Tinley Creek Streambank Stabilization

Request for Proposal #21-015

Technical Proposal
Prepared for

ORLAND PARK

14700 S. Ravinia Ave
Orland Park, IL 60462

Prepared by
Cardno, Inc.
6605 W. Steger Road
Monee, IL 60449

March 29, 2021

Cardno

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Acronyms

AGO	ArcGIS Online
BEHI	Bank Erosion Hazard Index
CSF	Critical success factors
ENR	Engineering News-Record
GVSU	Grand Valley State University
H&H	Hydrologic and hydraulic
IDNR	Indiana Department of Natural Resources
IEPA	Illinois Environmental Protection Agency
LARE	Lake and River Enhancement
LMR	Little Mac Ravine
MBE	Minority-Owned Business Enterprise
MDEQ	Michigan Department of Environmental Quality
MDNR	Missouri Department of Natural Resources
MWRDGC	Metropolitan Water Reclamation District of Greater Chicago
NPDES	National Pollutant Discharge Elimination System
O&M	Operations and maintenance
PCE	Protected Class Enterprise
PM	Project Manager
PS&E	Plans, Specifications, and Estimates
RFP	Request for Proposals
SBE	Small Business Enterprise
SWCD	Soil and Water Conservation District
USACE	U.S. Army Corps of Engineers
VE	Value Engineering
VOSB	Veteran-owned Small Business

1. Cover Letter

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March 29, 2021

Mr. John C. Mehalek, Office of the Village Clerk
Village of Orland Park
14700S. Ravinia Ave
Orland Park, IL 60462

RE: Tinley Creek Streambank Stabilization Request for Proposals #21-015

Dear Mr. Mehalek and Board of Trustees for Village of Orland Park:

Cardno, Inc. (Cardno) understands the Village of Orland Park (Village) is seeking an environmental and engineering consulting partner for the Tinley Creek Streambank Stabilization Project (Project) located in the Village. The Cardno team including **Cardno**, **Andrews Engineering (SBE)**, **Aqua Vitae (VOSB),** and **Valdes Engineering (MBE)** offers the right depth and breadth of experience and commitment to effectively review and update the previous Project design, conduct site surveys, design additional streambank sections, prepare separate exhibits and deliver Plans, Specifications, and Estimates that would be used by the Village to pursue a construction contract.

Cardno, as one of the largest professional infrastructure and environmental services firms in the Midwest, with a local project office ten miles from the site, provides a deep bench of stream and streambank stabilization design experts, surveyors, civil site designers, and technical staff with essential public involvement experience. During the last decade, our staff has completed over 70 projects and designed over 15 miles of streambank stabilization and habitat enhancement projects across the country. Our team is highly knowledgeable of programmatic watershed goals and objectives, technical stream stabilization design, and the need for stakeholder support for successful, implementable projects. Cardno partners closely with our clients, often acting as an extension of staff and assisting in the implementation of a given project. You have worked with us before and we remain committed to your goals and the long-term success of your projects.

Cardno acknowledges receipt of Addenda (Questions and Answers) dated March 17, 2021 and March 23, 2021. Per the RFP, Cardno has reviewed in advance, the General Terms and Conditions and accepts the responsibility to deliver any contracts, bonds, and insurance that may be required within ten days following Notice to Proceed. Following your review of our team's qualifications with the Technical Proposal attached herein and our Proposal Summary Sheet (Price Proposal) provided under separate cover, should the Village require additional information or clarification of any portion of our package, please contact Project Manager Heather Schwar, PE, with phone and email provided below. Cardno appreciates this opportunity to partner with the Village of Orland Creek again.

Sincerely,

Cardno Inc.

Heather Schwar, PE
Project Manager
for Cardno
Mobile: 414 617 7891
Email: heather.schwar@cardno.com

Anngie Richter
Senior Principal, Business Unit Leader Restoration Services
for Cardno
Direct Line: 708 516 2544
Email: anngie.richter@cardno.com

2. Qualifications

Meet the Cardno Team

We have assembled a broad, interdisciplinary team composed of four firms: Cardno, Andrews Engineering (SBE), Aqua Vitae (VOSB), and Valdes Engineering (MBE). The Cardno team will deliver a comprehensive streambank stabilization design to the Village of Orland Park and the Metropolitan Water Reclamation District of Greater Chicago (MWRDGC) and will provide necessary information to individual property owners to ensure a successful outcome. It is a broad and deep partnership that can bring to bear the right expertise for a project with a complicated history. Our team has stream and streambank stabilization design experts, surveyors, civil site designers, and technical staff with public involvement experience. This teaming arrangement starts with Ms. Heather Schwar, PE, a senior water resources engineer with extensive stream design experience and previous MWRDGC project management experience. She listens to the client to understand their needs, takes into account input from local stakeholders, and brings together the design team to address the problem.

Our team is led by Cardno, a professional infrastructure and environmental services firm with a local office 10 miles from the project site. Over the last 13 years, the Cardno stream team has completed over 70 projects and designed over 15 miles of streambank stabilization and habitat enhancement projects throughout the United States. Cardno will manage the project, provide streambank erosion evaluations, assist in the overall streambank design, provide permitting services, coordinate between the Village, MWRDGC, and the design team, and address public involvement and easement needs. Aqua Vitae's design experience compliments Cardno's extensive geomorphic and streambank stabilization experience. Mr. Gary Paradoski from Aqua Vitae brings previous and comprehensive project experience on the Tinley Creek Streambank Stabilization Project. He was the project manager and lead professional engineer for the Tinley Creek project previously completed by Baker. The Cardno and Aqua Vitae partnership will complete the streambank stabilization design together, bringing together the technical talents of our two firms to provide a comprehensive design to address the unique challenges that Tinley Creek presents. Aqua Vitae will provide CADD services, review and revise construction specifications, and assist the Village with easement preparations. Andrews Engineering delivers their conventional civil engineering expertise including site survey, stormwater and geotechnical engineering. They will address topographic and utility surveying, soil borings and geotechnical soil information, stormwater inputs and construction information such as traffic plans and erosion control plans. Finally, Valdes Engineering will provide land surveying to provide information for easement documents and property owner exhibits. They also have structural engineering capabilities should the need arise regarding previous wall designs.

Additional detail about each of the team firm's is below, including key personnel who will be involved with the projects, and representative and relevant project descriptions.

About Cardno

Cardno®

Founded in 1945, Cardno is a professional infrastructure and environmental services company. Our team includes leading professionals who plan, design, manage, and deliver sustainable projects and community programs. We have expertise and experience in supporting some of the largest companies around the world on projects and programs ranging from large scale infrastructure improvements to addressing the world's most complex environmental challenges. Cardno provides a wide range of integrated environmental, engineering, infrastructure, scientific consulting and field services supporting public and private sector clients.

With more than 90 offices in the Americas and 30 additional offices worldwide, Cardno offers clients access to more than 4,400 professionals with exceptional local client service and project delivery.

Clients turn to Cardno for assistance in navigating complex environmental challenges because of our reputation for integrity, responsiveness, and innovation. Our clients benefit from the wealth of knowledge and experience of our multi-disciplinary team of environmental professionals. Cardno senior staff and management are highly regarded and respected throughout private and public sectors for their technical expertise, science-based approach, and ability to provide sustainable business solutions. Our focus is to provide exceptional project delivery and build long-term relationships. At Cardno, we pride ourselves on technical excellence, communication, and working closely with stakeholders to make a difference for our clients. Cardno in 2020, ranked 49th on *Engineering News-Record's (ENR)* Top 500 Design Firms nationally. Cardno also ranks among the Top 200 Environmental Firms in 2020. Visit www.cardno.com to learn more.

ENR #49 2020 TOP 500 DESIGN FIRMS

Cardno is a one of the Village of Orland Park's ecological restoration contractors, providing restoration and consulting for various naturalized properties and stormwater basins, as well as the implementation of the Stellwagon Park project. Additionally, Cardno has worked with MWRDGC on various projects including construction of the Tinley Creek streambank restoration, Melvina Ditch, stormwater master plan for Harwood Heights and is a review consultant for permit applications under MWRDGC watershed development ordinance. Our knowledge and history of Orland Park and MWRDGC provides unique insight into the values and vision for both Orland Park and MWRDGC.

Subconsultants

ANDREWS ENGINEERING

Andrews Engineering is a small employee-owned professional consulting firm providing a wide range of engineering and environmental design and support services. As a full-service consulting organization, we possess the in-house capability to provide engineering and environmental services to support both routine and out-of-scope project requirements. Their firm was established in 1975 by James D. Andrews and incorporated in Illinois in 1978. Andrews is led by a team of senior engineering and environmental professionals with extensive technical expertise, regulatory insight, and value added services. Their management approach focuses on the use of common sense principles to develop cost-effective and efficient solutions to the environmental and engineering challenges our clients face in their day to day operations. Andrews staff is comprised of approximately 50 qualified professionals whose focus is on achieving results. This includes civil and environmental engineers, geologists/hydrogeologists, environmental scientists, engineering and scientific field technicians, safety professionals, and administrative staff, all of whom bring wide-ranging experience and capabilities. These individuals are dedicated to providing clients with premier service and innovative ideas. Their staff members bring valuable knowledge of and experience with regulatory agency internal processes and requirements and use expertise to help clients effectively and efficiently manage and solve difficult regulatory matters.

Aqua Vitae is a certified veteran-owned small business that was founded in 2014 by Mr. Paradoski, who has over 30 years of civil engineering and surveying experience. Aqua Vitae specializes in green infrastructure, natural resources, and water quality. Its projects include the design of erosion and sediment controls, Best Management Practices (BMPs), green infrastructure, hydrologic and hydraulic studies, water quality modeling & analyses, and sustainable storm water management. Often this involves land surveying and earth balancing, GIS analysis and field studies, acquiring and administering permits, preparation of construction documents, writing specifications, and construction observation. They provide services such as conservation, preservation, restoration, low impact design, watershed and water quality protection, and planning and modeling.

VALDES ENGINEERING COMPANY

Valdes Engineering is a certified Minority-Owned Business Enterprise (MBE) founded by Robert (Bob) Valdes in 1992 and has now completed more than 6,000 projects across the United States and is ranked as one of ENR's top 500 engineering design firms nationwide. Valdes has grown to be a 200-person business and they attribute success to their commitment to safety, industry knowledge and client satisfaction. Valdes will be providing land surveying services that include: laser scanning, pre-design surveys, utility mapping, topographic maps, spool verification, structural steel surveys, foundation surveys, and vessel and equipment surveys. They also have a licensed Structural Engineer who could assist if retaining wall designs are necessary.

Proposed Project Team

Cardno has assembled a design team with technical niche expertise such as Rosgen, geomorphology, ecology and knowledge of how to build these designs for long-term success. Our team of technical experts is based on the knowledge and experience needed to successfully design and restore streams in urban watersheds. We feel that our task based approach combined with close coordination with the Village will result in a highly successful project. Our team is comprised of experts in the fields of Engineering, Geomorphology, Naturalized Stream Design, Hydraulics/Hydrology, biology, Ecology, Landscape Architecture, Permitting, and Construction. The day to day project manager and liaison to the Village is **Ms. Heather Schwar, PE**. Ms. Schwar has 20 years of experience in streambank restoration and has the expertise to oversee all phases of the project. In addition to the project manager, key Cardno team staff are introduced in Table 1 below. Abbreviated resumes are also provided as Appendix A to this response.

The Cardno team will be managed by Ms. Schwar Schwar, PE from Cardno's Milwaukee office. Ms. Schwar is exceptionally qualified to serve as project manager (PM) for the Tinley Creek Streambank Stabilization Project. She has managed complex projects with large teams for federal, municipal, and local clients at Cardno for the last six years and over nine years with previous firms HNTB and CDM Smith. Recent examples of Ms. Schwar's project management experience include:

- **Professional Engineering Services for Stormwater Master Plan for the Village of Harwood Height**s for MWRDGC, Illinois, where Ms. Schwar managed the Cardno team including three subconsultants and exceeded the District's Protected Class Enterprise (PCE) goals, finished $20,000 under the $690,000 budget, and met the contract schedule (2015-2017).
- **Natural Areas Restoration Services** for Oakton Community College, where Ms. Schwar managed a team of up to eight restoration specialists and subcontractors in restoring and maintaining 74 acres of upland and floodplain forest and reconstructing 8 acres of prairie with a $500,000 budget (2017-2019).
- **City of Sterling's Riverfront Revitalization: Green Infrastructure Design/Engineering and Construction Oversight.** Along with providing water resources engineering design, Ms. Schwar served as the project manager and provided engineering services during construction for this stormwater management project which included a stormwater treatment train with almost 13 acres of native prairie plantings to capture stormwater, create habitat, and provide a green space for the community, and a permeable paver plaza with raised planters and concrete benches for community use. She oversaw the development of the Operations and Maintenance Plan and the final project close-out.
- **North 30th Street Corridor Wet Weather Relief Phase 1 Preliminary Engineering and Design**. Prior to joining Cardno, Ms. Schwar was the assistant PM on the Milwaukee Metropolitan Sewerage District's 30th Street Project. In addition to providing engineering support for the detention basins and storm sewer design as well as a feasibility analysis for green infrastructure along Roosevelt Drive, Ms. Schwar assembled monthly invoices; organized monthly progress meeting agendas and minutes; coordinated the subconsultant team for field surveys, design deliverables and meetings; and worked

extensively with the outreach specialist to organize and host productive public, stakeholder, and design meetings.

Our QA/QC practices are focused on ensuring that our projects progress in an organized, planned sequence. This reduces unnecessary work and ensures timely and efficient completion of projects. Our QA/QC Management Plan includes defining a team structure that identifies a technical advisory and quality assurance/quality control (QA/QC) role for Ross St. Clair, PE and PM Heather Schwar, PE.

In addition to her project management experience, Ms. Schwar has provided technical engineering design on river restoration and streambank stabilization projects for more than 20 years. Recently, Ms. Schwar led the engineering and design, through construction of the Kinnickinnic River I-94 to Becher Habitat Restoration for Milwaukee's Metropolitan Sewerage District and the Little Mac Ravine Stabilization and Restoration Planning, Design, and Construction project at Grand Valley State University (see example projects in Relevant Project Experience Section). Please see her resume for additional examples highlighting her technical and project management abilities to deliver the Tinley Creek Streambank Stabilization Project.

Ms. Schwar will be personally responsible for all products generated by the project team, will be the primary point of contact for communication between the Team and the Village and MWRDGC, and will be accountable to answer any information requests. As such, she will attend all project meetings, all public involvement meetings, and oversee all of the project management processes necessary for smooth project delivery including executing Cardno's Quality Assurance and Quality Control Management Plan (see callout) along with the our QA/QC Lead, Ross St. Clair. She is well aware that this project requires adherence to scope, schedule and budget as laid out in the RFP and sample agreement/contract. Ms. Schwar understands the need for independent cost estimates for the Village and MWRDGC. Given the size and complexity of administering this project, Ben Balskus, a project administrator, will assist Ms. Schwar with invoicing, scheduling, budgeting and communications.

On the following pages, we present our Organizational Chart and a summary of key staff qualifications. Resumes are provided as Appendix A.

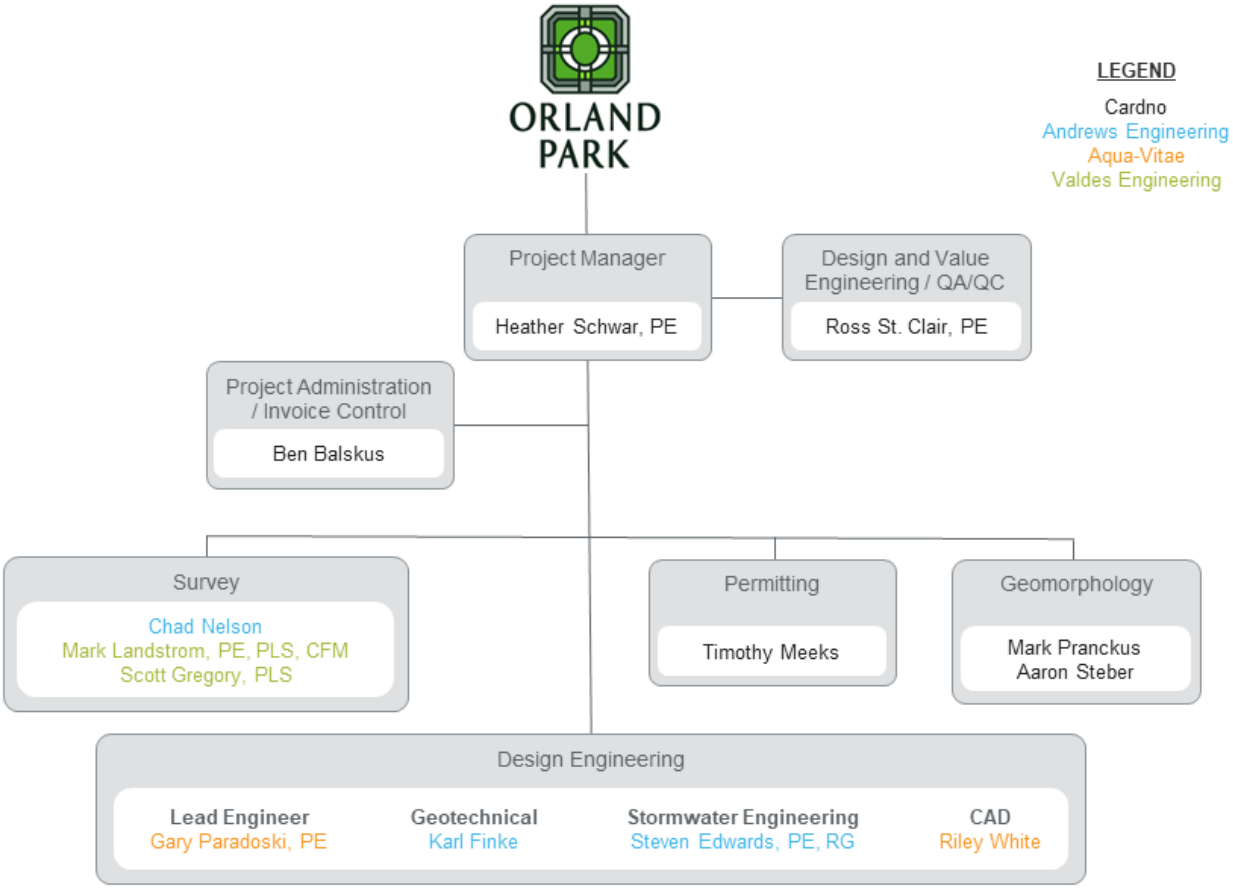


Figure 1 – Organizational Chart

Table 1 – Summary of Key Staff

Staff	Experience
Ms. Schwar Schwar, PE **Role:** Project Manager **Years' Experience:** 20 **Years with Cardno:** 6 **Education:** ▪ MS, Civil Engineering (Water Resources), University of Wisconsin-Madison ▪ BS, Geological Engineering and Geology, University of Wisconsin-Madison **Registrations/Certifications:** ▪ Professional Engineer- IL #062068101, FL, IN, KY, LA, MN, MI, MO, NY, OH, WA, WI ▪ Rosgen Level I: Applied Fluvial Geomorphology	Ms. Schwar brings more than 20 years of extensive restoration experience, and serves as a senior water resources engineer and project manager responsible for leading design and engineering services. She successfully manages, designs and implements stream and wetland restorations, streambank stabilizations, stormwater projects, and natural area restorations with channel, dam removal and fish passage improvements, and habitat enhancement features. Ms. Schwar primarily focuses on water resources by evaluating and designing various hydrologic and hydraulic (H&H) projects, with her expertise in numerous hydrologic and hydraulic models including Hydrologic Engineering Centers River Analysis System (HEC-RAS), Hydrologic Engineering Centers-Hydrologic Modeling System (HEC-HMS), XP-Storm Water Management Model (XP-SWMM), PondPack, Culvert Master, in addition to various Geographic Information System (GIS) applications. As a project manager, Ms. Schwar has managed complex projects with large teams for federal, municipal, and local clients.

Staff	Experience
Ross St. Clair, PE **Role:** Design and Value Engineering / QA/QC **Years' Experience: 8** **Years with Cardno: 2** **Education:** ▪ BS, Agricultural Engineering, Purdue University **Registrations/Certifications:** ▪ Professional Engineer - IN, MI, IL #062.071739, SC, NC, OH	Mr. St. Clair is licensed as a Professional Engineer in six states. He is a water resources engineer with experience in-stream, shoreline, and wetland restoration H&H modeling, site survey, stormwater design and management, and construction monitoring and oversight. He is skilled in using AutoCAD Civil 3D, Autodesk Storm and Sanitary Sewer Analysis, Hydrologic Engineering Centers – Hydrologic Modeling System (HEC-HMS), Hydrologic Engineering Centers – River Analysis System (HEC-RAS), Flow/Culvert Master, and ArcGIS.
Gary Paradoski, PE **Role:** Lead Design Engineer **Years' Experience:** 30 **Years with Aqua Vitae:** 7 **Education:** ▪ BS**,** Civil Engineering, Construction, Lawrence Technological University **Registrations/Certifications:** ▪ Professional Engineer – WI, IL #062.059667, IA, KS, MI, MO, MS, TX ▪ ASCE Sustainability Committee ▪ IDOT Documentations	Mr. Paradoski has 30 years of experience in land surveying, field studies, acquiring and administering permits, preparation of construction documents and specifications, and construction observation. He routinely performs design and oversight of natural resources, green infrastructure, and water quality projects. Aspects of these projects include underground utilities, stream stabilization and ecosystem restoration, BMPs, hydrologic & hydraulic studies, water quality monitoring & analyses, erosion & sediment control, and sustainable storm water management. He engages stakeholders regarding sustainable engineering practices, including low impact development and agricultural nutrient management.
Aaron Steber **Role:** Geomorphology/channel assessment and design **Years' Experience:** 17 **Years with Cardno:** 13 **Education:** ▪ MS, Hydrology and Watershed Management, University of Minnesota ▪ BS, Water and Soil Resources, University of Minnesota **Registrations/Certifications:** ▪ Rosgen Level IV: River Restoration and Natural Channel Design ▪ Rosgen Level III: River Assessment and Monitoring ▪ Rosgen Level II: River Morphology and Applications ▪ Rosgen Level I: Applied Fluvial Geomorphology	Mr. Steber works primarily on streams and has over 20 years of experience surveying, designing, permitting, and constructing stream restoration and habitat enhancement projects throughout the United States. His work in the Midwest includes working with municipalities such as the City of Middleton and utilities where his designs protect critical infrastructure. Mr. Steber specializes in using woody materials to increase stream habitat complexity and diversity and also works with private groups such as Trout Unlimited and the Lake Superior Steelhead Association to restore degraded streams using natural channel design techniques. His background working with streams in urban areas will allow him to contribute to the design team as well as help identify and provide solutions to issues that may arise including the potential for tree removal and disturbance to existing wetlands at the project site.

Staff	Experience
Mark Pranckus **Role:** Geomorphology/channel assessment and design and Ecologist/Vegetation Management **Years' Experience:** 20 **Years with Cardno:** 17 **Education:** ▪ MS, University of Minnesota-Duluth, 2004 ▪ BS, Indiana University, 1996 **Registrations/Certifications:** ▪ American Fisheries Society ▪ Rosgen Level IV: River Restoration and Natural Channel Design ▪ Rosgen Level III: River Assessment and Monitoring ▪ Rosgen Level II: River Morphology and Applications ▪ Rosgen Level I: Applied Fluvial Geomorphology	Mr. Pranckus leads ecological restoration projects including stream restoration and native plant community restoration and acts as a technical lead for natural resource management projects. He leads engineering feasibility studies, design projects and manages stream and wetland construction projects from the bidding process through project implementation. He has completed training through Level IV of the courses offered by Dr. Dave Rosgen and Wildland Hydrology in geomorphic assessment and natural channel design. He is proficient in using RiverMorph to analyze, assess and design stream restoration and bank stabilization projects. Mr. Pranckus has extensive experience in working directly with a wide range of contractors to implement stream construction projects.
Timothy Meeks **Role:** Permitting **Years' Experience:** 11 **Years with Cardno:** 6 **Education:** ▪ MS, Natural Resource Management, Bethany College of WV ▪ BS, Environmental Science, Slippery Rock University **Registrations/Certifications:** ▪ Swamp School Wetland Delineation Certification	Mr. Meeks is a wetland scientist with experience in wetland delineations and linear facility studies. He has completed environmental surveys and inventories for facilities including private properties, developers, pipelines, roadways, coal mine expansions and residential development. He is experienced in-stream delineations and habitat assessments of streams and riparian zones. Mr. Meeks is also experienced in-stream and groundwater hydrology monitoring, benthic macro invertebrate sampling, identification, and community assessments, as well as fish community sampling and assessments. He has completed permit applications for Waters of the U.S. under the Clean Water Act 404 and 401. Mr. Meeks is also wetland review specialist for MWRDGC permit applications under the watershed development ordinance.
Karl Finke, PE **Role:** Geotechnical Engineer **Years' Experience :** 25 **Years with Andrews:** 16 **Education:** ▪ MBA, Columbia College ▪ BS, Geological Engineering University of Missouri, Rolla **Registrations/Certifications:** ▪ PE – IL #062.068571, MO ▪ RG – MO ▪ OSHA 40-hr Hazardous Waste Site Worker ▪ OSHA 30-hr Construction Industry ▪ MSHA Part 46 Certification Training ▪ Permit Required Confined Space Entry ▪ First Aid / CPR ▪ Nuclear Gage Safety Training Nuclear Radiation Safety Officer	Mr. Finke serves as a Project Director for Andrews Engineering and specializes in geotechnical and environmental work, ranging from seismic slope stability to groundwater hydrology and statistics. Mr. Finke has served as an expert witness regarding various environmental issues, including fate and transport of contaminated groundwater and the applicability of historical state and federal regulations. Prior to joining Andrews Engineering, Mr. Finke served as an Engineer in the Solid Waste Management Program for the Missouri Department of Natural Resources (MDNR). While with MDNR, Mr. Finke assisted in the development of the risk-based correction groundwater rule and the current solid waste management regulations and technical guidance documents, including but not limited to; Static and Seismic Slope Stability for Solid Waste Containment Facilities, and Guidance for Preparing a Statistical Analysis Plan. Mr. Finke also participated in the Solid Waste Management Program's rule revisions of the Detailed Hydrogeologic Site Investigation for landfills.

