

Contract Routing Form

ROUTING: Routine

printed on: 04/25/2023

Contract between: Integrity Grading & Excavating, Inc.
and Dept. or Division: Engineering Division
Name/Phone Number:

Project: Lower Badger Mill Creek Flood Mitigation

Contract No.: 8875
Enactment No.: RES-23-00289
Dollar Amount: 2,664,573.72

File No.: 76675
Enactment Date: 04/19/2023

(Please DATE before routing)

Signatures Required	Date Received	Date Signed
City Clerk	4/25/2023	4/25/2023
Director of Civil Rights	04/26/2023	04/27/2023 (REL)
Risk Manager	4/28/23	4/28/23 mcl
Finance Director	04.28.23	04.28.23
City Attorney	5-1-2023	5-1-23
Mayor	5.2.23	5.2.23

Please return signed Contracts to the City Clerk's Office
Room 103, City-County Building for filing.

Original + 2 Copies

04/25/2023 14:27:45 enlmp - Matt Allie, 266-4058



Legislation Details (With Text)

File #: 76675 **Version:** 1 **Name:**
Type: Resolution **Status:** Passed
File created: 3/8/2023 **In control:** Engineering Division
On agenda: 4/18/2023 **Final action:** 4/18/2023
Enactment date: 4/19/2023 **Enactment #:** RES-23-00289
Title: Awarding Public Works Contract No. 8875, Lower Badger Mill Creek Flood Mitigation. (1st AD)

Sponsors:

Indexes:

Code sections:

Attachments: 1. 8875_BidOpeningTab.pdf, 2. 8875 breakdown.pdf

Date	Ver.	Action By	Action	Result
4/18/2023	1	COMMON COUNCIL		
3/22/2023	1	BOARD OF PUBLIC WORKS		
3/10/2023	1	Engineering Division	Refer	

Fiscal Note

The proposed resolution authorizes a contract for Lower Badger Mill Creek Flood Mitigation at a total estimated cost of \$2,877,740 including contingency. Funding is available in Munis projects 13893 and 11063. Account details are included in the attachment. No additional appropriation is required.

Title

Awarding Public Works Contract No. 8875, Lower Badger Mill Creek Flood Mitigation. (1st AD)

Body

BE IT RESOLVED, that the following low bids for miscellaneous improvements be accepted and that the Mayor and City Clerk be and are hereby authorized and directed to enter into a contract with the low bidder contained herein, subject to the Contractor's compliance with Section 39.02 of the Madison General Ordinances concerning compliance with the Affirmative Action provisions **and subject to the Contractor's compliance with Section 33.07 of the Madison General Ordinances regarding Best Value Contracting:**

BE IT FURTHER RESOLVED, that the funds be encumbered to cover the cost of the projects contained herein.

See attached document (Contract No. 8875) for itemization of bids.

PROJECT

CONTRACTOR

AMOUNT OF BID

CONTRACT NO. 8875
LOWER BADGER MILL CREEK FLOOD MITIGATION

INTEGRITY GRADING & EXCAVATING, INC.

\$2,664,573.72

Acct. No. 13893-402-170: 54410 (91350)	\$ 319,487.10
Contingency 8%±	<u>25,562.90</u>
Sub-Total	\$ 345,050.00

Acct. No. 13893-402-171: 54420 (91313)	\$ 514,288.32
Contingency 8%±	<u>41,141.68</u>
Sub-Total	\$ 555,430.00

Acct. No. 11063-84-174-84400: 54445 (91345)	\$1,746,845.60
Contingency 8%±	<u>139,744.40</u>
Sub-Total	\$1,886,590.00

Acct. No. 13893-83-173: 54445 (91345)	\$ 83,952.70
Contingency 8%±	<u>6,717.30</u>
Sub-Total	\$ 90,670.00

GRAND TOTAL	<u>\$2,877,740.00</u>
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Demographics

Company Name: Liberty Mutual Insurance Company	Short Name:	SBS Company Number: 54219414
NAIC CoCode: 23043	Country of Domicile: United States	Domicile Type: Foreign
State of Domicile: Massachusetts	Date of Incorporation: 01/01/1912	NAIC Group Number: 111 - LIBERTY MUT GRP
Organization Type: Stock		Merger Flag: No

Address

Business Address 175 Berkeley Street Boston, MA 02116 United States	Mailing Address 175 Berkeley Street Boston, MA 02116 United States	Statutory Home Office Address 175 Berkeley Street Boston, MA 02116 United States	Main Administrative Office Address 175 Berkeley Street Boston, MA 02116 United States
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Phone, Email, Website

Phone

Type	Number

Email

No results found.

Website

No results found.

Company Type

Company Type: Property and Casualty

Status: Active

Effective Date: 03/11/1919

Issue Date: 03/11/1919

Articles of Incorporation Received: No

Business Activities of Members:

Status Reason:

Legacy State ID: 111480

Approval Date:

Article No:

Status Date: 03/11/1919

Expiration Date:

File Date:

COA Number:

Appointments

Show 10 entries

Showing 1 to 4 of 4 entries

Search:

Licensee Name	License Number	NPN	License Type	Line of Authority	Appointment Date	Effective Date	Expiration Date
CHRIS STEINAGEL	7307304	7307304	Intermediary (Agent) Individual	Property	04/29/2004	02/06/2023	03/15/2024
CHRIS STEINAGEL	7307304	7307304	Intermediary (Agent) Individual	Casualty	04/29/2004	02/06/2023	03/15/2024

Company Type: **Property and Casualty**

CRIS SESMA	16449691	16449691	Intermediary (Agent) Individual	Property	08/06/2021	02/06/2023	03/15/2024
CHRIS SESMA	16449691	16449691	Intermediary (Agent) Individual	Casualty	08/06/2021	02/06/2023	03/15/2024

[First](#)
[Previous](#)
1
[Next](#)
[Last](#)

Line Of Business

Show entries

Showing 1 to 10 of 12 entries

Filter

Line of Business	Citation Type	Effective Date
Aircraft	Aircraft	03/11/1919
Automobile	Automobile	03/11/1919
Credit Insurance	Credit Insurance	03/11/1919
Disability Insurance	Disability Insurance	03/11/1919
Fidelity Insurance	Fidelity Insurance	03/11/1919
Fire, Inland Marine and Other Property Insurance	Fire, Inland Marine and Other Property Insurance	03/11/1919
Legal Expense Insurance	Legal Expense Insurance	03/11/1919
Liability and Incidental Medical Expense Insurance (other than automobile)	Liability and Incidental Medical Expense Insurance (other than automobile)	03/11/1919
Miscellaneous	Miscellaneous	03/11/1919
Ocean Marine Insurance	Ocean Marine Insurance	03/11/1919

[First](#)
[Previous](#)
1
2
[Next](#)
[Last](#)

Contact

Contact Type	Preferred Name	Name	E-mail	Phone	Address
Registered Agent for Service of Process		*			Other CORPORATION SERVICE COMPANY 33 E MAIN ST STE 610 MADISON, WI United States County 53703

Company Merger

No results found.



CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

3/28/2023

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER CSDZ, LLC 1818 Parmenter Street, Suite 240 Middleton WI 53562	CONTACT NAME: Robyn Henslin PHONE (A/C, No, Ext): 608 242-2555 FAX (A/C, No): E-MAIL ADDRESS: rhenslin@holmesmurphy.com													
	<table border="1"> <thead> <tr> <th>INSURER(S) AFFORDING COVERAGE</th> <th>NAIC #</th> </tr> </thead> <tbody> <tr> <td>INSURER A : Zurich American Insurance Company</td> <td>16535</td> </tr> <tr> <td>INSURER B : Continental Casualty Company</td> <td>20443</td> </tr> <tr> <td>INSURER C : Charter Oak Fire Insurance Company</td> <td>25615</td> </tr> <tr> <td>INSURER D : Berkley Assurance Company</td> <td>39462</td> </tr> <tr> <td>INSURER E :</td> <td></td> </tr> <tr> <td>INSURER F :</td> <td></td> </tr> </tbody> </table>	INSURER(S) AFFORDING COVERAGE	NAIC #	INSURER A : Zurich American Insurance Company	16535	INSURER B : Continental Casualty Company	20443	INSURER C : Charter Oak Fire Insurance Company	25615	INSURER D : Berkley Assurance Company	39462	INSURER E :		INSURER F :
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INSURER E :														
INSURER F :														
INSURED Integrity Grading & Excavating, Inc. 605 Grossman Drive Schofield, WI 54476	INTGRAPC													

COVERAGES

CERTIFICATE NUMBER: 1900126547


REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	<input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR <input checked="" type="checkbox"/> XCU not extended <input checked="" type="checkbox"/> Contractual Liab GEN'L AGGREGATE LIMIT APPLIES PER: <input type="checkbox"/> POLICY <input checked="" type="checkbox"/> PRO-JECT <input checked="" type="checkbox"/> LOC OTHER:			GLO112510205	4/1/2023	4/1/2024	EACH OCCURRENCE	\$2,000,000
							DAMAGE TO RENTED PREMISES (Ea occurrence)	\$ 500,000
							MED EXP (Any one person)	\$ 10,000
							PERSONAL & ADV INJURY	\$ 1,000,000
							GENERAL AGGREGATE	\$ 4,000,000
							PRODUCTS - COMP/OP AGG	\$ 4,000,000
								\$
A	<input checked="" type="checkbox"/> AUTOMOBILE LIABILITY <input checked="" type="checkbox"/> ANY AUTO <input type="checkbox"/> OWNED AUTOS ONLY <input type="checkbox"/> SCHEDULED AUTOS <input type="checkbox"/> HIRED AUTOS ONLY <input type="checkbox"/> NON-OWNED AUTOS ONLY			BAP112510305	4/1/2023	4/1/2024	COMBINED SINGLE LIMIT (Ea accident)	\$2,000,000
							BODILY INJURY (Per person)	\$
							BODILY INJURY (Per accident)	\$
							PROPERTY DAMAGE (Per accident)	\$
								\$
B	<input type="checkbox"/> UMBRELLA LIAB <input checked="" type="checkbox"/> OCCUR <input checked="" type="checkbox"/> EXCESS LIAB <input type="checkbox"/> CLAIMS-MADE <input type="checkbox"/> DED <input checked="" type="checkbox"/> RETENTION \$ 0			7014770054	4/1/2023	4/1/2024	EACH OCCURRENCE	\$ 10,000,000
							AGGREGATE	\$ 10,000,000
								\$
A	<input checked="" type="checkbox"/> WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory In NH) If yes, describe under DESCRIPTION OF OPERATIONS below		Y/N N	WC112510105	4/1/2023	4/1/2024	<input checked="" type="checkbox"/> PER STATUTE <input type="checkbox"/> OTHER	
			N/A				E.L. EACH ACCIDENT	\$ 1,000,000
							E.L. DISEASE - EA EMPLOYEE	\$ 1,000,000
							E.L. DISEASE - POLICY LIMIT	\$ 1,000,000
C D	<input type="checkbox"/> Install Floater/Cargo Pollution Liability / Professional Liability			8608J906403 PCADB50276860423	4/1/2023 4/1/2023	4/1/2024 4/1/2024	Limits: Per Claim: \$5M Per Claim: \$2M	\$250,000/1,000,000 Aggregate: \$5M Aggregate: \$2M

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)
 The City of Madison, its officers, officials, agents and employees as Additional Insured

CERTIFICATE HOLDER**CANCELLATION**

City of Madison Engineering 210 Martin Luther King Jr Blvd, Rm 115 Madison WI 53703	SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS. AUTHORIZED REPRESENTATIVE 
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\$2,664,573.72
FILE COPY

BID OF INTEGRITY GRADING & EXCAVATING, INC.

2023

PROPOSAL, CONTRACT, BOND AND SPECIFICATIONS

FOR

LOWER BADGER MILL CREEK FLOOD MITIGATION

CONTRACT NO. 8875

MUNIS NO. 11063

IN

MADISON, DANE COUNTY, WISCONSIN

AWARDED BY THE COMMON COUNCIL
MADISON, WISCONSIN ON APRIL 18, 2023

CITY ENGINEERING DIVISION
1600 EMIL STREET
MADISON, WISCONSIN 53713

<https://bidexpress.com/login>

**LOWER BADGER MILL CREEK FLOOD MITIGATION
CONTRACT NO. 8875**

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This Proposal, and Agreement have
been prepared by:

**CITY ENGINEERING DIVISION
CITY OF MADISON
MADISON, DANE COUNTY, WISCONSIN**

Greg Fries for:

James M. Wolfe, P.E., City Engineer

JMW: ma

SECTION A: ADVERTISEMENT FOR BIDS AND INSTRUCTIONS TO BIDDERS

REQUEST FOR BID FOR PUBLIC WORKS CONSTRUCTION CITY OF MADISON, WISCONSIN

A BEST VALUE CONTRACTING MUNICIPALITY

PROJECT NAME:	LOWER BADGER MILL CREEK FLOOD MITIGATION
CONTRACT NO.:	8875
SBE GOAL	20%
BID BOND	5%
SBE PRE BID MEETING	See Pre Bid Meeting info below
PREQUALIFICATION APPLICATION DUE (2:00 P.M.)	MARCH 2, 2023
BID SUBMISSION (2:00 P.M.)	MARCH 9, 2023
BID OPEN (2:30 P.M.)	MARCH 9, 2023
PUBLISHED IN WSJ	FEBRUARY 16, 23, & MARCH 2, 2023

SBE PRE BID MEETING: Small Business Enterprise Pre-Bid Meetings are not being held in person at this time. Contractors can schedule one-on-one phone calls with Tracy Lomax in Affirmative Action to count towards good faith efforts. Tracy can be reached at (608) 267-8634 or by email, tlomax@cityofmadison.com.

PREQUALIFICATION APPLICATION: Forms are available on our website, www.cityofmadison.com/engineering/developers-contractors/contractors/how-to-get-prequalified. If not currently prequalified in the categories listed in Section A, an amendment to your Prequalification will need to be submitted prior to the same due date. Postmark is not applicable.

BIDS TO BE SUBMITTED: by hand to 1600 EMIL ST., MADISON, WI 53713 or online at www.bidexpress.com.

Bids may be submitted on line through Bid Express or in person at 1600 Emil St. The bids will be posted on line after the bid opening. If you have any questions, please call Alane Boutelle at (608) 267-1197, or John Fahrney at (608) 266-9091.

STANDARD SPECIFICATIONS

The City of Madison's Standard Specifications for Public Works Construction - 2023 Edition, as supplemented and amended from time to time, forms a part of these contract documents as if attached hereto.

These standard specifications are available on the City of Madison Public Works website, www.cityofmadison.com/engineering/developers-contractors/standard-specifications.

The Contractor shall review these Specifications prior to preparation of proposals for the work to be done under this contract, with specific attention to Article 102, "BIDDING REQUIREMENTS AND CONDITIONS" and Article 103, "AWARD AND EXECUTION OF THE CONTRACT." For the convenience of the bidder, below are highlights of three subsections of the specifications.

SECTION 102.1: PRE-QUALIFICATION OF BIDDERS

In accordance with Wisconsin State Statutes 66.0901 (2) and (3), all bidders must submit to the Board of Public Works proof of responsibility on forms furnished by the City. The City requires that all bidders be qualified on a biennial basis.

Bidders must present satisfactory evidence that they have been regularly engaged in the type of work specified herein and they are fully prepared with necessary capital, materials, machinery and supervisory personnel to conduct the work to be contracted for to the satisfaction of the City. All bidders must be pre-qualified by the Board of Public Works for the type of construction on which they are bidding prior to the opening of the bid.

In accordance with Section 39.02(9)(a)l. of the General Ordinances, all bidders shall submit in writing to the Affirmative Action Division Manager of the City of Madison, a Certificate of Compliance or an Affirmative Action Plan at the same time or prior to the submission of the proof of responsibility forms.

The bidder shall be disqualified if the bidder fails to or refuses to, prior to opening of the bid, submit a Certificate of compliance, Affirmative Action Plan or Affirmative Action Data Update, as applicable, as defined by Section 39.02 of the General Ordinances (entitled Affirmative Action) and as required by Section 102.11 of the Standard Specifications.

SECTION 102.4 PROPOSAL

No bid will be accepted that does not contain an adequate or reasonable price for each and every item named in the Schedule of Unit Prices.

A lump sum bid for the work in accordance with the plans and specifications is required. The lump sum bid must be the same as the total amounts bid for the various items and it shall be inserted in the space provided.

All papers bound with or attached to the proposal form are considered a part thereof and must not be detached or altered when the proposal is submitted. The plans, specifications and other documents designated in the proposal form will be considered a part of the proposal whether attached or not.

A proposal submitted by an individual shall be signed by the bidder or by a duly authorized agent. A proposal submitted by a partnership shall be signed by a member/partner or by a duly authorized agent thereof. A proposal submitted by a corporation shall be signed by an authorized officer or duly authorized registered agent of such corporation, and the proposal shall show the name of the State under the laws of which such corporation was chartered. The required signatures shall in all cases appear in the space provided thereof on the proposal.

Each proposal shall be placed, together with the proposal guaranty, in a sealed envelope, so marked as to indicate name of project, the contract number or option to which it applies, and the name and address of the Contractor or submitted electronically through Bid Express (www.bidexpress.com). Proposals will be accepted at the location, the time and the date designated in the advertisement. Proposals received after the time and date designated will be returned to the bidder unopened.

SECTION 102.5: BID DEPOSIT (PROPOSAL GUARANTY)

All bids, sealed or electronic, must be accompanied with a Bid Bond (City of Madison form) equal to at least 5% of the bid or a Certificate of Annual/Biennial Bid Bond or certified check, payable to the City Treasurer. Bid deposit of the successful bidders shall be returned within forty-eight (48) hours following execution of the contract and bond as required.

MINOR DISCREPENCIES

Bidder is responsible for submitting all forms necessary for the City to determine compliance with State and City bidding requirements. Notwithstanding any language to the contrary contained herein, the City may exercise its discretion to allow bidders to correct or supplement submissions after bid opening, if the minor discrepancy, bid irregularity or omission is insignificant and not one related to price, quality, quantity, time of completion or performance of the contract.

Bidders for this Contract(s) must be Pre-Qualified for at least one of the following type(s) of construction denoted by an

Building Demolition

- 101 Asbestos Removal
 120 House Mover

- 110 Building Demolition

Street, Utility and Site Construction

- 201 Asphalt Paving
 205 Blasting
 210 Boring/Pipe Jacking
 215 Concrete Paving
 220 Con. Sidewalk/Curb & Gutter/Misc. Flat Work
 221 Concrete Bases and Other Concrete Work
 222 Concrete Removal
 225 Dredging
 230 Fencing
 235 Fiber Optic Cable/Conduit Installation
 240 Grading and Earthwork
 241 Horizontal Saw Cutting of Sidewalk
 242 Hydro Excavating
 243 Infrared Seamless Patching
 245 Landscaping, Maintenance
 246 Ecological Restoration
 250 Landscaping, Site and Street
 251 Parking Ramp Maintenance
 252 Pavement Marking
 255 Pavement Sealcoating and Crack Sealing
 260 Petroleum Above/Below Ground Storage Tank Removal/Installation
 262 Playground Installer

- 265 Retaining Walls, Precast Modular Units
 270 Retaining Walls, Reinforced Concrete
 275 Sanitary, Storm Sewer and Water Main Construction
 276 Sawcutting
 280 Sewer Lateral Drain Cleaning/Internal TV Insp.
 285 Sewer Lining
 290 Sewer Pipe Bursting
 295 Soil Borings
 300 Soil Nailing
 305 Storm & Sanitary Sewer Laterals & Water Svc.
 310 Street Construction
 315 Street Lighting
 318 Tennis Court Resurfacing
 320 Traffic Signals
 325 Traffic Signing & Marking
 332 Tree pruning/removal
 333 Tree, pesticide treatment of
 335 Trucking
 340 Utility Transmission Lines including Natural Gas, Electrical & Communications
 399 Other _____

Bridge Construction

- 501 Bridge Construction and/or Repair

Building Construction

- 401 Floor Covering (including carpet, ceramic tile installation, rubber, VCT)
 402 Building Automation Systems
 403 Concrete
 404 Doors and Windows
 405 Electrical - Power, Lighting & Communications
 410 Elevator - Lifts
 412 Fire Suppression
 413 Furnishings - Furniture and Window Treatments
 415 General Building Construction, Equal or Less than \$250,000
 420 General Building Construction, \$250,000 to \$1,500,000
 425 General Building Construction, Over \$1,500,000
 428 Glass and/or Glazing
 429 Hazardous Material Removal
 430 Heating, Ventilating and Air Conditioning (HVAC)
 433 Insulation - Thermal
 435 Masonry/Tuck pointing

- 437 Metals
 440 Painting and Wallcovering
 445 Plumbing
 450 Pump Repair
 455 Pump Systems
 460 Roofing and Moisture Protection
 464 Tower Crane Operator
 461 Solar Photovoltaic/Hot Water Systems
 465 Soil/Groundwater Remediation
 466 Warning Sirens
 470 Water Supply Elevated Tanks
 475 Water Supply Wells
 480 Wood, Plastics & Composites - Structural & Architectural
 499 Other _____

State of Wisconsin Certifications

- 1 Class 5 Blaster - Blasting Operations and Activities 2500 feet and closer to inhabited buildings for quarries, open pits and road cuts.
 2 Class 6 Blaster - Blasting Operations and Activities 2500 feet and closer to inhabited buildings for trenches, site excavations, basements, underwater demolition, underground excavations, or structures 15 feet or less in height.
 3 Class 7 Blaster - Blasting Operations and Activities for structures greater than 15 ' in height, bridges, towers, and any of the objects or purposes listed as "Class 5 Blaster or Class 6 Blaster".
 4 Petroleum Above/Below Ground Storage Tank Removal and Installation (Attach copies of State Certifications.)
 5 Hazardous Material Removal (Contractor to be certified for asbestos and lead abatement per the Wisconsin Department of Health Services, Asbestos and Lead Section (A&LS).) See the following link for application: www.dhs.wisconsin.gov/Asbestos/Cert. State of Wisconsin Performance of Asbestos Abatement Certificate must be attached.
 6 Certification number as a Certified Arborist or Certified Tree Worker as administered by the International Society of Arboriculture
 7 Pesticide application (Certification for Commercial Applicator For Hire with the certification in the category of turf and landscape (3.0) and possess a current license issued by the DATCP)
 8 State of Wisconsin Master Plumbers License.

SECTION B: PROPOSAL

Please refer to the
Bid Express Website
at <https://bidexpress.com>
look up contract number
and go to
Section B: Proposal Page

You can access all City of Madison bid solicitations for FREE at www.bidexpress.com

Click on the "Register for Free" button and follow the instructions to register your company and yourself. You will be asked for a payment subscription preference, since you may wish to bid online someday. Simply choose the method to pay on a 'per bid' basis. This requires no payment until / unless you actually bid online. You can also choose the monthly subscription plan at this time. You will, however, be asked to provide payment information. Remember, you can change your preference at anytime. You will then be able to complete your free registration and have full access to the site. Your free access does not require completion of the 'Digital ID' process, so you will have instant access for viewing and downloading. To be prepared in case you ever do wish to bid online, you may wish to establish your digital ID also, since you cannot bid without a Digital ID.

If you have any problems with the free registration process, you can call the bidexpress help team, toll free at 1-888-352-2439 (option 1, option1).

SECTION C: SMALL BUSINESS ENTERPRISE

Instructions to Bidders City of Madison SBE Program Information

2 Small Business Enterprise (SBE) Program Information

2.1 Policy and Goal

The City of Madison reaffirms its policy of nondiscrimination in the conduct of City business by maintaining a procurement process which remains open to all who have the potential and ability to sell goods and services to the City. It is the policy of the City of Madison to allow Small Business Enterprises (SBE) maximum feasible opportunity to participate in City of Madison contracting. The bidder acknowledges that its bid has been submitted in accordance with the SBE program and is for the public's protection and welfare.

Please refer to the "ADVERTISEMENT FOR BIDS" for the goal for the utilization of SBEs on this project. SBEs may participate as subcontractors, vendors and/or suppliers, which provide a commercially useful function. The dollar value for SBE suppliers or 'materials only' vendors shall be discounted to 60% for purposes of meeting SBE goals.

A bidder which achieves or exceeds the SBE goal will be in compliance with the SBE requirements of this project. In the event that the bidder is unable to achieve the SBE goal, the bidder must demonstrate that a good faith effort to do so was made. Failure to either achieve the goal or demonstrate a good faith effort to do so will be grounds for the bidder being deemed a non-responsible contractor ineligible for award of this contract.

A bidder may count towards its attainment of the SBE goal only those expenditures to SBEs that perform a commercially useful function. For purposes of evaluating a bidder's responsiveness to the attainment of the SBE goal, the contract participation by an SBE is based on the percentage of the total base bid proposed by the Contractor. The total base bid price is inclusive of all addenda.

Work performed by an SBE firm in a particular transaction can be counted toward the goal only if it involves a commercially useful function. That is, in light of industry practices and other relevant considerations, does the SBE firm have a necessary and useful role in the transaction, of a kind for which there is a market outside the context of the SBE Program, or is the firm's role a superfluous step added in an attempt to obtain credit towards goals? If, in the judgment of the Affirmative Action Division, the SBE firm will not perform a commercially useful function in the transaction, no credit towards goals will be awarded.

The question of whether a firm is performing a commercially useful function is completely separate from the question of whether the firm is an eligible SBE. A firm is eligible if it meets the definitional criteria and ownership and control requirements, as set forth in the City of Madison's SBE Program.

If the City of Madison determines that the SBE firm is performing a commercially useful function, then the City of Madison must then decide what that function is. If the commercially useful function is that of an SBE vendor / supplier that regularly transacts business with the respective product, then the City of Madison will count 60% of the value of the product supplied toward SBE goals.

To be counted, the SBE vendor / supplier must be engaged in selling the product in question to the public. This is important in distinguishing an SBE vendor / supplier, which has a regular trade with a variety of customers, from a firm which performs supplier-like functions on an ad hoc basis or for only one or two contractors with whom it has a special relationship.

A supplier of bulk goods may qualify as an eligible SBE vendor / supplier if it either maintains an inventory or owns or operates distribution equipment. With respect to the distribution equipment; e.g., a fleet of trucks, the term "operates" is intended to cover a situation in which the supplier leases the equipment on a regular basis for its entire business. It is not intended to cover a situation in which the firm simply provides drivers for trucks owned or leased by another party; e.g., a prime contractor, or leases such a party's trucks on an ad hoc basis for a specific job.

If the commercially useful function being performed is not that of a qualified SBE vendor / supplier, but rather that of delivery of products, obtaining bonding or insurance, procurement of personnel, acting as a broker or manufacturer's representative in the procurement of supplies, facilities, or materials, etc., only the fees or commissions will apply towards the goal.

For example, a business that simply transfers title of a product from manufacturer to ultimate purchaser; e. g., a sales representative who re-invoices a steel product from the steel company to the Contractor, or a firm that puts a product into a container for delivery would not be considered a qualified SBE vendor / supplier. The Contractor would not receive credit based on a percentage of the cost of the product for working with such firms.

Concerning the use of services that help the Contractor obtain needed supplies, personnel, materials or equipment to perform a contract: only the fee received by the service provider will be counted toward the goal. For example, use of a SBE sales representative or distributor for a steel company, if performing a commercially useful function at all, would entitle the Contractor receiving the steel to count only the fee paid to the representative or distributor toward the goal. This provision would also govern fees for professional and other services obtained expressly and solely to perform work relating to a specific contract.

Concerning transportation or delivery services: if an SBE trucking company picks up a product from a manufacturer or a qualified vendor / supplier and delivers the product to the Contractor, the commercially useful function it is performing is not that of a supplier, but simply that of a transporter of goods. Unless the trucking company is itself the manufacturer or a qualified vendor / supplier in the product, credit cannot be given based on a percentage of the cost of the product. Rather, credit would be allowed for the cost of the transportation service.

The City is aware that the rule's language does not explicitly mention every kind of business that may contribute work on this project. In administering these programs, the City would, on a case-by-case basis, determine the appropriate counting formula to apply in a particular situation.

2.2 Contract Compliance

Questions concerning the SBE Program shall be directed to the Contract Compliance Officer of the City of Madison Department of Civil Rights, Affirmative Action Division, 210 Martin Luther King, Jr. Blvd., Room 523, Madison, WI 53703; telephone (608) 266-4910.

2.3 Certification of SBE by City of Madison

The Affirmative Action Division maintains a directory of SBEs which are currently certified as such by the City of Madison. Contact the Contract Compliance Officer as indicated in Section 2.2 to receive a copy of the SBE Directory or you may access the SBE Directory online at www.cityofmadison.com/civil-rights/contract-compliance/targeted-business-enterprise-programs/targeted-business-enterprise.

All contractors, subcontractors, vendors and suppliers seeking SBE status must complete and submit the **Targeted Business Certification Application** to the City of Madison Affirmative Action Division by the time and date established for receipt of bids. A copy of the Targeted Business Certification Application is available by contacting the Contract Compliance Officer at the address and telephone indicated in Section 2.2 or you may access the Targeted Business Certification Application online at www.cityofmadison.com/civil-rights/contract-compliance/targeted-business-enterprise-programs/targeted-business-enterprise. Submittal of the Targeted Business Certification Application by the time specified does not guarantee that the applicant will be certified as a SBE eligible to be utilized towards meeting the SBE goal for this project.

2.4 Small Business Enterprise Compliance Report

2.4.1 Good Faith Efforts

Bidders shall take all necessary affirmative steps to assure that SBEs are utilized when possible and that the established SBE goal for this project is achieved. A contractor who self performs a portion of the work, and is pre-qualified to perform that category of work, may subcontract that portion of the work, but shall not be required to do so. When a bidder is unable to achieve the established SBE goal, the bidder must demonstrate that a good faith effort to do so was made. Such a good faith effort should include the following:

- 2.4.1.1 Attendance at the pre-bid meeting.
- 2.4.1.2 Using the City of Madison's directory of certified SBEs to identify SBEs from which to solicit bids.
- 2.4.1.3 Assuring that SBEs are solicited whenever they are potential sources.
- 2.4.1.4 Referring prospective SBEs to the City of Madison Affirmative Action Division for certification.
- 2.4.1.5 Dividing total project requirements into smaller tasks and/or quantities, where economically feasible, to permit maximum feasible SBE participation.
- 2.4.1.6 Establishing delivery schedules, where requirements permit, which will encourage participation by SBEs.
- 2.4.1.7 Providing SBEs with specific information regarding the work to be performed.
- 2.4.1.8 Contacting SBEs in advance of the deadline to allow such businesses sufficient time to prepare a bid.
- 2.4.1.9 Utilizing the bid of a qualified and competent SBE when the bid of such a business is deemed reasonable (i.e. 5% above the lowest bidder), although not necessarily low.
- 2.4.1.10 Contacting SBEs which submit a bid, to inquire about the details of the bid and confirm that the scope of the work was interpreted as intended.
- 2.4.1.11 Completion of Cover Page (page C-6), Summary Sheet (page C-7) and SBE Contact Reports (pages C-8 and C9) if applicable.

2.4.2 Reporting SBE Utilization and Good Faith Efforts

The Small Business Enterprise Compliance Report is to be submitted by the bidder with the bid: This report is due by the specified bid closing time and date. Bids submitted without a completed SBE Compliance Report as outlined below may be deemed non-responsible and the bidder ineligible for award of this contract. Notwithstanding any language to the contrary contained herein, the City may exercise its discretion to allow bidders to correct or supplement submissions after bid opening, if the minor discrepancy, bid irregularity or omission is insignificant and not one related to price, quality, quantity, time of completion, performance of the contract, or percentage of SBE utilization.

2.4.2.1 If the Bidder meets or exceeds the goal established for SBE utilization, the Small Business Enterprise Compliance Report shall consist of the following:

2.4.2.1.1 **Cover Page**, Page C-6; and

2.4.2.1.2 **Summary Sheet**, C-7.

2.4.2.2 If the bidder does not meet the goal established for SBE utilization, the Small Business Enterprise Compliance Report shall consist of the following:

2.4.2.2.1 **Cover Page**, Page C-6;

2.4.2.2.2 **Summary Sheet**, C-7; and

2.4.2.2.3 **SBE Contact Report**, C-8 and C-9. (A separate Contact Report must be completed for each applicable SBE which is not utilized.)

2.5 Appeal Procedure

A bidder which does not achieve the established goal and is found non-responsible for failure to demonstrate a good faith effort to achieve such goal and subsequently denied eligibility for award of contract may appeal that decision to the Small Business Enterprises Appeals Committee. All appeals shall be made in writing, and shall be delivered to and received by the City Engineer no later than 4:30 PM on the third business day following the bidder's receipt of the written notification of ineligibility by the Affirmative Action Division Manager. Postmark not acceptable. The notice of appeal shall state the basis for the appeal of the decision of the Affirmative Action Division Manager. The Appeal shall take place in accordance with Madison General Ordinance 33.54.

2.6 SBE Requirements After Award of the Contract

The successful bidder shall identify SBE subcontractors, suppliers and vendors on the subcontractor list in accordance with the specifications. The Contractor shall submit a detailed explanation of any variances between the listing of SBE subcontractors, vendors and/or suppliers on the subcontractor list and the Contractor's SBE Compliance Report for SBE participation.

No change in SBE subcontractors, vendors and/or suppliers from those SBEs indicated in the SBE Compliance Report will be allowed without prior approval from the Engineer and the Affirmative Action Division. The contractor shall submit in writing to the City of Madison Affirmative Action Division a request to change any SBE citing specific reasons which necessitate such a change. The Affirmative Action Division will use a general test of reasonableness in approving or rejecting the contractor's request for change. If the request is approved, the Contractor will make every effort to utilize another SBE if available.

The City will monitor the project to ensure that the actual percentage commitment to SBE firms is carried out.

2.7 SBE Definition and Eligibility Guidelines

A Small Business Enterprise is a business concern awarded certification by the City of Madison. For the purposes of this program a Small Business Enterprise is defined as:

- A. An independent business operated under a single management. The business may not be a subsidiary of any other business and the stock or ownership may not be held by any individual or any business operating in the same or a similar field. In determining whether an entity qualifies as a SBE, the City shall consider all factors relevant to being an independent business including, but not limited to, the date the business was established, adequacy of its resources for the work in which it proposes to involve itself, the degree to which financial, equipment leasing and other relationships exist with other ineligible firms in the same or similar lines of work. SBE owner(s) shall enjoy the customary incidents of ownership and shall share in the risks and profits commensurate with their enjoyment interests, as demonstrated by an examination of the substance rather than form or arrangements that may be reflected in its ownership documents.
- B. A business that has averaged no more than \$4.0 million in annual gross receipts over the prior three year period and the principal owner(s) do not have a personal net worth in excess of \$1.32 million.

Firm and/or individuals that submit fraudulent documents/testimony may be barred from doing business with the City and/or forfeit existing contracts.

SBE certification is valid for one (1) year unless revoked.

SECTION D: SPECIAL PROVISIONS

LOWER BADGER MILL CREEK FLOOD MITIGATION CONTRACT NO. 8875

It is the intent of these Special Provisions to set forth the final contractual intent as to the matter involved and shall prevail over the Standard Specifications and plans whenever in conflict therewith. In order that comparisons between the Special Provisions can be readily made, the numbering system for the Special Provisions is equivalent to that of the Specifications.

Whenever in these Specifications the term "Standard Specifications" appears, it shall be taken to refer to the City of Madison Standard Specifications for Public Works Construction and Supplements thereto.

SECTION 102.11 BEST VALUE CONTRACTING

This Contract shall be considered a Best Value Contract if the Contractor's bid is equal to or greater than \$74,000 for a single trade contract; or equal to or greater than \$360,500 for a multi-trade contract pursuant to MGO 33.07(7).

SECTION 102.9 BIDDER'S UNDERSTANDING

In the preparation of Drawings and Specifications, Strand Associates, Inc.[®] relied upon the following reports of explorations and tests of subsurface conditions at the Site which are attached at the end of the **SPECIAL PROVISIONS**:

Report dated February 20, 2018, prepared by CGC, Inc., of Madison, Wisconsin, titled: Geotechnical Exploration Report–Proposed Meadow Road Area Site Improvements–Madison, Wisconsin, consisting of 32 pages.

Report dated October 28, 2022, prepared by CGC, Inc., of Madison, Wisconsin, titled: Geotechnical Exploration Report–Bridge and Road Construction–Blue Harvest Lane, Madison, Wisconsin, consisting of 29 pages.

The technical data in the above reports, upon which Contractor may rely, consists of boring methods, level of subsurface water, boring logs, laboratory test methods and results, and boring locations all as of the date made.

City accepts no responsibility for accuracy of the soil data or water level information. Soil borings and report, included with these Contract Documents, were not obtained for the purposes of designing excavations and trenches. Soils information was used by Strand Associates, Inc.[®] for design purposes of new structures only. Contractor shall assure itself by personal examination as to subsurface conditions and shall provide its own investigations and make its own assumptions to comply with OSHA and any other applicable laws and regulations regarding excavation and trenching requirements.

SECTION 103 AWARD AND EXECUTION OF THE CONTRACT

The awarded Contractor shall completely execute the signing of all contract documents and submit them to City Engineering (1600 Emil Street, Madison, WI 53713) prior to 12:00 PM on Thursday, April 20, 2023. Delays in turning in the required completed contract documents will not adjust the project completion date.

Payment and Performance Bonds shall be dated no sooner than Wednesday, April 19, 2023.

SECTION 104 SCOPE OF WORK

This flood mitigation project consists of the following: the grading of three proposed wet detention ponds; sediment removal from an existing open-water wetland; storm sewer improvements; grading of a mainline

channel connecting two open-water wetlands; construction of gravel maintenance paths; construction of a single slab concrete bridge; and construction of a new road (Blue Harvest Lane) up to subgrade elevation.

Work shall include, but is not limited to: clearing & grubbing, channel excavation, maintenance path base course, installation of storm pipe and structures, installation of box culvert wingwalls and apron, bridge construction, and restoration.

SECTION 104.4 INCREASED OR DECREASED QUANTITIES

The Contractor shall note that some bid item quantities may increase or decrease based on what is encountered in the field. If the actual field conditions vary from the plan quantity, no additional compensation shall be given for increasing or decreasing quantities. Any overruns shall be paid for under the appropriate bid item(s) without any penalty or change to the bid price for the associated bid item. The Contractor shall not be reimbursed for any deletions to the contract. No change to the unit bid price will be allowed for changes to the quantities.

