Illinois Department of Natural Resources
JB Pritzker, Governor • Natalie Phelps Finnie, Director
One Natural Resources Way • Springfield, Illinois 62702-1271
www.dnr.illinois.gov

Office of Water Resources, Michael A. Bilandic Building, 160 N. LaSalle St., S-703, Chicago, IL 60601

January 14, 2026

Illinois Department of Natural Resources, Office of Water Resources
Public Notice

Construction of a bluff and shoreline restoration project, in Lake Michigan, at the Jean and John Greene Nature Preserve, at 797-793 Sheridan Road, Lake Forest, Illinois 60045

The Lake County Forest Preserves, 1899 West Winchester Road, Libertyville, Illinois 60048, and the Lake Forest Open Lands Association, 350 North Waukegan Road, Lake Forest, Illinois 60045, have applied for an Illinois Department of Natural Resources, Office of Water Resources permit for the construction of a bluff and shoreline restoration project, in Lake Michigan, at the Jean and John Greene Nature Preserve, at 797-793 Sheridan Road, Lake Forest, Illinois 60045.

The proposed bluff restoration is comprised of a hybrid stone toe and a bluff face treatment. The stone toe treatment is proposed to be partially buried, to naturalize the transition zone and to provide integrated soil matrix for vegetation establishment. The portion of the stone toe at the beach/slope interface will be left exposed to withstand energy and saturation of the active wave/splash zone. The stone toe will be 489.1 feet long with a top elevation of 590.9. The bluff toe treatment includes the installation of large woody debris structures to naturalize and enhance the toe treatment zone. The proposed shoreline restoration is comprised of an in-lake boulder cluster field and three in-lake habitat reefs. The boulder cluster field includes 17 small diameter stone clusters, 25 large diameter stone clusters, and 27 Natrix cubes, to reduce near-shore wave energy, promote long-term sand deposition, and to create functional aquatic habitat. The small diameter clusters will be made of approximately 10 stones, with individual stones having a mean diameter of one foot; and will consist of two layers of stone, creating a two-foot high structure. The large diameter clusters will be made of four stones, with individual stones having a mean diameter of 2.5 feet; and will consist of two layers of stone, creating a five-foot high structure. The Natrix cube structures are cubic and have a side length of 33 inches. The reefs consist of large limestone blocks surrounded by cobbles interspersed with sub-aquatic plantings, to attenuate waves, provide fish habitat, and accumulate sand offshore to help supplement the beach. The reefs will have side slopes of 1V:2H, widths of 27.5 feet, and maximum heights of 5 feet; and are designed to be submerged. The reefs will have centerline lengths of 334, 315, and 315 feet, from north to south, respectively. The maximum distances from the existing toe of bluff to the lakeward ends of the reefs will be 692.9, 651.3, and 602.1 feet, from north to south, respectively. 3,389 cubic yards of beach-quality sand will be placed as pre-mitigational fill for the project. All elevations are International Great Lakes Datum 1985-adjusted (IGLD-85). The proposed project will be reviewed using the Department's Part 3704 Rules. A location map and plans are attached to this notice.

No work is to start on this project unless and until such a time that the permit is issued.

Inquiries and comments regarding the proposed project can be directed to Eric Otto, Senior Water Resources Engineer, of the Chicago Office at IDNR/OWR, 160 N. LaSalle Street, Suite S-703, Chicago, Illinois 60601 or eric.otto@illinois.gov.

An expanded version of the public notice can be viewed at https://dnr.illinois.gov/waterresources/publicnotices.html.

The signatures, email addresses, and phone numbers of the applicant, co-applicant (if any), and authorized agent (if any) are redacted from this public notice. The mailing addresses and phone numbers of adjoining and adjacent property owners are redacted from this public notice.

Comments will be accepted through **February 17, 2026**.

JOINT APPLICATION FORM FOR ILLINOIS

ITEMS 1 AND 2 FOR AGENCY USE

1. Application Number	2. Date Received

3. and 4. (SEE SPECIAL INSTRUCTIONS) NAME, MAILING ADDRESS AND TELEPHONE NUMBERS

3a. Applicant's Name:	3b. Co-Applicant/Property Owner Name (if needed or if different from applicant):	4. Authorized Agent (an agent is not required):
Matthew Ueltzen	Ryan London	Dave Kraft, PE, CFM
Company Name (if any) : Lake County Forest Preserves	Company Name (if any): Lake Forest Open Lands	Company Name (if any): Hey & Associates, Inc.
Address: 1899 West Winchester Road Libertyville, Illinois 60048	Address: 350 N Waukegan Road Lake Forest, Illinois 60045	Address: 26757 W Commerce Dr Ste 601 Volo, IL 60073
Email Address:	E	Email Address:
Applicant's Phone Nos. w/area code Business: Residence: Cell: Fax:	Applicant's Phone Nos. w/area code Business: Residence: Cell: Fax:	Agent's Phone Nos. w/area code Business: Residence: Cell: Fax:

STATEMENT OF AUTHORIZATION

I hereby authorize, Dave Kraft, PE, CFM to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

Applicant's Signature 2026.01.07 14:15:58 -06'00' Date 12/19/2025

5. ADJOINING PROPERTY OWNERS (Upstream and Downstream of the water body and within Visual Reach of Project)

Name	Mailing Address	Phone No. w/area code
a. Circle Lane LLC		
b. LCFPD		
c.		
d.		

6. PROJECT TITLE:
Jean and John Greene Nature Preserve Ravine, Bluff, and Shoreline Restoration

7. PROJECT LOCATION:
Jean and John Greene Nature Preserve

LATITUDE: 42.226410 °N LONGITUDE: -87.815995 °W	UTMs Northing: 4675237.04 Easting: 432661.10				
STREET, ROAD, OR OTHER DESCRIPTIVE LOCATION	LEGAL DESCRIPT	QUARTER	SECTION	TOWNSHIP NO.	RANGE
797-793 Sheridan Rd		SW SE	03	43	12

☒ IN OR ☐ NEAR CITY OF TOWN (check appropriate box)
Municipality Name: Lake Forest

COUNTY	STATE	ZIP CODE	WATERWAY	RIVER MILE (if applicable)
Lake	IL	60045	Lake Michigan	N/A

Revised 2010

☐ Corps of Engineers ☒ IL Dep't of Natural Resources ☐ IL Environmental Protection Agency ☐ Applicant's Copy

8. PROJECT DESCRIPTION (Include all features):

The Jean and John Greene Nature Preserve Ravine, Bluff, and Shoreline Restoration is an aquatic habitat enhancement being proposed by Lake Forest Open Lands to enhance and naturalize areas located at John and Jane Greene Nature Preserve. The proposed project includes the restoration and stabilization of steep banks at the head of McCormick Ravine, the installation of rock grade control structures with side slope grading in the Deromedi Ravine, installation of a buried stone toe, slope grading, and vegetative restoration of the Lake Michigan bluff, and installation of stone habitat features in the nearshore zone of Lake Michigan.

9. PURPOSE AND NEED OF PROJECT:

Stabilization, restoration, and habitat enhancement

COMPLETE THE FOLLOWING FOUR BLOCKS IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

10. REASON(S) FOR DISCHARGE:

Stabilization and habitat enhancement

11. TYPE(S) OF MATERIAL BEING DISCHARGED AND THE AMOUNT OF EACH TYPE IN CUBIC YARDS FOR WATERWAYS:

TYPE: Armor stone, rounded natural stone, limestone blocks, cobbles, and bedding material

AMOUNT IN CUBIC YARDS:

See attached narrative and Plans

12. SURFACE AREA IN ACRES OF WETLANDS OR OTHER WATERS FILLED (See Instructions)

13. DESCRIPTION OF AVOIDANCE, MINIMIZATION AND COMPENSATION (See instructions)

Discharges were minimized to the extent practical, but unavoidable given the stabilization, restoration, and habitat creation intent.

14. Date activity is proposed to commence: 08/01/2026

Date activity is expected to be completed: 07/31/2027

15. Is any portion of the activity for which authorization is sought now complete? Yes [ ] No [X]

NOTE: If answer is "YES" give reasons in the Project Description and Remarks section. Indicate the existing work on drawings.

Month and Year the activity was completed: N/A

16. List all approvals or certification and denials received from other Federal, interstate, state, or local agencies for structures, construction, discharges or other activities described in this application.

Issuing Agency	Type of Approval	Identification No.	Date of Application	Date of Approval	Date of Denial
USACE	NWP & LMRGP, 408	TBD	TBD	TBD	
IEPA	NPDES	TBD	TBD	TBD	
City of Lake Forest	WDP	TBD	TBD	TBD	
INPC	Nature Preserve Approval	TBD	TBD	TBD	

17. CONSENT TO ENTER PROPERTY LISTED IN PART 7 ABOVE IS HEREBY GRANTED. Yes [X] No

18. APPLICATION VERIFICATION (SEE SPECIAL INSTRUCTIONS)

Application is hereby made for the activities described herein. I certify that I am familiar with the information contained in the application, and that to the best of my knowledge and belief, such information is true, complete, and accurate. I further certify that I possess the authority to undertake the proposed activities.

12/19/2025
Date

Date

Signature of Applicant or Authorized Agent

Date

[ ] Corps of Engineers [X] IL Dep't of Natural Resources [ ] IL Environmental Protection Agency [ ] Applicant's Copy

Revised 2010

SEE INSTRUCTIONS FOR ADDRESS

LOCATION MAP

Revised 2010

☐ Corps of Engineers ☒ IL Dep't of Natural Resources ☐ IL Environmental Protection Agency ☐ Applicant's Copy

PLAN VIEW

FOR AGENCY USE ONLY

Revised 2010

☐ Corps of Engineers ☒ IL Dep't of Natural Resources ☐ IL Environmental Protection Agency ☐ Applicant's Copy

Jean and John Greene Nature Preserve Ravine, Bluff, and Shoreline Restoration Lake Forest, Illinois

Client:

Lake Forest Open Lands Assn.
Ryan London
350 N. Waukegan Rd.
Lake Forest, Illinois, 60045

Engineer:

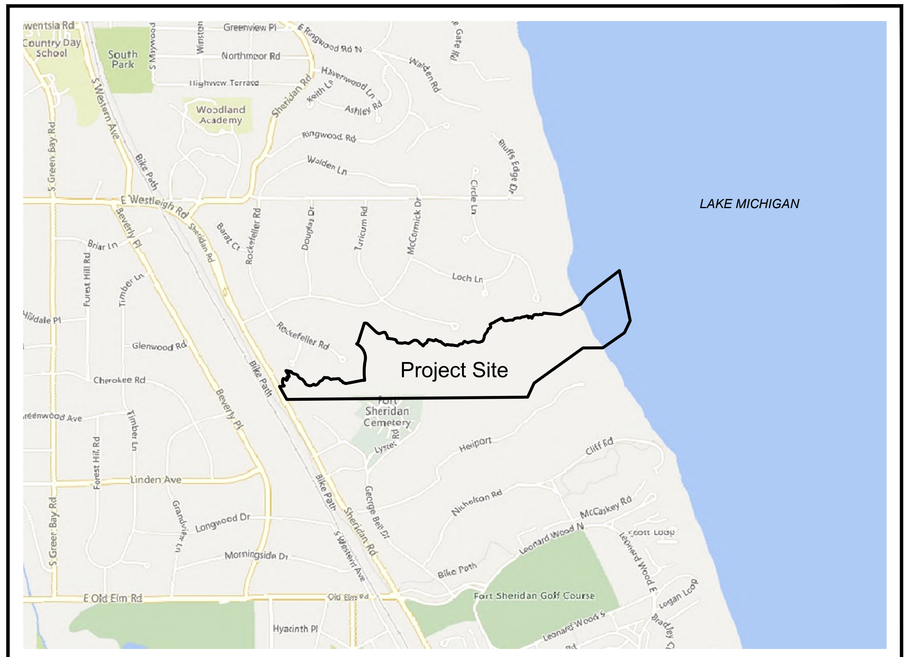
Hey and Associates, Inc.
26575 West Commerce Drive, Suite 601
Volo, Illinois 60073
Office (847) 740-0888
Fax (847) 740-2888

Benchmark:

CP1: Cross notch on curb south side of island in Circle Lane turnaround.
Elevation = 655.76 (NAVD 1988)
As established by GPS observations 11/01/2023

CP2: Cross notch on Circle Lane, just north of the driveway to 624 Circle Ln.
Elevation = 655.57 (NAVD 1988)
As established by GPS observations 11/01/2023

NAVD 88 - 0.096' = IGLD 85



Scale	Project Area	
1" = 1000'		N

DRAINAGE STATEMENT
To the best of our knowledge and belief, the drainage of the surface waters will not be changed by the construction of this site or any part thereof, or that if such surface water drainage will be changed, reasonable provisions have been made for the collection and diversion of such water into public areas or such waters will be planned for in accordance with generally accepted engineering practices so as to reduce the likelihood of damage to the adjoining property because of the construction of this site.

Sheet List Table

Call J.U.L.I.E. 811 or (800) 892-0123 at least 48 hours before start of construction with the following:

County: Lake
City or Township: Lake Forest
Tier, Range & Section: T45N, R12E, Sec. 3

The information shown on this drawing concerning type and location of underground utilities is not guaranteed to be accurate or all inclusive. The Contractor is responsible for making their own determinations as to the type and location of underground utilities as may be necessary to avoid damage thereto.

PROFESSIONAL SEAL

DAVID A. KRAFT
062-060360
LICENSED
PROFESSIONAL
ENGINEER
STATE OF ILLINOIS

Signature:
Date: January 8, 2026
License Expires: November 30, 2027

This document shall not be considered a valid technical submittal unless it bears an original seal and signature.

Base Survey Information provided by:
See Sheet C1.1

No.	Revision/Issue	Date

Hey and Associates, Inc.
Engineering, Ecology and Landscape Architecture
26575 West Commerce Drive, Suite 601
Volo, Illinois 60073
Office (847) 740-0888
Fax (847) 740-2888
Volo@Heyassoc.com

Professional Design Firm
License No. 184-002429

Jean and John Greene Nature Preserve Ravine, Bluff, and Shoreline Restoration

Lake Forest, Illinois

Cover Sheet

PROJECT NO: 24-0271		SHEET NO:
DESIGNED BY	DAK/KNJ	C1.0
DRAWN BY	ATJ/KNJ	
CHECKED BY	DAK/KNJ	
APPROVED BY	DAK	PAGE NO:
ISSUE DATE	01/08/2026	01 OF 27

For Permit

File: P:\24\0024-0271 LFOLA-Greene NP Bluff and Ravines\05 CAD\24-0271 Greene NP Bluff and Ravines.dwg Plot Date: January 8, 2026 Plotted by: Kirsten James

GENERAL NOTES AND CONSTRUCTION SPECIFICATIONS

1. All construction shall be in accordance with the applicable sections of the following, except as modified herein or on the plans:
   a. "Standard Specifications for Road and Bridge Construction" (Latest Edition), by the Illinois Department of Transportation (SSRBC) and "Supplemental Specifications and Recurring Special Provisions" (Latest Edition) for all improvements except for sanitary sewer, watermain and plumbing construction;
   b. Standard Specifications for Water and Sewer Main Construction in Illinois" (Latest Edition) (SSWS) for sanitary and water main construction;
   c. City of Lake Forest municipal code;
   d. The Lake County Watershed Development Ordinance (Latest Revision);
   e. Illinois Plumbing Code;
   f. International Mechanical Code;
   g. In case of conflict between the applicable ordinances noted, the more stringent shall take precedence and shall control all construction.
2. The Contractor shall examine all plans and specifications, visit the site of the work and inform themself fully with the work involved, general and local conditions, all Federal, State and local laws, ordinances, rules and regulations and all other pertinent items which may affect the cost and time of completion of this project before submitting a proposal.
3. Prior to submitting a bid and beginning construction, the Contractor shall verify the lines and grades shown on the plans. If there are any discrepancies from what is shown on the plans, the Contractor shall immediately report them to the Owner prior to performing the work. The Contractor shall be responsible for coordination of work as required.
4. Prior to submitting his bid, the Contractor shall call the attention of the Engineer to any material or equipment he deems inadequate and to any item of work omitted.
5. Location of above and belowground utilities shown on plans are for information only and represent the best knowledge of the Engineer. Contractor shall make his own investigations as to location and elevation of all utilities, existing underground structures, cables and pipe lines prior to the start of construction operations.
6. If existing utility lines of any nature are encountered which conflict in location with new construction, the Contractor shall notify the Engineer and Owner so that the conflict may be resolved.
7. The Contractor shall notify the J.U.L.I.E. (811 or 1-800-892-0123) at least ten days prior to construction so that each utility company can stake out any underground improvements that they may have which might interfere with the proposed construction.
8. The Contractor shall be responsible for providing the necessary protection of all existing private and public utilities in conformance with the affected utility company's requirements as may be required to perform the work. Any utility that is damaged during construction shall be repaired or replaced by the Contractor at their own expense to the satisfaction of the Engineer, Owner and/or utility company.
9. The Contractor shall be required to make arrangements for the proper bracing, shoring and other required protection of all roadways, buildings, structures, poles, cables and pipe lines, before construction begins. Contractor shall be responsible for any damage to the site, streets, roadway, structures and shall make repairs as necessary to the satisfaction of the Engineer and Owner at the Contractor's own expense.
10. The work performed under this contract shall in no way interfere with the normal operation of any existing utility service. The Contractor shall furnish all necessary items of equipment required to maintain such normal operations at no additional expense to the Owner.
11. The Contractor shall obtain, erect, maintain and remove all signs, barricades, flagmen and other control devices as may be necessary for the purpose of regulating, warning or guiding traffic. Placement and maintenance of all traffic control devices shall be in accordance with the applicable parts of Article 1106 of the SSRBC and the "Standard Specifications for Traffic Control Items".
12. The Contractor shall restore any area disturbed outside the construction site to a condition equal to or better than its original use. This shall include finish grading, establishment of a vegetative cover (seeding or sod), general cleanup and pavement replacement.
13. All new and existing utility structures on site and in areas disturbed during construction shall be adjusted to final grade prior to final inspection. No additional compensation shall be paid and said adjustments shall be considered incidental.
14. All trenches caused by the construction of sewers, service sewers, piping, utilities, and the excavation around catch basins, manholes, inlets and other appurtenances which occur within the limits of existing or proposed pavements, sidewalks and curb and gutters or where the edge of the trench shall be within two feet (2') of said improvements shall be backfilled with approved suitable select material and properly compacted.
15. The Contractor shall be responsible for providing safe and healthful working conditions throughout the construction of the proposed improvements.
16. The Contractor shall protect and carefully preserve all section or subsection monuments, lot irons, or other property or reference markers until the Engineer, his agent or an authorized surveyor has witnessed or otherwise referenced their location. Any damages shall be replaced by the Contractor and said cost of replacement shall be paid by the Contractor.
17. The Contractor shall provide a written work schedule and shall update said schedule as required. A minimum twenty-four (24) hour notice shall be given for any item that requires approval or inspection.
18. The Owner, Owner's Representative, municipality, or regulatory agency shall have the authority to inspect, approve and reject the construction improvements.
19. Before acceptance by the Owner and final payment, all work shall be inspected and approved by the Engineer and Owner. Final payments shall be made after all of the Contractor's work has been approved and accepted.
20. The Contractor is responsible for coordinating any required inspections with the Owner, Engineer and other agencies.
21. If any approved equal items are proposed, the Contractor shall contact the Engineer for written approval prior to use or installation.
22. The Engineer and Owner are not responsible for the construction means, methods, techniques, sequences or procedures, time of performance, programs or for any safety precautions used by the Contractor. The Contractor is solely responsible for execution of his work in accordance with the contract documents and specifications.
23. Permits and licenses of a temporary nature necessary for the prosecution of the work shall be secured and paid for by the Contractor.
24. The Contractor will have in his possession on the job site a copy of the plans and specifications during construction.
25. Special attention is drawn to the fact that Article 105.06 of the SSRBC requires the Contractor to have a competent superintendent on the project site at all times, irrespective of the amount of work sublet. The superintendent shall be capable of reading and understanding the plans and specifications, shall have full authority to execute orders to expedite the project, shall be responsible for scheduling and have control of all work as the agent of the Contractor. Failure to comply with this provision will result in a suspension of work as provided in Article 108.07.
26. Record drawings shall be kept by the Contractor and submitted to the Engineer within 30 days of completion of the project, or as mutually agreed upon by the Engineer. Final payments to the Contractor shall be held until they are received. Any changes in length, location or alignment shall be shown in red. All wyes or bends shall be located from the downstream manhole.
27. The Contractor(s) shall indemnify the Owner, Engineer, Municipality and their agents, etc. from all liability involved with the construction, installation, or testing of work on the project.
28. Contractor is responsible for all site layout, including verification of benchmarks provided within the plans. If the Contractor identifies a discrepancy, it shall be brought to the attention of the Engineer immediately. DuPage County is not responsible for any rework on the project required due to improper grade stakes or failure of Contractor to verify existing benchmarks.
29. Any modifications of a drainage tile shall comply with the Illinois Drainage Code, and Section 15-77.

EARTHWORK AND GRADING CONSTRUCTION

All work done under this heading will be done in accordance with applicable provisions of the "Standard Specifications for Road and Bridge Construction", State of Illinois, Department of Transportation, adopted January 1, 2022.

1. Work under this section shall include, but not be limited to, the following:
   a. Clearing and removal of all undesirable vegetative growth within the construction area except as noted otherwise on the plans.
   b. Placement and construction of structural and non-structural fills.
   c. Movement and compaction of spoil material from the construction of underground utilities.
   d. Final shaping and trimming to the lines, grades and cross-sections shown in these plans, and topsoil placement to design finish grade elevations.
   e. Soil erosion control measures in accordance with the applicable specifications and county requirements.
2. Silt fence as shown in the construction plans shall be erected prior to start of work.
3. It is the Contractor's responsibility to determine all material quantities and the Contractor should be familiar with all site conditions. No claims for extra work will be recognized unless ordered in writing by the Owner.
4. The grading and construction of the site improvements shall not cause ponding of stormwater except as noted on the plans. All areas adjacent to these improvements shall be graded to allow positive drainage.
5. The proposed grading elevations shown on the plans are finish grade. For all landscape areas, a minimum of six inches (6") of topsoil (4" min. in sodded areas) is to be placed before finish grade elevations are achieved, except where noted otherwise.
6. All disturbed areas to be seeded or planted as specified on the Restoration or Planting Plans. Any disturbed areas not specified on the Restoration Plans shall be replaced in kind.
7. Detailed drawings for any sheeting and bracing shall be provided for review to the Owner's representative prior to implementation of the method. A trench box shall be available on the job site at all times and be utilized in accordance with OSHA standards.
8. Suitable excavated materials subject to the review of the Owner's representative may be used to backfill the excavated areas of the site; unless shown otherwise.
9. No underground work shall be covered until it has been reviewed by Engineer.

CITY OF LAKE FOREST GENERAL ENGINEERING CONSTRUCTION REQUIREMENTS

1. A work day shall be from 7:00 A.M. to 7:00 P.M., Monday through Friday. The contractor may work on Saturdays and legal holidays with the written permission of the City Surveyor and Engineer. Approved Saturday work shall be from 8:00 AM to 6:00 PM. A request for Saturday and holiday work shall be made a minimum of Forty-eight (48) hours prior to the day requested.
2. The Contractor shall follow the below regulations in notifying the proper jurisdictions prior to the commencement of work:
   a. The contractor shall notify the City Surveyor and Engineer's office a minimum of 48 hours prior to the start of any work.
   b. All required tree protection and safety fences as well as all required soil erosion control methods shall be in place and approved by the City prior to the start of any demolition or construction.
   a. The contractor shall notify the North Shore Sanitary District a minimum of 24 hours prior to the start of any work related to sanitary sewers.
   b. The contractor shall notify The Lake County Stormwater Management Commission, The Army Corps of Engineers and/or any other government agency which issued permits for work within a designated wetland.
3. A Designated Erosion Control Inspector, hired or employed by the applicant, is required for all development that exceeds 10 acres of hydrologic disturbance or exceeds 1 acre of hydrologic disturbance and has a Regulatory Floodplain, Isolated Waters of Lake County or Waters of the United States on-site or on adjoining property
4. The use of city water from fill points in prosecution of the work shall be prearranged and approved by Public Works. The contractor shall comply with all city requirements for use of facilities, documentation of quantities, and payment for water used. Fire hydrants shall not be used.
5. The City of Lake Forest has not been retained or compensated to provide design and construction review services relating to the Contractor's safety precautions or to means, methods, techniques, sequences, or procedures required for the Contractor to perform his work. Omitted services include but are not limited to shoring, scaffolding, underpinning, temporary retainment of excavations and any erection methods and temporary bracing.
6. The contractor shall notify the City at least 5 days in advance of the starting of any work which might in any way inconvenience or endanger traffic, so that arrangements may be made, if necessary, for closing the road and providing suitable detours. The contractor shall at all times conduct all work in such a manner as to insure the least obstruction to vehicular and pedestrian traffic.

REQUIREMENTS FOR IN-STREAM CONSTRUCTION ACTIVITIES

The U.S. Army Corps of Engineers and the Lake County Stormwater Management Commission shall be contacted for a review of the proposed In-stream work plan which must be approved by both offices prior to the commencement of work. The plan shall meet applicable erosion and sediment control standards and include means and methods for completing work within a waterway.

The following definitions apply to these notes:

In-stream work area: work occurring at or below the ordinary high water mark (OHWM) of a waterway or the normal water level (NWL) of abutting wetlands, including adjacent uplands.

Work within a waterway must meet the following standards:

1. Work in the waterway should be limited to the extent practical.
2. Work in the waterway should be timed to take place during low or no-flow conditions. Low flow conditions are flow at or below the normal water elevations.
3. The plan will be designed to consider maintaining conveyance of the 2-year peak flow past the work area if feasible.
4. 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.

BASE SURVEY INFORMATION

1. Lake County
2. Hey topographic survey, dated January 23, 2025 and February 24, 2025.
3. Hey bathymetric survey, dated July 15, 2025.
4. Prairie Research Institute bathymetric survey, dated November 20, 2025.

LAKE COUNTY STORMWATER MANAGEMENT COMMISSION
SOIL EROSION AND SEDIMENT CONTROL CONSTRUCTION NOTES

A. SEDIMENT CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE COMMENCEMENT OF HYDROLOGIC DISTURBANCE OF UPLAND AREAS.

B. FOR THOSE DEVELOPMENTS THAT REQUIRE A DESIGNATED EROSION CONTROL INSPECTOR (DECI), INSPECTIONS AND DOCUMENTATION SHALL BE PERFORMED, AT A MINIMUM:
   - UPON COMPLETION OF SEDIMENT AND RUNOFF CONTROL MEASURES (INCLUDING PERIMETER CONTROLS AND DIVERSIONS), PRIOR TO PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING.
   - AFTER EVERY SEVEN (7) CALENDAR DAYS OR STORM EVENT WITH GREATER THAN 0.5 INCH OF RAINFALL OR LIQUID EQUIVALENT PRECIPITATION.

C. SOIL DISTURBANCE SHALL BE CONDUCTED IN SUCH A MANNER AS TO MINIMIZE EROSION. IF STRIPPING, CLEARING, GRADING, OR LANDSCAPING ARE TO BE DONE IN PHASES, THE PERMITTEE SHALL PLAN FOR APPROPRIATE SOIL EROSION AND SEDIMENT CONTROL MEASURES.

D. A STABILIZED MAT OF CRUSHED STONE MEETING IDOT GRADATION CA-1 UNDERLAIN WITH FILTER FABRIC AND IN ACCORDANCE WITH THE ILLINOIS URBAN MANUAL, OR OTHER APPROPRIATE MEASURE(S) AS APPROVED BY THE ENFORCEMENT OFFICER, SHALL BE INSTALLED AT ANY POINT WHERE TRAFFIC WILL BE ENTERING OR LEAVING A CONSTRUCTION SITE. SEDIMENT OR SOIL REACHING AN IMPROVED PUBLIC RIGHT-OF-WAY, STREET, ALLEY OR PARKING AREA SHALL BE REMOVED BY SCRAPING OR STREET CLEANING AS ACCUMULATIONS WARRANT AND TRANSPORTED TO A CONTROLLED SEDIMENT DISPOSAL AREA.

E. TEMPORARY DIVERSIONS SHALL BE CONSTRUCTED AS NECESSARY TO DIRECT ALL RUNOFF FROM HYDROLOGICALLY DISTURBED AREAS TO AN APPROPRIATE SEDIMENT TRAP OR BASIN.

F. DISTURBED AREAS SHALL BE STABILIZED WITH TEMPORARY OR PERMANENT MEASURES WITHIN SEVEN (7) CALENDAR DAYS FOLLOWING THE END OF ACTIVE HYDROLOGIC DISTURBANCE OR REDISTURBANCE.

G. ALL STOCKPILES SHALL HAVE APPROPRIATE MEASURES TO PREVENT EROSION. STOCKPILES SHALL NOT BE PLACED IN FLOOD PRONE AREAS OR WETLANDS AND DESIGNATED BUFFERS.

H. SLOPES STEEPER THAN 3H:1V SHALL BE STABILIZED WITH APPROPRIATE MEASURESAS APPROVED BY THE ENFORCEMENT OFFICER.

I. APPROPRIATE EROSION CONTROL BLANKET SHALL BE INSTALLED ON ALL INTERIOR DETENTION BASIN SIDE SLOPES BETWEEN THE NORMAL WATER LEVEL AND HIGH WATER LEVEL.

J. STORM SEWERS THAT ARE OR WILL BE FUNCTIONING DURING CONSTRUCTION SHALL BE PROTECTED BY AN APPROPRIATE SEDIMENT CONTROL MEASURE.

K. IF DEWATERING SERVICES ARE USED, ADJOINING PROPERTIES AND DISCHARGE LOCATIONS SHALL BE PROTECTED FROM EROSION AND SEDIMENTATION. DISCHARGES SHALL BE ROUTED THROUGH AN APPROVED ANIONIC POLYMER DEWATERING SYSTEM OR A SIMILAR MEASURE AS APPROVED BY THE ENFORCEMENT OFFICER. DEWATERING SYSTEMS SHOULD BE INSPECTED DAILY DURING OPERATIONAL PERIODS. THE ENFORCEMENT OFFICER, OR APPROVED REPRESENTATIVE, MUST BE PRESENT AT THE COMMENCEMENT OF DEWATERING ACTIVITIES.

L. IF INSTALLED SOIL EROSION AND SEDIMENT CONTROL MEASURES DO NOT MINIMIZE SEDIMENT LEAVING THE DEVELOPMENT SITE, ADDITIONAL MEASURES SUCH AS ANIONIC POLYMERS OR FILTRATION SYSTEMS MAY BE REQUIRED BY THE ENFORCEMENT OFFICER.

M. ALL TEMPORARY AND PERMANENT EROSION CONTROL MEASURES MUST BE MAINTAINED AND REPAIRED AS NEEDED. THE PROPERTY OWNER SHALL BE ULTIMATELY RESPONSIBLE FOR MAINTENANCE AND REPAIR.

N. ALL TEMPORARY SEDIMENT CONTROL MEASURES SHALL BE REMOVED WITHIN 30 DAYS AFTER FINAL SITE STABILIZATION IS ACHIEVED OR AFTER THE TEMPORARY MEASURES ARE NO LONGER NEEDED.

O. THE EROSION CONTROL MEASURES INDICATED ON THE PLANS ARE THE MINIMUM REQUIREMENTS. ADDITIONAL MEASURES MAY BE REQUIRED, AS DIRECTED BY THE ENGINEER, ENFORCEMENT OFFICER, OR OTHER GOVERNING AGENCY.

U:\Regulatory Program\SESC handouts\SE-SC Notes 2013 TAC-approved.docx

LAKE COUNTY STORMWATER MANAGEMENT COMMISSION

TYPICAL CONSTRUCTION SEQUENCING

1.) Installation of soil erosion and sediment control SE/SC measures
   a.) Selective vegetation removal for silt fence installation
   b.) Silt fence installation
   c.) Construction fencing around areas not to be disturbed
   d.) Stabilized construction entrance
2.) Tree removal where necessary (clear & grub)
3.) Construct sediment trapping devices (sediment traps, basins…)
4.) Construct detention facilities and outlet control structure with restrictor & temporary perforated riser
5.) Strip topsoil, stockpile topsoil and grade site
6.) Temporarily stabilize topsoil stockpiles (seed and silt fence around toe of slope)
7.) Install storm sewer, sanitary sewer, water and associated inlet & outlet protection
8.) Permanently stabilize detention basins with seed and erosion control blanket
9.) Temporarily stabilize all areas including lots that have reached temporary grade
10.) Install roadways
11.) Permanently stabilize all outlot areas
12.) Install structures and grade individual lots
13.) Permanently stabilize lots
14.) Remove all temporary SE/SC measures after the site is stabilized with vegetation

* Soil erosion and sediment control maintenance must occur every two weeks and after every ½ or greater rainfall event

U:\Regulatory Program\SESC handouts\TYPICAL CONSTRUCTION SEQUENCING.doc

LEGEND

No.	Revision/Issue	Date

Hey and Associates, Inc.
Engineering, Ecology and Landscape Architecture
26575 West Commerce Drive, Suite 601
Volo, Illinois 60073
Office (847) 740-0888
Fax (847) 740-2888
Volo@Heyassoc.com

Professional Design Firm
License No. 184-002429

Jean and John Greene Nature Preserve Ravine, Bluff, and Shoreline Restoration

Lake Forest, Illinois

General Notes

PROJECT NO: 24-0271		SHEET NO:
DESIGNED BY	DAK/KNJ	C1.1
DRAWN BY	ATJ/KNJ	
CHECKED BY	DAK/KNJ	
APPROVED BY	DAK	PAGE NO:
ISSUE DATE	01/08/2026	02 OF 27

For Permit

File: P:\24\00\24-0271 LFOLA-Greene NP Bluff and Ravines\05 CAD\24-0271 Greene NP Bluff and Ravines.dwg Plot Date: January 8, 2026 Plotted by: Kirsten James

LEGEND

- Ex. Property Line
- Ex. Parcel Line
- Ex. Easement Line
- Ex. Right-of-Way Line
- Ex. Contours (Lake County)
- Ex. Contours (Hey Survey)
- Ex. Bathymetric Contours (Hey Survey)
- Prop. Contours
- Ex. FEMA Floodway Line
- Ex. FEMA Floodplain Line
- Ex. FEMA Floodplain Line (by Elevation)
- Ex. Wetland Boundary (WL)
- Ex. Waters Boundary (OHWM)
- Ex. Drainageway
- Ex. Ravine Centerline
- Ex. Storm Sewer
- Existing Sanitary Sewer
- Ex. Sanitary Forcemain
- Ex. Drain Tile
- Ex. Water Main (W)
- Ex. Gas Main (G)
- Ex. Electric Line (E)
- Ex. Telephone Line (T)
- Ex. Cable TV Line (CTV)
- Ex. Fiber Optic Line (FO)
- Ex. Overhead Wire (OHW)
- Ex. Fence (X)
- Ex. Guardrail
- Potential Construction Access Route
- Prop. Storm Sewer
- Prop. Sanitary Sewer
- Prop. Water Main (W)
- Prop. Silt Fence (SF)
- Prop. Perimeter Erosion Barrier (PEB)
- Prop. Floating Silt Curtain (FSC)
- Prop. Limits of Grading (LIM)
- Ex. Sensitive Area
- Prop. Exposed Stone Toe
- Prop. Bluff Slope Grade to Remain Zone
- Prop. Bluff Slope Grading Zone
- Prop. Exposed Stone Toe
- Prop. Ravine Side Slope Stabilization

- Ex. Inlet
- Ex. Catch Basin (CB)
- Ex. Storm Manhole (MH)
- Ex. Flared End Section (FES)
- Ex. Sanitary Sewer Manhole
- Ex. Valve Vault
- Ex. Fire Hydrant
- Ex. Buffalo Box
- Ex. Power Pole
- Ex. Electric Manhole
- Ex. Light
- Ex. Traffic Light
- Ex. Gas Valve
- Ex. Telephone Manhole
- Ex. Sign
- Ex. Tree
- Ex. Shrub
- Prop. Tree Removal
- Prop. Inlet Protection
- Prop. Inlet
- Prop. Catch Basin (CB)
- Prop. Storm Manhole (MH)
- Prop. Flared End Section (FES)
- Prop. Sanitary Manhole (MH)
- Prop. Hydrant
- Prop. Water Valve and Vault
- Prop. Water Valve
- Prop. Reducer
- 671.13 (ME) Prop. Spot Elevation (Match Existing)
- Drainage Arrow
- Drainage Arrow - Swale
- Drainage Arrow - Overflow
- Prop. Woody Material Stabilization
- Prop. Nearshore Small Dia. Stone Cluster
- Prop. Nearshore Large Dia. Stone Cluster
- Prop. Nearshore Natrx Cube

- Prop. Offshore Habitat Reef
- Prop. Pre-fill Sand
- Prop. Outfall Stone
- Prop. Wooded Bluff Seed/Plant Zone
- Prop. Open Bluff Seed/Plant Zone
- Prop. Dune Plant Zone

LEGEND

No.	Revision/Issue	Date

Hey and Associates, Inc.
Engineering, Ecology and Landscape Architecture
26575 West Commerce Drive, Suite 601
Volo, Illinois 60073
Office (847) 740-0888
Fax (847) 740-2888
Volo@Heyassoc.com

Professional Design Firm
License No. 184-002429

Jean and John Greene Nature Preserve Ravine, Bluff, and Shoreline Restoration

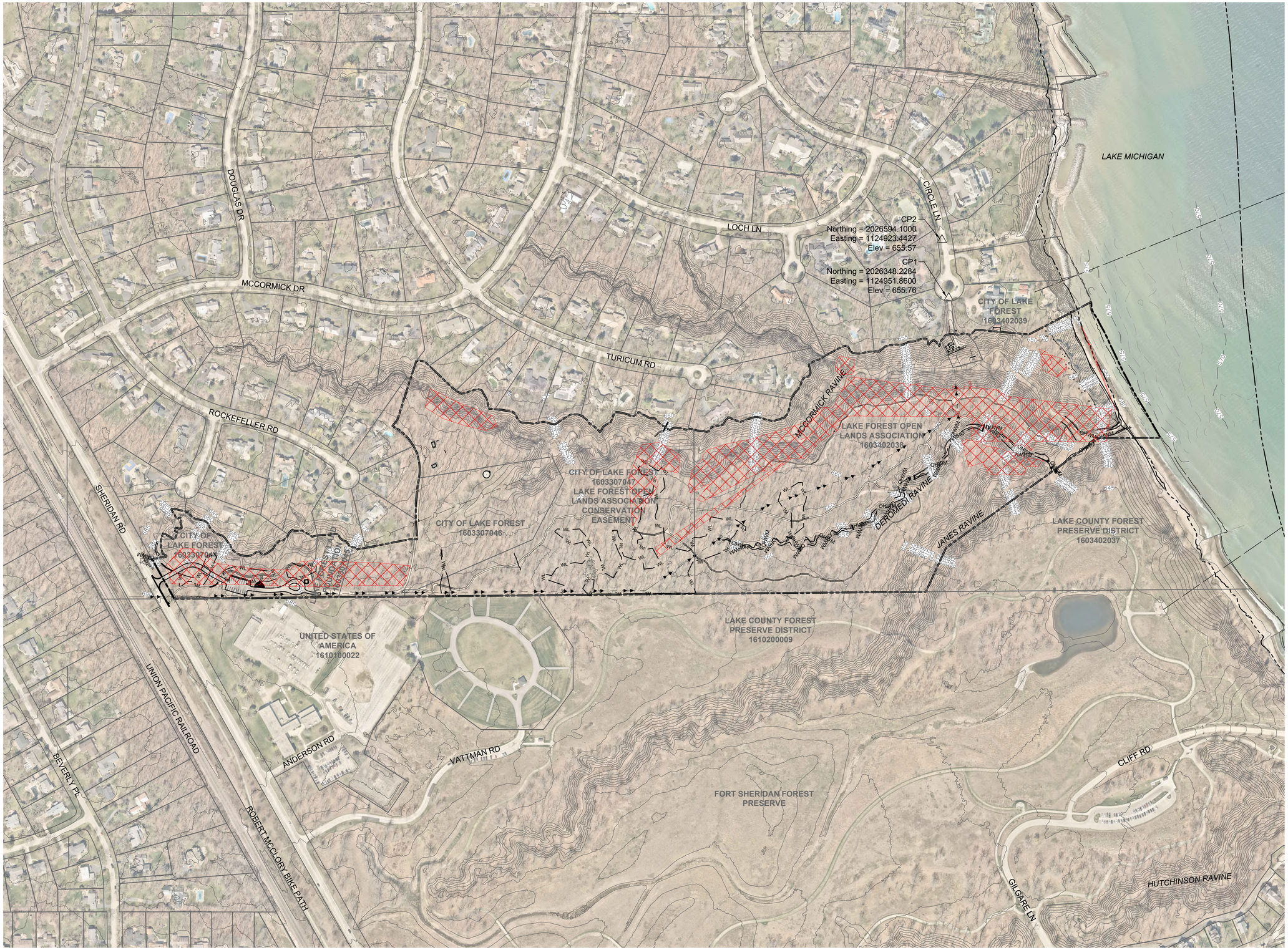
Lake Forest, Illinois

General Notes and Legend

PROJECT NO: 24-0271		SHEET NO:
DESIGNED BY	DAK/KNJ	C1.2
DRAWN BY	ATJ/KNJ	
CHECKED BY	DAK/KNJ	
APPROVED BY	DAK	PAGE NO:
ISSUE DATE	01/08/2026	03 OF 27

For Permit

File: P:\24\00\24-0271 LFOI\A-Greene NP Bluff and Ravines\05 CAD\24-0271 Greene NP Bluff and Ravines.dwg Plot Date - January 8, 2026 Plotted by: Kirsten James



0 200 400

Scale: 1" = 200'

N

LEGEND

- Ex. Property Line
- Ex. Parcel Line
- Ex. Contours (Lake County)
- Ex. Contours (Hey Survey)
- Ex. Bathymetric Contours (PRI Survey)
- Ex. FEMA Floodway Line
- Ex. FEMA Floodplain Line
- Ex. FEMA Floodplain Line (by Elevation)
- Ex. Wetland Boundary (WL)
- Ex. Waters Boundary (OHWM)
- Ex. Drainageway
- Ex. Ravine Centerline
- Ex. Storm Sewer
- Ex. Sanitary Forcemain
- Ex. Sensitive Area

NOTES:

1. Existing trails are based on previous design drawings. Actual trail location may vary.

No.	Revision/Issue	Date

Hey and Associates, Inc.
Engineering, Ecology and Landscape Architecture
26575 West Commerce Drive, Suite 601
Volo, Illinois 60073
Office (847) 740-0888
Fax (847) 740-2888
Volo@Heyassoc.com

Professional Design Firm
License No. 184-002429

Jean and John Greene Nature Preserve Ravine, Bluff, and Shoreline Restoration

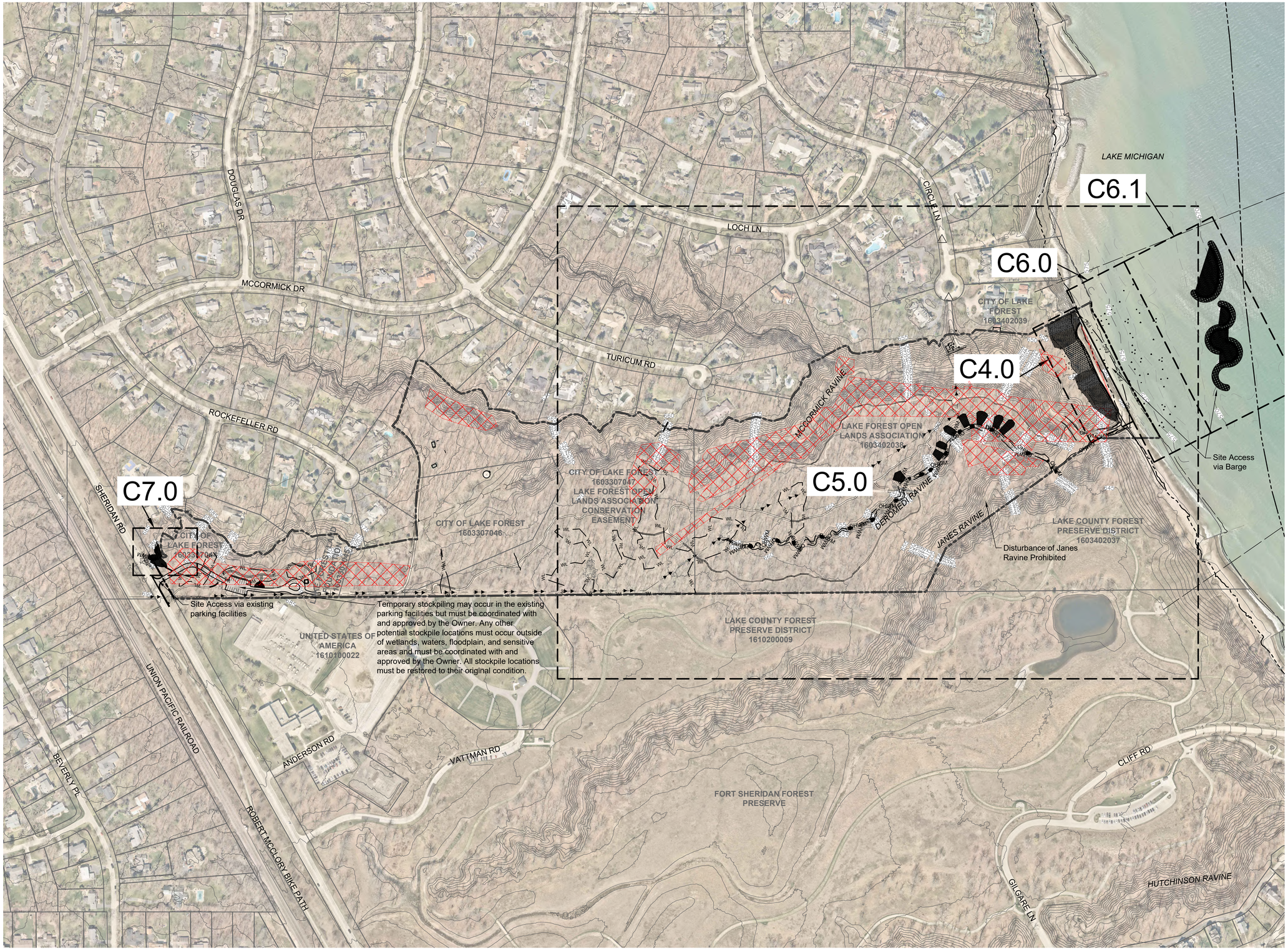
Lake Forest, Illinois

Existing Conditions

PROJECT NO: 24-0271		SHEET NO:
DESIGNED BY	DAK/KNJ	C2.0
DRAWN BY	ATJ/KNJ	
CHECKED BY	DAK/KNJ	
APPROVED BY	DAK	PAGE NO:
ISSUE DATE	01/08/2026	04 OF 27

For Permit

File: P:\24\00\24-0271 LFOLA-Greene NP Bluff and Ravines\05 CAD\24-0271 Greene NP Bluff and Ravines.dwg Plot Date: January 8, 2026 Plotted by: Kirsten James



0 200 400

Scale: 1" = 200'

N

LEGEND

- Ex. Property Line
- Ex. Parcel Line
- Ex. Contours (Lake County)
- Ex. Contours (Hey Survey)
- Ex. Bathymetric Contours (Hey Survey)
- Ex. FEMA Floodway Line
- Ex. FEMA Floodplain Line
- Ex. FEMA Floodplain Line (by Elevation)
- Ex. Wetland Boundary (WL)
- Ex. Waters Boundary (OHWM)
- Ex. Drainageway
- Ex. Ravine Centerline
- Ex. Sanitary Forcemain
- Potential Construction Access Route
- Ex. Sensitive Area

NOTES:

1. Existing trails are based on previous design drawings. Actual trail location may vary.
2. Avoid pitting and rutting of the site. Work shall be performed under hard and/or dry ground conditions or timber matting shall be used.

