:

- 475 linear feet (LF) of streambank stabilization
- 250 LF of bioswales
- 0.19 Acres of restoration of riparian corridor

East Branch of Marley Creek Streambank Stabilization

The project area is located at 18850 Crystal Creek Drive in Mokena, Will County, Illinois 60448. The project area includes 130 LF of streambank along East Branch of Marley Creek, adjacent to a prairie nature area, recreational trails, and residential area. Project BMP implementation included:

- 130 LF of streambank stabilization

Washington Street Streambank Stabilization

The Washington Street Streambank Stabilization project is located at 921 Washington Street in Joliet, Will County, Illinois 60433. The project area is located near the Joliet Water & Sewer Service Center and adjacent to the mainstem of Hickory Creek. The BMPs implemented include:

- 460 LF of streambank stabilization
- 1.3 Acres of native vegetation

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ACRONYMS

BMP	BEST MANAGEMENT PRACTICE
HCWPG	HICKORY CREEK WATERSHED PLANNING GROUP
H&H	HUFF & HUFF INC., A SUBSIDIARY OF GZA
HUC	HYDROLOGIC UNIT CODE
NPS	NONPOINT SOURCE
O&M	OPERATION & MAINTENANCE
STEPL	SPREADSHEET TOOL FOR ESTIMATING POLLUTANT LOAD
SWCD	SOIL & WATER CONSERVATION DISTRICT
VFW	VETERANS OF FOREIGN WARS

1.0 INTRODUCTION

In 2018, Hickory Creek Watershed Planning Group (HCWPG) implemented Best Management Practices (BMPs) at three sites within the Hickory Creek watershed. The BMPs include streambank stabilization to prevent erosion and reducing suspended solids in stormwater, critical area native planting and vegetated terraces to increase infiltration, and bioswales to reduce nonpoint source pollution from stormwater runoff. The three sites are listed below:

- Site 1- New Lenox Veterans of Foreign Wars (VFW) Streambank Stabilization, New Lenox, IL (Hydrologic Unit Code (HUC) 12: 0712000406)
- Site 2- East Branch of Marley Creek Streambank Restoration, Mokena, IL (HUC 12: 0712000406)
- Site 3- Washington Street, City of Joliet, IL (HUC 12: 0712000406)

An Operation & Maintenance plan was developed for each project area to ensure BMPs and vegetation are properly installed and maintained. Water quality monitoring at a watershed scale was administered by the HCWPG. In addition, the HCWPG implemented a public outreach program, known as Bio-Blitz, to educate the watershed community on how aquatic communities are indicators of water quality and on the importance of environmental stewardship.

2.0 BACKGROUND

The HCWPG is taking a voluntary approach to address nutrient loss and stormwater runoff within the Hickory Creek watershed[1]. Through stakeholder engagement and ongoing education, HCWPG identified high priority projects to implement a comprehensive suite of BMPs for reducing nonpoint source pollutant loads, manage stormwater runoff, and improve water quality and habitat. As noted in the 2011 Hickory Creek Watershed plan, much of the watershed is densely developed, and over time public infrastructure and facilities will require rehabilitation or replacement. As part of the HCWPG's implementation process, opportunities to integrate BMPs into the rehabilitation and replacement of public infrastructure were also considered.

HCWPG prioritized projects and recognized that the initial list of implementation projects in the watershed plan did not encompass enough projects to address excess sedimentation in the impaired streams. As a result, HCWPG amended the watershed plan to include additional projects, with the goal of preventing erosion and reducing total suspended solids in the streams (HCWPG Watershed Plan-DRAFT Chapter 4, 2014).

In 2015, a request for proposal was released by the HCWPG to determine which preliminary list of projects would be feasible and economically viable with identified local match. Three streambank stabilization/ shoreline protection project sites (New Lenox VFW, Prestwick in Frankfort, and Washington Street in Joliet) were selected by HCWPG to address nonpoint source pollution and stormwater management. In 2017, the Prestwick Country Club Executive Board decided to not pursue the project. Hickory Creek Watershed Group identified a comparable streambank stabilization project within the Hickory Creek Watershed (HUC 12: 0712000406) in Mokena, Illinois. The Village of Mokena pursued the implementation of the streambank stabilization project on their property along East Branch of Marley Creek in Crystal

[1] IEPA. 2015. Illinois Nutrient Loss Reduction Strategy. Illinois Environmental Protection Agency. DRAFT. Available at: http://www.epa.state.il.us/water/nutrient/documents/illinois-nlrs-public-comment-11-20-14.pdf.

Creek Nature Area. HCWPG's goal was to have these three proposed BMPs be demonstration sites to encourage future implementation of BMPs within Hickory Creek Watershed. A list of BMPs implemented are provided in Table 1.

3.0 NEW LENOX VFW: STREAMBANK STABILIZATION

(Prepared by Living Waters Consultants, Inc. and edited by Huff & Huff, Inc. (H&H), on behalf of Hickory Creek Watershed Planning Group and New Lenox VFW)

3.1 PROJECT GOALS, OBJECTIVES, AND ACTIVITIES

The New Lenox VFW is a 501(c)(3) non-profit organization dedicated to providing financial, social, and emotional support to members of the Armed Forces, veterans, and their dependents. Post No. 9545 is located at 232 Old Hickory Road in New Lenox, Will County, Illinois 60451. The New Lenox VFW property is located on the northwest corner of Old Hickory Road and North Vine Street and is bordered to the north by Hickory Creek. The VFW property includes the building, parking lot, lawn, picnic shelter, and approximately 475 feet of streambank along Hickory Creek. Selected stream stabilization techniques included 475 LF of streambank stabilization, and 250 LF of bioswale installation. Streambank stabilization included rock toe, re-shaped slopes, rock points, bioswales, native plantings, and other measures. Installed stream stabilization techniques have provided effective and environmentally sound bank protection and channel stability for the project reach. Selected nonpoint source pollutant loading reduction benefits from streambank stabilization include but are not limited to the following: Sediment Load Reduction = 40.4 tons/year; Total Phosphorus Reduction = 40.4 lbs/year; and Total Nitrogen Reduction = 80.8 lbs/ year. The VFW is providing long-term maintenance for this project site. Public involvement to date includes public meetings, outreach to adjacent homeowners, outreach to the Village of New Lenox officials, and numerous vehicular and pedestrian passersby near existing signage.

3.1.1 Evaluation of Goal Achievement

The improvements at the VFW in New Lenox, Illinois is aligned with HCWPG's watershed management plan goal to stabilize streambanks from erosion and nonpoint source pollution. The 2011 Hickory Creek Watershed plan (amended in June 2014), identified "bio-technical" streambank restoration measures to prevent further erosion, reduce nonpoint source pollution, and improve habitat along Hickory Creek in New Lenox (Page 4-21, Project Site No. 22-B).

3.2 BEST MANAGEMENT PRACTICES DEVELOPED AND/OR REVISED

The New Lenox VFW Streambank Stabilization (Project Site) design, engineering, survey, native planting selection, construction observation, and maintenance observation were provided with assistance from Living Waters Consultants. Initial project management and wetland permitting assistance was provided by Planning Resources, Inc. The VFW provided project oversight, construction observation, coordination, and contract administration. Encap, Inc. provided construction services and is under contract to provide a minimum of 3 years of site maintenance. The BMPs described below were utilized to restore the riparian corridor and to stabilize the streambanks of the Project Site.

Project Site construction was substantially complete in October 2017. One extreme flood event (approximately 50-year return period considering flood elevations) occurred February 2018. Following flooding, erosion blanket needed to be replaced and re-seeded in some areas. Rock toe was also expanded in some areas such as near the parking lot where the bank width is more constricted, and scouring is higher. Temporary cover crop became established May 2018. Final planting installations were installed June 2018. Observations suggest that the banks are well protected, and erosion has been greatly reduced. Selected vegetation replacement of turf grass with native species in the 0.19-acre riparian area

also substantially reduces the loss of bank soils and promotes bank soil stability. Native riparian plantings reduce sheet erosion within the flood zone. Rock points have functioned as intended to maintain flow deflection away from the bank. Some onsite habitat areas, such as an existing island, have become cultivated with native plant species following initial native plant maintenance. These measures significantly reduce nonpoint source pollutant loadings to the downstream Hickory Creek. Photos of pre- and post-construction are provided in Appendix A.

3.2.1 Restoration of Riparian Corridor

The Project Site included vegetation management with replacement of 0.19 acres of turf grass with native plants. The replacement of undesirable vegetation with native species prevents loss of bank soils and promotes bank stability. This reduces nonpoint source pollutant loadings to Hickory Creek located directly adjacent to the Project Site. Replacement of invasive species with native tree grasses and forbs promotes filtration and assimilation of nutrients, as well as contaminated runoff that can be discharged from surrounding upland areas. Aquatic habitat along the Hickory Creek riparian corridor was enhanced and diversified.

3.2.2 Rock Toe Rock Points and Re-shaped Slopes (475 LF)

Streambank stabilization was provided to prevent additional soil pollutant transport to Hickory Creek. Most of the Project Site contained moderate to severe erosion. In all areas, the streambank toe of slope was protected with rock toe. Above the rock toe, slopes were re-shaped to a stable slope (typically 3:1 H:V or flatter) and stabilized using erosion blanket (NAG SC150-BN). All slopes were stabilized with native plant seed, native plant plugs, and erosion blanket. Fifteen (15) rock points were constructed adjacent to installed rock toe. Rock toe structures deflect flows away from the eroding banks. They also provide a stable mass at the base of the slope to prevent bank slumping and sliding of saturated soils. This type of soil stabilization facilitates the establishment of native plantings. The rock helps to protect against bank erosion. Final engineering design plans are provided in Appendix B.

3.3 MONITORING RESULTS

3.3.1 Pollution Reduction

Implementation of the BMPs at the Project Site has been estimated to have reduced pollutant loading into Hickory Creek. The estimated load reductions are described below.

Pollutant Reduction from Streambank Stabilization & Rock Points:

- Sediment Load Reduction = 40.4 tons / year.
- Total Phosphorus Reduction = 40.4 lb / year.
- Total Nitrogen Reduction = 80.8 lb / year.

In addition, bioswale pollutant load reductions based on runoff from 3 acres of residential area and the VFW parking lot runoff include TSS reduction of 337 lbs/yr, BOD reduction of 17 lbs/yr, and COD reduction of 85 lbs/yr (see Table 2).

3.3.2 Habitat and Riparian Benefits

The following habitat and riparian benefits have occurred. Selected vegetation replacement of non-native species with native grasses and forbs will protect and diversify the wildlife habitat corridor along Hickory Creek. The proposed plant species also increase the diversity of foraging opportunities for wildlife.

The density of native forbs and grasses enhances pollutant filtration and assimilation of nutrients, as well as contaminated runoff discharged from surrounding upland areas, or through the Project Site. Native groundcover such as grasses and forbs are particularly efficient at trapping sediment in the uptake of phosphorus and nitrogen nutrients within the waterway. These measures increase the uptake of nitrogen from shallow groundwater, improving water quality of the stream.

The planting plan helps to restore in-stream vegetative cover by encouraging partial sunlight penetration into the water column to enhance growth of shoreline forbs and grasses. This enhances the function of in-stream habitat conditions.

3.3.3 Operation and Maintenance Plan

The annual Operation and Maintenance (O&M) cost for each of the first three years has been calculated to be $3,200. Maintenance efforts are likely higher during the first three years for native plant maintenance and nuisance weed control as the native plantings become established. Thereafter, it is likely that annual maintenance costs will be lower. Native plant maintenance is required to prevent undesirable vegetation from taking over the establishing native plants. Costs for O&M shall be paid by the Owner, the VFW. The maintenance schedule through 2026 is shown in Table 3.

3.3.3.1 Responsibilities

The VFW and their designated Representative shall be responsible for Project Site maintenance. Participating parties include the Owner's Representative, professional Contractor services support, or possibly staff of the VFW.

3.4 COORDINATION EFFORTS

Significant coordination occurred among the following project partners: New Lenox VFW, Living Waters Consultants (Engineer), HCWPG, Planning Resources (Wetland Consultant), Encap (Contractor), Village of New Lenox, Will County Land Use Department, Will / South Cook Soil and Water Conservation District (SWCD), and others. The Village of New Lenox was instrumental in assisting with the disposal of excess soil cut from the site. Coordination included numerous VFW Board meetings, HCWPG meetings and presentations, funding coordination, construction-related meetings, and native plant maintenance meetings.

3.4.1 Other Sources of Funding

As mentioned above, the Village of New Lenox provided disposal of excess soil cut from the site during construction. Funding assistance in the amount of $22,500 was received from the Will / South Cook SWCD. Funding assistance in the amount of $20,670 was received from the Will County Land Use Department.

3.5 PUBLIC OUTREACH/EDUCATION

Project signage placed at the Project Site is being utilized to notify VFW members, pedestrians, and visitors regarding the project, funding sources, and proposed improvements and activities. The Project Site likely receives hundreds of visitors annually. Many residents and visitors use the sidewalks along the Hickory Creek stream corridor which further enhances community educational outreach from the Project Site.

The VFW has been active with outreach and educational efforts over the last few years. A list of outreach activities includes the following:

- Conducting public meetings for residents along the Project Site;
- Educating homeowners and acquiring landowner signoffs for the proposed work in the common area;
- Contacting landowners along the Project Site and the community to notify them of the Project's goals and objectives and the work conducted;
- Conducting additional outreach / educational efforts presented in VFW Board meetings and provided in VFW newsletter updates;
- Meeting with the Village of New Lenox Public Works Department officials to review project restoration efforts and related benefits and to coordinate for the Project Site; and,
- Posting of a project description on the VFW website is being undertaken.

3.6 PROJECT MODIFICATIONS/ASPECTS OF THE PROJECT THAT DID NOT DO WELL

See Section 3.2 Best Management Practices Developed and/or Revised above.

3.7 FUTURE ACTIVITY RECOMMENDATIONS

Given that this was the first Illinois EPA Section 319 Grant received by the VFW, they did a remarkable job in educating their members over a relatively short time period. Significant and multi-faceted support was provided by several VFW members ranging from Frank Novak, to Commander Paul Barclay, to Quartermaster Larry Paveza. These members also were able to attend some of the HCWPG meetings and to learn about water quality improvement and the grant process. The HCWPG, including Dr. Lindsay Birt, provided significant assistance with grant application review, project coordination, and grant assistance support.

3.8 CONCLUSIONS

The project has provided educational opportunities for the public and serves as a highly visible demonstration project for green infrastructure. The VFW has held numerous member meetings regarding the project. The Project Site is being utilized as part of HCWPG's Bio-Blitz, an educational event where students and volunteers learn how biological diversity prior to implementation of the project can be compared to biological diversity in subsequent years post-implementation to better understand environmental performance of BMP implementation. Water quality sampling will also be conducted to compare pre- and post-project conditions. In addition to the schools and institutions directly involved in the project, the VFW provides an opportunity to educate a variety of visitors who may not have opportunities to see firsthand the effectiveness of green infrastructure. The most significant aesthetic concerns relate primarily to the ongoing use of the site for recreational activities, and how the height of the native plants will be managed at the site. Native plant maintenance will be essential for project success, use, and acceptance by the VFW. Low-height native plant materials were selected for the streambanks and bioswale areas. At this point, year one (1) of native plant maintenance is underway. The contractor is under contract to provide three (3) years of native plant maintenance at the Project Site.

Based on the stabilization efforts observed to date, including the growth of temporary cover crop along with native plant species, the public perception of the Project Site appears to be that the stream stabilization effort has been successful.

4.0 EAST BRANCH OF MARLEY CREEK STREAMBANK STABILIZATION

(Prepared by H&H and HR Green, on behalf of Hickory Creek Watershed Planning Group)

4.1 PROJECT GOALS, OBJECTIVES, AND ACTIVITIES

The East Branch of Marley Creek Streambank Stabilization (Project Area) is located along East Branch of Marley Creek, at the Crystal Creek Prairie Path near 191st Street and Wolf Road in Mokena, Will County, Illinois. High levels of erosion were visible through much of the project limits. To address this issue, the project included restoration of 130 linear feet (streambank and shoreline protection, BMP No. 580) of highly eroded stream bank using bio-engineering practices. Improvements included clearing, regrading, and replanting along these areas of the East Branch of Marley Creek. Photographs of the Project Area before, during, and after construction are provided in Appendix C.

4.1.1 Planned and Actual Milestones

The Project Area included 4:1 (H:V) slope on the east side of the bank to provide a bench for high flows. The newly graded banks were stabilized with native prairie grass and shrubs. The portion of the streambank which has experienced the highest level of erosion was stabilized with stone riprap from the toe of slope to the 2-year flood elevation and then native prairie grass above the 2-year flood elevation. A list of actual milestones and completion dates are provided below:

- Original concept plans developed – December 2017
- Begin construction document development – January 2017
- Competitive bid opening – May 30, 2018
- Award contract to lowest bidder – April 2018
- Permits obtained – April 2018
- Begin construction – August 2018
- Complete construction – September 2018
- Begin 10-year operations and maintenance period – September 2018
- Contractor 3-year maintenance period ends – September 2021
- 10-year O&M ends September 2028

4.1.2 Evaluation of Goal Achievement and Relationship to State NPS Management Plan

The Project Area is adjacent to natural prairie and a recreational area (Crystal Creek Prairie Path) and a residential area, which contribute nonpoint source pollutants and suspended solids. The project will reduce suspended solids, improve habitat, improve aquatic community diversity, and educate the community on green infrastructure and native vegetation – all relevant goals of HCWPG and the Illinois Nonpoint Source (NPS) Management Plan.

4.2 BEST MANAGEMENT PRACTICES DEVELOPED AND/OR REVISED

The Project Area design, engineering, survey, and construction observation was provided with assistance from HR Green. Project management, landscape design, native planting selection, O&M plan development, and maintenance observation was provided by H&H. The Village of Mokena provided project oversight, construction observation, coordination, and contract administration. Copenhaver Construction provided construction services and is under contract to provide a minimum of three years of site maintenance. The BMPs implemented include the following:

- Approximately 0.2 acres of invasive brush and vegetation clearing
- 0.2 acres of native prairie and wetland seeding
- 228 native plugs planted on a newly graded floodplain bench
- 54 square yards of stone riprap stabilization
- Total of over 130 linear feet of stabilized streambank

A typical cross-section was used through the project. The typical cross-sections called for the creation of a floodplain bench to be created two feet above the normal water level on the outer bank and 2.5:1 slope to be established and vegetation with native species. Below the bench was stabilized with stone riprap. The inside bend of the existing meander was graded to reduce the channelization of the stream and to provide a floodplain bench on the inner bank. Figure 1 shows the typical cross-section.

The implementation of this project has reduced the sediment and nutrient loading to the East Branch of Marley Creek, which discharges to Marley Creek and then into Hickory Creek. Final engineering design plans are provided in Appendix D.

4.3 BMP PERFORMANCE

BMP performance at the Project Area was estimated using Spreadsheet Tool for Estimating Pollutant Load (STEPL) model[2]. The estimated pollutant load reductions are described below:

Pollutant Reduction from Streambank Stabilization:

- Total Phosphorus Reduction = 24 lb / year
- Total Nitrogen Reduction = 48 lb / year
- Sediment Load Reduction = 24 tons / year

4.3.1 Operation and Maintenance Plan

The Village of Mokena is committed to a 10-year O&M agreement and proposes to implement a two-phase approach to O&M as part of the IEPA 319 grant award. During the first year after restoration, more intensive management is expected to be necessary to control weedy invasive plants. Conducting site inspections is essential to take appropriate actions on a timely basis. Phase 2 will include annual long-term maintenance, past year one, to maintain native vegetation. An electronic reader-friendly O&M plan, prepared by H&H, will be used by the Contractor and the Village of Mokena's

[2] STEPL 4.3a. Available at: http://it.tetratech-ffx.com/steplweb/.

maintenance crew. Phase 2 will include annual long-term maintenance, past year one, to maintain native vegetation. Costs for O&M shall be paid by the Landowner, the Village of Mokena.

4.3.1.1 Responsibilities of O&M

The Contractor is responsible for the first three years of vegetation maintenance. After the first three years of maintenance, the Village of Mokena will be responsible for completing the long-term O&M. The Village typically contracts out the maintenance of their many native vegetation sites. The Village will likely partner with a contractor who specializes in the maintenance of native vegetation.

4.4 COORDINATION EFFORTS

Collaborative coordination occurred among the following project partners: Village of Mokena, HR Green (Engineer), H&H (Landscape Architect and Environmental Consultant), Copenhaver Construction (Contractor), Will County Land Use Department (Stormwater Management Planning Committee), and HCWPG. The Village of Mokena led the coordination of construction supervision and in-kind services. Additional coordination included pre-design meetings, pre-construction and construction meetings, O&M coordination, HCWPG meetings and presentations, and funding coordination.

4.4.1 Other Sources of Funding

Other funding sources were provided for the implementation of the streambank stabilization project in Mokena, Illinois. Funding assistance in the amount of $20,670 was received from the Will County Land Use Department.

4.5 PUBLIC OUTREACH/EDUCATION

The Village of Mokena, in collaboration with HCWPG, utilized the project as an opportunity to inform and educate the public about the effectiveness of BMP implementation toward improved habitat and water quality. The HCWPG established the Bio-Blitz initiative to conduct public outreach and establish a baseline aquatic community assessment, both goals in its watershed management plan. In the early fall (September) of 2017 and 2018, volunteers collected aquatic macroinvertebrates at the Project Area, in addition to other locations across Hickory Creek Watershed. Bio-Blitz energizes community interest in water quality and provides much-needed scientific data for HCWPG. Data from collection efforts will benefit the watershed group's goals of tracking effectiveness of future watershed improvements by creating a baseline condition for comparison. Results collected from the Bio-Blitz event are presented in Appendix G.

The location of the project is adjacent to a walking trail in a residential community. The Project Area will likely be utilized by neighboring residents and visitors, which further enhances community educational outreach.

Other local support and public participation for the project implementation include the following activities:

- Presented project goals and objectives at a HCWPG steering committee meeting;
- Posted project description and pre- and post-construction photos on the HCWPG geospatial tool, known as Story Map; and,
- Meeting with the Village of New Lenox Public Works Department officials to review project restoration efforts and related benefits and to coordinate for the Project Area.

4.6 PROJECT MODIFICATIONS/ASPECTS OF THE PROJECT THAT DID NOT DO WELL

The project limits increased during the design from approximately 75 linear feet to 130 linear feet, and the design was expanded to include grading on the interior bank of the bend. The project was constructed very close to plan, with no major changes to the design during construction. The only modification to the design was that one silver maple tree that was identified for removal was able to be preserved.

4.7 FUTURE ACTIVITY RECOMMENDATIONS

The Village of Mokena made a significant effort to communicate and collaborate with team members early and often to complete the streambank stabilization. Dan Peloquin (Mokena) led the team (H&H/HR Green) in design, permitting, contract bid, pre-construction meetings, construction, and post-construction. Additionally, Dan attended HCWPG meetings and participated in Bio-Blitz public education. Future activities including implementation of an additional 100 feet of streambank restoration downstream, in-stream restoration, and education signage are recommended.

5.0 WASHINGTON STREET STREAMBANK STABILIZATION

(Prepared by HR Green, edited by H&H on behalf of HCWPG and the City of Joliet)

5.1 PROJECT GOALS, OBJECTIVES, AND ACTIVITIES

The Washington Street Streambank Stabilization (Project Site) is located at 921 E. Washington Street in Joliet, Will County, Illinois. The project goal was to stabilize the southern streambank of Hickory Creek. The stabilization (460 linear feet) of this highly eroded streambank was completed to reduce the sediment and nutrient load to the Hickory Creek Watershed and its receiving waterways. This project included completing earthwork, tree clearing, stone riprap placement, and streambank stabilization using bio-engineered techniques.

5.1.1 Planned and Actual Milestones

The planned milestones included design, permitting, bidding, construction, post-construction maintenance, and public education. The actual milestones achieved were closely aligned to the planned schedule and are listed below:

- Original concept plans developed – June 2017
- Begin construction document development – December 2017
- Advertise the project for competitive bidding – February 8, 2018
- Award contract to lowest bidder – March 2018
- Permits obtained – April 2018
- Begin construction – April 2018
- Complete construction – July 2018
- Begin 10-year operations and maintenance period – July 2018

- Host educational event at the site (Joliet Bio-Blitz) – September 2018
- Contractor 3-year maintenance period ends – July 2021
- 10-year O&M ends July 2028

5.1.2 Evaluation of Goal Achievement and Relationship to State NPS Management Plan

The project achieved HCWPG's goal of stabilizing and restoring streambanks along Hickory Creek and its tributaries. These improvements help to reduce sediment and sediment-bound nutrient loading into Hickory Creek. The stone riprap, boulders, and deep-rooted native vegetation provide stable and sustainable solutions to the erosion that was occurring on the site. Photographs from before and after construction are provided in Appendix E.

5.2 BEST MANAGEMENT PRACTICES DEVELOPED AND/OR REVISED

The project included the following BMPs and activities:

- Approximately 1.3 acres of brush clearing
- 1.3 acres of native prairie and wetland seeding
- 520 square yards of stone riprap stabilization
- Total of over 400 linear feet of stabilized streambank

Two typical cross-sections were used throughout the project. Figure 2 was used to regrade the streambank and implement planting of native vegetation. The slope was stabilized with a SC-150-BN erosion blanket, cover crop, and native seed mix. In other areas, stone riprap was used in conjunction with native vegetation (see Figure 3). Final engineering design plans are provided in Appendix F.

5.3 MONITORING RESULTS

Pollutant load reduction from the project site was modeled using STEPL model[1]. The estimated BMP performance is described below:

Pollutant Reduction from Streambank Stabilization:

- Total Phosphorus Reduction = 66 lb / year
- Total Nitrogen Reduction = 133 lb / year
- Sediment Load Reduction = 66 tons / year

5.3.1 Operation and Maintenance Plan

The City of Joliet purchased this parcel of land prior to completing the streambank restoration project. Through the purchase of the site, the City has ensured that they will have continued access to the area for future maintenance. A 10-ft access gate was installed in the City's fence to allow for access to the site for maintenance needs. The first three (3) years of the project maintenance are the responsibility of the contractor who completed the streambank stabilization

construction. A maintenance bond is held by the City to ensure that the project proceeds, and that the vegetation is established and thriving. The first three years of maintenance requirements are described below:

The site visits each year shall be conducted between June 1 and September 30. Each visit shall be conducted by a qualified professional with adequate plant identification skills and who is also able to make recommendations regarding management of native plant communities and stream structure maintenance. The site inspector shall collaborate over the needed maintenance requirements for a given year with the City of Joliet and the Engineer.

5.3.1.1 Responsibilities of O&M

After the first three years of maintenance, the City of Joliet will be responsible for completing the long-term O&M. The City typically contracts out the maintenance of their many native vegetation sites. The City will likely partner with a contractor who specializes in the maintenance of native vegetation.

5.4 COORDINATION EFFORTS

This project has been a collaboration between the City of Joliet, HCWPG, H&H, Ruettiger, Tonelli & Associates, Inc., Stip Bros. Excavating, and HR Green, Inc. The City of Joliet worked with the HCWPG to identify the project and apply for the Section 319 grant. H&H led 319 grant coordination, Ruettiger, Tonelli & Associates, Inc. completed the concept design, and Stip Bros. Excavating completed construction. HR Green completed the final design, construction documents, and construction observation.

5.4.1 Other Sources of Funding

Other funding sources were provided for the implementation of the streambank stabilization project in Joliet. Funding assistance in the amount of $20,670 was received from the Will County Land Use Department.

5.5 PUBLIC OUTREACH/EDUCATION

While the project was in design phase, the City of Joliet hosted, in collaboration with HCWPG, its annual Bio-Blitz event which is an educational event open to the public. This event was hosted at 921 E. Washington Street and allowed for participants to see how highly eroded the existing bank was. This year, the 2018 Bio-Blitz was hosted in the same location and allowed attendees from the 2017 event to see how much the site changed through the restoration (See Appendix G).

5.6 PROJECT MODIFICATIONS/ASPECTS OF THE PROJECT THAT DID NOT DO WELL

The original concept design incorporated the use of gabions into the toe of slope of less than 100 feet of streambank. This technology was abandoned during the design phase. Hickory Creek experiences high flow rates and velocities during flood events, and large rip rap was assessed to be a better long-term method of stabilization rather than the originally proposed gabions. During the survey stage of the design process it was determined that it would be beneficial to stabilize more than the originally identified length of streambank. The project limits were expanded from approximately 100 linear feet to 460 linear feet. The grading of the banks to a more gradual slope and the use of riprap in key locations was constructible and has been holding up well against the erosive forces of Hickory Creek. One aspect of the design has not been doing well; the live willow stakes appear to have been eaten by beavers or musk rats. A new batch of willow stakes will be installed in spring 2019 as part of the maintenance program.

5.7 FUTURE ACTIVITY RECOMMENDATIONS

Immediately downstream from the project the banks are relatively steep and prone to erosion. The banks on the north bank across from the project site have high concentrations of invasive brush and opportunistic fast-growing trees. This is typical for this reach of the stream. The dense vegetation does not allow much light down to the ground which increases the amount of exposed soil and therefore increases the risk of erosion occurring. Invasive brush clearing, and selective tree removal may be a useful BMP to allow for light to reach the ground.

5.8 CONCLUSIONS

Overall, the project has drastically improved the condition of 460 feet of streambank along Hickory Creek. The project vegetation is established and is expected to be fully vegetated with mesic and wetland species by 2019. This stabilization also serves as an educational centerpiece to the City's annual Bio-Blitz event which allows for residents to learn more about stormwater pollution prevention and the Hickory Creek Watershed.

6.0 MEASURING PROGRESS

As part of HCWPG's implementation management strategy, the group's goal was to develop an approach to measure progress. Initially, HCWPG proposed to continue where the watershed plan stopped, by developing a technical strategy memorandum for monitoring success and sharing results with stakeholders and others to adjust, termed "Watershed Management 2.0". In 2017, the HCWPG recognized a platform was first warranted to map projects implemented spatially as a precursor to the development of a tool to measure progress. A geospatial information systems platform was developed by H&H for mapping locations of BMPs implemented, known as Hickory Creek Watershed Story Map. The story map also maps the Bio-Blitz sampling locations and results to support public education and outreach (see Figure 4). The new interactive Hickory Creek Watershed Story Map is available online and is accessible through mobile devices at:

https://gisweb.gza.com/portal/apps/Cascade/index.html?appid=4055d8bf754440c4a335ef96f820dc3e

In 2018, the HCWPG developed a geospatial platform to map instream water quality monitoring results. A beta version of Hickory Creek Water Quality Sampling Dashboard was prepared by H&H. The online tool includes current sampling locations, proposed sampling locations, water quality data, and dashboard to show trend analysis and gage performance measures (e.g. weekly chloride concentrations) (see Figure 5). The final version of the geospatial tool will be available in May of 2019.

Tables

Table 1: BMPs Implemented (Hickory Creek Watershed Planning Group)

Project Title	Applicant	Project Area	BMP Type	Length (ft)	Unit	N (lbs/yr)	P (lbs/yr)	TSS (lbs/yr)	Sediment (tons/yr)	Primary Cause[1]	2nd Cause[1]	3rd Cause[1]	Watershed Management Plan Page No.
Hickory Creek Green Infrastructure Phase 1 Implementation	Hickory Creek Watershed Planning Group (HCWPG)	VFW Streambank Stabilization, New Lenox, IL	Streambank and Shoreline Protection (580)	475	1	80.8	40.4	_	40.4	403	371	400	4-21 (Draft Appended WBP 2014)
Hickory Creek Green Infrastructure Phase 1 Implementation	Hickory Creek Watershed Planning Group (HCWPG)	VFW Streambank Stabilization, New Lenox, IL	Bioswale	250	1	4	1	337	_	462	403	138	4-18
Hickory Creek Green Infrastructure Phase 1 Implementation	Hickory Creek Watershed Planning Group (HCWPG)	East Branch of Marley Creek, Mokena, IL	Streambank and Shoreline Protection (580)	130	1	48	24	_	24	403	371	400	4-24
Hickory Creek Green Infrastructure Phase 1 Implementation	Hickory Creek Watershed Planning Group (HCWPG)	Washington Street, Joliet, IL	Streambank and Shoreline Protection (580)	460	1	133	66	_	66	403	371	400	4-21 (Draft Appended WBP 2014)
TOTAL				**1,315**	**4**	**266**	**131**	**337**	**130**				

[1]Causes to be addressed by BMP type. Specific causes: 371-Sedimentation/Siltation, 400-Fecal Coliform, 403-Total Suspended Solids (TSS), 462-Total Phosphorus, 138-Chloride

Table 2: Summary of Pollutant Load Reduction Before and After Implementation of Bioswale (New Lenox, IL)

	Load before BMP (lbs/yr)		Load after BMP (lbs/yr)		Load Reduction (lbs/yr)
BOD	33		16		17
COD	213		128		85
TSS	462		125		337
LEAD	0		0		0
COPPER	0		U		U
ZINC	1		1		1
TDS	654		U		U
TN	9		6		4
TKN	5		U		U
DP	0		U		U
TP	1		1		1
CADMIUM	0		U		U

U = Removal Efficiency for the particular BMP and constituent unavailable.
Tetra Tech. 2017. STEPL (Spreadsheet Tool for Estimating Pollutant Load) model. http://it.tetratech-ffx.com/steplweb/default.htm

Table 3: Site Maintenance Schedule (Post-Construction through 2026)

HICKORY CREEK STABILIZATION PROJECT
VFW New Lenox
May 3, 2017

Personnel:

VFW New Lenox = "VFW"
Living Waters Consultants = "LWC"
Landscape Contractor = "LC"
Volunteers = "VL"

2017 - 2026 (ongoing)

Coordinator	Patricipants	Activity	mid-April	late-May	late-June	mid-July	mid-August
VFW, VW & LWC	LWC, VFW, VW, LC	Weed-whip and Cut Natives (see Notes)	X				
VFW, VW & LWC	LWC, VFW, VW, LC	Spot Herbicide / Remove Weeds	X	X	X	X	X
VFW, VW & LWC	LWC, VFW, VW, LC	Bioengineering Materials Inspection	X				
VFW, VW & LWC	LWC, VFW, VW	Vegetation Monitoring		X		X	

Notes:
Herbicides shall be applied by a USDA-licensed applicator.
Cutting and Mowing of Native Plants should include removal of clippings from the site.

Figures

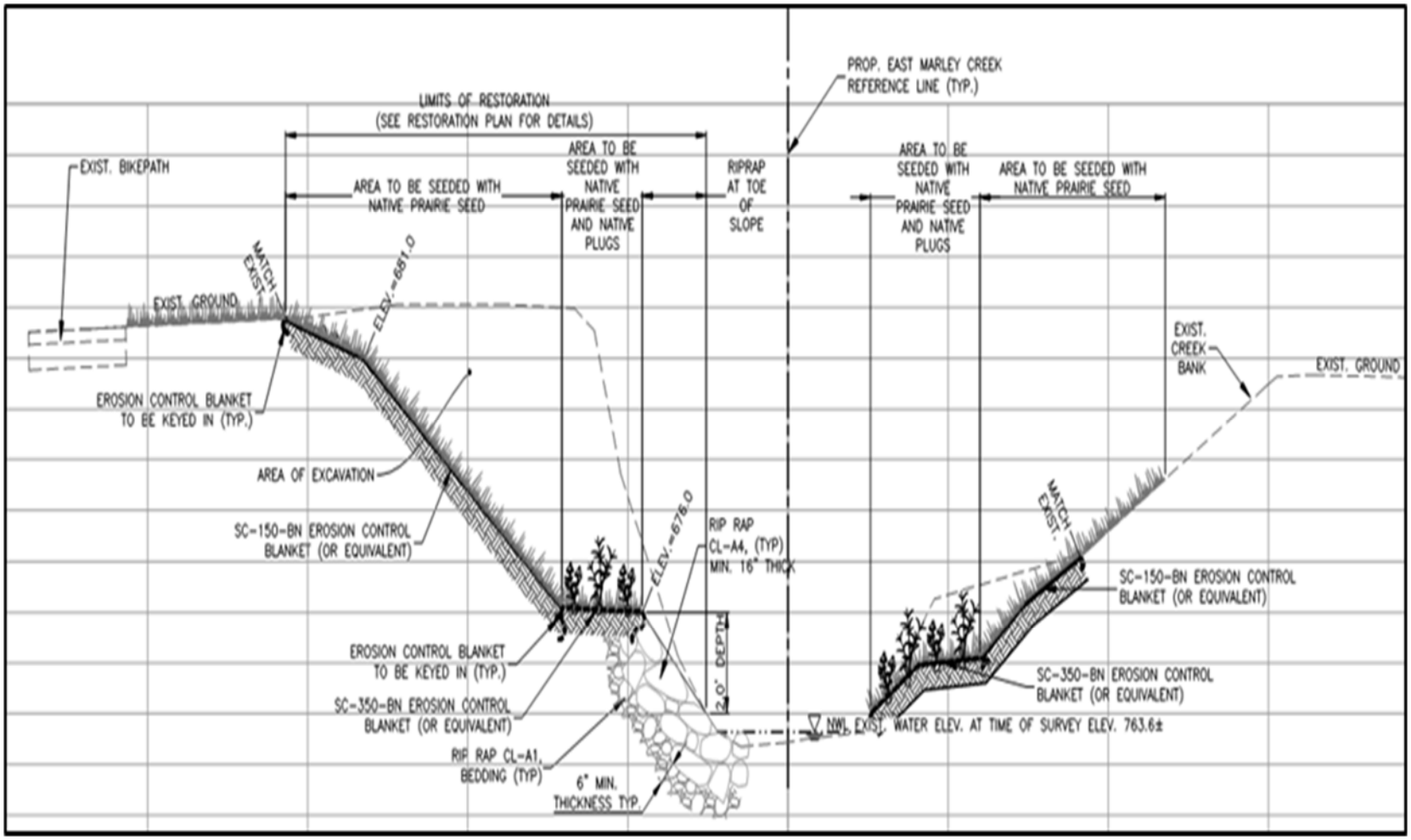


Figure 1: Typical cross-section for East Branch of Marley Creek streambank stabilization in Mokena, IL

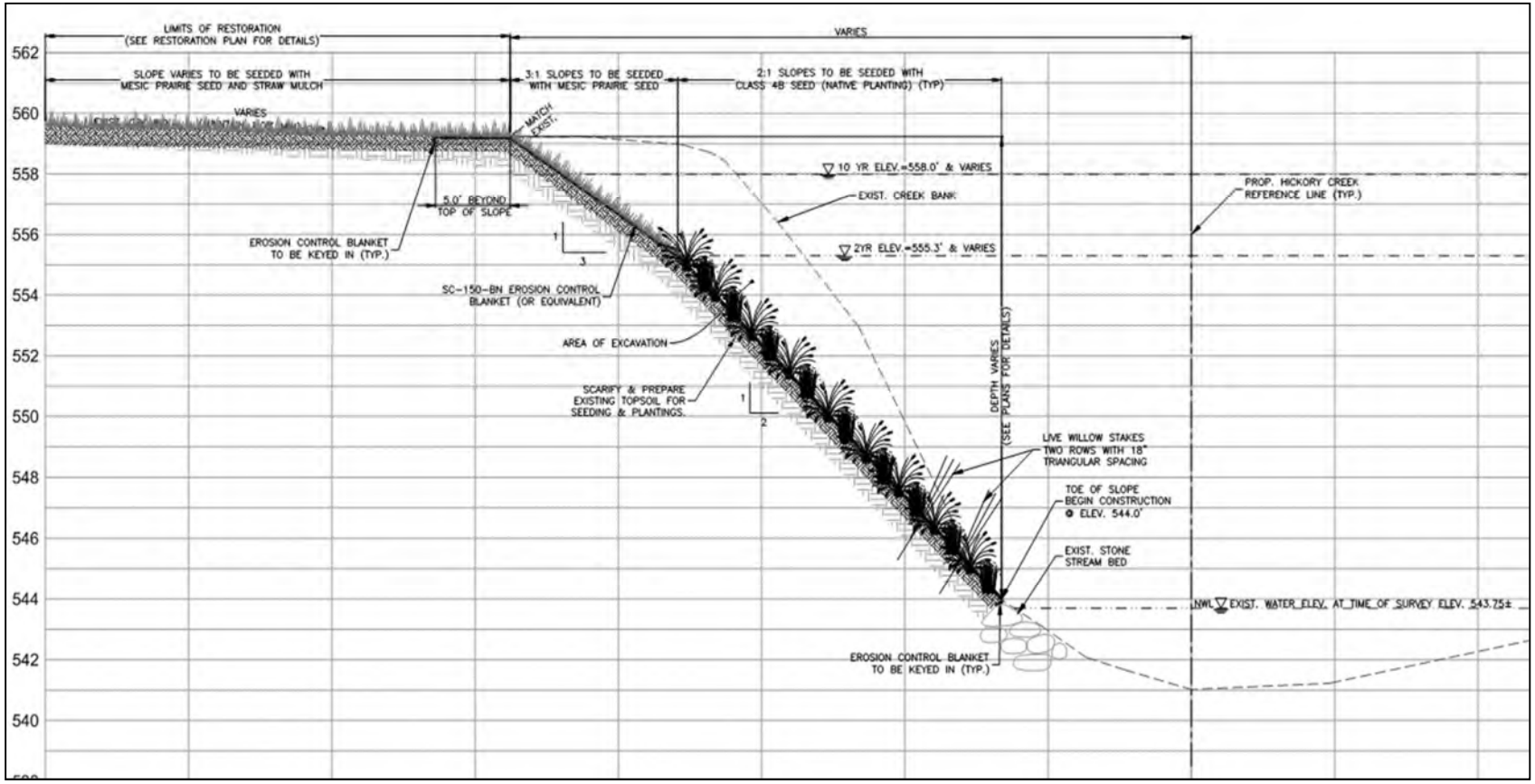


Figure 2: Typical cross-section for Washington Street in Joliet, IL.

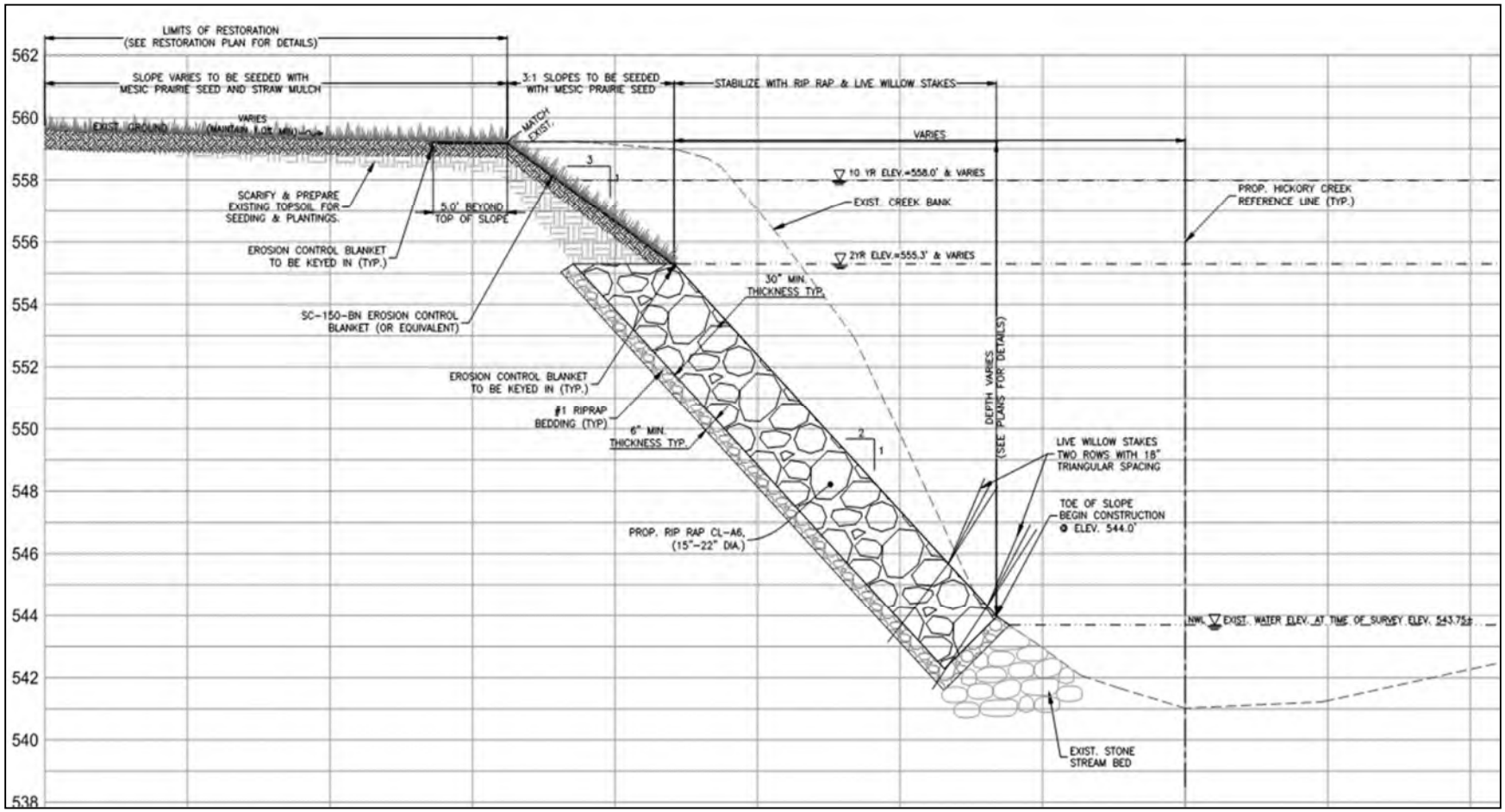


Figure 3: Cross-section B for Washington Street in Joliet, IL.

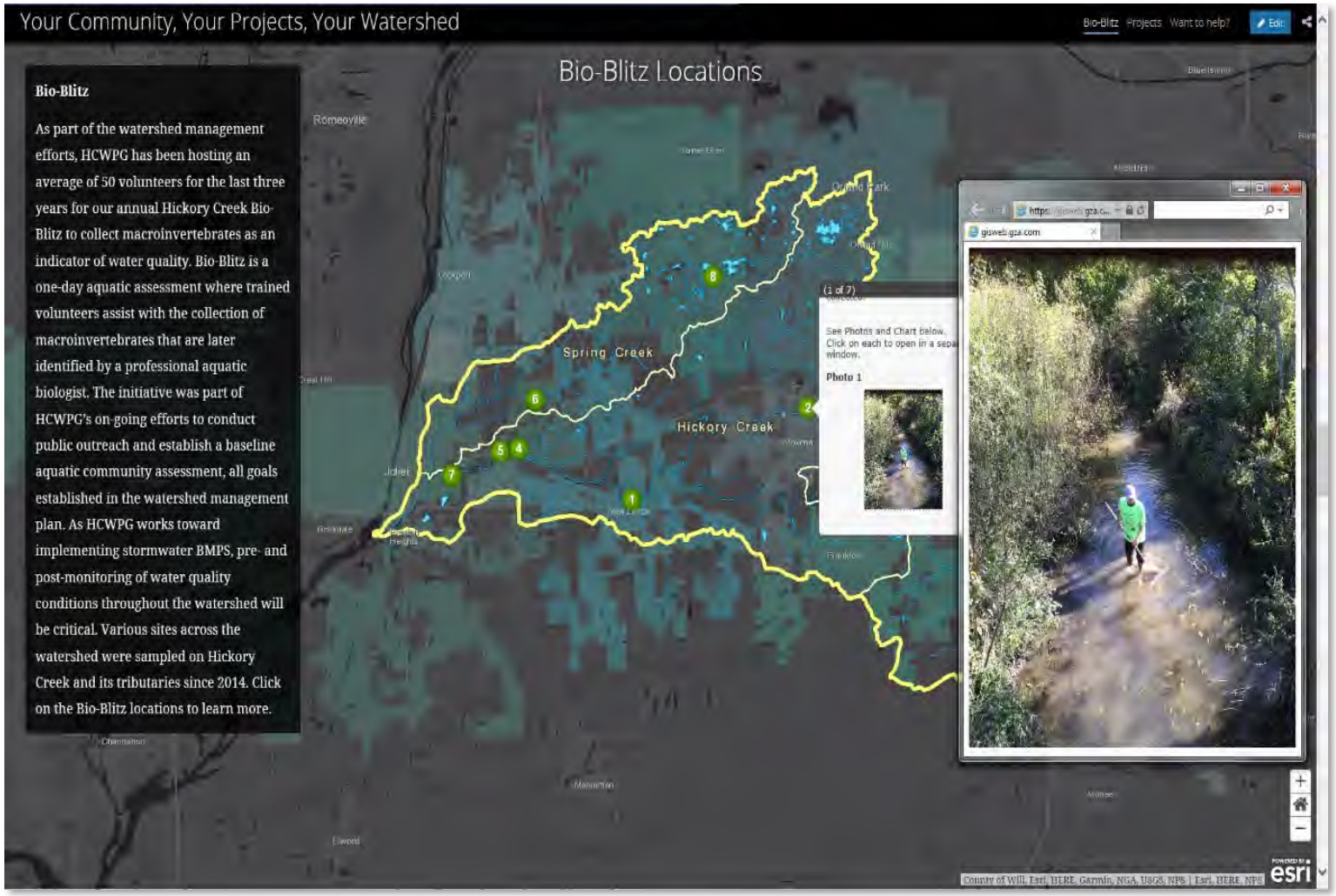


Figure 4: Hickory Creek Watershed Story Map

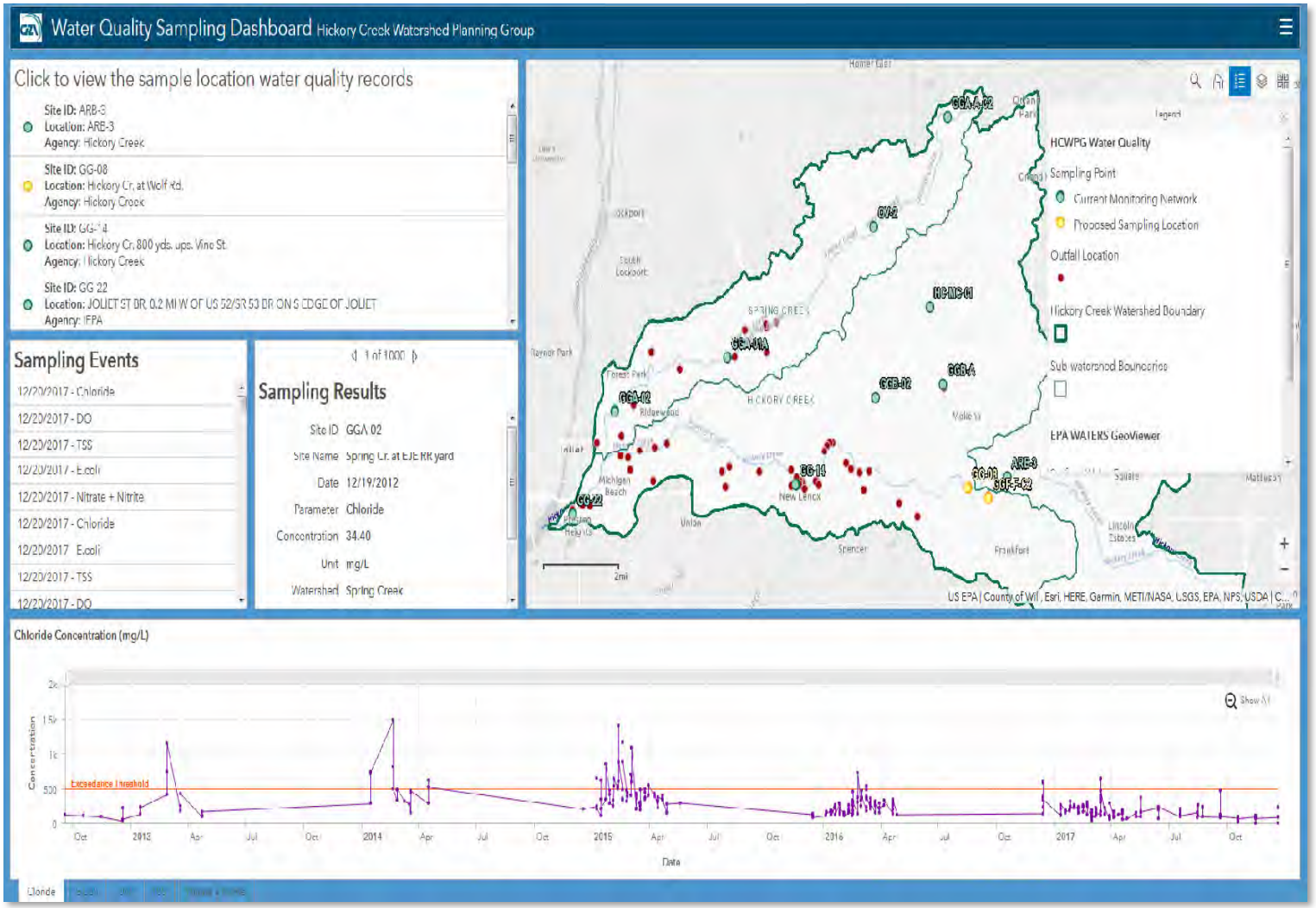


Figure 5: Hickory Creek Water Quality Sampling Dashboard (Beta Version, 2018)

Appendix A – Photos of New Lenox VFW Streambank Stabilization

Photo 1 (before, facing upstream): Significant bank erosion and sediment discharge was occurring at Hickory Creek. Several trees had also fallen into the Hickory Creek.

Photo 2: With streambank stabilization, rock toe was installed. Banks were re-shaped to 3:1 (H:V) or flatter, and planted with native plant species.

Photo 3: Upstream project site, before construction. Large chunks of concrete were becoming dislodged from the eroded bank condition.

Photo 4: Large-sized rock was needed at the upstream project site due to channel construction, and increased scour. The re-planted site attracts local fishermen and provides a recreational area for the VFW.

Photo 5: Central project site, facing downstream. Tree preservation was an important goal of the VFW.

Photo 6: Rock points help to deflect erosive flows away from the stabilized banks.

Photo 7: Downstream project site had locally severe scour. Scouring would occur along the turf grass behind the immediate shoreline area.

Photo 8: Downstream project site, after construction. Re-directing flows away from the scoured bank allowed for increased wetland formation between the streambank and the existing off-bank island.

Photo 9a and 9b: Parking lot runoff had previously scoured the turf grass, and directly discharged pollutants into Hickory Creek.

Photo 10: Bioswale with native plants in the early emergence stage, after installation of native plant plugs. The bioswale contains over 2 feet of aggregate to store, detail, and infiltrate parking lot runoff.

Photo 11: Parking lot bioswale, facing east. Rock aprons were used to control parking lot runoff as it entered the bioswale.

Photo 12: VFW members have been enthusiastic and engaged throughout the important streambank stabilization process. The project improved a vital recreational area that is being used frequently by the New Lenox VFW Post No. 9545.

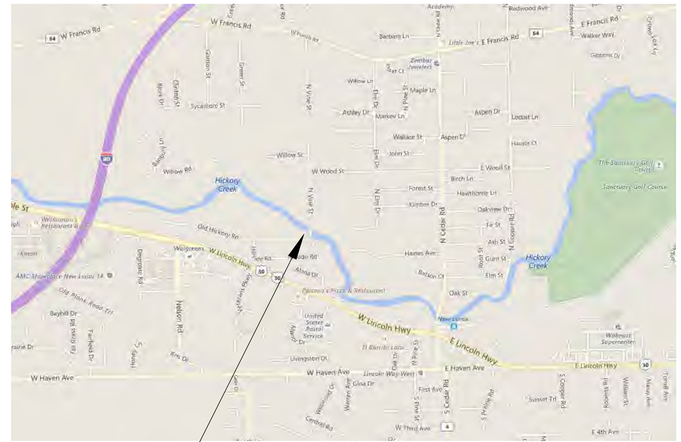
Photo 13: Secondary contact recreational activities include multiple fishermen at the project site.

Appendix B –Final Engineering Plans (New Lenox VFW Streambank Stabilization)

HICKORY CREEK STREAMBANK STABILIZATION
VFW POST NO. 9545
VILLAGE OF NEW LENOX, ILLINOIS

INDEX TO SHEETS

SHEET 1 - COVER SHEET
SHEET 2 - PLAN VIEW
SHEET 3 - CROSS SECTIONS
SHEET 4 - DETAILS
SHEET 5 - DETAILS
SHEET 6 - SPECIFICATIONS
SHEET 7 - SPECIFICATIONS
SHEET 8 - SPECIFICATIONS



PROJECT LOCATION

THE HICKORY CREEK PROJECT SITE IS LOCATED NORTH OF LINCOLN HIGHWAY (RT. 30), WEST OF N. VINE STREET, AT 323 OLD HICKORY ROAD, NEW LENOX, WILL COUNTY, ILLINOIS.

