ADDENDUM #1

DATE:	August 31, 2022
PROJECT:	Northern Moraine Wastewater Reclamation District Lakemoor Lift Stations Modifications
PROJECT NUMBER:	NMW-070
OWNER:	Northern Moraine Wastewater Reclamation District, Illinois
ENGINEER:	Trotter and Associates, Inc. 40W201 Wasco Road, Suite D St. Charles, Illinois 60175
TO:	Prospective Bidders

The Addendum forms a part of the Contract Documents and modifies the Bidding Documents dated July 15, 2022, with amendments and additions noted below.

Return the provided Receipt of Addendum Acknowledgement to Trotter and Associates, Inc. and acknowledge receipt of this Addendum in the space provided on the Bid Form. Failure to do so may disqualify the Bidder.

This Addendum consists of five (5) pages, plus attachments consisting of sixty seven (67) pages.

General Comments

- 1. The bid opening is hereby extended to 1:00 PM September 21, 2022 at the Owner's office.
- 2. A Pre-Bid Conference was held at 10:00 AM on August 17, 2022, at the District's Office located at 113 Timber Trail, Island Lake, Illinois 60042. The minutes of the Pre-Bid conference can be found attached and shall be considered a part of Addendum 1.

Modifications to Project Specifications

- 1. Invitation to Bid Section has been replaced in its entirety to reflect the updated work scope.
- 2. Section 26 32 13.01 Engine Generators Lift Stations No. 3 and 4 Section 26 32 13.01, 2.4 A, is hereby modified as follows:
 - A. Manufacturer / Model No.
 - 1. Lift Station No. 3 Transfer Switch (ADD1) DO NOT REPLACE ASCO D3ATSA3200FGXF 11BE
 - 2. Lift Station No. 4 Transfer Switch ASCO D3ATSA3200FGXF 11BE

(ADD1) NOTE: Automatic Transfer Switch at Lift Station No. 3 was recently replaced by owner. Replacement switch for Lift Station No. 4 shall be the same Manufacturer / Model No. as Lift Station No. 3.

- 3. Section 43 25 13.27 Submersible Pumping Equipment Lift Station No. 1 Section 43 25 13.27, 2.1 M.8, is hereby modified as follows:
- 1. 8. Control Module

Control module (Grundfos IO113) shall be supplied by pump manufacturer and to be mounted within the control panel. Module shall mount on a din rail and shall be UL 61010 approved. One module shall be supplied for each pump by pump manufacturer and provided to the Integrator for incorporation into the existing control panel.

Signals from the pump shall be received by the module via a control cable. While pump is running the module shall monitor real time real time thermal sensor status and moisture switches status.

A warning signal and alarm signal shall be outputted by the control module. (ADD1) The control module shall be capable of meg testing the motor stator.

 4. Section 43 25 13.28 – Submersible Pumping Equipment – Lift Station No. 2 & 5 Specification Title is hereby modified to Submersible Pumping Equipment – Lift Station No. 2
 2

Section 43 25 13.27, 2.1 M.8, is hereby modified as follows:

2. 8. Control Module

Control module (Grundfos IO113) shall be supplied by pump manufacturer and to be mounted within the control panel. Module shall mount on a din rail and shall be UL 61010 approved. One module shall be supplied for each pump by pump manufacturer and provided to the Integrator for incorporation into the existing control panel.

Signals from the pump shall be received by the module via a control cable. While pump is running the module shall monitor real time real time thermal sensor status and moisture switches status.

A warning signal and alarm signal shall be outputted by the control module. (ADD1) The control module shall be capable of meg testing the motor stator.

5. Section 43 25 13.27, 3.5 A, is hereby modified as follows:

- A. Submersible Pump Schedule:
 - A. P-21 (ADD1) and P-52
 - 1. Location: Lakemoor Lift Station No. 2 and (ADD1) No. 5.
 - 2. Type of Fluid: Raw Sewage.
 - 3. Capacity: 270 GPM.

- 4. Discharge Head (TDH): 27 FT.
- 5. Maximum Speed: 1,760 RPM.
- 6. Motor:
 - i. Maximum Power: 5.5 hp.
 - ii. Voltage/Phase: 230/460 V / 3ph.
- 7. Manufacturer and Model:
 - i. Grundfos, SL1.30.A40.55.EX.4.61L.C
- 6. Sections 40 05 06 Couplings, Adapters, and Specials for Process Piping, Section 40 05 07 Hangers and Supports for Process Piping, and Section 40 05 19 – Ductile Iron Piping have been added to the Project Specifications.

Modifications to the Drawings

- 1. Drawing LS1.1 has been modified to include Notes on the available gravity bypass to Lift Station 7 and to depict the existing ATS on the control panel pad.
- 2. Drawing LS1.2 has been modified to add scope including existing base elbows to be replaced on both pumps with Grundfos compatible fittings and discharge pipe replacement in the wet well.
- 3. Drawing LS2.1 has been modified to depict existing upstream sewer.
- 4. Drawing LS2.2 has been modified to add scope including existing base elbows to be replaced on both pumps with Grundfos compatible fittings and discharge pipe replacement in the wet well.
- 5. Drawing LS3.1 has been modified to depict existing upstream sewer and to depict the ATS as being replaced. Notes associated with the instructions to reuse the existing ATS were removed.
- 6. Drawing LS3.2 has been added to show added scope including existing base elbows to be replaced on both pumps with Grundfos compatible fittings and discharge pipe replacement in the wet well (typical 2 risers).
- 7. Drawing LS4.1 has been modified to depict the proposed natural gas service to the utility and a requirement for the Contractor to provide construction fencing around the work area due to the vicinity to the playground.
- 8. Drawing LS4.2 has been added to show added scope including existing base elbows to be replaced on both pumps with Grundfos compatible fittings and discharge pipe replacement in the wet well (typical 2 risers).
- 9. Drawing LS5.1 has been modified to depict existing upstream sewer.
- 10. Drawing LS5.2 has been modified to remove the pump replacement from the scope. Drawing LS5.2 has been modified to add scope including existing base elbows to be replaced on both pumps with Grundfos compatible fittings and discharge pipe replacement in the wet well (typical 2 risers).
- 11. Drawings LS6.1 has been modified to correct the existing lift station lid material from concrete to steel. Notes were removed associated with the Owner providing bypass pumping during the lining work. Contractor to provide bypass pumping at LS6.
- 12. Drawing LS6.2 has been modified to add scope including applying the corrosion resistant lining to the existing steel dry well, in addition to the existing wet well. Drawings also have been corrected to show the existing steel lid. Drawing LS6.2 has been modified to add scope including existing base elbows to be replaced on both pumps with Grundfos compatible fittings and discharge pipe replacement in the wet well (typical 2 risers).
- Drawing LS7.1 has been modified to include Notes on the available gravity bypass to Lift Station
 1.
- 14. Drawing LS7.2 add scope including discharge pipe replacement (typical 3 risers) in the wet well. And clarifying the new base elbow installation only on the new pump riser. Existing pumps have upgraded elbows.

- 15. Drawing E1.1 has been modified by adding conditions in Note 1 that the District can provide temporary power to the station if needed during work to add the proposed service disconnect.
- 16. Drawing E2.1 has been modified by adding conditions in Note 1 that the District can provide temporary power to the station if needed during work to add the proposed service disconnect.
- 17. Drawing E3.1 has been modified to add scope including a new ATS. Drawing E3.1 has been modified by changing conductors and adding conditions in Note 1 that the District can provide bypass pumping or vactor truck during down time associated with the electrical work.
- 18. Drawing E4.1 has been modified by changing conductors and adding conditions in Note 1 that the District can provide bypass pumping or vactor truck during down time associated with the electrical work.
- 19. Drawing E5.1 has been modified to remove the pump replacement from the scope. The numbering of keynotes have been revised. Drawing E5.1 has also been modified by adding conditions in Note 1 that the District can provide temporary power to the station if needed during work to add the proposed service disconnect.

Questions & Clarifications

1. Can wet well contents be transported and disposed at the NMWRD WWTF by the Contractor?

Response: Yes.

2. Please provide the fuel consumption for the Lift Station 7 proposed generator.

Response: Generator Set Data Sheet is provided as an attachment.

3. Is the existing concrete equipment pad to remain with the replacement of the Lift Station 6 control panel?

Response: Yes.

4. How much bypass pumping is required?

Response: The Owner intends on providing temporary power for the following work. All other bypass pumping to be provided by Contractor. Bypass pumping requirements will be clarified in a future addendum.

• Work associated with adding the proposed service disconnect at Lift Stations 1, 2, 3, 4 and 5.

ALL ITEMS IN CONFLICT WITH THIS ADDENDUM ARE HEREBY DELETED.

THIS ADDENDUM IS HEREBY MADE PART OF THE CONTRACT DOCUMENTS AND SHALL BE NOTED ON THE PROPOSAL.

Attachments:

- 1. Pre-Bid Meeting Minutes (5 Pages)
- 2. Pre-Bid Attendance Sheet (1 Page)
- 3. Addendum Receipt Acknowledgement (1 Page)

- 4. Table of Contents
- 5. Invitation to Bid Section
- 6. Section 40 05 06 Couplings, Adapters, and Specials for Process Piping
- 7. Section 40 05 07 Hangers and Supports for Process Piping
- 8. Section 40 05 19 Ductile Iron Piping
- 9. LS7 Generator Data Sheet
- 10. Revised Drawings

END ADDENDUM NO. 1



Northern Moraine Wastewater Reclamation District Lakemoor Lift Station No. 1-7 Modifications

Pre-Bid Conference Wednesday, August 17, 2022, 10:00 a.m. Minutes

A meeting for the Screen Channel Modifications was held on August 17, 2022 at 10:00 am at the Northern Moraine Wastewater Reclamation District Offices at 113 Timber Trail, Island Lake, Illinois. Attendee sign-in sheet is enclosed.

Introductions

Mohammed Haque	NMWRD	District Manager
Joe Lapastora	NMWRD	Staff Engineer
Luke Markko	NMWRD	Superintendent
Jillian Kiss	Trotter and Associates, Inc.	Project Manager

Receipt of Bids

Sealed proposals will be received by the Northern Moraine Wastewater Reclamation District for the project entitled "Lakemoor Lift Station Modifications" until 1:00 PM on September 7, 2022 at the District's office, 113 Timber Trail, Island Lake, IL 60042. The sealed bids will be publicly opened and read aloud immediately afterwards in the District's Board Room, on the same date. Sealed bids shall be addressed to the Northern Moraine Wastewater Reclamation District, Attn: Mohammed Haque, District Manager and shall be labeled "Bid for Lakemoor Lift Station Modifications".

Bid Security

Each bid shall be accompanied by a bid bond, bank draft, cashier's check or certified check payable to the order of the Northern Moraine Wastewater Reclamation District, Illinois in an amount not less than ten (10) percent of the amount of the bid, as a guaranty that the bidder will execute the contract, if it is awarded, in conformity with the bid form.

The successful bidder will be required to furnish Performance and Completion and Payment Bonds on forms provided in the Specifications and Contract Documents, each in an amount equal to 100 percent of the contract price, respectively.

Bidder Certification

Bidders must complete all of the certifications within the Proposal including but not limited to the Bidder's Sworn Acknowledgement and the Bidder's Sworn Work History Statement. These Certifications are required by the Northern Moraine Wastewater Reclamation District.

Northern Moraine Wastewater Reclamation District Lakemoor Lift Stations No. 1-7 Modifications Meeting Agenda Page 2

Instructions to Bidders

The Project Specifications provides general instructions to bidders on the requirements of the bid package.

Contract Time

Substantial completion shall be met within 500 days following Commencement of the project and final completion shall be met within 530 days following Commencement of the project.

Wage Provisions

In accordance with the Prevailing Wage Act, 820 ILCS 130/0.01 et seq., the contractor shall pay prevailing wages in accordance with the Illinois Department of Labor Prevailing Wages for McHenry County. The prevailing rates of hourly wages are revised from time to time by the Illinois Department of Labor and are available on the Department's official website at: <u>https://www2.illinois.gov/idol/laws-rules/conmed/pages/rates.aspx</u>.

Project Summary

- A. Demolition
 - 1. Lift Station pumps, control panel, generator.
- B. Lift Station No. 1 generally includes:
 - 1. Replace (2) electromagnetic flow meters and transmitters.
 - 2. Blast and re-coat dry well piping.
 - 3. Replace submersible pumps and pump controllers.
 - 4. Landscape around wet well.
 - 5. Install light pole and LED fixture.
 - 6. Install new alarm system.
 - 7. Add service disconnect to exterior of existing control panel enclosure.
 - 8. Install isolation transformer on exterior of existing control panel enclosure
- C. Lift Station No. 2 generally includes:
 - 1. Replace submersible pump.
 - 2. Blast and re-coat dry well piping.
 - 3. Install new LED light fixture on existing light pole.
 - 4. Install new alarm system.
- D. Lift Station 3 generally includes:
 - 1. Replace generator and concrete equipment pad.
 - 2. Blast and re-coat dry well piping.
 - 3. Install light pole and LED fixture.
 - 4. Install new alarm system.
- E. Lift Station 4 generally includes
 - 1. Install generator and concrete equipment pad.
 - 2. Install fence, gates and landscaping.
 - 3. Install LED light fixture on existing pole.
 - 4. Install new alarm system.