SECTION 105.12 COOPERATION BY THE CONTRACTOR

The City of Madison is not aware of other projects taking place in the vicinity of this project. If, during the proposed ground disturbing activity, the Contractor encounters human remains, the Contractor shall stop work at that location and contact the City immediately for further coordination, and, in the event that human remains must be excavated and analyzed, for negotiation and execution of an appropriate contract.

Existing Items to Remain

The Contractor shall use care around existing trees, plantings, walls, signs, utilities, traffic signals, street lights, pedestrian flashers and any other structures or amenities that are indicated on the plans to remain. The Contractor shall protect all items that are to remain and shall immediately clean off any residue from adjacent construction activities.

The Contractor shall use care around existing trees to remain and as shown on the plans as protected with construction fencing. No trees, other than those shown on the plan to be removed, shall be cut without the approval of the Engineer and the City Forester; the abutting property owners shall be notified in accordance with the City's Administrative Procedure Memorandum No. 6-2 prior to any removal. Several trees are noted on plans to follow the "No Root Cutting" procedures as identified in the standard specifications. The Contractor shall not store materials or equipment within in 6 ft. of any existing tree that is to remain.

Access to Properties

The Contractor shall maintain pedestrian access to all properties within the project limits and shall maintain vehicle access to all commercial driveways within the project limits. All means necessary to maintain this access shall be considered incidental.

Coordination with Utilities

This project will require close coordination with private utility companies. There are existing utilities located within the project limits that are to remain. The Contractor will be responsible for coordination and providing work space for any conflict resolution work that will need to be performed by the private utility companies. The Contractor shall coordinate with all utilities for any structure adjustments. Provide a minimum of 1 week notice prior to needing structure adjustments.

Haul Route

The Contractor will utilize proposed maintenance path alignments as haul routes during construction operations throughout the project duration. The maintenance path alignments were strategically designed to avoid wetland impacts as much as possible. While Town of Middleton seasonal weight restrictions (see Section 107.7) are in place on Meadow Road trucks and equipment that exceed the weigh restriction shall enter and exit the site directly to Mid Town Road. Access via neighborhood streets, including but not

limited to Hidden Hill Drive, Treetops Drive, Feather Edge Drive, and Soaring Sky Run, shall not be allowed.

SECTION 107.13 TREE PROTECTION

Contractor shall review Section 107.13 of the Standard Specifications for tree protection. Other sections are applicable except as provided below.

All trees shall be saved except those trees marked for removal on the plans and with pink paint in the field. Because of the intent to save trees, there are trees to be saved that are inside the construction limits. It is recognized that grading operations and root cutting of these trees may need to occur within 5 feet of these trees in order to complete the work, but care must be taken in these areas. Roots shall be cut cleanly by using lopping shears, chainsaw, stump grinder, sawzall, or other means which will produce a clean cut. Exposed roots shall be covered as soon as excavation is complete. Contractor shall not rip or pull roots out towards the trunk of a tree while excavating with a backhoe. The use of a backhoe to cut roots is **not** acceptable. All mechanical grading, including sod installation within five (5) feet of any tree as measured from the outside edge of the tree trunk or visible aboveground portion of the root system shall be prohibited unless directed by the City Engineer or City Forester.

With regard to Section 107.13(f), pruning to accommodate construction equipment invading the tree crown may be done by Contractor, with advance permission from City Forestry and Construction Engineer. No pruning will be performed by City Forestry. All pruning shall be done according to ANSI A300 tree pruning specifications.

With regard to Section 107.14(g), no parked vehicles, construction equipment, materials, or spoils will be allowed to be placed within 5 feet of a tree. Construction traffic within 5 feet of a tree will be allowed only where necessary to complete grading operations, as described above, at the discretion of the Construction Engineer.

Where noted on the tree inventory plan within the construction drawings, trees shall be protected per the tree protection detail with plastic construction fencing. City Forestry and City Engineering will mark these trees with ribbon after the site has been staked prior to construction. Contractor shall not disturb these trees and may further indicate their presence by placing temporary fencing between the work area and tree. Temporary fencing shall be paid separately under Bid Item 21302.

SECTION 107.2 PROTECTION AND RESTORATION OF PROPERTY AND PROPERTY OWNERS

Care shall be taken not to disturb property irons, sod areas and retaining walls on private property. Materials, equipment, and other items incidental to the work shall, at no time, be placed on private property.

SECTION 107.6 DUST PROOFING

The Contractor shall take all necessary steps to control dust arising from operations connected with this contract. When ordered by the Engineer, the Contractor shall dust proof the construction area by using power sweepers and water. Dust proofing shall be incidental with operations connected with this contract.

SECTION 107.7 MAINTENANCE OF TRAFFIC

During construction, the Town of Middleton will have a spring weight restriction of 10 tons in place on all Town roads, including Meadow Road. Any questions for the Town pertaining to these restrictions shall be sent to the City and the City will coordinate having questions answered. Between March 10 and May 10 restrictions equivalent to Wisconsin Department of Transportation Class II restrictions (<https://wisconsin.gov/Pages/dmv/com-drv-vehs/mtr-car-trkr/ssnl-wt-rsrctns/default.aspx>) will apply on Mid Town Road. This restriction applies to vehicles exceeding legal axle weights or 40 tons during spring thaw.

SECTION 108.2 PERMITS

The City of Madison will obtain a City of Madison Erosion Control Permit and Wisconsin DNR WRAPP (Notice of Intent) prior to the preconstruction meeting for this project. Additionally, a Chapter 30 permit for wetland disturbance will be issued by Wisconsin DNR, with approval from U.S. Army Corps of Engineers, once the City of Madison provides affidavit of purchase of wetland mitigation credits, which is a condition of permit approval. Permit issuance is anticipated in early to mid-March.

The Contractor shall meet the conditions of the permits by properly installing and maintaining the erosion control measures shown on the plans, specified in these Special Provisions, or as directed by the Construction Engineer or their designees. This work will be paid for under the appropriate contract bid items or, if appropriate items are not included in the contract, shall be paid for as Extra Work. Additionally, the Contractor shall not perform land disturbing activities within delineated wetland boundaries beyond what is shown on the plans and covered by the issued Chapter 30 permit. A copy of the permits will be provided at the preconstruction meeting and is available at the City of Madison Engineering Division office.

These permits covers trench dewatering to a maximum of 70 gallons/minute from the project, provided appropriate control measures are in place. The City's obtaining these permits is not intended to be exhaustive of all permits that may be required to be obtained by the Contractor for construction of this project. It shall be the responsibility of the Contractor to identify and obtain any other permits needed for construction.

Copies of all permits listed above will be provided to the Contractor prior to the start of construction. The Contractor must keep a copy of each individual permit on site at all times throughout construction.

SECTION 109.2 PROSECUTION OF WORK

The Contractor shall begin work on or after May 1, 2023. All work shall be completed on or prior to October 27, 2023.

Work shall begin only after the start work letter is received. If it is desirable to begin work before or after the above mentioned date, the Contractor shall establish a mutually acceptable date with the City Engineer, and the agreed upon date must be determined prior to the preconstruction meeting.

The Contractor is made aware that the start of work date listed above may be delayed, due to concerns and problems addressing the effects of COVID-19. This change is at the discretion of the Engineer.

The Contractor shall limit workdays to 7:00 a.m. to 7:00 p.m. Monday – Saturday within the roadway, greenway, or pond, unless approved by the Engineer in writing.

City expects that all permits applied for by the City listed in Section 108.2 will be obtained prior to the named start date. If elements of work critical to the schedule are delayed beyond the agreed start date due solely to the City's failure to obtain the permits listed in Section 108.2, the Completion Date will be adjusted accordingly. However, such delays shall not be grounds for any compensation from the City or adjustment in unit prices.

Any work shall be completed no later than October 27, 2023.

Work shall begin only after the start work letter is received.

SECTION 210.1(d) STREET SWEEPING

When required, either by the erosion control plan or the Construction Engineer, the Contractor shall perform mechanical street-sweeping on all streets or paved surfaces affected by construction equipment, hauling or related construction activities that result in mud tracking or siltation. Mechanical street sweeping shall be completed as directed by the Construction Engineer and shall remove all loose material to the satisfaction of the Construction Engineer. Depending on site conditions, construction

activities, and hauling methods utilized by the Contractor mechanical street sweeping may be required multiple times throughout the day with an absolute minimum that all streets are clean at the end of the work day. Areas not accessible by mechanical street sweepers may require hand scraping with shovels.

SECTION 500 SEWER AND SEWER STRUCTURES GENERAL

The sanitary sewer designer for the project is Matt Allie and may be contacted at mallie@cityofmadison.com (preferred) or (608) 266-4058. Any questions related to the project may be directed to Matt Allie.

Sanitary Sewer General

Sanitary sewer pipe work will include installation of approximately 250 feet of new 8" diameter ASTM D3034 SDR-35 main. Sanitary sewer pipe work shall include installing new sewers at the size and location specified on the plan set and in accordance with the City of Madison Standard Specifications for Public Works Construction latest edition. Disturbance for sanitary sewer installation shall be restricted to the limits shown on the plans and additional compensation will not be provided for restoring areas disturbed outside of these limits.

All new sanitary sewer access structures shall include the Neenah R-1550 Frame with City of Madison Logo Lid 1550-0054 (see S.D.D. 5.7.16 of the City of Madison Standard Specification for Public Works Construction latest edition). All new sewer main connections may be factory cored and shall be included in the structure price.

BID ITEM 20101 – EXCAVATION CUT

A. Description

The item of Excavation Cut shall apply to all excavation for wet detention ponds, channels, removal of sediment from the northern open-water wetland, earthen embankment, and any other areas within the project limits where excavation is below existing ground. This item does not include trenching for sanitary sewer or storm sewer, restoration work, and excavation for structures. Excavation Cut shall be in accordance with Article 201 of the Standard Specifications except as provided below.

The plan quantity of excavation cut includes quantities for all work necessary to construct the project area where the proposed profile is at a lower elevation than the existing profile. The plan quantity also includes the extra material needed to be removed for installation of the earthen embankment north of Blue Harvest Lane shown on the construction drawings.

In locations that will involve filling, it is assumed that suitable fill material will be found from excavation areas within the limits of the project or hauled in from an off-site location, and the Contractor shall use these materials as necessary to establish the grade in fill areas. The material used for construction of Blue Harvest Lane should meet the specifications for "Fill Borrow - Blue Harvest Lane" and the material for the earthen embankment shall meet the specifications for this bid item.

Suitable material, as determined by the Construction Engineer, from the cut shall be used on site in appropriate locations. Placing, grading and compaction of excavated materials will be incidental to this bid item unless used for earthen embankment. The earthen embankment bid item includes all labor, materials, and incidentals required to place, grade, and compact area on the construction drawings that call for an earthen embankment.

The Contractor shall be responsible for determining a suitable off-site disposal location for excess or unsuitable material. Contractor shall comply with all laws and permit conditions for off-site disposal and any off-site disposal costs or fees are considered incidental to this bid item. The disposal site for clean excess material shall meet the performance requirements in NR 504.04(4). The disposal site may not cause:

- (a) A significant adverse impact on wetlands
- (b) A take of an endangered or threatened species
- (c) A detrimental effect on any surface water

(d) A detrimental effect on groundwater quality

B. Method of Measurement

The quantity of Excavation Cut as shown on the construction drawings will not be measured in the field, but will be assumed to be the Plan Quantity as shown on the Plans. Excavation below Subgrade (EBS or undercut, including topsoil stripping), where required by the Construction Engineer, will be measured in the field. The pay quantity for the item of Excavation Cut shall be the sum of the plan quantity for Unclassified Excavation and the measured quantity of EBS, with no adjustment for shrink/swell.

C. Basis of Payment

Excavation Cut, measured as provided above, will be paid at the contract unit price per Cubic Yard, which shall be full compensation for all excavation of granular materials or soil, compaction where required, removal, hauling, and disposal of all excess materials of all types, and all labor, tools, equipment, and incidentals necessary to complete this item of work.

BID ITEM 20204 – SELECT FILL

Work under this item shall include all excavation and fill required for the street shown on the cross sections as well as within the grading limits shown on the plans. The plan quantity for excavation includes all necessary topsoil stripping under the new street. Reusing topsoil material from on-site shall be paid separately. These items shall be in accordance with Article 201 and 202 of the Standard Specifications.

No bulking/expansion or shrink factors were used in determining earthwork quantities for this project. A detailed summary of the earthwork quantities (unadjusted) is as follows:

Excavation Cut (Blue Harvest per cross sections)

- Estimated Undercut for streets & paths (waste material under this contract): 1,580 CY
- Estimated Topsoil Stripping for Blue Harvest (under this contract): 1,400 CY
- Total Unclassified Excavation for Blue Harvest (paid under item 20101): 2,980 CY

Select Fill (Blue Harvest) cross sections, paid under item 20204..... 13,600 TON

- Placed in fill areas where base course is above existing ground.
- On-site soil excavated under this contract is expected to be used for fill areas.
- If on-site excavated material is not usable, select fill from offsite will be required.
- Breaker Run Undercut (Blue Harvest per cross sections (paid under item 20219): 2,750 TON

The Contractor shall place Geosynthetic Reinforcement Fabric (paid under 90018) and Breaker Run (paid under 20219) in the undercut areas.

BID ITEM 20221 – TOPSOIL

A. Description

Topsoil shall include furnishing, spreading, fine grading and raking the surface in preparation for seeding, in accordance with Section 202 of the Standard Specifications. Contractor may use salvaged topsoil obtained from excavation within the project limits for some or all of the topsoil required. If salvaged topsoil is used, this item includes any additional effort to strip the topsoil, stockpile it on site and prepare it to meet the material specifications. If off-site topsoil is required, no extra compensation will be allowed.

All areas within the limits of disturbance, except areas of hard surface, shall have topsoil placed to a minimum thickness of six (6) inches unless otherwise shown on Drawings.

B. Method of Measurement

Topsoil will be measured by the square yard, in place.

C. Basis of Payment

Topsoil will be paid at the contract price per square yard, which shall be full payment for segregating, stockpiling and preparing salvaged topsoil, furnishing additional topsoil from offsite if needed, placing, grading and raking finished surface, all materials, labor and incidentals necessary to complete the work as provided.

BID ITEMS 20404 AND 20409 – CLEARING AND GRUBBING

A. Description

Work under these items consists of the clearing and grubbing of trees shown on the construction drawings for removal, and any additional trees removed at the direction of the Construction Engineer or City Forester. This bid item also includes the removal of the large existing sandbags shown on the construction drawings.

Clearing and Grubbing shall be done in accordance with Article 204 of the Standard Specifications as modified in these Special Provisions.

B. Method of Measurement

Clearing and Grubbing will be measured by the lump sum as the contract indicates.

C. Basis of Payment

Clearing and Grubbing, measured as provided above, will be paid at the lump sum contract price, which shall be full payment for all work to complete this item in accordance with the Standard Specifications.

BID ITEM 50511 – PRECAST REINFORCED CONCRETE BOX CULVERT WINGWALLS AND APRON

A. Description

Work under this item shall include all work, materials, and incidentals necessary to construct and install full precast concrete box culvert wingwalls and apron at the downstream end of the 6-foot (span) by 3-foot (rise) box culvert across Meadow Road as shown on the construction drawings and per the City of Madison's Standard Detail Drawings (S.D.D.) 5.5.1A and 5.5.1B. Excavation and clear stone bedding shall be installed as stated in S.D.D. 5.5.1A and shall be paid for under this bid item. At the edge of the apron, cutoff wall shall be installed, as shown in the detail referenced above. If a cast-in-place wingwall and apron are requested by the Contractor, there shall be no additional compensation by the City for the substitute. The Contractor shall provide shop drawings of any precast wingwall and apron to be used for the project. The shop drawings shall be stamped by a Professional Engineer registered in the state of Wisconsin.

B. Method of Measurement

Precast reinforced concrete box culvert wingwalls and apron shall be measured by each unit completed in place and satisfactorily installed.

C. Basis of Payment

Precast reinforced concrete box culvert wingwalls and apron, as measured above, shall be paid at contract price and be considered full compensation for all work, materials and incidentals to complete the work as explained in the description above.

BID ITEMS 90000-90015 – BRIDGE CONSTRUCTION

A. Scope of Work

1. The work under this section includes all items related to construction of a bridge including excavation, backfill, concrete, reinforcing, geotextile fabric, and other incidentals.

B. Source of Materials

1. All materials are subject to City's approval before incorporation into the work. Submit a source of materials report to City for review and approval.

C. Specifications

1. Unless otherwise specified or required, all work shall conform to the requirements of the STATE SPECIFICATIONS, Parts 2 through 6.
2. The Specifications, Method of Measurement, and Basis of Payment for the following Bid Items are provided in the STATE SPECIFICATIONS:

Bid Item	Section
#90000 Excavation for Structures Bridges B-13-908	206
#90001 Backfill Structure Type A	210
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D. Special Provisions

1. These Special Provision govern wherever there is conflict or discrepancy with the STATE SPECIFICATIONS.
2. Concrete Structures Quality Management Plan (QMP)
 - a. Description
 - (1) This Section describes Contractor mix design and testing requirements for Class I concrete used in concrete structures.
 - (2) Quality Control Program
 - (a) General
 - 1) Conform to the general requirements under **Sections 701** and **710** of the STATE SPECIFICATIONS, as well as the additional specific Contract QMP provisions for Class I concrete specified herein. The City defines Class I concrete as cast-in-place concrete used in structure applications where all of the following apply:
 - a) Mix design requires review by ENGINEER.
 - b) The Contract defines specification limits for strength.
 - (b) Small Quantities

- 1) City defines small quantities of Class I concrete, subject to the reduced requirements under **Section 710.2** of the STATE SPECIFICATIONS, as follows:
 - a) Less than one hundred fifty (150) cubic yards of structure concrete placed under a single Bid Item.
 - (c) Pre-Pour Meetings for Structure Concrete
 - 1) Arrange two pre-pour meetings to discuss concrete placement. Discuss the placement schedule, personnel roles and responsibilities, testing and quality control, and how test results will be communicated. Schedule the first meeting before placing any concrete and the second before placing any bridge deck concrete. Representatives from all parties involved with the concrete work, including Contractor, subcontractor, ready-mix supplier, testers, and ENGINEER, shall attend the meeting.
 - (d) Quality Control (QC) Plan
 - 1) Submit a quality control plan 7 (seven) business days before producing concrete, conforming to **Section 701.1.2.2** of the STATE SPECIFICATIONS and include the following:
 - a) Concrete mix design documentation as required in **710.4**.
 - b) Proposed methods for monitoring and recording batch weights.
 - c) Aggregate gradation acceptance method for class I concrete items.
 - d) Methods for monitoring and adjusting blended aggregate gradations before corrective action is required under **Section 710.5.7** of the STATE SPECIFICATIONS; and methods for documenting corrective action.
- b. Materials
- (1) General
 - (a) Determine mixes for Class I concrete used under the Contract using one (1) or more of the following methods:
 - 1) Have a HTCP-certified PCC Technician II develop new concrete mixes qualified based on the results of mix development tests performed by a City-qualified laboratory.
 - 2) Submit previously used City-approved mixes qualified based on field performance.
 - (b) In addition to the mix information required under **Section 710.4** of the STATE SPECIFICATIONS, submit two (2) copies of a concrete mix report at least three (3) business days before producing concrete. For lab qualified mixes, include strength data, test dates, and the name and location of the laboratory that performed mix development testing. For field-qualified mixes, include historical data that demonstrate acceptable strength and field performance.
 - (c) Provide mix report shop drawing for ENGINEER to review prior to the start of concreting operations.
 - (2) Class I Concrete Mixes
 - (a) Structures
 - 1) Qualify compressive strength according to ACI 301—Specifications for Structural Concrete—Subsections 4.2.3.1 through 4.2.3.4. Demonstrate that the 28-day compressive strength of the proposed mix will equal or exceed the 90 percent within limits criterion specified in **Section 715.5.3** of the STATE SPECIFICATIONS.
 - 2) Provide Grade A concrete with SCM as a partial replacement for cement as specified in **Section 501.3.2.2.2** of the STATE SPECIFICATIONS.
 - 3) The target ratio of net water to cementitious material (w/cm) for the submitted mix design shall not exceed 0.45 by weight. Include free water on the aggregate surface but do not include water absorbed within aggregate particles. Control the w/cm ratio throughout production by adjusting batch weights for changes in the aggregate moisture as required under **Section 715.3.3** of the STATE SPECIFICATIONS.
 - 4) Do not use mixes containing accelerators, except Contractor may use mixes containing non-chloride accelerators in substructure elements.
- c. Testing and Acceptance
- (1) Class I Concrete Testing

- (a) General
 - 1) Provide slump, air content, concrete temperature, and compressive strength test results, as specified in **Section 710.5** of the STATE SPECIFICATIONS. Provide a battery of QC tests, consisting of results for each specified property, using a single sample randomly located within each subplot. Cast three (3) cylinders for strength evaluation.
 - 2) If a subplot random test location falls within a mainline pavement gap, relocate the test to a different location within the subplot.
- (b) Lot and Sublot Definition
 - 1) General
 - a) Designate the location and size of all lots before placing concrete. No lot shall contain concrete of more than one (1) mix design, as defined in these Specifications, or more than one (1) placement method, defined as either slip formed, not slip formed, or placed under water.
 - b) Lots and sublots include ancillary concrete placed integrally with the Class I concrete.
 - 2) Lots by Cubic Yard
 - a) Define standard lots and sublots conforming to the following:
 - i. Max of 250 cubic yard lot size.
 - ii. Max of 50 cubic yard subplot size.
 - iii. Max number of 5 sublots per lot.
- (2) Strength Evaluation
 - (a) General
 - 1) Randomly select two (2) QC cylinders to test at twenty eight (28) days for percent within limits (PWL). Compare the strengths of the two (2) randomly-selected QC cylinders and determine the twenty-eight (28) day subplot average strength as follows:
 - a) If the lower strength divided by the higher strength is 0.9 or more, average the two (2) QC cylinders.
 - b) If the lower strength divided by the higher strength is less than 0.9, break one (1) additional cylinder and average the two (2) higher-strength cylinders.
 - 2) City will evaluate the subplot for possible removal and replacement if the 28-day subplot average strength is $< f_c - 500$ psi (f_c is design strength found in Drawings or Special Provisions).
 - (b) Removal and Replacement
 - 1) Structures
 - a) City will direct CONTRACTOR to core the affected subplot to determine the structural adequacy. Timeframe of coring operations and locations will be agreed upon between City and Contractor. Determine core locations that do not interfere with structural steel.
 - b) Perform coring according to CMM 870 Attachment 9: WTM AASHTO T24.
 - c) Have an independent consultant test cores according to CMM 870 Attachment 9: WTM AASHTO T24. City will assess concrete for removal and replacement based on a subplot-by-subplot analysis of core strength. Perform coring and testing, fill voids with an ENGINEER-approved non-shrink grout or concrete, and provide traffic control during operations.
 - d) The subplot will remain in place if the 3-core average is greater than or equal to 85 percent of f_c , and no individual core is less than 75 percent of f_c . The 28-day QC average subplot strength will be included in the compressive strength PWL equation of **Section 715.5.2** of the STATE SPECIFICATIONS.
 - e) If the compressive strength of the 3-core average is less than 85 percent of f_c or an individual core is less than 75 percent f_c , City will direct Contractor to either:
 - i. Remove and replace unacceptable structure or cast-in-place barrier subplot with new concrete of conforming strength. There is no incentive for replaced concrete, but City will adjust pay for PWL values < 85

according to **715.5.2**. City will pay once for the area at the full contract price.

- ii. Permit concrete to remain in place. The original 28-day QC average subplot strength will be included in the compressive strength PWL equation of **Section 715.5.2** of the STATE SPECIFICATIONS.

(3) Aggregate

(a) General

- 1) Except as allowed for small quantities in **Section 710.2** of the STATE SPECIFICATIONS provide aggregate test results conforming to **Section 710.5.6** of the STATE SPECIFICATIONS.

(b) Structures

- 1) In addition to the aggregate testing required under **Section 710.5.6** of the STATE SPECIFICATIONS, determine the fine and coarse aggregate moisture content for each sample.
- 2) Calculate target batch weights for each mix when the production of that mix begins. Whenever the moisture content of the fine or coarse aggregate changes by more than 0.5%, adjust the batch weights to maintain the design W/Cm ratio.

d. Basis of Payment

- (1) Costs for all sampling, testing, and documentation required under this Specification and all charges incurred for coring, including traffic control, are incidental to Bid Item #90002–Concrete Masonry Bridges.

BID ITEM 90016 – ARCHITECTURAL SURFACE TREATMENT B-13-908

A. Description

- 1. This special provision describes providing a concrete masonry architectural surface treatment on the exposed concrete surfaces of structures as the plan details show.

B. Materials

- 1. Use form liners that attach easily to the forming system, and do not compress more than 1/4 inch when poured at a rate of 10 vertical feet/hour.
- 2. Use a release agent that is compatible with the form liner and coloring materials.
- 3. Wall ties shall have set "break-backs" at a minimum of 3/4 inch from the finished concrete surface.
- 4. Submit form liner product details for review by ENGINEER prior to ordering or using form liners on project.

C. Construction

- 1. Equipment
 - a. Equipment and tools necessary for performing all parts of the work shall be satisfactory as to design, capacity, and mechanical condition for the purposes intended. Repair, improve, replace, or supplement all equipment that is not maintained in full working order, or which is proven inadequate to obtain the results prescribed.
- 2. Form Liner Preparation
 - a. Clean the form liner before each pour and verify that it is free of any build-up. Visually inspect each liner for blemishes or tears, and repair if necessary, per manufacturer's recommendations.
 - b. Apply form release per manufacturer's recommendations.
- 3. Form Liner Attachment
 - a. Place adjacent liners less than 1/4 inch from each other, attach liner securely to forms according to the manufacturer's recommendations, and coordinate wall ties with form liner and form manufacturer, e.g., diameter, size, and frequency.
- 4. Surface Finishing
 - a. Verify that the textured surface is free of laitance; sandblasting is not permitted.
 - b. Grind or fill pouring blemishes.
- 5. Test Area
 - a. Pour a sample panel for ENGINEER to review. Do not place any concrete for the structure that is to receive form liner until ENGINEER has approved the sample panel.

Provide a sample panel measuring a minimum of 48 inches by 48 inches by 6 inches thick and place in an area for removal after the surface treatment has been compared with the reference panel and approved.

D. Method of Measurement

1. City will measure Architectural Surface Treatment B-13-908 in area by the square foot of architectural surface acceptably completed, measured as the vertical area within the pay limits the Contract Drawings show. No allowance will be made for the sample panel.

E. Basis of Payment

1. City will pay for measured quantities at the contract unit price. Payment is full compensation for producing the proposed architectural surface treatment including: preparing the foundation; finishing and protecting the surface treatment; and for properly disposing of surplus material.

BID ITEM 90017 – CONCRETE STAINING B-13-908

A. Description

1. This special provision describes providing a two-coat concrete stain on the exposed concrete surfaces of structures as the Drawings show.

B. Materials

1. Mortar
 - a. Use mortar for sack rubbing the concrete surfaces as given in **Section 502.3.7.5** of the STATE SPECIFICATIONS or use one of the following products:
 - (1) Preblended, Packaged Type II Cement
 - a) Tri-Mix by TK Products.
 - b) Thoroseal Pearl Gray by Thoro Products.
 - b. The mortar shall contain one of the following acrylic bonding admixtures mixed and applied according to manufacturer's recommendations:
 - (1) Acrylic Bonding Admixture
 - a) TK-225 by TK Products.
 - b) Achro 60 by Thoro Products.
 - c) Achro Set by Master Builders.
 2. Concrete Stain
 - a. Use concrete stain manufactured for use on exterior concrete surfaces, consisting of a base coat and a pigmented sealer finish coat. Use the following products, or equal as approved by City, as part of the two coat finish system:
 - (1) Tri-Sheen Concrete Surfacer, Smooth by TK Products.
 - (2) Tri-Sheen Acrylic by TK Products.
 - (3) TK-1450 Natural Look Urethane Anti-Graffiti Primers by TK Products.
 - (4) Safe-Cure & Seal EPX by Chem Masters.
 - (5) H&C Concrete Stain Solid Color Water Based by Sherwin-Williams.

C. Construction

1. General
 - a. Furnish, prepare, apply, cure, and store all materials according to the product manufacturer's specifications for the type and condition of application required.
 - b. Match or exceed the stain manufacturer's minimum recommended curing time of the concrete or 28 days, whichever is greater, before staining.
2. Preparation of Concrete Surfaces
 - a. Provide a sack rubbed finish as specified in **Section 502.3.7.5** of the STATE SPECIFICATIONS, using mortar as indicated above on concrete surfaces with open voids or honeycombing.
 - b. Following the sack rubbing, clean all concrete surfaces that are to be coated so that the surface is free of all laitance, dirt, dust, grease, efflorescence, and any foreign material and that the surface will accept the coating material according to product requirements. As a minimum, clean the surface using a 3000-psi water blast. Hold the nozzle of the water blaster approximately 6 inches from the concrete surface and

move it continuously in a sweeping motion. Give special attention to smooth concrete surfaces to produce an acceptable surface texture. Correct any surface problems resulting from the surface preparation methods. Grit blasting of the concrete surface is not allowed.

3. Staining Concrete Surfaces
 - a. Apply the concrete stain according to the manufacturer's recommendations.
 - b. Apply the concrete stain when the temperature of the concrete surface is 45°F or higher, or as given by the manufacturer.
 - c. The color of the stain shall be as given on the Drawings. Tint the base coat to match the finish coat; the two coats shall be compatible with each other.
 - d. Do not begin staining the structure until earthwork operations are completed to a point where this work can begin without receiving damage. Where this work is adjacent to exposed soil or pavement areas, provide temporary covering protection from overspray or splatter.
4. Test Areas
 - a. Before applying stain to the structure, apply the stain to sample panels measuring a minimum of 48 inches by 48 inches and constructed to demonstrate workmanship in the use of the form liner specified on the structure if applicable. Match or exceed the stain manufacturer's minimum recommended curing time of the concrete or 28 days, whichever is greater, before staining. Prepare the concrete surfaces of the sample panels and apply stain using the same materials and in the same manner as proposed for the structure, including staining of the joints between the stones produced by the form liner if applicable. Do not apply stain to the structure until City approves the test panels.
5. Surfaces to be Coated
 - a. Apply concrete stain to the surfaces according to the Drawings.

D. Method of Measurement

1. City will measure Concrete Staining B-13-908 in area by the square foot of surface, acceptably prepared and stained.

E. Basis of Payment

1. The City will pay for measured quantities at the contract unit price. Payment is full compensation for furnishing and applying the two-coat system; for preparing the concrete surface; and for preparing the sample panels.

BID ITEM 90018 – GEOSYNTHETIC REINFORCEMENT FABRIC

A. Description

Work under this item shall include all work, materials, equipment, and incidentals necessary to provide and install Mirafi RS580i, or an approved equal.

B. Construction Methods

The Geosynthetic Reinforcement Fabric shall be installed in accordance with the manufacturer's recommendations. A maximum of 12" of Undercut shall be removed, under the entire road area, and replaced with Breaker Run. Undercut and Breaker Run shall be paid for under the appropriate bid items. The Breaker Run shall be placed directly over the Geosynthetic Reinforcement Fabric in 8 to 12-inch loose lifts. Rubber-tired vehicles may be driven at low speeds, 10 mph or less, and in straight paths over the exposed Geosynthetic Reinforcement Fabric.

C. Method of Measurement

The Geosynthetic Reinforcement Fabric shall be measured by the square yard, in place. Any overlap of the rolls, measured either longitudinally or transversely, shall be included in the pay quantity.

D. Basis of Payment

Geosynthetic Reinforcement Fabric shall be measured as described above, which shall be full compensation for all work, materials, equipment and incidentals to complete the work as described above.

BID ITEM 90030 – STORMWATER CONTROL PLAN AND IMPLEMENTATION

A. Description

Work under this item shall include all labor, materials, and incidentals required to prepare a stormwater control plan and to implement the approved plan. The storm control plan shall include dry weather, wet weather, and backwater flow control contingencies. Contractor shall submit to the project ENGINEER a plan that details how upstream stormwater flows that drain to the project area will be managed and/or diverted during project construction. The stormwater control plan shall be approved by the project ENGINEER prior to any contracted work. Any work, materials, and incidentals necessary to repair and restore the site in conjunction with the Storm Control Plan and Implementation shall be considered incidental to this Bid item.

If phasing will be required to properly control the stormwater flows on site during project construction, this shall be defined and detailed in the Stormwater Control Plan. Contractor shall provide appropriate stormwater control measures during the entire duration of the project. Removal of all equipment and materials used for storm control shall be considered incidental to this Bid item.

B. Method of Measurement

Stormwater Control Plan and Implementation shall be measured as a lump sum bid item.

C. Basis of Payment

Stormwater Control Plan and Implementation, as measured above, shall be paid at the contract price and be considered full compensation for all work, materials, and incidentals required to complete the work as described above.

BID ITEM 90031 – POND C OUTLET CONTROL STRUCTURE

A. Description

Work under this bid item shall consist of a precast 4-foot diameter access structure with Neenah Foundry R-1480-E frame and lid that contains a prefabricated weir conforming to the shape, orientation, and dimensions shown on the detail sheet. The weir material shall be plate steel and be attached to the structure by bolting it to mounted angle iron. Alternate weir materials and means of attachment may be used if approved by ENGINEER.

B. Method of Measurement

Pond C Outlet Control Structure will be measured by each completed in place and satisfactorily installed.

C. Basis of Payment

Pond C Outlet Control Structure as measured above, shall be considered full compensation for all work, materials, and incidentals required to complete the work as described above.

BID ITEM 90032 – CLAY ANTI-SEEPAGE COLLAR

A. Description

Work under this bid item shall consist of furnishing and installing low permeable clay around reinforced concrete storm sewer pipe at the locations shown on the Drawings.

B. Material

For each source, prior to excavating and hauling the low permeable clay to the project, submit the results of the laboratory tests described in Table 1. The laboratory testing shall document that each clay type from the source meets or exceeds the requirements.

The sample for the hydraulic conductivity test shall be remolded clay at a minimum dry density of 95% of the maximum dry density as determined by the Standard Proctor test ASTM D698 and at a moisture content required to achieve the required hydraulic conductivity, but with a minimum moisture content at or above the optimum moisture content as determined in the Standard Proctor test ASTM D698. Submit the test results to ENGINEER for review, two weeks prior to construction.

Table 1

Reference	Number	Test Title	Requirements	Testing Frequency		
				Screening	QA/QC ³	
					Top Cover	Sideslopes
ASTM ¹	D698	Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort	NA ²	1/source	1/source	1/source
ASTM	D1140	Standard Test Methods for Amount of Material in Soils Finer Than the No. 200 (75-um) Sieve	Per NR 538 ⁴	2/source	1/2,220 cy per lift ⁵	1/3,330 cy per lift
ASTM	D422	Standard Test Method for Particle-Size Analysis of Soils	Per NR 538	2/source	1/2,220 cy per lift	1/3,330 cy per lift
ASTM	D4318	Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.	Per NR 538	2/source	1/2,220 cy per lift	1/3,330 cy per lift
ASTM	D2487	Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)	Per NR 538	2/source	1/2,220 cy per lift	1/3,330 cy per lift
ASTM	D2922	Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)	Per NR 538	NA	200'x200' Grid/lift	240'x240' Grid/lift
ASTM	D5084	Standard Test Methods for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter	Per NR 538	1/source ⁶	1/6,660 cy per lift ⁷	1/10,000 cy per lift ⁷

Notes:

1. ASTM = American Society of Testing and Materials.
2. NA = Not applicable.
3. QA/QC = Quality Assurance / Quality Control. One QA/QC test for the project quantity required.
4. NR 538 = Wisconsin Department of Natural Resources regulations Chapter NR 538 Beneficial Use of Industrial Byproducts.
5. A lift shall not exceed 8-inches.
6. The sample for the test shall be remolded at a minimum dry density of 95% of the maximum dry density as determined by the Standard Proctor test and at a moisture content required to achieve the required hydraulic conductivity, but with a minimum moisture content at or above the optimum moisture content as determined in the Standard Proctor test.
7. An undisturbed sample from a thinned walled sampler (Shelby tube).

C. Construction

Place and compact low permeable clay in 6-inch lifts. Place each lift of low permeable clay in one continuous lift. The thickness of the low permeable clay shown on the Drawings should be measured perpendicular to the surface.

Extend the clay collar a minimum of four feet along the length of pipe, centered on the joint, and construct the clay collar in accordance with the construction detail.

Compact the low permeable clay to a minimum of 95% Standard Proctor ASTM D698 Maximum Dry Density. Break up clods greater than 4-inches in diameter prior to compaction. Provide all equipment necessary to adjust low permeable clay to the proper moisture content for compaction. Do not proceed with placement of additional lifts until all required low permeable clay testing and documentation has been completed for the previous lift. During placement of the low permeable clay the minimum moisture content shall be as defined by the testing performed in the source evaluation and with the following limits:

- No drier than the optimum moisture content as determined by the Standard Proctor test ASTM D698.

Low permeable clay not meeting the above requirements will be removed as directed by ENGINEER and removing, replacing, and/or reworking low permeable clay not meeting the above requirements will be completed at no cost to the department.

D. Method of Measurement

Clay Anti-Seepage Collar will be measured as each individual Clay Anti-Seepage Collar, acceptably completed.

E. Basis of Payment

Clay Anti-Seepage Collar as measured above, shall be considered full compensation for all testing/sampling, furnishing, hauling and placing of all materials; and for excavation, backfilling and disposing of excess material to complete the work as described above.

BID ITEM 90033 – BIKE GATE

A. Description

Work under this item shall include all labor, materials, and incidentals required to install the bicycle gate that crosses the maintenance path at Meadow Road south of Blue Harvest Lane as shown on the construction drawings. The intent of the bike gate is to allow bicycle traffic to pass through and not allow cars or other vehicles to pass through.

B. Materials

All materials except the padlock, are to be furnished by Contractor, and are included in this bid item. Materials are detailed in the Construction Drawings. The color of the paint shall be off white.

C. Construction

Construction of the bike gate shall be in accordance to the detail in the Construction Drawings.

D. Submittals

Shop drawings for all materials needed to construct the bike gate shall be submitted to City for review. Submittals shall include but not limited to steel, paint, concrete, and grout.

E. Method of Measurement

Bike gate shall be measured by the lump sum. Construction of one bike gate shall include both halves.

