MILTON MUNICIPAL UTILITY COMMISSION
CABELL COUNTY, WEST VIRGINIA

CONTRACT #1 – MORRIS MEMORIAL SANITARY SEWER EXTENSION

ADDENDUM #2

FEBRUARY 10, 2022

THRASHER PROJECT #020-01526

TO WHOM IT MAY CONCERN:

A Pre-Bid Conference was held on Tuesday, January 25, 2022 on the above-referenced project. The following are clarifications and responses to questions posed by contractors for the above reference project.

A. GENERAL

1. **THE BID FORM HAS BEEN REVISED. YOU MUST USE THE REVISED BID FORM WHEN PREPARING YOUR BID PACKAGE FOR THIS PROJECT.**

B. SPECIFICATIONS

1. **DELETE** Specification Index in its entirety and **REPLACE** with attached Specification Index.
2. **DELETE** Section C-410 Bid Form in its entirety and **REPLACE** with attached Section C-410 Bid Form.
3. **DELETE** Section 011000 - Summary in its entirety and **REPLACE** with attached Section 011000 – Summary.
4. **DELETE** Section 012000 – Price and Payment Procedures in its entirety and **REPLACE** with attached Section 012000 – Price and Payment Procedures.
5. **ADD** the attached Section 262930 – Cellular Monitoring Telemetry.
6. **DELETE** Specification 263200 – Transfer Switches in its entirety and **REPLACE** with attached Specification 263200 – Transfer Switches.
7. **DELETE** Section 432540.02 – Flea Market Lift Station in its entirety and **REPLACE** with attached Section 432540.02 - Flea Market Lift Station.

C. DRAWINGS

1. **DELETE** Sheet 4 in its entirety and **REPLACE** with the attached Sheet 4.
2. **DELETE** Sheet E-1 in its entirety and **REPLACE** with the attached Sheet E-1.
3. **DELETE** Sheet E-2 in its entirety and **REPLACE** with the attached Sheet E-2.
4. **DELETE** Sheet E-4 in its entirety and **REPLACE** with the attached Sheet E-4.

D. QUESTIONS AND RESPONSES

QUESTION

1. Is an office trailer/field office required for each contract?

RESPONSE

Yes.

QUESTION

2. Are any geotechnical reports available?

RESPONSE

No.

QUESTION

3. The pre-bid meeting agenda included in Addendum #1 reference is made to an SHPO Clearance in the Permits section. It states that an archeologist will need to be on site during excavations. Where are these excavations and who will pay for the archeologist?

RESPONSE

Archeological monitoring during excavations will not be necessary on this project.

QUESTION

4. Will you please clarify the type of bedding and initial backfill that is required? The detail shows #57's and the specs state #8's.

RESPONSE

#57 stone shall be used for bedding and initial backfill.

QUESTION

5. Will the ductile iron pipe require polyethylene encasement?

RESPONSE

No.

QUESTION

6. Several of the lines are in the streets. Can we close the streets to through traffic until the lines are laid through those areas, allowing access for the residents/businesses from either end of the street?

RESPONSE

Streets can be closed as long as residences/businesses still have access. A traffic control plan will need to be approved by the City prior to any construction activities.

QUESTION

7. Can we put steel plates over the open trench excavation on the nights and weekends or will we need to backfill the trenches for the nights and weekends and then open them up again the next workday?

RESPONSE

Steel plates over the open trench excavation during the night is acceptable. Trenches will need to be backfilled or blockaded during weekends.

QUESTION

8. Specification 310513 – 2.2 – E states that granular backfill required under improved areas (streets, driveways, sidewalks, etc.) but it doesn't show on the trench details. Is this required?

RESPONSE

Each trench repair detail states the required gradation and depth of the granular backfill.

QUESTION

9. Will you add bid items for drop manhole connections?

RESPONSE

No. Drop manhole connections shall be included in the price of the manholes.

QUESTION

10. Will you add bid items for terminal gravity cleanouts?

RESPONSE

No, Terminal gravity cleanouts shall be included in the price of gravity sewer line.

QUESTION

11. What exactly gets coated in the pump stations, is it just the walls of the precast structure or more than that? If it is just the walls will a coating from the precast manufacturer be acceptable for the new stations. Please clarify what needs done at each station.

RESPONSE

The interior concrete faces of the wet well of the new pump stations shall be coated. Coating shall be applied in place once the concrete structure is installed.

QUESTION

12. Will the owner pay for any fees charged by the power company for services at the pump stations?

RESPONSE

Yes

QUESTION

13. Is a project sign required for each contract? If not which contract(s) will need to provide the sign(s)?

RESPONSE

Yes.

QUESTION

14. Pay Item 11b, where does the 60" manhole get installed?

RESPONSE

Manhole #4-1 and #5-1 on Sheet 6 are 60" manholes. See Sheet 6 included in Addendum #1.

QUESTION

15. Where does Bid Item 10a - 20" Casing get installed?

RESPONSE

Bid Item 10a – 20" Steel Casing has been eliminated. See revised Bid Form.

QUESTION

16. Can you clarify the control sections in regard to what will require a VFD, what will require a soft start? And what will require an across the line starter?

RESPONSE

VFDs shall be installed on all lift station pumps.

QUESTION

17. Can you verify the voltage for each station? Some say 230 Volt but has a 480/120 Volt control transformer and some drawings voltages don't match the specs?

RESPONSE

Grand Patrician Lift Station – 120/240V, 3 Phase
Flea Market Lift Station – 120/240V, 3 Phase

QUESTION

18. Can you verify the incoming power transformer configuration for each station?

RESPONSE

The incoming transformer for the lift stations are in a "Y" configuration.

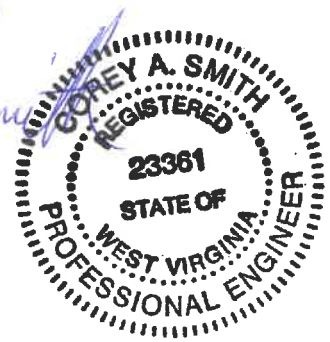
E. CLARIFICATIONS

1. Odor Control Equipment has been added to Specification 432540.02 – Flea Market Lift Station.
2. The three contracts will be opened in order from Contract #1 to Contract #3 at Milton City Hall. All bids must be received by 2:00 p.m. on Thursday, February 17, 2022. After opening all bids for Contract #1, the apparent low bidder has the ability to pull their bid on the other contracts. The same procedure applies to Contract #2.

If you have any questions or comments, please feel free to contact me at your earliest convenience. As a reminder, bids will be received until 2:00 p.m. on Thursday, February 17, 2022 at Milton City Hall, 1139 Smith Street, Milton, WV 25541. Good luck to everyone and thank you for your interest in the project.

Sincerely,

THE THRASHER GROUP, INC.



COREY SMITH, PE
Project Manager

Revised per Addendum #2
February 10, 2022

MILTON MUNICIPAL UTILITY COMMISSION
CABELL COUNTY, WEST VIRGINIA
FOR THE
CONTRACT #1 – MORRIS MEMORIAL SANITARY SEWER EXTENSION

- I N D E X -

Revised per Addendum #2
February 10, 2022

RUS – WV Supplemental General Conditions	RUS
Additional Supplemental General Conditions	ASGC
American Iron and Steel	AISR
TECHNICAL SPECIFICATIONS	
Summary	011000
Price and Payment Procedures	012000
Substitution Procedures	012500
Contract Modification Procedures	012600
Administrative Requirements	013000
Construction Progress Schedule	013216
Submittal Procedures	013300
Quality Requirements	014000
Temporary Facilities and Controls	015000
Traffic Control	015700
Product Requirements	016000
Execution and Closeout Requirements	017000
Closeout Procedures	017700
Operation and Maintenance Data	017823
Project Record Documents	017839
Commissioning	019100
Video Recording	020100
Cast-In-Place Concrete	033000
Crystalline Concrete Waterproofing	033050
Grouting	036000

Revised per Addendum #2
February 10, 2022

Rough Carpentry	061000
Access Hatches	083500
Coating Systems for Wastewater Equipment	099010
Jib Crane Hoist and Trolley	110520
Basic Electrical Materials and Methods	260500
Conductors and Cables	260523
Grounding and Bonding	260526
Raceways	260533
Wiring Devices	262726
Fuses	262813
Enclosed Switches and Circuit Breakers	262816
Cellular Monitoring Telemetry	262930
Transfer Switches	263200
LED Exterior Lighting	265619
Portable Generator	268010
Soils for Earthwork	310513
Aggregates for Earthwork	310516
Earth Moving	312000
Excavation	312316
Trenching	312316.13
Dewatering	312319
Erosion and Sedimentation Controls	312500
Asphalt Paving	321216
Stone Surfacing Material	321217