OWNER

NEW LENOX VFW NO. 9545
323 OLD HICKORY ROAD
NEW LENOX, IL 60451
PHONE: 815-715-8727
CONTACT: FRANK NOVAK

ENGINEER

LIVING WATERS CONSULTANTS, INC.
P.O. BOX 473
WESTERN SPRINGS, IL 60558
630-321-1133 OFFICE
630-321-1144 FAX
CONTACT: TED GRAY, PE, CFM, CPESC

SITE BENCHMARK

1. BENCHMARK = NATIONAL GEODETIC SURVEY #AE2575 . N 41 30 25.69745 (N); E 087 54 43.65429 (W), ELEV. (NAVD 88) 724.62 FT. STATION IS LOCATED IN THE VILLAGE OF MOKENA. TO REACH FROM INTERSECTION US 30 AND US 45, WEST 3 MI. ON US 30 TO ARROWHEAD ROAD, POINT IS IN SOUTHEAST CORNER OF INTERSECTION OF ARROWHEAD AND ENTRANCE TO SUBDIVISION. STATION IS FLUSH WITH SURFACE AND IS STAINLESS ROD WITH SLEEVE WITH CAST CAP AND LID STATION RECOVERY (2008. POINT IS AT THE SOUTHEAST CORNER OF BLUESTONE BAY DRIVE AND US RT. 30. POINT IS 32.6' NORTHEAST OF A CUT CROSS IN THE NORTHEAST FLANGE BOLT OF FIRE HYDRANT AT SAID SOUTHEAST CORNER. POINT IS ALSO 82.2' EAST OF A STREET LITE POLE AT THE SOUTHWEST CORNER OF SAID INTERSECTION. POINT ACCESS COVER IS FLUSH WITH GROUND.

NOTE: THE EXISTING TOPOGRAPHIC CONTOURS (NAVD88 DATUM) AS DEPICTED HAVE BEEN PROVIDED THROUGH THE WILL COUNTY GIS SYSTEM, ILLINOIS.

PROFESSIONAL ENGINEER'S CERTIFICATION:
THEODORE R. GRAY, A LICENSED PROFESSIONAL ENGINEER OF ILLINOIS HEREBY CERTIFIES THAT THIS SUBMISSION WAS PREPARED ON BEHALF OF LIVING WATERS CONSULTANTS, INC. UNDER MY PERSONAL DIRECTION. THIS TECHNICAL SUBMISSION IS INTENDED TO BE USED AS AN INTEGRAL PART OF AND IN CONJUNCTION WITH THE PROJECT SPECIFICATIONS AND CONTRACT DOCUMENTS.

ILLINOIS LICENSED PROFESSIONAL ENGINEER 062-060330
EXPIRES 11/30/2018

CALL JULLE TOLL FREE 800-892-0123
JOINT UTILITY LOCATING INFORMATION FOR EXCAVATORS
Call 48 hours before you dig (Excluding Sat. Sun. & Holidays)
1-800-892-0123

Living Waters Consultants, Inc. WESTERN SPRINGS, IL		
DRN	TRG	APR 10 2017
DES	TRG	APR 10 2017
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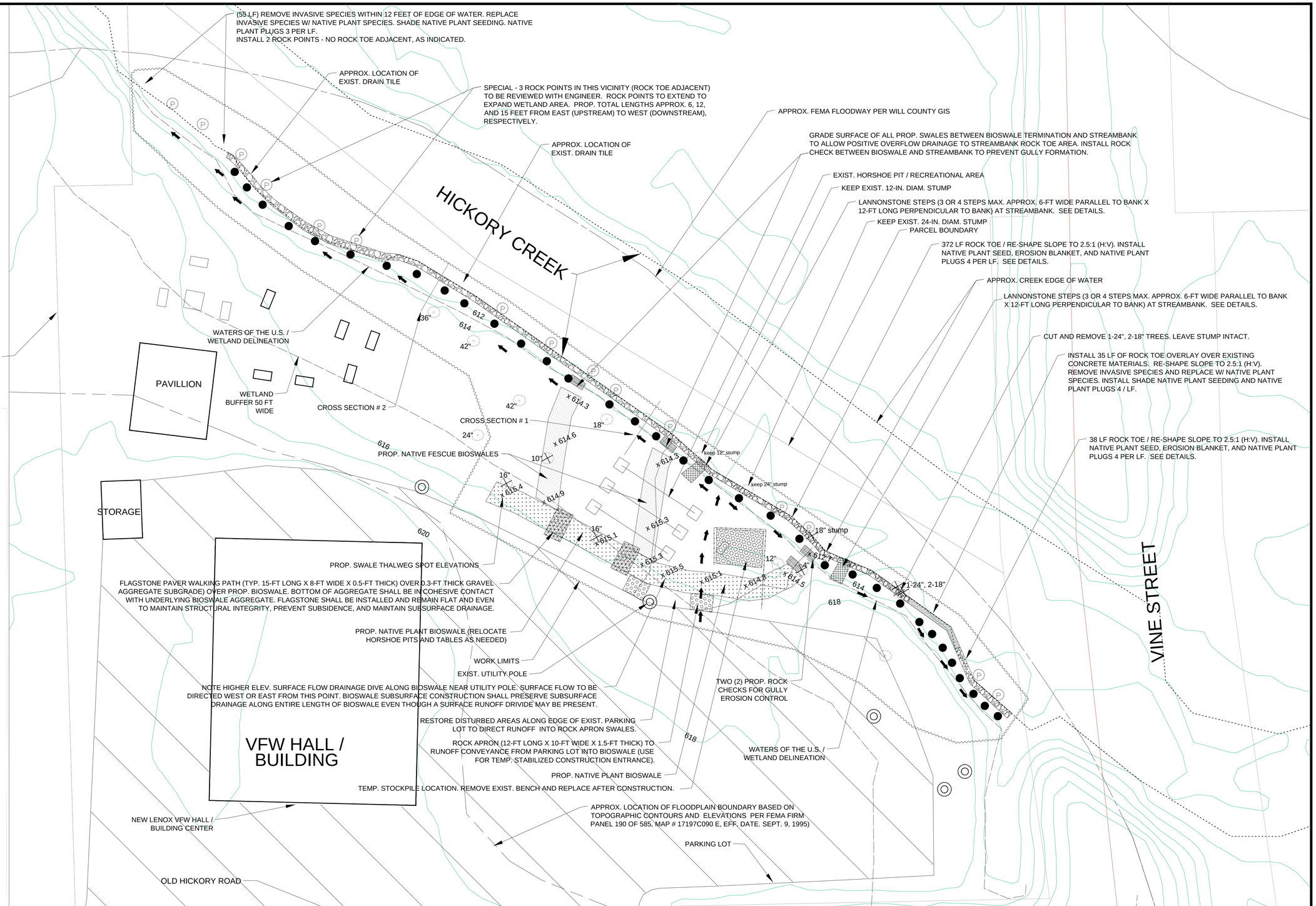
WESTERN SPRINGS, IL 60558
TEL: 630- 321-1133 FAX: 630- 321-1144

NEW LENOX VFW POST NO. 9545

SHEET 1: COVER SHEET
HICKORY CREEK STREAM STABILIZATION
VFW POST NO. 9545
SHEET 1 OF 8

NOTES:
1) INSTALL SILT FENCE AROUND ANY TEMP-ORARY SEDIMENT STOCKPILE AREAS (ABOVE BFE ELEV. 620 FT). SEE SOIL EROSION AND SEDIMENT CONTROL SPECIFICATIONS.
2) EXISTING TOPOGRAPHIC CONTOURS ARE FROM WILL COUNTY GIS SYSTEM. CONTRACTOR SHALL INDEPENDENTLY VERIFY EXISTING GRADES SO THAT THE CONSTRUCTED PROJECT DRAINS POSITIVELY AS IS INTENDED BY THIS PLAN.
3) CONTRACTOR SHALL PERFORM ALL REQUIRED SURVEY PER PLANS, DETAILS, AND SPECIFICATIONS.
4) CONTRACTOR SHALL BE RESPONSIBLE TO LOCATE PRIOR TO COMMENCEMENT OF WORK, PROTECT, AND PREVENT DAMAGE TO MARKED OR UNMARKED UTILITIES AND FACILITIES (INCLUDING BUT NOT LIMITED TO PARKING LOT, SIDEWALK, ELECTRICAL, DRAINAGE, UTILITY POLES, LIGHTING, PATIO, IRRIGATION, CABLE, SPRINKLERS, IRRIGATION LINE, GAS, PHONE, ETC.) OVER THE DURATION OF THE PROJECT THROUGHOUT THE PROJECT SITE PER PLANS AND SPECIFICATIONS. ANY DAMAGED STRUCTURES OR UTILITIES SHALL BE REPAIRED AND/OR REPLACED IMMEDIATELY BY CONTRACTOR TO THE SATISFACTION OF THE OWNER AND ENGINEER AT NO ADDITIONAL COST TO OWNER OR ENGINEER.
5) MOST EXIST. TREES ARE NOT MARKED ON PLANS. CONTRACTOR SHALL OBTAIN APPROVAL FOR TREE REMOVAL BY OWNER AND ENGINEER AND SHALL PROTECT TREES UNLESS TREES HAVE BEEN APPROVED FOR REMOVAL.
6) CONTACT ENGINEER FOR LOCAL SURVEY CONTROL SUCH AS PK NAILS IN PARKING LOT.
7) RE-USE BOULDERS AND LARGE COBBLE ENCOUNTERED DURING EXCAVATION FOR ROCK TOE OR ROCK POINTS.
8) FINAL LOCATION OF ROCK POINTS, LIMESTONE STEPS, ROCK CHECKS, ROCK TOE, ETC. SHALL BE DETERMINED IN CONSULTATION W/ ENGINEER PRIOR TO INSTALLATION.



LEGEND

- ROCK TOE
- OVERLAY ROCK TOE AT EXIST. CONCRETE
- RE-SHAPE SLOPE
- LANNONSTONE STEPS
- FLAGSTONE PAVERS
- ROCK APRON
- ROCK CHECK
- ROCK POINT
- NATIVE PLANT BIOSWALE
- NATIVE FESCUE BIOSWALE
- PROP. TEMP. STOCKPILE
- CONSTRUCTION ACCESS
- PROP. SILT FENCE
- APPROX. CREEK EDGE OF WATER
- x 615.5 PROP. SPOT ELEV. CENTER OF BIOSWALE
- 1-16" EXIST. TREE TO BE PROTECTED DO NOT REMOVE EXCEPT W/ WRITTEN PERMISSION BY OWNER
- EXIST. TREE TO BE REMOVED
- WETLAND / WATERS OF U.S.
- WETLAND 50-FT BUFFER
- 1-FOOT TOPOGRAPHY
- PARCEL BOUNDARIES
- WORK LIMITS
- FLOODPLAIN BOUNDARY
- FLOODWAY BOUNDARY
- EXIST. UTILITY POLE
- EX. STORM INLET
- EX. STORM FES
- TEMP. CONSTRUCTION FENCE.

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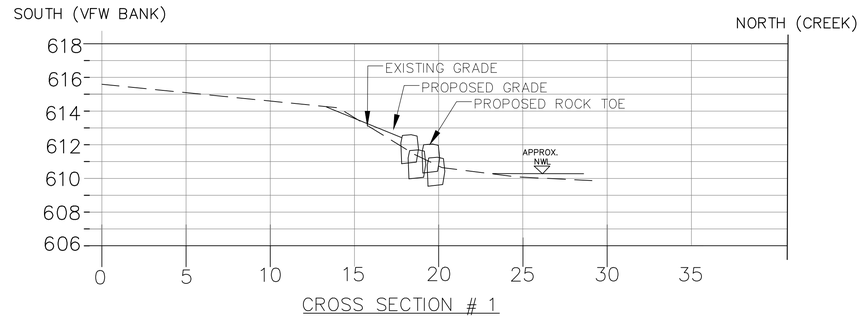
TEL: 630- 321-1133 FAX: 630- 321-1144

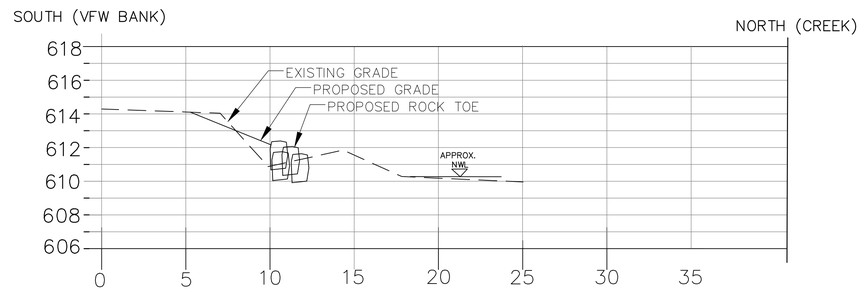
NEW LENOX VFW POST NO. 9545

SHEET 2: STREAM STABILIZATION PLANS
HICKORY CREEK STREAM STABILIZATION
VFW POST NO. 9545
SHEET 2 OF 8

HICKORY CREEK CROSS SECTIONS AT THE NEW LENOX VFW



CROSS SECTION # 1



CROSS SECTION # 2

LEGEND:

EXISTING NORMAL WATER LEVEL

EXISTING GRADE

PROPOSED GRADE

NOTES:

A) ALL UTILITIES SHALL BE LOCATED BY J.U.L.I.E. AT THE DIRECTION OF THE CONTRACTOR PRIOR TO COMMENCEMENT OF WORK.

B) FEMA FLOODPLAIN ELEVATION = APPROX. 619.5 FT

CALL J.U.L.I.E. TOLL FREE 800-892-0123

JOINT UTILITY LOCATING INFORMATION FOR EXCAVATORS

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1-800-892-0123

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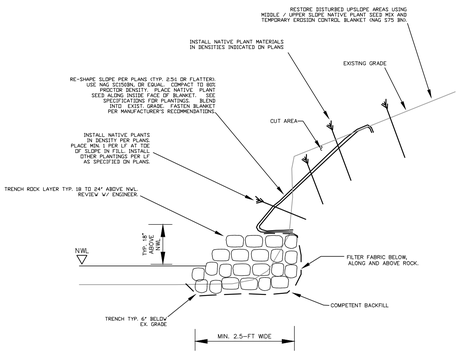
NEW LENOX VFW POST NO. 9545

SHEET 3: CROSS SECTIONS

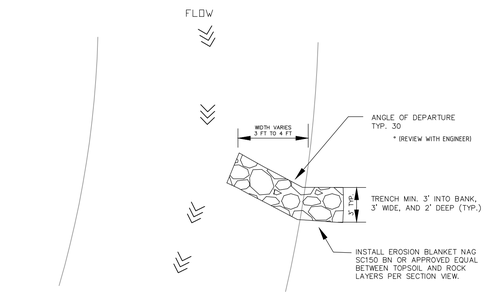
HICKORY CREEK STREAMBANK STABILIZATION
NEW LENOX VFW POST NO. 9545
SHEET 3 OF 8



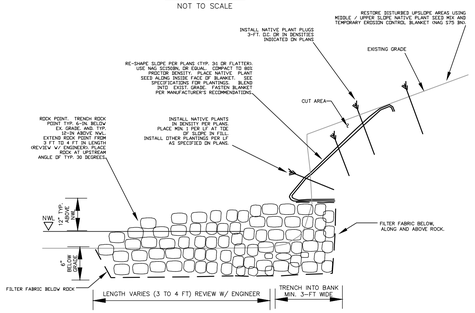
ROCK SIZES
(SEE SPECS FOR ROCK TYPE)
D100 = 18"
D75 = 12"
D50 = 9"
D20 = 6"

ROCK TYPE:
IDOT CLASS MIX OF R4 AND R3 CRUSHED LIMESTONE.
BID ALTERNATE ROCK TYPES MAY INCLUDE "WHITE BOULDERS" PROVIDED BY LEMKE STONE (WWW.LEMKESTONE.COM) PER BID ALTERNATES.

1 ROCK TOE / RE-SHAPE SLOPE
NOT TO SCALE



PLAN VIEW
NOT TO SCALE

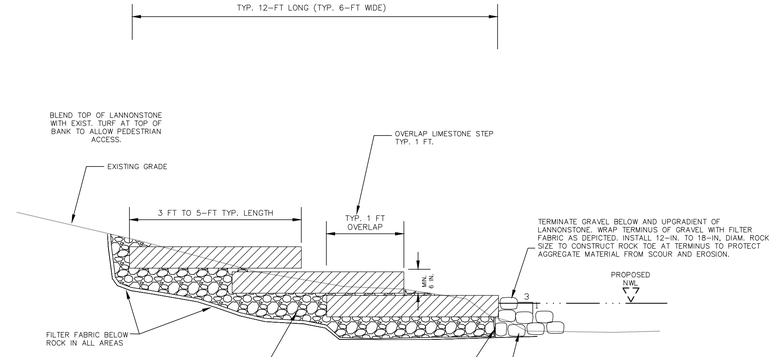


SECTION VIEW
NOT TO SCALE

ROCK SIZES
D100 = 18"
D50 = 12"
D20 = 6"

ROCK TYPE: IMPORTED ROCK SHALL BE
IDOT CLASS MIX OF R4 AND R3 CRUSHED LIMESTONE. BID ALTERNATE ROCK TYPES MAY INCLUDE "WHITE BOULDERS" PROVIDED BY LEMKE STONE (WWW.LEMKESTONE.COM) PER BID ALTERNATES.

3 ROCK POINT (NO ROCK TOE ADJACENT)
NOT TO SCALE



LIMESTONE STEP SIZE
3-FT TO 5-FT LONG,
MIN. 3-FT WIDE,
MIN. 6-IN THICK

AGGREGATE BASE COURSE
D90 = 3 IN.
D50 = 1 IN.
D20 = 0.25 IN.

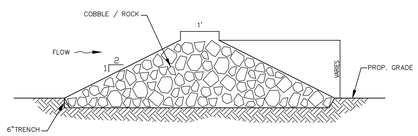
SMALL OUTER ROCK TOE

D95 = 18"
D5 = 12"

1. PLACE NATURAL LIMESTONE IN TYP. 6 FT WIDE, 12-FT LONG LIMESTONE STEPS AT STREAMBANK, WHERE INDICATED ON PLANS, TO ALLOW PEDESTRIAN ACCESS TO SHORELINE.
2. STABILIZE DISTURBED AREAS USING NAG S75 BN AND NATIVE PLANT SEED PER SPECIFICATIONS. INSTALL TURF GRASS IN EXIST. TURF AREAS FOR ACCESS. TRENCH EROSION CONTROL BLANKET MIN. 6 IN. BELOW ROCK AROUND PERIMETER OF STRUCTURE.
3. CONTRACTOR SHALL SUBMIT STONE SAMPLE TO OWNER FOR APPROVAL AT LEAST 48 HOURS PRIOR TO CONSTRUCTION.

SECTION VIEW

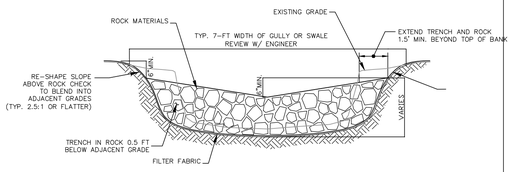
5 LANNONSTONE STEPS AT STREAMBANK
NOT TO SCALE



PROFILE VIEW

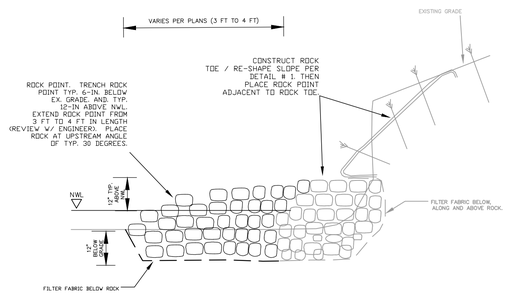
ROCK BOULDER AND COBBLE:
D100 = 12+ INCH
D75 = 9 INCH
D50 = 6 INCH
D25 = 4 INCH

ROCK TYPE: IMPORTED ROCK SHALL BE
IDOT CLASS MIX OF R4 AND R3 CRUSHED LIMESTONE. BID ALTERNATE ROCK TYPES MAY INCLUDE "WHITE BOULDERS" PROVIDED BY LEMKE STONE (WWW.LEMKESTONE.COM) PER BID ALTERNATES.



SECTION VIEW

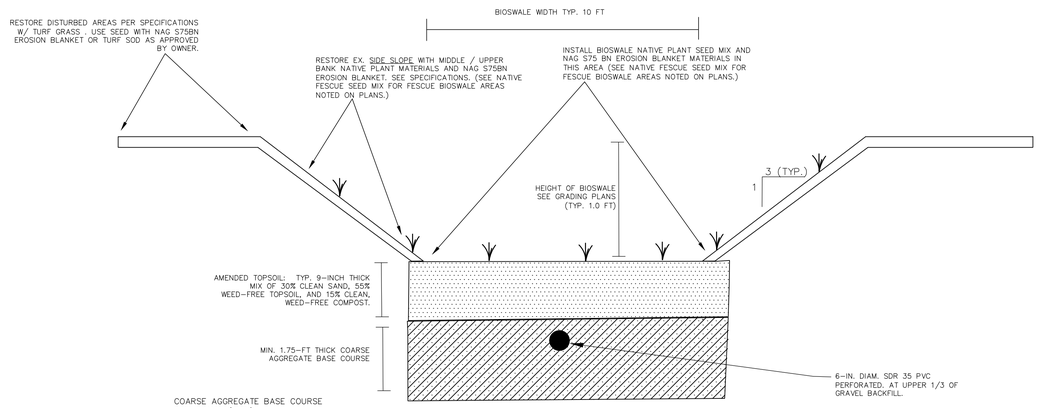
2 ROCK CHECK
NOT TO SCALE



ROCK SIZES
(SEE SPECS FOR ROCK TYPE)
D100 = 18"
D50 = 12"
D20 = 6"

ROCK TYPE:
IDOT CLASS MIX OF R4 AND R3 CRUSHED LIMESTONE. OR ROCK SHALL BE "WHITE BOULDERS" PROVIDED BY LEMKE STONE (WWW.LEMKESTONE.COM) PER BID ALTERNATES.

4 ROCK POINT (EXTENSION OFF ROCK TOE)
NOT TO SCALE



COARSE AGGREGATE BASE COURSE
SIZE RANGE (TYP.):
D90 = 0.5 IN.
D50 = 0.25 IN.
D10 = 0.1 IN.

GENERAL NOTES:
1. SWALE BOTTOM SHALL BE FLAT AND GRADED PER SPOT ELEVATION SON PLANS FOR UNIFORM DRAINAGE. SEE PLANS FOR SWALE LOCATIONS AND SLOPES.
2. BIOSWALE PERMEABLE SAND AND GRAVEL MATERIALS AND AMENDED TOPSOIL SHALL NOT BE INSTALLED UNTIL FINAL LANDSCAPING AND STABILIZATION OF UPGRADIENT TRIBUTARY AREA TO AVOID SEDIMENT CLOGGING OF SAND AND GRAVEL.
3. INSTALL NORTH AMERICAN GREEN S 75 BN EROSION BLANKET IN ALL AREAS ACROSS WIDTH OF BIOSWALE TO TOP OF EACH BANK PER MFR. RECOMMENDATIONS.
4. WHERE PRACTICABLE, INSTALL BIOSWALE MATERIALS (EXCLUDING TOPSOIL) AS SUBGRADE BELOW PROP. ROCK APRONS OR ROCK CHECKS TO STABILIZE AGGREGATE SUBGRADE. REVIEW LOCATIONS W/ OWNER AND ENGINEER.

6 BIOSWALE INSTALLATION
NOT TO SCALE

CALL JULLE TOLL FREE 800-892-0123
JOINT UTILITY LOCATING INFORMATION FOR EXCAVATORS
Call 48 hours before you dig (Excluding Sat. Sun. & Holidays)
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WESTERN SPRINGS, IL 60558
TEL: 630- 321-1133 FAX: 630- 321-1144

NEW LENOX VFW POST NO. 9545

SHEET 4: DETAILS
HICKORY CREEK STREAM STABILIZATION
VFW POST NO. 9545
SHEET 4 OF 8

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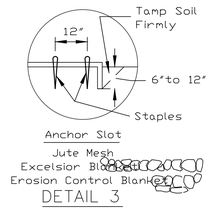
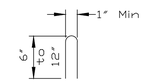
THIS SPACE INTENTIONALLY LEFT BLANK

Each edge of blanket shall be secured using anchor slot. Do not use lap joints between sections of erosion control blanket.



DETAIL 3



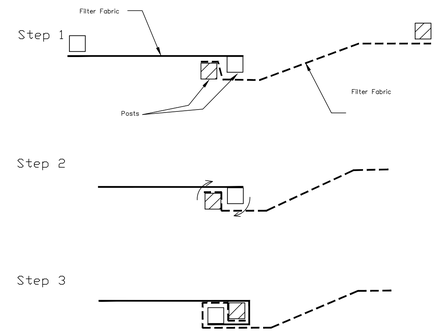
STAPLE DETAIL

NOTES:

1. Staples are to be placed alternately, in columns approximately 2' apart and in rows approximately 3' apart. Approximately 175 staples are required per 4'x 225' roll of material and 125 staples are required per 4'x 150' roll of material.
2. Erosion control material shall be placed firmly in contact with soil.
3. All terminal ends and transverse laps shall be stapled at approximately 12" intervals.

IL URBAN MANUAL IL-530B

10 EROSION BLANKET KEY-IN
NOT TO SCALE



ATTACHING TWO SILT FENCES

NOTES:
1. PLACE THE END POST OF THE SECOND FENCE INSIDE THE END POST OF THE FIRST FENCE.
2. ROTATE BOTH POSTS AT LEAST 180 DEGREES IN A CLOCKWISE DIRECTION TO CREATE A TIGHT SEAL WITH THE FABRIC MATERIAL.
3. DRIVE BOTH POSTS A MINIMUM OF 18 INCHES INTO THE GROUND AND BURY THE FLAP.

IL URBAN MANUAL IL-620B

12 SILT FENCE FASTENING
NOT TO SCALE

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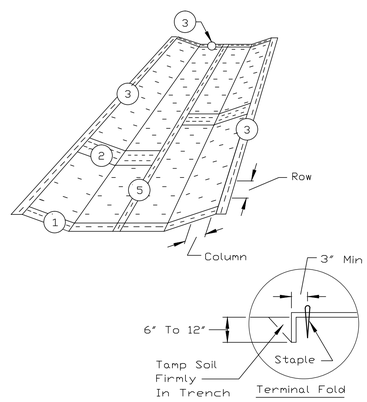
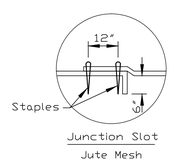
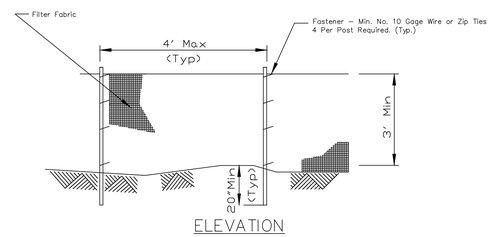


DETAIL 1

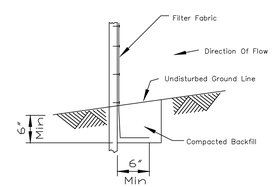


IL URBAN MANUAL IL-530A

11 EROSION BLANKET
NOT TO SCALE



ELEVATION



FABRIC ANCHOR

NOTES:
1. TEMPORARY SEDIMENT FENCE SHALL BE INSTALLED PRIOR TO ANY GRADING WORK IN THE AREA TO BE PROTECTED. THEY SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD AND REMOVED IN CONJUNCTION WITH THE FINAL GRADING AND SITE STABILIZATION.
2. FILTER FABRIC SHALL MEET THE REQUIREMENTS OF MATERIAL SPECIFICATION AASHTO M288 WITH MIN. AVG. ROLL VALUES (MARV) OF EITHER 90 LB. FORCE BEFORE THE FABRIC TEARS FOR WIRE-BACKED SILT FENCE, OR 124-LB FORCE WITH MACHINE DIRECTION, OR 101-LB. FORCE PERPENDICULAR TO THE MACHINE DIRECTION. MARV PERMITTIVITY SHALL MEET ASTM D4491 0.05 / SEC. APPARENT OPENING SIZE SHALL MEET ASTM D4751 MARV 0.024 INCHES. UV STABILITY SHALL MEET ASTM D4355 70% RETAINED STRENGTH AFTER 500 HOURS OF EXPOSURE.
3. POST SPACING SHALL BE MAX. 4-FT WITH WIRE-BACKED SILT FENCE OR WITH UNSUPPORTED ELONGATION >= 50%
POST SPACING MAY BE MAX. 6-FT WITH UNSUPPORTED ELONGATION < 50%
4. FENCE POSTS SHALL BE EITHER HARDWOOD MIN. 1.2-IN. X 1.2-IN. SQUARE OR STEEL WITH MIN. 20-IN. DEPTH BELOW GRADE AND 3-FT ABOVE GRADE.

SILT FENCE SHALL MEET AASHTO M288 STANDARDS AND
IL URBAN MANUAL IL-620A, WHICHEVER IS MORE RESTRICTIVE

13 SILT FENCE
NOT TO SCALE

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JOINT UTILITY LOCATING INFORMATION FOR EXCAVATORS

Call 48 hours before you dig (Excluding Sat. Sun. & Holidays)
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NEW LENOX VFW POST NO. 9545

SHEET 5: DETAILS
HICKORY CREEK STREAM STABILIZATION
VFW POST NO. 9545
SHEET 5 OF 8

SPECIFICATIONS

THE FOLLOWING SPECIFICATIONS SUPPLEMENT THE LATEST EDITION OF THE ILLINOIS DEPARTMENT OF TRANSPORTATION'S (IDOT) "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION", HEREINAFTER REFERRED TO AS THE "STANDARD SPECIFICATIONS." IN CASE OF CONFLICT WITH ANY PART OR PARTS OF THE STANDARD SPECIFICATIONS, THESE SPECIAL PROVISIONS SHALL TAKE PRECEDENCE AND SHALL GOVERN.

DESCRIPTION OF WORK

THE WORK SHALL CONSIST OF STREAM STABILIZATION, GRADING OF STREAMBANK AND RIPARIAN SLOPES, STUMP REMOVAL, OFF-SITE TREE, SOIL, AND SHRUB DISPOSAL, NATIVE PLANT SEEDING, FURNISHING AND INSTALLING LIVE PLANT MATERIALS, AND OTHER ITEMS AS LISTED ON THE ATTACHED PROJECT PLANS AND SPECIFICATIONS. CONTRACTOR SHALL INCLUDE ALL EXCAVATION AND BACKFILL HANDLING, HAULING, STOCKPILING, TOPSOIL RE-SPREAD, TREE REMOVAL, DISPOSAL OF CUT TREES, SHRUBS OR DEBRIS, AND/OR OTHER ACTIVITIES REQUIRED TO COMPLETE THE PROJECT IN THE RESPECTIVE BID ITEMS REQUIRING SAID WORK. TOPSOIL AND/OR SUBSOIL USED TO RE-CONSTRUCT PRE-EROSION STREAMBANK GRADES SHALL BE FREE FROM LARGE ROOTS, STICKS, WEEDS, BRUSH, STONES LARGER THAN ONE INCH DIAM. OR OTHER LITTER OR WASTE. FAILURE TO PROPERLY SEQUENCE STOCKPILING OR EARTHWORK OPERATIONS SHALL NOT CONSTITUTE A CLAIM FOR ADDITIONAL COMPENSATION. NO MATERIAL SHALL BE STOCKPILED IN DRAINAGE SWALES, UTILITY AREAS, OR IN THE RIGHT-OF-WAY. SURFACE VEGETATION, TOPSOIL, AND UNSUITABLY SOFT SOILS SHALL BE STRIPPED FROM AREAS TO RECEIVE FILL. CONTRACTOR IS RESPONSIBLE FOR RESTORATION OF ALL AREAS DISTURBED BY CONSTRUCTION ACTIVITIES. THERE SHALL BE NO ALLOWANCE FOR IMPORT OR HAULOFF OFF-SITE UNLESS SO DIRECTED BY OWNER'S REPRESENTATIVE.

LIMITATIONS ON ENGINEER'S AUTHORITY AND RESPONSIBILITIES:

THE AUTHORITY AND DUTIES OF THE ENGINEER ARE DESCRIBED IN ARTICLE 105.10 OF THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, DEPARTMENT OF TRANSPORTATION, STATE OF ILLINOIS, LATEST EDITION. THE ENGINEER WILL BE THE OWNER'S REPRESENTATIVE DURING THE CONSTRUCTION PERIOD. THE ENGINEER WILL FURNISH JOB-SITE OBSERVATION OF THE CONTRACTOR'S WORK. THE OWNER'S REPRESENTATIVE WILL PROVIDE BASE LINES, BENCHMARK ELEVATIONS, ASSIST THE CONTRACTOR WITH INTERPRETATION OF THE PLANS AND SPECIFICATIONS, OBSERVE IN GENERAL IF THE CONTRACTOR'S WORK IS IN CONFORMITY WITH THE CONTRACT DOCUMENTS, OBSERVE THE ADAPTATION OF PLANS AND SPECIFICATIONS TO FIELD CONDITIONS, AND MONITOR THE CONTRACTOR'S PROGRESS AS RELATED TO THE DATE OF COMPLETION. THE OWNER'S REPRESENTATIVE WILL NOT SUPERVISE, DIRECT, CONTROL OR HAVE AUTHORITY OVER OR BE RESPONSIBLE FOR THE CONTRACTOR'S MEANS, METHODS, TECHNIQUES, SEQUENCES OR PROCEDURES OF CONSTRUCTION, OR THE SAFETY PRECAUTIONS AND PROGRAMS INCIDENT THERETO, OR FOR ANY FAILURE OF THE CONTRACTOR TO COMPLY WITH LAWS AND REGULATIONS APPLICABLE TO THE FURNISHING OR PERFORMANCE OF THE WORK. THE OWNER'S REPRESENTATIVE WILL NOT BE RESPONSIBLE FOR THE CONTRACTOR'S FAILURE TO PERFORM OR FURNISH THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. THE OWNER'S REPRESENTATIVE WILL NOT BE RESPONSIBLE FOR THE ACTS OR OMISSIONS OF THE CONTRACTOR OR ANY SUBCONTRACTOR, ANY SUPPLIER, OR OF ANY OTHER PERSON OR ORGANIZATION PERFORMING OR FURNISHING ANY OF THE WORK. THE OWNER'S REPRESENTATIVE WILL HAVE THE AUTHORITY TO REJECT DEFECTIVE WORK, MATERIALS, OR SUSPEND ANY WORK THAT IS IMPROPERLY PERFORMED. THESE LIMITATIONS ON AUTHORITY AND RESPONSIBILITY SET FORTH HEREIN SHALL ALSO APPLY TO THE OWNER'S REPRESENTATIVE AND ASSISTANTS.

HOURS OF WORK

CONTRACTOR WILL NOT PERMIT OVERTIME WORK OR THE PERFORMANCE OF WORK ON SATURDAY, SUNDAY, OR ANY LEGAL HOLIDAY WITHOUT OWNER'S WRITTEN CONSENT GIVEN AFTER PRIOR WRITTEN NOTICE TO SUPERINTENDENT. REGULAR WORK HOURS SHALL BE A CONSECUTIVE EIGHT (8) HOUR PERIOD BETWEEN THE HOURS OF SEVEN (7) O'CLOCK A.M. AND SIX (6) O'CLOCK P.M. MONDAY THROUGH FRIDAY.

MINIMIZATION OF COMPACTION AND IMPACTS

EQUIPMENT SHALL BE UTILIZED TO MINIMIZE SITE IMPACTS AND MINIMIZE SOIL COMPACTION IN ACCESS AREAS. OWNER SHALL HAVE THE RIGHT TO REVIEW AND REJECT EQUIPMENT, WORK, AND/OR CONSTRUCTION TECHNIQUES NOT IN CONFORMANCE WITH THE PLANS, DETAILS AND SPECIFICATIONS.

TOLERANCES FOR ACCURACY OF SUBGRADE AND FINISHED GRADE ELEVATIONS

THE BIOSWALE AS WELL AS OTHER AREAS WILL BE REVIEWED FOR ACCURACY OF INSTALLED GRADES. SITE LAYOUT AND SURVEY SHALL BE PERFORMED BY CONTRACTOR. OWNER AND OWNER'S REPRESENTATIVE RESERVE THE RIGHT TO REVIEW CONTRACTOR'S RESULTS OF CONTRACTOR'S SURVEY INCLUDING VERIFICATION OF COMPLETION OF THE FOLLOWING STAGES: SUBGRADE COMPLETION, TOPSOIL GRADE COMPLETION, SPOT ELEVATIONS, OR OTHER ITEMS UPON THE REQUEST OF THE OWNER. CONTRACTOR VERIFICATION OF GRADES SHALL AT A MINIMUM OCCUR AFTER COMPLETION OF MASS GRADING AND AFTER INSTALLATION OF TOPSOIL. SEE ALSO SECTIONS PLAN SHEET SECTION # 2 NOTES.

1) ALL SPOT ELEVATIONS SHALL BE CONSTRUCTED TO WITHIN +/- 0.1 FT OF THE ELEVATION INDICATED ON THE PLANS. CONTRACTOR VERIFICATION OF GRADES SHALL AT A MINIMUM OCCUR AFTER COMPLETION OF MASS GRADING AND AFTER INSTALLATION OF TOPSOIL.
2) ELEVATIONS BELOW THE FEMA FLOODPLAIN BOUNDARY SHALL BE CONSTRUCTED TO WITHIN +/- 0.1 FT OF THE GRADES DEPICTED ON THE PLANS. CONTRACTOR VERIFICATION OF GRADES SHALL AT A MINIMUM OCCUR AFTER COMPLETION OF MASS GRADING AND AFTER INSTALLATION OF TOPSOIL.
3) GRADES AND ELEVATIONS ABOVE THE FEMA FLOODPLAIN BOUNDARY (INCLUDING BUT NOT LIMITED TO BERMS) SHALL BE CONSTRUCTED TO WITHIN +/- 0.25 FT OF THE GRADES DEPICTED ON THE PLANS.

TOLERANCES FOR RUTS AND DIRT CLODS

1) ELEVATIONS INCLUDING BUT NOT LIMITED TO PROPOSED BIOSWALE AREAS SHALL BE CONSTRUCTED TO BE FREE FROM RUTS THAT ARE 0.1 FT OR LARGER, AND SHALL CONTAIN LESS THAN 10% DIRT CLODS THAT ARE 3-INCH OR LARGER.
2) ELEVATIONS ALONG THE STREAMBANKS SHALL BE CONSTRUCTED TO BE FREE FROM RUTS THAT ARE 0.1 FT OR LARGER, AND SHALL CONTAIN LESS THAN 25% DIRT CLODS 3-INCH OR LARGER.

NORMAL WATER LEVEL

CONTRACTOR SHALL REVIEW SITE CONDITIONS WITH OWNER AND OWNER'S REPRESENTATIVE TO ESTABLISH ELEVATIONS OF PROPOSED STABILIZATION STRUCTURES.

ROCK TOE

1. DESCRIPTION:
ROCK TOE INSTALLATION SHALL CONSIST OF EXCAVATION OF A TRENCH (SEE DETAILS) AT EXISTING STREAMBANK TOE OF SLOPE TO RECEIVE ROCK, PLACEMENT OF FILTER FABRIC BELOW ROCK, AND INSTALLATION OF BANK-RUN COBBLE ROCK EXTENDING AT LEAST ABOVE NWL PER DETAILS.

2. MATERIALS:
MATERIALS FOR SHALL INCLUDE THE FOLLOWING:
A. FILTER FABRIC: FILTER FABRIC SHALL BE PLACED IN A TRENCH AT THE BASE OF THE ERODED SLOPE BELOW, BEHIND AND ABOVE ROUNDED ROCK PER DETAILS. FILTER FABRIC SHALL BE NON-WOVEN POLYPROPYLENE, WITH THE FOLLOWING MARV VALUES: GRAB TENSILE STRENGTH OF 165 LBS., TEAR STRENGTH OF 65 LBS., AND WATER FLOW RATE OF 80 GPM/FT2, OR EQUAL.
B. ROCK: ROCK SIZE RANGES ARE SPECIFIED IN DETAILS. CONTRACTOR SHALL SUBMIT SAMPLE OF ROCK MATERIALS FOR APPROVAL BY OWNER'S REPRESENTATIVE AT LEAST 72 HOURS PRIOR TO START OF CONSTRUCTION. ROCK SHALL BE ROUNDED TO SUB-ROUNDED IN SHAPE, DENSE, SOUND, AND FREE FROM CRACKS, SEAMS AND OTHER DEFECTS CONDUCIVE TO ACCELERATED WEATHERING.

3. INSTALLATION:
THE ROCK SHALL BE PLACED ALONG THE TOE OF SLOPE IN A TRENCH PER PLAN DETAIL. THE TOP OF THE ROCK SHALL BE ABOVE NORMAL WATER LEVEL PER DETAIL. PLACE FILTER FABRIC BELOW, BEHIND, AND ON TOP OF ROCK AS DEPICTED ON DETAILS. THE FILTER FABRIC SHALL REMAIN INTACT ABOVE THE ROCK TO PREVENT OVERLYING SOIL WASHOUT.

4. VEGETATED GEOGRID, RE-SHAPED SLOPE AND PLANTINGS:
ROCK TOE SHALL BE INSTALLED WITH VEGETATED GEOGRID OR RE-SHAPED SLOPE IN LOCATIONS INDICATED ON PLANS. SEE PLANS, PLAN SPECIFICATIONS AND DETAILS FOR PLANTING INSTALLATION.

ROCK POINT

1. DESCRIPTION.
THE WORK SHALL CONSIST OF FURNISHING, TRANSPORTING, AND PLACING ROCK AND OTHER MATERIALS AT LOCATIONS SHOWN ON PLAN. ROCK POINT SHALL BE PLACED INTO A SHALLOW TRENCH.

2. MATERIALS:
MATERIALS FOR ROCK POINT SHALL BE AS FOLLOWS:
A.ROCK: ROCK SIZE RANGES ARE SPECIFIED IN DETAILS. CONTRACTOR SHALL SUBMIT SAMPLE OF ROCK MATERIALS FOR APPROVAL BY OWNER'S REPRESENTATIVE AT LEAST 72 HOURS PRIOR TO START OF CONSTRUCTION. ROCK SHALL BE ROUNDED TO SUB-ROUNDED IN SHAPE, DENSE, SOUND, AND FREE FROM CRACKS, SEAMS AND OTHER DEFECTS CONDUCIVE TO ACCELERATED WEATHERING.

ROCK MIX: SEE DETAILS.

B. FILTER FABRIC: FILTER FABRIC SHALL BE NON-WOVEN POLYPROPYLENE, WITH THE FOLLOWING MINIMUM AVERAGE ROLL VALUES: GRAB TENSILE STRENGTH OF 165 LBS., TEAR STRENGTH OF 65 LBS., AND WATER FLOW RATE OF 80 GPM/FT2.

3. CONFIGURATION OF TRENCH:
A. SHALLOW TRENCH SHALL CONFIRM TO THE DEPTH AND WIDTH PER DETAILS. THE TRENCH SHOULD FORM ANGLE UPSTREAM AT APPROX. 30 DEGREES. REVIEW IN FIELD W/ ENGINEER.
B. PLACE FILTER FABRIC ACROSS THE BOTTOM OF THE TRENCH AND INSTALL AS DESCRIBED ABOVE. EDGES OF FILTER FABRIC SHALL BE TRIMMED WHEN CONSTRUCTION IS COMPLETE SO THE FILTER FABRIC IS NOT VISIBLE.
C. IF PLANS INCLUDE ROCK TOE IMMEDIATELY ADJACENT TO ROCK POINT, THEN INSTALL ROCK POINT - WITH ROCK TOE ADJACENT PER DETAILS. IF PLANS INCLUDE NO ROCK TOE IMMEDIATELY ADJACENT TO ROCK POINT, THEN INSTALL ROCK POINT - NO ROCK TOE ADJACENT PER DETAILS.
D. PLACE FILTER FABRIC ACROSS THE BOTTOM OF THE TRENCH AND INSTALL AS DESCRIBED ABOVE. TRIM EDGES OF FILTER FABRIC AFTER INSTALLATION TO WITHIN 6-IN. OF EDGE OF ROCK SO FILTER FABRIC IS NOT VISIBLE.

4. PLACEMENT OF ROCK:
A. THE ROCK SHALL BE PLACED IN THE SHALLOW TRENCH AND EXTEND TO AN ELEV. ABOVE THE NORMAL WATER LEVEL (NWL) PER DETAILS. THE LARGEST ROCK SHALL BE LOCATED NEAR THE SURFACE OF THE ROCK POINT. PLACE FILTER FABRIC IN TRENCH BELOW ALL ROCK. ROCK SHOULD BE WELL-SECURED TO THE STREAMBANK AND BOTTOM OF TRENCH. THE SIDES OF THE ROCK POINT SHOULD FORM AN ANGLE APPROX. 30 DEGREES WITH THE STREAMBANK. ROCK POINT SHALL EXTEND TYP. OUT FROM THE BANK TOE OF SLOPE - SEE DETAILS FOR LENGTH. ROCKS SHALL BE FIRMLY IN CONTACT WITH ONE ANOTHER.

RE-SHAPE SLOPE ON STREAMBANKS

1. GENERAL DESCRIPTION:
RE-SHAPING STREAMBANK SLOPES SHALL OCCUR IN SLIGHTLY TO MODERATELY ERODED BANK AREAS BY REGRADING ERODED BANKS ACCORDING TO PLAN DETAILS AND SECTIONS, AND COVERING EXPOSED SOILS WITH EROSION CONTROL BLANKET. NATIVE PLANT SEED SHALL BE BROADCAST PER PLAN SPECIFICATIONS BETWEEN BACKFILL AND BLANKET. FINISHED RE-SHAPED SLOPES ARE PLANTED WITH 2-INCH POTTED PRAIRIE PLUGS, OR SHRUB LIVE STAKES WHERE INDICATED ON PLANS.

2. MATERIALS:
MATERIALS FOR RE-SHAPING SLOPES INCLUDES THE FOLLOWING:
A. EROSION CONTROL BLANKET SHALL BE NORTH AMERICAN GREEN SC150-BN, OR APPROVED EQUAL.
B. SUBSOIL AND TOPSOIL: THE UPPER SIX (6) INCHES SHALL BE TOPSOIL. CLAYEY MATERIALS MAY BE PLACED BELOW THE TOPSOIL AND/OR BELOW NORMAL WATER LEVEL. OBTAIN OR REUSE EXISTING REGRADED TOPSOIL WITH REMOVAL OF INVASIVE PLANT SPECIES ROOTS AND VEGETATION, OR USE APPROVED IMPORTED PULVERIZED, LOCAL IN ORIGIN, LOAMY SOIL FROM "A-HORIZON", FREE OF STICKS, ROOTS, WEEDS, BRUSH OR STONES LARGER THAN 1" IN DIA., OR OTHER LITTER AND WASTE. AT LEAST 90% SHALL PASS NO. 10 SIEVE AND THE PH SHALL BE BETWEEN 5.5 AND 8.0. SAMPLE TO BE TAKEN AND RECOMMENDATIONS SUBMITTED TO ENGINEER PRIOR TO ADDITION OF ANY SOIL AMENDMENTS. CONTRACTOR SHALL NOTIFY OWNER AS TO THE SOURCE LOCATION OF ANY IMPORTED TOPSOIL AT LEAST 48 HOURS PRIOR TO ITS DELIVERY.
C. INSTALL NATIVE PLANT SEED MIX IN ACCORDANCE WITH PLAN SPECIFICATIONS.
D. INSTALL NATIVE PLANT PLUGS, SHRUBS AND TREES WHERE INDICATED ON PLANS.

3. CONSTRUCTION:
RE-SHAPED SLOPES SHOULD BE CONSTRUCTED IN THE FOLLOWING SEQUENCE:
A. PREPARE SLOPE TO PROVIDE SMOOTH CONTINUOUS GRADES, FREE OF OBSTRUCTIONS AND MATERIALS THAT WOULD PREVENT CONTACT BETWEEN THE SOIL AND THE BLANKET.
B. PROVIDE MINIMUM TOPSOIL DEPTH OF 6" USING EITHER ON-SITE OR ANY IMPORTED MATERIAL. ENGINEER SHALL DETERMINE IF ON-SITE SOIL IS ADEQUATE FOR SEED BED. COMPACT TO 80% PROCTOR DENSITY.
C. INSTALL NATIVE PLANT SEED MIX AS INDICATED ON PLANS, ACCORDING TO PLAN SPECIFICATIONS.
D. PREPARE TYP. 12-IN. DEEP TRENCH TO RECEIVE FRONT END OF BLANKET, AS INDICATED ON DETAILS. PLACE FRONT END OF BLANKET IN TRENCH, STAPLE, AND BACKFILL TRENCH TO KEY IN BLANKET.
E. TYP. INSTALLATION OF EROSION BLANKET SHALL BE VERTICAL UP THE SLOPE, PERPENDICULAR TO THE STREAMBANK, PER MANUFACTURER'S RECOMMENDATIONS.
F. INSTALL BLANKET IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS FOR ANCHORING OTHER EDGES INTO 12-IN. DEEP TRENCHES, OVERLAPS, AND STAPLING PATTERNS. THE 12" STAPLES SHOULD BE UTILIZED FOR LOOSE SOIL CONDITIONS. INSTALL MINIMUM 4 STAPLES PER SQ. YD.
G. INSTALL PRAIRIE PLUGS, SHRUB LIVE STAKES, OR OTHER MATERIALS ACCORDING TO PLAN SPECIFICATIONS.

4. PLANTINGS:
PLANTING DENSITIES VARY AND SHALL BE INSTALLED PER PLANS. PLANT LISTS ARE INDICATED IN PLAN SPECIFICATIONS.

TREES AND SHRUBS

1. DESCRIPTION:
TREES AND SHRUBS SHALL BE INSTALLED WHERE INDICATED BY OWNER. LOCATIONS OF TREES AND SHRUBS WITHIN 25 FEET OF SHORELINE AREAS SHALL BE REVIEWED BY OWNER'S REPRESENTATIVE PRIOR TO INSTALLATION.

2. MATERIALS:
A. TREES SHALL BE 1.5-IN. CALIPER, PER THE BID LIST. SHRUBS SHALL BE IN A 3-GALLON CONTAINER, PER THE BID LIST.
B. CONTAINER MATERIALS SHALL BE HEALTHY (SPECIES SPECIFIED BELOW). WITH AN ORIGIN AS CLOSE AS POSSIBLE TO PROJECT SITE. MATERIALS FROM BEYOND A 150-MILE RADIUS OF THE PROJECT SITE SHALL BE APPROVED IN WRITING PRIOR TO USE BY OWNER'S REPRESENTATIVE.
C. SUBSTITUTIONS SHALL NOT BE MADE WITHOUT WRITTEN APPROVAL OF OWNER'S REPRESENTATIVE.

3. QUALITY CONTROL:
A. PROVIDE TREE AND SHRUB CONTAINERS TO THE PROJECT SITE. WATERING SHOULD OCCUR IF NECESSARY TO MAINTAIN VIGOR.
B. DELIVERY: ACCEPT DELIVERY OF TREES AND SHRUBS AFTER PREPARATIONS FOR PLANTINGS HAVE BEEN COMPLETED AND PLANT IMMEDIATELY.
C. TEMPORARY STORAGE: IF PLANTING IS DELAYED MORE THAN 4 HOURS AFTER DELIVERY, MAKE PROVISIONS FOR PROTECTING PLANTS FROM WEATHER, AND WATERING AS NEEDED.
D. LABEL AT LEAST ONE PLANT OF EACH VARIETY IN EACH PLANTING AREA WITH SECURELY ATTACHED WATERPROOF TAGS BEARING LEGIBLE DESIGNATION OF BOTANICAL AND COMMON NAME.
E. ALL PLANT MATERIAL, INCLUDING COLLECTED STOCK, MUST SHOW APPEARANCE OF NORMAL HEALTH AND VIGOR AND SHALL COMPLY WITH THE STATE AND FEDERAL LAWS WITH RESPECT TO INSPECTION FOR PLANT DISEASES AND INSECT INFESTATIONS.
F. EACH SPECIES SHALL BE HANDLED AND PACKED IN THE MANNER APPROVED FOR THAT PLANT, HAVING REGARD FOR THE SOIL AND CLIMATE CONDITIONS AT THE TIME AND PLACE OF DIGGING OR CUTTING AND DELIVERY, AND TO THE TIME THAT WILL BE CONSUMED WHILE IN TRANSIT OR DELIVERY. ALL PRECAUTIONS THAT ARE CUSTOMARY IN GOOD TRADE PRACTICES SHALL BE TAKEN TO INSURE THE ARRIVAL OF PLANTS IN GOOD CONDITION.

4. INSTALLATIONS
A. HAND BROADCAST SEEDING SHALL BE USED TO INSTALL SEED IN ALL GRADED AREAS. EITHER DRILL SEEDING OR RAKING SHALL BE USED TO INSTALL SEED IN NON-GRADED RIPARIAN, WETLAND OR RESTORATION AREAS. IF STREAMBANKS OR AREAS WHERE EROSION CONTROL BLANKET IS INSTALLED, BROADCAST SEEDING MAY OCCUR. ALL SEED INSTALLATION SHALL OCCUR AFTER THE SEEDBED IS PROPERLY PREPARED BUT PRIOR TO THE INSTALLATION OF PLUGS, IF ANY. ROOTS AND SMALL STICKS (<2" DIAM.) SHALL BE REMOVED PRIOR TO SEEDING. LARGE BRANCHES (>2" DIAM.) MAY BE KEPT ONSITE IF THEY DO NOT INTERFERE WITH SEED INSTALLATION. SUBSOIL AND TOPSOIL SHALL NOT BE COMPACTED TO MORE THAN 80% PROCTOR DENSITY. DISKING SHALL OCCUR AS DESCRIBED BELOW.
B. SUBSOIL AND TOPSOIL: THE UPPER SIX (6) INCHES SHALL BE TOPSOIL. REUSE EXISTING REGRADED TOPSOIL WITH REMOVAL OF LIVE ROOTS AND WEEDS. REUSED TOPSOIL SHALL BE LOAM SOIL FROM "A-HORIZON", FREE OF STICKS, ROOTS, WEEDS, OR BRUSH LARGER THAN 1" IN DIA., OR OTHER LITTER AND WASTE. AT LEAST 90% SHALL PASS NO. 10 SIEVE AND THE PH SHALL BE BETWEEN 5.5 AND 8.0. UNDER NO CIRCUMSTANCES SHALL SOIL BE IMPORTED WITHOUT WRITTEN PERMISSION FROM OWNER. CLAYEY MATERIALS (GREATER THAN 30% CLAY) MAY BE PLACED BELOW THE TOPSOIL IN PROPOSED BASINS BELOW NORMAL WATER LEVEL.
C. IF THE COVERAGE OF NATIVE PLANT SPECIES IN PROPOSED NON-GRADED RIPARIAN OR STREAMBANK AREAS IS LESS THAN 40% THEN THOSE AREAS SHALL FIRST BE HERBICIDED TO REMOVE UNDESIRABLE COVERAGE OF INVASIVE PLANT SPECIES. SUFFICIENT TIME SHALL ELAPSE BETWEEN HERBICIDING AND NATIVE PLANT MATERIALS INSTALLATION TO ALLOW HERBICIDE EFFECT TO SUBSTANTIALLY DISSIPATE. HERBICIDED WEEDS SHALL BE REMOVED PRIOR TO DISKING OR TILLING. PROPER HERBICIDE APPLICATION RATES SHALL BE ACHIEVED USING ROUNDUP IN UPLAND AREAS AND RODEO (GLYPHOSPHATE) NEAR WATER ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
D. FOLLOWING MASS GRADING AND PRIOR TO TOPSOIL PLACEMENT, SUBGRADE SHALL BE PREPARED WITH A DISK OR CHISEL TO A MINIMUM 6-INCH TILLAGE DEPTH. SUBSOIL DISKING SHALL NOT OCCUR DURING WET SOIL CONDITIONS. FOLLOWING PLACEMENT OF TOPSOIL, SEEDBED SHALL BE PREPARED WITH A DISK OR CHISEL IN ALL GRADED AREAS TO A MINIMUM 6-INCH TILLAGE DEPTH. MAXIMUM DIRT CLOD SIZE SHALL BE APPROXIMATELY 3 INCHES. A RAKE SHALL BE APPLIED TO REMOVE LARGE CLODS AND TO CREATE A SMOOTH AND LEVEL SEEDBED. SEEDBED PREPARATION SHALL NOT OCCUR DURING WET SOIL CONDITIONS. SEEDBED SHALL HAVE MINIMUM COMPACTION, BE SMOOTH AND FREE OF DEBRIS TO PROMOTE SEED-SOIL CONTACT.
E. PLANTING DATES: FOR NATIVE PLANT SEED: NO INSTALLATION UNDER FROZEN OR SATURATED GROUND SURFACE CONDITIONS. NATIVE PLANT SEED AND WETLAND SEED INSTALLATION SHALL OCCUR BETWEEN APRIL 1 AND AUGUST 15 UNLESS APPROVED OTHERWISE BY OWNER. FALL SEEDING SHALL OCCUR BETWEEN NOVEMBER 1 AND DECEMBER 15.
F. CONTRACTOR SHALL NOTIFY OWNER'S REPRESENTATIVE AT LEAST 48 HOURS PRIOR TO PLANTING.
G. SHORELINE PLANT SEED: SHALL BE INSTALLED ALONG STREAMBANKS FROM -0.25 TO +0.75 FT VERTICAL DISTANCE FROM NORMAL WATER LEVEL. INSTALL BELOW EROSION CONTROL BLANKET IN RE-GRADED SLOPES, SHORELINE AREAS, RESTORED ACCESS AREAS, OR OTHER AREAS.
H. MIDDLE / UPPER BANK NATIVE PLANT SEED: SHALL INSTALLED ALONG STREAMBANKS ABOVE THE SHORELINE SEED FROM 0.75 FT ABOVE NWL EXTENDING UP TO APEX OF TOP OF BANK. INSTALL BELOW EROSION CONTROL BLANKET IN RE-GRADED SLOPES, SHORELINE AREAS, RESTORED ACCESS AREAS, OR OTHER AREAS.
I. TOP OF APEX AT STREAMBANK NATIVE PLANT SEED: SHALL INSTALLED ALONG AND ABOVE THE APEX OF TOP OF BANK. INSTALL BELOW EROSION CONTROL BLANKET IN RE-GRADED SLOPES, SHORELINE AREAS, RESTORED ACCESS AREAS, OR OTHER AREAS.
J. NATIVE PLANT BIOSWALE SEED: SHALL INSTALLED WITHIN THE NATIVE PLANT BIOSWALE AS DESIGNATED ON THE PLANS. INSTALL BELOW EROSION CONTROL BLANKET IN RE-GRADED SLOPES, SHORELINE AREAS, RESTORED ACCESS AREAS, OR OTHER AREAS.
K. NATIVE FESCUE BIOSWALE SEED: SHALL INSTALLED WITHIN THE NATIVE FESCUE BIOSWALE AS DESIGNATED ON THE PLANS. INSTALL BELOW EROSION CONTROL BLANKET IN RE-GRADED SLOPES, SHORELINE AREAS, RESTORED ACCESS AREAS, OR OTHER AREAS.