F. Basis of Payment

Payment for Bike Gate shall be full compensation for complete installation of the bike gate as shown on the Drawings. All excavation, foundation work, painting, preparation, drilling, welding, transportation, concrete, backfilling and disposing of surplus material, labor, and restoring the work site shall be incidental to this bid item. All labor, tools, and materials shall be incidental to the bid item.

BID ITEM 90034 – OVERFLOW ARMORING

A. Description

This work shall consist of furnishing and placing the Flexamat, or similar approved tied concrete block erosion control mat, system in accordance with this specification and conforming to the lines, grades, design, and dimensions shown on the Drawings.

B. Materials

Flexamat Plus is manufactured from individual concrete blocks tied together with high strength knitted polypropylene bi-axial geogrid. Each block is tapered, beveled and interlocked and includes connections that prevent lateral displacement of the blocks within the mats when they are lifted for placement.

Tied Concrete Block Mats with Triple Underlayment shall be Flexamat, manufactured by Motz Enterprises, Inc., or approved equal.

Blocks. Furnish blocks manufactured with concrete conforming to the cement requirements of ASTM C150 and to the aggregate requirements of ASTM C33. Meet a minimum compressive strength of 6,900 psi at 28 days. Furnish blocks that have a minimum weight of 3 pounds per block. Blocks shall be placed no further than 2 inches apart. Material weight per square foot shall not exceed 10 pounds. Blocks shall have a 2.25-inch profile, a flat-top pyramid shape, and a coarse finish without protrusions.

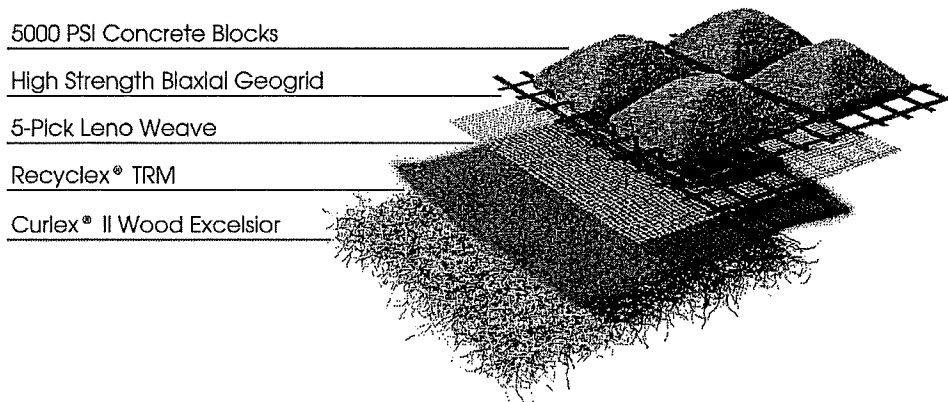
Polypropylene Bi-Axial Geogrid. The interlocking geogrid shall be an open knitted fabric composed of high tenacity, multifilament polypropylene yarns knitted and coated in tension with an acrylic based coating which is designed to resist degradation in environments with exposure to water and low pH (<4 pH) and high pH (>9 pH). Carbon black UV inhibitor shall be blended into the extruded yarns at a rate no less than 0.8% by weight. When combined with the revetment mat, this will yield a high tenacity, low elongating, and continuous filament polypropylene geogrid that is embedded within the base of the concrete blocks. Geogrid shall meet the requirements of Table 1.

**Table 1
Polypropylene Bi-Axial Geogrid**

Property	Unit	Test	Requirement
Mass/Unit Area	oz/yd ²	ASTM D5261	6.5 oz/yd ²
Aperture Size	English units	Measured	1.4x 1.4 inch
Ultimate Wide Width Tensile Strength (MD x CMD)	lb/ft	ASTM D6637	2,055 lb/ft
Elongation at Ultimate Tensile Strength (MD x CMD)	%	ASTM D6637	6%
Wide Width Tensile Strength @ 2% (MD x	lb/ft	ASTM D6637	822 lb/ft

CMD)			
Wide Width Tensile Strength @ 5% (MD x CMD)	lb/ft	ASTM D6637	1,640 lb/ft
Tensile Modulus @ 2% (MD x CMD)	lb/ft	ASTM D6637	41,100 lb/ft
Tensile Modulus @ 5% (MD x CMD)	lb/ft	ASTM D6637	32,800 lb/ft

Underlayment Materials. A four-layered system includes, in order from top to bottom, 1) Concrete block mat 2) 5-Pick Leno Weave 3) Recyclax TRM-V and 4) Curlex® II. The underlayment materials shall be packaged within the roll of the Flexamat Plus.



Five-Pick Leno Weave:

This Five-Pick Weave provides added strength and support to the underlayments.

<u>Index Property</u>	<u>Units</u>	<u>Value</u>
GSM	g/m ²	118 (-3 ~ +3)
Density	Picks/10cm	62 x 24 (+/- 2)
Warp Strength	N/5cm	≥ 350
Warp Elongation	%	20 - 50
Weft Strength	N/5cm	≥ 280
Weft Elongation	%	20 - 50
Warp Shrinkage	%	≤ 7
Weft Shrinkage	%	≤ 9

Recyclax® TRM:

Recyclax TRM – V is a permanent non-degradable Turf Reinforcement Mat (TRM), consists of 100% post-consumer recycled polyester (green or brown bottles) with 80% five-inch fibers or greater fiber length. It is of consistent thickness with fibers evenly distributed throughout the entire area of the TRM. The top and bottom of each TRM is covered with heavy duty polypropylene net. Fibers are tightly crimped and curled to allow fiber interlock, and to retain 95% memory of the original shape after loading by hydraulic events. Fibers have a specific gravity greater than 1.0; therefore, the blanket will not float during hydraulic events. Recyclax TRM – V meets Federal Government Executive Order initiatives for use of products made from, or incorporating, recycled materials. Recyclax TRM – V shall be manufactured in the U.S.A. and the fibers shall be made from 100% recycled post-consumer goods.

<u>Index Property</u>	<u>Test Method</u>	<u>Value</u>
Thickness	ASTM D 6525	0.294 in (7.47 mm)

Light Penetration	ASTM D 6567	57%
Resiliency	ASTM D 6524	86%
Mass per Unit Area	ASTM D 6566	0.50 lb/yd ² (271 g/m ²)
MD-Tensile Strength Max.	ASTM D 6818	295.2 lb/ft (4.32 kN/m)
TD-Tensile Strength Max.	ASTM D 6818	194.4 lb/ft (2.85 kN/m)
MD-Elongation	ASTM D 6818	32.2%
TD-Elongation	ASTM D 6818	40.8%
Swell	ECTC Procedure	8%
Water Absorption	ASTM D 1117/ECTC	33.8%
Specific Gravity	ASTM D 792	1.21
UV Stability	ASTM D 4355 (1,000 hr)	80% minimum
Porosity	Calculated	97.5%
Bench-Scale Rain Splash	ECTC Method 2	SLR = 5.86 @ 2 in/hr ^{1,2}
Bench-Scale Rain Splash	ECTC Method 2	SLR = 5.00 @ 4 in/hr ^{1,2}
Bench-Scale Rain Splash	ECTC Method 2	SLR = 6.33 @ 6 in/hr ^{1,2}
Bench-Scale Shear	ECTC Method 3	2.41 lb/ft ² @ 0.5 in soil loss ²
Germination Improvement	ECTC Method 4	432%

¹ SLR is the Soil Loss Ratio, as reported by NTPEP/AASHTO. ² Bench-scale index values should not be used for design purposes

Curlex® II:

Curlex II erosion control blanket (ECB) consists of a specific cut of naturally seed free Great Lakes Aspen curled wood excelsior with 80% 6-inch fibers or greater fiber length. It is of consistent thickness with fibers evenly distributed throughout the entire area of the blanket. The top and bottom of each blanket is covered with degradable polypropylene netting.

Index Property	Test Method	Value
Thickness	ASTM D 6525	0.418 in (10.62 mm)
Light Penetration	ASTM D 6567	34.6%
Resiliency	ASTM D 6524	64%
Mass per Unit Area	ASTM D 6475	0.57 lb/yd ² (309 g/m ²)
MD-Tensile Strength Max.	ASTM D 6818	127.0 lb/ft (1.9 kN/m)
TD-Tensile Strength Max.	ASTM D 6818	50.9 lb/ft (0.7 kN/m)
MD-Elongation	ASTM D 6818	28.64%
TD-Elongation	ASTM D 6818	29.84%
Swell	ECTC Procedure	89%
Water Absorption	ASTM D 1117/ECTC	199%
Bench-Scale Rain Splash	ECTC Method 2	SLR = 6.84 @ 2 in/hr ^{2,3}
Bench-Scale Rain Splash	ECTC Method 2	SLR = 7.19 @ 4 in/hr ^{2,3}
Bench-Scale Rain Splash	ECTC Method 2	SLR = 7.56 @ 6 in/hr ^{2,3}
Bench-Scale Shear	ECTC Method 3	2.6 lb/ft ² @ 0.5 in soil loss ³
Germination Improvement	ECTC Method 4	645%

¹ Weight is based on a dry fiber weight basis at time of manufacture. Baseline moisture content of Great Lakes Aspen excelsior is 22%.

² SLR is the Soil Loss Ratio, as reported by NTPEP/AASHTO. ³ Bench-scale index values should not be used for design purposes.

Mats will be rolled for shipment. Upon delivery, rolls may be left exposed for up to 30 days. If exposure will exceed 30 days, cover or tarp the rolls to minimize UV exposure.

Chipping or missing concrete resulting in a weight loss exceeding 15% of the average weight of a concrete unit is grounds for rejection by ENGINEER. Replace, repair or patch the damaged areas per the manufacturer’s recommendations

Alternative products may be considered if composition matches the materials detailed in this specification. Such products must be pre-approved in writing by the Engineer prior to bid date. Alternative product packages must be submitted to ENGINEER a minimum of fifteen (15) days prior to bid date. Submittal packages for alternate products must include, as a minimum, the following:

- a. Product Properties – Product must be comprised of materials as detailed in the materials section of this specification, including both composition, underlayment layers, and performance requirements.
- b. Full-Scale laboratory testing performed by an independent 3rd party testing facility with associated engineered calculations certifying the hydraulic capacity of the proposed Tied-Concrete Block Erosion Control Mat meets the following performance requirements.

Test	Tested Value	Bed Slope	Soil Classification	Limiting Value
ASTM 6460	Shear Stress	30%	Sandy Loam (USDA)	24 lb./ft ²
ASTM 6460	Velocity	20%	Loam (USDA)	30 ft./sec

- c. A list of 15 comparable projects in terms of project size, application and material dimensions in the United States, where the results of the specific alternative material’s use can be verified and reviewed for system integrity and sustained after a minimum of 10 years of service life.

The Engineer for this project is Matt Allie, who may be reached at MAllie@cityofmadison.com or (608) 266-4058.

C. Construction

Prior to installing Flexamat, prepare the subgrade as detailed in the plans. All subgrade surfaces to be smooth and free of all rocks, stones, sticks, roots, and other protrusions or debris of any kind that would result in an individual block being raised more than 3/4 inch above the adjoining blocks. When seeding is shown on the Drawings, provide subgrade material that can sustain growth.

The prepared subgrade shall provide a smooth, firm, and unyielding foundation for the mats. The subgrade shall be graded into a parabolic or trapezoidal shape to concentrate flow to middle of mat or mats.

When vegetation is required, distribute seed on the prepared topsoil subgrade before installation of the concrete mats in accordance with the specifications.

Install mats to the line and grade shown on the Drawings and per the manufacturer's guidelines. The manufacturer or authorized representative will provide technical assistance during the slope preparation and installation of the concrete block mats as needed.

Provide a minimum 18-inch-deep concrete mat embedment toe trench at all edges exposed to concentrated flows. Recess exterior edges subject to sheet flow a minimum of 6 inches.

When needed, provide fastening or anchoring as recommended by the manufacturer or ENGINEER for the site conditions.

D. Measurement

This Item will be measured by the square foot, as shown on the Drawings, complete in place.

E. Basis of Payment

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Overflow Armoring." This price is full compensation for loading and transporting, placing concrete block mats; excavation and disposal; furnishing topsoil and bedding; and equipment, labor, materials, tools, and incidentals.

BID ITEM 90035 – EARTHEN EMBANKMENT

A. Description

Work under this item shall include all labor, materials, and incidentals required to place, grade, and compact area on the construction drawings that call for an earthen embankment along the maintenance paths north of Blue Harvest to the northern project limits.

B. Materials

Construct all embankments with non-organic soils. During construction of the maintenance path berms north of Blue Harvest Lane, Contractor shall coordinate with the City and the City's geotechnical engineer to determine if native soils meet the Earthen Embankment material specifications.

C. Construction

The distribution of materials throughout the earthen embankment shall be essentially uniform, and the embankment shall be free from lenses, pockets, streaks, or layers of material differing substantially in texture, moisture content, or gradation from the surrounding material. If the surface of any layer becomes too hard and smooth for proper bond with the succeeding layer, it shall be scarified to a depth of not less than 2 inches before the next layer is placed.

Compact earthen embankment material to 90% standard proctor according to the procedures outlines in ASTM D698 or by using compaction requirements of USDA Natural Resources Conservation Service (NRCS), Wisconsin Construction Specifications 3. Do not bury tree stumps, or other organic material in the embankment. A core trench or key-way along the centerline of the embankment should be constructed per the construction drawings to prevent seepage at the joint between the existing soil and the fill material.

D. Method of Measurement

Earthen Embankment shall be measured in cubic yards in place, computed by the method of average end areas with no correction for curvature or in tons based on tickets received by City for each load.

No additional compensation will be provided to Contractor if on site material is partially or wholly not suitable for use as an earthen embankment or is partially or wholly not sufficient in quantity to construct the earthen embankment. Contractor is responsible for excavation and excess material disposal necessary to construct the earthen embankment, regardless of source of material.

E. Basis of Payment

Earthen Embankment, as measured above, shall be paid at the contract price and be considered full compensation for all work, materials, and incidentals required to complete the work as described above.

BID ITEM 90050 – TOPSOIL SALVAGE FOR TRENCH RESTORATION

A. Description

Work under this item shall include all labor, materials, and incidentals required to strip and stockpile existing topsoil from over the sanitary sewer trench as excavation is beginning within the limits shown on the plan. Disturbance for sanitary sewer installation shall be restricted to the limits shown on the plans and additional compensation will not be provided for restoring areas outside of these limits. After the sanitary sewer has been installed and the trench has been backfilled, paid under bid item 50212, trench restoration shall include replacement of topsoil to original depth encountered (minimum depth of 12", maximum depth of 36") within the limits of the disturbed area prior to seeding and matting.

B. Method of Measurement

Topsoil Salvage and Trench Restoration shall be measured by the square yard.

C. Basis of Payment

Topsoil Salvage and Trench Restoration, as measured above, shall be paid at the contract price and be considered full compensation for all work, materials, and incidentals required to complete the work as described above.

CGC, Inc.

Construction • Geotechnical
Consulting Engineering/Testing

2018

February 22, 2010
C17051-19

Ms. Sally Swenson
City of Madison Engineering Dept.
City-County Building, Room 115
210 Martin Luther King, Jr. Blvd.
Madison, WI 53703-3345

Re: Geotechnical Exploration Report
Proposed Meadow Road Area Site Improvements
Madison, Wisconsin

Dear Ms. Swenson:

Construction • Geotechnical Consultants, Inc. (CGC) has completed the subsurface exploration program for the above-referenced project. The primary purpose of this exploration program was to identify subsurface conditions at the site, and to provide preliminary geotechnical recommendations regarding site preparation, utility, pavement and pond design/construction. An electronic copy of this report is being transmitted for your use, and a hard copy can also be provided upon request.

SITE AND PROJECT DESCRIPTIONS

The site is located to the east of Meadow Road between Valley View Road and Mid Town Road. It is comprised of agricultural fields, smaller areas of trees/brush, and ponds surrounded by significant grassy (unplanted) areas. Based on site observations and topographic information obtained from Dane County DCiMap, site topography is generally characterized as gently sloping, with the highest elevation at about EL 1070 ft within the northeastern portion of the site. Site grades generally slope down to the west, with the lowest areas near EL 1035 ft at, and extending between, ponds situated at the northwest and southern portions of the site.

We understand the proposed project would include an expansion of existing Hill Creek Park, extensions of roadways/utilities from a residential subdivision to the east as well as the enlargement/deepening of existing ponds situated at the northwestern and southern ends of the site. Currently, the area is mostly cropland accessible to farm equipment except during periods of high water such as those experienced during the spring and summer of 2017. It is our understanding the ponds would serve primarily as sedimentation basins for storm water runoff prior to entering the Sugar River watershed. Additional details of pond construction including depths are unknown at this time.



Ms. Sally Swenson
City of Madison Engineering Dept.
February 20, 2018
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SUBSURFACE EXPLORATION

The subsurface conditions in the area of proposed construction were explored by drilling 14 Standard Penetration Test (SPT) borings to depths of 10 to 25 ft below existing grades within the proposed project area. Boring locations were determined by the City of Madison and staked in the field by CGC personnel using a Trimble GPS R6 Rover, at which time elevations were obtained. Northing/Eastings as well as elevations are included on the individual boring logs. The borings were performed by Badger State Drilling (under subcontract to CGC) on December 11-12, 2017, using both truck-mounted and all-terrain drill rigs. The specific procedures used for drilling and sampling are described in Appendix A.

SITE CONDITIONS

The subsurface profile revealed by the borings is significantly variable. A generalized soil profile of the site can be summarized (in descending order) as:

- 8 to 36 in. of **topsoil**; underlain by
- 2.5 to 16 ft of **cohesive soils** consisting of **lean to silty clay** generally having soft to stiff consistencies (with zones of very soft consistencies encountered at B12 and B14); followed by
- 4.5 to 20 ft of **granular soils** with variable silt, clay and gravel contents to the maximum depths explored.

As exceptions to the above generalized soil profile, the clays were overlain by approximately 2 ft of *silt* at B1, B11 and B14, or 7 ft of sand at B2; while a 2.5-ft layer of *silt interrupted* the clays at B8. Portions of the granular soils were considered to be *silts* at B1-B5, B8, B11 and B14.

Groundwater was encountered between 6 and 18.5 ft below existing grades at B1, B2, B5, B8, B11-B14. Groundwater levels are anticipated to fluctuate based on variations in precipitation, infiltration, the existing pond stages, as well as other factors. For a more detailed description of the site soil and groundwater conditions please refer to the boring logs attached in Appendix B.

DISCUSSION AND RECOMMENDATIONS

Subject to the limitations discussed below and based on the subsurface exploration program, it is our opinion that this site is generally suitable for construction. *However, some excavation below subgrade (EBS or undercutting/replacement) may be required during site grading for roadway construction. The presence of groundwater should be further evaluated to prepare for pond enlargement/deepening.*

Ms. Sally Swenson
City of Madison Engineering Dept.
February 20, 2018
Page 3

Our recommendations for site preparation, roadway and utility design/construction are presented in the following subsections. Additional information regarding the conclusions and recommendations presented in this report is discussed in Appendix D.

Site Preparation

We recommend that topsoil and vegetation be stripped at least 10 ft beyond the construction limits in areas to receive fill where roadway/utility construction is planned. The topsoil can be stockpiled on-site and re-used as fill in landscape areas. Topsoil thicknesses varied between 8 to 36 inches in the borings, but variable topsoil thicknesses should be expected due to past agricultural activities.

The exposed soils after topsoil removal are largely expected to consist of natural cohesive soils. Exposed cohesive soils in areas at-grade or requiring fill should be statically compacted (without vibration) and then proof-rolled with a heavy rubber-tire piece of construction equipment (i.e., a loaded scraper, tri-axle dump truck, etc.) to check for soft/yielding areas. If soft/unstable clay soils are encountered, we recommend they be removed and replaced with compacted granular soils. As an alternative, soft/loose subgrade soils could be stabilized using coarse aggregate (e.g., 3-in. dense graded base, select crushed material, etc.) that is compacted into the subgrade until deflection ceases. Significant construction traffic and exposure to wet weather could further destabilize the existing materials. As such, some undercutting should be anticipated and an allowance budgeted for subgrade improvements.

After a stable subgrade has been developed, fill placement to establish site grades may then proceed. To the extent practical, we recommend using granular soils (i.e., sand and/or gravel) as fill in roadway areas, as these soils are generally easier to place and compact compared to cohesive soils, particularly in adverse weather conditions. Clay and silt soils are best used in landscaping, assuming that moisture conditioning will be completed to facilitate adequate compaction. Moisture conditioning (drying) may require several cycles of aeration and densification in order to develop adequate compaction, which could delay construction progress. Fill/backfill should be placed in accordance with the Recommended Compacted Fill Specifications presented in Appendix C. Standard earthwork-related techniques that should be used during roadway construction include:

- Proof-rolling of the exposed subgrades;
- Undercutting and/or stabilization in soft areas; and
- Compaction control of fill/backfill materials.

If a utility alignment coincides with soft/loose conditions (which were encountered in a majority of the borings), we recommend that increased bedding thicknesses, possibly underlain by a



Ms. Sally Swenson
City of Madison Engineering Dept.
February 20, 2018
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geotextile, be considered. In addition, dewatering could be necessary during some utility installations. Pumping from sump pits is typically acceptable for drawdowns of about two feet or less and well points are generally needed for greater drawdowns. Additional details can be provided upon request.

Pavement Design

Clays will control the pavement design, as we anticipate that the pavement subgrades will generally consist of clay soils. The following *generalized* parameters should be used to develop the design pavement section (which are considered conservative in sandy areas):

AASHTO classification	A-6
Frost group index	F-3
Design group index	14
Soil support value	3.9
Subgrade modulus, k (pci)	125
Estimated percent shrinkage	20 - 30
Estimated CBR value	2-5

Assuming the proposed roadways will experience traffic volumes not exceeding 3000 cars and 100 trucks per day per design lane, a typical pavement design per WDOT Standard Specifications should meet E-1 (LT) requirements. If one or more of the roadways will be considered a local business/arterial street, we estimate it will experience 51 to 275 design daily ESALs (18,000 pound Equivalent Single Axle Loads). A typical pavement design per WDOT Standard Specifications should then meet E-3 (MT) requirements.

Compaction Requirements

Regarding utility construction, we anticipate that imported sands will be required for use as backfill which is a typical requirement for City projects. On-site sands could be considered for reuse as trench backfill but they should be separated from any clay soils and selectively stockpiled. Moisture conditioning could be necessary to achieve desired compaction levels. Sands with significant clay content or silt soils should *not* be considered for reuse as backfill. We recommend that at least a level of 95% compaction be achieved within backfill material placed within the final 3 feet below finished subgrades (including undercut backfill - if any), with 90% compaction required at depths greater than 3 feet. The specified levels of compaction are based on modified Proctor methods (ASTM D1557). Also, the backfill material should be placed and compacted in accordance with our Recommended Compacted Fill Specifications presented in Appendix B.

Ms. Sally Swenson
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February 20, 2018
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Pond Construction

Pond depths and other related construction items were unavailable at the time of this submittal. In our opinion, the ponds should be designed with a minimum 2-ft thick clay liner if it is desired to maintain a somewhat constant water surface elevation independent of natural groundwater level fluctuations. Should water level fluctuations not be an important element pertaining to pond design/performance, then the ponds could simply be cut to depth without subsequent liner construction. We recommend that temporary shallow monitoring wells be installed to further evaluate existing groundwater levels, which could greatly influence pond constructability.

Depending on overall depth and the relationship to natural groundwater, dewatering will likely be needed during construction *and afterward until the pond is filled*. CGC can elaborate on construction methodology upon request when additional pond details become available.

If the chosen option, we recommend that construction of a clay liner involve the placement of three lifts of clay each compacted to a minimum 90% using modified Proctor methods (ASTM D1557). The final thickness of the liner should be a minimum of 2 feet after compaction and final grading. Note that some of the borings encountered clay materials at relatively shallow depths; however, softer consistencies of some of the shallower clay soils could potentially make processing more difficult. In areas where the excavation depth coincides with native clay soils the final liner thickness could include "credit" of native clay for the lower 1 ft to achieve the ultimate goal of a 2-ft thick liner (which is dependent on field confirmation at the time of construction).

CLOSING REMARKS

We wish to reiterate that dewatering will likely be necessary during utility and pond construction due to the presence of groundwater. It has been a pleasure to serve you on this project. If you have any questions or need additional consultation, please contact us.



Ms. Sally Swenson
City of Madison Engineering Dept.
February 20, 2018
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We appreciate the opportunity to be of service on this project and look forward to working with you as it proceeds. Other information regarding this report and its limitations is included in Appendix C.

We trust this report addresses your present needs. If you have any questions, please contact us.

Sincerely,

CGC, Inc.

A handwritten signature in black ink, appearing to read "Eric S. Fair".

Eric S. Fair
Staff Geologist

A handwritten signature in black ink, appearing to read "Michael N. Schultz".

Michael N. Schultz, P.E.
Principal/Consulting Professional

- Encl: Appendix A - Field Exploration
Appendix B - Soil Boring Location Map
Logs of Test Borings (14)
Log of Test Boring-General Notes
Unified Soil Classification System
Appendix C - Recommended Compacted Fill Specifications
Appendix D - Document Qualifications

APPENDIX A
FIELD EXPLORATION

APENDIX A

FIELD EXPLORATION

The subsurface conditions in the areas of the proposed improvements were explored by drilling 14 SPT soil borings to depths of 10 to 25 ft at locations determined by the City of Madison which are shown in plan on the soil boring location map presented in Appendix B.

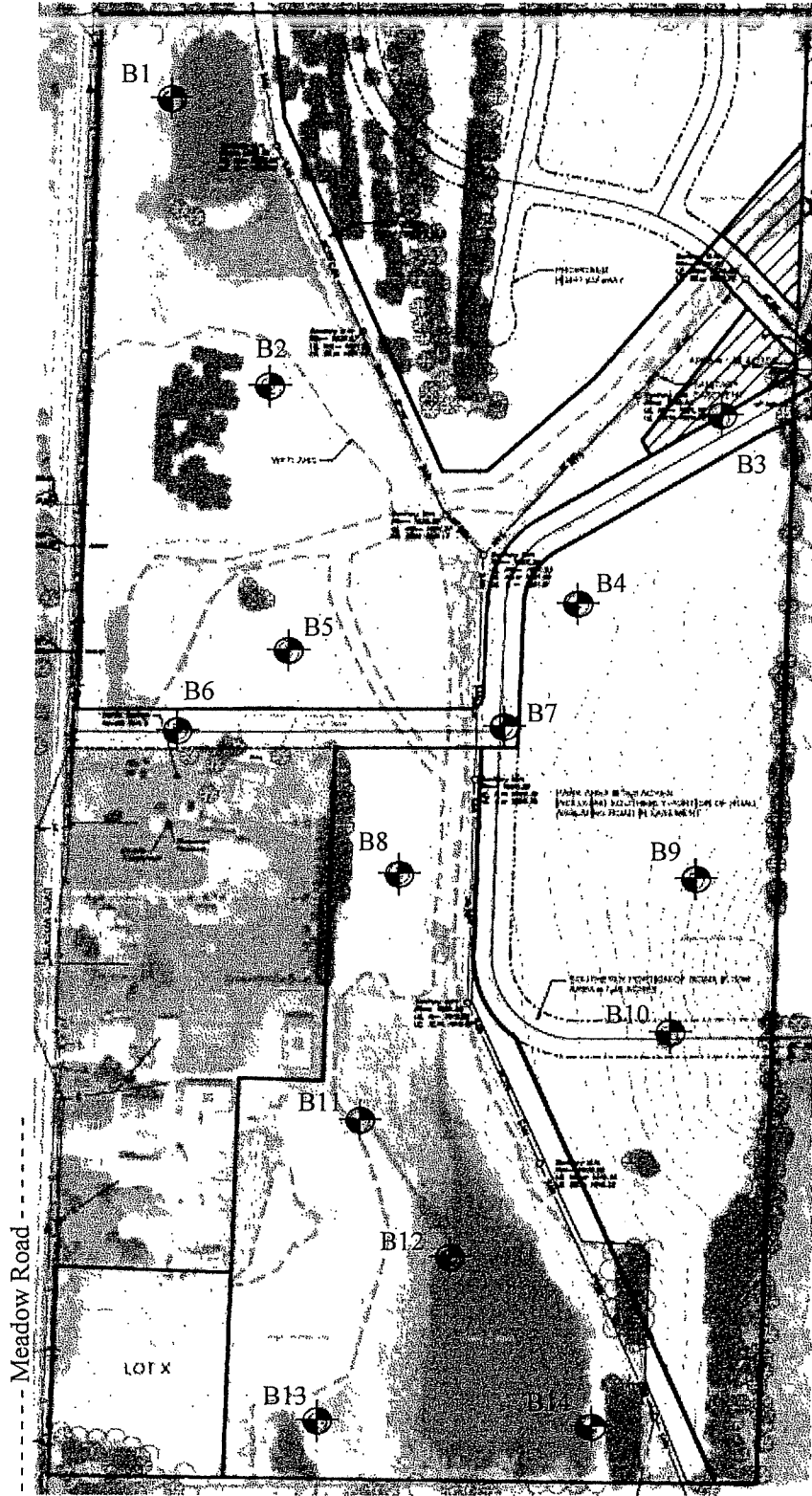
The soil borings were performed by Badger State Drilling using rotary Diedrich D-50 (all-terrain) and CME 55 (truck-mounted) drill rigs. The SPT method consists of driving a 2-inch outside diameter split-barrel sampler using a 140-pound weight falling freely through a distance of 30 inches. The sampler is first seated 6 inches into the material to be sampled and then driven 12 inches. The number of blows required to drive the sampler the final 12 inches is recorded on the log of borings and is known as the Standard Penetration Resistance (commonly referred to as the N-value).

During the field exploration, the driller visually classified the soil and prepared a field log. *Field screening of the samples for possible environmental contaminants was not conducted by the drillers, as such activities were not part of CGC's work scope.* Water level observations were made in each boring during drilling (and after when possible) and are shown at the bottom of each boring log. Upon completion of drilling, the borings were backfilled with bentonite in accordance with WDNR regulations, and the soil samples were delivered to our laboratory for classification and limited laboratory testing. The soils were visually classified by CGC and reviewed by a geotechnical engineer using the Unified Soil Classification System (USCS). The final logs prepared by the engineer and a description of the USCS are presented in Appendix B.

APPENDIX B

**SOIL BORING LOCATION MAP
LOGS OF TEST BORINGS (14)
LOG OF TEST BORING - GENERAL NOTES
UNIFIED SOIL CLASSIFICATION SYSTEM**

To Valley View Road ↑



Legend

⊗ Denotes Boring Location

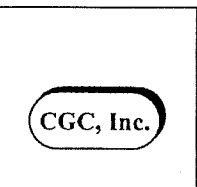
Scale: Reduced



Notes

1. Soil borings performed by Badger State Drilling on December 11-12, 2018
2. Boring locations are approximate.

Job No. C17051-19
Date: 12/22/17



SOIL BORING LOCATION MAP
Lower Badger Mill Creek Ponds
Madison, Wisconsin



LOG OF TEST BORING

Project Lower Badger Mill Creek Ponds
N470806 E772426
 Location Madison, Wisconsin

Boring No. 1
 Surface Elevation (ft) 1033.3
 Job No. C17051-19
 Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	DEPTH RECORDED (in.)	Moist	N	Depth (ft)		qu (qa) (tsf)	W	LL	PL	LI
				0	14 in. Dark Brown to Black TOPSOIL					
1	8	M	6	8	Loose, Light Brown to Gray SILT (ML)					
2	18	M	4	18	Medium Stiff, Brown Lean CLAY (CL)	(0.75)	22.2			
3	18	W	2	18	Very Loose, Brown Fine to Coarse SAND, Some Silt and Gravel, Trace CLAY (SM)					
4	18	W	3	18	Very Loose to Loose, Brown Fine to Medium SAND, Little to Some Silt (SP-SM/SM)					
5	16	W	8	16						
6	18	W	16	16	Medium Dense to Dense, Brown Fine to Medium SAND, Some Silt and Gravel, Scattered Cobbles and Boulders (SM)					
7	18	W	19	19						
8	14	W	34	14						
					End Boring at 25 ft					
					Borehole backfilled with bentonite chips					

WATER LEVEL OBSERVATIONS					GENERAL NOTES				
While Drilling	▽	6.0'	Upon Completion of Drilling	10.8'	Start	12/12/17	End	12/12/17	
Time After Drilling				30 min.	Driller	BSD	Chief	DB	Rig D-50
Depth to Water				8.3' ▼	Logger	DC	Editor	ESF	
Depth to Cave in				11'	Drill Method	2.25 HSA; Autohammer			
<small>The stratification lines represent the approximate boundary between soil types and the transition may be gradual.</small>									



LOG OF TEST BORING

Project **Lower Badger Mill Creek Ponds**
N470291 E772609
 Location **Madison, Wisconsin**

Boring No. **2**
 Surface Elevation (ft) **1035.0**
 Job No. **C17051-19**
 Sheet **1** of **1**

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	DEPTH (in.)	Moist	N	Depth (ft)		q _u (qs) (tsf)	W	LL	PL	LI
					12 in. Brown Sandy TOPSOIL					
1	18	M	13		Medium Dense to Loose, Brown Fine to Coarse SAND, Some Silt and Gravel (SM)					
2	18	M	6							
3	18	M	8		Occasional Seams of Sandy Silt Near 7 ft					
4	18	M/W	2		Soft to Stiff, Gray Silty CLAY (CL-ML)	(0.5-1.0)	24.8	30	22	
5	18	M/W	4			(0.5-1.0)	25.1			
6	18	M/W	20		Medium Dense, Dark Brown to Gray SILT, Occasional Seams of Laminated Silt and Clay (ML)					
					Medium Dense to Very Dense, Brown Fine to Coarse SAND and GRAVEL, Trace Silt, Scattered Cobbles (SP/GP)					
7	14	W	23							
8	2	W	50/3"		End Boring at 23.9 ft					
					Borehole backfilled with bentonite chips					

WATER LEVEL OBSERVATIONS

While Drilling ∇ 16.0' Upon Completion of Drilling 15.8'
 Time After Drilling _____ 2 hrs
 Depth to Water _____ 15.1' ∇
 Depth to Cave in _____ 17.3'

GENERAL NOTES

Start 12/12/17 End 12/12/17
 Driller BSD Chief DB Rig D-50
 Logger DC Editor ESF
 Drill Method 2.25 HSA; Autohammer

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.



LOG OF TEST BORING

Project Lower Badger Mill Creek Ponds
N470240 E773420
 Location Madison, Wisconsin

Boring No. 3
 Surface Elevation (ft) 1042.1
 Job No. C17051-19
 Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES					
No.	TYPE	Rec (in.)	Moist	N		Depth (ft)	qu (qa) (tsf)	W	LL	PL	LI
					0	8 in. TOPSOIL					
1	█	10	M	6	1	Stiff, Brown Lean CLAY (CL)	(1.25)	26.2			
2	█	8	M	7	2	Loose, Brown Fine to Medium SAND, Little to Some Silt (SP-SM/SM)					
3	█	12	M	24	3	Medium Dense, Light Brown Fine SAND, Trace Silt (SP)					
4	█	14	M	12	4	Medium Dense, Light Brown to Gray SILT (ML)					
					10	End Boring at 10 ft					
					15	Borehole backfilled with bentonite chips					
					20						
					25						
					30						

WATER LEVEL OBSERVATIONS	GENERAL NOTES
While Drilling <input checked="" type="checkbox"/> <u>NW</u> Upon Completion of Drilling _____ Time After Drilling _____ Depth to Water _____ Depth to Cave in _____	Start <u>12/12/17</u> End <u>12/12/17</u> Driller <u>BSD</u> Chief <u>MC</u> Rig <u>CME-55</u> Logger <u>MG</u> Editor <u>ESF</u> Drill Method <u>2.25 HSA; Autohammer</u>

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.



LOG OF TEST BORING

Project Lower Badger Mill Creek Ponds
N469904 E773164
 Location Madison, Wisconsin

Boring No. 4
 Surface Elevation (ft) 1041.3
 Job No. C17051-19
 Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	Rec (in.)	Moist	N	Depth (ft)		qu (tsf)	W	LL	PL	LI
					8 in. TOPSOIL					
1	10	M	7	7	Stiff, Brown Lean CLAY (CL)	(1.5)	24.0			
2	10	M	5	5	Loose to Medium Dense, Light Brown to Gray Sandy SILT (ML)					
3	16	M	12	12						
4	16	M	18	18	Medium Dense, Light Brown Silty Fine SAND (SM)					
					End Boring at 10 ft					
					Borehole backfilled with bentonite chips					
					15					
					20					
					25					
					30					

WATER LEVEL OBSERVATIONS	GENERAL NOTES
While Drilling <input checked="" type="checkbox"/> NW Upon Completion of Drilling _____ Time After Drilling _____ Depth to Water _____ Depth to Cave in _____	Start <u>12/12/17</u> End <u>12/12/17</u> Driller <u>BSD</u> Chief <u>MC</u> Rig <u>CME-55</u> Logger <u>MG</u> Editor <u>ESF</u> Drill Method <u>2.25 HSA; Autohammer</u>
The stratification lines represent the approximate boundary between soil types and the transition may be gradual.	



LOG OF TEST BORING

Project Lower Badger Mill Creek Ponds
N469819 E772638
 Location Madison, Wisconsin

Boring No. 5
 Surface Elevation (ft) 1036.1
 Job No. C17051-19
 Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	TYPE	Rec (in.)	Moist	N		Depth (ft)	qu (qa) (tsf)	W	LL	PL
					8 in. Topsoil					
1		10	M	7	Soft to Stiff, Brown Lean CLAY, Some Sand (CL)	(0.5-1.0)	18.4			
2		16	M	9	Loose, Gray to Light Brown Fine to Medium SAND, Little to Some Silt (SP-SM/SM)					
3		18	M	7	Loose to Medium Dense, Light Brown to Gray SILT, Some Sand, Occasional Seams of Gray Silty Clay (ML/ML-CL)	(1.25)				
4		12	M	13		(0.5)				
5		10	M	14						
6		16	M	34	Medium Dense to Dense, Brown Fine to Coarse SAND and GRAVEL, Trace Silt, Scattered Cobbles (SP/GP)					
7		10	W	26	Dense, Brown Sandy SILT (ML)					
8		18	W	40						
					End Boring at 25 ft					
					Borehole backfilled with bentonite chips					

WATER LEVEL OBSERVATIONS					GENERAL NOTES				
While Drilling	▽	18.5'	Upon Completion of Drilling	_____	Start	12/12/17	End	12/12/17	
Time After Drilling				5 hrs	Driller	BSD	Chief	MC	Rig CME-55
Depth to Water					Logger	MG	Editor	ESF	
Depth to Cave in				16.5'	Drill Method	2.25 HSA; Autohammer			
The stratification lines represent the approximate boundary between soil types and the transition may be gradual.									