Northern Moraine Wastewater Reclamation District Lakemoor Lift Stations No. 1-7 Modifications Meeting Agenda Page 3

- F. Lift Station No. 5 generally includes:
 - 1. Install bollards.
 - 2. Replace submersible pump.
 - 3. Install LED light fixture.
 - 4. Install new alarm system.
 - 5. Install landscaping.
- G. Lift Station No. 6 generally includes:
 - 1. Coat steel wet well with corrosion-resistant lining material.
 - 2. Install new control panel.
 - 3. Install new light pole and LED fixture.
- H. Lift Station No. 7 generally includes:
 - 1. Install new control panel.
 - 2. Install new light pole and fixture.
 - 3. Install access hatch fall protection on dry well access hatch.
 - 4. Install submersible pump.
 - 5. Remove fencing.
 - 6. Replace generator and concrete equipment pad.
 - 7. Install landscaping

Work Sites:

- Lift Station No. 1 598 Fritzsche Rd, Lakemoor. On the NE corner of Fritzsche and Wegner
- Lift Station No. 2 North end of Herbert Road, enter John Deere Landscapes, on west side of road
- Lift Station No. 3 316 Venice Rd, Lakemoor
- Lift Station No. 4 112 Lily Lake Pkwy, Lakemoor
- Lift Station No. 5 532 Santa Barbara Road, Lakemoor
- Lift Station No. 6 32205 Darrell Rd, Lakemoor (at Heritage Community Park entrance)
- Lift Station No. 7 160 South Drive, Lakemoor. On the south side of South Drive at Venice Road

Addendum

Failure to acknowledge receipt of addenda on the Bidder's Proposal may result in the Bid being declared Non-responsive. Addendum #1 will be issued within the next week and will include, at a minimum, the following items:

- A. Copy of Pre-Bid Meeting Minutes
- B. Copy of Pre-Bid Meeting Sign-in Sheet

Discussion

- A. Bypass Pumping by Owner
- B. DCEO Grant Requirements & Forms
 - Illinois Works Apprenticeship Initiative Periodic Reporting
 - Business Enterprise Program Utilization Plan

Questions/Clarifications from Bidders

Questions and/or clarifications regarding this project should be directed in writing to Jillian Kiss, at the office of the Engineer by email to <u>j.kiss@trotter-inc.com</u>. Clarifications requested by Bidders must be in writing not less than 7 days prior to the date set for receipt of Bids. The reply will be in the form of an

Northern Moraine Wastewater Reclamation District Lakemoor Lift Stations No. 1-7 Modifications Meeting Agenda Page 4

Addendum, a copy of which will be forwarded to all plan holders. Verbal answers are not binding on any party.

Contractor Questions

At Lift Station 6, is the existing control panel concrete pad to remain? Response: Yes.

Contractor Questions to be addressed in future addendum?

- A. At Lift Station 3, is the existing ATS compatible with the new Cummins generator?
- B. Provide fuel consumption requirements for the new generator at Lift Station 7.
- C. Provide bypass pumping requirements for the lift stations.
- D. Provide sanitary sewer atlases for bypassed structures.
- E. What is the difference between the Business Enterprise Program and IEPA's DBE requirements?
- F. Can the wet well contents be transported and disposed at the WWTF?

These minutes were recorded to the best recollection of Trotter and Associates, Inc. and are assumed to be accurate. The information within this document shall become record unless changes are submitted in writing within the next seven days.



Northern Moraine Wastewater Reclamation District Lakemoor Lift Stations No. 1-7 Modifications

Pre-Bid Conference 10:00 am - Wednesday, August 17, 2022 Attendee Sign-In Sheet

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Telephone	(847)(662-556	8-17) (19-3-02)	847-244-5222	847-429-090	630-514-6780	(Bur) 350 - 564	Rapi rosta						
Company	Buller Construction	Menuses Gear Carl.	JJ Henclerson	MRCILL	TET.R SYSTEMS INC.	Powerlink Electric Inc.	TAT	MMMAD					
Name	Adam Dunkelbere	KEVIN Amereon	Mare Cilman	MARC RR = Merry	TYPER Van Conservena	Steven L'Esperance	chillian Iciss	Joe Lapuetria.					



Northern Moraine Wastewater Reclamation District Lakemoor Lift Stations No. 1-7 Modifications

Receipt of Addendum Acknowledgement Addendum No. 1

Please check the appropriate box, enter the corresponding information required below, and return via email to <u>a.fialko@trotter-inc.com</u>. If you do not respond to this notice, repeat notices may follow. Failure to acknowledge receipt of addenda within the project Bid Documents may result in the Bid being declared Non-responsive.

	(Name of Plan Holder)
I have received the Addendum by email. I have confirmed that the as indicated in the Addendum description.	Addendum is complete
	(Signature)
	_(Printed Name, Title)
Please send future correspondence by email to the address below.	
	(Email Address)

I will not be bidding this project and request no further correspondence.

Northern Moraine Wastewater Reclamation District Lakemoor Lift Stations No. 1-7 Modifications

<u>BID PACKAGE</u> TABLE OF CONTENTS

- 1. Invitation for Bidder's Proposals
- 2. General Instructions to Bidders
- 3. Bidder's Proposal
- 4. Bidder's Sworn Acknowledgement
- 5. Bidder's Sworn Work History Statement
- 6. Notice of Award (Sample)
- 7. Contract (Sample Attached as Separate Document)

Attachment AProject Specifications and Supplemental Contract TermsAttachment BSchedule of PricesAttachment CBidder's Certification

- 8. DCEO Grant Requirements and Forms
 - a. Illinois Works Apprenticeship Initiative Periodic Reporting Form
 - b. Business Enterprise Program (BEP) Utilization Plan Forms
- 9. General Conditions
- 10. Supplementary Conditions

Division 1 – General Requirements

01 10 00	Summary
01 20 00	Price and Payment Procedures

- 01 25 00 Substitution Procedures
- 01 30 00 Administrative Requirements
- 01 32 16 Construction Progress Schedule
- 01 33 00 Submittal Procedures
- 01 40 00 Quality Requirements
- 01 42 19 Reference Standards
- 01 50 00 Temporary Facilities and Controls
- 01 60 00 Product Requirements
- 01 70 00 Execution Requirements

Division 2 – Existing Conditions

02 41 19.13 Selective Building Demolition

Division 3 – Concrete

- 03 05 05 Concrete Testing and Inspection
- 03 10 00 Concrete Forming and Accessories
- 03 20 00 Concrete Reinforcing
- 03 30 00 Cast-In-Place Concrete
- 03 35 00 Concrete Finishing
- 03 41 34 Precast Concrete Pad

Division 8 - Openings Access Doors

08 31 00 Access Doo

Division 9 - Finishes 09 96 00 High Performance Coatings

09 96 35	Chemical Resistant Coatings
101100	Division 10 - Specialties
10 14 00	Identification Devices
	Division 13 – Special Construction
13 44 00	Instrumentation for Process Control: Basic Requirements
13 44 10	Process Instrumentation and Control Equipment
13 44 20	Primary Elements and Transmitters
	Division 26 - Electrical
26 05 00	Electrical: Basic Requirements
26 05 05	Selective Demolition for Electrical
26 05 19	Wire and Cable – 600 Volt and Below
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26 05 43	Electrical – Exterior Underground
26 05 53	Identification for Electrical Systems
26 05 73	Power System Studies
26 08 13	Acceptance Testing
26 27 26	Wiring Devices
26 28 00	Overcurrent and Short Circuit Protective Devices
26 32 13.01	Engine Generators – Lift Station No. 3 and No. 4
26 32 13.02	Engine Generators – Lift Station No. 7
26 50 00	Interior and Exterior Lighting
	Division 31 – Earthwork
31 05 13	Soils for Earthwork
31 05 16	Aggregates for Earthwork
31 10 00	Site Clearing
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31 23 16	Excavation
31 23 16.13	Trenching
31 23 16.26	Rock Removal
31 23 18	Site Backfilling
31 23 23	Fill
31 25 00	Erosion and Sedimentation Control
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32 31 13	Chain Link Fences and Gates
32 91 13	Soil Preparation
32 91 19	Landscape Grading
32 92 19	Seeding
32 93 00	Plants
	Division 40 – Process Interconnections
40 05 06	Couplings, Adapters, and Specials for Process Piping
40 05 07	Hangers and Supports for Process Piping
40 05 19	Ductile Iron Piping

Division 43 – Process Gas and Liquid Handling, Purification and Storage Equipment

43 05 20	Common Work Results for Liquid Handling Equipment
43 25 13.27	Submersible Pumping Equipment – Lift Station No. 1
43 25 13.28	Submersible Pumping Equipment – Lift Stations No. 2
43 25 13.29	Submersible Pumping Equipment – Lift Station No. 7
END TOC	

NORTHERN MORAINE WASTEWATER RECLAMATION DISTRICT

CONTRACT FOR

Lakemoor Lift Stations No. 1-7 Modifications

INVITATION FOR BIDDER'S PROPOSALS

OWNER: Northern Moraine Wastewater Reclamation District Attn: Mohammed Haque, District Manager 113 Timber Trail P. O. Box 240 Island Lake, IL 60042

1. Invitation to Bid

Owner invites sealed Bidder's Proposals for the Work described in detail in the Contract and generally described as follows:

A. Demolition

- 1. Lift Station pumps, discharge piping, control panels, generators.
- B. Lift Station No. 1 generally includes:
 - 1. Replace (2) electromagnetic flow meters and transmitters.
 - 2. Blast and re-coat dry well piping.
 - 3. (ADD1) Replace 6" wet well piping.
 - 4. (ADD1) Replace (2) submersible pumps, (2) base elbows, and pump controllers.
 - 5. Landscape around wet well.
 - 6. Install light pole and LED fixture.
 - 7. Install new alarm system.
 - 8. Add service disconnect to exterior of existing control panel enclosure.
 - 9. Install isolation transformer on exterior of existing control panel enclosure.
- C. Lift Station No. 2 generally includes:
 - 1. (ADD1) Replace 4" wet well piping.
 - 2. (ADD1) Replace (1) submersible pump and (2) base elbows.
 - 3. Blast and re-coat dry well piping.
 - 4. Install new LED light fixture on existing light pole.
 - 5. Install new alarm system.
 - 6. (ADD1) Add service disconnect to exterior of existing control panel enclosure.
 - 7. (ADD1) Install isolation transformer on exterior of existing control panel enclosure.
- D. Lift Station 3 generally includes:
 - 1. (ADD1) Replace 4" wet well piping and (2) base elbows.
 - 2. Replace generator and concrete equipment pad.

- 3. Blast and re-coat dry well piping.
- 4. Install light pole and LED fixture.
- 5. Install new alarm system.
- 6. (ADD1) Add service disconnect to exterior of existing control panel enclosure.
- 7. (ADD1) Install isolation transformer on exterior of existing control panel enclosure.
- E. Lift Station 4 generally includes
 - 1. (ADD1) Replace 4" wet well piping and (2) base elbows.
 - 2. Install generator and concrete equipment pad.
 - 3. Install fence, gates and landscaping.
 - 4. Install LED light fixture on existing pole.
 - 5. Install new alarm system.
 - 6. (ADD1) Add service disconnect to exterior of existing control panel enclosure.
 - 7. (ADD1) Install isolation transformer on exterior of existing control panel enclosure.
- F. Lift Station No. 5 generally includes:
 - 1. (ADD1) Replace 4" wet well piping and (2) base elbows.
 - 2. Install bollards.
 - 3. Replace submersible pump.
 - 4. Install LED light fixture.
 - 5. Install new alarm system.
 - 6. Install landscaping.
 - 7. (ADD1) Add service disconnect to exterior of existing control panel enclosure.
 - 8. (ADD1) Install isolation transformer on exterior of existing control panel enclosure.
- G. Lift Station No. 6 generally includes:
 - 1. (ADD1) Coat steel wet well and dry well with corrosion-resistant lining material.
 - 2. (ADD1) Replace 6" wet well piping and (2) base elbows.
 - 3. Install new control panel.
 - 4. Install new light pole and LED fixture.
- H. Lift Station No. 7 generally includes:
 - 1. Install new control panel.
 - 2. Install new light pole and fixture.
 - 3. Install access hatch fall protection on dry well access hatch.
 - 4. (ADD1) Install (1) submersible pump and (1) base elbow.
 - 5. (ADD1) Replace 10" wet well piping
 - 6. Remove fencing.
 - 7. Replace generator and concrete equipment pad.
 - 8. Install landscaping

The Work shall be performed at the following Work Sites:

Lift Station No. 1 - 598 Fritzsche Rd, Lakemoor. On the NE corner of Fritzsche and Wegner Lift Station No. 2 - North end of Herbert Road, enter John Deere Landscapes, on west side of road Lift Station No. 3 - 316 Venice Rd, Lakemoor Lift Station No. 4 - 112 Lily Lake Pkwy, Lakemoor Lift Station No. 5 - 532 Santa Barbara Road, Lakemoor Lift Station No. 6 - 32205 Darrell Rd, Lakemoor (at Heritage Community Park entrance) Lift Station No. 7 - 160 South Drive, Lakemoor. On the south side of South Drive at Venice Road

2. Defined Terms

All terms capitalized in this Invitation for Bidder's Proposals and in the other documents included in the Bid Package are defined in the documents included in the Bid Package, as hereinafter defined, and shall have such defined meanings wherever used.