5. SHORELINE SEED MIX :
TYPICAL INSTALLATION ALONG STREAMBANKS FROM -0.25 TO +0.75 FT VERTICAL DISTANCE FROM NORMAL WATER LEVEL.

SHORELINE SEED MIX	COMMON NAME	(LB/ACRE)
ASTER PURPUREUS	PURPLE STEM ASTER	0.25
ASTER SIMPLEX	MARSH ASTER	0.25
CAREX COMOSA	BRISTLY SEDGE	0.50
CAREX FRANKII	FRANK'S SEDGE	0.50
CAREX GRANULARIS	MEADOW SEDGE	0.50
CAREX MOLESTA	FIELD OVAL SEDGE	0.50
CAREX STIPATA	COMMON FOX SEDGE	1.25
CAREX VULPINOIDEA	FOX GRASS	2.00
ELIOCHARIS PALUSTRIS	GREAT SPIKE RUSH	0.50
ELYMUS CANADENSIS	CANADA WILD RYE	1.25
ELYMUS RIPARIUS	RIVERBANK WILD RYE	1.00
ELYMUS VIRGINICUS	VIRGINIA WILD RYE	1.25
GLYCERIA STRIATA	FOWL MANNA GRASS	0.50
JUNCUS EFFUSUS	SOFT RUSH	0.50
JUNCUS TORREYI	TORREY'S RUSH	1.50
JUSTICIA AMERICANA	WATER WILLOW	0.5
LEERSIA ORYZOIDES	RICE CUTGRASS	3.00
SCIRPUS PUNGENS	WOOL GRASS	0.50
		16.25 LB/ACRE

COVER CROP (20 LB/ACRE)		
AVENA SATIVA	SEED OATS	10.00
LOLIUM MULTIFLORUM	ANNUAL RYE	10.00
		20.00 LB/AC

6. MIDDLE / UPPER STREAMBANK NATIVE PLANT SEED MIX : SHALL INSTALLED ALONG STREAMBANKS ABOVE THE SHORELINE SEED FROM 0.75 FT ABOVE NWL EXTENDING TO APEX OF TOP OF BANK.

MIDDLE / UPPER BANK MIX	COMMON NAME	(LB/ACRE)
AQUILEGIA CANADENSIS	COLUMBINE	0.2
ASCLEPIAS INCARNATA	BUTTERFLY WEED	0.2
ASTER NOVAE-ANGLIAE	NEW ENGLAND ASTER	0.3
BOUTELOUA CURTIPENDULA	SIDE OATS GRAMA	3.0
CAREX SPP.	SEDGES	0.7
CAREX BICKNELLI	PRAIRIE SEDGE	0.5
CAREX FRANKII	FRANK'S SEDGE	0.5
CAREX GRANULARIS	MEADOW SEDGE	0.5
CAREX VULPINODEA	FOX SEDGE	1.5
ELYMUS CANADENSIS	PRAIRIE WILD RYE	2.0
ELYMUS VIRGINICUS	VIRGINIA WILD RYE	2.0
GLYCERIA STRIATA	FOWL MANNA GRASS	0.1
HYSTRIX PATULA	BOTTLEBRUSH GRASS	1.0
JUNCUS TORREYI	TORREY'S RUSH	0.3
POLYGONUM SPP.	SMARTWEED	0.4
RUDBECKIA HIRTA	BLACK-EYED SUSAN	0.3
RUDBECKIA SUBTOMENTOSA	SWEET BLACK-EYED SUSAN	0.3
		13.80 LB/AC

COVER CROP (15 LB/ACRE)		
AVENA SATIVA	SEED OATS	10.0
COSMOS SPP.	COSMOS	0.50
LOLIUM MULTIFLORUM	ANNUAL RYE	10.0
		20.50 LB/AC

7. TOP OF APEX AT STREAMBANK NATIVE PLANT SEED MIX : SHALL INSTALLED ALONG STREAMBANKS ALONG THE APEX AND ABOVE THE APEX OF TOP OF BANK TRANSITIONING TO EXISTING TURF GRASS.

TOP OF APEX MIX	COMMON NAME	(LB/ACRE)
AGROSTIS ALBA PALUSTRIS	CREEPING BENT GRASS	3.0
ALLIUM CERNUUM	NODDING WILD ONION	0.3
ANEMONE CANADENSIS	CANADA ANEMONE	0.5
CAREX BICKNELLI	PRAIRIE SEDGE	0.5
CAREX VULPINODEA	FOX SEDGE	1.5
FESTUCA ELIATOR	TALL FESCUE	3.5
FESTUCA OVINA	SHEEP FESCUE	3.5
GERANIUM MACULATUM	WOODLAND GERANIUM	0.5
GLYCERIA STRIATA	FOWL MANNA GRASS	0.3
HYSTRIX PATULA	BOTTLEBRUSH GRASS	0.5
JUNCUS EFFESUS	PATH RUSH	0.5
PYCNANTHEMUM VIRGINIANUM	COMMON MOUNTAIN MINT	0.3
RUDBECKIA HIRTA	BLACK-EYED SUSAN	0.5
RUDBECKIA SUBTOMENTOSA	SWEET BLACK-EYED SUSAN	0.5
		15.90 LB/AC

COVER CROP (15 LB/ACRE)		
AVENA SATIVA	SEED OATS	10.0
COSMOS SPP.	COSMOS	0.50
LOLIUM MULTIFLORUM	ANNUAL RYE	10.0
		20.50 LB/AC

8. NATIVE PLANT BIOSWALE SEED MIX : SHALL INSTALLED ALONG NATIVE PLANT BIOSWALE (GENERALLY PARALLEL TO PARKING LOT PER PLANS).

NATIVE PLANT BIOSWALE SEED MIX	COMMON NAME	(LB/ACRE)
AGROSTIS ALBA PALUSTRIS	CREEPING BENT GRASS	1.0
AQUILEGIA CANADENSIS	COLUMBINE	0.5
ASCLEPIAS INCARNATA	MARSH MILKWEED	0.5
ASTER NOVAE-ANGLIAE	NEW ENGLAND ASTER	0.5
BOUTELOUA CURTIPENDULA	SIDE OATS GRAMA	3.0
CAREX BICKNELLI	PRAIRIE SEDGE	0.5
CAREX EMORYII	RIVERBANK TUSSOCK SEDGE	1.0
CAREX FRANKII	FRANK'S SEDGE	0.5
CAREX GRANULARIS	MEADOW SEDGE	0.5
CAREX VULPINODEA	FOX SEDGE	1.5
FESTUCA ELIATOR	TALL FESCUE	1.5
FESTUCA OVINA	SHEEP FESCUE	1.5
GLYCERIA STRIATA	FOWL MANNA GRASS	0.5
IRIS VIRGINICA SHREVEI	BLUE FLAG IRIS	0.5
JUNCUS EFFESUS	PATH RUSH	0.5
PHYSOSTEGIA VIRGINIANA	OBEDIENT PLANT	0.5
RUDBECKIA HIRTA	BLACK-EYED SUSAN	0.5
RUDBECKIA SUBTOMENTOSA	SWEET BLACK-EYED SUSAN	0.5
SCHIZACHYRIUM SCOPARIUM	LITTLE BLUESTEM	1.5
TRADESCANTIA OHIENSIS	SPIDERWORT	0.5
ZIZIA AUREA	GOLDEN ALEXANDER	0.5

7. TOP OF APEX AT STREAMBANK NATIVE PLANT SEED MIX : SHALL INSTALLED ALONG STREAMBANKS ALONG THE APEX AND ABOVE THE APEX OF TOP OF BANK TRANSITIONING TO EXISTING TURF GRASS.

TOP OF APEX NATIVE PLUG SPECIES	COMMON NAME	(%)
ALLIUM CERNUUM	NODDING WILD ONION	3%
ANEMONE CANADENSIS	CANADA ANEMONE	5%
AQUILEGIA CANADENSIS	COLUMBINE	8%
BOUTELOUA CURTIPENDULA	SIDE OATS GRAMA	15%
CAREX VULPINODEA	FOX SEDGE	17%
GERANIUM MACULATUM	WOODLAND GERANIUM	6%
GLYCERIA STRIATA	FOWL MANNA GRASS	5%
HYSTRIX PATULA	BOTTLEBRUSH GRASS	4%
LOBELIA CARDINALIS	CARDINAL FLOWER	3%
LOBELIA SIPHILITICA	GREAT BLUE LOBELIA	5%
PHYSOSTEGIA VIRGINIANA	OBEDIENT PLANT	7%
RUDBECKIA SUBTOMENTOSA	SWEET BLACK-EYED SUSAN	5%
SCHIZACHYRIUM SCOPARIUM	LITTLE BLUESTEM	10%
ZIZEA AUREA	GOLDEN ALEXANDER	5%
		100%

8. NATIVE PLANT BIOSWALE SEED MIX : SHALL INSTALLED ALONG NATIVE PLANT BIOSWALE (GENERALLY PARALLEL TO PARKING LOT PER PLANS).

BIOSWALE NATIVE PLUG SPECIES	COMMON NAME	(%)
AQUILEGIA CANADENSIS	COLUMBINE	6%
ASCLEPIAS INCARNATA	MARSH MILKWEED	5%
ASTER NOVAE-ANGLIAE	NEW ENGLAND ASTER	3%
BOUTELOUA CURTIPENDULA	SIDE OATS GRAMA	5%
CAREX BICKNELLII	PRAIRIE SEDGE	3%
CAREX EMORYII	RIVERBANK TUSSOCK SEDGE	3%
CAREX FRANKII	FRANK'S SEDGE	5%
CAREX GRANULARIS	MEADOW SEDGE	5%
CAREX VULPINODEA	FOX SEDGE	20%
GLYCERIA STRIATA	FOWL MANNA GRASS	5%
IRIS VIRGINICA SHREVEI	BLUE FLAG IRIS	5%
LOBELIA CARDINALIS	CARDINAL FLOWER	3%
LOBELIA SIPHILITICA	GREAT BLUE LOBELIA	3%
PHYSOSTEGIA VIRGINIANA	OBEDIENT PLANT	3%
RUDBECKIA HIRTA	BLACK-EYED SUSAN	3%
RUDBECKIA SUBTOMENTOSA	SWEET BLACK-EYED SUSAN	3%
SCHIZACHYRIUM SCOPARIUM	LITTLE BLUESTEM	10%
TRADESCANTIA OHIENSIS	SPIDERWORT	5%
ZIZIA AUREA	GOLDEN ALEXANDER	5%
		100%

9. FESCUE BIOSWALE PLANT SEED MIX : SHALL INSTALLED ALONG "FESCUE BIOSWALE" PERPENDICULAR TO PARKING LOT AND STREAMBANK.)

FESCUE BIOSWALE NATIVE SEED MIX	COMMON NAME	(%)
SEED ONLY. NO PLUGS INCLUDED		
		0%
		0%

NATIVE SHRUB LIVE STAKES

1. DESCRIPTION:
SHRUB LIVE STAKES ARE TO BE USED IN LOCATIONS INDICATED ON PLANS. SHRUB LIVE STAKE CUTTINGS SHALL BE STORED IN WATER AT ALL TIMES IMMEDIATELY FOLLOWING HARVEST UNTIL INSTALLATION.

2. MATERIALS:
A. LIVE STAKES ARE UPROOTED CUTTINGS HARVESTED BY CUTTING NEAR BASE OF LIVE, HEALTHY SHRUBS (SPECIES SPECIFIED BELOW). LENGTH OF LIVE STAKES SHALL BE BETWEEN 2 FT. TO 3 FT. LONG.
B. ORIGIN OF SHRUB LIVE STAKES SHOULD BE AS CLOSE AS POSSIBLE TO PROJECT SITE. CUTTINGS FROM BEYOND A 250-MILE RADIUS OF THE PROJECT SITE SHALL BE APPROVED IN WRITING PRIOR TO USE BY OWNER'S REPRESENTATIVE. CUTTINGS FROM SELECTED AND IDENTIFIED ONSITE NATIVE SHRUBS MAY BE USED UPON WRITTEN APPROVAL OF OWNER.
C. SUBSTITUTIONS SHALL NOT BE MADE WITHOUT WRITTEN APPROVAL OF OWNER'S REPRESENTATIVE.

3. QUALITY CONTROL:
A. PROVIDE FRESHLY HARVESTED LIVE STAKES TO PROJECT SITE; CUTTINGS SHOULD BE STORED AT ALL TIMES IN A WATERPROOF CONTAINER WITH WATER COVERING BOTTOM OF BUNDLES.
B. DELIVERY: ACCEPT DELIVERY OF LIVES STAKES AFTER PREPARATIONS FOR PLANTINGS HAVE BEEN COMPLETED AND PLANT IMMEDIATELY.
C. REQUIRED SOAKING PRIOR TO INSTALLATION: SHRUB LIVE STAKES SHALL BE SOAKED A MINIMUM 10 DAYS AND A MAXIMUM 30 DAYS PRIOR TO INSTALLATION.
D. TEMPORARY STORAGE: DETAIN LIVE STAKES IN WATER STORAGE UNTIL PLANTING.
E. LABEL AT LEAST ONE PLANT OF EACH VARIETY WITH SECURELY ATTACHED WATERPROOF TAGS BEARING LEGIBLE SPECIES AND BOTANICAL NAME.
F. ALL PLANT MATERIAL, INCLUDING COLLECTED STOCK, MUST SHOW APPEARANCE OF NORMAL HEALTH AND VIGOR AND SHALL COMPLY WITH STATE AND FEDERAL LAWS FOR PLANT DISEASES AND INSECT INFESTATIONS.
G. EACH SPECIES SHALL BE HANDLED IN A MANNER APPROVED FOR THAT PLANT, WITH RESPECT TO THE DELIVERY, TRANSIT AND STORAGE. PRECAUTIONS THAT ARE CUSTOMARY IN GOOD TRADE PRACTICES SHALL BE TAKEN TO INSURE ARRIVAL OF PLANTS IN GOOD CONDITION.

4. INSTALLATIONS
A. SEE "REQUIRED SOAKING" ABOVE.
B. SHRUB LIVES STAKES SHALL BE USED FOR STREAMBANK BIOENGINEERING TREATMENTS IN AREAS INDICATED ON PLANS.
C. PLANTING DATES FOR SHRUB LIVE STAKES: OCTOBER 1 THROUGH APRIL 15, IN NON-FROZEN GROUND CONDITIONS.
D. INSTALL SHRUB LIVES STAKES THROUGH EROSION BLANKET BY INSERTING 1/4-IN. TO 1/2-IN. PLANTING BAR. HOLES SHALL BE OF SUFFICIENT SIZE TO PERMIT PLACING THE PLANT WITHOUT BENDING THE SHOOTS. INSTALL LIVE STAKES AT LEAST 2 FEET BELOW GROUND, IF POSSIBLE AT OR BELOW SATURATED SOILS. FILL HOLES WITH SOIL AND PRESS FIRM UP TO GROUND SURFACE. FILL AND COMPACT DISTURBED AREA.

5. SHRUB LIVE STAKES DENSITIES AND TYPES:
A. SHRUB LIVE STAKES:
TYPICAL ONE (1) SHRUB LIVE STAKE PER 3 SQ. FT. ON CENTER, UNLESS INDICATED OTHERWISE ON PLANS.

6. SHRUB LIVE STAKE SPECIES LIST

SCIENTIFIC NAME	COMMON NAME	PERCENT
CEPHALANTHUS OCCIDENTALIS	BUTTON BUSH	50%
CORNUS STOLONIFERA	RED-OSIER DOGWOOD	50%
		100%

CLEARING / GRUBBING / STUMP REMOVAL / STUMP CUTTING / DISPOSAL

1. PLANS AND QUANTITIES INDICATE CLEARING AND GRUBBING AS REQUIRED WITHIN STABILIZATION AREAS. (SELECTED TREES WITHIN ACCEPTABLE SIZE RANGES SHALL BE USED FOR LOG HABITAT STRUCTURES OR ROOTBALL REVETMENTS IF SPECIFIED ON DETAILS.) EXCESS OR DAMAGED TREES, AS WELL AS CLEARED BRUSH, PLANTS AND INVASIVE SPECIES SHALL BE REMOVED FROM THE PROJECT SITE AND DISPOSED IN A LICENSED OFF-SITE FACILITY. COST FOR CLEARING, GRUBBING, REMOVAL, AND/OR MULCHING SHALL BE INCIDENTAL TO PROJECT COSTS.

2. ENHANCEMENT AREAS, IF ANY, IDENTIFIED ON PLANS SHALL INCLUDE REMOVAL OF INVASIVE WOODY VEGETATION. AND INVASIVE SPECIES SHALL BE REMOVED FROM THE PROJECT SITE AND DISPOSED IN A LICENSED OFF-SITE FACILITY. COST FOR CLEARING, GRUBBING, REMOVAL, AND/OR MULCHING SHALL BE INCIDENTAL TO PROJECT COSTS. CUT STUMPS, SPROUTS, SUCKERS, AND RE-SPROUTS OF WOODY VEGETATION SHALL BE TREATED WITH HERBICIDE TO MINIMIZE SUCKERING OR RE-SPROUTING. CUT STUMPS OF BUCKTHORN SHALL BE TREATED WITH GARLON (TRYCLOPYR) DILUTED NO MORE THAN 50% WITH WATER. HONEYSUCKLE (LONICERA MACKII; LONICERA X BELLA) CUT STUMPS SHALL BE TREATED WITH ROUNDUP (GLYHOSPHATE) DILUTED NO MORE THAN 50% WITH WATER. MIX ALL STUMP HERBICIDE WITH A DARK GREEN DYE TO IDENTIFY TREAT STUMP HERBICIDE AREAS.

3. QUALITY CONTROL
A. NO ON-SITE BURNS SHALL BE ALLOWED UNLESS APPROVED IN WRITING BY OWNER. ALL EXCESS TREES, BRUSH, OTHER PLANT MATERIALS, DEBRIS SHALL BE REMOVED FROM THE PROJECT SITE AND DISPOSED OF IN AN APPROVED FACILITY.
B. PESTICIDE LICENSE: HERBICIDES SHALL BE APPLIED BY A LICENSED PESTICIDE APPLICATOR WITH GENERAL, RIGHT-OF-WAY, AQUATIC AND/OR OTHER APPLICABLE PESTICIDE LICENSURE.
C. AT LEAST ONE PERSON WITH AT LEAST 3 YEARS OF NATIVE PLANT IDENTIFICATION EXPERIENCE SHALL BE PRESENT AT ALL TIMES DURING SELECTIVE REMOVAL OF INVASIVE SPECIES.
D. DISTURBANCE DURING TREE AND SHRUB CUTTING AND REMOVAL SHALL NOT OCCUR TO FLAGGED TREES OR SHRUBS WHICH HAVE BEEN DESIGNATED BY OWNER TO BE PROTECTED.

3-YEAR VEGETATIVE PERFORMANCE STANDARDS FOR NATIVE PLANT MATERIALS

NATIVE PLANT MAINTENANCE SHALL BE REIMBURSED ON A LUMP SUM BASIS, PER BID COSTS, PRO-RATED ACCORDING TO COMPLIANCE WITH VEGETATIVE PERFORMANCE STANDARDS. THE LUMP SUM RATE SHALL INCLUDE ALL NATIVE PLANT SEED, PLUGS, TREES, SHRUBS, OR OTHER MATERIALS, EQUIPMENT, METHODS, AND PRACTICES DEEMED NECESSARY BY THE CONTRACTOR TO ACCOMPLISH THE VEGETATIVE PERFORMANCE STANDARDS.

1. STREAMBANK STABILIZATION VEGETATION PERFORMANCE STANDARDS
A. WITHIN TEN (10) DAYS AFTER SEEDING AND PLANTING ARE COMPLETED, THE SOIL SHALL BE STABILIZED BY A TEMPORARY COVER CROP AND /OR EROSION BLANKET.
B. WITHIN AT LEAST THREE (3) MONTHS OF SEEDING AND PLANTING (WITHIN THE GROWING SEASON OF APRIL THROUGH OCTOBER), AT LEAST 90% OF THE SEEDED AREA SOIL SURFACE WILL BE VEGETATED AND NO SEEDED AREA WILL HAVE MORE THAN TWO (2) SQUARE FEET DEVOID OF VEGETATIVE COVER.

C. WITHIN THE FOLLOWING SPECIFIED TIME PERIODS AFTER SEEDING AND PLANTING (WITHIN THE GROWING SEASON OF APRIL THROUGH OCTOBER), THE STABILIZATION AREAS SHALL HAVE THE FOLLOWING MIN. PERCENT NATIVE SPECIES COVERAGE BY AREA:

BY 12 MONTHS	=	25% COVERAGE BY NATIVE SPECIES
BY 24 MONTHS	=	50% COVERAGE BY NATIVE SPECIES
BY 24 MONTHS	=	NONE OF 3 MOST DOMINANT SPECIES ARE NON-NATIVE OR INVASIVE (INCLUDING BUT NOT LIMITED TO TYPHA ANGUSTIFOLIA, PHALARIS ARUNDINACEA, SALIX INTERIOR, LYTHRUM SALICARIA, POA PRATENSIS)
BY 36 MONTHS	=	75% COVERAGE BY NATIVE SPECIES
BY 36 MONTHS	=	FLORISTIC QUALITY INDEX (FQI) = 20
BY 36 MONTHS	=	COEFF. OF CONSERVATISM = 3.5

D. INVASIVE PLANT SPECIES IN ALL AREAS WITHIN WORK LIMITS (STREAMBANKS, WETLAND, RIPARIAN, BERM) SHALL NOT EXCEED 15% OF THE VEGETATIVE COVERAGE AT ANY TIME (SPECIES INCLUDE BUT NOT LIMITED TO TEASEL (DIPASCUS SPP.), GARLIC MUSTARD (ALLIARIA OFFICINALIS), REED CANARYGRASS (PHALARIS ARUNDINACEA), PURPLE LOOSESTRIFE (LYTHRUM SALICARIA), CANADA THISTLE (CIRSIUM ARVENSE), GIANT RAGWEED (AMBROSIA TRIFIDA), COMMON RAGWEED (AMBROSIA ARTEMISIIFOLIA), HONEYSUCKLE (LONICERA MACKII; LONICERA x BELLA), COMMON BUCKTHORN (RHAMNUS CATHARTICA), YELLOW CLOVER, WHITE CLOVER, (MELILOTUS SPP.). WOODY INVASIVE SPECIES BEYOND PROPOSED GRADING AREA SUCH AS BUCKTHORN, HONEYSUCKLE, OR OTHER INVASIVE SPECIES THAT ARE NOT COMPLETELY REMOVED SHALL BE CUT AT GROUND LEVEL. CUT STUMPS SHALL BE TREATED USING GARLON APPLIED AT MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY RE-SPROUTING OF CUT SHRUBS OR OTHER SPECIES.

E. THE COVERAGE OF PHRAGMITES SHALL BE 0%. EXISTING PHRAGMITES SHALL BE REMOVED AS REQUIRED.

2. NATIVE PLANT PLUGS VEGETATION PERFORMANCE STANDARDS:
NATIVE PLANT PLUG SURVIVORSHIP SHALL REMAIN AT 80% OR HIGHER THROUGHOUT THE PROJECT SITE THROUGH THE END OF THE VEGETATIVE PERFORMANCE TIME PERIOD. CONTRACTOR AND ENGINEER SHALL REVIEW PLANT SURVIVORSHIP BETWEEN MAY 15 AND SEPTEMBER 15. CONTRACTOR SHALL INSTALL ADDITIONAL PLANTS TO ENSURE A MINIMUM 80% SURVIVORSHIP AT NO ADDITIONAL COST TO OWNER. ANY IRRIGATION OR OTHER MAINTENANCE ACTIVITIES PERFORMED TO MEET SURVIVORSHIP SHALL BE PERFORMED AT A COST INCIDENTAL TO THE INSTALLATION OF NATIVE PLANT PLUGS.

3. NATIVE SHRUB LIVE STAKES VEGETATION PERFORMANCE STANDARDS :
WITHIN AT LEAST THREE (3) MONTHS OF INSTALLATION OF UN-ROOTED SHRUB LIVE STAKES (WITHIN THE GROWING SEASON OF APRIL THROUGH OCTOBER), THE STREAMBANK STABILIZATION AREAS SHALL HAVE NATIVE SHRUB LIVE STAKES COVERING 60% OR MORE OF THE DENSITY PER UNIT AREA OR BANK LENGTH AS SPECIFIED ON THE PLANS FOR INSTALLATION OF SHRUB LIVE STAKES.

4. POTTED TREES AND SHRUBS VEGETATIVE PERFORMANCE STANDARDS :
A. WITHIN AT LEAST THREE (3) MONTHS OF INSTALLATION OF SHRUBS AND TREES (WITHIN THE GROWING SEASON OF APRIL THROUGH OCTOBER), THE PROJECT AREA SHALL HAVE 100% SURVIVAL OF POTTED TREES AND SHRUBS.
B. AFTER 3 MONTHS OF INSTALLATION, THE SURVIVAL OF POTTED TREES AND SHRUBS SHALL REMAIN AT 100% THROUGHOUT THE VEGETATIVE PERFORMANCE PERIOD.

5. GUARANTEE
A. SEED AND PLANTING PROCEDURES NOT IN CONFORMANCE WITH THESE STANDARDS AND THE PLANTING SPECIFICATIONS AS APPROVED BY PERMITTING AGENCIES SHALL BE REMOVED AND REPLACED AT NO ADDITIONAL COST TO THE OWNER.
B. THE CONTRACTOR SHALL BE RESPONSIBLE FOR AND GUARANTEE ATTAINMENT OF FINAL ACCEPTANCE REQUIREMENTS AS OUTLINED IN THESE STANDARDS. WHERE INSPECTED WORK DOES NOT COMPLY WITH REQUIREMENTS, REMEDIAL MEASURES AS OUTLINED IN THESE STANDARDS WILL APPLY.

C. THE CONTRACTOR SHALL REPLACE REJECTED WORK AND PERFORM APPROPRIATE MANAGEMENT UNTIL REINSPECTED BY THE OWNER AND FOUND TO BE ACCEPTABLE. REJECTED PLANTS AND MATERIALS SHALL BE REMOVED PROMPTLY FROM THE PROJECT SITE AT NO ADDITIONAL COST TO THE OWNER. THE CONTRACTOR SHALL RESEED AND/OR REPLANT DEFICIENT AREAS AT NO ADDITIONAL COST TO THE OWNER. IF MEASURES ARE NOT ACHIEVED FOLLOWING ONE (1) REMEDIAL SEEDING EFFORT, THE CONTRACTOR SHALL INSTALL PLUG MATERIALS AS PART OF REMEDIAL ACTIONS INSTEAD OF, OR IN ADDITION TO, SEED.

NATIVE SPECIES MAINTENANCE

1. NATIVE SPECIES MAINTENANCE:
A. NATIVE PLANT MAINTENANCE SHALL BE REIMBURSED ON A LUMP SUM BASIS, PER BID COSTS, PRO-RATED ACCORDING TO COMPLIANCE WITH VEGETATIVE PERFORMANCE STANDARDS. THE LUMP SUM RATE SHALL INCLUDE ALL ALL NATIVE PLANT SEED, PLUGS, TREES, SHRUBS, OR OTHER MATERIALS, EQUIPMENT, METHODS, AND PRACTICES DEEMED NECESSARY BY THE CONTRACTOR TO ACCOMPLISH THE VEGETATIVE PERFORMANCE STANDARDS (THESE ITEMS SHALL BE INCIDENTAL TO THE COST OF THE LUMP SUM RATE). CONTRACTOR RETAIN QUALIFIED NATIVE PLANT IDENTIFICATION & MAINTENANCE PERSONNEL WITH STATE OF ILLINOIS DEPARTMENT OF AGRICULTURE PESTICIDE APPLICATOR OR OPERATOR LICENSURE TO PERFORM NATIVE PLANT MAINTENANCE FOR DURATION DESCRIBED IN CONTRACT FOLLOWING INSTALLATION OF ALL NATIVE PLANT MATERIALS. AREAS TO BE MAINTAINED INCLUDE ALL WORK LIMIT AREAS CONTAINING NATIVE PLANTS OR INVASIVE SPECIES AT THE PROJECT SITE.

B. THE CONTRACTOR SHALL MAINTAIN NATIVE PLANT MATERIAL TO CONFORM TO VEGETATIVE PERFORMANCE CRITERIA. A MINIMUM FIVE (5) ANNUAL WEED CONTROL APPLICATIONS SHALL OCCUR PER THE FOLLOWING GENERAL SCHEDULE:
I. APPLICATION # 1 (APRIL 10 TO APRIL 20).
II. APPLICATION # 2 (MAY 25 TO JUNE 10).
III. APPLICATION # 3 (JUNE 20 TO JUNE 30).
IV. APPLICATION # 4 (JULY 10 TO JULY 20).
V. APPLICATION # 5 (AUGUST 5 TO AUGUST 15)

ONE (1) ANNUAL EARLY SPRING CUT OR MOW OF PLANTINGS WITH REMOVAL OF CUT MATERIAL TO OFFSITE DISPOSAL IN APPROVED FACILITY. ADDITIONAL MAINTENANCE MAY BE NEEDED TO MEET THE MINIMUM PERFORMANCE. ADDITIONAL MAINTENANCE MAY BE NEEDED TO MEET THE MINIMUM PERFORMANCE.
C. CONTRACTOR SHALL CONDUCT SITE INSPECTIONS WITH OWNER AND OWNER'S REPRESENATIVE TO REVIEW WEED CONTROL LOCATIONS. SITE INSPECTIONS SHALL OCCUR BOTH BEFORE AND AFTER WEED CONTROL APPLICATIONS FOR SATISFACTORY PERFORMANCE.

2. NATIVE SPECIES MANAGEMENT TECHNIQUES:
A. EXAMPLE MAINTENANCE PRACTICES MAY INCLUDE WATERING, SPOT-HERBICIDING, HAND REMOVAL, BURNING (EXCEPT FOR VEGETATED GEOGRID OR OTHER AREAS WITH PERMANENT EROSION BLANKET), MOWING, OR OTHER NATIVE PLANT MANAGEMENT TECHNIQUES. CONTRACTOR SHALL MAINTAIN NATIVE PLANT MATERIAL AS NECESSARY TO MEET THE MINIMUM PERFORMANCE REQUIREMENTS.
B. WATERING SHALL OCCUR IF NECESSARY TO MAINTAIN GROWTH AND VIGOR OF LIVE PLANT MATERIALS (INSTALLED POTTED TREES, SHRUBS, 2-INCH POTTED PLUGS, OR OTHER LIVE CONTAINER PLANT MATERIALS).
C. THE COST OF NATIVE PLANT MAINTENANCE SHALL BE ITEMIZED FOR 3-YEAR NATIVE PLANT MAINTENANCE.

PROGRESS MEETINGS / NOTIFICATION OF UNSATISFACTORY CONDITIONS

1. CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING OWNER'S REPRESENTATIVE, OWNER, AND PERMITTING AGENCIES AT LEAST TWO WEEKS PRIOR TO ALL PRE-CONSTRUCTION AND CONSTRUCTION MEETINGS. REQUIRED MEETINGS INCLUDE BUT ARE NOT LIMITED TO PRE-CONSTRUCTION CONFERENCE, ONE WEEK PRIOR TO THE COMMENCEMENT OF LAND DISTURBING ACTIVITIES, AND ONE WEEK PRIOR TO THE FINAL INSPECTION, AS WELL AS ANY MEETINGS REQUIRED PER TERMS AND CONDITIONS OF AGENCY PERMITS.

2. THE CONTRACTOR'S FOREMAN SHALL ATTEND PROGRESS MEETINGS AT A LOCATION DESIGNATED BY THE OWNER. MEETINGS SHALL INCLUDE SUCH ITEMS AS EQUIPMENT STORAGE SITES, EARTHWORK, TOPSOIL STOCKPILE LOCATIONS, CLEARING AND GRUBBING, ACCESS ROUTES, SCHEDULE, TRASH REMOVAL, LOCATIONS OF INVASIVE SPECIES REMOVAL, TRAFFIC CONTROL, PAYMENT REQUESTS, CHANGE ORDERS, OR ANY OTHER CONCERNS DURING THE PROGRESS OF THE WORK.

3. CONTRACTOR SHALL EXAMINE AND EVALUATE GRADES, SOILS, AND NOTIFY OWNER OF UNSATISFACTORY CONDITIONS. CONTRACTOR SHALL NOT PROCEED WITH WORK UNTIL SATISFACTORY CONDITIONS HAVE BEEN CORRECTED IN A MANNER ACCEPTABLE TO OWNER.

4. IN ANY CASE OF DISCREPANCY IN THE PLANS VERSUS SPECIFICATIONS, THE MATTER SHALL BE SUBMITTED IMMEDIATELY TO OWNER'S REPRESENTATIVE AND OWNER, WITHOUT WHOSE DECISION SAID DISCREPANCY SHALL NOT BE CHANGED BY CONTRACTOR, EXCEPT AT CONTRACTOR'S OWN RISK AND EXPENSE.

CONSTRUCTION SEQUENCE / PHASING

REPRESENTATIVE CONSTRUCTION ACTIVITIES AND THEIR APPROXIMATE ORDER ARE AS FOLLOWS:

1. SIGNAGE TO CLOSE ACCESS (BY OWNER)
2. INSTALL SOIL EROSION AND SEDIMENT CONTROL MEASURES
3. INSTALL STREAM STABILIZATION. INSTALL NATIVE PLANT SEED & EROSION BLANKET INSTALLATION PER PLANS, DETAILS AND SPECIFICATIONS
4. EXCAVATE BIOSWALES, INSTALL AGGREGATE AND FILTER FABRIC, NATIVE PLANT SEED & EROSION BLANKET PER PLANS, DETAILS AND SPECIFICATIONS.
5. INSTALLATION OF NATIVE PLANT TREES, SHRUBS, OR OTHER MATERIAL.
6. RESTORATION OF CONSTRUCTION ACCESS AREAS INCLUDING EXISTING ACCESS ROADS
7. REMOVAL OF EROSION AND SEDIMENT CONTROL
8. NATIVE PLANT MAINTENANCE PER CONTRACT

SEDIMENT AND EROSION CONTROL MEASURES

THE EROSION CONTROL MEASURES INDICATED ON THE PLANS, DETAILS AND SPECIFICATIONS ARE THE MINIMUM REQUIREMENTS. ADDITIONAL MEASURES MAY BE REQUIRED AS DIRECTED BY THE VILLAGE ENGINEER OR OTHER AGENCIES.
- A COPY OF THE APPROVED EROSION AND SEDIMENT CONTROL PLAN SHALL BE MAINTAINED BY THE CONTRACTOR ON THE SITE AT ALL TIMES.
- THE PURPOSE OF THIS PROJECT IS TO PREVENT THE ONGOING EROSION PROBLEMS THROUGH THE STREAM REACH. THE GRADING, PLANTING AND STABILIZE MEASURES PROPOSED WILL CONTROL EROSION ON THE BANKS IN THE PROJECT REACH UPON COMPLETION OF THE PROJECT.
- UNLESS OTHERWISE NOTED, ALL VEGETATIVE AND STRUCTURAL EROSION AND SEDIMENT CONTROL PRACTICES WILL BE CONSTRUCTED TO STANDARDS AND SPECIFICATIONS IN THE VILLAGE OF NEW LENOX / WILL COUNTY STORMWATER ORDINANCE, ILLINOIS URBAN MANUAL - CURRENT EDITION, WHICHEVER IS MORE RESTRICTIVE.
- SOIL EROSION AND SEDIMENT CONTROL MAINTENANCE MUST OCCUR EVERY WEEK AND/OR AFTER EVERY 0.25 IN. OR GREATER RAINFALL EVENT.
- CONTRACTOR SHALL NOTIFY THE VILLAGE OF NEW LENOX MUST ONE WEEK PRIOR TO THE PRE-CONSTRUCTION CONFERENCE, ONE WEEK PRIOR TO THE COMMENCEMENT OF LAND DISTURBING ACTIVITIES, AND ONE WEEK PRIOR TO THE FINAL INSPECTION.
- THERE SHALL BE NO LAND-DISTURBING ACTIVITIES ON-SITE OTHER THAN IN AREAS INDICATED ON THE PLANS.
- THE CONTRACTOR IS RESPONSIBLE FOR INSTALLATION OF ANY ADDITIONAL EROSION CONTROL MEASURES NECESSARY TO PREVENT EROSION AND SEDIMENTATION AS DETERMINED BY THE VILLAGE OF NEW LENOX.
- SOIL EROSION AND SEDIMENT CONTROL FEATURES SHALL BE CONSTRUCTED PRIOR TO THE COMMENCEMENT OF HYDROLOGIC DISTURBANCE OF UPLAND AREAS.
- EXCAVATED SUBGRADE MATERIALS AND/OR EXCESS CUT SHALL BE REMOVED AND DISPOSED OFFSITE IN AN APPROVED FACILITY.
- CONSTRUCTION ACTIVITIES WILL, TO THE EXTENT PRACTICABLE, BE SCHEDULED TO AVOID PERIODS OF RUNOFF.
- THE SEQUENCE OF DAILY CONSTRUCTION OF THE STREAMBANKS SHALL INCLUDE THE FOLLOWING. GRADING ACTIVITIES ALONG THE STREAMBANK SHALL BE LIMITED SO THAT THE AREA OF THE STREAM THAT IS EXPOSED TO REGRADING CAN BE COVERED WITH STAPLED EROSION CONTROL BLANKET AND SEED MIX (IF COMPLETE) BY THE END OF THE WORK DAY. UNDER NO CIRCUMSTANCES SHALL RE-GRADED STREAMBANKS BE UNCOVERED BY EROSION BLANKET DURING A PRECIPITATION EVENT. DISTURBED SOILS WILL BE EXPOSED AS BRIEFLY AS PRACTICABLE.
- RESTORED STREAMBANK AREAS WILL BE RAPIDLY STABILIZED WITH EROSION CONTROL BLANKET, PERMANENT NATIVE PLANT SEEDING, AND TEMPORARY QUICK-GROWING COVER CROP.
- EXCAVATED SOILS WILL PERMANENTLY STOCKPILED IN THE APPROVED AREAS INDICATED ON THE PLANS. SOIL WITHIN APPROVED TEMPORARY SOIL STOCKPILE LOCATIONS SHALL BE REMOVED WITHIN OR BEFORE 7 DAYS.
- SOIL STOCKPILES SHALL NOT BE LOCATED IN A FLOOD PRONE AREA OR A DESIGNATED BUFFER PROTECTING WATERS OF THE UNITED STATES OR ISOLATED WATERS OF WILL COUNTY.
- A STABILIZED CONSTRUCTION ENTRANCE CONSISTING OF ⅜ INCH PLYWOOD SHEETS, SHALL BE LOCATED AT ANY POINT WHERE TRAFFIC WILL BE ENTERING OR LEAVING A CONSTRUCTION SITE TO OR FROM A PUBLIC RIGHT-OF-WAY, STREET, ALLEY OR PARKING AREA.
- THE SOIL STOCKPILE AREA SHALL BE PROTECTED WITH SILT FENCE AS INDICATED IN THE PLAN DETAILS. DURING AND UPON COMPLETION OF CONSTRUCTION ACTIVITIES, SEDIMENT ACCUMULATED ALONG THE SILT FENCE FROM CONSTRUCTION ACTIVITIES SHALL BE CLEANED OUT FROM THE STREAM AND REMOVED DIRECTLY FROM THE SITE, OR TEMPORARILY STOCKPILED IN THE AREA INDICATED.
- IF DEWATERING SERVICES ARE NEEDED, ADJOINING PROPERTIES AND DISCHARGE LOCATIONS SHALL BE PROTECTED FROM EROSION. DISCHARGES SHALL BE ROUTED THROUGH AN EFFECTIVE SEDIMENT CONTROL MEASURE (e.g. SEDIMENT TRAP, SEDIMENT BASIN, OR OTHER APPROPRIATE MEASURE.
- GRADE CONTROL STRUCTURES (ROCK RIFFLES, ROCK VANES, ROCK CHECKS, ETC.) SHALL BE CONSTRUCTED BY TEMPORARILY PLACING A FIBER ROLL STAKED ACROSS THE STREAM CHANNEL IMMEDIATELY DOWNSTREAM OF THE AREA OF DISTURBANCE. UPON COMPLETION OF GRADE CONTROL CONSTRUCTION ACTIVITIES, SEDIMENT ACCUMULATED ALONG THE FIBER ROLL FROM CONSTRUCTION ACTIVITIES SHALL BE CLEANED OUT FROM THE STREAM AND REMOVED DIRECTLY FROM THE SITE, OR TEMPORARILY STOCKPILED IN THE AREA INDICATED THE PLANS. THE FIBER ROLL BARRIER AND STAKES PLACED ACROSS THE STREAM CHANNEL SHALL BE REMOVED.
- ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED WITHIN 30 DAYS AFTER FINAL SITE STABILIZATION IS ACHIEVED OR AFTER THE TEMPORARY MEASURES ARE NO LONGER NEEDED.
- UPON COMPLETION OF CONSTRUCTION, EQUIPMENT ACCESS AREAS SHALL BE RESTORED AND SOIL STABILIZATION PROVIDED THROUGH REMOVAL OF RUTS AND SEED INSTALLATION ALONG DISTURBED AREAS. SEE "SITE CLEANUP" MEASURES IN THESE SPECIFICATIONS.

ROAD CLEANUP / SEWER PROTECTION

THE CONTRACTOR SHALL MAINTAIN THE PARKING LOT AND ROADWAYS ADJOINING THE PROJECT SITE FROM MUD AND DEBRIS AT ALL TIMES. IF MUD AND OR DEBRIS IS CARRIED ONTO THE PARKING LOT OR ROADWAYS FROM VEHICLES ENTERING ONTO THE HIGHWAY / STREETS FROM EITHER THE CONTRACTOR'S TRUCKS, HIS EMPLOYEES' VEHICLES, OR HIS MATERIAL SUPPLIERS, THE CONTRACTOR SHALL IMMEDIATELY REMOVE SAID MUD AND OR DEBRIS. ALL EXISTING AND NEW DRAINAGE STRUCTURES SHALL BE PROTECTED FROM DEBRIS PER IDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, CURRENT EDITION. IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO PROHIBIT SEDIMENT AND DEBRIS FROM ENTERING THE STORM SEWER SYSTEM AND ALLOW DRAINAGE. THE COST TO ESTABLISH AND MAINTAIN THE SEDIMENT / DEBRIS METHOD SHALL BE INCIDENTAL TO THE CONTRACT AND WILL NOT BE A PAY ITEM.

RESTORATION OF DISTURBED AREAS / SITE CLEANUP

SEE " **TOLERANCES FOR RUTS AND DIRT CLODS**" IN THESE SPECIFICATIONS. DEBRIS SHALL BE REMOVED FROM THE WORK AREA ON A DAILY BASIS. ALL AREAS DISTURBED BY CONSTRUCTION ACTIVITIES INCLUDING ACCESS ROUTES, INGRESS, EGRESS, AND OTHER DISTURBED AREAS AS WELL AS THE EXISTING ON-SITE ROADS SHALL BE RESTORED AS DESCRIBED BELOW. PRE-CONSTRUCTION, EXISTING AND CONSTRUCTED ACCESS ROUTES, COMPACTED AREAS, RUTS OR OTHER DISTURBED AREAS SHALL BE DISKED OR TILLED TO A MIN. 6 INCH DEPTH PRIOR TO RESTORATION. SUITABLE ON-SITE TOPSOIL MATERIAL SHALL BE PREPARED OR SPREAD TO A MIN. 6 INCH DEPTH OVER THE RESTORED AREA. TOPSOIL PLACEMENT, IF ANY, SHALL BE FINISHED BY DISKING AND RAKING. EXISTING TURF GRASS AREAS SHALL BE RESTORED TO TURF GRASS AS APPROVED BY OWNER USING EITHER SEED OR SOD. IF SEED IS USED, TURF GRASS SEED MIX SHALL CONSIST OF 80 LB/ACRE BROADCAST APPLICATION OF OF KENTUCKY BLUEGRASS, *POA PRATENSIS* , MIXED WITH 80 LB/ACRE OF PERRENIAL RYEGRASS, *LOLIUM PERENNE*, PLACED BELOW EROSION BLANKET.

A. WITHIN TEN (10) DAYS AFTER SEEDING AND PLANTING ARE COMPLETED, THE SOIL IN RESTORED TURF GRASS AREAS SHALL BE STABILIZED BY TURF GRASS SEED AND EROSION BLANKET, OR SOD.

B. WITHIN AT LEAST THREE (3) MONTHS OF SEEDING AND PLANTING (WITHIN THE GROWING SEASON OF APRIL THROUGH OCTOBER), AT LEAST 90% OF THE SEEDED AREA SOIL SURFACE WILL BE VEGETATED AND NO SEEDED AREA WILL HAVE MORE THAN TWO (2) SQUARE FEET DEVO

DAMAGE TO PUBLIC OR PRIVATE PROPERTY

RESTORATION OF DAMAGE TO PUBLIC OR PRIVATE PROPERTY OUTSIDE THE LIMITS OF THIS PROJECT AND OF ALL EXISTING ROADS AND RIGHTS-OF-WAY AND EASEMENTS SHALL BE COMPLETED IN ACCORDANCE WITH THE APPLICABLE SECTIONS OF THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, DEPARTMENT OF TRANSPORTATION, STATE OF ILLINOIS, LATEST EDITION, THE ENGINEER, AND GOOD CONSTRUCTION PRACTICES. ACCORDINGLY, THE FOLLOWING SPECIFICATIONS ARE CITED:

BITUMINOUS CONCRETE BINDER AND SURFACE COURSE (CLASS I)
SECTION 406
PAVEMENT REPLACEMENT
SECTION 492
SOD
SECTION 252

IT IS THE INTENT OF THESE SPECIFICATIONS THAT CLEAN-UP AND FINAL RESTORATION SHALL BE PERFORMED IMMEDIATELY UPON COMPLETION OF EACH PHASE OF THE WORK OR WHEN SO DIRECTED BY THE ENGINEER SO THAT THESE AREAS WILL BE RESTORED AS NEARLY AS POSSIBLE TO THEIR ORIGINAL CONDITIONS OR BETTER, AND SHALL INCLUDE BUT NOT LIMITED TO RESTORATION OF MAINTAINED LAWNS AND RIGHTS-OF-WAY, ROADWAYS, DRIVEWAYS, SIDEWALKS, DITCHES, BUSHES, HEDGES, TREES, SHRUBS, FENCES, MAILBOXES, SEWERS, DRAINS, TILES, WATER MAINS, B-BOXES, ETC.

EXCAVATION SPECIFICATIONS

I. EXCAVATION AND GRADING

A. STANDARDS

ALL SITE CLEARING, TOPSOIL, EXCAVATION, EMBANKMENT, GRADING, COMPACTION, SUBGRADE / SUBBASE PREPARATION, AND ALL OTHER WORK HEREIN CONTEMPLATED SHALL BE CONSTRUCTED IN CONFORMANCE WITH THE APPLICABLE SECTIONS OF THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, DEPARTMENT OF TRANSPORTATION, STATE OF ILLINOIS, LATEST EDITION, AND THE CURRENT VILLAGE OF NEW LENOX DEVELOPMENT REGULATIONS, EXCEPT THAT PAYMENT WILL BE DEFINED A DETAILED IN THE CONTRACT DOCUMENTS. ACCORDINGLY, THE FOLLOWING SPECIFICATIONS ARE CITED WITH EXCEPTIONS AS NOTED:

1. CLEARING, TREE REMOVAL, & HEDGE REMOVAL SECTION 201
2. EARTH AND ROCK EXCAVATION SECTION 202
3. EMBANKMENT SECTION 205
4. POROUS GRANULAR EMBANKMENT SECTION 206
5. SUBGRADE SECTION 301
6. TOPSOIL AND COMPOST SECTION 211
7. FINAL SHAPING, TRIMMING AND FINISHING SECTION 212
8. SEEDING SECTION 250
9. SOD SECTION 252

B. GENERAL

1. EARTHWORK CALCULATIONS AND CROSS SECTIONS

THE CONTRACTOR UNDERSTANDS THAT ANY EARTHWORK CALCULATIONS, QUANTITIES OR CROSS SECTIONS THAT HAVE BEEN FURNISHED BY THE ENGINEER ARE FOR INFORMATION ONLY AND ARE PROVIDED WITHOUT ANY GUARANTEE BY THE ENGINEER WHATSOEVER AS TO THEIR SUFFICIENCY OR ACCURACY, CONTRACTOR WARRANTS THAT HE HAS PREPARED HIS OWN CALCULATIONS AND CROSS SECTIONS TO DETERMINE EARTHWORK VOLUMES NEEDED TO PREPARE HIS PROPOSAL AND PRICES HEREIN ARE REPRESENTED BY THE CONTRACTOR AS COVERING ALL COSTS TO THE ENGINEER FOR THE WORK.

2. WORK LIMITS

THE CONTRACTOR, HIS AGENTS AND EMPLOYEES AND THEIR EMPLOYEES AND THEIR EQUIPMENT, MACHINERY AND VEHICLES SHALL CONFINE THEIR WORK WITHIN THE BOUNDARIES OF THE PROJECT AND SHALL BE SOLELY LIABLE FOR DAMAGE CAUSED BY THEIR EQUIPMENT, MACHINERY AND VEHICLES ON ADJACENT PROPERTY.

C EXCAVATION AND EMBANKMENT

1. TOPSOIL RESPREAD

UPON COMPLETION OF IMPROVEMENTS AND INSTALLATION, A MINIMUM SIX INCHES (6") OF TOPSOIL SHALL RESPREAD FOR ALL LANDSCAPED AREAS WHICH ARE DISTURBED BY EARTHWORK CONSTRUCTION. THE CONTRACTOR THEREFORE MAY PLACE TEMPORARY STOCKPILES OF TOPSOIL IN LOCATIONS APPROVED BY THE ENGINEER THAT WILL FACILITATE THE RESPREAD OF TOPSOIL. IN NO CASE SHALL TEMPORARY SOIL STOCKPILES REMAIN FOR LONGER THAN 7 DAYS. ONLY THE BEST QUALITY TOPSOIL SHALL BE USED FOR TOPSOIL RESPREAD.

2. EXCAVATION AND EMBANKMENT

ALL EXCAVATION AND EMBANKMENTS SHALL BE COMPLETED IN ACCORDANCE WITH SECTIONS 202, 203, 204, 205, AND 206 AND AS SHOWN ON THE PLANS. ALL SUITABLE EXCAVATED MATERIALS SHALL BE HAULED, PLACED, AND COMPACTED IN THE EMBANKMENT AREAS IN ACCORDANCE WITH THE PLANS AND SECTION 206. THE CONTRACTOR SHALL INCLUDE ALL DEWATERING, TEMPORARY DITCHING AND CULVERTS NECESSARY TO COMPLETE THE EXCAVATION AND EMBANKMENTS.

SPECIFICALLY INCLUDED IN THE COST OF EXCAVATION AND EMBANKMENTS IS GRADING AND SHAPING OF ALL CUT OR FILL AREAS SUCH AS CROWNING ROADWAY SUBGRADE AND ALL WORK REQUIRED TO PROVIDE POSITIVE DRAINAGE AT THE END OF EACH WORKING DAY AND UPON COMPLETION OF A SECTION.

THE EXCAVATION CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVAL OF UTILITY AND FOUNDATION SPOIL. ALL UNSUITABLE MATERIALS ENCOUNTERED ABOVE THE PROPOSED SUBGRADE ELEVATIONS SHALL BE EXCAVATED AND REMOVED FROM THE PROJECT AREA TO AN OFFSITE LOCATION OF THE CONTRACTOR'S CHOICE.

A SOILS TESTING FIRM EMPLOYED BY THE ENGINEER SHALL DETERMINE WHICH SOILS ARE UNSUITABLE.

GOOD EROSION CONTROL PRACTICES SHALL BE MAINTAINED IN ACCORDANCE WITH THE ILLINOIS PROCEDURES AND STANDARDS FOR URBAN SOIL EROSION AND SEDIMENTATION CONTROL, AND THE VILLAGE OF WOODRIEGE BY THE EXCAVATION AND ROADWAY CONTRACTORS. THIS CONTRACTOR SHALL:

(A) STOCKPILE TOPSOIL OUTSIDE OF ANY WATER COURSE.
(B) CONSTRUCT DITCHES AND TOPSOIL AND SEED IMMEDIATELY IF NECESSARY.
(C) INSTALL BARRIER FILTERS AT ALL ENTRANCES TO DETENTION AREAS, CULVERTS, AND STORM SEWER INLETS. THESE FILTERS SHALL BE MAINTAINED AND SILT ACCUMULATIONS REGULARLY REMOVED TO THE SATISFACTION OF THE ENGINEER.
(D) MAINTAIN NEW AND EXISTING GRASS COVER WHERE POSSIBLE. HEAVY EQUIPMENT SHALL BE CONFINED TO SPECIFIC WORK AREAS DURING EACH PHASE OF CONSTRUCTION.
(E) REMOVE ANY MUD OR DEBRIS TRACKED ONTO ROADWAYS ADJACENT TO THE SITE DUE TO CONSTRUCTION OPERATIONS.
(F) PROVIDE DUST CONTROL TO THE SATISFACTION OF THE ENGINEER.