LOG OF TEST BORING

Project Lower Badger Mill Creek Ponds
N469680 E772440
 Location Madison, Wisconsin

Boring No. 6
 Surface Elevation (ft) 1034.8
 Job No. C17051-19
 Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES									
No.	TYPE	Rec (in.)	Moist	N		Depth (ft)	qu (qa) (tsf)	W	LL	PL	LI				
					0	8 in. TOPSOIL									
1	█	10	M	11	1	Very Stiff to Hard, Brown Silty CLAY (CL-ML)					(3.0-4.5)	16.0			
2	█	10	M	6	5	Medium Stiff To Stiff, Brown Lean CLAY (CL)					(0.75-1.25)	23.8			
3	█	16	M	4	7	Soft to Medium Stiff Near 7 ft					(0.5)	26.8			
4	█	12	M	7	10	Loose, Brown Fine to Coarse SAND, Some Silt and Gravel, Trace CLAY (SM)									
5	█	8	M	52	10	Very Dense, Brown Fine to Coarse SAND and GRAVEL, Some Silt, Scattered Cobbles (SM/GM)									
6	█	16	M	31	15	Dense, Brown Fine to Medium SAND, Some Silt and Gravel, Scattered Cobbles and Boulders (SM)									
7	█	18	M	40	20	End Boring at 20 ft									
					20	Borehole backfilled with bentonite chips									
					25										
					30										

WATER LEVEL OBSERVATIONS	GENERAL NOTES
While Drilling <input checked="" type="checkbox"/> NW Upon Completion of Drilling _____ Time After Drilling _____ Depth to Water _____ Depth to Cave in _____	Start <u>12/12/17</u> End <u>12/12/17</u> Driller <u>BSD</u> Chief <u>MC</u> Rig <u>CME-55</u> Logger <u>MG</u> Editor <u>ESF</u> Drill Method <u>2.25 HSA; Autohammer</u>
The stratification lines represent the approximate boundary between soil types and the transition may be gradual.	



LOG OF TEST BORING

Project Lower Badger Mill Creek Ponds
N469684 E773031
 Location Madison, Wisconsin

Boring No. 7
 Surface Elevation (ft) 1037.1
 Job No. C17051-19
 Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	Rec (in.)	Moist	N	Depth (ft)		qu (qa) (tsf)	W	LL	PL	LI
					8 in. TOPSOIL					
1	12	M	6		Stiff, Brown Lean CLAY (CL)	(1.75)	25.9			
2	6	M	7		Loose, Light Brown Silty Fine to Medium SAND, Trace to Little Clay (SM)					
3	16	M	28		Medium Dense, Brown Fine SAND, Trace to Little Silt (SP/SP-SM)					
4	16	M	62		Very Dense, Brown Fine to Medium SAND, Some Silt and Gravel, Scattered Cobbles and Boulders (SM)					
5	18	M	58							
6	16	M	62							
7	10	M/W65/11'			End Boring at 19.5 ft					
					Borehole backfilled with bentonite chips					

WATER LEVEL OBSERVATIONS

While Drilling NW Upon Completion of Drilling _____
 Time After Drilling _____
 Depth to Water _____
 Depth to Cave in _____

GENERAL NOTES

Start 12/12/17 End 12/12/17
 Driller BSD Chief MC Rig CME-55
 Logger MG Editor ESF
 Drill Method 2.25 HSA; Autohammer

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.



LOG OF TEST BORING

Project Lower Badger Mill Creek Ponds
N469421 E772843
 Location Madison, Wisconsin

Boring No. 8
 Surface Elevation (ft) 1035.8
 Job No. C17051-19
 Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	TYPE	Rec (in.)	Moist	N		Depth (ft)	q _u (tsf)	W	LL	PL
					13 in. Black Silty TOPSOIL					
1		8	M	14	Soft to Medium Stiff, Brown to Gray Mottled Lean CLAY, Trace Sand (CL)	(0.75)	21.4			
2		12	M	24		(0.5)	15.7			
3		18	M	11	Soft to Medium Stiff, Brown to Gray Silty CLAY, Trace to Little Sand (CL-ML)	(0.5)	26.3	27	21	
4		18	M	12	Medium Dense, Light Brown to Gray SILT, Occasional Seams of Brown Sandy Silt (ML)					
5		18	W	5	Soft to Medium Stiff, Brown to Gray Mottled Lean CLAY, Trace Sand (CL)	(0.75)				
6		18	M	12		(0.5)				
7		14	W	41	Dense, Light Brown Fine to Coarse SAND, Trace Silt (SP)					
8		14	W	66	Very Dense, Brown Fine to Medium SAND, Some Silt and Gravel, Scattered Cobbles and Boulders (SM)					
					End Boring at 25 ft					
					Borehole backfilled with bentonite chips					

WATER LEVEL OBSERVATIONS					GENERAL NOTES				
While Drilling	▽	12.3'	Upon Completion of Drilling	19.3'	Start	12/12/17	End	12/12/17	
Time After Drilling				4 hrs	Driller	BSD	Chief	DB	Rig D-50
Depth to Water				12' ▼	Logger	DC	Editor	ESF	
Depth to Cave in				20'	Drill Method	2.25 HSA; Autohammer			
<small>The stratification lines represent the approximate boundary between soil types and the transition may be gradual.</small>									



LOG OF TEST BORING

Project Lower Badger Mill Creek Ponds
N469409 E773375
 Location Madison, Wisconsin

Boring No. 9
 Surface Elevation (ft) 1048.2
 Job No. C17051-19
 Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	TYPE	Rec (in.)	Moist	N		Depth (ft)	qu (qa) (tsf)	W	LL	PL
					8 in. TOPSOIL					
1		10	M	7	Stiff, Brown Lean CLAY (CL)	(1.75)	27.6			
2		14	M	8	Medium Dense, Brown Fine to Medium SAND, Little to Some Silt and Gravel(SP-SM/SM)	(1.5)	20.2			
3		12	M	17						
4		12	M	40	Dense, Brown Fine to Medium SAND, Some Silt and Gravel, Scattered Cobbles and Boulders (SM)					
					End Boring at 10 ft					
					Borehole backfilled with bentonite chips					

WATER LEVEL OBSERVATIONS					GENERAL NOTES				
While Drilling	<input checked="" type="checkbox"/>	NW	Upon Completion of Drilling	_____	Start	12/12/17	End	12/12/17	
Time After Drilling	_____	_____	_____	_____	Driller	BSD	Chief	MC	Rig CME-55
Depth to Water	_____	_____	_____	_____	Logger	MG	Editor	ESF	
Depth to Cave in	_____	_____	_____	_____	Drill Method	2.25 HSA; Autohammer			

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.



LOG OF TEST BORING

Project Lower Badger Mill Creek Ponds
N469124 E773319
 Location Madison, Wisconsin

Boring No. 10
 Surface Elevation (ft) 1044.1
 Job No. C17051-19
 Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	Rec (in.)	Moist	N	Depth (ft)		qu (tsf)	W	LL	PL	LI
				0	8 in. TOPSOIL					
1	10	M	6	6	Meduim Stiff to Stiff, Brown Lean CLAY, Some Sand (CL)	(1.0)	23.6			
2	10	M	6	6	Thin (<2 in.) Seam of Clayey Sand with Trace Gravel Near 5 ft	(1.0)	20.3			
3	8	M	8	8	Loose to Medium Dense, Brown Fine to Medium SAND, Some Silt and Gravel, Scattered Cobbles and Boulders (SM)					
4	16	M	20	20	End Boring at 10 ft Borehole backfilled with bentonite chips					

WATER LEVEL OBSERVATIONS	GENERAL NOTES
While Drilling <input checked="" type="checkbox"/> <u>NW</u> Upon Completion of Drilling _____ Time After Drilling _____ Depth to Water _____ Depth to Cave in _____	Start <u>12/12/17</u> End <u>12/12/17</u> Driller <u>BSD</u> Chief <u>MC</u> Rig <u>CME-55</u> Logger <u>MG</u> Editor <u>ESF</u> Drill Method <u>2.25 HSA; Autohammer</u>
The stratification lines represent the approximate boundary between soil types and the transition may be gradual.	



LOG OF TEST BORING

Project Lower Badger Mill Creek Ponds
N468971 E772759
 Location Madison, Wisconsin

Boring No. 11
 Surface Elevation (ft) 1032.0
 Job No. C17051-19
 Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	Rec (in.)	Moist	N	Depth (ft)		qu (qa) (tsf)	W	LL	PL	LI
					3 ft Black Clayey TOPSOIL					
1	18	M	6			(1.75)	35.6			
					Medium Dense, Gray SILT (ML)					
2	18	M	14							
				5						
3	18	M	5		Stiff Brown to Gray Mottled Lean CLAY, Trace Sand (CL)	(1.25)	29.1			
4	18	W	2		Very Loose, Dark Brown Clayey Fine SAND, Trace Gravel (SC)					
				10						
5	0	W	2							
6	16	W	2							
				15						
7	14	W	27		Medium Dense to Dense, Brown Fine to Medium SAND, Some Silt and Gravel, Scattered Cobbles and Boulders (SM)					
				20						
8	18	W	33							
				25						
					End Boring at 25 ft					
					Borehole backfilled with bentonite chips					
				30						

WATER LEVEL OBSERVATIONS					GENERAL NOTES	
While Drilling	∇	8.6'	Upon Completion of Drilling	10'	Start	12/12/17
Time After Drilling				6 hrs	Driller	BSD Chief DB Rig D-50
Depth to Water				7.3' ∇	Logger	DC Editor ESF
Depth to Cave in				16.4'	Drill Method	2.25 HSA; Autohammer
<small>The stratification lines represent the approximate boundary between soil types and the transition may be gradual.</small>						



LOG OF TEST BORING

Project Lower Badger Mill Creek Ponds
N468724 E772926
 Location Madison, Wisconsin

Boring No. 12
 Surface Elevation (ft) 1030.7
 Job No. C17051-19
 Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	Rec (in.)	Moist	N	Depth (ft)		q _u (qa) (tsf)	W	LL	PL	LI
					13 in. Black Silty TOPSOIL					
1	14	M	6		Stiff Brown Lean CLAY (CL)	(1.75)	23.1			
2	18	M	3		Medium Stiff to Stiff, Brown to Gray Mottled Lean CLAY, Trace Sand (CL)	(1.0)	29.0			
3	18	M/W	2		Very Soft, Gray Silty CLAY, Trace to Little Sand (CL-ML)	(<0.2)	34.3			
4	18	M/W	3			(<0.2)				
5	18	M/W	2			(<0.2)				
6	18	M	9		Stiff, Gray Silty CLAY (CL-ML)	(1.5)				
7	16	M/W	23		Medium Dense to Dense, Brown Fine to Medium SAND, Some Silt and Gravel, Scattered Cobbles and Boulders (SM)					
8	14	W	42		End Boring at 25 ft Borehole backfilled with bentonite chips					

WATER LEVEL OBSERVATIONS

While Drilling ∇ 20.6' Upon Completion of Drilling 9'
 Time After Drilling _____ 24 hrs
 Depth to Water _____ 6.8' ∇
 Depth to Cave in _____ 21'

GENERAL NOTES

Start 12/11/17 End 12/11/17
 Driller BSD Chief DB Rig D-50
 Logger DC Editor ESF
 Drill Method 2.25 HSA; Autohammer

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.



LOG OF TEST BORING

Project Lower Badger Mill Creek Ponds
N468431 E772683
 Location Madison, Wisconsin

Boring No. 13
 Surface Elevation (ft) 1033.7
 Job No. C17051-19
 Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	Field Rec (in.)	Moist	N	Depth (ft)		qu (qa) (tsf)	W	LL	PL	LI
1	18	M	3	0-18	12 in. Black Silty TOPSOIL Soft to Medium Stiff, Brown Lean CLAY (CL)	(0.5)	40.6			
2	8	M	9	18-26	Stiff, Brown to Gray Mottled Lean CLAY, Trace Sand (CL)	(1.75)	31.1			
3	14	M	6	26-40	Becoming Soft to Medium Stiff Near 9 ft	(1.75)	30.2			
4	18	W	2	40-42		(0.5)	27.6			
5	18	W	3	42-45		(0.75)				
6	14	M	27	45-72	Medium Dense to Very Dense, Brown Fine to Medium SAND, Some Silt and Gravel, Scattered Cobbles and Boulders (SM)					
7	15	M	35	72-87						
8	14	M	58	87-145						
					End Boring at 25 ft					
					Borehole backfilled with bentonite chips					

WATER LEVEL OBSERVATIONS					GENERAL NOTES				
While Drilling	<input checked="" type="checkbox"/>	NW	Upon Completion of Drilling	15.4'	Start	12/11/17	End	12/11/17	
Time After Drilling				24 hrs	Driller	BSD	Chief	DB	Rig D-50
Depth to Water				5.9'	Logger	DC	Editor	ESF	
Depth to Cave in				21.3'	Drill Method	2.25 HSA; Autohammer			
<small>The stratification lines represent the approximate boundary between soil types and the transition may be gradual.</small>									



LOG OF TEST BORING

Project Lower Badger Mill Creek Ponds
N468424 E773171
 Location Madison, Wisconsin

Boring No. 14
 Surface Elevation (ft) 1030.3
 Job No. C17051-19
 Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	DEPTH (ft)	Rec (in.)	Moist	N		Depth (ft)	q _u (qa) (tsf)	W	LL	PL
1	0-3	18	M	5	3 ft Black Silty TOPSOIL		33.8			
2	3-5	18	M	10	Loose to Medium Dense, Dark Brown to Gray SILT (ML)		27.1			
3	5-12	18	M	12	Very Stiff to Very Soft, Brown to Gray Mottled Lean CLAY, Trace Sand (CL)	(2.5)	23.1			
4	12-14	18	M/W	2	Gravelly Layer with Cobbles Noted by Drillers from 17.6' to 18'	(<0.2)	31.7			
5	14-17.6	18	M/W	2		(<0.2)				
6	17.6-18	18	M/W	6	Loose, Brown Fine to Coarse SAND, Some Silt and Gravel, Trace CLAY (SM)					
7	18-20	10	M/W	15	Soft to Medium Stiff, Gray Silty CLAY, Little to Some Sand and Gravel (CL-ML)	(0.5)				
8	20-25	12	M/W	65	Very Dense, Brown Fine to Medium SAND, Some Silt and Gravel, Scattered Cobbles and Boulders (SM)					
					End Boring at 25 ft					
					Borehole backfilled with bentonite chips					

WATER LEVEL OBSERVATIONS

While Drilling NW Upon Completion of Drilling 14.5'
 Time After Drilling _____ 24 hrs
 Depth to Water _____ 11.2' ▼
 Depth to Cave in _____ 18.6'

GENERAL NOTES

Start 12/11/17 End 12/11/17
 Driller BSD Chief DB Rig D-50
 Logger DC Editor ESF
 Drill Method 2.25 HSA; Autohammer

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

LOG OF TEST BORING
General Notes

DESCRIPTIVE SOIL CLASSIFICATION

Grain Size Terminology

Soil Fraction	Particle Size	U.S. Standard Sieve Size
Boulders	Larger than 12"	Larger than 12"
Cobbles	3" to 12"	3" to 12"
Gravel: Coarse.....	¾" to 3"	¾" to 3"
Fine	4.76 mm to ¾".....	#4 to ¾"
Sand: Coarse.....	2.00 mm to 4.76 mm.....	#10 to #4
Medium	0.42 to mm to 2.00 mm	#40 to #10
Fine	0.074 mm to 0.42 mm.....	#200 to #40
Silt.....	0.005 mm to 0.074 mm.....	Smaller than #200
Clay.....	Smaller than 0.005 mm.....	Smaller than #200

Plasticity characteristics differentiate between silt and clay.

General Terminology

Physical Characteristics
 Color, moisture, grain shape, fineness, etc.
Major Constituents
 Clay, silt, sand, gravel
Structure
 Laminated, varved, fibrous, stratified, cemented, fissured, etc.
Geologic Origin
 Glacial, alluvial, eolian, residual, etc.

Relative Density

Term	"N" Value
Very Loose.....	0 - 4
Loose.....	4 - 10
Medium Dense.....	10 - 30
Dense.....	30 - 50
Very Dense.....	Over 50

Relative Proportions Of Cohesionless Soils

Proportional Term	Defining Range by Percentage of Weight
Trace.....	0% - 5%
Little.....	5% - 12%
Some.....	12% - 35%
And	35% - 50%

Consistency

Term	q _u -tons/sq. ft
Very Soft.....	0.0 to 0.25
Soft.....	0.25 to 0.50
Medium.....	0.50 to 1.0
Stiff.....	1.0 to 2.0
Very Stiff.....	2.0 to 4.0
Hard.....	Over 4.0

Organic Content by Combustion Method

Soil Description	Loss on Ignition
Non Organic.....	Less than 4%
Organic Silt/Clay.....	4 - 12%
Sedimentary Peat.....	12% - 50%
Fibrous and Woody Peat...	More than 50%

Plasticity

Term	Plastic Index
None to Slight.....	0 - 4
Slight.....	5 - 7
Medium.....	8 - 22
High to Very High ..	Over 22

The penetration resistance, N, is the summation of the number of blows required to effect two successive 6" penetrations of the 2" split-barrel sampler. The sampler is driven with a 140 lb. weight falling 30" and is seated to a depth of 6" before commencing the standard penetration test.

SYMBOLS

Drilling and Sampling

- CS – Continuous Sampling
- RC – Rock Coring: Size AW, BW, NW, 2"W
- RQD – Rock Quality Designation
- RB – Rock Bit/Roller Bit
- FT – Fish Tail
- DC – Drove Casing
- C – Casing: Size 2 ½", NW, 4", HW
- CW – Clear Water
- DM – Drilling Mud
- HSA – Hollow Stem Auger
- FA – Flight Auger
- HA – Hand Auger
- COA – Clean-Out Auger
- SS - 2" Dia. Split-Barrel Sample
- 2ST – 2" Dia. Thin-Walled Tube Sample
- 3ST – 3" Dia. Thin-Walled Tube Sample
- PT – 3" Dia. Piston Tube Sample
- AS – Auger Sample
- WS – Wash Sample
- PTS – Peat Sample
- PS – Pitcher Sample
- NR – No Recovery
- S – Sounding
- PMT – Borehole Pressuremeter Test
- VS – Vane Shear Test
- WPT – Water Pressure Test

Laboratory Tests

- q_a – Penetrometer Reading, tons/sq ft
- q_a – Unconfined Strength, tons/sq ft
- W – Moisture Content, %
- LL – Liquid Limit, %
- PL – Plastic Limit, %
- SL – Shrinkage Limit, %
- LI – Loss on Ignition
- D – Dry Unit Weight, lbs/cu ft
- pH – Measure of Soil Alkalinity or Acidity
- FS – Free Swell, %

Water Level Measurement
















- ▽ - Water Level at Time Shown
- NW – No Water Encountered
- WD – While Drilling
- BCR – Before Casing Removal
- ACR – After Casing Removal
- CW – Cave and Wet
- CM – Caved and Moist

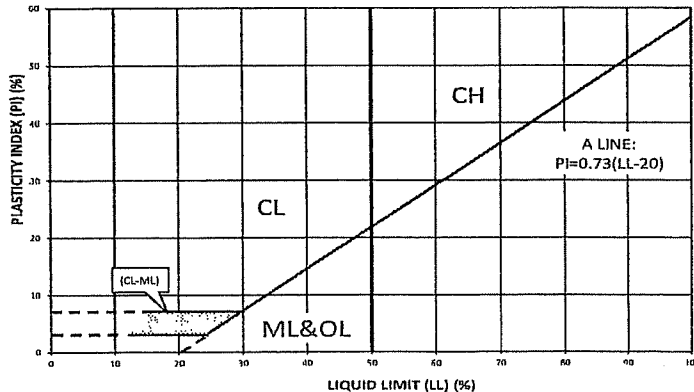
Note: Water level measurements shown on the boring logs represent conditions at the time indicated and may not reflect static levels, especially in cohesive soils.

CGC, Inc.

Madison - Milwaukee

Unified Soil Classification System

UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART			
COARSE-GRAINED SOILS (more than 50% of material is larger than No. 200 sieve size)			
Clean Gravels (Less than 5% fines)			
GRAVELS More than 50% of coarse fraction larger than No. 4 sieve size		GW	Well-graded gravels, gravel-sand mixtures, little or no fines
		GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines
	Gravels with fines (More than 12% fines)		
		GM	Silty gravels, gravel-sand-silt mixtures
		GC	Clayey gravels, gravel-sand-clay mixtures
Clean Sands (Less than 5% fines)			
SANDS 50% or more of coarse fraction smaller than No. 4 sieve size		SW	Well-graded sands, gravelly sands, little or no fines
		SP	Poorly graded sands, gravelly sands, little or no fines
	Sands with fines (More than 12% fines)		
		SM	Silty sands, sand-silt mixtures
		SC	Clayey sands, sand-clay mixtures
FINE-GRAINED SOILS (50% or more of material is smaller than No. 200 sieve size.)			
SILTS AND CLAYS Liquid limit less than 50%		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
		OL	Organic silts and organic silty clays of low plasticity
SILTS AND CLAYS Liquid limit 50% or greater		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
		CH	Inorganic clays of high plasticity, fat clays
		OH	Organic clays of medium to high plasticity, organic silts
HIGHLY ORGANIC SOILS		PT	Peat and other highly organic soils

LABORATORY CLASSIFICATION CRITERIA			
GW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3		
GP	Not meeting all gradation requirements for GW		
GM	Atterberg limits below "A" line or P.I. less than 4	Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols	
GC	Atterberg limits above "A" line or P.I. greater than 7		
SW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3		
SP	Not meeting all gradation requirements for GW		
SM	Atterberg limits below "A" line or P.I. less than 4	Limits plotting in shaded zone with P.I. between 4 and 7 are borderline cases requiring use of dual symbols	
SC	Atterberg limits above "A" line with P.I. greater than 7		
Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows:			
Less than 5 percent GW, GP, SW, SP			
More than 12 percent GM, GC, SM, SC			
5 to 12 percent Borderline cases requiring dual symbols			
PLASTICITY CHART			
			

APPENDIX C

RECOMMENDED COMPACTED FILL SPECIFICATIONS

APPENDIX C

CGC, INC.

RECOMMENDED COMPACTED FILL SPECIFICATIONS

General Fill Materials

Proposed fill shall contain no vegetation, roots, topsoil, peat, ash, wood or any other non-soil material which by decomposition might cause settlement. Also, fill shall never be placed while frozen or on frozen surfaces. Rock, stone or broken concrete greater than 6 in. in the largest dimension shall not be placed within 10 ft of the building area. Fill used greater than 10 ft beyond the building limits shall not contain rock, boulders or concrete pieces greater than a 2 sq ft area and shall not be placed within the final 2 ft of finish subgrade or in designated utility construction areas. Fill containing rock, boulders or concrete pieces should include sufficient finer material to fill voids among the larger fragments.

Special Fill Materials

In certain cases, special fill materials may be required for specific purposes, such as stabilizing subgrades, backfilling undercut excavations or filling behind retaining walls. For reference, WisDOT gradation specifications for various types of granular fill are attached in Table 1.

Placement Method

The approved fill shall be placed, spread and leveled in layers generally not exceeding 10 in. in thickness before compaction. The fill shall be placed at moisture content capable of achieving the desired compaction level. For clay soils or granular soils containing an appreciable amount of cohesive fines, moisture conditioning will likely be required.

It is the Contractor's responsibility to provide all necessary compaction equipment and other grading equipment that may be required to attain the specified compaction. Hand-guided vibratory or tamping compactors will be required whenever fill is placed adjacent to walls, footings, columns or in confined areas.

Compaction Specifications

Maximum dry density and optimum moisture content of the fill soil shall be determined in accordance with modified Proctor methods (ASTM D1557). The recommended field compaction as a percentage of the maximum dry density is shown in Table 2. Note that these compaction guidelines would generally not apply to coarse gravel/stone fill. Instead, a method specification would apply (e.g., compact in thin lifts with a vibratory compactor until no further consolidation is evident).

Testing Procedures

Representative samples of proposed fill shall be submitted to CGC, Inc. for optimum moisture-maximum density determination (ASTM D1557) prior to the start of fill placement. The sample size should be approximately 50 lb.

CGC, Inc. shall be retained to perform field density tests to determine the level of compaction being achieved in the fill. The tests shall generally be conducted on each lift at the beginning of fill placement and at a frequency mutually agreed upon by the project team for the remainder of the project.

Table 1
Gradation of Special Fill Materials

Material	WisDOT Section 311	WisDOT Section 312	WisDOT Section 305			WisDOT Section 209		WisDOT Section 210
	Breaker Run	Select Crushed Material	3-in. Dense Graded Base	1 1/4-in. Dense Graded Base	3/4-in. Dense Graded Base	Grade 1 Granular Backfill	Grade 2 Granular Backfill	Structure Backfill
Sieve Size	Percent Passing by Weight							
6 in.	100							
5 in.		90-100						
3 in.			90-100					100
1 1/2 in.		20-50	60-85					
1 1/4 in.				95-100				
1 in.					100			
3/4 in.			40-65	70-93	95-100			
3/8 in.				42-80	50-90			
No. 4			15-40	25-63	35-70	100 (2)	100 (2)	25-100
No. 10		0-10	10-30	16-48	15-55			
No. 40			5-20	8-28	10-35	75 (2)		
No. 100						15 (2)	30 (2)	
No. 200			2-12	2-12	5-15	8 (2)	15 (2)	15 (2)

Notes:

1. Reference: Wisconsin Department of Transportation *Standard Specifications for Highway and Structure Construction*.
2. Percentage applies to the material passing the No. 4 sieve, not the entire sample.
3. Per WisDOT specifications, both breaker run and select crushed material can include concrete that is 'substantially free of steel, building materials and other deleterious material'.

Table 2
Compaction Guidelines

Area	Percent Compaction (1)	
	Clay/Silt	Sand/Gravel
<u>Within 10 ft of building lines</u>		
Footing bearing soils	93 - 95	95
Under floors, steps and walks		
- Lightly loaded floor slab	90	90
- Heavily loaded floor slab and thicker fill zones	92	95
<u>Beyond 10 ft of building lines</u>		
Under walks and pavements		
- Less than 2 ft below subgrade	92	95
- Greater than 2 ft below subgrade	90	90
Landscaping	85	90

Notes:

1. Based on Modified Proctor Dry Density (ASTM D 1557)

APPENDIX D

DOCUMENT QUALIFICATIONS

APPENDIX D

DOCUMENT QUALIFICATIONS

I. GENERAL RECOMMENDATIONS/LIMITATIONS

CGC, Inc. should be provided the opportunity for a general review of the final design and specifications to confirm that earthwork and foundation requirements have been properly interpreted in the design and specifications. CGC should be retained to provide soil engineering services during excavation and subgrade preparation. This will allow us to observe that construction proceeds in compliance with the design concepts, specifications and recommendations, and also will allow design changes to be made in the event that subsurface conditions differ from those anticipated prior to the start of construction. CGC does not assume responsibility for compliance with the recommendations in this report unless we are retained to provide construction testing and observation services.

This report has been prepared in accordance with generally accepted soil and foundation engineering practices and no other warranties are expressed or implied. The opinions and recommendations submitted in this report are based on interpretation of the subsurface information revealed by the test borings indicated on the location plan. The report does not reflect potential variations in subsurface conditions between or beyond these borings. Therefore, variations in soil conditions can be expected between the boring locations and fluctuations of groundwater levels may occur with time. The nature and extent of the variations may not become evident until construction.

II. IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL ENGINEERING REPORT

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes. While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. *No one except you* should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one - not even you* - should apply the report for any purpose or project except the one originally contemplated.

READ THE FULL REPORT

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A GEOTECHNICAL ENGINEERING REPORT IS BASED ON A UNIQUE SET OF PROJECT-SPECIFIC FACTORS

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, *do not rely on a geotechnical engineering report* that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes - even minor ones - and request an assessment of their impact. *CGC cannot accept responsibility or liability for problems that occur because our reports do not consider developments of which we were not informed.*

SUBSURFACE CONDITIONS CAN CHANGE

A geotechnical engineering report is based on conditions that existed at the time the geotechnical engineer performed the study. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

MOST GEOTECHNICAL FINDINGS ARE PROFESSIONAL OPINION

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgement to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ - sometimes significantly - from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most

effective method of managing the risks associated with unanticipated conditions.

A REPORT'S RECOMMENDATIONS ARE NOT FINAL

Do not over-rely on the confirmation-dependent recommendations included in your report. *Those confirmation-dependent recommendations are not final*, because geotechnical engineers develop them principally from judgement and opinion. Geotechnical engineers can finalize their recommendations *only* by observing actual subsurface conditions revealed during construction. *CGC cannot assume responsibility or liability for the report's confirmation-dependent recommendations if we do not perform the geotechnical-construction observation required to confirm the recommendations' applicability.*

A GEOTECHNICAL ENGINEERING REPORT IS SUBJECT TO MISINTERPRETATION

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Constructors can also misinterpret a geotechnical engineering report. Confront that risk by having CGC participate in prebid and preconstruction conferences, and by providing geotechnical construction observation.

DO NOT REDRAW THE ENGINEER'S LOGS

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

GIVE CONSTRUCTORS A COMPLETE REPORT AND GUIDANCE

Some owners and design professionals mistakenly believe they can make constructors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give constructors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise constructors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure constructors have sufficient time* to perform additional study. Only then might you be in a position to give constructors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

READ RESPONSIBILITY PROVISIONS CLOSELY

Some clients, design professionals, and constructors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic

expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineer's responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

ENVIRONMENTAL CONCERNS ARE NOT COVERED

The equipment, techniques, and personnel used to perform an *environmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

OBTAIN PROFESSIONAL ASSISTANCE TO DEAL WITH MOLD

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, many mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; *none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention.* *Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.*

RELY ON YOUR GEOTECHNICAL ENGINEER FOR ADDITIONAL ASSISTANCE

Membership in the Geotechnical Business Council (GBC) of Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk confrontation techniques that can be of genuine benefit for everyone involved with a construction project. Confer with CGC, a member of GBC, for more information.

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of the Geoprofessional Business Association
8811 Colesville Road, Suite G 106
Silver Spring, MD 20910



Construction • Geotechnical
Consulting Engineering/Testing

October 28, 2022
C21051-31

Mr. Matt Allie, P.E.
City of Madison – Engineering Department
210 Martin Luther King, Jr. Boulevard, Room 115
Madison, WI 53710

Re: Geotechnical Exploration Report
Blue Harvest Lane
Bridge and Road Construction
Madison, Wisconsin

Dear Mr. Allie:

Construction • Geotechnical Consultants, Inc. (CGC) has completed the geotechnical exploration program for the project referenced above. The purpose of this exploration program was to evaluate the subsurface conditions within the proposed construction area and to provide geotechnical recommendations regarding bridge foundation, and roadway pavement design/construction. An electronic copy of this report is provided for your use, and a paper copy can be provided upon request.

PROJECT AND SITE DESCRIPTION

We understand that new paved roadways are to be created eastward from Meadow Road toward Hawks Woods development and Hill Creek Park. Blue Harvest Lane is to extend east through a local lowland and connect with a new section of Feather Edge Drive. A new single-span bridge is planned along Blue Harvest Lane extending west to east over a planned channel within the lowland. We assume the new sections of roadway will be underlain by typical utilities such as sanitary sewer, water main and storm sewer, as well as gas and electric facilities. While some minor cutting may be necessary, significant filling of up to 7 feet above existing grades will be necessary to construct the new roadways. A separate report dated October 6, 2022, was issued to provide geotechnical recommendations regarding slope stability and embankment settlement details associated with the planned filling for design and construction of an adjacent regional stormwater management facility

Although limited information is available, we envision the single-span bridge to be a prestressed concrete girder structure, with cast-in-place concrete deck, wing walls and abutments. Bottom of abutment elevations have preliminarily been set at EL 1030.5 ft.

The area of the planned roadways are primarily undeveloped local lowland, with site grades sloping gently down from the east and west toward a north to south drainage trend which is to be channelized beneath the new bridge. Mainly residential properties border the site to the north and south, with some agricultural land use as well.

SUBSURFACE CONDITIONS

Three Standard Penetration Test (SPT) soil borings were completed for this project. The borings (B5, B6 and B7) were extended to depths of 63, 60 and 92.5 ft below existing site grades, respectively, near the proposed bridge abutments. Borings B5 and B6 were drilled by Soil Essentials using hollow-stem augers on August 22, 2022, using an ATV-mounted 7822 DT drill rig; while B7 was drilled by Americas Drilling Co. using mud rotary tools on September 8 and 9, 2022. Both drill rigs were equipped with an automatic SPT hammer.

Borings B5 and B6 were located in the field by City personnel, and B7 was subsequently located between the two by CGC. Ground surface elevations at B5 and B6 were provided by the City while the elevation at B7 was estimated by CGC. The boring locations are shown in plan on the Soil Boring Location Map attached in Appendix B.

The subsurface conditions at the boring locations were fairly similar (with some differences noted in consistency within the granular layers presumably due to cobbles/possible boulders encountered during drilling). A generalized profile includes the following strata, in descending order:

Proposed Bridge (Borings 5, 6 and 7)

- About 6 to 9 in. of clayey *topsoil* (considered possible fill), over
- About 10 to 11 ft of *lean clay*, having stiff to very soft consistencies (with the top 5 to 5.5 ft considered to be *possible fill*), atop
- Very loose to very dense *sands* which vary with silt, gravel, cobble and boulder contents to the maximum depths explored (note that a 4 to 5 ft layer of stiff clay was present beginning near 56 ft below existing grades at B6 and B7).

Groundwater was noted at depths of 20.8 to 39.8 ft below existing grades in the borings during and shortly after (within 24 hours) of drilling. Groundwater levels can be expected to fluctuate with seasonal variations in the nearby pond stages, precipitation, infiltration, evapotranspiration, as well as other factors. A more detailed description of the site soil and groundwater conditions is presented on the Soil Boring Logs attached in Appendix A.

DISCUSSION AND RECOMMENDATIONS

Subject to the limitations discussed below and based on the subsurface exploration, we recommend that the proposed bridge be supported on piles driven to the required capacity within the medium dense to very dense granular soils encountered with depth below the proposed abutment locations. In addition, the site generally appears suitable for the creation of new roadways including the installation of new utilities. The following subsections provide our recommendations for bridge foundation, utility



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Blue Harvest Lane Bridge
CGC Project No. C21051-31
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installation and roadway pavement design/construction.

1. Bridge Foundation Recommendations

A. General

As noted previously, we understand that a new bridge with cast-in-place concrete abutments and wingwalls will be constructed to span over a planned drainage channel near the eastern end of Blue Harvest Lane. The bridge will be a single-span and the clear width will include two vehicle and pedestrian lanes. Preliminary plans indicated that bottom of abutment has been set at EL 1030.5 ft, approximately 2.5 ft below existing site grades at the boring locations.

For pile design, the *nominal (ultimate, unfactored)* geotechnical capacities and associated estimated depths were determined using the A-Pile (Ensoft) software program in general accordance with the WisDOT *Load and Resistance Factored Design (LRFD)* procedures (adopted from the AASHTO *LRFD Bridge Design Specifications*). The *factored* resistance can be calculated by multiplying the nominal resistance by the applicable resistance factor (ϕ), with the resistance factor determined by the level of pile testing completed prior to and during construction. For example, if pile driving will be monitored during construction using the Modified Gates formula, the minimum amount expected on WisDOT projects, a resistance factor of 0.5 is applicable. If dynamic (PDA) or static pile load testing is completed, the resistance factor can be increased, but we do not anticipate that the moderate to significant expense associated with pile load testing and the limited number of piles anticipated to be necessary for the support of the bridge will make economic sense for this project. We can provide additional consultation on load testing, if needed.

Utilizing the subsurface information obtained from the borings, we estimated pile tip depths and elevations required to develop an ultimate ($\phi = 1.0$) capacity of 150 and 210 tons for 10.75-in. CIP piles (0.365-in. shell thickness) and 12.75-in. CIP piles (0.375-in. shell thickness), respectively. These capacities are the maximum allowable for each pile size (and shell thickness) according to Table 11.3.-5 in the WisDOT *LRFD Bridge Manual*. For the purposes of estimating pile lengths using A-Pile, the closed-end pipe pile option was selected for CIP pile analysis. We expect that the CIP piles will achieve the required driving resistance within the medium dense to very dense sand encountered Borings 5, 6 and 7, and the estimated CIP pile tip elevations and lengths below abutment elevations are summarized in Table 1. Based on the presence of dense to very dense zones, as well as cobbles/boulders within the deposit, some variability should be expected in actual driven depths between boring locations.

Based on preliminary grading plans, site grades may be raised by as much as about 7 ft at the bridge approaches. Therefore, settlement of the native clay layers could occur that will result in down drag loads (negative skin friction) being developed on the piles that will reduce the available load carrying capacity of the piles. In order to help reduce, though not eliminate, down drag loads on the piles, we recommend that the bridge approach embankments be filled well in advance of pile driving operations to allow for consolidation/settlement of the new embankment fill and underlying compressible soils to

largely occur prior to pile driving. While early fill placement will help reduce the potential for down drag loads, we recommend that an unfactored (ultimate) negative skin friction load of 10 kips (5 tons) for the clay soils, as well and newly-placed fill above, be added as a load to the piles to account for potential longer-term settlement after pile driving.

Although final required design capacities were not provided, the maximum ultimate capacities for 10.75-in. CIP piles (0.365-in. shell thickness) and 12.75-in. CIP piles (0.375-in. shell thickness) are anticipated to be greater than what may be required for bridge support. Therefore, down drag loads can typically be accommodated by driving the piles to a greater depth and driving resistance than required for the bridge structural loads. Care should be exercised such that the maximum capacity of the pile is not exceeded during driving. Actual required driving resistances should be clearly stated on the project plans. Once final bridge loading has been determined, we can provide updated estimated depths based on the addition of the 10 kips for down drag to the final design bridge loads.

While HP piles were also considered, the estimated pile depths to reach capacity were up to 10 ft deeper than CIP piles, which is mostly due to the larger end area and resulting higher end bearing of a CIP pile compared to a HP pile. It has also been our experience that HP piles tend to drive to less predictable depths than CIP piles.