3. <u>The Bid Package</u>

The Bid Package consists of the following documents, all of which are by this reference made a part of this Invitation for Bidder's Proposals as though fully set forth herein:

- (1) Invitation for Bidder's Proposals;
- (2) General Instructions to Bidders;
- (3) Addenda, if issued;
- (4) Bidder's Proposal;
- (5) Bidder's Sworn Acknowledgement;
- (6) Bidder's Sworn Work History Statement;
- (7) Other Information Submitted by Bidder, if requested;
- (8) Notice of Award; and
- (9) Contract, including all of its Attachments and Appendices, if any.

4. **Inspection and Examination**

The Bid Package may be inspected and purchased at the following location: Trotter and Associates, Inc. 40W201 Wasco Rd. Suite D St. Charles, Illinois 60175 630/587–0470 Payment for Contract Documents is non-refundable and shall be payable to Trotter and Associates, Inc. in the form of cash, certified check or money order. No partial sets of specifications or drawings will be issued. The non-refundable cost for plans and specifications is \$50.00. Contract documents can be distributed electronically if requested by the Contractor. Addenda will be issued only to plan holders. Please contact Andrea Fialko (630) 587-0470 a.fialko@trotter-inc.com to purchase contract documents. All other questions should be directed to Jillian Kiss (630) 587-0470 j.kiss@trotter-inc.com.

Each prospective Bidder shall, before submitting its Bidder's Proposal, carefully examine the Bid Package. Each prospective Bidder shall inspect in detail the Work Site and the surrounding area and shall familiarize itself with all local conditions, including subsurface, underground and other concealed conditions, affecting the Contract, the Work, and the Work Site. The Bidder whose Bidder's Proposal is accepted will be responsible for all errors in its Bidder's Proposal.

5. Bid Opening

Owner will receive sealed Bidder's Proposals for the Work until 1:00pm, local time, September (ADD1) 7th 21st, 2022, at Owner's office listed above, at which time, or as soon thereafter as possible, all Bidder's Proposals will be publicly opened and read aloud. Bidders or their agents are invited to be present.

6. Bid Security, Bonds and Insurance

A. <u>Bid Security</u>. Each Bidder's Proposal shall be accompanied by a security deposit of ten percent of the Bidder's Price Proposal in the form of (1) a Cashier's Check or Certified Check drawn on a solvent bank insured by the Federal Deposit Insurance Corporation and payable without condition to Owner or (2) a Bid Bond in a form satisfactory to Owner from a surety company licensed to do business in the State of Illinois with a general rating of A minus and a financial size category of Class X or better in Best's Insurance Guide.

B. <u>Performance and Payment Bonds</u>. The successful Bidder may be required to furnish a Performance Bond and a Labor and Material Payment Bond upon award of the Contract, each in the penal sum of the full amount of the Contract Price, on forms provided by, or otherwise acceptable to, Owner.

C. <u>Insurance</u>. The successful Bidder will be required to furnish certificates and policies of insurance as required by the Contract upon award of the Contract. Each Bidder's Proposal must be accompanied by a letter from Bidder's insurance carrier or its agent certifying that said insurer has read the requirements set forth in the Contract and will issue the required certificates and policies of insurance upon award of the Contract to Bidder.

- 7. Pre-Bid Conference
 - A. A Pre-Bid Conference will be held on August 17th, 2022 at 10:00am at the District's office 113 Timber Trail, Island Lake, IL 60042.

SECTION 40 05 06 - COUPLINGS, ADAPTERS, AND SPECIALS FOR PROCESS PIPING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Pipe pressure testing.
 - 2. Cleaning, disinfection and purging.
 - 3. Restrained joints.

B. Related Requirements:

- 1. Division 0 Procurement and Contracting Requirements.
- 2. Division 1 General Requirements.
- 3. Section 40 05 19 Ductile Iron Process Pipe.

1.2 DEFINITIONS

- A. FM: Factory Mutual Insurance Company; FM Global is the communicative name of the company.
- B. WH: Warnock Hersey; indicates compliance to relevant building codes, association criteria, and product safety and performance standards.

1.3 REFERENCE STANDARDS

- A. American Water Works Association:
 - 1. AWWA C219 Bolted, Sleeve-Type Couplings for Plain-End Pipe.
- B. American Welding Society:
 - 1. AWS D1.1/D1.1M Structural Welding Code Steel.
- C. ASME International:
 - 1. ASME A13.1 Scheme for the Identification of Piping Systems.
 - 2. ASME B31.3 Process Piping.
 - 3. ASME B31.9 Building Services Piping.
- D. ASTM International:
 - 1. ASTM D2000 Standard Classification System for Rubber Products in Automotive Applications.
- E. NSF International:
 - 1. NSF 61 Drinking Water System Components Health Effects.
 - 2. NSF 372 Drinking Water System Components Lead Content.

1.4 COORDINATION

- A. Section 01 30 00 Administrative Requirements: Requirements for coordination.
- B. Coordinate Work of this Section with installation of valves and equipment.

1.5 SUBMITTALS

- A. Section 01 33 00 Submittal Procedures: Requirements for submittals.
- B. Product Data:
 - 1. Submit manufacturer catalog information for each specified product.
- C. Shop Drawings:
 - 1. Identification:
 - a. Submit list of wording, symbols, letter size, and color coding for pipe identification.
 - b. Comply with ASME A13.1.
 - 2. Indicate restrained joint details and materials.
 - 3. Submit layout drawings showing piece numbers and location, indicating restrained joint locations.
 - 4. Indicate layout of piping systems, including flexible connectors, expansion joints and compensators, loops, offsets, and swing joints.
- 1.6 CLOSEOUT SUBMITTALS
 - A. Section 01 70 00 Execution and Closeout Requirements: Requirements for submittals.
- 1.7 QUALITY ASSURANCE
 - A. Materials in Contact with Potable Water: Certified to NSF Standards 61 and 372.
 - B. Perform Work according to ASME B31.3, ASME B31.9 and applicable code for installation of piping systems.

1.8 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years' documented experience.
- B. Installer: Company specializing in performing Work of this Section with minimum three years' documented experience and approved by manufacturer.
- 1.9 DELIVERY, STORAGE, AND HANDLING
 - A. Section 01 60 00 Product Requirements: Requirements for transporting, handling, storing, and protecting products.

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1.10 EXISTING CONDITIONS

- A. Field Measurements:
 - 1. Verify field measurements prior to fabrication.
 - 2. Indicate field measurements on Shop Drawings.

1.11 WARRANTY

- A. Section 01 70 00 Execution and Closeout Requirements: Requirements for warranties.
- B. Furnish five-year manufacturer's warranty for items covered under this specification section.

PART 2 - PRODUCTS

2.1 PIPE PRESSURE TESTING

- A. Pipe Testing General:
 - 1. Test piping systems as follows:
 - a. Test exposed, non-insulated piping systems upon completion of system.
 - b. Test exposed, insulated piping systems upon completion of system but prior to application of insulation.
 - c. Test concealed interior piping systems prior to concealment and, if system is insulated, prior to application of insulation.
 - d. Test buried piping (insulated and non-insulated) prior to backfilling and, if insulated, prior to application of insulation.
 - 2. Utilize pressures, media and pressure test durations as specified in Piping Specification Schedules.
 - 3. Isolate equipment which may be damaged by the specified pressure test conditions.
 - 4. Perform pressure test using calibrated pressure gages and calibrated volumetric measuring equipment to determine leakage rates.
 - a. Select each gage so that the specified test pressure falls within the upper half of the gage's range.
 - b. Notify the Engineer 24 HRS prior to each test.
 - 5. Completely assemble and test new piping systems prior to connection to existing pipe systems.
 - 6. Acknowledge satisfactory performance of tests and inspections in writing to Engineer prior to final acceptance.
 - 7. Bear the cost of all testing and inspecting, locating and remedying of leaks and any necessary retesting and re-examination.
- B. Pressure Testing:
 - 1. Testing medium: Unless otherwise specified in the Piping Specifications, utilize the following test media.
 - a. Process and plant air systems:
 - 1) 2 IN and smaller, tested at 75 psi or less: Air or water
 - 2) 2 IN and smaller, tested at greater than 75 psi or less: Water

- 3) Greater than 2 IN, tested at 3 psi or less: Air or water
- 4) Greater than 2 IN, tested at greater than 3 psi: Water
- b. Liquid systems:
 - 1) Up to and including 48 IN gravity systems, tested at 25 psig or less: Air or water.
 - 2) Above 48 IN gravity systems, tested at 25 psig or less: Water.
 - 3) All sizes of pumped systems, tested at 250 psig or less: Water
- 2. Allowable leakage rates:
 - a. Hazardous gas systems, all exposed piping systems, all pressure piping systems and all buried, insulated piping systems which are hydrostatically pressure tested shall have zero leakage at the specified test pressure throughout the duration of the test.
 - b. Hydrostatic exfiltration and infiltration for sanitary and stormwater sewers (groundwater level is below the top of pipe):
 - 1) Leakage rate: 200 GAL per inch diameter per mile of pipe per day at average head on test section of 3 FT.
 - 2) Average head is defined from groundwater elevation to average pipe crown.
 - 3) Acceptable test head leakage rate for heads greater than 3 FT: Acceptable leakage rate (gallons per inch diameter per mile per day) = 115 x (actual test head to the 1/2 power).
 - c. Hydrostatic infiltration test for sanitary and stormwater sewers (groundwater level is above the top of pipe):
 - 1) Allowable leakage rate: 200 GAL per inch diameter per mile of pipe per day when depth of groundwater over top of pipe is 2 to 6 FT.
 - Leakage rate at heads greater than 6 FT: Allowable leakage rate (gallons per inch diameter per mile of pipe per day) = 82 x (actual head to the 1/2 power).
 - d. Large diameter (above 48 IN) gravity plant piping systems shall have a maximum exfiltration of 25 gpd per inch-mile.
 - e. Non-hazardous gas and air systems which are tested with air shall have a maximum pressure drop of 5 percent of the specified test pressure throughout the duration of the test.
 - f. For low pressure (less than 25 psig) air testing, the acceptable time for loss of 1 psig of air pressure shall be:

Pipe Size (inches diameter)	Time (minutes per 100 LF)
4	0.3
6	0.7
8	1.2
10	1.5
12	1.8
15	2.1
18	2.4
21	3.0
24	3.6
27	4.2
30	4.8
33	5.4
36	6.0
42	7.3
48	7.6

- 3. Hydrostatic pressure testing methodology:
 - a. General:
 - 1) All joints, including welds, are to be left exposed for examination during the test.
 - 2) Provide additional temporary supports for piping systems designed for vapor or gas to support the weight of the test water.
 - 3) Provide temporary restraints for expansion joints for additional pressure load under test.
 - 4) Isolate equipment in piping system with rated pressure lower than pipe test pressure.
 - 5) Do not paint or insulate exposed piping until successful performance of pressure test.
 - b. Soil, waste, drain and vent systems:
 - 1) Test at completion of installation of each stack or section of piping by filling system with water and checking joints and fittings for leaks.
 - 2) Eliminate leaks before proceeding with work or concealing piping.
 - 3) Minimum test heights shall be 10 FT above highest stack inlet.
 - c. Larger diameter (above 36 IN) gravity plant piping:
 - 1) Plug downstream end of segment to be tested. Provide bracing as required.
 - 2) Fill segment and upstream structure to normal operating level as per hydraulic profile.
 - 3) Allow 24 HRS for absorption losses.
 - 4) Refill to original level.
 - 5) Provide reservoir to maintain constant head over duration of test.
 - 6) Record reservoir water volume at beginning and end of test.

- 4. Air testing methodology:
 - a. General:
 - 1) Assure air is ambient temperature.
 - b. Low pressure air testing:
 - 1) Place plugs in line and inflate to 25 psig.
 - 2) Check pneumatic plugs for proper sealing.
 - 3) Introduce low pressure air into sealed line segment until air pressure reaches 4 psig greater than ground water that may be over the pipe.
 - a) Use test gage conforming to ASME B40.100 with 0 to 15 psi scale and accuracy of 1 percent of full range.
 - 4) Allow 2 minutes for air pressure to stabilize.
 - 5) After stabilization period (3.5 psig minimum pressure in pipe) discontinue air supply to line segment.
 - 6) Record pressure at beginning and end of test.
- C. Dielectric Testing Methods and Criteria:
 - 1. Provide electrical check between metallic non-ferrous pipe or appurtenances and ferrous elements of construction to assure discontinuity has been maintained.
 - 2. Wherever electrical contact is demonstrated by such test, locate the point or points of continuity and correct the condition.