II. UNDERGROUND IMPROVEMENTS

A. GENERAL

1. STANDARDS

ALL UNDERGROUND IMPROVEMENTS SHALL BE CONSTRUCTED WITH THE STANDARD SPECIFICATIONS FOR WATER AND SEWER MAIN CONSTRUCTION IN ILLINOIS, LATEST EDITION, VILLAGE OF NEW LENOX DEVELOPMENT REGULATIONS, CURRENT EDITION, STANDARDS SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, DEPARTMENT OF TRANSPORTATION, STATE OF ILLINOIS, LATEST EDITION.

Appendix C– Photos (E. Branch of Marley Creek Streambank Stabilization)

Photo 1: Pre-construction conditions, looking upstream (E. Branch Marley Creek).

Photo 2: Pre-construction streambank conditions, facing upstream (E. Branch of Marley Creek).

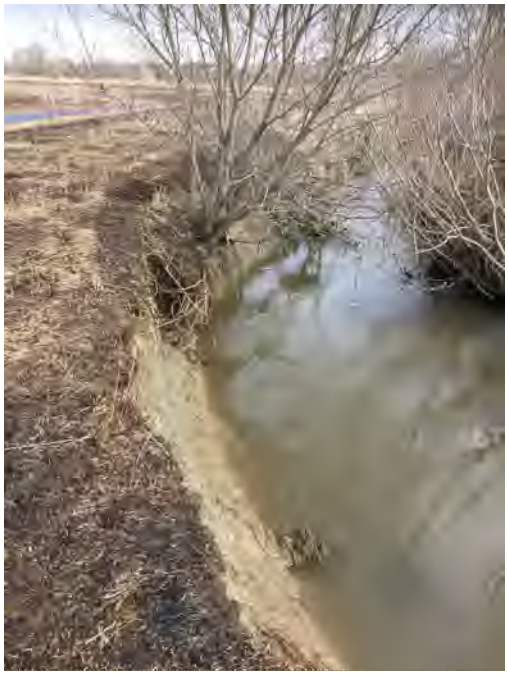


Photo 3: Project area prior to construction, looking upstream (E. Branch Marley Creek).

Photo 4: Project area prior to construction, facing west (E. Branch Marley Creek).

Photo 5: Construction conditions, looking upstream (E. Branch of Marley Creek).

Photo 6: Stabilized streambank (after construction), looking downstream (E. Branch of Marley Creek).

Photo 7: Stabilized streambank (after construction), looking downstream (E. Branch of Marley Creek).

Photo 8: Stabilized streambank (after construction), looking upstream (E. Branch of Marley Creek).

Photo 9: Stabilized streambank with boulders, looking downstream (E. Branch of Marley Creek).

Photo 10: Planting native plugs along bank.

Appendix D – Final Engineering Plans (E. Branch of Marley Creek Streambank Stabilization)

FINAL ENGINEERING PLANS FOR:

EAST BRANCH MARLEY CREEK STREAMBANK STABILIZATION

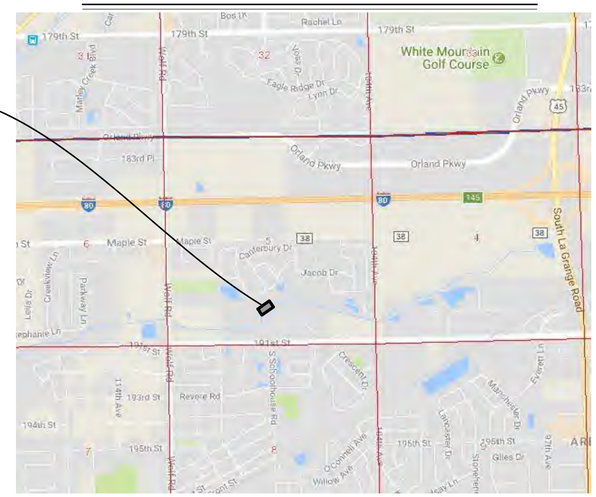
VILLAGE OF MOKENA, ILLINOIS

WILL COUNTY, ILLINOIS

CLIENT: VILLAGE OF MOKENA

LOCATION MAP

PROJECT LOCATION
ZONED: P-1
PROPERTY IDENTIFICATION NUMBER:
19-09-05-308-002



Dial 811 or 1-800-892-0123 JULIE DESIGN TICKET NUMBER:# X0530452-00X

811 Know what's below. Call before you dig.

WITH THE FOLLOWING:
COUNTY WILL COUNTY
CITY-TOWNSHIP MOKENA-FRANKFORT TOWNSHIP
SEC. & 1/4 SEC. NO.# 5-35 N.-12 E.

(2) Working Days before you dig (Excluding Sat., Sun. & Holidays)

NOTE:

- HR GREEN, INC. IS TO BE NOTIFIED 3 DAYS PRIOR TO CONSTRUCTION START.
- HR GREEN, INC. SHALL BE INCLUDED IN ALL PRE-CONSTRUCTION MEETINGS.
- ANY KNOWN DISCREPANCIES ON THIS PLAN SET MUST BE BROUGHT TO THE ATTENTION OF HR GREEN, INC. PRIOR TO THE START OF CONSTRUCTION.

CLIENT:

VILLAGE OF MOKENA
MR. DANIEL PELOQUIN, P.E.,
VILLAGE ENGINEER
VILLAGE OF MOKENA
11004 CARPENTER STREET
MOKENA, IL 60448
PHONE: 708-479-3927

ENGINEER / SURVEYOR:

HR GREEN INC.,
323 ALANA DR..
NEW LENOX, IL. 60451
PHONE: (815) 462-9324

AJAY JAIN, P.E., CFM, - VICE PRESIDENT,
WATER RESOURCES PRACTICE LEADER
PHONE: (815) 759-8331

LOGAN GILBERTSEN, P.E., CFM, PROJECT ENGINEER
PHONE: (815) 759-8370

MIKE LEWIS, PROJECT DESIGNER
PHONE: (815) 759-8340

MILAN DOBROSAVLJEVIC, P.L.S. - PROJECT LAND SURVEYOR
PHONE: (815) 320-7118

VILLAGE OF MOKENA, ILL. Est. 1852 Inc. 1880

HRGreen

323 ALANA DRIVE | NEW LENOX, IL 60451
Phone: 815.462.9324 | Toll Free: 800.728.7805 | Fax 815.462.9328 | HRGreen.com

Sheet List Table

Sheet Number	Sheet Title
C-01	COVER SHEET
C-02	GENERAL NOTES (1)
C-03	SUMMARY OF QUANTITIES AND LEGEND SHEET
C-04	TYPICAL SECTIONS - CONSTRUCTION & LANDSCAPING RESTORATION
C-05	OVERALL PLAN
C-06	DEMOLITION PLAN
C-07	GRADING - RESTORATION PLAN
C-08	EROSION CONTROL SPECIFICATIONS
C-09	EROSION CONTROL DETAILS
C-10	EROSION CONTROL DETAILS
C-11	CROSS SECTIONS
L-01	RESTORATION PLAN
L-02	RESTORATION PLAN

SITE BENCHMARKS:

SITE BENCHMARK 1
CHISELED SQUARE IN NORTHWEST CORNER OF CONCRETE BRIDGE ABUTMENT
ELEVATION: 682.06 (NAVD 88)

CERTIFICATION

LOGAN R. GILBERTSEN 062-067541 REGISTERED PROFESSIONAL ENGINEER OF ILLINOIS EXP: 11/30/2019

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Illinois.

5/16/2018
DATE

LOGAN R. GILBERTSEN, P.E.
License Number: 062.067541
My license renewal date is 11/30/2019.
Pages or sheets covered by this seal:
C-01 - C-11

FOR CONSTRUCTION

NO.	DATE	BY	REVISION DESCRIPTION
1	05/16/18	MPL	ADDENDUM #1

Huff & Huff incorporated
A Subsidiary of GZA GeoEnvironmental, Inc.

ILLINOIS DESIGN FIRM # 184.001322
323 ALANA DRIVE
NEW LENOX, IL 60451
PHONE: 815.462.9324
FAX: 815.462.9328

HRGreen

EAST BRANCH MARLEY CREEK STREAMBANK STABILIZATION
VILLAGE OF MOKENA, ILLINOIS
FINAL ENGINEERING - FOR BIDDING
COVER SHEET

BAR IS ONE INCH ON OFFICIAL DRAWINGS
0 1"
IF NOT ONE INCH, ADJUST SCALE ACCORDINGLY

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APPROVED: AJ
JOB DATE: 05/01/2018
JOB NO: 171805

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C-01

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SPECIFICATIONS & GENERAL NOTES

GENERAL NOTES:

1. All items of this project shall be governed by specifications included in the documents listed below:

   A. "Standard Specifications for Road and Bridge Construction" prepared by the Department of Transportation of the State of Illinois and adopted by said department (Latest Edition).
   B. "Supplemental Specifications and Recurring Special Provisions" adopted by the Illinois Department of Transportation (Latest Edition).
   C. "Bureau of Design & Environment Manual" (BDE) by Illinois Department of Transportation (Latest Edition)
   D. "Manual on Uniform Traffic Control Devices" – Federal Highway Administration MUTCD (Latest Edition).
   E. "Illinois Supplement to the National Manual on Uniform Traffic Control Devices" (Latest Edition).
   F. "Standard Specifications for Water and Sewer Main Construction in Illinois" (Latest Edition).
   G. "Illinois Urban Manual" prepared by the U.S. Department of Agriculture NRCS and maintained by the Association of Illinois Soil and Water Conservation Districts (Latest Edition).
   H. "Standards and Specifications for Soil Erosion and Sediment Control" by IEPA, Illinois Urban Manual – A Technical Manual Designed For Urban Ecosystem Protection and Enhancement, (Latest Edition).
   I. "Will County Stormwater Ordinance"
   J. "Village of Mokena Municipal Code and Engineering Standards"

In addition the following special provisions supplement the said specifications, and in case of conflict with any part or parts of said specifications, these special provisions shall take precedence and shall govern.

2. SCOPE OF WORK: The proposed improvement consists of supplying all the necessary labor, material and equipment to satisfactorily construct and install all improvements according to the plans designated as East Branch Marley Creek Streambank Stabilization.

3. COORDINATION WITH UTILITIES

   Prior to the start of construction, the contractor shall have all utilities located by J.U.L.I.E (811) or (1–800–892–0123) at least 48 hours prior to the start of construction. The contractor shall cooperate with all utility owners as provided for in the Standard Specifications.

   The contractor shall be responsible for the protection of all underground or surface utilities, even though they may not be shown on the plans. Any utility that is damaged during construction shall be repaired or replaced to the satisfaction of the Engineer or the Owner. This work shall be paid for at the Contractor's expense.

   It is the Contractor's responsibility to locate all existing utilities prior to construction. The location of existing utilities as shown on these plans is based on record information and may not be accurate. Where conflict exists between existing utilities and the proposed underground piping requiring a revision to the plans, such construction shall not be undertaken until such changes are approved by the Engineer. The contractor shall report all such conflicts immediately to the Engineer.

   All existing utilities within the project area shall be removed and relocated, if necessary, for construction by the utility company which has jurisdiction over it. The Contractor is responsible for scheduling with the appropriate utility company.

   The coordination of all utility work for the construction project will be discussed at a pre construction meeting.

4. CONSTRUCTION OF UNDERGROUND UTILITIES

   A. Removal of water: Contractors shall, at all times during construction, provide and maintain ample means and devices with which to remove and properly dispose of all water entering the excavations. No sanitary sewer shall be used for disposal of trench water. This shall be incidental to the utility work unless otherwise noted.

   B. Restoration of drainage: As soon as possible after backfilling the trench, all ditching, grading and shaping necessary to restore the original drainage in the area of work shall be performed. Culverts removed during the course of the work shall be replaced as soon as practicable.

   Adequate temporary drainage facilities meeting the approval of the Engineer shall be provided during construction. This work shall be incidental to the project unless otherwise noted.

   C. Utilities: The Contractor shall notify all utilities owners prior to the installation of any pipe lines. Where conflict exists between underground utilities and the proposed underground piping requiring a revision to the plans, such construction shall not be undertaken until such changes are approved by the Village Of Mokena and or Engineer in writing.

   D. UTILITIES IN EMBANKMENT SECTION. All embankment material which is to be placed within the area of influence of proposed underground utilities, as shown on the plans, including storm sewer, shall be compacted to 95% of Standard Proctor. The area of influence shall be determined as follows:

      a. Horizontal Alignment: The horizontal area of influence shall be that area 5 foot from both sides of the proposed trench alignment.
      b. Vertical: The vertical area of influence shall be determined as that area located directly under the horizontal alignment as defined in (1) from the bottom of the proposed subgrade to the top of the remaining in–situ material after topsoil stripping and undercutting as directed by the Engineer or as shown on the plans.
      c. The subgrade shall be free of unsuitable material and shall be compacted to a minimum of ninety–five percent (95%) of modified Proctor density. Testing for compaction shall be the responsibility of the Contractor. All topsoil and any organic materials must be removed.
      d. Easements for the existing utilities, both public and private, and utilities within public rights–of–way are shown on the plans according to available records. The Contractor shall be responsible for determining the exact location in the field of these utility lines and their protection from damage due to construction operations. If existing utility lines of any nature are encountered which conflict in location with new construction, the Contractor shall notify the Engineer so that the conflict may be resolved.
      e. Contractor shall be responsible for securing all Permits including municipal permits for all proposed improvements according to the plans designated as East Branch Marley Creek Streambank Stabilization.

5. CLEARING, TREE REMOVAL, BUSH REMOVAL, AND PROTECTION

   Contractor shall provide Clearing, tree removal, bush removal and protection as per section Article 201 of the Standard Specifications and as specified in the project manual.

6. CONSTRUCTION FENCING

   E. Perimeter Construction Fencing to be placed at the direction of the owner and per the location found on the construction documents. Paid for per linear foot, excluding areas fenced for contractors stockpile, staging, security and only other fencing not first authorized by owner.

7. CONSTRUCTION OBSERVATION
   All improvements shall be subject to observation by a duly authorized and qualified Village or owner's representative both during the course of construction and after construction is complete for final project closeout.

8. EROSION CONTROL. It shall be the Contractor's responsibility to properly control erosion on the jobsite. Any siltation of pavement, conduits, or channel, or ditches shall be cleaned and maintained by the Contractor until the seeding has taken hold. All washouts, gullies, etc. will be regraded and reseeded by the Contractor.

   The Contractor's responsibility for erosion control shall extend throughout the construction process. The Contractor shall be responsible for clean–up of paved surfaces within and adjacent to the project on a timely basis and/or at the direction of the Village & WILL COUNTY.

   For all drainage structures in the disturbed areas, inlet protection shall be placed and maintained by the Contractor until vegetation is established, as determined by the Village.

   Erosion control measures must be inspected weekly and after every storm of one half inch of rainfall or greater by the Contractor. An inspection report must be submitted by the Contractor to the Village following each inspection. Any repairs or replacement needed to ensure adequate erosion control must be made immediately at the Contractor's expense.

   Construction & Silt fencing and other identified erosion control measures must be installed prior to starting construction.

   Erosion control measures must be inspected within 24 hours of 0.5" of rain or more and corrective measures must be completed within 48 hours.

   Substantial completion is when 70% of the site vegetation is established.

9. TOPSOIL PLACEMENT. Contractor shall place stockpiled topsoil or imported material on all disturbed areas with a minimum 6" topsoil raked smooth to be ready for landscaping (seeding, sod, etc.).

10. **No construction plans shall be used for construction unless specifically marked "For Construction." Prior to commencement of construction, the Contractor shall verify all dimensions and conditions affecting their work with the actual conditions at the job site. If there are any discrepancies from what is shown on the construction plans, he must immediately report same to the Engineer before doing any work, otherwise the Contractor assumes full responsibility. In the event of disagreement between the construction plans, standard specifications and/or special details, the Contractor shall secure written instructions from the Engineer prior to proceeding with any part of the work affected by omissions or discrepancies. Failing to secure such instructions, the Contractor will be considered to have proceeded at his own risk and expense.**
    In the event of any doubt or question arising with respect to the true meaning of the construction plans or specifications, the decision of the Engineer shall be final and conclusive.

11. INDEMNIFICATION

    Contractor shall provide indemnification as per Article 107.26 of the Standard Specifications. All costs for insurance shall be considered incidental to the contract.

    ADDITIONAL REQUIREMENTS: The Contractor shall also indemnify and hold harmless, HR Green, Inc., Village of Mokena, its officers, employees, agents, and subcontractors. The Contractor shall not commence work until additional indemnification requirements have been obtained under this paragraph.

12. INSURANCE AND LIABILITY

    Contractor shall provide insurance coverage as per Article 107.27 of the Standard Specifications. All costs for insurance shall be considered incidental to the contract.

    The "Department" shall be taken to mean HR Green, Inc. The policy of insurance shall include HR Green, Inc., Village of Mokena, and it's Agents as an additional insured or provide separate coverage with an Owner's Protective Policy, as per the amounts stated in the Standard Specifications. No work shall begin until the certificate of insurance is on file with the Engineer.

    ADDITIONAL REQUIREMENTS: The Contractor shall secure and maintain such insurance from an insurance company authorized to write casualty insurance in the State where the work is located and also will protect and list as additional insured, HR Green, Inc., Village of Mokena, and his subcontractors and his employees from claims for bodily injury, death or property damage which may arise from improvements on the property. The Contractor shall not commence work until he/she has obtained all insurance required under this paragraph and filed the certificate of insurance or the certified copy of the insurance policy.

13. SITE CLEAN UP

    When construction operations take place adjacent to public roadways, railways or waterways, the contractor shall be responsible for removal of all loose debris deposited on the pavement. The stock piling of spoils from foundations or utility excavations will not be allowed on the pavement or in special management areas such as floodplains or wetlands.

14. LANDSCAPING & RESTORATION

    See project manual for specifications.

15. STAKING

    The contractor shall protect and carefully preserve all section or subsection monuments or property or reference markers until the Owner, his agent or an authorized surveyor has witnessed or otherwise referenced their locations

    The Engineer shall be responsible for providing any additionally required staking information.

    All elevations are on U.S.G.S. Datum. (NAVD 88)

16. MISCELLANEOUS

    The Contractor shall notify the VILLAGE OF MOKENA and the residents within the project limits a minimum of 48 hours prior to the start of construction.

    All work performed relative to this improvement shall comply with all applicable rules and regulations of O.S.H.A.

    All construction personnel will be required to wear a safety vest, complying with the latest O.S.H.A. requirements, at all times while at the construction site. Compliance with this requirement shall be considered as incidental to the contract.

    Unless otherwise indicated, the cost of all materials required and all labor necessary to comply with the above provisions will not be paid for separately, but shall be considered as included in the unit bid prices of the contract, and no additional compensation will be allowed.

MISC. GENERAL NOTES

1. SITE GRADING SHALL NOT PROCEED UNTIL EROSION CONTROL MEASURES HAVE BEEN INSTALLED.
2. THE CONTRACTOR SHALL COMPLY TO THE FULLEST EXTENT WITH THE LATEST OSHA STANDARDS AND REGULATIONS, OR ANY OTHER AGENCY HAVING JURISDICTION FOR EXCAVATION AND TRENCHING PROCEDURES. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE "MEANS AND METHODS" REQUIRED TO MEET THE INTENT AND PERFORMANCE CRITERIA OF OSHA, AS WELL AS ANY OTHER ENTITY THAT HAS JURISDICTION FOR EXCAVATION AND/OR TRENCHING PROCEDURES.
3. THE TOPS OF EXISTING MANHOLES, INLET STRUCTURES, AND SANITARY CLEANOUT TOPS SHALL BE ADJUSTED, IF REQUIRED, TO MATCH PROPOSED GRADES IN ACCORDANCE WITH ALL APPLICABLE STANDARDS.
4. THE CONTRACTOR IS RESPONSIBLE FOR VERIFICATION OF EXISTING TOPOGRAPHIC INFORMATION AND UTILITY INVERT ELEVATIONS PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION. CONTRACTOR TO ENSURE 0.50% MINIMUM SLOPE ALONG ALL ISLANDS, GUTTERS, AND CURBS; 1.0% ON ALL CONCRETE SURFACES; AND 1.5% MINIMUM ON ASPHALT, UNLESS NOTED OTHERWISE, TO PREVENT PONDING. ANY DISCREPANCIES THAT MAY AFFECT THE PUBLIC SAFETY OR PROJECT COST MUST BE IDENTIFIED TO THE ENGINEER IN WRITING IMMEDIATELY. PROCEEDING WITH CONSTRUCTION WITHOUT NOTIFICATION IS DONE SO AT THE CONTRACTOR'S OWN RISK.
5. IN CASE OF DISCREPANCIES BETWEEN PLANS OR RELATIVE TO OTHER PLANS, THE SITE PLAN WILL TAKE PRECEDENCE. IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY CONFLICTS.
6. ALL EXISTING STRUCTURES, UNLESS OTHERWISE NOTED TO REMAIN, FENCING, TREES, & ETC., WITHIN CONSTRUCTION AREA SHALL BE REMOVED & DISPOSED OF OFF SITE. NO ON SITE BURNING WILL BE ALLOWED
7. GENERAL CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES HAVING UNDERGROUND UTILITIES ON SITE OR IN RIGHT–OF–WAY PRIOR TO EXCAVATION. CONTRACTOR SHALL CONTACT UTILITY LOCATING COMPANY AND LOCATE ALL UTILITIES PRIOR TO GRADING START.
8. PART OF THE PROPOSED PROJECT IS LOCATED WITHIN A FLOOD HAZARD AREA/WETLAND.
9. THE CONTRACTOR SHALL CONFINE THEIR GRADING OPERATIONS TO WITHIN CONSTRUCTION LIMITS AND EASEMENTS SHOWN ON THE PLANS. ANY DAMAGE TO PROPERTIES OUTSIDE THE SITE BOUNDARY SHALL BE AT THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
10. THE CONTRACTOR SHALL APPLY NECESSARY MOISTURE CONTROL TO THE CONSTRUCTION AREA AND HAUL ROADS TO PREVENT THE SPREAD OF DUST.
11. ALL FIELD TILES ENCOUNTERED SHALL BE REPLACED AND/OR CONNECTED TO THE STORM SEWER SYSTEM AND LOCATED AND IDENTIFIED ON THE RECORD PLANS BY THE CONTRACTOR.
12. ALL STORM DRAINAGE CONSTRUCTION SHALL BE PERFORMED IN ACCORDANCE WITH THE VILLAGE OF MOKENA.
13. ELEVATIONS AND CONTOURS ARE TO STATE PLANE COORDINATES PER NAVD DATUM.
14. ACCESSIBLE PARKING, RAMPS, AND SIGNAGE SHALL COMPLY WITH ADA ACCESSIBILITY GUIDELINES FOR BUILDINGS AND FACILITIES.
15. THE CONTRACTOR SHALL NOT DISTURB DESIRABLE GRASS AREAS AND DESIRABLE TREES OUTSIDE THE CONSTRUCTION UNITS. THE CONTRACTOR SHALL NOT BE PERMITTED TO PARK OR SERVICE VEHICLES AND EQUIPMENT OR USE THESE AREAS FOR STORAGE OR MATERIALS. STORAGE, PARKING AND SERVICE AREAS WILL BE SUBJECT TO THE APPROVAL OF THE OWNER.
16. THE CONTRACTOR IS RESPONSIBLE FOR REPLACING ANY AREAS OF PAVEMENT OR SIDEWALK NOT TO BE REMOVED THAT IS DAMAGED DUE TO OPERATING EQUIPMENT ON THE PAVEMENT OR SIDEWALK.
17. THE CONTRACTOR MAY BE REQUIRED TO PLACE TEMPORARY WARNING DEVICES AND SAFETY FENCE AT CERTAIN LOCATIONS WHERE REPLACEMENT FEATURES ARE NOT INSTALLED THE SAME DAY, AS DIRECTED BY THE ENGINEER OR THE **OWNER**.
18. ALL CONSTRUCTION WITHIN PUBLIC ROW/EASEMENTS AND/OR ANY CONNECTION TO PUBLIC SEWERS AND STREETS, SHALL COMPLY WITH THE VILLAGE CONSTRUCTION SPECIFICATIONS FOR SUBDIVISIONS AND LATEST EDITION OF **IDOT** DESIGN STANDARDS
19. ALL SUBGRADE AND SUBBASE SHALL BE PROOFROLLED PER THE I.D.O.T. STANDARD SPECIFICATIONS AND BRIDGE CONSTRUCTION.
20. FIELD VERIFY ELEVATIONS AND LOCATIONS OF ALL CONNECTIONS TO EXISTING UTILITIES PRIOR TO COMMENCING CONSTRUCTION.
21. WHERE PUBLIC UTILITY FIXTURES ARE SHOWN AS EXISTING ON THE PLANS OR ENCOUNTERED WITHIN THE CONSTRUCTION AREA, IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY THE OWNERS OF THOSE UTILITIES PRIOR TO THE BEGINNING OF ANY CONSTRUCTION. THE CONTRACTOR SHALL AFFORD ACCESS TO THESE FACILITIES FOR NECESSARY MODIFICATION OF SERVICES. UNDERGROUND FACILITIES, STRUCTURES, AND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE SURVEYS AND RECORDS AND THEREFORE, THEIR LOCATIONS MUST BE CONSIDERED APPROXIMATE ONLY. IT IS POSSIBLE THERE MAY BE OTHERS. THE EXISTENCE OF WHICH IS PRESENTLY NOT KNOWN OR SHOWN. IT IS THE CONTRACTORS RESPONSIBILITY TO DETERMINE THEIR EXISTENCE AND EXACT LOCATIONS AND TO AVOID DAMAGE THERETO. NO CLAIMS FOR ADDITIONAL COMPENSATION WILL BE ALLOWED TO THE CONTRACTOR FOR ANY INTERFERENCE OR DELAY CAUSED BY SUCH WORK. THE CONTRACTOR IS REQUIRED TO UTILIZE THE UTILITY CALL **JULIE AT 1–800–892–0123** AT LEAST 48 HOURS PRIOR TO EXCAVATING ANYWHERE ON THE PROJECT.
22. PROVIDE UNDERDRAINS FROM SEEPS OR SPRINGS ENCOUNTERED. EXTEND TO STORM SEWER SYSTEM OR DAYLIGHT AT THE BOTTOM OF THE THE FILL SLOPE
23. GENERAL CONTRACTOR SHALL HAVE APPROVAL OF ALL GOVERNING AGENCIES HAVING JURISDICTION OVER THIS SYSTEM PRIOR TO INSTALLATION.
24. ALL EXISTING UTILITIES TO BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
25. CONTRACTOR TO LOCATE ANY ELECTRIC LINES SERVICING SURROUNDING PARKING LOT LIGHTING WITH IN THE AREA OF CONSTRUCTION PRIOR TO THE INSTALLATION OF SANITARY, STORM AND WATER MAIN PIPE.
26. CONTRACTOR TO MINIMIZE DISTURBANCE TO THE 921 E. WASHINGTON SITE. THE PROPERTY IS AN ACTIVE CITY OF JOLIET PUBLIC WORKS LOCATION AND EXISTING ACCESS TO TRAFFIC PATTERNS MUST BE OBTAINED.
27. TREES LARGER THAN 5" IN DIAMETER CANNOT BE REMOVED FROM MAY 1 TO NOVEMBER 14. TREE REMOVAL MUST BE COMPLETED OUTSIDE OF THIS TIMEFRAME.
28. SEE PROJECT MANUAL FOR SEEDING SPECIFICATIONS

FOR CONSTRUCTION

NO.	DATE	BY	REVISION DESCRIPTION
1	05/16/18	MPL	ADDENDUM #1

Huff & Huff incorporated
A Subsidiary of GZA GeoEnvironmental, Inc.

ILLINOIS DESIGN FIRM
184.001322
323 ALANA DRIVE
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HRGreen

EAST BRANCH MARLEY CREEK
STREAMBANK STABILIZATION
VILLAGE OF MOKENA, ILLINOIS

FINAL ENGINEERING – FOR BIDDING
GENERAL NOTES (1)

BAR IS ONE INCH ON OFFICIAL DRAWINGS
0 — 1"
IF NOT ONE INCH, ADJUST SCALE ACCORDINGLY

DRAWN BY: MPL
APPROVED: AJ
JOB DATE: 05/01/2018
JOB NO: 171805

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C–02

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SUMMARY OF QUANTITIES

	PAY ITEM #	PAY ITEM	UNITS	QUANTITY
	20100110	TREE REMOVAL (6 TO 15 UNITS DIAMETER)	UNIT	54
+	20200100	EARTH EXCAVATION	CU YD	269
+	20201200	REMOVAL AND DISPOSAL OF UNSUITABLE MATERIAL	CU YD	27
	28000305	TEMPORARY DITCH CHECKS	FOOT	15
	21101505	TOPSOIL EXCAVATION AND PLACEMENT	CU YD	84
	25100115	MULCH, METHOD 2 - STRAW MULCH	ACRE	0.08
+	K1005421	SEEDING (SPECIAL), MESIC PRAIRIE	ACRE	0.19
	25000115	SEEDING, CLASS 1B	SQ YD	50.00
1	25100630	EROSION CONTROL BLANKET - SC-150-BN	SQ YD	580
	28000400	PERIMETER EROSION BARRIER	FOOT	308
	28100101	STONE RIPRAP, CLASS A1	SQ YD	54
	28100107	STONE RIPRAP, CLASS A4	SQ YD	54
+	X0100003	CLEARING AND GRUBBING (SPECIAL)	SQ YD	980
+	X2800400	PERIMETER EROSION BARRIER, SPECIAL (TURBIDITY BARRIER)	FOOT	229
+	Z0013797	STABILIZED CONSTRUCTION ENTRANCE	SQ YD	120
+	Z0013798	CONSTRUCTION LAYOUT	L SUM	1
+	XXXXXXXX	MONITORING AND MAINTENANCE	YEAR	3
+	XXXXXXXX	PLANTINGS - PLUGS	EA	228

+ = SPECIAL PROVISION

PROJECT LEGENDS:

- (P) DESIGNATES PROPOSED HMA PAVEMENT
- (P) DESIGNATES PROPOSED PCC PAVEMENT
- RIDGE LINE — DESIGNATES RIDGE LINES
- DESIGNATES PROPOSED CONCRETE SIDEWALK
- DESIGNATES AREA OF DEPRESSED SIDEWALK
- DESIGNATES AREA TO UTILIZE TRUNCATED DOMES
- (FF) DESIGNATES EROSION CONTROL MEASURE (SEE SHEET C-08-C-10 FOR EROSION CONTROL LEGEND)
- (BF) DESIGNATES SILT FILTER FENCE (LIMITS OF GRADING) (SEE SPECIFIED SHEET FOR DETAILS.)
- (PS) DESIGNATES AREA TO BE SEEDED (SEE LANDSCAPE PLANS)
- (PS) DESIGNATES AREA TO BE SEEDED (SEE LANDSCAPE PLANS)
- (EB) DESIGNATES AREA TO BE SEEDED AND TO UTILIZE EXCELSIOR BLANKET (SEE DETAILS) (SEE LANDSCAPE PLANS)
- (RR) (LC) DESIGNATES PROPOSED RIPRAP AREA (SEE DETAILS) (QUANTITY AS INDICATED)
- (SE) DESIGNATES TEMPORARY CONSTRUCTION ACCESS
- (CG) DESIGNATES CONCRETE CURB & GUTTER
- (CG) DESIGNATES REVERSE CURB & GUTTER
- (CG) DESIGNATES AREA OF DEPRESSED CURB AND GUTTER.
- DESIGNATES TREE AND BRUSH REMOVAL (SEE SHEET FOR SIZE AND QUANTITY)
- DESIGNATES TREE TRUNK & ROOT PROTECTION (POTENTIAL ROOT PRUNING REQUIRED)
- DESIGNATES MAINTAIN 18" VERTICAL SEPARATION PER TO I.E.P.A.'S REQUIREMENTS
- (#) DESIGNATES SANITARY SEWER TAG
- (#) DESIGNATES WATER MAIN TAG
- (#) DESIGNATES STORM SEWER TAG
- (A) DESIGNATES CROSSING TAG

SYMBOL LEGEND

	EXISTING	PROPOSED
SANITARY MANHOLE		
STORM MANHOLE		
STORM CATCH BASIN/INLET		
INLET		
FLARED END SECTION		
VALVE VAULT		
WATER SERVICE VALVE		
FIRE HYDRANT WITH AUXILIARY VALVE		
LIGHT POLE		
REGULATORY SIGN		
UTILITY POLE		
UTILITY BOX	GAS ELEC CATV	GAS ELEC CATV
MAILBOX		
WELL	W	
SANITARY SEWER		
STORM SEWER		
CULVERT		
PERFORATED UNDERDRAIN		
WATER MAIN	W	W
WATER MAIN ENCASEMENT		W
TRENCH BACKFILL		W
SANITARY FORCE MAIN		
ELECTRIC LINE	E	E
OVERHEAD ELECTRIC LINE	OE	OE
UNDERGROUND ELECTRIC	UE	UE
TELEPHONE LINE	T	T
GAS LINE	G	G
CABLE TV LINE	CATV	CATV
FIBER OPTIC LINE	FO	FO
TREE LINE		
TREE		
CONTOURS		
SPOT ELEVATION	EXIST	PROP
FENCE	x	
DRAINAGE DIRECTION ARROW		
DRAINAGE 10-100 YEAR OVERFLOW DIRECTION ARROW		

STANDARD ABBREVIATIONS

B-B – BACK TO BACK OF CURB
B.C. – BACK OF CURB
B.O.C. – BACK OF CURB
B.S.L. – BUILDING SETBACK LINE
P.S.L. – PARKING SETBACK LINE
C.B. – STORM CATCH BASIN
C.E. – COMMONWEALTH EDISON CO.
D.E. – DRAINAGE EASEMENT
E-E – EDGE TO EDGE OF PAVEMENT
E.O.P. – EDGE OF PAVEMENT
E.O.S. – EDGE OF SHOULDER
E.P. – EDGE OF PAVEMENT
E.S. – EDGE OF SHOULDER
F.E.S. – FLARED END SECTION
I.B.T. – ILLINOIS BELL TELEPHONE CO.
L.E. – LANDSCAPE EASEMENT
M.H. – MANHOLE (TYPE SPECIFIED ON PLANS)
R.C.M.E. – ROAD CONSTRUCTION & MAINTENANCE EASEMENT
R.O.W. – RIGHT OF WAY
S.R.L. – SEPTIC RESTRICTION LINE
T.B.F. – TRENCH BACKFILL
T.C. – TOP OF CURB
T.C.E. – TEMPORARY CONSTRUCTION EASEMENT
T.O.B. – TOP OF BERM
T.O.C. – TOP OF CURB
U.E. – UTILITY EASEMENT
P.S.L. – PARKING SETBACK LINE
P.U.E. –PUBLIC UTILITY EASEMENT
P.G.L. – PROFILE GRADE LINE

FOR CONSTRUCTION

NO.	DATE	BY	REVISION DESCRIPTION
1	05/16/18	MPL	ADDENDUM #1

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HRGreen

EAST BRANCH MARLEY CREEK STREAMBANK STABILIZATION
VILLAGE OF MOKENA, ILLINOIS

FINAL ENGINEERING – FOR BIDDING
SUMMARY OF QUANTITIES AND LEGEND SHEET

BAR IS ONE INCH ON OFFICIAL DRAWINGS
0 — 1"
IF NOT ONE INCH, ADJUST SCALE ACCORDINGLY

DRAWN BY: MPL
APPROVED: AJ
JOB DATE: 05/01/2018
JOB NO: 171805

DRAWING
C-03

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Xrefs: xgt-1-dx01; xcs-Tabulations
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PROPOSED LEGEND

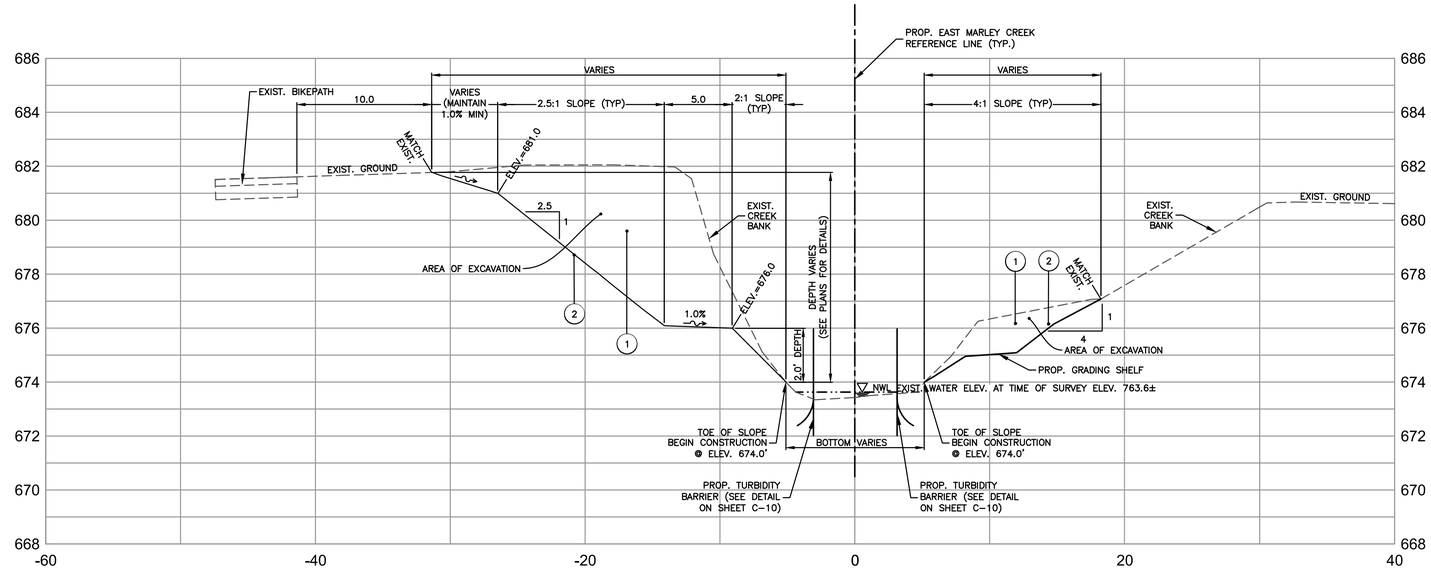
1. EXISTING EARTH EXCAVATION MATERIAL TO BE REMOVED & DISPOSED OF (EXCLUDING TOPSOIL STRIP & RESPREAD)
2. PROPOSED FINAL GRADE, RESTORATION & PLANTINGS (SEE PLANTING TYPICAL SECTION AND RESTORATION PLANS)

LEGEND

- TOP SOIL (6" MINIMUM)
- STONE BOULDERS
- RIPRAP BEDDING
- N.A.G. SC-150 BN EROSION CONTROL BLANKET OR EQUIVALENT
- IDOT CLASS 1B & NATIVE PRAIRIE SEEDING (SEE SHEET L-01 & L-02 FOR ZONES AND SEED MIX.)
- NATIVE PRAIRIE SEEDING WITH NATIVE PLUGS (SEE SHEET L-01 & L-02 FOR ZONES AND SEED MIX.)

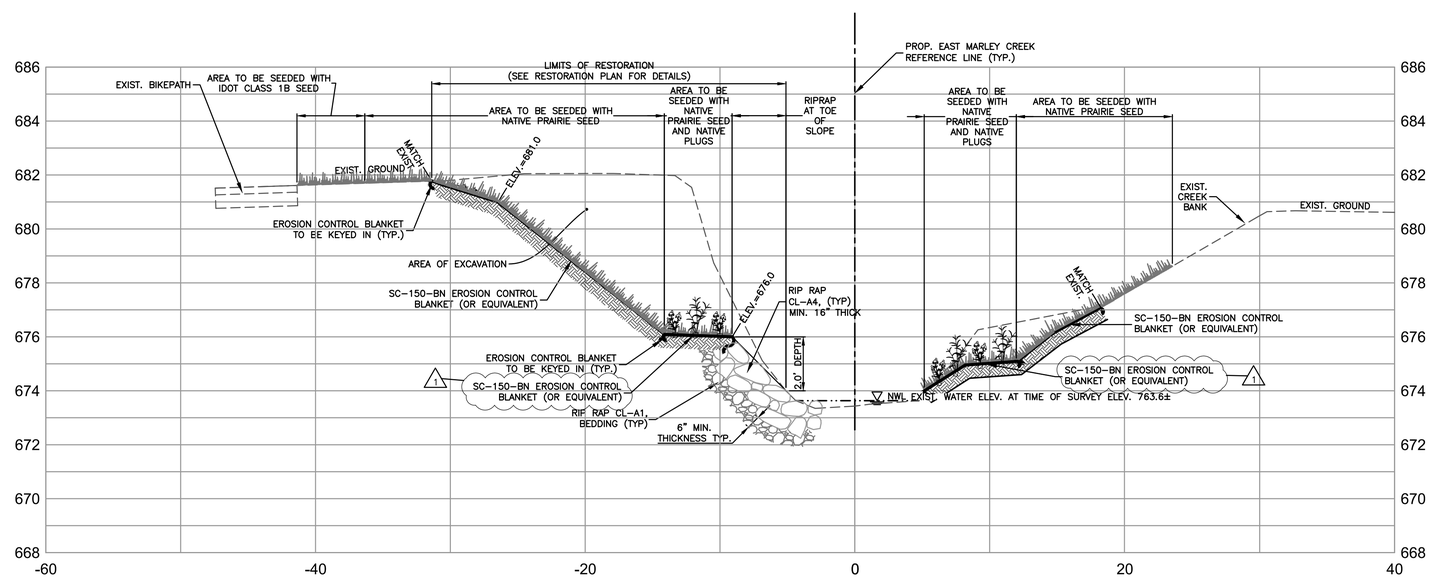
NOTE:

- PRIOR TO STARTING EARTHWORK, THE WORK AREA SHALL BE HERBICIDED WITH GLYPHOSATE OR A ROUND UP SIMILAR CHEMICAL TWICE (2X) DURING THE GROWING SEASON.
- WHERE EMBANKMENT IS UNCHANGED (NO GRADING). SCARIFY EXISTING TOPSOIL & PREPARE FOR SEEDING & PLANTINGS.
- WORK MAY NOT BE PERFORMED IN THE WATER, EXCEPT FOR THE PLACEMENT OF THE MATERIALS NECESSARY FOR THE INSTALLATION OF THE TEMPORARY EROSION CONTROL TURBIDITY BARRIER OR THE PLACEMENT OF THE STONE BOULDERS AS NEEDED FOR RESTORATION / EROSION CONTROL MEASURES.
- NO EQUIPMENT MAY ENTER THE WATER AT ANY TIME.



1 EAST MARLEY CREEK IMPROVEMENTS (LOOKING UPSTREAM)
STA. 10+80 TO STA. 12+10

SCALE: N.T.S.



2 EAST MARLEY CREEK PLANTING IMPROVEMENTS (LOOKING UPSTREAM)
STA. 10+80 TO STA. 12+10

SCALE: N.T.S.

FOR CONSTRUCTION

NO.	DATE	BY	REVISION DESCRIPTION
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EAST BRANCH MARLEY CREEK STREAMBANK STABILIZATION
VILLAGE OF MOKENA, ILLINOIS

FINAL ENGINEERING – FOR BIDDING
TYPICAL SECTIONS – CONSTRUCTION & LANDSCAPING RESTORATION

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APPROVED: AJ
JOB DATE: 05/01/2018
JOB NO: 171805

DRAWING
C-04

Xrefs: 86140264-xc-prof; xgt-1-dh01; xgt-1-dv01
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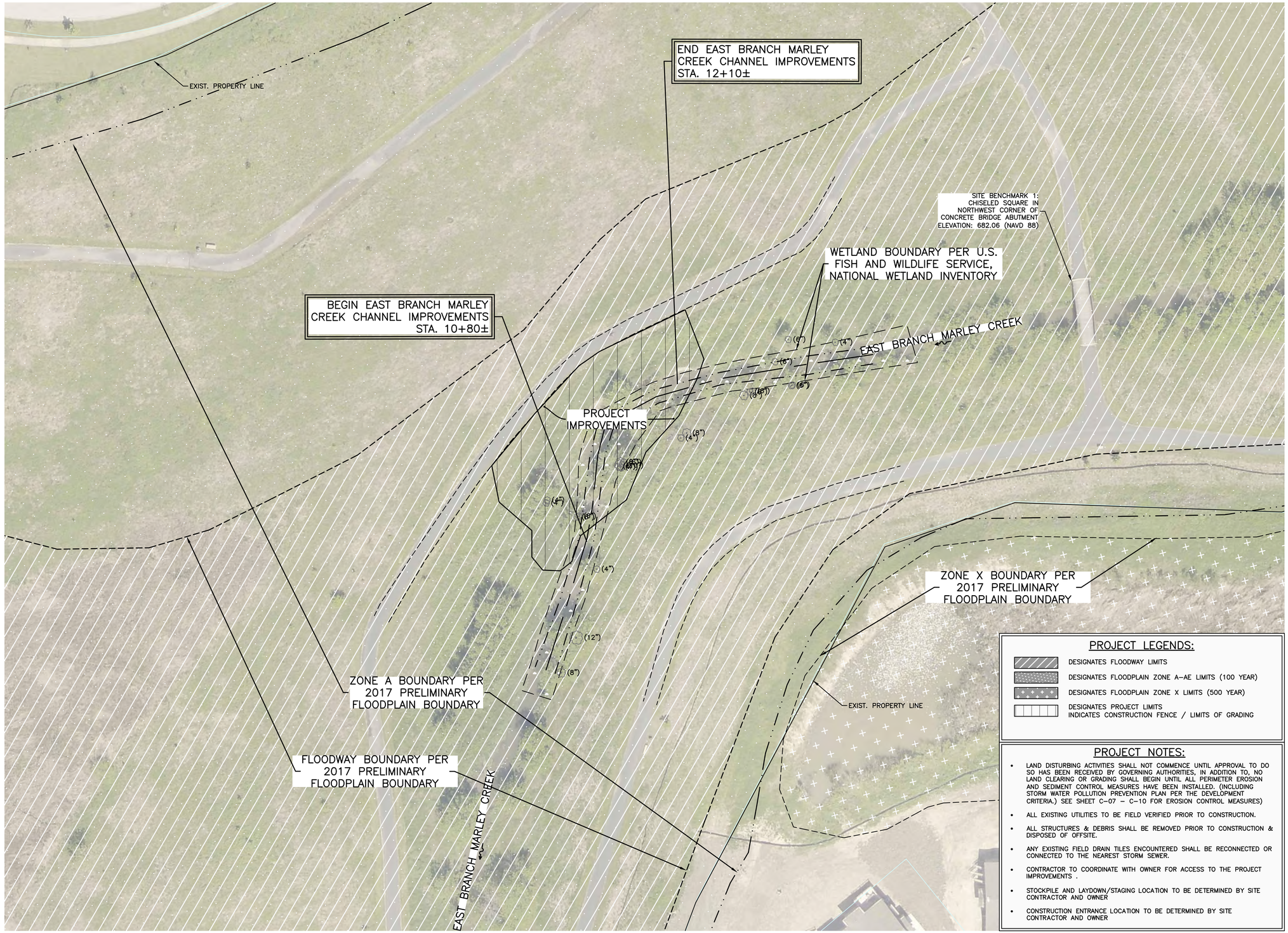

PROJECT LEGENDS:

- DESIGNATES FLOODWAY LIMITS
- DESIGNATES FLOODPLAIN ZONE A–AE LIMITS (100 YEAR)
- DESIGNATES FLOODPLAIN ZONE X LIMITS (500 YEAR)
- DESIGNATES PROJECT LIMITS INDICATES CONSTRUCTION FENCE / LIMITS OF GRADING

PROJECT NOTES:

- LAND DISTURBING ACTIVITIES SHALL NOT COMMENCE UNTIL APPROVAL TO DO SO HAS BEEN RECEIVED BY GOVERNING AUTHORITIES, IN ADDITION TO, NO LAND CLEARING OR GRADING SHALL BEGIN UNTIL ALL PERIMETER EROSION AND SEDIMENT CONTROL MEASURES HAVE BEEN INSTALLED. (INCLUDING STORM WATER POLLUTION PREVENTION PLAN PER THE DEVELOPMENT CRITERIA.) SEE SHEET C–07 – C–10 FOR EROSION CONTROL MEASURES)
- ALL EXISTING UTILITIES TO BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
- ALL STRUCTURES & DEBRIS SHALL BE REMOVED PRIOR TO CONSTRUCTION & DISPOSED OF OFFSITE.
- ANY EXISTING FIELD DRAIN TILES ENCOUNTERED SHALL BE RECONNECTED OR CONNECTED TO THE NEAREST STORM SEWER.
- CONTRACTOR TO COORDINATE WITH OWNER FOR ACCESS TO THE PROJECT IMPROVEMENTS .
- STOCKPILE AND LAYDOWN/STAGING LOCATION TO BE DETERMINED BY SITE CONTRACTOR AND OWNER
- CONSTRUCTION ENTRANCE LOCATION TO BE DETERMINED BY SITE CONTRACTOR AND OWNER

FOR CONSTRUCTION

NO.	DATE	BY	REVISION DESCRIPTION
1	05/16/18	MPL	ADDENDUM #1

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EAST BRANCH MARLEY CREEK STREAMBANK STABILIZATION

VILLAGE OF MOKENA, ILLINOIS

FINAL ENGINEERING – FOR BIDDING

OVERALL PLAN

BAR IS ONE INCH ON OFFICIAL DRAWINGS
0 1"
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APPROVED: AJ
JOB DATE: 05/01/2018
JOB NO: 171805

DRAWING
C–05

Xrefs: 171805-xC-Dsgn; 171805-xC-Survey; 171805-xV-Survey; xgt-1-dx01; 171805-xV-Aerial; 171805-xC-Gis-Data; Mokena_Crystal_Cr_Restoration
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PROJECT NOTES:

- LAND DISTURBING ACTIVITIES SHALL NOT COMMENCE UNTIL APPROVAL TO DO SO HAS BEEN RECEIVED BY GOVERNING AUTHORITIES, IN ADDITION TO, NO LAND CLEARING OR GRADING SHALL BEGIN UNTIL ALL PERIMETER EROSION AND SEDIMENT CONTROL MEASURES HAVE BEEN INSTALLED. (INCLUDING STORM WATER POLLUTION PREVENTION PLAN PER THE DEVELOPMENT CRITERIA.) SEE SHEET C–07 – C–10 FOR EROSION CONTROL MEASURES)
- ALL EXISTING UTILITIES TO BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
- ALL STRUCTURES & DEBRIS SHALL BE REMOVED PRIOR TO CONSTRUCTION & DISPOSED OF OFFSITE.
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- CONTRACTOR TO COORDINATE WITH OWNER FOR ACCESS TO THE PROJECT IMPROVEMENTS .
- STOCKPILE AND LAYDOWN/STAGING LOCATION TO BE DETERMINED BY SITE CONTRACTOR AND OWNER
- CONSTRUCTION ENTRANCE LOCATION TO BE DETERMINED BY SITE CONTRACTOR AND OWNER

LEGEND:

- INDICATES TREE REMOVAL, CLEARING AND GRUBBING AREA
- INDICATES AREA TO BE TREATED WITH HERBICIDE
- INDICATES EROSION CONTROL FENCE (SEE SPECIFIED SHEET FOR DETAILS.)
- (BF) INDICATES EROSION CONTROL MEASURE (SEE SHEET C–08 – C–10 FOR EROSION CONTROL LEGEND / DETAILS)
- INDICATES TREE AND BRUSH PROTECTION (SEE SHEET FOR SIZE AND QUANTITY)
- INDICATES TREE AND BRUSH REMOVAL (SEE SHEET FOR SIZE AND QUANTITY)

EXIST. FLOODWAY BOUNDARY PER 2017 PRELIMINARY FLOODPLAIN BOUNDARY

AREA TO BE TREATED WITH A GLYPHOSATE HERBICIDED TWICE (2X) PRIOR TO EARTHWORK. SEEDING MUST NOT OCCUR WITHIN 2 WEEKS OF LAST HERBICIDE TREATMENT. SEE PROJECT MANUAL FOR DETAILS.

APPROXIMATE LOCATION OF LIMITS OF CONSTRUCTION

PROP. EROSION CONTROL SILT FENCE (SEE C–09 FOR DETAILS) (TYP.)

70.0'

EXIST. HMA BIKE PATH

BEGIN EAST BRANCH MARLEY CREEK CHANNEL IMPROVEMENTS STA. 10+80±

EXIST. TREES TO BE REMOVED (TYP)

PROP. EAST MARLEY CREEK REFERENCE LINE (TYP.)

AREA TO BE TREATED WITH A GLYPHOSATE HERBICIDED TWICE (2X) PRIOR TO EARTHWORK. SEEDING MUST NOT OCCUR WITHIN 2 WEEKS OF LAST HERBICIDE TREATMENT. SEE PROJECT MANUAL FOR DETAILS.

EXIST. TREES TO BE REMOVED (TYP)

EXIST. WETLAND BOUNDARY PER U.S. FISH AND WILDLIFE SERVICE, NATIONAL WETLAND INVENTORY

11+00

12+00

13+00

EAST BRANCH MARLEY CREEK

EXIST. WATER LINE ELEV. AT TIME OF SURVEY 673.60±

PROP. EROSION CONTROL TURBIDITY BARRIER (SEE C–10 FOR DETAILS) (TYP.)

EXIST. TREES TO BE REMOVED (TYP)

END EAST BRANCH MARLEY CREEK CHANNEL IMPROVEMENTS STA. 12+10±

EAST BRANCH MARLEY CREEK

PROP. ROLLED SEDIMENTATION CONTROL (SEE C–10 FOR DETAILS) (TYP.)

PROP. EROSION CONTROL SILT FENCE (SEE C–09 FOR DETAILS) (TYP.)

APPROXIMATE LOCATION OF LIMITS OF CONSTRUCTION

AREA TO BE TREATED WITH A GLYPHOSATE HERBICIDED TWICE (2X) PRIOR TO EARTHWORK. SEEDING MUST NOT OCCUR WITHIN 2 WEEKS OF LAST HERBICIDE TREATMENT. SEE PROJECT MANUAL FOR DETAILS.