Table 1 - Estimated CIP Pile Tip Elevations and Lengths

Boring	Approximate Bottom of Abutment Elevation (ft)	10.75-in. CIP (0.365-in.) Nominal (Ultimate - $\phi = 1.0$) Axial Compression Resistance of 150 tons		12.75-in. CIP (0.375-in.) Nominal (Ultimate - $\phi = 1.0$) Axial Compression Resistance of 210 tons	
		Tip Elevation (ft)	Length (ft) ⁽¹⁾	Tip Elevation (ft)	Length (ft) ⁽¹⁾
B-5	830.5	775.5	55	770.5	60
B-6		770.5	60	765.5	65
B-7		780.5	50	775.5	55

Notes:

1. Measured from bottom of abutment.
2. Nominal axial compression resistance does not include a resistance factor; to determine factored axial compression resistance, multiply the nominal axial

compression resistance by the applicable resistance factor in accordance with AASHTO Section 10.5.5.

B. Drivability

Based on our experience completing drivability analyses for piles driven to capacity within medium dense to dense soils, CIP piles can generally be driven to the required driving resistance *with an appropriately sized pile hammer to achieve the required driving resistance while not overstressing the piles*. However, we recommend that a drivability analysis be completed by the pile driving contractor prior to construction to check that the selected pile type, cushion and hammer are compatible and do not result in the pile being overstressed, while still being able to develop the required driving resistance. It is also important that pile driving stop shortly after capacity (and possible refusal) occurs to reduce the risk of pile damage.

C. Lateral Earth Pressures

In accordance with WisDOT *Bridge Manual* procedures (Sections 12.4 and 12.8), wing walls (if any) should be designed as cantilever retaining walls extending from the abutments, and an equivalent fluid pressure of 40 psf per foot of depth and a 2 ft surcharge (240 psf) should be used in design. This recommendation is based on granular fill being used as backfill, as indicated in Section 210 of the WisDOT *Standard Specifications*. It is recommended that procedures for placement and compaction of backfill conform to those outlined in paragraph 207.3.6.2 (Standard Compaction) of the *Standard Specifications*. The wing wall design should include surcharge loads, if applicable.

D. Additional Recommendations

Due to the potential for high stresses during driving through granular soils with gravel and potentially cobbles/boulders as encountered in the borings, we recommend that thicker pile shells (e.g., minimum 0.365 to 0.375-in. shell thickness for 10.75 and 12.75-in. CIP piles, respectively) and potentially reinforced/thicker end plates, be used to reduce the risk of overstressing the piles during driving. End plates must not extend beyond the outer diameter of the pile wall in order to not adversely affect development of side friction.

Other pertinent pile design parameters include the following:

- While groundwater was not encountered in the borings within excavation depths anticipated for this project, surface water has been observed across portions of the site, especially during and following periods of wet weather. Therefore, temporary dewatering will likely be required during periods of work to facilitate excavation and abutment construction. Dewatering means and methods are the responsibility of the earthwork contractor.

- For adequate frost protection, we recommend that the abutment pile caps be founded at least 4 ft below finish grade. A minimum embedment depth of 2.5 ft is recommended for abutments, per *WisDOT Bridge Manual*.
- It is recommended that the minimum spacing between individual piles be no less than 2.5 ft or 2.5 times the pile diameter, whichever is greater. WisDOT recommends a maximum pile spacing of 8 ft. During driving, heaving and/or lateral displacements of driven piles may occur during subsequent nearby pile driving operations. Therefore, it is important that horizontal and vertical alignment checks be performed during pile driving operations. Piles that heave more than 0.25 in. vertically must be resealed. However, heaving is generally not a concern with HP piling since they are considered non-displacement piles.
- Appropriate scour protection should be provided to prevent soil eroding from below the abutments (and around the piles) in the event of high-water events.

2. Blue Harvest Lane Construction

A. *Overview*

Where filling is necessary for the new sections of roadway to be created, soil conditions encountered at borings B5-B7 suggest that after topsoil stripping, some stabilization of the exposed clays may be necessary to support construction traffic. We recommend that the project include a contingency for EBS which includes about 12 in. of additional coarse aggregate over a biaxial geogrid (e.g. Tensar BX Type 1 or equivalent) to be installed prior to or during fill placement in areas exhibiting significant instability. Utilities can be installed using traditional open-cut or braced excavations, with the understanding that some undercutting and or dewatering could be required where invert elevations coincide with loose/soft conditions (which were encountered at all of the boring locations) or perched water zones.

Using preliminary cross-sections provided, we estimated settlement of the on-site clay layers caused by the weight of new fill required to establish Blue Harvest Lane subgrade elevations. We conservatively estimated settlement based on the thickest clay layer encountered in the borings (Boring 6) and the required fill thickness. Based on a maximum fill thickness of about 7 ft at the proposed bridge approaches, we estimate that maximum total settlement of the clay soils caused by the weight of the new embankment fill will be on the order of approximately 1.5 to 2 in. For more typical fill thickness of 1 to 3 ft within western portions of Blue Harvest Lane, total settlements are estimated to be on the order of approximately 0.5 to 1 in.

Although our estimates conservatively used the thickest clay layer encountered in the borings, greater settlement than our estimates may occur where thicker deposits of clay or other compressible soils are

present between or beyond the boring locations along Blue Harvest Lane. To account for variability in settlement potential, we recommend that fill placement to establish roadway subgrade elevations occur early in the construction sequence to allow for minor regrading (e.g., addition of more fill) to account for settlement and to reduce potential down drag loads on driven piles at the abutments (discussed further below). However, in order to reduce the potential regrading required, the design elevations of the embankments could be established such that the estimated settlement is accounted for during construction. Note that as an alternative to accounting for settlement in the design embankment elevations, and to reduce the potential variability in settlement where a thicker deposit of compressible soils may be present between boring locations, the embankments could be overfilled by several feet to essentially surcharge the clay soil in order to promote quicker settlement. Settlement monitoring points installed along the top of the embankments would then be surveyed on a regular basis to determine when settlement has largely ceased, followed by removal of the surcharge soil and final grading. Overfilling can also be employed to protect eventual road subgrades from construction traffic. Additional information can be provided, if needed.

B. Utility Installation

As stated, some undercutting of pipe subgrades, possibly underlain by a geotextile, should be anticipated in areas where invert elevations coincide with soft/loose conditions. While groundwater was greater than 20 ft below existing grades at B5-B7, localized areas of saturated soils could necessitate dewatering during utility installations. Pumping from filtered sump pits is typically acceptable for drawdowns of about two feet or less. In regards to backfilling, we anticipate that imported sands will generally be required which is a typical requirement for City projects. On-site sands could be considered for reuse as trench backfill but they should be separated from clay soils and selectively stockpiled. Moisture conditioning could be necessary to achieve desired compaction levels. We recommend that at least a level of 95% compaction be achieved within backfill material placed within the final 3 feet below finished subgrades (including undercut backfill - if any), with 90% compaction required at depths greater than 3 feet. The specified levels of compaction are based on modified Proctor methods (ASTM D1557). Also, the backfill material should be placed and compacted in accordance with our Recommended Compacted Fill Specifications presented in Appendix B.

C. Pavement Subgrade Preparation

Significant construction traffic and exposure to wet weather have the potential to destabilize the surficial clay and necessitate some undercutting. Areas requiring undercutting and stabilization will depend on several factors including weather, as well as the level of care exercised to protect existing soils from disturbance. Pavement subgrades should be evaluated following utility installation by proof-rolling with a loaded tri-axle dump truck to determine the EBS locations and required stabilization section (i.e., EBS depth, need for geogrid reinforcement). Standard earthwork-related techniques that are typically utilized during City of Madison roadway reconstruction projects include:

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- Proof-rolling/recompaction of the exposed subgrades;
- Undercutting and/or stabilization in soft areas; and
- Compaction control of fill/backfill materials.

D. Roadway Pavement Design

Clays will control the roadway pavement design, as we anticipate that the pavement subgrades will at times consist of native clay or fill soils containing clay. The following *generalized* parameters should be used to develop the design pavement sections (which are considered conservative in sandy areas):

TABLE 2 – Recommended Pavement Design Parameters

Parameter	Recommended Design Value
USCS Classification	ML/CL
AASHTO Classification	A-4/A-6
Design Group Index, DGI	16
Frost Index, FI	F-4
Soil Support Value, SSV	3.6
Subgrade Modulus, k (pci)	75

Note:

These values are based on the following assumptions:

- 1) The subgrade has been closely monitored.
- 2) The subgrade has been thoroughly and adequately compacted.
- 3) Wet zones have been dried, drained, or removed.
- 4) Pockets of dissimilar material have been removed, replaced or mixed to achieve a homogeneous subgrade.
- 5) Adequate subgrade drainage has been achieved.

(Reference: WisDOT, *Geotechnical Manual*)

Provided that stable subgrade conditions are developed, and based on our understanding that Blue Harvest Lane will generally experience light-duty passenger vehicle traffic, a typical pavement section of 4 to 5 in. of asphalt over 12 to 16 in. of coarse aggregate appears suitable for traffic support. However, pavement section thicknesses should be based on the provided soil parameters in Table 2 and City of Madison requirements.



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 Blue Harvest Lane Bridge
 CGC Project No. C21051-31
 October 25, 2022
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CONSTRUCTION CONSIDERATIONS

Due to variations in weather, construction methods and other factors, specific construction problems are difficult to predict. Soil related difficulties that could be encountered on the site are discussed below:

- Earthwork construction during the early spring or late fall could be complicated as a result of wet weather and freezing temperatures. During cold weather, exposed subgrades should be protected from freezing. Fill should never be placed while frozen or on frozen ground.
- Excavations extending greater than 4 ft in depth below the existing ground surface should be sloped in accordance with current OSHA standards.
- While groundwater was not encountered within the upper 20 ft of the borings, surface water has been observed across portions of the site, especially during and following periods of wet weather. Therefore, temporary dewatering will likely be required during periods of work to facilitate excavation and construction. Dewatering means and methods are the responsibility of the earthwork contractor.

RECOMMENDED CONSTRUCTION MONITORING

The level of care exercised during site development and earthwork activities will largely determine the quality of subgrades and wet pond construction. To check that earthwork and construction proceeds in accordance with our recommendations, qualified construction inspectors should monitor the following operations:

- Site stripping and subgrade preparation (including EBS);
- Fill/backfill placement and compaction; and
- Pile driving observations.

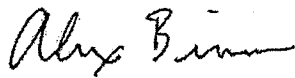
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We trust this report addresses your present needs. General limitations regarding the conclusions and opinions presented in this report are discussed in Appendix C. We appreciate the opportunity to be of service on this project and look forward to working with you as it proceeds. If you have any questions, please contact us.

Sincerely,

CGC, Inc.



Alex J. Bina, P.E.
Consulting Professional



Eric S. Fair
Senior Staff Engineer/Geologist



Michael N. Schultz, PE
Principal/Senior Consulting Professional

Encl: Appendix A - Soil Boring Location Exhibit
 Logs of Test Borings (3)
 Log of Test Boring-General Notes
 Unified Soil Classification System
Appendix B - Recommended Compacted Fill Specifications
Appendix C - Document Qualifications

APPENDIX A
SUBSURFACE EXPLORATION

APPENDIX A

SUBSURFACE EXPLORATION

Three Standard Penetration Test (SPT) soil borings were completed for this project. The borings (B5, B6 and B7) were extended to depths of 63 ft, 60 ft and 92.5 ft, respectively, below existing site grades near the proposed bridge abutments. B5 and B6 were drilled by Soil Essentials on August 22, 2022; and B7 was drilled by America's Drilling Co. on September 8 and 9, 2022, using ATV and truck-mounted drill-rigs equipped with hollow-stem augers, mud-rotary tools and automatic SPT hammers. The borings were located in the field both by City personnel (B5 and B6) as well as CGC (B7). Ground surface elevations at B5 and B6 were provided by the City, and B7 was subsequently estimated by CGC. The boring locations are shown in plan on the Soil Boring Location Map attached in Appendix A.

Soil samples were obtained at 2.5-foot intervals to a depth of 15 ft and at 5-foot intervals thereafter. The soils samples were obtained in general accordance with specifications for standard penetration testing, ASTM D 1586. The specific procedures used for drilling and sampling are described below:

1. Boring Procedures Between Samples

The boring is extended downward, between samples, by a hollow stem auger (B1-B5) or mud-rotary tools (B6 and B7).

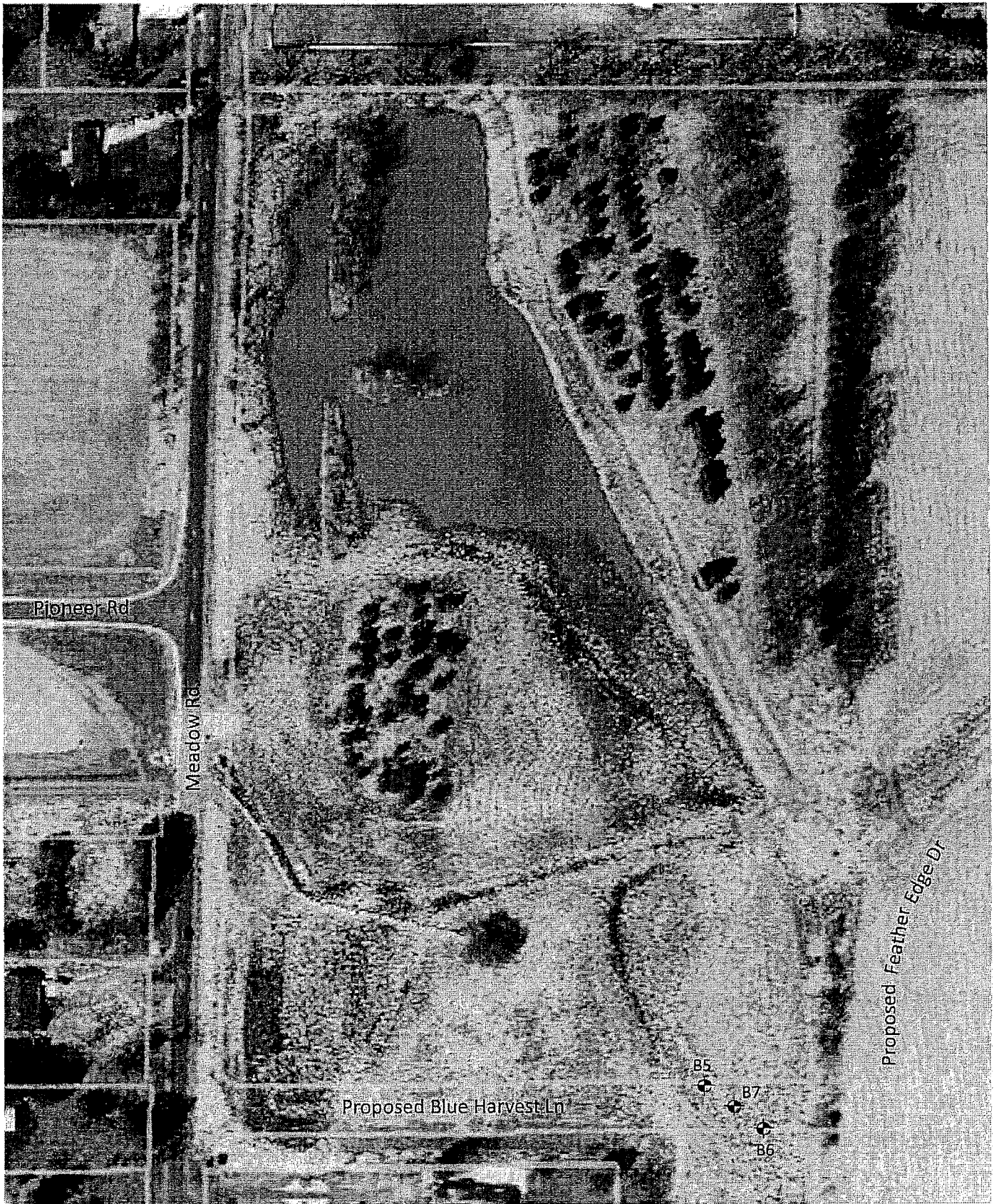
2. Standard Penetration Test and Split-Barrel Sampling of Soils
(ASTM Designation: D 1586)

This method consists of driving a 2-in. outside diameter split barrel sampler using a 140-pound weight falling freely through a distance of 30 in. The sampler is first seated 6 inches into the material to be sampled and then driven 12 in. The number of blows required to drive the sampler the final 12 in. is recorded on the log of borings and known as the Standard Penetration Resistance. Recovered samples are first classified as to texture by the driller.

During the field exploration, the driller visually classified the soil and prepared a field log. Water level observations were made in each boring during and after drilling (with only initial observations possible when drilling fluid is employed) and are shown at the bottom of each boring log. *Field screening of the soil samples for possible environmental contaminants was not conducted by the drillers, as environmental site assessment activities were not part of CGC's work scope.* Upon completion of drilling, the borings were backfilled to satisfy WDNR requirements, and soil samples delivered to our laboratory for visual classification and laboratory testing. The soils were visually classified by a geotechnical engineer using the Unified Soil Classification System. The final logs prepared by the engineer and a description of the Unified Soil Classification System are presented in Appendix B.

APPENDIX B

**SOIL BORING LOCATION EXHIBIT
LOGS OF TEST BORINGS (3)
LOG OF TEST BORING – GENERAL NOTES
UNIFIED SOIL CLASSIFICATION SYSTEM**



Legend

☛ Denotes Boring Location

Notes

1. Soil Borings performed by Soil Essentials in August 2022 (B5, B6) or America's Drilling Co. in September 2022 (B7)
2. Boring locations are approximate



Scale: Reduced

Job No. C21051-31		SOIL BORING LOCATION MAP Blue Harvest Ln Bridge Madison, Wisconsin
Date: 10/2022		



LOG OF TEST BORING

Project Feather Edge Pond
(Blue Harvest Lane Bridge)
 Location Madison, WI

Boring No. 5
 Surface Elevation (ft) 1033.1
 Job No. C21051-31
 Sheet 1 of 2

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	DEPTH (ft)	Rec (in.)	Moist	N		Depth (ft)	q _u (tsf)	W	LL	PL
1	4	16	M	4	0-9 in. Dark Brown Clayey TOPSOIL Stiff to Soft, Brown Lean CLAY, Trace Sand (CL - Possible Fill)	(1.5)				
2	5	17	M/W	2		(0.5)				
3	6	16	M	2	Very Soft, Stratified Brown, Dark Brown and Gray Lean to Silty CLAY, Trace Sand (CL/CL-ML)	(<0.2)				
4	10	14	M/W	3	Very Loose, Brown Silty Fine SAND, Some Gravel, Trace Clay (SM)					
5	11	4	M	85	Medium Dense, Brown Fine to Medium SAND, Some Silt and Gravel, Scattered Cobbles and Boulders (SM)					
6	13	6	M	20	(Rough drilling/cobbles/very dense conditions from 11'-13')					
7	21	15	M	21						
8	25	14	M	17						
9	26	7	M	26						
10	35	15	W	11	Medium Dense, Brown Fine to Coarse SAND, Some Silt and Gravel, Scattered Cobbles (SM)					
11	40	17	M/W	16	Medium Dense, Brown Sandy SILT, Trace Gravel and Clay, Scattered Cobbles (ML)					

WATER LEVEL OBSERVATIONS

GENERAL NOTES

While Drilling 33.5' Upon Completion of Drilling 34.5'
 Time After Drilling 24 Hours
 Depth to Water 20.8'
 Depth to Cave in 25.1'

Start 8/22/22 End 8/22/22
 Driller SE Chief CRJ Rig 7822DT
 Logger AR Editor ESF
 Drill Method 2.25" HSA; Autohammer

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.



LOG OF TEST BORING

Project Feather Edge Pond
(Blue Harvest Lane Bridge)
 Location Madison, WI

Boring No. 5
 Surface Elevation 1033.1
 Job No. C21051-31
 Sheet 2 of 2

2921 FERRY STREET, MADISON, WIS. 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	Rec (in.)	Moist	N	Depth (ft)		qu (qa) (tsf)	W	LL	PL	LI
				40	Medium Dense, Brown Sandy SILT, Trace Gravel and Clay, Scattered Cobbles (ML)					
12	15	M/W	11	45						
				50	Medium Dense, Brown Fine to Coarse SAND, Some Silt and Gravel, Scattered Cobbles (SM)					
13	16	M/W	27	55						
				60	Medium Dense, Brown Sandy SILT, Trace Gravel and Clay, Scattered Cobbles (ML)					
14	15	W	28	60						
				65	Medium Dense, Brown Sandy SILT, Trace Gravel and Clay, Scattered Cobbles (ML)					
15	0	-	11	60						
				65	Dense, Brown Fine to Coarse SAND, Some Silt and Gravel, Scattered Cobbles (SM)					
16	16	W	11	65						
				70	Dense, Brown Fine to Coarse SAND, Some Silt and Gravel, Scattered Cobbles (SM)					
17	11	W	32	70						
				75	End of Boring at 63 ft Backfilled with Bentonite Chips					
				80						
				85						



LOG OF TEST BORING

Project Feather Edge Pond
 (Blue Harvest Lane Bridge)
 Location Madison, WI

Boring No. 6
 Surface Elevation (ft) 1033.1
 Job No. C21051-31
 Sheet 1 of 2

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	EXTR Rec (in.)	Moist	N	Depth (ft)		qu (qa) (tsf)	W	LL	PL	LOI
					9 in. Brown Clayey TOPSOIL					
1	16	M	6		Stiff to Very Soft, Stratified Brown, Dark Brown and Gray Lean to Silty CLAY, Trace Sand with thin (<1") Sandy Seams and Lenses (CL - Possible Fill to 5')	(1.5)				
2	15	M	4			(0.5)				
3	17	M/W	0			(<0.2)				
4	16	M/W	0			(<0.2)				
					Medium Dense, Brown Fine to Medium SAND, Some Silt and Gravel, Scattered Cobbles and Boulders (SM)					
5	15	M	14		Medium Dense, Brown Sandy SILT to Silty Fine SAND, Some Gravel, Scattered Cobbles (ML/SM)					
6	17	M	19							
7	15	M	23							
					Medium Dense, Brown Silty Fine SAND, Some Gravel, Trace Clay (SM)					
8	16	M	24		Very Stiff, Brownish-Gray Lean CLAY, Scattered Sand, Gravel and Cobbles (CL)					
9	17	W	18							
10	16	M/W	12			(2.5)				

WATER LEVEL OBSERVATIONS					GENERAL NOTES				
While Drilling	∇ 33.5'	Upon Completion of Drilling	39.8'		Start	8/22/22	End	8/22/22	
Time After Drilling					Driller	SE	Chief	CRJ	Rig 7822DT
Depth to Water					Logger	AR	Editor	ESF	
Depth to Cave in			48.1'		Drill Method	2.25" HSA; Autohammer			

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.



LOG OF TEST BORING

Project Feather Edge Pond
 (Blue Harvest Lane Bridge)
 Location Madison, WI

Boring No. 6
 Surface Elevation 1033.1
 Job No. C21051-31
 Sheet 2 of 2

2921 FERRY STREET, MADISON, WIS. 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	Rec (in.)	Moist	N	Depth (ft)		qu (qa) (tsf)	W	LL	PL	LI
					Very Stiff, Brownish-Gray Lean CLAY, Scattered Sand, Gravel and Cobbles (CL)					
11	15	M/W	9	45	Loose, Grayish-Brown SILT (ML)					
12	16	W	31	50	Dense to Medium Dense, Brown Fine to Coarse SAND, Some Silt and Gravel, Scattered Cobbles (SM)					
13	0	-	11	55						
14	12	M/W	16	60	Stiff, Grayish-Brown Lean CLAY, Trace Sand, Scattered Gravel and Cobbles (CL)	(1.5)				
				60	End of Boring at 60 ft					
					Backfilled with Bentonite Chips					
				65						
				70						
				75						
				80						
				85						



LOG OF TEST BORING

Project Feather Edge Pond
 (Blue Harvest Lane Bridge)
 Location Madison, WI

Boring No. 7
 Surface Elevation (ft) 1033.1
 Job No. C21051-31
 Sheet 1 of 3

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	REC (in.)	Moist	N	Depth (ft)		qu (qa) (tsf)	W	LL	PL	LOI
					7 in. TOPSOIL					
1	10	M	9		Stiff to Soft Brown Lean Clay, Trace Sand (CL - Possible Fill to 3') Numerous Sand Partings Beginning Near 4'	(1.0)				
2	16	M	4			(0.5)				
3	10	M/W	4		Loose to Very Loose, Brown Silty Fine SAND, Trace Gravel and Clay (SM) Increasing Clay Content with Depth					
4	14	M	3							
5	14	M	42		Dense to Very Dense, Brown Fine to Medium SAND, Some Silt and Gravel, Scattered Cobbles and Boulders (SM)					
6	18	M	45							
7	12	M	64		Very Dense, Brown Fine to Coarse SAND, Some Silt and Gravel, Scattered Cobbles (SM)					
8	8	W	65							
9	8	W	42		Stiff, Brown Lean CLAY, Trace to Little Sand and Gravel (CL)					
10	8	W	19			(1.25)				

WATER LEVEL OBSERVATIONS	GENERAL NOTES
While Drilling ∇ <u>33.5'</u> Upon Completion of Drilling _____ Time After Drilling _____ Depth to Water _____ Depth to Cave in _____	Start <u>9/8/22</u> End <u>9/9/22</u> Driller <u>ADC</u> Chief <u>KD</u> Rig <u>CME</u> Logger <u>DB</u> Editor <u>ESF</u> <u>55</u> Drill Method <u>4.25" HSA to 10 ft; 3-7/8</u> <u>in. RB with Mud to 92.5'</u>

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.



LOG OF TEST BORING

Project Feather Edge Pond
 (Blue Harvest Lane Bridge)
 Location Madison, WI

Boring No. 7
 Surface Elevation 1033.1
 Job No. C21051-31
 Sheet 2 of 3

2921 PERRY STREET, MADISON, WIS. 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	EXAM REMARKS	Rec (in.)	Moist	N		Depth (ft)	qu (qa) (tsf)	W	LL	PL
					Stiff, Brown Lean CLAY, Trace to Little Sand and Gravel (CL)					
11		18	W	11	Medium Dense, Stratified Brown and Light Brown Sandy SILT and Silty Fine SAND, Trace Clay (ML/SM)					
					Very Dense, Brown Fine to Coarse Sand, Some Silt and Gravel, Trace Clay (SM)					
12		10	W	88						
					Very Soft, Brown Lean CLAY, Trace Sand (CL)					
14		18	W	12		(<0.2)				
					Very Dense, Brown Fine to Coarse SAND and GRAVEL, Some Silt (SM/GM)					
15		6	W	61/9"						
					(Medium Dense with Scattered Clay Lenses Near 69')					
16		6	W	24						
17		10	W	31						
18		10	W	36						
19		8	W	82 /10"						

LOG OF TEST BORING
General Notes

DESCRIPTIVE SOIL CLASSIFICATION

Grain Size Terminology

Soil Fraction	Particle Size	U.S. Standard Sieve Size
Boulders	Larger than 12"	Larger than 12"
Cobbles	3" to 12"	3" to 12"
Gravel: Coarse.....	¾" to 3"	¾" to 3"
Fine	4.76 mm to ¾"	#4 to ¾"
Sand: Coarse.....	2.00 mm to 4.76 mm.....	#10 to #4
Medium	0.42 to mm to 2.00 mm	#40 to #10
Fine	0.074 mm to 0.42 mm.....	#200 to #40
Silt.....	0.005 mm to 0.074 mm.....	Smaller than #200
Clay.....	Smaller than 0.005 mm.....	Smaller than #200

Plasticity characteristics differentiate between silt and clay.

General Terminology

Physical Characteristics
 Color, moisture, grain shape, fineness, etc.
 Major Constituents
 Clay, silt, sand, gravel
 Structure
 Laminated, varved, fibrous, stratified,
 cemented, fissured, etc.
 Geologic Origin
 Glacial, alluvial, eolian, residual, etc.

Relative Density

Term	"N" Value
Very Loose.....	0 - 4
Loose.....	4 - 10
Medium Dense.....	10 - 30
Dense.....	30 - 50
Very Dense.....	Over 50

Relative Proportions Of Cohesionless Soils

Proportional Term	Defining Range by Percentage of Weight
Trace.....	0% - 5%
Little.....	5% - 12%
Some.....	12% - 35%
And	35% - 50%

Consistency

Term	q _u -tons/sq. ft
Very Soft.....	0.0 to 0.25
Soft.....	0.25 to 0.50
Medium.....	0.50 to 1.0
Stiff.....	1.0 to 2.0
Very Stiff.....	2.0 to 4.0
Hard.....	Over 4.0

Organic Content by Combustion Method

Soil Description	Loss on Ignition
Non Organic.....	Less than 4%
Organic Silt/Clay.....	4 - 12%
Sedimentary Peat.....	12% - 50%
Fibrous and Woody Peat...	More than 50%

Plasticity

Term	Plastic Index
None to Slight.....	0 - 4
Slight.....	5 - 7
Medium.....	8 - 22
High to Very High ..	Over 22

The penetration resistance, N, is the summation of the number of blows required to effect two successive 6" penetrations of the 2" split-barrel sampler. The sampler is driven with a 140 lb. weight falling 30" and is seated to a depth of 6" before commencing the standard penetration test.

SYMBOLS

Drilling and Sampling

- CS – Continuous Sampling
- RC – Rock Coring: Size AW, BW, NW, 2"W
- RQD – Rock Quality Designation
- RB – Rock Bit/Roller Bit
- FT – Fish Tail
- DC – Drove Casing
- C – Casing: Size 2 ½", NW, 4", HW
- CW – Clear Water
- DM – Drilling Mud
- HSA – Hollow Stem Auger
- FA – Flight Auger
- HA – Hand Auger
- COA – Clean-Out Auger
- SS – 2" Dia. Split-Barrel Sample
- 2ST – 2" Dia. Thin-Walled Tube Sample
- 3ST – 3" Dia. Thin-Walled Tube Sample
- PT – 3" Dia. Piston Tube Sample
- AS – Auger Sample
- WS – Wash Sample
- PTS – Peat Sample
- PS – Pitcher Sample
- NR – No Recovery
- S – Sounding
- PMT – Borehole Pressuremeter Test
- VS – Vane Shear Test
- WPT – Water Pressure Test

Laboratory Tests

- q_a – Penetrometer Reading, tons/sq ft
- q_u – Unconfined Strength, tons/sq ft
- W – Moisture Content, %
- LL – Liquid Limit, %
- PL – Plastic Limit, %
- SL – Shrinkage Limit, %
- LI – Loss on Ignition
- D – Dry Unit Weight, lbs/cu ft
- pH – Measure of Soil Alkalinity or Acidity
- FS – Free Swell, %

Water Level Measurement

- ▽ – Water Level at Time Shown
- NW – No Water Encountered
- WD – While Drilling
- BCR – Before Casing Removal
- ACR – After Casing Removal
- CW – Cave and Wet
- CM – Caved and Moist

Note: Water level measurements shown on the boring logs represent conditions at the time indicated and may not reflect static levels, especially in cohesive soils.

CGC, Inc.

Madison - Milwaukee

Unified Soil Classification System

UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART

COARSE-GRAINED SOILS

(more than 50% of material is larger than No. 200 sieve size)

Clean Gravels (Less than 5% fines)



GW

Well-graded gravels, gravel-sand mixtures, little or no fines



GP

Poorly-graded gravels, gravel-sand mixtures, little or no fines

Gravels with fines (More than 12% fines)



GM

Silty gravels, gravel-sand-silt mixtures



GC

Clayey gravels, gravel-sand-clay mixtures

GRAVELS
More than 50% of coarse fraction larger than No. 4 sieve size

Clean Sands (Less than 5% fines)



SW

Well-graded sands, gravelly sands, little or no fines



SP

Poorly graded sands, gravelly sands, little or no fines

SANDS
50% or more of coarse fraction smaller than No. 4 sieve size

Sands with fines (More than 12% fines)



SM

Silty sands, sand-silt mixtures



SC

Clayey sands, sand-clay mixtures

FINE-GRAINED SOILS

(50% or more of material is smaller than No. 200 sieve size.)

SILTS AND CLAYS

Liquid limit less than 50%



ML

Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity



CL

Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays



OL

Organic silts and organic silty clays of low plasticity

SILTS AND CLAYS

Liquid limit 50% or greater



MH

Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts



CH

Inorganic clays of high plasticity, fat clays



OH

Organic clays of medium to high plasticity, organic silts

HIGHLY ORGANIC SOILS



PT

Peat and other highly organic soils

LABORATORY CLASSIFICATION CRITERIA

GW $C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3

GP Not meeting all gradation requirements for GW

GM Atterberg limits below "A" line or P.I. less than 4

Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols

GC Atterberg limits above "A" line or P.I. greater than 7

SW $C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3

SP Not meeting all gradation requirements for GW

SM Atterberg limits below "A" line or P.I. less than 4

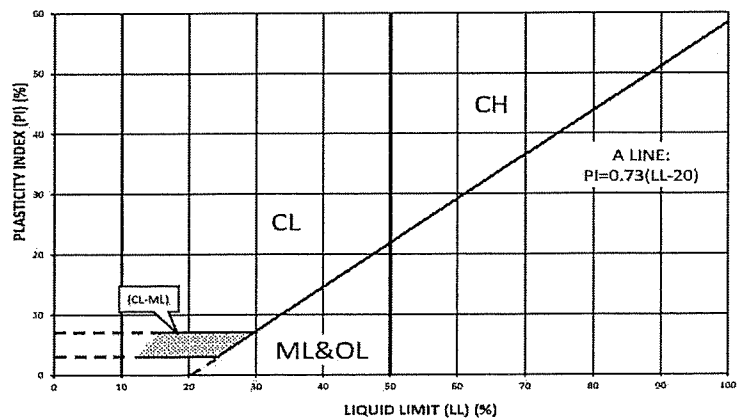
Limits plotting in shaded zone with P.I. between 4 and 7 are borderline cases requiring use of dual symbols

SC Atterberg limits above "A" line with P.I. greater than 7

Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows:

Less than 5 percent GW, GP, SW, SP
More than 12 percent GM, GC, SM, SC
5 to 12 percent Borderline cases requiring dual symbols

PLASTICITY CHART



APPENDIX C

RECOMMENDED COMPACTED FILL SPECIFICATIONS

APPENDIX C

CGC, INC.

RECOMMENDED COMPACTED FILL SPECIFICATIONS

General Fill Materials

Proposed fill shall contain no vegetation, roots, topsoil, peat, ash, wood or any other non-soil material which by decomposition might cause settlement. Also, fill shall never be placed while frozen or on frozen surfaces. Rock, stone or broken concrete greater than 6 in. in the largest dimension shall not be placed within 10 ft of the building area. Fill used greater than 10 ft beyond the building limits shall not contain rock, boulders or concrete pieces greater than a 2 sq ft area and shall not be placed within the final 2 ft of finish subgrade or in designated utility construction areas. Fill containing rock, boulders or concrete pieces should include sufficient finer material to fill voids among the larger fragments.

Special Fill Materials

In certain cases, special fill materials may be required for specific purposes, such as stabilizing subgrades, backfilling undercut excavations or filling behind retaining walls. For reference, WisDOT gradation specifications for various types of granular fill are attached in Table 1.

Placement Method

The approved fill shall be placed, spread and leveled in layers generally not exceeding 10 in. in thickness before compaction. The fill shall be placed at moisture content capable of achieving the desired compaction level. For clay soils or granular soils containing an appreciable amount of cohesive fines, moisture conditioning will likely be required.

It is the Contractor's responsibility to provide all necessary compaction equipment and other grading equipment that may be required to attain the specified compaction. Hand-guided vibratory or tamping compactors will be required whenever fill is placed adjacent to walls, footings, columns or in confined areas.

Compaction Specifications

Maximum dry density and optimum moisture content of the fill soil shall be determined in accordance with modified Proctor methods (ASTM D1557). The recommended field compaction as a percentage of the maximum dry density is shown in Table 2. Note that these compaction guidelines would generally not apply to coarse gravel/stone fill. Instead, a method specification would apply (e.g., compact in thin lifts with a vibratory compactor until no further consolidation is evident).

Testing Procedures

Representative samples of proposed fill shall be submitted to CGC, Inc. for optimum moisture-maximum density determination (ASTM D1557) prior to the start of fill placement. The sample size should be approximately 50 lb.

CGC, Inc. shall be retained to perform field density tests to determine the level of compaction being achieved in the fill. The tests shall generally be conducted on each lift at the beginning of fill placement and at a frequency mutually agreed upon by the project team for the remainder of the project.

Table 1
Gradation of Special Fill Materials

Material	WisDOT Section 311	WisDOT Section 312	WisDOT Section 305			WisDOT Section 209		WisDOT Section 210
	Breaker Run	Select Crushed Material	3-in. Dense Graded Base	1 1/4-in. Dense Graded Base	3/4-in. Dense Graded Base	Grade 1 Granular Backfill	Grade 2 Granular Backfill	Structure Backfill
Sieve Size	Percent Passing by Weight							
6 in.	100							
5 in.		90-100						
3 in.			90-100					100
1 1/2 in.		20-50	60-85					
1 1/4 in.				95-100				
1 in.					100			
3/4 in.			40-65	70-93	95-100			
3/8 in.				42-80	50-90			
No. 4			15-40	25-63	35-70	100 (2)	100 (2)	25-100
No. 10		0-10	10-30	16-48	15-55			
No. 40			5-20	8-28	10-35	75 (2)		
No. 100						15 (2)	30 (2)	
No. 200			2-12	2-12	5-15	8 (2)	15 (2)	15 (2)

Notes:

1. Reference: Wisconsin Department of Transportation *Standard Specifications for Highway and Structure Construction*.
2. Percentage applies to the material passing the No. 4 sieve, not the entire sample.
3. Per WisDOT specifications, both breaker run and select crushed material can include concrete that is 'substantially free of steel, building materials and other deleterious material'.

Table 2
Compaction Guidelines

Area	Percent Compaction (1)	
	Clay/Silt	Sand/Gravel
<u>Within 10 ft of building lines</u>		
Footing bearing soils	93 - 95	95
Under floors, steps and walks		
- Lightly loaded floor slab	90	90
- Heavily loaded floor slab and thicker fill zones	92	95
<u>Beyond 10 ft of building lines</u>		
Under walks and pavements		
- Less than 2 ft below subgrade	92	95
- Greater than 2 ft below subgrade	90	90
Landscaping	85	90

Notes:

1. Based on Modified Proctor Dry Density (ASTM D 1557)

APPENDIX D

DOCUMENT QUALIFICATIONS

APPENDIX D

DOCUMENT QUALIFICATIONS

I. GENERAL RECOMMENDATIONS/LIMITATIONS

CGC, Inc. should be provided the opportunity for a general review of the final design and specifications to confirm that earthwork and foundation requirements have been properly interpreted in the design and specifications. CGC should be retained to provide soil engineering services during excavation and subgrade preparation. This will allow us to observe that construction proceeds in compliance with the design concepts, specifications and recommendations, and also will allow design changes to be made in the event that subsurface conditions differ from those anticipated prior to the start of construction. CGC does not assume responsibility for compliance with the recommendations in this report unless we are retained to provide construction testing and observation services.