No.	Revision/Issue	Date

Hey and Associates, Inc.
Engineering, Ecology and Landscape Architecture
26575 West Commerce Drive, Suite 601
Volo, Illinois 60073
Office (847) 740-0888
Fax (847) 740-2888
Volo@Heyassoc.com

Professional Design Firm
License No. 184-002429

Jean and John Greene Nature Preserve Ravine, Bluff, and Shoreline Restoration

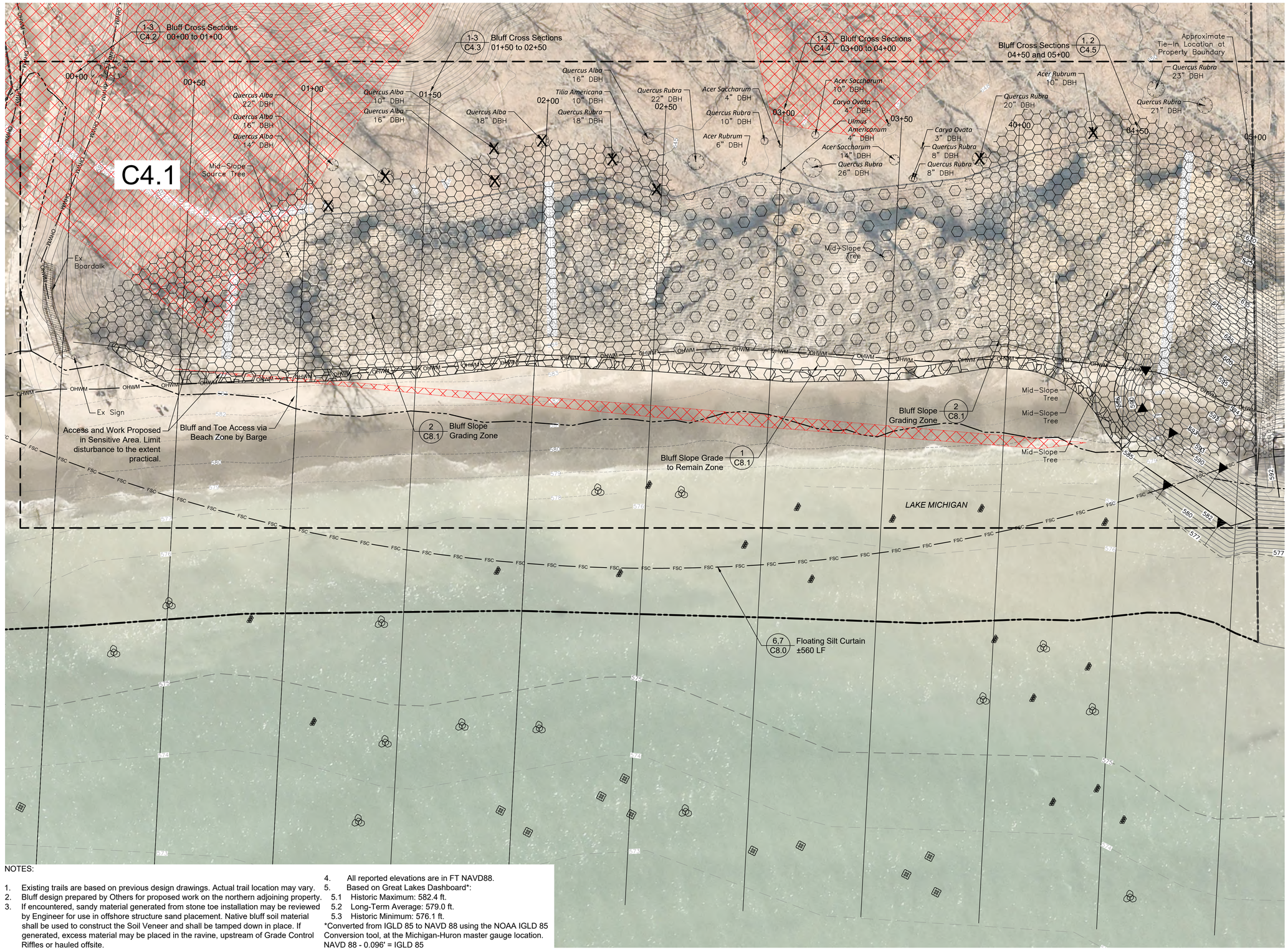
Lake Forest, Illinois

Overall Plan

PROJECT NO: 24-0271		SHEET NO:
DESIGNED BY	DAK/KNJ	C3.0
DRAWN BY	ATJ/KNJ	
CHECKED BY	DAK/KNJ	
APPROVED BY	DAK	PAGE NO:
ISSUE DATE	01/08/2026	05 OF 27

For Permit

File: P:\24\0024-0271 LEO_A-Greene NP Bluff and Ravines\05.CAD\24-0271 Greene NP Bluff and Ravines.dwg Plot Date: January 8, 2026 Plotted by: Kirsten James



NOTES:

1. Existing trails are based on previous design drawings. Actual trail location may vary.
2. Bluff design prepared by Others for proposed work on the northern adjoining property.
3. If encountered, sandy material generated from stone toe installation may be reviewed by Engineer for use in offshore structure sand placement. Native bluff soil material shall be used to construct the Soil Veneer and shall be tamped down in place. If generated, excess material may be placed in the ravine, upstream of Grade Control Riffles or hauled offsite.
4. All reported elevations are in FT NAVD88.
5. Based on Great Lakes Dashboard*:
   - 5.1 Historic Maximum: 582.4 ft.
   - 5.2 Long-Term Average: 579.0 ft.
   - 5.3 Historic Minimum: 576.1 ft.

*Converted from IGLD 85 to NAVD 88 using the NOAA IGLD 85 Conversion tool, at the Michigan-Huron master gauge location. NAVD 88 - 0.096' = IGLD 85

0 20 40
Scale: 1" = 20'

LEGEND

- Ex. Property Line
- Ex. Parcel Line
- Ex. Contours (Lake County)
- Ex. Contours (Hey Survey)
- Ex. Bathymetric Contours (Hey Survey)
- Ex. FEMA Floodway Line
- Ex. FEMA Floodplain Line
- Ex. FEMA Floodplain Line (by Elevation)
- Ex. Waters Boundary (OHWM)
- Prop. Floating Silt Curtain (FSC)
- Ex. Sensitive Area
- Prop. Exposed Stone Toe
- Prop. Bluff Slope Grade to Remain Zone
- Prop. Bluff Slope Grading Zone
- Ex. Tree
- Prop. Tree Removal

No.	Revision/Issue	Date

Hey and Associates, Inc.
Engineering, Ecology and Landscape Architecture
26575 West Commerce Drive, Suite 601
Volo, Illinois 60073
Office (847) 740-0888
Fax (847) 740-2888
Volo@Heyassoc.com

Professional Design Firm
License No. 184-002429

Jean and John Greene Nature Preserve Ravine, Bluff, and Shoreline Restoration

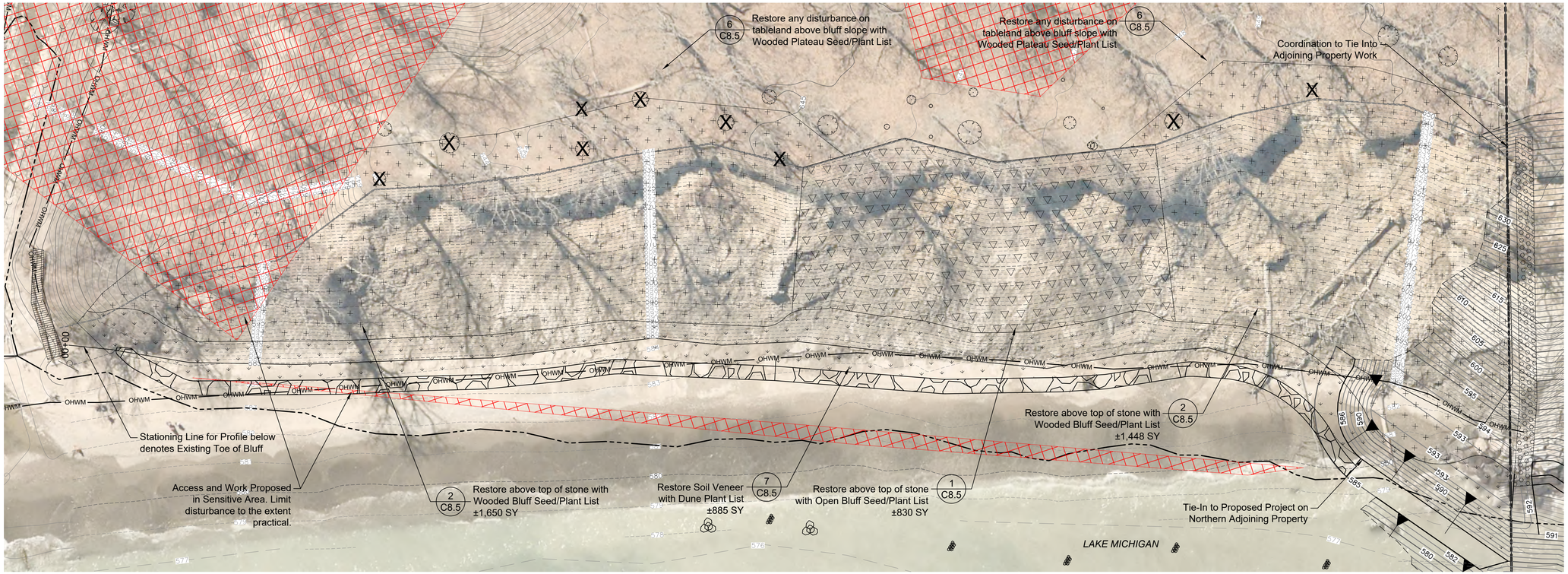
Lake Forest, Illinois

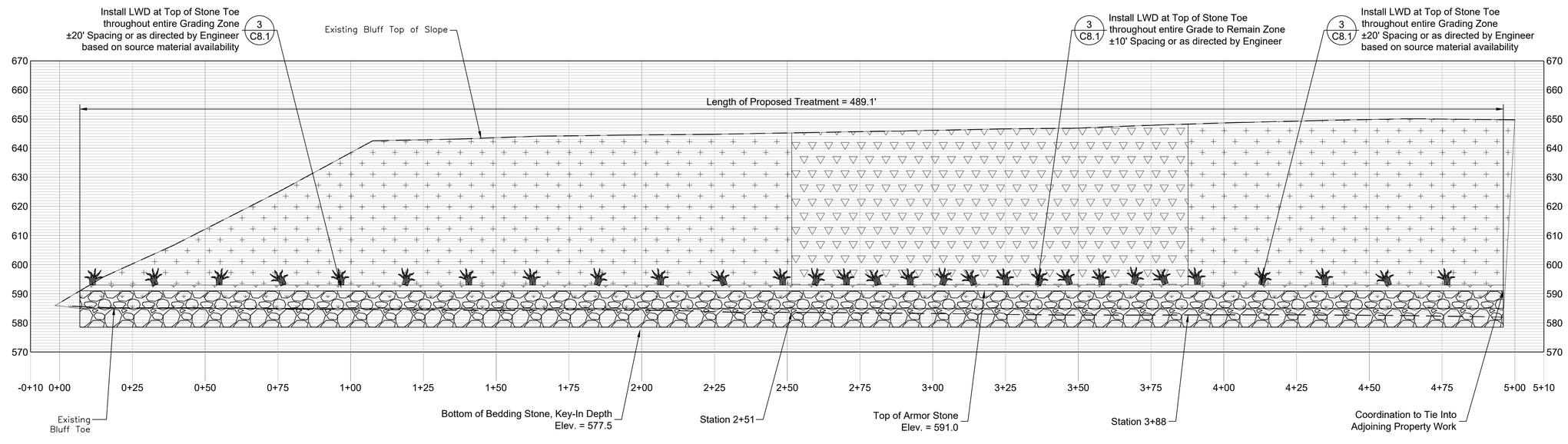
Bluff Plan

PROJECT NO:	24-0271	SHEET NO:
DESIGNED BY	DAK/KNJ	C4.0
DRAWN BY	ATJ/KNJ	
CHECKED BY	DAK/KNJ	
APPROVED BY	DAK	PAGE NO:
ISSUE DATE	01/08/2026	06 OF 27

For Permit

File: P:\24\0\0\24-0271 LFO\LA-Greene NP Bluff and Ravines\05 CAD\24-0271 Greene NP Bluff and Ravines.dwg Plot Date: January 8, 2026 Plotted by: Kristen James





NOTES:

1. Existing trails are based on previous design drawings. Actual trail location may vary.
2. Bluff design prepared by Others for proposed work on the northern adjoining property.
3. If encountered, sandy material generated from stone toe installation may be reviewed by Engineer for use in offshore structure sand placement. Native bluff soil material shall be used to construct the Soil Veneer and shall be tamped down in place. If generated, excess material may be placed in the ravine, upstream of Grade Control Riffles or hauled offsite.
4. All reported elevations are in FT NAVD88.
5. Based on Great Lakes Dashboard*:
   - 5.1 Historic Maximum: 582.4 ft.
   - 5.2 Long-Term Average: 579.0 ft.
   - 5.3 Historic Minimum: 576.1 ft.

*Converted from IGLD 85 to NAVD 88 using the NOAA IGLD 85 Conversion tool, at the Michigan-Huron master gauge location. NAVD 88 - 0.096' = IGLD 85

H:0 20 40
V:0 5 10
Scale: 1" = 20' (Horiz.)
1" = 5' (Vert.)

LEGEND

- Ex. Property Line
- Ex. Parcel Line
- Ex. Contours (Lake County)
- Ex. Contours (Hey Survey)
- Ex. Bathymetric Contours (Hey Survey)
- Ex. FEMA Floodway Line
- Ex. FEMA Floodplain Line
- Ex. FEMA Floodplain Line (by Elevation)
- Ex. Waters Boundary (OHWM)
- Prop. Floating Silt Curtain (FSC)
- Ex. Sensitive Area
- Prop. Exposed Stone Toe
- Prop. Wooded Bluff Seed/Plant Zone
- Prop. Open Bluff Seed/Plant Zone
- Prop. Dune Plant Zone
- Prop. Tree Removal

No.	Revision/Issue	Date

Hey and Associates, Inc.
Engineering, Ecology and Landscape Architecture
26575 West Commerce Drive, Suite 601
Volo, Illinois 60073
Office (847) 740-0888
Fax (847) 740-2888
Volo@Heyassoc.com

Professional Design Firm
License No. 184-002429

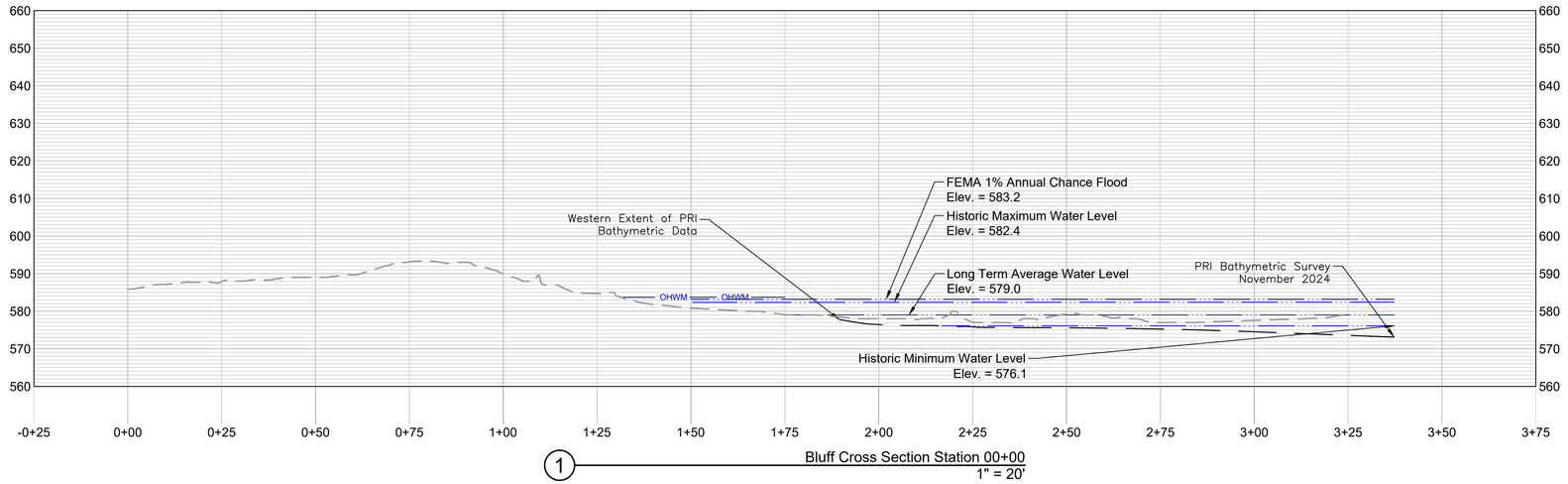
Jean and John Greene Nature Preserve Ravine, Bluff, and Shoreline Restoration

Lake Forest, Illinois

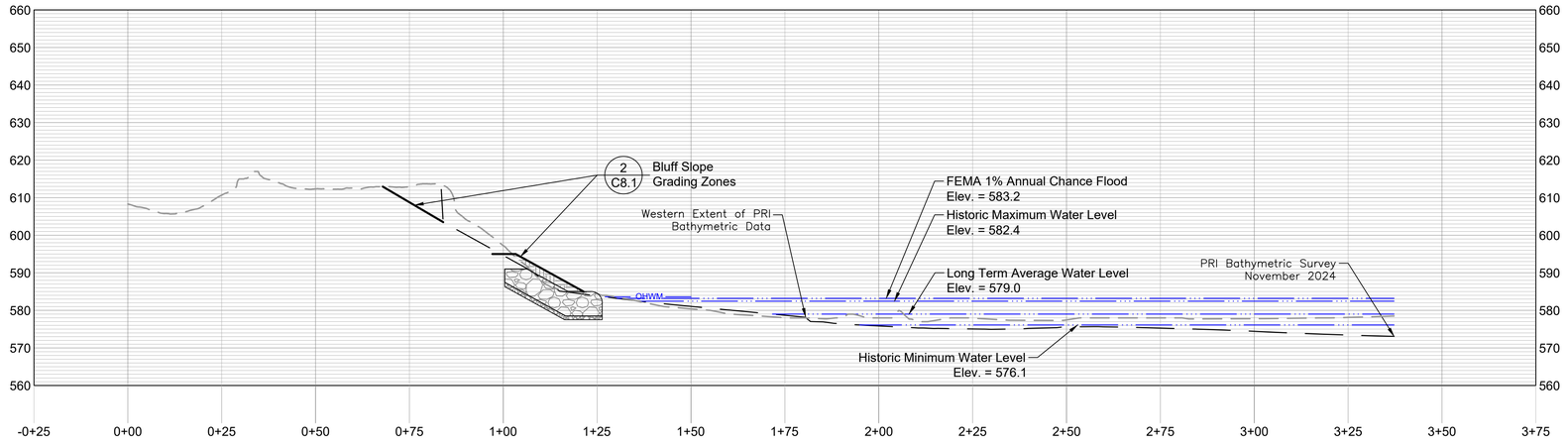
Bluff Plan and Profile

PROJECT NO: 24-0271		SHEET NO:
DESIGNED BY	DAK/KNJ	C4.1
DRAWN BY	ATJ/KNJ	
CHECKED BY	DAK/KNJ	
APPROVED BY	DAK	PAGE NO:
ISSUE DATE	01/08/2026	07 OF 27

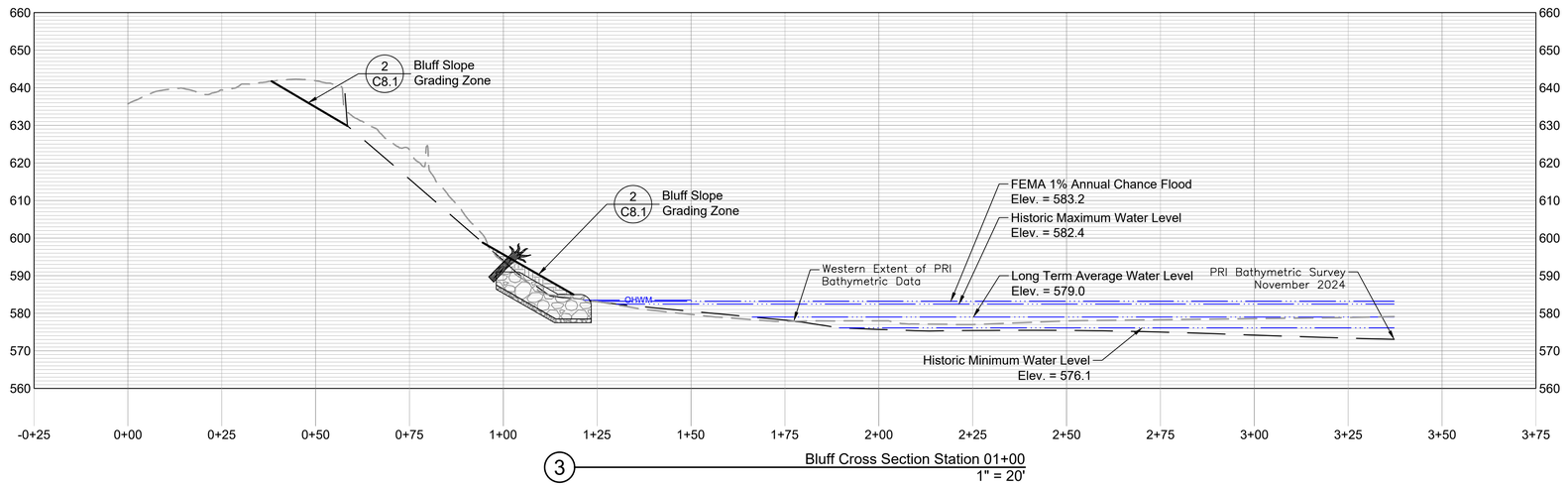
For Permit



1 Bluff Cross Section Station 00+00
1" = 20'



2 Bluff Cross Section Station 00+50
1" = 20'



3 Bluff Cross Section Station 01+00
1" = 20'

H:0 20 40
V:0 5 10
Scale: 1" = 20' (Horiz.)
1" = 5' (Vert.)

LEGEND

Ex. Waters Boundary OHWM OHWM OHWM
Ex. Relative Water Levels and Flood Elevations
Ex. Grade (Historical)
Ex. Grade
Pr. Grade

NOTES:

1. All reported elevations are in FT NAVD88.
2. Based on Great Lakes Dashboard*:
   2.1. Historic Maximum: 582.4 ft.
   2.2. Long-Term Average: 579.0 ft.
   2.3. Historic Minimum: 576.1 ft.

*Converted from IGLD 85 to NAVD 88 using the NOAA IGLD 85 Conversion tool, at the Michigan-Huron master gauge location.
NAVD 88 - 0.096' = IGLD 85

No.	Revision/Issue	Date

Hey and Associates, Inc.
Engineering, Ecology and Landscape Architecture
26575 West Commerce Drive, Suite 601
Volo, Illinois 60073
Office (847) 740-0888
Fax (847) 740-2888
Volo@Heyassoc.com

Professional Design Firm
License No. 184-002429

Jean and John Greene Nature Preserve Ravine, Bluff, and Shoreline Restoration

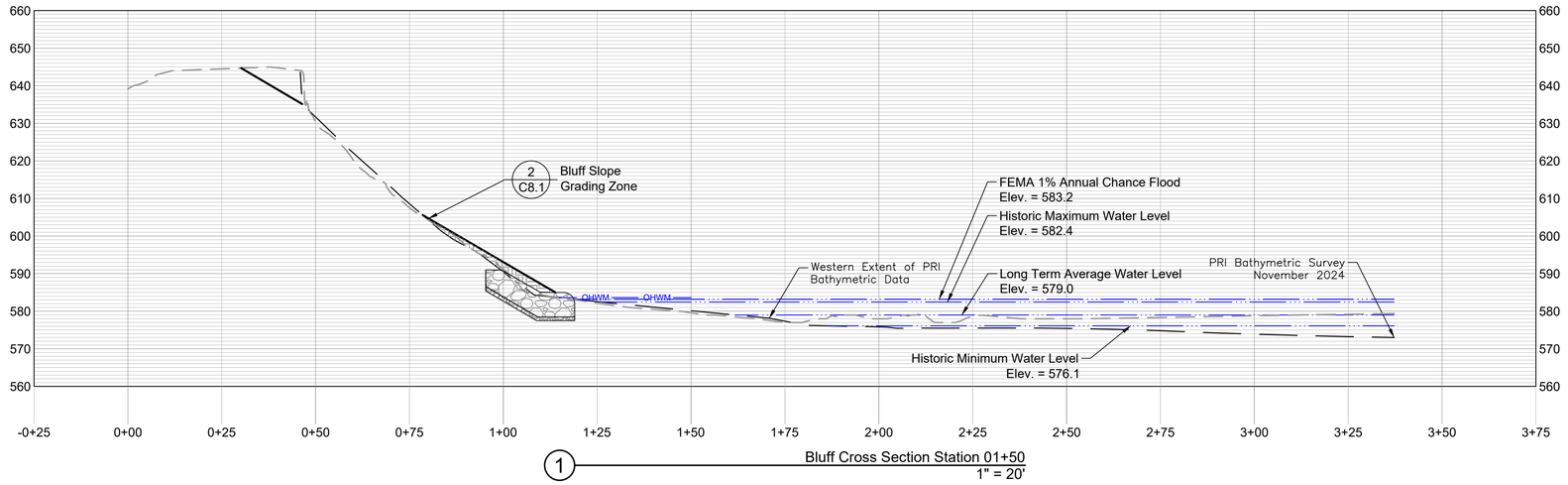
Lake Forest, Illinois

Bluff Cross Section

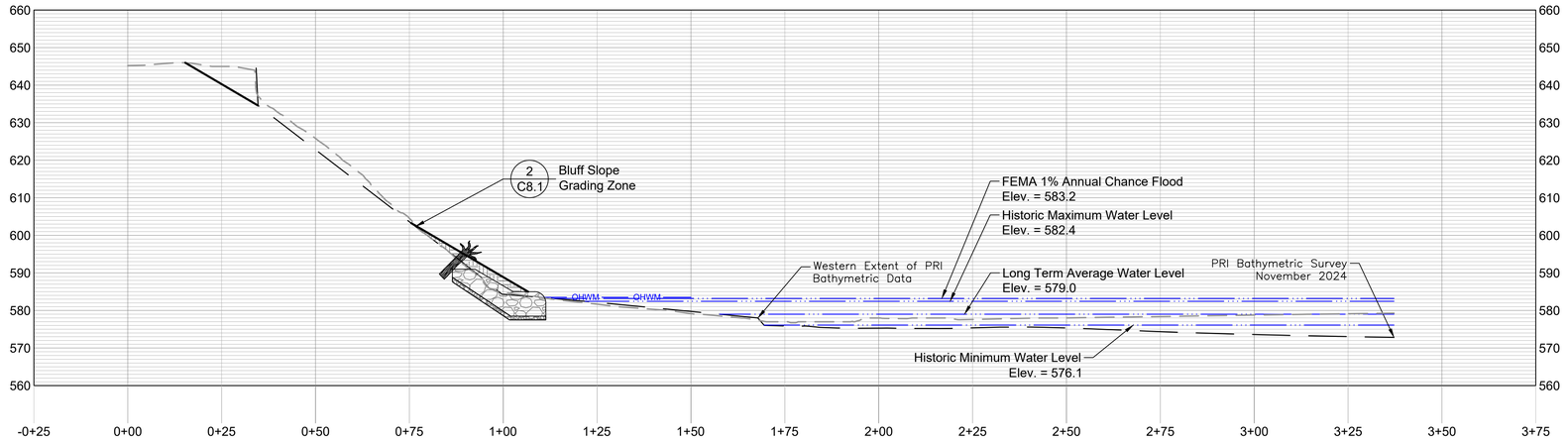
PROJECT NO: 24-0271		SHEET NO:
DESIGNED BY	DAK/KNJ	C4.2
DRAWN BY	ATJ/KNJ	
CHECKED BY	DAK/KNJ	
APPROVED BY	DAK	PAGE NO:
ISSUE DATE	01/08/2026	08 OF 27

For Permit

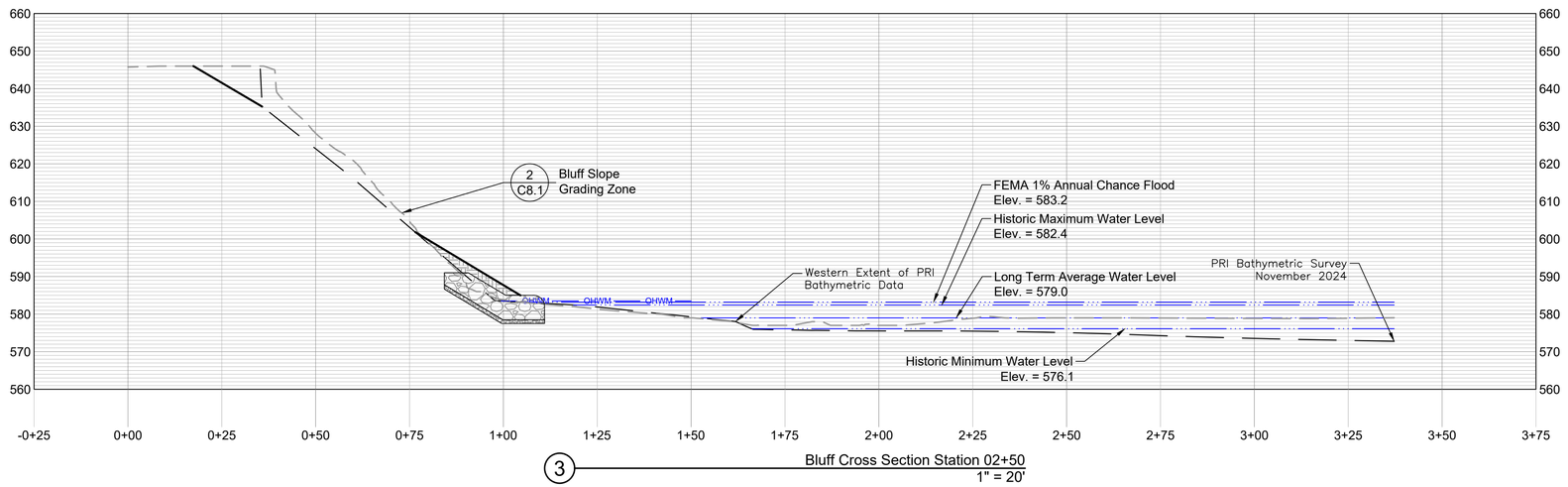
File: P:\24\0024-0271 LFQLA-Greene NP Bluff and Ravines\05 CAD\24-0271 Greene NP Bluff and Ravines.dwg Plot Date: January 8, 2026 Plotted by: Kirsten James



1 Bluff Cross Section Station 01+50
1" = 20'



2 Bluff Cross Section Station 02+00
1" = 20'



3 Bluff Cross Section Station 02+50
1" = 20'

H:0 20 40
V:0 5 10
Scale: 1" = 20' (Horiz.)
1" = 5' (Vert.)

LEGEND

Ex. Waters Boundary
OHWM OHWM OHWM
Ex. Relative Water Levels and Flood Elevations
Ex. Grade (Historical)
Ex. Grade
Pr. Grade

NOTES:

1. All reported elevations are in FT NAVD88.
2. Based on Great Lakes Dashboard*:
   2.1. Historic Maximum: 582.4 ft.
   2.2. Long-Term Average: 579.0 ft.
   2.3. Historic Minimum: 576.1 ft.

*Converted from IGLD 85 to NAVD 88 using the NOAA IGLD 85 Conversion tool, at the Michigan-Huron master gauge location.
NAVD 88 - 0.096' = IGLD 85

No.	Revision/Issue	Date

Hey and Associates, Inc.
Engineering, Ecology and Landscape Architecture
26575 West Commerce Drive, Suite 601
Volo, Illinois 60073
Office (847) 740-0888
Fax (847) 740-2888
Volo@Heyassoc.com

Professional Design Firm
License No. 184-002429

Jean and John Greene Nature Preserve Ravine, Bluff, and Shoreline Restoration

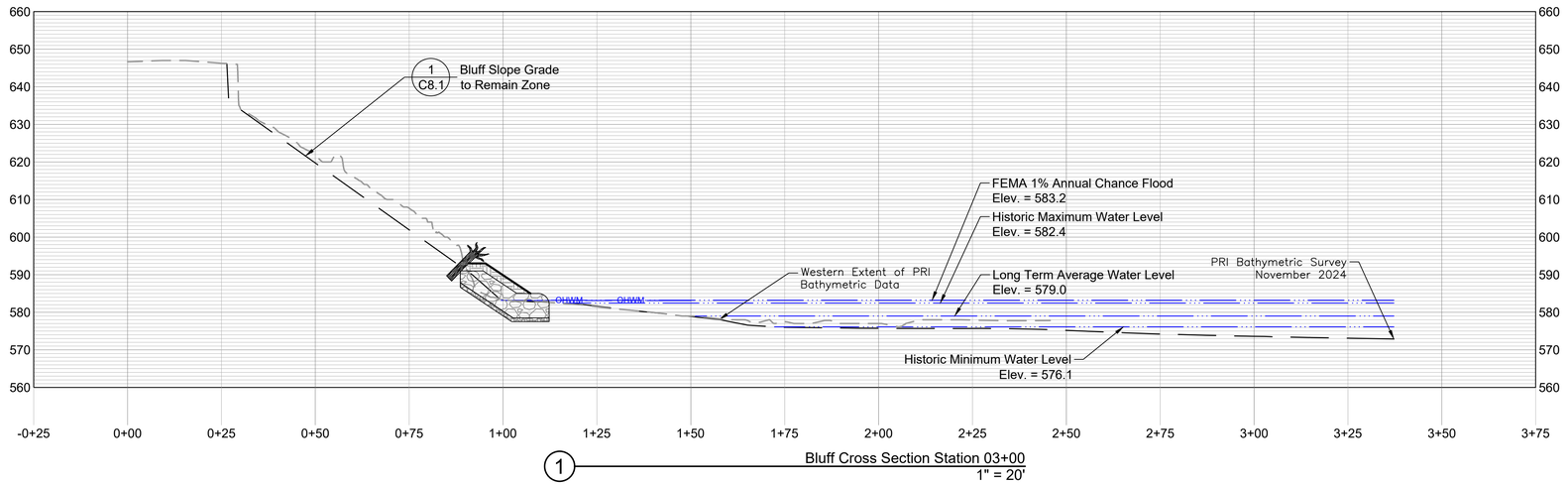
Lake Forest, Illinois

Bluff Cross Section

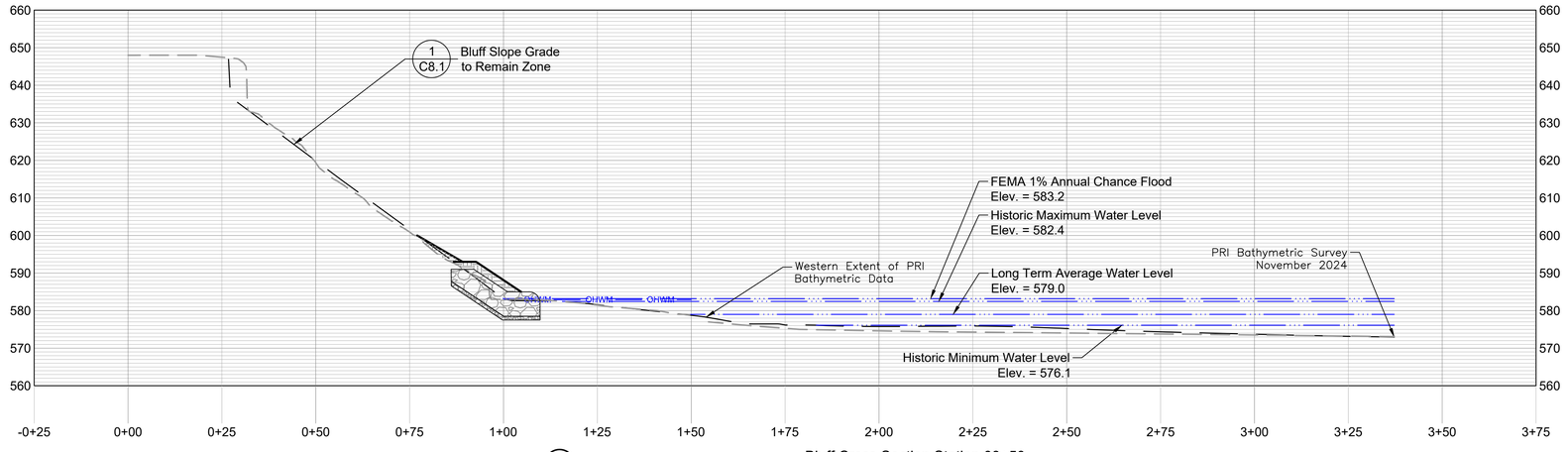
PROJECT NO: 24-0271		SHEET NO:
DESIGNED BY	DAK/KNJ	C4.3
DRAWN BY	ATJ/KNJ	
CHECKED BY	DAK/KNJ	
APPROVED BY	DAK	PAGE NO:
ISSUE DATE	01/08/2026	09 OF 27

For Permit

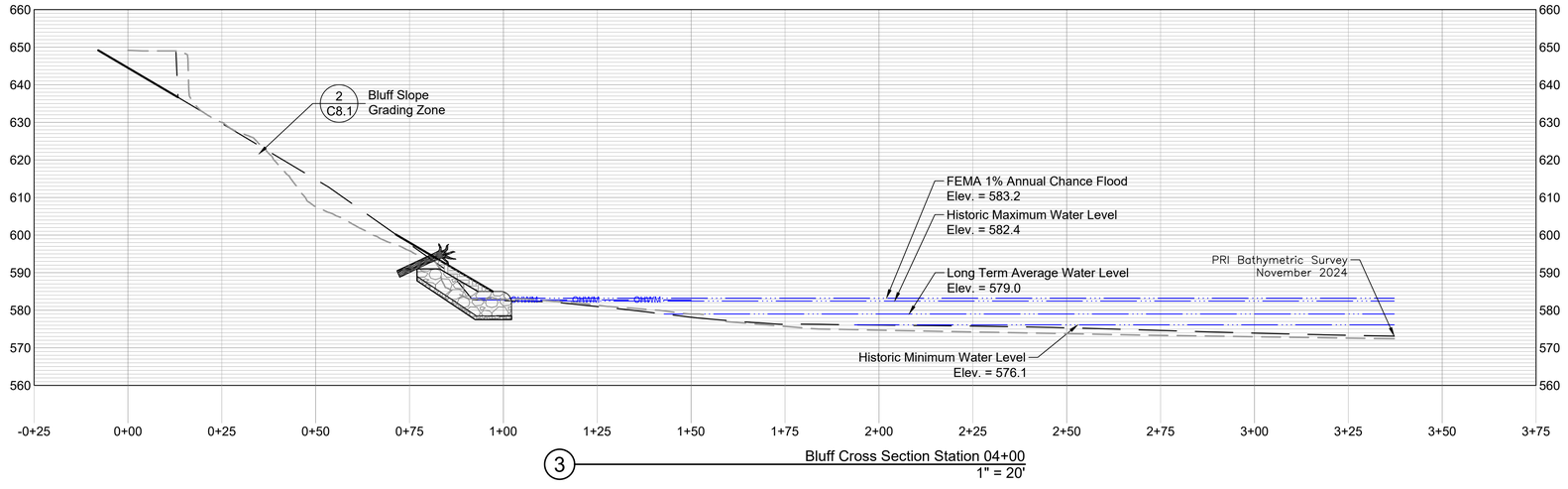
File: P:\24\00024-0271 LFOLA-Greene NP Bluff and Ravines\05 CAD\24-0271 Greene NP Bluff and Ravines.dwg Plot Date: January 8, 2026 Plotted by: Kirsten James



1 Bluff Cross Section Station 03+00
1" = 20'



2 Bluff Cross Section Station 03+50
1" = 20'



3 Bluff Cross Section Station 04+00
1" = 20'

H:0 20 40
V:0 5 10
Scale: 1" = 20' (Horiz.)
1" = 5' (Vert.)