2.2 CLEANING, DISINFECTION AND PURGING

- A. Cleaning:
 - 1. Clean interior of piping systems thoroughly before installing.
 - 2. Maintain pipe in clean condition during installation.
 - 3. Before jointing piping, thoroughly clean and wipe joint contact surfaces and then properly dress and make joint.
 - 4. Immediately prior to pressure testing, clean and remove grease, metal cuttings, dirt, or other foreign materials which may have entered the system.
 - 5. At completion of work and prior to Final Acceptance, thoroughly clean work installed under these Specifications.
 - a. Clean equipment, fixtures, pipe, valves, and fittings of grease, metal cuttings, and sludge which may have accumulated by operation of system, from testing, or from other causes.
 - b. Repair any stoppage or discoloration or other damage to parts of building, its finish, or furnishings, due to failure to properly clean piping system, without cost to Owner.

2.3 RESTRAINED JOINTS

A. As specified in associated piping Sections.

2.4 FINISHES

- A. Prepare piping appurtenances for field finishes as specified in Section 09 96 00 High Performance Coatings.
- 2.5 SOURCE QUALITY CONTROL
 - A. Section 01 40 00 Quality Requirements: Requirements for testing, inspection, and analysis.
 - 1. Provide shop inspection and testing of completed assemblies.
 - B. Certificate of Compliance:
 - 1. If manufacturer is approved by authorities having jurisdiction, submit certificate of compliance indicating Work performed at manufacturer's facility conforms to Contract Documents.
 - 2. Specified shop tests are not required for Work performed by approved manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 01 70 00 Execution and Closeout Requirements: Requirements for installation examination.
- B. Verify that field dimensions are as indicated on Drawings.
- C. Inspect existing flanges for nonstandard bolt hole configurations or design and verify that new pipe and flanges mate properly.
- D. Verify that openings are ready to receive sleeves and firestopping.
- E. Verify that pipe plain ends to receive sleeve-type couplings are smooth and round for 12 inches from pipe ends.
- F. Verify that pipe outside diameter conforms to sleeve manufacturer's requirements.

3.2 PREPARATION

- A. Section 01 70 00 Execution and Closeout Requirements: Requirements for installation preparation.
- B. Cleaning: Thoroughly clean end connections before installation.
- C. Close pipe and equipment openings with caps or plugs during installation.
- D. Surface Preparation: Clean surfaces to remove foreign substances.

3.3 INSTALLATION

- A. According to ASME B31.3.
- B. Restrained Joints: As specified in associated piping Sections.
- 3.4 FIELD QUALITY CONTROL
 - A. Section 01 40 00 Quality Requirements: Requirements for inspecting and testing.
 - B. Section 01 70 00 Execution and Closeout Requirements.
 - C. Repair damaged coatings with material equal to original coating.

3.5 CLEANING

- A. Section 01 70 00 Execution and Closeout Requirements: Requirements for cleaning.
- B. Keep equipment interior clean as installation progresses.

END OF SECTION 40 05 06

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes: Pipe support and anchor systems.
- B. Related Sections include but are not necessarily limited to:
 - 1. Division 0 Procurement and Contracting Requirements.
 - 2. Division 1 General Requirements.
 - 3. Section 09 96 00 Painting and Protective Coatings.

1.2 QUALITY ASSURANCE

- A. Referenced Standards:
 - 1. ANVIL International (ANVIL).
 - 2. American Society of Mechanical Engineers (ASME):
 - a. B31.1, Power Piping.
 - b. B31.3, Process Piping.
 - 3. ASTM International (ASTM):
 - a. A36, Standard Specification for Carbon Structural Steel.
 - b. A575, Standard Specification for Steel Bars, Carbon, Merchant Quality, M-Grades.
 - c. A576, Standard Specification for Steel Bars, Carbon, Hot-Wrought, Special Quality.
 - 4. American Welding Society (AWS):
 - a. D1.1, Structural Welding Code Steel.
 - 5. Manufacturers Standardization Society of the Valve and Fittings Industry Inc. (MSS):
 - a. SP-58, Pipe Hangers and Supports Materials, Design and Manufacture.
 - b. SP-69, Pipe Hangers and Supports Selection and Application.

1.3 SUBMITTALS

- A. Shop Drawings:
 - 1. See Section 01 30 00 for requirements for the mechanics and administration of the submittal process.
 - 2. Product technical data including:
 - a. Acknowledgement that products submitted meet requirements of standards referenced.
 - b. Manufacturer's installation instructions.
 - c. Itemized list of wall sleeves, anchors, support devices and all other items related to pipe support system.
 - d. Scale Drawings showing guides, hangers, supports, anchors, structural members and appurtenances to describe the pipe support system.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Subject to compliance with the Contract Documents, the manufacturers listed in the applicable Articles below are acceptable.
- B. Submit request for substitution in accordance with Specification Section 01 60 00.

2.2 MANUFACTURED UNITS

- A. Hanger Rods:
 - 1. Material:
 - a. ASTM A36.
 - b. ASTM A575, Grade M1020.
 - c. ASTM A576, Grade 1020.
 - d. Minimum allowable tensile stress of 12,000 psi at 650 DegF per MSS SP-58.
 - 2. Continuously threaded.
 - 3. Electro-galvanized or cadmium plated after threads are cut.
 - 4. Load limit:

NOMINAL ROD	MAXIMUM SAFE LOAD,
DIAMETER	(LBS)
3/8 IN DIA (min)	610
1/2 IN DIA	1,130
5/8 IN DIA	1,810
3/4 IN DIA	2,710
7/8 IN DIA	3,770
1 IN DIA	4,960

B. Hangers:

- 1. Hangers for use directly on copper pipe: Copper or cadmium plated.
- 2. Hangers for use other than directly on copper pipe: Cadmium plated or galvanized.
- 3. Hanger type schedule:

APPLICATION	PIPE SIZE	HANGER TYPE
All except noted	4 IN and less	ANVIL Figure 108 with Figure 114
All except noted	Over 4 IN	ANVIL Figure 590
Steam, condensate and hot	All	ANVIL Figure 181, Figure 82
water		

- C. Concrete Inserts for Hanger Rods:
 - 1. Continuous slots: Unistrut #P1000.
 - 2. Individual inserts: ANVIL Figure 281.
 - 3. Self-drilling expansion anchors: Phillips flush-end or snap-off end type.
- D. Beam Clamps for Hanger Rods:
 - 1. Heavy duty.

- 2. ANVIL Figure 133
- E. Trapeze Hangers for Suspended Piping:
 - 1. Material:
 - a. Galvanized Steel.
 - 2. Angles, channels, or other structural shapes.
 - 3. Curved roller surfaces at support point corresponding with type of hanger required.
- F. Vertical Pipe Supports:
 - 1. At base of riser.
 - 2. Lateral movement:
 - a. Clamps or brackets:
 - 1) ANVIL Figure 261
- G. Expanding Pipe Supports:
 - 1. Spring hanger type.
 - 2. MSS SP-58.
- H. Pipe Support Saddle:
 - 1. For pipe located 3 FT or less from floor elevation, except as otherwise indicated on Drawings.
 - 2. 304 L stainless steel for exterior and corrosive installations.
 - 3. ANVIL Figure 264.
- I. Pipe Support Risers:
 - 1. Schedule 40 pipe.
 - 2. 304 L stainless steel for exterior and corrosive installations.
 - 3. Galvanized.
 - 4. As recommended by saddle manufacturer.
- J. Pipe Support Base Plate:
 - 1. 4 IN larger than support.
 - 2. Collar 3/16 IN thickness, circular in shape, and sleeve type connection to pipe.
 - 3. Collar fitted over outside of support pipe and extended 2 IN from floor plate.
 - 4. Collar welded to floor plate.
 - 5. Edges ground smooth.
 - 6. All other assemblies shall be hot dipped galvanized after fabrication.
- K. Pipe Covering Protection Saddle:
 - 1. For insulated pipe at point of support.
 - 2. ANVIL Figure 167, Type B.
- L. Wall Brackets:
 - 1. For pipe located near walls and 8 FT or more above floor elevation or as otherwise indicated on the Drawings.
 - 2. ANVIL Figure 199.
- M. Pipe Anchors:
 - 1. For locations shown on the Drawings.
 - 2. Pipe anchors located in corrosive areas shall be 1/4 IN type 304 stainless steel.

- 3. All other pipe anchors shall be 1/4 IN steel plate construction.
- 4. Hot dipped galvanized after fabrication.
- 5. Designed to prevent movement of pipe at point of attachment.

N. Pipe Guides:

- 1. For locations on both sides on each expansion joint or loop.
- 2. To ensure proper alignment of expanding or contracting pipe.
- 3. ANVIL Figure 256.

2.3 DESIGN REQUIREMENTS

- A. Supports capable of supporting the pipe for all service and testing conditions.1. Provide 5 to 1 safety factor.
- B. Allow free expansion and contraction of the piping to prevent excessive stress resulting from service and testing conditions or from weight transferred from the piping or attached equipment.
- C. Design supports and hangers to allow for proper pitch of pipes.
- D. For chemical and waste piping, design, materials of construction and installation of pipe hangers, supports, guides, restraints, and anchors:
 - 1. ASME B31.3.
 - 2. MSS SP-58 and MSS SP-69.
 - 3. Except where modified by this Specification.
- E. For steam and hot and cold water piping, design, materials of construction and installation of pipe hangers, supports, guides, restraints, and anchors:
 - 1. ASME B31.1.
 - 2. MSS SP-58 and MSS SP-69.
- F. Check all physical clearances between piping, support system and structure.1. Provide for vertical adjustment after erection.
- G. Support vertical pipe runs in pipe chases at base of riser.
 - 1. Support pipes for lateral movement with clamps or brackets.
- H. Place hangers on outside of pipe insulation.
 - 1. Use a pipe covering protection saddle for insulated pipe at support point.
 - 2. Insulated piping 1-1/2 IN and less: Provide a 9 IN length of 9 LB density fiberglass insulation at saddle.
 - 3. Insulated piping over 1-1/2 IN: Provide a 12 IN length of 9 LB density fiberglass insulation on saddle.
- I. Provide 20 GA galvanized steel pipe saddle for fiberglass and plastic support points to ensure minimum contact width of 4 IN.

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- J. Pipe Support Spacing:
 - 1. General:
 - a. Factor loads by specific weight of liquid conveyed if specific weight is greater than water.

- b. Locate pipe supports at maximum spacing scheduled unless indicated otherwise on the Drawings.
- c. Provide at least one (1) support for each length of pipe at each change of direction and at each valve.
- 2. Steel, stainless steel, cast-iron pipe support schedule:

PIPE SIZES - IN	MAXIMUM SPAN - FT
1-1/2 and less	5
2 thru 4	10
5 thru 8	15
10 and greater	20

3. Copper pipe support schedule:

PIPE SIZES - IN	MAXIMUM SPAN -
	FT
2-1/2 and less	5
3 thru 6	10
8 and greater	15

4. PVC pipe support schedule:

PIPE SIZES - IN	MAXIMUM SPAN -
	FT
1-1/4 and less	3
1-1/2 thru 3	4
4 and greater	5

* Maximum fluid temperature of 120 DegF.

- 5. Support each length and every fitting:
 - a. Bell and spigot piping:
 - 1) At least one (1) hanger.
 - 2) Applied at bell.
 - b. Mechanical coupling joints:
 - 1) Place hanger within 2 FT of each side of fittings to keep pipes in alignment.
- 6. Space supports for soil and waste pipe and other piping systems not included above every 5 FT.
- 7. Provide continuous support for nylon tubing.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Provide piping systems exhibiting pulsation, vibration, swaying, or impact with suitable constraints to correct the condition.
 - 1. Included in this requirement are movements from:
 - a. Trap discharge.
 - b. Water hammer.

- c. Similar internal forces.
- B. Weld Supports:
 - 1. AWS D1.1.
 - 2. Weld anchors to pipe in accordance with ASME B31.3.
- C. Locate piping and pipe supports as to not interfere with open accesses, walkways, platforms, and with maintenance or disassembly of equipment.
- D. Inspect hangers for:
 - 1. Design offset.
 - 2. Adequacy of clearance for piping and supports in the hot and cold positions.
 - 3. Guides to permit movement without binding.
 - 4. Adequacy of anchors.
- E. Inspect hangers after erection of piping systems and prior to pipe testing and flushing.
- F. Install individual or continuous slot concrete inserts for use with hangers for piping and equipment.
 - 1. Install concrete inserts as concrete forms are installed.
- G. Welding:
 - 1. Welding rods: ASTM and AWS standards.
 - 2. Integral attachments:
 - a. Include welded-on ears, shoes, plates and angle clips.
 - b. Ensure material for integral attachments is of good weldable quality.
 - 3. Preheating, welding and postheat treating: ASME B31.3, Chapter V.
- H. Field Painting:
 - 1. Comply with Section 09 90 00.

END OF SECTION 40 05 07

SECTION 40 05 19 - DUCTILE IRON PROCESS PIPE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

- 1. Ductile iron pipe and fittings.
- 2. Accessories.