This report has been prepared in accordance with generally accepted soil and foundation engineering practices and no other warranties are expressed or implied. The opinions and recommendations submitted in this report are based on interpretation of the subsurface information revealed by the test borings indicated on the location plan. The report does not reflect potential variations in subsurface conditions between or beyond these borings. Therefore, variations in soil conditions can be expected between the boring locations and fluctuations of groundwater levels may occur with time. The nature and extent of the variations may not become evident until construction.

II. IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL ENGINEERING REPORT

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes. While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. *No one except you* should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one - not even you* - should apply the report for any purpose or project except the one originally contemplated.

READ THE FULL REPORT

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A GEOTECHNICAL ENGINEERING REPORT IS BASED ON A UNIQUE SET OF PROJECT-SPECIFIC FACTORS

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, *do not rely on a geotechnical engineering report* that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes - even minor ones - and request an assessment of their impact. *CGC cannot accept responsibility or liability for problems that occur because our reports do not consider developments of which we were not informed.*

SUBSURFACE CONDITIONS CAN CHANGE

A geotechnical engineering report is based on conditions that existed at the time the geotechnical engineer performed the study. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

MOST GEOTECHNICAL FINDINGS ARE PROFESSIONAL OPINION

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgement to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ - sometimes significantly - from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most

effective method of managing the risks associated with unanticipated conditions.

A REPORT'S RECOMMENDATIONS ARE NOT FINAL

Do not over-rely on the confirmation-dependent recommendations included in your report. *Those confirmation-dependent recommendations are not final*, because geotechnical engineers develop them principally from judgement and opinion. Geotechnical engineers can finalize their recommendations *only* by observing actual subsurface conditions revealed during construction. *CGC cannot assume responsibility or liability for the report's confirmation-dependent recommendations if we do not perform the geotechnical-construction observation required to confirm the recommendations' applicability.*

A GEOTECHNICAL ENGINEERING REPORT IS SUBJECT TO MISINTERPRETATION

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Constructors can also misinterpret a geotechnical engineering report. Confront that risk by having CGC participate in prebid and preconstruction conferences, and by providing geotechnical construction observation.

DO NOT REDRAW THE ENGINEER'S LOGS

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

GIVE CONSTRUCTORS A COMPLETE REPORT AND GUIDANCE

Some owners and design professionals mistakenly believe they can make constructors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give constructors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise constructors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure constructors have sufficient time to perform additional study.* Only then might you be in a position to give constructors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

READ RESPONSIBILITY PROVISIONS CLOSELY

Some clients, design professionals, and constructors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic

expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineer's responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

ENVIRONMENTAL CONCERNS ARE NOT COVERED

The equipment, techniques, and personnel used to perform an *environmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

OBTAIN PROFESSIONAL ASSISTANCE TO DEAL WITH MOLD

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, many mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; *none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention.* *Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.*

RELY ON YOUR GEOTECHNICAL ENGINEER FOR ADDITIONAL ASSISTANCE

Membership in the Geotechnical Business Council (GBC) of Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk confrontation techniques that can be of genuine benefit for everyone involved with a construction project. Confer with CGC, a member of GBC, for more information.

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Geotechnical Business Council
of the Geoprofessional Business Association
8811 Colesville Road, Suite G 106
Silver Spring, MD 20910



Construction • Geotechnical
Consulting Engineering/Testing

October 6, 2022
C21051-31

Mr. Matt Allie
City of Madison – Engineering Department
210 Martin Luther King, Jr. Boulevard, Room 115
Madison, WI 53710

Re: Geotechnical Exploration Report
Proposed Flood Mitigation
Lower Badger Mill Creek
Madison, Wisconsin

Dear Mr. Allie:

Construction • Geotechnical Consultants, Inc. (CGC) has completed the geotechnical exploration program for the project referenced above. The purpose of this exploration program was to evaluate the subsurface conditions within the proposed construction area and to provide geotechnical recommendations regarding path embankment and basin design/construction, as well as to summarize the findings of settlement and stability analyses performed on representative embankment cross-sections. Recommendations regarding roadway embankment design and construction along a portion of Blue Harvest Lane, which will be constructed adjacent to a wet pond, will also be discussed. Recommendations regarding embankment, pavement and utility design /construction, as well as bridge foundation support recommendations along Blue Harvest Lane, will be provided under separate cover. An electronic copy of this report is provided for your use. We are also sending an electronic copy to Strand Associates, the project design consultant.

PROJECT AND SITE DESCRIPTIONS

In an attempt to mitigate regional flooding, we understand that the City is proposing to construct a series of wet ponds within an area located along the east side of Meadow Road, between Valley View Road and Mid-Town Road on the southwest side of Madison. Preliminary plans indicate that three ponds, denoted as Ponds A, B and C, will be constructed within the southern portion of the site. Ponds A and B will have bottom elevations of 1025 ft, while the bottom of Pond C will be established at 1027 ft. The normal surface water elevation in each pond is proposed at EL 1032 ft. We understand that these ponds will be constructed using a compacted clay liner. In addition to the new clay-lined ponds, an existing localized depression in the northeast corner of the site is proposed to be dredged to EL 1025 ft to provide additional water storage. This area may require a clay-liner, pending evaluation of the exposed soils following dredging. In addition to the new water storage areas, a channel is proposed to route water from north to south through the site and below future Blue Harvest Lane.

In addition to the storage ponds, new maintenance paths are proposed throughout the site around the basins. The gravel surface of the 12-ft wide paths will be established near EL 1035 ft and we anticipate the generally light infrequent traffic, consisting of pedestrian and motorized service/maintenance

vehicles. Outside of the stormwater management areas, Blue Harvest Lane and Feather Edge Drive will be constructed to the south and east receptively, which will include a new pile-supported bridge crossing over the new channel, which will be just west of the intersection of the two roads.

The project site is bounded to the west by Meadow Road, the north and east by undeveloped land and the south by residential areas. Existing site grades are generally flat to gently sloping between about EL 1032 and 1034 ft. Isolated areas are slightly higher or lower, with evidence of previous earthwork activities present across the area, which was also indicated by surficial fill at some borings (discussed below). More regionally, surrounding site grades are higher and slope down towards the project area from all directions. Preliminary plans indicate that portions of the site have been delineated as wetland, with standing water observed during and following periods of wet weather. Scattered small trees and vegetation are also present.

Based on existing topography, filling of between about 1 and 4 ft is generally expected to be required in order to establish maintenance path grades and upper slopes of the storage ponds. Maximum fill heights of about 6 to 7 ft will be required along a portion of Blue Harvest Lane. Cutting on the order of 9 to 11 ft will be required to establish bottom elevations within Ponds A, B, and C, with up to about 7 ft of cutting required within the new channel. Dredging of 2 to 3 ft may be required to establish bottom elevations in the northern dredged pond.

SUBSURFACE CONDITIONS

A total of four (4) Standard Penetration Test (SPT) soil borings, denoted at Borings 1 through 4, were initially completed for this project. The borings were drilled to planned depths of 20 ft by Badger State Drilling (under subcontract to CGC) on February 16 and 17, 2022 using an ATV-mounted drill rig equipped with hollow-stem augers and an automatic SPT hammer. The boring locations were chosen by the project team based on preliminary site layout and were staked in the field by CGC. Ground surface elevations were surveyed by City staff following completion of drilling. The boring locations are shown in plan on the Boring Location Exhibit attached in Appendix A.

Following further site development and planning, two additional drilling mobilizations were completed to drill deeper borings for the proposed Blue Harvest Lane Bridge. Given the proximity of the additional borings to Ponds B and C, as well as wide spacing of the project specific borings, the findings from the bridge borings were referenced in our analyses completed for this project. The additional boring locations are also shown on the Boring Location Exhibit in Appendix A.

The subsurface conditions at the boring locations were somewhat variable at shallow depths due to previous filling, but the profile was fairly similar with depth. A generalized profile included the following strata, in descending order:

- About 8 to 12 in. of topsoil/topsoil fill; followed by

- About 2 to 4 ft of *fill/possible fill*, involving stiff clay and/or loose sand, silt and clay mixture; over
- 3 to 11 ft of fine-grained soils, including medium stiff to stiff *lean clay* and *silty clay* and loose *silt*; followed by
- Loose to very dense *sand* with variable silt and gravel contents, and scattered cobbles and boulders, occasionally interrupted by thin clay or silt seams/layers to the maximum depth explored.

Notable exceptions to the profile include the presence of a very soft clay layer at depths of about 6 to 11 ft at Borings 5 and 6, completed near the southeast portion of the project for the planned bridge construction.

Groundwater was not encountered within Borings 1 through 4 during or shortly following drilling, which extended to 20 ft below existing site grades. Groundwater was encountered between depths of about 33 ft and 34 ft during drilling at Borings 5, 6 and 7. Due to the low permeability of the native siltier sand soils, groundwater inflow into open boreholes can be delayed. Therefore, a 24 hr water level reading was taken at Boring 5, which indicated groundwater levels at a depth of 20.8 ft below existing site grades.

While shallow groundwater was not encountered during or shortly following drilling, visual observations indicate that intermittent overland flow of water occurs southward on the site towards a culvert at Mid-Town Road during and following wet periods. The native soils have a fairly low hydraulic conductivity near the surface, but vertical infiltration occurs and water levels are observed to naturally drop over time following rain events. Groundwater levels can be expected to fluctuate with seasonal variations in precipitation, infiltration, evapotranspiration, as well as other factors. A more detailed description of the site soil and groundwater conditions is presented on the Soil Boring Logs attached in Appendix B.

DISCUSSION AND RECOMMENDATIONS

Subject to the limitations discussed below and based on the subsurface exploration, it is our opinion that the site is generally suitable for the proposed wet pond and maintenance path construction. However, temporary construction dewatering will likely be required to facilitate pond construction and dredging, particularly in the northern portion of the site where standing water is present during and following periods of wet weather. In addition, undercutting and/or stabilization of soft subgrades will likely be required in some areas to facilitate fill placement to establish maintenance path and roadway embankment elevations.

The following subsections provide our recommendations regarding path embankment and basin design and construction, and summarize the findings of settlement and stability analyses performed on

representative embankment cross-sections. Recommendations regarding roadway embankment design and construction along a portion of Blue Harvest Lane, which will be constructed adjacent to a wet pond, will also be discussed.

1. Maintenance Path Design and Construction

A. *General*

Based on existing and proposed grades, new maintenance paths will generally be established about 2 to 4 ft above existing site grades, with isolated areas requiring slightly more fill. Prior to fill placement, we recommend that topsoil be stripped within and up to about 10 ft beyond the limits of grading activities. Topsoil thicknesses were between about 8 and 12 in. at the boring locations, but variability should be expected between and beyond the widespread boring locations due to previous grading activities on the site and the presence of a delineated wetland in the project area. Following topsoil stripping and removal of thicker deposits of organic material, exposed subgrades are generally expected to consist of native medium stiff to stiff clay and loose fill comprised of silt, sand and clay. However, variability subgrade conditions should be expected between and beyond the boring locations, particularly where previous earthwork has occurred, and where sediment has collected within the depression located in the northeastern portion of the site. Further, variable soil conditions, including the presence of thicker deposits of organic soils may be expected within the delineated wetland area across portions of the project which were unexplored by soils borings. A series of test pits is recommended during initial phases of construction to further explore subgrade conditions across the entire project area.

The exposed existing native clay and mixed fill soils present following topsoil stripping may be marginal to poor near the ground surface, and may become unstable following exposure to repeated construction traffic, especially in lower-lying wetland areas during periods of wet weather. Therefore, some excavation below subgrade (EBS) or stabilization of very soft or unstable soils may be required to facilitate fill placement activities. In this past, this has consisted of about 12 to 18 in. of course aggregate over biaxial geogrid (e.g., Tensar BX Type 1 or equivalent). It has been our experience that the amount of EBS may be reduced where at least 2 ft of high-quality granular fill soils are required following topsoil stripping. However, isolated undercutting/stabilization may still be required in these areas in order to develop stable enough conditions to facilitate fill placement and compaction.

Following development of stable subgrades, fill placement to establish embankment elevations can proceed. Based on the scope of the project, we envision that on-site clay and granular soils excavated during construction of the ponds will be utilized to construct the embankments. Where required, engineered fill should be placed and compacted in accordance with City of Madison requirements (or the recommended compacted fill specifications in Appendix B). While clay soils are considered suitable for embankment construction, we recommend that the upper 1 to 2 ft of fill immediately below the base course layers of the maintenance path consist of granular soils, in order to develop a more suitable subgrade for traffic support. Specific compaction requirements outlined by NRCS will be

required for clay-lined portions of the embankments in wet pond areas. This is further discussed in a following section.

B. Maintenance Path Settlement Estimates

Using preliminary cross-sections provided, we estimated settlement of the on-site clay layers caused by the weight of new fill required to establish maintenance path subgrade elevations. Due to the generally widespread spacing of the soil borings in relation to the proposed paths, we conservatively estimated settlement based on the thickest clay layer encountered in the borings (Boring 6) and the required fill thickness at each cross-section. Based on a maximum fill thickness of about 5.5 ft, we estimate that maximum total settlement of the clay soils caused by the weight of the new embankment fill will on the order of approximately 1.5 in. For more typical fill thickness of 1 to 3 ft, total settlements are estimated to be on the order of approximately 0.5 to 1 in.

Although our estimates conservatively used the thickest clay layer encountered in the borings, greater settlement than our estimates may occur where thicker deposits of clay or other compressible soils are present between or beyond the boring locations. To account for variability in settlement potential, we recommend that fill placement to establish path subgrade elevations occur early in the construction sequence to allow for minor regrading (e.g., addition of more fill) to account for settlement. Because the proposed maintenance paths will be gravel surfaced, we envision periodic maintenance of the path will be required, at which time gravel can be added as fill, where required. However, in order to reduce the potential regrading required, the design elevations of the embankments could be established such that the estimated settlement is accounted for during construction. Note that as an alternative to accounting for settlement in the design embankment elevations, and to reduce the potential variability in settlement where a thicker deposit of compressible soils may be present between boring locations, the embankments could be overfilled by several feet to essentially surcharge the clay soil in order to promote quicker settlement. Settlement monitoring points installed along the top of the embankments would then be surveyed on a regular basis to determine when settlement has largely ceased, followed by removal of the surcharge soil and final grading. We can provide additional information, if needed.

C. Slope Stability

Based on very similar geometries at the ponds and adjacent maintenance path and/or road, slope stability analyses were performed on cross-sections determined to be the most critical of those provided (where slopes were steepest and tallest), and where new fill thickness were greatest. This generally aligned with Pond B along Blue Harvest Lane and the Dredged Pond along the maintenance path. These sections were depicted based on their geometries included on preliminary plans provided. Subsurface conditions at the cross-sections analyzed were modeled based on the findings in Boring 1 (Pond B section) and Boring 3 (Dredged Pond section).

Slope stability analyses of proposed embankment and pond cross-sections were performed using software program PCSTABL™, incorporating the modified Bishop method. The program identifies

failure arcs which represent the ten (10) lowest factors of safety. The following additional parameters and assumptions were used in our analyses:

- Geometry of cross sections from preliminary plans provided, which generally include the following at the ponds and embankments; 3H:1V slopes from pond bottom to 1 ft below the normal water level (NWL), a 10H:1V safety shelf up to NWL, followed by a 4H:1V slope from NWL to approximately path (and road) subgrade elevations. The dredged pond contained a 3H:1V slope from pond bottom to path surface.
- Long term soil parameters were determined to control and are conservatively based upon the findings in the soil borings and laboratory testing completed by CGC.
- Soil properties for new embankment fill are based on our understanding that embankments will be constructed using on-site clay and sand soils compacted to a minimum of 95% standard Proctor methods (ASTM D698) (or 90% modified Proctor - ASTM D1557).
- Three pond water level scenarios were analyzed: 1) Empty, 2) NWL = 1032 ft based on preliminary plans, and 3) 100-year flood elevation, which is understood to be near EL 1040, or about 6 ft above NWL. Based on the presence of a relatively impermeable liner, water levels were modeled to slope downwards from behind the clay liner to elevations below the pond bottom.
- A surcharge load of 240 psf was used to represent typical vehicle traffic on the maintenance paths and Blue Harvest Lane.

The results of the slope stability analyses completed for three pond water levels scenarios at two cross-sections indicate that factors of safety against global slope stability failure range between 2.0 and 3.0. Therefore, based on similarities between the analyzed and additional cross sections, and provided the embankments are constructed according to the recommendations contained herein, it is our opinion that the factors of safety against potential slope failure for the planned pond and path/road slopes meet or exceed the typically acceptable factor of safety of 1.5.

2. Clay Liner Construction

A. *General*

We understand that Ponds A, B and C will be constructed utilizing a clay liner. Where a clay liner is required, it is our opinion that portions of the on-site clayey soils (CL, CL-ML on boring logs) encountered on the site are suitable for re-use as liner material. However, careful sorting from the underlying sand and silt soils will be required. Additional sampling and laboratory testing of the clay will likely be required during initial site preparation, depending on the liner type required or specified.

Based on the findings at Borings 3 and 4 coupled with planned bottom elevations, dredging operations at the Dredged Pond will likely extend through the native clay material in some locations. Therefore, installation of a clay liner will likely be required. Based on the presence of silt seams at Boring 3, we recommend that the materials be carefully evaluated at the time of dredging to check whether suitable soils exist, and if the minimum required thickness of clay soils are present (typically 2 ft).

Where clay liner construction is necessary, the clay should be placed in maximum 6-in. (loose) lifts and compacted to a minimum of 95% based on standard Proctor methods (ASTM D 698) (or 90% by the modified Proctor method – ASTM D 1557) based on specifications outlined in NRCS Wisconsin Construction Specification 300. Note that the clay should be placed wet of the optimum moisture content. Moisture conditioning of the on-site clay soils should be anticipated to achieve adequate compaction levels. Side slopes cut into suitable native clay soils should be adequately recompacted as outlined in NRCS Wisconsin 300 and care should be exercised to determine that the minimum in-place thickness is present.

B. Blue Harvest Lane Embankment

Due to the potential for 100-yr flood events causing site water levels to rise to near the surface of Blue Harvest Lane, we understand that the roadway embankment may be constructed as a dam. This includes not only along Pond B, but also to the north where site grades will remain lower. Based on current site and proposed grades filling of 2 to 6 ft will be required to establish roadway elevations. Native soils are anticipated to consist of a layer of surficial clay underlain by more permeable granular soils.

At a minimum, it is our opinion that the northern slope of the embankment could be constructed similar to a typical wet pond clay liner, with a minimum thickness of clay placed and compacted along the slope to create a relatively impermeable boundary. In this scenario, the clay liner should extend vertically up the slope to at least the expected high water mark.

Other types of earthen dam embankment may be considered, including an embankment with an impervious core and more permeable outside zone, which includes adequate slope protection on the water side of the embankment. Care should be included in design and construction to incorporate adequate measures to help protect against dam failure due to excessive, uncontrolled seepage and piping. We recommend that the embankment be designed by a professional with experience in earthen dam design and construction.

Regardless of design method considered, portions of the on-site clay soils are considered suitable for re-use as fill, provided they are selectively stockpiled during earthwork activities. Fill placement should be completed as specified in applicable local, state or federal guidelines for earthen dam construction.

CONSTRUCTION CONSIDERATIONS

Due to variations in weather, construction methods and other factors, specific construction problems are difficult to predict. Soil related difficulties that could be encountered on the site are discussed below:

- Earthwork construction during the early spring or late fall could be complicated as a result of wet weather and freezing temperatures. During cold weather, exposed subgrades should be protected from freezing. Fill should never be placed while frozen or on frozen ground.
- Excavations extending greater than 4 ft in depth below the existing ground surface should be sloped in accordance with current OSHA standards.
- While groundwater was not encountered in the borings within excavation depths anticipated for this project, surface water has been observed across portions of the site, especially during and following periods of wet weather. Therefore, temporary dewatering will likely be required during periods of work to facilitate excavation and construction. This may be of particular need during clay-liner installation during and following periods of wet weather in order to surface water to facilitate placement and compaction of clay fill. Dewatering means and methods are the responsibility of the earthwork contractor.

RECOMMENDED CONSTRUCTION MONITORING

The level of care exercised during site development and earthwork activities will largely determine the quality of subgrades and wet pond construction. To check that earthwork and construction proceeds in accordance with our recommendations, qualified construction inspectors should monitor the following operations:

- Site stripping and subgrade preparation (including EBS); and
- Fill/backfill placement and compaction.

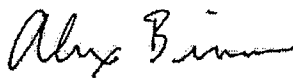
* * * * *

Geotechnical Exploration Report
Lower Badger Mill Creek Flood Mitigation
CGC Project No. C21051-31
October 6, 2022
Page 9

We trust this report addresses your present needs. General limitations regarding the conclusions and opinions presented in this report are discussed in Appendix C. We appreciate the opportunity to be of service on this project and look forward to working with you as it proceeds. If you have any questions, please contact us.

Sincerely,

CGC, Inc.



Alex J. Bina, P.E.
Consulting Professional



Eric S. Fair
Senior Staff Engineer/Geologist

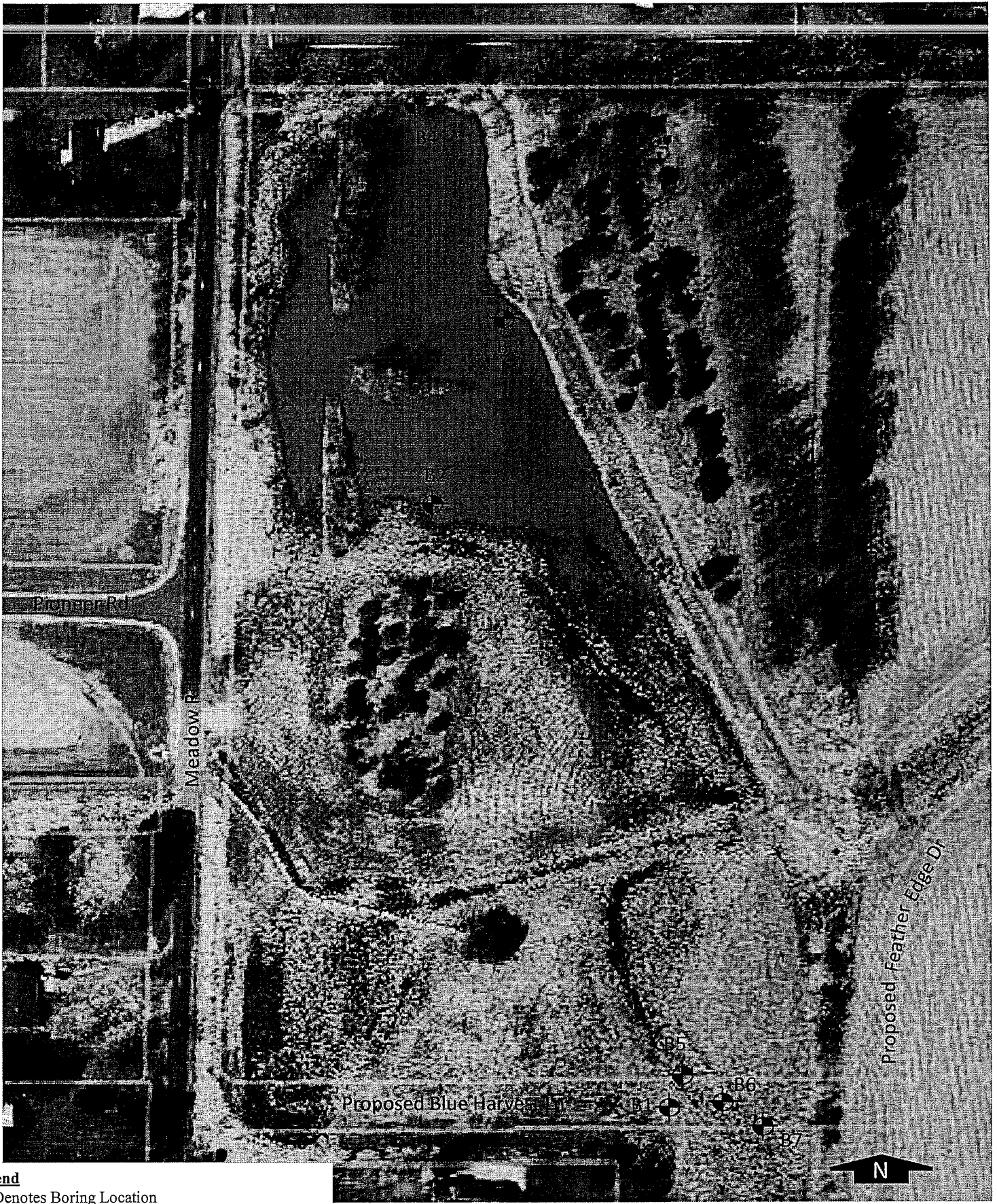


Michael N. Schultz, PE
Principal/Senior Consulting Professional

Encl: Appendix A - Soil Boring Location Exhibits (2)
Logs of Test Borings (7)
Log of Test Boring-General Notes
Unified Soil Classification System
Appendix B - Recommended Compacted Fill Specifications
Appendix C - Document Qualifications

APPENDIX A

**SOIL BORING LOCATION EXHIBITS (2)
LOGS OF TEST BORINGS (7)
LOG OF TEST BORING – GENERAL NOTES
UNIFIED SOIL CLASSIFICATION SYSTEM**



Legend

⊕ Denotes Boring Location

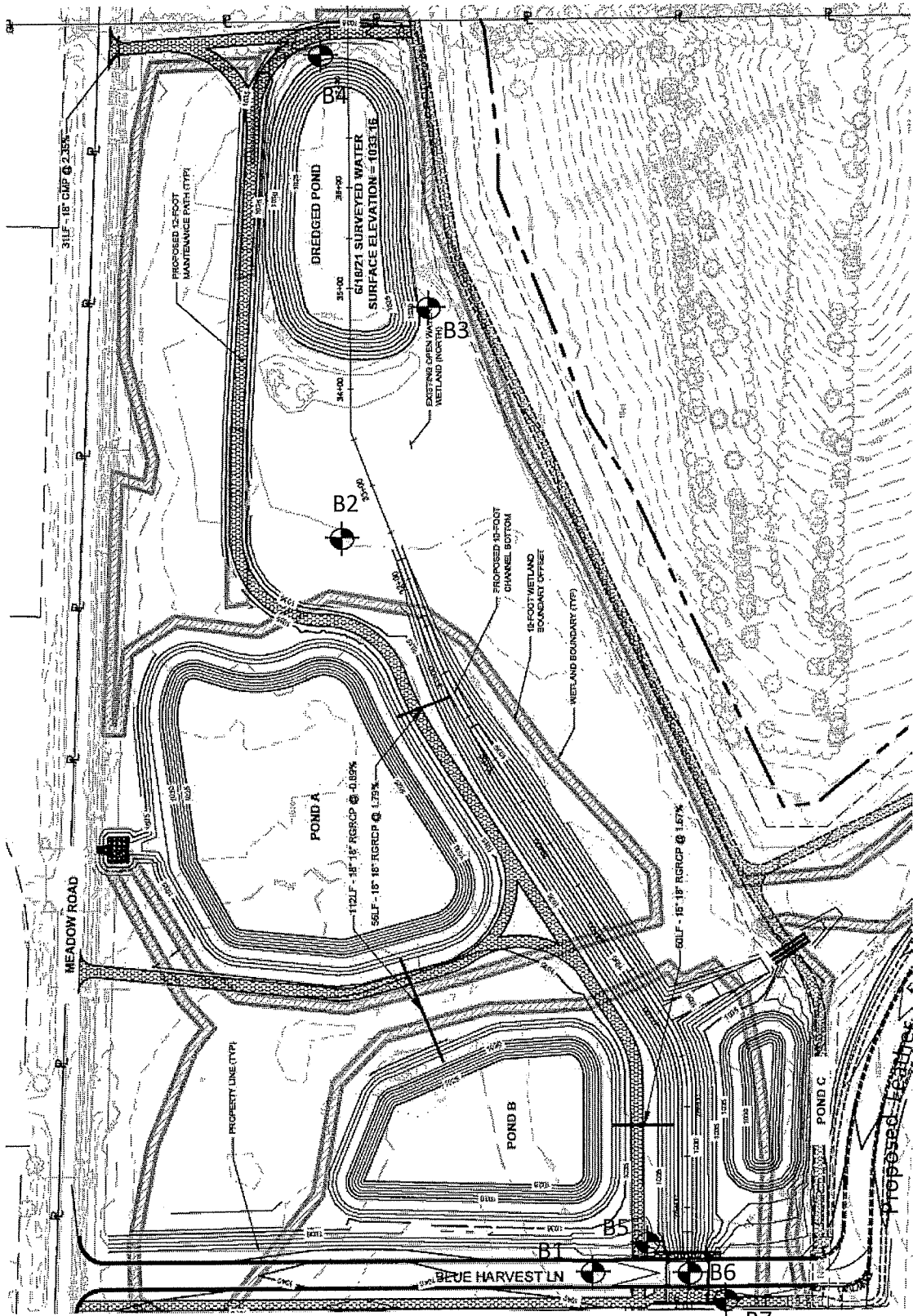
Notes

1. Soil borings B1 through B4 performed by Badger State Drilling in February 2022.
2. Soil borings B5 and B6 performed by Soil Essentials in August 2022, and B7 performed by B in September 2022.
3. Boring locations are approximate

Scale: Reduced

Job No. C21051-31	CGC, Inc.
Date: 10/2022	

SOIL BORING LOCATION MAP
Feather Edge Pond
Madison, Wisconsin



Legend

⊙ Denotes Boring Location

Notes

1. Soil borings B1 through B4 performed by Badger State Drilling in February 2022.
2. Soil borings B5 and B6 performed by Soil Essentials in August 2022, and B7 performed by B in September 2022.
3. Boring locations are approximate

Scale: Reduced

Job No. C21051-31	CGC, Inc.
Date: 10/2022	

SOIL BORING LOCATION MAP
Feather Edge Pond
Madison, Wisconsin



LOG OF TEST BORING

Project Feather Edge Pond
N469744.5 E772822.3
 Location Madison, WI

Boring No. 1
 Surface Elevation (ft) 1033.4
 Job No. C21051-31
 Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	Rec (in.)	Moist	N	Depth (ft)		qu (qa) (tsf)	W	LL	PL	LOI
					12 in. TOPSOIL					
1	18	M	7		FILL: Stiff Brown Clay to 3'					
2	18	M	7		Loose Brown Silty Sand with Clay and Gravel to 5'					
3	12	M/W	5		Loose, Brown Fine to Medium SAND, Some Silt, Trace Gravel, Scattered Thin (<1/2 in.) Clay Seams (SM)					
4	14	M	5							
5	18	M	20		Medium Dense to Very Dense, Brown Fine to Medium SAND, Some Silt and Gravel, Scattered Cobbles and Boulders (SM)					
6	14	M	77/8"		Hard Drilling Noted Near 14'					
7	18	M	45		End of Boring at 20 ft Backfilled with Bentonite Chips					

WATER LEVEL OBSERVATIONS

While Drilling NW Upon Completion of Drilling NW
 Time After Drilling _____
 Depth to Water _____
 Depth to Cave in _____

GENERAL NOTES

Start 2/17/22 End 2/17/22
 Driller BSD Chief KD Rig D-50
 Logger GB Editor ESF
 Drill Method 2.25" HSA; Autohammer

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.



LOG OF TEST BORING

Project Feather Edge Pond
N470419.5 E772526.1
 Location Madison, WI

Boring No. 2
 Surface Elevation (ft) 1033.6
 Job No. C21051-31
 Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	Rec (in.)	Moist	N	Depth (ft)		qu (qa) (tsf)	W	LL	PL	LOI
					12 in. TOPSOIL					
1	16	M	9		FILL: Loose Brown Silt with Clay and Sand					
2	18	M	10	5	Medium Stiff to Stiff, Brown and Gray (Mottled) Lean CLAY, Trace Sand (CL)					
3	18	M	10		Loose to Dense, Brown Fine to Medium SAND, Some Silt and Gravel, Scattered Cobbles and Boulders (SM)					
4	18	M	45	10						
5	0		50/1"		Large Cobble/Possible Boulder Noted Near 11'					
6	29	M/W	29	15						
7	31	M	31	20	End of Boring at 20 ft					
					Backfilled with Bentonite Chips					

WATER LEVEL OBSERVATIONS	GENERAL NOTES
While Drilling <input checked="" type="checkbox"/> <u>NW</u> Upon Completion of Drilling <input type="checkbox"/> <u>NW</u> Time After Drilling _____ Depth to Water _____ Depth to Cave in _____	Start <u>2/17/22</u> End <u>2/17/22</u> Driller <u>BSD</u> Chief <u>KD</u> Rig <u>D-50</u> Logger <u>GB</u> Editor <u>ESF</u> Drill Method <u>2.25" HSA; Autohammer</u>
The stratification lines represent the approximate boundary between soil types and the transition may be gradual.	



LOG OF TEST BORING

Project Feather Edge Pond
N470654.2 E772620.2
 Location Madison, WI

Boring No. 3
 Surface Elevation (ft) 1031.3
 Job No. C21051-31
 Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	RECYCLE	Rec (in.)	Moist	N		Depth (ft)	qu (qa) (tsf)	W	LL	PL
1	█	18	M	10	8 in. TOPSOIL Medium Stiff, Brown Silty CLAY, Scattered Sand Partings (CL-ML) (Possible Fill)	(0.75)				
2	█	18	M/W	9	Loose, Brown SILT, Trace Sand and Clay (ML)					
3	█	18	M/W	8	Medium Stiff, Brown Silty CLAY, Scattered Sand Partings (CL-ML)	(0.75)				
4	█	18	M/W	9						
5	█	18	M/W	13	Stratified Medium Dense, Brown Silty SAND and Sandy SILT, Trace Clay (SM/ML)					
6	█	18	M/W	70	Very Dense to Dense, Brown Fine to Medium SAND, Some Silt and Gravel, Scattered Cobbles and Boulders (SM)					
7	█	18	M	37	End of Boring at 20 ft Backfilled with Bentonite Chips					

WATER LEVEL OBSERVATIONS	GENERAL NOTES
While Drilling <input checked="" type="checkbox"/> <u>NW</u> Upon Completion of Drilling <input type="checkbox"/> <u>NW</u> Time After Drilling _____ Depth to Water _____ Depth to Cave in _____	Start <u>2/17/22</u> End <u>2/17/22</u> Driller <u>BSD</u> Chief <u>KD</u> Rig <u>D-50</u> Logger <u>GB</u> Editor <u>ESF</u> Drill Method <u>2.25" HSA; Autohammer</u>
The stratification lines represent the approximate boundary between soil types and the transition may be gradual.	



LOG OF TEST BORING

Project Feather Edge Pond
N470949.2 E772501.7
 Location Madison, WI

Boring No. 4
 Surface Elevation (ft) 1035.6
 Job No. C21051-31
 Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	Rec (in.)	Moist	N	Depth (ft)		qu (qa) (tsf)	W	LL	PL	LOI
				0	8 in. TOPSOIL					
1	8	M/W	7	7	FILL: Loose Brown Silt with Clay and Sand					
2	18	M	7	7	Stiff, Brown and Gray (Mottled) Lean CLAY, Trace Sand (CL)	(1.5)				
3	12	M	9	9	Loose to Medium Dense, Brown Fine to Coarse SAND, Some Silt and Gravel (SM)					
4	10	M	17	17	Medium Dense, Brown Fine to Medium SAND, Some Silt and Gravel, Scattered Cobbles and Boulders (SM)					
5	18	M	13	13						
6	18	M	27	27						
7	18	M	21	21						
End of Boring at 20 ft										
Backfilled with Bentonite Chips										

WATER LEVEL OBSERVATIONS

GENERAL NOTES

While Drilling NW Upon Completion of Drilling NW
 Time After Drilling _____
 Depth to Water _____
 Depth to Cave in _____

Start 2/16/22 End 2/16/22
 Driller BSD Chief KD Rig D-50
 Logger GB Editor ESF
 Drill Method 2.25" HSA; Autohammer

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.



LOG OF TEST BORING

Project Feather Edge Pond
 (Blue Harvest Lane Bridge)
 Location Madison, WI

Boring No. 5
 Surface Elevation (ft) 1033.1
 Job No. C21051-31
 Sheet 1 of 2

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES					
No.	TYPE	Rec (in.)	Moist	N		Depth (ft)	qu (qa) (tsf)	W	LL	PL	LOI
					0	9 in. Dark Brown Clayey TOPSOIL					
1		16	M	4	1	Stiff to Soft, Brown Lean CLAY, Trace Sand (CL - Possible Fill)	(1.5)				
2		17	M/W	2	3		(0.5)				
3		16	M	2	5	Very Soft, Stratified Brown, Dark Brown and Gray Lean to Silty CLAY, Trace Sand (CL/CL-ML)	(<0.2)				
4		14	M/W	3	7						
5		4	M	85	10	Very Loose, Brown Silty Fine SAND, Some Gravel, Trace Clay (SM)					
6		6	M	20	13						
					15	Medium Dense, Brown Fine to Medium SAND, Some Silt and Gravel, Scattered Cobbles and Boulders (SM) (Rough drilling/cobbles/very dense conditions from 11'-13')					
7		15	M	21	17						
					20	Medium Dense, Brown Fine to Coarse SAND, Some Silt and Gravel, Scattered Cobbles (SM)					
8		14	M	17	23						
					25	Medium Dense, Brown Sandy SILT, Trace Gravel and Clay, Scattered Cobbles (ML)					
9		7	M	26	27						
					30	Medium Dense, Brown Fine to Coarse SAND, Some Silt and Gravel, Scattered Cobbles (SM)					
10		15	W	11	33						
					35	Medium Dense, Brown Sandy SILT, Trace Gravel and Clay, Scattered Cobbles (ML)					
11		17	M/W	16	37						
					40						

WATER LEVEL OBSERVATIONS

GENERAL NOTES

While Drilling ∇ 33.5' Upon Completion of Drilling 34.5'
 Time After Drilling _____ 24 Hours _____
 Depth to Water _____ 20.8' _____ ∇
 Depth to Cave in _____ 25.1' _____

Start 8/22/22 End 8/22/22
 Driller SE Chief CRJ Rig 7822DT
 Logger AR Editor ESF
 Drill Method 2.25" HSA; Autohammer

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.