EXIST. HMA BIKE PATH

0 5 10

FOR CONSTRUCTION

NO.	DATE	BY	REVISION DESCRIPTION
1	05/16/18	MPL	ADDENDUM #1

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EAST BRANCH MARLEY CREEK STREAMBANK STABILIZATION

VILLAGE OF MOKENA, ILLINOIS

FINAL ENGINEERING – FOR BIDDING

DEMOLITION PLAN

BAR IS ONE INCH ON OFFICIAL DRAWINGS
0 1"
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DRAWN BY: MPL
APPROVED: AJ
JOB DATE: 05/01/2018
JOB NO: 171805

DRAWING
C–06

Xrefs: 171805-xC-Dsgn; 171805-xC-Survey; 171805-xV-Survey; xqt-1-dv01; 171805-xC-Gis-Data
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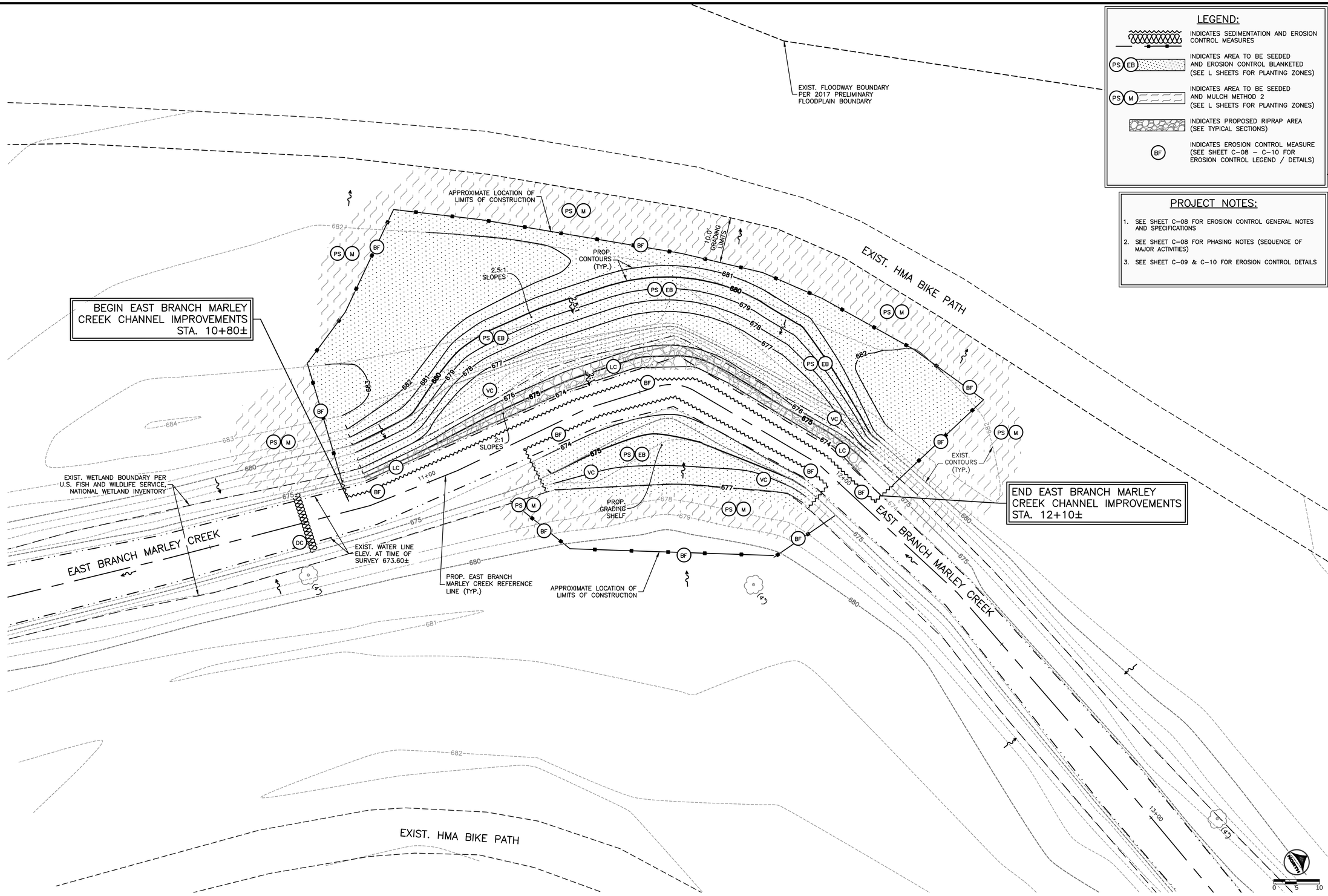

LEGEND:

- INDICATES SEDIMENTATION AND EROSION CONTROL MEASURES
- (PS)(EB) INDICATES AREA TO BE SEEDED AND EROSION CONTROL BLANKETED (SEE L SHEETS FOR PLANTING ZONES)
- (PS)(M) INDICATES AREA TO BE SEEDED AND MULCH METHOD 2 (SEE L SHEETS FOR PLANTING ZONES)
- INDICATES PROPOSED RIPRAP AREA (SEE TYPICAL SECTIONS)
- (BF) INDICATES EROSION CONTROL MEASURE (SEE SHEET C-08 – C-10 FOR EROSION CONTROL LEGEND / DETAILS)

PROJECT NOTES:

1. SEE SHEET C-08 FOR EROSION CONTROL GENERAL NOTES AND SPECIFICATIONS
2. SEE SHEET C-08 FOR PHASING NOTES (SEQUENCE OF MAJOR ACTIVITIES)
3. SEE SHEET C-09 & C-10 FOR EROSION CONTROL DETAILS

NO.	DATE	BY	REVISION DESCRIPTION
1	05/16/18	MPL	ADDENDUM #1

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EAST BRANCH MARLEY CREEK STREAMBANK STABILIZATION

VILLAGE OF MOKENA, ILLINOIS

FINAL ENGINEERING – FOR BIDDING

GRADING – RESTORATION PLAN

BAR IS ONE INCH ON OFFICIAL DRAWINGS
0 1"
IF NOT ONE INCH, ADJUST SCALE ACCORDINGLY

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APPROVED: AJ
JOB DATE: 05/01/2018
JOB NO: 171805

DRAWING
C-07

FOR CONSTRUCTION

Xrefs: 171805-xC-Dsgn; 171805-xC-Survey; 171805-xV-Survey; xgt-1-dx01; 171805-xC-Gis-Data
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CONTROL MEASURE GROUP	CONTROL MEASURE	APPL.	KEY	CONTROL MEASURE CHARACTERISTICS	TEMP.	PERMNT
VEGETATIVE SOIL COVER	TEMPORARY SEEDING	X	TS	PROVIDES QUICK TEMPORARY COVER TO CONTROL EROSION WHEN PERMANENT SEEDING IS NOT DESIRED OR TIME OF YEAR IS INAPPROPRIATE.	X	
	PERMANENT SEEDING	X	PS	PROVIDES PERMANENT VEGETATIVE COVER TO CONTROL EROSION, FILTERS SEDIMENT FROM WATER. MAY BE PART OF FINAL LANDSCAPE PLAN.		X
	DORMANT SEEDING		DS	SAME AS PERMANENT SEEDING EXCEPT IS DONE DURING DORMANT SEASON. HIGHER RATES OF SEED APPLICATION ARE REQUIRED.		
	SODDING		SO	QUICK PERMANENT COVER TO CONTROL EROSION. QUICK WAY TO ESTABLISH VEGETATION FILTER STRIP. CAN BE USED ON STEEP SLOPES OR IN DRAINAGEWAYS WHERE SEEDING MAY BE DIFFICULT.		
	GROUND COVER		GC	PROVIDES GROUND COVER, SHRUBS AND TREES IN ADDITION TO PERMANENT VEGETATION. MAY BE USED AS PART OF A FINAL LANDSCAPE PLAN ALONG WITH SHRUBS AND TREES.		
	RAIN GARDEN		RG	PROVIDES A TYPE OF FUNCTIONAL LANDSCAPING FEATURE DESIGNED TO CONTROL STORMWATER RUNOFF. SEE LANDSCAPING PLANS FOR DETAILS		
NON VEGETATIVE SOIL COVER	MULCHING	X	M	ADDED INSURANCE OF A SUCCESSFUL TEMPORARY OR PERMANENT SEEDING. CONTROLS UNWANTED VEGETATION AND PRESERVES MOISTURE. PROVIDES COVER WHERE VEGETATION CANNOT BE ESTABLISHED.	X	
	AGGREGATE COVER		AG	PROVIDES SOIL COVER ON ROADS AND PARKING LOTS AND AREAS WHERE VEGETATION CANNOT BE ESTABLISHED. PREVENTS MUD FROM BEING PICKED UP AND TRANSPORTED OFF-SITE.		
	PAVING		P	PROVIDES PERMANENT COVER ON PARKING LOTS AND ROADS OR OTHER AREAS WHERE VEGETATION CANNOT BE ESTABLISHED.		
	EROSION BLANKET	X	EB	PROVIDES QUICK TEMPORARY COVER TO CONTROL EROSION WHEN PERMANENT SEEDING TIME OF YEAR IS INAPPROPRIATE AND IN SLOPED AREAS.	X	
DIVERSIONS	RIDGE DIVERSION		RD	TYPICALLY USED ABOVE SLOPES. USED WHERE AN EXCESS OF SOIL IS AVAILABLE.		
	CHANNEL DIVERSION		CD	TYPICALLY USED AT TOP OR BASE OF SLOPES. USED WHEN EXCESS SOIL IS NOT AVAILABLE.		
	COMBINATION DIVERSION		CDB	TYPICALLY USED ANYWHERE ONA SLOPE. SOIL TAKEN OUT OF CHANNEL IS USED TO BUILD THE RIDGE.		
	CURB AND GUTTER		CG	SPECIAL CASE OF DIVERSION USED IN CONJUNCTION WITH A STREET TO DIVERT WATER FROM AN AREA NEEDING PROTECTION.		
	BENCHES		B	SPECIAL CASE OF DIVERSION CONSTRUCTED WHEN WORKING ON CUT SLOPES TO SHORTEN LENGTH OF SLOPE AND ADD SLOPE STABILITY.		
WATERWAYS	BARE CHANNEL		BC	PROVIDES MEANS OF CONVEYING RUNOFF TO DESIRED LOCATION. MAY BE USED TO DRAIN DEPRESSIONAL AREAS. ONLY APPLICABLE WHEN VELOCITY OF FLOW IS VERY LOW.		
	VEGETATIVE CHANNEL	X	VC	PROVIDED ADDED STABILITY TO CHANNEL. USED WHEN VELOCITY OF FLOW IS NOT EXTREMELY FAST.		X
	LINED CHANNEL	X	LC	USED WHEN VEGETATION WILL NOT PROTECT THE CHANNEL AGAINST HIGH VELOCITIES OF FLOW OR WHERE VEGETATION CANNOT BE ESTABLISHED.		X
	DITCH CHECKS		DC	PROVIDES AN ENERGY DISSIPATOR ALONG A LENGTHY CHANNEL TO REDUCE VELOCITY OF STORMWATER		
ENCLOSED DRAINAGE	STORM SEWER		ST	CAN BE USED TO CONVEY SEDIMENT LADEN WATER TO SEDIMENT BASIN OR IN CONJUNCTION WITH A WATERWAY.		
	UNDERDRAIN		UD	USED TO LOWER WATER TABLE AND INTERCEPT GROUNDWATER FOR BETTER VEGETATION GROWTH AND SLOPE STABILITY. USED TO CARRY BASE FLOW IN WATERWAYS AND TO DEWATER SEDIMENT BASINS.		
SPILLWAYS	STRAIGHT PIPE SPILLWAY		SS	USED FOR RELATIVELY SMALL VERTICAL DROPS AND SMALL FLOWS OF WATER		
	DROP INLET PIPE SPILLWAY		DIS	SAME AS PIPE SPILLWAY EXCEPT LARGER FLOWS AND LARGE VERTICAL DROPS CAN BE ACCOMMODATED.		
	WEIR SPILLWAY		W	USED FOR RELATIVELY SMALL VERTICAL DROPS AND FLOWS MUCH GREATER THAN PIPE STRUCTURES.		
	BOX INLET WEIR SPILLWAY		BS	SAME AS WEIR SPILLWAY EXCEPT LARGER FLOWS CAN BE ACCOMMODATED BECAUSE OF LOWER WEIR LENGTH.		
OUTLETS	LINED APRON		LA	PROTECTS DOWNSTREAM CHANNEL FROM HIGH VELOCITY OF FLOW DISCHARGING FROM STRUCTURES.		
	STONE RIP RAP		RR	USED AS AN ENERGY DISSIPATOR AT OUTLET STRUCTURES TO REDUCE VELOCITIES		
SEDIMENT BASINS	EMBANKMENT SEDIMENT BASIN		ES	USED WHERE TOPOGRAPHY LENDS ITSELF TO CONSTRUCTING A DAM AND EARTH FILL IS AVAILABLE.		
	EXCAVATED SEDIMENT BASIN		XS	USED WHERE EMBANKMENT COULD CAUSE A HAZARD DOWNSTREAM IN CASE OF FAILURE AND WHEN EXCESS EARTH FILL IS NOT AVAILABLE.		
	COMBINATION SEDIMENT BASIN		CS	USED WHEN TOPOGRAPHY IS SUITABLE BUT ADDITIONAL CAPACITY IS NEEDED.		
SEDIMENT FILTERS	SILT FENCE	X	BF	USED FOR SINGLE LOTS OR DRAINAGE AREAS LESS THAN 1/2 ACRE TO FILTER SEDIMENT FROM RUNOFF.	X	
	VEGETATIVE FILTER		VF	USED ALONG DRAINAGE WAYS OR PROPERTY LINES TO FILTER SEDIMENT FROM RUNOFF. SIZE MUST BE INCREASED IN PROPORTION TO DRAINAGE AREA.		
	FILTER BASKET		FB	USED FOR FILTERING SEDIMENT WITHIN THE ROADWAY BEFORE ENTERING THE STORM SEWER		
	FILTER FABRIC		FF	USED FOR FILTERING SEDIMENT WITHIN THE ROADWAY BEFORE ENTERING THE STORM SEWER		
	INLET PROTECTION		IP	USED FOR FILTERING SEDIMENT WITHIN GRASS AREAS BEFORE WATER ENTERS THE STORM SEWER		
MUD AND DUST CONTROL	STABILIZED CONST. ENTRANCE		SE	PREVENT MUD FROM BEING PICKED UP AND CARRIED OFF-SITE.		
	DUST AND TRAFFIC CONTROL		DT	PREVENTS DUST FROM LEAVING CONSTRUCTION SITE.		

SEEDING / SODDING CHART

	RESPONSIBILITIES BY OTHERS			PER I.D.O.T. SPECIFICATIONS APR. 1 – JUNE 15		RESPONSIBILITIES BY OTHERS		PER I.D.O.T. SPECIFICATIONS AUG. 1 – NOV. 1			RESPONSIBILITIES BY OTHERS	
STABILIZATION TYPE	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG	SEPT.	OCT.	NOV.	DEC.
NATIVE SEEDING												
TEMPORARY SEEDING												

- SEE PROJECT MANUAL AND I.D.O.T SPECIFICATIONS FOR INSTALLATION AND APPLICATION REQUIREMENTS
- SUPPLEMENTAL WATERING MAYBE REQUIRED. (SEE PROJECT MANUAL AND I.D.O.T. SPECIFICATIONS FOR REQUIREMENTS)

EROSION CONTROL NOTES:

- **Land disturbing activities shall not commence until approval to do so has been received by governing authorities, in addition to, no land clearing or grading shall begin until all perimeter erosion and sediment control measures have been installed.**
- **(including storm water pollution prevention plan per the development criteria.)**
- **The general contractor shall strictly adhere to the storm water pollution prevention plan (SWPPP) during construction operations.**
- **All topsoil shall be stripped prior to filling**
- **All exposed areas shall be seeded as specified within 14 days of final grading.**
- **Should construction stop for longer than 14 days, the site shall be seeded as specified.**
- **Sediment and erosion control measures shall be inspected at least once every seven (7) days and within 24 hours of a rainfall exceeding 0.5 inches during a 24-hour period or more frequently if required by governing NPDES general permit. All maintenance required by inspection shall commence within 24 hours and be completed within 48 hours of report.**
- **This plan shall not be considered all inclusive as the general contractor shall take all necessary precautions to prevent soil sediment from leaving the site.**
- **General contractor shall comply with all state and local ordinances that apply.**
- **Additional erosion and sediment control measures will be installed if deemed necessary by on site inspection.**
- **If installation of storm drainage system should be interrupted by weather or nightfall, the pipe ends shall be covered with filter fabric.**
- **General contractor shall be responsible to take whatever means necessary to establish permanent soil stabilization.**
- **All sedimentation and erosion control regulations shall be adhered to per VILLAGE OF MOKENA's requirements**
- **All erosion and sediment control practices shall be maintained and repaired as needed to ensure effective performance of the required erosion control measures.**
- **All erosion and sediment control work shall conform to the I.D.O.T. Manual for, standards and procedures for erosion control.**
- **All construction will adhere to the requirements set forth in the IEPA'S new construction site activities national pollutant discharge elimination system (NPDES) storm water permit.**
- **All roadways shall be cleaned at the end of each construction day.**
- **All disturbed areas shall be stabilized within 7 days of active disturbance.**
- **All erosion control measures shall be disposed of within 30 days of final stabilization of the site.**
- **Ground cover for 5:1 slopes or greater shall be established as soon as possible.**
- **All disturbed areas to to restored w/ 6" topsoil respread & seeding/sodding unless otherwise noted on plans**
- **Inlet protection such as Silt filter fabric or filter baskets shall be placed between frame and grate until vegetation is established. (see detail)**
- **Utilize excelsior blanket on all slopes of 5:1 or greater.**
- ***Seeding per I.D.O.T. Manual, section 251,standard specifications for road and bridge construction, (latest edition**
- ***Class 3 type – slope mixture**
- ***Mulch/hydroseed per I.D.O.T. Manual, section 251, standard specifications for road and bridge construction, (latest edition**
- ***Mulch/hydroseed method 2, procedure 3**
- **No dimensions shall be assumed by scaling.**
- **No known drain tiles are present on the proposed development, if tiles are encountered during construction please notify the engineer immediately.**
- **Part of the proposed project is located within a flood hazard 10-100yr area a flood hazard area**
- **Excess material shall be placed at specified location unless otherwise specified by owner and approved by engineer for use of lot grading. Stockpiles shall be surrounded with filter fence and shall be seeded per I.D.O.T. Manual (latest addition) (temporary) if left more than 14 working days.**
- **General contractor shall notify all utility companies having underground utilities on site or in right-of-way prior to excavation. Contractor shall contact utility locating company and locate all utilities prior to grading start.**

PHASING NOTES:

SEQUENCE OF MAJOR ACTIVITIES

The Contractor will be responsible for implementing the following erosion control and storm water management control measures. The Contractor may designate these tasks to certain subcontractors as he sees fit, but the ultimate responsibility for implementing these controls and ensuring their proper functioning remains with the Contractor. The order of activities will be as follows (refer to the Erosion and Sediment Control Plan Sheet contained in this SWPPP for details and refer to the Suggested Phasing Plan in the design drawings for construction sequencing):

A. Secure storm water NPDES permit with the IEPA at least 30 days prior to beginning work.
B. A pre-construction meeting shall be held by the Site Project Manager and the Operator's Engineer prior to land disturbing activities.
C. Install perimeter silt fences and inlet protection to existing storm infrastructure in the locations shown on the Demolition Plan sheets.
D. Implement erosion control measures around the existing storm sewer to prevent sedimentation from infiltrating into the storm sewer system as shown on the Demolition Plan plan sheets.
E. Construct temporary construction exits at locations shown on the Erosion Control plan sheets.
F. Begin clearing and grubbing operations if applicable. Clearing and grubbing shall be done only in areas where earthwork will be performed.
G. Disturbed areas of the site where Construction Activity has ceased for more than 7 days shall be temporarily seeded and watered.
H. Commence site Mass/Rough grading using low points in profile as sediment ponds. If low points are to be drained by pumping, a sump pit shall be installed per the typical detail.
I. Install new perimeter silt fences to newly graded areas per the locations shown on the Grading / Erosion Control plan sheets.
J. Install inlet / outlet protection around the constructed storm sewer to prevent sedimentation from infiltrating into the storm sewer system as shown on the Erosion Control & Restoration Plan sheets.
K. Temporary seed all fill slopes around perimeter of project.
L. Carry out final stream bank stabilization measures with Plant native plugs, seeding, sodding and other plantings, including rolled erosion control products where shown on the Erosion Control & Restoration Plan sheets.
S. Stockpile respread.
T. Remove silt fencing only after all surfaces at are at least 70% growth of permanent seedings are stabilized.
U. Remove temporary construction exits.
V. Remove inlet protection around inlets and manholes.

A schedule for implementation for the activities identified above is included as Form C-3 of the SWPPP.

NOTES

This plan has been prepared to comply with the provisions of the NPDES Permit Number issued by the Illinois Environmental Protection Agency for Stormwater Discharges from Construction Site Activities.

The total area of the site that is estimated to be disturbed by excavation, grading, or other activities, is 0.20 acres of disturbance.

1. Site Description.
   a. The stormwater is tributary to the Des-Plaines River from East Marley creek to the Hickory Creek.
   b. The following is a description of the construction activity which is the subject of this plan: The proposed development consists of construction of, Streambank Stabilization/restoration, wetland restoration, and riparian and buffer strips. The construction activities for site improvements will include: site clearing, grubbing, mass grading, installation of soil erosion and sedimentation control measures, as a minimum.
   c. The following is a description of the intended sequence of major activities which will disturb soils for major portions of the construction site such as grubbing, excavation, and grading:

      The sequence of the construction activities may be as follows:
      See Sequence of major activities on this sheet.

   The soil erosion and sedimentation control items will be constructed as needed during the above construction activities.

2. Controls.

   This plan addresses the various controls that will be implemented for each of the major construction activities described in 1.b above. For each measure discussed, the contractors will be responsible for its implementation as indicated. Each such contractor has signed the required certification on forms which are attached to, and are a part of, this plan.

   a. Erosion and Sediment Controls.

      (i) STABILIZATION PRACTICES. Provided below is a description of interim and permanent stabilization practices, including site-specific scheduling of the implementation of the practices. Site plans will ensure that existing vegetation is preserved where attainable and disturbed portions of the site will be stabilized. Except as provided in 2.a. (i) (A) and 2.b. stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than 10 days after the construction activity in that portions of the site where construction activity will not occur for a period of 21 or more calendar days.

      (A) Where the initiation of stabilization measures by the 14th day after construction activity temporarily or permanently ceases is precluded by snow cover, stabilization measures shall be initiated as soon as practicable thereafter.

      The following interim and permanent stabilization practices, as a minimum, will be implemented to stabilize the disturbed area of the site.

1. Temporary Seeding	5. Stone Riprap	8. Outlet Protection
2. Permanent Seeding	6. Vegetative Filter	9. Dust & Traffic Control
3. Erosion Blanket	7. Vegetative Channel	10. Barrier Fence
4. Stabilized Construction Entrance	8. Inlet Protection	

      (ii) STRUCTURAL PRACTICES. Provided below is a description of structural practices that will be implemented, to the degree attainable, to divert flows from exposed soils, store flows or otherwise limit runoff and the discharge of pollutants from exposed areas of the site. The installation of these devices may be subject to Section 404 of the Clean Water Act.

1. Detention basins	5. Stone Riprap
2. Storm sewer system	6. Filter fabric
3. Vegetated drainage swales	7. Inlet and Outlet Protection
4. Permanent seeding	

   b. Erosion Control. It shall be the Contractor's responsibility to provide adequate erosion control on the job site. The following erosion control sequence shall be adhered to:
      See Sequence of major activities on this sheet

      Any siltation of structures or ditches shall be cleaned and maintained by the Contactor, on a weekly basis, until the seeding has taken hold. 70% growth of permanent grass or temporary cover crop. All washouts, gullies, etc. will be regraded and reseeded by the Contactor, at the Contractor's expense.

      The Contractor's responsibility for erosion control shall extend throughout the construction process. The Contractor shall be responsible for cleanup of paved surfaces within and adjacent to the project.

      All erosion control practices shall be in compliance with the latest revision of the "Illinois Urban Manual," by the Natural Resources Conservation Service and with "Standards and Specifications for Soil Erosion and Sedimentation Control" as published by the Illinois Environmental Protection Agency.

      If a topsoil stockpile location is provided and approved by the Owner, Contractor shall establish erosion control measures for the stockpile if it is to remain in place for more than three days. In addition, barrier filter fence shall enclose topsoil stockpile location with exception of truck access during construction hours.

   c. Stormwater Management

      (i) Provided below is a description of measures that will be installed during the construction process to control pollutants in stormwater discharges that will occur after construction operations have been completed. The installation of these devices may be subject to Section 404 of the Clean Water Act.

      The practices selected for implantation were determined on the basis of the technical guidance contained in IEPA's Standard Specifications for Soil Erosion and Sedimentation Control, and other ordinances listed in the Specifications.

      The stormwater pollutant control measures shall include:

1. Silt Filter fence	4. Stone Riprap	7. Native Plantings
2. Drainage Swales	5. Rip-Rap outlet protection	8. Filter fabric
3. Storm Sewers	6. Wetland restoration	9. Riparian Buffers

      (ii) Velocity dissipation devices will be placed at discharge locations and along the length of any outfall channel as necessary to provide a non-erosive velocity flow from the structure to a water course so that the natural physical and biological characteristics and functions are maintained and protected (e.g., maintenance of hydrologic conditions, such as the hydroperiod and hydrodynamics present prior to the initiation of construction activities).

      Stormwater Management Control includes:

1	Stone Riprap	5 Inlet protection.
2	Filter Fabric	6 Wetland Restoration
3	Vegetative channels.	7 Native Plantings
4	Outlet protection using RipRap.	8 Riparian Buffer

   d. Approved State and Local Plans.

      The management practices, controls and other provisions contained in this plan are at least as protective as the requirements contained in the Illinois Environmental Protection Agency's Standards and Specifications for Soil and Erosion and Sediment Control dated June 2013. Illinois Procedures and Standards for Urban Soil Erosion and Sedimentation Plan, and the Municipal Subdivision Ordinance. Requirements specified in sediment and erosion control site plans or site permits or stormwater management or site plans or site permits approved by local officials that are applicable to protecting surface water resources are, upon submittal of an NOI to be authorized to discharge under this permit, incorporated by reference and are enforceable under this permit even it they are not specifically included in the plan.

   e. Maintenance.

      The following is a description of procedures that will be used to maintain, in good and effective operating conditions, vegetation, erosion and sediment control measures and other protective measures identified in this plan and Standard Specifications.

      Stabilized construction entrance: The entrance shall be maintained to prevent tracking of sediment onto public streets. This will be done by top dressing with additional stones, remove and replace top layer of stones or washing the entrance. The sediment washed on the public right-of-way will be removed immediately.

      Vegetative erosion control measures: The vegetative growth of temporary and permanent seeding shall be maintained periodically and supply adequate watering. The vegetative cover shall be reseeded as necessary.

      Silt filter fence: The damaged silt filter fence shall be restored to meet the standards or removed and replaced as needed.

      Riprap outlet protection: It shall be inspected after high flows for any scour beneath the riprap or for stones that have been dislodged. It shall be repaired immediately.

      Inlet Protection: Shall be inspected and emptied of silt if filled as required.

      Stabilization of the disturbed areas must be initiated within one working day of permanent or temporary cessation of earth disturbing activities and shall be completed as soon as possible but not later than 14 days form the initiation of the stabilization work in an area.
      (i) Appropriate temporary or permanent stabilization measures shall include seeding, mulching, sodding, and/or non-vegitative measures.
      (ii) Areas having slopes greater than 12 percent shall be stabilized with sod, mat, or blanket in combination with seeding or equivalent.

   Soil storage piles containing more than 10 cu. yds. of material shall not be located with a downslope drainage length less than 25 feet to a roadway or drainage channel. Filter barriers, including straw bales, filter fence, or equivalent, shall be installed immediately on the down slope of the piles.

3. Other Controls.

   (i) Waste Disposal. The solid waste materials including trash, construction debris, excess construction materials, machinery, tools and other items will be collected and disposed off-site by the contractor. The contractor is responsible to acquire any permit required for such disposal. Burning on the site will not be permitted. No solid materials, including building materials, shall be discharged into Water of the State, except as authorized by a Section 404 permit.
   (ii) The provisions of this plan shall ensure and demonstrate compliance with applicable State and/or local waste disposal, sanitary sewer or septic system regulations.
   (iii) The sanitary sewage will be discharged to the proposed sanitary sewer constructed per IEPA and local standards.

4. Inspections.

   The Owner, or Owner's representative shall provide qualified personnel to inspect disturbed areas of the construction site which have not been finally stabilized, structural control measures and location where vehicles enter or exit the site. Such inspections shall be conducted at least once every seven (7) calendar days and within 24 hours of the end of a storm that is 0.5 inches or greater or equivalent snowfall.

   a. Disturbed areas and areas used for storage of materials that are exposed to precipitation shall be inspected for evidence of, or the potential for, pollutants entering the drainage system. Erosion and sediment control measures identified in the plan shall be observed to ensure that they are operating correctly. Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters. Locations where vehicles enter or exit the site shall be inspected for evidence of off-site sediment tracking.

   b. Based on the results of the inspection, the description of potential pollutant sources identified in section 1 above and pollution prevention measures identified in Section 2 above shall be revised as appropriate as soon as practicable after such inspection. Any changes to this plan resulting from the required inspections shall be implemented within 7 calendar days following the inspection.

   c. A report summarizing the scope of the inspection, name(s) and qualifications of personnel making the inspection, the date(s) of the inspection, major observations relating to the implementation of this stormwater pollution prevention plan and actions taken in accordance with section 4.b shall be made and retained as part of the plan for at least three (3) years after the date of the inspection. The report shall be signed in accordance with Part VI.G of the general permit.

   d. If any violation of the provisions of this plan is identified during the conduct of the construction work covered by this plan, the Resident Engineer or Resident Technician shall complete and file an "Incidence of Noncompliance" (ION) report for the identified violation. The Resident Engineer or Resident Technician shall use forms provided by the Illinois Environmental Protection Agency and shall include specific information on the cause of noncompliance, actions which were taken to prevent any further causes of noncompliance, and a statement detailing any environmental impact which may have resulted from the noncompliance. All reports of noncompliance shall be signed by a responsible authority in accordance with Part VI. G of the general permit. The report of noncompliance shall be mailed to the following address:

   Illinois Environmental Protection Agency
   Division of Water Pollution Control
   Attn: Compliance Assurance Section
   2200 Churchill Road
   P.O. Box 19276
   Springfield, Illinois 62794-9276

5. Non-Stormwater Discharges.

   Except for flows from fire fighting activities, sources of non-stormwater that may be combined with stormwater discharges associated with the construction activity addressed in this plan, are described below:

   a. Water main flushing
   b. Fire hydrant flushing
   c. Watering for dust control
   d. Irrigation drainage for vegetative growth for seeding, etc.

   The pollution prevention measures, as described below, will be implemented for non-stormwater components of the discharge.

   The fire hydrant and water main shall not be flushed directly on the exposed area of sub grade of the pavement. Hoses shall be used to direct the flow into the storm sewer system, if available.

   The erosion due to irrigation of seeding shall be considered minor.

   Contractor to provide the above non-stormwater discharged control to the standard specification required by the County or the approved equal.

6. Monitoring and Management Plan
   A 3-year maintenance and monitoring plan is required after installation of native landscaping.
   See Project Specifications for details.

7. I certify under penalty of law that I understand the terms and conditions of the general National Pollutant Discharge Elimination System (NPDES) permit (ILR10) that authorizes the storm water discharges associated with industrial activity from the construction site identified as part of this certification."

CONTRACTOR'S AND SUBCONTRACTOR'S CERTIFICATE

I certify under penalty of law that I understand the terms and conditions of the general National Pollutant Discharge Elimination System (NPDES) permit (ILR10) that authorizes the storm water discharges associated with industrial activity from the construction site identified as part of this certification.

_____ _____
CONTRACTOR'S PRINTED NAME AND SIGNATURE — CERTIFICATION DATE

_____ _____
CONTRACTOR TITLE — TELEPHONE NUMBER

_____
CONTRACTOR COMPANY NAME AND ADDRESS

_____ _____
SUBCONTRACTOR'S NAME AND SIGNATURE — CERTIFICATION DATE

_____ _____
SUBCONTRACTOR'S TITLE — TELEPHONE NUMBER

_____
SUBCONTRACTOR'S COMPANY NAME AND ADDRESS

CRYSTAL CREEK DR. /
EAST BRANCH MARLEY CREEK
SITE ADDRESS

IEPA: ILR10 PERMIT #_____

FOR CONSTRUCTION

NO.	DATE	BY	REVISION DESCRIPTION
1	05/16/18	MPL	ADDENDUM #1

Huff & Huff incorporated
A Subsidiary of GZA GeoEnvironmental, Inc.
ILLINOIS DESIGN FIRM # 184.001322
323 ALANA DRIVE
NEW LENOX, IL 60451
PHONE: 815.462.9324
FAX: 815.462.9328
HRGreen

EAST BRANCH MARLEY CREEK
STREAMBANK STABILIZATION
VILLAGE OF MOKENA, ILLINOIS
FINAL ENGINEERING – FOR BIDDING
EROSION CONTROL SPECIFICATIONS

BAR IS ONE INCH ON OFFICIAL DRAWINGS
0 1"
IF NOT ONE INCH, ADJUST SCALE ACCORDINGLY

DRAWN BY: MPL
APPROVED: AJ
JOB DATE: 05/01/2018
JOB NO: 171805

DRAWING
C-08

UNITED STATES ARMY CORPS OF ENGINEERS NOTES:

1. EARTHEN COFFERDAMS OR OTHER PRACTICES THAT WOULD RESULT IN A RELEASE OF SEDIMENT INTO WATERS OF THE U.S. ARE NOT AUTHORIZED FOR USE. COFFERDAMS SHALL BE CONSTRUCTED OF NON-ERODIBLE MATERIALS ONLY. ACCEPTABLE PRACTICES INCLUDE, BUT ARE NOT LIMITED TO: PRE-FABRICATED RIGID

2. COFFERDAMS, SHEET PILING, INFLATABLE BLADDERS, SANDBAGS AND FABRIC-LINED BASINS. 1. WORK IN THE WATERWAY SHOULD BE TIMED TO TAKE PLACE DURING LOW ORNO-FLOW CONDITIONS. LOW FLOW CONDITIONS ARE FLOW AT OR BELOW THE NORMAL WATER ELEVATION.

3. WATER SHALL BE ISOLATED FROM THE IN-STREAM WORK AREA USING A COFFERDAM CONSTRUCTED OF NON-ERODIBLE MATERIALS (STEEL SHEETS, AQUA BARRIERS, RIP RAP AND GEOTEXTILE FABRIC, ETC.). EARTHEN COFFERDAMS ARE NOT PERMISSIBLE.

4. WORK MAY NOT BE PERFORMED IN THE WATER, EXCEPT FOR THE PLACEMENT OF THE MATERIALS NECESSARY FOR THE CONSTRUCTION OF THE COFFERDAM. THE COFFERDAM MUST BE CONSTRUCTED FROM THE UPLAND AREA AND NO EQUIPMENT MAY ENTER THE WATER AT ANY TIME. IF THE INSTALLATION OF THE COFFERDAM CANNOT BE COMPLETED FROM SHORE AND ACCESS IS NEEDED TO REACH THE AREA TO BE COFFERED, OTHER MEASURES, SUCH AS THE CONSTRUCTION OF A CAUSEWAY, WILL BE NECESSARY TO ENSURE THAT EQUIPMENT DOES NOT ENTER THE WATER. ONCE THE COFFERDAM IS IN PLACE AND THE ISOLATED AREA IS DEWATERED, EQUIPMENT MAY ENTER THE COFFERED AREA TO PERFORM THE REQUIRED WORK.

5. IF BYPASS PUMPING IS NECESSARY, THE INTAKE HOSE SHALL BE PLACED ON A STABLE SURFACE OR FLOATED TO PREVENT SEDIMENT FROM ENTERING THE HOSE.THE BYPASS DISCHARGE SHALL BE PLACED ON A NON-ERODIBLE, ENERGY DISSIPATING SURFACE PRIOR TO REJOINING THE STREAM FLOW AND SHALL NOT CAUSE EROSION. FILTERING OF BYPASS WATER IS NOT NECESSARY UNLESS THE BYPASS WATER HAS BECOME SEDIMENT-LADEN AS A RESULT OF THE CURRENT CONSTRUCTION ACTIVITIES.

6. DURING DEWATERING OF THE COFFERED AREA, ALL WATER MUST BE FILTERED TO REMOVE SEDIMENT. POSSIBLE OPTIONS FOR SEDIMENT REMOVAL INCLUDE BAFFLE SYSTEMS, ANIONIC POLYMERS, DEWATERING BAGS, OR OTHER APPROPRIATE METHODS.WATER SHALL HAVE SEDIMENT REMOVED PRIOR TO BEING RE-INTRODUCED TO THE DOWNSTREAM WATERWAY. A STABILIZED CONVEYANCE FROM THE DEWATERING DEVICE TO THE WATERWAY MUST BE IDENTIFIED. DISCHARGE WATER IS CONSIDERED CLEAN IF IT DOES NOT RESULT IN A VISUALLY IDENTIFIABLE DEGRADATION OF WATER CLARITY.

7. THE PORTION OF THE SIDE SLOPE THAT IS ABOVE THE OBSERVED WATER ELEVATION SHALL BE STABILIZED AS SPECIFIED IN THE PLANS PRIOR TO ACCEPTING FLOWS. THE SUBSTRATE AND TOE OF SLOPE THAT HAS BEEN DISTURBED DUE TO CONSTRUCTION ACTIVITIES SHALL BE RESTORED TO PRE-CONSTRUCTIONCONDITIONS AND FULLY STABILIZED PRIOR TO ACCEPTING FLOWS.

COUNTY STORM WATER PERMIT REQUIREMENTS

SOIL DISTURBANCE SHALL BE CONDUCTED IN SUCH A MANNER AS TO MINIMIZE EROSION. AREAS OF THE DEVELOPMENT SITE THAT ARE NOT TO BE GRADED SHALL BE PROTECTED FROM CONSTRUCTION TRAFFIC OR OTHER DISTURBANCE UNTIL FINAL SEEDING IS PREFORMED.

SOIL STABILIZATION MEASURES SHALL CONSIDER THE TIME OF YEAR, DEVELOPMENT SITE CONDITIONS AND THE USE OF TEMPORARY OR PERMANENT MEASURES.

STABILIZATION BY SEEDING SHALL INCLUDE TOPSOIL PLACEMENT AND FERTILIZATION, AS NECESSARY.

NATIVE SEED MIXTURES SHALL INCLUDE RAPID-GROWING ANNUAL GRASSES OR SMALL GRAINS TO PROVIDE INITIAL, TEMPORARY SOIL STABILIZATION.

OFFSITE PROPERTY SHALL BE PROTECTED FROM EROSION AND SEDIMENTATION. VELOCITY DISSIPATION DEVICES SHALL BE PLACED AT CONCENTRATED DISCHARGE LOCATIONS ALONG THE LENGTH OF ANY OUTFALL CHANNEL, AS NECESSARY TO PREVENT EROSION.

SEDIMENT CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE DISTURBANCE OF TRIBUTARY AREAS.

STABILIZATION OF DISTURBED AREAS SHALL BE INITIATED IMMEDIATELY WHENEVER ANY CLEARING, GRADING, EXCAVATING OR OTHER EARTH DISTURBING ACTIVITIES HAVE PERMANENTLY CEASED ON ANY PORTION OF THE DEVELOPMENT SITE, OR TEMPORARY CEASED ON ANY PORTION OF THE DEVELOPMENT SITE AND WILL NOT RESUME FOR A PERIOD EXCEEDING 14 CALENDAR DAYS. STABILIZATION OF DISTURBED AREAS SHALL BE INITIATED WITHIN 1 WORKING DAY OF PERMANENT OR TEMPORARY CESSATION OF EARTH DISTURBING ACTIVITIES AND SHALL BE COMPLETED AS SOON AS POSSIBLE, BUT NO LATER THAN 14 CALENDAR DAYS FROM THE INITIATION OF STABILIZATION WORK IN THE AREA. EXCEPTIONS TO THESE TIME FRAMES ARE SPECIFIED AS INSTANCES WHEN THE INITIATION OF STABILIZATION MEASURES IS PRECLUDED BY SNOW COVER, STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS PRACTICABLE AND IN AREAS WHERE CONSTRUCTION ACTIVITY HAS TEMPORARILY CEASED AND WILL RESUME AFTER 14 DAYS, A TEMPORARY STABILIZATION METHOD MAY BE USED.

DISTURBANCE OF STEEPS SLOPES SHALL BE MINIMIZED. AREAS OR EMBANKMENTS HAVING SLOPES STEEPER THAN 3:1 SHALL BE STABILIZED WITH STAKING IN PLACE SOD, EROSION CONTROL BLANKET IN COMBINATION WITH SEEDING, OR EQUIVALENT CONTROL MEASURE.

PERIMETER CONTROL MEASURES SHALL BE PROVIDED DOWN SLOPE AND PERPENDICULAR TO THE FLOW OF RUNOFF FROM DISTURBED AREAS, WHERE THE TRIBUTARY AREA IS GREATER THAN 5,000 SQUARE FEET, AND WHERE RUNOFF WILL FLOW IN A SHEET FLOW MANNER. PERIMETER EROSION CONTROL SHALL ALSO BE PROVIDED AT THE BASE OF SOIL STOCKPILES.

THE DRAINAGE SYSTEM SHALL BE PROTECTED FROM EROSION AND SEDIMENTATION DOWN SLOPE FROM DISTURBED AREAS. INLET PROTECTION THAT REDUCES SEDIMENT LOADING, WHILE ALLOWING RUNOFF TO ENTER THE INLET SHALL BE REQUIRED FOR ALL STORM SEWERS. CHECK DAMS, OR AN EQUIVALENT CONTROL MEASURE, SHALL BE REQUIRED FOR ALL CHANNELS. FILTER FABRIC INLET PROTECTION AND STRAW BALE DITCH CHECKS ARE NOT ACCEPTABLE CONTROL MEASURES.

IF DEWATERING SERVICES ARE USED, ADJOINING PROPERTIES AND DISCHARGE LOCATIONS SHALL BE PROTECTED FROM EROSION. DISCHARGES SHALL BE ROUTED THROUGH AN EFFECTIVE SEDIMENT CONTROL MEASURE (E.G., SEDIMENT TRAP, SEDIMENT BASIN, OR OTHER APPROPRIATE MEASURES). THE ENGINEER AND THE WILL COUNTY SOIL AND WATER CONSERVATION DISTRICT SHALL BE NOTIFIED PRIOR TO THE COMMENCEMENT OF DEWATERING ACTIVITIES.

ALL TEMPORARY SOIL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED WITHIN THIRTY (30) DAYS AFTER FINAL SITE STABILIZATION IS ACHIEVED OR AFTER THE TEMPORARY MEASURES ARE NO LONGER NEEDED. TRAPPED SEDIMENT AND OTHER DISTURBED SOIL AREAS SHALL BE PERMANENTLY STABILIZED.

STOCKPILED SOIL AND MATERIALS SHALL BE REMOVED FROM FLOOD HAZARD AREAS AT THE END OF EACH WORK DAY. SOIL AND MATERIALS STOCKPILED IN IWMC OR BUFFER AREAS SHALL BE PLACED ON TIMBER MATS, OR AN EQUIVALENT CONTROL MEASURE.

EFFECTIVE CONTROL MEASURES SHALL BE UTILIZED TO MINIMIZE THE DISCHARGE OF POLLUTANTS FROM THE DEVELOPMENT SITE. AT A MINIMUM, CONTROL MEASURES SHALL BE IMPLEMENTED IN ORDER TO:

MINIMIZE THE DISCHARGE OF POLLUTANTS FROM EQUIPMENT AND VEHICLE WASHING, WHEEL WASH WATER, AND OTHER WASH WATER.

MINIMIZE THE EXPOSURE OF BUILDING MATERIALS, BUILDING PRODUCTS, CONSTRUCTION WASTES, TRASH, LANDSCAPE MATERIALS, FERTILIZERS, PESTICIDES, HERBICIDES, DETERGENTS, VEHICLE FLUIDS, SANITARY WASTE, AND OTHER MATERIALS PRESENT ON THE DEVELOPMENT SITE TO PRECIPITATION AND TO STORM WATER.

ADEQUATE RECEPTACLES SHALL BE PROVIDED FOR THE DEPOSITION OF ALL CONSTRUCTION MATERIAL DEBRIS GENERATED DURING THE DEVELOPMENT PROCESS. THE CONTRACTOR SHALL NOT CAUSE OR PERMIT THE DUMPING, DEPOSITING, DROPPING, THROWING, DISCARDING OR LEAVING OF CONSTRUCTION MATERIAL DEBRIS UPON OR INTO ANY DEVELOPMENT SITE, CHANNEL OR IWMC. THE DEVELOPMENT SITE SHALL BE MAINTAINED FREE OF CONSTRUCTION MATERIAL DEBRIS.

A STABILIZED MAT OF AGGREGATE UNDERLAIN WITH FILTER CLOTH (OR OTHER APPROPRIATE MEASURES) SHALL BE LOCATED AT ANY POINT WHERE TRAFFIC WILL BE ENTERING OR LEAVING A CONSTRUCTION-SITE OF A MAJOR DEVELOPMENT TO OR FROM A PUBLIC RIGHT-OF-WAY, STREET ALLEY, OR PARKING AREA. ANY SEDIMENT OR SOIL REACHING AN IMPROVED PUBLIC RIGHT OF WAY, STREET, ALLEY OR PARKING AREA SHALL BE SCRAPED OR STREET CLEANED AS ACCUMULATIONS WARRANT AND TRANSPORTED TO A CONTROLLED SEDIMENT DISPOSAL AREA.

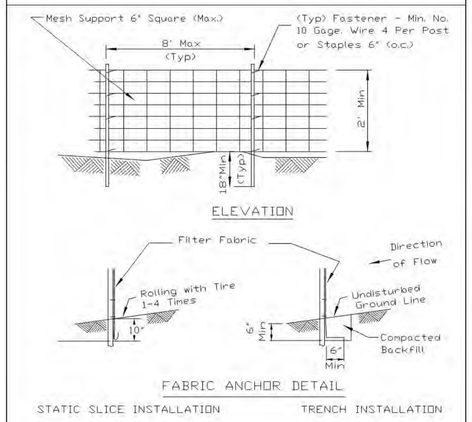
ALL TEMPORARY AND PERMANENT EROSION AND SEDIMENT CONTROL MEASURES SHALL BE MAINTAINED IN AN EFFECTIVE WORKING CONDITION.

DRAIN TILE SYSTEMS DISTURBED DURING DEVELOPMENT MUST BE RECONNECTED BY THOSE RESPONSIBLE FOR THEIR DISTURBANCE UNLESS THE APPROVED ENGINEERING PLANS INDICATE HOW THE DRAIN TILE SYSTEM IS TO BE CONNECTED TO THE PROPOSED STORM WATER MANAGEMENT SYSTEM.

ALL ABANDONED DRAIN TILES SHALL BE REMOVED IN THEIR ENTIRETY.

DRAIN TILES WITHIN THE DISTURBED AREA OF THE DEVELOPMENT SHALL BE REPLACED, BYPASSED AROUND THE DEVELOPMENT OR INTERCEPTED AND CONNECTED TO THE DRAINAGE SYSTEM FOR THE DEVELOPMENT. THE SIZE OF THE REPLACED OR BYPASSED DRAIN TILE SHALL BE EQUIVALENT TO THE EXISTING DRAIN TILE.

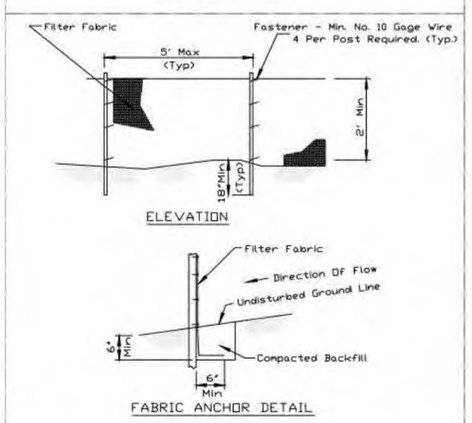
(BF) SILT FENCE WITH WIRE SUPPORT PLAN



NOTES:
1. Silt Fence shall be installed prior to any grading work in the area to be protected. They shall be maintained throughout the construction period and removed in conjunction with the final grading and site stabilization. Silt fence shall be placed on the flattest area available.
2. Filter fabric shall meet the requirements of material specification 592 Geotextile Table 1 or 2, Class I with equivalent opening size of at least 30 for nonwoven and 40 for woven.
3. Fence posts shall be either standard steel post or wood post with a minimum cross-sectional area of 3.0 sq. in.

REFERENCE		STANDARD DWG. NO.
Project		IUM-620A(W)
Designed ____ Date ____		SHEET 1 OF 2
Checked ____ Date ____		DATE 3-16-2012
Approved ____ Date ____		

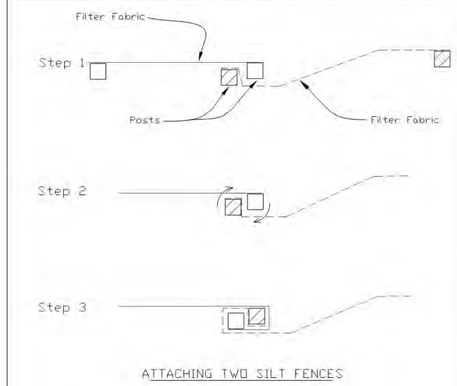
(BF) SILT FENCE PLAN



NOTES:
1. Temporary sediment fence shall be installed prior to any grading work in the area to be protected. They shall be maintained throughout the construction period and removed in conjunction with the final grading and site stabilization.
2. Filter fabric shall meet the requirements of material specification 592 Geotextile based upon performance needed.
3. Fence posts shall be either standard steel post or wood post with a minimum cross-sectional area of 2" x 2" nominal size.

REFERENCE		STANDARD DWG. NO.
Project		IUM-620
Designed ____ Date ____		SHEET 1 OF 1
Checked ____ Date ____		DATE 3-16-12
Approved ____ Date ____		

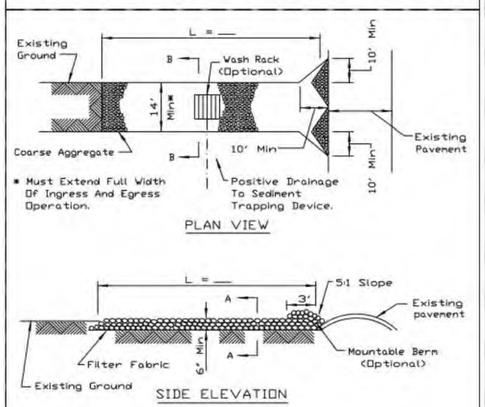
(BF) SILT FENCE - SPLICING TWO FENCES



1. Place the end post of the second fence inside the end post of the first fence.
2. Rotate both posts at least 180 degrees in a clockwise direction to create a tight seal with the fabric material.
3. Cut the fabric near the bottom of the stakes to accommodate the 6" flap.
4. Drive both posts a minimum of 18 inches into the ground and bury the flap.
5. Compact backfill (particularly at splices) completely to prevent stormwater piping.

REFERENCE		STANDARD DWG. NO.
Project		IUM-620B(W)
Designed ____ Date ____		SHEET 1 OF 1
Checked ____ Date ____		DATE 3-16-2012
Approved ____ Date ____		

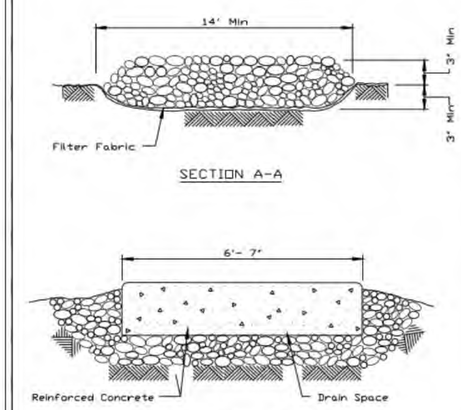
(SE) STABILIZED CONSTRUCTION ENTRANCE PLAN



NOTES:
1. Filter fabric shall meet the requirements of material specification 592 GEOTEXTILE, Table I or 2, Class I, II or IV and shall be placed over the cleared area prior to the placing of rock.
2. Rock or reclaimed concrete shall meet one of the following IDOT coarse aggregate gradation, CA-1, CA-2, CA-3 or CA-4 and be placed according to construction specification 25 ROCKFILL using placement Method 1 and Class III compaction.
3. Any drainage facilities required because of washing shall be constructed according to manufacturers specifications.
4. If wash racks are used they shall be installed according to the manufacturer's specifications.

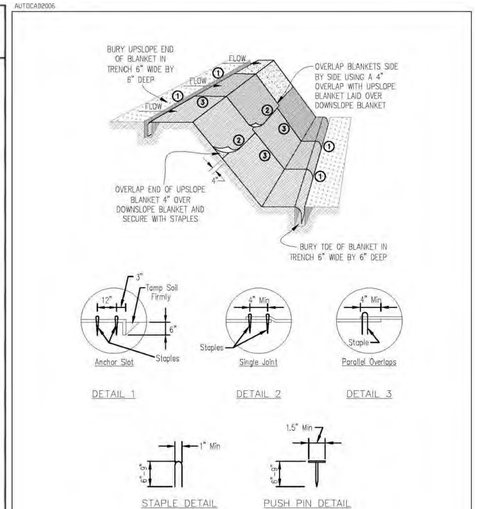
REFERENCE		STANDARD DWG. NO.
Project	NRCS Natural Resources Conservation Service	IL-630
Designed ____ Date ____		SHEET 1 OF 2
Checked ____ Date ____		DATE 8-18-94
Approved ____ Date ____		

(SE) STABILIZED CONSTRUCTION ENTRANCE PLAN



REFERENCE		STANDARD DWG. NO.
Project	NRCS Natural Resources Conservation Service	IL-630
Designed ____ Date ____		SHEET 2 OF 2
Checked ____ Date ____		DATE 8-18-94
Approved ____ Date ____		

AUTOCAD2006



NOTES:
1. Staples shall be placed in a diamond pattern at 2 per s.y. for stiched blankets. Non-stiched shall use 4 staples per s.y. of material. This equates to 200 staples with stiched blanket and 400 stapels with non-stiched blanket per 100 s.y. of material.
2. Staple or push pin lengths shall be selected based on soil type and conditions. (minimum staple length is 6")
3. Erosion control material shall be placed in contact with the soil over a prepared seedbed.
4. All anchor slots shall be stapled at approximately 12" intervals.

NO.	DATE	BY	REVISION DESCRIPTION
1	05/16/18	MPL	ADDENDUM #1

(EB) EROSION CONTROL BLANKET INSTALLATION DETAILS

FOR CONSTRUCTION

Huff & Huff incorporated
A Subsidiary of GZA GeoEnvironmental, Inc.

ILLINOIS DESIGN FIRM
184.001322
323 ALANA DRIVE
NEW LENOX, IL 60451
PHONE: 815.462.9324
FAX: 815.462.9328

HRGreen

EAST BRANCH MARLEY CREEK
STREAMBANK STABILIZATION
VILLAGE OF MOKENA, ILLINOIS

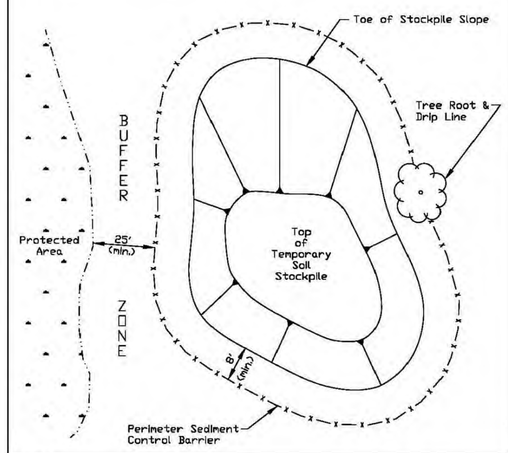
FINAL ENGINEERING - FOR BIDDING
EROSION CONTROL DETAILS

BAR IS ONE INCH ON OFFICIAL DRAWINGS
0 — 1"
IF NOT ONE INCH, ADJUST SCALE ACCORDINGLY

DRAWN BY: MPL
APPROVED: AJ
JOB DATE: 05/01/2018
JOB NO: 171805

DRAWING
C-09

TEMPORARY SOIL STOCKPILE DETAIL

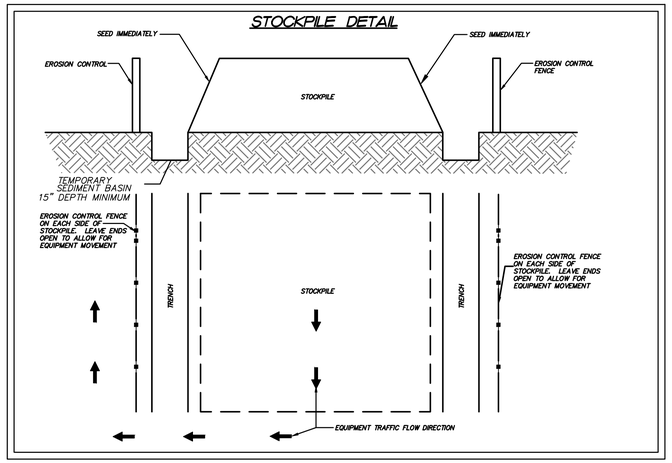


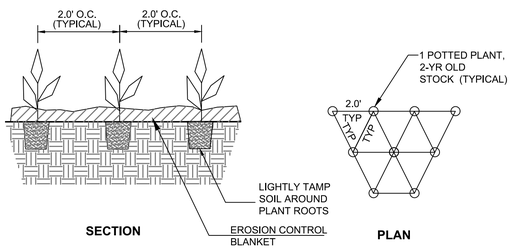
NOTES:

1. Stockpile slopes should be based on angle of repose of the soil material to avoid potential sloughing of the slope.
2. Soil stockpile to be stabilized in accordance with practical standards.
3. Do not locate stockpile within overland drainage flow path, designated floodways, drip line or over the root crown of adjacent trees.
4. Provisions for sediment control practices may be required along haul roads and entrance/exit locations for access the soil stockpile that can create flow path for stormwater runoff.
5. Installation of benches, terraces, or slope interrupters should be considered.
6. Avoid building soil stockpiles on impervious surfaces.
7. Linear sediment trap surrounding the stockpile base may be used to control sediment.