Staff	Experience
Steven Edwards, PE **Role:** Stormwater Engineer **Years' Experience :** 11 **Years with Andrews:** 5 **Education:** ▪ BS, Civil Engineering, Missouri University of Science and Technology **Registrations/Certifications:** ▪ PE – IL #062.068648 ▪ OSHA 40-hr Hazardous Waste ▪ OSHA 10-hr Construction Industry ▪ RCRA Hazardous Waste Generator	Mr. Edwards serves as a Project Engineer for Andrews Engineering and specializes in site development and utility design and permitting. His primary responsibilities include SWPP and SPCC plans, developing site plans with engineering controls to meet State and local regulations, oversight of drainage projects, and developing and permitting for watermain replacements. Mr. Edwards also has design and permitting experience related to solid waste, environmental/remediation, industrial, and transportation projects, as well as performing construction oversight and quality assurance activities.
Chad Nelson **Role:** Survey Field Technician **Years' Experience :** 26 **Years with Andrews:** 26 **Education:** ▪ Computer Aided Drafting Certificate, Kankakee Community College **Registrations/Certifications:** ▪ OSHA 40-hr Hazardous Waste ▪ OSHA 10-hr Construction Industry ▪ Nuclear Density Gauge Operator ▪ IDOT Hot Mix Asphalt Level I & II ▪ IDOT / PCC Level 1 Technician ▪ IDOT ACI Concrete Testing Grade 1 ▪ IDOT Mixture Aggregate Technician ▪ IDOT STTP-S33 Soils Field Testing and Inspection ▪ MSHA Part 48B ▪ Transportation Worker Identification ▪ Credential (TWIC)	Mr. Nelson serves as an engineering technician and survey crew chief for Andrews Engineering, and is experienced in a variety of field tasks. His experience in land surveying includes residential and commercial properties, involving boundary control, topographic surveys, ALTA surveys, and vertical control. His civil construction inspection experience includes concrete testing, site grading for commercial and residential development and underground utility installation. In addition, he has performed at state of the art landfills for mass excavation, structural fill, clay liners, synthetic liners, geotextile stabilization and landfill leachate collection systems, as a surveyor, technician, and Construction Quality Assurance officer.
Riley White **Role:** CAD Specialist **Years' Experience:** 2 **Years with Aqua Vitae:** 2 **Education:** ▪ BS, Mechanical Engineering, University of Illinois **Registrations/Certifications:** ▪ Designated Erosion Control Inspector Training (DECI) ▪ ISTHA e-Builder ▪ Bentley SUDA/SUE design	Mr. White is an engineer with duties that include preparing engineering construction documents, specifications and quantities. He is proficient using CAD to MWRDGC standards, including subsurface utility design. In addition to his office duties, Riley routinely conducts NPDES/404 erosion control inspections and prepares associated reports.

Staff	Experience
Mark Landstrom, PE, PLS, CFM **Role:** Professional Land Surveyor **Years' Experience :** 45 **Years with Valdes Engineering:** 11 **Education:** ▪ BS, Civil Engineering **Registrations/Certifications:** ▪ PE – IL #062-040214, IN, WI ▪ PLS – IL, IN, WI	Mr. Landstrom has over 45 years of engineering and surveying experience, focused on designing and executing horizontal and vertical survey measurement networks and making data adjustments for civil transportation, commercial and industrial applications. Mark provides expertise in project management, project execution and client management. He has led all aspects of project work including planning, initial project reconnaissance, field work, calculations, cost controls, client coordination and satisfaction. He takes pride in completing projects on time and within budget, while maintaining the highest of accuracy standards. Mark has a BS Civil Engineering degree, is a licensed PE in three states, and a Professional Land Surveyor in three states.
Scott Gregory, PLS **Role:** Professional Land Surveyor **Years' Experience :** 15 **Years with Valdes Engineering:** 1 **Education:** ▪ BS, Construction Management & Engineering Technology; Surveying Technology Option, Purdue University, Calumet ▪ Associates, Civil Engineering Technology **Registrations/Certifications:** ▪ PLS – IL #035003942, IN	Mr. Gregory is a Licensed Land Surveyor with over 15 years' experience and is currently managing the land surveying operations firm-wide. Surveying project types include boundary surveys, topographic surveys, 3D scanning in heavy industrial environments, utility relocation projects, legal description writing, and volume surveys. Project management duties include cost estimating, drafting proposals, researching project data, job scheduling, reviewing/stamping surveys, conducting interviews/hiring of staff, and quality assurance/quality control. Scott has a Bachelor's Degree in Construction Management and Engineering Technology with the Surveying Technology Option, and an Associate's Degree in Civil Engineering Technology.
Ben Balskus **Role:** Project Administration / Invoice Control **Years' Experience :** 3 **Years with Cardno:** 1 **Education:** ▪ BA, Comparative History and Literature, Harvard University, 2004 ▪ Project Management Strategy Certificate, University of Chicago Graham School, 2016 **Registrations/Certifications:** ▪ I-100 ICS Orientation ▪ S-130 Basic Firefighter Training ▪ S-190 Introduction to Wildland Fire Behavior	At Cardno, Mr. Balskus works as an assistant project manager and project coordinator for the Chicago Monee office. In this role he assists our operations team with estimating, proposal preparation, procurement, and project management, as well as fiscal compliance, budget management, and client coordination.

Relevant Project Experience

The Cardno team is highly knowledgeable of programmatic watershed goals and objectives, technical stream stabilization design, and the need for stakeholder support for successful, implementable projects. We take pride in the fact that we partner closely with our clients, often acting as an extension of staff and assisting in the implementation of a given project. Our proposal demonstrates how the Cardno team expects to bring our local resources, depth of experience and the strength of our team to serve the Village, and achieve the stabilization objectives for the Village with the support of MWRDGC.

This section provides a summary of recent streambank stabilization projects of similar size and scope to the Tinley Creek Streambank Stabilization Project. The Cardno team has many example projects to choose from. We specifically chose projects that: (1) highlight streambank stabilization and stream restoration with assessment, design, permitting, and/or construction oversight, (2) show local and regional experience, (3) provide urban settings with infrastructure concerns, (4) include multiple stakeholders and/or public involvement, and (5) meet the 10 year requirement as requested in the RFP. We also chose some older projects, still within the 10 year project limit, to show that our streambank stabilization projects are designed and constructed as desired, but also were designed and constructed to be sustainable and provide many years of protection and benefit. Stream projects with less than a few years of record after construction do not necessarily demonstrate a successful project. We have included many before and after photos to assist in your evaluation.

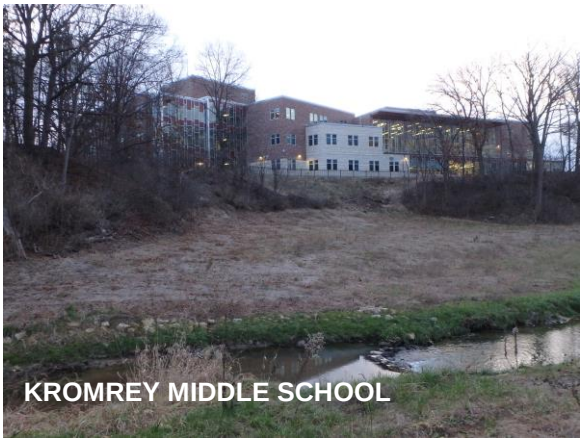
At the conclusion of this section, we provide a summary of project references and would encourage the Village to contact any of our clients listed for additional background on the experience and quality of our work, coupled by our team's commitment to excellence, integrity, and safety.

Streambank Stabilization and Restoration Projects

Pheasant Branch Stream Restoration and Stormwater Improvements Design and Design-Build Services, Middleton, Dane County, Wisconsin		
Client	**Firm and Staff**	**Start and Completion**
City of Middleton Public Lands Recreation and Forestry Department	Cardno Aaron Steber (PM, Design),Heather Schwar (Engineer and Modeling), Mark Pranckus (Stream Survey)	2007- 2019

Since 2007, the City of Middleton has relied upon the expertise of Cardno to address severe erosion, infrastructure protection, and stormwater management within the City. Pheasant Branch Creek, a tributary to Lake Mendota, meanders through a steep sandy valley. Over the last half of the 20th century, increased stormwater runoff has resulted in higher flows and massive erosion.

Several locations along the creek had eroding banks and steep slopes, in some instances as high as 40 feet. These steep eroded slopes have residential homes and businesses located along their bluffs. One location included the newly renovated Kromrey Middle School. To protect the natural riparian corridor and nearby infrastructure, Cardno designed ecologically-sensitive erosion control and stabilization techniques. Cardno worked with a variety of agencies to apply for and manage multiple grants to help the City fund this effort, including Federal Emergency Management Agency, Wisconsin Department of Natural Resources (WDNR) Clean Water, WDNR Nonpoint Source Pollution Grants and the American Recovery and Reinvestment Act's Clean Water Fund Program.


KROMREY MIDDLE SCHOOL

Cardno was retained to design, permit, and complete construction oversight on a project to stabilize and restore nearly two miles of eroding stream bank and steep slopes. Cardno completed channel surveys, analyzed stream hydraulic and geomorphic data, and developed a streambank stabilization design using a series of techniques that accounted for stream stability and biological value. The stabilization methods used increase habitat complexity.

For example, rootwad composites provide cover for small fish, as well as reptiles and small mammals found in the riparian habitat. In-stream vane structures create shallow mudflats and deep scour pools. In addition, native seed planted on these sites, once established, have deep, extensive root systems that will trap and hold bank material in place, further reducing erosion of bank sediments while also increasing the biotic diversity of the riparian corridor. Cardno applied for all the permits necessary to complete this work and performed bid-letting and construction oversight of the City's chosen contractors. Cardno was also contracted to perform invasive species maintenance, and Cardno staff led multiple volunteer and citizen group volunteer tree-planting programs within Pheasant Branch. Cardno regularly attends city council and public meetings and has been a continuing partner with the City to help them achieve their long-term plans.

Cardno led multiple town hall and citizen group meetings to gain public input necessary to complete a Master Plan for the future of the Pheasant Branch stream system.

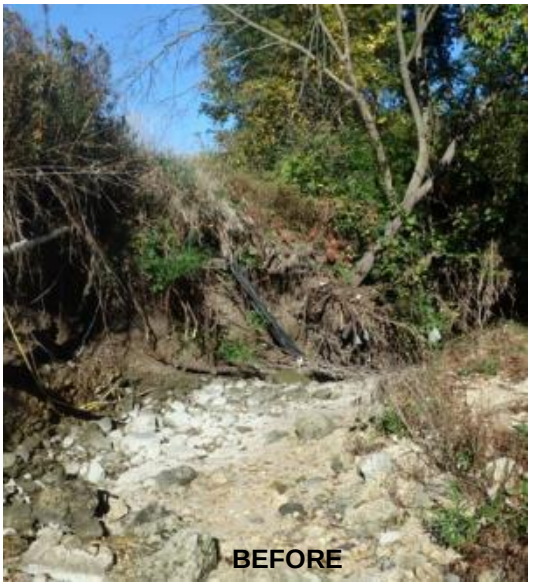
In 2018, the City received a ~500-year storm event (more than 11 inches rain in under 24 hours in the Pheasant Branch watershed), resulting in catastrophic flooding and flood damage. The City contacted Cardno to assist with the emergency response and post-storm restoration planning for the creek corridor. Cardno performed a flood damage assessment, including flying the Pheasant Branch stream corridor to procure LiDAR to assess the damage. Cardno used this information to apply for and help the City receive more than $650,000 of grant funding from the State of Wisconsin to help the City pay for restoration. Cardno led multiple town hall and citizen group meetings to gain public input necessary to complete a master plan for the future of the Pheasant Branch stream system. Presently, Cardno continues to assist with master planning for future restoration efforts for Pheasant Branch Creek. Cardno is currently completing design, permitting and construction oversight of an additional 10,000 linear feet of stream restoration to repair damage from this flooding event.

Cardno has also expanded upon its stream design and construction capabilities by also supporting the City's effort to install rain gardens throughout public lands. Cardno has designed, installed, and maintained several rain gardens and bio-infiltration swales throughout the City. Cardno also supported design and construction of large, regional infiltration basins, such as one located at Lakeview Park.

South Fork Keith Creek Streambank Stabilization– Rockford and Winnebago Counties, Illinois		
Client	**Firm and Staff**	**Start and Completion**
City of Rockford	Cardno Aaron Steber (PM, design), Heather Schwar (Engineer and Modeling), Mark Pranckus (Stream Survey)	2013 – 2017

After completing a wetland delineation and geomorphic stream assessment and survey of 1800 linear feet, Cardno created a Master plan for the South Branch of Keith Creek (2014). Using that plan, Cardno developed a streambank stabilization design for approximately 350 linear feet of channel work through an exposed pipeline area as well as an additional 150 linear feet of channel work to protect the abutments of two bridges within a park district golf course, adjacent to neighborhoods and roadways. Hydraulic modeling was used to determine impacts to water surface elevations and aid in the design. The modeling was also used to secure an Illinois Department of Natural Resources Office of Water Resources (IDNR-OWR) permit, U.S. Army Corps of Engineers, Regional Permit #16 for Bank Stabilization treatments, IDNR Section 404, along with endangered species impacts and avoidance coordination.

Flow redirection structures such as single arm vanes constructed in the project area help force flows back to the center of the channel and way from eroding streambanks. Downstream of the first bridge a boulder rapids/rock riffle grade control structure approximately 170 linear feet long was installed to provide protection over two existing exposed sanitary sewer lines. Bank grading throughout the project reach near the exposed pipelines was completed in order to decrease bank angles to a more stable angle of repose and increase flood flow capacity throughout the project area.



Kinnickinnic River Restoration: Feasibility Study, and I-94 to Becher Habitat Restoration Design and Construction Oversight – Milwaukee, Wisconsin		
Client	**Firm and Staff**	**Start and Completion**
Milwaukee Metropolitan Sewerage District (MMSD)	Cardno Heather Schwar (PM, Water Resources Engineer), Aaron Steber (QA/QC, Construction oversight),	2015 – 2018

Building upon a well-received feasibility study completed by Cardno, Cardno designed habitat improvements to address degraded aquatic habitat conditions in the Milwaukee Estuary Area of Concern. This is one of the few stretches of the Kinnickinnic River that has natural bed and native banks remaining. The project required coordination with stakeholders such as Wisconsin Department of Natural Resources and Milwaukee County. Cardno designed and developed construction plans and specifications, and oversaw construction of 165 linear feet of bank stabilization and habitat structures which included root wads, toe wood, stone, and in-channel habitat boulders to improve channel diversity and reduce streambank erosion. Site access was a challenge; due to the confined urban stream corridor, a barge was used to bring in equipment and perform the work.

St. Joseph River Bank Stabilization Design Study – South Bend, St. Joseph County, Indiana		
Client	**Firm**	**Start and Completion**
City of South Bend	Cardno Ross St. Clair (PM), Aaron Steber (QA/QC)	2019 – Ongoing

The City of South Bend, Division of Engineering, received an Indiana Department of Natural Resources Lake and River Enhancement (LARE) Grant in 2019. The grant provided funds to complete an engineering design study for bank stabilization of the project sites along North Shore Drive and Riverside Drive. The City of South Bend selected Cardno to continue their previous work on the LARE feasibility study by also completing the engineering design study.

The two projects located along the St. Joseph River have primary goals of reducing bank erosion, enhancing aquatic and riparian habitat, and protecting existing utilities and roadways. Cardno performed a site investigation, site assessment, project design, modeling, and project permitting, reporting, and assisted with property owner approval. Cardno subcontracted with a professional land surveyor to complete a topographic survey of the project site banks and full river cross sections and to provide geotechnical investigation services at each site.

Cardno hosted two property owner public meetings to review the project purpose and collect input from local residents.

A rock toe will be implemented at both project sites to stabilize the toe of slope. Vegetated soil lifts will provide additional bank support and enhanced riparian habitat along North Shore Drive. Bank grading, native seeding and plantings, and placement of erosion control blanket will provide bank stabilization along Riverside Drive. Construction is set to begin in May 2021 with Cardno providing construction oversight.

Little Mac Ravine Stabilization and Restoration Planning, Design, and Construction – Allendale, Michigan		
Client	**Firm and Staff**	**Start and Completion**
Fishbeck, Thompson, Carr & Huber, Inc.	Cardno Heather Schwar (Design Engineer and Modeling)	2015 – 2022

Grand Valley State University, Allendale Campus (GVSU) needed to stabilize the existing Little Mac Ravine (LMR) and stream channel within the GVSU campus to prevent catastrophic slope failure at an elevation consistent with the profile before campus construction. The pre-construction pattern of incision was effecting adjacent slope stability and tributary ravine stability, resulting in excessive erosion that delivered large volumes of sediment to the Grand River. The project area was on campus along a stream corridor that students frequently walk through.

The project goals were to prevent slope failure below GVSU infrastructure and to reduce sediment loading to the Grand River. The LMR stream to its Ordinary High Water Mark and adjacent wetlands are under the jurisdiction of the Michigan Department of Environmental Quality (MDEQ). Cardno teamed and was the designer and permitting lead for the stream restoration portion of the project. Cardno incorporated three goals into the stream design:

- Design a perennial channel with s a stable, naturalized profile, plan form, and dimensions consistent with the current hydrological regime;
- Create a channel that does not result in increased sediment loading to the Grand River due to bank or bed erosion; and
- Create a channel that buttresses the existing ravine slopes from additional rotational failure and slumping.

Where stable is defined as the capacity of a stream, over time, to transport the flows and sediment of its watershed in such a manner that the dimension, pattern, and profile of the river (stream) are maintained without aggrading or degrading; and

Where naturalized is defined as a stream that has its cross-sectional dimensions, plan form, and profile similar to other less impacted ravines in the vicinity of the project and allows bankfull return flows (1.5 to 2 years) to reach the most dominant adjacent floodplain.

The design was achieved beginning with a Level II geomorphological survey that was performed in the existing channel and in a reference reach. The design featured three channel types, including a step pool system on the steep upper slopes, a uniform “B” channel, and a meandering lower reach consistent with a reference reach in the vicinity of the project. Hydraulic modeling was completed to aid in design and permitting. The design included 1,263 linear feet of channel relocation, 150 linear feet of channel realignment, 340 linear feet of rock bank stabilization, eight wood habitat structures, 25 in-stream rock structures including eight cross-vanes, nine riffles, five J-hooks, one plunge pool, one tributary grade control and one end treatment. Cardno also considered site conditions including soils, canopy cover, and existing invasive species when address planting/seeding. Permitting was complex including MDEQ permits Part 301 for Inland Lakes and Streams and Part 303 for Wetland Protection. Permits were issued in March 2017. Cardno provided construction oversight. Construction was completed in July 2017. Cardno provided stream monitoring for three years through 2022.

Kalamazoo River Slope Stabilization– Allegan, Michigan		
Client	**Firm and Staff**	**Start and Completion**
Confidential Multi-National Corporation and City of Allegan, Michigan	Cardno Heather Schwar (Water Resources Engineer and Hydraulic Modeling)	2013 – 2019

In 2013, Cardno was hired to develop a feasible approach for stabilizing an embankment on the Kalamazoo River that measured 80 feet tall and over 500 feet long. Cardno completed hydraulic modeling of existing and proposed conditions to assist with the channel alignment and streambank stabilization design. Then 60% design-level plans were developed which included the toe of slope stabilization and moving 600 feet of the Kalamazoo River over to allow for a stable slope angle between the river and the building at the top of the slope for Michigan Department of Environmental Quality permitting. Cardno completed the final design while teaming with G2 Consulting Group who designed the retaining wall around a building at the top of the slope.

Cardno produced the bid documents and assisted the City with obtaining project bids. Cardno performed the construction inspections and project management, including reviewing and approving of all change orders, pay applications and communication with the City and corporation. Cardno revised the hydraulic modeling to include as-built conditions of the channel and streambank. The project was successfully completed in June 2019 and finished within the allocated budget.

Cardno led the design team on a $5 million slope stabilization project for a multi-national corporation on the Kalamazoo River.

Skunk Creek Stability and Restoration – Carlton, Minnesota		
Client	**Firm and Staff**	**Start and Completion**
Carlton County Transportation Department (CCTD)	Cardno Mark Pranckus (PM, Channel Assessment and Design, Construction oversight), Heather Schwar (Water Resources Engineer, QA/QC)	2017 – 2019

Cardno developed a design to restore 200 feet of Skunk Creek and stabilize two severely eroding banks that threaten the integrity of County Road 103. Through the use of natural channel design principles, Cardno surveyed the project sites and used reference reach data to develop a stable dimension, pattern, and channel profile. Featured design elements included daylighting the stream from an existing pipe, creating a floodplain with a meandering channel, and installing grade control and woody habitat structures such as toewood and log vanes to provide enhanced aquatic habitat. The project was constructed during summer 2019 during the two month period when construction within trout streams are allowed. A Minnesota Department of Natural Resources Public Waters Work permit and a USACE Nationwide permit were obtained to authorize the project. Cardno provided construction oversight support including assisting with the bid process and on-site technical construction support.

Blackhoof River Restoration – Carlton, Minnesota		
Client	**Firm and Staff**	**Start and Completion**
Minnesota Trout Unlimited	Cardno Mark Pranckus (PM, Channel Assessment and Design, Construction Oversight), Heather Schwar (Water Resources Engineer, QA/QC)	2017 – 2019

Minnesota Trout Unlimited sought to enhance the quantity and quality of trout habitat in the Blackhoof River. To help achieve this goal, Cardno developed a design for approximately 2,400 feet of stream to move the channel away from six actively eroding 40 foot high collapsing slopes, which stabilized the streambanks, reducing bank erosion and sedimentation to the stream.

As part of the design, streambanks were graded to more stable angles and floodplain access was created to allow flood flows to access vegetated banks. In-stream structures including J-hook log vanes were installed to re-direct flow away from the streambanks towards the center of the channel. Toewood structures were installed to provide deep pools for holding adult trout as well as overhead cover for juveniles. These habitat enhancement structures were installed utilizing trees removed during bank grading operations. To support stability, all exposed areas created during construction were seeded with native grasses and forbs endemic to this part of Minnesota. Cardno completed the design, regulatory permitting, managed the bid process, and completed the majority of the construction administration.

Cardno's construction oversight provided field-level direction to adapt to changing conditions and maximize the value to the resource, the client, and the contractor. In northeastern Minnesota, the construction timeframe is limited to a 2.5 month window. This project was constructed on time within two construction seasons.

Indian Creek Streambank Stabilization – Vernon Township, Illinois		
Client	**Firm and Staff**	**Start and Completion**
Vernon Township, Lake County	Cardno Aaron Steber (PM, Design), Mark Pranckus (Design, QAQC)	2013 – 2014

Cardno restored nearly 2,000 linear feet of eroding streambank along Indian Creek in Lake County, Illinois. Cardno completed channel surveys of this entire reach and developed a streambank stabilization design using bioengineering techniques to reduce the sediment load from the banks and upland areas to the creek.

Cardno worked with the client to complete all the necessary permitting and provided construction services to install stream energy dissipation structures and integrated bank treatments, including rootwad composites, cross-vanes, and single arm vanes. These methods, along with bankfull bench grading, stabilized the banks while providing improved habitat for the insects, amphibians, reptiles, and fish found within the creek and riparian corridor.

The native seed mix planted on these sites is full of northern Illinois native species that have deep extensive rooting systems. Once established, the dense roots of these native grasses and forbs will trap and hold bank material in place, further reducing erosion of bank sediments while increasing the biotic diversity of the riparian corridor.