B. Related Requirements:

- 1. Section 33 05 19 Pressure Piping Tied Joint Restraint System.
- 2. Section 40 05 06 Couplings, Adapters and Specials for Process Piping.
- 3. Section 40 05 51 Common Requirements for Process Valves.

1.2 REFERENCE STANDARDS

- A. American Society of Mechanical Engineers:
 - 1. ASME B16.1 Gray Iron Pipe Flanges and Flanged Fittings.
 - 2. ASME B31.3 Process Piping Design.
- B. ASTM International:
 - 1. ASTM A48 Standard Specification for Gray Iron Castings.
- C. American Water Works Association:
 - 1. AWWA C104/A21.4 Cement-Mortar Lining for Ductile-Iron Pipe and Fittings.
 - 2. AWWA C105/A21.5 Polyethylene Encasement for Ductile-Iron Pipe Systems.
 - 3. AWWA C110/A21.10 Ductile-Iron and Gray-Iron Fittings.
 - 4. AWWA C111/A21.11 Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
 - 5. AWWA C150/A21.50 Thickness Design of Ductile-Iron Pipe.
 - 6. AWWA C151/A21.51 Ductile-Iron Pipe, Centrifugally Cast.
 - 7. AWWA C153/A21.53 Ductile-Iron Compact Fittings.
 - 8. AWWA C600 Installation of Ductile-Iron Mains and Their Appurtenances.
- D. The Society for Protective Coatings:
 - 1. SSPC-SP 6/NACE No. 3 Commercial Blast Cleaning.

1.3 COORDINATION

- A. Section 01 30 00 Administrative Requirements: Requirements for coordination.
- B. Coordinate Work of this Section with piping and equipment connections specified in other Sections and indicated on Drawings.

1.4 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Submittal procedures.

- B. Product Data: Submit manufacturer's catalog information on pipe materials and fittings.
- C. Shop Drawings: Submit under provisions of Section 01 33 00 and include the following:
 - 1. Certified dimensional drawings of all valves, fittings and appurtenances.
 - 2. Certified dimensional drawings of joints showing the manufacturer's allowable deflections.
 - 3. Copies of the manufacturer's approved installation instructions for the types of joints being used.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Section 01 70 00 Execution and Closeout Requirements: Requirements for maintenance materials.
- B. Tools: Furnish any special devices required for Owner to maintain fittings and appurtenances.

1.6 QUALITY ASSURANCE

- A. Perform Work according to manufacturer's standards.
- B. Maintain a copy of each standard affecting the Work of this Section on-site.
- C. Inspection: All pipe shall be subject to inspection at the place of manufacture, in accordance with the provisions of the referenced standards, as supplemented by the requirements herein.
- D. Tests: Except as modified herein, all materials used in the manufacture of the pipe shall be tested in accordance with requirements as applicable.
- E. Test Costs: Manufacturer shall perform said material tests at no additional cost to the Owner. Engineer shall have the right to witness all testing conducted by the Manufacturer.
- F. Affidavits: Contractor shall submit affidavits of compliance from the Manufacturer for the following:
 - 1. Ductile iron pipe is in accordance with the requirements of AWWA C151 and these specifications.
 - 2. Cement-mortar lining of ductile iron pipe, appurtenances and fittings is in accordance with the requirements of AWWA C104 and these specifications.
 - 3. If specified, polyethylene encasement for ductile iron piping is in accordance with AWWA C105.
 - 4. The grooved coupling manufacturer's factory trained representative shall provide on-site training for contractor's field personnel in the use of grooving tools, application of groove, and installation of grooved joint products. (A distributor's representative is not considered qualified to conduct the training.) The manufacturer's representative shall periodically visit the jobsite and review installation. Contractor shall remove and replace any joints deemed improperly installed.
 - 5. Rubber gasket joints for ductile iron pressure pipe and fittings is in accordance with the requirements of AWWA C111 and these specifications.
 - 6. Charpy impact testing of ductile iron used in the manufacture of pipe shall be performed in accordance with AWWA C151. The minimum corrected absorbed energy shall be 7 ft.–lbs. at 70° F +10° F.

- 7. Low-temperature impact tests shall be made from at least 10% of the test pipe to assure compliance. The minimum corrected absorbed energy shall be 3 ft.-lbs. at -40° F.
- 8. Affidavits of compliance shall be certified by a registered professional engineer.

1.7 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum five years' documented experience.
- B. Installer: Company specializing in performing Work of this Section with minimum five years' documented experience and approved by manufacturer.
- C. Licensed Professional: Professional engineer experienced in design of specified Work and licensed in State of Illinois.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.

1.9 EXISTING CONDITIONS

A. Field Measurements: Verify field measurements prior to fabrication. Indicate field measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 DUCTILE IRON PIPE AND FITTINGS

- A. Manufacturers:
 - 1. American Cast Iron Pipe Company Birmingham, Alabama.
 - 2. Atlantic States Cast Iron Pipe Company Phillipsburg, New Jersey.
 - 3. Clow Water Systems Co. Coshocton, Ohio.
 - 4. Griffin Pipe Products Co. Downers Grove, Illinois.
 - 5. McWane Cast Iron Pipe Co. Birmingham, Alabama.
 - 6. Pacific States Cast Iron Pipe Co. Provo, Utah.
 - 7. United States Pipe and Foundry Co. Birmingham, Alabama.
 - 8. Substitutions: Specified in Section 01 60 00 Product Requirements.
- B. Piping:
 - 1. Diameter and Class: As indicated on Drawings.
 - 2. Furnishing and installation of Ductile Iron Pipe and all appurtenances, complete in place, all in accordance with the requirements of the Contract Documents. Where standards, specifications or methods are cited without dates, the reference shall be construed to apply to the latest revision in effect at the time of contract.
 - 3. Standards: Ductile iron pipe shall conform to AWWA C151, subject to the following supplemental requirements. The pipe shall be of the diameter and class shown on the plans, shall be furnished complete with rubber gaskets as indicated in the Contract Documents, and all appurtenances and fittings shall be provided as required under the Contract Documents.
- 4. Laying Lengths: Pipe laying lengths shall be provided in 20–foot nominal lengths with allowable trim pipe lengths in accordance with AWWA C151 and special shorter lengths provided as required by the Drawings.
- 5. The class or nominal thickness, net weight without lining, and casting period shall be clearly marked on each length of pipe. Additionally, the manufacturer's mark, country where cast, year in which the pipe was produced, and the letters "DI" or "Ductile" shall be stamped on the pipe.
- 6. Pipe Design Parameters: All ductile iron pipe shall be designed and manufactured in accordance with AWWA C150 and AWWA C151, respectively, for the following minimum operating conditions:
 - a. The minimum internal design pressure shall be 150–psi with a 100–psi surge allowance, with a safety factor of 2.0 for a total internal design pressure of 500–psi. No reduction of safety factor for transient pressures shall be allowed.
 - b. The thickness design of ductile iron pipe shall be in accordance with AWWA C150.
 - c. The external loads design criteria shall be a minimum of 36" depth of cover at 120 pcf soil weight and live load based on one AASHTO H–20 load.
 - d. The horizontal deflection of cement-mortar lined ductile iron pipe resulting from external load conditions shall not exceed 3% of the pipe diameter.
 - e. The pipe trench, per AWWA C150, for design purposes shall be:
 - Laying condition Type 5 Pipe bedded to its centerline in compacted granular material, 4" minimum under pipe. Compacted granular or select material to top of pipe. (Approximately 90% Standard Proctor, AASHTO T-99.)
 - f. For purposes of restrained joint calculations per the Ductile Iron Pipe Research Association (DIPRA) method, the soil classification as described in "Thrust Restraint Design for Ductile Iron Pipe", Current Edition, for both the native trench soil and also the backfill soil to surround the pipe shall be considered to be cohesive–granular.
- 7. Minimum Pipe Class: Ductile iron pipe shall conform to AWWA C151. All pipe shall have a minimum pressure rating as indicated below, or higher ratings as indicated in the contract documents:

Nominal Pipe Diameter	Pressure Class
4" to 12"	350-psi
14" to 20"	250–psi
24"	200-psi
30" to 64"	150–psi

C. Joints:

- 1. Pressure Rating: As indicated on Drawings.
- 2. General: Ductile Iron Pipe and fittings shall be furnished with:
 - a. Below Grade: Push–on joints, push–on restrained joints, or mechanical joints.
 - b. Above Grade: Flanged or grooved-end joints as indicated on Drawings.
- 3. Mechanical Joints:
 - a. Acceptable Manufacturers
 - 1) EBAA Iron, Inc. Eastland, Texas Series 1100 MEGALUG.

- 2) Product substitutions allowed per Section 01 60 00 Product Requirements.
- b. Design
 - 1) Restraint devices for nominal pipe sizes 3" through 48" shall consist of multiple gripping wedges incorporated into a follower gland meeting the applicable requirements of ANSI/AWWA C110/A21.10.
 - 2) Devices shall have a working pressure rating of 350-psi for 3" to 16" and 250-psi for 18" to 48" pipe. Ratings are for water pressure must include a minimum safety factor of 2.0 for all sizes.
- c. Material
 - 1) Gland body, wedges and wedge actuating components shall be cast from grade 65–45–12 ductile iron material in accordance with ASTM A536.
 - 2) Ductile iron gripping wedges shall be heat treated within a range of 370 to 470 BHN.
 - 3) Three (3) test bars shall be incrementally poured per production shift as per Underwriter's Laboratory (U.L.) specifications and ASTM A536. Testing for tensile, yield and elongation shall be done in accordance with ASTM E8.
 - 4) Chemical and nodularity tests shall be performed as recommended by the Ductile Iron Society, on a per ladle basis.
- d. Coating System
 - 1) All wedge assemblies and related parts shall be processed through a phosphate wash, rinse and drying operation prior to coating application. The coating shall consist of a minimum of two coats of a liquid fluoropolymer coating with heat cure to follow each coat.
 - 2) All casting bodies shall be surface pretreated with a phosphate wash, rinse and sealer before drying. The coating shall be electrostatically applied and heat cured. The coating shall be a polyester based powder to provide corrosion, impact and UV resistance.
- e. Traceability
 - 1) An identification number consisting of year, day, plant and shift shall be cast into each gland body.
 - 2) All physical and chemical test results shall be recorded such that they can be accessed via the identification number on the casting. These Material Traceability Records (MTR's) are to be made available, in hard copy, to the purchaser that requests such documentation and submits his gland body identification number.
- 4. Push-on Joints:
 - a. Push–on joints shall conform to AWWA C111.
 - b. Gasket material shall be as shown on the plans and/or as designated GASKET MATERIAL SCHEDULE shown below.
 - c. The pressure rating for push-on joints shall be a minimum of 350-psi or the specified pressure rating of the pipe, whichever is less.
 - d. Standard allowable joint deflection for push-on type pipe shall be:

Nominal Pipe Diameter	Deflection
4" to 30"	5°
36"	4°

42" to 64" 3°

e.

- 5. Restrained Joints:
 - a. AWWA C111.
 - b. Restrained joints shall be boltless, push-on restrained devices and shall be provided by the same manufacturer supplying the pipe.
 - c. Gasket material shall be as shown on the plans and/or as designated GASKET MATERIAL SCHEDULE shown below.
 - d. Restrained joints and restrained joint pipe shall be rated for the minimum pressure shown in specified pressure rating of the pipe.
 - e. Manufacturer shall furnish test results showing that restrained joints in the sizes specified have been successfully tested to at least twice the specified pressure rating of the joint without leakage or failure.
 - 1) Tests shall be performed on pipe with nominal metal thickness less than or equal to that specified for the project
- 6. Flanged Joints:
 - a. AWWA C110.
 - b. Pipe for 4" to 54" flanged pipe thread–fabrication shall be Special Thickness Class 53 in accordance with AWWA C115.
 - c. Threaded companion flanges for ductile iron pipe shall be ductile iron in accordance with AWWA C115. Bolt circle and bolt holes match those of ANSI B16.1 class 125 and ANSI B16.5 class 150 flanges.
 - d. The flanges shall be rated for at least 250–psi working pressure.
 - e. The threaded flanges shall be individually fitted and machine tightened on the pipe ends.
 - f. Bolts, gaskets and installation shall be in accordance with AWWA C115 (Appendix A) requirements.
 - g. Flanged gaskets shall be NSF 61 certified gaskets and shall be full face NSF 61 certified design for all service installations. Gaskets for flanged ductile iron pipe must not have the larger inside diameters provided by the requirements of ANSI B16.21.
 - h. Flange facing shall be smooth or with shallow serrations per AWWA C115.