REFERENCE		STANDARD DWG. NO.
Project		IUM-627
Designed	Date	SHEET 1 OF 1
Checked	Date	DATE JANUARY 2017
Approved	Date	

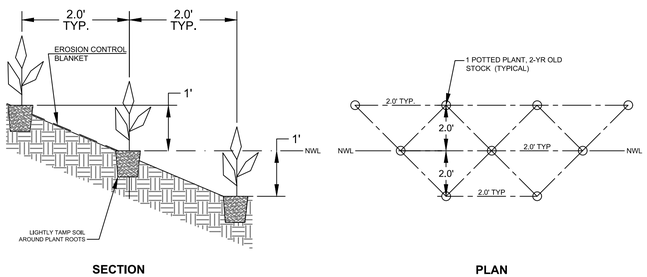
STOCKPILE DETAIL





HERBACEOUS PERENNIAL PLANTING DETAIL (SWALE & WET PRAIRIE PLUGS)

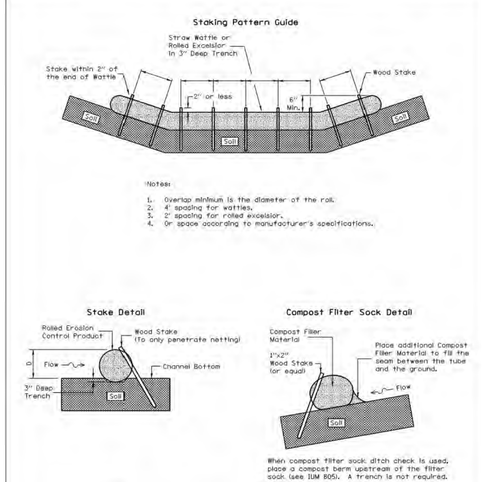
NOT TO SCALE



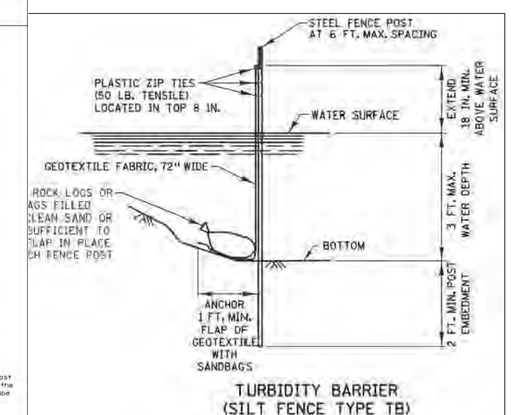
HERBACEOUS PERENNIAL PLANTING DETAIL (SHORELINE EDGE PLUGS)

NOT TO SCALE

(DC) ROLLED EROSION CONTROL PRODUCTS



REFERENCE		STANDARD DWG. NO.
Project		IUM-514
Designed	Date	SHEET 1 OF 1
Checked	Date	DATE 8-19-11
Approved	Date	



TURBIDITY BARRIER (SILT FENCE TYPE TB)

FOR CONSTRUCTION

NO.	DATE	BY	REVISION DESCRIPTION
1	05/16/18	MPL	ADDENDUM #1

Huff & Huff incorporated
A Subsidiary of GZA GeoEnvironmental, Inc.

ILLINOIS DESIGN FIRM
184.001322
323 ALANA DRIVE
NEW LENOX, IL 60451
PHONE: 815.462.9324
FAX: 815.462.9328

HRGreen

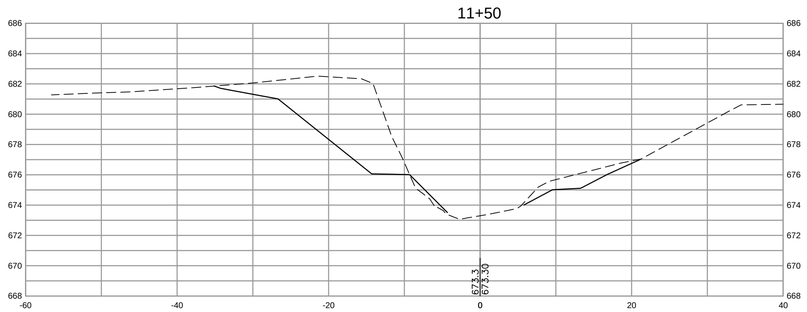
EAST BRANCH MARLEY CREEK
STREAMBANK STABILIZATION
VILLAGE OF MOKENA, ILLINOIS

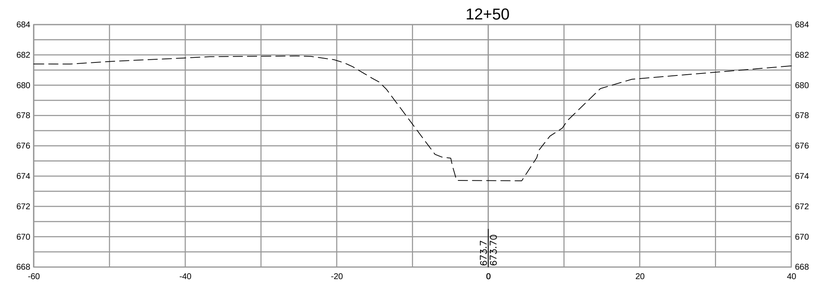
FINAL ENGINEERING – FOR BIDDING
EROSION CONTROL DETAILS

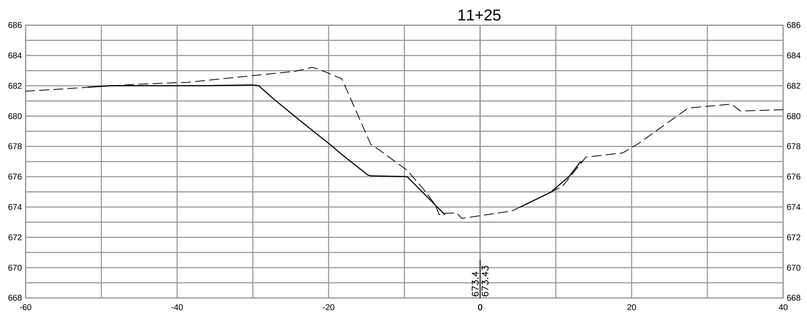
BAR IS ONE INCH ON OFFICIAL DRAWINGS
0 1"
IF NOT ONE INCH, ADJUST SCALE ACCORDINGLY

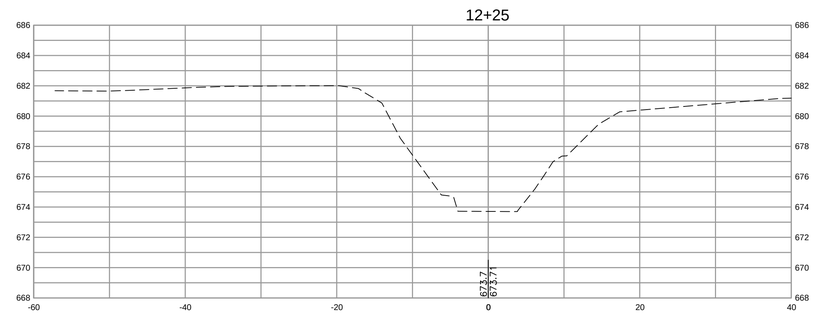
DRAWN BY: MPL
APPROVED: AJ
JOB DATE: 05/01/2018
JOB NO: 171805

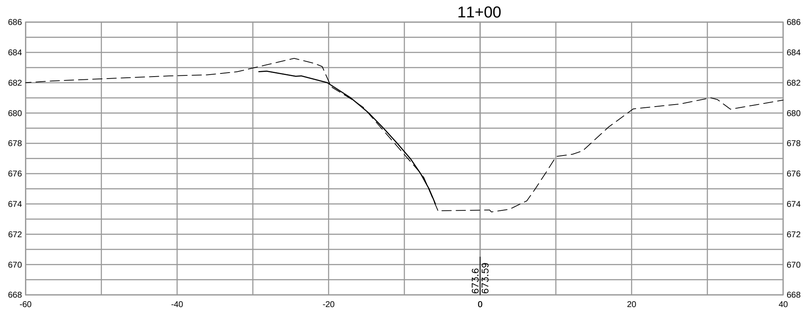
DRAWING
C–10

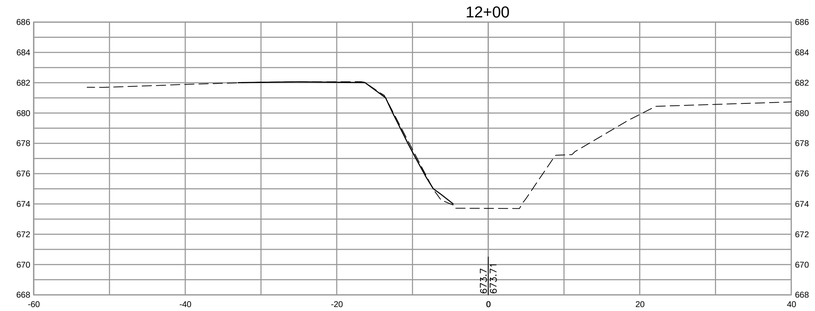


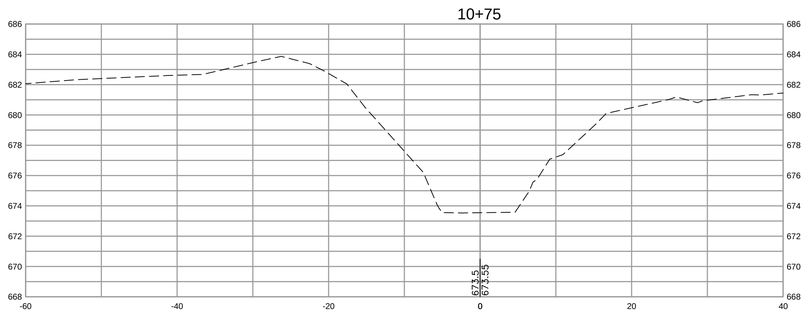


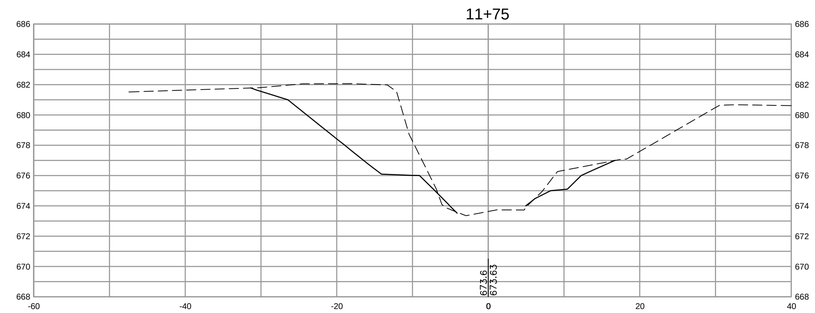












FOR CONSTRUCTION

NO.	DATE	BY	REVISION DESCRIPTION
1	05/16/18	MPL	ADDENDUM #1

Huff & Huff incorporated
A Subsidiary of GZA GeoEnvironmental, Inc.

ILLINOIS DESIGN FIRM
184.001322
323 ALANA DRIVE
NEW LENOX, IL 60451
PHONE: 815.462.9324
FAX: 815.462.9328

HRGreen

EAST BRANCH MARLEY CREEK STREAMBANK STABILIZATION
VILLAGE OF MOKENA, ILLINOIS
FINAL ENGINEERING – FOR BIDDING
CROSS SECTIONS

BAR IS ONE INCH ON OFFICIAL DRAWINGS
0 1"
IF NOT ONE INCH, ADJUST SCALE ACCORDINGLY

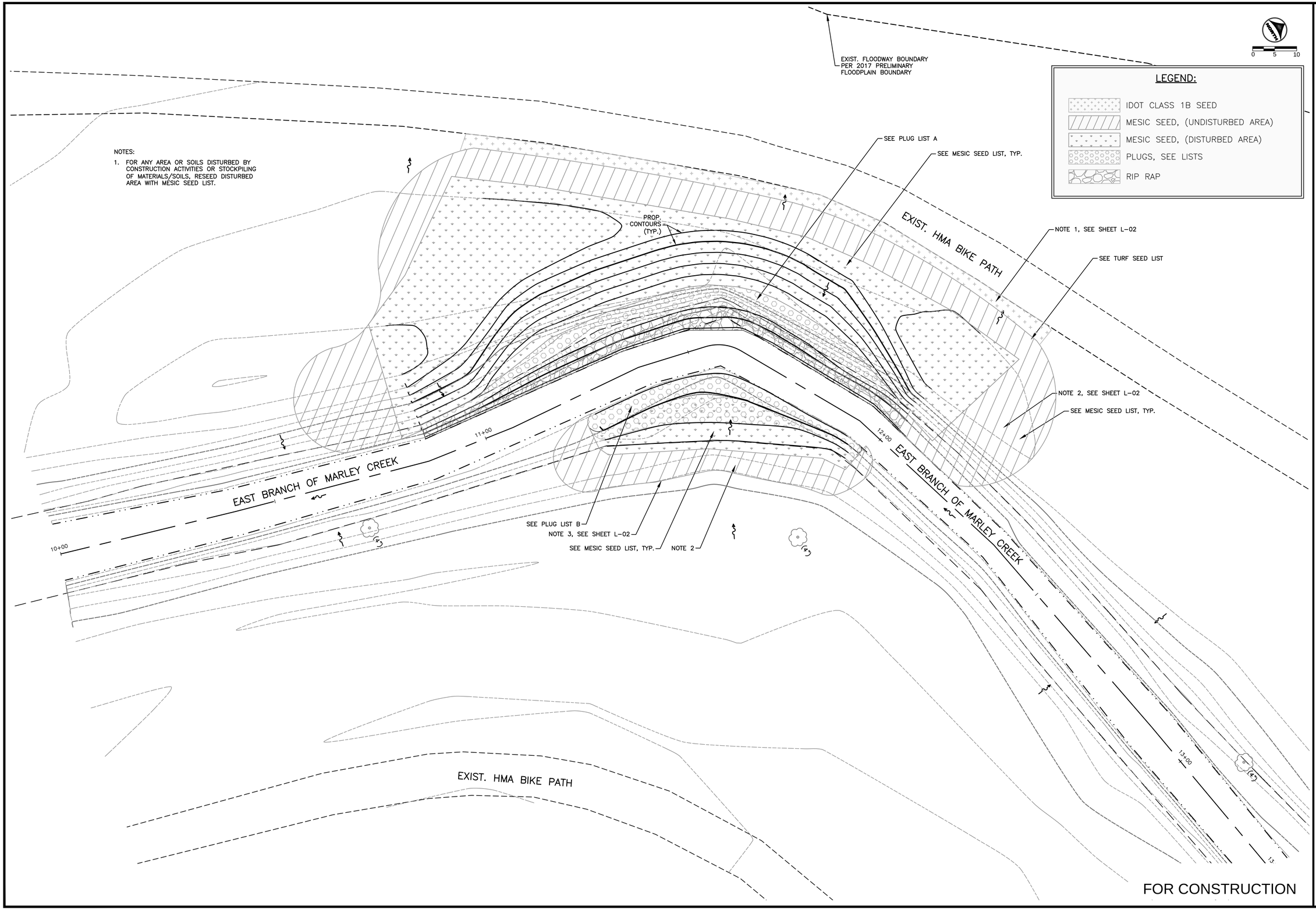
DRAWN BY: MPL
APPROVED: AJ
JOB DATE: 05/01/2018
JOB NO: 171805

DRAWING
C–11

Xrefs: xgt-1-dh01; xgt-1-dh20-25; xgt-1-dv01; xgt-1-dv20-500ft; 171805-xV-Survey
3/12/2018 2:07:30 PM U:\2017\171805\CAD\Dwgs\171805-xC-Xsec.dwg

NOTES:

1. FOR ANY AREA OR SOILS DISTURBED BY CONSTRUCTION ACTIVITIES OR STOCKPILING OF MATERIALS/SOILS, RESEED DISTURBED AREA WITH MESIC SEED LIST.



FOR CONSTRUCTION

NO.	DATE	BY	REVISION DESCRIPTION

Huff & Huff Incorporated
A Subsidiary of GZA GeoEnvironmental, Inc.

ILLINOIS DESIGN FIRM # 184.001322
323 ALANA DRIVE
NEW LENOX, IL 60451
PHONE: 815.462.9324
FAX: 815.462.9328
HRGreen

EAST MARLEY CREEK STREAMBANK STABILIZATION
VILLAGE OF MOKENA, ILLINOIS
FINAL ENGINEERING
RESTORATION PLAN

BAR IS ONE INCH ON OFFICIAL DRAWINGS
0 1"
IF NOT ONE INCH, ADJUST SCALE ACCORDINGLY

DRAWN BY: HC
APPROVED:
JOB DATE: 03/16/2018
JOB NO:

DRAWING
L-01

MESIC SEED LIST

Quantity	Botanical Name	Common Name	Root
4.0 oz/acre	*Asclepias tuberosa*	Butterfly weed	seed
2.0 oz/acre	*Astragalus canadensis*	Canada milk vetch	seed
8 lb/acre	*Bouteloua curtipendula*	Side-Oats Grama	seed
4.0 oz/acre	*Carex bicknelli*	Copper oval sedge	seed
2.0 oz/acre	*Desmodium canadense*	Showy Tick Trefoil	seed
3.0 oz/acre	*Echinacea pallida*	Pale purple coneflower	seed
3 lbs/acre	*Elymus canadensis*	Canada wild rye	seed
4.0 oz/acre	*Eryngium yuccafolium*	Rattlesnake master	seed
3.0 oz/acre	*Lespedeza capitata*	Round-headed bush clover	seed
3.0 oz/acre	*Monarda fistulosa*	Wild Bergamot	seed
1.0 oz/acre	*Oligoneuron rigidum*	Stiff goldenrod	seed
4.0 oz/ cre	*Penstemon digitalis*	Foxglove Beard Tongue	seed
2.0 oz/acre	*Petalostemum purpureum*	Purple prairie clover	seed
1.0 oz/acre	*Pycnanthemum virginionum*	Mountain mint	seed
3.0 oz/acre	*Ratibida pinnata*	Gray-headed Coneflower	seed
4.0 oz/acre	*Rudbeckia hirta*	Black-eyed Susan	seed
3.0 oz/acre	*Rudbeckia triloba*	Brown-eyed Susan	seed
6 lb/acre	*Schizachryium scoparium*	Little Bluestem	seed
8.0 oz/acre	*Silphium integrifolium*	Rosin weed	seed
2.0 oz/acre	*Symphyotrichum laeve*	Smooth blue aster	seed
2.0 oz/acre	*Symphyotrichum oolentangiense*	Sky blue aster	seed
1.0 oz/acre	*Zizia aurea*	Golden Alexanders	seed
Cover Crop			
50 lbs/acre	*Avena sativa*	Seed Oats	seed

PLUG LIST A

Quantity	Botanical Name	Common Name	Root	Spacing
38	*Carex annectens*	Yellow fox sedge	38 flat NGN	2'-0" o.c.
38	*Carex molesta*	Field oval sedge	38 flat NGN	2'-0" o.c.
38	*Schizachryium scoparium*	Little bluestem	38 flat NGN	2'-0" o.c.
38	*Symphyotrichum laeve*	Smooth blue aster	38 flat NGN	2'-0" o.c.

PLUG LIST B

Quantity	Botanical Name	Common Name	Root	Spacing
38	*Carex vulpinoidea*	Brown fox sedge	38 flat NGN	2'-0" o.c.
38	*Juncus torreyi*	Torrey's rush	38 flat NGN	2'-0" o.c.

NOTES:

1. HERBICIDE EXISTING VEGETATION WITH 2.5% APPROVED AQUATIC HERBICIDE SUCH AS RODEO, AQUA NEAT, OR EQUIVALENT. ACTIVE INGREDIENTS MUST BE EQUAL TO 53.8% COMPOSITION OR HIGHER. ONLY SPRAY WHEN VEGETATION IS GREEN OR ACTIVELY GROWING. REAPPLY HERBICIDE TWO WEEKS LATER TO ENSURE 100% OF VEGETATION IS DEAD FOLLOWING APPLICATION. MOW DEAD VEGETATION TO GROUND, REMOVE DUFF AND SEED TURF GRASS INTO AREA AS SHOWN ON SHEET L-01. DO NOT DISTURB SOIL THAT HAS NOT BEEN IMPACTED BY GRADING PROCEDURES.

2. HERBICIDE EXISTING VEGETATION WITH 2.5% APPROVED AQUATIC HERBICIDE SUCH AS GLYPHOSATE, N-(PHOSPHONOMETHYL) GLYCINE, TRADE NAME RODEO, AQUA NEAT, OR EQUIVALENT. THE ACTIVE INGREDIENT MUST BE EQUAL TO 53.8% COMPOSITION OR HIGHER. ONLY SPRAY WHEN VEGETATION IS GREEN OR ACTIVELY GROWING. REAPPLY HERBICIDE TWO WEEKS LATER TO ENSURE 100% OF VEGETATION IS DEAD FOLLOWING APPLICATION. MOW DEAD VEGETATION TO GROUND, REMOVE DUFF AND SEED MESIC SEED LIST INTO AREAS SHOWN ON SHEET L-01. DO NOT DISTURB SOIL THAT HAS NOT BEEN IMPACTED BY GRADING PROCEDURES.

3. CUT ALL TREES AND SHRUBS IN LANDSCAPE ZONE NOT TAGGED BY OWNER REPRESENTATIVE FLUSH TO THE GROUND, IMMEDIATELY APPLY 30% SOLUTION OF AN APPROVED AQUATIC HERBICIDE SUCH AS RODEO, AQUA NEAT, OR EQUIVALENT. ACTIVE INGREDIENTS MUST BE EQUAL TO 53.8% COMPOSITION OR HIGHER. IF HERBICIDE IS NOT APPLIED WITHIN ONE HOUR OF CUTTING, STUMPS WILL NEED TO BE RECUT TO PROVIDE FRESH EXPOSURE. REMOVE AND PROPERLY DISPOSE OF ALL CUT MATERIAL OFF SITE. IF PHRAGMITES ARE PRESENT, CUT 6" FROM GROUND, HERBICIDE WITH AN AQUATIC APPROVED VERSION OF GLYPHOSATE, N-(PHOSPHONOMETHYL) GLYCINE, TRADE NAME RODEO, AQUA NEAT, OR EQUIVALENT. THE ACTIVE INGREDIENT MUST BE EQUAL TO 53.8% COMPOSITION OR HIGHER. REMOVE AND PROPERLY DISPOSE OF ALL CUT MATERIAL OFF SITE.

NO.	DATE	BY	REVISION DESCRIPTION

Huff & Huff Incorporated
A Subsidiary of GZA GeoEnvironmental, Inc.

ILLINOIS DESIGN FIRM
184.001322
323 ALANA DRIVE
NEW LENOX, IL 60451
PHONE: 815.462.9324
FAX: 815.462.9328

HRGreen

EAST MARLEY CREEK
STREAMBANK STABILIZATION
VILLAGE OF MOKENA, ILLINOIS

FINAL ENGINEERING
RESTORATION PLAN

BAR IS ONE INCH ON OFFICIAL DRAWINGS
0 1"
IF NOT ONE INCH, ADJUST SCALE ACCORDINGLY

DRAWN BY: HC
APPROVED:
JOB DATE: 03/02/2018
JOB NO:

DRAWING
L-02

Appendix E – Photos (Washington Street Streambank Stabilization)

Photo 1: Pre-construction conditions, looking upstream. The project site is located along the right bank up to the railroad bridge crossing (Hickory Creek, Joliet, IL).

Photo 2: Typical streambank conditions prior to improvements (Hickory Creek, Joliet, IL).

Photo 3: Highly eroded banks which were nearly 18' high in some locations (Hickory Creek, Joliet, IL).

Photo 4: Clearing Vegetation (4/25/18)

Photo 5: Jobsite after clearing vegetation, prior to tree clearing (Joliet, IL)

Photo 6: Jobsite during excavation (5/15/18)

Photo 7: Topsoil spread (5/17/18)

Photo 8: Job site looking west (5/22/18)

Photo 9: Jobsite looking west (Hickory Creek, Joliet, IL).

Photo 10: Completed project looking downstream (Hickory Creek, Joliet, IL).

Appendix F– Final Engineering Plans (Washington St. Streambank Stabilization)

FINAL ENGINEERING PLANS FOR:

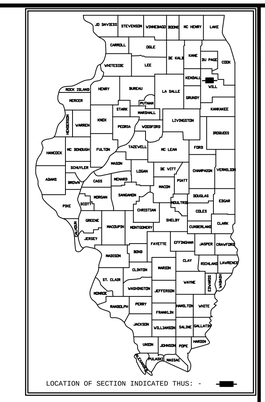
921 E. WASHINGTON ST. STREAMBANK STABILIZATION

CITY OF JOLIET, ILLINOIS

WILL COUNTY, ILLINOIS

CLIENT: CITY OF JOLIET

CONTRACT NO: 2313-0318



Dial 811 or 1-800-892-0123

Know what's below. Call before you dig.

JULIE DESIGN TICKET NUMBER:# X2612012-00X

WITH THE FOLLOWING:
COUNTY WILL COUNTY
CITY–TOWNSHIP JOLIET–JOLIET TOWNSHIP
SEC. & 1/4 SEC. NO.# 11&14–35 N.–10 E.

(2) Working Days before you dig (Excluding Sat., Sun. & Holidays)

NOTE:

- HR GREEN, INC. IS TO BE NOTIFIED 3 DAYS PRIOR TO CONSTRUCTION START.
- HR GREEN, INC. SHALL BE INCLUDED IN ALL PRE–CONSTRUCTION MEETINGS.
- ANY KNOWN DISCREPANCIES ON THIS PLAN SET MUST BE BROUGHT TO THE ATTENTION OF HR GREEN, INC. PRIOR TO THE START OF CONSTRUCTION.

CLIENT:

CITY OF JOLIET
MS. ALLISON SWISHER,
DEPARTMENT OF PUBLIC UTILITIES
CITY OF JOLIET
150 W. JEFFERSON STREET
JOLIET, IL 60432
PHONE: 815–724–4222

ENGINEER / SURVEYOR:

HR GREEN INC.,
323 ALANA DR..
NEW LENOX, IL. 60451
PHONE: (815) 462–9324

AJAY JAIN, P.E., CFM, – VICE PRESIDENT,
WATER RESOURCES PRACTICE LEADER
PHONE: (815) 759–8331

LOGAN GILBERTSEN, P.E., CFM, PROJECT ENGINEER
PHONE: (815) 759–8370

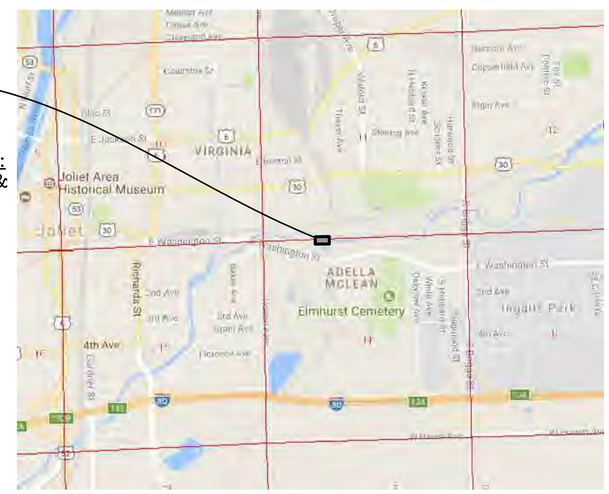
BERNIE BAUER, PLS – PROJECT LAND SURVEYOR
PHONE: (630) 708–5033

CONTACT INFORMATION

	CONTACT INFORMATION	TELEPHONE #
J.U.L.I.E.	DESIGN TICKET #X2612012-00X	ILLINOIS JULIE, 800-892-0123
CITY CONTACT	CITY OF JOLIET MS. ALLISON SWISHER 150 W. JEFFERSON STREET JOLIET, IL 60432	815-724-4222 DEPARTMENT OF PUBLIC UTILITIES
SANITARY / WATER	CITY OF JOLIET PUBLIC UTILITIES DEPARTMENT 150 W. JEFFERSON STREET JOLIET, IL 60432	815-724-4230 EMERGENCY LINE 815-724-4220
ELECTRICAL POWER	COMED MR. MISAEL HERNANDEZ Misael.Hernandez@Comed.com	630-723-2397 815-724-5010
NATURAL GAS	NICOR GAS BRUCE KOPPANG bkoppan@aglresources.com DOT LIAISON 1844 FERRY RD. NAPERVILLE, IL 60563	630-388-3046 708-243-5136
TELEPHONE	ATT / DISTRIBUTION DOMINIC GURGONE 1000 COMMERCE DRIVE, FLOOR 1 OAK BROOK, IL 60523 Dg1235@att.com	630-573-5703 815-727-8309
CABLE / INTERNET	COMCAST FRANK GAUTIER MARTHA GIERAS Martha_gieras@cable.comcast.com 680 INDUSTRIAL DRIVE ELMHURST, IL 60126	224-229-5862 630-600-6348
IEPA	I.E.P.A. - PERMIT SECTION, DIVISION OF WATER POLLUTION P.O. BOX 19276 SPRINGFIELD, IL 62794-9276	217-782-0610

LOCATION MAP

PROJECT LOCATION
ZONED: I–1
PROPERTY IDENTIFICATION NUMBER:
30–07–14–101–015 &
30–07–14–101–018



NORTH

JOLIET Illinois

HRGreen

323 ALANA DRIVE | NEW LENOX, IL 60451

Phone: 815.462.9324 | Toll Free: 800.728.7805 | Fax 815.462.9328 | HRGreen.com

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SITE BENCHMARKS:

DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88)

SOURCE BENCHMARK
NGS MONUMENT W 141 (MF0090)
ELEVATION = 548.65 (NAVD 88)

SITE BENCHMARK 1
CROSS CUT IN CURB LOCATED APPROXIMATELY 40 FEET EAST OF THE NORTHEAST CORNER OF THE JOLIET SEWER MAINTENANCE BUILDING AT 921 E WASHINGTON STREET.
ELEVATION = 563.13 (NAVD 88)

SITE BENCHMARK 2
ARROW BOLT ON UPPER FLANGE OF FIRE HYDRANT LOCATED APPROXIMATELY 45 FEET SOUTH OF THE SOUTHEAST CORNER OF THE JOLIET SEWER MAINTENANCE BUILDING AT 921 E WASHINGTON STREET.
ELEVATION = 567.26 (NAVD 88)

CERTIFICATION

LOGAN R. GILBERTSEN 062–067541 REGISTERED PROFESSIONAL ENGINEER OF ILLINOIS
EXP: 11/30/2019

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Illinois.

2/14/2018
DATE

LOGAN R. GILBERTSEN, P.E.
License Number: 062.067541
My license renewal date is 11/30/2019.
Pages or sheets covered by this seal:
C-01 - C-15

FOR CONSTRUCTION

NO.	DATE	BY	REVISION DESCRIPTION
1	02/14/18	MPL	PER CLIENT REVIEW

ILLINOIS DESIGN FIRM # 184.001322
323 ALANA DRIVE
NEW LENOX, IL 60451
PHONE: 815.462.9324
FAX: 815.462.9328
HRGreen

921 E. WASHINGTON ST. STREAMBANK STABILIZATION
CLIENT: CITY OF JOLIET
JOLIET, ILLINOIS

FINAL ENGINEERING – FOR REVIEW & PERMIT

COVER SHEET

BAR IS ONE INCH ON OFFICIAL DRAWINGS
0 — 1"
IF NOT ONE INCH, ADJUST SCALE ACCORDINGLY

DRAWN BY: MPL
APPROVED: AJ
JOB DATE: 02/02/18
JOB NO: 170706

DRAWING
C–01

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Xrefs: xgt–1–dv01; xcs–Tabulations
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SUMMARY OF QUANTITIES

	PAY ITEM #	PAY ITEM	UNITS	QUANTITY
	20100110	TREE REMOVAL (6 TO 15 UNITS DIAMETER)	UNIT	670
	20100210	TREE REMOVAL (OVER 15 UNITS DIAMETER)	UNIT	284
	20101000	TEMPORARY FENCE	FOOT	200
+	20200100	EARTH EXCAVATION	CU YD	2,180
+	20201200	REMOVAL AND DISPOSAL OF UNSUITABLE MATERIAL	CU YD	242
	21101505	TOPSOIL EXCAVATION AND PLACEMENT	CU YD	170
	21101625	TOPSOIL FURNISH AND PLACE, 6"	SQ YD	450
	25100115	MULCH, METHOD 2	ACRE	0.90
	25000314	SEEDING, CLASS 4B	ACRE	0.20
	25100630	EROSION CONTROL BLANKET - SC-150-BN	SQ YD	1,910
	28000400	PERIMETER EROSION BARRIER	FOOT	270
	28000500	INLET AND PIPE PROTECTION	EACH	3
	28100101	STONE RIPRAP, CLASS A1	SQ YD	520
	28100111	STONE RIPRAP, CLASS A6	SQ YD	520
	55101600	STORM SEWER REMOVAL - 36"	FOOT	24
	54213681	PRECAST REINFORCED CONCRETE FLARED END SECTIONS 36"	EACH	1
	67100100	MOBILIZATION	L SUM	1
+	K1005421	SEEDING (SPECIAL)	ACRE	0.90
+	X0100003	CLEARING AND GRUBBING	SQ YD	6,440
+	X0324840	DISKING	ACRE	0.90
+	X2800400	PERIMETER EROSION BARRIER, SPECIAL (TURBIDITY BARRIER)	FOOT	480
+	X6640298	CHAIN LINK FENCE (SPECIAL)	FOOT	770
+	X6640300	CHAIN LINK FENCE REMOVAL	FOOT	705
+	X6640308	CHAIN LINK GATES (SPECIAL)	EACH	1
+	Z0013797	STABILIZED CONSTRUCTION ENTRANCE	SQ YD	70
+	Z0013798	CONSTRUCTION LAYOUT	L SUM	1
+	XXXXXXXX	SUPPLEMENTAL WATERING AND MAINTENANCE	ANN	3
+	XXXXXXXX	PLANTINGS - LIVE WILLOW STAKES	EA	320

+ = SPECIAL PROVISION

PROJECT LEGENDS:

- (P) DESIGNATES PROPOSED HMA PAVEMENT
- (P) DESIGNATES PROPOSED PCC PAVEMENT
- RIDGE LINE — DESIGNATES RIDGE LINES
- DESIGNATES PROPOSED CONCRETE SIDEWALK
- DESIGNATES AREA OF DEPRESSED SIDEWALK
- DESIGNATES AREA TO UTILIZE TRUNCATED DOMES
- (FF) DESIGNATES EROSION CONTROL MEASURE (SEE SHEET C-10-C-15 FOR EROSION CONTROL LEGEND)
- (BF) DESIGNATES SILT FILTER FENCE (LIMITS OF GRADING) (SEE SPECIFIED SHEET FOR DETAILS.)
- (PS) DESIGNATES AREA TO BE SEEDED (SEE LANDSCAPE PLANS)
- (PS) DESIGNATES AREA TO BE SEEDED (SEE LANDSCAPE PLANS)
- (EB) DESIGNATES AREA TO BE SEEDED AND TO UTILIZE EXCELSIOR BLANKET (SEE DETAILS) (SEE LANDSCAPE PLANS)
- (RR) DESIGNATES PROPOSED RIPRAP AREA (SEE DETAILS) (QUANTITY AS INDICATED)
- DESIGNATES TEMPORARY CONSTRUCTION ACCESS
- (CG) DESIGNATES CONCRETE CURB & GUTTER
- (CG) DESIGNATES REVERSE CURB & GUTTER
- (CG) DESIGNATES AREA OF DEPRESSED CURB AND GUTTER.
- DESIGNATES TREE AND BRUSH REMOVAL (SEE SHEET FOR SIZE AND QUANTITY)
- DESIGNATES TREE TRUNK & ROOT PROTECTION (POTENTIAL ROOT PRUNING REQUIRED) (SEE SHEET C-15 FOR DETAIL)
- DESIGNATES MAINTAIN 18" VERTICAL SEPARATION PER TO I.E.P.A.'S REQUIREMENTS
- # DESIGNATES SANITARY SEWER TAG
- # DESIGNATES WATER MAIN TAG
- # DESIGNATES STORM SEWER TAG
- A DESIGNATES CROSSING TAG

SYMBOL LEGEND

	EXISTING	PROPOSED
SANITARY MANHOLE		
STORM MANHOLE		
STORM CATCH BASIN/INLET		
INLET		
FLARED END SECTION		
VALVE VAULT		
WATER SERVICE VALVE		
FIRE HYDRANT WITH AUXILIARY VALVE		
LIGHT POLE		
REGULATORY SIGN		
UTILITY POLE		
UTILITY BOX	GAS ELEC CATV	GAS ELEC CATV
MAILBOX		
WELL	W	
SANITARY SEWER		
STORM SEWER		
CULVERT		
PERFORATED UNDERDRAIN		
WATER MAIN	W	W
WATER MAIN ENCASEMENT		
TRENCH BACKFILL		W
SANITARY FORCE MAIN		
ELECTRIC LINE	E	E
OVERHEAD ELECTRIC LINE	OE	OE
UNDERGROUND ELECTRIC	UE	UE
TELEPHONE LINE	T	T
GAS LINE	G	G
CABLE TV LINE	CATV	CATV
FIBER OPTIC LINE	FO	FO
TREE LINE		
TREE		
CONTOURS		
SPOT ELEVATION	EXIST	PROP
FENCE	x	
DRAINAGE DIRECTION ARROW		
DRAINAGE 10-100 YEAR OVERFLOW DIRECTION ARROW		

STANDARD ABBREVIATIONS

B-B – BACK TO BACK OF CURB
B.C. – BACK OF CURB
B.O.C. – BACK OF CURB
B.S.L. – BUILDING SETBACK LINE
P.S.L. – PARKING SETBACK LINE
C.B. – STORM CATCH BASIN
C.E. – COMMONWEALTH EDISON CO.
D.E. – DRAINAGE EASEMENT
E-E – EDGE TO EDGE OF PAVEMENT
E.O.P. – EDGE OF PAVEMENT
E.O.S. – EDGE OF SHOULDER
E.P. – EDGE OF PAVEMENT
E.S. – EDGE OF SHOULDER
F.E.S. – FLARED END SECTION
I.B.T. – ILLINOIS BELL TELEPHONE CO.
L.E. – LANDSCAPE EASEMENT
M.H. – MANHOLE (TYPE SPECIFIED ON PLANS)
R.C.M.E. – ROAD CONSTRUCTION & MAINTENANCE EASEMENT
R.O.W. – RIGHT OF WAY
S.R.L. – SEPTIC RESTRICTION LINE
T.B.F. – TRENCH BACKFILL
T.C. – TOP OF CURB
T.C.E. – TEMPORARY CONSTRUCTION EASEMENT
T.O.B. – TOP OF BERM
T.O.C. – TOP OF CURB
U.E. – UTILITY EASEMENT
P.S.L. – PARKING SETBACK LINE
P.U.E. –PUBLIC UTILITY EASEMENT
P.G.L. – PROFILE GRADE LINE

FOR CONSTRUCTION

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921 E. WASHINGTON ST. STREAMBANK STABILIZATION
CLIENT: CITY OF JOLIET
JOLIET, ILLINOIS

FINAL ENGINEERING – FOR REVIEW & PERMIT

SUMMARY OF QUANTITIES AND LEGEND SHEET

BAR IS ONE INCH ON OFFICIAL DRAWINGS
0 — 1"
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DRAWN BY: MPL
APPROVED: AJ
JOB DATE: 02/02/18
JOB NO: 170706

DRAWING
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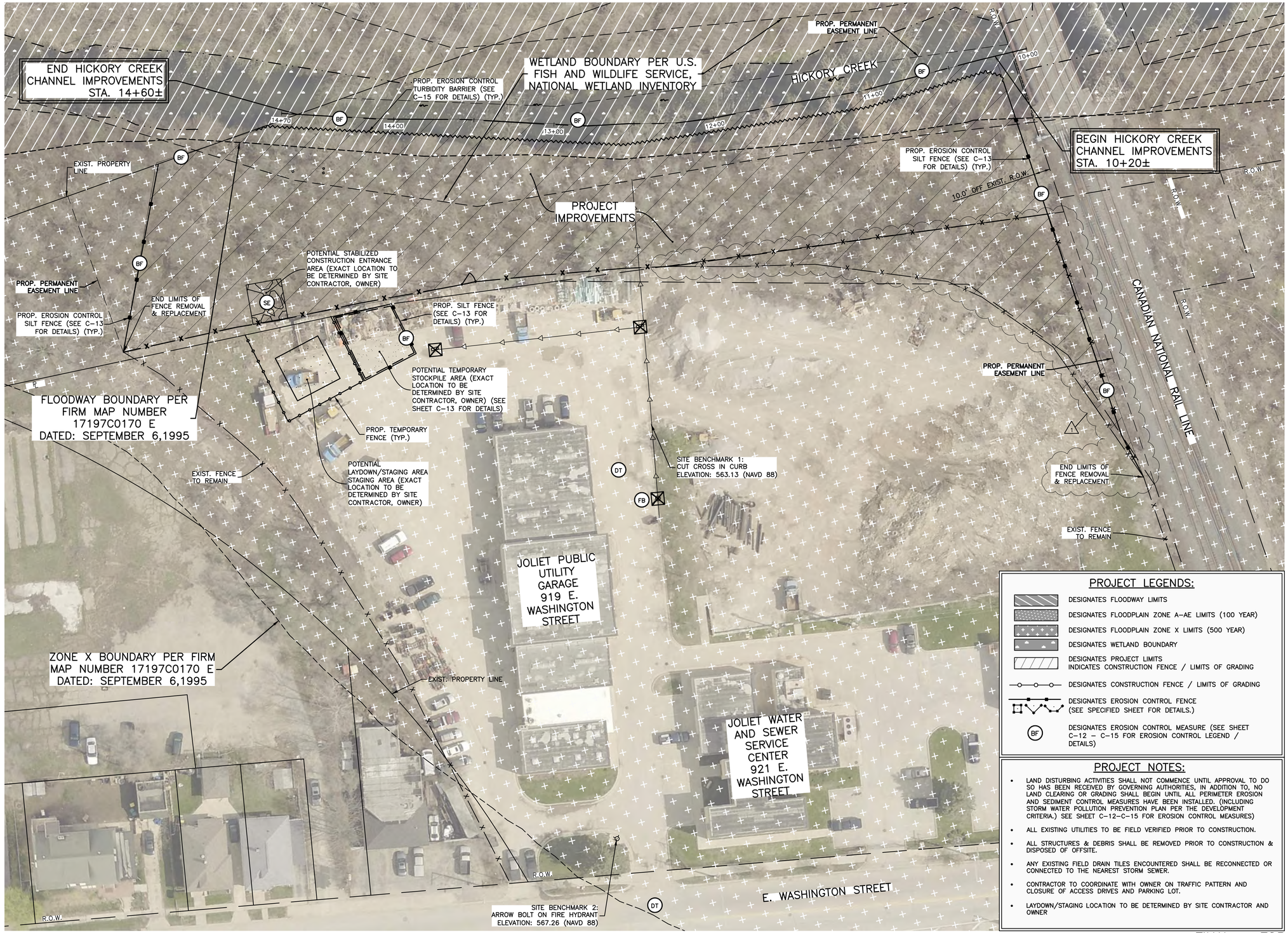

PROJECT LEGENDS:

- DESIGNATES FLOODWAY LIMITS
- DESIGNATES FLOODPLAIN ZONE A–AE LIMITS (100 YEAR)
- DESIGNATES FLOODPLAIN ZONE X LIMITS (500 YEAR)
- DESIGNATES WETLAND BOUNDARY
- DESIGNATES PROJECT LIMITS INDICATES CONSTRUCTION FENCE / LIMITS OF GRADING
- DESIGNATES CONSTRUCTION FENCE / LIMITS OF GRADING
- DESIGNATES EROSION CONTROL FENCE (SEE SPECIFIED SHEET FOR DETAILS.)
- BF — DESIGNATES EROSION CONTROL MEASURE (SEE SHEET C–12 – C–15 FOR EROSION CONTROL LEGEND / DETAILS)

PROJECT NOTES:

- LAND DISTURBING ACTIVITIES SHALL NOT COMMENCE UNTIL APPROVAL TO DO SO HAS BEEN RECEIVED BY GOVERNING AUTHORITIES, IN ADDITION TO, NO LAND CLEARING OR GRADING SHALL BEGIN UNTIL ALL PERIMETER EROSION AND SEDIMENT CONTROL MEASURES HAVE BEEN INSTALLED. (INCLUDING STORM WATER POLLUTION PREVENTION PLAN PER THE DEVELOPMENT CRITERIA.) SEE SHEET C–12–C–15 FOR EROSION CONTROL MEASURES)
- ALL EXISTING UTILITIES TO BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
- ALL STRUCTURES & DEBRIS SHALL BE REMOVED PRIOR TO CONSTRUCTION & DISPOSED OF OFFSITE.
- ANY EXISTING FIELD DRAIN TILES ENCOUNTERED SHALL BE RECONNECTED OR CONNECTED TO THE NEAREST STORM SEWER.
- CONTRACTOR TO COORDINATE WITH OWNER ON TRAFFIC PATTERN AND CLOSURE OF ACCESS DRIVES AND PARKING LOT.
- LAYDOWN/STAGING LOCATION TO BE DETERMINED BY SITE CONTRACTOR AND OWNER

NORTH
0 15 30

FOR CONSTRUCTION

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323 ALANA DRIVE
NEW LENOX, IL 60451
PHONE: 815.462.9324
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921 E. WASHINGTON ST. STREAMBANK STABILIZATION
CLIENT: CITY OF JOLIET
JOLIET, ILLINOIS

FINAL ENGINEERING – FOR REVIEW & PERMIT

OVERALL EXISTING CONDITIONS – PROJECT LIMITS PLAN

BAR IS ONE INCH ON OFFICIAL DRAWINGS
0 1"
IF NOT ONE INCH, ADJUST SCALE ACCORDINGLY

DRAWN BY: MPL
APPROVED: AJ
JOB DATE: 02/02/18
JOB NO: 170706

DRAWING
C–04

Xrefs: 170706-xC-Dsgn; 170706-xC-Survey; 170706-xV-Survey; xgt-1-dv01; 170706-xV-Aerial; 170706-xC-Gis-Data
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PROPOSED LEGEND

(0) EXISTING EARTH EXCAVATION MATERIAL TO BE REMOVED & DISPOSED OF (EXCLUDING TOPSOIL STRIP & RESPREAD)

(1) UNDISTURBED SUBGRADE

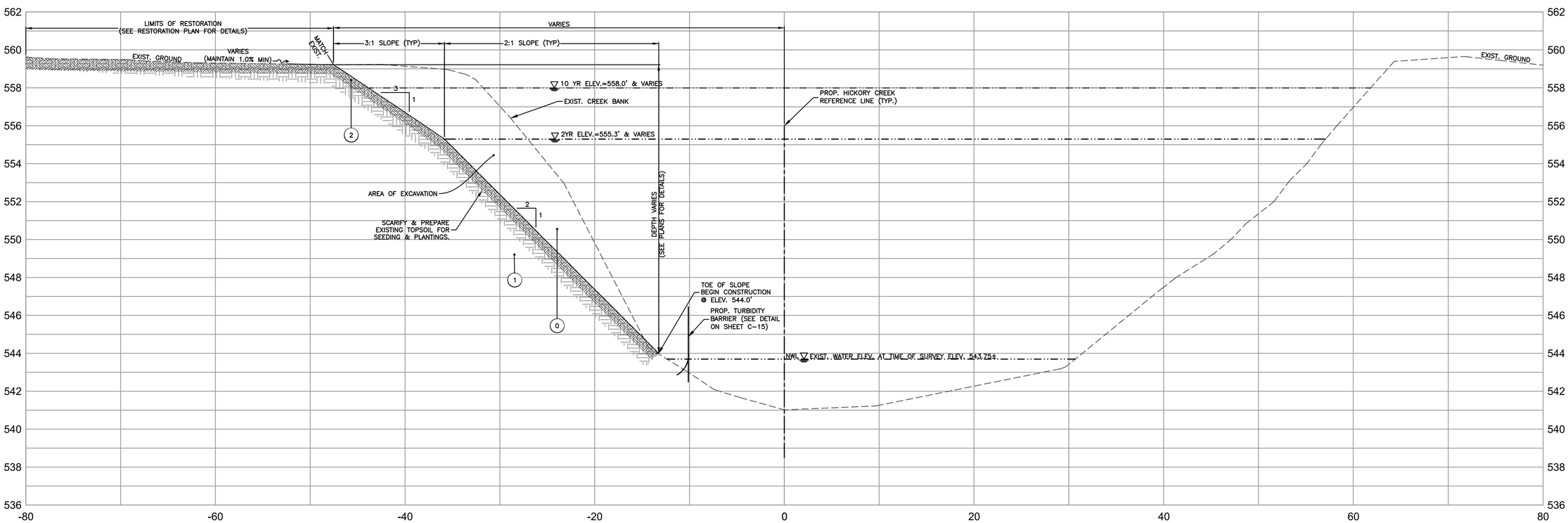
(2) PROPOSED RESTORATION & PLANTINGS (SEE PLANTING AND RESTORATION PLANS, SHEET P-1 THRU P-6)

LEGEND

- TOP SOIL
- NATIVE SOIL

NOTE:

- WHERE EMBANKMENT IS CUT & RE-GRADED TOPSOIL = RESPREAD FROM STOCKPILE CREATED FROM TOPSOIL STRIP IN AREAS OF RE-GRADING.
- WHERE EMBANKMENT IS UNCHANGED (NO GRADING) TOPSOIL = SCARIFY EXISTING TOPSOIL & PREPARE FOR SEEDING & PLANTINGS.
- WORK MAY NOT BE PERFORMED IN THE WATER, EXCEPT FOR THE PLACEMENT OF THE MATERIALS NECESSARY FOR THE INSTALLATION OF THE TEMPORARY EROSION CONTROL TURBIDITY BARRIER OR THE CONSTRUCTION OF A PARTIAL COFFERDAM. THE PARTIAL COFFERDAM MUST BE CONSTRUCTED FROM THE UPLAND AREA AND NO EQUIPMENT MAY ENTER THE WATER AT ANY TIME.



1 HICKORY CREEK IMPROVEMENTS (LOOKING DOWNSTREAM)
STA. 10+20 TO STA. 14+60

SCALE: N.T.S.

FOR CONSTRUCTION

NO.	DATE	BY	REVISION DESCRIPTION

ILLINOIS DESIGN FIRM
184.001322
420 N. FRONT
STREET, SUITE 100
McHENRY, IL 60050
PHONE: 815.385.1778
FAX: 815.385.1781

HRGreen

921 E. WASHINGTON ST. STREAMBANK STABILIZATION
CLIENT: CITY OF JOLIET
JOLIET, ILLINOIS

FINAL ENGINEERING – FOR REVIEW & PERMIT

TYPICAL SECTION – CONSTRUCTION

BAR IS ONE INCH ON OFFICIAL DRAWINGS
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JOB NO: 170706

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Xrefs: 86140264-xc-prof; xgt-1-dh01; xgt-1-dv01
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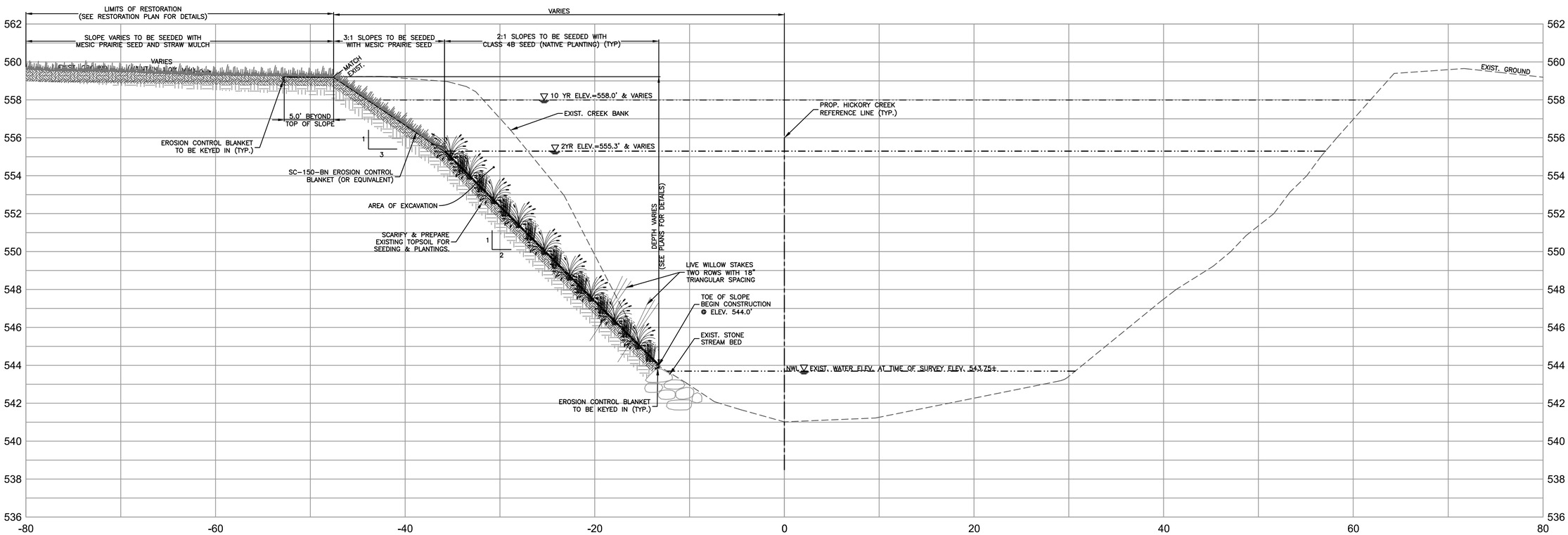
LEGEND

- TOP SOIL (6" MINIMUM)
- NATIVE SOIL
- RIPRAP
- RIPRAP BEDDING
- N.A.G. SC-150 BN EROSION CONTROL BLANKET OR EQUIVALENT
- MESIC PRAIRIE SEEDING (SEE PROJECT MANUAL FOR SEED MIX.)
- I.D.O.T. CLASS 4B SEEDING (WETLAND GRASS & SEDGE MIXTURE)



1 HICKORY CREEK PLANTING IMPROVEMENTS (LOOKING DOWNSTREAM)
STA. 10+20 TO STA. 12+00 & STA. 13+70 TO STA.14+60

SCALE: N.T.S.

FOR CONSTRUCTION

NO.	DATE	BY	REVISION DESCRIPTION

ILLINOIS DESIGN FIRM # 184.001322
420 N. FRONT STREET, SUITE 100
McHENRY, IL 60050
PHONE: 815.385.1778
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921 E. WASHINGTON ST. STREAMBANK STABILIZATION
CLIENT: CITY OF JOLIET
JOLIET, ILLINOIS

FINAL ENGINEERING – FOR REVIEW & PERMIT

TYPICAL SECTIONS – LANDSCAPING RESTORATION

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JOB DATE: 02/02/18
JOB NO: 170706

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C–06

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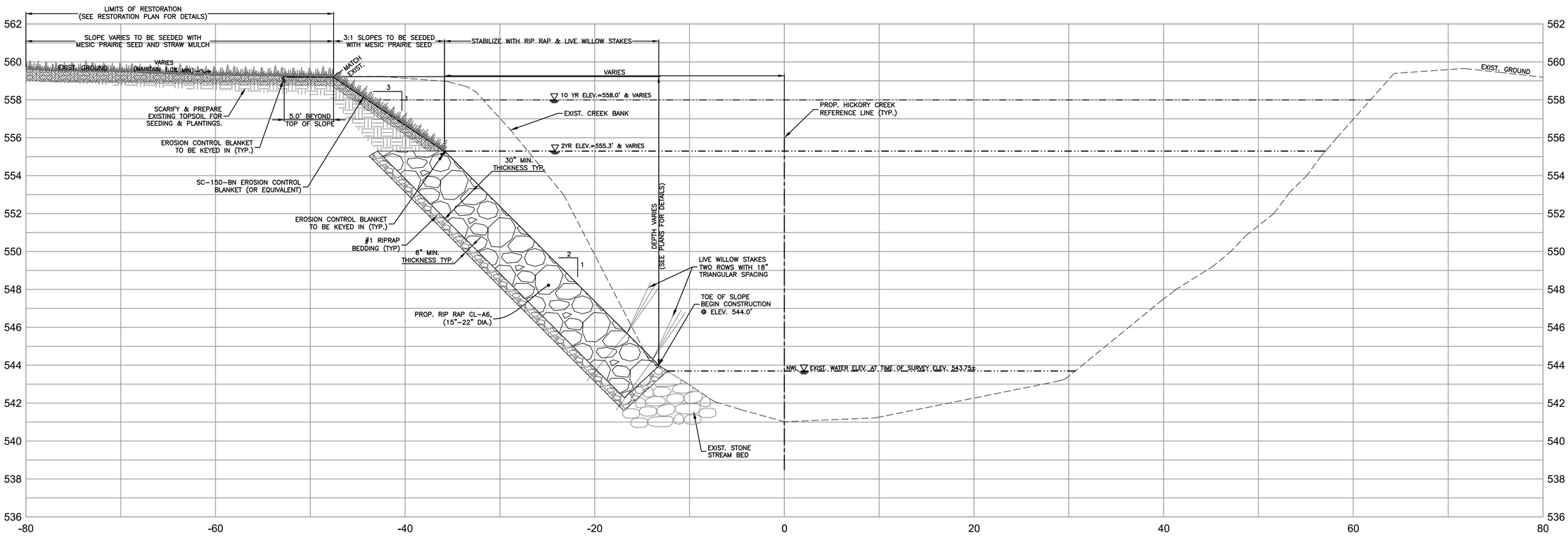
LEGEND

- TOP SOIL (6" MINIMUM)
- NATIVE SOIL
- RIPRAP
- RIPRAP BEDDING
- N.A.G. SC-150 BN EROSION CONTROL BLANKET OR EQUIVALENT
- MESIC PRAIRIE SEEDING (SEE PROJECT MANUAL FOR SEED MIX.)
- I.D.O.T. CLASS 4B SEEDING (WETLAND GRASS & SEDGE MIXTURE)



2 HICKORY CREEK PLANTING IMPROVEMENTS (LOOKING DOWNSTREAM)
STA. 12+00 TO STA. 13+70

SCALE: N.T.S.