LOG OF TEST BORING

Project Feather Edge Pond
 (Blue Harvest Lane Bridge)
 Location Madison, WI

Boring No. 5
 Surface Elevation 1033.1
 Job No. C21051-31
 Sheet 2 of 2

2921 PERRY STREET, MADISON, WIS. 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	Rec (in.)	Moist	N	Depth (ft)		qu (qa) (tsf)	W	LL	PL	LI
				45	Medium Dense, Brown Sandy SILT, Trace Gravel and Clay, Scattered Cobbles (ML)					
12	15	M/W	11							
				50	Medium Dense, Brown Fine to Coarse SAND, Some Silt and Gravel, Scattered Cobbles (SM)					
13	16	M/W	27							
				55	Medium Dense, Brown Sandy SILT, Trace Gravel and Clay, Scattered Cobbles (ML)					
14	15	W	28							
				60	Medium Dense, Brown Sandy SILT, Trace Gravel and Clay, Scattered Cobbles (ML)					
15	0	-	11							
				65	Dense, Brown Fine to Coarse SAND, Some Silt and Gravel, Scattered Cobbles (SM)					
16	16	W	11							
				70	Dense, Brown Fine to Coarse SAND, Some Silt and Gravel, Scattered Cobbles (SM)					
17	11	W	32							
				75	End of Boring at 63 ft Backfilled with Bentonite Chips					
				80						
				85						



LOG OF TEST BORING

Project Feather Edge Pond
 (Blue Harvest Lane Bridge)
 Location Madison, WI

Boring No. 6
 Surface Elevation (ft) 1033.1
 Job No. C21051-31
 Sheet 1 of 2

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	TYPE	Rec (in.)	Moist	N		Depth (ft)	qu (qa) (tsf)	W	LL	PL
					0					
1	█	16	M	6	0	9 in. Brown Clayey TOPSOIL Stiff to Very Soft, Stratified Brown, Dark Brown and Gray Lean to Silty CLAY, Trace Sand with thin (<1") Sandy Seams and Lenses (CL - Possible Fill to 5')	(1.5)			
2	█	15	M	4	5		(0.5)			
3	█	17	M/W	0	10		(<0.2)			
4	█	16	M/W	0	15		(<0.2)			
					15	Medium Dense, Brown Fine to Medium SAND, Some Silt and Gravel, Scattered Cobbles and Boulders (SM)				
5	█	15	M	14	20					
					20	Medium Dense, Brown Sandy SILT to Silty Fine SAND, Some Gravel, Scattered Cobbles (ML/SM)				
6	█	17	M	19	25					
					25	Medium Dense, Brown Silty Fine SAND, Some Gravel, Trace Clay (SM)				
7	█	15	M	23	30					
					30	Very Stiff, Brownish-Gray Lean CLAY, Scattered Sand, Gravel and Cobbles (CL)				
8	█	16	M	24	35		(2.5)			
					35	Very Stiff, Brownish-Gray Lean CLAY, Scattered Sand, Gravel and Cobbles (CL)				
9	█	17	W	18	40					
					40					
10	█	16	M/W	12	40					

WATER LEVEL OBSERVATIONS			
While Drilling	▽ 33.5'	Upon Completion of Drilling	39.8'
Time After Drilling			
Depth to Water			▼
Depth to Cave in			48.1'

GENERAL NOTES			
Start	8/22/22	End	8/22/22
Driller	SE	Chief	CRJ Rig 7822DT
Logger	AR	Editor	ESF
Drill Method	2.25" HSA; Autohammer		

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.



LOG OF TEST BORING

Project Feather Edge Pond
 (Blue Harvest Lane Bridge)
 Location Madison, WI

Boring No. 6
 Surface Elevation 1033.1
 Job No. C21051-31
 Sheet 2 of 2

2921 PERRY STREET, MADISON, WIS. 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	Rec (in.)	Moist	N	Depth (ft)		qu (qa) (tsf)	W	LL	PL	LI
				40	Very Stiff, Brownish-Gray Lean CLAY, Scattered Sand, Gravel and Cobbles (CL)					
11	15	M/W	9	45	Loose, Grayish-Brown SILT (ML)					
				50	Dense to Medium Dense, Brown Fine to Coarse SAND, Some Silt and Gravel, Scattered Cobbles (SM)					
12	16	W	31	55	Stiff, Grayish-Brown Lean CLAY, Trace Sand, Scattered Gravel and Cobbles (CL)	(1.5)				
13	0	-	11	60	End of Boring at 60 ft					
14	12	M/W	16	65	Backfilled with Bentonite Chips					
				70						
				75						
				80						
				85						



LOG OF TEST BORING

Project Feather Edge Pond
 (Blue Harvest Lane Bridge)
 Location Madison, WI

Boring No. 7
 Surface Elevation (ft) 1033.1
 Job No. C21051-31
 Sheet 1 of 3

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	TYPE	Rec (in.)	Moist	N		Depth (ft)	q _u (qa) (tsf)	W	LL	PL
1	█	10	M	9	0	7 in. TOPSOIL Stiff to Soft Brown Lean Clay, Trace Sand (CL - Possible Fill to 3') Numerous Sand Partings Beginning Near 4'				
2	█	16	M	4	5					
3	█	10	M/W	4	10	Loose to Very Loose, Brown Silty Fine SAND, Trace Gravel and Clay (SM) Increasing Clay Content with Depth				
4	█	14	M	3	15					
5	█	14	M	42	20	Dense to Very Dense, Brown Fine to Medium SAND, Some Silt and Gravel, Scattered Cobbles and Boulders (SM)				
6	█	18	M	45	25					
7	█	12	M	64	30	Very Dense, Brown Fine to Coarse SAND, Some Silt and Gravel, Scattered Cobbles (SM)				
8	█	8	W	65	35					
9	█	8	W	42	40	Stiff, Brown Lean CLAY, Trace to Little Sand and Gravel (CL)				
10	█	8	W	19	40					

WATER LEVEL OBSERVATIONS

While Drilling ∇ 33.5' Upon Completion of Drilling _____
 Time After Drilling _____
 Depth to Water _____
 Depth to Cave in _____

GENERAL NOTES

Start 9/8/22 End 9/9/22
 Driller ADC Chief KD Rig CME
 Logger DB Editor ESF 55
 Drill Method 4.25" HSA to 10 ft; 3-7/8
in. RB with Mud to 92.5'

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.



LOG OF TEST BORING

Project Feather Edge Pond
(Blue Harvest Lane Bridge)
 Location Madison, WI

Boring No. 7
 Surface Elevation 1033.1
 Job No. C21051-31
 Sheet 2 of 3

2921 PERRY STREET, MADISON, WIS. 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	FINES %	Rec (in.)	Moist	N		Depth (ft)	q _u (qa) (tsf)	W	LL	PL
					45	Stiff, Brown Lean CLAY, Trace to Little Sand and Gravel (CL)				
11	18	W	11		45	Medium Dense, Stratified Brown and Light Brown Sandy SILT and Silty Fine SAND, Trace Clay (ML/SM)				
					50	Very Dense, Brown Fine to Coarse Sand, Some Silt and Gravel, Trace Clay (SM)				
12	10	W	88		50					
					55					
13	12	W	73		55					
					60	Very Soft, Brown Lean CLAY, Trace Sand (CL)				
14	18	W	12		60		(<0.2)			
					65	Very Dense, Brown Fine to Coarse SAND and GRAVEL, Some Silt (SM/GM)				
15	6	W	61/9"		65					
					70	(Medium Dense with Scattered Clay Lenses Near 69')				
16	6	W	24		70					
					75					
17	10	W	31		75					
					80					
18	10	W	36		80					
					85					
19	8	W	82 /10"		85					



LOG OF TEST BORING

Project Feather Edge Pond
 (Blue Harvest Lane Bridge)
 Location Madison, WI

Boring No. 7
 Surface Elevation 1033.1
 Job No. C21051-31
 Sheet 3 of 3

2921 PERRY STREET, MADISON, WIS. 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES					
No.	TYPE	Rec (in.)	Moist	N		Depth (ft)	qu (qa) (tsf)	W	LL	PL	LI
					90	Very Dense, Brown Fine to Coarse SAND and GRAVEL, Some Silt (SM/GM)					
20	█	4	W	98 /11"							
21	█	10	W	70 /10"							
					95	End of Boring at 92.5 ft					
					100	Backfilled with Bentonite Slurry and Chips					
					105						
					110						
					115						
					120						
					125						

LOG OF TEST BORING
General Notes

DESCRIPTIVE SOIL CLASSIFICATION

Grain Size Terminology

Soil Fraction	Particle Size	U.S. Standard Sieve Size
Boulders	Larger than 12"	Larger than 12"
Cobbles	3" to 12"	3" to 12"
Gravel: Coarse.....	¾" to 3"	¾" to 3"
Fine	4.76 mm to ¾"	#4 to ¾"
Sand: Coarse.....	2.00 mm to 4.76 mm.....	#10 to #4
Medium	0.42 to mm to 2.00 mm	#40 to #10
Fine	0.074 mm to 0.42 mm.....	#200 to #40
Silt.....	0.005 mm to 0.074 mm.....	Smaller than #200
Clay.....	Smaller than 0.005 mm.....	Smaller than #200

Plasticity characteristics differentiate between silt and clay.

General Terminology

Physical Characteristics
 Color, moisture, grain shape, fineness, etc.
Major Constituents
 Clay, silt, sand, gravel
Structure
 Laminated, varved, fibrous, stratified, cemented, fissured, etc.
Geologic Origin
 Glacial, alluvial, eolian, residual, etc.

Relative Density

Term **"N" Value**
 Very Loose..... 0 - 4
 Loose..... 4 - 10
 Medium Dense.....10 - 30
 Dense.....30 - 50
 Very Dense.....Over 50

Relative Proportions Of Cohesionless Soils

Proportional Term	Defining Range by Percentage of Weight
Trace.....	0% - 5%
Little.....	5% - 12%
Some.....	12% - 35%
And	35% - 50%

Consistency

Term	q _u -tons/sq. ft
Very Soft.....	0.0 to 0.25
Soft.....	0.25 to 0.50
Medium.....	0.50 to 1.0
Stiff.....	1.0 to 2.0
Very Stiff.....	2.0 to 4.0
Hard.....	Over 4.0

Organic Content by Combustion Method

Soil Description	Loss on Ignition
Non Organic.....	Less than 4%
Organic Silt/Clay.....	4 - 12%
Sedimentary Peat.....	12% - 50%
Fibrous and Woody Peat...	More than 50%

Plasticity

Term	Plastic Index
None to Slight.....	0 - 4
Slight.....	5 - 7
Medium.....	8 - 22
High to Very High ..	Over 22

The penetration resistance, N, is the summation of the number of blows required to effect two successive 6" penetrations of the 2" split-barrel sampler. The sampler is driven with a 140 lb. weight falling 30" and is seated to a depth of 6" before commencing the standard penetration test.

SYMBOLS

Drilling and Sampling

- CS – Continuous Sampling
- RC – Rock Coring: Size AW, BW, NW, 2"W
- RQD – Rock Quality Designation
- RB – Rock Bit/Roller Bit
- FT – Fish Tail
- DC – Drove Casing
- C – Casing: Size 2 ½", NW, 4", HW
- CW – Clear Water
- DM – Drilling Mud
- HSA – Hollow Stem Auger
- FA – Flight Auger
- HA – Hand Auger
- COA – Clean-Out Auger
- SS - 2" Dia. Split-Barrel Sample
- 2ST – 2" Dia. Thin-Walled Tube Sample
- 3ST – 3" Dia. Thin-Walled Tube Sample
- PT – 3" Dia. Piston Tube Sample
- AS – Auger Sample
- WS – Wash Sample
- PTS – Peat Sample
- PS – Pitcher Sample
- NR – No Recovery
- S – Sounding
- PMT – Borehole Pressuremeter Test
- VS – Vane Shear Test
- WPT – Water Pressure Test

Laboratory Tests

- q_a – Penetrometer Reading, tons/sq ft
- q_a – Unconfined Strength, tons/sq ft
- W – Moisture Content, %
- LL – Liquid Limit, %
- PL – Plastic Limit, %
- SL – Shrinkage Limit, %
- LI – Loss on Ignition
- D – Dry Unit Weight, lbs/cu ft
- pH – Measure of Soil Alkalinity or Acidity
- FS – Free Swell, %

Water Level Measurement

- ▽ - Water Level at Time Shown
- NW – No Water Encountered
- WD – While Drilling
- BCR – Before Casing Removal
- ACR – After Casing Removal
- CW – Cave and Wet
- CM – Caved and Moist














Note: Water level measurements shown on the boring logs represent conditions at the time indicated and may not reflect static levels, especially in cohesive soils.

CGC, Inc.

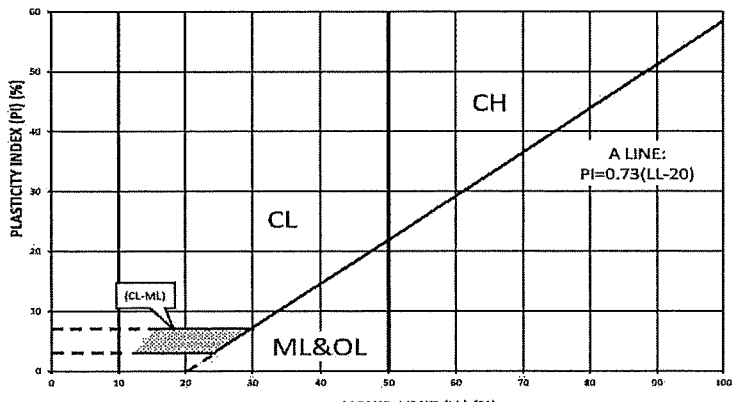
Madison - Milwaukee

Unified Soil Classification System

UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART

COARSE-GRAINED SOILS (more than 50% of material is larger than No. 200 sieve size)		
Clean Gravels (Less than 5% fines)		
GRAVELS More than 50% of coarse fraction larger than No. 4 sieve size		GW Well-graded gravels, gravel-sand mixtures, little or no fines
		GP Poorly-graded gravels, gravel-sand mixtures, little or no fines
		GM Silty gravels, gravel-sand-silt mixtures
		GC Clayey gravels, gravel-sand-clay mixtures
SANDS 50% or more of coarse fraction smaller than No. 4 sieve size		
Clean Sands (Less than 5% fines)		
SANDS 50% or more of coarse fraction smaller than No. 4 sieve size		SW Well-graded sands, gravelly sands, little or no fines
		SP Poorly graded sands, gravelly sands, little or no fines
		SM Silty sands, sand-silt mixtures
		SC Clayey sands, sand-clay mixtures
FINE-GRAINED SOILS (50% or more of material is smaller than No. 200 sieve size.)		
SILTS AND CLAYS Liquid limit less than 50%		ML Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity
		CL Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
		OL Organic silts and organic silty clays of low plasticity
SILTS AND CLAYS Liquid limit 50% or greater		MH Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
		CH Inorganic clays of high plasticity, fat clays
		OH Organic clays of medium to high plasticity, organic silts
HIGHLY ORGANIC SOILS		PT Peat and other highly organic soils

LABORATORY CLASSIFICATION CRITERIA

GW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3	
GP	Not meeting all gradation requirements for GW	
GM	Atterberg limits below "A" line or P.I. less than 4	Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
GC	Atterberg limits above "A" line or P.I. greater than 7	
SW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3	
SP	Not meeting all gradation requirements for GW	
SM	Atterberg limits below "A" line or P.I. less than 4	Limits plotting in shaded zone with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
SC	Atterberg limits above "A" line with P.I. greater than 7	
Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows:		
Less than 5 percent GW, GP, SW, SP		
More than 12 percent GM, GC, SM, SC		
5 to 12 percent Borderline cases requiring dual symbols		
PLASTICITY CHART		
		

APPENDIX B

RECOMMENDED COMPACTED FILL SPECIFICATIONS

APPENDIX B

CGC, INC.

RECOMMENDED COMPACTED FILL SPECIFICATIONS

General Fill Materials

Proposed fill shall contain no vegetation, roots, topsoil, peat, ash, wood or any other non-soil material which by decomposition might cause settlement. Also, fill shall never be placed while frozen or on frozen surfaces. Rock, stone or broken concrete greater than 6 in. in the largest dimension shall not be placed within 10 ft of the building area. Fill used greater than 10 ft beyond the building limits shall not contain rock, boulders or concrete pieces greater than a 2 sq ft area and shall not be placed within the final 2 ft of finish subgrade or in designated utility construction areas. Fill containing rock, boulders or concrete pieces should include sufficient finer material to fill voids among the larger fragments.

Special Fill Materials

In certain cases, special fill materials may be required for specific purposes, such as stabilizing subgrades, backfilling undercut excavations or filling behind retaining walls. For reference, WisDOT gradation specifications for various types of granular fill are attached in Table 1.

Placement Method

The approved fill shall be placed, spread and leveled in layers generally not exceeding 10 in. in thickness before compaction. The fill shall be placed at moisture content capable of achieving the desired compaction level. For clay soils or granular soils containing an appreciable amount of cohesive fines, moisture conditioning will likely be required.

It is the Contractor's responsibility to provide all necessary compaction equipment and other grading equipment that may be required to attain the specified compaction. Hand-guided vibratory or tamping compactors will be required whenever fill is placed adjacent to walls, footings, columns or in confined areas.

Compaction Specifications

Maximum dry density and optimum moisture content of the fill soil shall be determined in accordance with modified Proctor methods (ASTM D1557). The recommended field compaction as a percentage of the maximum dry density is shown in Table 2. Note that these compaction guidelines would generally not apply to coarse gravel/stone fill. Instead, a method specification would apply (e.g., compact in thin lifts with a vibratory compactor until no further consolidation is evident).

Testing Procedures

Representative samples of proposed fill shall be submitted to CGC, Inc. for optimum moisture-maximum density determination (ASTM D1557) prior to the start of fill placement. The sample size should be approximately 50 lb.

CGC, Inc. shall be retained to perform field density tests to determine the level of compaction being achieved in the fill. The tests shall generally be conducted on each lift at the beginning of fill placement and at a frequency mutually agreed upon by the project team for the remainder of the project.

Table 1
Gradation of Special Fill Materials

Material	WisDOT Section 311	WisDOT Section 312	WisDOT Section 305			WisDOT Section 209		WisDOT Section 210
	Breaker Run	Select Crushed Material	3-in. Dense Graded Base	1 1/4-in. Dense Graded Base	3/4-in. Dense Graded Base	Grade 1 Granular Backfill	Grade 2 Granular Backfill	Structure Backfill
Sieve Size	Percent Passing by Weight							
6 in.	100							
5 in.		90-100						
3 in.			90-100					100
1 1/2 in.		20-50	60-85					
1 1/4 in.				95-100				
1 in.					100			
3/4 in.			40-65	70-93	95-100			
3/8 in.				42-80	50-90			
No. 4			15-40	25-63	35-70	100 (2)	100 (2)	25-100
No. 10		0-10	10-30	16-48	15-55			
No. 40			5-20	8-28	10-35	75 (2)		
No. 100						15 (2)	30 (2)	
No. 200			2-12	2-12	5-15	8 (2)	15 (2)	15 (2)

Notes:

1. Reference: Wisconsin Department of Transportation *Standard Specifications for Highway and Structure Construction*.
2. Percentage applies to the material passing the No. 4 sieve, not the entire sample.
3. Per WisDOT specifications, both breaker run and select crushed material can include concrete that is 'substantially free of steel, building materials and other deleterious material'.

Table 2
Compaction Guidelines

Area	Percent Compaction (1)	
	Clay/Silt	Sand/Gravel
<u>Within 10 ft of building lines</u>		
Footing bearing soils	93 - 95	95
Under floors, steps and walks		
- Lightly loaded floor slab	90	90
- Heavily loaded floor slab and thicker fill zones	92	95
<u>Beyond 10 ft of building lines</u>		
Under walks and pavements		
- Less than 2 ft below subgrade	92	95
- Greater than 2 ft below subgrade	90	90
Landscaping	85	90

Notes:

1. Based on Modified Proctor Dry Density (ASTM D 1557)

APPENDIX C
DOCUMENT QUALIFICATIONS

APPENDIX C DOCUMENT QUALIFICATIONS

I. GENERAL RECOMMENDATIONS/LIMITATIONS

CGC, Inc. should be provided the opportunity for a general review of the final design and specifications to confirm that earthwork and foundation requirements have been properly interpreted in the design and specifications. CGC should be retained to provide soil engineering services during excavation and subgrade preparation. This will allow us to observe that construction proceeds in compliance with the design concepts, specifications and recommendations, and also will allow design changes to be made in the event that subsurface conditions differ from those anticipated prior to the start of construction. CGC does not assume responsibility for compliance with the recommendations in this report unless we are retained to provide construction testing and observation services.

This report has been prepared in accordance with generally accepted soil and foundation engineering practices and no other warranties are expressed or implied. The opinions and recommendations submitted in this report are based on interpretation of the subsurface information revealed by the test borings indicated on the location plan. The report does not reflect potential variations in subsurface conditions between or beyond these borings. Therefore, variations in soil conditions can be expected between the boring locations and fluctuations of groundwater levels may occur with time. The nature and extent of the variations may not become evident until construction.

II. IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL ENGINEERING REPORT

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes. While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. *No one except you* should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one - not even you* - should apply the report for any purpose or project except the one originally contemplated.

READ THE FULL REPORT

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A GEOTECHNICAL ENGINEERING REPORT IS BASED ON A UNIQUE SET OF PROJECT-SPECIFIC FACTORS

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, *do not rely on a geotechnical engineering report* that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes - even minor ones - and request an assessment of their impact. *CGC cannot accept responsibility or liability for problems that occur because our reports do not consider developments of which we were not informed.*

SUBSURFACE CONDITIONS CAN CHANGE

A geotechnical engineering report is based on conditions that existed at the time the geotechnical engineer performed the study. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

MOST GEOTECHNICAL FINDINGS ARE PROFESSIONAL OPINION

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgement to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ - sometimes significantly - from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most

effective method of managing the risks associated with unanticipated conditions.

A REPORT'S RECOMMENDATIONS ARE NOT FINAL

Do not over-rely on the confirmation-dependent recommendations included in your report. *Those confirmation-dependent recommendations are not final*, because geotechnical engineers develop them principally from judgement and opinion. Geotechnical engineers can finalize their recommendations *only* by observing actual subsurface conditions revealed during construction. *CGC cannot assume responsibility or liability for the report's confirmation-dependent recommendations if we do not perform the geotechnical-construction observation required to confirm the recommendations' applicability.*

A GEOTECHNICAL ENGINEERING REPORT IS SUBJECT TO MISINTERPRETATION

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Constructors can also misinterpret a geotechnical engineering report. Confront that risk by having CGC participate in prebid and preconstruction conferences, and by providing geotechnical construction observation.

DO NOT REDRAW THE ENGINEER'S LOGS

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

GIVE CONSTRUCTORS A COMPLETE REPORT AND GUIDANCE

Some owners and design professionals mistakenly believe they can make constructors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give constructors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise constructors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure constructors have sufficient time to perform additional study.* Only then might you be in a position to give constructors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

READ RESPONSIBILITY PROVISIONS CLOSELY

Some clients, design professionals, and constructors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic

expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineer's responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

ENVIRONMENTAL CONCERNS ARE NOT COVERED

The equipment, techniques, and personnel used to perform an *environmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

OBTAIN PROFESSIONAL ASSISTANCE TO DEAL WITH MOLD

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, many mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; *none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention.* *Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.*

RELY ON YOUR GEOTECHNICAL ENGINEER FOR ADDITIONAL ASSISTANCE

Membership in the Geotechnical Business Council (GBC) of Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk confrontation techniques that can be of genuine benefit for everyone involved with a construction project. Confer with CGC, a member of GBC, for more information.

Modified and reprinted with permission from:

Geotechnical Business Council
of the Geoprofessional Business Association
8811 Colesville Road, Suite G 106
Silver Spring, MD 20910



Department of Public Works
Engineering Division

James M. Wolfe, P.E., City Engineer
City-County Building, Room 115
210 Martin Luther King, Jr. Boulevard
Madison, Wisconsin 53703
Phone: (608) 266-4751
Fax: (608) 264-9275
engineering@cityofmadison.com
www.cityofmadison.com/engineering

Assistant City Engineer
Bryan Cooper, AIA
Gregory T. Fries, P.E.
Chris Petykowski, P.E.

Deputy Division Manager
Kathleen M. Cryan

Principal Engineer 2
John S. Fahrney, P.E.
Janet Schmidt, P.E.

Principal Engineer 1
Mark D. Moder, P.E.

Financial Manager
Steven B. Danner-Rivers

February 21, 2023

**NOTICE OF ADDENDUM
ADDENDUM 1
CONTRACT NO. 8875, PROJECT NO. 11063
LOWER BADGER MILL CREEK FLOOD MITIGATION**

Revise and amend the contract document(s) for the above project as stated in this addendum, otherwise, the original document shall remain in effect.

PLANS:

REMOVE

Remove Sheet 2

INSERT

Insert Sheet 2

Sheet 2 is being revised to include an Earthwork Summary.

SPECIAL PROVISIONS:

ADD: BID ITEM 90019 – CONSTRUCTION SURVEYING

A. DESCRIPTION

The Contractor shall be responsible for all surveying and staking required for layout, construction and accurate completion of the project in accordance with the plans or any field changes directed by the Engineer. This includes staking all objects shown in the plans, limits, lines, contours, bid items, additional control, and grades required for construction of the project. An AutoCAD (.dwg) file and digital terrain model file will be provided by the City upon request. The Contractor shall be responsible for configuring the file to a usable format in order to create nodes, alignments, or other useful data to facilitate surveying and staking.

The City of Madison shall provide initial local horizontal control (coordinates) and initial vertical control (benchmarks) for use during construction. The City will provide staking for all storm and sanitary sewer pipe and structures. The City will verify the bottom, safety shelf and top of pond or basin segments during construction. Contractor shall coordinate verification of the basin layout and elevations with the City. If it is found during verification that the grading is not set to the correct limits or elevation the contractor shall continue grading until the correct elevations are met at no additional cost to the City.

The Contractor shall use the established horizontal and vertical control points as provided by the City of Madison as initial control. The contractor may need to set additional control for completion of the project. Additional control set by the contractor shall be incidental to this bid item. It is the contractor's responsibility to check for accuracy of set control.

The City of Madison will check the accuracy of the detention basin grading in order to provide quality control. The City of Madison will also provide staking for storm pipe and structures. The Contractor shall contact the City

surveyor assigned to this project at least 48 hours prior to requesting storm sewer staking, elevation checks of subgrades and finished grades.

B. METHOD OF MEASUREMENT

Construction Surveying shall be measured as a Lump Sum for all construction surveying necessary for project completion throughout construction.

C. BASIS OF PAYMENT

Construction Surveying shall be paid for at the contract unit price, which shall be full compensation for all work, materials and incidental to complete the work described above.

PROPOSAL:

A summary of the changes to the proposal is as follows:

ACTION	ITEM NUMBER	TYPE OF WORK	UNITS
ADD	90019	CONSTRUCTION SURVEYING	LUMP SUM

Please see Bid Express for revised bid item quantities.

Please acknowledge this addendum on page E1 of the contract documents and/or in Section E: Bidder's Acknowledgement on Bid Express.

Electronic version of these documents can be found on the Bid Express web site at: <http://www.bidexpress.com>

If you are unable to download plan revisions associated with the addendum, please contact the Engineering office at 608-266-4751 receive the material by another route.

Sincerely,

Greg Fries for: _____
Jim Wolfe, P.E., City Engineer

JMW: maa

GENERAL NOTES

- CONTRACTOR SHALL CHECK BETWEEN ALL BENCHMARKS AND CONTROL POINTS TO
- CONTRACTOR SHALL PROTECT ALL CONTROL POINTS NOT DIRECTLY IN THE CONSTR
- CONTRACTOR SHALL ESTABLISH ADDITIONAL BENCHMARKS AND CONTROL POINTS A TO CHECK BENCHMARKS.
- PROTECT EXISTING UTILITIES DURING CONSTRUCTION.
- EXISTING UTILITIES SHOWN ARE INDICATED IN ACCORDANCE WITH AVAILABLE RECOI FOR OBTAINING EXACT LOCATIONS AND ELEVATION OF ALL UTILITIES IN THE FIELD.
- CONTRACTOR SHALL PROTECT ALL PROPERTY IRONS.
- CONTRACTOR SHALL DRAIN/DEWATER EXISTING OPEN-WATER WETLAND BEFORE DR WILDLIFE PRIOR TO CONSTRUCTION.
- ON A DAILY BASIS, PRIOR TO ENTERING THE PROJECT SITE, AND PRIOR TO ENTRANC USED AT THE PROJECT SHALL BE SPRAYED CLEAN OF ALL DIRT, SOD, OR FOREIGN M THE PROJECT SITE THAT DOES NOT DRAIN TO THE SITE OR IN CONTRACTORS SHOP. DOZERS, SCRAPERS, BACKHOES, DUMP TRUCKS, TRUCKS, SHOVELS, PICKS, AND HAN TO CLEANSE THE UNDERBODY, SUSPENSION, TRACKS, WHEELS, TIRES, AND WHEEL BRUSHES, OR SCRAPERS MAY BE REQUIRED TO REMOVE HEAVY ACCUMULATIONS OF
- DISTURBANCE LIMITS ARE RESTRICTED TO AREA AS SHOWN ON PLANS.
- ALLOWABLE STAGING AREAS FOR EQUIPMENT AND MATERIALS ARE ONLY ALLOWED I AGREED UPON BETWEEN CONTRACTOR AND THE CITY PRIOR TO CONSTRUCTION.
- CONTRACTOR SHALL USE PROPOSED MAINTENANCE PATH AND BLUE HARVEST LANE CONSTRUCTION.
- DURING CONSTRUCTION OF THE MAINTENANCE PATH BERMS NORTH OF BLUE HARVE CITY'S GEOTECHNICAL ENGINEER TO DETERMINE IF NATIVE SOILS AT THE EMBANKME SPECIFICATIONS.

TRAFFIC CONTROL NOTES:

- USE WISDOT STANDARD DETAIL SDD 15D29 "TRAFFIC CONTROL, VEHICLE ENTRANCE/I ROAD. SEE SHEET 5 FOR SDD 15C29. PLACE TRAFFIC CONTROL AT BOTH NORTH AND
- DURING NON-CONSTRUCTION HOURS, PLACE TYPE III BARRICADES ACROSS CONSTR
- THE CONTRACTOR SHALL MAKE ALL CHANGES IN THE SIGNING THAT ARE DEEMED NE
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTENANCE OF ALL BARRICADES, CONTRACTOR, THAT ARE IN PLACE AND OPERATION 24 HOURS A DAY, 7 DAYS A WEEK
- BARRICADES THAT MUST BE MOVED FOR A WORK OPERATION SHALL BE IMMEDIATELY CONTINUING OPERATIONS, AT THE END OF EACH WORKING DAY.

PROPOSED

- PROPOSED GAS LINE
- PROPOSED SANITARY SEWER
- PROPOSED WATER MAIN
- PROPOSED WATER MAIN W/ CASING
- PROPOSED STORM SEWER
- PROPOSED TELEPHONE LINE
- PROPOSED UNDERGROUND ELECTRIC LINE
- PROPOSED FIBER OPTIC LINE
- PROPOSED FENCE
- PROPOSED SILT FENCE
- PROPOSED SHEET PILING
- PROPOSED INLET PROTECTION
- PROPOSED END CAP
- PROPOSED WATER VALVE
- PROPOSED FIRE HYDRANT
- PROPOSED SANITARY SEWER MANHOLE
- PROPOSED STORM SEWER MANHOLE
- PROPOSED INLET
- FUTURE PROJECT BY OTHERS
- MAJOR CONTOUR
- MINOR CONTOUR
- PROPOSED STORM SEWER
- TREE TO BE REMOVED

STRUCTURE

STRUCT NO.	TYPE	NORTHING	EASTING	DISCHA STRUCT
OUTLET 1	OUTLET CONTROL	469965.141	772920.098	AEW 2
AEW 1.1	END WALL	469950.470	772928.893	OUTLE
AEW 1.2	END WALL	469977.942	772890.933	NORTHE CHANN
AEW 2.1	END WALL	469622.708	772788.627	AEW 2
AEW 2.2	END WALL	469620.920	772838.715	MAIN L CHANN
AEW 3.1	END WALL	469855.272	772788.921	AEW 3
AEW 3.2	END WALL	469854.928	772847.627	MAIN L CHANN
AEW 4.1	END WALL	469925.388	772618.366	AEW 4
AEW 4.2	END WALL	470026.375	772575.981	AEW 4
AEW 5.1	END WALL	470252.690	772574.543	AEW 5
AEW 5.2	END WALL	470281.078	772627.210	MAIN LIY CHANN
AEW 6.1	END WALL	470445.967	772394.917	AEW 6
AEW 6.2	END WALL	470445.444	772430.408	AEW 6
AEW 7.1	END WALL	470633.213	772400.685	AEW 7
AEW 7.2	END WALL	470631.248	772436.265	AEW 7
AEW 8.1	END WALL	470831.447	772411.462	AEW 8
AEW 8.2	END WALL	470830.005	772443.878	AEW 8
AEW 9.1	END WALL	470940.814	772297.084	AEW 9
AEW 9.2	END WALL	470909.167	772298.267	-

MARK	REVISION	DATE	BY
###	###	###	###
###	###	###	###
###	###	###	###
###	###	###	###

Scale: 1"=40'
 Designed By: JGG
 Date: 2/16/2023 2:39 PM
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1020.129
CITY OF MADISON
CONTRACT NO: 9030
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GENERAL NOTES & LEGEND
LOWER BADGER MILL CREEK FLOOD MITIGATION

1020.129
2

LEGEND

EXISTING

PROPOSED

	EXISTING RIGHT OF WAY
	EXISTING PROPERTY LINE
	EXISTING GAS LINE
	EXISTING SANITARY SEWER
	EXISTING WATER MAIN
	EXISTING STORM SEWER
	EXISTING TELEPHONE LINE
	EXISTING UNDERGROUND ELECTRIC LINE
	EXISTING OVERHEAD ELECTRIC LINE
	EXISTING FIBER OPTIC LINE
	EXISTING FENCE
	CONTROL POINT
	EXISTING BENCHMARK
	SOIL BORING
	EXISTING DECIDUOUS/CONIFEROUS TREE
	EXISTING TREE STUMP
	EXISTING MANHOLE
	EXISTING INLET
	EXISTING CATCH BASIN
	EXISTING POWER POLE
	EXISTING LIGHT POLE
	EXISTING GAS VALVE
	EXISTING SIGN
	EXISTING WATER VALVE
	EXISTING WATER MANHOLE
	EXISTING FIRE HYDRANT
	WETLAND DELINEATION
	WETLAND BUFFER
	EXISTING APRON END WALL
	IRON PIPE
	PROPERTY LINE
	MAINTENANCE PATH
	FUTURE MUTLI-USE PATH
	EXISTING SAND BAGS

	PROPOSED GAS LINE
	PROPOSED SANITARY SEWER
	PROPOSED WATER MAIN
	PROPOSED WATER MAIN W/ CASING
	PROPOSED STORM SEWER
	PROPOSED TELEPHONE LINE
	PROPOSED UNDERGROUND ELECTRIC LINE
	PROPOSED FIBER OPTIC LINE
	PROPOSED FENCE
	PROPOSED SILT FENCE
	PROPOSED SHEET PILING
	PROPOSED INLET PROTECTION
	PROPOSED END CAP
	PROPOSED WATER VALVE
	PROPOSED FIRE HYDRANT
	PROPOSED SANITARY SEWER MANHOLE
	PROPOSED STORM SEWER MANHOLE
	PROPOSED INLET
	FUTURE PROJECT BY OTHERS
	MAJOR CONTOUR
	MINOR CONTOUR
	PROPOSED STORM SEWER
	TREE TO BE REMOVED

1020.129	1020.129	1020.129	1020.129	1020.129
CITY OF MADISON				
LOWER BADGER MILL CREEK FLOOD MITIGATION				
CONTRACT NO: 9030				
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2				

07/12/2023

SECTION E: BIDDERS ACKNOWLEDGEMENT

**LOWER BADGER MILL CREEK FLOOD MITIGATION
CONTRACT NO. 8875**

Bidder must state a Unit Price and Total Bid for each item. The Total Bid for each item must be the product of quantity, by Unit Price. The Grand Total must be the sum of the Total Bids for the various items. In case of multiplication errors or addition errors, the Grand Total with corrected multiplication and/or addition shall determine the Grand Total bid for each contract. The Unit Price and Total Bid must be entered numerically in the spaces provided. All words and numbers shall be written in ink.

1. The undersigned having familiarized himself/herself with the Contract documents, including Advertisement for Bids, Instructions to Bidders, Form of Proposal, City of Madison Standard Specifications for Public Works Construction - 2023 Edition thereto, Form of Agreement, Form of Bond, and Addenda issued and attached to the plans and specifications on file in the office of the City Engineer, hereby proposes to provide and furnish all the labor, materials, tools, and expendable equipment necessary to perform and complete in a workmanlike manner the specified construction on this project for the City of Madison; all in accordance with the plans and specifications as prepared by the City Engineer, including Addenda Nos. _____ through _____ to the Contract, at the prices for said work as contained in this proposal. (Electronic bids submittals shall acknowledge addendum under Section E and shall not acknowledge here)
2. If awarded the Contract, we will initiate action within seven (7) days after notification or in accordance with the date specified in the contract to begin work and will proceed with diligence to bring the project to full completion within the number of work days allowed in the Contract or by the calendar date stated in the Contract.
3. The undersigned Bidder or Contractor certifies that he/she is not a party to any contract, combination in form of trust or otherwise, or conspiracy in restraint of trade or commerce or any other violation of the anti-trust laws of the State of Wisconsin or of the United States, with respect to this bid or contract or otherwise.
4. I hereby certify that I have met the Bid Bond Requirements as specified in Section 102.5. (IF BID BOND IS USED, IT SHALL BE SUBMITTED ON THE FORMS PROVIDED BY THE CITY. FAILURE TO DO SO MAY RESULT IN REJECTION OF THE BID).
5. I hereby certify that all statements herein are made on behalf of Integrity Grading & Excavating, Inc. (name of corporation, partnership, or person submitting bid) a corporation organized and existing under the laws of the State of Wisconsin a partnership consisting of _____; an individual trading as _____; of the City of _____ State of _____; that I have examined and carefully prepared this Proposal, from the plans and specifications and have checked the same in detail before submitting this Proposal; that I have fully authority to make such statements and submit this Proposal in (its, their) behalf; and that the said statements are true and correct.