Revised per Addendum #2
February 10, 2022

Concrete Paving	321313
Chain Link Fences and Gates	323113
Landscaping	329119
Sewer and Manhole Testing	330130.13
Utility Directional Drilling	330507.13
Manholes and Structures	330513
Trenchless Utility Installation	330523
Utility Identification	330526
Temporary Bypass Pumping	330600
Public Sanitary Utility Sewage Piping	333113
Sanitary Utility Sewerage Force Mains	333400
Hangers and Supports for Process Piping	400507
Ductile Iron Process Pipe	400519
Plug Valves	400562
Swing Check Valves	400565.23
Air/Vacuum Valves for Wastewater Service	400578.23
Abbott Lane Lift Station Rehabilitation	432540.01
Sunset View Lift Station Rehabilitation	432540.02
Jim's Camping Lift Station	432540.03

WV WAGE RATES

ACCOMMODATION OF UTILITIES ON HIGHWAY RIGHT OF WAY

MILTON MUNICIPAL UTILTIY COMMISSION
CABELL COUNTY, WEST VIRGINIA
PROPOSED
CONTRACT #1 – MORRIS MEMORIAL SANITARY SEWER EXTENSION
THRASHER PROJECT #020-01526

BID FORM

ARTICLE 1 – BID RECIPIENT

1.01 This Bid is submitted to:

MILTON MUNICIPAL UTILITY COMMISSION
1139 SMITH STREET
MILTON, WV 25541

1.02 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

ARTICLE 2 – BIDDER'S ACKNOWLEDGEMENTS

2.01 Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for 90 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

ARTICLE 3 – BIDDER'S REPRESENTATIONS

3.01 In submitting this Bid, Bidder represents that:

A. Bidder has examined and carefully studied the Bidding Documents, and any data and reference items identified in the Bidding Documents, and hereby acknowledges receipt of the following Addenda:

Addendum No.	Addendum Date
_____	_____
_____	_____
_____	_____

B. Bidder has visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfied itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

C. Bidder is familiar with and has satisfied itself as to all Laws and Regulations that may affect cost, progress, and performance of the Work and including all AIS requirements.

D. Bidder has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and (2) reports and drawings relating to Hazardous

Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings.

E. Bidder has considered the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and any Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder; and (3) Bidder's safety precautions and programs.

F. Bidder agrees, based on the information and observations referred to in the preceding paragraph, that no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents.

G. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.

H. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and confirms that the written resolution thereof by Engineer is acceptable to Bidder.

I. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the Work.

J. The submission of this Bid constitutes an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, and that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

ARTICLE 4 – BIDDER'S CERTIFICATION

4.01 Bidder certifies that:

A. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation;

B. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;

C. Bidder has not solicited or induced any individual or entity to refrain from bidding; and

D. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 4.01.D:

1. "corrupt practice" means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process;

2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;

3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels; and

4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the e execution of the Contract.

ARTICLE 5 – BASIS OF BID

GENERAL

The Bidder shall take notice of and shall be responsible for any local or state taxes levied and applicable, and the cost for the same shall be included as part of the submitted Bid.

The total Bid cost stated includes a complete operating installation including furnishing and installation of any and all changes or additions in plans, piping, mechanical work, additional electrical work, accessories, controls, etc. necessary to accommodate alternative equipment systems or materials used in construction.

BID PROPOSAL

The Bidder agrees to perform all required Work described in the detailed Specifications and as shown on the Plans for the complete construction and placing in satisfactory operation the Milton Municipal Utility Commission Contract #1 – Morris Memorial Sanitary Sewer Extension. The Project "Sequence of Construction" has been detailed in the Drawings and Specification Division 1, Project Summary, Section 1010, Part-2 Execution. The Bidder agrees to perform all the Work proposed for the total of the following Bid prices.

5.01 Bidder will complete the Work in accordance with the Contract Documents for the following price(s):

PROPOSED
CONTRACT #1 – MORRIS MEMORIAL SANITARY SEWER EXTENSION
FOR THE

MILTON MUNICIPAL UTILTIY COMMISSION
CABELL COUNTY, WEST VIRGINIA

THRASHER PROJECT #020-01526

BID SCHEDULE

NOTE: Bid Unit PRICE amounts are to be shown in both words and figures. In case of discrepancy, the amount shown in words will govern. Bids shall include sales tax and all other applicable taxes and fees.

Item	Quantity	Description with Unit Price Written		Unit Price	Total Price
1	1 LS	Mobilization/Demobilization			
		_____	Dollars		
		_____	Cents	_____	_____
2	1 LS	Videotaping of Project Area			
		_____	Dollars		
		_____	Cents	_____	_____
3	1 LS	Erosion and Sedimentation Control			
		_____	Dollars		
		_____	Cents	_____	_____

Item	Quantity	Description with Unit Price Written	Unit Price	Total Price
4a	1,200 LF	10” Gravity Sewer Line (0’-6’ Deep) _____ Dollars _____ Cents	_____	_____
4b	660 LF	10” Gravity Sewer Line (6’-9’ Deep) _____ Dollars _____ Cents	_____	_____
4c	1,060 LF	10” Gravity Sewer Line (9’-12’ Deep) _____ Dollars _____ Cents	_____	_____
5a	1,130 LF	8” Gravity Sewer Line (0’-6’ Deep) _____ Dollars _____ Cents	_____	_____
5b	2,130 LF	8” Gravity Sewer Line (6’-9’ Deep) _____ Dollars _____ Cents	_____	_____
5c	240 LF	8” Gravity Sewer Line (9’-12’ Deep) _____ Dollars _____ Cents	_____	_____
5d	30 LF	8” Gravity Sewer Line (12’-15’ Deep) _____ Dollars _____ Cents	_____	_____
5e	90 LF	8” Gravity Sewer Line (+18’ Deep) _____ Dollars _____ Cents	_____	_____
6a	40 LF	8” D.I. Gravity Sewer Line (0’-6’ Deep) _____ Dollars _____ Cents	_____	_____

Item	Quantity	Description with Unit Price Written	Unit Price	Total Price
6b	40 LF	8" D.I. Gravity Sewer Line (6'-9' Deep) _____ Dollars _____ Cents	_____	_____
6c	30 LF	8" D.I. Gravity Sewer Line (+18' Deep) _____ Dollars _____ Cents	_____	_____
7	1,500 LF	6" Forcemain _____ Dollars _____ Cents	_____	_____
8	2,600 LF	6" Forcemain, Installed in Same Trench as Gravity Sewer Line _____ Dollars _____ Cents	_____	_____
9	270 LF	4" Customer Service Lateral _____ Dollars _____ Cents	_____	_____
10a	180 LF	16" Steel Casing (Bore & Jack) _____ Dollars _____ Cents	_____	_____
10b	120 LF	12" Steel Casing (Bore & Jack) _____ Dollars _____ Cents	_____	_____
11a	35 EA	48" Diameter Manhole Base, Cone Top, Regular Casting _____ Dollars _____ Cents	_____	_____
11b	2 EA	60" Diameter Manhole Base, Cone Top, Regular Casting _____ Dollars _____ Cents	_____	_____

Item	Quantity	Description with Unit Price Written	Unit Price	Total Price
12a	55 VF	48” Diameter Manhole Riser Pipe _____ Dollars _____ Cents	_____	_____
12b	35 VF	60” Diameter Manhole Riser Pipe _____ Dollars _____ Cents	_____	_____
13a	6 EA	10”x4” PVC Wye Connection _____ Dollars _____ Cents	_____	_____
13b	12 EA	8”x4” PVC Wye Connection _____ Dollars _____ Cents	_____	_____
14	18 EA	Customer Service Lateral Cleanout Assembly _____ Dollars _____ Cents	_____	_____
15	2 EA	Pressure Inline Cleanout _____ Dollars _____ Cents	_____	_____
16	4 EA	Combination Vacuum/Air Release Valve _____ Dollars _____ Cents	_____	_____
17a	375 LF	WVDOH Type “B” Trench Repair _____ Dollars _____ Cents	_____	_____
17b	400 LF	WVDOH Type “C” Trench Repair _____ Dollars _____ Cents	_____	_____

Item	Quantity	Description with Unit Price Written		Unit Price	Total Price
18a	90 LF	Asphalt Driveway Repair			
		_____	Dollars		
		_____	Cents	_____	_____
18b	1,660 LF	Gravel Driveway Repair			
		_____	Dollars		
		_____	Cents	_____	_____
19	1 LS	Aerial Crossing			
		_____	Dollars		
		_____	Cents	_____	_____
20	1 LS	Grand Patrician Lift Station			
		_____	Dollars		
		_____	Cents	_____	_____
21	1 LS	Flea Market Lift Station			
		_____	Dollars		
		_____	Cents	_____	_____
22	1 EA	Existing Grinder Station Decommissioning			
		_____	Dollars		
		_____	Cents	_____	_____
23	8,300 LF	Reclamation of Disturbed Area			
		_____	Dollars		
		_____	Cents	_____	_____
24	2,000 LF	WVDOH Inspection Fee Allowance			
		Three	Dollars		
		Thirty-Seven	Cents	$3.37	$6,740.00

TOTAL BID: _____

_____ ($_____)

(Amounts are to be shown in both words and figures. In case of discrepancy, the amount shown in words will govern.)