FOR CONSTRUCTION

NO.	DATE	BY	REVISION DESCRIPTION

ILLINOIS DESIGN FIRM # 184.001322
420 N. FRONT STREET, SUITE 100
McHENRY, IL 60050
PHONE: 815.385.1778
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921 E. WASHINGTON ST. STREAMBANK STABILIZATION
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JOLIET, ILLINOIS

FINAL ENGINEERING – FOR REVIEW & PERMIT

TYPICAL SECTIONS – LANDSCAPING RESTORATION

BAR IS ONE INCH ON OFFICIAL DRAWINGS
0 1"
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JOB DATE: 02/02/18
JOB NO: 170706

DRAWING
C-07

Xrefs: 86140264-xc-prof; xgt-1-dh01; xgt-1-dv01
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PROJECT NOTES:

- LAND DISTURBING ACTIVITIES SHALL NOT COMMENCE UNTIL APPROVAL TO DO SO HAS BEEN RECEIVED BY GOVERNING AUTHORITIES, IN ADDITION TO, NO LAND CLEARING OR GRADING SHALL BEGIN UNTIL ALL PERIMETER EROSION AND SEDIMENT CONTROL MEASURES HAVE BEEN INSTALLED. (INCLUDING STORM WATER POLLUTION PREVENTION PLAN PER THE DEVELOPMENT CRITERIA.) (SEE SHEET C-12–C-15 FOR EROSION CONTROL MEASURES)
- ALL EXISTING UTILITIES TO BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
- ALL STRUCTURES & DEBRIS SHALL BE REMOVED PRIOR TO CONSTRUCTION & DISPOSED OF OFFSITE.
- ANY EXISTING FIELD DRAIN TILES ENCOUNTERED SHALL BE RECONNECTED OR CONNECTED TO THE NEAREST STORM SEWER.
- CONTRACTOR TO COORDINATE WITH OWNER ON TRAFFIC PATTERN AND CLOSURE OF ACCESS DRIVES AND PARKING LOT.
- LAYDOWN/STAGING LOCATION TO BE DETERMINED BY SITE CONTRACTOR AND OWNER
- TREES LARGER THAN 5" IN DIAMETER CANNOT BE REMOVED FROM MAY 1 TO NOVEMBER 14. TREE REMOVAL MUST BE COMPLETED OUTSIDE OF THIS TIMEFRAME.

LEGEND:

- INDICATES TREE REMOVAL, CLEARING AND GRUBBING AREA
- INDICATES PIPE REMOVAL OR ABANDONMENT
- INDICATES CONSTRUCTION FENCE / LIMITS OF GRADING
- INDICATES EROSION CONTROL FENCE (SEE SPECIFIED SHEET FOR DETAILS.)
- FB — INDICATES EROSION CONTROL MEASURE (SEE SHEET C-12 – C-15 FOR EROSION CONTROL LEGEND / DETAILS)
- INDICATES TREE AND BRUSH REMOVAL (SEE SHEET FOR SIZE AND QUANTITY)

BEGIN HICKORY CREEK CHANNEL IMPROVEMENTS STA. 14+60±

EXIST. FLOODWAY BOUNDARY PER FIRM MAP NUMBER 17197C0170 E DATED: SEPTEMBER 6,1995

PROP. EROSION CONTROL SILT FENCE (SEE C-13 FOR DETAILS) (TYP.)

PROP. EROSION CONTROL TURBIDITY BARRIER (SEE C-15 FOR DETAILS) (TYP.)

EXIST. WATER LINE ELEV. AT TIME OF SURVEY 543.45±

TOE OF SLOPE/EDGE OF WATER LINE APPROXIMATE LOCATION OF LIMITS OF CONSTRUCTION

HICKORY CREEK

PROP. HICKORY CREEK REFERENCE LINE (TYP.)

PROP. PERMANENT EASEMENT LINE

14+70 14+00 13+00

EXIST. PROPERTY LINE

EXIST. CONCRETE FOUNDATIONS TO BE REMOVED (3 SURVEYED, CONTRACTOR TO REMOVE ADDITIONAL FOUNDATIONS WITHIN PROJECT LIMITS)

PROP. EROSION CONTROL SILT FENCE (SEE C-13 FOR DETAILS) (TYP.)

EXIST. WETLAND BOUNDARY PER U.S. FISH AND WILDLIFE SERVICE, NATIONAL WETLAND INVENTORY

EXIST. TREES TO BE REMOVED (SIZES AS INDICATED) (TYP)

PROP. CLEARING AND GRUBBING (TYP)

MATCH LINE STA. 12+70 SEE SHEET NO. C-09

EXIST. CHAIN LINK MAN GATE TO BE REMOVED AND REPLACED WITH 10' GATE

EXIST FENCE LINE/ APPROXIMATE LOCATION OF LIMITS OF CONSTRUCTION

EXIST. CHAIN LINK FENCE TO BE REMOVED & REPLACED (705 LF)

PROP. PERMANENT EASEMENT LINE

BEGIN LIMITS OF FENCE REMOVAL & REPLACEMENT

EXIST. FENCE TO REMAIN

EXIST. 8" DIP STORM SEWER

NORTH

0 5 10

FOR CONSTRUCTION

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921 E. WASHINGTON ST. STREAMBANK STABILIZATION

CLIENT: CITY OF JOLIET

JOLIET, ILLINOIS

FINAL ENGINEERING – FOR REVIEW & PERMIT

DEMOLITION PLAN

BAR IS ONE INCH ON OFFICIAL DRAWINGS
0 1"
IF NOT ONE INCH, ADJUST SCALE ACCORDINGLY

DRAWN BY: MPL
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JOB DATE: 02/02/18
JOB NO: 170706

DRAWING
C-08

Xrefs: 170706-xC-Bgn; 170706-xC-Survey; 170706-xV-Survey; xgt-1-dx01; 170706-xC-Gis-Data
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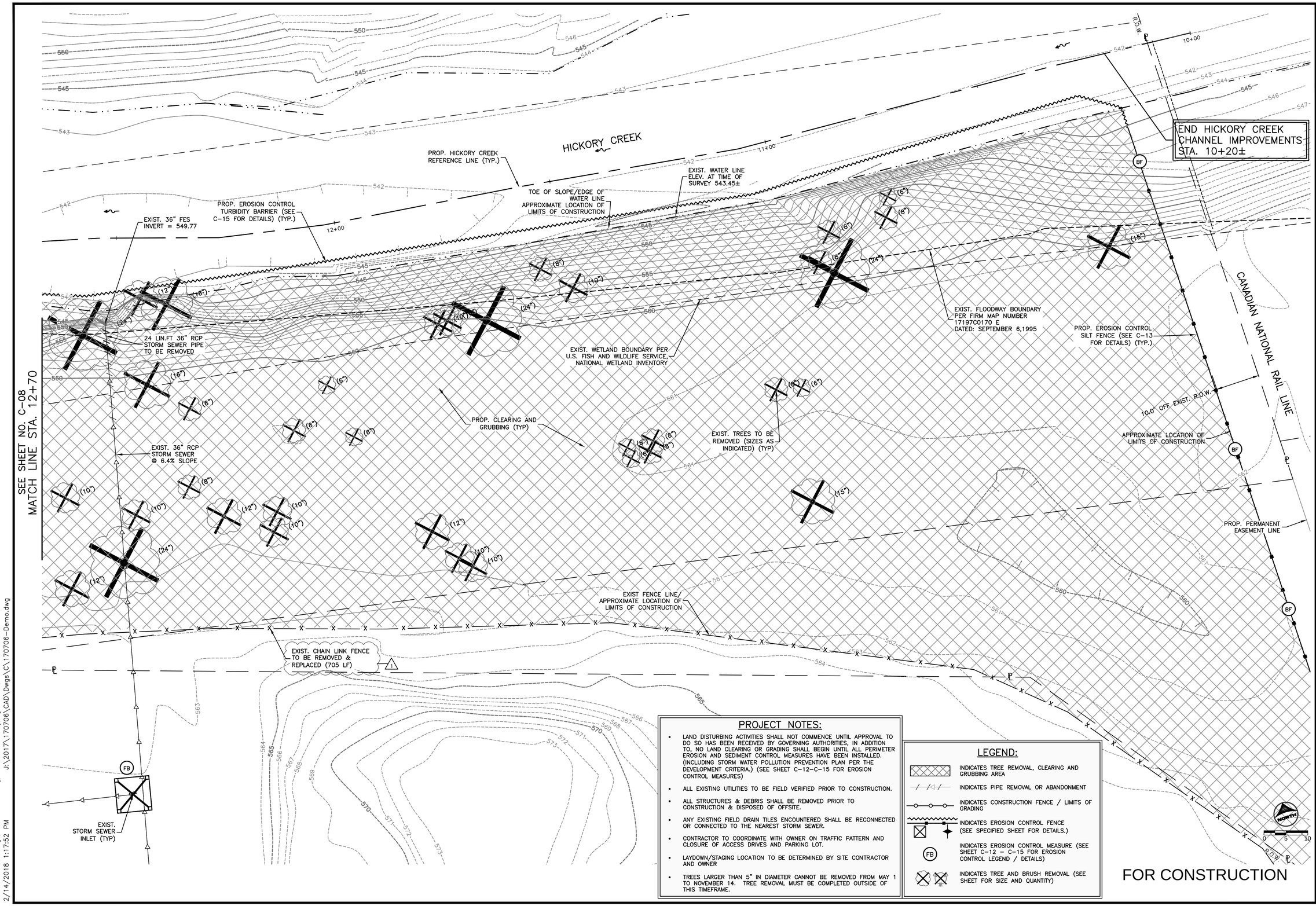

PROJECT NOTES:

- LAND DISTURBING ACTIVITIES SHALL NOT COMMENCE UNTIL APPROVAL TO DO SO HAS BEEN RECEIVED BY GOVERNING AUTHORITIES, IN ADDITION TO, NO LAND CLEARING OR GRADING SHALL BEGIN UNTIL ALL PERIMETER EROSION AND SEDIMENT CONTROL MEASURES HAVE BEEN INSTALLED. (INCLUDING STORM WATER POLLUTION PREVENTION PLAN PER THE DEVELOPMENT CRITERIA.) (SEE SHEET C-12-C-15 FOR EROSION CONTROL MEASURES)
- ALL EXISTING UTILITIES TO BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
- ALL STRUCTURES & DEBRIS SHALL BE REMOVED PRIOR TO CONSTRUCTION & DISPOSED OF OFFSITE.
- ANY EXISTING FIELD DRAIN TILES ENCOUNTERED SHALL BE RECONNECTED OR CONNECTED TO THE NEAREST STORM SEWER.
- CONTRACTOR TO COORDINATE WITH OWNER ON TRAFFIC PATTERN AND CLOSURE OF ACCESS DRIVES AND PARKING LOT.
- LAYDOWN/STAGING LOCATION TO BE DETERMINED BY SITE CONTRACTOR AND OWNER
- TREES LARGER THAN 5" IN DIAMETER CANNOT BE REMOVED FROM MAY 1 TO NOVEMBER 14. TREE REMOVAL MUST BE COMPLETED OUTSIDE OF THIS TIMEFRAME.

LEGEND:

- INDICATES TREE REMOVAL, CLEARING AND GRUBBING AREA
- INDICATES PIPE REMOVAL OR ABANDONMENT
- INDICATES CONSTRUCTION FENCE / LIMITS OF GRADING
- INDICATES EROSION CONTROL FENCE (SEE SPECIFIED SHEET FOR DETAILS.)
- FB — INDICATES EROSION CONTROL MEASURE (SEE SHEET C-12 – C-15 FOR EROSION CONTROL LEGEND / DETAILS)
- INDICATES TREE AND BRUSH REMOVAL (SEE SHEET FOR SIZE AND QUANTITY)

FOR CONSTRUCTION

NO.	DATE	BY	REVISION DESCRIPTION
1	02/14/18	MPL	PER CLIENT REVIEW

HRGreen
ILLINOIS DESIGN FIRM # 184.001322
323 ALANA DRIVE
NEW LENOX, IL 60451
PHONE: 815.462.9324
FAX: 815.462.9328

921 E. WASHINGTON ST. STREAMBANK STABILIZATION
CLIENT: CITY OF JOLIET
JOLIET, ILLINOIS

FINAL ENGINEERING – FOR REVIEW & PERMIT

DEMOLITION PLAN

BAR IS ONE INCH ON OFFICIAL DRAWINGS
0 1"
IF NOT ONE INCH, ADJUST SCALE ACCORDINGLY

DRAWN BY: MPL
APPROVED: AJ
JOB DATE: 02/02/18
JOB NO: 170706

DRAWING
C-09

Xrefs: 170706-xC-Dsgn; 170706-xC-Survey; 170706-xV-Survey; xgt-1-dx01; 170706-xC-Gis-Data
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PROJECT NOTES:

1. SEE SHEET C-12 FOR EROSION CONTROL GENERAL NOTES AND SPECIFICATIONS
2. SEE SHEET C-12 FOR PHASING NOTES (SEQUENCE OF MAJOR ACTIVITIES)
3. SEE SHEET C-12 & C-15 FOR EROSION CONTROL DETAILS

LEGEND:

- INDICATES EROSION CONTROL MEASURES (LIMITS OF GRADING)
- INDICATES AREA TO BE SEEDED MESIC PRAIRIE SEED WITH MULCH.
- INDICATES AREA TO BE SEEDED WITH MESIC PRAIRIE SEED AND SC-150-BN EROSION CONTROL BLANKET.
- INDICATES AREA TO BE SEEDED WITH I.D.O.T.CLASS 4B SEED AND SC-150-BN EROSION CONTROL BLANKET.
- INDICATES PROPOSED RIPRAP AREA CL-A6 (SEE DETAILS)
- (BF) INDICATES EROSION CONTROL MEASURE (SEE SHEET C-12 - C-15 FOR EROSION CONTROL LEGEND / DETAILS)

BEGIN HICKORY CREEK CHANNEL IMPROVEMENTS STA. 14+60±

HICKORY CREEK

EXIST. FLOODWAY BOUNDARY PER FIRM MAP NUMBER 17197C0170 E DATED: SEPTEMBER 6,1995

PROP. EROSION CONTROL SILT FENCE (SEE C-13 FOR DETAILS) (TYP.)

EXIST. WATER LINE ELEV. AT TIME OF SURVEY 543.45±

TOE OF SLOPE/EDGE OF WATER LINE APPROXIMATE LOCATION OF LIMITS OF RESTORATION

2:1 SLOPES

PROP. EROSION CONTROL TURBIDITY BARRIER (SEE C-15 FOR DETAILS) (TYP.)

PROP. HICKORY CREEK REFERENCE LINE (TYP.)

PROP. RIP RAP WITH LIVE WILLOW STAKES (SEE SHEET C-07 FOR DETAILS)

EXIST. PROPERTY LINE

EXIST. WETLAND BOUNDARY PER U.S. FISH AND WILDLIFE SERVICE, NATIONAL WETLAND INVENTORY

AREA TO BE SEEDED WITH CLASS 4B SEED (NATIVE PLANTING) WITH SC-150-BN EROSION CONTROL BLANKET (SEE TYP. SECTIONS) LIVE WILLOW STAKES BELOW THE 2-YEAR FLOOD ELEVATION

PROP. EROSION CONTROL SILT FENCE (SEE C-13 FOR DETAILS) (TYP.)

PROP. RIP RAP CL-A6, (SEE TYP. SECTIONS FOR ADDITIONAL DETAILS)

AREA TO BE SEEDED WITH MESIC PRAIRIE SEED WITH SC-150-BN EROSION CONTROL BLANKET

PROP. CONTOURS (TYP.)

3:1 SLOPES

2 YEAR ELEV. 555.3'

10 YEAR ELEV. 558.0'

MATCH LINE STA. 12+70 SEE SHEET NO. C-10

AREA TO BE SEEDED WITH MESIC PRAIRIE SEED WITH MULCH

EXIST. CONTOURS (TYP.)

PROP. CHAIN LINK MAN GATE TO BE REPLACED WITH 10' GATE

EXIST FENCE LINE/ APPROXIMATE LOCATION OF LIMITS OF CONSTRUCTION

PROP. CHAIN LINK FENCE TO BE REPLACED (770 LF) 1

PROP. PERMANENT EASEMENT LINE

BEGIN LIMITS OF FENCE REPLACEMENT

EXIST. 8" DIP STORM SEWER

NORTH

0 5 10

FOR CONSTRUCTION

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NEW LENOX, IL 60451
PHONE: 815.462.9324
FAX: 815.462.9328
HRGreen

921 E. WASHINGTON ST. STREAMBANK STABILIZATION
CLIENT: CITY OF JOLIET
JOLIET, ILLINOIS

FINAL ENGINEERING - FOR REVIEW & PERMIT

RESTORATION PLAN

BAR IS ONE INCH ON OFFICIAL DRAWINGS
0 1"
IF NOT ONE INCH, ADJUST SCALE ACCORDINGLY

DRAWN BY: MPL
APPROVED: AJ
JOB DATE: 02/02/18
JOB NO: 170706

DRAWING
C-10

Xrefs: 170706-xC-Dwgn; 170706-xC-Survey; 170706-xV-Survey; xgt-1-dv01; 170706-xC-Gis-Data
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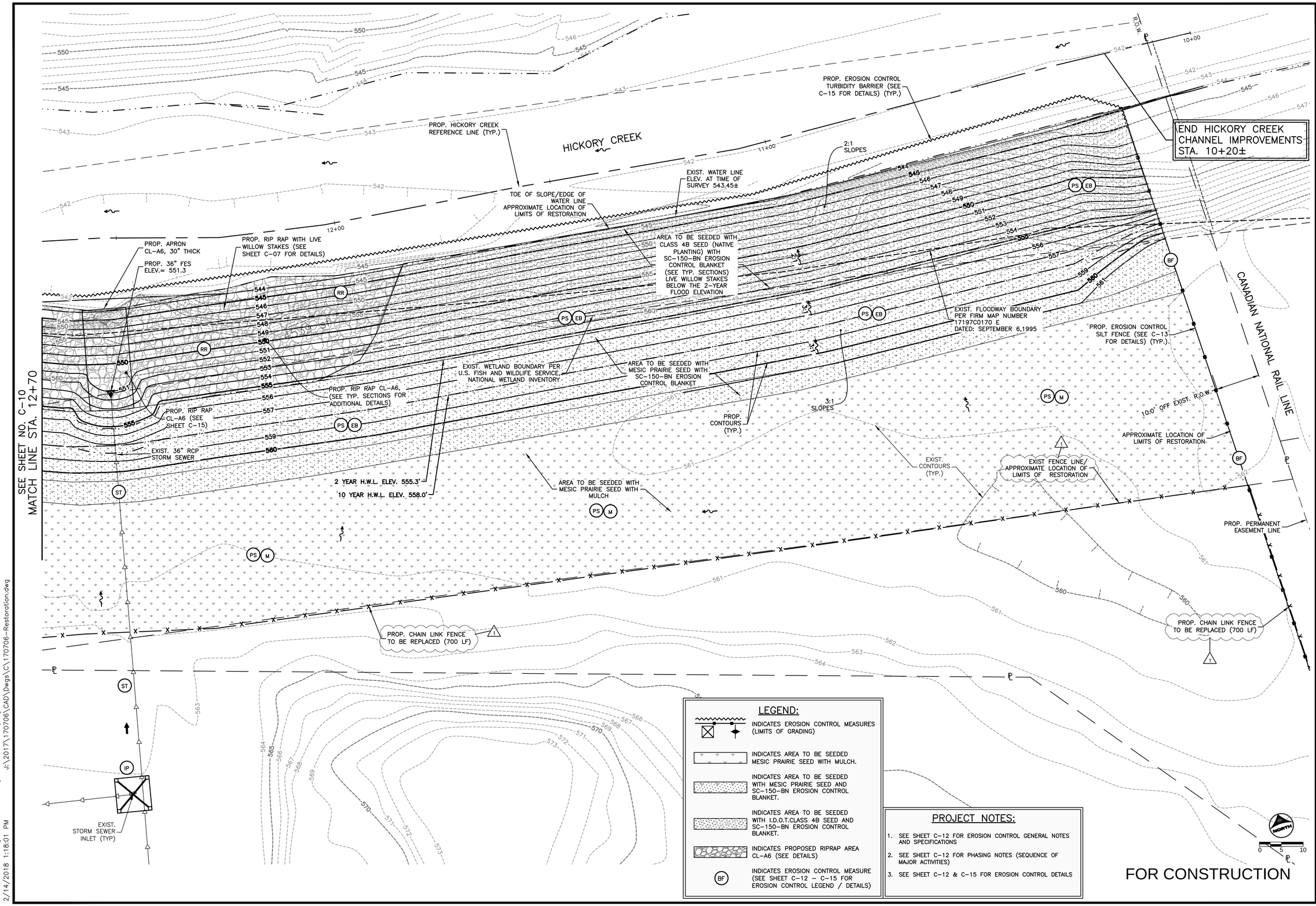

LEGEND:

- INDICATES EROSION CONTROL MEASURES (LIMITS OF GRADING)
- INDICATES AREA TO BE SEEDED MESIC PRAIRIE SEED WITH MULCH.
- INDICATES AREA TO BE SEEDED WITH MESIC PRAIRIE SEED AND SC-150-BN EROSION CONTROL BLANKET.
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- INDICATES PROPOSED RIPRAP AREA CL-A6 (SEE DETAILS)
- (BF) INDICATES EROSION CONTROL MEASURE (SEE SHEET C-12 – C-15 FOR EROSION CONTROL LEGEND / DETAILS)

PROJECT NOTES:

1. SEE SHEET C-12 FOR EROSION CONTROL GENERAL NOTES AND SPECIFICATIONS
2. SEE SHEET C-12 FOR PHASING NOTES (SEQUENCE OF MAJOR ACTIVITIES)
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FOR CONSTRUCTION

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RESTORATION PLAN

BAR IS ONE INCH ON OFFICIAL DRAWINGS
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DRAWN BY: MPL
APPROVED: AJ
JOB DATE: 02/02/18
JOB NO: 170706

DRAWING
C-11

Xrefs: 170706-xC-Dsgn; 170706-xC-Survey; 170706-xV-Survey; xgt-1-dx01; 170706-xC-Gis-Data
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CONTROL MEASURE GROUP	CONTROL MEASURE	APPL.	KEY	CONTROL MEASURE CHARACTERISTICS	TEMP.	PERMNT
VEGETATIVE SOIL COVER	TEMPORARY SEEDING	X	TS	PROVIDES QUICK TEMPORARY COVER TO CONTROL EROSION WHEN PERMANENT SEEDING IS NOT DESIRED OR TIME OF YEAR IS INAPPROPRIATE.	X	
	PERMANENT SEEDING	X	PS	PROVIDES PERMANENT VEGETATIVE COVER TO CONTROL EROSION, FILTERS SEDIMENT FROM WATER. MAY BE PART OF FINAL LANDSCAPE PLAN.		X
	DORMANT SEEDING		DS	SAME AS PERMANENT SEEDING EXCEPT IS DONE DURING DORMANT SEASON. HIGHER RATES OF SEED APPLICATION ARE REQUIRED.		
	SODDING		SO	QUICK PERMANENT COVER TO CONTROL EROSION. QUICK WAY TO ESTABLISH VEGETATION FILTER STRIP. CAN BE USED ON STEEP SLOPES OR IN DRAINAGEWAYS WHERE SEEDING MAY BE DIFFICULT.		
	GROUND COVER		GC	PROVIDES GROUND COVER, SHRUBS AND TREES IN ADDITION TO PERMANENT VEGETATION. MAY BE USED AS PART OF A FINAL LANDSCAPE PLAN ALONG WITH SHRUBS AND TREES.		
	RAIN GARDEN		RG	PROVIDES A TYPE OF FUNCTIONAL LANDSCAPING FEATURE DESIGNED TO CONTROL STORMWATER RUNOFF. SEE LANDSCAPING PLANS FOR DETAILS		
NON VEGETATIVE SOIL COVER	MULCHING	X	M	ADDED INSURANCE OF A SUCCESSFUL TEMPORARY OR PERMANENT SEEDING. CONTROLS UNWANTED VEGETATION AND PRESERVES MOISTURE. PROVIDES COVER WHERE VEGETATION CANNOT BE ESTABLISHED.	X	
	AGGREGATE COVER		AG	PROVIDES SOIL COVER ON ROADS AND PARKING LOTS AND AREAS WHERE VEGETATION CANNOT BE ESTABLISHED. PREVENTS MUD FROM BEING PICKED UP AND TRANSPORTED OFF-SITE.		
	PAVING		P	PROVIDES PERMANENT COVER ON PARKING LOTS AND ROADS OR OTHER AREAS WHERE VEGETATION CANNOT BE ESTABLISHED.		
	EROSION BLANKET	X	EB	PROVIDES QUICK TEMPORARY COVER TO CONTROL EROSION WHEN PERMANENT SEEDING TIME OF YEAR IS INAPPROPRIATE AND IN SLOPED AREAS.	X	
DIVERSIONS	RIDGE DIVERSION		RD	TYPICALLY USED ABOVE SLOPES. USED WHERE AN EXCESS OF SOIL IS AVAILABLE.		
	CHANNEL DIVERSION		CD	TYPICALLY USED AT TOP OR BASE OF SLOPES. USED WHEN EXCESS SOIL IS NOT AVAILABLE.		
	COMBINATION DIVERSION		DC	TYPICALLY USED ANYWHERE ONA SLOPE. SOIL TAKEN OUT OF CHANNEL IS USED TO BUILD THE RIDGE.		
	CURB AND GUTTER		CG	SPECIAL CASE OF DIVERSION USED IN CONJUNCTION WITH A STREET TO DIVERT WATER FROM AN AREA NEEDING PROTECTION.		
	BENCHES		B	SPECIAL CASE OF DIVERSION CONSTRUCTED WHEN WORKING ON CUT SLOPES TO SHORTEN LENGTH OF SLOPE AND ADD SLOPE STABILITY.		
WATERWAYS	BARE CHANNEL		BC	PROVIDES MEANS OF CONVEYING RUNOFF TO DESIRED LOCATION. MAY BE USED TO DRAIN DEPRESSIONAL AREAS. ONLY APPLICABLE WHEN VELOCITY OF FLOW IS VERY LOW.		
	VEGETATIVE CHANNEL		VC	PROVIDED ADDED STABILITY TO CHANNEL. USED WHEN VELOCITY OF FLOW IS NOT EXTREMELY FAST.		
	LINED CHANNEL		LC	USED WHEN VEGETATION WILL NOT PROTECT THE CHANNEL AGAINST HIGH VELOCITIES OF FLOW OR WHERE VEGETATION CANNOT BE ESTABLISHED.		
	DITCH CHECKS		RC	PROVIDES AN ENERGY DISSIPATOR ALONG A LENGTHY CHANNEL TO REDUCE VELOCITY OF STORMWATER		
ENCLOSED DRAINAGE	STORM SEWER	X	ST	CAN BE USED TO CONVEY SEDIMENT LADEN WATER TO SEDIMENT BASIN OR IN CONJUNCTION WITH A WATERWAY.		X
	UNDERDRAIN		UD	USED TO LOWER WATER TABLE AND INTERCEPT GROUNDWATER FOR BETTER VEGETATION GROWTH AND SLOPE STABILITY. USED TO CARRY BASE FLOW IN WATERWAYS AND TO DEWATER SEDIMENT BASINS.		
SPILLWAYS	STRAIGHT PIPE SPILLWAY		SS	USED FOR RELATIVELY SMALL VERTICAL DROPS AND SMALL FLOWS OF WATER		
	DROP INLET PIPE SPILLWAY		DIS	SAME AS PIPE SPILLWAY EXCEPT LARGER FLOWS AND LARGE VERTICAL DROPS CAN BE ACCOMMODATED.		
	WEIR SPILLWAY		W	USED FOR RELATIVELY SMALL VERTICAL DROPS AND FLOWS MUCH GREATER THAN PIPE STRUCTURES.		
	BOX INLET WEIR SPILLWAY		BS	SAME AS WEIR SPILLWAY EXCEPT LARGER FLOWS CAN BE ACCOMMODATED BECAUSE OF LOWER WEIR LENGTH.		
OUTLETS	LINED APRON		LA	PROTECTS DOWNSTREAM CHANNEL FROM HIGH VELOCITY OF FLOW DISCHARGING FROM STRUCTURES.		
	STONE RIP RAP	X	RR	USED AS AN ENERGY DISSIPATOR AT OUTLET STRUCTURES TO REDUCE VELOCITIES		X
SEDIMENT BASINS	EMBANKMENT SEDIMENT BASIN		ES	USED WHERE TOPOGRAPHY LENDS ITSELF TO CONSTRUCTING A DAM AND EARTH FILL IS AVAILABLE.		
	EXCAVATED SEDIMENT BASIN		XS	USED WHERE EMBANKMENT COULD CAUSE A HAZARD DOWNSTREAM IN CASE OF FAILURE AND WHEN EXCESS EARTH FILL IS NOT AVAILABLE.		
	COMBINATION SEDIMENT BASIN		CS	USED WHEN TOPOGRAPHY IS SUITABLE BUT ADDITIONAL CAPACITY IS NEEDED.		
SEDIMENT FILTERS	SILT FENCE	X	BF	USED FOR SINGLE LOTS OR DRAINAGE AREAS LESS THAN 1/2 ACRE TO FILTER SEDIMENT FROM RUNOFF.	X	
	VEGETATIVE FILTER		VF	USED ALONG DRAINAGE WAYS OR PROPERTY LINES TO FILTER SEDIMENT FROM RUNOFF. SIZE MUST BE INCREASED IN PROPORTION TO DRAINAGE AREA.		
	FILTER BASKET	X	FB	USED FOR FILTERING SEDIMENT WITHIN THE ROADWAY BEFORE ENTERING THE STORM SEWER	X	
	FILTER FABRIC		FF	USED FOR FILTERING SEDIMENT WITHIN THE ROADWAY BEFORE ENTERING THE STORM SEWER		
	INLET PROTECTION		IP	USED FOR FILTERING SEDIMENT WITHIN GRASS AREAS BEFORE WATER ENTERS THE STORM SEWER		
MUD AND DUST CONTROL	STABILIZED CONST. ENTRANCE	X	SE	PREVENT MUD FROM BEING PICKED UP AND CARRIED OFF-SITE.	X	
	DUST AND TRAFFIC CONTROL	X	DT	PREVENTS DUST FROM LEAVING CONSTRUCTION SITE.	X	

	RESPONSIBILITIES BY OTHERS			PER I.D.O.T. SPECIFICATIONS APR. 1 – JUNE 15		RESPONSIBILITIES BY OTHERS		PER I.D.O.T. SPECIFICATIONS AUG. 1 – NOV. 1			RESPONSIBILITIES BY OTHERS	
STABILIZATION TYPE	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG	SEPT.	OCT.	NOV.	DEC.
NATIVE SEEDING												
LIVE WILLOW STAKES												
TEMPORARY SEEDING												

EROSION CONTROL NOTES:

- **No land disturbing activities shall not commence until approval to do so has been received by governing authorities, in addition to, no land clearing or grading shall begin until all perimeter erosion and sediment control measures have been installed.**
- **(including storm water pollution prevention plan per the development criteria.)**
- **The general contractor shall strictly adhere to the storm water pollution prevention plan (swppp) during construction operations.**
- **All topsoil shall be stripped prior to filling**
- **All exposed areas shall be seeded as specified within 14 days of final grading.**
- **Should construction stop for longer than 14 days, the site shall be seeded as specified.**
- **Sediment and erosion control measures shall be inspected at least once every seven (7) days and within 24 hours of a rainfall exceeding 0.5 inches during a 24-hour period or more frequently if required by governing NPDES general permit. All maintenance required by inspection shall commence within 24 hours and be completed within 48 hours of report.**
- **This plan shall not be considered all inclusive as the general contractor shall take all necessary precautions to prevent soil sediment from leaving the site.**
- **General contractor shall comply with all state and local ordinances that apply.**
- **Additional erosion and sediment control measures will be installed if deemed necessary by on site inspection.**
- **If installation of storm drainage system should be interrupted by weather or nightfall, the pipe ends shall be covered with filter fabric.**
- **General contractor shall be responsible to take whatever means necessary to establish permanent soil stabilization.**
- **All sedimentation and erosion control regulations shall be adhered to per CITY OF JOLIET's requirements**
- **All erosion and sediment control practices shall be maintained and repaired as needed to ensure effective performance of the required erosion control measures.**
- **All erosion and sediment control work shall conform to the I.D.O.T. Manual for, standards and procedures for erosion control.**
- **All construction will adhere to the requirements set forth in the IEPA'S new construction site activities national pollutant discharge elimination system (NPDES) storm water permit.**
- **All roadways shall be cleaned at the end of each construction day.**
- **All disturbed areas shall be stabilized within 7 days of active disturbance.**
- **All erosion control measures shall be disposed of within 30 days of final stabilization of the site.**
- **Ground cover for 5:1 slopes or greater shall be established as soon as possible.**
- **All disturbed areas to to restored w/ 6" topsoil respread & seeding/sodding unless otherwise noted on plans**
- **Inlet protection such as Silt filter fabric or filter baskets shall be placed between frame and grate until vegetation is established. (see detail)**
- **Utilize excelsior blanket on all slopes of 5:1 or greater.**
- ***Seeding per I.D.O.T. Manual, section 251,standard specifications for road and bridge construction, (latest edition**
- ***Class 3 type – slope mixture**
- ***Mulch/hydroseed per I.D.O.T. Manual, section 251, standard specifications for road and bridge construction, (latest edition**
- ***Mulch/hydroseed method 2, procedure 3**
- **No dimensions shall be assumed by scaling.**
- **No known drain tiles are present on the proposed development, if tiles are encountered during construction please notify the engineer immediately.**
- **Part of the proposed project is located within a flood hazard 10-100yr area a flood hazard area**
- **Excess material shall be placed at specified location unless otherwise specified by owner and approved by engineer for use of lot grading. Stockpiles shall be surrounded with filter fence and shall be seeded per I.D.O.T. Manual (latest addition) (temporary) if left more than 14 working days.**
- **General contractor shall notify all utility companies having underground utilities on site or in right-of-way prior to excavation. Contractor shall contact utility locating company and locate all utilities prior to grading start.**

PHASING NOTES:

SEQUENCE OF MAJOR ACTIVITIES

The Contractor will be responsible for implementing the following erosion control and storm water management control measures. The Contractor may designate these tasks to certain subcontractors as he sees fit, but the ultimate responsibility for implementing these controls and ensuring their proper functioning remains with the Contractor. The order of activities will be as follows (refer to the Erosion and Sediment Control Plan Sheet contained in this SWPPP for details and refer to the Suggested Phasing Plan in the design drawings for construction sequencing):

A. Secure storm water NPDES permit with the IEPA at least 30 days prior to beginning work.
B. A pre-construction meeting shall be held by the Site Project Manager and the Operator's Engineer prior to land disturbing activities.
C. Install perimeter silt fences and inlet protection to existing storm infrastructure in the locations shown on the Demolition Plan sheets.
D. Implement erosion control measures around the existing storm sewer to prevent sedimentation from infiltrating into the storm sewer system as shown on the Demolition Plan plan sheets.
E. Construct temporary construction exits at locations shown on the Erosion Control plan sheets.
F. Begin clearing and grubbing operations if applicable. Clearing and grubbing shall be done only in areas where earthwork will be performed.
G. Disturbed areas of the site where Construction Activity has ceased for more than 7 days shall be temporarily seeded and watered.
H. Commence site Mass/Rough grading using low points in profile as sediment ponds. If low points are to be drained by pumping, a sump pit shall be installed per the typical detail.
I. Install new perimeter silt fences to newly graded areas per the locations shown on the Grading / Erosion Control plan sheets.
J. Install inlet / outlet protection around the constructed storm sewer to prevent sedimentation from infiltrating into the storm sewer system as shown on the Erosion Control & Restoration Plan sheets.
K. Temporary seed all fill slopes around perimeter of project.
L. Carry out final stream bank stabilization measures with Plant native plugs, seeding, sodding and other plantings, including rolled erosion control products where shown on the Erosion Control & Restoration Plan sheets.
S. Stockpile respread.
T. Remove silt fencing only after all surfaces at are at least 70% growth of permanent seedings are stabilized.
U. Remove temporary construction exits.
V. Remove inlet protection around inlets and manholes.

A schedule for implementation for the activities identified above is included as Form C-3 of the SWPPP.

NOTES

This plan has been prepared to comply with the provisions of the NPDES Permit Number issued by the Illinois Environmental Protection Agency for Stormwater Discharges from Construction Site Activities.

The total area of the site that is estimated to be disturbed by excavation, grading, or other activities, is 1.40 acres of disturbance.

1. Site Description.
   a. The stormwater is tributary to the Des-Plaines River from Hickory Creek. The Overall property area is tributary to City storm sewer to the Hickory Creek.
   b. The following is a description of the construction activity which is the subject of this plan: The proposed development consists of construction of, Streambank Stabilization/restoration, wetland restoration, and riparian and buffer strips. The construction activities for site improvements will include: site clearing, grubbing, mass grading, installation of soil erosion and sedimentation control measures, as a minimum.
   c. The following is a description of the intended sequence of major activities which will disturb soils for major portions of the construction site such as grubbing, excavation, and grading:

      The sequence of the construction activities may be as follows:
      See Sequence of major activities on this sheet.

   The soil erosion and sedimentation control items will be constructed as needed during the above construction activities.

2. Controls.

   This plan addresses the various controls that will be implemented for each of the major construction activities described in 1.b above. For each measure discussed, the contractors will be responsible for its implementation as indicated. Each such contractor has signed the required certification on forms which are attached to, and are a part of, this plan.

   a. Erosion and Sediment Controls.

      (i) STABILIZATION PRACTICES. Provided below is a description of interim and permanent stabilization practices, including site-specific scheduling of the implementation of the practices. Site plans will ensure that existing vegetation is preserved where attainable and disturbed portions of the site will be stabilized. Except as provided in 2.a. (i) (A) and 2.b. stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than 10 days after the construction activity in that portions of the site where construction activity will not occur for a period of 21 or more calendar days.

      (A) Where the initiation of stabilization measures by the 14th day after construction activity temporarily or permanently ceases is precluded by snow cover, stabilization measures shall be initiated as soon as practicable thereafter.

      The following interim and permanent stabilization practices, as a minimum, will be implemented to stabilize the disturbed area of the site.
      1. Temporary Seeding
      2. Permanent Seeding
      3. Erosion Blanket
      4. Stabilized Construction Entrance
      5. Stone Riprap
      6. Vegetative Filter
      7. Vegetative Channel
      8. Inlet Protection
      8. Outlet Protection
      9. Dust & Traffic Control
      10. Barrier Fence

      (ii) STRUCTURAL PRACTICES. Provided below is a description of structural practices that will be implemented, to the degree attainable, to divert flows from exposed soils, store flows or otherwise limit runoff and the discharge of pollutants from exposed areas of the site. The installation of these devices may be subject to Section 404 of the Clean Water Act.
      1. Detention basins
      2. Storm sewer system
      3. Vegetated drainage swales
      4. Permanent seeding
      5. Stone Riprap
      6. Filter fabric
      7. Inlet and Outlet Protection

   b. Erosion Control. It shall be the Contractor's responsibility to provide adequate erosion control on the job site. The following erosion control sequence shall be adhered to:
      See Sequence of major activities on this sheet

      Any siltation of structures or ditches shall be cleaned and maintained by the Contactor, on a weekly basis, until the seeding has taken hold. 70% growth of permanent grass or temporary cover crop. All washouts, gullies, etc. will be regraded and reseeded by the Contactor, at the Contractor's expense.

      The Contractor's responsibility for erosion control shall extend throughout the construction process. The Contractor shall be responsible for cleanup of paved surfaces within and adjacent to the project.

      All erosion control practices shall be in compliance with the latest revision of the "Illinois Urban Manual," by the Natural Resources Conservation Service and with "Standards and Specifications for Soil Erosion and Sedimentation Control" as published by the Illinois Environmental Protection Agency.

      If a topsoil stockpile location is provided and approved by the Owner, Contractor shall establish erosion control measures for the stockpile if it is to remain in place for more than three days. In addition, barrier filter fence shall enclose topsoil stockpile location with exception of truck access during construction hours.

   c. Stormwater Management

      (i) Provided below is a description of measures that will be installed during the construction process to control pollutants in stormwater discharges that will occur after construction operations have been completed. The installation of these devices may be subject to Section 404 of the Clean Water Act.

      The practices selected for implantation were determined on the basis of the technical guidance contained in IEPA's Standard Specifications for Soil Erosion and Sedimentation Control, and other ordinances listed in the Specifications.

      The stormwater pollutant control measures shall include:
      1. Silt Filter fence
      2. Drainage Swales
      3. Storm Sewers
      4. Stone Riprap
      5. Rip-Rap outlet protection
      6. Wetland restoration
      7. Native Plantings
      8. Filter fabric
      9. Riparian Buffers

      (ii) Velocity dissipation devices will be placed at discharge locations and along the length of any outfall channel as necessary to provide a non-erosive velocity flow from the structure to a water course so that the natural physical and biological characteristics and functions are maintained and protected (e.g., maintenance of hydrologic conditions, such as the hydroperiod and hydrodynamics present prior to the initiation of construction activities).

      Stormwater Management Control includes:
      1 Stone Riprap
      2 Filter Fabric
      3 Vegetative channels.
      4 Outlet protection using RipRap.
      5 Inlet protection.
      6 Wetland Restoration
      7 Native Plantings
      8 Riparian Buffer

   d. Approved State and Local Plans.

      The management practices, controls and other provisions contained in this plan are at least as protective as the requirements contained in the Illinois Environmental Protection Agency's Standards and Specifications for Soil and Erosion and Sediment Control dated June 2013. Illinois Procedures and Standards for Urban Soil Erosion and Sedimentation Plan, and the Municipal Subdivision Ordinance. Requirements specified in sediment and erosion control site plans or site permits or stormwater management or site plans or site permits approved by local officials that are applicable to protecting surface water resources are, upon submittal of an NOI to be authorized to discharge under this permit, incorporated by reference and are enforceable under this permit even it they are not specifically included in the plan.

   e. Maintenance.

      The following is a description of procedures that will be used to maintain, in good and effective operating conditions, vegetation, erosion and sediment control measures and other protective measures identified in this plan and Standard Specifications.

      Stabilized construction entrance: The entrance shall be maintained to prevent tracking of sediment onto public streets. This will be done by top dressing with additional stones, remove and replace top layer of stones or washing the entrance. The sediment washed on the public right-of-way will be removed immediately.

      Vegetative erosion control measures: The vegetative growth of temporary and permanent seeding shall be maintained periodically and supply adequate watering. The vegetative cover shall be reseeded as necessary.

      Silt filter fence: The damaged silt filter fence shall be restored to meet the standards or removed and replaced as needed.

      Riprap outlet protection: It shall be inspected after high flows for any scour beneath the riprap or for stones that have been dislodged. It shall be repaired immediately.

      Inlet Protection: Shall be inspected and emptied of silt if filled as required.

      Stabilization of the disturbed areas must be initiated within one working day of permanent or temporary cessation of earth disturbing activities and shall be completed as soon as possible but not later than 14 days form the initiation of the stabilization work in an area.
      (i) Appropriate temporary or permanent stabilization measures shall include seeding, mulching, sodding, and/or non-vegitative measures.
      (ii) Areas having slopes greater than 12 percent shall be stabilized with sod, mat, or blanket in combination with seeding or equivalent.

      Soil storage piles containing more than 10 cu. yds. of material shall not be located with a downslope drainage length less than 25 feet to a roadway or drainage channel. Filter barriers, including straw bales, filter fence, or equivalent, shall be installed immediately on the down slope of the piles.

3. Other Controls.
   (i) Waste Disposal. The solid waste materials including trash, construction debris, excess construction materials, machinery, tools and other items will be collected and disposed off-site by the contractor. The contractor is responsible to acquire any permit required for such disposal. Burning on the site will not be permitted. No solid materials, including building materials, shall be discharged into Water of the State, except as authorized by a Section 404 permit.
   (ii) The provisions of this plan shall ensure and demonstrate compliance with applicable State and/or local waste disposal, sanitary sewer or septic system regulations.
   (iii) The sanitary sewage will be discharged to the proposed sanitary sewer constructed per IEPA and local standards.

4. Inspections.

   The Owner, or Owner's representative shall provide qualified personnel to inspect disturbed areas of the construction site which have not been finally stabilized, structural control measures and location where vehicles enter or exit the site. Such inspections shall be conducted at least once every seven (7) calendar days and within 24 hours of the end of a storm that is 0.5 inches or greater or equivalent snowfall.

   a. Disturbed areas and areas used for storage of materials that are exposed to precipitation shall be inspected for evidence of, or the potential for, pollutants entering the drainage system. Erosion and sediment control measures identified in the plan shall be observed to ensure that they are operating correctly. Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters. Locations where vehicles enter or exit the site shall be inspected for evidence of off-site sediment tracking.

   b. Based on the results of the inspection, the description of potential pollutant sources identified in section 1 above and pollution prevention measures identified in Section 2 above shall be revised as appropriate as soon as practicable after such inspection. Any changes to this plan resulting from the required inspections shall be implemented within 7 calendar days following the inspection.

   c. A report summarizing the scope of the inspection, name(s) and qualifications of personnel making the inspection, the date(s) of the inspection, major observations relating to the implementation of this stormwater pollution prevention plan and actions taken in accordance with section 4.b shall be made and retained as part of the plan for at least three (3) years after the date of the inspection. The report shall be signed in accordance with Part VI.G of the general permit.

   d. If any violation of the provisions of this plan is identified during the conduct of the construction work covered by this plan, the Resident Engineer or Resident Technician shall complete and file an "Incidence of Noncompliance" (ION) report for the identified violation. The Resident Engineer or Resident Technician shall use forms provided by the Illinois Environmental Protection Agency and shall include specific information on the cause of noncompliance, actions which were taken to prevent any further causes of noncompliance, and a statement detailing any environmental impact which may have resulted from the noncompliance. All reports of noncompliance shall be signed by a responsible authority in accordance with Part VI. G of the general permit. The report of noncompliance shall be mailed to the following address:

   Illinois Environmental Protection Agency
   Division of Water Pollution Control
   Attn: Compliance Assurance Section
   2200 Churchill Road
   P.O. Box 19276
   Springfield, Illinois 62794-9276

5. Non-Stormwater Discharges.

   Except for flows from fire fighting activities, sources of non-stormwater that may be combined with stormwater discharges associated with the construction activity addressed in this plan, are described below:

   a. Water main flushing
   b. Fire hydrant flushing
   c. Watering for dust control
   d. Irrigation drainage for vegetative growth for seeding, etc.

   The pollution prevention measures, as described below, will be implemented for non-stormwater components of the discharge.

   The fire hydrant and water main shall not be flushed directly on the exposed area of sub grade of the pavement. Hoses shall be used to direct the flow into the storm sewer system, if available.

   The erosion due to irrigation of seeding shall be considered minor.

   Contractor to provide the above non-stormwater discharged control to the standard specification required by the County or the approved equal.

6. Monitoring and Management Plan
   A 3-year maintenance and monitoring plan is required after installation of native landscaping.
   See Project Specifications for details.

7. I certify under penalty of law that I understand the terms and conditions of the general National Pollutant Discharge Elimination System (NPDES) permit (ILR10) that authorizes the storm water discharges associated with industrial activity from the construction site identified as part of this certification."

CONTRACTOR'S AND SUBCONTRACTOR'S CERTIFICATE

I certify under penalty of law that I understand the terms and conditions of the general National Pollutant Discharge Elimination System (NPDES) permit (ILR10) that authorizes the storm water discharges associated with industrial activity from the construction site identified as part of this certification.

CONTRACTOR'S PRINTED NAME AND SIGNATURE — CERTIFICATION DATE

CONTRACTOR TITLE — TELEPHONE NUMBER

CONTRACTOR COMPANY NAME AND ADDRESS

SUBCONTRACTOR'S NAME AND SIGNATURE — CERTIFICATION DATE

SUBCONTRACTOR'S TITLE — TELEPHONE NUMBER

SUBCONTRACTOR'S COMPANY NAME AND ADDRESS

921 E. WASHINGTON ST.

SITE ADDRESS

IEPA: ILR10 PERMIT #_____

FOR CONSTRUCTION

NO.	DATE	BY	REVISION DESCRIPTION

ILLINOIS DESIGN FIRM
184.001322
420 N. FRONT STREET, SUITE 100
McHENRY, IL 60050
PHONE: 815.385.1778
FAX: 815.385.1781
HRGreen

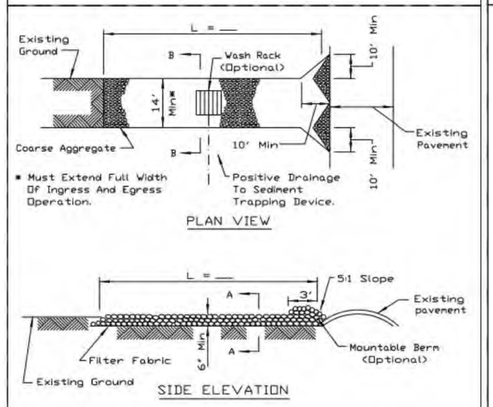
921 E. WASHINGTON ST. STREAMBANK STABILIZATION
CLIENT: CITY OF JOLIET
JOLIET, ILLINOIS
FINAL ENGINEERING – FOR REVIEW & PERMIT
EROSION CONTROL SPECIFICATIONS

BAR IS ONE INCH ON OFFICIAL DRAWINGS
0 1"
IF NOT ONE INCH, ADJUST SCALE ACCORDINGLY

DRAWN BY: MPL
APPROVED: AJ
JOB DATE: 02/02/18
JOB NO: 170706

DRAWING
C-12

(SE) STABILIZED CONSTRUCTION ENTRANCE PLAN



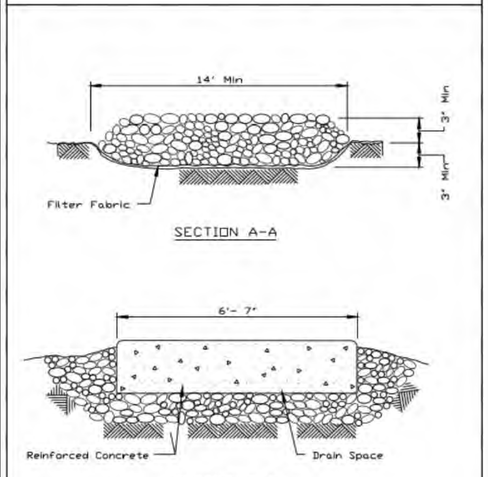
NOTES:
1. Filter fabric shall meet the requirements of material specification 592 GEOTEXTILE, Table I or 2, Class I, II or IV and shall be placed over the cleared area prior to the placing of rock.
2. Rock or reclaimed concrete shall meet one of the following IDOT coarse aggregate gradation, CA-1, CA-2, CA-3 or CA-4 and be placed according to construction specification 25 ROCKFILL using placement Method 1 and Class III compaction.
3. Any drainage facilities required because of washing shall be constructed according to manufacturers specifications.
4. If wash racks are used they shall be installed according to the manufacturer's specifications.

REFERENCE
Project
Designed ____ Date ____
Checked ____ Date ____
Approved ____ Date ____

NRCS Natural Resources Conservation Service

STANDARD DWG. NO. IL-630
SHEET 1 OF 2
DATE 8-18-94

(SE) STABILIZED CONSTRUCTION ENTRANCE PLAN

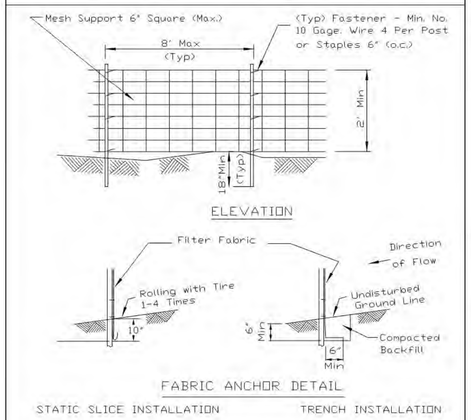


REFERENCE
Project
Designed ____ Date ____
Checked ____ Date ____
Approved ____ Date ____

NRCS Natural Resources Conservation Service

STANDARD DWG. NO. IL-630
SHEET 2 OF 2
DATE 8-18-94

(BF) SILT FENCE WITH WIRE SUPPORT PLAN

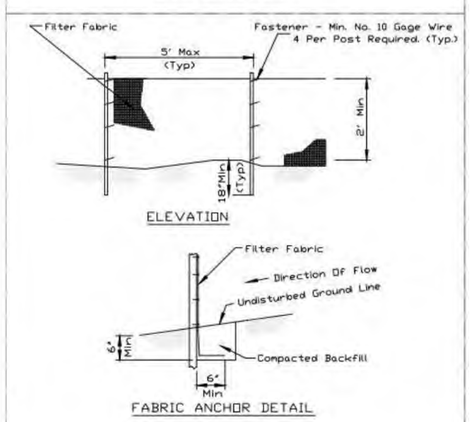


NOTES:
1. Silt Fence shall be installed prior to any grading work in the area to be protected. They shall be maintained throughout the construction period and removed in conjunction with the final grading and site stabilization. Silt fence shall be placed on the flattest area available.
2. Filter fabric shall meet the requirements of material specification 592 Geotextile Table 1 or 2, Class I with equivalent opening size of at least 30 for nonwoven and 40 for woven.
3. Fence posts shall be either standard steel post or wood post with a minimum cross-sectional area of 3.0 sq. in.

REFERENCE
Project
Designed ____ Date ____
Checked ____ Date ____
Approved ____ Date ____

STANDARD DWG. NO. IUM-620A(W)
SHEET 1 OF 2
DATE 3-16-2012

(BF) SILT FENCE PLAN

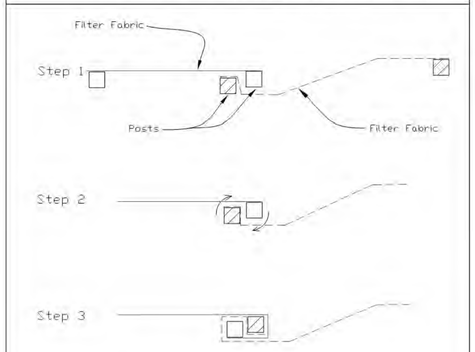


NOTES:
1. Temporary sediment fence shall be installed prior to any grading work in the area to be protected. They shall be maintained throughout the construction period and removed in conjunction with the final grading and site stabilization.
2. Filter fabric shall meet the requirements of material specification 592 Geotextile based upon performance needed.
3. Fence posts shall be either standard steel post or wood post with a minimum cross-sectional area of 2" x 2" nominal size.