LEGEND

Ex. Waters Boundary
OHWM OHWM OHWM
Ex. Relative Water Levels and Flood Elevations
Ex. Grade (Historical)
Ex. Grade
Pr. Grade

NOTES:

1. All reported elevations are in FT NAVD88.
2. Based on Great Lakes Dashboard*:
   2.1. Historic Maximum: 582.4 ft.
   2.2. Long-Term Average: 579.0 ft.
   2.3. Historic Minimum: 576.1 ft.

*Converted from IGLD 85 to NAVD 88 using the NOAA IGLD 85 Conversion tool, at the Michigan-Huron master gauge location.
NAVD 88 - 0.096' = IGLD 85

No.	Revision/Issue	Date

Hey and Associates, Inc.
Engineering, Ecology and Landscape Architecture
26575 West Commerce Drive, Suite 601
Volo, Illinois 60073
Office (847) 740-0888
Fax (847) 740-2888
Volo@Heyassoc.com

Professional Design Firm
License No. 184-002429

Jean and John Greene Nature Preserve Ravine, Bluff, and Shoreline Restoration

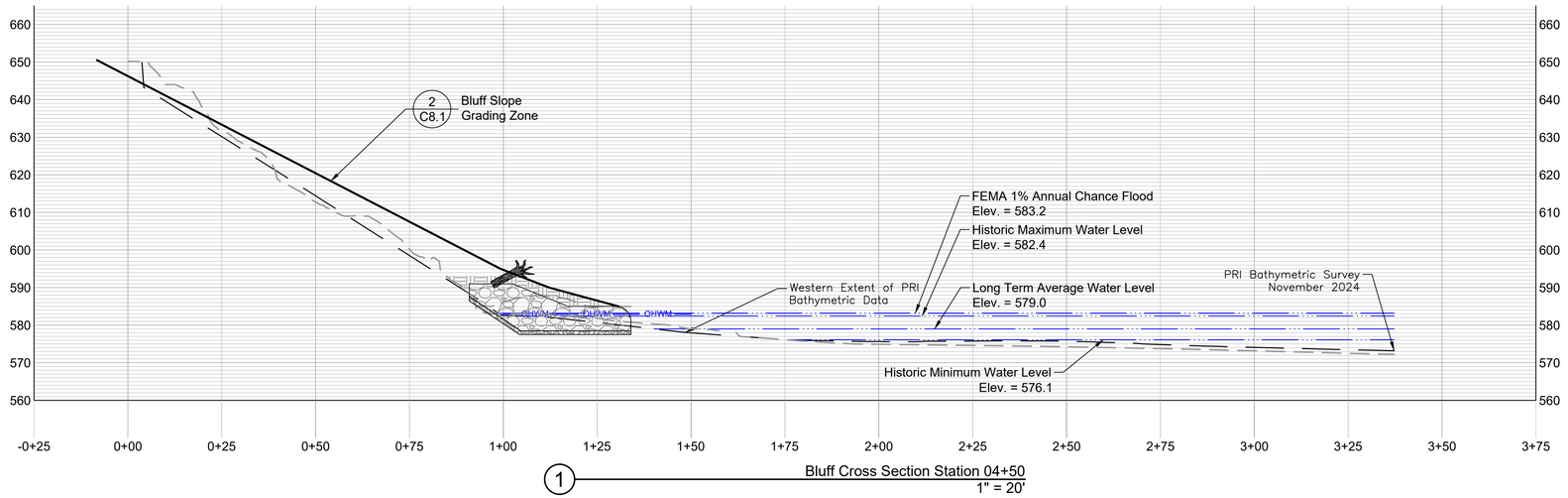
Lake Forest, Illinois

Bluff Cross Section

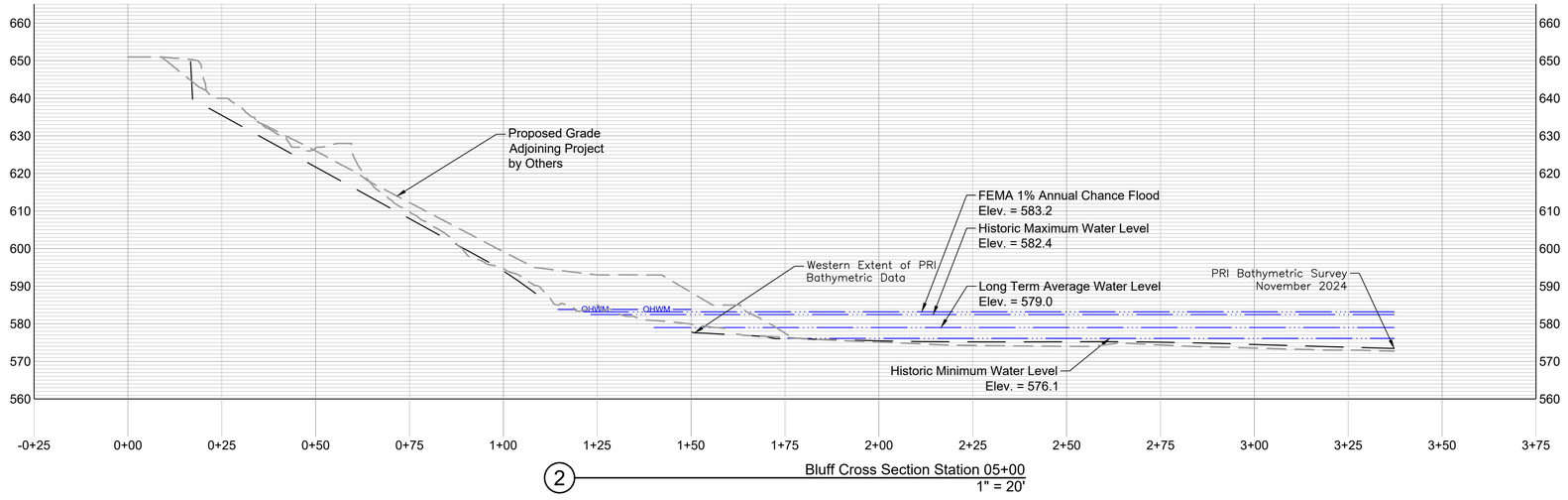
PROJECT NO:	24-0271	SHEET NO:
DESIGNED BY	DAK/KNJ	C4.4
DRAWN BY	ATJ/KNJ	
CHECKED BY	DAK/KNJ	
APPROVED BY	DAK	PAGE NO:
ISSUE DATE	01/08/2026	10 OF 27

For Permit

File: P:\24\0024-0271 LFOLA-Greene NP Bluff and Ravines\05 CAD\24-0271 Greene NP Bluff and Ravines.dwg Plot Date: January 8, 2026 Plotted by: Kirsten James



1 Bluff Cross Section Station 04+50
1" = 20'



2 Bluff Cross Section Station 05+00
1" = 20'

H:0 20 40
V:0 5 10
Scale: 1" = 20' (Horiz.)
1" = 5' (Vert.)

LEGEND

Ex. Waters Boundary
OHWM OHWM OHWM
Ex. Relative Water Levels and Flood Elevations
Ex. Grade (Historical)
Ex. Grade
Pr. Grade

NOTES:

1. All reported elevations are in FT NAVD88.
2. Based on Great Lakes Dashboard*:
   2.1. Historic Maximum: 582.4 ft.
   2.2. Long-Term Average: 579.0 ft.
   2.3. Historic Minimum: 576.1 ft.

*Converted from IGLD 85 to NAVD 88 using the NOAA IGLD 85 Conversion tool, at the Michigan-Huron master gauge location.
NAVD 88 - 0.096' = IGLD 85

No.	Revision/Issue	Date

Hey and Associates, Inc.
Engineering, Ecology and Landscape Architecture
26575 West Commerce Drive, Suite 601
Volo, Illinois 60073
Office (847) 740-0888
Fax (847) 740-2888
Volo@HeyAssoc.com

Professional Design Firm
License No. 184-002429

Jean and John Greene Nature Preserve Ravine, Bluff, and Shoreline Restoration

Lake Forest, Illinois

Bluff Cross Section

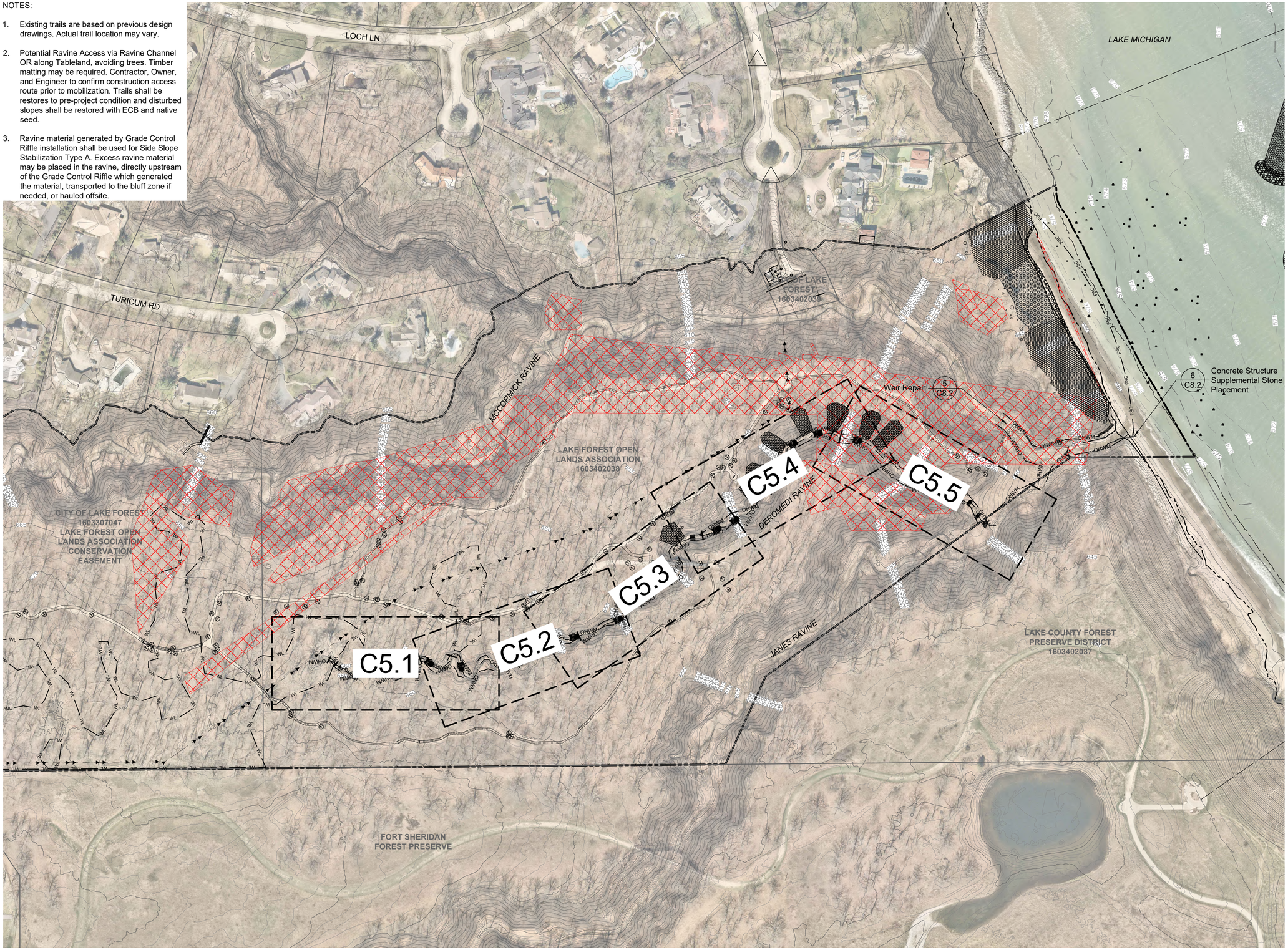
PROJECT NO: 24-0271		SHEET NO:
DESIGNED BY	DAK/KNJ	C4.5
DRAWN BY	ATJ/KNJ	
CHECKED BY	DAK/KNJ	
APPROVED BY	DAK	PAGE NO:
ISSUE DATE	01/08/2026	11 OF 27

For Permit

File: P:\24\00024-0271 LFOLA-Greene NP Bluff and Ravines\05 CAD\24-0271 Greene NP Bluff and Ravines.dwg Plot Date: January 8, 2026 Plotted by: Kirsten James

NOTES:

1. Existing trails are based on previous design drawings. Actual trail location may vary.
2. Potential Ravine Access via Ravine Channel OR along Tableland, avoiding trees. Timber matting may be required. Contractor, Owner, and Engineer to confirm construction access route prior to mobilization. Trails shall be restores to pre-project condition and disturbed slopes shall be restored with ECB and native seed.
3. Ravine material generated by Grade Control Riffle installation shall be used for Side Slope Stabilization Type A. Excess ravine material may be placed in the ravine, directly upstream of the Grade Control Riffle which generated the material, transported to the bluff zone if needed, or hauled offsite.



0 100 200

Scale: 1" = 100'

N

LEGEND

- Ex. Property Line
- Ex. Parcel Line
- Ex. Contours (Lake County)
- Ex. Contours (Hey Survey)
- Ex. Wetland Boundary (WL)
- Ex. Waters Boundary (OHWM)
- Ex. Drainageway
- Ex. Ravine Centerline
- Ex. Storm Sewer
- Ex. Sanitary Forcemain
- Potential Construction Access Route
- Ex. Sensitive Area
- Prop. Ravine Side Slope Stabilization
- Prop. Woody Material Stabilization

No.	Revision/Issue	Date

Hey and Associates, Inc.
Engineering, Ecology and Landscape Architecture
26575 West Commerce Drive, Suite 601
Volo, Illinois 60073
Office (847) 740-0888
Fax (847) 740-2888
Volo@Heyassoc.com

Professional Design Firm
License No. 184-002429

Jean and John Greene Nature Preserve Ravine, Bluff, and Shoreline Restoration

Lake Forest, Illinois

Ravine Plan

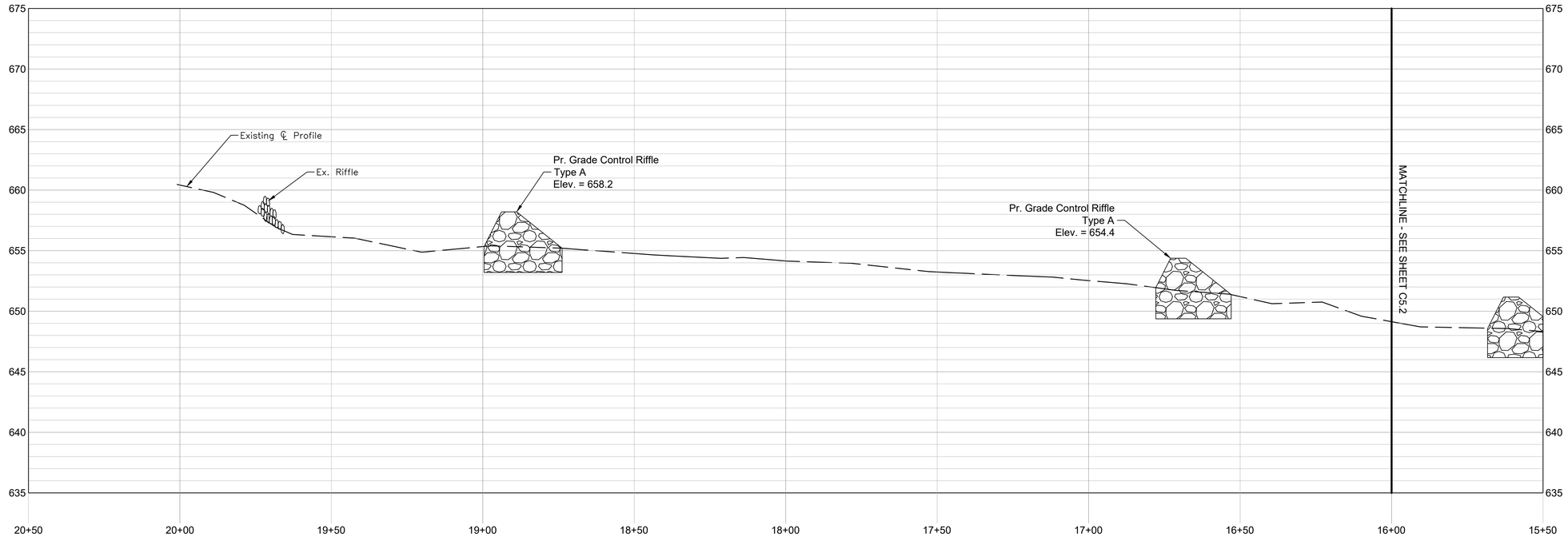
PROJECT NO:	24-0271	SHEET NO:
DESIGNED BY	DAK/KNJ	C5.0
DRAWN BY	ATJ/KNJ	
CHECKED BY	DAK/KNJ	
APPROVED BY	DAK	PAGE NO:
ISSUE DATE	01/08/2026	12 OF 27

For Permit

File: P:\24\0024-0271 LFOLA-Greene NP Bluff and Ravines\05 CAD\24-0271 Greene NP Bluff and Ravines.dwg Plot Date: January 8, 2026 Plotted by: Kirsten James

NOTES:

1. Existing trails are based on previous design drawings. Actual trail location may vary.
2. Potential Ravine Access via Ravine Channel OR along Tableland, avoiding trees. Timber matting may be required. Contractor, Owner, and Engineer to confirm construction access route prior to mobilization. Trails shall be restores to pre-project condition and disturbed slopes shall be restored with ECB and native seed.
3. Ravine material generated by Grade Control Riffle installation shall be used for Side Slope Stabilization Type A. Excess ravine material may be placed in the ravine, directly upstream of the Grade Control Riffle which generated the material, transported to the bluff zone if needed, or hauled offsite.



H:0 20 40
V:0 5 10
Scale: 1" = 20' (Horiz.)
1" = 5' (Vert.)

N

LEGEND

- Ex. Property Line
- Ex. Parcel Line
- Ex. Contours (Lake County)
- Ex. Contours (Hey Survey)
- Ex. Wetland Boundary (WL)
- Ex. Waters Boundary (OHWM)
- Ex. Drainageway
- Ex. Ravine Centerline
- Ex. Storm Sewer
- Ex. Sanitary Forcemain
- Potential Construction Access Route
- Ex. Sensitive Area
- Prop. Ravine Side Slope Stabilization
- Prop. Woody Material Stabilization

NOTES:

Potential Ravine Access from Parking Facility along existing trail routes.

No.	Revision/Issue	Date

Hey and Associates, Inc.
Engineering, Ecology and Landscape Architecture
26575 West Commerce Drive, Suite 601
Volo, Illinois 60073
Office (847) 740-0888
Fax (847) 740-2888
Volo@Heyassoc.com

Professional Design Firm
License No. 184-002429

Jean and John Greene Nature Preserve Ravine, Bluff, and Shoreline Restoration

Lake Forest, Illinois

Ravine Plan and Profile

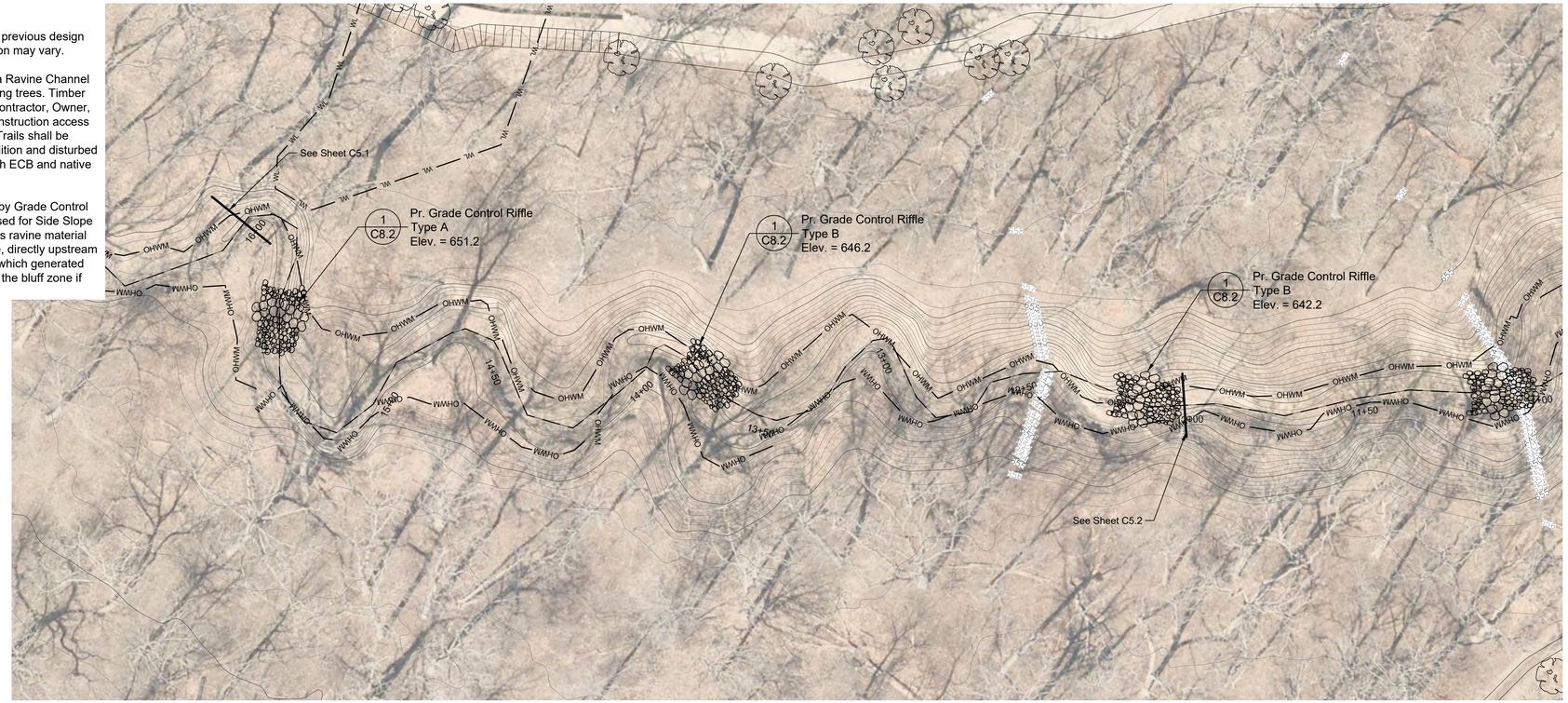
PROJECT NO: 24-0271		SHEET NO:
DESIGNED BY	DAK/KNJ	C5.1
DRAWN BY	ATJ/KNJ	
CHECKED BY	DAK/KNJ	
APPROVED BY	DAK	PAGE NO:
ISSUE DATE	01/08/2026	13 OF 27

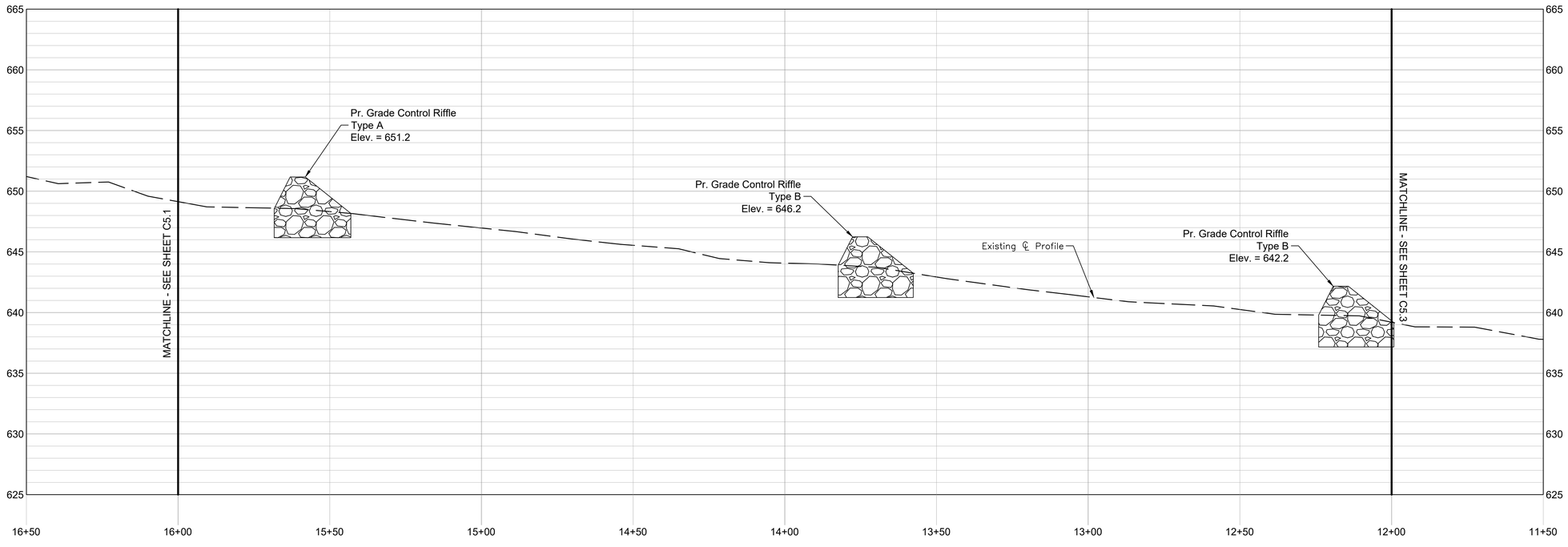
For Permit

File: P:\24000\24-0271 LFOLA-Greene NP Bluff and Ravines\05 CAD\24-0271 Greene NP Bluff and Ravines.dwg Plot Date: January 8, 2026 Plotted by: Kirsten James

NOTES:

1. Existing trails are based on previous design drawings. Actual trail location may vary.
2. Potential Ravine Access via Ravine Channel OR along Tableland, avoiding trees. Timber matting may be required. Contractor, Owner, and Engineer to confirm construction access route prior to mobilization. Trails shall be restores to pre-project condition and disturbed slopes shall be restored with ECB and native seed.
3. Ravine material generated by Grade Control Riffle installation shall be used for Side Slope Stabilization Type A. Excess ravine material may be placed in the ravine, directly upstream of the Grade Control Riffle which generated the material, transported to the bluff zone if needed, or hauled offsite.





H:0 20 40
V:0 5 10
Scale: 1" = 20' (Horiz.)
1" = 5' (Vert.)

N

LEGEND

- Ex. Property Line
- Ex. Parcel Line
- Ex. Contours (Lake County)
- Ex. Contours (Hey Survey)
- Ex. Wetland Boundary (WL)
- Ex. Waters Boundary (OHWM)
- Ex. Drainageway
- Ex. Ravine Centerline
- Ex. Storm Sewer
- Ex. Sanitary Forcemain
- Potential Construction Access Route
- Ex. Sensitive Area
- Prop. Ravine Side Slope Stabilization
- Prop. Woody Material Stabilization

No.	Revision/Issue	Date

Hey and Associates, Inc.
Engineering, Ecology and Landscape Architecture
26575 West Commerce Drive, Suite 601
Volo, Illinois 60073
Office (847) 740-0888
Fax (847) 740-2888
Volo@Heyassoc.com

Professional Design Firm
License No. 184-002429

Jean and John Greene Nature Preserve Ravine, Bluff, and Shoreline Restoration

Lake Forest, Illinois

Ravine Plan and Profile

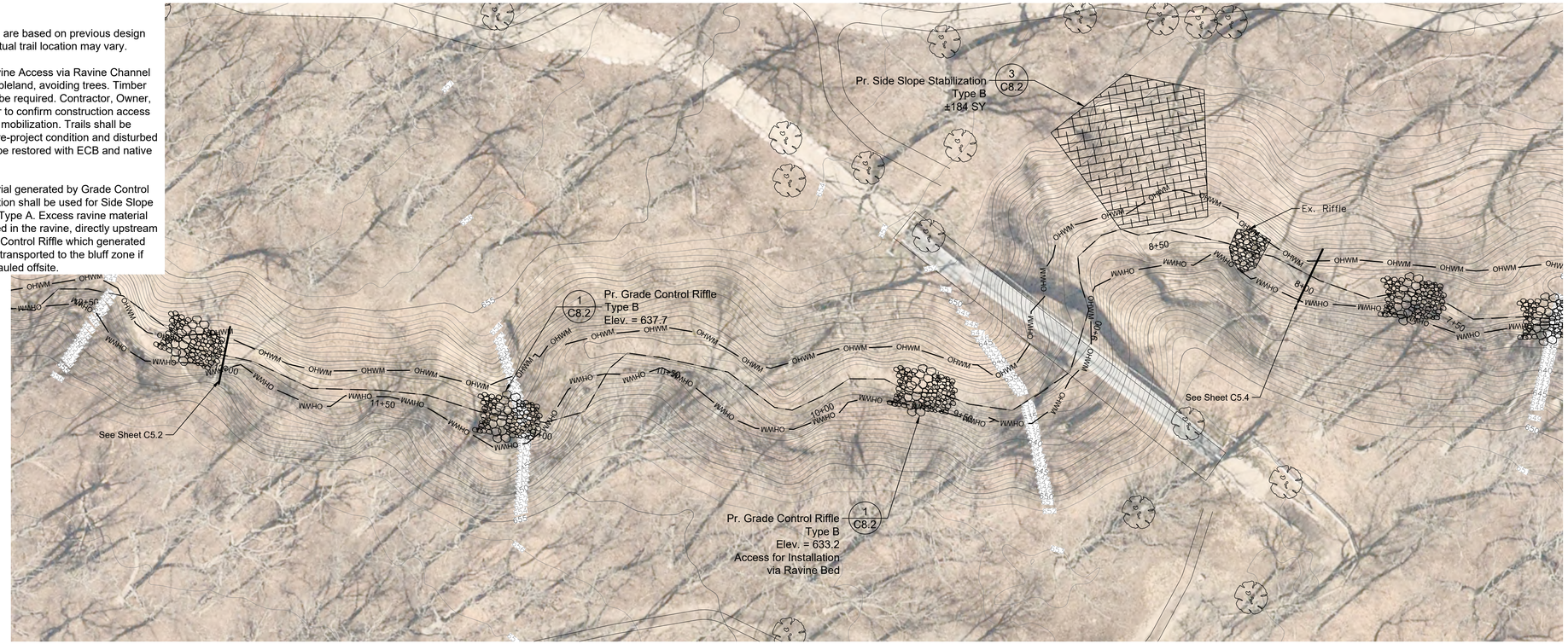
PROJECT NO: 24-0271		SHEET NO:
DESIGNED BY	DAK/KNJ	C5.2
DRAWN BY	ATJ/KNJ	
CHECKED BY	DAK/KNJ	
APPROVED BY	DAK	PAGE NO:
ISSUE DATE	01/08/2026	14 OF 27

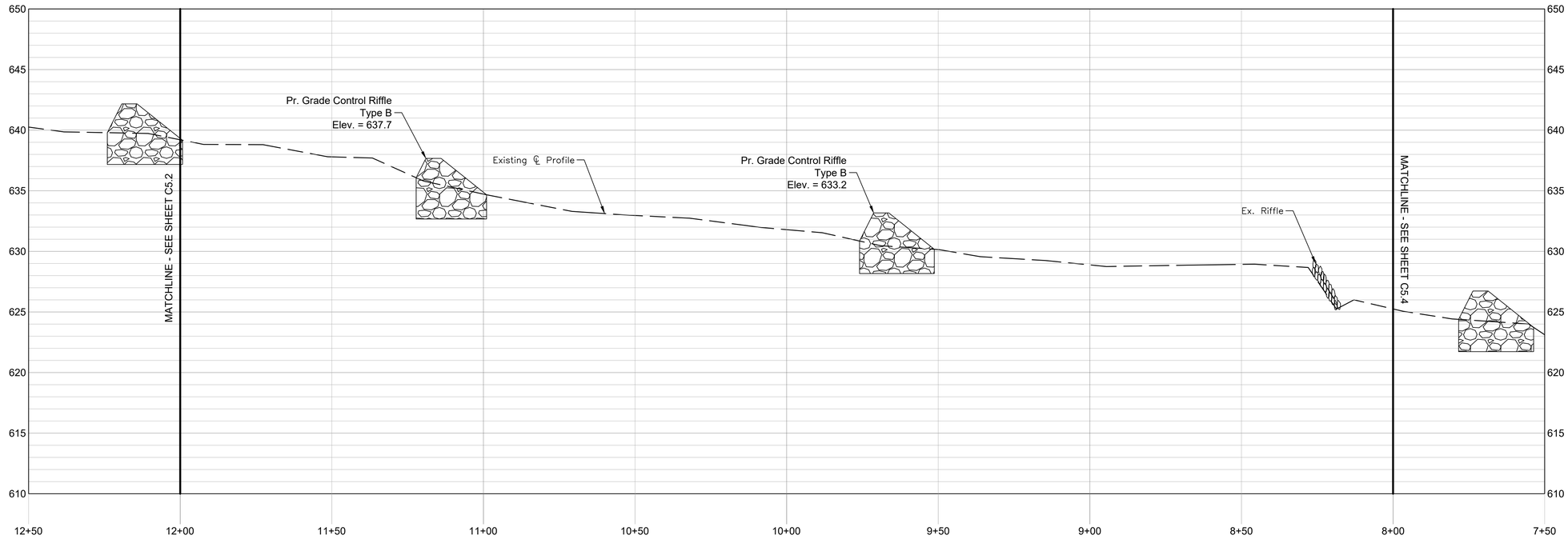
For Permit

File: P:\24\00\24-0271 LFOLA-Greene NP Bluff and Ravines\05 CAD\24-0271 Greene NP Bluff and Ravines.dwg Plot Date: January 8, 2026 Plotted by: Kirsten James

NOTES:

1. Existing trails are based on previous design drawings. Actual trail location may vary.
2. Potential Ravine Access via Ravine Channel OR along Tableland, avoiding trees. Timber matting may be required. Contractor, Owner, and Engineer to confirm construction access route prior to mobilization. Trails shall be restores to pre-project condition and disturbed slopes shall be restored with ECB and native seed.
3. Ravine material generated by Grade Control Riffle installation shall be used for Side Slope Stabilization Type A. Excess ravine material may be placed in the ravine, directly upstream of the Grade Control Riffle which generated the material, transported to the bluff zone if needed, or hauled offsite.





H:0 20 40
V:0 5 10
Scale: 1" = 20' (Horiz.)
1" = 5' (Vert.)

LEGEND

- Ex. Property Line
- Ex. Parcel Line
- Ex. Contours (Lake County)
- Ex. Contours (Hey Survey)
- Ex. Wetland Boundary
- Ex. Waters Boundary
- Ex. Drainageway
- Ex. Ravine Centerline
- Ex. Storm Sewer
- Ex. Sanitary Forcemain
- Potential Construction Access Route
- Ex. Sensitive Area
- Prop. Ravine Side Slope Stabilization
- Prop. Woody Material Stabilization

No.	Revision/Issue	Date

Hey and Associates, Inc.
Engineering, Ecology and Landscape Architecture
26575 West Commerce Drive, Suite 601
Volo, Illinois 60073
Office (847) 740-0888
Fax (847) 740-2888
Volo@Heyassoc.com

Professional Design Firm
License No. 184-002429

Jean and John Greene Nature Preserve Ravine, Bluff, and Shoreline Restoration

Lake Forest, Illinois

Ravine Plan and Profile

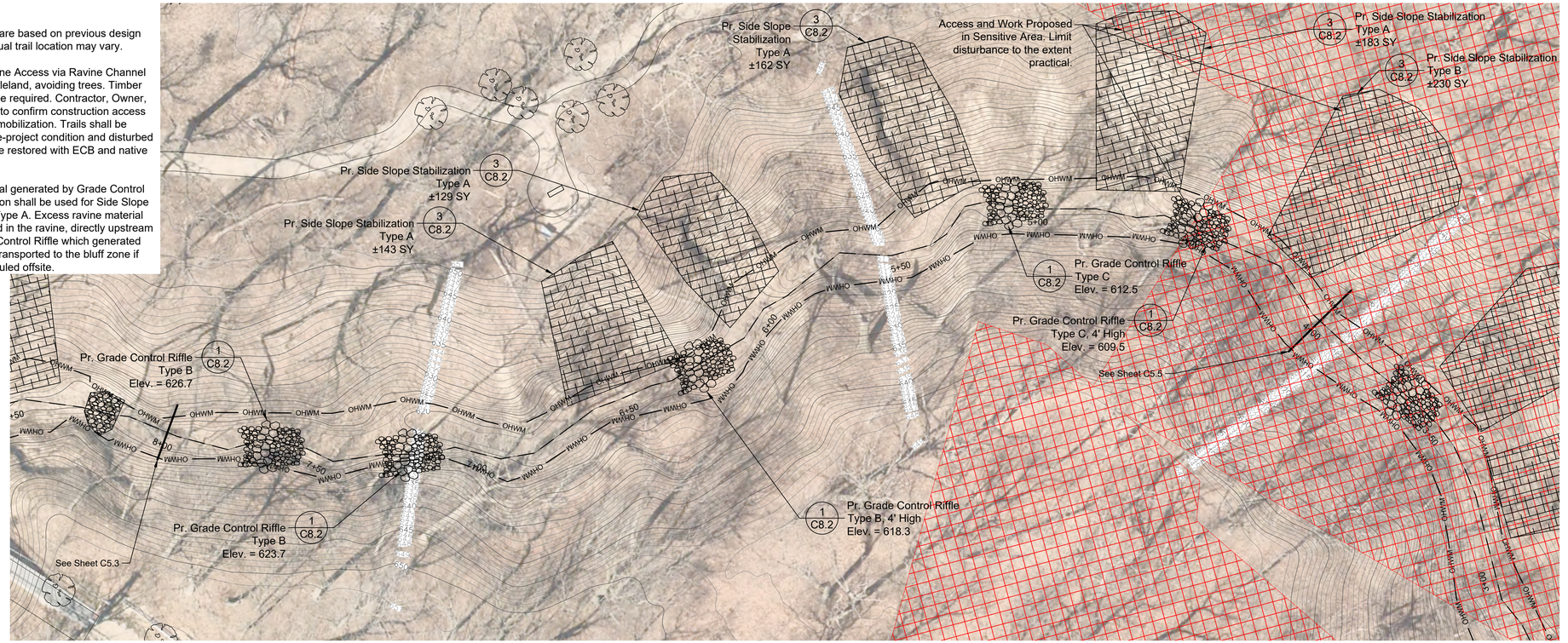
PROJECT NO: 24-0271		SHEET NO:
DESIGNED BY	DAK/KNJ	C5.3
DRAWN BY	ATJ/KNJ	
CHECKED BY	DAK/KNJ	
APPROVED BY	DAK	PAGE NO:
ISSUE DATE	01/08/2026	15 OF 27

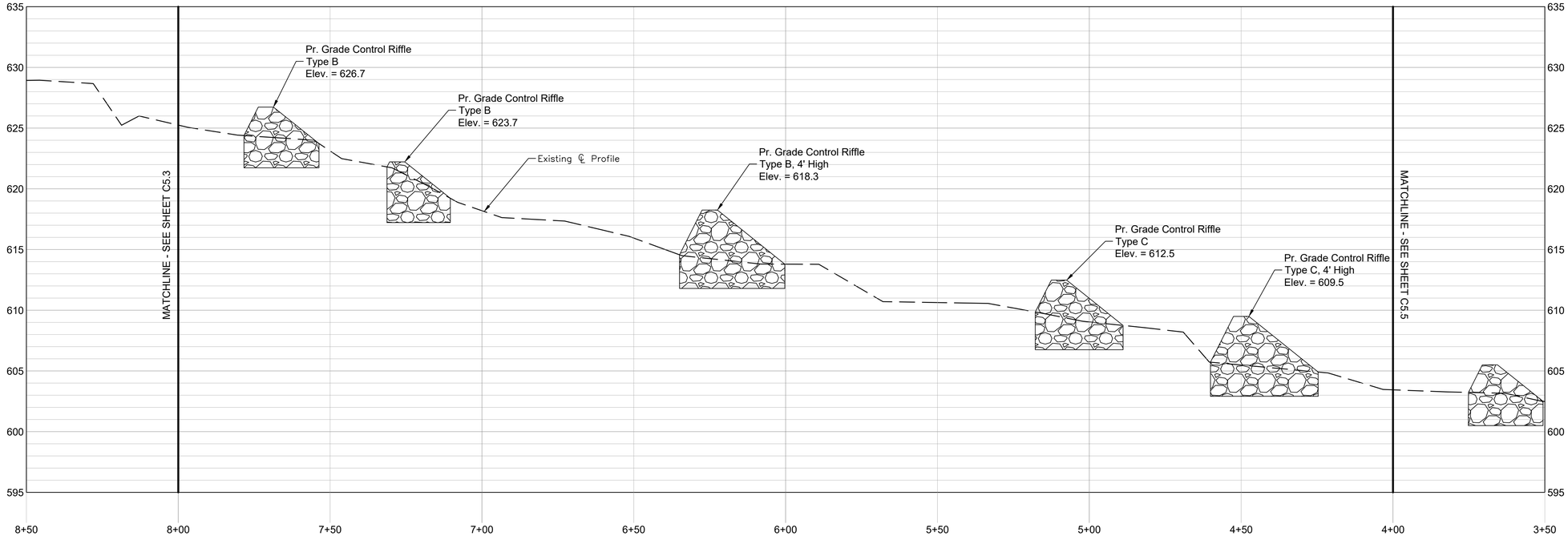
For Permit

File: P:\24\00\24-0271 LFOLA-Greene NP Bluff and Ravines\05 CAD\24-0271 Greene NP Bluff and Ravines.dwg Plot Date: January 8, 2026 Plotted by: Kirsten James

NOTES:

1. Existing trails are based on previous design drawings. Actual trail location may vary.
2. Potential Ravine Access via Ravine Channel OR along Tableland, avoiding trees. Timber matting may be required. Contractor, Owner, and Engineer to confirm construction access route prior to mobilization. Trails shall be restores to pre-project condition and disturbed slopes shall be restored with ECB and native seed.
3. Ravine material generated by Grade Control Riffle installation shall be used for Side Slope Stabilization Type A. Excess ravine material may be placed in the ravine, directly upstream of the Grade Control Riffle which generated the material, transported to the bluff zone if needed, or hauled offsite.