NOTE: THE CONTRACTOR'S UNIT PRICES SHALL INCLUDE PURCHASE AND INSTALLATION, COMPLETE IN PLACE, PER BID ITEM IN ACCORDANCE WITH THE DETAILED SPECIFICATIONS.

Bidder acknowledges that (1) each Bid Unit Price includes an amount considered by Bidder to be adequate to cover Contractor's overhead and profit for each separately identified item, and (2) estimated quantities are not guaranteed, and are solely for the purpose of comparison of Bids, and final payment for all unit price Bid items will be based on actual quantities, determined as provided in the Contract Documents.

METHOD OF AWARD

If at the time this contract is to be awarded, the lowest total bid submitted by a qualified, responsible Bidder does not exceed the amount of funds then estimated by the Owner, as available to finance the contract, the construction contract will be awarded. If such bids exceed such amount, the Owner may reject all bids.

A. Unit prices have been computed in accordance with paragraph 13.03.A of the General Conditions.

B. Bidder acknowledges that estimated quantities are not guaranteed, and are solely for the purpose of comparison of Bids, and final payment for all Unit Price Bid items will be based on actual quantities, determined as provided in the Contract Documents.

ARTICLE 6 – TIME OF COMPLETION

6.01 Bidder agrees that the Work will be substantially complete and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before the dates or within the number of calendar days indicated in the Agreement.

6.02 Bidder accepts the provisions of the Agreement as to liquidated damages.

ARTICLE 7 – ATTACHMENTS TO THIS BID

7.01 The following documents are submitted with and made a condition of this Bid:

A. Bid Opening Requirements

ARTICLE 8 – DEFINED TERMS

8.01 The terms used in this Bid with initial capital letters have the meanings stated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.

ARTICLE 9 – BID SUBMITTAL

BIDDER: *[Indicate correct name of bidding entity]*

_____

By:
[Signature] _____

[Printed name] _____
(If Bidder is a corporation, a limited liability company, a partnership, or a joint venture, attach evidence of authority to sign.)

Attest:
[Signature] _____

[Printed name] _____

Title: _____

Submittal Date: _____

Address for giving notices:

_____

_____

_____

Telephone Number: _____

Fax Number: _____

Contact Name and e-mail address: _____

_____

Bidder's License No.: _____
(where applicable)

SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Project information.
2. Work covered by Contract Documents.
3. Phased construction.
4. Work under separate contracts.
5. Access to site.
6. Coordination with occupants.
7. Work restrictions.
8. Specification and drawing conventions.
9. Miscellaneous provisions.

B. Related Requirements:

1. Section 015000 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

1.2 PROJECT INFORMATION

A. Project Identification: Contract #1 – Morris Memorial Sanitary Sewer Extension

1. Project Location: Cabell County, West Virginia

B. Owner: Milton Municipal Utility Commission

1. Owner's Representative: Charlie Conard

C. Engineer: The Thrasher Group, Inc.

1.3 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of Project is defined by the Contract Documents and consists of the following:

1 LS Mobilization/Demobilization; 1 LS Videotaping of Project Area; 1 LS Erosion and Sedimentation Control; 2,920 LF 10" PVC SDR-35 Gravity Sewer Line; 3,625 LF 8" PVC SDR-35 Gravity Sewer Line; 110 LF 8" D.I. Gravity Sewer Line; 1,500 LF 6" PVC DR-18 Forcemain; 2,600 LF 6" PVC DR-18 Forcemain, Installed in Same Trench as Gravity Sewer Line; 270 LF 4" PVC SDR-35 Customer Service Lateral; 180 LF 16" Steel Casing (Bore & Jack); 120 LF 12" Steel Casing (Bore & Jack); 35 EA 48" Diameter Manhole Base, Cone Top, Regular Casting; 2 EA 60" Diameter Manhole Base, Cone Top, Regular Casting; 55 VF 48" Diameter Manhole

Riser Pipe; 35 VF 60" Diameter Manhole Riser Pipe; 6 EA 10"x4" PVC Wye Connection; 12 EA 8"x4" PVC Wye Connection; 18 EA Customer Service Lateral Cleanout Assembly; 2 EA Pressure Inline Cleanout; 4 EA Combination Vacuum/Air Release Valve; 375 LF WVDOH Type "B" Trench Repair; 400 LF WVDOH Type "C" Trench Repair; 90 LF Asphalt Driveway Repair; 1,660 LF Gravel Driveway Repair; 1 LS Aerial Crossing; 1 LS Grand Patrician Lift Station; 1 LS Flea Market Lift Station; 1 EA Existing Grinder Station Decommissioning; 8,300 LF Reclamation of Disturbed Area; $6,740.00 WVDOH Inspection Fee Allowance.

B. Type of Contract.

1. Project will be constructed under coordinated, concurrent multiple contracts. Contracts for this Project include the following:

a. Contract #1 – Morris Memorial Sanitary Sewer Extension
b. Contract #2 – Sanitary Sewer Rehab and Lift Station Relocation
c. Contract #3 – Miscellaneous Sewer Improvements

1.4 WORK UNDER SEPARATE CONTRACTS

A. General: Cooperate fully with separate contractors so work on those contracts may be carried out smoothly, without interfering with or delaying work under this Contract or other contracts.

1. Coordinate Work of this Contract with work performed under Contract #2 and Contract #3

1.5 ACCESS TO SITE

A. General: Contractor shall have full use of Project site for construction operations during construction period. Contractor's use of Project site is limited only by Owner's right to perform work or to retain other contractors on portions of Project.

B. Use of Site: Limit use of Project site to areas within the Contract limits indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.

1. Driveways, Walkways and Entrances: Keep driveways parking areas, and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.

a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

C. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.

1.6 WORK RESTRICTIONS

A. Work Restrictions, General: Comply with restrictions on construction operations.

1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.

B. On-Site Work Hours: Limit work in the existing building to normal business working hours of 7:00 a.m. to 5:00 p.m., Monday through Friday, unless otherwise indicated.

C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:

1. Notify Engineer not less than two days in advance of proposed utility interruptions.
2. Obtain Engineer's written permission before proceeding with utility interruptions.

D. Environmental Protection

1. Applicable Regulations

a. The Contractor and his subcontractors, in the performance of this Contract, shall comply with all applicable Federal, State and local laws and regulations concerning environmental pollution control and abatement as well as the specific requirements stated elsewhere in the Contract Documents.

b. Water Pollution

1) The Contractor shall take all precautions necessary to avoid pollution of water in adjacent watercourses or water storage areas including wells.
2) All earthwork, equipment movement, control of water in excavations and other operations which may create silting shall be conducted in a manner to keep water pollution to an absolute minimum.
3) Water used during the contract work which has become polluted with oil, harmful or objectionable chemicals, sewage or other pollutants shall be disposed of in a manner that will not affect nearby waters and land. The Contractor shall not, under any circumstances, discharge pollutants into any watercourse.

c. Noise, Vibration, and Odors: Coordinate operations that may result in high level of noise and vibration, odors, or other disruption to Owner occupancy with Owner.

1) The Contractor shall take all precautions necessary to avoid noise and air pollution during the course of the Contract.
2) Notify Engineer not less than two days in advance of proposed disruptive operations.
3) Obtain Engineer's written permission before proceeding with disruptive operations.

E. Controlled Substances: Use of tobacco products and other controlled substances within the existing building on Project site is not permitted.

1.7 SPECIFICATION AND DRAWING CONVENTIONS

A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.

B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.

C. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:

1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard and scheduled on Drawings.
3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

D. Plans and Working Drawings

1. Approved plans will show the location, profile, typical cross section, structures except as hereinafter specified, incidental items, and a summary of all items appearing in the proposal. Any deviations which may be required by the construction will be determined by the Engineer and authorized by him in writing. The Contractor shall keep one set of approved plans available of the work at the project site at all times.
2. Plans will show details necessary to give a comprehensive idea of the construction contemplated. Any information which may be shown on drawings regarding results obtained from test borings will be a record of conditions encountered at the place where such test borings were made, as nearly as these conditions could be interpreted by the Engineer observing the operations. The Contractor shall interpret the data in the light of his own experience. The Contractor is not bound to accept or rely on the data shown on the drawings, but may make additional borings and investigations, including test piles, to satisfy himself concerning the lengths of piles and the conditions governing or entering into the construction of foundations.
3. The plans may show the construction depths and dimensions on which the estimate of quantities is based. These depths and dimensions, however, are subject to variations as necessary to the Engineer, and the right is expressly reserved to increase or diminish the dimensions and depths as the Engineer may determine.
4. The Contractor shall submit to the Engineer for approval additional calculation sheets, shop details, and other working drawings required for the construction of any part of the work; and prior to the approval of such plans, any work done or materials ordered shall be at the Contractor's risk.

5. Working drawings for concrete structures shall consist of detailed plans required for the successful execution of the work and which are not included in the plans furnished by the Engineer. These may include plans for drainage structures, falsework, bracing, centering and formwork, masonry layout diagrams, and diagrams for reinforced concrete structures and bent reinforcement.
6. The Contractor shall furnish the Engineer copies of the working drawings for approval and for construction purposes, and upon completion of the work the original tracings of working drawings shall be delivered to the Engineer. The drawings are to be on tracing paper, in ink or in pencil. The size of all drawings and prints shall be 22 inches by 34 inches or 24 inches by 36 inches, including margins.
7. It is expressly understood that the Engineer's approval of the Contractor's working drawings relate to the requirements for strength and general arrangement, and approval will not relieve the Contractor of responsibility for omissions, errors in dimensions, shop fits, field connections, etc., for quantity of materials, or of his responsibility under the contract for the successful completion of the work.
8. The contract price shall include the cost of furnishing all working drawings, and the Contractor will be allowed no extra compensation for such drawings.

E. Conformity with Plans and Specifications

1. All work performed, and all materials furnished shall be in reasonably close conformity with the lines, grades, cross sections, dimensions, and material requirements, including tolerances, shown on the plans or indicated in the specifications.
2. Should the Engineer determine the materials or the finished product does not conform with the specifications or the plans, he will then make a determination if the work will be accepted and remain in place. In this event, the Engineer will document the basis of acceptance by contract modification which will provide for an adjusted payment. All nonconforming material or construction judged to be inadequate for the use intended shall either be reworked or removed and replaced at no expense to the Owner.

F. Errors or Omissions in Plans

1. The Contractor shall take no advantage of any apparent error or omission in the plans or specifications. In the event the Contractor discovers such an error or omission, he shall immediately notify the Engineer. The Engineer will then make such corrections and interpretations necessary for fulfilling the intent of the plans and specifications.

1.8 CONSTRUCTION SEQUENCE OF EVENTS

1. Call Miss Utility 1-800-245-4848.
2. Pre-Construction Video of Project Area.
3. Mobilization to Project Site.
4. Installation of Erosion and Sediment Control Measures.
5. Site Preparation.
6. Install Force Mains, Gravity Sewer Lines, and Manholes.
7. Testing of Force Mains, Gravity Sewer Lines and Manholes.
8. Complete Flea Market Lift Station.
9. Complete Grand Patrician Lift Station.

10. Start up. Testing, and Commissioning of Lift Stations.
11. Complete all Restoration of Disturbed Areas and Clean-Up.
12. Substantial Completion.
13. Complete Punch List Items.
14. Remove Erosion and Sediment Control Measures once Site is Stabilized.
15. Final Completion and Demobilization.
16. Project Closeout.

1.9 MISCELLANEOUS PROVISIONS

A. The Contractor shall be responsible for conducting all Work in a safe manner and shall take reasonable precautions to ensure the safety and protection of workers, property and the general public.

B. All construction shall be conducted in accordance with the latest applicable requirements for Part 1926 of the Occupational Safety and Health Act. Safety and Health Regulations for Construction, Section 107 of the Contract Work Hours and Safety Standards Act, as well as any other local, state or federal safety codes and regulations.

C. The Contractor shall designate a trained and qualified employee who is to be responsible for ensuring that the Work is performed safely and in conformance with all applicable regulations.

D. The Contractor shall determine the safety hazards involved in prosecuting the Work and the precautions necessary to conduct the Work safely. If the Contractor is unsure as to any special hazards which may be unique to the various processes and facilities at the treatment plant, it shall be the Contractor's responsibility to determine such information prior to beginning the Work.

E. The Contractor shall bear all risks associated with performing the Work and shall fully indemnify and hold harmless the Owner and Engineer.

F. The Contractor's attention to the fact that construction activities within wastewater collection systems and treatment plants shall occasionally involve work in potentially hazardous environments in which oxygen deficient, toxic or explosive conditions may exist. Additional hazards arise from the presence of pathogens in wastewater and sludge found in collection systems and wastewater treatment plants, which form the slime and scum layer that coat walking, working and other surfaces. In dealing with these hazards, the Contractor shall take special precautions to ensure worker safety. Such precautions shall include, but are not limited to, the following, as applicable:

1. Installing temporary forced air ventilation equipment and ducts for fresh air in enclosed areas.
2. Using pneumatic tools and equipment instead of electric-driven equipment in hazardous areas.
3. Avoiding the use of cutting torches, field welding and grinders in hazardous areas.
4. Cleaning and disinfecting working surfaces with hot water, high pressure washers prior to commencing work.
5. Installing sealed wooden baffles or bulkheads to isolate working areas from hazardous atmospheres.

6. Providing portable oxygen meters, combustible gas detectors and hydrogen sulfide detectors to continuously monitor the atmosphere in enclosed working areas.
7. Providing safety harnesses, safety lines and recovery crews for workers in hazardous areas.
8. Providing self-contained breathing apparatus with spare air cylinders for workers in hazardous areas.
9. Providing dry chemical fire extinguishers and connected fire hoses in areas where a danger of fire or explosion exists.
10. Providing adequate, oxygen-equipped, first aid facilities.
11. Providing suitable wash-up areas and facilities for workers.
12. Installing temporary lighting using explosion-proof fixtures in hazardous environments.
13. Installing approved warning and hazard signs and posting safety procedures.
14. Instructing all workers as to the hazards present, the procedures to be followed and the proper function and use of all safety and emergency equipment furnished.

G. Prior to commencing Work on existing facilities and equipment, the Contractor shall notify the collection system and/or plant superintendent and shall ensure that the source of electrical energy to all affected equipment is shut off and locked out at the appropriate motor control center. Local switches and pushbutton stations, where provided, shall be locked in the "off" position.

H. Prior to entering or commencing work in a hazardous area, the Contractor shall ensure all safety and emergency equipment is in place and in satisfactory operating condition.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

This page intentionally left blank

SECTION 012000 - PRICE AND PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract Documents, including General and Supplementary Conditions, Division 01, and all related Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

A. Schedule of Values.

B. Application for Payment.

C. Change procedures.

D. Defect assessment.

E. Measurement and Payment.

F. Alternates.

1.3 SCHEDULE OF VALUES

A. Submit printed schedule on Progress Estimate schedule on EJCDC C-620.

B. Submit Schedule of Values in duplicate within twenty (20) days after date established in Notice to Proceed.

C. Format: Identify each line item with number and title of major Specification Section. Contractor shall submit a balanced Schedule of Values. The total value of activities shall equal the identifiable Contract Price. The Schedule of Values shall be accompanied by a proposed cash flow for the duration of the Project. Line items shall be broken down as appropriate and listed as units. Overhead and profit shall be prorated to all the activities.

1. Unless otherwise specified, the Schedule of Values shall include the following percentages for each of the listed activities:

    a. Mobilization, Bonds, Insurance, and Demobilization: no greater than 5 percent
    b. As-Built Drawings: no less than 1 percent
    c. Punchlist: no less than 2 percent
    d. Final Bound O&M Manuals: no less than 1 percent
    e. All Spare Parts Values not specifically assigned elsewhere: no less than 0.5 percent

f. Testing: no less than 1 percent

2. Schedules whose non-equipment related cash flow exceeds 10 percent of the total Contract amount (exclusive of equipment) in any one (1) month, or 45 percent of the total Contract amount (exclusive of equipment) in any three (3) consecutive months shall be deemed unacceptable and require revision. Exceptions may be granted at the discretion of the Engineer for unusual circumstances or non-routine construction.
3. If, in the opinion of Engineer or Owner, the Schedule of Values is unbalanced, Contractor shall submit documentation substantiating the cost allocations of those activities believed to be unbalanced. No pay requests will be accepted until the Schedule of Values submittals has been marked "No Exceptions Taken" or "Make Corrections Noted" by Engineer.