REFERENCE
Project
Designed ____ Date ____
Checked ____ Date ____
Approved ____ Date ____

STANDARD DWG. NO. IUM-620
SHEET 1 OF 2
DATE 3-16-12

(BF) SILT FENCE - SPLICING TWO FENCES

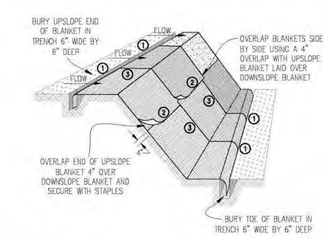


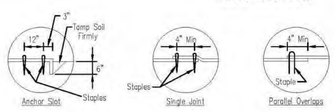
ATTACHING TWO SILT FENCES

1. Place the end post of the second fence inside the end post of the first fence.
2. Rotate both posts at least 180 degrees in a clockwise direction to create a tight seal with the fabric material.
3. Cut the fabric near the bottom of the stakes to accommodate the 6" flap.
4. Drive both posts a minimum of 18 inches into the ground and bury the flap.
5. Compact backfill (particularly at splices) completely to prevent stormwater piping.

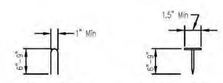
REFERENCE
Project
Designed ____ Date ____
Checked ____ Date ____
Approved ____ Date ____

STANDARD DWG. NO. IUM-620B(W)
SHEET 1 OF 1
DATE 3-16-2012





DETAIL 1 DETAIL 2 DETAIL 3

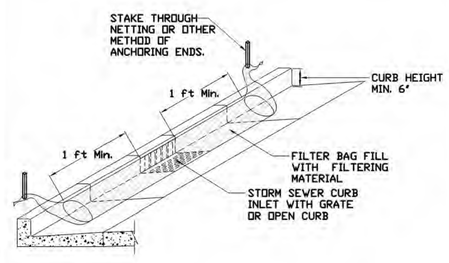


STAPLE DETAIL PUSH PIN DETAIL

NOTES:
1. Staples shall be placed in a diamond pattern at 2 per s.y. for stitched blankets. Non-stitched shall use 4 staples per s.y. of material. This equates to 200 staples with stitched blanket and 400 staples with non-stitched blanket per 100 s.y. of material.
2. Staple or push pin lengths shall be selected based on soil type and conditions. (minimum staple length is 6")
3. Erosion control material shall be placed in contact with the soil over a prepared seedbed.
4. All anchor slots shall be stapled at approximately 12" intervals.

EROSION CONTROL BLANKET INSTALLATION DETAILS

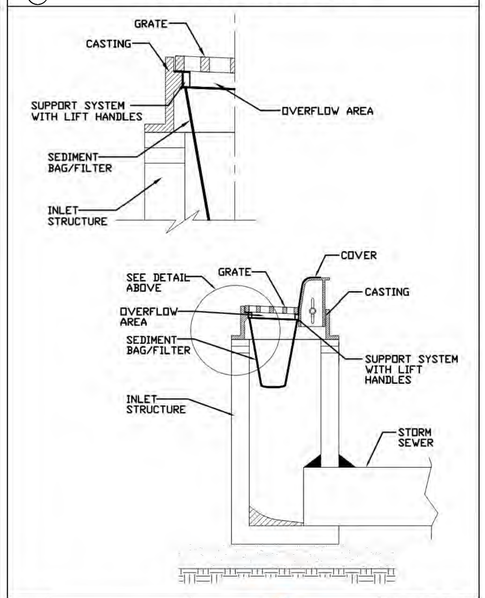
(IP) INLET PROTECTION - PAVED AREAS CURB PROTECTION



REFERENCE
Project
Designed ____ Date ____
Checked ____ Date ____
Approved ____ Date ____

STANDARD DWG. NO. IUM-561C
SHEET 1 OF 1
DATE 01-11-11

(IP) (FB) INLET PROTECTION - PAVED AREAS DROP-IN PROTECTION



REFERENCE
Project
Designed ____ Date ____
Checked ____ Date ____
Approved ____ Date ____

STANDARD DWG. NO. IUM-561D
SHEET 1 OF 1
DATE 01-11-11

FOR CONSTRUCTION

NO.	DATE	BY	REVISION DESCRIPTION

HRGreen
ILLINOIS DESIGN FIRM # 184.001322
420 N. FRONT STREET, SUITE 100
McHENRY, IL 60050
PHONE: 815.385.1778
FAX: 815.385.1781

921 E. WASHINGTON ST. STREAMBANK STABILIZATION
CLIENT: CITY OF JOLIET
JOLIET, ILLINOIS

FINAL ENGINEERING - FOR REVIEW & PERMIT

EROSION CONTROL DETAILS

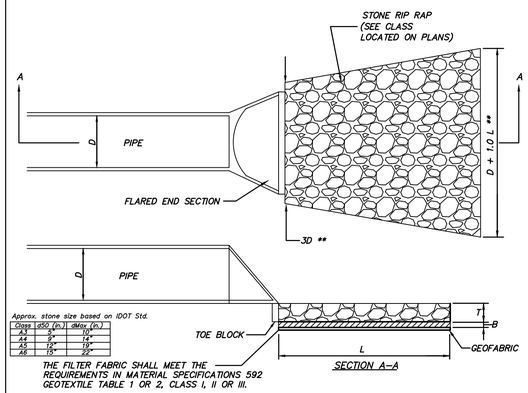
BAR IS ONE INCH ON OFFICIAL DRAWINGS
0 — 1"
IF NOT ONE INCH, ADJUST SCALE ACCORDINGLY

DRAWN BY: MPL
APPROVED: AJ
JOB DATE: 02/02/18
JOB NO: 170706

DRAWING
C-13

STONE RIP RAP DETAIL

FOR ANY TAILWATER CONDITION



Approx. stone size based on IDOT Std.

Class	d50 (in.)	d100 (in.)
A4	9"	14"
A5	12"	19"
A6	15"	22"

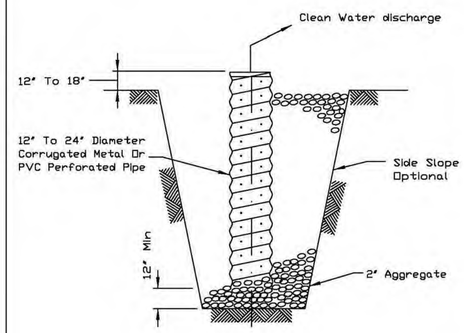
THE FILTER FABRIC SHALL MEET THE REQUIREMENTS IN MATERIAL SPECIFICATIONS 592 GEOTEXTILE TABLE 1 OR 2, CLASS I, II OR III.

** NOTE: WHEN OUTLETING TO A DEFINED CHANNEL, WIDTH AND AREA OF APRON SHALL CONFORM TO TOP OF CHANNEL BANK

LOW VELOCITY (<5fps)					HIGH VELOCITY (5–10fps)				
D	T	L	B	–	D	T	L	B	–
Pipe Size in.	Rock Class (Min. Thickness)	Length of Apron	Bedding Class (Thickness)	Quantity SY. **	Pipe Size in.	Rock Class (Min. Thickness)	Length of Apron	Bedding Class (Thickness)	Quantity SY. **
10"	A2 (6")	10'	–	8	10"	A2 (6")	10'	–	8
12"	A3 (15")	12'	–	11	12"	A3 (15")	15'	–	16
15"	A3 (15")	13'	–	13	15"	A3 (15")	15'	–	17
18"	A3 (15")	14'	–	16	18"	A4 (16")	16'	A1 (6")	20
21"	A3 (15")	15'	–	18	21"	A4 (16")	18'	A1 (6")	25
24"	A3 (15")	16'	–	21	24"	A4 (16")	20'	A1 (6")	31
27"	A3 (15")	17'	–	25	27"	A4 (16")	21'	A1 (6")	35
30"	A3 (15")	18'	–	28	30"	A4 (16")	22'	A1 (6")	39
33"	A4 (16")	19'	A1 (6")	32	33"	A5 (22")	23'	A1 (8")	44
36"	A4 (16")	20'	A1 (6")	36	36"	A5 (22")	24'	A1 (8")	48
42"	A4 (16")	22'	A1 (6")	44	42"	A6 (26")	26'	A2 (10")	58
48"	A4 (16")	24'	A1 (6")	53	48"	A6 (26")	28'	A2 (10")	68

Note See current Illinois Department of Transportation Standard Specification to verify rock size and bedding thickness. RIPRAP

SUMP PIT PLAN



SECTION

NOTES:
1. Pit dimensions are optional.
2. The standpipe will be constructed by perforating a 12"-24" diameter corrugated metal or PVC pipe.
3. A base of 2" aggregate will be placed in the pit to a minimum depth of 12". After installing the standpipe, the pit surrounding the standpipe will then be backfilled with 2" aggregate.
4. The standpipe will extend 12" to 18" above the lip of the pit.
5. If discharge will be pumped directly to a storm drainage system, the standpipe will be wrapped with filter fabric before installation.
6. If desired, 1/4"-1/2" hardware cloth may be placed around the standpipe prior to attaching the filter fabric. This will increase the rate of water seepage into the pipe.

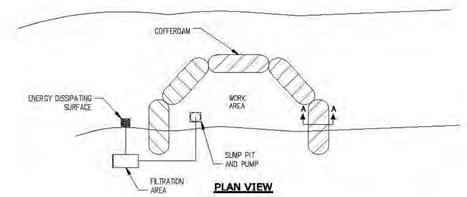
REFERENCE
Project
Designed _____ Date _____
Checked _____ Date _____
Approved _____ Date _____

NRCS Natural Resources Conservation Service

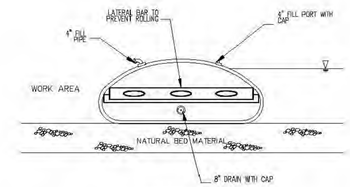
STANDARD DWG. NO. IL-650
SHEET 1 OF 1
DATE 8-11-94

BLADDER PARTIAL COFFERDAM

*USE AS NEEDED. COORDINATION WITH HR GREEN REQUIRED & THE ARMY CORPS. OF ENGINEERS.



PLAN VIEW



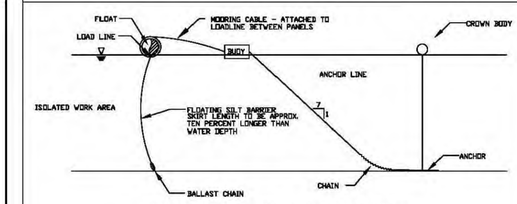
COFFERDAM PROFILE

NOTES:
1. ALL DISCHARGES SHOULD BE ON ENERGY DISSIPATING SURFACES.
2. LOCATIONS FOR THE SUMP PIT, FILTRATION AREA, AND ENERGY DISSIPATING SURFACES MAY VARY DEPENDING ON SITE CONDITIONS.

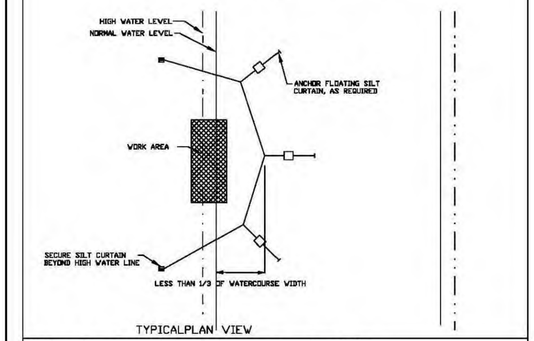
REFERENCE
Project
Designed _____ Date _____
Checked _____ Date _____
Approved _____ Date _____

STANDARD DWG. NO. IUM-503BP
SHEET 4 OF 7
DATE 7-09-2012

*USE AS NEEDED. COORDINATION WITH HR GREEN REQUIRED FLOATING SILT CURTAIN - TYPICAL LAYOUT



TYPICAL COMPONENTS / ANCHORAGE SYSTEM



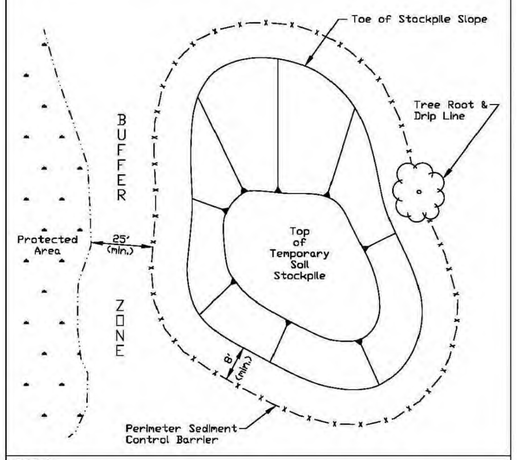
TYPICALPLAN VIEW

Maximum flow for waterbody shall be less than 5fps.
Isolated work area shall not exceed more than 1/3 stream width.
Silt curtain shall be placed parallel to stream flow.

REFERENCE
Project
Designed _____ Date _____
Checked _____ Date _____
Approved _____ Date _____

STANDARD DWG. NO. IUM-617A
SHEET 1 OF 1
DATE 1-06-2012

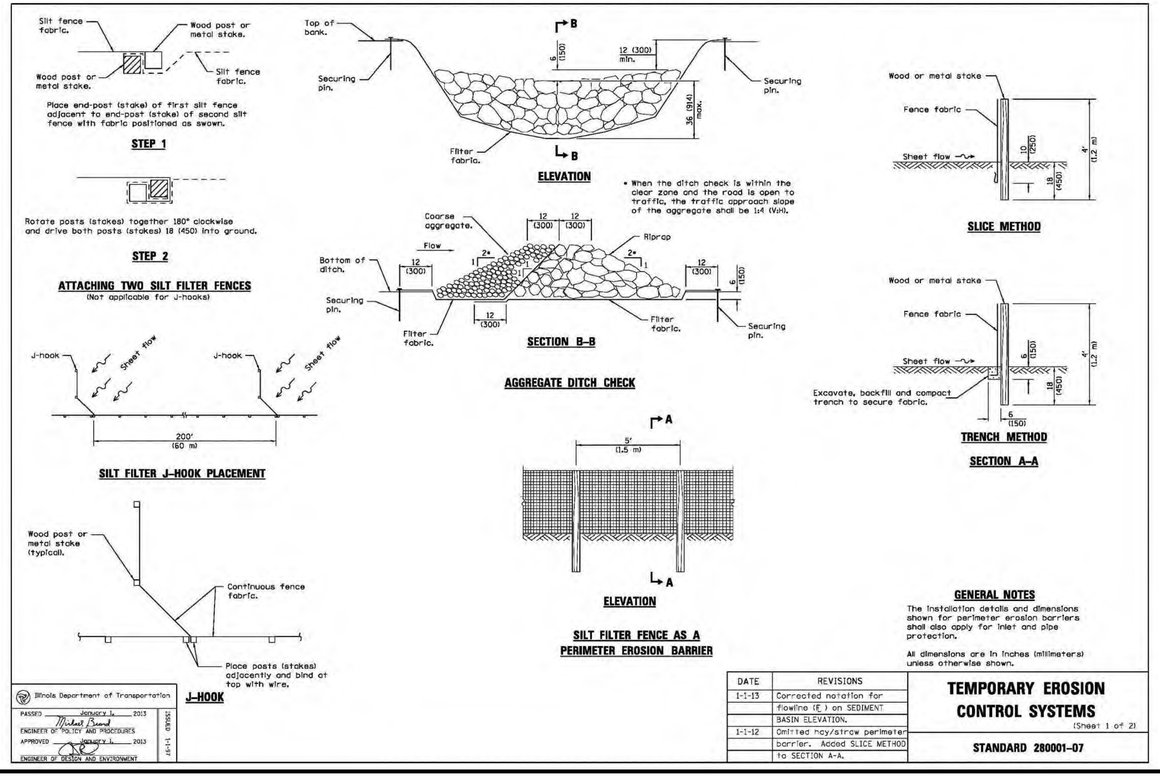
TEMPORARY SOIL STOCKPILE DETAIL



NOTES:
1. Stockpile slopes should be based on angle of repose of the soil material to avoid potential sloughing of the slope.
2. Soil stockpile to be stabilized in accordance with practical standards.
3. Do not locate stockpile within overland drainage flow path, designated floodways, drip line or over the root crown of adjacent trees.
4. Provisions for sediment control practices may be required along haul roads and entrance/exit locations for access the soil stockpile that can create flow path for stormwater runoff.
5. Installation of benches, terraces, or slope interrupters should be considered.
6. Avoid building soil stockpiles on impervious surfaces.
7. Linear sediment trap surrounding the stockpile base may be used to control sediment.

REFERENCE
Project
Designed _____ Date _____
Checked _____ Date _____
Approved _____ Date _____

STANDARD DWG. NO. IUM-627
SHEET 1 OF 1
DATE JANUARY 2017



Illinois Department of Transportation
PASSED January 4, 2013
ENGINEER OF POLICY AND PROCEDURES
APPROVED January 4, 2013
ENGINEER OF DESIGN AND ENVIRONMENT
BS-1-1 03/2001

GENERAL NOTES
The installation details and dimensions shown for perimeter erosion barriers shall also apply for inlet and pipe protection.
All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-13	Corrected notation for
	flowline (E) on SEDIMENT
	BASIN ELEVATION.
1-1-12	Omitted hay/straw perimeter
	barrier. Added SLICE METHOD
	to SECTION A-A.

TEMPORARY EROSION CONTROL SYSTEMS
(Sheet 1 of 2)
STANDARD 280001-07

FOR CONSTRUCTION

NO.	DATE	BY	REVISION DESCRIPTION

HRGreen
ILLINOIS DESIGN FIRM # 184.001322
420 N. FRONT STREET, SUITE 100
McHENRY, IL 60050
PHONE: 815.385.1778
FAX: 815.385.1781

921 E. WASHINGTON ST. STREAMBANK STABILIZATION
CLIENT: CITY OF JOLIET
JOLIET, ILLINOIS
FINAL ENGINEERING – FOR REVIEW & PERMIT
EROSION CONTROL DETAILS

BAR IS ONE INCH ON OFFICIAL DRAWINGS
0 1"
IF NOT ONE INCH, ADJUST SCALE ACCORDINGLY

DRAWN BY: MPL
APPROVED: AJ
JOB DATE: 02/02/18
JOB NO: 170706

DRAWING
C–14

UNITED STATES ARMY CORPS OF ENGINEERS NOTES:

1. EARTHEN COFFERDAMS OR OTHER PRACTICES THAT WOULD RESULT IN A RELEASE OF SEDIMENT INTO WATERS OF THE U.S. ARE NOT AUTHORIZED FOR USE. COFFERDAMS SHALL BE CONSTRUCTED OF NON-ERODIBLE MATERIALS ONLY. ACCEPTABLE PRACTICES INCLUDE, BUT ARE NOT LIMITED TO: PRE-FABRICATED RIGID

2. COFFERDAMS, SHEET PILING, INFLATABLE BLADDERS, SANDBAGS AND FABRIC-LINED BASINS. 1. WORK IN THE WATERWAY SHOULD BE TIMED TO TAKE PLACE DURING LOW ORNO-FLOW CONDITIONS. LOW FLOW CONDITIONS ARE FLOW AT OR BELOW THE NORMAL WATER ELEVATION.

3. WATER SHALL BE ISOLATED FROM THE IN-STREAM WORK AREA USING A COFFERDAM CONSTRUCTED OF NON-ERODIBLE MATERIALS (STEEL SHEETS, AQUA BARRIERS, RIP RAP AND GEOTEXTILE FABRIC, ETC.). EARTHEN COFFERDAMS ARE NOT PERMISSIBLE.

4. WORK MAY NOT BE PERFORMED IN THE WATER, EXCEPT FOR THE PLACEMENT OF THE MATERIALS NECESSARY FOR THE CONSTRUCTION OF THE COFFERDAM. THE COFFERDAM MUST BE CONSTRUCTED FROM THE UPLAND AREA AND NO EQUIPMENT MAY ENTER THE WATER AT ANY TIME. IF THE INSTALLATION OF THE COFFERDAM CANNOT BE COMPLETED FROM SHORE AND ACCESS IS NEEDED TO REACH THE AREA TO BE COFFERED, OTHER MEASURES, SUCH AS THE CONSTRUCTION OF A CAUSEWAY, WILL BE NECESSARY TO ENSURE THAT EQUIPMENT DOES NOT ENTER THE WATER. ONCE THE COFFERDAM IS IN PLACE AND THE ISOLATED AREA IS DEWATERED, EQUIPMENT MAY ENTER THE COFFERED AREA TO PERFORM THE REQUIRED WORK.

5. IF BYPASS PUMPING IS NECESSARY, THE INTAKE HOSE SHALL BE PLACED ON A STABLE SURFACE OR FLOATED TO PREVENT SEDIMENT FROM ENTERING THE HOSE.THE BYPASS DISCHARGE SHALL BE PLACED ON A NON-ERODIBLE, ENERGY DISSIPATING SURFACE PRIOR TO REJOINING THE STREAM FLOW AND SHALL NOT CAUSE EROSION. FILTERING OF BYPASS WATER IS NOT NECESSARY UNLESS THE BYPASS WATER HAS BECOME SEDIMENT-LADEN AS A RESULT OF THE CURRENT CONSTRUCTION ACTIVITIES.

6. DURING DEWATERING OF THE COFFERED AREA, ALL WATER MUST BE FILTERED TO REMOVE SEDIMENT. POSSIBLE OPTIONS FOR SEDIMENT REMOVAL INCLUDE BAFFLE SYSTEMS, ANIONIC POLYMERS, DEWATERING BAGS, OR OTHER APPROPRIATE METHODS.WATER SHALL HAVE SEDIMENT REMOVED PRIOR TO BEING RE-INTRODUCED TO THE DOWNSTREAM WATERWAY. A STABILIZED CONVEYANCE FROM THE DEWATERING DEVICE TO THE WATERWAY MUST BE IDENTIFIED. DISCHARGE WATER IS CONSIDERED CLEAN IF IT DOES NOT RESULT IN A VISUALLY IDENTIFIABLE DEGRADATION OF WATER CLARITY.

7. THE PORTION OF THE SIDE SLOPE THAT IS ABOVE THE OBSERVED WATER ELEVATION SHALL BE STABILIZED AS SPECIFIED IN THE PLANS PRIOR TO ACCEPTING FLOWS. THE SUBSTRATE AND TOE OF SLOPE THAT HAS BEEN DISTURBED DUE TO CONSTRUCTION ACTIVITIES SHALL BE RESTORED TO PRE-CONSTRUCTIONCONDITIONS AND FULLY STABILIZED PRIOR TO ACCEPTING FLOWS.

COUNTY STORM WATER PERMIT REQUIREMENTS

SOIL DISTURBANCE SHALL BE CONDUCTED IN SUCH A MANNER AS TO MINIMIZE EROSION. AREAS OF THE DEVELOPMENT SITE THAT ARE NOT TO BE GRADED SHALL BE PROTECTED FROM CONSTRUCTION TRAFFIC OR OTHER DISTURBANCE UNTIL FINAL SEEDING IS PREFORMED.

SOIL STABILIZATION MEASURES SHALL CONSIDER THE TIME OF YEAR, DEVELOPMENT SITE CONDITIONS AND THE USE OF TEMPORARY OR PERMANENT MEASURES.

STABILIZATION BY SEEDING SHALL INCLUDE TOPSOIL PLACEMENT AND FERTILIZATION, AS NECESSARY.

NATIVE SEED MIXTURES SHALL INCLUDE RAPID-GROWING ANNUAL GRASSES OR SMALL GRAINS TO PROVIDE INITIAL, TEMPORARY SOIL STABILIZATION.

OFFSITE PROPERTY SHALL BE PROTECTED FROM EROSION AND SEDIMENTATION. VELOCITY DISSIPATION DEVICES SHALL BE PLACED AT CONCENTRATED DISCHARGE LOCATIONS ALONG THE LENGTH OF ANY OUTFALL CHANNEL, AS NECESSARY TO PREVENT EROSION.

SEDIMENT CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE DISTURBANCE OF TRIBUTARY AREAS.

STABILIZATION OF DISTURBED AREAS SHALL BE INITIATED IMMEDIATELY WHENEVER ANY CLEARING, GRADING, EXCAVATING OR OTHER EARTH DISTURBING ACTIVITIES HAVE PERMANENTLY CEASED ON ANY PORTION OF THE DEVELOPMENT SITE, OR TEMPORARY CEASED ON ANY PORTION OF THE DEVELOPMENT SITE AND WILL NOT RESUME FOR A PERIOD EXCEEDING 14 CALENDAR DAYS. STABILIZATION OF DISTURBED AREAS SHALL BE INITIATED WITHIN 1 WORKING DAY OF PERMANENT OR TEMPORARY CESSATION OF EARTH DISTURBING ACTIVITIES AND SHALL BE COMPLETED AS SOON AS POSSIBLE, BUT NO LATER THAN 14 CALENDAR DAYS FROM THE INITIATION OF STABILIZATION WORK IN THE AREA. EXCEPTIONS TO THESE TIME FRAMES ARE SPECIFIED AS INSTANCES WHEN THE INITIATION OF STABILIZATION MEASURES IS PRECLUDED BY SNOW COVER, STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS PRACTICABLE AND IN AREAS WHERE CONSTRUCTION ACTIVITY HAS TEMPORARILY CEASED AND WILL RESUME AFTER 14 DAYS, A TEMPORARY STABILIZATION METHOD MAY BE USED.

DISTURBANCE OF STEEPS SLOPES SHALL BE MINIMIZED. AREAS OR EMBANKMENTS HAVING SLOPES STEEPER THAN 3:1 SHALL BE STABILIZED WITH STAKING IN PLACE SOD, EROSION CONTROL BLANKET IN COMBINATION WITH SEEDING, OR EQUIVALENT CONTROL MEASURE.

PERIMETER CONTROL MEASURES SHALL BE PROVIDED DOWN SLOPE AND PERPENDICULAR TO THE FLOW OF RUNOFF FROM DISTURBED AREAS, WHERE THE TRIBUTARY AREA IS GREATER THAN 5,000 SQUARE FEET, AND WHERE RUNOFF WILL FLOW IN A SHEET FLOW MANNER. PERIMETER EROSION CONTROL SHALL ALSO BE PROVIDED AT THE BASE OF SOIL STOCKPILES.

THE DRAINAGE SYSTEM SHALL BE PROTECTED FROM EROSION AND SEDIMENTATION DOWN SLOPE FROM DISTURBED AREAS. INLET PROTECTION THAT REDUCES SEDIMENT LOADING, WHILE ALLOWING RUNOFF TO ENTER THE INLET SHALL BE REQUIRED FOR ALL STORM SEWERS. CHECK DAMS, OR AN EQUIVALENT CONTROL MEASURE, SHALL BE REQUIRED FOR ALL CHANNELS. FILTER FABRIC INLET PROTECTION AND STRAW BALE DITCH CHECKS ARE NOT ACCEPTABLE CONTROL MEASURES.

IF DEWATERING SERVICES ARE USED, ADJOINING PROPERTIES AND DISCHARGE LOCATIONS SHALL BE PROTECTED FROM EROSION. DISCHARGES SHALL BE ROUTED THROUGH AN EFFECTIVE SEDIMENT CONTROL MEASURE (E.G., SEDIMENT TRAP, SEDIMENT BASIN, OR OTHER APPROPRIATE MEASURES). THE ENGINEER AND THE WILL COUNTY SOIL AND WATER CONSERVATION DISTRICT SHALL BE NOTIFIED PRIOR TO THE COMMENCEMENT OF DEWATERING ACTIVITIES.

ALL TEMPORARY SOIL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED WITHIN THIRTY (30) DAYS AFTER FINAL SITE STABILIZATION IS ACHIEVED OR AFTER THE TEMPORARY MEASURES ARE NO LONGER NEEDED. TRAPPED SEDIMENT AND OTHER DISTURBED SOIL AREAS SHALL BE PERMANENTLY STABILIZED.

STOCKPILED SOIL AND MATERIALS SHALL BE REMOVED FROM FLOOD HAZARD AREAS AT THE END OF EACH WORK DAY. SOIL AND MATERIALS STOCKPILED IN IWMC OR BUFFER AREAS SHALL BE PLACED ON TIMBER MATS, OR AN EQUIVALENT CONTROL MEASURE.

EFFECTIVE CONTROL MEASURES SHALL BE UTILIZED TO MINIMIZE THE DISCHARGE OF POLLUTANTS FROM THE DEVELOPMENT SITE. AT A MINIMUM, CONTROL MEASURES SHALL BE IMPLEMENTED IN ORDER TO:

MINIMIZE THE DISCHARGE OF POLLUTANTS FROM EQUIPMENT AND VEHICLE WASHING, WHEEL WASH WATER, AND OTHER WASH WATER.

MINIMIZE THE EXPOSURE OF BUILDING MATERIALS, BUILDING PRODUCTS, CONSTRUCTION WASTES, TRASH, LANDSCAPE MATERIALS, FERTILIZERS, PESTICIDES, HERBICIDES, DETERGENTS, VEHICLE FLUIDS, SANITARY WASTE, AND OTHER MATERIALS PRESENT ON THE DEVELOPMENT SITE TO PRECIPITATION AND TO STORM WATER.

ADEQUATE RECEPTACLES SHALL BE PROVIDED FOR THE DEPOSITION OF ALL CONSTRUCTION MATERIAL DEBRIS GENERATED DURING THE DEVELOPMENT PROCESS. THE CONTRACTOR SHALL NOT CAUSE OR PERMIT THE DUMPING, DEPOSITING, DROPPING, THROWING, DISCARDING OR LEAVING OF CONSTRUCTION MATERIAL DEBRIS UPON OR INTO ANY DEVELOPMENT SITE, CHANNEL OR IWMC. THE DEVELOPMENT SITE SHALL BE MAINTAINED FREE OF CONSTRUCTION MATERIAL DEBRIS.

A STABILIZED MAT OF AGGREGATE UNDERLAIN WITH FILTER CLOTH (OR OTHER APPROPRIATE MEASURES) SHALL BE LOCATED AT ANY POINT WHERE TRAFFIC WILL BE ENTERING OR LEAVING A CONSTRUCTION-SITE OF A MAJOR DEVELOPMENT TO OR FROM A PUBLIC RIGHT-OF-WAY, STREET ALLEY, OR PARKING AREA. ANY SEDIMENT OR SOIL REACHING AN IMPROVED PUBLIC RIGHT OF WAY, STREET, ALLEY OR PARKING AREA SHALL BE SCRAPED OR STREET CLEANED AS ACCUMULATIONS WARRANT AND TRANSPORTED TO A CONTROLLED SEDIMENT DISPOSAL AREA.

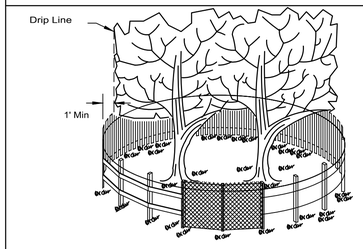
ALL TEMPORARY AND PERMANENT EROSION AND SEDIMENT CONTROL MEASURES SHALL BE MAINTAINED IN AN EFFECTIVE WORKING CONDITION.

DRAIN TILE SYSTEMS DISTURBED DURING DEVELOPMENT MUST BE RECONNECTED BY THOSE RESPONSIBLE FOR THEIR DISTURBANCE UNLESS THE APPROVED ENGINEERING PLANS INDICATE HOW THE DRAIN TILE SYSTEM IS TO BE CONNECTED TO THE PROPOSED STORM WATER MANAGEMENT SYSTEM.

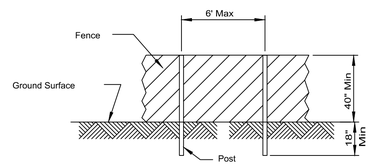
ALL ABANDONED DRAIN TILES SHALL BE REMOVED IN THEIR ENTIRETY.

DRAIN TILES WITHIN THE DISTURBED AREA OF THE DEVELOPMENT SHALL BE REPLACED, BYPASSED AROUND THE DEVELOPMENT OR INTERCEPTED AND CONNECTED TO THE DRAINAGE SYSTEM FOR THE DEVELOPMENT. THE SIZE OF THE REPLACED OR BYPASSED DRAIN TILE SHALL BE EQUIVALENT TO THE EXISTING DRAIN TILE.

TREE PROTECTION - FENCING



SIDE VIEW



POST AND FENCE DETAIL

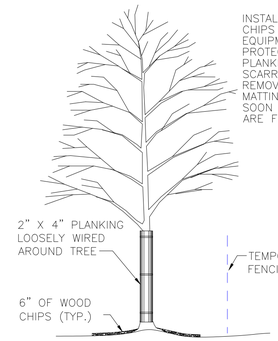
NOTES:

1. The fence shall be located a minimum of 1 foot outside the drip line of the tree to be saved and in no case closer than 5 feet to the trunk of any tree.
2. Fence posts shall be either standard steel posts or wood posts with a minumum cross sectional area of 3.0 sq. in.
3. The fence may be either 40" high snow fence, 40" plastic web fencing or any other material as approved by the engineer/inspector.

REFERENCE			
Project			
Designed		Date	
Checked		Date	
Approved		Date	

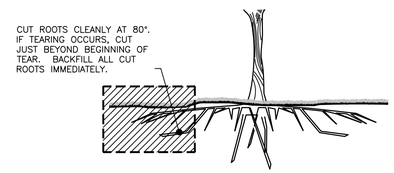
NRCS
Natural Resources Conservation Service

STANDARD DWG. NO.
IL-690
SHEET 1 OF 1
DATE 4-7-94



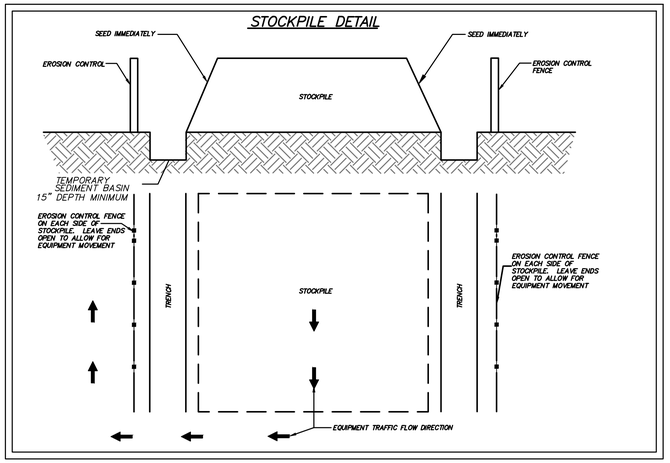
TYP. TREE TRUNK PROTECTION DETAIL

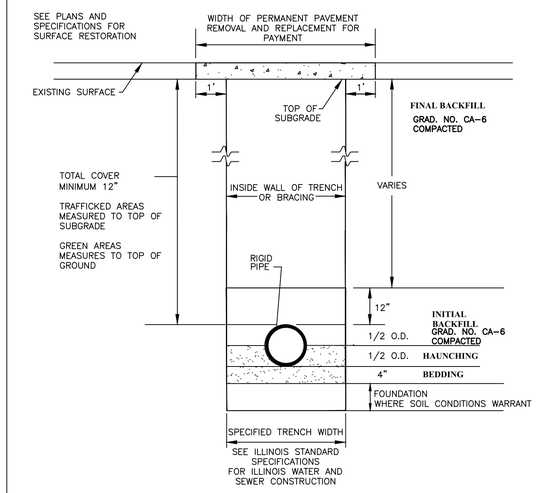
SCALE: NTS



TYP. ROOT PRUNING DETAIL

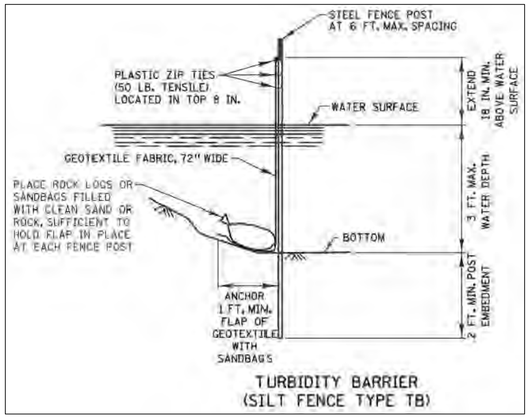
SCALE: NTS





RIGID PIPE INSTALLATION DETAIL

STANDARD DRAWING NO.1



TURBIDITY BARRIER
(SILT FENCE TYPE TB)

FOR CONSTRUCTION

NO.	DATE	BY	REVISION DESCRIPTION

ILLINOIS DESIGN FIRM
184.001322
420 N. FRONT
STREET, SUITE 100
McHENRY, IL 60050
PHONE: 815.385.1778
FAX: 815.385.1781
HRGreen

921 E. WASHINGTON ST. STREAMBANK STABILIZATION
CLIENT: CITY OF JOLIET
JOLIET, ILLINOIS

FINAL ENGINEERING – FOR REVIEW & PERMIT

EROSION CONTROL DETAILS

BAR IS ONE INCH ON OFFICIAL DRAWINGS
0 1"
IF NOT ONE INCH, ADJUST SCALE ACCORDINGLY

DRAWN BY: MPL
APPROVED: AJ
JOB DATE: 02/02/18
JOB NO: 170706

DRAWING
C-15

Appendix G– Hickory Creek Bio-Blitz

Appendix G: Hickory Creek Bio-Blitz (Public Education and Outreach)

In 2014, HCWPG, in collaboration with H&H, began the Hickory Creek Bio-Blitz, an annual one-day aquatic assessment. At the Bio-Blitz, HCWPG members engaged with the community to collect and sort macroinvertebrates, which are later identified by H&H professional aquatic biologists. The community volunteers participated alongside H&H professional biologists, sampling in Hickory Creek and its tributaries. The 2015 Bio-Blitz was expanded to include more sampling locations, including a fish shocking demonstration along Spring Creek, and a tour of Illinois American Water Wastewater Treatment Plant in Homer Glen, Illinois. The 2017 Bio-Blitz increased in participation (about 100 volunteers) and included public tours of the City of Joliet Drinking Water Treatment Facility and the New Lenox Wastewater Treatment Plant (STP #1). The 2017 and 2018 Bio-Blitz events gained greater visibility in the communities, and trained biologists engaged with public participants to enhance the learning experience. The Bio-Blitz has helped connect residents to their watershed, built community support for improving the watershed, and produced valuable data that will be used to track water quality and measure the effectiveness of future watershed improvements. The following supporting documents are provided:

- Flyers
- Photos
- Bio-Assessment report is also available online at www.hickorycreekwatershed.com

Figure G-1: Middle school student sorting macroinvertebrates in Tinley Park, IL.

Hickory Creek Bio-Blitz Flyers

Hickory Creek Watershed

SAVE THE DATE!
SATURDAY, SEPTEMBER 8th, 2018
9:30 am –12 Noon
FREE EVENT - PUBLIC ARE WELCOME

Team up with other researchers and biologists to help sample and identify aquatic organisms in Hickory Creek at this BioBlitz on September 8th from 9:30 a.m. – noon.

BioBlitz Scientists will complete the macroinvertebrates identification and calculate the MBI/mIBI score. A designated Hickory Creek Watershed Planning Group member will be at each sampling site as a steward to welcome the public.

REGISTER TODAY!

1. Register to volunteer at: ***http://eepurl.com/dCI1YD***
2. *Select one preferred staging location:*

EAST: Union Creek Community Park, 19900 S. 80th Ave, Tinley Park. *Host: Village of Tinley Park (start at 9:30 am)*

WEST: Pilcher Park Nature Center, 2501 Highland Park Dr, Joliet. *Host: Pilcher Park (start at 9:30 am)*

WEST: Joliet Water & Sewer Service Center, 921 Washington St, Joliet. Host: *City of Joliet (start at 9:30 am)*

CENTRAL: Crystal Creek Prairie, 10798 Crystal Creek Dr, Mokena. *Host: Village of Mokena (start at 9:30 am)*

SOUTH: New Lenox Sanitary Treatment Plant #1, 323 N. Cedar Rd, New Lenox. *Host: Village of New Lenox Public Works (start at 11:00 am)*

SOUTH: New Lenox VFW Post 9545, 323 Old Hickory Rd, New Lenox. *Host: New Lenox VFW (start at 9:30 am)*

Hickory Creek Watershed Planning Group
http://www.hickorycreekwatershed.org

EEC ENVIRONMENTAL ENHANCEMENT COMMISSION The Village of Tinley Park

THE VILLAGE OF TINLEY PARK ILLINOIS

Pilcher Park Nature Center

Hull & Hull

Hickory Creek Watershed

SAVE THE DATE!
SATURDAY, SEPTEMBER 16th, 2017
9:30 am –12 Noon
FREE EVENT - PUBLIC ARE WELCOME

Team up with other researchers and biologists to help sample and identify aquatic organisms in Hickory Creek at this BioBlitz on September 16th from 9:30 a.m. – noon.

BioBlitz Scientists will complete the macroinvertebrates identification and calculate the MBI/mIBI score. A designated Hickory Creek Watershed Planning Group member will be at each sampling site as a steward to welcome the public.

REGISTER TODAY!

1. Register to volunteer at ***http://www.hickorycreekwatershed.org/bioblitz-2017/***
2. Select one preferred staging locations :

EAST: Union Creek Community Park, 19900 S. 80th Ave, Tinley Park. *Host: Tinley Park Environmental Commission. (Start at 9:30am)*

WEST: Pilcher Park Nature Center, 2501 Highland Park Dr. Joliet. *Host: Pilcher Park (Start at 11 am)*

WEST: Joliet Water & Sewer Service Center,921 Washington Street, Joliet. *Host: the City of Joliet (Start at 9:30 am)*

SOUTH: New Lenox Sanitary Treatment Plant #1, 323 N. Cedar Rd, New Lenox. *Host: New Lenox Public Works (Start at 11 am)*

SOUTH: New Lenox VFW Post 9545, 323 Old Hickory Rd, New Lenox. *Host: New Lenox VFW (Start at 9:30 am)*

Hickory Creek Watershed Planning Group

Huff & Huff Incorporated

Village of New Lenox Illinois

City of Joliet Illinois

The Village of Tinley Park Illinois

http://www.hickorycreekwatershed.org

Hickory Creek Bio-Blitz Photos

Photographic Log

Client Name: Hickory Creek Watershed Planning Group Meeting	**Site Location:** Joliet, New Lenox, Tinley Park, Pilcher Park, Will County, IL (09/16/17)	**Project No.** 81.0220157.04

Photo 1

Photo 2

Photo 3

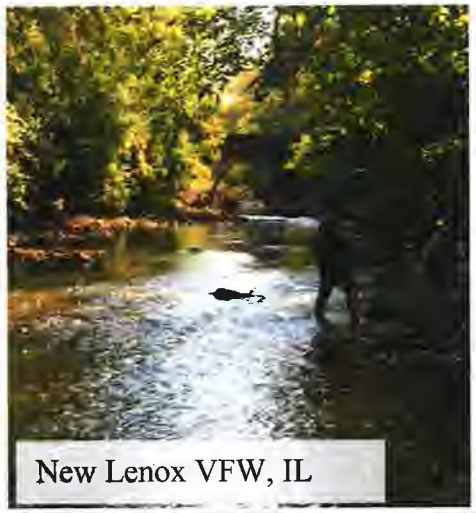


Photo 4

Photographic Log

Client Name: Hickory Creek Watershed Planning Group Meeting	**Site Location:** Joliet, New Lenox, Tinley Park, Pilcher Park, Will County, IL (09/16/17)	**Project No.** 81.0220157.04

Photo 5

Photo 6

Photo 7

Photo 8

Photographic Log

Client Name: Hickory Creek Watershed Planning Group Meeting	**Site Location:** Joliet, New Lenox, Tinley Park, Pilcher Park, Will County, IL (09/16/17)	**Project No.** 81.0220157.04

Photo 9

Photo 10

Photo 11

Photo 12

Photographic Log

Client Name: Hickory Creek Watershed Planning Group Meeting	**Site Location:** Joliet, New Lenox, Tinley Park, Pilcher Park, Mokena in Will County, IL (09/08/18)	**Project No.** 81.0220157.03

Photo 1

Photo 2

Photo 3

Photo 4

Photographic Log

Client Name: Hickory Creek Watershed Planning Group Meeting	**Site Location:** Joliet, New Lenox, Tinley Park, Pilcher Park, Mokena in Will County, IL (09/08/18)	**Project No.** 81.0220157.03

Photo 5

Photo 6

Photo 7

Photo 8

Photographic Log

Client Name: Hickory Creek Watershed Planning Group Meeting	**Site Location:** Joliet, New Lenox, Tinley Park, Pilcher Park, Mokena in Will County, IL (09/08/18)	**Project No.** 81.0220157.03

Photo 9

Photo 10

Photo 11

Photo 12

2017 Hickory Creek Bio-Blitz Report

Huff & Huff
Incorporated
A Subsidiary of GZA

Geotechnical
Environmental
Ecological
Water
Construction Management

915 Harger Road
Suite 330
Oak Brook, IL 60523
T: 630.684.9100
F: 630.684.9120
www.huffnhuff.com
www.gza.com

MEMORANDUM

TO: Hickory Creek Watershed

FROM: Roger Klocek, Huff & Huff, Inc.
Lindsay Birt, Ph.D. Huff & Huff, Inc.

DATE: February 2, 2018

RE: Bio Blitz Macroinvertebrate Results
Will County, Illinois

1.0 INTRODUCTION

Hickory Creek Watershed Planning Group (HCWPG) hosted a one-day Bio-Blitz (a rapid biological assessment) within Hickory Creek watershed on September 10, 2017. More than 100 volunteers collected and sorted aquatic macroinvertebrates from streams within the Hickory Creek watershed. Volunteers teamed up with trained biologists and HCWPG members to sample aquatic macroinvertebrates at five sites within the watershed: Union Ditch in the Village of Tinley Park, Hickory Creek at the Joliet Water and Sewer Service Center, Hickory Creek at New Lenox Sanitary Treatment Plant (STP) #1, Hickory Creek at Pilcher Park #1 (above the dam), and Hickory Creek at the VFW Post 9545 in New Lenox, Illinois. The initiative was part of HCWPG's on-going efforts to conduct public outreach and establish a baseline aquatic community assessment, which are goals established in the watershed management plan.

Aquatic macroinvertebrates were sampled because they can be used to characterize stream quality and prioritize restoration efforts. Aquatic macroinvertebrates consist of aquatic worms, macro-crustaceans, aquatic insects and mollusks which meet the following criteria: they 1) spend all or part of their life cycles in or on aquatic substrates; 2) can be seen with the naked eye; and 3) can be retained in a U.S. Standard No. 30 sieve. Aquatic macroinvertebrates are often used to assess stream water quality due to their relative abundance, diversity, and presence in most aquatic systems.

2.0 METHODOLOGY

A variety of methodologies have been developed to assess stream macroinvertebrate communities. The Illinois Environmental Protection Agency (IEPA) developed the 20-jab multi-habitat method in 2008 (IEPA 2011). The multi-habitat method is a standard methodology in

the State of Illinois for stream assessment using macroinvertebrates. The IEPA method uses a fine mesh net to take qualitative samples for laboratory processing and analysis.

The metric used in evaluating the macroinvertebrate community in Illinois is the Macroinvertebrate Biotic Index (MBI) and the multi-habitat method, the Macroinvertebrate Index of Biotic Integrity (MIBI). The MBI for each sample was calculated using the numerical rating of each taxa developed by the IEPA (2011). MBI values and tolerance values range from 0 to 11, with 0 assigned to the most sensitive taxa (Hilsenhoff 1997, IEPA 2011).

The MIBI uses seven individual metrics, including the MBI, coleopteran taxa, ephemeroptera taxa, total taxa, intolerant taxa, percent scrapers, and percent Ephemeroptera, Plecoptera, Coleoptera (EPT) taxa, to score the sample. Best values represent the best metric values one would typically expect to encounter in a similar sized stream with similar habitat attributes in Illinois. The best values for each metric from the least disturbed Illinois streams are listed in Table 2.1. For the MIBI, a higher score is indicative of a higher quality macroinvertebrate community (Table 2.2). The MIBI is a preferred metric to the MBI as a finer resolution of detail can often be acquired from the statistically based MIBI compared to more broadly-based identifications used to formulate the MBI.

Table 2.1. IEPA Macroinvertebrate Metric Scores

Metric	Best Value*
Coleoptera Taxa	5
Ephemeroptera Taxa	10.2
Total taxa	46
Intolerant Taxa	9
MBI	4.9
Percent Scrapers	29.6
Percent EPT Taxa	74

*Source: IEPA 2011b

Table 2.2. IEPA Method of Interpreting MIBI Scores

Lower Boundary Score	Upper Boundary Score	Comparison to Reference Conditions	Narrative description
73	100	> 75th Percentile	Exceptional
41.8	72.9	> 10th Percentile	Good
20.9	41.7	Bisects 10th percentile (Upper)	Fair
0	20.8	Bisects 10th Percentile (lower)	Poor

Source: IEPA 2011a

3.0 RESULTS

The MBI and MIBI scores from sampling locations in the Hickory Creek watershed are listed in Table 3.1. Table 3.2 presents the metric data used to determine the MIBI scores for the 2017 sampling locations. Hickory Creek at the VFW Post 9545 in New Lenox had the highest numerical MIBI score of all sample sites at 59.0 and a narrative rating of "good". Hickory Creek at the VFW Post 9545 was last sampled in 2015 when it had an MIBI score of 51.9 with a narrative rating of "good" (Figure 3.1). This site had a good number of both aquatic beetle and mayfly taxa. The 2017 VFW sample contained 204 individuals, 36 less than the recommended sample size; which, resulted in a higher MIBI score. The habitat at the VFW site is primarily comprised of cobble, gravel and sand with some boulder and sparse woody debris present, a habitat consistent with rapid water movement and good oxygenation for organisms.

Hickory Creek at the Joliet Water and Sewer Service Center had a high numerical MIBI score of 55.1 with a narrative rank of "good". The 2017 sample was the first time this site was sampled by HCWPG. The habitat is primarily composed of cobble, gravel and sand, with frequent boulders and infrequent woody debris. Rooted macrophytes and filamentous algae are almost absent. The habitat supports a reasonable number of mayfly and beetle taxa but caddisflies were not abundant. Several intolerant taxa are present. This site had the highest number of counted taxa (30) of the sites sampled in 2017.

Union Ditch in Tinley Park had a "fair" MIBI rating. The MIBI score for Union Ditch did not significantly change since 2014 and 2016. Union Ditch primarily has finer and softer substrates which are not preferred habitats for many aquatic organisms. No intolerant taxa were collected in Union Ditch during the last three collection periods which is one of the metrics used to calculate the MIBI.

Hickory Creek at Pilcher Park #1 (above the dam) had an MIBI score during 2017 at 53.8 with a narrative ranking of "good". During 2016, this site had an MIBI score of 19.57 and a narrative rank of "poor". The 2016 MIBI score was significantly lower than the score from 2014 (36.8) and slightly higher than the score from 2015. Hickory Creek at Pilcher Park #1 did not have at least 240 organisms collected in 2015 through 2017. The shoreline habitat at Pilcher Park #1 (above the dam) is primarily comprised of silty and muddy substrates with abundant woody debris. One small section of shoreline is rockier, comprised of cobbles, gravel, and sand. In 2017, the sample was collected in this rockier shoreline area, 0.2 miles north of the 2016 site location. As a result, of the more diverse organisms collected from the rockier habitat, the MBI score was dramatically altered compared to 2016. Care should be taken to ensure that samples are gathered from the same location in "typical" habitat in the future, avoiding the atypical rocky location, for ease in comparison of MIBI scores.

Hickory Creek at New Lenox STP #1 scored an MIBI of 57.1 with a narrative rank of "good" during 2017. New Lenox STP #1 site has consistently had an MIBI rank of "good" during the last four years. The habitat at this site is composed of cobble, gravel and sand with boulders present and infrequent snags of woody debris. The habitat is conducive to a diverse aquatic fauna.

The IEPA methodology for calculating the MIBI score states a minimum of 300 ± 20 percent organisms should be collected. Two sites, the VFW and Pilcher Park #1 (above the dam) did not have the minimum of 240 organisms collected. Despite the low number of organisms collected, the MBI and MIBI scores were calculated and compared against 2015-2016 results (Figure 3.1).

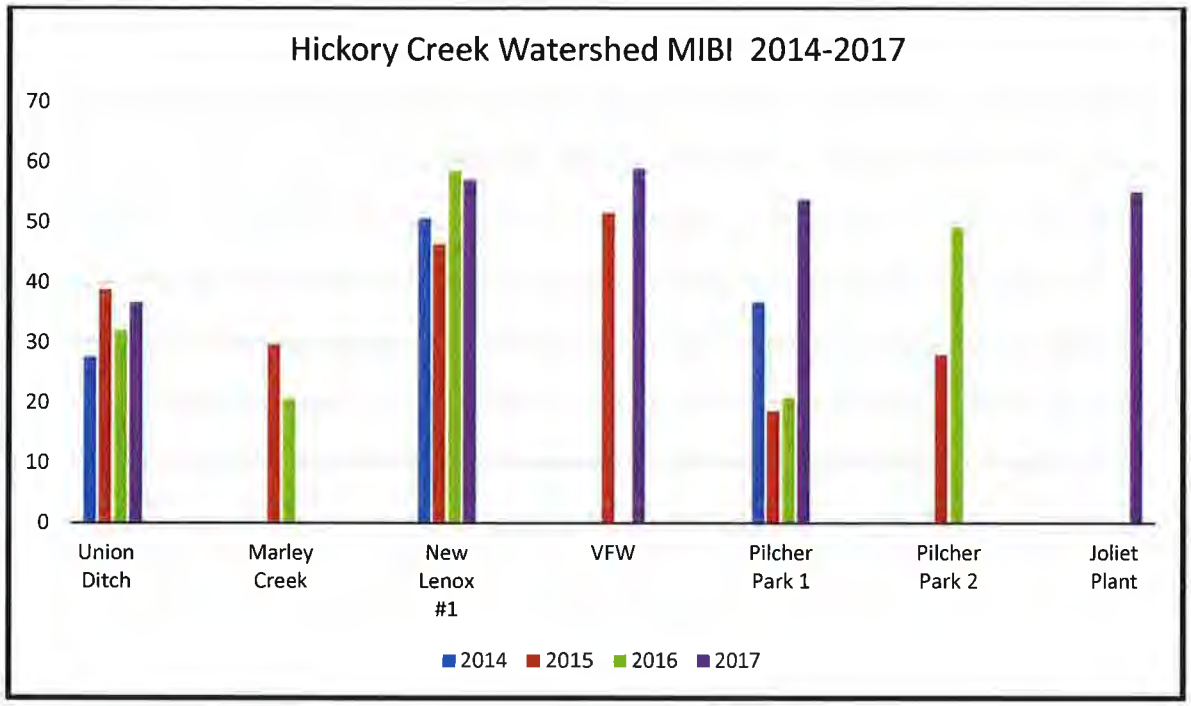
Table 3.1. MBI And MIBI Scores by Site (2017)

Site	MBI Score	MIBI Score	MIBI Narrative rank	Change in MIBI Score since 2016
Hickory Creek at VFW Post 9545, New Lenox, IL	5.2	59.0	"good"	About the Same
Hickory Creek at Joliet Water and Sewer Service Center	5.2	55.1	"good"	First Year of Sample
Union Ditch in Tinley Park, IL	5.9	36.7	"fair"	About the Same
Hickory Creek at Pilcher Park (#1) (above the dam)	5.3	53.8	"good"	Very Significant increase
Hickory at New Lenox STP #1	5.3	57.1	"good"	About the Same

Table 3.2. 2017 Metrics for MIBI Scores

Site	Number Total Taxa	Number Individuals	# Taxa Beetles	# Taxa Mayflies	# Taxa Intolerant	% EPT Individuals	% Scrapers
VFW New Lenox	27	204	4	3	2	20.6	37.3
Joliet Water and Sewer Service Center	30	264	4	3	2	32.6	14.8
Pilcher Park #1 (above dam)	24	150	2	1	0	29.3	10.7
Union Ditch	24	291	3	3	2	14.4	40.2
New Lenox STP #1	28	260	4	3	1	19.2	41.1

FIGURE 3.1. A Comparison of MIBI Scores from 2014 to 2017



4.0 DISCUSSION

The collection of data across multiple years provides comparative data for each site, allowing for tracking of the quality of the macroinvertebrate communities over time. The use of the metrics and comparison across years is dependent on the validity of the data. With additional years of data collected, greater inferences of the changes in the macroinvertebrate communities could be made. As a result, the changes in MIBI over time could be due to changes in the stream water quality, habitat, or missing taxa from the samples; however, a low number of organisms was collected in 2016. The 2017 data was generally better than the 2016 data, with higher numbers of organisms collected except at Pilcher Park #1 (above dam). As a result, the trends for stream quality at each site over several years is consistent, except for Pilcher Park #1 (above dam). Conclusions regarding changes in the quality of the stream macroinvertebrate communities at Pilcher Park #1 (above dam) should be made only after weighing the possibility of incomplete data based on low numbers of specimens collected. Low numbers of collected specimens can produce artificially high or low MIBI scores, depending on the proportion of tolerant or intolerant species in the sample.

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