Cardno provided in-kind grant writing and design assistance in support of a Clean Water Act Section 319 Nonpoint Source Program grant.

Oak Meadows Golf Course Restoration – Addison, DuPage County, Illinois		
Client	**Firm**	**Start and Completion**
Martam Construction	Cardno Tony St. Aubin (Project Manager), James Melledy (QA/QC)	2015 – Ongoing

Cardno is providing restoration services as part of a flood control project, led by Martam Construction, at the almost century-old Oak Meadows Golf Course for the Forest Preserve District of DuPage County. Flooding has repeatedly damaged the existing golf course. Reducing the course's holes from 27 to 18 will help restore Salt Creek where hydrology, reintroduced to the adjacent areas, created 24.6 acres of new wetland, 107 acres of new natural area restoration, and an additional 35 acre-feet of floodplain storage.

Cardno's services include installing 327,000 square yards of erosion control blanket, 392,000 wetland plantings, 115 acres of native seeding, over 2.3 miles of stream with five years of ecological maintenance and monitoring.

The project will help manage flood control for the area, creating a natural preserve with bike and walking trails within the new flood resistant golf course, enhancing water quality and ecology along the Salt Creek.

St. Joseph Creek North Branch Streambank Stabilization Design/Build– Downers Grove, DuPage County, Indiana		
Client	**Firm and Staff**	**Start and Completion**
Village of Downers Grove	Cardno Mark Pranckus (PM, Construction Oversight), Aaron Steber (Designer)	2011 – 2012

Cardno and their teaming partners were contracted by the Village of Downers Grove to complete a design/build project to stabilize approximately a combined 900 linear feet of streambank at three project sites. St. Joseph Creek North Branch is an urban stream through the Village of Downers Grove, Illinois. Like many urban streams, extensive development has occurred in the riparian area and floodplain of the creek resulting in a stream with flashy flows, eroding banks, and degraded habitat. Previous attempts to stabilize the banks using wooden timbers have begun to fail as their service life has come to an end.

Cardno conducted an initial site assessment and stream survey to collect data necessary for the design and permit applications. A design was completed with specific elements for each site; however, the overall design concept utilized biotechnical treatments to stabilize the stream bed and bank and provide increased stream function. Treatments included stream barbs, floodplain bench establishment, log vanes, rock cross-vanes, and rootwad composites. At several locations within the project site where site limitations required a more structural stabilization technique, limestone block walls were used as an alternative to sheetpiling or other more traditional methods. In addition to the in-stream structures, native vegetation along the streambank was installed to provide enhance bank stabilization.

As part of the regulatory processes, Cardno completed a wetland delineation of the three project areas and applied for an erosion and sediment control permit through the local Soil and Water District. Cardno assisted with completing the municipal and county floodway and floodplain permit applications. The design required hydrologic modeling to receive DuPage County approval. Cardno supported modeling effort to obtain the appropriate permit.

After permits were acquired, Cardno along with a contractor constructed the project. Cardno was responsible for three years of post-construction vegetation maintenance at the sites and any required vegetation monitoring and reporting.

Riverfront Revitalization: Green Infrastructure Design/Engineering and Construction Oversight – Sterling, Illinois		
Client	**Firm and Staff**	**Start and Completion**
City of Sterling	Cardno Heather Schwar (Project Engineer)	2012 – 2016

Located on the Rock River in western Illinois, the City of Sterling wanted to revitalize its riverfront by transforming a former industrial district along the river into a mixed-use development that includes restored natural areas and open spaces.

The City retained Cardno to conduct their Riverfront Revitalization Project, which involved planning, designing, and implementing a series of green infrastructure BMPs to management stormwater on the site. The State of Illinois funded this project through the Illinois Green Infrastructure Grant program and the Build Illinois Bonds program. Cardno assisted the City in securing these funds.

Working in partnership with the City's riverfront redevelopment committee, the project team generated ideas to holistically address stormwater management while improving the overall quality of life for the citizens of Sterling. Cardno developed a conceptual plan for a stormwater treatment train and upland prairie that will capture stormwater and either retain it, allow it to naturally enter the ground, or send it through a network of green infrastructure installations before entering the Rock River. The final design for the site included a constructed infiltration channel, a stormwater pond with step pools to the Rock River, almost 13 acres of native prairie plantings to capture stormwater, create habitat, and provide a green space for the community, and a permeable paver plaza with raised planters and concrete benches for community use. Cardno secured permits and performed engineering services during construction. A long-term operations and maintenance (O&M) plan was also created.

In addition to stormwater management, a long-term goal of this project is to create a green space amenity that will establish a new gateway into the community, attract visitors to the waterfront, and encourage economic redevelopment along the Rock River in Sterling.

Elm Woods Stream Stabilization and Oak Regeneration Program – Lake County, Illinois		
Client	**Firm and Staff**	**Start and Completion**
Lake County Forest Preserve District	Aqua Vitae Gary Pardoski (Project Engineer)	2016

The Elm Woods stream stabilization is an initial phase of a large, publicly funded project for the Southern Des Plaines River Preserves to enhance a series of hydraulically connected sites, both individually and collectively, as a riparian corridor woodland system. Major initiatives focused on stabilizing woodland structure; restoring age/size class distribution of native trees; restoring historic drainage patterns; replacing invasive species with native forbs, grasses, shrubs and trees; enhancing breeding areas for birds, amphibians, small mammals and reptiles; and re-introducing native wildlife by establishing long-term monitoring and management schedules.

Elm Woods is an Illinois Nature Preserve with a ravine-like oak forest and high quality historic flatwoods at the uppermost reach of the watershed. Surrounding development and excessive oak canopy have decimated the understory vegetation, thereby allowing head cut to progress upstream and jeopardizing the groundwater hydrology of the flatwoods.

The project began with selective thinning of oak trees to allow sunlight into the understory and promote oak succession. Felled oaks were then harvested, cut and repurposed to use as cross-vanes and log rollers that serve as grade controls to arrest the head cut. Native grasses will be planted to promote bank stabilization and rejuvenate the understory growth.

In a collaborative endeavor, Aqua Vitae prepared construction documents, wrote permit applications, and worked together with Black Creek Hydrology to provide construction direction and “field-fit” in-stream treatments. Construction was performed by the Forest Preserve District’s in-house contracting crews. For additional photos taken during its first growing season, please click here.

This project won the 2016 ASCE Illinois Section Sustainability in Civil Engineering Achievement Award.

Buffalo Creek Stream Bank Stabilization for Lynn Plaza Shopping Center – Wheeling, Illinois		
Client	**Firm and Staff**	**Start and Completion**
Hallmark & Johnson Property Management, Ltd.	Aqua Vitae Gary Paradoski (Project Engineer)	2014 – Ongoing

Emergency stream bank stabilization along the Wheeling Ditch reach of Buffalo Creek to protect an existing shopping center parking lot delivery area. The design uses the implementation of rock vane bioengineering techniques, riprap rock toe, and native vegetation to stabilize the bank from surface sliding and toe scour. The project includes design, preparation of construction documents, specifications, and comprehensive permitting/consultation with various regulatory agencies including the U.S. Army Corps of Engineers (USACE), IDNR, MWRGC, North Cook County Soil & Water Conservation District, and the Village of Wheeling.

The project is a design-build, ecologically-based approach whereby its in-stream structures also provide aquatic habitat and help reduce sedimentation. The approach has been estimated to reduce construction costs by as much as 80% when compared with structural retaining walls. It addresses a combination of problems caused from natural channel responses to increased urbanization as well as surface erosion from pavement runoff.

Construction has been completed and Aqua Vitae provided construction observation, erosion and sediment control inspections, and Clean Water Act Section 404 permitting documentation on behalf of the owner and the contractor. In addition, Aqua Vitae prepared a long-term monitoring and maintenance program for the owner so that adaptive management will take place to address future problems before they become costly impacts to the environment and to infrastructure. The program has been adapted from BMPs recommended by the Center for Watershed Protection. Aqua Vitae continues to monitor the project.

Metropolitan Water Reclamation District of Greater Chicago (MWRDGC) Projects

Streambank Stabilization/Flood Control Project, Tinley Creek – Orland Hills, IL		
Client	**Firm and Staff**	**Start and Completion**
Metropolitan Water Reclamation District of Greater Chicago	Cardno James Melledy (Project Manager), Brian Glaves (QA/QC)	2016 – 2020

Cardno was contracted to make channel modifications along a 1,500 linear-foot section of Tinley Creek in Orland Hills, Illinois, which included the construction of bank stabilization and erosion control elements, placement of in-stream pools and riffles, and the installation of native vegetation. Construction design included import of offsite soil, which Cardno certified as uncontaminated through Illinois Environmental Protection Agency (IEPA) Form LPC-663. Cardno's Native Plant Nursery provided plants and seed for this project. Cardno is in the final year of a multi-year adaptive management program. The project is expected to meet all performance standards by the end of the current growing season.

Harwood Heights (IL) Stormwater Management Master Plan		
Client	**Firm**	**Start and Completion**
Metropolitan Water Reclamation District	Cardno Heather Schwar (Project Engineer)	2014 – 2016

The Village of Harwood Heights, in Cook County, Illinois, has an extensive combined sewer and separate storm/sanitary sewer system. Like many communities developed in the late 1940s, the Village's sewer capacity is limited, and when storms occur, flooding is a major problem for residents, businesses and visitors. The West Central Municipal Conference selected the Village for the District to investigate urban flooding for the one percent annual storm event, evaluate potential green and gray infrastructure alternatives to reduce flood damages, and complete a stormwater master plan. This project was one of five pilot studies selected by the four Councils of Government and the City of Chicago. The District partnered with local communities and residents to develop community-based conceptual plans to address local flooding.

Cardno exceeded the District's PCE goal with 73% participation.

The District retained the Cardno team to complete the Stormwater Management Master Plan to address the Village's flooding issues. Cardno partnered for modeling and development and implement of a comprehensive community engagement program. Cardno exceeded the District's PCE goals with 73% participation. The Cardno team used ArcGIS and XP-SWMM hydrologic model to determine the root causes of flooding, as well as Optimatics optimization software to identify the most cost-effective solutions. Causes of flooding included tailwater effects from the downstream transmission system, undersized collection systems, and inadequate inlet capacity on the residential streets. A variety of solutions were studied, including subsurface storage and piping upgrades. To fully engage the community, understand the extent of the flooding problems, and offer appropriate solutions, a series of public involvement events were held for the residents to describe their flooding experiences and for the team to demonstrate the effect of possible solutions. Twenty community stakeholder interviews, three community meetings (including a Green Infrastructure Expo), six 'pop-up' meetings and two surveys (the second being an online alternative analysis platform) were conducted. The pop-up meetings engaged residents at the grocery store, library, schools, and neighborhood festivals. They allowed the team to connect with many more facets of the community. Informational materials and community meeting discussions were translated into Polish, to involve the Village's Polish population.

Themaster plan includes: 1) Further analysis of local drainage issues and technically feasible and innovative concept-level alternatives, with an emphasis on reducing structural damage; 2) Potential infrastructure projects (both traditional/gray infrastructure and sustainable/green infrastructure solutions) to mitigate flood impacts in the Village up to the one percent annual storm event; 3) An “outcomes engineering” approach to stormwater issues, which prioritizes private property flood damage reduction measures over traditional gray infrastructure; and 4) A community engagement program used to help residents understand that stormwater management at the property owner level is critical to solving the Village’s flooding problem. As a result of the Harwood Heights Master Plan, our team learned about the various barriers to stormwater program management, the importance of having a transparent program, the needs facing communities in Cook County, and the importance of finding a solution that is compatible with available capabilities, resources and local attitudes.

Tinley Creek (Orland Park, IL), Midlothian Creek (Tinley Park, IL), and Calumet Union Drainage Ditch (Markham, IL)

Client	Firm and Staff	Start and Completion
Metropolitan Water Reclamation District of Greater Chicago	Aqua Vitae Gary Parakoski (Project Engineer)	2014

The MWRDGC conducted comprehensive watershed management planning throughout Cook County to determine where streams are threatening infrastructure and risking neighborhood flooding. As a result, they proceeded with natural channel design for stream bank stabilization and flood risk reduction within numerous reaches that are at highest risk. Our team conducted design for three urban streams that meander through residential communities within the Village, Tinley Park, and Markham, Illinois.

The project team was tasked with using natural channel design techniques combined with traditional engineering approaches to provide holistic and cost-effective solutions. The project areas consist of highly degraded habitat and eroded banks. It was particularly challenging to identify the effective discharges given the dynamics of the watershed, which includes highly impervious areas, floodplain encroachments, and disconnected open space/Forest Preserves.

The team was led by Mr. Paradoski who worked in collaboration with multiple other firms to conduct site assessments, wetland/WOUS delineations, and soils analyses. The team designed bioengineering techniques such as cross-vanes, rock vanes, and encapsulated soil lifts. Retaining walls and other traditional engineering measures were included in the design. Existing structures and drainage easements posed significant site constraints. The team also prepared temporary easements for construction access and long-term maintenance.

For permitting, the team conducted pre-application meetings with the U.S. Army Corps of Engineers (USACE), the IDNR, and local municipalities. As a result of preliminary coordination, the projects were permitted through the USACE 404 Regional Permit Program to streamline the schedule and minimize costs. To help MWRDGC fully realize the complexities and effectiveness of bioengineering techniques, Mr. Paradoski organized a tour of stream construction along the West Branch of the DuPage River. He led a walking tour so that MWRDGC staff could visualize rock vanes, riffles, and stream diversions while construction was underway.

Geotechnical and Stormwater Experience

Timberlane Apartment Complex Stormwater Drainage Network Design – Peoria, Illinois		
Client	**Firm and Staff**	**Start and Completion**
Timberlane Apartment Complex	Andrews Engineering Steven Edwards (Project Engineer), Chad Nelson, (Survey Technician)	2019

Andrews conducted a review of the flood prone areas at the Timberlane Apartment Complex in Peoria, Illinois. A new stormwater structure network was proposed to replace the existing structures that were no longer serviceable. A topographic survey of the existing conditions was performed to complete the calculations and design. Based on the calculations, plans were developed for use in the construction and permitting process.

Water Main along 151st Street and Will-Cook Road – Homer Glen, Illinois		
Client	**Firm and Staff**	**Start and Completion**
Illinois American Water Company	Andrews Engineering Steven Edwards (Project Engineer), Chad Nelson, (Survey Technician)	Ongoing

Andrews provided professional engineering services for the design and permitting for the placement of 1,750 LF of 12-inch water main along 151st St. and Will-Cook Rd. in the Chicago-Metro Homer Glen Service Area. Tasks included topographic surveying of areas of rights-of-way, oversite of a geotechnical study and preparation of a summary report, and preparation and submission of applications for all local, state and federal permits, preparation of design drawings for all engineering disciplines, preparation of technical specifications, preparation of Engineer's Estimate of Probable Construction Costs, as well as providing bidding assistance.

References

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3. Technical Proposal

Familiarity with Tinley Creek

The Cardno team is familiar with the challenges of the Tinley Creek Streambank Stabilization Project. Not only have we previously worked in Tinley Creek and constructed similar MWRDGC projects as provided in our Relevant Project Experience Section, our team member, Mr. Paradoski was the project manager and lead professional engineer for the Tinley Creek project completed by Baker. As PM, Mr. Paradoski coordinated all the subconsultants and answered directly to MWRDGC. He was the technical lead at all the community meetings, where he explained to residents in layman's terms what the design entailed and how it impacted each of their individual properties. Mr. Paradoski has walked Tinley Creek numerous times, sat at kitchen tables with residents, and measured their yards with them to explain easements, construction access points, and why such changes are necessary. This includes explaining how design decisions were made and prioritized by MWRDGC.

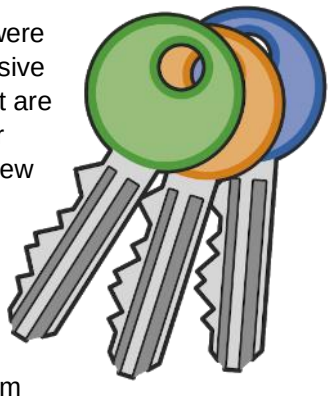
As lead professional engineer, Mr. Paradoski directed all the site investigations and design elements. This began with stream walks to assess the creek that has developed over time since the watershed has been developed. This site assessment information was used to calculate the size, shape, and frequency of in-stream structures and bank stabilization measures using sound engineering principles that have been exhaustively tested and detailed in the federal government's USDA NRCS National Engineering Handbook Part 654. Streams are dynamic and respond to changes throughout their watershed. So, it is important to understand their stability given current and potential future changes.

Mr. Paradoski also directed critical success factors (CSF) such as the franchise utility locates and soil boring locations. He walked the creek with ComEd and the cable TV provider to show them where relocates needed to happen. Mr. Paradoski also assessed every construction access point to minimize impacts to infrastructure. Mr. Paradoski prepared the access and maintenance easements to ensure that equipment will not only be able to build the creek stabilization, but also that the Village will have sufficient access to the creek for long-term maintenance. To that end, Mr. Paradoski developed the long-term maintenance Field Data Sheets (example enclosed in Section 6 – Other Documents) that are simple for non-technical maintenance staff to use for monitoring but also robust for prioritizing and budgeting maintenance, which could range from clearing debris jams to augmenting bank protection measures. Following the public outreach meetings and site walks that he attended for the previous design, several CSFs were evident at that time. We have listed them below along with solutions that we propose. We have included and identified these solutions in our Technical Project Approach using a key symbol.

The Cardno Team includes Mr. Paradoski, a previous project manager for the Tinley Creek project, who bring integral knowledge of previous design, decisions made, and how to provide support to the Village and MWRD goals for long term stabilization success of Tinley Creek.

Critical Success Factors

1. **Resident Buy-in** – Several residents did not understand why retaining walls were proposed to protect certain properties and not others, thereby pushing the erosive velocities and bank stabilization problem downstream. For those residents that are having their yards graded along the creek banks, this felt like a "taking" of their property. In some instances, properties extend across the creek, making the new construction access and maintenance easements appear as very large takings. Other residents were concerned about vibration monitoring for the installation of the retaining walls. Until all the residents' concerns were alleviated, and they signed the easement agreements, it seemed apparent that the project could not move forward.



Solution: Our team will work with the Village and residents to develop a system that is agreed upon to be fair. We recommend a 1-day design charrette for listing all concerns, discussing all challenges, and agreeing upon an equitable approach. Property owner buy-in and easement agreement are so important for a successful project that the Cardno team proposes to have meetings with the Village for easements decisions throughout the entire length of the project.

The Cardno team proposes to stabilize the banks with grading activities, vegetation and toe protection, rather than retaining walls as much as possible. We feel this approach of limiting walls will provide a more natural appearance to the stream corridor, provide floodplain capacity and connection to reduce flood water elevations, allow for more efficient permitting (see Critical Success Factor #3 below), and save on construction costs, as well as provide a sense of equity among the residents regarding changes to their properties and long-term maintenance.

The Cardno team proposes to limit the use of Retaining Walls which:

- *Are expensive!*
- *Previously caused property owner confusion and conflict.*
- *Are unattractive.*
- *Could be a falling hazard!*
- *Could delay/end the project because permitting requirements on length of wall along the stream.*
- *Could delay/end the project because they could affect flood water elevations and velocities*
- *Deflect the problem onto adjacent and downstream neighbors*

2. **Franchise Utilities** – The franchise utility companies needed a significant lead time to process new public utility easements and schedule relocates. If relocates were minimized to shorter lengths, the lead time could've been significantly reduced because ComEd could sub-contract shorter lengths. Relocating franchise utilities is one of the first tasks on the construction critical path. Mostly, it could've been done by directional bore, with nominal disturbance to private property and only brief outages with little inconvenience for residents and businesses.

   Solution: At the onset of the project, our technical leads will conduct a half-day site walk with ComEd and the cable TV provider to review new public utility easements. Easement documents will be routed immediately so that relocates can be scheduled with sufficient lead time for construction.

3. **Permitting** – The TICR 7 and TICR 8 creek improvements designed by Baker were specifically submitted as two separate permits to comply with the U.S. Army Corps of Engineers (USACE) and Illinois Department of Natural Resources Office of Water Resources (IDNR-OWR) Permit Programs to expedite the permitting process. This included limiting the length of retaining walls (new minus existing)

and ensuring no fill within the floodplain or changes that would increase the regulatory flood elevations. Furthermore, the southern reach (TICR 7) is adjacent to an area of historic archaeological and cultural artifacts and its potential work area has already been investigated by an archaeologist. Also, soils along the Baker reaches have already been evaluated for special waste, to significantly reduce construction costs for haul off of dirt.

Now that all reaches of the project are contiguously one project, it is likely that the USACE and IDNR-OWR permits will restrict the length of retaining walls to half of what was previously allowed as two separate permits.

Solution: Our team will coordinate and conduct pre-application meetings with each agency to revisit the solutions that have already been realized and confirm the latest permit conditions that will be imposed. As a part of developing an equitable approach (see Critical Success Factor 1), our team will explore which retaining walls can be removed from the design since they do not protect critical infrastructure. The Cardno team proposes to stabilize the banks with grading activities, vegetation and toe protection, rather that retaining walls as much as possible. We feel that this will not only provide a more natural appearance to the stream corridor, allow for more efficient permitting, and save on construction costs, it will also provide a sense of equity among the residents regarding changes to their properties and long-term maintenance (see Critical Success Factors #1 and 5).

4. **Standards and Specifications and Construction Experience** – Standards and Specifications provided details for a contractor to construct a successful project. However, standard specifications for streambank stabilizations needed to be developed on a project by project basis due to the unique parameters of streams. These specifications were time consuming and a costly part of design.

   Solution: Mr. Paradoski previously wrote and refined the specifications in MasterSpec format to apply specifically to the Tinley Creek project and comply with MWRDGC standard specifications. In particular, specs have been written for in-stream structures and retaining walls to clearly convey technical information to the Contractor(s) in an effort to limit change orders and to use locally and readily available construction materials that comply with the USACE and IDNR-OWR permit conditions as well as provide long-term creek bank stability. Cardno routinely builds streambank stabilization projects throughout the region and will apply its experience toward reviewing and updating the standards and specifications. *At the onset of the project, Cardno will review with the Village the benefits of considering making this a design-build project, which could potentially reduce costs, streamline construction, and reduce long-term maintenance.*

5. **Long-Term Monitoring and Operations & Maintenance** – Since streams are dynamic and affected by changes throughout the watershed, it is imperative to have a long-term Monitoring and an O&M Plan. Furthermore, it is likely that the USACE permit will require an O&M Plan as a part of its permit.

   Solution: Cardno's ecologist and vegetation specialist will complete a site evaluation of the vegetation and determine if areas would benefit from treatment and/or removal of invasive, non-native vegetation that are preventing long-rooted native vegetation and accelerating bank erosion. Cardno will review and include in the design documents brush clearing and invasive treatment where non-native shrub species are present within the creek corridor. Mr. Paradoski has already developed O&M Field Data Sheets that are specific to Tinley Creek (See Section 6 – Other Documents). Cardno will review and update the Field Data Sheets based upon its experience performing routine maintenance on creek bank stabilization projects throughout the region and complete at O&M Plan. As an additional service, with Village approval, Cardno is available to complete treatment of these bank areas, where stabilization improvements are not needed, before the design project is completed. It is important for a successful project for the impacted property owners to not only accept the easement requirements, be to agree to pay for the long-term maintenance of improvements.

Project Understanding

The Cardno team understands that the Village and their partner, MWRDGC, wish to address the ongoing streambank erosion along the entire reach of Tinley Creek within the Village (excluding the forest preserve and golf course), which is owned by private homeowners and Homeowner's Associations. The project will include design phases from preliminary engineering through final design and bid. The project will require an approach which will be viewed as "fair" and "inclusive" to property owners in order for easement agreements to be completed and long-term maintenance to occur. In addition, franchise utility coordination and agency permit requirements will need to be determined as early as possible in the design process to ensure a successful and timely project.

Properties that are not critical for a successful streambank stabilization project or if easement conditions cannot be agreed upon, will be removed from the project. Because the Village and MWRDGC are providing funding for separate project elements, detailed cost estimates will be prepared to show funding sources for the two agencies.

In addition to exceptional project management and an understanding of Village and MWRDGC processes and expectations, the Tinley Creek Streambank Stabilization Project requires a consultant team that is experienced in providing a variety of services, including hydraulic modeling, permitting, preliminary engineering through final design for streambank and channel stabilization, vegetation management, long-term monitoring and of course, public involvement. The Cardno team is ready and capable to perform the services the Village requires to ensure a successful streambank stabilization of Tinley Creek.

Our project understanding is based on information provided in the RFP, its attachments and three addenda, our initial review of the 2014 Baker Design, previous experience in urban stream corridors and Mr. Paradoski's project experience.