H:0 20 40
V:0 5 10
Scale: 1" = 20' (Horiz.)
1" = 5' (Vert.)

LEGEND

- Ex. Property Line
- Ex. Parcel Line
- Ex. Contours (Lake County)
- Ex. Contours (Hey Survey)
- Ex. Wetland Boundary
- Ex. Waters Boundary
- Ex. Drainageway
- Ex. Ravine Centerline
- Ex. Storm Sewer
- Ex. Sanitary Forcemain
- Potential Construction Access Route
- Ex. Sensitive Area
- Prop. Ravine Side Slope Stabilization
- Prop. Woody Material Stabilization

No.	Revision/Issue	Date

Hey and Associates, Inc.
Engineering, Ecology and Landscape Architecture
26575 West Commerce Drive, Suite 601
Volo, Illinois 60073
Office (847) 740-0888
Fax (847) 740-2888
Volo@Heyassoc.com

Professional Design Firm
License No. 184-002429

Jean and John Greene Nature Preserve Ravine, Bluff, and Shoreline Restoration

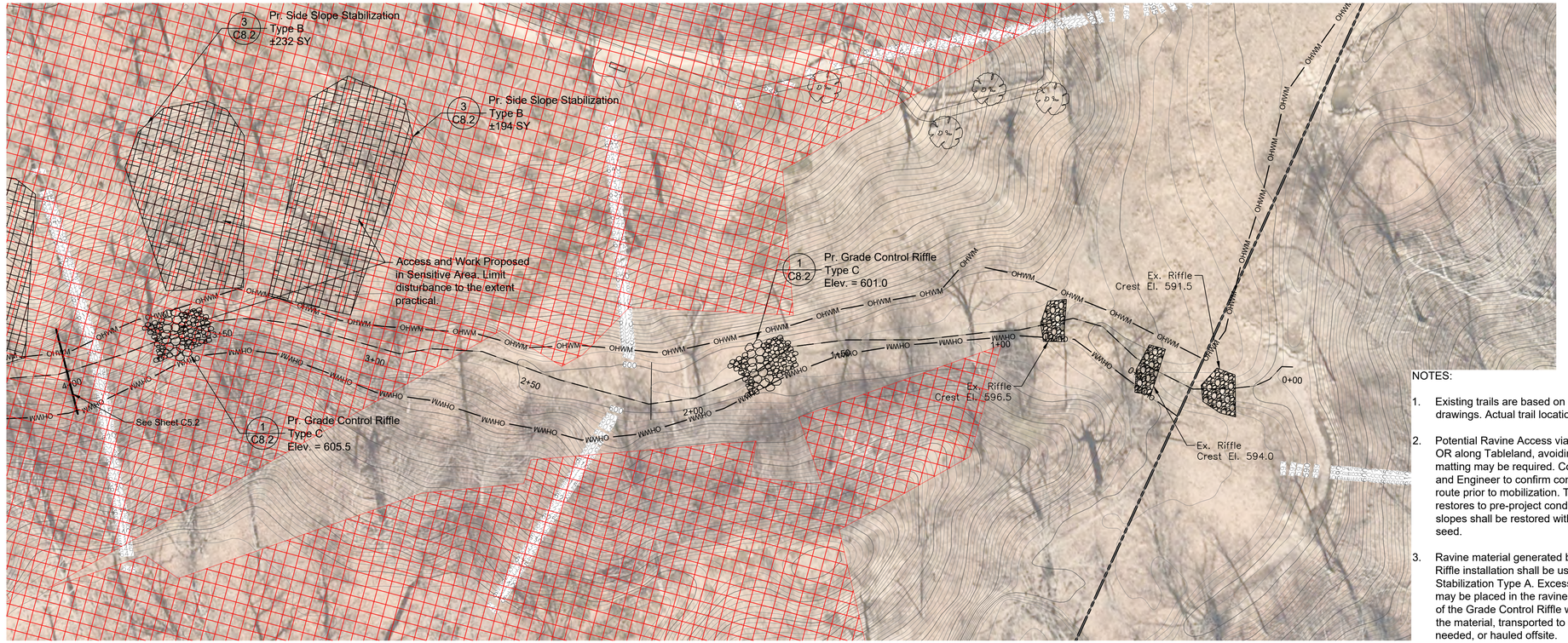
Lake Forest, Illinois

Ravine Plan and Profile

PROJECT NO: 24-0271		SHEET NO:
DESIGNED BY	DAK/KNJ	C5.4
DRAWN BY	ATJ/KNJ	
CHECKED BY	DAK/KNJ	
APPROVED BY	DAK	PAGE NO:
ISSUE DATE	01/08/2026	16 OF 27

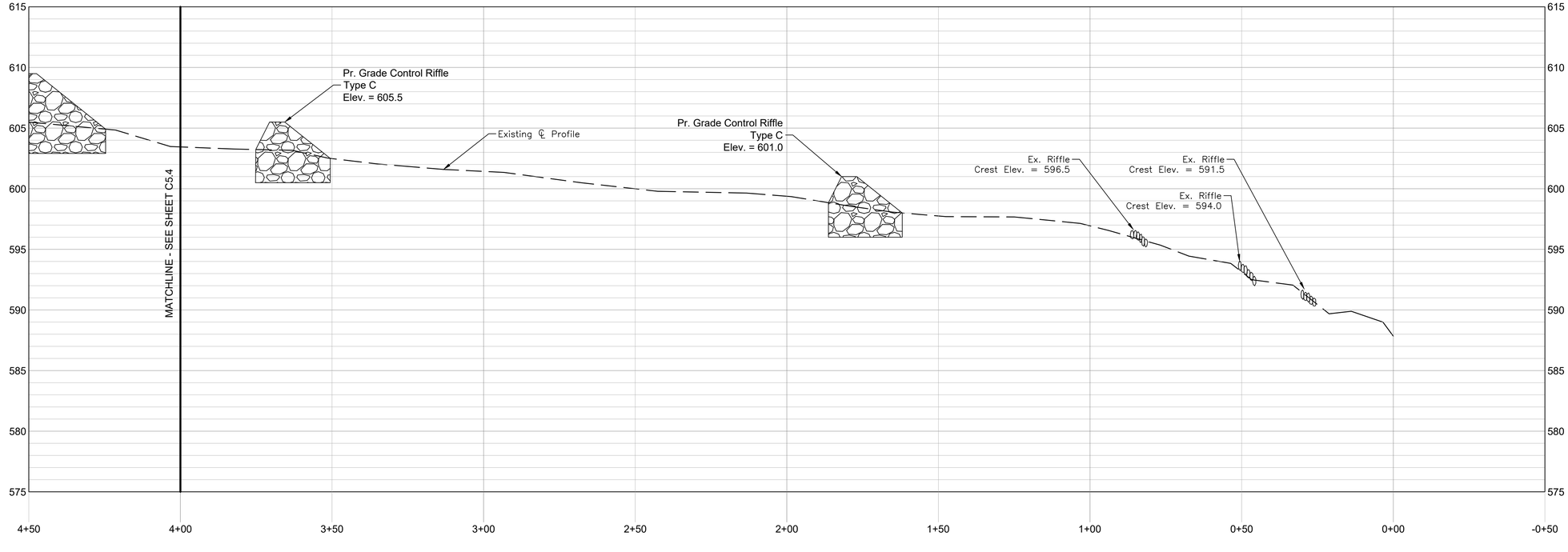
For Permit

File: P:\24\00\24-0271 LFOLA-Greene NP Bluff and Ravines\05 CAD\24-0271 Greene NP Bluff and Ravines.dwg Plot Date: January 8, 2026 Plotted by: Kirsten James



NOTES:

1. Existing trails are based on previous design drawings. Actual trail location may vary.
2. Potential Ravine Access via Ravine Channel OR along Tableland, avoiding trees. Timber matting may be required. Contractor, Owner, and Engineer to confirm construction access route prior to mobilization. Trails shall be restores to pre-project condition and disturbed slopes shall be restored with ECB and native seed.
3. Ravine material generated by Grade Control Riffle installation shall be used for Side Slope Stabilization Type A. Excess ravine material may be placed in the ravine, directly upstream of the Grade Control Riffle which generated the material, transported to the bluff zone if needed, or hauled offsite.



H:0 20 40
V:0 5 10
Scale: 1" = 20' (Horiz.)
1" = 5' (Vert.)

LEGEND

- Ex. Property Line
- Ex. Parcel Line
- Ex. Contours (Lake County)
- Ex. Contours (Hey Survey)
- Ex. Wetland Boundary (WL)
- Ex. Waters Boundary (OHWM)
- Ex. Drainageway
- Ex. Ravine Centerline
- Ex. Storm Sewer
- Ex. Sanitary Forcemain
- Potential Construction Access Route
- Ex. Sensitive Area
- Prop. Ravine Side Slope Stabilization
- Prop. Woody Material Stabilization

No.	Revision/Issue	Date

Hey and Associates, Inc.
Engineering, Ecology and Landscape Architecture
26575 West Commerce Drive, Suite 601
Volo, Illinois 60073
Office (847) 740-0888
Fax (847) 740-2888
Volo@Heyassoc.com

Professional Design Firm
License No. 184-002429

Jean and John Greene Nature Preserve Ravine, Bluff, and Shoreline Restoration

Lake Forest, Illinois

Ravine Plan and Profile

PROJECT NO: 24-0271		SHEET NO:
DESIGNED BY	DAK/KNJ	C5.5
DRAWN BY	ATJ/KNJ	
CHECKED BY	DAK/KNJ	
APPROVED BY	DAK	PAGE NO:
ISSUE DATE	11/11/2025	17 OF 27

For Permit

File: P:\24\00\24-0271 LFO\LA-Greene NP Bluff and Ravines\05 CAD\24-0271 Greene NP Bluff and Ravines.dwg Plot Date: January 8, 2026 Plotted by: Kirsten James

NOTES:

1. All reported elevations are in FT NAVD88.
2. Based on Great Lakes Dashboard*:
   - 2.1. Historic Maximum: 582.4 ft.
   - 2.2. Long-Term Average: 579.0 ft.
   - 2.3. Historic Minimum: 576.1 ft.

*Converted from IGLD 85 to NAVD 88 using the NOAA IGLD 85 Conversion tool, at the Michigan-Huron master gauge location.
NAVD 88 - 0.096' = IGLD 85

Stationing Line denotes Existing Toe of Bluff

125' Offset from Existing Toe of Bluff

ZONE 1

ZONE 2

2 / C8.3 — 17 Proposed Nearshore Small Dia. Stone Clusters

3 / C8.3 — 25 Proposed Nearshore Large Dia. Stone Clusters

4 / C8.3 — 27 Proposed Nearshore Natrx Cubes

Access and Installation of Nearshore and Offshore Structures by Barge

0 30 60

Scale: 1" = 30'

LEGEND

- Ex. Property Line
- Ex. Parcel Line
- Ex. Contours (Lake County)
- Ex. Contours (Hey Survey)
- Ex. Bathymetric Contours (Hey Survey)
- Ex. FEMA Floodway Line
- Ex. FEMA Floodplain Line
- Ex. FEMA Floodplain Line (by Elevation)
- Ex. Waters Boundary (OHWM)
- Ex. Storm Sewer
- Potential Construction Access Route
- Prop. Offshore Habitat Reef
- Prop. Sand Placement
- Prop. Nearshore Small Dia. Stone Cluster
- Prop. Nearshore Large Dia. Stone Cluster
- Prop. Nearshore Natrx Cube

NOTES:

1. Exact quantity of the Nearshore structures will be finalized upon bidding. Maximum extent shown.

No.	Revision/Issue	Date

Hey and Associates, Inc.
Engineering, Ecology and Landscape Architecture
26575 West Commerce Drive, Suite 601
Volo, Illinois 60073
Office (847) 740-0888
Fax (847) 740-2888
Volo@Heyassoc.com

Professional Design Firm
License No. 184-002429

Jean and John Greene Nature Preserve Ravine, Bluff, and Shoreline Restoration

Lake Forest, Illinois

In-Lake Plan - Nearshore

PROJECT NO:	24-0271	SHEET NO:
DESIGNED BY	DAK/KNJ	C6.0
DRAWN BY	ATJ/KNJ	
CHECKED BY	DAK/KNJ	
APPROVED BY	DAK	PAGE NO:
ISSUE DATE	01/08/2026	18 OF 27

For Permit

File: P:\24\00\24-0271 LFOLA-Greene NP Bluff and Ravines\05 CAD\24-0271 Greene NP Bluff and Ravines.dwg Plot Date: January 8, 2026 Plotted by: Kirsten James

NOTES:

1. Beach quality sand, free of supplemental materials non-native to Lake Michigan, reasonably matching the native sands to the beach zone within the project area shall be used. Sand shall be approved by Owner/Engineer.
2. Sand shall be placed at ±2.5' high.
3. All reported elevations are in FT NAVD88.
4. Based on Great Lakes Dashboard*:
   - 4.1. Historic Maximum: 582.4 ft.
   - 4.2. Long-Term Average: 579.0 ft.
   - 4.3. Historic Minimum: 576.1 ft.

*Converted from IGLD 85 to NAVD 88 using the NOAA IGLD 85 Conversion tool, at the Michigan-Huron master gauge location. NAVD 88 - 0.096' = IGLD 85

Stationing Line denotes Existing Toe of Bluff

125' Offset from Existing Toe of Bluff

Maximum Distance from Existing Toe of Bluff = 602.1'

Maximum Distance from Existing Toe of Bluff = 651.3'

Maximum Distance from Existing Toe of Bluff = 692.9'

1 C8.3 Pr. Offshore Habitat Reef Centerline Length = 315 LF

1 C8.3 Pr. Offshore Habitat Reef Centerline Length = 315 LF

Sand Placement ±444 CY

Sand Placement ±1,333 CY

Access and Installation of Nearshore and Offshore Structures by Barge

1 C8.3 Pr. Offshore Habitat Reef Centerline Length = 334 LF

Sand Placement ±1,612 CY

0 40 80

Scale: 1" = 40'

LEGEND

- Ex. Property Line
- Ex. Parcel Line
- Ex. Contours (Lake County)
- Ex. Contours (Hey Survey)
- Ex. Bathymetric Contours (Hey Survey)
- Ex. FEMA Floodway Line
- Ex. FEMA Floodplain Line
- Ex. FEMA Floodplain Line (by Elevation)
- Ex. Waters Boundary (OHWM)
- Ex. Storm Sewer
- Potential Construction Access Route
- Prop. Offshore Habitat Reef
- Prop. Sand Placement
- Prop. Nearshore Small Dia. Stone Cluster
- Prop. Nearshore Large Dia. Stone Cluster
- Prop. Nearshore Natrx Cube

NOTES:

1. Exact quantity of the Nearshore structures will be finalized upon bidding. Maximum extent shown.

No.	Revision/Issue	Date

Hey and Associates, Inc.
Engineering, Ecology and Landscape Architecture
26575 West Commerce Drive, Suite 601
Volo, Illinois 60073
Office (847) 740-0888
Fax (847) 740-2888
Volo@Heyassoc.com

Professional Design Firm
License No. 184-002429

Jean and John Greene Nature Preserve Ravine, Bluff, and Shoreline Restoration

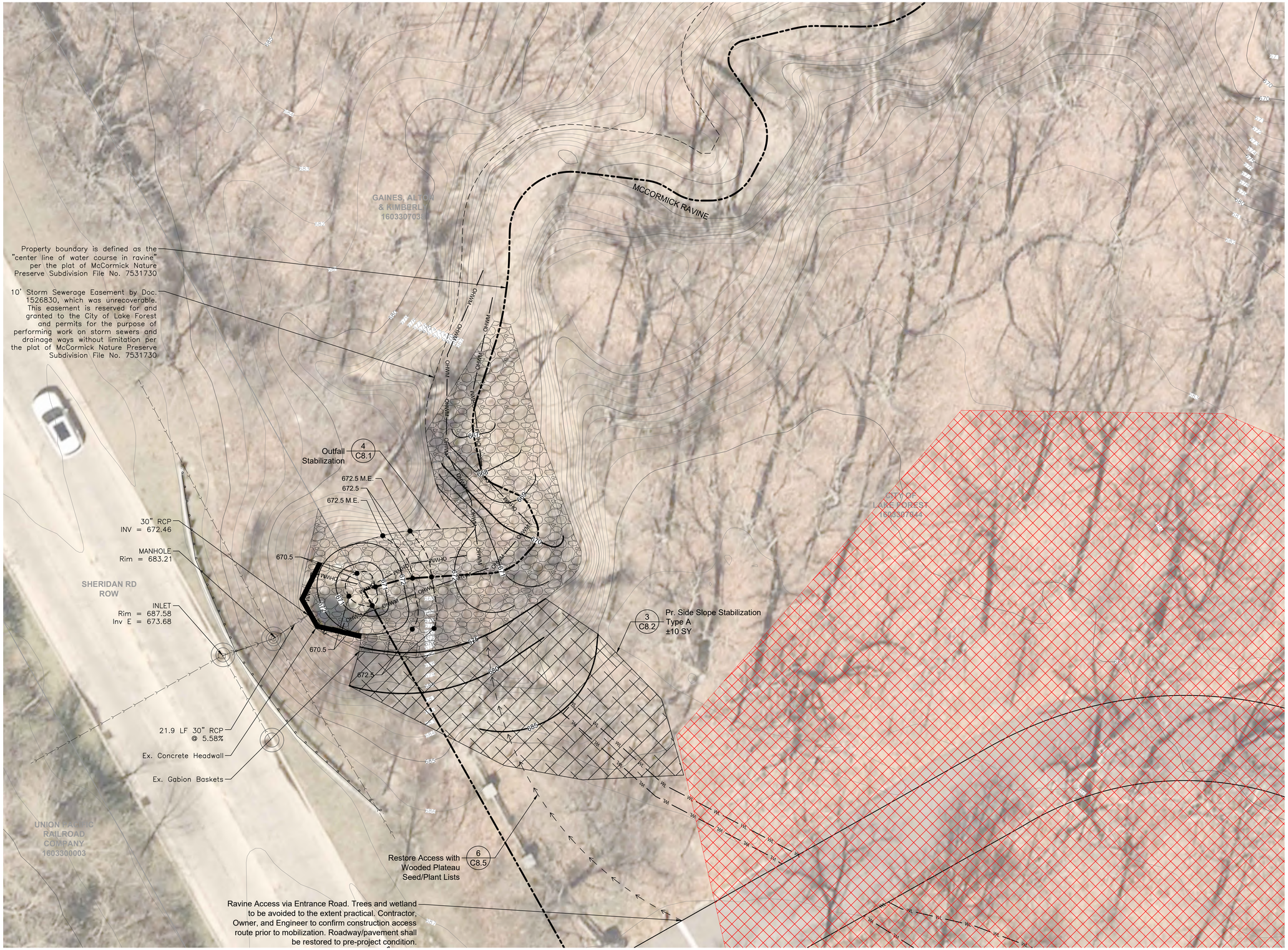
Lake Forest, Illinois

In-Lake Plan - Offshore

PROJECT NO:	24-0271	SHEET NO:
DESIGNED BY	DAK/KNJ	C6.1
DRAWN BY	ATJ/KNJ	
CHECKED BY	DAK/KNJ	
APPROVED BY	DAK	PAGE NO:
ISSUE DATE	01/08/2026	19 OF 27

For Permit

File: P:\24\0\0024-0271 LFOLA-Greene NP Bluff and Ravines\05 CAD\24-0271 Greene NP Bluff and Ravines.dwg Plot Date: January 8, 2026 Plotted by: Kirsten James



0 10 20

Scale: 1" = 10'

N

LEGEND

- Ex. Property Line
- Ex. Parcel Line
- Ex. Easement Line
- Ex. Right-of-Way Line
- Ex. Contours (Lake County)
- Ex. Contours (Hey Survey)
- Ex. Bathymetric Contours (PRI Survey)
- Prop. Contours
- Ex. Wetland Boundary
- Ex. Waters Boundary
- Ex. Drainageway
- Ex. Ravine Centerline
- Ex. Storm Sewer
- Ex. Guardrail
- Potential Construction Access Route
- Prop. Outfall Stone
- Prop. Ravine Side Slope Stabilization

No.	Revision/Issue	Date

Hey and Associates, Inc.
Engineering, Ecology and Landscape Architecture
26575 West Commerce Drive, Suite 601
Volo, Illinois 60073
Office (847) 740-0888
Fax (847) 740-2888
Volo@Heyassoc.com

Professional Design Firm
License No. 184-002429

Jean and John Greene Nature Preserve Ravine, Bluff, and Shoreline Restoration

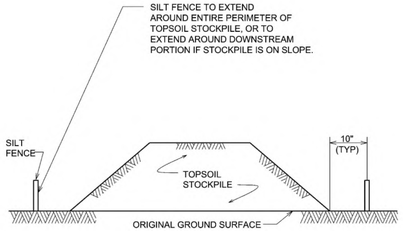
Lake Forest, Illinois

Outfall Plan

PROJECT NO:	24-0271	SHEET NO:
DESIGNED BY	DAK/KNJ	C7.0
DRAWN BY	ATJ/KNJ	
CHECKED BY	DAK/KNJ	
APPROVED BY	DAK	PAGE NO:
ISSUE DATE	01/08/2026	20 OF 27

For Permit

File: P:\24\00\24-0271 LFOL-A-Greene NP Bluff and Ravines\05 CAD\24-0271 Greene NP Bluff and Ravines.dwg Plot Date: January 8, 2026 Plotted by: Kirsten James



NOTES:

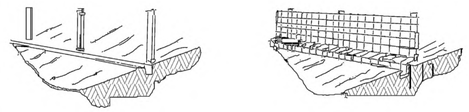
1. AN ON-SITE DRAINAGE SWALE SHALL BE LOCATED BETWEEN THE TOPSOIL STOCKPILE AND OFF-SITE PROPERTY.
2. REFERENCE IS MADE TO THE SILT FENCE DETAIL FOR MATERIALS AND INSTALLATION METHODS.
3. IF THE STOCKPILE IS TO REMAIN FOR MORE THAN 14 DAYS, IT SHALL BE STABILIZED WITH BURLAP MATTING OR SEEDED WITHIN 7 DAYS OF COMPLETION TO MINIMIZE EROSION.
4. INSPECTION OF SILT FENCES SHALL BE AT LEAST ONCE PER WEEK AND AFTER RAIN EVENTS IN EXCESS OF 1/2". REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.
5. SEDIMENT TRAPPED BY THE FENCES SHALL BE REMOVED AND PROPERLY DISPOSED OF WHENEVER SIGNIFICANT ACCUMULATION OCCURS.
6. SILT FENCES SHALL BE MAINTAINED IN PLACE UNTIL TOPSOIL STOCKPILE HAS BEEN ELIMINATED AND SHALL BE REMOVED ONLY WHEN DIRECTED BY THE CITY ENGINEER.

TEMPORARY TOPSOIL STOCKPILE

NOT TO SCALE

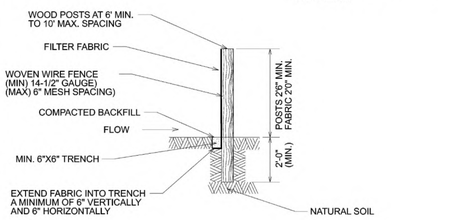
LAKE FOREST STANDARD 11.04
APPROVED BY : KMM
DATE : 1/1/2006
G:\Engineer\ENGSTD\Standard Details\ . . . \Topsoil Stockpile 11-04

1 Temporary Topsoil Stockpile Detail (If Needed) (Not to Scale)



1. SET POSTS AND EXCAVATE A 6"X6" TRENCH UPSLOPE ALONG LINE OF POSTS

2. STAPLE WIRE FENCE TO POSTS, ATTACH FILTER FABRIC TO WIRE FENCE AND EXTEND BOTH INTO THE TRENCH



NOTES:

1. FILTER BARRIERS SHALL BE PLACED AT THOSE LOCATIONS SHOWN ON THE PLANS.
2. OVERLAP FILTER FABRIC BY 6" AND FOLD WHERE 2 SECTIONS ADJOIN.
3. INSPECTION OF SILT FENCES SHALL BE AT LEAST ONCE PER WEEK AND AFTER RAIN EVENTS IN EXCESS OF 1/2". REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.
4. SEDIMENT TRAPPED BY THE FENCE SHALL BE REMOVED AND PROMPTLY DISPOSED OF WHENEVER SIGNIFICANT ACCUMULATION OCCURS.
5. BARRIERS SHALL BE MAINTAINED IN PLACE UNTIL COMPLETION OF CONSTRUCTION AND THE UPSLOPE AREA HAS BEEN STABILIZED, AND BE REMOVED ONLY WHEN DIRECTED BY THE CITY.

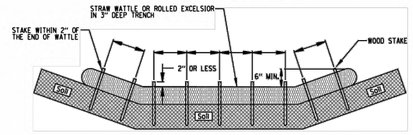
SILT FENCE DETAIL

LAKE FOREST STANDARD 11.02
APPROVED BY : KMM
DATE : 1/1/2006
G:\Engineer\Standard Details\Silt Fence 11-02

2 Silt Fence Detail (If Needed) (Not to Scale)

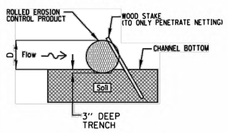
ROLLED EROSION CONTROL PRODUCTS

STAKING PATTERN GUIDE



NOTES:
1. OVERLAP MINIMUM IS THE DIAMETER OF THE ROLL.
2. 4' SPACING FOR WATTLES.
3. 2' SPACING FOR ROLLED EXCELSIOR.
4. OR SPACE ACCORDING TO MANUFACTURER'S SPECIFICATIONS.

STAKE DETAIL

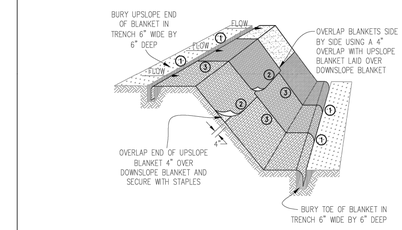


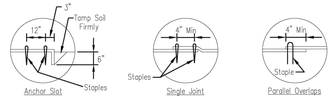
NOTES:
1. DRAWINGS ARE NOT TO SCALE.
2. ENDS OF WATTLES OR ROLLED EXCELSIOR SHALL BE TURNED AT LEAST 6" UPSLOPE.
3. RECOMMENDED STAKES ARE 1 1/8" WIDE x 1 1/8" THICK x 30" LONG.
4. STAKES SHALL NOT EXTEND ABOVE THE STRAW WATTLE MORE THAN 2".
5. SPACING: THE TOE OF THE UPSTREAM DITCH CHECK SHALL CREATE A HORIZONTAL LINE WITH THE TOP OF THE DOWNSTREAM DITCH CHECK.

REFERENCE
Project
Designed Date
Checked Date
Approved Date

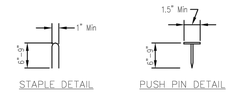
STANDARD DWG. NO. IUM-514
SHEET 1 OF 1
DATE 08-2-2019

3 Rolled Erosion Control Products Detail (Not to Scale)





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 stiched blankets. Non-stiched shall use 4 staples per s.y. of material. This equates to 200 staples with stiched blanket and 400 staples 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.

EROSION CONTROL BLANKET INSTALLATION DETAILS

4 Erosion Control Blanket Installation Details (Not to Scale)

Scale bar measures 1" at full scale

0 1"

LEGEND

No.	Revision/Issue	Date

Hey and Associates, Inc.
Engineering, Ecology and Landscape Architecture
26575 West Commerce Drive, Suite 601
Volo, Illinois 60073
Office (847) 740-0888
Fax (847) 740-2888
Volo@Heyassoc.com

Professional Design Firm
License No. 184-002429

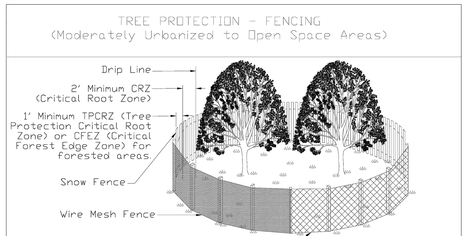
Jean and John Greene Nature Preserve Ravine, Bluff, and Shoreline Restoration

Lake Forest, Illinois

SESC Details

PROJECT NO:	24-0271	SHEET NO:
DESIGNED BY	DAK/KNJ	C8.0
DRAWN BY	ATJ/KNJ	
CHECKED BY	DAK/KNJ	
APPROVED BY	DAK	PAGE NO:
ISSUE DATE	01/08/2026	21 OF 27

For Permit



NOTES:

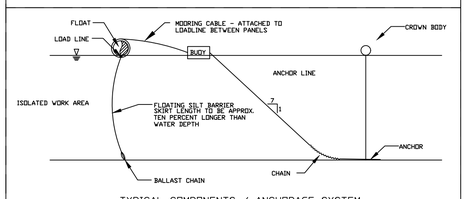
1. Call J.U.L.I.E. (800-892-0123) for the location of existing utilities 48 hours prior to commencement of work.
2. The CRZ is located 2' from the farthest outreaching branch (drip edge) or the distance as determined by the ISA trunk diameter method or whichever is greater.
3. The Fence shall be located 1' from the Critical Root Zone (CRZ) of the protected tree, thus creating the Tree Protection Critical Root Zone (TPCRZ) and the Critical Forest Edge Zone (CFEZ) for forested areas.
4. Fence Posts shall be either 6' steel posts @ 1.33Lbs./Ft. or 2" x 2" nominal wood posts.
5. For projects without highly significant or historical trees and that will last for less than 6 months duration, a non-treated wood lath snow fence or wire mesh fencing shall be used with appropriate posts that are securely anchored into the ground. For projects over 6 months in duration or trees considered significant or historical, a chain link fence with Construction Specification Chain Link Fence IUM 91 or better (as approved by the local Forester per local ordinances singularly or in tandem with the project Engineer) shall be used. Fencing shall be a minimum height of 4'. For chain link fencing, metal posts shall be placed 6' on center (OC) and the fencing securely anchored to the post.
6. Outside the TPCRZ or CFEZ, erosion and sediment control measures shall be installed to prevent sediment reaching the TPCRZ or the CFEZ. These measures shall extend out from the fence 10' and shall be continuous around the perimeter of the fence. These measures include, but are not limited to vegetative filter strip, rolled excelsior blankets and mulch with a 3" to 5" depth. Other measures may be used if approved by the Professional Forester, Certified Arborist or Horticulturalist. Installation shall cause no disturbance to soils.

REFERENCE
Project
Designed Date
Checked Date
Approved Date

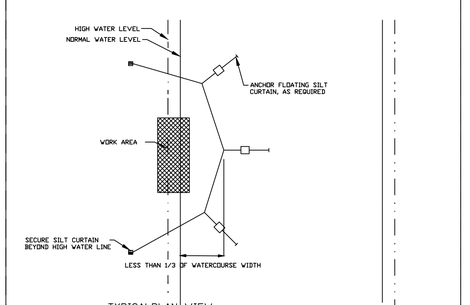
STANDARD DWG. NO. IUM-690-A
SHEET 1 OF 1
DATE 09-14-2017

5 Tree Protection Fencing Detail (If Needed) (Not to Scale)

FLOATING SILT CURTAIN - TYPICAL LAYOUT



TYPICAL COMPONENTS / ANCHORAGE SYSTEM



TYPICAL PLAN VIEW

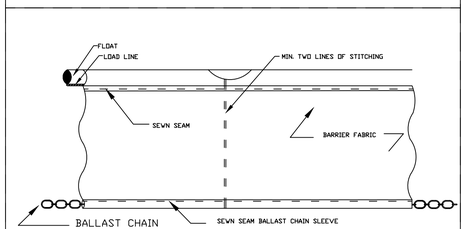
Maximum flow for waterbody shall be less than 5fps.
Isolated work area shall not exceed more than 1/3 stream width.
Silt curtain shall be placed parallel to stream flow.

REFERENCE
Project
Designed Date
Checked Date
Approved Date

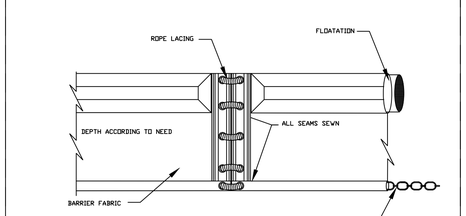
STANDARD DWG. NO. IUM-617A
SHEET 1 OF 1
DATE 1-06-2012

6 Floating Silt Curtain - Typical Layout Detail (Not to Scale)

FLOATING SILT CURTAIN - PANEL CONNECTORS



SEWN SEAM



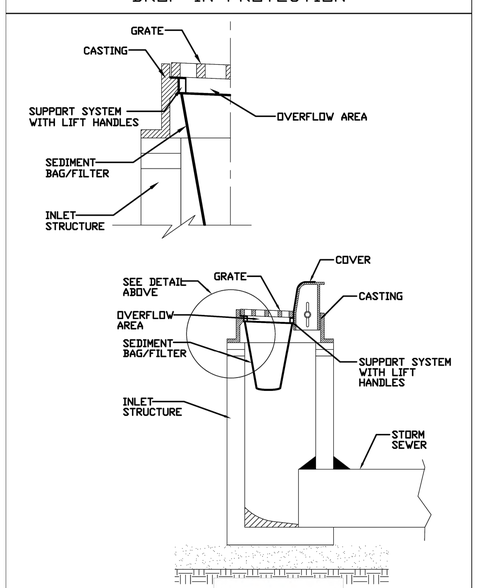
GROMMETED HOLES WITH ROPE LACING

REFERENCE
Project
Designed Date
Checked Date
Approved Date

STANDARD DWG. NO. IUM-617B
SHEET 1 OF 1
DATE 1-6-2012

7 Floating Silt Curtain - Pannel Connectors Detail (Not to Scale)

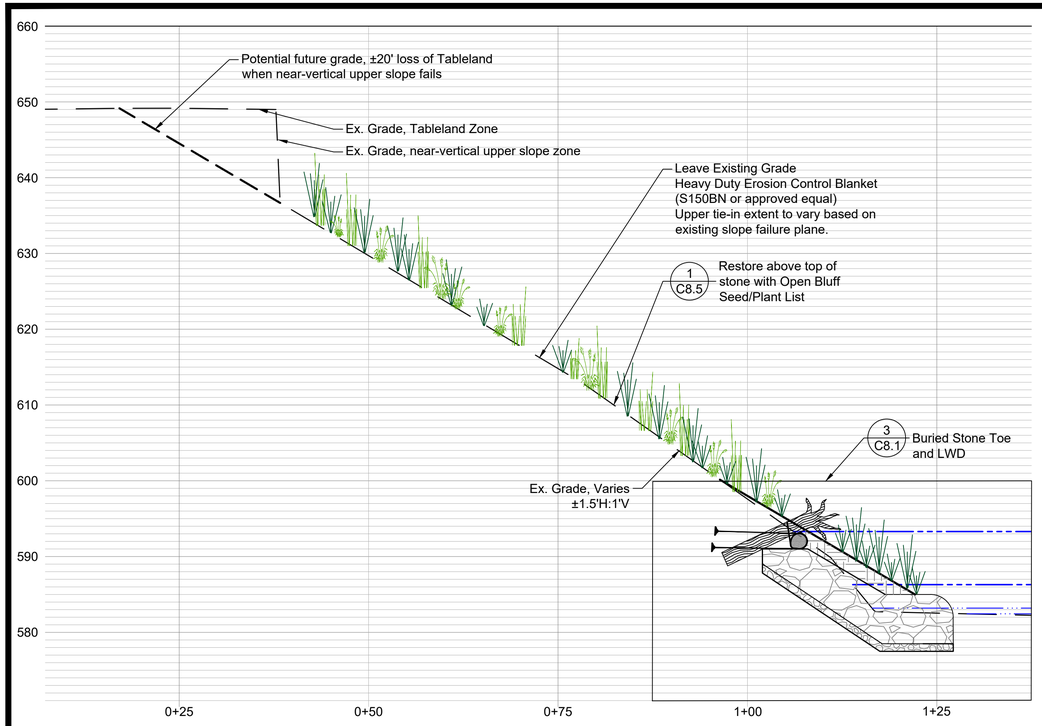
INLET PROTECTION - PAVED AREAS DROP-IN PROTECTION



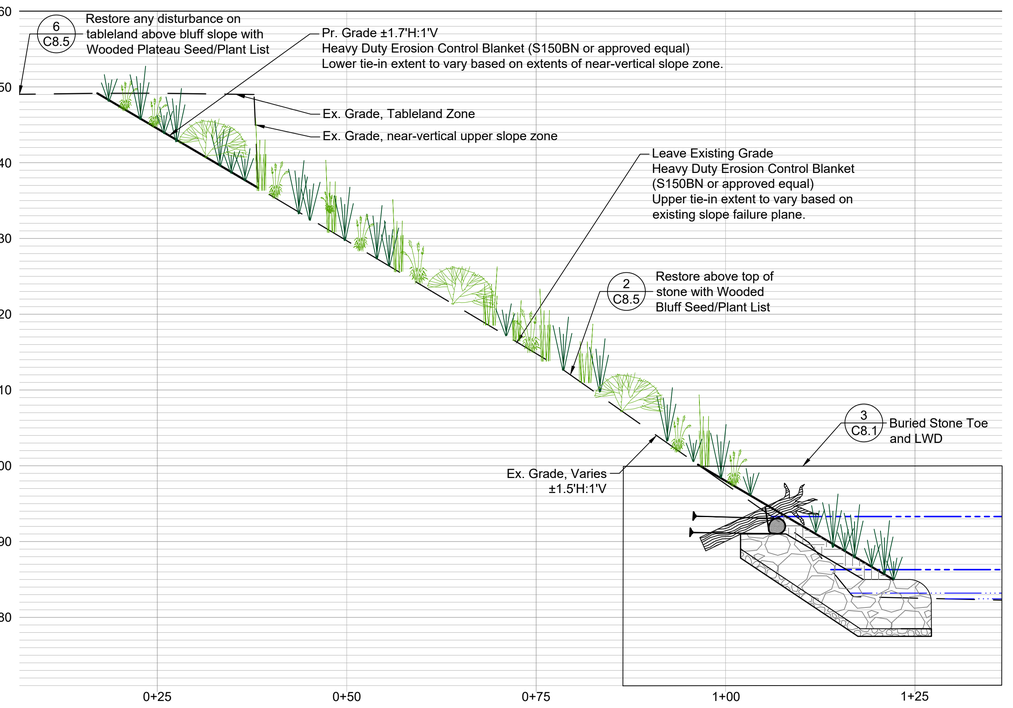
REFERENCE
Project
Designed Date
Checked Date
Approved Date

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

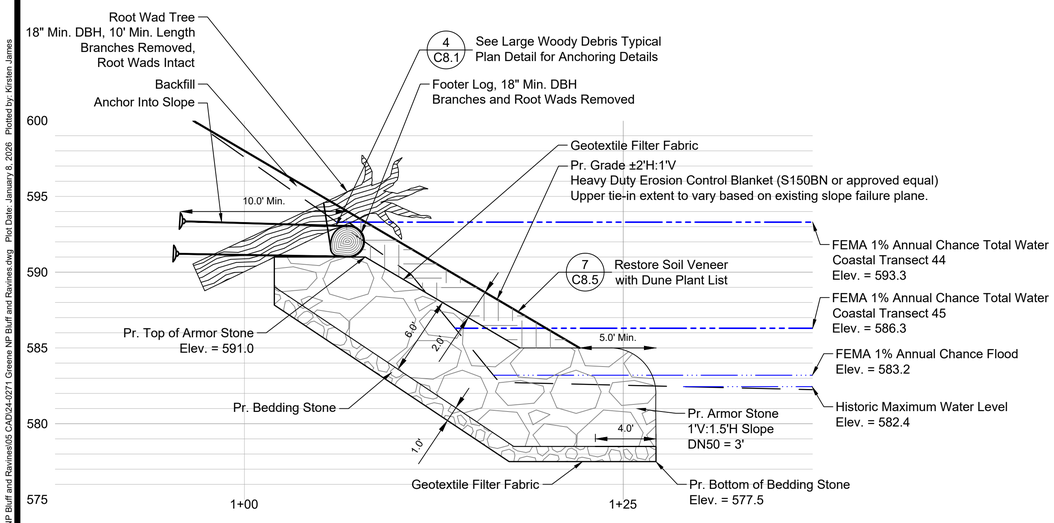
8 Inlet Protection Detail (If Needed) (Not to Scale)



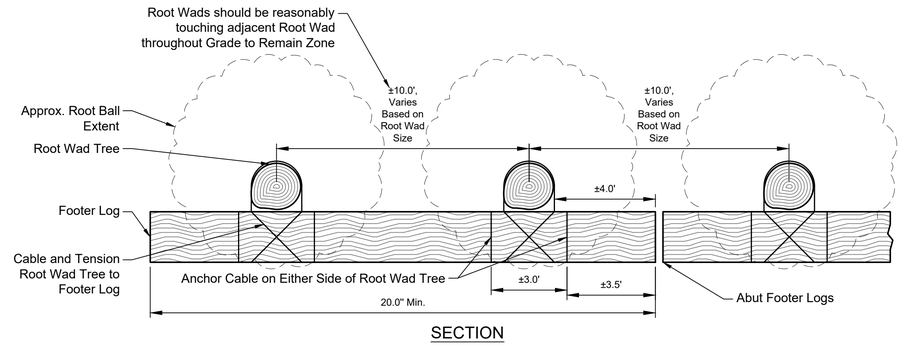
1 Bluff Slope Grade to Remain Zone Typical Detail
1" = 10'



2 Bluff Slope Grading Zone Typical Detail
1" = 10'



3 Bluff Stone Toe and Large Woody Debris Typical Detail
1" = 5'



SECTION

NOTES:

1. All Footer Logs and Root Wad Trees require approval by the Owner/Engineer prior to mobilization to the beach zone. The Owner/Engineer reserve the right to reject any Footer Logs and Root Wad Trees.
2. Final Root Wad and Anchor Cable spacing to be field directed by Engineer based on source material available.
3. Root Wad Trees shall be set back into the slope so only the root wad protrudes. The base of the trunk shall meet the ground surface of the soil veneer.
4. Do not fasten footer logs to adjacent footer logs.
5. Bury all cabling.

4 Large Woody Debris Typical Plan Detail
1" = 3'

H:0 10 20
V:0 10 20
Scale: 1" = 10' (Horiz.)
1" = 10' (Vert.)

LEGEND

NOTES:

1. If encountered, sandy material generated from stone toe installation may be reviewed by Engineer for use in offshore structure sand placement. Native bluff soil material shall be used to construct the Soil Veneer and shall be tamped down in place. If generated, excess material may be placed in the ravine, upstream of Grade Control Riffles or hauled offsite
2. All reported elevations are in FT NAVD88.
3. Based on Great Lakes Dashboard*:
   - 3.1. Historic Maximum: 582.4 ft.
   - 3.2. Long-Term Average: 579.0 ft.
   - 3.3. Historic Minimum: 576.1 ft.