D. Include within each line item, direct proportional amount of Contractor's overhead and profit.

E. Revise schedule to list approved Change Orders with each Application for Payment.

1.4 APPLICATION FOR PAYMENT

A. Submit five (5) copies of each Application for Payment on EJCDC C-620 – Contractor's Application for Payment.

B. Content and Format: Use Schedule of Values for listing items in Application for Payment.

C. Submit updated construction schedule and payment schedule with each Application for Payment.

D. Payment Period: Submit at intervals stipulated in the Agreement.

E. Submit submittals with transmittal letter as specified in Section 013300 - Submittal Procedures.

F. Substantiating Data: When Engineer requires substantiating information, submit data justifying dollar amounts in question. Include the following with Application for Payment:

1. Current construction photographs
2. Partial release of Liens from major Subcontractors and vendors.
3. Record Documents as specified in Section 017000 - Execution and Closeout Requirements, for review by Owner, which will be returned to Contractor.
4. Affidavits attesting to off-Site stored products.
5. Construction Progress Schedule revised and current as specified in Section 013300 - Submittal Procedures.

1.5 CHANGE PROCEDURES

A. Submittals: Submit name of individual who is authorized to receive change documents and is responsible for informing others in Contractor's employ or Subcontractors of changes to the Work.

B. Carefully study and compare Contract Documents before proceeding with fabrication and installation of Work. Promptly advise Engineer of any error, inconsistency, omission, or apparent discrepancy.

C. Requests for Interpretation (RFI) and Clarifications: Allot time in construction scheduling for liaison with Engineer; establish procedures for handling queries and clarifications.

1. Use Request for Information Form for requesting interpretations (provided by Engineer upon request).
2. Engineer may respond with a direct answer on the Request for Information form, separate Engineer Response, EJCDC C-942 - Field Order, or EJCDC C-940 - Work Change Directive Form.

D. Engineer will advise of minor changes in the Work not involving adjustment to Contract Sum/Price or Contract Time by issuing supplemental instructions on EJCDC C-942.

E. Engineer may issue Notice of Change including a detailed description of proposed change with supplementary or revised Drawings and Specifications, a change in Contract Time for executing the change with stipulation of overtime Work required and with the period of time during which the requested price will be considered valid. Contractor will prepare and submit estimate within ten (10) days.

F. Contractor may propose changes by submitting a request for change to Engineer, describing proposed change and its full effect on the Work. Include a statement describing reason for the change and the effect on Contract Sum/Price and Contract Time with full documentation and a statement describing effect on the Work by separate or other Contractors.

G. Stipulated Sum/Price Change Order: Based on Proposal Request or Work Change Directive and Contractor's maximum price quotation or Contractor's request for Change Order as approved by Engineer.

H. Unit Price Change Order: For Contract unit prices and quantities, the Change Order will be executed on a fixed unit price basis. For unit costs or quantities of units of that which are not predetermined, execute Work under Work Directive Change. Changes in Contract Sum/Price or Contract Time will be computed as specified for Time and Material Change Order.

I. Work Change Directive: Engineer may issue directive, on EJCDC C-940 - Work Change Directive, instructing Contractor to proceed with change in the Work, for subsequent inclusion in a Change Order. Document will describe changes in the Work and designate method of determining any change in Contract Sum/Price or Contract Time. Promptly execute change.

J. Time and Material Change Order: Submit itemized account and supporting data after completion of change, within time limits indicated in Conditions of the Contract. Engineer will determine change allowable in Contract Sum/Price and Contract Time as provided in Contract Documents.

K. Maintain detailed records of Work done on time and material basis. Provide full information required for evaluation of proposed changes and to substantiate costs for changes in the Work.

L. Document each quotation for change in Project Cost or Time with sufficient data to allow evaluation of quotation.

M. Change Order Forms: EJCDC C-941 - Change Order.

N. Execution of Change Orders: Engineer will issue Change Orders for signatures of parties as provided in Conditions of the Contract.

O. Correlation of Contractor Submittals:

1. Promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as separate line item and adjust Contract Sum/Price.
2. Promptly revise Progress Schedules to reflect change in Contract Time, revise sub-schedules to adjust times for other items of Work affected by the change, and resubmit.
3. Promptly enter changes in Record Documents.

1.6 DEFECT ASSESSMENT

A. Replace the Work, or portions of the Work, not conforming to specified requirements.

B. If, in the opinion of Engineer or Owner, it is not practical to remove and replace the Work, Engineer or Owner will direct appropriate remedy or adjust payment.

C. The defective Work may remain, but unit sum/price will be adjusted to new sum/price at discretion of Owner.

D. Defective Work will be partially repaired according to instructions of Engineer, and unit sum/price will be adjusted to new sum/price at discretion of Owner.

E. Individual Specification Sections may modify these options or may identify specific formula or percentage sum/price reduction.

F. Authority of Owner to assess defects and identify payment adjustments is final.

G. Nonpayment for Rejected Products: Payment will not be made for rejected products for any of the following reasons:

1. Products wasted or disposed of in a manner that is not acceptable.
2. Products determined as unacceptable before or after placement.
3. Products not completely unloaded from transporting vehicle.
4. Products placed beyond lines and levels of the required Work.
5. Products remaining on hand after completion of the Work.
6. Loading, hauling, and disposing of rejected products.

1.7 MEASUREMENT AND PAYMENT

A. General Requirements

1. Contractor shall take measurements and compute quantities. Resident Project Representative and Engineer will verify measurements and quantities.
2. Unit Quantities: Quantities and measurements indicated on Bid Form are for Contract purposes only. Actual quantities provided shall determine payment.

    a. When actual Work requires more or fewer quantities than those quantities indicated, provide required quantities at Contracted unit sum/prices.
    b. When actual Work requires 25 percent or greater change in quantity than those quantities indicated, Owner or Contractor may claim a Contract Price adjustment.

3. Payment Includes: Full compensation for required labor, products, tools, equipment, plant and facilities, transportation, services and incidentals; erection, application, or installation of item of the Work; overhead and profit.
4. Final payment for Work governed by unit prices will be made on basis of actual measurements and quantities accepted by Engineer multiplied by unit sum/price for Work incorporated in or made necessary by the Work.

B. Measurement of Quantities

1. Weigh Scales: Inspected, tested, and certified by applicable West Virginia weights and measures department within past year.
2. Platform Scales: Of sufficient size and capacity to accommodate conveying vehicle.
3. Metering Devices: Inspected, tested, and certified by applicable West Virginia department within past year.
4. Measurement by Weight: Concrete reinforcing steel, rolled or formed steel, or other metal shapes will be measured by handbook weights. Welded assemblies will be measured by handbook or scale weight.
5. Measurement by Volume: Measured by cubic dimension using mean length, width, and height or thickness.
6. Measurement by Area: Measured by square dimension using mean length and width or radius.
7. Linear Measurement: Measured by linear dimension, at item centerline or mean chord.
8. Stipulated Sum/Price Measurement: Items measured by weight, volume, area, or linear means or combination, as appropriate, as completed item or unit of the Work.

C. Unit Price Schedule:

1. Bid Item 1 – Mobilization/Demobilization

    a. This Item shall include the performance of construction preparatory operations, including the movement of equipment and personnel to and from the Project Site, establishment and decommissioning of Contractor's Field Office, storage buildings, and other facilities necessary to conduct Work under this Contract.
    b. This Bid Item shall also include all costs associated with installing, maintaining, and removing the Project Sign.
    c. This Bid Item shall also include any and all costs associated with the following Specification Sections:

        1) Section 013000 – Administrative Requirements
        2) Section 013216 – Construction Progress Schedule

3) Section 013300 – Submittal Procedures
4) Section 015000 – Temporary Facilities and Controls
5) Section 017000 – Execution and Closeout Requirements
6) Section 017839 – Project Record Documents

d. Payment shall be made at the lump sum (LS) price Bid for Mobilization/Demobilization, but in no case shall the total lump sum Bid Price exceed 5 percent of the total Bid.
e. Partial Payments of the lump sum Bid amount for mobilization/demobilization shall be as follows:

1) One-fourth of the amount Bid for Mobilization/Demobilization will be released to the Contractor as the first estimate payable, not less than fifteen (15) days after the start of Work at the Project Site.
2) The second one-fourth of the amount Bid for Mobilization/Demobilization shall be released with the estimate payable thirty (30) days after the first estimate.
3) The third one-fourth of the amount Bid for Mobilization/Demobilization shall be released with the estimate payable thirty (30) days later than the estimate in which the second one-fourth has been paid.
4) The final one-fourth of the amount Bid for Mobilization/Demobilization shall be released with the final payment.
5) No reduction will be made, nor any increase be made, in the lump sum mobilization item amount regardless of decreased or increases in the final total Contract amount or for any other cause.