We have assumed a reach length of approximately 3.1 miles along the Tinley Creek (2.6 miles investigated by Christopher Burke per July 30, 2020 from 151st Street at the northern end to 162nd Street and Laurel Drive at the southern end) and an additional ~ 0.5 miles of Tinley Creek south of Laurel Drive to 88th Avenue per the addendum answers provided by the Village. We assumed the project excludes the small section of stream within the Village, east of 82nd Avenue and south of Basswood Road (shown by yellow circle in Figure 2, which can be addressed if requested at an additional cost).

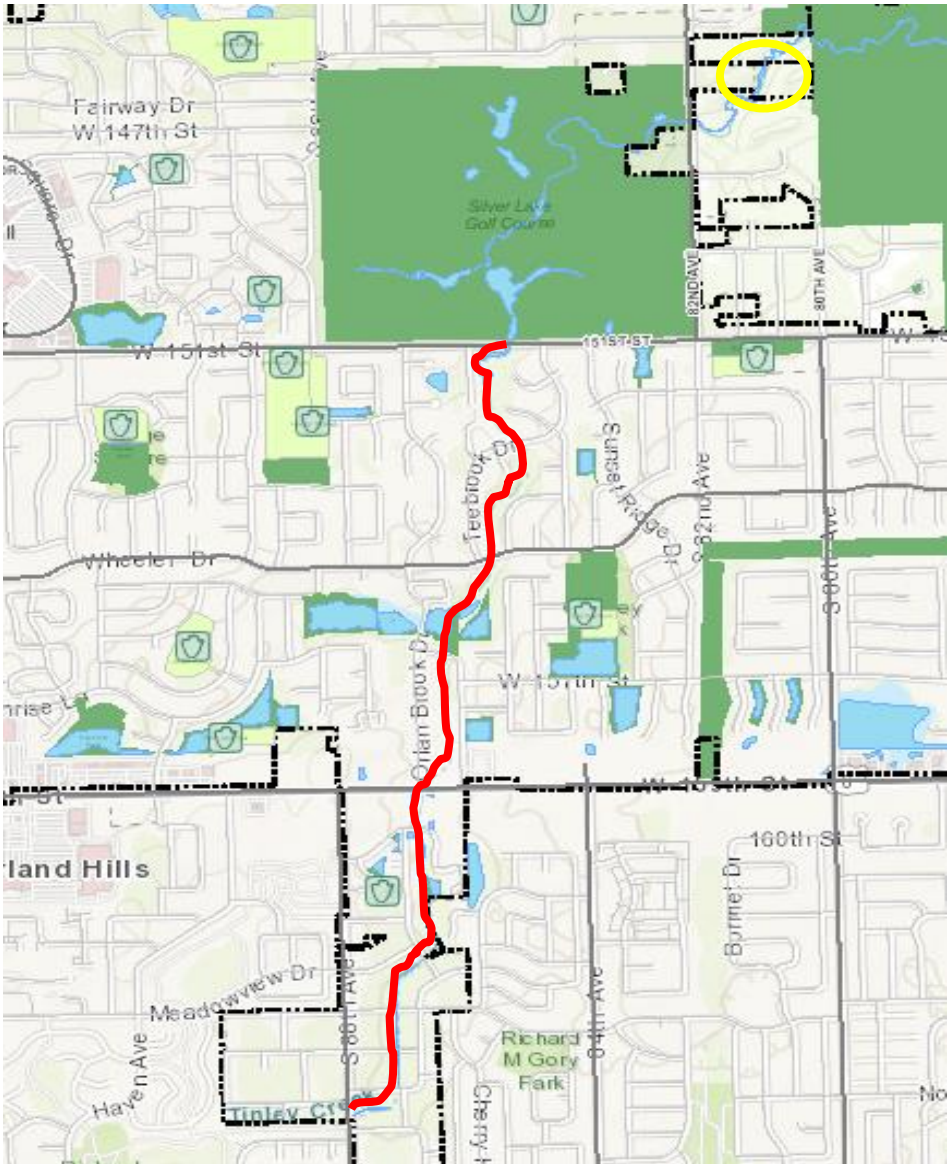


Figure 2 – Map of Tinley Creek Project Reach.

Approximate channel centerline shown in red. Small section of stream assumed excluded from project circled in yellow (adapted from Village of Orland Park GIS website, https://gis.orland-park.il.us/ accessed 3/25/2021).

Technical Project Approach

The Cardno team proposes a two-year schedule to proceed through a four phase project; 30% Preliminary Design, 60% Design Engineering, 90% Design and Value Engineering, and Final Plans, Specifications, and Estimates (PS&E) and Bid. Figure 3, in the following section, shows the proposed schedule.

Overall Project Management and Coordination Services

The Cardno team PM Ms. Schwar Schwar, PE, will be responsible for providing design team coordination, management and reporting of the Cardno team activities to the Village. Ms. Schwar will develop a project work plan that identifies and compiles the staffing assignments, level of effort and budget, schedule (proposed detailed schedule attached in Section 6 – Other Documents) and list of deliverables, communication processes, record-keeping and invoicing procedures, and Cardno's QA/QC plan for the project. Ms. Schwar will hold a project kick-off meeting to introduce the Village to the key Cardno team members and to initiate the project where we will review the project scope, staff roles, previous designs, outline our project communication plan, and identify the procedures needed for a smooth project delivery. The Cardno team will review with the Village the benefits of considering making this a design-build project, which could potentially reduce costs, streamline construction, and reduce long-term maintenance.

After the kick-off meeting, Ms. Schwar will hold bi-monthly status meetings with the Village (virtual meetings are proposed at this time) and submit monthly invoices. She will be the point of contact for the Village and oversee the coordination between Cardno and our subconsultants. Safety is one of Cardno's core values, one that we live every day at project sites, our offices, and all points in between. We believe that creating a safe environment for our people, clients, and the communities we impact should always come first. Ms. Schwar will ensure adherence to the Village's, MWRDGC's and Cardno's safety requirements across our Cardno team.

Ms. Schwar will be responsible for overall project including team oversight and coordination between the geomorphic assessment, survey, design engineering, and permitting teams and the transition of the project through its phases from preliminary design to bid. Finally, Ms. Schwar will provide the connection between the design team and the Village for public involvement activities such as the public meeting and meetings with individual property owners. Her technical water resources knowledge along with her previous large scale project implementation experience, project management for MWRDGC and previous stakeholder involvement make this a perfect fit. Supporting Ms. Schwar, Mr. Paradoski will be available to assist, if necessary, with project management processes and public involvement.

Design Phases Overview

30% Preliminary Design

The 30% Preliminary Design is the longest phase due to the need to evaluate previous designs, complete surveys of the entire project area, meet with MWRDGC and utilities such as ComEd and cable TV, and begin the easement process. It will begin with a kick-off meeting for the project team as described in the project management section. The review of information and site surveys will follow as described in detail below. The permitting and easement processes are so important for a successful project, that the Cardno team proposes to have meetings with the regulatory agencies for permitting and meetings with the Village for easements throughout the entire length of the project. Two meetings with the Village regarding property owner coordination and easements and pre-application meetings with up to three regulatory agencies are proposed during the 30% Preliminary Design. Permitting is further discussed in a following section. This phase will include updates to previously completed designs and a design of reaches previously not

investigated. Preliminary streambank stabilization design including floodplain benches, in-stream structures, rock/scour toe protection, and vegetation management and plantings will be completed.

The Cardno team proposes to stabilize the banks with grading activities, native vegetation and toe protection, rather than retaining walls as much as possible. We feel this approach of limiting walls will provide a more natural appearance to the stream corridor, provide floodplain capacity and connection to reduce flood water elevations, allow for more efficient permitting, and save on construction costs, as well as provide a sense of equity among the residents regarding changes to their properties and long-term maintenance.

60% Design Engineering

Once the 30% design has been completed and reviewed, the Cardno team will kick-off the 60% design phase with a 1-day design charrette for the public to discuss concerns and challenges, and agree upon an equitable approach. This meeting will inform the refinement of the design during the 60% design engineering including the design plans, specifications and cost estimates and allow for easement documents to be drafted. More on this meeting is provided in the Public Involvement Section below.

For the 60% design, specifications will be drafted for project elements and construction procedures. A steady state HEC-RAS Hydraulic modeling using will be used to determine impacts to water surface elevations and aid in the design. The modeling will also be used to secure an Illinois Department of Natural Resources Office of Water Resources (IDNR-OWR) permit. A Design Report detailing the stream assessment and survey, permitting, project design and criteria will be drafted. On the previous Tinley Creek project, Mr. Paradoski wrote and refined the specifications in MasterSpec format to apply specifically to the Tinley Creek project and comply with MWRDGC standard specifications. In particular, specifications have been written for in-stream structures and retaining walls to clearly convey technical information to the Contractor(s) in an effort to limit change orders and to use locally and readily available construction materials that comply with the USACE and IDNR-OWR permit conditions as well as provide long-term creek bank stability. Cardno routinely builds streambank stabilization projects throughout the region and will apply its experience toward reviewing and updating the standards and specifications, including the vegetation management in the project reach.

This 60% design phase is slightly different from the 30% and 90% design phases in that the major deliverables (plans, specifications, cost estimates) will be completed in the middle of the phase to enable us to meet again with the permitting agencies toward the end of this phase. Two meetings with the Village regarding property owner coordination and easements and pre-application meetings with up to three regulatory agencies are proposed during the 60% Preliminary Design. Once the Village and MWRDGC have reviewed the deliverables and the Cardno team has addressed comments, our team will present the revised 60% design at a public meeting. The following three weeks will be dedicated to meetings with property owners, homeowners associations and any other significant stakeholders previously defined to address design concerns and easement coordination. Once the public meeting has occurred, Valdes Engineering (land surveyor) will complete property surveys for those requiring easements, verifying property lines assumed during 30% and 60% plan development.

We will identify and address any design and easement issues before we progress to the 90% Design Engineering. Also at the end of this phase, the Cardno team will meet again with the franchise utility companies to verify the design. If additional site survey (stream, topographic utility, etc.) is required to inform the design, it would happen at the end of this phase.

90% Design and Value Engineering

The 90% design phase with begin with a month long Value Engineering (VE) process, where Ross St. Clair will lead the project team in a review of the overall design, engage others from across Cardno, Andrews, and Aqua Vitae to determine if there are alternative design elements, materials and methods to provide a cost-savings. Following the VE, the streambank stabilization design and specifications, cost estimates and permits will be refined as necessary. Cardno will review and update the Field Data Sheets based upon its experience performing routine maintenance on creek bank stabilization projects throughout the region and complete an O&M Plan. The Cardno team recommends additional meetings with property owners at this time if the VE results in a change of the appearance of the streambank stabilization (additional cost). One meeting with the Village to finalize easement documents as well as a short timeframe to survey properties to confirm easements before the Village executes them is planned. Once the Village and MWRDGC have reviewed the deliverables, the Cardno team will address comments. The 60% Draft Design Report will be updated to the 90% Design Report by including public involvement information, additional design details including specifications, and easement information. The Cardno team will present the proposed project to the Village Board of Trustees and submit necessary permits to regulatory agencies at the end of this phase.

Final PS&E and Bid

The Final PS&E phase will involve the Village and MWRDGC making the ultimate determination of properties for inclusion in the final design plans and specifications. The Cardno team proposes additional meetings with impacted property owners to discuss expectations during construction. Our team will present the final design to the Village Board of Trustees, if requested by the Village. Our team will assist the Village in developing the Invitation to Bid along with criteria that the Village can use to evaluate a contractor's qualifications and bid. With this proposed schedule, the Invitation to Bid will be released in March 2023, with evaluations in April. The Cardno team strongly feels that a more aggressive schedule may be possible, but for property owner buy-in, ample permitting review time, and adequate time for VE, a two-year project schedule is ideal. This schedule provides adequate timing for the relevant permits to be in hand when the construction bids are received.

Additionally, we will refine our detailed construction cost estimate that can be used to evaluate bids along with a proposed construction schedule. One of the key components to a successful stream project is the having construction observation services by the lead designers. Stream projects are complex and dynamic. Our stream construction experts can be there to support the Village during implementation by providing on-site instruction, problem solving, and quality control. We work hand-in-hand with a wide range of contractors throughout the country installing stream designs. This experience will bring value to the Village and help to insure a successful project.

Detailed Descriptions of Specific Tasks

Information Review and Site Survey

Our team will review the previously completed design by Michael Baker. This includes the 2014 completed design, environmental and geotechnical data used to develop the design, and July 2020 update memo provided to the Village. We will convert the redline update of the plan set into geospatial layers and upload them to ArcGIS Online (AGO).

We will use AGO extensively through the information review, assessment and design phases of the project because it is a flexible platform that allows us to use GIS in the field and use it as a tool to communicate to others. For example, if the Village has an AGO license, we can share the map and they can review our

photos and field notes remotely. Because AGO is a dynamic tool, the AGO map can also be used by the Village to communicate to property owners during public meetings and individual owner meetings.

Following our initial desktop review of the previous information, our team will walk the entire project length and verify what previously designed elements are appropriate including the 2020 update memo changes. We will document our comments in AGO and share with the Village. We will conduct a second walkthrough of the project site and include the Village on the visit to explain our initial design analysis. We believe in the two-step process because we want the opportunity to collect and process information and provide the Village with a clear and concise options. After our site visit with the Village, we will provide a summary report indicating what portions of the Michael Baker plan we believe are adequate and need no or minimal changes prior to permitting and construction and what sections will need additional design work. Additional design work may be due to a change in previous conditions, developing an approach that is acceptable to a property owner, and/or modifying the design so that the treatments on the entire project flow together better without causing unintended consequences to adjacent properties or downstream stream reaches. This summary report will also identify additional areas to survey or areas that require an updated/revised topographic survey.

Soil borings were previously completed in locations close to proposed walls. Based on our initial review, we feel that a single boring within the public right of way on the north side of 86th Ave near the Orlan Brook Condo Association property and pool area. Based on previous wall plans, we anticipate a single boring about 35 feet deep.

Geomorphic and Stream Assessment

As part of the design review and update for the portion of Tinley Creek previously designed by Michael Baker as well as the new Middle Reach, our team will conduct a comprehensive geomorphic and stream assessment. The geomorphic and stream assessment will focus on collecting data that provides information on the causes of streambank instability, potential solutions to address instability, and delineates areas where priorities should be focused. We believe this third element is extremely important for large projects where decisions may need to be made on what should be funded, what are critical elements for the best chance of success and what elements may be superfluous and not necessarily fundamental to project success.

Our geomorphic assessment will focus on collecting standard parameters such a longitudinal profile and representative cross sections so we can understand channel geometry. This information will be integrated into a revised topographic survey to understand the whole stream system throughout the project reach. Additionally, we will collect information on bank stability. We will complete a streambank erosion assessment of both banks along Tinley Creek using a model called the Bank Erosion Hazard Index (BEHI). The BEHI model evaluates the susceptibility of a streambank to erosion for multiple erosional processes. Individual BEHI variables are recorded through visual assessments and physical measurements to determine the combined risk for specific streambank sections to future streambank erosion. The end result is a relatively quantitative rating for each bank that allows comparison among banks and highlights where work should be focused. The advantage of the BEHI is that it translates very well to a spatial format. Bank ratings can be color-coded and displayed on a map and labeled with descriptive words such as “low potential, moderate potential, or extreme potential” based on the BEHI score. We will upload a BEHI GIS layer to the AGO map so the Village and property owners can understand where bank erosion is an issue and potentially why work has to focus on one area of the stream vs. other areas of the stream.

To create a photographic record and document the existing conditions of the stream (Scope of Services #7), we will use a drone to record low-elevation, high-resolution video of the stream corridor. During the stream assessment, we will take photographs along the stream and document important features such as current bank cover (natural vegetation, wood retaining wall, hard armoring, etc.). This information along with parcel coverages provided by Cook County will be integrated into a GIS and provided in AGO during the project and as a standalone GIS product for once the project finishes. We envision a GIS map that the Village can click on an address and see photos and description of the bank conditions so that any potential conflicts can be resolved. As added benefit, post-construction monitoring reports can be uploaded to the map and used for future reporting.

In addition to evaluating the geomorphic conditions of the stream corridor, Cardno's ecologist/vegetation specialist will complete a site evaluation of the vegetation and determine if areas would benefit from treatment and/or removal of invasive, non-native vegetation that are preventing long-rooted native vegetation and accelerating bank erosion. Cardno will include in the design documents brush clearing and invasive treatment where non-native shrub species are present within the creek corridor. And if possible Cardno will recommend native plantings that are salt-tolerant and have been successful in urban environments at stabilizing banks by themselves or along with structural toe protection. Cardno's vegetation management will also inform the O&M plan, as part of the 90% Design deliverable. As an additional service, with Village approval, Cardno could complete treatment of these bank areas, where structural improvements are not needed, before the design project is completed.

Permitting

The Cardno team provides permitting services for implementation of stream restoration, streambank stabilization, flood storage creation, and stormwater/drainage system improvements along with many other types of projects. Cardno is also a wetland review consultant for MWRDGC. Through these projects, we have gained a focused understanding of the regulations and have developed a strong relationship with regulating agencies to ensure project compliance.

The Cardno team will provide permitting services for the design plan of the streambank stabilization. Because the permitting process is so important to executing a successful and timely project, The Cardno team will engage the regulatory agencies such as U.S. Army Corps of Engineers (USACE) Chicago District, IDNR-OWR, and Will-South Cook Soil and Water Conservation District (SWCD), MWRDGC WMO throughout the entire design process through pre-application meetings. We will complete permit applications and the Village will sign and submits them during the 90% design phase.

Full consultation and submissions for 404/401 permitting requirements through the USACE Chicago District will be completed. The project was previously permitted under Regional Permit 10 (Bank Stabilization). As described in CSF #3, the previously designed TICR 7 and TICR 8 creek improvements were specifically submitted as two separate permits to comply with USACE and IDNR-OWR Permit Programs and to expedite the permitting process. Now that all reaches of the project are contiguously one project, it is likely that the USACE and IDNR-OWR permits will restrict the length of any proposed retaining walls to half of what was previously allowed. If the project is not covered under the RP10 requirements and guidelines, it may be determined that an Individual Permit Application must be submitted and an Individual 401 IEPA water quality certification is required for the project if retaining walls are included. Under this permit application, the consultant would be required to lead the development of an Alternatives Analysis which must assess all other options and designs for the project as to why the submitted plans are the preferred option. The application would also require a full public notice and public notice comment period. In addition, IDNR-OWR will require a hydraulic model (HEC-RAS steady state) to demonstrate that the proposed project does not cause an increase in flood elevations and no average increase in velocities throughout the project

reach. During the previous project, the IDNR raised a concern regarding the increased velocities and permitting the backfill behind the walls. Therefore, the Cardno team proposes to not use retaining walls and rather stabilize the banks with grading activities, vegetation and toe protection, as much as possible. This approach will provide a more natural appearance to the stream corridor, provide floodplain capacity and connection to reduce flood water elevations, allow for more efficient permitting, and save on construction costs, as well as provide a sense of equity among the residents regarding changes to their properties and long-term maintenance.

The Cardno team will ensure that the project has complied with the Endangered Species Act and will compile a Section 7 species list for the project area. We will also provide full consultation with the Illinois Endangered Species Protection Act, the Illinois Natural Areas Preservation Act and the Illinois State Agency Historic Resources Preservation Act, and provide all pertinent correspondence documenting compliance and initial documentation required for the Illinois State Historic Preservation Officer. The Illinois Historic Preservation Agency contacted the design team during the previous project after the EcoCAT submittal regarding historical and cultural artifacts. An area of concern touches Tinley Creek near 159th. An archaeologist provided a report stating that there was a low likelihood of uncovering artifacts given the development that has occurred along the creek. With the additional reaches of stream being added to the project, if further historical and cultural concerns may occur, Cardno has a local team of cultural and archaeological staff to assist in any issues that may arise.

A soil erosion control permit through Will-South Cook SWCD will be needed. Previously, soil sampling determined no hazardous materials and materials likely qualified as clean construction or demolition debris through the IEPA. However, it was the intent that disturbed soils could be respread on-site and haul off to a special waste landfill was not necessary. However, if it is determined that soil are contaminated and/or need to be hauled off, this could significantly impact the construction budget and require additional permitting. With the additional project reach length, the earth disturbance may exceed the 1-acre threshold and require an IEPA National Pollutant Discharge Elimination System (NPDES) Permit.

Public Involvement

Knowing the property owners desire to understand the designs and the impacts to their properties, the Cardno team feels that the project engineer and PM are the best suited for leading and participating in the public meeting and property owner coordination. Also we understand that the Village desires/prefers to oversee the message to the public. However, we are prepared to bring on a “Public Involvement Specialist” as a subconsultant to lead this public involvement effort for an additional fee if the Village requests.

As mentioned earlier, the public involvement, especially regarding easements, are so important for a successful project that the Cardno team proposes to have follow up meetings with the Village throughout the entire length of the project. The process to understand the necessary public involvement starts right after the kick-off meeting, with two meetings during the 30% design process. We will review existing easements and easements which were sought as part of the previous design. We will identify property owners who did not previously wish to participate in the project as determine how to best approach them.

The 60% design begins with a 1-day design charrette workshop for the public to discuss concerns and challenges, and agree upon an equitable approach. The Cardno team will present the results of the site survey and geomorphic and stream assessment. Our geomorphic team along with our design engineering team will discuss the existing conditions, rate of erosion, and causes of erosion to the residents. Then we will discuss the various methods and approaches available for streambank stabilization and provide an understanding of how each method works and why they would be chosen for a given location (natural materials verses hard armoring, construction cost, impacts to natural resources, site constraints, surrounding infrastructure, etc.).

After the presentation, we would open it up for a discussion regarding concerns, listen to residents discuss how the stream has changed recently, and listen for any challenges they may see. We may have a survey for residents to fill-out, or an open discussion forum, depending on the number of residents in attendance. We will then try to guide the discussion towards defining a way for our team to evaluate properties and streambanks for improvement in a way deemed equitable by residents. This meeting will inform the refinement of the design during the 60% design engineering.

After the public meeting, the following three weeks will be dedicated to meetings led by the Village with property owners, homeowners associations and any other significant stakeholders previously defined to address design concerns and easement coordination. Cardno is prepared to attend five of these meetings with the Village. Additional meetings can be attended by two members of the Cardno team at the Village's request at a cost of $750 per meeting (assuming a staff of two at an hour long meeting). We will provide exhibits based on our 60% design plans, showing proposed easements. These exhibits will be at a scale that will highlight individual properties and will show limits of construction work and present a typical section and photo of what the stream will look like within their property limits. Our land surveyor, Valdes, will be surveying during this timeframe to demonstrate to the public that no decisions regarding their properties had been made prior to the public or property owner coordination meetings.

Design Schedule

The Cardno team proposes a two-year schedule to proceed from 30% design to bid award. Figure 3 shows the proposed schedule. The 30% Preliminary Design Phase is the longest phase at 8 months due to the need to evaluate previous designs completed, complete surveys of the entire project area, meet with MWRDGC and utilities, and begin the easement process.

In addition, the Cardno team proposes pre-application meetings with regulatory agencies to verify the project approach is acceptable and the design will meet expectations of regulatory agencies. The permitting and easement processes are so important for a successful project, that the Cardno team proposes to have meetings with the regulatory agencies for permitting and meetings with the Village for easements throughout the entire length of the project.

Once the 30% design has been completed and reviewed, the design will refined and the 60% design plans, draft specifications and cost estimates will be completed. This phase is slightly different in that the deliverable will be completed in the middle of the phase to enable us to meet again with the permitting agencies. We will then present the design at a public meeting and complete property owner coordination meetings. We will identify and address any design and easement issues before we progress to the 90% Design Engineering.

During the 90% Design Engineering, property owner coordination will continue and the Cardno team is available to assist the Village as needed. During this phase, the Cardno team will present the proposed project to the Village Board of Trustees and submit necessary permits to regulatory agencies during this phase.

The Final PS&E phase will involve the Village and MWRDGC making the ultimate determination of properties for inclusion in the final design plans and specifications. The Cardno team proposes additional meetings with impacted property owners to discuss expectations during construction. An additional meeting with the Village Board of Trustees may be requested during this time as well.

With this proposed schedule, the Invitation to Bid will be released in March 2023, with evaluations in April. The Cardno team strongly feels that a more aggressive schedule may be possible, but for property owner buy-in, a smooth permitting process, and adequate time for VE, a two-year project schedule is necessary.

A detailed schedule is provided in Section 6 – Other Documents.