D. Fittings:

- 1. Fittings shall be ductile iron in accordance with AWWA C110, AWWA C153, or AWWA C606, latest revisions.
- 2. Cement-mortar lining, AWWA C104;
 - a. Fittings shall have linings identical to the pipe to which they are connected.
- 3. Outside Coating:
 - a. Buried Service: Asphaltic; 0.001 in thick.
 - b. Exposed Service: As specified in Section 09 96 00 High Performance Industrial Coatings.
- 4. Pressure Rating:
 - a. Buried Service Fittings:

- 1) Fittings, sizes 4" to 24", with push-on, restrained push-on, or mechanical joints shall be rated for 350-psi working pressure.
- 2) Fittings, sizes 30" to 64", with push-on, restrained push-on, or mechanical joints shall be rated for 250-psi working pressure.
- b. Aboveground Service Fittings:
 - 1) Fittings, sizes 4" to 64", with flanged joints shall be rated for 250–psi working pressure.
 - 2) Flanged joints for 12" and smaller sizes may be rated for 350–psi when used with NSF 61 certified gaskets.
- 5. Gray Iron Fittings:
 - a. Cement-mortar lining; standard thickness.
- 6. Flanged Fittings:
 - a. Flange fittings shall be ductile iron in accordance with AWWA C110 or AWWA C153.
 - b. Bolt circle and boltholes match those of ANSI B16.1 class 125 and ANSI B16.5 class 150 flanges.
 - c. Flanges shall be rated for at least 250–psi working pressure.
 - d. Bolts, gaskets and installation shall be in accordance with AWWA C110 or AWWA C115, Appendix A requirements.
 - e. Flanged gaskets shall be NSF 61 certified and shall be full face NSF 61 certified design for all service installations. Gaskets for flanged ductile iron pipe must not have the larger inside diameters provided by the requirements of ANSI B16.21.

2.2 FINISHES

- A. Cement-mortar lining:
 - 1. Cement–Mortar Lining for Shop Application
 - a. Except for sanitary sewers that drain by gravity and as otherwise provided herein, interior surfaces of all ductile iron pipe, fittings and appurtenances shall be cleaned and lined in the shop with a standard thickness cement-mortar lining applied in conformity with a portland cement mortar meeting the requirements of AWWA C104.
 - b. Every precaution shall be taken to prevent damage to the lining. If lining is damaged or found faulty at delivery site, the damaged or unsatisfactory portions shall be repaired or replaced with lining conforming to these Specifications.
 - 2. Seal Coat Cement–Mortar Lining
 - a. Ductile iron pipe shall be internally lined with cement-mortar lining in accordance with AWWA C104, by a high speed, centrifugal process. The quality system of the manufacturer shall be registered to an ISO 9000 quality standard by an accredited registrar. Grinding of linings shall not be allowed. The finished cement lining shall be uniformly smooth. In addition to complying with AWWA C104, the linings shall also comply with the following additional requirements:
 - 1) Material: The cement used shall be a Portland Cement. Sand shall consist of inert, hard, strong and durable silica grains. The water used in the cement mortar shall be potable, and free from injurious quantities of organic matter, alkali, salt or other impurities that might reduce the strength, durability or

other desirable qualities of the lining. All material in contact with water shall be certified to meet the requirements of ANSI/NSF Standard 61. The cement mortar shall contain not less than one part of cement to two parts of sand, by volume.

- 2) Lining Thickness: Cement lining thicknesses shall be per AWWA C104 at the thicknesses shown in 2.7.B.1.
- 3) Surface Preparation: All surfaces to be mortar lined shall be cleaned as necessary to remove foreign matter that could interfere with the adherence of the cement mortar or protrude through the lining.
- 4) Lining Equipment and Process: Linings shall be manufactured using centrifugal pipe rotational equipment capable of sufficient rotation speed to sustain 60 G to 100 G of compaction force. Simultaneous controlled vibration shall be applied to the pipe during high–speed rotation to produce a lining of such high density and firm compaction that the laitance can be washed from the surface of the lining immediately after consolidation. Upon request, the Manufacturer shall submit an affidavit of compliance certified by a registered professional engineer that the linings have been applied according to these specifications. The mortar shall be mixed in batches. The amount of cement and sand entering into each batch shall be measured by weight. The quantity of mixing water entering into each batch shall be otherwise measured to ensure that the correct quantity of water is being added.
- 5) Washing and Finish: After the mortar has been distributed, the rotational speed and vibration shall be increased to produce a mortar lining with a uniformly smooth, firm surface. Immediately after lining, the surface of the lining shall be flushed with a large volume of water to remove excess laitance.
- 6) Curing: Cement-mortar linings shall be lined and stored in a building with controlled atmosphere for a minimum of 18 hours. Linings shall be furnished standard with seal coat.
- 7) Repairs: All repairs of handling or other damage shall be made in accordance with the recommendations of the Manufacturer and shall be reasonably smooth and may not project into the waterway
- B. Ceramic Epoxy Lining for Gravity Sanitary Sewer Installations
 - 1. Ceramic Epoxy Lining
 - a. Condition of Ductile Iron Prior to Surface Preparation
 - 1) All Ductile Iron pipe and fittings shall have a high build protective lining on the interior and a bituminous coating on the exterior except that the bituminous coating shall not be applied to the first 6 inches of the exterior of the spigot ends.
 - 2) All ductile pipe and fittings shall be delivered to the application facility without asphalt, cement lining or any other lining on the interior surface.
 - 2. Lining Material
 - a. Lining material must be a high build multi-component Amine cured Novalac Epoxy lining. Any request for substitution must meet the following criteria and be accompanied by:

- 1) The permeability rating when tested according to Method A of ASTM E– 96–66 (Procedure A) with a test duration of 42 days as reported by an independent laboratory.
- 2) A statement from the manufacturer of the submitted material attesting to the fact that a least 20% of the volume of the lining contains ceramic quartz pigment.
- 3) A laboratory report containing test data for Immersion in Acids, Bases, and Deionized Water at elevated temperatures using ASTM-D 714-56 (1974) for the rating method. The report should also contain data on ASTM D-2794 Direct Impact and ASTM-G 53-77 Moisture and Ultraviolet Light Exposure.
- 4) A statement concerning re-coatability and repair to the lining.
- 3. Application
 - a. Applicator: The lining shall be applied by a competent firm with a successful history of applying linings to the interior of Ductile Iron pipe and fittings.
 - b. Surface Preparation: Prior to abrasive blasting, the entire area that will receive the protective compound shall be inspected for oil, grease, etc. Any areas where oil, grease, or any substance that can be removed by solvent is present shall be solvent cleaned using the guidelines outlined in SSPC–1 Solvent Cleaning. After the surface has been made free of grease, oil or other substances, all areas to receive the protective compounds shall be abrasive blasted using compressed air nozzles with sand or grit abrasive media. The entire surface to be lined shall be struck with the blast media so that all rust, loose oxides, etc., are removed from the surface. Only slight stains and tightly adhering annealing oxide may be left on the surface. Any area where rust reappears before coating must be re–blasted to remove all rust.
- 4. Lining
 - a. After the surface preparation and within 12 hours of surface preparation, the interior pipe shall receive 40 mils dry film thickness of the protective lining. No lining shall take place when the substrate or ambient temperature is below 40°F. The surface also must be dry and dust free. If flange fittings of pipe are included in the project, the linings must not be used on the face of the flange; however, full–face gaskets must be used to protect the ends of the pipe. All fittings shall be lined with 40 mils of the protective lining. The 40 mils system shall not be applied in the gasket grooves.
- 5. Coating of Gasket and Spigot Ends
 - a. Due to the tolerances involved, the gasket area and spigot end up to 6" back from the end of the spigot end must be coated with 6 mils nominal, 10 mils maximum of the epoxy lining compound. This coating shall be applied by brush to ensure coverage. Care should be taken that the coating is smooth without excess buildup in the gasket groove or on the spigot end. All materials for the gasket groove and spigot end shall be applied after the application of the lining.
- 6. Number of Coats
 - a. The number of coats of lining material applied shall be as recommended by the lining manufacturer. However, in no case shall this material be applied above the dry thickness per coat recommended by the lining manufacturer in printed literature. The time between coats shall never exceed that time recommended by

the lining material manufacturer. No material shall be used for lining which is not indefinitely re-coatable with itself without roughening of the surface.

- 7. Touch–Up/Repair
 - a. Lining material shall be capable of being used for field touch-up or repair. Procedures for touch-up or repair shall be in accordance with manufacturer's recommendations.
- 8. Inspection/Certification
 - a. All Ductile Iron pipe and fitting linings shall be checked for thickness using a magnetic film thickness gauge. The thickness testing shall be done using the method outlined in SSPC-PA-2 Film Thickness Rating.
 - b. The interior lining of all pipe and fittings shall be tested for pinholes with a nondestructive 2,500-volt test.
 - c. Each pipe joint and fitting shall be marked with the date of application of the lining system and with its numerical sequence of application on that date.
 - d. The pipe or fitting manufacturer must supply a certificate attesting to the fact that the applicator met the requirements of this specification, and that the material used was as specified, and that the material was applied as required by the specification.
- C. Outside Coating:
 - 1. Buried: The exterior of ductile iron pipe, special, and fittings shall be coated with a 1-mil asphaltic coating in accordance with AWWA C151, Section 51–9.
 - 2. Exposed: As specified in Section 09 96 00 High Performance Industrial Coatings.

2.3 ACCESSORIES

- A. Jackets:
 - 1. Polyethylene Encasement:
 - a. All underground ductile iron pipe, fittings, valves and appurtenances shall be protected from corrosion with a polyethylene encasement installed in accordance with ANSI/AWWA C105/A21.5.
 - b. Polyethylene wrap in tube form for piping encasement shall be manufactured from virgin polyethylene material conforming to the requirements of ANSI/ASTM Standard Specification D1248. A linear low-density polyethylene film shall be used to encase the pipe.
 - 1) Film Thickness = 4 mils, minimum.

B. Gaskets:

- 1. Unless called out specifically on the plans, the following schedule shall be used for determining the various gasket compounds for push–on and mechanical joints.
 - a. Potable Water, Non–Potable Water and Wastewater:
 - 1) Buried Plain Rubber/Styrene Butadiene (SBR).
 - 2) Exposed Neoprene/Polychloroprene (CR).
 - b. Ketones, Dilute Acids and Alkalies, Vegetable Oil, Alcohols with Outdoor Exposure or Air:
 - 1) Ethylene Propylene (EPDM).

- c. Non-Aromatic Hydrocarbons, Petroleum Oil, Hydraulic Fluids, Fuel Oil, Fats, Oil and Grease:
 - 1) Buna–N/Nitrile.
- d. Aromatic Hydrocarbons, Gasoline, Refined Petroleum Products, most Chemicals and Solvents, High Temperature or Air:
 - 1) Flororelastomer/Fluorel/Viton (FKM).
- C. Flange Adapters:
 - 1. Acceptable Manufacturers:
 - a. Only in locations indicated on the plans or approved by the Engineer, flange adapters are to be provided in accordance with the following specifications.
 - 1) EBAA Iron Eastland, Texas Series 1200 Flange.
 - 2) Victaulic Company Easton, Pennsylvania Series 741/743 Flange.
 - 3) Substitutions allowed per Section 01 60 00 Product Requirements.
 - 2. Flange adapters are only permitted in locations shown on the plans or approved by the Engineer. The use of flange adapters in any other location is prohibited. Flange adapters found to be used in locations not shown on the plans or approved by the Engineer shall be replaced with flanged pipe at the Contractor's expense.
 - a. Contractor will be responsible for all costs associated with the removal of the unauthorized flange adapters, including Engineering labor and any other labor deemed necessary to address the situation.
 - b. No additional time extension will be granted for the replacement of the pipe.
 - 3. Fabrication
 - a. Flange adapters shall be made of ductile iron conforming to ASTM A536 and have flange bolt circles that are compatible with ANSI/AWWA C110/A21.10.
 - b. Restraint for the flange adapter shall consist of a plurality of individual actuated gripping wedges to maximize restraint capability. Torque limiting actuating screws shall be used to insure proper initial set of gripping wedges.
 - c. The flange adapter shall be capable of deflection during assembly, or permit lengths of pipe to be field cut, to allow a minimum of 0.6" gap between the end of the pipe and the mating flange without affecting the integrity of the seal.
 - d. The flange adapter shall have a safety factor of 2:1 minimum.
 - e. Wedges must be contoured to fit pipe and mechanically retained in pockets.
 - f. Pressure Ratings (Minimum 2:1 safety factor in all sizes):
 - 1) 350 psi for 4" to 16" nominal sizes.
 - 2) 250 psi in 18" to 36" nominal sizes.
 - g. Units must be UL listed and FM approved.
 - 4. Coating:
 - a. All wedge assemblies and related parts shall be processed through a phosphate wash, rinse and drying operation prior to coating application. The coating shall consist of a minimum of two coats of liquid thermoset epoxy coating with heat cure to follow each coat.
 - b. All casting bodies shall be surface pretreated with a phosphate wash, rinse and sealer before drying. The coating shall be electrostatically applied and heat cured.

The coating shall be a polyester based powder to provide corrosion, impact and UV resistance.