2. Bid Item 2 - Videotaping of Project Area

a. The cost of this work shall be included in a lump sum bid item. Such payment shall constitute full compensation for labor, materials, equipment and other cost associated to provide a complete documentation.
b. Videotaping shall include the entire construction area affected, including any Contractor secured waste site and material storage or staging areas. The measurement for this bid items shall be based on a complete video recording on a DVD of the entire project area.

3. Bid Item 3 – Erosion and Sedimentation Controls

a. The cost for this Work shall be a lump sum.
b. This Bid item shall include all costs associated with erosion and sedimentation controls including all materials and labor for installation, maintenance, and removal.
c. The cost of this Work shall be paid for at the lump sum Bid price for all erosion and sedimentation controls at all locations directly and/or indirectly disturbed by the Work.

4. Bid Item 4 – 10" Gravity Sewer Line

a. Bid Items are broken out according to the depth of excavation required as shown on the Bid form and as follows: 4a – 0'-6', 4b – 6'-9', 4c – 9'-12'.

b. This Bid item shall include all required labor, materials, equipment and all other costs associated with the complete installation of 10" gravity sewer including excavation, bedding, backfill, materials, fittings, terminal cleanouts, pipe joints, pipe, tools, supplies, testing, and incidentals. All pipe covered under this bid item shall have a minimum pressure rating of 46 psi in conformance with the contract drawings. All fittings used shall be included in the linear foot price of the pipe.

c. The sewers installed under this item shall be measured and paid for at the unit price Bid per linear feet of pipe of each type and size as specified on Drawings or as directed by the Engineer, and installed complete in place. The measurement under this item shall be the length of pipe and fittings as installed in place and accepted and shall be measured in the horizontal plane along the centerline of each pipe installed, measured from the face of manhole to face of manhole.

5. Bid Item 5 – 8" Gravity Sewer Line

a. Bid Items are broken out according to the depth of excavation required as shown on the Bid form and as follows: 5a – 0'-6', 5b – 6'-9', 5c – 9'-12', 5d – 12'-15', 5e – +18'.

b. This Bid Item shall include all required labor, materials, equipment and all other costs associated with the complete installation of 8" gravity sewer including excavation, bedding, backfill, materials, fittings, terminal cleanouts, pipe joints, concrete anchors, pipe, tools, supplies, testing, and incidentals. All pipe covered under this bid item shall have a minimum pressure rating of 46 psi in conformance with the contract drawings. All fittings used shall be included in the linear foot price of the pipe.

c. The sewers installed under this item shall be measured and paid for unit price Bid per linear foot of pipe of each type and size as specified on Drawings or as directed by the Engineer, and installed complete in place. The measurement under this item shall be the length of pipe and fittings as installed in place and accepted and shall be measured in the horizontal plane along the centerline of each pipe installed, measured from the face of manhole to face of manhole.

6. Bid Item 6 – 8" D.I. Gravity Sewer Line

a. Bid Items are broken out according to the depth of excavation required as shown on the Bid form and as follows: 6a – 0'-6', 6b – 6'-9', 6c – +18'.

b. This Bid Item shall include all required labor, materials, equipment and all other costs associated with the complete installation of 8" Class 50 ductile iron gravity sewer line including, but not limited to, excavation, bedding, backfill, concrete anchors, materials, fittings, terminal cleanouts, pipe joints, concrete thrust blocks, pipe, tools, supplies, testing, and incidentals. All fittings used shall be included in the linear foot price of the pipe.

c. The sewer line installed under this Bid item shall be measured and paid for at the unit price Bid per linear feet of pipe of each type and size as specified on Drawings or as directed by the Engineer and installed complete in place. The measurement under this item shall be the length of pipe and fittings as installed in place and accepted and shall be measured in the horizontal plane along the centerline of each pipe installed, measured from the face of manhole to face of manhole.

7. Bid Item 7 – 6" Forcemain

a. The force main installed under this Bid Item shall be measured and paid for by the linear foot of pipe installed complete in place. The measurement under this item shall be the length of pipe and fittings installed in place and accepted and shall be measured in the horizontal plane along the centerline of each pipe installed, measured centerline of tie in to centerline of tie in. All pipe covered under this bid item shall have a minimum pressure rating of 235 psi in conformance with the contract drawings.
b. The quantities determined as provided above will be paid for at the unit price Bid, which shall be full compensation for excavation, bedding, and backfilling and furnishing all materials and doing all the work herein prescribed in a workmanlike and acceptable manner, including all labor, tools, equipment, supplies, testing, and incidentals necessary to complete the work.
c. Fittings used will be paid for as part of linear foot of pipe.

8. Bid Item 8 – 6" Forcemain, Installed in Same Trench as Gravity Sewer Line

a. The force main installed under this Bid Item shall be measured and paid for by the linear feet of pipe installed complete in place. The measurement under this item shall be the length of pipe and fittings installed in place and accepted and shall be measured in the horizontal plane along the centerline of each pipe installed, measured centerline of tie in to centerline of tie in. All pipe covered under this bid item shall have a minimum pressure rating of 235 psi in conformance with the contract drawings.
b. The quantities determined as provided above will be paid for at the unit price Bid, which shall be full compensation for excavation, bedding, and backfilling and furnishing all materials and doing all the work herein prescribed in a workmanlike and acceptable manner, including all labor, tools, equipment, supplies, testing, and incidentals necessary to complete the work.
c. Fittings used will be paid for as part of linear foot of pipe.
d. The price for this Bid Item shall be reduced in comparison to any other pipe bid item installed in its own trench. This is due to the reduced and equipment labor requirements for installation within the same trench as the gravity sewer line.

9. Bid Item 9 – 4" Customer Service Lateral

a. This Bid Item shall include all required labor, materials, equipment and all other costs associated with the complete installation and removal of existing customer service lateral regardless of size and material and the subsequent replacement with 4" PVC customer service lateral including, but not limited to, excavation, bedding, backfill, materials, fittings, pipe, tools, supplies, testing, and incidentals. All fittings used shall be included in the linear foot price of the pipe. All pipe covered under this bid item shall have a minimum pressure rating of 46 psi in conformance with the contract drawings.
b. This Bid Item shall also include all costs associated with temporary bypass pumping, as required, to ensure existing sanitary service remains during construction. Any and all spills, fines, and/or backups shall be the sole responsibility of the Contractor.

c. The customer service laterals installed under this item shall be measured and paid for at the unit price Bid per linear feet of pipe as specified on Drawings or as directed by the Engineer and installed complete in place. The measurement under this item shall be the length of pipe and fittings installed in place and accepted and shall be measured in the horizontal plane along the centerline of each pipe installed, measured from the customer service wye connection to the customer service lateral cleanout.

10. Bid Item 10 – Steel Casing (Bore and Jack)

a. Bid Items are broken out according to the size of the casing as shown on the Bid form and as follows: 10a – 16", 10b – 12".
b. This Bid item shall include all labor, material, and equipment necessary for, and incidental to, the construction of the crossing, complete in place, including, but not limited to, excavation, sheeting, bracing, backfilling, grouting, casing seal, blocking, etc.
c. Measurement and payment under this item shall be measured and paid for at the unit price Bid per linear foot of the overall length of the casing pipe satisfactorily installed.
d. Payment shall be for casing pipe only; carrier pipe shall be paid by the unit Bid price per foot.
e. Compensation for unauthorized casing footage beyond that which is called for in the Drawings and Specifications will not be made.

11. Bid Item 11 – Manhole Base, Cone Top, Regular Casting

a. Bid Items are broken out according to the size of the manhole as shown on the Bid form and as follows: 11a – 48", 11b – 60".
b. This Bid Item shall include all required labor, materials, equipment and all other costs associated with the complete installation of manholes bases, cone tops, and regular castings including, but not limited to, excavation, bedding backfill, installation of pre-cast manholes, and other appurtenances.
c. Payment for manholes shall be as follows:

1) Gravel sub-base, manhole base, steps, cone top, frame, and watertight cover, up to 6-foot depth measured from invert out elevation to top of cover elevation, shall be paid at the Contract unit Bid price per each.
2) Payment for internal drop connectors, as required, for manhole construction shall be included in the unit Bid price for each new manhole installed.
3) Manhole Riser Pipe required for additional depth over 6 feet shall be paid for by the unit Bid price per vertical foot for Manhole Riser Pipe.