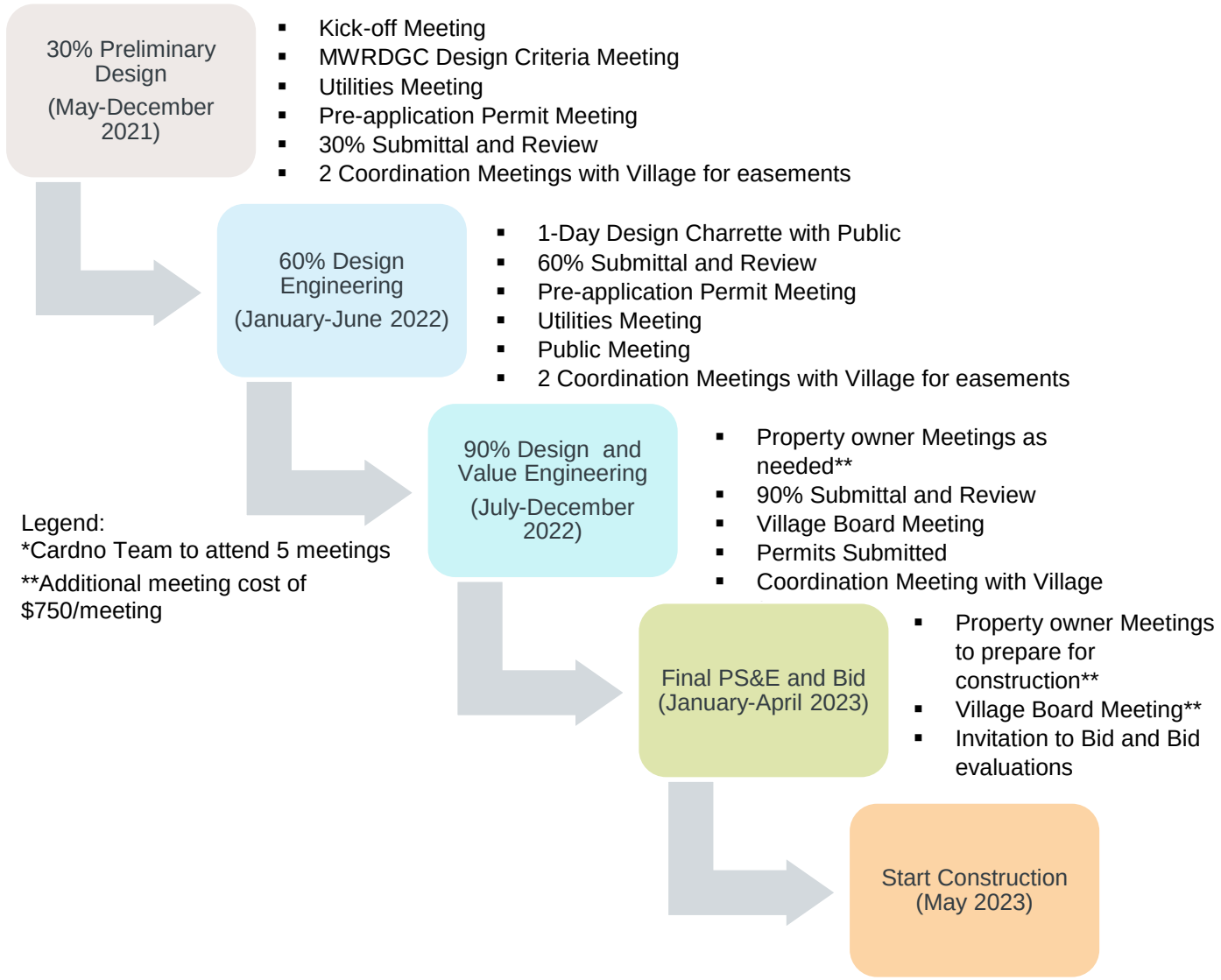


Figure 3 – Project Progression

4. Professional Fee

Per RFP #21-015 and Addendum No. 1 (Questions and Answers) posted on March 17, 2021, the Cardno team offers Proposal Summary Sheet (Price Proposal) under separate cover. Detailed pricing for prime and subconsultants with breakdown of scope items are available upon request.

The Cardno Team made the following assumptions when developing pricing:

- The project will take two years to progress from start to review of bids
- Two client update meetings per month throughout the project schedule
- No retaining walls will be required
- Only one soil boring is needed
- The ~3 miles of stream will require three weeks or geomorphic, topographic and erosion surveys
- Three pre-application meetings (1 per design phase) with up to three regulatory agencies at a time (two virtual, and one in-person)
- The Cardno team will participate in up to 5 property landowner meetings over two days, with additional meeting attendance with up to staff at a rate of $750
- Sixty properties/parcels will need detailed parcel boundary surveys for easements
- The Cardno team will prepare easements and the Village will execute easements
- One Public Meeting will occur
- Additional cultural surveys are not required
- Based on previous soil sampling, no hazardous materials are on properties and bank materials qualify as clean construction or demolition debris

The following Baker design information will be provided:

- HEC-RAS files
- 98% Opinion of Probable Costs
- 98% Design Reports/Criteria
- 98% CADD files
  - Existing topo and ALTA surveys
  - Proposed conditions
  - Retaining walls
  - Utility locates
  - Existing and proposed easements
- Previous easement exhibits with metes and bounds descriptions
- Previous meeting agendas and minutes
  - Public meetings
  - IDNR
  - USACE

5. Required Forms

Per RFP #21-015 and Addendum No. 1 (Questions and Answers) posted on March 17, 2021, the Cardno team offers in the following pages required forms, as summarized below. Our team's Proposal Summary Sheet (with Price Proposal) is offered under separate cover.

Required Forms:

> Certificate of Compliance

> References

> Insurance Requirements

ORLAND PARK

CERTIFICATE OF COMPLIANCE

The undersigned Anngie Richter, as Business Unit Leader, Restoration Services
(Enter Name of Person Making Certification) *(Enter Title of Person Making Certification)*

and on behalf of Cardno, Inc., certifies that:
(Enter Name of Business Organization)

1) BUSINESS ORGANIZATION:

The Proposer is authorized to do business in Illinois: Yes [X] No [ ]

Federal Employer I.D.#: 45-2663666
(or Social Security # if a sole proprietor or individual)

The form of business organization of the Proposer is (*check one*):

___ Sole Proprietor
___ Independent Contractor *(Individual)*
___ Partnership
___ LLC
_X_ Corporation Delaware *(State of Incorporation)* June 10, 2011 *(Date of Incorporation)*

2) ELIGIBILITY TO ENTER INTO PUBLIC CONTRACTS: **Yes [X] No [ ]**

The Proposer is eligible to enter into public contracts, and is not barred from contracting with any unit of state or local government as a result of a violation of either Section 33E-3, or 33E-4 of the Illinois Criminal Code, or of any similar offense of "Bid-rigging" or "Bid-rotating" of any state or of the United States.

3) SEXUAL HARRASSMENT POLICY: **Yes [X] No [ ]**

Please be advised that Public Act 87-1257, effective July 1, 1993, 775 ILCS 5/2-105 (A) has been amended to provide that every party to a public contract must have a written sexual harassment policy in place in full compliance with 775 ILCS 5/2-105 (A) (4) and includes, at a minimum, the following information: (I) the illegality of sexual harassment; (II) the definition of sexual harassment under State law; (III) a description of sexual harassment, utilizing examples; (IV) the vendor's internal complaint process including penalties; (V) the legal recourse, investigative and complaint process available through the Department of Human Rights (the "Department") and the Human Rights Commission (the "Commission"); (VI) directions on how to contact the Department and Commission; and (VII) protection against retaliation as provided by Section 6-101 of the Act. (Illinois Human Rights Act). (emphasis added). Pursuant to 775 ILCS 5/1-103 (M) (2002), a "public contract" includes "...every contract to which the State, any of its political subdivisions or any municipal corporation is a party."

4) EQUAL EMPLOYMENT OPPORTUNITY COMPLIANCE: Yes [X] No [ ]

During the performance of this Project, Proposer agrees to comply with the "Illinois Human Rights Act", 775 ILCS Title 5 and the Rules and Regulations of the Illinois Department of Human Rights published at 44 Illinois Administrative Code Section 750, et seq. The

Proposer shall: (I) not discriminate against any employee or applicant for employment because of race, color, religion, sex, marital status, national origin or ancestry, age, or physical or mental handicap unrelated to ability, or an unfavorable discharge from military service; (II) examine all job classifications to determine if minority persons or women are underutilized and will take appropriate affirmative action to rectify any such underutilization; (III) ensure all solicitations or advertisements for employees placed by it or on its behalf, it will state that all applicants will be afforded equal opportunity without discrimination because of race, color, religion, sex, marital status, national origin or ancestry, age, or physical or mental handicap unrelated to ability, or an unfavorable discharge from military service; (IV) send to each labor organization or representative of workers with which it has or is bound by a collective bargaining or other agreement or understanding, a notice advising such labor organization or representative of the Vendor's obligations under the Illinois Human Rights Act and Department's Rules and Regulations for Public Contract; (V) submit reports as required by the Department's Rules and Regulations for Public Contracts, furnish all relevant information as may from time to time be requested by the Department or the contracting agency, and in all respects comply with the Illinois Human Rights Act and Department's Rules and Regulations for Public Contracts; (VI) permit access to all relevant books, records, accounts and work sites by personnel of the contracting agency and Department for purposes of investigation to ascertain compliance with the Illinois Human Rights Act and Department's Rules and Regulations for Public Contracts; and (VII) include verbatim or by reference the provisions of this Equal Employment Opportunity Clause in every subcontract it awards under which any portion of this Agreement obligations are undertaken or assumed, so that such provisions will be binding upon such subcontractor. In the same manner as the other provisions of this Agreement, the Proposer will be liable for compliance with applicable provisions of this clause by such subcontractors; and further it will promptly notify the contracting agency and the Department in the event any subcontractor fails or refuses to comply therewith. In addition, the Proposer will not utilize any subcontractor declared by the Illinois Human Rights Department to be ineligible for contracts or subcontracts with the State of Illinois or any of its political subdivisions or municipal corporations. Subcontract" means any agreement, arrangement or understanding, written or otherwise, between the Proposer and any person under which any portion of the Proposer's obligations under one or more public contracts is performed, undertaken or assumed; the term "subcontract", however, shall not include any agreement, arrangement or understanding in which the parties stand in the relationship of an employer and an employee, or between a Proposer or other organization and its customers. In the event of the Proposer's noncompliance with any provision of this Equal Employment Opportunity Clause, the Illinois Human Right Act, or the Rules and Regulations for Public Contracts of the Department of Human Rights the Proposer may be declared non-responsible and therefore ineligible for future contracts or subcontracts with the State of Illinois or any of its political subdivisions or municipal corporations, and this agreement may be canceled or avoided in whole or in part, and such other sanctions or penalties may be imposed or remedies involved as provided by statute or regulation.

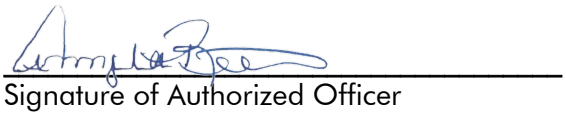
5) TAX CERTIFICATION: Yes [X] No [ ]

Contractor is current in the payment of any tax administered by the Illinois Department of Revenue, or if it is: (a) it is contesting its liability for the tax or the amount of tax in accordance with procedures established by the appropriate Revenue Act; or (b) it has entered into an agreement with the Department of Revenue for payment of all taxes due and is currently in compliance with that agreement.

6) AUTHORIZATION & SIGNATURE:

I certify that I am authorized to execute this Certificate of Compliance on behalf of the Contractor set forth on the Proposal, that I have personal knowledge of all the information set forth herein and that all statements, representations, that the Proposal is genuine and not collusive, and information provided in or with this Certificate are true and accurate. The undersigned, having become familiar with the Project specified, proposes to provide and furnish all of the labor, materials, necessary tools, expendable equipment and all utility and transportation services necessary to perform and complete in a workmanlike manner all of the work required for the Project.

ACKNOWLEDGED AND AGREED TO:



Signature of Authorized Officer

Anngie Richter
Name of Authorized Officer

Business Unit Leader, Restoration Services
Title

March 29, 2021
Date

REFERENCES

Provide three (3) references for which your organization has performed similar work.

Bidder's Name: Cardno, Inc.
(Enter Name of Business Organization)

1. ORGANIZATION Metropolitan Water Reclamation District of Greater Chicago
   ADDRESS 111 E. Erie St. Chicago, IL 60611
   PHONE NUMBER 312 751 5479
   CONTACT PERSON Richard Fisher, PE, CFM Senior Civil Engineer
   YEAR OF PROJECT 2014-2016

2. ORGANIZATION City of Middleton
   ADDRESS 7426 Hubbard Ave Middleton, WI 53562
   PHONE NUMBER 608 821 8360
   CONTACT PERSON Mark Wegner, Assistant Director for Field Services / City Forester
   YEAR OF PROJECT 2007-2019

3. ORGANIZATION Rockford Park District
   ADDRESS Mail 401 S. Main St., Rockford, IL 61101
   PHONE NUMBER 815 987 1649
   CONTACT PERSON Tom Lind Landscape Architect, Capital Planning and Management
   YEAR OF PROJECT 2017

ORLAND PARK

INSURANCE REQUIREMENTS

Please submit a policy Specimen Certificate of Insurance showing bidder's current coverage's

WORKERS COMPENSATION & EMPLOYER LIABILITY
Workers' Compensation – Statutory Limits
Employers' Liability
$1,000,000 – Each Accident $1,000,000 – Policy Limit
$1,000,000 – Each Employee
Waiver of Subrogation in favor of the Village of Orland Park

AUTOMOBILE LIABILITY
$1,000,000 – Combined Single Limit

GENERAL LIABILITY (Occurrence basis)
$1,000,000 – Each Occurrence $2,000,000 – General Aggregate Limit
$1,000,000 – Personal & Advertising Injury
$2,000,000 – Products/Completed Operations Aggregate
Primary Additional Insured Endorsement & Waiver of Subrogation in favor of the Village of Orland Park

PROFESSIONAL LIABILITY
$1,000,000 Limit - Claims Made Form, Indicate Retroactive Date & Deductible

EXCESS LIABILITY (Umbrella-Follow Form Policy)
$2,000,000 – Each Occurrence
$2,000,000 – Aggregate
EXCESS MUST COVER: General Liability, Automobile Liability, Workers Compensation

Any insurance policies providing the coverages required of the Consultant, excluding Professional Liability, shall be specifically endorsed to identify "The Village of Orland Park, and their respective officers, trustees, directors, officials, employees, agents, representatives and assigns as Additional Insureds on a primary/non-contributory basis with respect to all claims arising out of operations by or on behalf of the named insured." If the named insureds have other applicable insurance coverage, that coverage shall be deemed to be on an excess or contingent basis. The policies shall also contain a Waiver of Subrogation in favor of the Additional Insureds in regards to General Liability and Workers Compensation coverages. The certificate of insurance shall also state this information on its face. Any insurance company providing coverage must hold an A VII rating according to Best's Key Rating Guide. Permitting the contractor, or any subcontractor, to proceed with any work prior to our receipt of the foregoing certificate and endorsement, however, shall not be a waiver of the contractor's obligation to provide all of the above insurance.

Proposer agrees that prior to any commencement of work to furnish evidence of Insurance coverage providing for at minimum the coverages and limits described above directly to the Village of Orland Park, Nicole Merced, Purchasing Coordinator, 14700 S. Ravinia Avenue, Orland Park, IL 60462. Failure to provide this evidence in the time frame specified and prior to beginning of work may result in the termination of the Village's relationship with the contractor.

ACCEPTED & AGREED THIS 29th DAY OF March, 20 21

Signature

Authorized to execute agreements for:

Anngie Richter, Business Unit Leader, Restoration Services
Printed Name & Title

Cardno, Inc.
Name of Company

6. Other Documents

Per RFP #21-015 and Addendum No. 1 (Questions and Answers) posted on March 17, 2021, the Cardno team offers additional information in the following pages, as summarized below.

Other Documents:

> Field Data Sheet

> Detailed Schedule

Stream Reach:	Assessed By:	Date:
Northing_____ Easting_____	Temp:_____ Weather:_____	Time:

Storm Water Outfalls, Crossings & Utility Impacts

Photo Point(s):

Material:
- ☐ Concrete
- ☐ PVC
- ☐ Metal

Size: _____(in)

Station: _____

Shape:
- ☐ Circular
- ☐ Box
- ☐ Elliptical
- ☐ Arch
- ☐ Other:

Condition:
- ☐ Good
- ☐ Chipped/Cracked
- ☐ Broken
- ☐ Corrosion
- ☐ Other:

Flow/Discharge:
- ☐ Clear
- ☐ Color: _____
- ☐ Turbidity
- ☐ Floatables
- ☐ Other:

Erosion

Photo Point(s):

Bank (Facing Downstream):
- ☐ Left
- ☐ Right
- ☐ Both:

Station: _____

Process:
- ☐ Downcutting
- ☐ Widening
- ☐ Headcutting
- ☐ Aggrading
- ☐ Sedimentation
- ☐ Degrading
- ☐ Bed Scour
- ☐ Bank Failure
- ☐ Bank Scour
- ☐ Other:

Dimensions:
- Length: _____
- Height: _____
- Bank Slope: ____
- Other:

Vegetation

Photo Point(s):

Bank (Facing Downstream):
- ☐ Left
- ☐ Right
- ☐ Both:

Station: _____

Impact:
- ☐ Lacking vegetation
- ☐ Invasive Plants/Shrubs
- ☐ Excessive Shade
- ☐ Impacted Buffer
- ☐ Other:

Dimensions:
- Length: _____
- Height: _____
- Bank Slope: ____
- Other:

Trash & Debris

Photo Point(s):

Type:
- ☐ Commercial
- ☐ Residential
- ☐ Natural

Station: _____

Material:
- ☐ Plastic
- ☐ Metal
- ☐ Tires
- ☐ Appliances
- ☐ Automotive
- ☐ Paper
- ☐ Construction
- ☐ Yard Waste
- ☐ Woody
- ☐ Other:

Source:
- ☐ Unknown
- ☐ Flooding
- ☐ Illegal Dump
- ☐ Other:

Amount: (# of Loads)

Walls

Photo Point(s):

Material:
- ☐ Soldier Pile
- ☐ Sheet Pile
- ☐ Other:

Station: _____

Process:
- ☐ Scour
- ☐ Bank Erosion
- ☐ Piping
- ☐ Other:

Condition:
- ☐ Good
- ☐ Chipped/Cracked
- ☐ Leaning
- ☐ Corrosion
- ☐ Other:

Dimensions:
- Length: _____
- Height: _____
- Bank Slope: ____
- Other:

Overall Reach Level Assessment

Photo Point(s):

Rain Last 24 Hours:
- ☐ Heavy Rain
- ☐ Steady Rain
- ☐ Intermittent
- ☐ Trace Rain

Present Conditions:
- ☐ Heavy Rain
- ☐ Steady Rain
- ☐ Intermittent
- ☐ Trace Rain
- ☐ Overcast/Cloudy
- ☐ Sunny

Water Clarity:
- ☐ Clear
- ☐ Turbid
- ☐ Chemicals
- ☐ Other:

Wildlife (Evidence)
- ☐ Fish
- ☐ Deer
- ☐ Racoon
- ☐ Beaver
- ☐ Frogs/Toads
- ☐ Birds
- ☐ Other:

Channel Dynamics:
- ☐ Downcutting
- ☐ Widening
- ☐ Headcutting
- ☐ Aggrading
- ☐ Sedimentation
- ☐ Degrading
- ☐ Bed Scour
- ☐ Bank Failure
- ☐ Bank Scour
- ☐ Other:

Shading:
- ☐ Mostly Shaded (>75% canopy)
- ☐ Half Shaded (50% canopy)
- ☐ Partially Shaded (>25% canopy)
- ☐ Unshaded (<25% canopy)

STREAM REACH:	ASSESSED BY:	DATE:
NORTHING_____ EASTING_____	TEMP:_____ WEATHER:_____	TIME:

CATEGORY	GOOD	FAIR	ADDRESS
VEGETATIVE PROTECTION	MORE THAN 80% OF THE STREAM BANKS AND BUFFERS COVERED BY NATIVE VEGETATION; VEGETATIVE DISRUPTION BY MOWING OR DUMPING MINIMAL OR NOT EVIDENT; ALMOST ALL PLANTS ALLOWED TO GROW NATURALLY.	50-80% OF THE STREAM BANKS AND BUFFERS COVERED BY NATIVE VEGETATION; MODERATE DIVERSITY IN PLANT SPECIES; EVIDENCE OF SOME DISRUPTION BUT NOT AFFECTING FULL PLANT GROWTH POTENTIAL; VEGETATION IS MORE THAN ONE-HALF ITS AVERAGE HEIGHT.	LESS THAN 50% OF THE STREAM BANKS AND BUFFERS COVERED BY NATIVE VEGETATION; LITTLE TO NO DIVERSITY IN PLANT SPECIES; DISRUPTION OF VEGETATION IS VERY HIGH; VEGETATION IS LESS THAN 3 INCHES IN AVERAGE HEIGHT.
	10 9 8	7 6 5 4	3 2 1 0
BED & BANK EROSION	MORE THAN 80% OF THE STREAM BED AND BANKS STABLE; EVIDENCE OF EROSION OR BANK FAILURE ABSENT OR MINIMAL; LITTLE POTENTIAL FOR FUTURE PROBLEMS.	50-80% OF THE STREAM BED AND BANKS HAVE STABLE GRADE AND WIDTH; ISOLATED AREAS OF BANK FAILURE/EROSION LIKELY CAUSED BY PIPE OUTFALLS, LOCAL SCOUR, IMPAIRED NATIVE VEGETATION, EXCESSIVE SHADING, ETC.	MORE THAN 50% OF THE STREAM BED AND BANKS SHOW PAST OR ACTIVE DOWN-CUTTING OR WIDENING; ACTIVE EROSION; MODERATE TO SIGNIFICANT SEDIMENT DEPOSITION; POTENTIAL OR IMMEDIATE THREATS TO PROPERTY OR INFRASTRUCTURE.
	10 9 8	7 6 5 4	3 2 1 0
STORM WATER OUTFALLS, STREAM CROSSINGS, UTILITY IMPACTS, TRASH AND DEBRIS	NO DRY WEATHER DISCHARGE, ODOR OR APPEARANCE OF EROSION PROBLEMS; TEMPORARY BLOCKAGES SUCH AS BEAVER DAMS OR DEBRIS JAMS WITH LITTLE IMPACT AND THAT CAN BE EASILY REMOVED; SMALL SECTION OF EXPOSED UTILITY NOT CAUSING A BLOCKAGE; A SMALL AMOUNT OF DEBRIS (LESS THAN TWO LOADS) WITH CLEANUP BY A SMALL CREW WITH NO EQUIPMENT.	LOW FLOW DRY WEATHER DISCHARGE, MOSTLY CLEAR AND ODORLESS; NOMINAL EROSION, MINOR/LOCALIZED IMPACTS; PARTIAL PIPE BLOCKAGE THAT MAY INTERFERE WITH STREAM FLOW AND CAUSE DAMAGE IF LEFT UNADDRESSED; MODERATE SECTION OF EXPOSED UTILITY WITH NO IMMEDIATE THREAT; MODERATE AMOUNT OF DEBRIS IN A CONFINED AREA WITH CLEANUP BY SMALL EQUIPMENT.	HEAVY DISCHARGE, DISTINCT COLOR AND/OR STRONG ODOR, SIGNIFICANT IMPACT DOWNSTREAM; SIGNIFICANT BLOCKAGE OF UPSTREAM FLOW SUCH AS DEBRIS OR ICE JAMS THAT CAN CAUSE SIGNIFICANT DAMAGE AND REQUIRE IMMEDIATE ATTENTION; EXPOSED UTILITY WITH THREAT OF EROSION OR COLLAPSE; LARGE AMOUNT OF DEBRIS ACROSS A LARGE AREA WHERE ACCESS IS DIFFICULT, POSSIBLY HAZARDOUS.
	10 9 8	7 6 5 4	3 2 1 0
WALLS	ALL CONCRETE IS SOUND WITH NO SIGNS OF DISTRESS, DISCOLORATION, CRACKING OR SPALLS. STEEL SHEET PILE SHOWS NO SIGNS OF SECTION LOSS OR DETERIORATION OR EXCESSIVE CORROSION. WALLS SHOW NO INDICATION OF LEANING OR LATERAL MOVEMENT. FINISHED GRADE AT FRONT OF WALL IS NOT SCOURED MORE THAN 1 FOOT FROM ITS ORIGINAL ELEVATION.	CONCRETE HAS MINOR CRACKING WITH NO SIGNS OF DISCOLORATION; SPALLS ARE LESS THAN 6 INCHES DIAMETER; NO REINFORCING IS EXPOSED AND CONCRETE IS SOUND. STEEL SHEET PILE IS PITTED WITH MINOR AREAS OF SECTION LOSS AND NO EXCESSIVE CORROSION OR HOLES. WALLS SHOW SLIGHT INDICATION OF LEANING (LESS THAN 1/4 IN HORIZONTAL TO 1 FOOT VERTICAL AND LESS THAN 2 INCHES TOTAL MOVEMENT AT TOP OF WALL FROM ITS ORIGINAL LOCATION). FINISHED GRADE AT FRONT OF WALLS IS SCOURED MORE THAN 1 FOOT BUT LESS THAN 3 FEET FROM ITS ORIGINAL ELEVATION.	CONCRETE HAS CRACKING GREATER THAN 1/8 INCH OR CRACKING WITH RUST COLOR INDICATING CORROSION OF REINFORCING; SPALLS WITH REINFORCING EXPOSED; CONCRETE IS NOT SOUND. STEEL SHEET PILE HAS HOLES IN SECTIONS, HAS EXCESSIVE CORROSION OR IS NOT SOUND. WALLS SHOW HEAVY INDICATION OF LEANING OR LATERAL MOVEMENT (MORE THAN 1/4 IN HORIZONTAL TO 1 FOOT VERTICAL AND MORE THAN 2 INCHES TOTAL MOVEMENT AT TOP OF WALL FROM ITS ORIGINAL LOCATION). FINISHED GRADE AT FRONT OF WALL IS SCOURED MORE THAN 3 FEET FROM ITS ORIGINAL ELEVATION OR BOTTOM OF SOLDIER PILE FACING IS EXPOSED.
	10 9 8	7 6 5 4	3 2 1 0