*Converted from IGLD 85 to NAVD 88 using the NOAA IGLD 85 Conversion tool, at the Michigan-Huron master gauge location.
NAVD 88 - 0.096' = IGLD 85

No.	Revision/Issue	Date

Hey and Associates, Inc.
Engineering, Ecology and Landscape Architecture
26575 West Commerce Drive, Suite 601
Volo, Illinois 60073
Office (847) 740-0888
Fax (847) 740-2888
Volo@Heyassoc.com

Professional Design Firm
License No. 184-002429

Jean and John Greene Nature Preserve Ravine, Bluff, and Shoreline Restoration

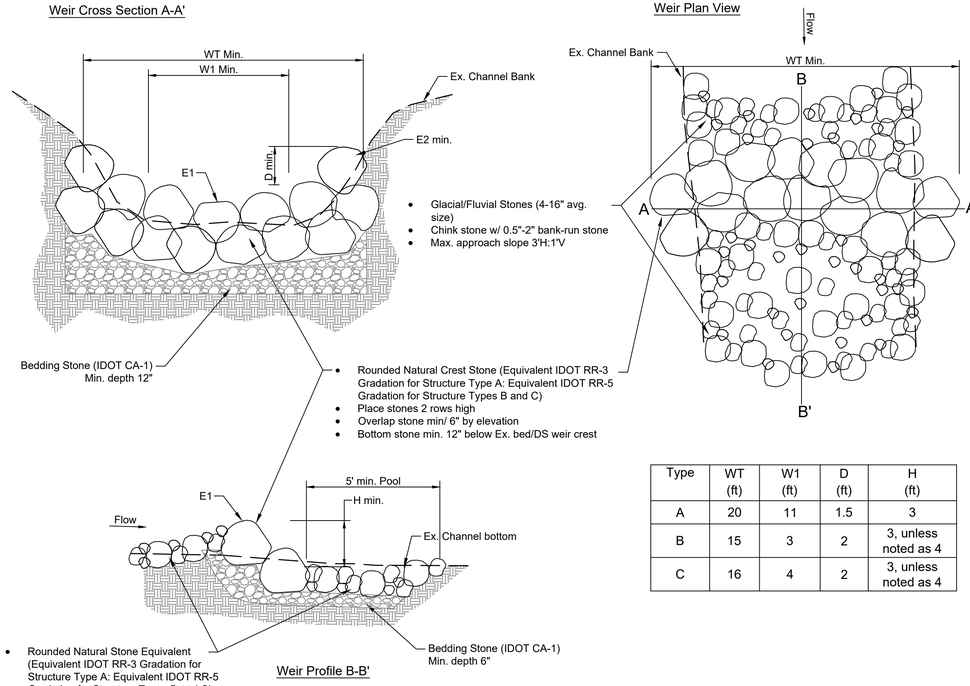
Lake Forest, Illinois

Bluff Details

PROJECT NO: 24-0271		SHEET NO:
DESIGNED BY	DAK/KNJ	C8.1
DRAWN BY	ATJ/KNJ	
CHECKED BY	DAK/KNJ	
APPROVED BY	DAK	PAGE NO:
ISSUE DATE	01/08/2026	22 OF 27

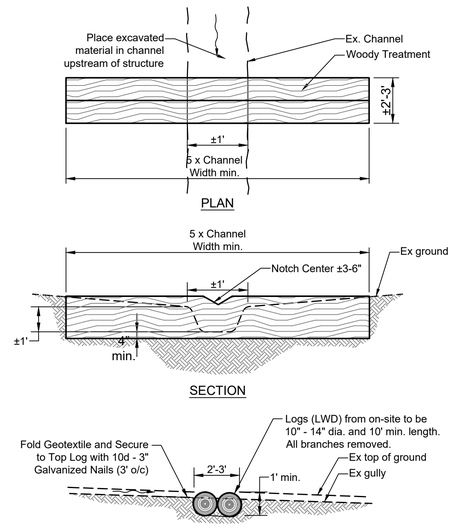
For Permit

File: P:\24\00\24-0271 LFOLA-Greene NP Bluff and Ravines\05 CAD\24-0271 Greene NP Bluff and Ravines.dwg Plot Date: January 8, 2026 Plotted by: Kristen James



Type	WT (ft)	W1 (ft)	D (ft)	H (ft)
A	20	11	1.5	3
B	15	3	2	3, unless noted as 4
C	16	4	2	3, unless noted as 4

1 Grade Control Structure Detail
(Not to Scale)



Notes:
1. All woody material will be supplied by the Owner and will be on-site at the time of construction.
2. Final field placement shall be directed by Owner/Engineer.
3. Treatment shall be placed along drainage, every ±1-2' in vertical elevation change.
4. Spoil material generated during treatment installation shall be placed in the channel, upstream of the treatment location, to match adjacent field grades.
5. SC75BN ECB or approved equal shall be installed to cover disturbed areas and spoil re-distribution area upstream of treatment. ECB installation shall be twice the width of treatment, perpendicular to flow. ECB installation shall fully cover the length of spoil material re-distribution, in the direction of flow, or be at a minimum of 8' in length.
6. All disturbed areas will be seeded with Wooded Plateau Seed/Plant List prior to blanket placement.
7. Work to be preformed in sections that can be stabilized (seeded and blanketed) that day.

2 Woody Material Stabilization Detail
(Not to Scale)

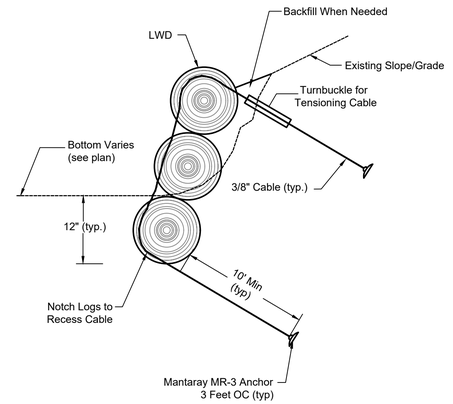
Type A Notes:

1. Place fill generated by grade control structures at the toe of the slough slope. Material shall be compacted and placed to extend up the side slope to conform to match existing adjacent slopes.
2. Install SC75BN ECB or approved equal and restore with Ravine Seed/Plant Lists. Owner shall direct installation of plugs. Interim wood staked coir logs shall be used in relatively steep slope sections at the direction of Engineer.

Type B Notes:

1. Type B shall be installation of SC75BN ECB or approved equal with Ravine Seed/Plant Lists. Owner shall direct installation of plugs. Interim wood staked coir logs shall be used in relatively steep slope sections at the direction of Engineer.

3 Side Slope Stabilization Notes
(Not to Scale)



4 Large Woody Debris (LWD) Anchoring Detail
(Not to Scale)

Scale bar measures 1" at full scale

0 1"

LEGEND

NOTES:

1. All reported elevations are in FT NAVD88.
2. Based on Great Lakes Dashboard*:
   2.1. Historic Maximum: 582.4 ft.
   2.2. Long-Term Average: 579.0 ft.
   2.3. Historic Minimum: 576.1 ft.

*Converted from IGLD 85 to NAVD 88 using the NOAA IGLD 85 Conversion tool, at the Michigan-Huron master gauge location.
NAVD 88 - 0.096' = IGLD 85

No.	Revision/Issue	Date

Hey and Associates, Inc.
Engineering, Ecology and Landscape Architecture
26575 West Commerce Drive, Suite 601
Volo, Illinois 60073
Office (847) 740-0888
Fax (847) 740-2888
Volo@heyassoc.com

Professional Design Firm
License No. 184-002429

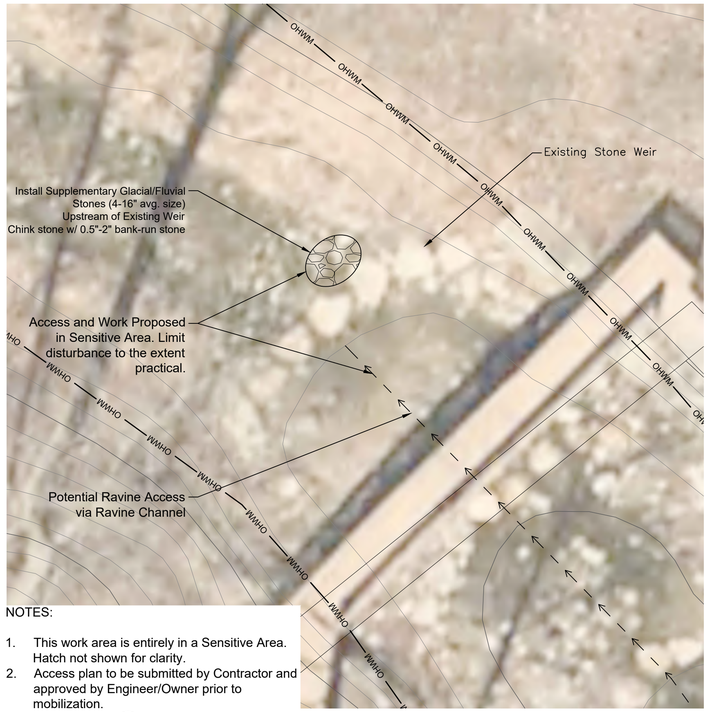
Jean and John Greene Nature Preserve Ravine, Bluff, and Shoreline Restoration

Lake Forest, Illinois

Ravine Details

PROJECT NO: 24-0271		SHEET NO:
DESIGNED BY	DAK/KNJ	C8.2
DRAWN BY	ATJ/KNJ	
CHECKED BY	DAK/KNJ	
APPROVED BY	DAK	PAGE NO:
ISSUE DATE	01/08/2026	23 OF 27

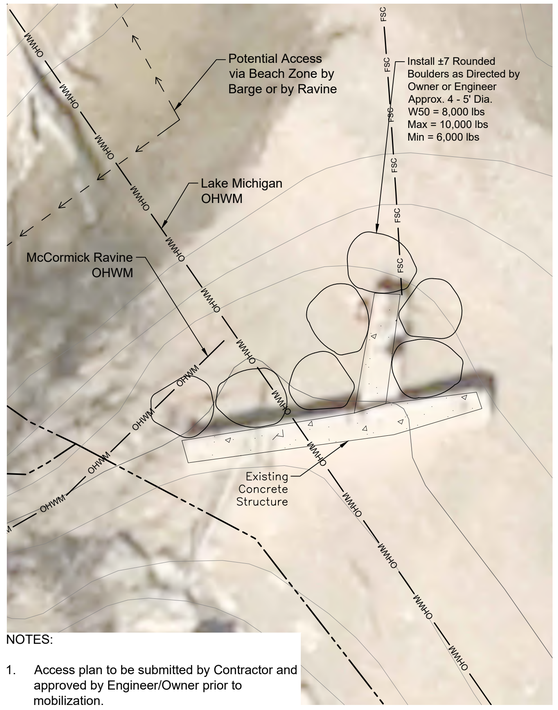
For Permit



NOTES:

1. This work area is entirely in a Sensitive Area. Hatch not shown for clarity.
2. Access plan to be submitted by Contractor and approved by Engineer/Owner prior to mobilization.

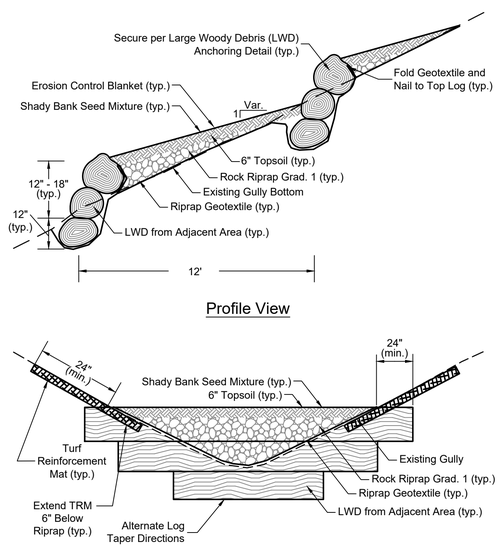
5 Weir Repair Detail
(1" - 5')



NOTES:

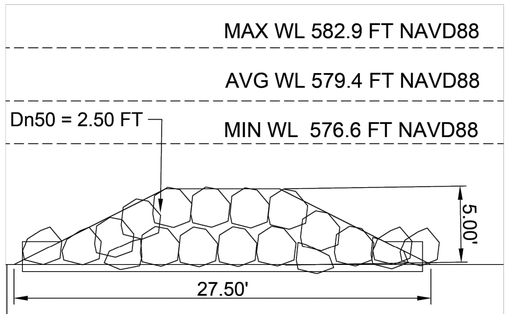
1. Access plan to be submitted by Contractor and approved by Engineer/Owner prior to mobilization.

6 Concrete Structure Supplemental Stone Detail
(1" - 5')



7 Large Woody Debris (LWD) Side Slope Stabilization Detail
(Not to Scale)

File: P:\24\00\24-0271 LFOLA-Greene NP Bluff and Ravines\05 CAD\24-0271 Greene NP Bluff and Ravines.dwg Plot Date: January 8, 2026 Plotted by: Kristen James

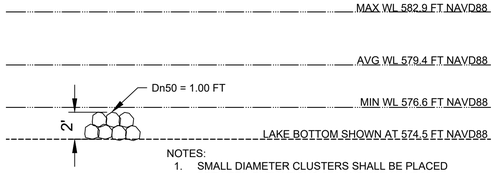


NOTES:

1. The anticipated Lake Bottom elevation range is 569-571.
2. The proposed reef is intended to be submerged at all times.

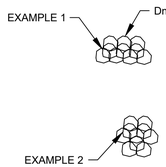
1 Offshore Habitat Reef Detail
(Not to Scale)

SMALL DIAMETER
CLUSTERS



NOTES:
1. SMALL DIAMETER CLUSTERS SHALL BE PLACED BETWEEN ELEVATIONS 574 AND 577' NAVD88.
2. LAYOUT CAN VARY. SEE EXAMPLE 1 AND EXAMPLE 2 IN PLAN VIEW DETAIL BELOW.
3. STONES SHALL BE STACKED 2 LAYERS TO CREATE A STRUCTURE NO GREATER THAN 2' IN HEIGHT.

ELEVATION VIEW

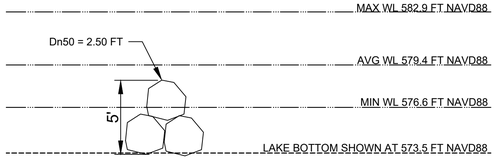


NOTES:
1. SMALL DIAMETER CLUSTERS SHALL CONSIST OF APPROXIMATELY 10 STONES WITH DN50 = 1'.
2. STONES SHALL BE STACKED 2 LAYERS TO CREATE A STRUCTURE NO GREATER THAN 2' IN HEIGHT.

PLAN VIEW

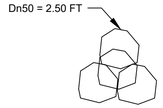
2 Nearshore Small Dia. Stone Cluster Detail
(Not to Scale)

LARGE DIAMETER
CLUSTERS



NOTES:
1. LARGE DIAMETER CLUSTERS SHALL BE PLACED BETWEEN ELEVATIONS 572' AND 577' NAVD88.

ELEVATION VIEW

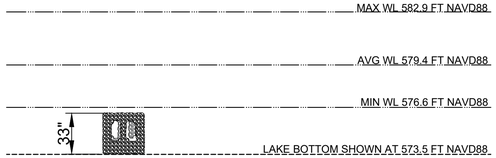


NOTES:
1. LARGE DIAMETER CLUSTERS SHALL CONSIST OF 4 STONES WITH DN50 = 2.5'.
2. STONES SHALL BE STACKED 2 LAYERS TO CREATE A STRUCTURE NO GREATER THAN 5' IN HEIGHT.

PLAN VIEW

3 Nearshore Large Dia. Stone Cluster Detail
(Not to Scale)

NATRX FISH HOUSE
OR EQUIVALENT



NOTES:
1. NATRX FISH HOUSE OR EQUIVALENT SHALL BE PLACED BETWEEN ELEVATIONS 572' AND 574' NAVD88.

ELEVATION VIEW

PLAN VIEW

4 Nearshore Natrx Cube Detail
(Not to Scale)

Scale bar measures 1" at full scale

0 1"

LEGEND

NOTES:

1. All reported elevations are in FT NAVD88.
2. Based on Great Lakes Dashboard*:
   2.1. Historic Maximum: 582.4 ft.
   2.2. Long-Term Average: 579.0 ft.
   2.3. Historic Minimum: 576.1 ft.

*Converted from IGLD 85 to NAVD 88 using the NOAA IGLD 85 Conversion tool, at the Michigan-Huron master gauge location.
NAVD 88 - 0.096' = IGLD 85

No.	Revision/Issue	Date

Hey and Associates, Inc.
Engineering, Ecology and Landscape Architecture
26575 West Commerce Drive, Suite 601
Volo, Illinois 60073
Office (847) 740-0888
Fax (847) 740-2888
Volo@Heyassoc.com

Professional Design Firm
License No. 184-002429

Jean and John Greene Nature Preserve Ravine, Bluff, and Shoreline Restoration

Lake Forest, Illinois

In-Lake Details

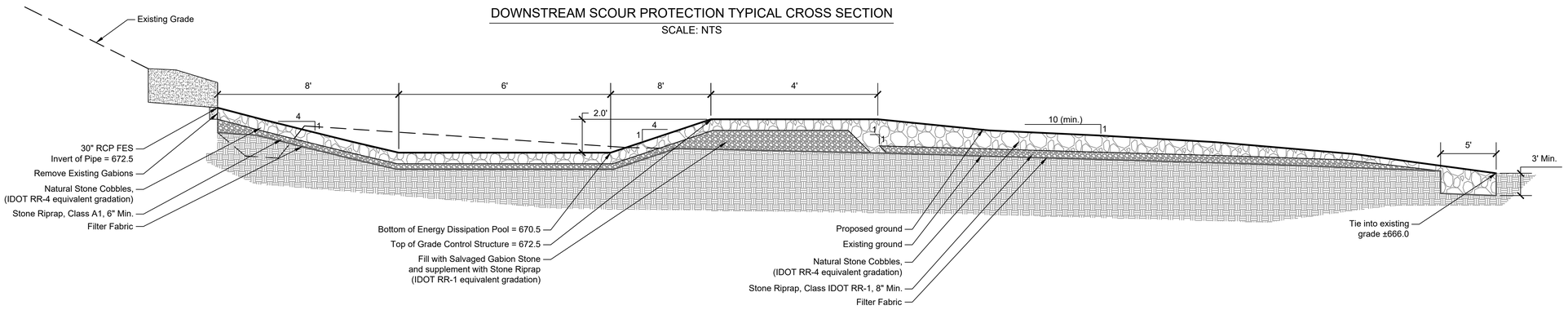
PROJECT NO: 24-0271		SHEET NO:
DESIGNED BY	DAK/KNJ	C8.3
DRAWN BY	ATJ/KNJ	
CHECKED BY	DAK/KNJ	
APPROVED BY	DAK	PAGE NO:
ISSUE DATE	01/08/2026	24 OF 27

For Permit

File: P:\2400\024-0271 LFOLA-Greene NP Bluff and Ravines\05 CAD\24-0271 Greene NP Bluff and Ravines.dwg Plot Date: January 8, 2026 Plotted by: Kristen James

DOWNSTREAM SCOUR PROTECTION TYPICAL CROSS SECTION

SCALE: NTS



1 Outfall Stabilization Detail
(Not to Scale)

Scale bar measures 1" at full scale

0 1"

LEGEND

No.	Revision/Issue	Date

Hey and Associates, Inc.
Engineering, Ecology and Landscape Architecture
26575 West Commerce Drive, Suite 601
Volo, Illinois 60073
Office (847) 740-0888
Fax (847) 740-2888
Volo@Heyassoc.com

Professional Design Firm
License No. 184-002429

Jean and John Greene Nature Preserve Ravine, Bluff, and Shoreline Restoration

Lake Forest, Illinois

Outfall Details

PROJECT NO: 24-0271		SHEET NO:
DESIGNED BY	DAK/KNJ	C8.4
DRAWN BY	ATJ/KNJ	
CHECKED BY	DAK/KNJ	
APPROVED BY	DAK	PAGE NO:
ISSUE DATE	01/08/2026	25 OF 27

For Permit

File: P:\24\00\24-0271 LFOLA-Greene NP Bluff and Ravines\05 CAD\24-0271 Greene NP Bluff and Ravines.dwg Plot Date - January 8, 2026 Plotted by: Kirsten James

Scientific Name	Common Name	Rate oz/acre
Open Bluff - Seed		
Allium canadense	Meadow Garlic	12
Antennaria plantaginifolia	Pussy-Toes	0.25
Asclepias verticillata	Whorled Milkweed	5
Bromus kalmii	Kalm's Brome	20
Desmodium canadense	Showy Tick-Trefoil	6
Elymus canadensis	Nodding Wild Rye	30
Euphorbia corollata	Flowering Spurge	6
Monarda fistulosa	Oswego-Tea	4
Pedicularis canadensis	Canadian Lousewort	2
Ranunculus fascicularis	Early Buttercup	4
Rudbeckia hirta	Black-Eyed-Susan	2
Sanicula marilandica	Maryland Black-Snakeroot	2
Schizachyrium scoparium	Little False Bluestem	48
Solidago nemoralis	Gray Goldenrod	1
Symphyotrichum leave	Smooth Blue American-Aster	10
Taenidia integerrima	Yellow Pimpernel	4
Zizia aurea	Golden Alexanders	8
Scientific Name	**Common Name**	**Quantity**
Open Bluff - Plugs		
Antennaria plantaginifolia	Pussy-Toes	TBD
Carex pensylvanica	Pennsylvania Sedge	TBD
Comandra umbellata	Bastard-Toadflax	TBD
Maianthemum stellatum	Starry False Solomon's-Seal	TBD
Potentilla simplex	Oldfield Cinquefoil	TBD
Schizachyrium scoparium	Little False Bluestem	TBD

1 Open Bluff Seed/Plant List
(Not to Scale)

Scientific Name	Common Name	Rate oz/acre
Wooded Bluff - Seed		
Anemone virginiana	Tall Thimbleweed	5
Antennaria plantaginifolia	Pussy-Toes	0.25
Bromus kalmii	Kalm's Brome	20
Bromus pubescens	Hairy Woodland Brome	8
Elymus hystrix	Eastern Bottle-Brush Grass	12
Euphorbia corollata	Flowering Spurge	6
Euthamia graminifolia	Flat-Top Goldentop	0.125
Gentianella quinquefolia ssp. occidentalis	Agueweed	1
Pedicularis canadensis	Canadian Lousewort	2
Solidago flexicaulis	Zigzag Goldenrod	0.5
Solidago juncea	Early Goldenrod	0.125
Solidago nemoralis	Gray Goldenrod	1
Solidago ulmifolia	Elm-Leaf Goldenrod	1
Symphyotrichum laeve	Smooth Blue American-Aster	12
Symphyotrichum urophyllum	Arrow-Leaf Aster	1
Taenidia integerrima	Yellow Pimpernel	4
Scientific Name	**Common Name**	**Quantity**
Wooded Bluff - Plugs		
Allium burdickii	Burdick's Leek	TBD
Antennaria plantaginifolia	Pussy-Toes	TBD
Carex pensylvanica	Pennsylvania Sedge	TBD
Comandra umbellata	Bastard-Toadflax	TBD
Scientific Name	**Common Name**	**Size / Quantity**
Wooded Bluff - Shrubs/Trees		
Quercus ellipsoidalis	Hill's Oak	5 Gallon / TBD

2 Wooded Bluff Seed/Plant List
(Not to Scale)

Scientific Name	Common Name	Rate oz/acre
Ravine (Toe of Slope/Seeps) - Seed		
Glyceria striata	Fowl Manna Grass	0.25
Lobelia cardinaliis	Cardinal-Flower	0.5
Penthorum sedoides	Ditch-Stonecrop	0.5
Scientific Name	**Common Name**	**Quantity**
Ravine (Toe of Slope/Seeps) - Plugs		
Caltha palustris	Yellow Marsh-Marigold	TBD
Carex emoryi	Emory's Sedge	TBD
Carex hystericina	Porcupine Sedge	TBD
Carex lacustris	Lakebank Sedge	TBD
Carex shortiana	Short's Sedge	TBD
Carex stricta	Uptight Sedge	TBD
Eupatorium perfoliatum	Common Boneset	TBD
Iris virginica var. shrevei	Virginia Blueflag	TBD
Scirpus atrovirens	Dark-Green Bulrush	TBD

3 Ravine (Toe of Slope/Seeps) Seed/Plant List
(Not to Scale)

Scientific Name	Common Name	Rate oz/acre
Ravine (Slopes) - Seed		
Allium burdickii	Burdick's Leek	2
Anemone quinquefolia	Nightcaps	0.25
Aquilegia canadensis	Red Columbine	1
Asclepias exaltata	Poke Milkweed	4
Bromus pubescens	Hairy Woodland Brome	12
Campanulastrum americanum	American-Bellflower	0.05
Desmodium glutinosum	Pointed Tick-Trefoil	20
Elymus hystrix	Eastern Bottle-Brush Grass	30
Eurybia macrophylla	Large-Leaf Wood-Aster	2
Eutrochium purpureum	Sweet-Scented Joe-Pye-Weed	1
Festuca subverticillata (obtusa)	Nodding Fescue	6
Heracleum maximum	American Cow-Parsnip	8
Hypericum punctatum	Spotted St. John's-Wort	0.05
Nabalus albus (Prenanthes alba)	White Rattlesnake-Root	1
Osmorhiza claytonii	Hairy Sweet-Cicely	5
Phlox divaricata	Wild Blue Phlox	2
Phryma leptostachya	Lopseed	3
Polemonium reptans	Greek-Valerian	1
Polygonatum biflorum var. commutatum	King Solomon's-Seal	5
Rudbeckia hirta	Black-Eyed-Susan	1
Scrophularia marilandica	Carpenter's-Square	0.1
Silene stellata	Starry Campion	2
Solidago flexicaulis	Zigzag Goldenrod	1.5
Solidago ulmifolia	Elm-Leaf Goldenrod	1
Symphyotrichum laeve	Smooth Blue American-Aster	12
Taenidia integerrima	Yellow Pimpernel	4
Thalictrum dioicum	Early Meadow-Rue	10
Thalictrum thalictroides	Rue-Anemone	0.25
Zizia aurea	Golden Alexanders	12
Scientific Name	**Common Name**	**Quantity**
Ravine (Slopes) - Plugs		
Actaea pachypoda	White Baneberry	TBD
Allium burdickii	Burdick's Leek	TBD
Carex pensylvanica	Pennsylvania Sedge	TBD
Geranium maculatum	Spotted Crane's-Bill	TBD
Polygonatum biflorum var. commutatum	King Solomon's-Seal	TBD
Solidago flexicaulis	Zigzag Goldenrod	TBD
Scientific Name	**Common Name**	**Size / Quantity**
Ravine - Shrubs/Trees		
Amelanchier laevis	Allegheny Service-Berry	1 Gallon / TBD
Cornus alternifolia	Alternate-Leaf Dogwood	5 Gallon / TBD
Ribes cynosbati	Eastern Prickly Gooseberry	1 Gallon / TBD
Staphylea trifolia	American Bladdernut	1 Gallon / TBD
Vaccinium angustifolium	Late Lowbush Blueberry	1 Gallon / TBD
Viburnum lentago	Nanny-Berry	1 Gallon / TBD

4 Ravine (Slopes) Seed/Plant List
(Not to Scale)

Scientific Name	Common Name	Rate oz/acre
Ravine (Crest) - Seed		
Danthonia spicata	Poverty Oat Grass	8
Scientific Name	**Common Name**	**Quantity**
Ravine (Crest) - Plugs		
Eurybia macrophylla	Large-Leaf Wood-Aster	TBD

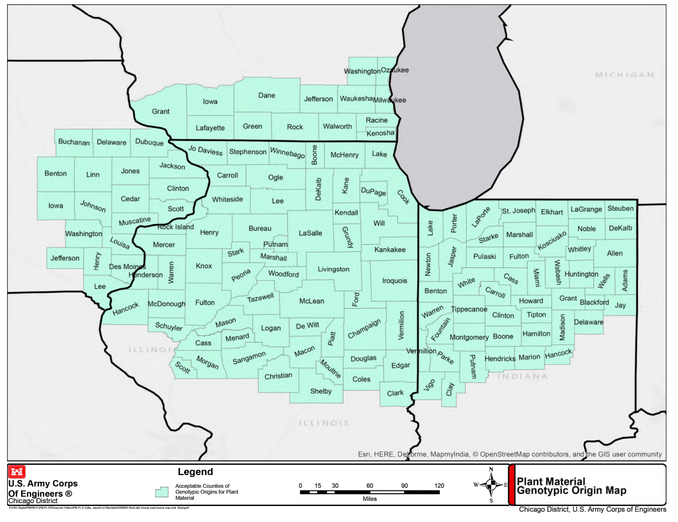
5 Ravine (Crest) Seed/Plant List
(Not to Scale)

Scientific Name	Common Name	Rate oz/acre
Wooded Plateau - Seed		
Agrostis perennans	Upland Bent	0.25
Anemone virginiana	Tall Thimbleweed	5
Antennaria plantaginifolia	Pussy-Toes	2
Asclepias exaltata	Poke Milkweed	3
Bromus pubescens	Hairy Woodland Brome	6
Carex stipata	Stalk-Grain Sedge	3
Carex tribuloides	Blunt Broom Sedge	0.25
Cinna arundinacea	Sweet Wood-Reed	1
Elymus hystrix	Eastern Bottle-Brush Grass	20
Eutrochium purpureum	Sweet-Scented Joe-Pye-Weed	2
Festuca subverticillata (obtusa)	Nodding Fescue	3
Galium concinnum	Shining Bedstraw	2
Glyceria striata	Fowl Manna Grass	2
Solidago flexicaulis	Zigzag Goldenrod	1
Symphyotrichum laeve	Smooth Blue American-Aster	4
Symphyotrichum urophyllum	Arrow-Leaf Aster	0.25
Thalictrum dasycarpum	Purple Meadow-Rue	5
Thalictrum dioicum	Early Meadow-Rue	6
Scientific Name	**Common Name**	**Quantity**
Wooded Plateau - Plugs		
Carex pensylvanica	Pennsylvania Sedge	TBD
Scientific Name	**Common Name**	**Size / Quantity**
Wooded Plateau - Shrubs/Trees		
Carya ovata	Shag-Bark Hickory	5 Gallon / TBD
Cephalanthus occidentalis	Common Buttonbush	5 Gallon / TBD
Cornus obliqua	Pale Dogwood	5 Gallon / TBD
Corylus americana	American Hazelnut	5 Gallon / TBD
Euonymus atropurpureus	Eastern Wahoo	5 Gallon / TBD
Lindera benzoin	Northern Spicebush	5 Gallon / TBD
Physocarpus opulifolius	Atlantic Ninebark	5 Gallon / TBD
Quercus bicolor	Swamp White Oak	1" Caliper / TBD
Quercus macrocarpa	Burr Oak	1" Caliper / TBD
Rosa carolina	Carolina Rose	1 Gallon / TBD
Vitis aestivalis	Summer Grape	1 Gallon / TBD

6 Wooded Plateau Seed/Plant List
(Not to Scale)

Scientific Name	Common Name	Quantity
Dune - Plug or stolon		
Ammophila brevilligulata	Beach Grass	TBD
Scientific Name	**Common Name**	**Size / Quantity**
Dune - Shrubs/Trees		
Salix myricoides	Bayberry Willow	1 Gallon / TBD

7 Dune Plant List
(Not to Scale)



8 Acceptable Counties of Genotypic Origins for Plant Material
(Not to Scale)

Scale bar measures 1" at full scale

0 1"

LEGEND

NOTES:

1. Final species lists, seeding rates, sizes, and quantities are subject to change based on source availability. Source vendor(s) is/are subject to Owner/Engineer approval and shall be located preferably in Northeast Illinois, or located in the Counties specified on the aside map. Contractor shall provide seed/plant list submittals and to Owner/Engineer for approval prior to mobilization and ordering products.

No.	Revision/Issue	Date

Hey and Associates, Inc.
Engineering, Ecology and Landscape Architecture
26575 West Commerce Drive, Suite 601
Volo, Illinois 60073
Office (847) 740-0888
Fax (847) 740-2888
Volo@Heyassoc.com

Professional Design Firm
License No. 184-002429

Jean and John Greene Nature Preserve Ravine, Bluff, and Shoreline Restoration

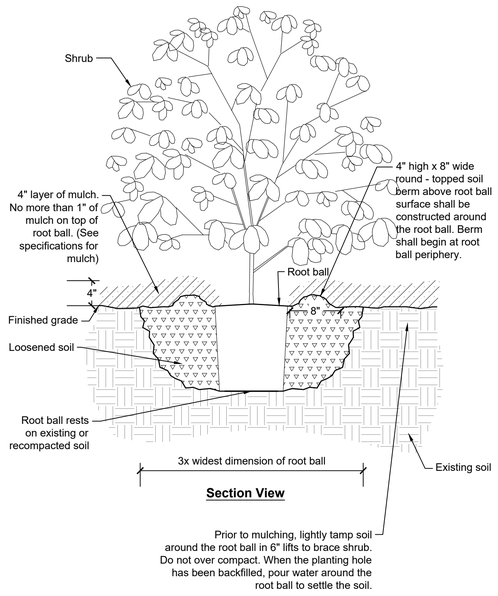
Lake Forest, Illinois

Vegetation Details

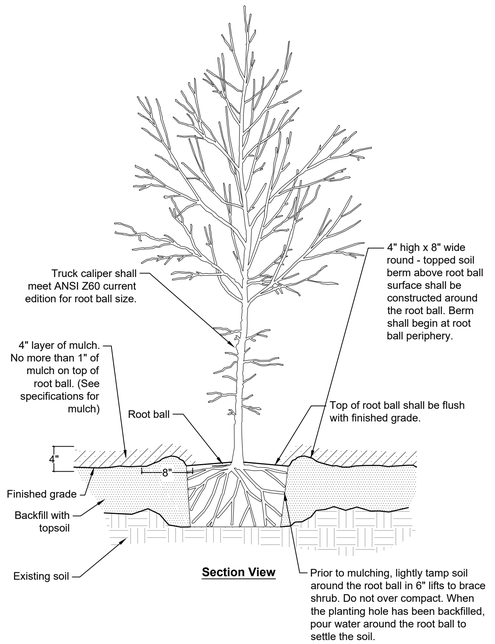
PROJECT NO:	24-0271	SHEET NO:	
DESIGNED BY	DAK/KNJ		C8.5
DRAWN BY	ATJ/KNJ		
CHECKED BY	DAK/KNJ		
APPROVED BY	DAK	PAGE NO:	
ISSUE DATE	01/08/2026	26 OF 27	

For Permit

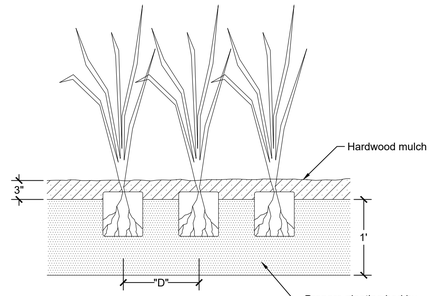
File: P:\24\00\24-0271 LFOLA-Greene NP Bluff and Ravines\05 CAD\24-0271 Greene NP Bluff and Ravines.dwg Plot Date: January 8, 2026 Plotted by: Kirsten James

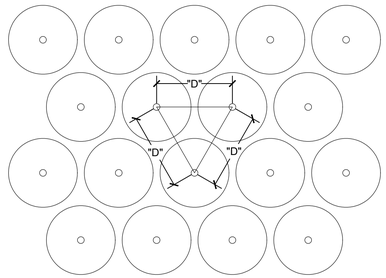


1 Shrub Planting Detail
(Not to Scale)



2 Tree Planting Detail
(Not to Scale)





Typical Plant Spacing
D = 12"-18" on center for all perennials and grasses

3 Perennial / Grass Planting Detail
(Not to Scale)

Scale bar measures 1" at full scale

0 1"

LEGEND

No.	Revision/Issue	Date

Hey and Associates, Inc.
Engineering, Ecology and Landscape Architecture
26575 West Commerce Drive, Suite 601
Volo, Illinois 60073
Office (847) 740-0888
Fax (847) 740-2888
Volo@Heyassoc.com

Professional Design Firm
License No. 184-002429

Jean and John Greene Nature Preserve Ravine, Bluff, and Shoreline Restoration

Lake Forest, Illinois

Vegetation Details

PROJECT NO:	24-0271	SHEET NO:
DESIGNED BY	DAK/KNJ	C8.6
DRAWN BY	ATJ/KNJ	
CHECKED BY	DAK/KNJ	
APPROVED BY	DAK	PAGE NO:
ISSUE DATE	01/08/2026	27 OF 27

For Permit

File: P:\24\00024-0271 LFOLA-Greene NP Bluff and Ravines\05 CAD\24-0271 Greene NP Bluff and Ravines.dwg Plot Date: January 8, 2026 Plotted by: Kirsten James

Hey and Associates, Inc.

Jean and John Greene Nature Preserve Ravine, Bluff, and Shoreline Restoration

Lake Forest, Lake County, Illinois

Stormwater Report

Prepared For:
Lake Forest Open Lands Association
350 North Waukegan Road
Lake Forest, Illinois 60045

Hey Project No. 24-0271

Prepared By:
Hey and Associates, Inc.
Engineering, Ecology and Landscape Architecture

Main Office:
Volo, IL
26575 W. Commerce Dr., Ste 601
Volo, Illinois 60073
847-740-0888 (phone)
847-740-2888 (fax)

Additional Offices:
Chicago, IL
8755 W. Higgins Rd., Ste 835
Chicago, Illinois 60631
773-693-9200 (phone)
847-740-2888 (fax)

Richland Center, WI
20422 County Highway G
Milwaukee, Wisconsin 53227
414-327-0440 (phone)
847-740-2888 (fax)

Illinois Professional Design Firm 184-002429 / Wisconsin Architectural and Engineering License # 2340-11
Staff licensed to practice in Illinois, Wisconsin, Indiana, Iowa, and Michigan
IDOT Prequalified

September 23, 2025
Revised January 8, 2026

Appendices

Unbound Attachments

INTRODUCTION

Hey and Associates, Inc (Hey) was retained by the Lake Forest Open Lands Association (LFOLA) to design restoration improvements to the ravine, bluff, and shoreline at the Jean and John Greene Nature Preserve (Project). As part of the Project, the U.S. Army Corps of Engineers' (USACE) *Engineering with Nature* initiative principals were employed to design a naturalized restoration plan at Deromedi Ravine, along the Lake Michigan bluff, and in the aquatic near shore zone. Constructed project benefits will include bed and slope stabilization, erosion mitigation, and habitat enhancement.

This work is funded, in part, by a National Oceanic and Atmospheric Administration (NOAA) grant through the FY24 Bipartisan Infrastructure Law Coastal Zone Management Habitat Protection and Restoration Competition.

The project area is shown on the Plans and is generally bounded by Sheridan Road to the west, Units 2 and 3 of the Robert W. Kendler's Villa Turicum Subdivisions to the north, and Lake County Forest Preserves' Fort Sheridan Forest Preserve to the south. The project extends east into Lake Michigan, which is a navigable public water body, as defined by Illinois Department of Natural Resources-Office of Water Resources (IDNR-OWR).

Hey has prepared plans for these improvements, entitled *Jean and John Greene Nature Preserve Ravine, Bluff, and Shoreline Restoration* (Plans) dated December 31, 2025, that document the project and accompany this report. The Plans include:

- Overall project information on sheets C1.0-C3.0
- Bluff restoration plans on sheets C4.0-C4.5
- Ravine restoration plans on sheets C5.0-C5.5
- In-Lake restoration plans on sheet C6.0
- Outfall protection plans on sheet C7.0
- Associated details on sheets C8.0-C8.4

This report documents the design of proposed plan components associated with this restoration project and how they meet regulatory requirements included in the Permits and Authorizations section of this report.

PROJECT AREA DESCRIPTION

The project is further located in Section 03, Township 43 North, Range 12 East in Lake County, Illinois. A location map is included on the sheet C1.0 of the Plans. The project area is comprised of parcels 1603402038 and 1603307044, both owned by LFOLA, and a City of Lake Forest drainage easement along the boundary between parcels 1603307044 (LFOLA) and 1603307038 (Gaines, Alton & Kimberly). The McCormick Nature Preserve Subdivision plat is included as Appendix A and includes documentation of the easement, which is also referenced on the Plans. Access to portions of the site will be by barge and may include access coordination with the Lake County Forest Preserve District.

The Jean and John Greene Nature Preserve is comprised of approximately 61 acres. The property currently exists as predominantly woodland, bluff, ravine, and beachfront with wetlands, trails, and a parking facility.

OVERALL PROJECT DISCUSSION

Restoration of the Lake Michigan bluff, Deromedi Ravine, and the near-shore zone and protection of a storm sewer outfall at the head of McCormick Ravine will be completed as part of this project. As relevant to regulations, the project will:

- Not increase runoff
- Not alter drainage patterns
- Not impact regulatory floodplains or floodway
- Not result in wetland impacts
- Include work in Waters, below the Ordinary High Water Mark (OHWM), in McCormick Ravine, Deromedi Ravine, and along Lake Michigan. Impacts are limited to what is necessary to install the specified restoration treatments.

- Include limited and specific tree removal

Construction of the project is scheduled to commence after August 1, 2025 and will be completed by July 31, 2026. Monitoring and vegetation management activities will continue, at least, throughout years 2 and 3.

Bluff Restoration

The coastal bluff at the Jean and John Greene Nature Preserve (Preserve) has experienced cyclical periods of erosion and failure and relative stability. These cycles are driven in part by Lake Michigan water levels, wave and ice action, precipitation regimes and groundwater levels, changing vegetation conditions, and large-scale nearshore sediment transport. As part of this project, the bluff will be encouraged to achieve a more stable, revegetated condition to protect and enhance habitat, support access and recreation, and to preserve the unique bluff/ravine landform.

The proposed bluff restoration is comprised of a hybrid stone toe and a bluff face treatment. The stone toe will protect the bluff toe zone from lake-induced erosion and will provide a level of stability for the mid- and upper-bluff zones. The slope will then be lightly graded in select high-slope zones to mitigate some localized failure. Native vegetation will be installed on the bluff face to utilize root structures to further stabilize the slope and enhance the diverse bluff face habitat zone.

The stone toe treatment is proposed to be partially buried, to naturalize the transition zone and to provide integrated soil matrix for vegetation establishment. The portion of the stone toe at the beach/slope interface will be left exposed to withstand energy and saturation of the active wave/splash zone. The stone toe extends to an elevation of 591.0, which was derived from the modeled 100-year wave runup elevation with a conservative factor of safety, consideration of the FEMA coastal transects, and is consistent with other local bluff projects. Although in-lake structures are also proposed as part of this project, no wave attenuation resulting from these structures was considered in the bluff toe design. It is noted that certain high water and wave conditions may exceed the ability of the soil and vegetation

veneer to withstand erosion, in which case, the stone may be more exposed and will serve more as a traditional stone toe treatment for the high-energy zone. Post-storm maintenance to restore the soil and vegetative veneer may be pursued as part of future projects.

The bluff toe treatment includes the installation of large woody structures to naturalize and enhance the toe treatment zone. Trees at the tableland-bluff interface and along the bluff face were surveyed and are indicated on the Plans. Select fallen trees are present in the mid-slope zone, having fallen from the tableland due to slope failure. These mid-slope trees will be harvested for use in the toe treatment. If more woody material is needed, large diameter trees will be harvested at the edge of tableland, starting with those that are the closest to the tableland/bluff interface and are therefore more likely to naturally fall as the bluff reaches a more stable state. If available and practical to use at this site, LFOLA may also provide stockpiled woody material for use in the treatment, which would limit harvest from the project area.