12. Bid Item 12 – 48" Diameter Manhole Riser Pipe

a. Bid Items are broken out according to the size of the manhole riser section as shown on the Bid form and as follows: 12a – 48", 12b – 60".
b. Manhole riser section required for depths over 6-feet shall be paid for at the unit Bid price per vertical foot.

13. Bid Item 13 – Wye Connection

a. Bid Items are broken out according to the size of gravity sewer line as shown on the Bid form and as follows: 13a – 10"x4", 13b – 8"x4".
b. This Bid item shall include all required labor, materials, equipment, and other costs associated with the complete construction of a customer service wye connection, as detailed in the Drawings.
c. The Wye fitting shall be of the same size and material as the main sewer line.
d. Payment for this Bid item shall be made on a per each basis for all customer service wye connections.

14. Bid Item 14 – Customer Service Lateral Cleanout Assembly

a. This Bid Item shall include all required labor, materials, equipment, and other costs associated with the complete construction of a new cleanout assembly, as detailed in the Drawings.
b. Payment for this Bid item shall be made on a per each basis for all new cleanout assemblies.

15. Bid Item 15 - Pressure Inline Cleanout

a. Payment for this Bid Item shall include the purchase and installation of all required material in order to construct an inline cleanout as detailed on the Drawings.
b. This Unit Bid Price shall include all required piping, valves, fittings, concrete, cast iron frame and cover, bedding, backfilling, restoration, cleanup, etc.

16. Bid Item 16 – Combination Vacuum/Air Release Valve

a. Payment for this Bid Item shall include the purchase and installation of all required material to construct a combination air/vac release valve as detailed on the Drawings.
b. This Unit Bid Price shall include all required piping, valves, fittings, manhole riser sections, cast iron frame and cover, bedding, backfilling, restoration, cleanup, etc.

17. Bid Item 17 – WVDOH Trench Repair

a. Bid Items are broken out according to the type of Trench Repair as shown on the Bid form and as follows: 17a – Type "B", 17b – Type "C".
b. This Bid item shall include all required labor, materials, equipment and all other costs associated with the type of trench repair within the WV Division of Highways Right-of-Way as shown on the Drawings or as directed by the Engineer and installed complete in place. All costs associated with traffic control shall be included in the unit price. Trench repairs shall be paid for by the linear foot, without regard to width, times the Bid price. No payment shall be made for trench repair outside the limits shown on the Contract Documents.
c. Payment shall be based on horizontal linear footage of trench repair as determined by the Contractor and confirmed by the Engineer. The Engineer has final authority for measured quantity.

18. Bid Item 18 – Driveway Repair

a. Bid Items are broken out according to the type of Driveway Repair as shown on the Bid form and as follows: 18a – Asphalt, 18b – Gravel.
b. This Bid item shall include all required labor, materials, equipment and all other costs associated with the type of driveway and road restoration as shown on the Drawings or as directed by Engineer. All costs required for traffic control shall be included in the unit price. Driveway repairs shall be paid for by the linear foot, without regard to width, times the Bid price. No payment shall be made for driveway repair outside the limits shown on the Contract Documents. No payment will be made for temporary paving required during construction. All driveway repair Work shall be included in this linear foot Bid Price.
c. Payment shall be based on horizontal linear footage of driveway repair as determined by the Contractor and confirmed by the Engineer. The Engineer has final authority for measured quantity.

19. Bid Item 19 – Aerial Crossing

a. This Bid Item shall include all costs associated with the Aerial Crossing, as specified herein and detailed within the Drawings for a complete and fully operating system.
b. This Bid Item shall include all required labor, materials, equipment and all other costs associated with the installation of the 10" PVC sanitary sewer line, 18" galvanized steel casing, casing spacers, end seals, coatings systems, anchoring brackets, and concrete support structures including excavation, backfill, materials, fittings, pipe joints, pipe, tools, supplies, material testing, sanitary sewer line testing, traffic control, asphalt repair, curb repair, seeding and mulching, and all other incidentals.

20. Bid Item 20 – Grand Patrician Lift Station

a. Measurement and payment for this bid item shall be based on the approved Schedule of Values provided by Contractor.
b. This Bid Item shall include all costs associated with furnishing a complete, in-place, working sewage pumping station, as detailed on the Drawings and in the Specifications, including, but not limited to, gravel surfacing, fencing, site lighting, control panel structure, pumps, motors, drives, controls, lifting chains, anchors, level control system, piping, valves, fittings, wet well, valve vault, access hatches, electrical conduit and wiring, and all other associated appurtenances.
c. This Bid Item shall also include all costs associated with the following Specification Sections relating to Work of this Bid Item:

Section 432540.01 – Grand Patrician Lift Station
Section 019100 – Commissioning

21. Bid Item 21 – Flea Market Lift Station

a. Measurement and payment for this bid item shall be based on the approved Schedule of Values provided by Contractor.

b. This Bid Item shall include all costs associated with furnishing a complete, in-place, working sewage pumping station, as detailed on the Drawings and in the Specifications, including, but not limited to, gravel surfacing, fencing, site lighting, control panel structure, pumps, motors, drives, controls, lifting chains, anchors, level control system, piping, valves, fittings, wet well, valve vault, access hatches, electrical conduit and wiring, and all other associated appurtenances.

c. This Bid Item shall also include all costs associated with the following Specification Sections relating to Work of this Bid Item:

1) Section 432540.02 – Flea Market Lift Station
2) Section 019100 – Commissioning

22. Bid Item 22 – Existing Grinder Station Decommissioning

a. This Bid Item shall include all labor, material, and equipment necessary for, and incidental to, the complete decommissioning of existing grinder station, including, but not limited to, excavation, backfilling, disposal of wet well, disposal of equipment, removal of electrical service, and all other associated appurtenances.

23. Bid Item 23 – Reclamation of Disturbed Area

a. This Bid Item shall include all costs associated with furnishing and placing lime, fertilizer, seed, and mulch to all disturbed areas.

b. This Bid item shall be measured and paid for by the liner foot, regardless of width, times the Bid Price. No payment shall be made for Reclamation of Disturbed Area outside the limits shown in the Drawings.

24. Bid Item 24 – WVDOH Inspection Fee Allowance

a. This Bid Item shall include all costs associated with paying the inspection fee required by the West Virginia Division of Highways for the project. The inspection fee allowance is $6,740.00.

b. The costs associated with this fee shall be in accordance with General Conditions Article 13. The fee is based on the per linear foot cost of sewer line installed in the WVDOH right-of-way to cover all WVDOH inspection costs. This bid item specifically excludes any work shown on the Contract Documents. All wok within the Contract Documents shall be included in previous bit items.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012000

SECTION 262930 - CELLULAR MONITORING TELEMETRY

PART 1 - GENERAL

1.1 SUMMARY

A. This Section describes the requirements for furnishing a full functional lift station cellular telemetry. The contractor shall furnish, install, and place into operation a comprehensive monitoring system for the water treatment facilities as described herein. All equipment is to be completely factory assembled, wired and tested prior to shipment.

B. The equipment provided shall be a completely integrated automatic monitoring system consisting of the required power equipment (circuit breakers, transformers etc.), automation and alarm monitoring equipment in a factory wired and tested assembly. The automatic data collection and alarm/monitoring system components shall be standard, cataloged, stocked products of the pump system supplier to assure one source responsibility, immediately available spare/replacement parts, proper system interconnections and reliable long term operation. The entire system software will be fully configurable by the owner, using a simple fill-in-the-blank configuration method. Systems that require trained programmers, or factory software setup and configuration for future software edits will not be acceptable.

1.2 TELEMETRY

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Omnisite.
2. Allen Bradley.
3. Square-D.
4. Foxboro.
5. Modicon.
6. Motorola MOSCAD.
7. Engineer's Approved Equal

B. Not less than (100%) of all equipment shall be standard catalogued products of the pumping system supplier to assure one source responsibility, proper system interconnections and reliable, long term operation. The pump supplier shall provide all monitoring equipment and employ full-time engineering, service and support personnel necessary to provide and support the complete system.

1.3 SUBMITTALS

A. The complete assembly shall be provided with job-specific wiring diagrams, parts lists, enclosure dimensional and door layout drawings and instructions.

B. Shop Drawings shall be submitted for approval for all equipment herein specified. The Shop Drawing Submittal shall include a Document List. An Order Specification shall be included which shall describe in detail all equipment provided. Each panel shall be provided job-specific wiring diagrams, parts list, enclosure door layout and enclosure dimension drawing. The wiring diagram requirement applies to all field mounted instruments, telemetry equipment as well as all required interfacing to the power panel. Interconnection details shall be shown for all field mounted instrumentation. A description of Operation shall be provided detailing the operation of the complete system, including the telemetry, control and alarm handling.