TOTAL POINTS _____ / 40 GOOD (32-40) FAIR (16-31) ADDRESS (0-15)

SKETCH/NOTES:

Detailed Weekly Schedule: Tinley Creek Streambank Stabilization

Year	2021																																				2022																																																				2023																
Month	May					June				July				August					September			October				November					December				January					February				March				April					May					June				July				August					September				October					November				December				January					February				March				April				May
Weeks after NTP	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	
A. OVERALL PROJECT MANASGEMENT AND COORDINATION SERVICES																																																																																																								
Bi-Monthly Client Update Meetings, during design (assume 48)		M		M		M		M			M		M		M		M		M		M		M		M		M		M			M		M			M		M		M		M		M		M		M		M			M		M		M		M			M		M		M		M		M		M			M		M		M		M		M		M			M		M		M		M		M		M		M		M		M		CONSTRUCTION BEGINS
Schedule, budget and Invoicing (monthly)					D				D				D					D				D				D					D				D					D						D				D				D					D				D				D					D				D				D				D				D				D				D			D	
Project Kick-off Meeting			M																																																																																																						
B. INFORMATION REVIEW																																																																																																								
Data gathering (review of previous plans and data, models, permits)																																																																																																								
MWRDGC meeting for design criteria						M																																																																																																	
ComEd, Cable TV and other Utilities Meetings							M	M																																															M																																																	
C. SITE SURVEYS																																																																																																								
Site survey (topographic and utilities) and verifications (not easements)																																																																																																								
Geomorphic Stream Assessment (including review of previous design)																																																																																																								
BEHI erosion survey																																																																																																								
Survey of plants and brush (invasive evaluation) for clearing																																																																																																								
Photographic Recording of existing site conditions																																																																																																								
D. STREAMBANK STABILIZATION DESIGN - 30% PLAN																																																																																																								
Previously designed reach updates																																																																																																								
New reach design																																																																																																								
Identify properties to include/exclude																																																																																																								
Soil Borings (only 1 likely needed near the Orlan Brook Condo pool)																																																																																																								
Preliminary Stability Design																																																																																																								
30% plan submittal and Village/MWRD Review																										D																																																																															
Address comments from Village, MWRDGC and permitting agencies																														M																																																																										
E. STREAMBANK STABILIZATION DESIGN - 60% PLAN																																																																																																								
Design refinement																																																																																																								
Verify properties for inclusion/exclusion, send to PLS																																																																																																								
Planting and riprap sizing																																																																																																								
Draft specification development and revisions, draft design report																																																																																																								
60% Cost estimate (breakout of Village and MWRDGC costs)																																																																																																								
60% plan submittal and Village/MWRD Review																																													D																																																											
Address comments from Village and MWRDGC																																																		M																																																					
F. PUBLIC INVOLVEMENT AND EASEMENT PREPARATIONS																																																																																																								
Meetings with Village for coordinaiton for landowners and easements					M																			M													M																M																				M																															
Land survey of easements based on 60% design, and confirm at 90% design																																																																																																								
Easement exhibit preparations, refinements, and execution																																																																																																								
Public meeting (1)																																																									M																																															
Landowner and HOA meetings (assume 5)																																W																										M	M	M								V	V	V																		V	V	V																	
Present to Village Board of Trustees																																																																																			M														V									
G. PERMITTING COORDINATION AND SUBMITTALS																																																																																																								
Pre-application Meetings (up to 3 agencies at a time)																								M																													M																														M																					
Permitting Submittals, finalization and acquistion																							D																														D																															D																D				
H. STREAMBANK STABILIZATION DESIGN - 90% PLAN																																																																																																								
Value Engineering and Design finalization																																																																																																								
Design finalization																																																																																																								
Updates for Permits																																																																																																								
Finalize specifications																																																																																																								
90% Cost estimate (breakout of Village and MWRDGC costs)																																																																																																								
Prepare estimated construction schedule (Gantt)																																																																																																								
90% plan submittal and Village/MWRD Review																																																																																																	D																											
Prepare O&M costs for next 20 years																																																																																			D																					
Address comments from Village, MWRDGC and permitting agencies																																																																																	M																							
I. FINAL PS&E FOR BID																																																																																																								
MWRD and Village Review (determine properties for bid)																																																																																																								
Final PS&E for Bid																																																																																									D															
Assist Village with bid invitation and criteria																																																																																																								
Develop scope of construction engineering/observation																																																																																																								
Invitation to Bid Issued																																																																																																								
Assist Village in review of bids																																																																																																								

LEGEND:

- D Deliverable
- M Meeting attended or lead by Cardno Team
- V Additional Meetings lead by the Village (suggested by Cardno, per meeting fee)
- W Design Charette/workshop

- 30% Preliminary Design
- 60% Design Engineering
- 90% 90% Design
- F Final PS&E for Bid

Tinley Creek Streambank Stabilization

Appendix A

RESUMES

Cardno

Heather Schwar, PE

Current Position
Senior Water Resources Engineer

Discipline Area
> Streambank Stabilization and Stream Restoration Analysis and Design
> Hydrologic and Hydraulic Modeling
> Watershed Management
> Stormwater BMP Design

Years' Experience
21

Joined Cardno
2015

Education
> MS, Civil Engineering (Water Resources), University of Wisconsi Madison, 2002
> BS, Geological Engineering and Geology, University of Wisconsin-Madison, 2000

Professional Registrations
> Professional Engineer,
WI #38355-6
IL #062068101
MN #53062
IN #PE11500602
MI #6201063307
OH #80838
KY #31799
MO, #2017022063
FL #83128
LA #41831
WA #51377
NY #98347

Summary of Experience

Ms. Heather Schwar is licensed as a Professional Engineer in 12 states with more than 20 years of extensive experience and practice. She currently serves as a Principal and senior water resources engineer and project manager responsible for leading design and engineering services on watershed management and ecological engineering projects. Ms. Schwar primarily focuses on and manages water resource projects including streambank protection and stabilization, stream habitat restoration, floodplain studies and stormwater management projects. She has expertise in numerous hydrologic and hydraulic (H&H) models including Hydrologic Engineering Centers River Analysis System (HEC-RAS), Hydrologic Engineering Centers-Hydrologic Modeling System (HEC-HMS), XP-Storm Water Management Model (XP-SWMM), in addition to various GIS applications. Ms. Schwar has a proven record of managing large, complex projects and delivering them on-time and on-budget. She is a recognized project management leader within Cardno and provides internal training to staff through Cardno's Project Management Center of Excellence. Her technical knowledge along with her project management abilities provide the perfect blend for a project manager on complex water resources projects.

Selected Project Management Experience

Harwood Heights Stormwater Management Master Plan, Metropolitan Water Reclamation District of Greater Chicago. Ms. Schwar oversaw all aspects of the Stormwater Management Master Plan including client communication, community engagement process, modeling, oversight of the engineering alternatives and identification of potential projects, and presentation and delivery of the final stormwater plan. The project was completed on schedule, under budget and exceeded MWRD's minority, women, and small business participation goals.

Oakton Community College: Natural Area Restoration – Des Plaines. Cardno provided ecological restoration services across 80+ acres of woodlands surrounding the campus, including woody clearing, invasive species management, the creation and maintenance of a native prairie, and prescribed burns. Heather managed a team of up to eight restoration specialists and subcontractors in restoring and maintaining 74 acres of upland and floodplain forest and reconstructing 8 acres of prairie with a $500,000 budget.

City of Sterling's Riverfront Revitalization: Green Infrastructure Design/Engineering and Construction Oversight – Illinois. Ms. Schwar served as the project manager and provided engineering services during construction for this stormwater management project. Cardno designed a stormwater treatment train with ~13 acres of native prairie plantings to capture stormwater, create habitat, and provide a green space with a permeable paver plaza, raised planters and concrete benches for community use. Ms. Schwar addressed change orders including design modifications to the plaza due to the construction of a roundabout, redesign of a stormwater pond, stormwater modifications due to the removal of an adjacent building, oversaw the development of the Operations and Maintenance Plan and the close-out of the project and grant. Cardno assisted the City in securing funding from the State of Illinois through the Illinois Green Infrastructure Grant (IGIG) program and the Build Illinois Bonds program.

30th Street Corridor Wet Weather Relief Phase 1 Preliminary Engineering and Design, Milwaukee Metropolitan Sewerage District. With a previous firm, Ms. Schwar provided engineering support for the detention basins and storm sewer design during the design phase of the 30th Street North Corridor Project. The Corridor has been subject to significant flooding impacts due to numerous factors such as limited storm sewer system

capacity, and lack of defined and continuous overland flow paths. Ms. Schwar assisted the PM by assembling monthly invoices; organizing progress meetings; coordinating subconsultants for surveys and deliverables; and worked extensively with the public outreach subconsultant to host productive public, stakeholder, and design meetings. She also provided engineering support for detention basins, storm sewers and green infrastructure including engineering cost estimate and H&H modeling.

Significant Design Projects

Kinnickinnic River Habitat Rehabilitation, I-94 to Becher Avenue, Milwaukee Metropolitan Sewerage District. Cardno teamed to design and implement habitat improvements to address degraded aquatic habitat conditions in the upper portion of the Milwaukee Estuary Area of Concern on the Kinnickinnic (KK) River. This is one of the few stretches of the KK River that has natural bed and native banks remaining; however this reach does not sustain a viable aquatic habitat due to low dissolved oxygen levels, lack of flow and limited diversity of channel morphology. Improvements to these conditions will improve fish passage to the upper reaches and tributaries of the KK River Watershed as well as improve the water quality of the Milwaukee Estuary. Cardno designed and oversaw construction of 165 linear feet of bank stabilization and habitat structures which included tree root wads, toe wood, stone, and in-channel habitat boulders along the KK River. Cardno also provided upland habitat improvements including herbicide treatment of approximately 1900 square feet of invasive weeds. Ms. Schwar led the technical design for streambank stabilization and riparian habitat restoration plans and assisted with construction oversight.

Skunk Creek Stream Restoration and Bank Stabilization Project – Carlton County, Minnesota. The Carlton County Transportation Department hired Cardno, along with our subconsultant, Northflow, to develop a design to restore 200 feet of Skunk Creek and stabilize two severely eroding banks that threaten the integrity of County Road 103. Through the use of Natural Channel Design principles, Cardno has surveyed the project sites and will use reference reach data to develop a stable dimension, pattern, and profile for Skunk Creek. Future design elements include removing the existing pipe, creating a floodplain with a meandering channel, and installing grade control and woody habitat structures such as toewood and log vanes to provide enhanced aquatic habitat for trout and other aquatic organisms. As the Project Engineer, Ms. Schwar assisted with the design and construction plan set for the stream restoration and stabilization.

Little Mac Ravine Stabilization and Restoration Planning, Design, and Construction – Michigan. Cardno was contracted to design and permit stream restoration of the existing Little Mac Ravine and stream channel within the Grand Valley State University, Allendale Campus, to prevent catastrophic slope failure at an elevation consistent with the profile before campus construction. The design was achieved beginning with a Level II morphological survey that was performed in the existing channel and in a reference reach. The design incorporates a continuous series of step pools consisting of a boulder vane-pool-glide-riffle sequence that has similar dimensions to those measured in a reference reach. The boulder vanes serve to hold the finer substrates in position and are sized to withstand greater velocities than 100 year discharges. The drop into the pools off the boulder vanes serves to dissipate energy, while the pool provides a place to install woody debris into the channel to increase habitat value. The glide and riffles transition the grade to the next boulder vane. Permits were issued in March 2017 and construction was completed in July 2017. Cardno will provide stream monitoring for three years. Ms. Schwar led the design, performed the hydraulic analysis including sizing of structures and rocks and provided engineering oversight on the design plans and specifications.

Ross St. Clair, PE

Current Position
Water Resources Engineer

Discipline Areas
> Stream and Wetland Restoration
> Hydrologic and Hydraulic Analysis
> Stormwater Design and Management
> Regulatory Compliance
> Environmental Site Assessments
> Construction Site Inspections

Years' Experience
8

Joined Cardno
2019

Education
> BS, Agricultural Engineering, Purdue University, 2013

Professional Registrations
> Professional Engineer,
IN #11900351
MI #6201068787
IL #062.071739
SC #34848
NC #048593
OH #85371

Certifications
> North Carolina State University River Courses Certificate (Stream Design, Modeling, and Construction Courses)

Summary of Experience

Mr. Ross St. Clair is licensed as a Professional Engineer in six states. He is a water resources engineer with experience in stream, shoreline, and wetland restoration hydrologic and hydraulic (H&H) modeling, site survey, stormwater design and management, and construction monitoring and oversight. He is skilled in using AutoCAD Civil 3D, Autodesk Storm and Sanitary Sewer Analysis, Hydrologic Engineering Centers – Hydrologic Modeling System (HEC-HMS), Hydrologic Engineering Centers – River Analysis System (HEC-RAS), Flow/Culvert Master, and ArcGIS.

Significant Projects with Cardno

Water Resources Engineer – Yellow River Restoration– Knox, Indiana

Mr. St.Clair is managing a design effort to stabilize and restore 9,000 linear feet of Rosgen F channel with severely eroding high cut sand banks. The design, currently at ninety percent level and being permitted, incorporates bank and inside floodplain grading to achieve reference channel dimension and incorporates constructed riffles, j-hooks, toewood, and boulder glide structures to establish proper bedform and bankfull slope throughout the reach. Phase I construction is estimated at 1.9 million dollars.

Water Resources Engineer – Kunze Creek Stream Restoration – Tawas City, Michigan

Mr. St.Clair is managing a design-build project to restore approximately 1,000 feet of previously channelized stream north of Tawas Lake. Utilizing a series of log vane structures, the restoration will reintroduce a meander pattern to the stream, provide enhanced streambed and flow diversity and, create fish habitat.

Water Resources Engineer – Deeds Creek Feasibility Study– Warsaw, Indiana

Mr. St.Clair is managing a feasibility study to assess channel stability and identify feasible restoration and wetland creation locations along 16 miles of a largely agricultural drainage through Kosciusko County, Indiana. Cardno is identifying and prioritizing critical reaches utilizing the BANCS streambank erosion model. Cardno is coordinating with landowners, City and County officials, local NRCS, and state agencies to complete the study and secure future funding for implementation projects.

Water Resources Engineer – Dinwiddie Ditch Stream Relocation– Lake County, Indiana

Mr. St.Clair is leading design efforts to relocate and enhance approximately 4,000 feet of agricultural drainage to accommodate future expansion of a local stone quarry. The project will relocate the channelized and severely eroded farm ditch and create a two-stage drainage with wide flood benches and enhanced native plantings to provide both water quantity and quality benefits for the watershed.

Water Resources Engineer – Highlands Stream Daylighting – Grand Rapids, Michigan

Mr. St.Clair is currently leading design efforts to daylight approximately 2,200 feet of headwater stream. This stream daylighting is part of a multiphase restoration of a former municipal golf course to nature area, which includes numerous wetland restorations, emergent and prairie native plantings, and walking trails.

- OSHA 40-hour HAZWOPER with Annual Refreshers
- South Carolina Certified Erosion and Sediment Control Inspector, No. 10842
- Master Rain Gardener Certification, Clemson Extension

Water Resources Engineer – Pike Lake Shoreline Restoration – Warsaw, Indiana

Mr. St.Clair is managed a design, permitting and construction effort to stabilize and restore 1,900 feet of degraded shoreline along Pike Lake. Cardno utilized a combination of glacial stone, native riparian plantings, vegetated soil lifts and invasive species treatment to provide shoreline restoration appropriate for the multiple types of shoreline present.

Water Resources Engineer – St. Joe River Bank Stabilization – South Bend, Indiana

Mr. St.Clair managed a design effort to stabilize nearly 1,000 feet of highly eroded banks along the St. Joe River in South Bend. Eroded banks in excess of 45 feet tall are eroding and migrating downstream as the result of stream realignment upstream. *Solutions will include rock toe, rock vanes, bank grading and native vegetation.*

Water Resources Engineer – Oak Ridge Landfill Stream Relocation – Logansport, Indiana

Mr. St. Clair managed a stream relocation effort of 2,000 feet of intermittent stream for mitigation related to a planned landfill cell. The design phase included watershed assessment, reference reach survey, hydrologic and hydraulic modeling, and construction document preparation. Step-pool structures and constructed riffles were designed to traverse the steep site terrain and unique site conditions.

Water Resources Engineer – Sultan's Run Golf Club Stream Mitigation – Jasper, Indiana

Mr. St.Clair led a mitigation effort to offset stream impacts as the result of condominium construction. The mitigation effort included enhancement of 1,900 feet of previously channelized agricultural ditch. The design redefined and enhanced the poorly defined riffle-pool sequence by deepening pools and installing Newbury Constructed Riffles. Toe wood was utilized throughout to protect higher risks sections of stream bank.

Water Resources Engineer – Crosby Run Creek Stream Stabilization –Valparaiso, Indiana

Mr. St.Clair managed the survey and design efforts for 900 feet of urban stream stabilization required as a result of upstream sewer separation and increased storm water flows through the project site. The design included enhancement of riffles and pools, grading of adjacent flood bench, stone toe and establishment of native grass vegetation.

Significant Projects with Previous Firm

Water Resources Engineer – Hunting Boy Stream Restoration – Robbinsville, North Carolina

While employed with another firm, Mr. St. Clair performed a stream assessment, reference reach survey, and wetland survey for a Priority One restoration of 1,600 feet of native trout fishing stream and a 2-acre wetland enhancement. He modeled existing and proposed conditions using HEC software to ensure proper restoration design; reconfigured the stream and floodplain to return the existing braided system to a single-channel trout stream; and coordinated with the North Carolina Department of Transportation (NCDOT) and USACE to complete permit applications to satisfy regulatory requirements.

Aqua Vitae

Gary Paradoski, PE, CPESC President

Gary has 30 years of experience in land surveying, field studies, acquiring and administering permits, preparation of construction documents and specifications, and construction observation. He routinely performs design and oversight of natural resources, green infrastructure, and water quality projects. Aspects of these projects include underground utilities, stream stabilization and ecosystem restoration, Best Management Practices (BMPs), hydrologic & hydraulic studies, water quality monitoring & analyses, erosion & sediment control, and sustainable storm water management. He engages stakeholders regarding sustainable engineering practices, including low-impact development (LID) and agricultural nutrient management.

Education

B.S. in Civil Engineering – Construction, Lawrence Technological University, 1996

U.S. Army Surveyor Advanced Training, 1989

Registration

Professional Engineer: WI, IL, IA, KS, MI, MO, MS, TX

CPESC

Affiliations & Certifications

ASCE Sustainability Committee

IDOT Documentations

Tinley Creek, Midlothian Creek and Calumet Union Drainage Ditch (Cook County, IL)
Project Manager and Lead Design Engineer. $1.7M design for bank stabilization and flood risk reduction along over a combined 7,800 lineal feet of suburban streams. Project area consists of degraded and eroded banks threatening infrastructure, causing frequent flooding, and impairing water quality. Project includes extensive coordination with the Metropolitan Water Reclamation District of Greater Chicago (MWRD) as well as the U.S. Army Corps of Engineers (USACE), Illinois Department of Natural Resources Office of Water Resources (IDNR-OWR), local municipalities and surrounding residents. Project goals and priorities are a direct result of comprehensive watershed management planning for the Cal-Sag Channel and the Little Calumet River.

Elm Woods Stream Stabilization and Oak Regeneration Program (Lake County, IL)
Selective clearing and repurposing of oak trees that serve as grade controls along over 3,000 linear feet of ephemeral stream to protect historic, high quality flatwoods within an Illinois Nature Preserve. Project is an initial phase of a large, $3M project for the Southern Des Plaines River Preserves to enhance a series of hydraulically connected sites. Major initiatives focused on stabilizing woodland structure, restoring age/size class distribution of native trees, restoring historic drainage patterns, replacing native species, and enhancing breeding areas for birds, amphibians, small mammals, and reptiles.

Lynn Plaza Stream Bank Stabilization (Wheeling, IL)
Stream bank stabilization along the Wheeling Ditch to protect existing infrastructure, including a parking lot delivery access for the adjacent shopping center, using rock vane bio-engineering techniques and riprap rock toe to stabilize the bank from surface sliding and toe scour. The project included design-build construction documents, and comprehensive permitting/consultation with various regulatory agencies including the U.S. Army Corps of Engineers (USACE), Illinois Department of Natural Resources Office of Water Resources (IDNR-OWR), Metropolitan Water Reclamation District of Greater Chicago (MWRD), North Cook County Soil & Water Conservation District, and the Village of Wheeling.

Fresh Coast Protection Partnership Green Infrastructure Certification (Milwaukee, WI).
Third-Party Inspector of Record (TPIR) for inspection of green infrastructure construction and certification of 8.45M gallons of runoff reduction within the MMSD District on private developments.

Aaron Steber

Current Position
Senior Consultant

Discipline Area
> Stream/Shoreline Restoration Design and Project Management
> Stream Survey/Assessment
> Road Streams Crossings
> Watershed Assessment and Planning
> ERSRI ArcGIS, EPA SWMM, WinSLAMM, RiverMorph
> Application of the Rosgen Natural Channel Classification System and Natural Channel Design
> Permit and Grant writing/management
> Erosion control design and management
> Habitat restoration planning, design, installation and management
> Geographic Information Systems (GIS) analysis and cartography
> Riparian PFC Assessments

Years' Experience
17

Joined Cardno
2008

Education
> MS, Hydrology and Watershed Management,

Summary of Experience

Mr. Aaron Steber is a stream restoration specialist managing streambank/shoreline stabilization and habitat enhancement projects including project planning, design, grant administration, permitting, and construction oversight. He has more than 17 years of experience working with streams located in Wisconsin, Minnesota, Illinois, Iowa, Michigan, Ohio, Colorado, Montana and Idaho, as well as internationally in Finland and Costa Rica. Mr. Steber conducts geomorphic surveys to review channel morphology/ stability, and works with computer modeling software to assess the most effective methods of managing available water resources in designated areas. He also provides design and construction oversight for aquatic organism passage, stormwater and water quality improvement projects, in addition to wetland, watershed and lake studies.

Significant Projects

Project Manager – 2017 Pheasant Branch Streambank Restoration and Habitat Enhancement Project North of Century Avenue – Wisconsin

Cardno was hired by the City of Middleton to stabilize over 1,000 linear feet of severely eroding streambanks and eroded steep slopes using ecologically sensitive techniques along Pheasant Branch Creek streambank north of Century Avenue. Mr. Steber was the project manager responsible for providing design, permitting, and construction oversight.

Stream Designer – Skunk Creek Stream Restoration and Bank Stabilization Project – Minnesota

The Carlton County Transportation Department hired Cardno, along with our subconsultant, Northflow, to develop a design to restore 200 feet of Skunk Creek and stabilize two severely eroding banks that threaten the integrity of County Road 103. Through the use of Natural Channel Design principles, Cardno has surveyed the project sites and will use reference reach data to develop a stable dimension, pattern, and profile for Skunk Creek. Future design elements include removing the existing pipe, creating a floodplain with a meandering channel, and installing grade control and woody habitat structures such as toewood and log vanes to provide enhanced aquatic habitat for trout and other aquatic organisms. Mr. Steber assisted with stream design on the project.

Project Manager – Indian Creek Streambank Stabilization Project – Illinois

Cardno restored nearly 2,000 linear feet of eroding streambank along Indian Creek in Lake County, Illinois. Cardno completed channel surveys of this entire reach and developed a streambank stabilization design using bioengineering techniques to reduce the sediment load from the banks and upland areas to the creek. Cardno worked with the client to complete all the necessary permitting and provided construction services to install stream energy dissipation structures and integrated bank treatments, including rootwad composites, cross-vanes, and single arm vanes. Mr. Steber was the project manager responsible for design and construction oversight.