At the adjacent property to the north, a separate bluff stabilization project is currently underway. As part of this effort, the transition between the two projects at the property boundary has been coordinated.

Also in the beach zone, remaining sections of an abandoned drain tile and concrete structure will be removed.

Ravine Restoration

Three ravines, the northern McCormick Ravine, central Deromedi Ravine, and southern Janes Ravine, are present at the Preserve, which all confluence just upstream of their ultimate outfall at Lake Michigan. Prior restoration of McCormick and Janes ravines and the confluence has been completed. The present project includes restoration of Deromedi Ravine.

Historical hydrologic changes have impacted Deromedi Ravine, which has led to downcutting and slope erosion. Ravine improvements are proposed as part of this project to mitigate erosion and to limit slope failure. These treatments will not only allow the ravine to adapt to

the present hydrologic conditions, but will provide stability for unique habitat conditions and protect access infrastructure along the adjacent tableland.

The project proposes to extend the GLFER-Fort Sheridan, IL Ecosystem Restoration Project and subsequent repair ravine restoration approach to reaches in Deromedi ravine that were not previously restored.

Stone grade control structures along Deromedi Ravine are included in the Plans on Sheets C5.0 through C5.5 stabilize grades and protect against downcutting. The Rational Method was used to conservatively estimate 100-year peak discharges at multiple locations along the ravine. These calculations were used to size the grade control riffles and to select Illinois Department of Transportation (IDOT) standard gradations for each structure type. Rounded, natural stone, of the equivalent sizing of the IDOT gradations selected, are specified. Methods and calculations are included in Appendix C.

In-Lake Restoration

Nearshore habitat enhancement is included in the restoration plan and is comprised of a boulder cluster field and a series of habitat reefs. The boulder cluster field concept is an Engineering with Nature strategy to reduce near-shore wave energy and to create functional aquatic habitat. These nearshore structures will not have the ability to trap sand from littoral drift.

Boulder field sediment and bluff dynamics were studied as part of the conceptual project development at Lookout Park near St. Joseph, Michigan. In addition to wave dynamics, fishery habitat benefits resulting from boulder fields were studied at the mouth of Racoon Creek at Lake Erie as part of the Conneaut Harbor. These two projects are included in the *Engineering with Nature Four Coasts Great Lakes* publication. This concept was also researched and modeled as part of development of nature-based alternatives to stabilize and mitigate ongoing erosion at Saint Croix Island, Maine, an International Historic Site managed by the National Park Service (NPS). Illinois-Indiana Sea Grant and the Shedd Aquarium were also consulted on design, related to the similar projects, including the rubble ridges at Illinois

Beach State Park and the submerged reefs at Fort Sheridan Forest Preserve, constructed as part of the GLFER-Fort Sheridan, IL Ecosystem Restoration Project.

A J-hook and "S" shaped habitat reefs are also planned as part of the project. These structures consist of large limestone blocks surrounded by cobbles interspersed with sub-aquatic plantings. These habitat reefs will have a maximum height of 5 feet and are designed to be submerged under minimum water level (576.6) conditions. Additional supporting information for these structures can be found in Appendix B.

Outfall Protection

McCormick Ravine is, in part, fed by the storm sewer outfall at Sheridan Road, near the main entrance to the Jean and John Greene Nature Preserve. The outfall configuration consists of a concrete headwall, a stone plunge pool, and staked gabion baskets. Just downstream of the plunge pool, channel scour and slope toe erosion are present, which is encouraging downcutting and slope sloughing. To protect the surrounding infrastructure and mitigate erosion impacts from the storm sewer inputs, the Plan proposes to enhance and expand the stone protection.

This work is confined to the parcel owned by LFOLA (1603307044) and the City of Lake Forest's drainage easement along the boundary between the LFOLA parcel and the adjoining parcel 1603307038 (Appendix A).

Stone outfall protection at the head of McCormick Ravine in included in the Plans on Sheet C7.0 to stabilize grades and protect against downcutting. The flowing-full capacity of the existing storm sewer outfall at Sheridan Road was calculated to inform design and to select IDOT standard gradation for the treatment. Rounded, natural stone, of the equivalent sizing of the IDOT gradations selected, are specified. Calculations are included in Appendix C.

PERMITS AND AUTHORIZATIONS

The following permits and authorizations are being pursued as part of this project.

- A City of Lake Forest Site Grading Permit

- A Watershed Development Permit (WDP) administered by the City of Lake Forest, as a certified community, on behalf of the LCSMC
- LCSMC Soil Erosion and Sediment Control review and approval (if requested by USACE)
- USACE Nationwide Permits 14 and 27
- USACE Chicago District Regional General Permit for Lake Michigan (LMRGP)
- USACE Section 408 Coordination
- IDNR-OWR Part 3704 Regulation of Public Waters Permit
- State and federal threatened and endangered species consultation through IDNR's Ecological Compliance Assessment Tool (EcoCAT) and through the U.S. Fish and Wildlife Service's (USFWS) Information for Planning and Consultation tool (IPAC)
- Cultural resource clearance through the IDNR State Historic Preservation Office (SHPO)
- Illinois Environmental Protection Agency (IEPA) National Pollutant Discharge Elimination System (NPDES) ILR-10 NPDES Permit
- IEPA Section 39 of the Illinois Environmental Protection Act (415 ILCS 5/39) authorization
- Illinois Nature Preserves Commission Coordination and Approval, as the site is a dedicated Nature Preserve

Soil Erosion and Sediment Control

At the bluff, work will be confined to the dry beach zone to the extent practical. A floating silt curtain will be installed in the lake to mitigate sediment migration during beach access and bluff toe work.

Work in McCormick and Deromedi Ravines will occur during low water periods. Stone grade control structures will be installed downstream to upstream to act as interim sediment control. US Army Corps of Engineers (USACE) in-stream construction notes are included on the Plans, which include a requirement for the Contractor to submit an in-stream work plan

to USACE, or the Lake County Stormwater Management Commission (LCSMC) if delegated by USACE, for review and approval.

A site access plan, traffic control, and final construction sequencing will be coordinated with the contractor when one is selected. Disturbance to the overall project site will be kept to a minimum. In-lake structures will be installed by barge and will minimize bottom disturbance to the extent practical.

Temporary stockpiles will not be located in floodplains or wetlands and will be protected with perimeter erosion control products. Imported stone material for the bluff, ravine, in-lake, and outfall treatments will be free of fines. The site will be restored and stabilized with erosion control blanket and seeded and planted with native species. A Designated Erosion Control Inspector (DECI) will be performing regular site inspections that meet the inspection requirements during construction and until at least 70% vegetative stabilization is reached.

LCSMC Soil Erosion and Sediment Control Construction Notes and Typical Construction Sequencing are shown on Sheet C1.1 of the Plans.

Lake County Watershed Development Ordinance Considerations

According to Section 300 of the Lake County Watershed Development Ordinance (WDO), last updated July 11, 2023, this project is considered a Major Development, as it:

- 300.01: Is located in a regulatory floodplain
- 300.02: Is located in a flood-prone area with 100-acres of tributary drainage area or more. The tributary drainage area is ±360-acres (Appendix D).
- 300.04: Creates a wetland impact within an area defined as Waters of the U.S. (WOUS) or Isolated Waters of Lake County (IWLC) (Appendix E)
- 300.05: Modifies the flood-prone area of a channel where the tributary drainage area is twenty (20) or more acres
- 300.08: Disturbs more than 5,000 square feet.

The project will not result in:

- 300.03: Modifications to depressional storage areas with a storage volume of 0.75 acre-foot or more for the base flood
- 300.06: An ownership parcel that includes:
    - More than 1-acre of new impervious surface area. No new impervious area will be created by the project.
    - More than 3-acres of hydrologically disturbed area, unless the total new impervious surface area is less than 0.5-acre
    - An impervious surface area ratio of 50% or greater
- 300.07: a public road development
- 300.09: Work to a building in a Special Flood Hazard Area

No stormwater management facilities are proposed as part of this project. Wetland and Waters buffers will be enhanced as part of this project.

APPENDIX A

MCCORMICK NATURE PRESERVE SUBDIVISION PLAT

Image# 057875720007 Type: PSB
Recorded: 12/13/2018 at 09:52:30 AM
Receipt#: 2018-00064868
Page 1 of 7
Fees: $72.00
IL Rental Housing Fund: $9.00
Lake County IL Recorder
Mary Ellen Vanderventer Recorder
File 7531730

PLAT INFORMATION SHEET

NUMBER OF PLAT PAGES 6

SECTION	TOWNSHIP	RANGE
3	43	12
LEGAL DESCRIPTION		
PART SE 1/4		

CHECK (√) TYPE OF PLAT:

- ☐ ANNEXATION/DISCONNECTION
- ☐ CONDOMINIUM
- ☐ DEDICATION
- ☐ EASEMENT
- ☐ VACATION
- ☐ OTHER _____
- ☒ SUBDIVISION (enter subdivision name on line below)

McCORMICK NATURE PRESERVE SUB

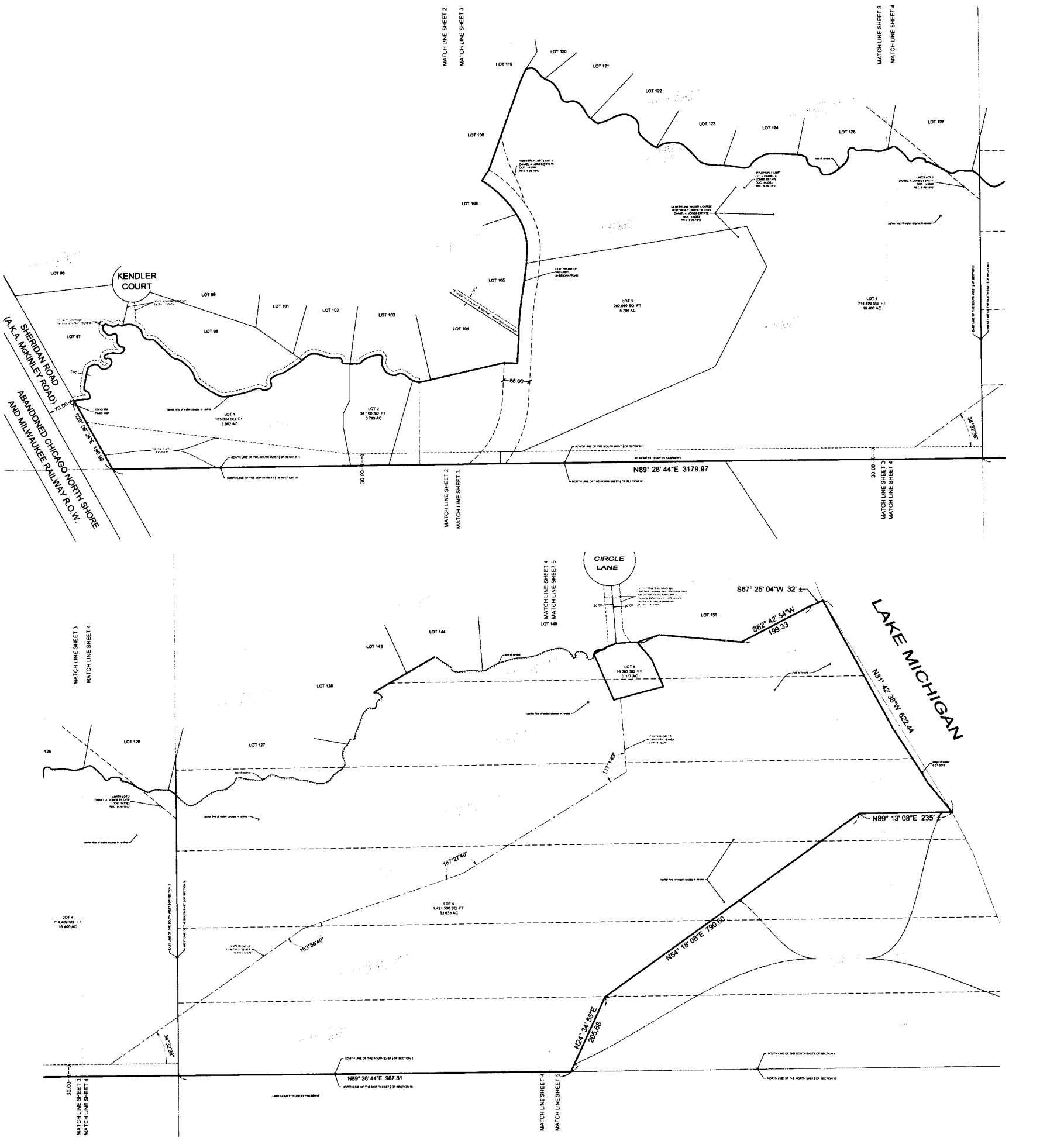
IF THE PLAT RECORDED WAS LARGER THAN 11" X 17", THE ATTACHED COPY HAS BEEN REDUCED FROM A SCANNED IMAGE.

ORIGINAL SCALE PAPER COPIES OR DIGITAL IMAGE FILES ARE ALSO AVAILABLE FOR PURCHASE – PLEASE CALL (847) 377-2678 FOR MORE INFORMATION

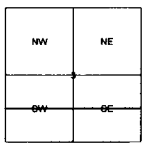
U:\Forms\PlatInfo\Plat Information Coversheet for Scanning.doc
Revised: February 22, 2007 12:00 PM

McCORMICK NATURE PRESERVE SUBDIVISION

BEING A SUBDIVISION OF PART OF THE SOUTH HALF OF THE SOUTHWEST QUARTER AND PART OF THE SOUTH HALF OF THE SOUTHEAST QUARTER OF FRACTIONAL SECTION 3, TOWNSHIP 43 NORTH, RANGE 12 EAST OF THE THIRD PRINCIPAL MERIDIAN, IN LAKE COUNTY, ILLINOIS.



ABBREVIATIONS:
m. or meas. = measured
r. or rec. = record
CB = chord bearing
CH = chord length
L = arc length
N = North
S = South
E = East
W = West
SQ. FT. = square feet
AC = acres



S 1/2 FRACTIONAL SECTION 3, TOWNSHIP
43 NORTH, RANGE 12 EAST

N

0' 50' 100' 200'
Scale 1" = 100'

SHEET 1 OF 6

AUGUST 1, 2018
PROJECT NO. 70-925

BLECK
engineers | surveyors

Prepared for:
THE CITY OF LAKE FOREST
800 N. Field Drive
Lake Forest, IL 60045

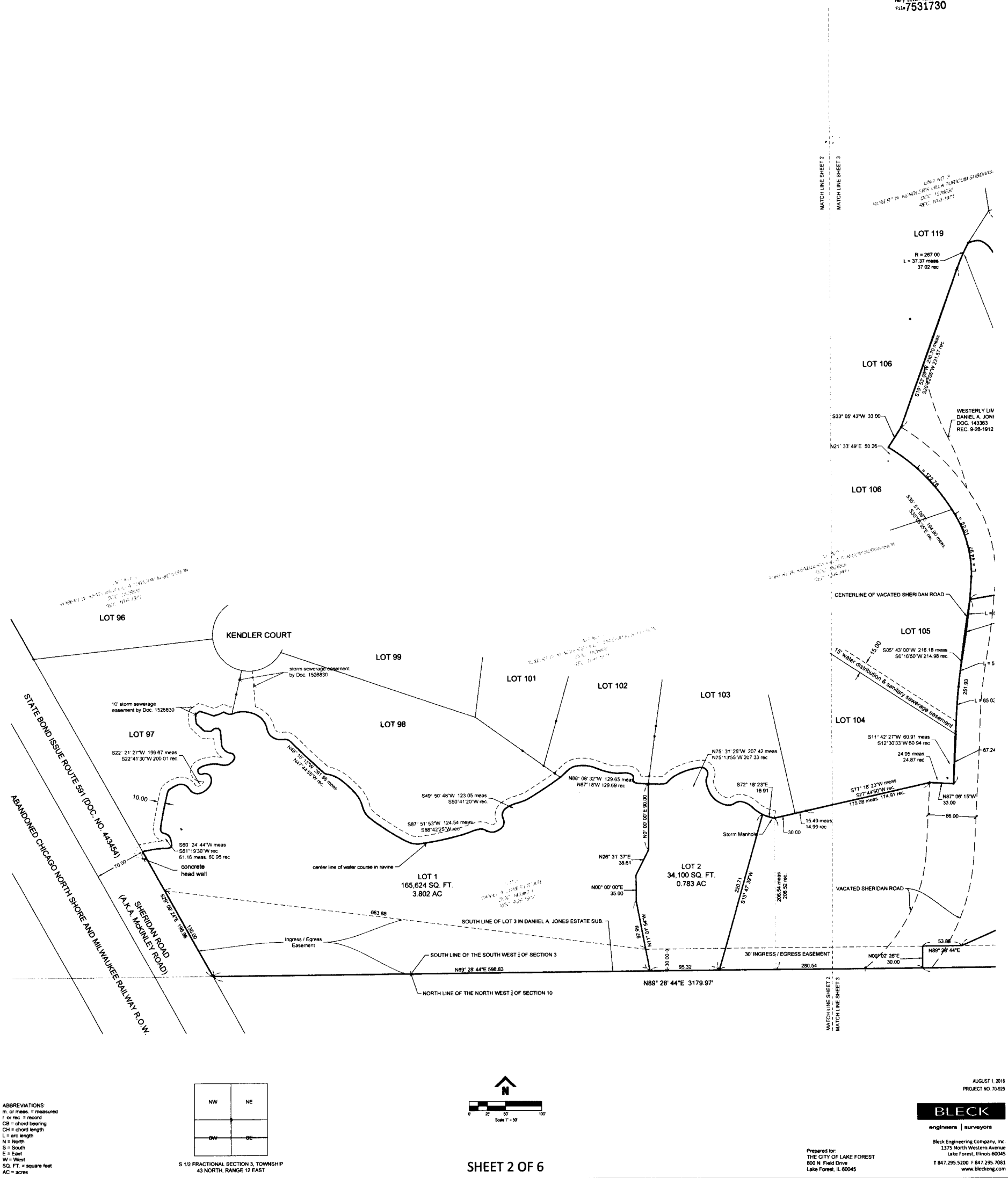
Bleck Engineering Company, Inc.
1375 North Western Avenue
Lake Forest, Illinois 60045
T 847.295.5200 F 847.295.7081
www.bleckeng.com

McCORMICK NATURE PRESERVE SUBDIVISION

7531730
12/18/2018

BEING A SUBDIVISION OF PART OF THE SOUTH HALF OF THE SOUTHWEST QUARTER AND PART OF THE SOUTH HALF OF THE SOUTHEAST QUARTER OF FRACTIONAL SECTION 3, TOWNSHIP 43 NORTH, RANGE 12 EAST OF THE THIRD PRINCIPAL MERIDIAN, IN LAKE COUNTY, ILLINOIS.

Image# 087672007 Type: PSD
Recorded: 12/18/2018 at 09:52:30 AM
Receipt#: 2018-00064868
Page 1 of 7
Fees: $72.00
IL Rental Housing Fund: $9.00
Lake County IL Recorder
Mary Ellen Vanderventer Recorder
File#7531730



ABBREVIATIONS
m. or meas. = measured
r. or rec. = record
CB = chord bearing
CH = chord length
L = arc length
N = North
S = South
E = East
W = West
SQ. FT. = square feet
AC = acres

S 1/2 FRACTIONAL SECTION 3, TOWNSHIP 43 NORTH, RANGE 12 EAST

SHEET 2 OF 6

AUGUST 1, 2018
PROJECT NO. 70-925

BLECK
engineers | surveyors

Bleck Engineering Company, Inc.
1375 North Western Avenue
Lake Forest, Illinois 60045
T 847.295.5200 F 847.295.7081
www.bleckeng.com

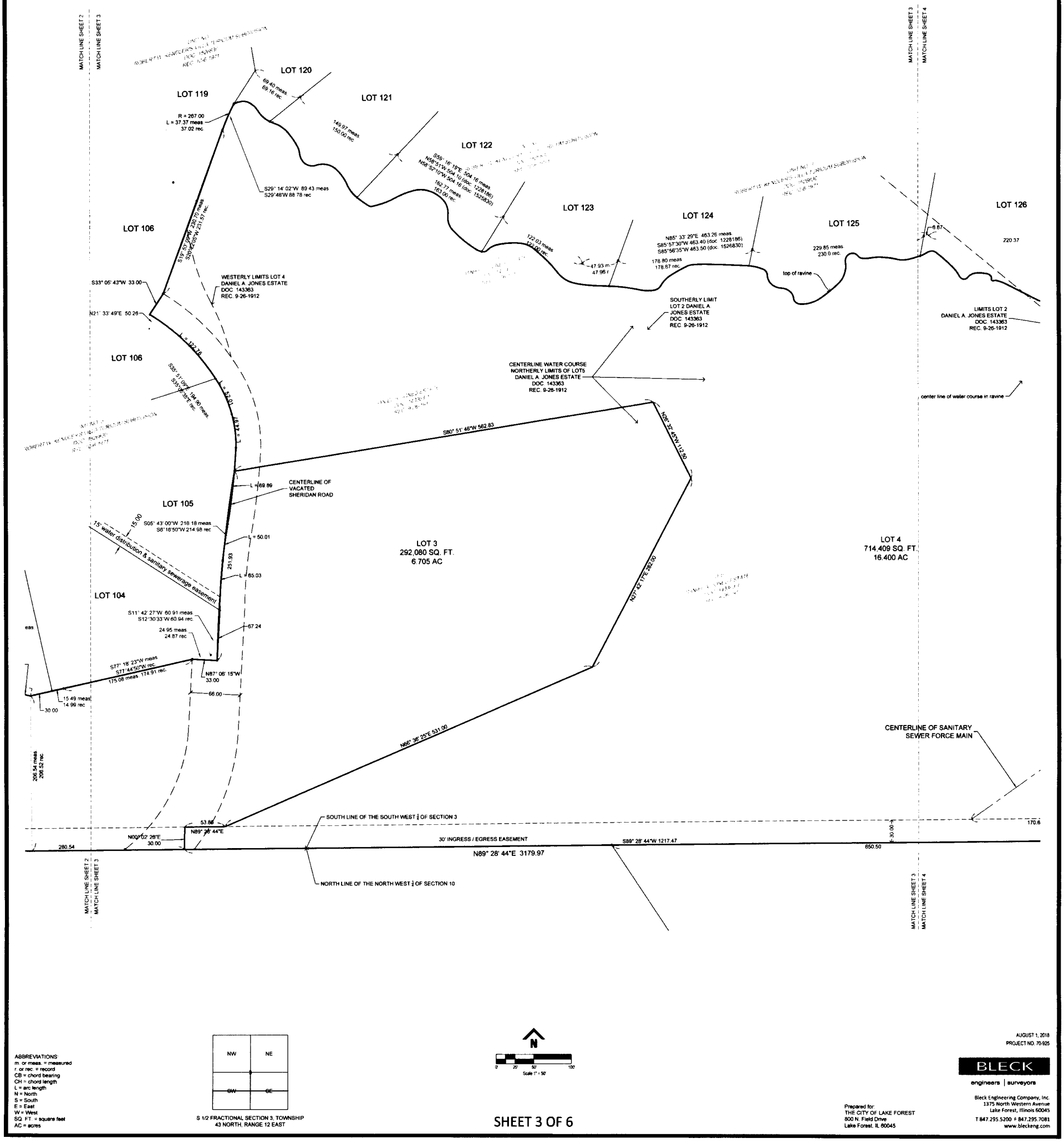
Prepared for:
THE CITY OF LAKE FOREST
800 N. Field Drive
Lake Forest, IL 60045

McCORMICK NATURE PRESERVE SUBDIVISION

7531730
12/19/2018

BEING A SUBDIVISION OF PART OF THE SOUTH HALF OF THE SOUTHWEST QUARTER AND PART OF THE SOUTH HALF OF THE SOUTHEAST QUARTER OF FRACTIONAL SECTION 3, TOWNSHIP 43 NORTH, RANGE 12 EAST OF THE THIRD PRINCIPAL MERIDIAN, IN LAKE COUNTY, ILLINOIS.

Imaged 087875720007 Type: PRE
Recorded: 12/19/2018 at 09:52:30 AM
Receipt#: 2018-00084868
Page 1 of 7
Fees: $72.00
IL Rental Housing Fund: $9.00
Lake County IL Recorder
Mary Ellen Vanderventer Recorder
File 7531730



ABBREVIATIONS:
m. or meas. = measured
r. or rec. = record
CB = chord bearing
CH = chord length
L = arc length
N = North
S = South
E = East
W = West
SQ. FT. = square feet
AC = acres

NW | NE
SW | SE
S 1/2 FRACTIONAL SECTION 3, TOWNSHIP 43 NORTH, RANGE 12 EAST

N
0' 25' 50' 100'
Scale 1" = 50'

SHEET 3 OF 6

AUGUST 1, 2018
PROJECT NO. 70-925

Prepared for:
THE CITY OF LAKE FOREST
800 N. Field Drive
Lake Forest, IL 60045

BLECK
engineers | surveyors
Bleck Engineering Company, Inc.
1375 North Western Avenue
Lake Forest, Illinois 60045
T 847.295.5200 F 847.295.7081
www.bleckeng.com

McCORMICK NATURE PRESERVE SUBDIVISION

7531370
12/13/2018

BEING A SUBDIVISION OF PART OF THE SOUTH HALF OF THE SOUTHWEST QUARTER AND PART OF THE SOUTH HALF OF THE SOUTHEAST QUARTER OF FRACTIONAL SECTION 3, TOWNSHIP 43 NORTH, RANGE 12 EAST OF THE THIRD PRINCIPAL MERIDIAN, IN LAKE COUNTY, ILLINOIS.

Images 00787572007 Type: PRR
Recorded: 12/13/2018 at 08:52:30 AM
Receipts: 2018-00084888
Page 1 of 7
Fees: $72.00
IL Rental Housing Fund: $9.00
Lake County IL Recorder
Mary Ellen Vanderventer Recorder
File 7531730

LOT 4
714,409 SQ. FT.
16.400 AC

LOT 5
1,421,500 SQ. FT.
32.633 AC

LOT 126
LOT 127
LOT 128
LOT 143
LOT 144
LOT 149

MATCH LINE SHEET 3
MATCH LINE SHEET 4
MATCH LINE SHEET 5

UNIT NO. 2
ROBERT W. KENDLER'S VILLA TURICUM SUBDIVISION
DOC. 134267
REC. 3-5-1968

PART OF LOT 2
FORT SHERIDAN NORTH SHORE SUBDIVISION
DOC. 48639
REC. 3-4-1892

LIMITS LOT 2
DANIEL A. JONES ESTATE
DOC. 143363
REC. 9-26-1912

EAST LINE OF THE SOUTH WEST ¼ OF SECTION 3
WEST LINE OF THE SOUTH EAST ¼ OF SECTION 3
705.44
S00° 29' 35"E

SOUTH LINE OF THE SOUTH EAST ¼ OF SECTION 3
NORTH LINE OF THE NORTH EAST ¼ OF SECTION 10
N89° 28' 44"E 3179.97'

LAKE COUNTY FOREST PRESERVE

30' INGRESS / EGRESS EASEMENT

CENTERLINE OF SANITARY SEWER FORCE MAIN

center line of water course in ravine

top of ravine

N89° 08' 16"W 611.11 meas.
N88°45'W 611.10 (doc. 1228186)
N88°44'50"W 611.15 (doc. 1526830)

390.74 meas
390.78 rec

S85° 34' 31"W 475.23 meas.
N85°56'E 475.60 (doc. 1228186)
N85°57'40"E 475.39 doc. 1370251)

N89° 54' 55"E meas
N89°E (doc. 1228186)
N89° 11'39"E (doc. 1370251)

N25° 19' 48"E 169.51 meas
S26° 40' 20"W 169.46 (doc. 1228186)
S26° 40' 20"W 169.51 (doc. 1526830)

ABBREVIATIONS
m. or meas. = measured
r. or rec. = record
CB = chord bearing
CH = chord length
L = arc length
N = North
S = South
E = East
W = West
SQ. FT. = square feet
AC = acres

NW | NE
SW | SE
S 1/2 FRACTIONAL SECTION 3, TOWNSHIP 43 NORTH, RANGE 12 EAST

Scale 1" = 50'

SHEET 4 OF 6

AUGUST 1, 2018
PROJECT NO. 70-925

Prepared for:
THE CITY OF LAKE FOREST
800 N. Field Drive
Lake Forest, IL 60045

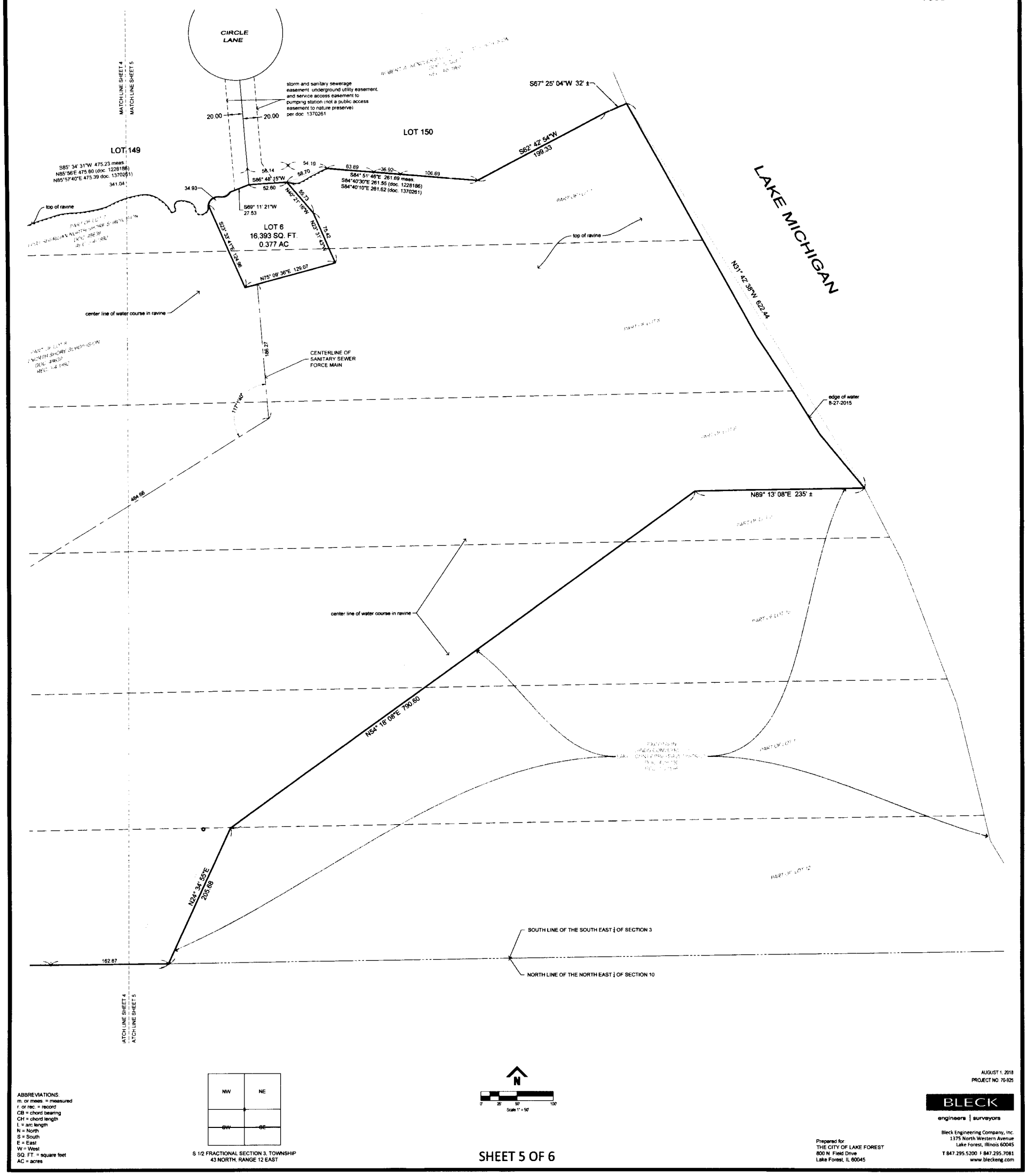
BLECK
engineers | surveyors
Bleck Engineering Company, Inc.
1375 North Western Avenue
Lake Forest, Illinois 60045
T 847.295.5200 F 847.295.7081
www.bleckeng.com

McCORMICK NATURE PRESERVE SUBDIVISION

7531730
12/13/2018

BEING A SUBDIVISION OF PART OF THE SOUTH HALF OF THE SOUTHWEST QUARTER AND PART OF THE SOUTH HALF OF THE SOUTHEAST QUARTER OF FRACTIONAL SECTION 3, TOWNSHIP 43 NORTH, RANGE 12 EAST OF THE THIRD PRINCIPAL MERIDIAN, IN LAKE COUNTY, ILLINOIS.

Image# 057875720007 Type: PRR
Recorded: 12/13/2018 11:09:52 AM
Receipt#: 2018-00064868
Page 1 of 7
Fees: $72.00
IL Rental Housing Fund: $9.00
Lake County IL Recorder
Mary Ellen Vanderventer Recorder
File 7531730



ABBREVIATIONS:
m. or meas. = measured
r. or rec. = record
CB = chord bearing
CH = chord length
L = arc length
N = North
S = South
E = East
W = West
SQ. FT. = square feet
AC = acres

S 1/2 FRACTIONAL SECTION 3, TOWNSHIP 43 NORTH, RANGE 12 EAST

SHEET 5 OF 6

AUGUST 1, 2018
PROJECT NO. 70-925

Prepared for:
THE CITY OF LAKE FOREST
800 N. Field Drive
Lake Forest, IL 60045

BLECK
engineers | surveyors
Bleck Engineering Company, Inc.
1375 North Western Avenue
Lake Forest, Illinois 60045
T 847.295.5200 F 847.295.7081
www.bleckeng.com

McCORMICK NATURE PRESERVE SUBDIVISION

7531730
12/13/2018

BEING A SUBDIVISION OF PART OF THE SOUTH HALF OF THE SOUTHWEST QUARTER AND PART OF THE SOUTH HALF OF THE SOUTHEAST QUARTER OF FRACTIONAL SECTION 3, TOWNSHIP 43 NORTH, RANGE 12 EAST OF THE THIRD PRINCIPAL MERIDIAN, IN LAKE COUNTY, ILLINOIS.

Imaged Q07S7S720007 Type: PSB
Recorded: 12/13/2018 at 09:52:30 AM
Receipt#: 2018-00064866
Page 1 of 7
Fees: $72.00
IL Rental Housing Fund: $9.00
Lake County IL Recorder
Mary Ellen Vanderventer Recorder
File#7531730

STATE OF ILLINOIS } S.S.
COUNTY OF LAKE }

This is to certify that the undersigned is the sole owner of the land described in the subject plat herein, that no other person has any right, title or interest in said land, and as owner, we have caused said property to be surveyed, subdivided, staked, dedicated, and platted as shown hereon for the purpose of having this plat recorded as provided by law, and hereby also reserve the easement provisions which are stated on their standard forms for AT&T, Peoples Energy, Commonwealth Edison Company, and the authorized Cable Television companies and their respective successors.

Dated at Lake Forest, Illinois, this 19TH day of November, 2018.

By: _____

OWNER City of Lake Forest
220 E Deerpath
Lake Forest, Illinois 60045
c/o Robert Kiely, City Manager

STATE OF ILLINOIS } S.S.
COUNTY OF LAKE }

I, Margaret Boyer, a Notary Public in and for the County of Lake in the State aforesaid, do hereby certify that Robert R. Kiely, Jr. personally known to me to be the same person whose name is subscribed to the adjacent certificate of ownership, appeared before me this day in person and individually acknowledged that they did sign and deliver the ownership certificate as his free and voluntary act, and as the free and voluntary act for the purpose and use therein set forth.

Given under my hand and notarial seal this 19TH day of November, 2018.

Notary Public

My notarial commission expires on June 15, 2021

OFFICIAL SEAL
MARGARET BOYER
NOTARY PUBLIC - STATE OF ILLINOIS
MY COMMISSION EXPIRES:06/15/21

The City of Lake Forest, the legal owner of the property described as "McCormick Nature Preserve" has determined to the best of their knowledge, that the school district in which this entire subdivision lies within Elementary School District 67, High School District 115, and Community College District 532.

Dated at Lake Forest, Illinois, this 19TH day of November, 2018.

By: _____

OWNER City of Lake Forest
220 E Deerpath
Lake Forest, Illinois 60045
Robert Kiely, City Manager

STATE OF ILLINOIS } S.S.
COUNTY OF LAKE }

I, Margaret Boyer, a Notary Public in and for the County of Lake in the State aforesaidto hereby certify that Robert R. Kiely, Jr. personally known to me to be the same person(s) whose name is subscribed to the adjacent certificate of ownership, appeared before me this day in person and individually acknowledged that he did sign and deliver the execution of this school district certificate as his free and voluntary act for the purpose and use therein set forth.

Given under my hand and notarial seal this 19TH day of NOVEMBER, 2018.

Notary Public

My notarial commission expires on June 15, 20 21

OFFICIAL SEAL
MARGARET BOYER
NOTARY PUBLIC - STATE OF ILLINOIS
MY COMMISSION EXPIRES:06/15/21

To the best of our knowledge and belief, the drainage of the surface waters will not be changed by the construction of this subdivision or any part thereof, or that if such surface waters drainage will be changed, reasonable provisions have been made for the collection and diversion of such surface waters into public areas or drains which the subdivider has a right to use, and that such surface waters will be planned for in accordance with generally accepted engineering practices so as to reduce the likelihood of the damage to the adjoining property because of the construction of the subdivision.

By: _____

OWNER or Representative

STATE OF ILLINOIS } SS
COUNTY OF SANGAMON }

Approved by the Department of Natural Resources of the State of Illinois insofar as this subdivision plat, showing lands bordering upon or including public waters of the State of Illinois, relates to provisions of 615 ICLS 5/7, "An act in relation to the regulation of rivers, lakes and streams of the State of Illinois" approved June 10, 1911, as amended, requiring review and approval by said departments as to the boundary line between private interests and public interests.

Dated at Springfield, Illinois, this 4 day of December, A.D., 2018.

State of Illinois, by its Department of Natural Resources

By: _____

Director

STATE OF ILLINOIS } SS
COUNTY OF LAKE }

I, Jack R. Bleck, a Registered Illinois Land Surveyor, do hereby certify that I have surveyed, subdivided and staked the premises described as follows:

PARTS OF LOTS 2, 3, 4 AND 5 IN DANIEL A. JONES ESTATE SUBDIVISION, ACCORDING TO THE PLAT THEREOF RECORDED AS DOCUMENT NO. 143363 ON SEPTEMBER 26, 1912, AND PARTS OF LOTS 7, 8, 9, 10, 11 AND 12 IN FORT SHERIDAN NORTH SHORE SUBDIVISION ACCORDING TO THE PLAT THEREOF RECORDED AS DOCUMENT NO. 48639 ON MARCH 4, 1892, IN THE SOUTHEAST QUARTER OF SECTION 3, AND PART OF ADJACENT SHERIDAN ROAD VACATED BY DOCUMENT NO. 1281948 FILED OCTOBER 21, 1965, IN THE SOUTHWEST QUARTER OF SECTION 3 , TOWNSHIP 43 NORTH, RANGE 12 EAST OF THE THIRD PRINCIPAL MERIDIAN, BOUNDED ON THE NORTH BY ROBERT W. KENDLER'S VILLA TURICUM SUBDIVISION UNITS NO. 2 ACCORDING TO THE PLAT THEREOF RECORDED MARCH 5, 1968 AS DOCUMENT NO. 1370261; AND ROBERT W. KENDLER'S VILLA TURICUM SUBDIVISION UNITS NO. 3 ACCORDING TO THE PLAT THEREOF RECORDED OCTOBER 6, 1971 AS DOCUMENT NO. 1526830; BOUNDED ON THE WEST BY THE EASTERLY RIGHT OF WAY OF SHERIDAN ROAD (A.K.A. McKINLEY ROAD); BOUNDED ON THE EAST BY THE WATERS EDGE OF LAKE MICHIGAN; (EXCEPT THAT PART OF THE THE SOUTHEAST QUARTER OF SAID SECTION 3 CONVEYED TO LAKE COUNTY FOREST PRESERVE DISTRICT BY DOCUMENT NO. 4095136 RECORDED MARCH 3, 1998), CITY OF LAKE FOREST, LAKE COUNTY, ILLINOIS.

CONTAINING 60.70 ± ACRES.

I have monumented the corners of the lots shown hereon and all points of curvature and points of tangency with iron rods (unless noted otherwise), and that the plat hereon drawn is a true and correct representation of the survey and staking. All dimensions shown hereon are in feet and decimals thereof. This professional service conforms to the current Illinois minimum standards for a boundary survey.

I further certify that a portion of the property along the shoreline of Lake Michigan as shown hereon is within a special flood hazard area as identified by the Federal Emergency Management Agency Community Panel No. 17097C0285 K dated September 18, 2013. I, also certify that the property included in this plat of subdivision is within the corporate limits of the City of Lake Forest, which has adopted an official City Plan and is exercising the special powers authorized by Division 12 of Article 11 of the municipal code of the state of Illinois.

Additionally, in accordance with PA87-0705 (The Plat Act) I, do hereby grant permission to the duly authorized individual employed by the City of Lake Forest, Illinois, to submit this plat for recording purposes to the Office of the Recorder of Deeds in the County aforesaid, (a true copy of which has been retained by me to assure no changes have been made to said plat), provided a copy of this plat is sent to this office after recording.

Dated at Lake Forest, Illinois, this 15th day of November, 2018.

_____

Registered Illinois Land Surveyor 3591

An easement is hereby reserved for and granted to North Shore Gas Company, its successors and assigns, in all platted "utility easement" areas, street, alleys, and other public ways and places shown on this plat. Said easement to be for the installation, maintenance, relocation, renewal and removal of gas mains and appurtenances for the purpose of serving all areas shown on this plat as well as other property, whether or not contiguous thereto. No buildings or other structures shall be constructed or erected in any such "utility easement" areas, streets, alleys, or other public ways or places nor shall any other use be made thereof which will interfere with the easements reserved and granted hereby.

A permanent, non exclusive easement for serving the subdivision and other property with electric and communications service is hereby reserved for and granted to

Commonwealth Edison Company
and AT&T
and Cable TV

their respective successors and assigns, jointly and severally, to install, operator, maintain and remove, from time to time, facilities used in connection with overhead and underground transmission and distribution of electricity and sounds and signals in, over, under, across, along and upon the surface of the property shown within the dotted lines on the plat and marked "utility easement". Relocation of facilities will be done by Grantees at cost of Grantor/ Lot Owner, upon written request.