- c. The coating system shall be MEGA-BOND by EBAA Iron, Inc. or approved equal.
- D. Dielectric Fittings: Provide between dissimilar metals.
- 2.4 SOURCE QUALITY CONTROL
 - A. Section 01 40 00 Quality Requirements: Requirements for testing, inspection, and analysis.
 - B. Owner Inspection: Make completed materials available for inspection at manufacturer's factory prior to packaging for shipment. Owner inspections will be at the Owner's discretion, and will be paid for by the Owner and coordinated by the Contractor. Notify Owner at least seven days before inspection is allowed.
 - C. Owner Witnessing: Allow witnessing of factory inspections and test at manufacturer's test facility. Owner witnessing will be at the Owner's discretion, and will be paid for by the Owner and coordinated by the Contractor. Notify Owner at least seven days before inspections and tests are scheduled.
 - D. Certificate of Compliance: When fabricator is approved by authorities having jurisdiction, submit certificate of compliance indicating Work performed at fabricator's facility conforms to Contract Documents.
 - 1. Specified shop tests are not required for Work performed by approved fabricator.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 01 70 00 Execution and Closeout Requirements: Requirements for installation examination.
- B. Verify that field dimensions are as indicated on Drawings.
- C. Inspect existing flanges for nonstandard bolt hole configurations or design, and verify that new pipe and flange mate properly.

3.2 PREPARATION

- A. Section 01 70 00 Execution and Closeout Requirements: Requirements for installation preparation.
- B. Thoroughly clean pipe and fittings before installation.
- C. Surface Preparation:
 - 1. Touch up shop-primed surfaces with primer as specified in Section 09 96 00 High Performance Industrial Coatings.
 - 2. Solvent-clean surfaces that are not shop primed.

3. Clean surfaces to remove loose rust, mill scale, and other foreign substances as specified in Section 09 96 00 – High Performance Industrial Coatings; prime surface as specified in Section 09 96 00 – High Performance Industrial Coatings.

3.3 INSTALLATION

- A. Buried Service:
 - 1. Install ductile iron pipe, fittings, valves and appurtenances specified herein and elsewhere in the project documents in complete conformance with Manufacturer's installation instructions.
 - 2. Installation Guide for Ductile Iron Pipe, Current Edition as published by the Ductile Iron Pipe Research Association.
 - 3. Grooved joint couplings and fittings shall be installed in accordance with the manufacturer's written installation instructions. Grooved ends shall be clean and free from indentations and projections in the area from pipe end to groove. Gaskets shall be verified as suitable for the intended service prior to installation. Gaskets shall be molded and produced by the coupling manufacturer.
 - 4. Split–Sleeve Couplings Joints Split–Sleeve Coupling Joints The contractor shall inspect each coupling to insure that there are no damaged portions of the coupling. Particular attention should be paid to the sealing pad / sealing plate area. Before installation, each coupling shall be thoroughly cleaned of any foreign substance which may have collected thereon and shall be kept clean at all time thereafter. Wrenches used shall be of a size and type recommended by the manufacturer. Bolts and studs shall be tightened so as to secure a uniform gasket compression between the coupling and the body of the pipe with all bolts or studs tightened approximately the same amount. Final tightening shall be done by hand (no air impact wrenches) and is complete when the coupling is in uniform contact around the circumference of the pipe.
 - a. In no case shall the deflection in the joint between the pipe ends exceed the maximum deflection recommended by the manufacturer. No joint shall be misfit any amount that would be detrimental to the strength and water tightness of the finished joint.
 - 5. Installation of Polyethylene Encasement:
 - a. Installment methods for polyethylene encasement of ductile iron pipe, fittings, valve and appurtenences as set forth and described in ANSI/AWWA C105/A21.5 and "Polyethelyne Encasement Effective, Economical Protection for Ductile Iron Pipe in Corrosive Environments", Current Edition should be followed.
- B. Exposed Service:
 - 1. Run piping straight along alignment indicated on Drawings with minimum number of joints.
 - 2. Install according to ASME B31.3.
 - 3. Fittings:
 - a. Clean gasket seats thoroughly, and wipe gaskets clean prior to installation.
 - b. Install fittings according to manufacturer's instructions.
 - c. Tighten bolts progressively, drawing up bolts on opposite sides until bolts are uniformly tight; use torque wrench to tighten bolts to manufacturer's recommendations.
 - 4. Provide required upstream and downstream clearances from devices as indicated.

- C. Make taps to ductile iron piping only with service saddle, tapping boss of a fitting or valve body, or equipment casting.
- D. Install piping with sufficient slopes for venting or drainage of liquids and condensate to low points.
- E. Support piping as specified in Section 40 05 07 Pipe Support Systems.
- F. Provide expansion joints as specified in Section 40 05 06 Couplings, Adapters and Specials for Process Piping and pipe guides as specified in Section 40 05 07 Pipe Support Systems to compensate for pipe expansion due to temperature differences.
- G. Field Cuts: According to pipe manufacturer's recommendations.
- H. Finish primed surfaces according to Section 09 96 00 High Performance Industrial Coatings.

3.4 TOLERANCES

- A. Section 01 40 00 Quality Requirements: Requirements for tolerances.
- B. Laying Tolerances: As specified in Section 33 11 16 Site Water Utility Distribution Piping.
- 3.5 FIELD QUALITY CONTROL
 - A. Section 01 40 00 Quality Requirements: Requirements for inspecting and testing.
 - B. Inspect for damage to pipe lining or coating, or other defects that may be detrimental as determined by the Engineer. Repair damaged piping, or provide new undamaged pipe.
 - C. Repairing field-damaged areas of epoxy-lined pipe and fittings:
 - 1. Remove burrs caused by field cutting of ends or handling damage and smooth out the edge of the lining if rough.
 - 2. Remove all traces of oil, grease, asphalt, dust, dirt, etc.
 - 3. Remove any damaged lining caused by field cutting operations or handling and clean any exposed metal by sanding or scraping. Sandblasting or power tool cleaning roughening is also acceptable. It is recommended that any loose lining be removed by chiseling, cutting, or scraping into well adhered lined area before patching. Be sure to overlap at least 1" of lining in the area to be repaired.
 - 4. With the area to be sealed or repaired, absolutely clean and suitably roughened, apply a coat of epoxy lining using the following procedure:
 - a. Mix the material that will be used to make the repair per the manufacturer's instructions.
 - b. Application of Material: After the material has been thoroughly mixed, it can be applied to the prepared surface by brush. Brushing is usually best, due to the fact that the areas are usually small.
 - c. It is important to coat the entire freshly cut exposed metal surface of any cut pipe ends. To ensure proper sealing, overlap at least 1" of the lining with the repair material.
 - D. Pressure Testing:

- 1. Section 40 05 06 Couplings, Adapters and Specials for Process Piping: Pipe Pressure Testing; Cleaning, Disinfection and Purging.
- 2. Test Pressure: Not less than 125 psig.
- 3. Conduct hydrostatic test for minimum two hours.

3.6 CLEANING

- A. Section 01 70 00 Execution and Closeout Requirements specifies requirements for cleaning.
- B. Section 40 05 06 Couplings, Adapters and Specials for Process Piping: Cleaning, Disinfection and Purging.
- C. Keep pipe interior clean as installation progresses.
- D. Clean pipe interior of soil, grit, loose mortar, and other debris after pipe installation.

END OF SECTION 40 05 19

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Generator Set Data Sheet



Model:	C125N6
Frequency:	60 Hz
Fuel type:	Natural gas
kW rating:	125 Natural gas standby

Emissions level: EPA Emissions

	Natural gas		Propane					
	Standby			Standby				
Fuel Consumption	kW (kVA)			kW (kVA)				
Ratings	125 (156)			125 (156)				
Load	1/4	1/2	3/4	Full	1/4	1/2	3/4	Full
scfh	652.0	981.3	1305.8	1665.6	262.8	383.7	517.3	674.1
m ³ /hr	18.46	27.79	36.98	47.17	7.44	10.87	14.65	19.09

	Natural gas	Propane	
Engine	Standby Rating	Standby Ratings	
Engine model	QSJ8.9G		
Configuration	Cast Iron, In line, 6 cylinders		
Aspiration	Turbocharged and aftercooled		
Gross engine power output, kWm (bhp)	152.9 (205)		
Bore, mm (in)	114.1 (4.49)		
Stroke, mm (in)	144.5 (5.69)		
Rated speed, rpm	1800		
Compression ratio	9.7:1		
Lube oil capacity, L (qt)	20.8 (22)		

Fuel Supply Pressure

Minimum operating pressure, kPa (in H ₂ O)	1.5 (6)
Maximum operating pressure, kPa (in H ₂ O)	3.5 (13)

Air	Natural gas Standby Rating	Propane Standby Rating
Combustion air, m ³ /min (scfm)	11.9 (421)	11.8 (417)
Maximum normal duty air cleaner restriction, kPa (in H ₂ O)	0.37 (1.5)	
Maximum heavy-duty air cleaner restriction, kPa (in H ₂ O)	3.7 (15.0)	

	Natural gas	Propane
Exhaust	Standby Rating	Standby Rating
Exhaust flow at set rated load, m3/min (cfm)	35.6 (1258)	36.9 (1305)
Exhaust temperature at set rated load, ${}^{\circ}\!\!\!C({}^{\circ}\!\!\!F)$	645.6 (1194)	685 (1265)
Maximum back pressure, kPa (inH ₂ O)	9 (36.1)	

	Natural gas	Propane
Standard set-mounted radiator cooling	Standby rating	Standby rating
Ambient design, ℃ (℉)	50 (122)	
Fan load, kWm (HP)	10.3 (13.8)	
Coolant capacity (with radiator), L (US gal)	26 (6.9)	
Cooling system air flow, m3/min (scfm)	249.2 (8800)	
Maximum cooling air flow static restriction, kPa (inH ₂ O)	0.125 (0.5)	

Weights	Natural gas	Propane
Unit wet weight kg (lb)	1776 (3915)	

Note: Weights represent a set with standard features. See outline drawing for weights of other configurations.

Derating factors

Natural gas

Standby Engine power Above these of	available up to 1800 m (5900 ft.) and ambient temperatures up to 40° C (104° F). conditions, derate at 4.25% per 300 m (985 ft.) and 2% per 10° C (18° F)
--	---

Propane

Standby	Engine power available up to 1800 m (5900 ft.) and ambient temperatures up to 40° C (104° F). Above these conditions, derate at 4.25% per 300 m (985 ft.) and 2% per 10° C (18° F).
---------	---

Ratings definitions

Emergency Standby Power	Limited-Time Running	Prime Power (PRP)	Base Load (Continuous)
(ESP)	Power (LTP)		Power (COP)
Applicable for supplying power to varying electrical load for the duration of power interruption of a reliable utility source. Emergency Standby Power (ESP) is in accordance with ISO 8528. Fuel Stop power in accordance with ISO 3046, AS 2789, DIN 6271 and BS 5514.	Applicable for supplying power to a constant electrical load for limited hours. Limited Time Running Power (LTP) is in accordance with ISO 8528.	Applicable for supplying power to varying electrical load for unlimited hours. Prime Power (PRP) is in accordance with ISO 8528. Ten percent overload capability is available in accordance with ISO 3046, AS 2789, DIN 6271 and BS 5514.	Applicable for supplying power continuously to a constant electrical load for unlimited hours. Continuous Power (COP) is in accordance with ISO 8528, ISO 3046, AS 2789, DIN 6271 and BS 5514.

Alternator data

.

Standard alternators	Single phase table		т	hree phase tab	le		Full single phase output, reconnectable
Maximum temperature rise above 40°C ambient	120°C	120°C	120°C	120°C	120°C	120°C	120°C
Feature code	BB88-2	B986-2	B946-2	B943-2	B952-2	BB86-2	BB88-2
Alternator data sheet number	ADS-211	ADS-208	ADS-208	ADS-208	ADS-209	ADS-208	ADS-211
Voltage ranges	120/240	120/240	120/208	277/480	347/600	127/220	120 - 480
Voltage feature code	R104-2	R106-2	R098-2	R002-2	R114-2	R020-2	Varies by voltage
Surge kW	126	131	130	131	132	131	Varies by voltage
Full load current amps at standby rating	521	376	434	188	151	411	Varies by voltage

Optional alternators for improved starting capability	Single phase table		т	hree phase tab	le		Full single phase output, reconnectable
Maximum temperature rise above 40 ℃ ambient	105°C	105°C	105°C	105°C	105°C	105° C	105°C
Feature code	BB87-2	BB94-2	BB93-2	BB95-2	BB92-2	BB85-2	BB87-2
Alternator data sheet number	ADS-211	ADS-209	ADS-209	ADS-208	ADS-209	ADS-209	ADS-211
Voltage ranges	120/240	120/240	120/208	277/480	347/600	127/220	120 – 480
Voltage feature code	R104-2	R106-2	R098-2	R002-2	R114-2	R020-2	Varies by voltage
Surge kW	127	133	132	132	133	132	Varies by voltage
Full load current amps at standby rating	521	376	434	188	151	411	Varies by voltage

Formulas for calculating full load currents:

Three phase output

Single phase output

kW x 1000 Voltage x 1.73 x 0.8

kW x SinglePhaseFactor x 1000 Voltage

Warning: Back feed to a utility system can cause electrocution and/or property damage. Do not connect to any buildings electrical system except through an approved device or after building main switch is open.