Project Manager – Newburg Creek Habitat Enhancement Project – Minnesota

Minnesota Trout Unlimited sought to enhance the quantity and quality of trout habitat in and along Newburg Creek, located in Fillmore County in southeastern Minnesota. To help Minnesota Trout Unlimited achieve this goal, Cardno developed a design for approximately 2,400 feet of stream to reduce stream bank erosion and sedimentation to the stream while also increasing brook trout habitat by creating deep pools and providing

University of Minnesota, 2005
> BS, Water and Soil Resources, University of Minnesota, 2002

overhead bank cover. Upland areas near Newburg Creek were seeded in a native oak savanna seed mix to help restore the uplands containing mature oak trees. Cardno completed the design, regulatory permitting, and construction oversight for the project. Mr. Steber was the project manager responsible for design, permitting and construction oversight.

Yahara River Streambank Stabilization – Wisconsin

Cardno developed and implemented low cost environmental approaches to increase bank stability and enhance habitat along the Yahara River in DeForest, Wisconsin. Bio-stabilization techniques in the design planset included: bankfull bench grading, rootwad composites, toewood stabilization and a canoe launch. Cardno also provided construction oversight. Mr. Steber assisted in stream stabilization design and lead construction oversight.

Project Manager/Design Lead/Construction Manager – Tiedeman Pond Water Quality and Habitat Enhancement Project – Wisconsin

Cardno applied for grants, designed and led construction of this habitat enhancement project designed to improve water quality in Tiedeman Pond, and ultimately Lake Mendota, while implementing increased outdoor educational and recreational opportunities on lands open to the public for the City of Middleton in Dane County, Wisconsin. Mr. Steber was project manager, lead designer, and construction manager.

Construction Manager – Blackhoof River Stream Restoration Project Phase I – Minnesota

Minnesota Trout Unlimited sought to enhance the quantity and quality of trout habitat in and along the Blackhoof River in Carlton, Minnesota. To help Minnesota Trout Unlimited achieve this goal, Cardno developed a design for approximately 900 feet of stream to move the channel away from two actively eroding 40 foot high collapsing slopes, reducing stream bank erosion and sedimentation to the stream. Cardno completed the design, regulatory permitting, and construction oversight for the project. The project was funded by the grant proceeds from the State of Minnesota's Lessard-Sams Outdoor Heritage Fund. Mr. Steber led the design and served as construction manager.

Design Lead/Construction Manager – Knife River Watershed Geomorphic Assessment and Stream Design and Construction Oversight – Minnesota

Cardno was contracted by Environmental Troubleshooters (ET) to provide technical guidance and support to the Lake Superior Steelhead Association's (LSSA) effort to assess multiple stream reaches for the potential for steelhead spawning, nursery, and overwintering habitat in the Knife River watershed. In 2016, Cardno was contracted by ET to complete the design and construction oversight of two reaches identified in the 2015 stream assessment report. Cardno developed a stream design using Natural Channel Design principles for approximately 2,000 linear feet of stream. Cardno provided on-site construction oversight to the ET construction team in late summer 2016. Mr. Steber was the lead designer and construction manager.

Certifications

> Rosgen Level IV: River Restoration and Natural Channel Design
> Rosgen Level III: River Assessment and Monitoring
> Rosgen Level II: River Morphology and Applications
> Rosgen Level I: Applied Fluvial Geomorphology
> 40-Hour OSHA HAZWOPER Certification
> 10-Hour OSHA Construction Outreach Certification
> OSHA General Industry Certification

Mark Pranckus

Current Position
Senior Consultant

Discipline Area
> Design and Construction of Agricultural and Urban Stormwater Management Techniques and Best Management Practices
> Natural Resource Management and Planning
> Design and Construction of Streambank and Shoreline Stabilization Projects and Stream Restoration Projects
> Physical and Biological Stream Surveying and Evaluation
> Fish and Invertebrate Sampling and Identification
> Regulatory Permitting, Local, State and Federal
> Native Plant Identification
> Restoration Methods Including Exotic/Invasive Species Control, Native Plant Installation, Erosion Control and Prescribed Burn Management

Years' Experience
17

Joined Cardno
2004

Summary of Experience

Mr. Mark Pranckus leads ecological restoration projects including stream restoration and native plant community restoration and acts as a technical lead for natural resource management projects. Mr. Pranckus leads engineering feasibility studies and manages constructions projects including stream restoration. He conducts physical and biological stream surveys, aquatic habitat assessments, and fish and invertebrate sampling and identification. Mr. Pranckus also leads and conducts macroinvertebrate, fishery, habitat, and water quality surveys; develops habitat and fisheries management plans, and leads with federal, state, and local permitting for stream and water-resource related projects. Additionally, he assists in the development of watershed management plans and aquatic resource management plans.

Significant Projects

Project Manager – Knife River Watershed Geomorphic Assessment and Stream Design and Construction Oversight – Minnesota

Cardno was contracted by Environmental Troubleshooters (ET) to provide technical guidance and support to the Lake Superior Steelhead Association's (LSSA) effort to assess multiple stream reaches for the potential for steelhead spawning, nursery, and overwintering habitat in the Knife River watershed. Cardno was contracted by ET to complete the design and construction oversight of two reaches identified in the 2015 stream assessment report. Cardno developed a stream design using Natural Channel Design principles for approximately 2,000 linear feet of stream. Cardno provided on-site construction oversight to the ET construction team. Mr. Pranckus was the project manager.

Project Manager – Blackhoof River Stream Restoration Project Phase I – Minnesota

Minnesota Trout Unlimited sought to enhance the quantity and quality of trout habitat in and along the Blackhoof River in Carlton, Minnesota. To help Minnesota Trout Unlimited achieve this goal, Cardno developed a design for approximately 900 feet of stream to move the channel away from two actively eroding 40 foot high collapsing slopes, reducing stream bank erosion and sedimentation to the stream. Cardno completed the design, regulatory permitting, and construction oversight for the project. The project was funded by the grant proceeds from the State of Minnesota’s Lessard-Sams Outdoor Heritage Fund. Mr. Pranckus was the project manager for design and permitting.

Project Manager – Miller Creek Streambank Restoration Design – Minnesota

Cardno was hired by the City of Duluth to complete a stream design to stabilize approximately 875 feet of eroding stream bank along Miller Creek in Lincoln Park The stream design stabilized the stream banks, preserved the character of the walls within the park and provided additional stream function and habitat. Cardno also completed a cultural resource investigation to determine the eligibility of the walls for the National Register of Historic Places and supported the Section 105 process with the City of Duluth and FEMA. Cardno led the permitting process, coordinating with state resource agencies, developing construction bid documents, and providing on-site construction oversight with Mr. Pranckus serving as the project manager.

Project Manager – Skunk Creek Stream Restoration and Bank Stabilization Project – Minnesota

Education

> MS, Biology, University of Minnesota-Duluth, 2004
> BS, Biology, Indiana University, 1996

Affiliations

> American Fisheries Society
> Indiana Chapter of AFS, Secretary/ Treasurer
> Indiana Lakes Management Society

The Carlton County Transportation Department hired Cardno, along with our subconsultant, Northflow, to develop a design to restore 200 feet of Skunk Creek and stabilize two severely eroding banks that threaten the integrity of County Road 103. Through the use of Natural Channel Design principles, Cardno has surveyed the project sites and will use reference reach data to develop a stable dimension, pattern, and profile for Skunk Creek. Future design elements include removing the existing pipe, creating a floodplain with a meandering channel, and installing grade control and woody habitat structures such as toewood and log vanes to provide enhanced aquatic habitat for trout and other aquatic organisms. Mr. Pranckus is the project manager.

Project Manager – Knowlton Creek Stream Restoration – Minnesota

Cardno assisted with the restoration of 5,800 feet of stream channel including 2,600 feet on Knowlton Creek and 3,200 feet on tributaries entering Knowlton Creek. Cardno provided one year of vegetation maintenance. Mr. Pranckus was the project manager.

Project Manager – St. Joseph Creek North Branch Streambank Stabilization Design/Build – Illinois

Cardno and their teaming partners Engineering Resource Associates (ERA) and Thornton Equipment were contracted by the Village of Downers Grove to complete a design/build project to stabilize approximately a combined 900 linear feet of streambank at three project sites. Site assessments, stream surveys, wetland delineations, and designs have been completed. Once permit applications are acquired, Cardno along with Thornton Equipment will construct the project. Cardno will also be responsible for post-construction vegetation maintenance and any required vegetation monitoring and reporting. As project manager, Mr. Pranckus coordinated the stream design, led the project permitting phase, and assisted with site supervision during construction.

Project Manager – Ferrettie-Baugo Creek Bank Stabilization – Indiana

Cardno was contracted by the St. Joseph County Park Department to design, permit, and construct a bank stabilization project on Baugo Creek at a highly used county park. Cardno employed bioengineering techniques to stabilize the bank and prevent further erosion that had the potential to cause significant park infrastructure damage. Prior to the beginning of the project, Cardno assisted the park department in acquiring grant funds to complete the project. Mr. Pranckus was the project manager responsible for the design, permitting, and construction of bank stabilization project at a highly used park in St. Joseph County, Indiana.

Project Manager – Baugo Creek NFWF Streambank Stabilization Design-Build – Indiana

The Elkhart County Drainage Board received a National Fish and Wildlife Foundation (NFWF) grant to reduce erosion and sedimentation and enhance fish and wildlife habitat at three project sites within the Baugo Creek watershed. At one site, approximately 90 feet of a streambank with bank heights of more than 25 feet were stabilized using a combination of rootwad structure and bench establishment to prevent the stream from undermining a county road. At a second site, approximately 1500 feet of stream bank was stabilized by installing five J-hook structures within the stream to re-direct channel flow away from eroding banks and provide increased habitat diversity through the creation of scour pools. Approximately 80 feet of streambank was stabilized at a canoe landing in Ferrettie Baugo Creek Park using a combination of rock toe and soil-encapsulated lifts. The St. Joseph County Park Department was also a project partner for one of the projects. As project manager. Mr. Pranckus was responsible for the design, permitting, and construction of three streambank stabilization projects on Baugo Creek to reduce erosion, sedimentation, and protect local infrastructure.

Timothy M. Meeks

Current Position
Senior Staff Scientist

Discipline Area
> Wetland and Stream Delineations
> Waters of the US Permit Applications
> Fish, Mussel, and Macroinvertebrate Sampling Techniques and Identification
> Stream Geomorphology Sampling and Habitat Quality Assessments
> Water Quality Sampling Procedures In Streams and Lakes

Years' Experience
11

Joined Cardno
2014

Education
> MS, Parks and Natural Resource Management, Slippery Rock University, 2008
> BS, Environmental Science, Bethany College, 2006

Summary of Experience

Mr. Timothy (Tim) Meeks is a wetland scientist with 11 years of experience in wetland delineations and linear facility studies. He has completed environmental surveys and inventories for facilities including pipelines, roadways, coal mine expansions and residential development. He is experienced in stream delineations and habitat assessments of streams and riparian zones. Mr. Meeks is also experienced in stream and groundwater hydrology monitoring, benthic macro invertebrate sampling, identification, and community assessments, as well as fish community sampling and assessments. He has completed permit applications for Waters of the U.S. under the Clean Water Act 404 and 401, as well as Indiana Department of Environmental Management Isolated Wetlands Program permitting and mitigation plans for purposed impacts.

Significant Projects

Environmental Services for 80/90 PUSH Project – Indiana

As a subcontractor to Rieth-Riley Construction Company, Cardno is providing all environmental support for the 80/90 PUSH Project over a several year period including: wetland delineations for the entire Indiana Toll Road; wetland permitting for bridge replacement, roadway replacement and 200 miles of fiber option line installation; floodway permitting for bridge replacement and fiber optic line installation, soil erosion permits and inspections; and protected species and NEPA work as required. The $200 million project undertaken by the Indiana Toll Road Concession Company (ITRCC) will rehabilitate 73 miles of pavement and 53 bridges along the Indiana Toll Road, from Lake Station (milepost 20) to Elkhart (milepost 93). Mr. Meeks assists with permitting and field surveys.

Senior Staff Scientist– Confidential Energy Company – Indiana, Illinois, Iowa, and Kentucky

Cardno has a master contract with a major energy company for a variety of ecological services at their power generation facilities and along their transmission lines. Provided services consist of wetland delineations, line environmental assessments, endangered species survey and review, cultural resources survey and desktop reviews, storm water pollution prevention plans, permitting and agency coordination.

Senior Staff Scientist – The Troyer Group – Indiana

Cardno has been contracted several times to conduct waters and wetlands delineation investigations for potential state and local roadway expansion and enhancement projects led by the engineering firm of The Troyer Group throughout northern Indiana. As Senior Staff Scientist, Mr. Meeks is responsible for conducting these investigations, reporting, and permit advisory guidance.

Senior Staff Scientist – Metropolitan Water Reclamation District of Greater Chicago Wetland Submittal Permit Application Reviewer Project – Illinois

In 2015, Cardno was retained by the Metropolitan Water Reclamation District of Greater Chicago (MWRDGC) to provide wetland review specialist services to assist the MWRDGC with reviewing compliance with the Watershed Management Ordinance and Submittal Permit Application. In this role, Cardno staff review and evaluate Watershed Management Wetland Submittal Permit Applications, delineation reports, impacts, mitigation plans, and other documentation related to wetlands, buffers, and riparian

environments. As Senior Staff Scientist, Mr. Meeks was responsible for the review of delineated wetland surveys and reports and the MWRD Schedule W application documents.

Senior Staff Scientist – Merrillville 86th Street Extension – Indiana

Cardno provided comprehensive environmental studies and surveys to identify sensitive areas containing biological and cultural resources and lead permit applications for waters of the U.S. impacts. Cardno biologists delineated wetlands. Cardno archaeologists and architectural historians conducted cultural resources surveys and reports. As Senior Staff Scientist, Mr. Meeks was responsible for the delineated wetland surveys and reports, and project lead on application process for environmental impacts.

Senior Staff Scientist – Dakota Access Pipeline Project (DAPL) – Illinois

Cardno was hired by Energy Transfer Partners, LP to assist with permitting the Illinois segment of a new interstate crude oil pipeline that passes through over 210 miles of Illinois to an existing terminal. Cardno provided comprehensive environmental studies and surveys to identify sensitive areas containing biological and cultural resources. Cardno biologists delineated wetlands, conducted stream and pond surveys; assessed threatened and endangered species habitat; and conducted bat, listed plant, and mussel surveys. Cardno archaeologists and architectural historians conducted cultural resources surveys and reports. Cardno also provided strategic guidance on National Environmental Policy Act and Section 106 of the National Historic Preservation Act for the project. As Senior Staff Scientist, Mr. Meeks was responsible for stream and wetland delineations. Data sheet reports and QA/QC of mapping and data reporting.

Senior Staff Scientist – Confidential Client, Chicago Market Expansion Project – Illinois

In response to a request from a confidential client, Cardno completed a combined Phase I archaeological and history/architecture literature review and reconnaissance survey over three properties where a potential natural gas compressor station was to be installed in Livingston, Illinois. The three project areas each measured approximately 20 acres in size, and were surveyed by cross-trained archaeologists and architectural historians to identify both above-ground (historic architectural) and below-ground (archaeological) cultural resources and ensure that the project was fully compliant with Section 106 of the National Historic Preservation Act (NHPA). Following completion of the surveys, Cardno made recommendations to the client regarding which parcel was least impactful to cultural resources, and completed State Historic Preservation Office and tribal consultation for the project. Each of the properties yielded a combination of above- and below-ground cultural resources; however, Cardno was able to recommend one parcel where impacts to these resources could be avoided by placing the compressor station within a particular area. The project was able to move forward with minimal delay in part as a result of these recommendations. As Senior Staff Scientist, Mr. Meeks conducted environmental surveys.

Certifications

- Wetland Delineation Certification, The Swamp School, 2012
- 40-Hour OSHA HAZWOPER Certification
- Waters of the US Update Seminar, The Swamp School, December 2, 2016
- Stormwater ONE- CI219: Qualified Compliance Inspector of Stormwater (QCIS), Indiana, September 2016

Karl Finke, P. E., R.G.
Project Director I

Experience
- Andrews: 16 years
- Other Firms: 9 years

Education
- B.S. – Geological Engineering
  University of Missouri, Rolla
- M.B.A. – Columbia College

Professional Registration
- P.E.: IL, MO
- R.G.: MO

Certifications
- OSHA 40-hr Hazardous Waste Site Worker
- OSHA 30-hr Construction Industry
- MSHA Part 46 Certification Training
- Permit Required Confined Space Entry
- First Aid / CPR
- Nuclear Gage Safety Training
- Nuclear Radiation Safety Officer

Mr. Finke serves as a Project Director for Andrews Engineering and specializes in geotechnical and environmental work, ranging from seismic slope stability to groundwater hydrology and statistics. Mr. Finke has served as an expert witness regarding various environmental issues, including fate and transport of contaminated groundwater and the applicability of historical state and federal regulations.

Prior to joining Andrews Engineering, Mr. Finke served as an Engineer in the Solid Waste Management Program for the Missouri Department of Natural Resources (MDNR). While with MDNR, Mr. Finke assisted in the development of the risk-based correction groundwater rule and the current solid waste management regulations and technical guidance documents, including but not limited to; Static and Seismic Slope Stability for Solid Waste Containment Facilities, and Guidance for Preparing a Statistical Analysis Plan. Mr. Finke also participated in the Solid Waste Management Program's rule revisions of the Detailed Hydrogeologic Site Investigation for landfills.

Representative Project Experience

Peabody Energy – Francisco Mine, Francisco, Indiana.
Mr. Finke's duties at this ongoing jobsite include assisting in the development of the plan for exploratory drilling in order to obtain the geotechnical parameters of the in-situ materials to modify the client's conceptual design as well as perform multiple static and seismic slope stability analyses, including deformation analysis for a slurry impoundment to obtain an MSHA and IDM permit.

Peabody Energy – Gateway Mine, Coulterville, Illinois.
Mr. Finke performed static and seismic slope stability analyses, including upstream construction for Phases 5 and 6 of the Client's existing Cell 3 slurry impoundment. Andrews Engineering performed further evaluation of Phases 5 and 6 for confirmation of the action levels based upon site-specific information. Andrews Engineering performed static and seismic slope stability analyses for the Cell 5 Phase 2 slurry impoundment, including deformation analysis.

Cascade Plastics – Truesdale, Missouri.
Mr. Finke oversaw a geotechnical site exploration for the construction of a 30-foot long pad for three silos. The geotechnical exploration included Shelby tube sampling, unconfined compressive strength testing, and split-spoon blow counts. Using the compiled data, Mr. Finke drafted a report detailing the structural stability of the underlying soils. Additionally, he performed a subgrade inspection during excavation.

Energy Systems Group – Munster Landfill, Munster, Indiana.
Mr. Finke provided the geotechnical analysis for the foundations of the Landfill Gas to Energy Facility at the Munster Landfill. He developed and oversaw the geotechnical exploration and laboratory testing of the foundation materials to provide the strengths of materials for foundation design for the construction of a skid mounted transformer, generator, evaporative cooler, chillers, gas blower and flare, a sulfatreat tank and a

retaining wall. Mr. Finke oversaw a geotechnical site exploration that included Shelby tube sampling, unconfined compressive strength (Rimac) testing, and split-spoon blow counts.

Warren County Road Shed – Geotechnical Exploration and Subsurface Evaluation, Warren County, Missouri.
Mr. Finke performed a geotechnical exploration and subsurface evaluation for a 3,750 square foot, single story, slab-on-grade, steel frame maintenance building. The subsurface exploration included split-spoon blow counts and unconfined compressive strength testing.

FWS Land Strategies – Cooperative Way Soils Investigation, Wright City, Missouri.
Mr. Finke performed a soils investigation for the anticipated future construction of a new warehouse, expansion of an existing warehouse, driveways, parking lots, and dock areas on two separate lots within the same industrial park. The subsurface exploration included unconfined compressive strength testing.

Montgomery County Water – Water Tower #2 (CertainTEED), Jonesburg, Missouri
Mr. Finke's duties included geotechnical drilling oversight and the creation of a geotechnical report. He also performed a subgrade inspection prior to the pouring of the concrete foundation to confirm that there was no significant deviation from the geotechnical report for an approximately 230-foot tall, 300,000-gallon water tower adjoining the CertainTEED site.

Meadowview Theatre Classic Cinemas – Geotechnical Exploration and Subsurface Evaluation, Kankakee, Illinois.
Mr. Finke performed a geotechnical exploration and subsurface evaluation for a 16,850 square-foot expansion at the Meadowview Theatre Classic Cinemas. The expansion intends to re-use the foundation of an existing building onsite to reduce costs, but which requires less settlement of the new foundation to equal the performance of the existing foundation. The subsurface exploration included split-spoon blow counts, soil classification, moisture content and unconfined compressive strength testing. The final report provided the geotechnical design parameters such as the recommended foundation design with net allowable bearing pressure of the insitu soils, the anticipated settlements, lateral earth pressures, compaction requirements, the seismic design category with the site specific seismic response, and the OSHA soil types for excavations.

Kedzie Avenue Transfer Station Design and Permitting – Chicago, Illinois
Mr. Finke oversaw a geotechnical site exploration for the construction of a large steel framed building (approximately 100,000 square feet) with adjacent loading docks, driveways and parking lot. The subsurface exploration included split-spoon, Shelby tubes, soil classification, moisture content, dry unit weight, Atterberg limits and unconfined compressive strength testing. The final report provided the geotechnical design parameters such as the recommended foundation design with net allowable bearing pressure of the insitu soils, the anticipated settlements, compaction requirements, the seismic design category with the site specific seismic response, and the OSHA soil types for excavations.

Incline Village Lake Sediment Mitigation Feasibility Study – Foristell, Missouri
Mr. Finke conducted a feasibility study for alternate methods to reduce/minimize sediment loading within the main lake body to reduce/alleviate the need for frequent lake-wide dredging. He reviewed numerous engineering controls and determined that the construction of a forebay within the upper reach of Incline Lake would be the most cost effective, easiest for permitting and least expensive alternative for the foreseeable future.

Steven Edwards, P.E.
Project Engineer

Experience
- Andrews: 5 years
- Other Firms: 6 years

Education
- B.S. – Civil & Environmental Engineering
  Missouri University of Science and Technology

Professional Registration
- P.E.: IL

Certifications
- OSHA 40-hr Hazardous Waste
- OSHA 10-hr Construction Industry
- RCRA Hazardous Waste Generator

Accolades
- Illinois Society of Professional Engineers 2020 Young Engineer of the Year

Mr. Edwards serves as a Project Engineer for Andrews Engineering and specializes in site development and utility design and permitting.

His primary responsibilities include SWPP and SPCC plans, developing site plans with engineering controls to meet State and local regulations, oversight of drainage projects, and developing and permitting for watermain replacements.

Mr. Edwards also has design and permitting experience related to solid waste, environmental/remediation, industrial, and transportation projects, as well as performing construction oversight and quality assurance activities.

Representative Project Experience

Illinois American Water Company Watermain Replacement Projects – Pontiac, Homer Glen & Wheaton, Illinois

Mr. Edwards performed the design of the replacement of 1,200-ft of 8" ductile iron water main pipe along IL-116 in Pontiac, IL. Responsibilities included working with Illinois American Water to establish proper alignment, permitting through IL-EPA for the installation of the new water main, permitting with IDOT for work within the state right-of way and coordination with the City of Pontiac for construction approval within the City limits. Andrews also provided construction oversight which included on-site observation and as-built surveying. The as-built survey data was then compiled and provided to Illinois American Water as a final deliverable. Mr. Edwards provided the engineering design and permitting services.

Mr. Edward completed the design and permitting phases for the placement of 1,750 LF of 12-inch water main along 151st St. and Will-Cook Rd. in the Chicago-Metro Homer Glen Service Area; as well as 2,600 LF of 8-inch water main along Jerome Avenue, Herrick Drive, Jewell Road and Woodland Drive in the Wheaton Service Area. Tasks included topographic surveying of areas of rights-of-way, oversite of a geotechnical study and preparation of a summary report, and preparation and submission of applications for all local, state and federal permits, preparation of design drawings for all engineering disciplines, preparation of technical specifications, preparation of Engineer's Estimate of Probable Construction Costs, as well as providing bidding assistance.

AGL Hudson Station – Drainage Improvements, Hudson, Illinois

Mr. Edwards oversaw the installation of drainage improvements including 4,000 LF of 8" forcemain pipe, lift station, detention basins, piping and manhole structures. The site needed to address existing flooding issues by expanding and updating the drainage system. Responsibilities include site visits, determination of drainage interaction and in-field design modifications while addressing unknown utility conflicts.

Brackenbox Roll Off Service, Inc. – NPDES Permit, SWPP Plan, and SPCC Plan – Markham, Illinois and Riverdale, Illinois
Mr. Edwards is responsible for filing an NPDES Permit with the IL-EPA on behalf of this client to allow the lient to discharge industrial stormwater runoff from the site. Additionally, he is has developed both SWPP and SPCC Plans for the client's Markham site. These tasks require Mr. Edwards to perform site visits, identify all potential sources of pollution that may affect the quality of stormwater discharge, and develop preventative solutions to keep potential pollutions from leaving the site utilizing engineering practice and approved IEPA standards. He must also submit applications (including area calculations) on behalf of the client to the Illinois EPA and obtain plan approval from the IL-EPA.