A permanent, non-exclusive easement is hereby reserved for and granted to the City of Lake Forest, Lake County, Illinois, (hereinafter referred to as the "City") and to its successors, assigns, employees, agents, contractors, and franchisees, in, upon, across, over, under, and through the areas shown on an easement within dashed lines on the attached plat of subdivision and/or by the terms "utility easement", "city easement", "drainage easement", and/or "public utility easement", for the purpose of installing, constructing, inspecting, operating, replacing, renewing, altering, enlarging, removing, repairing, cleaning, and maintaining any and all water mains, sanitary sewers, and without limitation, such other installations as may be required as to furnish connections, public water and sanitary sewer service to the attached area, and such appurtenances and additions thereto as said city may deem necessary, together with the right of access across the easements included in the attached plat for the necessary personnel and equipment to do any or all of the above work. The right, but not the obligation, is also hereby granted the city to do any or all of the above work. The right is also hereby granted to the city to cut down, trim, or remove any trees, shrubs, or other plants that interfere with the operation of or access to such facilities, in, across, under, or through said easements. No permanent buildings or trees shall be placed on said easements, but some may be used for gardens, shrubs, landscaping, and other purposes that do not then or later interfere with the aforesaid uses and rights, provided, however, that such use of said easements shall not conflict or interfere with public improvements and any conflicts in use shall be subject to the approval of the city.

MUNICIPAL UTILITY EASEMENT PROVISION

A permanent, non-exclusive easement is hereby reserved for and granted to the City of Lake Forest, Lake County, Illinois, (hereinafter referred to as the "City") and to its successors, assigns, employees, agents, contractors, and franchisees, in, upon, across, over, under, and through the areas shown on the attached plat of subdivision and/or by the terms "utility easement", "city easement", "drainage easement", and/or "public utility easement", for the purpose of installing, constructing, inspecting, operating, replacing, renewing, altering, enlarging, removing, repairing, cleaning, abandon in place, and maintaining any and all storm sewers and drainage ways without limitation, such other installations and improvements as may be required to furnish connections and services related to stormwater management facilities service to the attached area, and such appurtenances and additions thereto as said city may deem necessary, together with the right of access across the easements included in the attached plat for the necessary personnel and equipment to do any or all of the above work. The right, but not the obligation, is also hereby granted the city to do any or all of the above work. The right is also hereby granted to the city to cut down, trim, or remove any trees, shrubs, or other plants that interfere with the operation of or access to such facilities, in, across, under, or through said easements. No permanent buildings or trees shall be placed on said easements, but some may be used for gardens, shrubs, landscaping, and other purposes that do not then or later interfere with the aforesaid uses and rights, provided, however, that such use of said easements shall not conflict or interfere with public improvements and any conflicts in use shall be subject to the approval of the city.

NOTES:

1. LAKE FOREST OPEN LANDS ASSOCIATION SHALL HAVE INGRESS / EGRESS RIGHTS OVER LOT 6 IN McCORMICK NATURE PRESERVE SUBDIVISION FOR ACCESS TO LOT 5
2. THE INGRESS / EGRESS EASEMENT ACROSS LOTS 1, 2, 3, 4, AND 5 OF McCORMICK NATURE PRESERVE SUBDIVISION ARE FOR THE BENEFIT OF ALL OF THE LOTS WITHIN THIS SUBDIVISION

STATE OF ILLINOIS } S.S.
COUNTY OF LAKE }

Approved by the City Surveyor and Engineer of the City of Lake Forest, Lake County, IL this 10TH day of DECEMBER, A.D. 2018.

Signed _____

City Surveyor and Engineer

STATE OF ILLINOIS } S.S.
COUNTY OF LAKE }

Approved by the Plan Commission of the City of Lake Forest, Lake County, Illinois this 8TH day of AUGUST, A.D. 2018.

Signed _____

Chairman of said Plan Commission

STATE OF ILLINOIS } S.S.
COUNTY OF LAKE }

I, KARL WALLDORF, Marshal and Collector of the City of Lake Forest, Illinois, do hereby certify that I have examined the special assessment records of said city and that I find that all deferred installments, now due, of outstanding unpaid special assessments relating to the property included in this plat of subdivision have been paid.

Dated at Lake Forest, Illinois, this 19TH day of NOVEMBER, A.D. 2018.

Signed _____

Marshal of said City of Lake Forest

STATE OF ILLINOIS } S.S.
COUNTY OF LAKE }

Approved and accepted by the City Council of the City of Lake Forest, Lake County, Illinois, this 4TH day of SEPTEMBER, A.D. 2018.

Signed _____

Mayor

Attest _____

City Clerk

STATE OF ILLINOIS } S.S.
COUNTY OF LAKE }

I, ROBIN M. O'CONNOR, County Clerk of Lake County, Illinois, do hereby certify that there are no delinquent general taxes, unpaid current general taxes, delinquent special assessments or unpaid current special assessments against any of the land included in the described plat. I further certify that I have received all statutory fees in connection with the plat.

Given under my hand and seal of the County Clerk at Waukegan, Illinois.

This 13TH day of December, A.D. 2018.

Signed _____

County Clerk
Lake County, Illinois

This Plat submitted to the Office of the
Recorder of Deeds in Lake County, Illinois.

By: THE CITY OF LAKE FOREST

Address 800 FIELD DRIVE

City, State, Zip LAKE FOREST, IL 60045

Plat being submitted for recording by:
City of Lake Forest
800 North Field Drive
Lake Forest, Illinois 60045

Upon recordation mail to:
City of Lake Forest
800 North Field Drive
Lake Forest, Illinois 60045

AUGUST 1, 2018
PROJECT NO. 70-925

BLECK
engineers | surveyors

Bleck Engineering Company, Inc.
1375 North Western Avenue
Lake Forest, Illinois 60045
T 847.295.5200 F 847.295.7081
www.bleckeng.com

Prepared for:
THE CITY OF LAKE FOREST
800 N. Field Drive
Lake Forest, IL 60045

SHEET 6 OF 6

sgb. 11/30/18

APPENDIX B

OFFSHORE STRUCTURE DESIGN TECHNICAL MEMORANDUM

Dewberry

TECHNICAL MEMORANDUM

PREPARED FOR: Hey and Associates, Inc.

PREPARED BY: Dewberry

DATE: December 12, 2025

SUBJECT: Lake Forest Open Lands Association - Offshore Structure Design

Project Background

McCormick Ravine Bluff, located on the coast of Lake Michigan about 20 miles north of Chicago, is a steep sandy bluff which has faced significant erosion in recent years. Dewberry previously provided 60% design of a project to stabilize the bluff and enhance habitat in the area through Great Lakes Restoration Initiative (GLRI) nearshore framework in partnership with NOAA and the GLSLCI. Hey and Associates, Inc. has progressed the design to 100% and has contracted Dewberry to design offshore project components. The offshore structures consist of two components – nearshore structures to provide diverse habitat opportunity for fish and break down waves, and offshore submerged breakwaters, which will provide deeper water habitat and attenuate waves. This memorandum will provide an overview of the offshore structures design and considerations.

Proposed Nearshore Structures

Three structure types are proposed for the nearshore structures: small diameter clusters, large diameter clusters, and Natrx “Fish House” blocks, or equivalent pre-engineered structures designed for fish habitat. The structure specifications sheet is attached as Appendix A. Each of these structures provides a slightly varied habitat environment to support a diverse population of aquatic life. The Natrx Fish house blocks, pictured below in Figure 0-1, will provide the largest void space of the three structures. The structures are cubic and have a side length of 33 inches. The structures can be placed at elevations between 572’ and 574’ NAVD88. This will limit the structure’s exposure at low water and help preserve the character of the natural environment at McCormick Ravine.

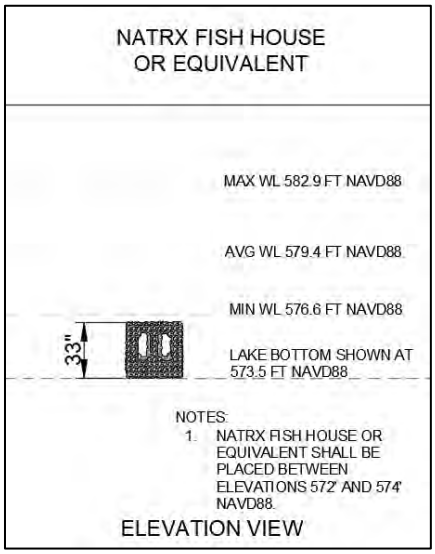


Figure 0-1: Natrx Fish House

The small diameter clusters will be made up stones with a mean diameter of 1'. Each cluster will be made of approximately 10 stones. The clusters should consist of two layers of stone, creating a structure with no more than 2' in height. The structures are intended to be placed between 574' and 577' NAVD88. If the rocks are placed at elevations 574.6'-577', rock will be exposed when the water level is below average but will be completely submerged at average and high-water levels. Stone placement at 574'-574.6' will limit the rock's exposure at all water levels. The stone clusters provide the smallest void spaces for fish to swim in and are intended to provide habitat for smaller or juvenile fish. The elevation view detail of the small diameter clusters is provided below in Figure 0-2.

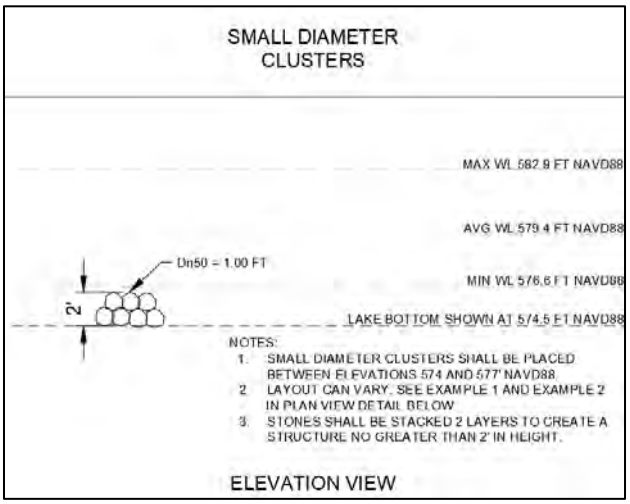


Figure 0-2: Small Diameter Clusters

The large diameter clusters will be made up of 4 stones with a mean diameter of 2.5'. The stones should be stacked to create a structure no more than 5' in height. These structures will create voids larger than the 1' diameter clusters and smaller than the Natrx Fish House cubes, which will help to provide a variety of habitat for various fish species. The structures can be placed from elevations 572'-577'. At a 5' height, these clusters will be exposed at low water when placed at any elevation. At average water levels, structures placed at 574.4' or higher elevations will be exposed. The structure elevation view is provided in below in Figure 0-3.

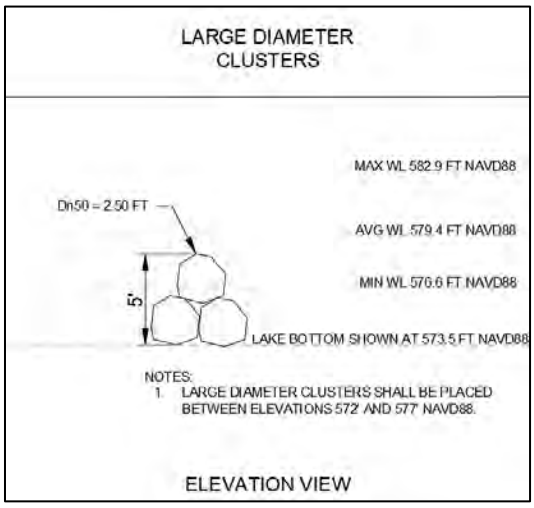


Figure 0-3: Large Diameter Clusters

Each nearshore structure may settle initially within the first 72 hours, which will not affect their ability to provide diverse habitat for fish. Settling may reduce, but will not eliminate the wave attenuation capacity of these nearshore structures.

Submerged Breakwater Structures

Offshore, a series of three submerged breakwaters will help attenuate waves, provide fish habitat, and accumulate sand offshore to help supplement the beach. Fill placement at 120% of the structure's sand retention capacity is required for the offshore structures based on local regulations as to minimize disruption of littoral sand transportation, which in this location is primarily North to South. Four areas within the submerged breakwaters have been identified as having potential to accumulate sand. These areas are highlighted in Figure 0-24.

Figure 0-4 Offshore Structures

To calculate the retention capacity, an average depth of 2.5 feet was used since the offshore structures have a maximum height of 5 feet. The resulting volume of sand is 2824 CYDS of sand. Calculations are summarized below in Figure 0-4.

Table 0.1: Sand Retention Capacity Calculations.

SAND ACCUMULATION AREA	FOOTPRINT (SF)	AVERAGE DEPTH (FT)	VOLUME (CFT)	VOLUME (CYD)
1	14500	2.5	36250	1343
2	4000	2.5	10000	370
3	12000	2.5	30000	1111
			TOTAL	**2824**

At 120% fill placement, 3389 CYDS of sand should be placed to prefill the structures. Beach quality sand shall be used as fill, meaning sediments shall be free of supplemental materials non-native to Lake Michigan and reasonably match the native sands to the beach at McCormick Ravine. The means and methods of fill placement will be up to contractor based on their available equipment. Sand should be placed as appropriate within the identified placement areas and feathered out to meet grade.

Wave Attenuation of Structures

The coupled system of nearshore and offshore submerged structures will help to attenuate wave energy along the property. The nearshore structures have crest elevations closer to the water surface than the deeply submerged structures. Because of this, the nearshore structures have more direct contact with waves and therefore will attenuate a higher percentage of wave energy than the deeply submerged structures. Due to the nearshore structures small, clustered nature, they will only attenuate waves within the immediate vicinity rather than consistently along the entire site. The offshore submerged structures will provide consistent wave attenuation along the majority of the shorefront, although the attenuation percentage will be less than at the points with nearshore structures. Final attenuation percentages will depend on placement of the nearshore structures as determined by the contractor.

Project Impact on Lake Michigan & Public

Although temporary disruption of navigation in the area will occur during construction, the increased habitat provided by the project is expected to provide long-lasting public and environmental benefits. While this area is navigable, it is not considered a navigation channel and will not disrupt, short term or long term, recreational or commercial use of the lake.

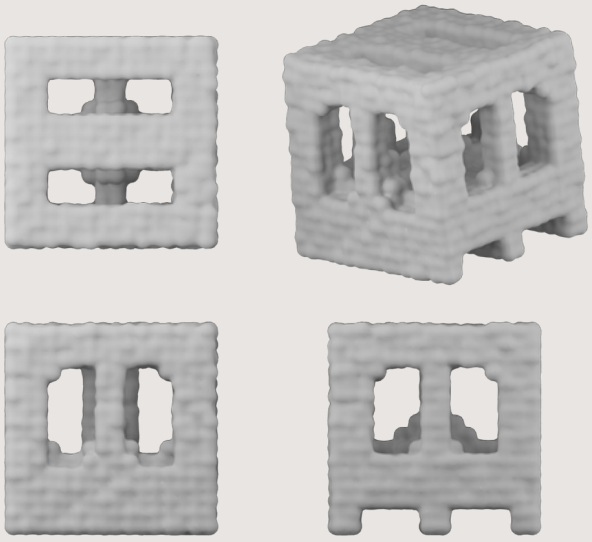
The intention of the offshore structures is to provide various habitats to attract a wide variety of species and enhance biodiversity of fish in the area. The structures are intended to provide feeding and spawning grounds and serve as habitat to juvenile fish to help supplement productivity of the ravine. The habitat opportunity at the site is expected to increase recreational fishing opportunities along approximately 500 linear feet of shoreline.

During construction, temporary disruption to navigation will occur along approximately 9 acres of Lake Michigan. This is primarily due to the contractor creating a restricted construction zone. After construction, the nearshore structures will provide various habitat opportunities throughout 4 acres of the lake. The submerged offshore structures will provide about 1.2 acres of habitat for fish, including the footprint of the structures and a 10’ offset from the structures. Structures are not in area frequented by recreational or navigational activity and are not expected to create a significant navigational hazard. Therefore, placement of buoys is not strictly necessary and may be omitted to reduce maintenance needs.

The offshore submerged breakwater structures were designed to minimize mobilization, so their footprint will remain stable over time. The nearshore structures have potential to mobilize, especially after low water levels coupled with icy conditions. These structures could be restacked after ice events or could function as mobile habitat features. This is to more closely mimic the dynamic nature of habitat within Lake Michigan

Attachments

Appendix A – Natrx Fish Specification Sheet



Fish House

Dimensions: 33” (L) x 33” (W) x 33” (H)
Weight: 1,600 lbs
Surface Area: 64ft² (7.5x net new)

KEY BENEFITS

A Natrx Fish House solution provides a range of practical benefits through planning, installation, and ongoing performance.

- Large surface area (64ft²) for less weight/material need
- Organic shape, and void spaces promote marine growth and provide ideal fish habitat
- Safer, faster, more cost-efficient installation compared with traditional solutions

APPLICATIONS

Fish House structures are most applicable for:

- Living shorelines, fisheries, artificial reefs
- Medium wave energy and larger tidal fluctuation environments
- Great habitat for fish or small organisms
- Ecological feature on breakwaters, jetties, seawalls

INSTALLATION

Fish House structures can be installed with minimal heavy equipment. Structures will need to be transported to the project site and placed in the water with a small crane or long reach excavator.

The equipment necessary for installing a Fish House structure will be lighter than the equipment needed to install a comparable rock solution.

"Natrx is a very good solution, especially in high wave energy areas. They've proven it again and again. It's just incredible. This new product from Natrx outperforms rock in big storms."

Wayne Savage
Senior Engineer
Bay Design Group

HOW TO PURCHASE

We pride ourselves on our ability to deliver high-quality solutions on-time and with transparent pricing. We can design a solution and develop a quote for your project with you directly or through your contractor.

PRICING

ExoForm solutions are engineered to achieve project goals while delivering an additional range of functional and ecological co-benefits at a cost that's comparable to traditional approaches. With ExoForms we can design the most cost-effective solution for addressing your challenges.

PROJECT INPUT:

Provide us with a general sense of the parameters of your project, your challenges, and your goals and we'll design and deliver the ExoForm solution that's best for your site.

PROJECT SITE SIZE: _____

PROJECT TIMELINE: _____

PROJECT GOAL(S): _____

_____

WHAT DOES SUCCESS LOOK LIKE? _____

_____

NOTES: _____

_____

_____

_____

Implementing an ExoForm Solution:

Natrx ExoForms solutions are designed for safe, fast, and efficient installation saving your project valuable time and cost. The process for using Natrx ExoForms is straightforward:

1. Get in touch with us to discuss the specifics of your project so we can determine the optimal ExoForm™ solution
2. Working from your input, we'll design the ExoForms for your project
3. Upon approval and initial payment, your order will enter our production queue and a delivery date and logistics is organized
4. Your ExoForms are delivered to your project site for quick and easy installation. That's it.

GET STARTED WITH NATRX

Our solutions are designed for straightforward implementation and we're here to answer any questions:

(919) 263-0667 info@natrx.io natrx.io

APPENDIX C

SUPPORTING CALCULATIONS

Rational Method Calculation Results

Tributary	Drainage Area		Tc	C	Intensity (100-yr)	Peak Discharge (100-yr)
	(ac)	(sqmi)	(min)	Value	(in/hr)	(cfs)
A	18.8	0.03	34	0.23	6.01	26.1
B	24.4	0.04	36	0.24	5.91	34.0
C	27.3	0.04	37	0.24	5.85	37.9

Contributing Drainage Area	Area (ac)	Lawn Area (ac) C=0.15	Woods Area (ac) C=0.25	Impervious Area (ac) C=0.90	Composite C-Value
1	2.9	0.0	2.9	0.0	0.25
2	5.6	0.0	5.6	0.0	0.25
A	18.8	8.7	9.3	0.8	0.23
B	24.4	8.7	14.9	0.8	0.24
C	27.3	8.7	17.8	0.8	0.24

	Slope	Length	US	DS
Overall	0.0363	2001.0	660.5	587.8

Discharge Calculation: Time of Concentration

			Basin ID	A	2	1
Sheet Flow			Segment ID	A-1		
1. Surface Description (table 3-1)				Woods, light underbrush		
2. Manning's Roughness Coefficient, n (table 3-1)				0.400		
3. Flow Length, L (total L $\leq$ 100 ft.)			ft	100		
4. Two-year, 24-hour rainfall, P_2			in	3.34		
5. Land Slope, s			ft/ft	0.020		
6. T_t =	$\frac{0.007\,(nL)^{0.8}}{P_2^{0.5} * s^{0.4}}$	Compute T_t	hr	0.35		
Shallow Concentrated Flow			Segment ID	A-2		
7. Surface Description (paved or unpaved)				Unpaved		
8. Flow Length, L			ft	1571		
9. Watercourse slope, s			ft/ft	0.018		
10. Average Velocity, V (figure 3-1)			ft/s	2.18		
11. T_t =	$\frac{L}{3600 * V}$		hr	0.20		
Channel flow			Segment ID	A-3	2-A	1-A
12. Cross Sectional Flow Area, a			ft^2	50.00	50.00	50.00
13. Wetted Perimeter, P_w			ft	41.00	41.00	41.00
14. Hydraulic Radius, $r=a/P_w$		Compute r	ft	1.22	1.22	1.22
15. Channel Slope, s			ft/ft	0.027	0.036	0.043
16. Manning's roughness coefficient, n				0.035	0.035	0.035
17. $V = (1.49 * r^{2/3} * s^{1/2})/n$		Compute V	ft/s	8.02	9.21	10.08
18. Flow length, L			ft	441	947	604
19. T_t =	$\frac{L}{3600 * V}$	Compute T_t	hr	0.02	0.03	0.02
20. Watershed or subarea T_c or T_t		Compute T_c	hr	0.6	0.0	0.0
(add T_t in steps 6, 11, and 19)			min	34	2	1

Updated Rainfall Depth Duration Frequency Table

Rainfall Depth Duration Frequency Tables for Lake County
Rainfall is in Inches

Storm Duration	2mo	3mo	4mo	6mo	9mo	1yr	2yr	5yr	10yr	25yr	50yr	100yr	500yr
5min	0.19	0.22	0.24	0.27	0.31	0.33	0.40	0.52	0.62	0.77	0.90	1.03	1.35
10min	0.35	0.40	0.43	0.49	0.56	0.61	0.73	0.95	1.13	1.42	1.65	1.89	2.47
15min	0.42	0.49	0.53	0.61	0.69	0.75	0.90	1.16	1.39	1.74	2.03	2.32	3.04
30min	0.58	0.66	0.73	0.83	0.94	1.03	1.24	1.59	1.91	2.39	2.78	3.17	4.16
1hr	0.74	0.84	0.93	1.05	1.20	1.30	1.57	2.02	2.42	3.03	3.53	4.03	5.28
2hr	0.91	1.04	1.14	1.30	1.48	1.61	1.94	2.49	2.99	3.74	4.35	4.97	6.52
3hr	1.00	1.15	1.26	1.44	1.63	1.77	2.14	2.75	3.30	4.13	4.80	5.49	7.20
6hr	1.18	1.35	1.48	1.68	1.91	2.08	2.51	3.23	3.86	4.84	5.63	6.43	8.43
12hr	1.37	1.56	1.71	1.95	2.21	2.41	2.91	3.74	4.48	5.61	6.53	7.46	9.78
18hr	1.48	1.69	1.85	2.11	2.39	2.61	3.14	4.04	4.84	6.06	7.05	8.06	10.57
24hr	1.57	1.80	1.97	2.24	2.55	2.77	3.34	4.30	5.15	6.45	7.50	8.57	11.24
48hr	1.72	1.97	2.16	2.46	2.79	3.04	3.66	4.71	5.62	6.99	8.13	9.28	12.10
72hr	1.87	2.14	2.34	2.67	3.03	3.30	3.97	5.08	6.05	7.49	8.64	9.85	12.81
120hr	2.08	2.38	2.61	2.97	3.37	3.67	4.42	5.63	6.68	8.16	9.39	10.66	13.81
240hr	2.63	3.01	3.30	3.76	4.27	4.65	5.60	7.09	8.25	9.90	11.26	12.65	16.00

References: ISWS Bulletin 75 Precipitation Frequency Study for Illinois
James R. Angel and Momcilo Markus
Illinois State Water Survey, March 2020

Bulletin 75 Northeast Section Rainfall Intensity
Intensity is in Inches/Hour

Storm Duration	1yr	2yr	5yr	10yr	25yr	50yr	100yr
5min	3.96	4.80	6.24	7.44	9.24	10.80	12.36
10min	3.48	4.20	5.40	6.48	8.10	9.48	10.80
15min	3.00	3.60	4.64	5.56	6.96	8.12	9.28
30min	2.06	2.48	3.18	3.82	4.78	5.56	6.34
1hr	1.30	1.57	2.02	2.42	3.03	3.53	4.03
2hr	0.81	0.97	1.25	1.50	1.87	2.18	2.49
3hr	0.59	0.71	0.92	1.10	1.38	1.60	1.83
6hr	0.35	0.42	0.54	0.64	0.81	0.94	1.07
12hr	0.20	0.24	0.31	0.37	0.47	0.54	0.62
18hr	0.15	0.17	0.22	0.27	0.34	0.39	0.45
24hr	0.12	0.14	0.18	0.21	0.27	0.31	0.36
48hr	0.06	0.08	0.10	0.12	0.15	0.17	0.19
72hr	0.05	0.06	0.07	0.08	0.10	0.12	0.14
120hr	0.03	0.04	0.05	0.06	0.07	0.08	0.09
240hr	0.02	0.02	0.03	0.03	0.04	0.05	0.05

References: Watershed Management
Ordinance Technical Guidance Manual
Table 5.15
Metropolitan Water Reclamation
District of Greater Chicago, May 2020

Structure Sizing Calculations

Tributary	W1 (ft)	W2 (ft)	D (ft)	H (ft)	Freeboard (in)	Crest Stone	Bedding Stone
A	20	11	1.5	3	11.9	RR 3	RR 1
B	15	3	2	3	12.2	RR 5	RR 1
C	16	4	2	3	12.0	RR 5	RR 1

Manning's Equation

Q=(1.49/n)*A*R^(2/3)*S^(1/2)

	A	B	C
Manning's n:	0.035	0.035	0.035
Bottom With (ft):	11	3	4
Left Side Slope (x:1):	3	3	3
Right Side Slope (y:1):	3	3	3
Slope:	0.0272	0.0359	0.0431
Flow Depth (ft):	0.51	0.98	1.00
Area of flow=	6.39	5.82	7.00
Wetted Perimeter=	14.23	9.20	10.32
Hydraulic Radius=	0.45	0.63	0.68
Hydraulic Slope=	0.0272	0.0359	0.0431
Velocity (ft/sec)=	4.12	5.95	6.82
Discharge (cfs)=	26.33	34.62	47.72
Capacity in excess of 100-yr Peak Q	0.22	0.66	9.87

Riprap Sizing Calculations: A

Corps of Engineers Method

$D_{30} = SF*C_S*C_V*C_T*Y((t_w/t_s-t_w)^{1/2}*(V/(KgY)^{1/2)})^{5/2}$

D_{30} = Riprap size of which 30% is finer by weight

Y = Flow depth (ft)

V = Velocity (ft/sec)

K = Side slope correction factor; K = 0.95 for channel sides, 0.705 for channel bottom

SF = Factor of safety (typically 1.20)

C_S = Stability coefficient for incipient failure (use 0.30 for angular rock, 0.36 for rounded)

C_V = Vertical velocity distribution coefficient (use 1.0 for straight channels, 1.25 for dike ends and chutes, 1.283-.2log(R/W) for os bends)

C_T = Thickness coefficient (use 1.0 for thickness = D_{100})

t_w = Specific weight of water (62.4 lbs/cf)

t_s = Specific weight of stone (typically 165 lbs/cf)

FHA Method

$D_{50} = .001*V^3/((Y^{1/2})*K^{3/2}$

D_{50} = riprap size of which 50% is finer by weight

Y = flow depth (ft)

V = velocity (ft/sec)

K = side slope correction factor; K = 0.95 for channel sides, 0.705 for channel bottom

Input Variables

Depth (Y) (ft) =	0.51	Stability coefficient (C_S) =	0.36
Velocity (V) (ft/sec) =	4.12	Vertical vel. coefficient (C_V) =	1
Correction Factor (K) =	0.705	Thickness coefficient (C_T) =	1
Slope (S) (ft/ft) =	0.0272	Specific weight of water (t_w) =	62.4
Factor of safety (SF) =	1.2	Specific weight of stone (t_s) =	165.36

Corps of Engineers Method D_{30} = riprap size of which 30% is finer by weight = **0.1902** ft

FHA Method D_{50} = riprap size of which 50% is finer by weight = **0.1656** ft

Tractive Force = 62.4 * D * S = **0.8668**

Median Riprap Weight

D_{50} = riprap size of which 50% is finer by weight = 0.17 ft

Ss = specific grafity of riprap (lbs/ft^3) = 2.65

W_{50} = 0.39 lbs

$$W_{50} = 32.67 D_{50}^3 S_s$$

According to IDOT Standard Specifications Section 1005.01(c.)

*** Grade 3** Riprap should be used.

Riprap Sizing Calculations: B

Corps of Engineers Method

$D_{30} = SF*C_S*C_V*C_T*Y((t_w/t_s-t_w)^{1/2}*(V/(KgY)^{1/2)})^{5/2}$

D_{30} = Riprap size of which 30% is finer by weight

Y = Flow depth (ft)

V = Velocity (ft/sec)

K = Side slope correction factor; K = 0.95 for channel sides, 0.705 for channel bottom

SF = Factor of safety (typically 1.20)

C_S = Stability coefficient for incipient failure (use 0.30 for angular rock, 0.36 for rounded)

C_V = Vertical velocity distribution coefficient (use 1.0 for straight channels, 1.25 for dike ends and chutes, 1.283-.2log(R/W) for os bends)

C_T = Thickness coefficient (use 1.0 for thickness = D_{100})

t_w = Specific weight of water (62.4 lbs/cf)

t_s = Specific weight of stone (typically 165 lbs/cf)

FHA Method

$D_{50} = .001*V^3/((Y^{1/2})*K^{3/2}$

D_{50} = riprap size of which 50% is finer by weight

Y = flow depth (ft)

V = velocity (ft/sec)

K = side slope correction factor; K = 0.95 for channel sides, 0.705 for channel bottom

Input Variables

Depth (Y) (ft) =	0.98	Stability coefficient (C_S) =	0.36
Velocity (V) (ft/sec) =	5.95	Vertical vel. coefficient (C_V) =	1
Correction Factor (K) =	0.705	Thickness coefficient (C_T) =	1
Slope (S) (ft/ft) =	0.0359	Specific weight of water (t_w) =	62.4
Factor of safety (SF) =	1.2	Specific weight of stone (t_s) =	165.36

Corps of Engineers Method D_{30} = riprap size of which 30% is finer by weight = **0.4040** ft

FHA Method D_{50} = riprap size of which 50% is finer by weight = **0.3588** ft

Tractive Force = 62.4 * D * S = **2.1959**

Median Riprap Weight

D_{50} = riprap size of which 50% is finer by weight = 0.36 ft

Ss = specific grafity of riprap (lbs/ft^3) = 2.65

W_{50} = 4.00 lbs

$$W_{50} = 32.67 D_{50}^3 S_s$$

According to IDOT Standard Specifications Section 1005.01(c.)

*** Grade 3** Riprap should be used.

Riprap Sizing Calculations: C

Corps of Engineers Method

$D_{30} = SF*C_S*C_V*C_T*Y((t_w/t_s-t_w)^{1/2}*(V/(KgY)^{1/2)})^{5/2}$

D_{30} = Riprap size of which 30% is finer by weight

Y = Flow depth (ft)

V = Velocity (ft/sec)

K = Side slope correction factor; K = 0.95 for channel sides, 0.705 for channel bottom

SF = Factor of safety (typically 1.20)

C_S = Stability coefficient for incipient failure (use 0.30 for angular rock, 0.36 for rounded)

C_V = Vertical velocity distribution coefficient (use 1.0 for straight channels, 1.25 for dike ends and chutes, 1.283-.2log(R/W) for os bends)

C_T = Thickness coefficient (use 1.0 for thickness = D_{100})

t_w = Specific weight of water (62.4 lbs/cf)

t_s = Specific weight of stone (typically 165 lbs/cf)

FHA Method

$D_{50} = .001*V^3/((Y^{1/2})*K^{3/2}$

D_{50} = riprap size of which 50% is finer by weight

Y = flow depth (ft)

V = velocity (ft/sec)

K = side slope correction factor; K = 0.95 for channel sides, 0.705 for channel bottom

Input Variables

Depth (Y) (ft) =	1.00	Stability coefficient (C_S) =	0.36
Velocity (V) (ft/sec) =	6.82	Vertical vel. coefficient (C_V) =	1
Correction Factor (K) =	0.705	Thickness coefficient (C_T) =	1
Slope (S) (ft/ft) =	0.0431	Specific weight of water (t_w) =	62.4
Factor of safety (SF) =	1.2	Specific weight of stone (t_s) =	165.36

Corps of Engineers Method D_{30} = riprap size of which 30% is finer by weight = **0.5657** ft

FHA Method D_{50} = riprap size of which 50% is finer by weight = **0.5353** ft

Tractive Force = 62.4 * D * S = **2.6867**

Median Riprap Weight

D_{50} = riprap size of which 50% is finer by weight = 0.54 ft

Ss = specific grafity of riprap (lbs/ft^3) = 2.65

W_{50} = 13.28 lbs

$$W_{50} = 32.67 D_{50}^3 S_s$$

According to IDOT Standard Specifications Section 1005.01(c.)

*** Grade 3** Riprap should be used.

Riprap Sizing Calculations: Outfall

Corps of Engineers Method

$D_{30} = SF*C_S*C_V*C_T*Y((t_w/t_s-t_w)^{1/2}*(V/(KgY)^{1/2)})^{5/2}$

D_{30} = Riprap size of which 30% is finer by weight

Y = Flow depth (ft)

V = Velocity (ft/sec)

K = Side slope correction factor; K = 0.95 for channel sides, 0.705 for channel bottom

SF = Factor of safety (typically 1.20)

C_S = Stability coefficient for incipient failure (use 0.30 for angular rock, 0.36 for rounded)

C_V = Vertical velocity distribution coefficient (use 1.0 for straight channels, 1.25 for dike ends and chutes, 1.283-.2log(R/W) for os bends)

C_T = Thickness coefficient (use 1.0 for thickness = D_{100})

t_w = Specific weight of water (62.4 lbs/cf)

t_s = Specific weight of stone (typically 165 lbs/cf)

FHA Method

$D_{50} = .001*V^3/((Y^{1/2})*K^{3/2}$

D_{50} = riprap size of which 50% is finer by weight

Y = flow depth (ft)

V = velocity (ft/sec)

K = side slope correction factor; K = 0.95 for channel sides, 0.705 for channel bottom

Input Variables

Depth (Y) (ft) =	1.60	Stability coefficient (C_S) =	0.36
Velocity (V) (ft/sec) =	4.76	Vertical vel. coefficient (C_V) =	1
Correction Factor (K) =	0.705	Thickness coefficient (C_T) =	1
Slope (S) (ft/ft) =	0.0100	Specific weight of water (t_w) =	62.4
Factor of safety (SF) =	1.2	Specific weight of stone (t_s) =	165.36

Corps of Engineers Method D_{30} = riprap size of which 30% is finer by weight = **0.2049** ft

FHA Method D_{50} = riprap size of which 50% is finer by weight = **0.1441** ft

Tractive Force = 62.4 * D * S = **0.9984**

Median Riprap Weight

D_{50} = riprap size of which 50% is finer by weight = 0.14 ft

Ss = specific grafity of riprap (lbs/ft^3) = 2.65

W_{50} = 0.26 lbs

$$W_{50} = 32.67 D_{50}^3 S_s$$

According to IDOT Standard Specifications Section 1005.01(c.)

*** Grade 3** Riprap should be used.

Outfall Capacity Calculation

Existing Pipe

U/S Inv	D/S Inv	Est. Length (ft)	Slope (ft/ft)	Diameter (in)	Material	Manning's n	Capacity (cfs)
673.7	*672.5*	21.9	*0.06*	30	Concrete	0.015	*83.92*

Tributary	W1 (ft)	W2 (ft)	D (ft)	H (ft)	Freeboard (in)	Crest Stone	Bedding Stone
Outfall	16	8	2	0	4.8	RR 5	RR 1

Manning's Equation

Q=(1.49/n)*A*R^(2/3)*S^(1/2)

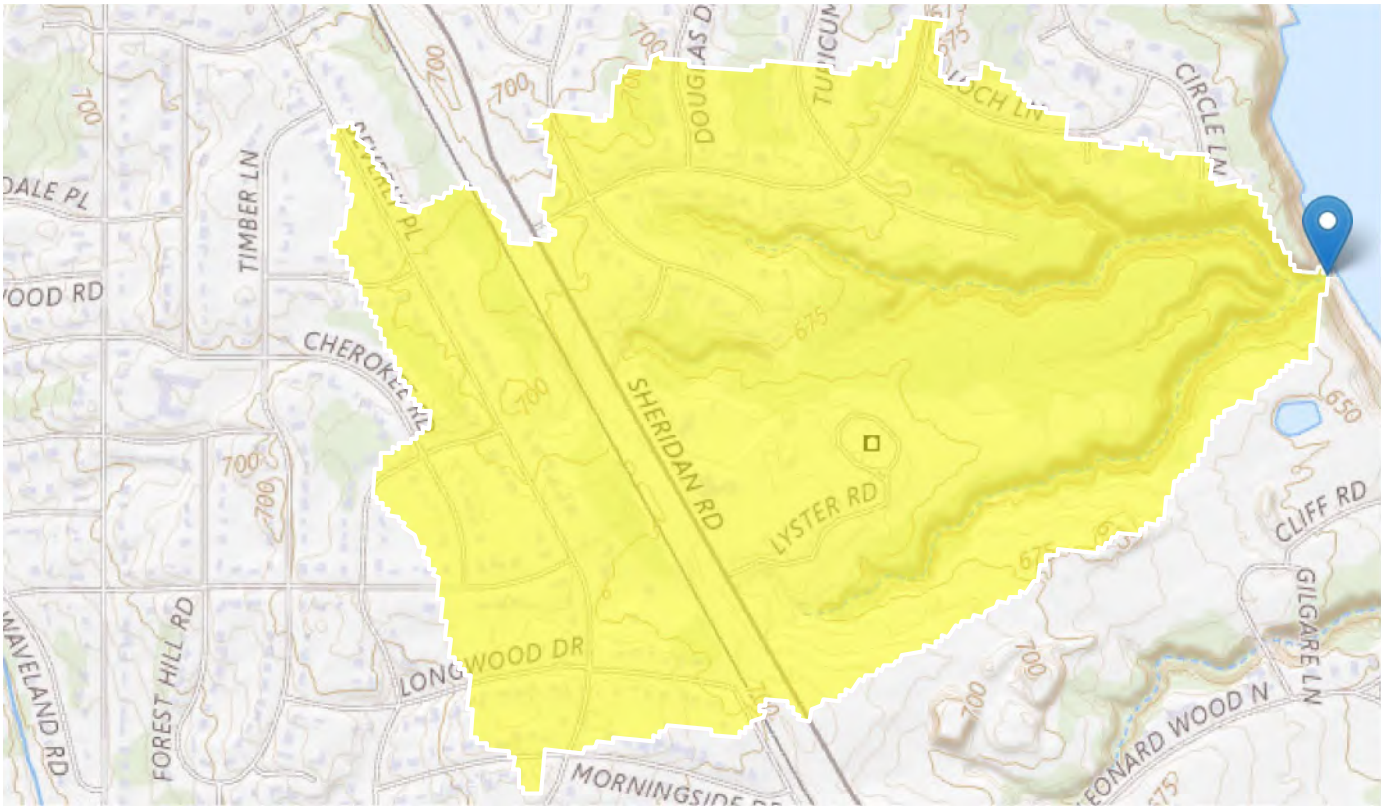
	Outfall
Manning's n:	0.035
Bottom With (ft):	8
Left Side Slope (x:1):	2
Right Side Slope (y:1):	2
Slope:	0.0100
Flow Depth (ft):	1.60
Area of flow=	17.92
Wetted Perimeter=	15.16
Hydraulic Radius=	1.18
Hydraulic Slope=	0.0100
Velocity (ft/sec)=	4.76
Discharge (cfs)=	85.30
Capacity in excess of 100-yr Peak Q	1.38

APPENDIX D

STREAMSTATS REPORT

StreamStats Report

Region ID: IL
Workspace ID: IL20250620120551043000
Clicked Point (Latitude, Longitude): 42.22719, -87.81117
Time: 2025-06-20 07:06:19 -0500



24-0271 Greene Nature Preserve

Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
BASINPERIM	Basin perimeter measured along entire drainage-basin divide	4.78	miles
CENTROIDX	Basin centroid horizontal (x) location in state plane coordinates	96821.1	meters

Parameter Code	Parameter Description	Value	Unit
CENTROIDY	Basin centroid vertical (y) location in state plane units	4457123.5	meters
CSL10_85	Change in elevation divided by length between points 10 and 85 percent of distance along main channel to basin divide - main channel method not known	94.76	feet per mi
DEMSLX100	Average slope of 10-meter DEM cells, using a vertical exaggeration factor of 100, computed using Slope tool in ArcMap	69.94	degrees
DRAININD	Drainage index from STATSGO soil properties computed as in SIR 2014-5177	32	dimensionless
DRNAREA	Area that drains to a point on a stream	0.563	square miles
ELEVMAX	Maximum basin elevation	716	feet
FCGSTRSED	Fraction of coarse-grained stratified sediment	0	decimal fraction
FEXBNGLCL	Fraction of exposed bedrock or sediment not of a glacial origin	0	decimal fraction
FEXDRAINED	Fraction of excessively drained soils	1	decimal fraction
FGLCLTILL	Fraction of glacial till	1	decimal fraction
FGSTRSED	Fraction of fine-grained stratified sediment	0	decimal fraction
FLC16DVLMH	Fraction of drainage area that is in low to high developed land use classes 22-24 from NLCD 2016	0.3	decimal fraction
FMWDRAINED	Fraction of moderately well-drained soils	0	decimal fraction
FPDRAINED	Fraction of poorly drained soils	0	decimal fraction
FSPDRAINED	Fraction of somewhat poorly drained soils	0	decimal fraction
FSSURGDC78	Fraction of land area that is in very poorly drained and unknown likely water drainage classes 7 and 8 from SSURGO	0	decimal fraction
FTK0_50	Fraction of 0 to 50 feet thickness category, from SIR 2014-5177	0	decimal fraction

Parameter Code	Parameter Description	Value	Unit
FTK100_200	Fraction of 100 to 200 feet thickness category, from SIR 2014-5177	0.66	decimal fraction
FTK200_400	Fraction of 200 to 400 feet thickness category, from SIR 2014-5177	0.34	decimal fraction
FTK400_600	Fraction of 400 to 600 feet thickness category, from SIR 2014-5177	0	decimal fraction
FTK50_100	Fraction of 50 to 100 feet thickness category, from SIR 2014-5177	0	decimal fraction
FVPDRAINED	Fraction of very poorly drained soils	0	decimal fraction
FWDRAINED	Fraction of well-drained soils	0	decimal fraction
LONG_CENT	Longitude Basin Centroid	87.822511	decimal degrees
MINBELEV	Minimum basin elevation	585	feet
PERMBXTHK	An index of the permeability of surficial Quaternary sediments (including fraction exposed bedrock) multiplied by their thickness. See SIR 2014-5177 page 3 for details.	201.21	dimensionless
PRSEPNOV00	Basin average mean precipitation for September to November from PRISM 1971-2000	2.94	inches
QSSPERMB	An index of the permeability of surficial Quaternary sediments c(including fraction exposed bedrock)). See SIR 2014-5177 page 3 for details.	1	dimensionless
QSSPERMTHK	Index of the permeability of surficial Quaternary sediments computed as in SIR 2014-5177	201.21	dimensionless
RELIEF	Maximum - minimum elevation	130	feet
RELRELF	Basin relief divided by basin perimeter	27.2	feet per mi
STATSPERM	Area-weighted average soil permeability from NRCS STATSGO database	0.614	inches per hour
STATSSLPWT	Area-weighted average of soil slopes of dominant component of STATSGO soil units	3	percent