North America 1400 73rd Avenue N.E. Minneapolis, MN 55432 USA

Phone 763 574 5000 Fax 763 574 5298

Our energy working for you."

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Lakemoor Lift Stations Modifications

Located in Section 5 Township 44 North and Section 33, Township 45 North Range 9 East, McHenry County, Illinois

Northern Moraine Wastewater Reclamation District

Office: 113 Timber Trail - P.O. Box 240 - Island Lake, Il. 60042 Plant: 420 Timber Trail - Island Lake, Il. 60042

District Officials

Kenneth A. Michaels, Jr, President - Trustee Lydia Ryberg, Vice President - Trustee John R. Ragland, Treasurer - Trustee Jacob Mann - Trustee Timothy R. Brunn - Trustee

Mohammed Haque, District Manager Debi Martin, District Clerk

SSRBC:

STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION IN ILLINOIS & SUPPLEMENTAL SPECIFICATIONS AND RECURRING SPECIAL PROVISIONS - ILLINOIS DEPARTMENT OF TRANSPORTATION, CURRENT EDITION. STANDARD SPECIFICATIONS FOR WATER AND SEWER MAIN CONSTRUCTION IN ILLINOIS, ILLINOIS SOCIETY OF PROFESSIONAL ENGINEERS, ETAL., CURRENT EDITION.

NOTE:

SSWSMC:

PLANS PREPARED BY:





THE CONTRACTOR SHALL BE RESPONSIBLE FOR DISTRIBUTING COMPLETE SETS OF THESE PLANS AND PROJECT SPECIFICATIONS TO ALL SUBCONTRACTORS INVOLVED IN THIS PROJECT. A COMPLETE COPY OF THESE PLANS AND PROJECT SPECIFICATIONS SHALL BE IN THE POSSESSION OF THE CONTRACTOR AND ALL SUBCONTRACTORS ON THE PROJECT AT ALL TIMES.

Engineering Plans for

Northern Moraine Wastewater Reclamation District



N.T.S.

Index of Sheets

	Cover Sheet
G0.1	General Notes
G0.2	Legend and Abbreviations
C0.1	Construction Details
C0.2	Construction Details
E0.1	Electrical Legend
E0.2	Electrical Details
E0.3	Existing Lift Station No. 1 Details
E0.4	Existing Lift Station No. 1 Details
E0.5	Existing Lift Station No. 2 Details
E0.6	Existing Lift Station No. 2 Details
LS1.1	Lift Station No. 1 Plan
LS1.2	Lift Station No. 1 Section
LS2.1	Lift Station No. 2 Plan
LS2.2	Lift Station No. 2 Section
LS3.1	Lift Station No. 3 Plan
▲ { LS3.2	Lift Station No. 3 Section 3
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LS6.1	Lift Station No. 6 Plan
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LS7.1	Lift Station No. 7 Plan
LS7.2	Lift Station No. 7 Section
E1.1	Lift Station No. 1 One-Line Diagram and Details
E1.2 - E1.7	Lift Station No. 1 Control Panel
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E6.1	Lift Station No. 6 Electrical Details
26.2 - E6.12	Lift Station No. 6 Control Panel
E7.1	Lift Station No. 7 Electrical Details
27.2 - E7.12	Lift Station No. 7 Control Panel

I HEREBY CERTIFY THAT THESE PLANS WERE PREPARED UNDER MY DIRECT SUPERVISION. DATED AT ST. CHARLES, ILLINOIS, THIS $__31st$ day of $__$ August



JILLIAN G. KISS, P.E., TROTTER AND ASSOCIATES, INC. ILLINOIS REGISTERED PROFESSIONAL ENGINEER No. 062-067200 / EXPIRATION DATE 11-30-2023 ILLINOIS DEPARTMENT OF PROFESSIONAL REGULATION FIRM NUMBER 184-002148





P. Se	P			PROTECT STAFF	ISSUE	REVISIONS	DATE
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te: She	No. F			ENGINEER: JILLIAN KISS, P.E.			
eet I	: ile S1.			TECHNICIAN: MIKE DAVISON			
8. 1/2 Nui	Nar 2.d	Liftstation No. I - Section					
/ 31 ''' = mb	NM ne: gn		ADDULATED, INC.				
/20 = 1' er 2	W07		ENGINEERS AND SURVEYORS				
-0''	0	Northern Moraine Wastewater Redamation District	40W201 Wasco Road, Suite D St Charles 11 60175		1.	ADDENDUM #1	8/31/22
		INDITICTIT MOTATIC MARCHARICI INCLUTION DISCLICE	Ph.: 630-587-0470 • Fax: 630-587-0475		0.	ISSUED FOR BIDDING	7/15/22

Service	Туре	Activation Elevation	Function
LOW LEVEL ALARM/ALL STOP	N.O.	737.50	LOW LEVEL ALARM / ALL STOP
IIGH WATER ALARM/ ALL START	N.O.	737.75	HIGH LEVEL ALARM / ALL START
SLX 130-M LEVEL TRANSDUCER			









1. RESTORE SITE TO PRE-CONSTRUCTION CONDITIONS UPON COMPLETION OF WORK.

NOTES:



NOTES:

1. FLOAT CONTROL SYSTEM TABLE PROVIDED FOR REFERENCE ONLY.

Float	Control System - Li	ft Statio	on No. 2	
Float No.	Service	Туре	Activation Elevation	Function
LS-21	LOW LEVEL ALARM	N.C.	737.71	LOW LEVEL ALARM / ALL STOP
LS-22	LEAD STOP	N.O.	738.75	STOP LEAD PUMP
LS-23	LAG STOP	N.O.	739.47	STOP LAG PUMP
LS-24	LEAD START	N.O.	740.19	START LEAD PUMP
LS-25	HIGH LEVEL ALARM	N.O.	740.91	HIGH LEVEL ALARM / ALL START

- REPLACE LIGHT FIXTURE WITH NEW TYPE S1 LED FIXTURE. EXISTING POLE TO REMAIN. INSTALL SWITCH INSIDE CONTROL PANEL. SEE SHEET E0.2 FOR FIXTURE DETAIL.

SEE ELECTRICAL EQUIPMENT MODIFICATIONS



Lift Station No. 2 Section 1 SCALE 1/2" = 1'-0"

DAT							8/31/22	7/15/22
REVISIONS							ADDENDUM #1	ISSUED FOR BIDDING
ISSUE							1.	°
PROJECT STAFF	PROJECT MANAGER: SCOTT TROTTER, P.E.	ENGINEER: JILLIAN KISS, P.E.	TECHNICIAN: MIKE DAVISON					
					ADDUCIALED, INC.	L ENGINEERS AND SURVEY(40W201 Wasco Road, Suite D St Charles 11 60175	Ph.: 630-587-0470 • Fax: 630-587-04
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Proj Plot		No. F L	: : : : : : : : : : : : : : : : : : :	Lift Station No. 2 - Section	NMV ne: gn /31	V07 /20 1'	¹ ²	I NOT CITATI MOTORIA WASH WASH WASH





NOTES: 1. FLOAT CONTROL SYSTEM TABLE PROVIDED FOR REFERENCE ONLY.

Float C	Control System - I	Lift Static	on No. 3	
Float No.	Service	Туре	Activation Elevation	Function
LS-31	LOW LEVEL ALARM	N.C.	737.50	LOW LEVEL ALARM / ALL STOP
LS-32	LEAD STOP	N.O.	737.75	STOP LEAD PUMP
LS-33	LAG STOP	N.O.	738.50	STOP LAG PUMP
LS-34	LEAD START	N.O.	739.20	START LEAD PUMP
LS-35	LAG START	N.O.	739.90	START LAG PUMP
LS-36	HIGH LEVEL ALARM	N.O.	740.50	HIGH LEVEL ALARM / ALL START

\mathbb{A}	Lift Station No. 3 Section	
	SCALE 1/2" = 1'-0"	LS3.1 LS3.2

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Lakemoor Lift Stations Modifications Lift Station No. 3 - Section Northern Moraine Wastewater Reclamation District	Lakemoor Lift Stations Modifications Lakemoor Lift Stations Modifications Lift Station No. 3 - Section Lift Station No. 3 - Section Northern Moraine Wastewater Reclamation District					ADDUCIALED, L	L ENGINEERS AND SURV	40W201 Wasco Road, Sui St Charles II 60175	Ph.: 630-587-0470 • Fax: 630-5
-	Project No.: NMW070 File Name: LS3.2.dgn Plot Date: 8/31/2022 Scale: 1/2" = 1'-0"	ifications	IIICAUUIIS					ation District	auon Distinct





NOTES: 1. FLOAT CONTROL SYSTEM TABLE PROVIDED FOR REFERENCE ONLY.

Float Control System - Lift Station No. 4							
Float No.	Service	Туре	Activation Elevation	Function			
LS-41	LOW LEVEL ALARM	N.C.	735.42	LOW LEVEL ALARM / ALL STOP			
LS-42	LEAD STOP	N.O.	735.68	STOP LEAD PUMP			
LS-43	LAG STOP	N.O.	737.18	STOP LAG PUMP			
LS-44	LEAD START	N.O.	738.68	START LEAD PUMP			
LS-45	LAG START	N.O.	740.18	START LAG PUMP			
LS-46	HIGH LEVEL ALARM	N.O.	740.84	HIGH LEVEL ALARM / ALL START			

DATE		8/31/22 7/15/22
REVISIONS		ADDENDUM #1 ISSUED FOR BIDDING
PROJECT STAFF ISSUE PROJECT MANAGER: SCOTT TROTTER, P.E. ENGINEER: JILLIAN KISS, P.E.	TECHNICIAN: MIKE DAVISON	0.
	ASSOCIATES, INC.	40W201 Wasco Road, Suite D St. Charles, II. 60175 Ph.: 630-587-0470 • Fax: 630-587-0475
	7	District
ations Modifications	No. 4 - Section	water Reclamation
Lakemoor Lift Sta	Lift Station 1	Northern Moraine Waste
Project No I Plot Date: Scale: Sh	0.: NMW0 File Name: LS4.2.dgn 8/31/ 1/2'' = reet Number	070 2022 1'-0''

EXISTING 14" VALVE W/ BOX

NOTE: FLOAT CONTROL SYSTEM TABLE PROVIDED FOR REFERENCE ONLY.

Float Control System - Lift Station No. 5							
Float No.	Service	Туре	Activation Elevation	Function			
LS-51	LOW LEVEL ALARM	N.C.	733.50	LOW LEVEL ALARM / ALL STOP			
LS-52	LEAD STOP	N.O.	733.75	STOP LEAD PUMP			
LS-53	LAG STOP	N.O.	734.25	STOP LAG PUMP			
LS-54	LEAD START	N.O.	734.75	START LEAD PUMP			
LS-55	LAG START	N.O.	735.30	START LAG PUMP			
LS-56	HIGH LEVEL ALARM	N.O.	735.89	HIGH LEVEL ALARM / ALL START			

	DATE		8/31/22 7/15/22
	REVISIONS		ADDENDUM #1 ISSUED FOR BIDDING
СН	PROJECT STAFF ISSUE	TECHNICIAN: MIKE DAVISON	
MJ-MJ SLEEVE T/4" DIP EL 745.66 4" PVC FORCE MAIN 53		AEROTIAN ASSOCIATES INC.	ENGINEERS AND SURVEYORS 40W201 Wasco Road, Suite D St. Charles, II. 60175 Ph.: 630-587-0470 • Fax: 630-587-0475
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PROJEC	PROJECT MANAGER:	ENGINEER	TECHNICIAN:			INEERS AND SURVEYORS	40W201 Wasco Road, Suite D St. Charles 11 60175	630-587-0470 • Fax: 630-587-0475
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Lakemoor Lift Stations Modificatio				Lift Station No. 6 - Section		Northern Moraine Wastewater Reclamation		
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/- 8" FORCEMAIN T/PIPE 8" EL. = 750.35

NOTES:

1. REFER TO SHEET E6.1 FOR REPLACEMENT OF EXISTING ENCLOSURE.

2. CONTRACTOR SHALL COORDINATE WITH COMED FOR REPLACEMENT OR RELOCATION OF EXISTING METER AND PEDESTAL IF REQUIRED TO ACCOMMODATE REPLACEMENT OF LIFT STATION ENCLOSURE.

	Lakemoor Lift Stations Modifications	Lift Station No. 7 - Section	Northern Moraine Wastewater Reclamation District
 NOTES: REFER TO SHEET E7.1 FOR REPLACEMENT OF EXISTING ENCLOSURE. CONTRACTOR SHALL COORDINATE WITH COMED FOR REPLACEMENT OR RELOCATION OF EXISTING METER AND PEDESTAL IF REQUIRED TO ACCOMMODATE REPLACEMENT OF LIFT STATION ENCLOSURE. CONTRACTOR SHALL ENSURE EXISTING CONDUITS ARE SUITABLE FOR USE WITH NEW GENSET. 	Project N Plot Date Scale:	o.: NMV File Name: LS7.2.dgn : 8/31 1/2" = heet Numbe	v070 /2022 = 1'-0'' er ₽