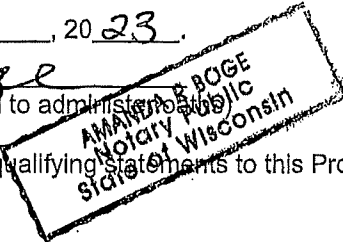
David M... [Signature]
SIGNATURE

President
TITLE, IF ANY

Sworn and subscribed to before me this
9 day of March, 2023.

Ann R. Boege
(Notary Public or other officer authorized to administer oaths)
My Commission Expires 3/12/23

Bidders shall not add any conditions or qualifying statements to this Proposal.



Contract 8875, Integrity Grading & Excavating, Inc.

Section E: Bidder's Acknowledgement

This section is a required document for the bid to be considered complete. There are two methods for completing the Bidder Acknowledgement Report. Method one: The report can be downloaded, completed, and uploaded to this site to be included with your electronic bid. Method two: The report can be downloaded from the site and submitted by hand to the City of Madison. Either method of submission requires that the Bidder Acknowledgement Report be received by the bid due date.

Please select the method of submission below. The form is in the section below to download and upload to the site or download and submit by hand.

Please check the box in the Upload section if submitting the report by hand.

Method of Submittal for Bidder Acknowledgement (click in box below to choose) *
I will download Bidder Acknowledgement Downloadable Document, complete, and upload online.

The bidder acknowledges receipt of the following addenda to the contract for the above designated project. Please check the appropriate box for each addendum reviewed. If no addenda have been issued, then no boxes are required to be checked.

Any addenda issues after 12:00 P.M. on the Tuesday proceeding the bid due date shall include a provision extending the bid due date.

Addendum Acknowledgement

Acknowledge each Addenda reviewed by checking the appropriate checkboxes below.

- Addendum 1*
- Addendum 2
- Addendum 3
- Addendum 4
- Addendum 5
- Addendum 6

Contract 8875 – Integrity Grading & Excavating, Inc.

Section F: Best Value Contracting (BVC)

This section is a required document for the bid to be considered complete. There are two methods for completing the Best Value Contracting (BVC) form. Method one: The form can be filled out online and submitted to this site to be included with your electronic bid. Method two: The form can be downloaded from the site and submitted by hand to the City of Madison.

Please check the box in the Upload section if submitting the report by hand.

Method of Submittal for BVC (click in box below to choose) *

I will submit Bid Express fillable online form (BVC).

Best Value Contracting

1. The Contractor shall indicate the non-apprenticeable trades used on this contract.

2. Madison General Ordinance (M.G.O.), 33.07(7), does provide for some exemptions from the active apprentice requirement. Apprenticeable trades are those trades considered apprenticeable by the State of Wisconsin. Please check applicable box if you are seeking an exemption.

Contractor has a total skilled workforce of four or less individuals in all apprenticeable trades combined.

No available trade training program; The Contractor has been rejected by the only available trade training program, or there is no trade training program within 90 miles.

Contractor is not using an apprentice due to having a journey worker on layoff status, provided the journey worker was employed by the contractor in the past six months.

First time contractor on City of Madison Public Works contract requests a onetime exemption but intends to comply on all future contracts and is taking steps typical of a "good faith" effort.

Contractor has been in business less than one year.

Contractor doesn't have enough journeyman trade workers to qualify for a trade training program in that respective trade.

An exemption is granted in accordance with a time period of a "Documented Depression" as defined by the State of Wisconsin.

3. The Contractor shall indicate on the following section which apprenticeable trades are to be used on this contract. Compliance with active apprenticeship, to the extent required by M.G.O. 33.07(7), shall be satisfied by documentation from an applicable trade training body; an apprenticeship contract with the Wisconsin Department of Workforce Development or a similar

agency in another state; or the U.S Department of Labor. This documentation is required prior to the Contractor beginning work on the project site.

The Contractor has reviewed the list and shall not use any apprenticeable trades on this project.

LIST APPRENTICABLE TRADES (check all that apply to your work to be performed on this contract)

- BRICKLAYER
- CARPENTER
- CEMENT MASON / CONCRETE FINISHER
- CEMENT MASON (HEAVY HIGHWAY)
- CONSTRUCTION CRAFT LABORER
- DATA COMMUNICATION INSTALLER
- ELECTRICIAN
- ENVIRONMENTAL SYSTEMS TECHNICIAN / HVAC SERVICE TECH/HVAC INSTALL / SERVICE
- GLAZIER
- HEAVY EQUIPMENT OPERATOR / OPERATING ENGINEER
- INSULATION WORKER (HEAT and FROST)
- IRON WORKER
- IRON WORKER (ASSEMBLER, METAL BLDGS)
- PAINTER and DECORATOR
- PLASTERER
- PLUMBER
- RESIDENTIAL ELECTRICIAN
- ROOFER and WATER PROOFER
- SHEET METAL WORKER
- SPRINKLER FITTER
- STEAMFITTER
- STEAMFITTER (REFRIGERATION)
- STEAMFITTER (SERVICE)
- TAPER and FINISHER
- TELECOMMUNICATIONS (VOICE, DATA and VIDEO) INSTALLER-TECHNICIAN
- TILE SETTER

**LOWER BADGER MILL CREEK FLOOD MITIGATION
CONTRACT NO. 8875**

Small Business Enterprise Compliance Report

This information may be submitted electronically through
Bid Express or submitted with bid in sealed envelope.

Cover Sheet

Prime Bidder Information

Company: Integrity Grading & Excavating, Inc.

Address: 605 Grossman Dr., Schofield, WI 54476

Telephone Number: 715-359-4042 Fax Number: 715-359-4142

Contact Person/Title: Sarah Janis - Executive Assistant to the President

Prime Bidder Certification

I, Daniel Weinkauf, President of
Name Title

Integrity Grading & Excavating, Inc. certify that the information
Company

contained in this SBE Compliance Report is true and correct to the best of my knowledge and belief.

Sarah Janis
Witness' Signature

Daniel Weinkauf
Bidder's Signature

03/09/2023
Date

LOWER BADGER MILL CREEK FLOOD MITIGATION

CONTRACT NO. 8875

DATE: 3/9/23

**Integrity Grading &
Excavating, Inc.**

Item	Quantity	Price	Extension
Section B: Proposal Page			
10911 - MOBILIZATION (STREET CONSTRUCTION) - L.S.	1.00	\$70,000.00	\$70,000.00
20101 - EXCAVATION CUT - C.Y.	2980.00	\$9.00	\$26,820.00
20204 - SELECT FILL (BLUE HARVEST LANE) - TON	13600.00	\$9.50	\$129,200.00
20219 - BREAKER RUN - TON	2750.00	\$18.00	\$49,500.00
20221 - TOPSOIL - S.Y.	5130.00	\$1.70	\$8,721.00
20703 - TEMPORARY SEEDING - S.Y.	5130.00	\$0.12	\$615.60
21063 - EROSION MATTING, CLASS I, TYPE A - ORGANIC - S.Y.	5130.00	\$1.85	\$9,490.50
90018 - GEOSYNTHETIC REINFORCEMENT FABRIC - S.Y.	4190.00	\$6.00	\$25,140.00
10911 - MOBILIZATION (BRIDGE CONSTRUCTION) - L.S.	1.00	\$45,750.00	\$45,750.00
90000 - EXCAVATION FOR STRUCTURES BRIDGES B-13-908 - EACH	1.00	\$8,500.00	\$8,500.00
90001 - BACKFILL STRUCTURE TYPE A - TON	422.00	\$35.00	\$14,770.00
90002 - CONCRETE MASONRY BRIDGES - C.Y.	293.00	\$900.00	\$263,700.00
90003 - PROTECTIVE SURFACE TREATMENT - S.Y.	234.00	\$2.50	\$585.00
90004 - PIGMENTED SURFACE SEALER - S.Y.	35.00	\$3.00	\$105.00
90005 - BAR STEEL REINFORCEMENT HS STRUCTURES - LB	6410.00	\$1.30	\$8,333.00
90006 - BAR STEEL REINFORCEMENT HS COATED STRUCTURES - LB	38340.00	\$1.40	\$53,676.00
90007 - RAILING STEEL TYPE C3 - L.F.	131.00	\$175.00	\$22,925.00
90008 - RUBBERIZED MEMBRANE WATERPROOFING - S.Y.	26.00	\$25.00	\$650.00
90009 - PILE POINTS - EACH	16.00	\$225.00	\$3,600.00
90010 - PILING CIP CONCRETE 10 3/4 X 0.365-INCH - L.F.	1000.00	\$50.00	\$50,000.00
90011 - RIPRAP HEAVY - C.Y.	262.00	\$85.00	\$22,270.00
90012 - PIPE UNDERDRAIN WRAPPED 6-INCH - L.F.	234.00	\$23.00	\$5,382.00
90013 - GEOTEXTILE TYPE DF SCHEDULE A - S.Y.	88.00	\$0.89	\$78.32
90014 - GEOTEXTILE TYPE HR - S.Y.	464.00	\$1.95	\$904.80
90015 - CONDUIT RIGID NONMETALLIC SCHEDULE 40 2-INCH - L.F.	155.00	\$13.00	\$2,015.00
90016 - ARCHITECTURAL SURFACE TREATMENT B-13-908 - S.F.	699.00	\$10.00	\$6,990.00
90017 - CONCRETE STAINING B-13-908 - S.F.	699.00	\$5.80	\$4,054.20
10701 - TRAFFIC CONTROL - L.S.	1.00	\$11,000.00	\$11,000.00
10911 - MOBILIZATION (POND CONSTRUCTION) - L.S.	1.00	\$50,000.00	\$50,000.00
20101 - EXCAVATION CUT - C.Y.	51710.00	\$18.50	\$956,635.00
20202 - FILL BORROW - C.Y.	6580.00	\$1.50	\$9,870.00
20219 - BREAKER RUN - TON	700.00	\$22.00	\$15,400.00
20221 - TOPSOIL - S.Y.	51540.00	\$3.50	\$180,390.00
20235 - HEAVY RIPRAP - GLACIAL FIELD STONE - C.Y.	60.00	\$124.00	\$7,440.00
20241 - RIPRAP FILTER FABRIC, TYPE HR - S.Y.	5270.00	\$2.04	\$10,750.80
20404 - CLEARING - L.S.	1.00	\$15,035.00	\$15,035.00
20409 - GRUBBING - L.S.	1.00	\$3,400.00	\$3,400.00
20703 - TEMPORARY SEEDING - S.Y.	51540.00	\$0.12	\$6,184.80
21002 - EROSION CONTROL INSPECTION - EACH	30.00	\$250.00	\$7,500.00
21011 - CONSTRUCTION ENTRANCE - EACH	5.00	\$1,000.00	\$5,000.00
21013 - STREET SWEEPING - L.S.	1.00	\$7,100.00	\$7,100.00
21014 - CLEAR STONE BERM (DITCH CHECK) - EACH	8.00	\$500.00	\$4,000.00
21017 - SILT SOCK (8-INCH) - COMPLETE - L.F.	3180.00	\$5.95	\$18,921.00
21021 - SILT FENCE - COMPLETE - L.F.	5640.00	\$1.95	\$10,998.00
21063 - EROSION MATTING, CLASS I, TYPE A - ORGANIC - S.Y.	24370.00	\$1.80	\$43,866.00
21073 - EROSION MATTING, CLASS II, TYPE C - ORGANIC - S.Y.	4500.00	\$4.75	\$21,375.00
21084 - EROSION MATTING, CLASS III, TYPE D - S.Y.	560.00	\$14.75	\$8,260.00

LOWER BADGER MILL CREEK FLOOD MITIGATION

CONTRACT NO. 8875

DATE: 3/9/23

**Integrity Grading &
Excavating, Inc.**

Item	Quantity	Price	Extension
21302 - CONSTRUCTION FENCE (PLASTIC) - L.F.	240.00	\$4.50	\$1,080.00
40102 - CRUSHED AGGREGATE BASE COURSE, GRADATION NO. 2 OR NO. 3 - TON	2890.00	\$18.00	\$52,020.00
50202 - TYPE II DEWATERING - L.S.	1.00	\$50,000.00	\$50,000.00
50401 - 12 INCH TYPE I RCP STORM SEWER PIPE - L.F.	110.00	\$83.00	\$9,130.00
50403 - 18 INCH TYPE I RCP STORM SEWER PIPE - L.F.	340.00	\$93.00	\$31,620.00
50461 - 12 INCH RCP AE - EACH	4.00	\$965.00	\$3,860.00
50463 - 18 INCH RCP AE - EACH	10.00	\$1,140.00	\$11,400.00
50511 - PRECAST REINFORCED CONCRETE BOX CULVERT WINGWALLS AND APRON - EACH	1.00	\$17,875.00	\$17,875.00
90030 - STORMWATER CONTROL PLAN AND IMPLEMENTATION - L.S.	1.00	\$5,000.00	\$5,000.00
90031 - POND C OUTLET STRUCTURE - EACH	1.00	\$5,200.00	\$5,200.00
90032 - CLAY ANTI-SEEPAGE COLLAR - EACH	10.00	\$1,230.00	\$12,300.00
90033 - BIKE GATE - L.S.	1.00	\$13,000.00	\$13,000.00
90034 - OVERFLOW ARMORING - S.F.	3550.00	\$22.00	\$78,100.00
90035 - EARTHEN EMBANKMENT - C.Y.	4705.00	\$9.00	\$42,345.00
10914 - MOBILIZATION FOR SANITARY SEWER CONSTRUCTION - L.S.	1.00	\$30,000.00	\$30,000.00
20336 - PIPE PLUG (SANITARY) - EACH	2.00	\$3,700.00	\$7,400.00
20703 - TEMPORARY SEEDING - S.Y.	310.00	\$0.12	\$37.20
21063 - EROSION MATTING, CLASS I, TYPE A - ORGANIC - S.Y.	310.00	\$1.80	\$558.00
50202 - TYPE II DEWATERING - L.S.	1.00	\$10,000.00	\$10,000.00
50212 - SELECT FILL FOR SANITARY SEWER MAIN - T.F.	250.00	\$3.00	\$750.00
50301 - 8" PVC SANITARY SEWER PIPE SDR-35 - L.F.	250.00	\$74.25	\$18,562.50
50390 - SEWER ELECTRONIC MARKERS - EACH	1.00	\$100.00	\$100.00
50701 - 4' DIAMETER SAS - EACH	1.00	\$6,500.00	\$6,500.00
50771 - INTERNAL CHIMNEY SEAL - EACH	1.00	\$250.00	\$250.00
50791 - SANITARY SEWER TAP - EACH	1.00	\$7,500.00	\$7,500.00
50797 - EXTERNAL SEWER ACCESS STRUCTURE JOINT SEAL - EACH	1.00	\$125.00	\$125.00
90050 - TOPSOIL SALVAGE FOR TRENCH RESTORATION - S.Y.	310.00	\$7.00	\$2,170.00
90019 - CONSTRUCTION SURVEYING - L.S.	1.00	\$20,790.00	\$20,790.00
75 Items	Totals		\$2,664,573.72

SECTION G: BID BOND

LET ALL KNOW BY THESE DOCUMENTS PRESENTED, THAT Principal and Surety, as identified below, are held and firmly bound unto the City of Madison, (hereinafter referred to as the "Obligee"), in the sum of five per cent (5%) of the amount of the total bid or bids of the Principal herein accepted by the Obligee, for the payment of which the Principal and the Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

The conditions of this obligation are such that, whereas the Principal has submitted, to the City of Madison a certain bid, including the related alternate, and substitute bids attached hereto and hereby made a part hereof, to enter into a contract in writing for the construction of:

LOWER BADGER MILL CREEK FLOOD MITIGATION CONTRACT NO. 8875

1. If said bid is rejected by the Obligee, then this obligation shall be void.
2. If said bid is accepted by the Obligee and the Principal shall execute and deliver a contract in the form specified by the Obligee (properly completed in accordance with said bid) and shall furnish a bond for his/her faithful performance of said contract, and for the payment of all persons performing labor or furnishing materials in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said bid, then this obligation shall be void.

If said bid is accepted by the Obligee and the Principal shall fail to execute and deliver the contract and the performance and payment bond noted in 2. above executed by this Surety, or other Surety approved by the City of Madison, all within the time specified or any extension thereof, the Principal and Surety agree jointly and severally to forfeit to the Obligee as liquidated damages the sum mentioned above, it being understood that the liability of the Surety for any and all claims hereunder shall in no event exceed the sum of this obligation as stated, and it is further understood that the Principal and Surety reserve the right to recover from the Obligee that portion of the forfeited sum which exceed the actual liquidated damages incurred by the Obligee.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its bond shall be in no way impaired or affected by an extension of the time within which the Obligee may accept such bid, and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them and the Corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, on the day and year set forth below.



Integrity Grading & Excavating, Inc.

Name of Principal

[Signature]

2/24/2023

Date

Daniel Weinkauff - President

Name and Title

Seal SURETY

Liberty Mutual Insurance Company

Name of Surety

By

[Signature]

2/24/2023

Date

Attorney-in-Fact: Connie Smith

Name and Title

This certifies that I have been duly licensed as an agent for the above company in Wisconsin under National Provider No. 16492915 for the year 2023, and appointed as attorney in fact with authority to execute this bid bond and the payment and performance bond referred to above, which power of attorney has not been revoked.

2/24/2023

Date

[Signature]

Agent Signature Connie Smith

2920 Enloe St. #103

Address

Hudson, WI 54016

City, State and Zip Code

(715)377-8230

Telephone Number

NOTE TO SURETY & PRINCIPAL

The bid submitted which this bond guarantees shall be rejected if the following instrument is not attached to this bond:

Power of Attorney showing that the agent of Surety is currently authorized to execute bonds on behalf of the Surety, and in the amounts referenced above.



This Power of Attorney limits the acts of those named herein, and they have no authority to bind the Company except in the manner and to the extent herein stated.

Liberty Mutual Insurance Company
The Ohio Casualty Insurance Company
West American Insurance Company

Certificate No: 8206417- 354057

POWER OF ATTORNEY

KNOWN ALL PERSONS BY THESE PRESENTS: That The Ohio Casualty Insurance Company is a corporation duly organized under the laws of the State of New Hampshire, that Liberty Mutual Insurance Company is a corporation duly organized under the laws of the State of Massachusetts, and West American Insurance Company is a corporation duly organized under the laws of the State of Indiana (herein collectively called the "Companies"), pursuant to and by authority herein set forth, does hereby name, constitute and appoint, Chris Steinagel; Christopher M. Kemp; Connie Smith; Eliot Motz; Kory Mortel; Michael J. Douglas; Robert Downey; Sam Duchow.

all of the city of Hudson state of WI each individually if there be more than one named, its true and lawful attorney-in-fact to make, execute, seal, acknowledge and deliver, for and on its behalf as surety and as its act and deed, any and all undertakings, bonds, recognizances and other surety obligations, in pursuance of these presents and shall be as binding upon the Companies as if they have been duly signed by the president and attested by the secretary of the Companies in their own proper persons.

IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Companies and the corporate seals of the Companies have been affixed thereto this 6th day of October, 2021.



Liberty Mutual Insurance Company
The Ohio Casualty Insurance Company
West American Insurance Company

By: David M. Carey, Assistant Secretary

Not valid for mortgage, note, loan, letter of credit, currency rate, interest rate or residual value guarantees.

State of PENNSYLVANIA
County of MONTGOMERY

On this 6th day of October, 2021 before me personally appeared David M. Carey, who acknowledged himself to be the Assistant Secretary of Liberty Mutual Insurance Company, The Ohio Casualty Company, and West American Insurance Company, and that he, as such, being authorized so to do, execute the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed my notarial seal at King of Prussia, Pennsylvania, on the day and year first above written.



Commonwealth of Pennsylvania - Notary Seal
Teresa Pastella, Notary Public
Montgomery County
My commission expires March 28, 2025
Commission number 1128044
Member, Pennsylvania Association of Notaries

By: Teresa Pastella, Notary Public

This Power of Attorney is made and executed pursuant to and by authority of the following By-laws and Authorizations of The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company which resolutions are now in full force and effect reading as follows:

ARTICLE IV - OFFICERS: Section 12. Power of Attorney.

Any officer or other official of the Corporation authorized for that purpose in writing by the Chairman or the President, and subject to such limitation as the Chairman or the President may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Corporation to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact, subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Corporation by their signature and execution of any such instruments and to attach thereto the seal of the Corporation. When so executed, such instruments shall be as binding as if signed by the President and attested to by the Secretary. Any power or authority granted to any representative or attorney-in-fact under the provisions of this article may be revoked at any time by the Board, the Chairman, the President or by the officer or officers granting such power or authority.

ARTICLE XIII - Execution of Contracts: Section 5. Surety Bonds and Undertakings.

Any officer of the Company authorized for that purpose in writing by the chairman or the president, and subject to such limitations as the chairman or the president may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Company by their signature and execution of any such instruments and to attach thereto the seal of the Company. When so executed such instruments shall be as binding as if signed by the president and attested by the secretary.

Certificate of Designation - The President of the Company, acting pursuant to the Bylaws of the Company, authorizes David M. Carey, Assistant Secretary to appoint such attorneys-in-fact as may be necessary to act on behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations.

Authorization - By unanimous consent of the Company's Board of Directors, the Company consents that facsimile or mechanically reproduced signature of any assistant secretary of the Company, wherever appearing upon a certified copy of any power of attorney issued by the Company in connection with surety bonds, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

I, Renee C. Llewellyn, the undersigned, Assistant Secretary, The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company do hereby certify that the original power of attorney of which the foregoing is a full, true and correct copy of the Power of Attorney executed by said Companies, is in full force and effect and has not been revoked.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this 24th day of February, 2023.



By: Renee C. Llewellyn, Assistant Secretary

For bond and/or Power of Attorney (POA) verification inquiries, please call 610-832-8240 or email HOSUR@libertymutual.com.

SECTION H: AGREEMENT

THIS AGREEMENT made this 19th day of April in the year Two Thousand and Twenty-Three between INTEGRITY GRADING & EXCAVATING, INC. hereinafter called the Contractor, and the City of Madison, Wisconsin, hereinafter called the City.

WHEREAS, the Common Council of the said City of Madison under the provisions of a resolution adopted APRIL 18, 2023, and by virtue of authority vested in the said Council, has awarded to the Contractor the work of performing certain construction.

NOW, THEREFORE, the Contractor and the City, for the consideration hereinafter named, agree as follows:

1. **Scope of Work.** The Contractor shall, perform the construction, execution and completion of the following listed complete work or improvement in full compliance with the Plans, Specifications, Standard Specifications, Supplemental Specifications, Special Provisions and contract; perform all items of work covered or stipulated in the proposal; perform all altered or extra work; and shall furnish, unless otherwise provided in the contract, all materials, implements, machinery, equipment, tools, supplies, transportation, and labor necessary to the prosecution and completion of the work or improvements:

LOWER BADGER MILL CREEK FLOOD MITIGATION CONTRACT NO. 8875

2. **Completion Date/Contract Time.** Construction work must begin within seven (7) calendar days after the date appearing on mailed written notice to do so shall have been sent to the Contractor and shall be carried on at a rate so as to secure full completion SEE SPECIAL PROVISIONS, the rate of progress and the time of completion being essential conditions of this Agreement.
3. **Contract Price.** The City shall pay to the Contractor at the times, in the manner and on the conditions set forth in said specifications, the sum of TWO MILLION SIX HUNDRED SIXTY-FOUR THOUSAND FIVE HUNDRED SEVENTY-THREE AND 72/100 (\$2,664,573.72) Dollars being the amount bid by such Contractor and which was awarded to him/her as provided by law.
4. **Affirmative Action.** In the performance of the services under this Agreement the Contractor agrees not to discriminate against any employee or applicant because of race, religion, marital status, age, color, sex, disability, national origin or ancestry, income level or source of income, arrest record or conviction record, less than honorable discharge, physical appearance, sexual orientation, gender identity, political beliefs, or student status. The Contractor further agrees not to discriminate against any subcontractor or person who offers to subcontract on this contract because of race, religion, color, age, disability, sex, sexual orientation, gender identity or national origin.

The Contractor agrees that within thirty (30) days after the effective date of this agreement, the Contractor will provide to the City Affirmative Action Division certain workforce utilization statistics, using a form to be furnished by the City.

If the contract is still in effect, or if the City enters into a new agreement with the Contractor, within one year after the date on which the form was required to be provided, the Contractor will provide updated workforce information using a second form, also to be furnished by the City. The second form will be submitted to the City Affirmative Action Division no later than one year after the date on which the first form was required to be provided.

The Contractor further agrees that, for at least twelve (12) months after the effective date of this contract, it will notify the City Affirmative Action Division of each of its job openings at facilities in Dane County for which applicants not already employees of the Contractor are to be considered. The notice will include a job description, classification, qualifications and application procedures.

and deadlines. The Contractor agrees to interview and consider candidates referred by the Affirmative Action Division if the candidate meets the minimum qualification standards established by the Contractor, and if the referral is timely. A referral is timely if it is received by the Contractor on or before the date started in the notice.

Articles of Agreement Article I

The Contractor shall take affirmative action in accordance with the provisions of this contract to insure that applicants are employed, and that employees are treated during employment without regard to race, religion, color, age, marital status, disability, sex, sexual orientation, gender identity or national origin and that the employer shall provide harassment free work environment for the realization of the potential of each employee. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer, recruitment or recruitment advertising, layoff or termination, rates of pay or other forms of compensation and selection for training including apprenticeship insofar as it is within the control of the Contractor. The Contractor agrees to post in conspicuous places available to employees and applicants notices to be provided by the City setting out the provisions of the nondiscrimination clauses in this contract.

Article II

The Contractor shall in all solicitations or advertisements for employees placed by or on behalf of the Contractors state that all qualified or qualifiable applicants will be employed without regard to race, religion, color, age, marital status, disability, sex, sexual orientation, gender identity or national origin.

Article III

The Contractor shall send to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding a notice to be provided by the City advising the labor union or worker's representative of the Contractor's equal employment opportunity and affirmative action commitments. Such notices shall be posted in conspicuous places available to employees and applicants for employment.

Article V

The Contractor agrees that it will comply with all provisions of the Affirmative Action Ordinance of the City of Madison, including the contract compliance requirements. The Contractor agrees to submit the model affirmative action plan for public works contractors in a form approved by the Affirmative Action Division Manager.

Article VI

The Contractor will maintain records as required by Section 39.02(9)(f) of the Madison General Ordinances and will provide the City Affirmative Action Division with access to such records and to persons who have relevant and necessary information, as provided in Section 39.02(9)(f). The City agrees to keep all such records confidential, except to the extent that public inspection is required by law.

Article VII

In the event of the Contractor's or subcontractor's failure to comply with the Equal Employment Opportunity and Affirmative Action Provisions of this contract or Section 39.03 and 39.02 of the Madison General Ordinances, it is agreed that the City at its option may do any or all of the following:

1. Cancel, terminate or suspend this Contract in whole or in part.

2. Declare the Contractor ineligible for further City contracts until the Affirmative Action requirements are met.
3. Recover on behalf of the City from the prime Contractor 0.5 percent of the contract award price for each week that such party fails or refuses to comply, in the nature of liquidated damages, but not to exceed a total of five percent (5%) of the contract price, or ten thousand dollars (\$10,000), whichever is less. Under public works contracts, if a subcontractor is in noncompliance, the City may recover liquidated damages from the prime Contractor in the manner described above. The preceding sentence shall not be construed to prohibit a prime Contractor from recovering the amount of such damage from the non-complying subcontractor.

Article VIII

The Contractor shall include the above provisions of this contract in every subcontract so that such provisions will be binding upon each subcontractor. The Contractor shall take such action with respect to any subcontractor as necessary to enforce such provisions, including sanctions provided for noncompliance.

Article IX

The Contractor shall allow the maximum feasible opportunity to small business enterprises to compete for any subcontracts entered into pursuant to this contract. (In federally funded contracts the terms "DBE, MBE and WBE" shall be substituted for the term "small business" in this Article.)

5. Substance Abuse Prevention Program Required. Prior to commencing work on the Contract, the Contractor, and any Subcontractor, shall have in place a written program for the prevention of substance abuse among its employees as required under Wis. Stat. Sec. 103.503.
6. **Contractor Hiring Practices.**

Ban the Box - Arrest and Criminal Background Checks. (Sec. 39.08, MGO)

This provision applies to all prime contractors on contracts entered into on or after January 1, 2016, and all subcontractors who are required to meet prequalification requirements under MGO 33.07(7)(I), MGO as of the first time they seek or renew pre-qualification status on or after January 1, 2016. The City will monitor compliance of subcontractors through the pre-qualification process.

- a. **Definitions.** For purposes of this section, "Arrest and Conviction Record" includes, but is not limited to, information indicating that a person has been questioned, apprehended, taken into custody or detention, held for investigation, arrested, charged with, indicted or tried for any felony, misdemeanor or other offense pursuant to any law enforcement or military authority.

"Conviction record" includes, but is not limited to, information indicating that a person has been convicted of a felony, misdemeanor or other offense, placed on probation, fined, imprisoned or paroled pursuant to any law enforcement or military authority.

"Background Check" means the process of checking an applicant's arrest and conviction record, through any means.

- b. **Requirements.** For the duration of this Contract, the Contractor shall:

1. Remove from all job application forms any questions, check boxes, or other inquiries regarding an applicant's arrest and conviction record, as defined herein.

2. Refrain from asking an applicant in any manner about their arrest or conviction record until after conditional offer of employment is made to the applicant in question.
3. Refrain from conducting a formal or informal background check or making any other inquiry using any privately or publicly available means of obtaining the arrest or conviction record of an applicant until after a conditional offer of employment is made to the applicant in question.
4. Make information about this ordinance available to applicants and existing employees, and post notices in prominent locations at the workplace with information about the ordinance and complaint procedure using language provided by the City.
5. Comply with all other provisions of Sec. 39.08, MGO.

c. Exemptions: This section shall not apply when:

1. Hiring for a position where certain convictions or violations are a bar to employment in that position under applicable law, or
2. Hiring a position for which information about criminal or arrest record, or a background check is required by law to be performed at a time or in a manner that would otherwise be prohibited by this ordinance, including a licensed trade or profession where the licensing authority explicitly authorizes or requires the inquiry in question.

To be exempt, Contractor has the burden of demonstrating that there is an applicable law or regulation that requires the hiring practice in question, if so, the contractor is exempt from all of the requirements of this ordinance for the position(s) in question.

**LOWER BADGER MILL CREEK FLOOD MITIGATION
CONTRACT NO. 8875**

IN WITNESS WHEREOF, the Contractor has hereunto set his/her hand and seal and the City has caused this contract to be sealed with its corporate seal and to be executed by its Mayor and City Clerk on the dates written below.

Countersigned:

INTEGRITY GRADING & EXCAVATING, INC.

Company Name

<u>Jarah Jarvis</u>	<u>4/14/23</u>	<u>[Signature]</u>	<u>4-14-23</u>
Witness	Date	President	Date
<u>Jarah Jarvis</u>	<u>4/14/23</u>	<u>[Signature]</u>	<u>4-14-23</u>
Witness	Date	Secretary	Date

CITY OF MADISON, WISCONSIN

Provisions have been made to pay the liability that will accrue under this contract.

Approved as to form:

<u>[Signature]</u>	<u>4-28-2023</u>	<u>[Signature]</u>	<u>5-1-23</u>
Finance Director	Date	City Attorney	Date
<u>[Signature]</u>	<u>5/2/23</u>	<u>[Signature]</u>	<u>5/2/23</u>
Witness	Date	Mayor	Date
<u>[Signature]</u>	<u>4-25-23</u>	<u>[Signature]</u>	<u>4-25-2023</u>
Witness	Date	City Clerk	Date

Maribeth Witzel Behl

SECTION I: PAYMENT AND PERFORMANCE BOND

LET ALL KNOW BY THESE DOCUMENTS PRESENTED, that we INTEGRITY GRADING & EXCAVATING, INC. as principal, and Liberty Mutual Insurance Company Company of Boston, MA as surety, are held and firmly bound unto the City of Madison, Wisconsin, in the sum of **TWO MILLION SIX HUNDRED SIXTY-FOUR THOUSAND FIVE HUNDRED SEVENTY-THREE AND 72/100 (\$2,664,573.72)** Dollars, lawful money of the United States, for the payment of which sum to the City of Madison, we hereby bind ourselves and our respective executors and administrators firmly by these presents.

The condition of this Bond is such that if the above bounden shall on his/her part fully and faithfully perform all of the terms of the Contract entered into between him/herself and the City of Madison for the construction of:

**LOWER BADGER MILL CREEK FLOOD MITIGATION
CONTRACT NO. 8875**

in Madison, Wisconsin, and shall pay all claims for labor performed and material furnished in the prosecution of said work, and save the City harmless from all claims for damages because of negligence in the prosecution of said work, and shall save harmless the said City from all claims for compensation (under Chapter 102, Wisconsin Statutes) of employees and employees of subcontractor, then this Bond is to be void, otherwise of full force, virtue and effect.

Signed and sealed this 19th day of April

Countersigned:

INTEGRITY GRADING & EXCAVATING, INC.

Company Name (Principal)

Bradley B...
Witness

David Wood
President

David Wood
Secretary

Approved as to form:

Liberty Mutual Insurance Company

Surety

Salary Employee

Commission

Seal

Michael Haas
City Attorney

By Chris Steinagel
Attorney-in-Fact Chris Steinagel

This certifies that I have been duly licensed as an agent for the above company in Wisconsin under National Producer Number 7307304 for the year 2023, and appointed as attorney-in-fact with authority to execute this payment and performance bond which power of attorney has not been revoked.

04/19/2023

Date

Chris Steinagel
Agent Signature Chris Steinagel

THIS POWER OF ATTORNEY IS NOT VALID UNLESS IT IS PRINTED ON RED BACKGROUND.

This Power of Attorney limits the acts of those named herein, and they have no authority to bind the Company except in the manner and to the extent herein stated.

Certificate No. 7429658

American Fire and Casualty Company
The Ohio Casualty Insurance Company

Liberty Mutual Insurance Company
West American Insurance Company

POWER OF ATTORNEY

KNOWN ALL PERSONS BY THESE PRESENTS: That American Fire & Casualty Company and The Ohio Casualty Insurance Company are corporations duly organized under the laws of the State of New Hampshire, that Liberty Mutual Insurance Company is a corporation duly organized under the laws of the State of Massachusetts, and West American Insurance Company is a corporation duly organized under the laws of the State of Indiana (herein collectively called the "Companies"), pursuant to and by authority herein set forth, does hereby name, constitute and appoint, Chris Steinagel; Christopher M. Kemp; Connie Smith; Michael J. Douglas; Robert Downey

all of the city of Hudson, state of WI each individually if there be more than one named, its true and lawful attorney-in-fact to make, execute, seal, acknowledge and deliver, for and on its behalf as surety and as its act and deed, any and all undertakings, bonds, recognizances and other surety obligations, in pursuance of these presents and shall be as binding upon the Companies as if they have been duly signed by the president and attested by the secretary of the Companies in their own proper persons.

IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Companies and the corporate seals of the Companies have been affixed thereto this 25th day of July, 2016.



American Fire and Casualty Company
The Ohio Casualty Insurance Company
Liberty Mutual Insurance Company
West American Insurance Company

By: David M. Carey
David M. Carey, Assistant Secretary

STATE OF PENNSYLVANIA ss
COUNTY OF MONTGOMERY

On this 25th day of July, 2016, before me personally appeared David M. Carey, who acknowledged himself to be the Assistant Secretary of American Fire and Casualty Company, Liberty Mutual Insurance Company, The Ohio Casualty Insurance Company, and West American Insurance Company, and that he, as such, being authorized so to do, execute the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed my notarial seal at Plymouth Meeting, Pennsylvania, on the day and year first above written.



COMMONWEALTH OF PENNSYLVANIA
Notarial Seal
Teresa Pastella, Notary Public
Plymouth Twp., Montgomery County
My Commission Expires March 28, 2017
Member, Pennsylvania Association of Notaries

By: Teresa Pastella
Teresa Pastella, Notary Public

This Power of Attorney is made and executed pursuant to and by authority of the following By-laws and Authorizations of American Fire and Casualty Company, The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company which resolutions are now in full force and effect reading as follows:

ARTICLE IV – OFFICERS – Section 12. Power of Attorney. Any officer or other official of the Corporation authorized for that purpose in writing by the Chairman or the President, and subject to such limitation as the Chairman or the President may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Corporation to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact, subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Corporation by their signature and execution of any such instruments and to attach thereto the seal of the Corporation. When so executed, such instruments shall be as binding as if signed by the President and attested to by the Secretary. Any power or authority granted to any representative or attorney-in-fact under the provisions of this article may be revoked at any time by the Board, the Chairman, the President or by the officer or officers granting such power or authority.

ARTICLE XIII – Execution of Contracts – SECTION 5. Surety Bonds and Undertakings. Any officer of the Company authorized for that purpose in writing by the chairman or the president, and subject to such limitations as the chairman or the president may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Company by their signature and execution of any such instruments and to attach thereto the seal of the Company. When so executed such instruments shall be as binding as if signed by the president and attested by the secretary.

Certificate of Designation – The President of the Company, acting pursuant to the Bylaws of the Company, authorizes David M. Carey, Assistant Secretary to appoint such attorneys-in-fact as may be necessary to act on behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations.

Authorization – By unanimous consent of the Company's Board of Directors, the Company consents that facsimile or mechanically reproduced signature of any assistant secretary of the Company, wherever appearing upon a certified copy of any power of attorney issued by the Company in connection with surety bonds, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

I, Gregory W. Davenport, the undersigned, Assistant Secretary, of American Fire and Casualty Company, The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company do hereby certify that the original power of attorney of which the foregoing is a full, true and correct copy of the Power of Attorney executed by said Companies, is in full force and effect and has not been revoked.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this 19th day of April, 2023.



By: Gregory W. Davenport
Gregory W. Davenport, Assistant Secretary

Not valid for mortgage, note, loan, letter of credit, currency rate, interest rate or residual value guarantees.

To confirm the validity of this Power of Attorney call 1-610-832-8240 between 9:00 am and 4:30 pm EST on any business day.