Parameter Code	Parameter Description	Value	Unit
TPISTATSGO	computed as 100*(percent sand) + 10*(percent silt) + (percent clay), using soil texture fractions from STATSGO	1570	percent
URBTHE2010	Fraction of drainage area that is in urban classes 7 to 10 from Theobald 2010	0.742	dimensionless
WATCAPINIL	Available water capacity from Miller and White 1998 in cm per 100 cm	11	centimeters

Peak-Flow Statistics

Peak-Flow Statistics Parameters [IL Peakflow Region 2 ICT-23-014]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.563	square miles	0.07031	1352
FLC16DVLMH	Frac_Lo_Med_Hi_Developed_from_NLCD2016	0.3	decimal fraction	0.002045	0.969
FSSURGDC78	Fraction_SSURGO_Drainage_Classes_7_and_8	0	decimal fraction	0	0.250
RELRELF	Relative Relief	27.2	feet per mi	0.8122	35.97

Peak-Flow Statistics Flow Report [IL Peakflow Region 2 ICT-23-014]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error, PC: Percent Correct, RMSE: Root Mean Squared Error, PseudoR^2: Pseudo R Squared (other -- see report)

Statistic	Value	Unit	PIL	PIU	ASEp
50-percent AEP flood	76.9	ft^3/s	36	164	46.9
20-percent AEP flood	144	ft^3/s	66.5	312	47.9
10-percent AEP flood	199	ft^3/s	89.1	444	49.9
4-percent AEP flood	280	ft^3/s	120	652	52.8
2-percent AEP flood	348	ft^3/s	144	843	55.6
1-percent AEP flood	421	ft^3/s	168	1060	58

Statistic	Value	Unit	PIL	PIU	ASEp
0.5-percent AEP flood	500	ft^3/s	192	1300	60.5
0.2-percent AEP flood	615	ft^3/s	227	1660	63.4

Peak-Flow Statistics Citations

Over, T.M., Marti, M.K., O'Shea, P.S., Sharpe, J.B.2023, Estimating peak-flow quantiles for selected annual exceedance probabilities in Illinois (Report No. FHWA-ICT-23-014). Illinois Center for Transportation. (https://doi.org/10.36501/0197-9191/23-019)

Flow-Duration Statistics

Flow-Duration Statistics Parameters [IL Flow duration Reg 1 DA only 2014 5177]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.563	square miles	12.1	2549

Flow-Duration Statistics Parameters [IL Flow duration Reg 1 Multivar 2014 5177]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRAININD	Drainage_Index	32	dimensionless	3.36	15.9
DRNAREA	Drainage Area	0.563	square miles	12.1	2549

Flow-Duration Statistics Disclaimers [IL Flow duration Reg 1 DA only 2014 5177]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Flow-Duration Statistics Flow Report [IL Flow duration Reg 1 DA only 2014 5177]

Statistic	Value	Unit
99_9_Percent_Duration_DA_Only_Regression	0.00034	ft^3/s
99_8_Percent_Duration_DA_Only_Regression	0.000428	ft^3/s
99_5_Percent_Duration_DA_Only_Regression	0.00213	ft^3/s
99_Percent_Duration_DA_Only_Regression	0.00871	ft^3/s
98_Percent_Duration_DA_Only_Regression	0.0152	ft^3/s
95_Percent_Duration_DA_Only_Regression	0.0317	ft^3/s

Statistic	Value	Unit
90_Percent_Duration_DA_Only_Regression	0.0567	ft^3/s
80_Percent_Duration_DA_Only_Regression	0.103	ft^3/s
75_Percent_Duration_DA_Only_Regression	0.125	ft^3/s
70_Percent_Duration_DA_Only_Regression	0.139	ft^3/s
60_Percent_Duration_DA_Only_Regression	0.174	ft^3/s
50_Percent_Duration_DA_Only_Regression	0.223	ft^3/s
40_Percent_Duration_DA_Only_Regression	0.3	ft^3/s
30_Percent_Duration_DA_Only_Regression	0.411	ft^3/s
25_Percent_Duration_DA_Only_Regression	0.474	ft^3/s
20_Percent_Duration_DA_Only_Regression	0.567	ft^3/s
10_Percent_Duration_DA_Only_Regression	0.945	ft^3/s
5_Percent_Duration_DA_Only_Regression	1.67	ft^3/s
2_Percent_Duration_DA_Only_Regression	3.67	ft^3/s
1_Percent_Duration_DA_Only_Regression	6.75	ft^3/s
0_5_Percent_Duration_DA_Only_Regression	11.5	ft^3/s
0_2_Percent_Duration_DA_Only_Regression	22.7	ft^3/s
0_1_Percent_Duration_DA_Only_Regression	34.9	ft^3/s

Flow-Duration Statistics Disclaimers [IL Flow duration Reg 1 Multivar 2014 5177]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Flow-Duration Statistics Flow Report [IL Flow duration Reg 1 Multivar 2014 5177]

Statistic	Value	Unit
99.9 Percent Duration	0.18	ft^3/s
99.8 Percent Duration	0.228	ft^3/s
99.5 Percent Duration	0.539	ft^3/s
99 Percent Duration	1.68	ft^3/s
98 Percent Duration	0.436	ft^3/s
95 Percent Duration	0.352	ft^3/s
90 Percent Duration	0.389	ft^3/s

Statistic	Value	Unit
80 Percent Duration	0.422	ft^3/s
75 Percent Duration	0.414	ft^3/s
70 Percent Duration	0.346	ft^3/s
60 Percent Duration	0.294	ft^3/s
50 Percent Duration	0.299	ft^3/s
40 Percent Duration	0.336	ft^3/s
30 Percent Duration	0.392	ft^3/s
25 Percent Duration	0.419	ft^3/s
20 Percent Duration	0.473	ft^3/s
10 Percent Duration	0.536	ft^3/s
5 Percent Duration	0.839	ft^3/s
2 Percent Duration	1.81	ft^3/s
1 Percent Duration	3.38	ft^3/s
0.5 Percent Duration	5.93	ft^3/s
0.2 Percent Duration	12.4	ft^3/s
0.1 Percent Duration	20.4	ft^3/s

Flow-Duration Statistics Flow Report [Area-Averaged]

Statistic	Value	Unit
99_9_Percent_Duration_DA_Only_Regression	0.00034	ft^3/s
99_8_Percent_Duration_DA_Only_Regression	0.000428	ft^3/s
99_5_Percent_Duration_DA_Only_Regression	0.00213	ft^3/s
99_Percent_Duration_DA_Only_Regression	0.00871	ft^3/s
98_Percent_Duration_DA_Only_Regression	0.0152	ft^3/s
95_Percent_Duration_DA_Only_Regression	0.0317	ft^3/s
90_Percent_Duration_DA_Only_Regression	0.0567	ft^3/s
80_Percent_Duration_DA_Only_Regression	0.103	ft^3/s
75_Percent_Duration_DA_Only_Regression	0.125	ft^3/s
70_Percent_Duration_DA_Only_Regression	0.139	ft^3/s
60_Percent_Duration_DA_Only_Regression	0.174	ft^3/s
50_Percent_Duration_DA_Only_Regression	0.223	ft^3/s

Statistic	Value	Unit
40_Percent_Duration_DA_Only_Regression	0.3	ft^3/s
30_Percent_Duration_DA_Only_Regression	0.411	ft^3/s
25_Percent_Duration_DA_Only_Regression	0.474	ft^3/s
20_Percent_Duration_DA_Only_Regression	0.567	ft^3/s
10_Percent_Duration_DA_Only_Regression	0.945	ft^3/s
5_Percent_Duration_DA_Only_Regression	1.67	ft^3/s
2_Percent_Duration_DA_Only_Regression	3.67	ft^3/s
1_Percent_Duration_DA_Only_Regression	6.75	ft^3/s
0_5_Percent_Duration_DA_Only_Regression	11.5	ft^3/s
0_2_Percent_Duration_DA_Only_Regression	22.7	ft^3/s
0_1_Percent_Duration_DA_Only_Regression	34.9	ft^3/s
99.9 Percent Duration	0.18	ft^3/s
99.8 Percent Duration	0.228	ft^3/s
99.5 Percent Duration	0.539	ft^3/s
99 Percent Duration	1.68	ft^3/s
98 Percent Duration	0.436	ft^3/s
95 Percent Duration	0.352	ft^3/s
90 Percent Duration	0.389	ft^3/s
80 Percent Duration	0.422	ft^3/s
75 Percent Duration	0.414	ft^3/s
70 Percent Duration	0.346	ft^3/s
60 Percent Duration	0.294	ft^3/s
50 Percent Duration	0.299	ft^3/s
40 Percent Duration	0.336	ft^3/s
30 Percent Duration	0.392	ft^3/s
25 Percent Duration	0.419	ft^3/s
20 Percent Duration	0.473	ft^3/s
10 Percent Duration	0.536	ft^3/s
5 Percent Duration	0.839	ft^3/s
2 Percent Duration	1.81	ft^3/s

Statistic	Value	Unit
1 Percent Duration	3.38	ft^3/s
0.5 Percent Duration	5.93	ft^3/s
0.2 Percent Duration	12.4	ft^3/s
0.1 Percent Duration	20.4	ft^3/s

Flow-Duration Statistics Citations

Over, T.M., Riley, J.D., Sharpe, J.B., and Arvin, Donald,2014, Estimation of regional flow-duration curves for Indiana and Illinois: U.S. Geological Survey Scientific Investigations Report 2014–5177, 24 p. and additional downloads, Tables 2–5, 8–13, and 18 (http://dx.doi.org/10.3133/sir20145177)

Bankfull Statistics

Bankfull Statistics Parameters [Interior Plains D Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.563	square miles	0.19305	59927.7393

Bankfull Statistics Parameters [Central Lowland P Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.563	square miles	0.200772	59927.66594

Bankfull Statistics Parameters [USA Bieger 2015]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.563	square miles	0.07722	59927.7393

Bankfull Statistics Flow Report [Interior Plains D Bieger 2015]

Statistic	Value	Unit
Bieger_D_channel_width	9.59	ft
Bieger_D_channel_depth	1.34	ft
Bieger_D_channel_cross_sectional_area	16.5	ft^2

Bankfull Statistics Flow Report [Central Lowland P Bieger 2015]

Statistic	Value	Unit
Bieger_P_channel_width	11.1	ft
Bieger_P_channel_depth	1.68	ft
Bieger_P_channel_cross_sectional_area	16	ft^2

Bankfull Statistics Flow Report [USA Bieger 2015]

Statistic	Value	Unit
Bieger_USA_channel_width	10.1	ft
Bieger_USA_channel_depth	1.07	ft
Bieger_USA_channel_cross_sectional_area	12.5	ft^2

Bankfull Statistics Flow Report [Area-Averaged]

Statistic	Value	Unit
Bieger_D_channel_width	9.59	ft
Bieger_D_channel_depth	1.34	ft
Bieger_D_channel_cross_sectional_area	16.5	ft^2
Bieger_P_channel_width	11.1	ft
Bieger_P_channel_depth	1.68	ft
Bieger_P_channel_cross_sectional_area	16	ft^2
Bieger_USA_channel_width	10.1	ft
Bieger_USA_channel_depth	1.07	ft
Bieger_USA_channel_cross_sectional_area	12.5	ft^2

Bankfull Statistics Citations

Bieger, Katrin; Rathjens, Hendrik; Allen, Peter M.; and Arnold, Jeffrey G.,2015, Development and Evaluation of Bankfull Hydraulic Geometry Relationships for the Physiographic Regions of the United States, Publications from USDA-ARS / UNL Faculty, 17p. (https://digitalcommons.unl.edu/usdaarsfacpub/1515?utm_source=digitalcommons.unl.edu%2Fusdaarsfacpub%2F1515&utm_medium=PDF&utm_cam

Maximum Probable Flood Statistics

Maximum Probable Flood Statistics Parameters [Crippen Bue Region 6]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.563	square miles	0.1	10000

Maximum Probable Flood Statistics Flow Report [Crippen Bue Region 6]

Statistic	Value	Unit
Maximum Flood Crippen Bue Regional	4260	ft^3/s

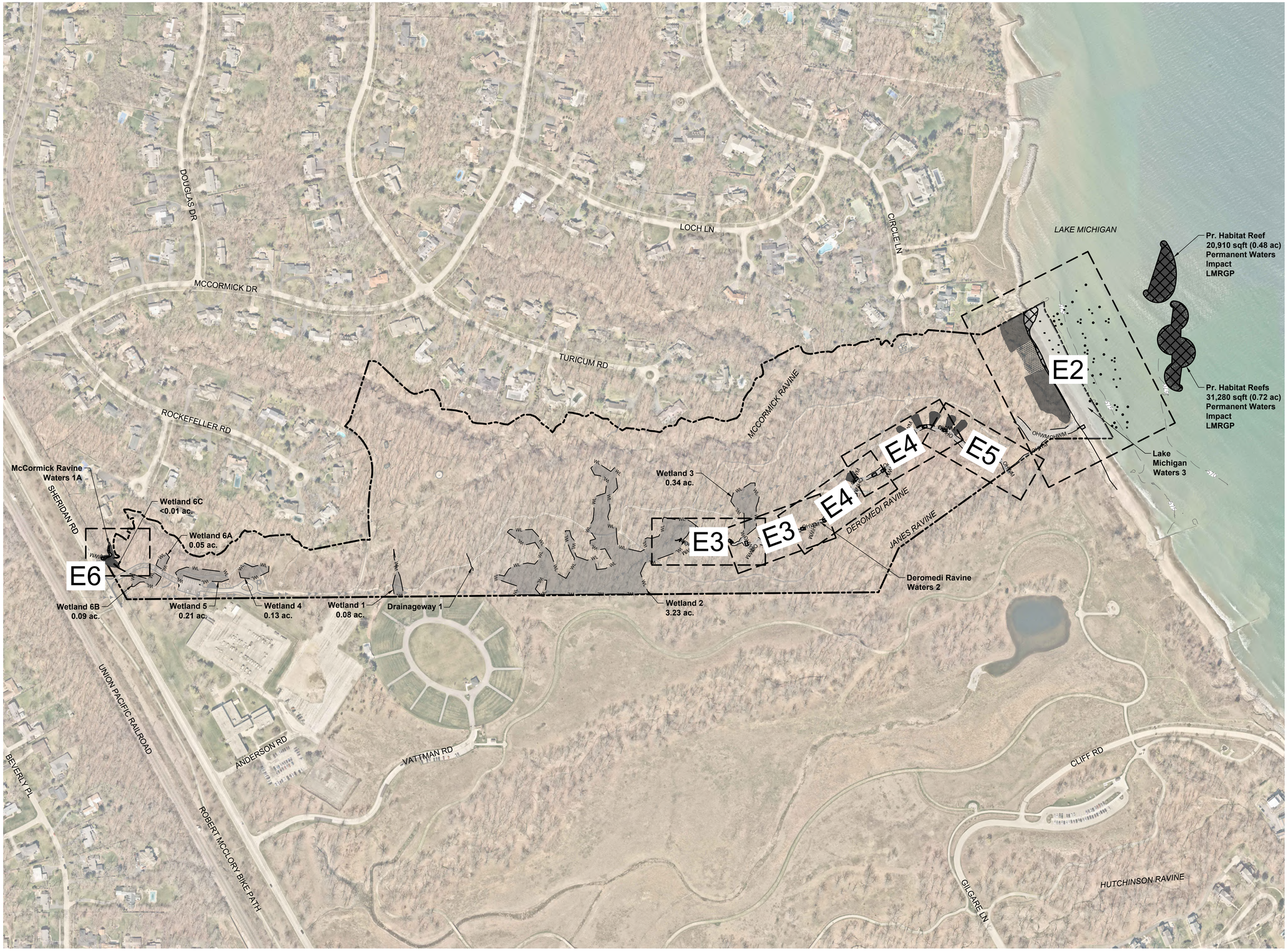
Maximum Probable Flood Statistics Citations

Crippen, J.R. and Bue, Conrad D.1977, Maximum Floodflows in the Conterminous United States, Geological Survey Water-Supply Paper 1887, 52p. (https://pubs.usgs.gov/wsp/1887/report.pdf)

Application Version: 4.29.1
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1

APPENDIX E

WETLAND AND WATERS IMPACT EXHIBITS



0 200 400

Scale: 1" = 200'

N

LEGEND

- Ex. Property Line
- Ex. Easement Line
- Ex. Wetland
- Ex. Waters of the U.S. (Waters)
- Ex. Drainageway
- Ex. Ravine Centerline
- Prop. Permanent Impact Area
- Prop. Temporary Impact Area
- Prop. Offshore Habitat Reef
- Prop. Pre-fill Sand

No.	Revision/Issue	Date

Hey and Associates, Inc.
Engineering, Ecology and Landscape Architecture
26575 West Commerce Drive, Suite 601
Volo, Illinois 60073
Office (847) 740-0888
Fax (847) 740-2888
Volo@Heyassoc.com

Professional Design Firm
License No. 184-002429

Jean and John Greene Nature Preserve Ravine, Bluff, and Shoreline Restoration

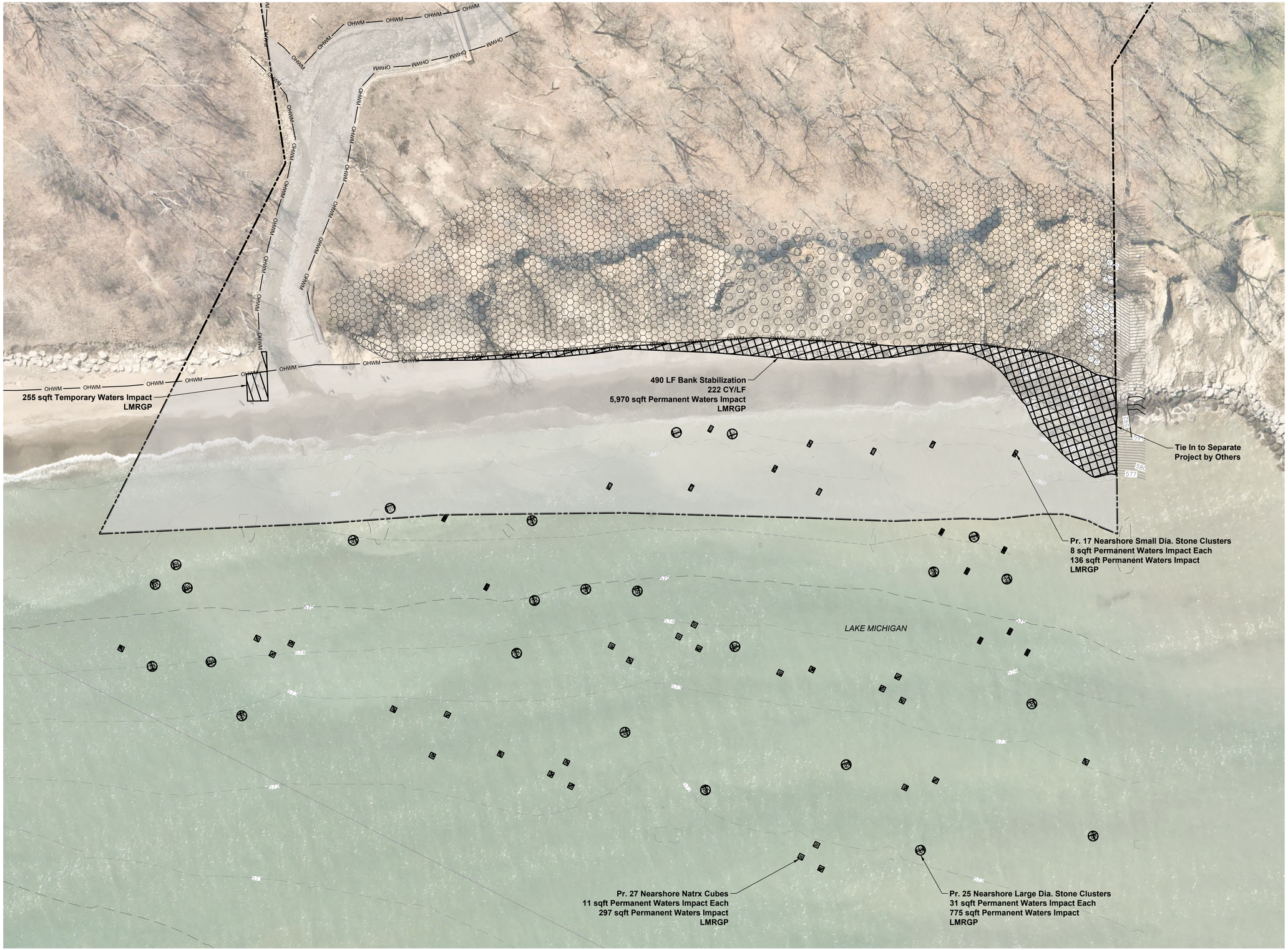
Lake Forest, Illinois

Wetlands and Waters Impacts - Overall Porject Area

PROJECT NO: 24-0271		SHEET NO:
DESIGNED BY	DAK/KNJ	E1
DRAWN BY	ATJ/KNJ	
CHECKED BY	KNJ	
APPROVED BY	SJR	PAGE NO:
ISSUE DATE	12/02/2025	01 OF 07

Impact Exhibits

File: P:\24\0024-0271 LFQLA-Greene NP Bluff and Ravines\05 CAD\24-0271 Wetlands Waters Impacts Exhibits.dwg, Plot Date: December 2, 2025, Plotted by: Kirsten James



0 30 60

Scale: 1" = 30'

N

LEGEND

- Ex. Property Line
- Ex. Easement Line
- Ex. Wetland
- Ex. Waters of the U.S. (Waters)
- Ex. Drainageway
- Ex. Ravine Centerline
- Prop. Permanent Impact Area
- Prop. Temporary Impact Area
- Prop. Exposed Stone Toe
- Prop. Bluff Slope Grade to Remain Zone
- Prop. Bluff Slope Grading Zone
- Prop. Nearshore Small Dia. Stone Cluster
- Prop. Nearshore Large Dia. Stone Cluster
- Prop. Nearshore Natrx Cube Detail

No.	Revision/Issue	Date

Hey and Associates, Inc.
Engineering, Ecology and Landscape Architecture
26575 West Commerce Drive, Suite 601
Volo, Illinois 60073
Office (847) 740-0888
Fax (847) 740-2888
Volo@Heyassoc.com

Professional Design Firm
License No. 184-002429

Jean and John Greene Nature Preserve Ravine, Bluff, and Shoreline Restoration

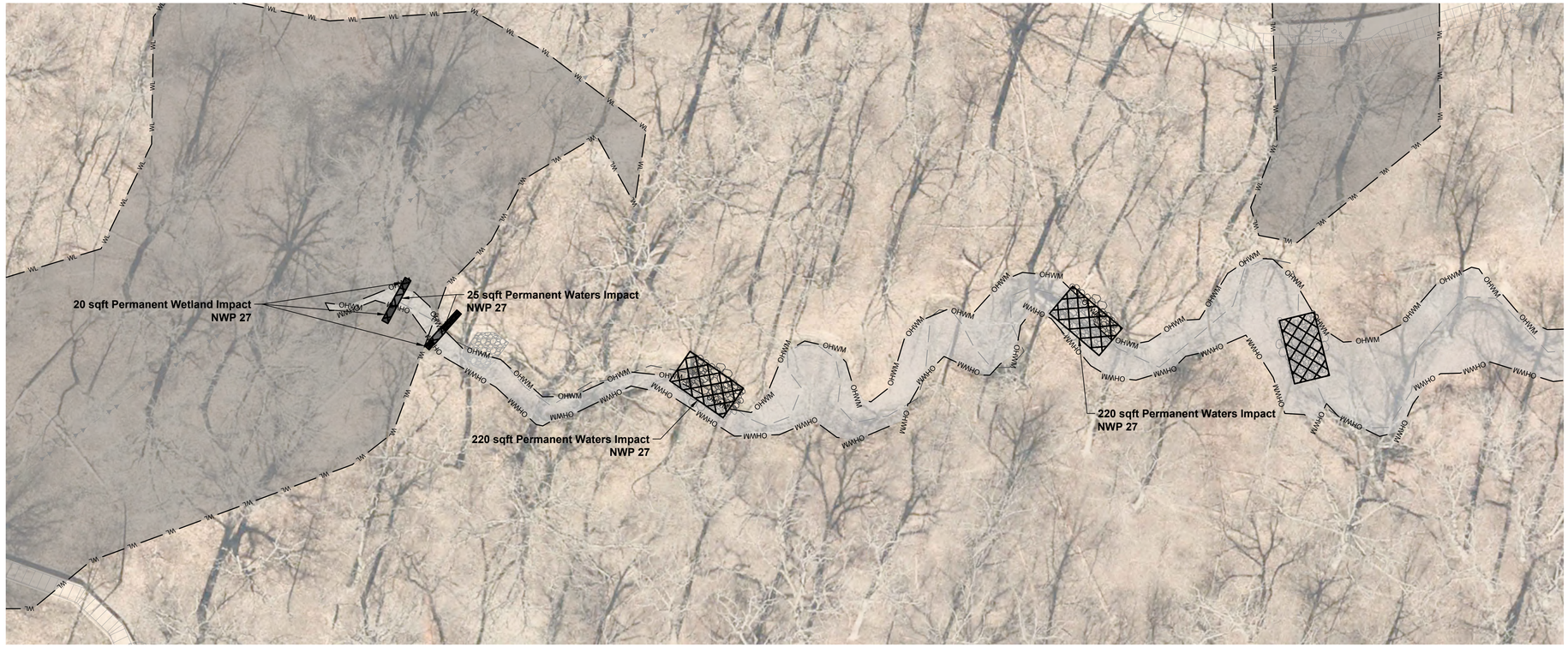
Lake Forest, Illinois

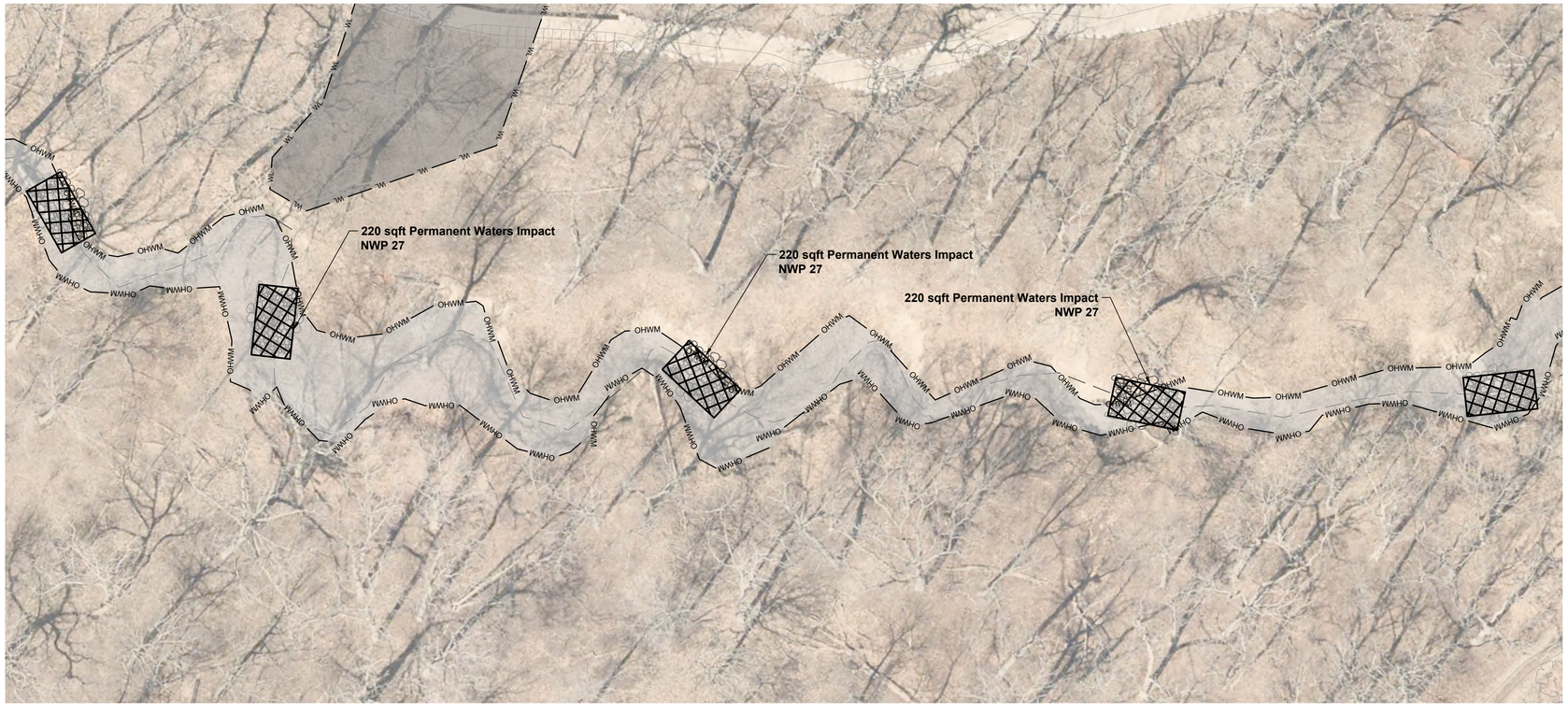
Wetlands and Waters Impacts - Bluff

PROJECT NO: 24-0271		SHEET NO:
DESIGNED BY	DAK/KNJ	E2
DRAWN BY	ATJ/KNJ	
CHECKED BY	KNJ	
APPROVED BY	SJR	PAGE NO:
ISSUE DATE	12/02/2025	02 OF 07

Impact Exhibits

File: P:\24\0024-0271 LFOLA-Greene NP Bluff and Ravines\05 CAD\24-0271 Wetlands Waters Impacts Exhibits.dwg Plot Date: December 2, 2025 Plotted by: Kirsten James





0 20 40

Scale: 1" = 20'

LEGEND

- Ex. Property Line
- Ex. Easement Line
- Ex. Wetland
- Ex. Waters of the U.S. (Waters)
- Ex. Drainageway
- Ex. Ravine Centerline
- Prop. Permanent Impact Area
- Prop. Temporary Impact Area
- Prop. Ravine Side Slope Stabilization
- Prop. Woody Material Stabilization

No.	Revision/Issue	Date

Hey and Associates, Inc.
Engineering, Ecology and Landscape Architecture
26575 West Commerce Drive, Suite 601
Volo, Illinois 60073
Office (847) 740-0888
Fax (847) 740-2888
Volo@Heyassoc.com

Professional Design Firm
License No. 184-002429

Jean and John Greene Nature Preserve Ravine, Bluff, and Shoreline Restoration

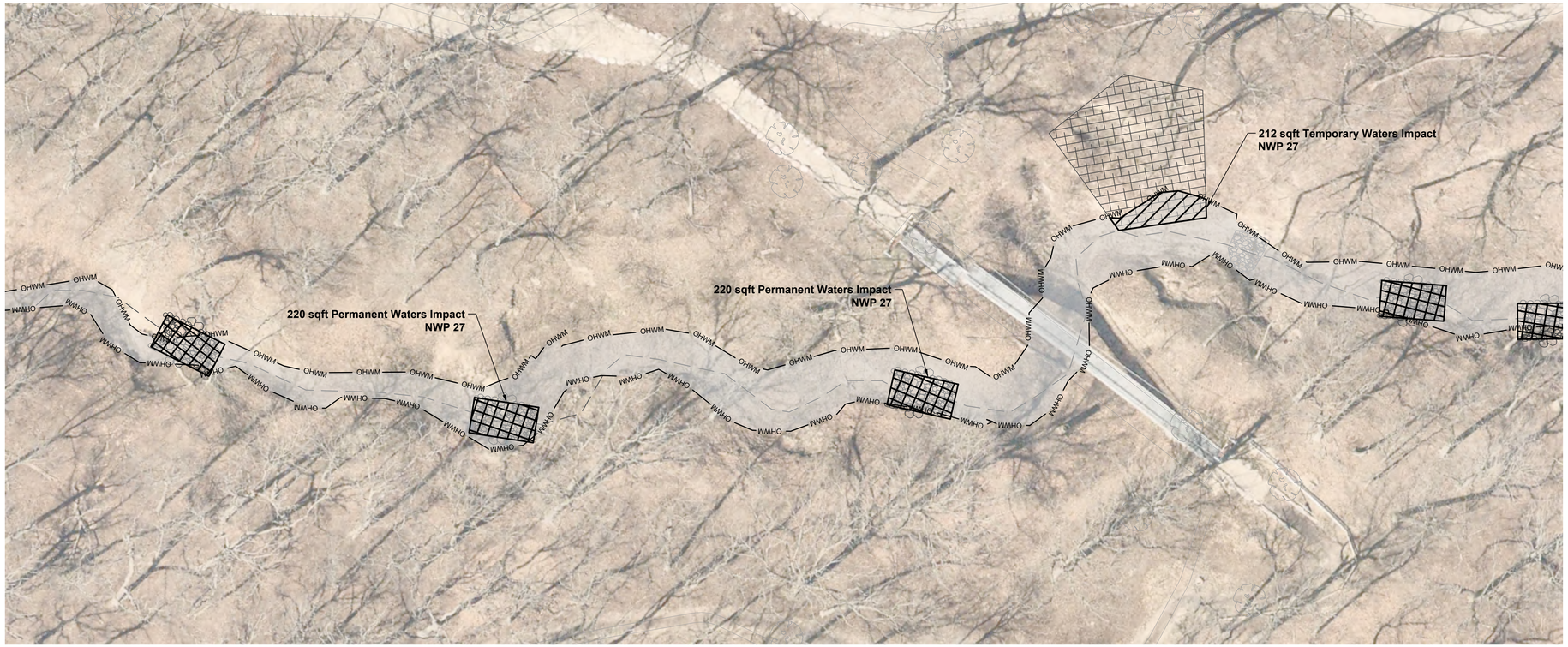
Lake Forest, Illinois

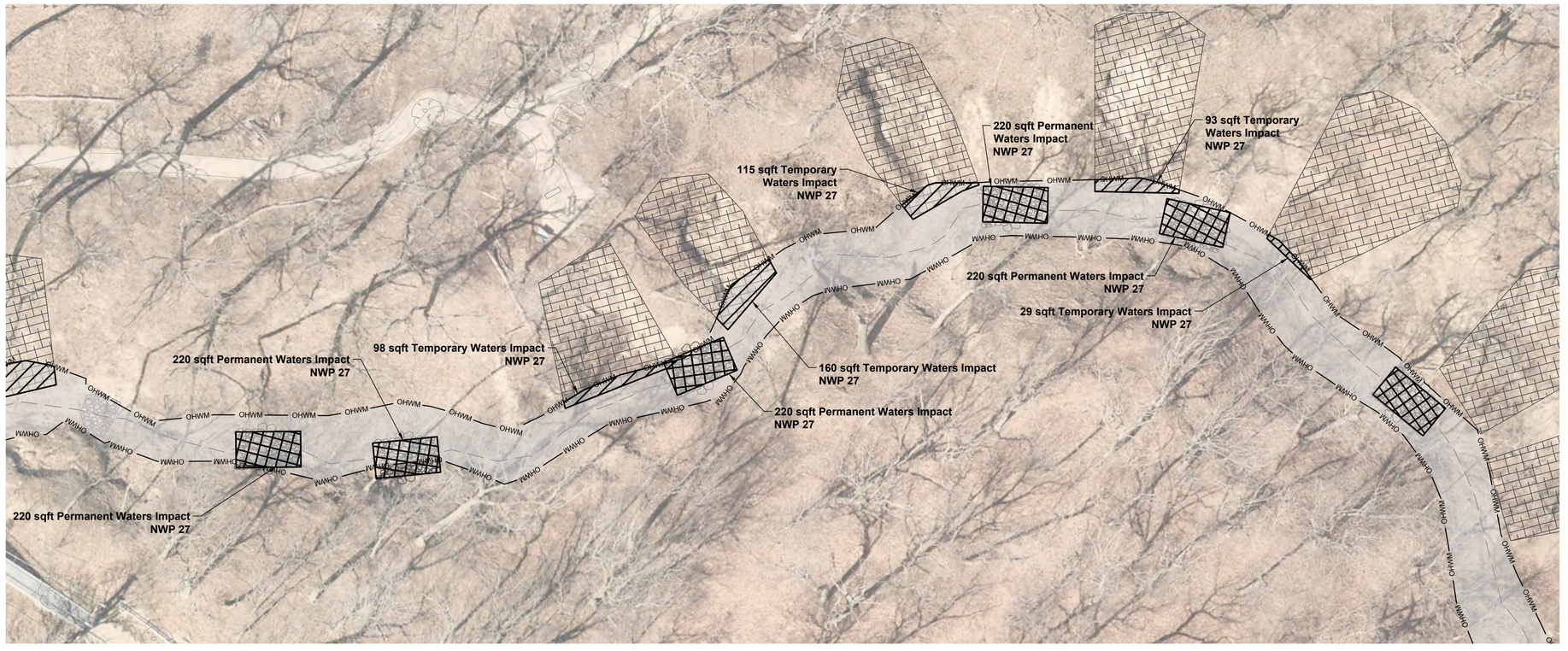
Wetlands and Waters Impacts - Ravine

PROJECT NO: 24-0271		SHEET NO:
DESIGNED BY	DAK/KNJ	E3
DRAWN BY	ATJ/KNJ	
CHECKED BY	KNJ	
APPROVED BY	SJR	PAGE NO:
ISSUE DATE	12/02/2025	03 OF 07

Impact Exhibits

File: P:\24\00\24-0271 LFOLA-Greene NP Bluff and Ravines\05 CAD\24-0271 Wetlands Waters Impacts Exhibits.dwg Plot Date: December 2, 2025 Plotted by: Kirsten James





0 20 40

Scale: 1" = 20'

LEGEND

- Ex. Property Line
- Ex. Easement Line
- Ex. Wetland
- Ex. Waters of the U.S. (Waters)
- Ex. Drainageway
- Ex. Ravine Centerline
- Prop. Permanent Impact Area
- Prop. Temporary Impact Area
- Prop. Ravine Side Slope Stabilization
- Prop. Woody Material Stabilization

No.	Revision/Issue	Date

Hey and Associates, Inc.
Engineering, Ecology and Landscape Architecture
26575 West Commerce Drive, Suite 601
Volo, Illinois 60073
Office (847) 740-0888
Fax (847) 740-2888
Volo@Heyassoc.com

Professional Design Firm
License No. 184-002429

Jean and John Greene Nature Preserve Ravine, Bluff, and Shoreline Restoration

Lake Forest, Illinois

Wetlands and Waters Impacts - Ravine

PROJECT NO: 24-0271		SHEET NO:
DESIGNED BY	DAK/KNJ	E4
DRAWN BY	ATJ/KNJ	
CHECKED BY	KNJ	
APPROVED BY	SJR	PAGE NO:
ISSUE DATE	12/02/2025	04 OF 07

Impact Exhibits

File: P:\24000\24-0271 LFOLA-Greene NP Bluff and Ravines\05 CAD\24-0271 Wetlands Waters Impacts Exhibits.dwg Plot Date: December 2, 2025 Plotted by: Kirsten James

0 20 40

Scale: 1" = 20'

LEGEND

- Ex. Property Line
- Ex. Easement Line
- Ex. Wetland
- Ex. Waters of the U.S. (Waters)
- Ex. Drainageway
- Ex. Ravine Centerline
- Prop. Permanent Impact Area
- Prop. Temporary Impact Area
- Prop. Ravine Side Slope Stabilization
- Prop. Woody Material Stabilization

No.	Revision/Issue	Date

Hey and Associates, Inc.
Engineering, Ecology and Landscape Architecture
26575 West Commerce Drive, Suite 601
Volo, Illinois 60073
Office (847) 740-0888
Fax (847) 740-2888
Volo@Heyassoc.com

Professional Design Firm
License No. 184-002429

Jean and John Greene Nature Preserve Ravine, Bluff, and Shoreline Restoration

Lake Forest, Illinois

Wetlands and Waters Impacts - Ravine

PROJECT NO: 24-0271		SHEET NO:
DESIGNED BY	DAK/KNJ	E5
DRAWN BY	ATJ/KNJ	
CHECKED BY	KNJ	
APPROVED BY	SJR	PAGE NO:
ISSUE DATE	12/02/2025	05 OF 07

Impact Exhibits

File: P:\24000\24-0271 LFOLA-Greene NP Bluff and Ravines\05 CAD\24-0271 Wetlands Waters Impacts Exhibits.dwg Plot Date: December 2, 2025 Plotted by: Kirsten James

0 10 20

Scale: 1" = 10'

N

LEGEND

- Ex. Property Line
- Ex. Easement Line
- Ex. Wetland
- Ex. Waters of the U.S. (Waters)
- Ex. Drainageway
- Ex. Ravine Centerline
- Prop. Permanent Impact Area
- Prop. Temporary Impact Area
- Prop. Outfall Stone
- Prop. Outfall Slope Mattress
- Prop. Ravine Side Slope Stabilization

No.	Revision/Issue	Date

Hey and Associates, Inc.
Engineering, Ecology and Landscape Architecture
26575 West Commerce Drive, Suite 601
Volo, Illinois 60073
Office (847) 740-0888
Fax (847) 740-2888
Volo@Heyassoc.com

Professional Design Firm
License No. 184-002429

Jean and John Greene Nature Preserve Ravine, Bluff, and Shoreline Restoration

Lake Forest, Illinois

Wetlands and Waters Impacts - Outfall

PROJECT NO: 24-0271		SHEET NO:
DESIGNED BY	DAK/KNJ	E6
DRAWN BY	ATJ/KNJ	
CHECKED BY	KNJ	
APPROVED BY	SJR	PAGE NO:
ISSUE DATE	12/02/2025	06 OF 07

Impact Exhibits

File: P:\24\00\24-0271 LFOLA-Greene NP Bluff and Ravines\05 CAD\24-0271 Wetlands Waters Impacts Exhibits.dwg Plot Date: December 2, 2025 Plotted by: Kirsten James

LEGEND

Ex. Property Line

Ex. Contours (Hey Survey)

NOTES:

Bathymetric survey collected by Hey and Associates, Inc. on July 15, 2025.

No.	Revision/Issue	Date

Hey and Associates, Inc.
Engineering, Ecology and Landscape Architecture
26575 West Commerce Drive, Suite 601
Volo, Illinois 60073
Office (847) 740-0888
Fax (847) 740-2888
Volo@Heyassoc.com

Professional Design Firm
License No. 184-002429

Jean and John Greene Nature Preserve Ravine, Bluff, and Shoreline Restoration

Lake Forest, Illinois

Bathymetry

PROJECT NO:	24-0271	SHEET NO:
DESIGNED BY	DAK/KNJ	E7
DRAWN BY	ATJ/KNJ	
CHECKED BY	KNJ	
APPROVED BY	SJR	PAGE NO:
ISSUE DATE	12/02/2025	07 OF 07

Impact Exhibits

File: P:\24\00\24-0271 LFOLA-Greene NP Bluff and Ravines\05 CAD\24-0271 Wetlands Waters Impacts Exhibits.dwg Plot Date: December 2, 2025 Plotted by: Kristen James