Five Oaks Landfill – NPDES Stormwater Modeling, Taylorville, Illinois
Mr. Edwards developed a stormwater runoff model for a ±234-acre landfill consisting of eight outfall locations to conform to the sampling requirements of the IL-EPA NPDES permit held by the facility. The site needed an accurate model of determining when a rainfall event would produce a runoff amount that would necessitate sampling per the requirements of the NPDES permit language. Responsibilities include site visits, determination of drainage interaction and model creation.

Anthony Liftgates – Building Expansion, Pontiac, Illinois
Mr. Edwards is responsible for the design and oversight of site construction activities including the design specifications, stormwater management, utilities locations and regulatory permits from the City of Pontiac and IL-EPA. The building expansion required the development of a stormwater detention basin with associated piping to route runoff and control the release into the City storm-sewer network. Responsibilities include site visits, construction quality assurance and liaison between regulatory agencies.

Village of Irwin Stormwater Drainage Network Design – Irwin, Illinois
Mr. Edwards was responsible for conducting a review of the flood prone areas in the Village of Irwin and designing a stormwater structure network to replace the existing pipes along the main road in the Village. A topographic survey of the existing conditions was performed to complete the calculations and design. Based on the calculations, plans were developed for use in the construction and permitting process.

Timberlane Apartment Complex Stormwater Drainage Network Design – Peoria, Illinois
Mr. Edwards was responsible for conducting a review of the flood prone areas at the Timberlane Apartment Complex in Peoria, Illinois. A new stormwater structure network was proposed to replace the existing structures that were no longer serviceable. A topographic survey of the existing conditions was performed to complete the calculations and design. Based on the calculations, plan were developed for use in the construction and permitting process.

Exxon Mobil Catch Basin Investigation – Cicero, Illinois
Mr. Edwards was the design engineer for this project, which consisted of abandoning approximately 100-ft of 8" storm sewer pipe and replacing with approximately 30-ft of 8" ductile iron pipe. Tasks included excavation, pipe placement, and concrete pouring. Mr. Edwards coordinated all design, permitting, and construction quality assurance activities.

NPL Watermain Permitting – Chicago, Illinois
Mr. Edwards developed drawing details to be used for the installation of watermain and sewer pipe. The details were location specific and Mr. Edwards was the engineer responsible for ensuring each location was consistent with Illinois EPA regulations.

Chad Nelson
Engineering Technician III

Experience
• Andrews: 26 years

Education
• Computer Aided Drafting Certificate
  Kankakee Community College

Certifications
• OSHA 40-hr Hazardous Waste
• OSHA 10-hr Construction Industry
• Nuclear Density Gauge Operator
• IDOT Hot Mix Asphalt Level I & II
• IDOT / PCC Level 1 Technician
• IDOT ACI Concrete Testing Grade 1
• IDOT Mixture Aggregate Technician
• IDOT STTP-S33 Soils Field Testing
  And Inspection
• MSHA Part 48B
• Transportation Worker Identification
  Credential (TWIC)

Mr. Nelson serves as an engineering technician and survey crew chief for Andrews Engineering, and is experienced in a variety of field tasks.

His experience in land surveying includes residential and commercial properties, involving boundary control, topographic surveys, ALTA surveys, and vertical control.

His civil construction inspection experience includes concrete testing, site grading for commercial and residential development and underground utility installation.

In addition, he has performed at state of the art landfills for mass excavation, structural fill, clay liners, synthetic liners, geotextile stabilization and landfill leachate collection systems, as a surveyor, technician, and Construction Quality Assurance (CQA) officer.

Representative Project Experience

Village of Irwin Stormwater Drainage Network Design – Irwin, Illinois
Andrews was contracted to conduct a review of the flood prone areas in the Village of Irwin and design a stormwater structure network to replace the existing pipes along the main road in the Village. Mr. Nelson performed a topographic survey of the existing conditions to complete the calculations and design. Based on the calculations, plans were developed for use in the construction and permitting process.

Timberlane Apartment Complex Stormwater Drainage Network Design – Irwin, Illinois
Andrews was contracted to conduct a review of the flood prone areas at the Timberlane Apartment Complex in Peoria, Illinois. A new stormwater structure network was proposed to replace the existing structures that were no longer serviceable. Mr. Nelson performed a topographic survey of the existing conditions to complete the calculations and design. Based on the calculations, plans were developed for use in the construction and permitting process.

Pipeline Repair Settlement Monitoring Plan – DeWitt, Illinois
Andrews was contracted to prepare a settlement-monitoring plan for a planned excavation within the right of way of a rail line, followed by continuous onsite visual and settlement monitoring during the excavation, pipeline repair, and backfilling of the excavation. The settlement monitoring of the array of monuments, which were installed and surveyed by Andrews, required precise readings to detect settlements of as little as a 1/32 of an inch and on frequencies not to exceed 4 hour intervals. Mr. Nelson conducted settlement surveys during this project.

NGPL Water Main Upgrade Design – Herscher, Illinois
Mr. Nelson provided surveying and engineering services to prepare design drawings to replace the existing water mains provided to rural individuals by Natural Gas Pipeline Co. of America, LLC. The actual water main upgrades will happen in the next 5 -10 year time frame as instructed by NGPL Co. All permitting, detailed

construction drawings and construction inspection will occur when the actual water main upgrade are scheduled by NGPL Co.

IKE Grant/Storm Sewer Improvements – Pontiac, Illinois
Mr. Nelson completed a topographic survey funded by a federal IKE Grant for comprehensive storm sewer improvements in Pontiac, Illinois.

ILAWC IL Route 23 Water Main Extension – Pontiac, Illinois
Mr. Nelson was responsible for the preliminary topographic associated with this project, as well as completing construction surveying for the new water main to be installed along Illinois Route 23 in Pontiac, Illinois.

Illinois Department of Natural Resources Northwestern C.C. & Bungalow Road Mine Sites, Bathymetric Surveying –Grundy County, Illinois
Mr. Nelson performed bathymetric surveys of two lakes. Location and verification of survey control points and surveying via boat were required to complete this work. AutoCAD surfaces for bottom of pond contours were created and merged into topography from aerial photography to create a continuous AutoCAD surface. This resultant surface will be utilized by IDNR staff to design remediation of dangerous high walls present at the site.

Illinois Department of Natural Resources Himrod Mine Subsidence Pits – Vermilion County, Illinois
The sites included a proposed borrow area with an existing pond which was to be sounded to provide its bottom topography. Mr. Nelson provided surveying services for 23 acres, including the access ways to the sites. Some of the areas surveyed have steep terrain and are heavily wooded.

Prairie Materials Sales Stone Quarries – Various locations, Illinois
This project included determining the boundaries, preparing the land title surveys and installing and restoring the monuments according to ALTA/ACSM specifications for eight separate stone quarries. These services were provided before Prairie Materials Sales Inc. purchased the properties.

Township Road 3200 North Reconstruction – Livingston County, Illinois
Mr. Nelson performed topographic field survey and construction staking for the upgrade of Township Road 3200 North into an 80,000-pound truck route.

Orchard Brook Project Lacey Creek Waterway – Downers Grove, Illinois
Mr. Nelson provided hydraulic topographic surveying for a HEC/RAS analysis of about 7,200 feet of waterway, including seven roadway culvert structures.

Edwards Soil Service – Various locations, Illinois
Mr. Nelson assisted with boundary determination, installing and restoring of monuments, preparing of topographic surveys and plats for four separate agri-chemical facilities prior to their sale.

Pontiac Airport Expansion Survey and Development Plan – Pontiac, Illinois
Mr. Nelson conducted a topographic survey of a defined expansion area at the Pontiac Airport in order to capture existing site conditions, including elevations, drainage structures, and utility information. The survey data was utilized to prepare a preliminary development plan showing layout, grading, and utilities, and to complete preliminary drainage and volume calculations to estimate the earth work and stormwater measurements.

Aqua Vitae

Riley White, Engineer

Riley White is an Engineer with duties that include preparing engineering construction documents, specifications and quantities. He is proficient using CAD, including subsurface utility design. In addition to his office duties, Riley routinely conducts NPDES/404 erosion control inspections and prepares associated reports.

Education

B.S. in Mechanical Engineering, University of Illinois, 2019

Additional Training

Designated Erosion Control Inspector Training (DECI)

ISTHA e-Builder

Bentley SUDA/SUE design

MMSD/Corvias Fresh Coast Protection Partnership Green Infrastructure Certification (Milwaukee, WI). Field Agent for inspection of green infrastructure construction and certification of 8.45M gallons of runoff reduction within the MMSD District on college and medical campuses.

Decatur Elementary School Annex, Public Building Commission of Chicago/Chicago Public Schools. Inspection and documentation for new building construction on a site undergoing remediation for Recognized Environmental Conditions (ROCs) and related Contaminants of Concern (COCs). Underground storm water chambers are installed to capture site runoff and filter contaminants prior to discharging into the public sewer system.

ISTHA PSB 19-1 (I-19-4469), Jane Addams Memorial Tollway, Bypass U.S. 20 Bridge Reconstruction (MP 19.8), Boone County, IL. Phase II drainage design for bridge reconstruction and flood risk reduction.

ISTHA PSB 18-2 (RR-18-9008), Systemwide Design Upon Request, Non-Roadway. Phase II design for converting wet detention basins into wetland and dry-bottom basins at I-90/IL 47.

ISTHA PSB 18-1 (RR-18-4354), Systemwide Design and Construction Management for Landscape Services Upon Request. GIS field data collection and construction inspection for the implementation of the Tollway's Master Plan update to identify locations for the systemwide urban canopy initiative to plant 58,000 trees in locations that meet design and long-term maintenance criteria.

ISTHA PSB 17-3 (I-17-4300), Tri-State Tollway, Roadway Reconstruction, Roosevelt Road (MP 30.5) to St. Charles Road (MP 32.3), Cook and DuPage Counties, IL. Phase II Erosion and Sediment Control, Landscape, and storm water BMP design for road and bridge construction/rehabilitation along the mainline and the I-294/I-290/I-88 interchange.

ISTHA PSB 17-2 (I-7-4677), Elgin O'Hare Western Access, Devon Avenue to Pratt Boulevard Phase II Engineering, Cook County, IL. Phase II Erosion and Sediment Control, and Landscape design for roadway and bridge construction. Work includes two mainline bridges over the UPRR and under the O'Hare flight pattern.

MARK LANDSTROM, PE, P.L.S., C.F.M.

PRINCIPAL ENGINEER

EDUCATION
B.S. Civil Engineering

REGISTRATIONS
P.E. – IL, IN, WI

Professional Land Surveyor – IL, IN, WI

YEARS OF EXPERIENCE
45+

SOFTWARE SYSTEMS
Pacsoft, Carlson, Leica, Trimble, Sokkia

Mr. Landstrom has over 45 years of engineering and surveying experience, focused on designing and executing horizontal and vertical survey measurement networks and making data adjustments for civil transportation, commercial and industrial applications. Mark provides expertise in project management, project execution and client management. He has led all aspects of project work including planning, initial project reconnaissance, field work, calculations, cost controls, client coordination and satisfaction. He takes pride in completing projects on time and within budget, while maintaining the highest of accuracy standards.

REPRESENTATIVE EXPERIENCE

Topographic Surveys for Gas Main Installation/Repair/Replacement – Peoples Gas

Chicago, IL

Land Surveyor responsible for producing Topographic Plats of Survey for areas where existing gas is being repaired or replaced or where new gas main is to be installed. Surveys show existing topography, street profiles, tree locations, right-of-way and boundary lines and underground utilities and are used as a base sheet in route designs covering gas main installation, repair or replacement plans.

Topographic Survey for Watermain Installation/Replacement – 16 Mile Watermain Route Survey

Chicago – Southwest Suburbs, IL

Land Surveyor responsible for producing Topographic Plat of Survey for 16 mile route where existing watermain is being repaired or replaced or new watermain is being installed. Survey showed existing topography, street profiles, tree locations, rights-of-way and boundary lines and underground utilities and was used as a base sheet in route design covering the watermain improvement plans.

Topographic Surveys for Watermain Replacement – Illinois American Water Company

Chicago Suburbs, IL

Land Surveyor responsible for producing Topographic Plats of Survey showing existing topography, street profiles, tree locations, right-of-way and boundary lines and underground utilities to be used as base sheets in route designs covering watermain improvement plans.

Land Survey for Pipeline Tracing at Midway Airport – Kinder Morgan

Summit, IL

Land Surveyor with the overall responsibility for three dimensional physical measurements utilizing P.I.G. data to trace existing pipeline to Midway Airport facilities and to ensure clearance between existing pipeline and proposed multilevel airport parking garage structure. Tied over two miles of pipeline to

existing client drawings and to Illinois East State Plane Coordinates and dealt directly with engineers in Germany.

Property Line Definitions and Highway Rights-of-Way – Indiana Route 41 Improvements

Hammond, IN

Land Surveyor responsible for providing integration of planned improvements based on State of Indiana issued engineering plans with property line definitions and highway rights-of-way, including conversion of plan coordinate system points into Indiana West State Plane coordinates based on measurements and ties to documentation and included creation of legal descriptions.

Land Survey of Entire Plant Facility – Nalco Chemical

Bedford Park, IL

Land Surveyor responsible for setting control points for client, making three dimensional physical measurements of existing piping and building structures to enable client to maintain an accurate CAD file of entire plant facilities tied to both real property lines and the Illinois East State Plane Coordinate System.

Land Survey of Existing Structures & Expansion and Improvement Plan – Akzo Nobel

Morris, IL

Land Surveyor/Designer used client control points to make three dimensional measurements of existing piping and building structures on client's local plant coordinate system to facilitate an expansion and roadway access improvement plan, including developing site drainage plans and infrastructure improvement plans.

Land Survey for Entire Plant – Powell Duffryn Terminals

Lemont, IL

Land Surveyor/Designer with overall responsibility for three dimensional physical measurements of existing piping and building structures to create a baseline reference system for entire plant that was then tied to both real property lines and the Illinois East State Plane Coordinate System.

Land Survey for Existing Piping Structures – Argo Corn Products

Summit, IL

Land Surveyor/Designer with overall responsibility for three dimensional physical measurements of existing piping structures to facilitate placement of a minimum clearance vertical improvement line. He created three dimensional coordinates for existing structures and pipes and for proposed improvements.

Renovation of Stadium – Comiskey Park

Chicago, IL

Land Surveyor/Designer with overall responsibility for renovation of stadium to retrofit new configuration. Field measured existing stadium and created overlay of architectural drawings to determine exact locations for walls, poles and structural components. Created three dimensional model of stadium and set control for contractor's layout surveyors.

MARK LANDSTROM, PE, P.L.S., C.F.M.

PRINCIPAL ENGINEER

Survey of Renovation Baselines – Navy Pier

Chicago, IL

Land Surveyor responsible for the field measurements of the existing pier baselines to convert to the Illinois East State Plane Coordinate System for determination of exact latitudes and longitudes at critical pier points and for easy insertion into the City of Chicago Geographic Information System.

Quality Control Checks – BP

Whiting, IN

Land Surveyor responsible for providing coordination and locations of existing and planned improvements using GPS to tie to the Indiana West State Plane coordinate system and also using ties to BP plant documentation. He has been retained to provide quality control checks for numerous projects throughout the refinery that requires extreme accuracy.

Land Survey to Recreate Entire Refinery Boundary – ExxonMobil

Joliet, IL

Land Surveyor responsible for preparing permit surveys and recreating entire refinery boundary using previous plats and GPS tying into Illinois East State Plane coordinates and local plant coordinate system. Also worked through record legal descriptions to develop permit surveys and met with local officials to expedite approvals.

SCOTT M. GREGORY, P.L.S

PRINCIPAL ENGINEER

EDUCATION
Purdue University-Calumet –

B.S. Construction Management & Engineering Technology; Surveying Technology Option

Associates – Civil Engineering Technology

REGISTRATIONS
Professional Land Surveyor – IL, IN

YEARS OF EXPERIENCE
15+

SOFTWARE SYSTEMS
Conventional & Robotic Total Stations
(Sokkia, Topcon, Trimble)
GPC (Topcon, Leica, Trimble)
3D Scanners (Trimble, FARO)
AutoCAD, Civil 3D

Mr. Gregory has over 15 years of land surveying and construction management experience in various industries. Scott has led many aspects of project work including planning, initial project research, field work, cost controls, and project scheduling. He takes pride in completing projects on time and within budget, while maintaining the highest quality deliverables.

REPRESENTATIVE EXPERIENCE

Department Manager Surveying Services – Confidential Engineering Company

Griffith, IN

Department manager responsible for overseeing land surveying operations firm-wide. Provided support for the following: project management, cost estimating, drafting proposals, project research, job scheduling, review/stamp surveys, conduct interviews/hiring of staff, quality assurance/quality control.

- Types of projects: Boundary surveys, topographic surveys, 3D scanning in heavy industrial environments, utility relocation projects, legal description writing, volume surveys

Adjunct Faculty – Purdue-NW, Ivy Tech Community College

Various Locations

Taught Surveying Fundamentals course (lecture and lab). Topics covered include: Basic measurement principles, level circuits, total station operation, coordinate geometry, and topography.

Board of Zoning Appeals – City of Hobart

Hobart, IN

Appointed member of the board. Vote on zone changes and variances for the City.

SCOTT M. GREGORY, P.L.S.

PRINCIPAL ENGINEER

Project Manager/Survey Manager – Abonmarche Consultants, Inc.

Hobart, IN

Project/Survey manager responsible for the management of survey operations for northwest Indiana offices while also overseeing all daily operations for the Hobart, Indiana office. Provided support for: Project management, cost estimating, drafting proposals, project research, job scheduling, reviewing/stamping surveys, invoicing, approve employee timesheets/expenses, employee interviews, hiring of personnel, employee reviews, regional safety director.

- Types of projects: surveyor location reports, boundary surveys, ALTA/NSPS land title surveys, topographic surveys, as-built surveys, elevation certificates, subdivision platting, legal description writing, construction layout, utility mapping, volume surveys, and engineering support.

Draftsman/Field Crew Chief – Land Technologies, Inc.

Hobart, IN

Draftsman/Crew Chief responsible for AutoCAD drafting, field crew chief, project research, job scheduling.

- Types of projects: surveyor location reports, boundary surveys, ALTA/NSPS land title surveys, topographic surveys, as-built surveys, elevation certificates, subdivision platting, legal description writing, and construction layout.

Benjamin R. Balskus

Current Position
Assistant Project Manager/Project Coordinator

Discipline Areas
> Project Management
> Procurement

Years' Experience
3

Joined Cardno
2020

Education
> BA, *cum laude*, Comparative History and Literature, Harvard University, 2004
> Project Management Strategy Certificate, University of Chicago Graham School, 2016

Certifications
> I-100 ICS Orientation
> S-130 Basic Firefighter Training
> S-190 Introduction to Wildland Fire Behavior

Affiliations
> Garfield Park Conservatory Member
> Midwest Fruit Explorer Club

Summary of Experience

At Cardno, Mr. Balskus works as an assistant project manager and project coordinator for the Chicago Monee office. In this role he assists our operations team with estimating, proposal preparation, procurement, and project management, as well as fiscal compliance, budget management, and client coordination.

Significant Projects

Assistant Project Manager – Feutz Construction and the City of Champaign, Boneyard Creek North – Champaign, Illinois

Cardno is providing a full landscape installation, including turf and native seeding, plugs, shrubs, trees, and landscape bed and edging as part of a creek restoration project in the heart of Champaign, Illinois. For this project, Mr. Balskus prepared field maps from existing seeding and planting plans and coordinated the procurement, inspection, and approval of 170 trees and shrubs from multiple nurseries.

Assistant Project Manager – County of DuPage, Native Vegetation On-Call Maintenance – DuPage County, Illinois

Cardno provides on-call vegetative management services at a variety of sites throughout DuPage County, Illinois. Under the direction of DuPage County ecologists, Cardno completes management tasks, including herbicide applications, hand weeding, brush and tree removal, prescribed burning, seeding, plug installation, tree and shrub installation, and the installation of erosion control measures. In the fall of 2020, Mr. Balskus managed an installation of native shrubs, grasses, and forbs at multiple locations at DuPage County's Government Campus.

Project Coordinator – Chicago Park District, Native Areas Maintenance – Chicago, Illinois

Cardno is providing management of natural areas for the Chicago Park District as part of a 5-year contract. Cardno's services include vegetation management; hardscape elements and repair; and landscape waste disposal. Nature garden services include ongoing maintenance; spring clean-up activities; planting beds, trees, and shrubs; and winterization services. Additional maintenance services include prescribed burn management; ecological restoration and consulting; and community outreach and volunteer stewardship coordination. Cardno is also working closely with Chicago Park District on the restoration and incorporation of over 5,500 acres of new natural areas within the greater natural areas program. In his role as project coordinator, Mr. Balskus has assisted with budget and expense management, as well as project administration for this contract.

Assitant Project Manager – Town of Normal, Ripariance Area Maintenance – Normal, Illinois

Cardno completed an inventory of native species, invasive species, and immediate concerns that exist within the town's riparian corridors including along 2.36 miles of creek/stream right-of-way and approximately 68 acres of detention basins within corporate limits. An inventory report documented existing conditions and made recommendations for maintenance activities to bring the site into compliance with long-term management goals. Cardno is currently performing prioritized maintenance activities within the riparian areas including streambank and detention pond erosion repairs and stabilization, herbicide maintenance, mowing, brush removal, prescribed burning,

seeding, erosion control installation, and shrub installation. All sites are currently being successfully maintained to the client's satisfaction and maintenance will continue through the duration of our contract. Mr. Balskus is assisting the project manager with procurement as well as budget and expense management.

Previous Experience

Estimator – Native Landscape Contractors, LLC – Chicago, Illinois (2018–2020)

As an estimator, Mr. Balskus was responsible for all aspects of the bidding and proposal process, including initial screening of RFPs, pre-bid meetings and RFIs, takeoffs, cost and scheduling estimating, proposal finalization, and client presentations. He provided estimates for a wide range of landscaping projects, ranging from ecosystem restorations and stewardship contracts to green infrastructure installations such as rain gardens, bioswales, and vegetated detention basins. In 2019, he estimated projects that resulted in over 1 million dollars of revenue, including construction projects for the Illinois Tollway, municipalities, general contractors, and private clients. Mr. Balskus also served as assistant project manager and quality control representative for Illinois Tollway contract RR-19-4455C and project manager for several fall 2019 installations, including a native prairie installation at Cantigny Park and an arboretum planting at the DuPage County Campus. Additional responsibilities included preparation of submittals and job maps, invoicing, and plant procurement. The software he used included Microsoft Excel, Bluebeam Revu, InDesign, eBuilder, and Procore project management software.

Senior Production Coordinator/Promotions Manager – University of Chicago Press, Books Division – Chicago, Illinois (2010–2018)

As the promotions manager for the books division, Mr. Balskus developed and executed marketing plans for a wide range of books in fields such as education, philosophy, science studies, military history, and gardening. He produced marketing materials, including back cover copy, web content, and press releases and coached authors for media exposure, generating ideas for and editing op-eds, coordinating events, and pitching stories to the media. He also cultivated relationships with local and national media, resulting in placement in outlets such as the *Atlantic* and the *New York Times*.

As a senior production coordinator, he managed a book production portfolio of over 150 projects a year, including new books and reprints on offset and short run digital printing platforms, while coordinating with vendors domestically and overseas.

Production Management Coordinator – University of Chicago School Mathematics Project – Chicago, Illinois (2006–2009)

Mr. Balskus managed textbook production for the third edition of the University of Chicago School Mathematics Project, which included full four-color production of the last two books of the series, *Functions, Statistics, and Trigonometry* and *Precalculus and Discrete Mathematics*. He held management and training responsibilities for a team of part-time and student employees that expanded to a staff of 12 in 2008. He also developed production manuals, templates, and a training curriculum to allow for in-house four-color production in InDesign.

Please Respect the Environment

ABOUT CARDNO

Cardno is an ASX-200 professional infrastructure and environmental services company, with expertise in the development and improvement of physical and social infrastructure for communities around the world. Cardno's team includes leading professionals who plan, design, manage, and deliver sustainable projects and community programs. Cardno is an international company listed on the Australian Securities Exchange [ASX:CDD]. For additional information, visit www.cardno.com.

Cardno ZERO HARM EVERY JOB. EVERY DAY.

At Cardno, our primary concern is to develop and maintain safe and healthy conditions for anyone involved at our project worksites. We require full compliance with our Health and Safety Policy Manual and established work procedures and expect the same protocol from our subcontractors. We are committed to achieving our Zero Harm goal by continually improving our safety systems, education, and vigilance at the workplace and in the field. Safety is a Cardno core value and through strong leadership and active employee participation, we seek to implement and reinforce these leading actions on every job, every day.

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