C. Provide Record Drawings and Instruction Manuals. These manuals shall include corrected Shop Drawings. In addition, a detailed Programming and Operations Manual for the Microprocessor-based Monitor and Data Collector Unit shall be included. The manual shall include all information as detailed for the Shop Drawing Submittals above.

1.4 PARTS

1) Telemetry to include for each telemetry installation:
1-Weatherproof 4X 12 X 10 X 4" polycarbonate enclosure.
1-Intelligent key reader station
1- Operator Interface LCD display and keypad
1-Surge Arrestor.
1-Remote Telemetry Unit.
1-Power supply, charger, backup battery and filter.
1-WINGS Cellular Modem.
1-15VDC power supply
1-Crew on-site intelligent key
1- High gain phantom antenna

PART 2 - PRODUCTS

2.1 GENERAL SPECIFICATIONS

A. A Microprocessor-based Monitoring Unit shall be provided for monitoring of the pump stations based on alarm contact closures, and universal voltage input signals.

B. The Microprocessor-based monitor shall be a standard, catalogued product of a water and wastewater equipment manufacturer regularly engaged in the design and manufacture of such equipment. The pump/alarm monitor shall be specifically designed for pumping automation utilizing standard hardware and software. "One of a kind" systems using custom software with a generic programmable controller, or pieces from many manufacturers that are "integrated" together will not be acceptable.

C. The monitor shall accept (10) universal DI configurable to monitor dry contacts or any voltage range between 12VDC/VAC to 120 VAC/VDC with two(2) of these inputs convertible to act as pulse counters; (1) rain guage input, and (1) crew on-site intelligent key reader input in its base form. It shall have Wago type removable terminal blocks.

D. Gel Cell Battery: On-board 12VDC, 800mAH gel cell battery provides backup for up to 4 hours in the event of power loss. Battery is automatically recharged using temperature compensated floating battery charging circuit.

E. LCD display: (16 character X 2 line) Liquid Crystal display is viewable in very bright sunlight, total darkness or very high or low temperatures. This high visibility operator display is used to configure and monitor variables and eliminates the need for programming devices such as laptop computers. Includes built-in screen saver that continuously scrolls values of all inputs and calculations for easy viewing and setpoint adjustment.

2.2 COLOR GRAPHIC SOFTWARE AND WEB-TO-WIRELESS TECHNOLOGY

A. The system software shall provide the following features:

1. Upon Alarm condition: facilitate the compilation and transmission of alarm information to commercially available alphanumeric pager systems.

2. Upon Alarm condition: facilitate the compilation and transmission of alarm information to commercially available numeric pager systems.

3. Upon Alarm condition: facilitate the compilation and transmission of alarm information to commercially available voice pagers.

4. Upon Alarm condition: facilitate the compilation and transmission of alarm information over standard telephone lines to residential or commercial sites, or cellular phones, provide for verbalization of alarm information and allow for the secure remote acknowledgment of such alarms.

5. Allows for Voice Dial-in Connection via telephone line to facilitate the Acknowledgment of active alarms.

6. Allows for Voice Dial-in Connection via telephone line to facilitate the inquiry of values of digital tags.

7. Both Voice Dial-in and Voice Dial-out access modes shall be protected by mandatory redundant password entry system.

8. Shall allow for the configuration and maintenance of a set of "global" voice data files used in the construction of voice output messages.

9. Shall allow for the creation and maintenance of a "phone book" of destinations for alarm transmissions. The quantity of eligibility entries in the phone book shall be unlimited.

10. Shall have the ability to archive collected data and export this data to common Microsoft packages.

11. Shall provide for the creation of "Groups" consisting of selected entries from the Phone Book. A "Group" may be considered to be a logical grouping of alarms, based upon the

type of transmission desired as a result of any alarm condition. Group configuration shall allow for:

a) Allow for selection of recipient list for alarm transmissions along with recipient priority determination.

b) Allow for creation of user configurable delays prior to commencement of alarm transmissions.

c) Allow for user selection of "single pass" or "continuous loop" modes through recipient list until alarms are acknowledged.

d) Allow for user enable/disable of: data logging to disk file, automatic acknowledgment upon return to normal of alarm condition, mandatory user acknowledgment of alarms.

12. Shall provide for Digital Alarm handling and allow a textual description field and voice verbalization files for each Digital Alarm. Standard alarm acknowledgment requires personal involvement.

13. Shall allow for the creation and maintenance of "reports" or organized collections of tags. Such reports may be Voice accessed via telephone line employing a mandatory password protection system. The report feature shall make it possible to inquire and receive a verbalization of the description of the tag requested, along with the current value. This alteration process calls for the pre-configuration of the tag, making it available for inquiry and/or change.

14. Execution Software

a) Shall be capable of displaying on screen, current alarm status and alarm history status of a minimum of 205,000 simultaneous alarm tags.

b) Shall allow for manual transmission of user entered alphanumeric or numeric pages by selection of destination from the phone book and message entry.

c) Shall be capable of maintaining a group by group activity log which may capture: Any alarms that may occur (along with user configurable time and date stamp), any return to normal transactions, any alphanumeric or numeric pages, any voice dial-outs, any voice-dial-ins (including who has accessed the system and who has acknowledged alarms).

d) Historical data collection of all alarm events, alarm acknowledgements, and return-to-normal events. Line and bar graphs are used to present level and control data in a user friendly format and can be exported at any time to other 3rd party software packages

e) No other special hardware or software is required for system operation.

2.3 INCOMING SERVICE AND LIGHTNING ARRESTOR

A. The incoming service for the control system shall be 120 volt, 1 phase, 3 wire, 60 Hertz. A single phase lightning arrestor shall be supplied in the control system and connected to each line of the incoming side of the power input terminals. The arrestor shall protect the control system against damage as the result of transient voltage surges caused by lightning interference, switching loads and power line interference's. It shall begin shunting to ground at 500 volts maximum.

B. All metering shall be done ahead of the main disconnect and control panel. The meter shall be supplied and installed by the Contractor in accordance with local power company requirements.

C. The electrical service shall be provided by the utility. Electric meterbase shall be provided by the owner and installed in accordance with the requirements of the electric utility. A UL rated main disconnect switch, circuit breaker panel, conduit and wiring between the power company termination and the control panel shall be furnished and installed by the contractor. The power supply to the control panels shall be 120 volts, one phase, three wire, 60 Hertz.Each module shall include at least one Ethernet port and one serial port. Some modules will have additional ports as well as built-in radios and modems as described in their individual I/O specifications

2.4 15 VDC POWER SUPPLY

A. AA regulated 15 VDC power supply shall be provided for the radios and other monitoring system components as required. The power supply shall include a terminal block for incoming AC. The power supply shall be powered from a 120 VAC and include tapered charge type battery charging circuitry to maximize battery life. The power supply shall be rated at minimum of 2.0A @ 15 VDC.

B. The power supply system shall include (1) 12 Volt battery sized to allow for 4 hours continued system operation during a power outage.

C. The power supply shall contain a fuse-protected, internal loop power supply capable of providing loop power for up to (10) external dry alarm contacts.12.1" Industrial HMI 1024 x 768 Pixel IPS LCD.

2.5 SIGNAL TRANSIENT PROTECTION

A. Transient protection shall be provided with all equipment to protect all instrumentation and telemetry devices either receiving or sending signals.

B. The transient protectors shall be 4000V optical isolators which shall effectively arrest most transients encountered in an instrumentation environment.

2.6 ENCLOSURE

A. NEMA 4X polycarbonate 12 X 10 X 4" . Includes stainless padlockable hasp(s).

2.7 ANTENNAS

A. The antenna for each location shall be selected based on the results of the cellular survey.

B. All antenna shall be provided and installed by the Contractor as per recommendations from the manufacturer.

1. The Systems supplier shall be responsible for installation, set-up, adjustment and tuning of the antenna to provide optimal communications for the system.

2. The antenna installation shall be external to the enclosure and shall be outdoors.

3. The Systems supplier shall utilize a built-in Radio Frequency signal meter during antenna installation to ensure that the antenna are installed for optimum signal reception.

C. The Contractor shall ensure that the cellular Network system work is properly interfaced with equipment and other work not furnished by the Systems supplier.

D. The Systems supplier shall install, make final connections to, adjust, test, and start-up the complete cellular Radio Network.

PART 3 - GENERAL EQUIPMENT REQUIREMENTS

3.1 WIRING

A. All wiring shall be minimum 600 volt UL type MTW or AWM and have a current-carrying capacity of not less than 125% of the full load current. The conductors shall be in complete conformity with the national electric codes, state, local and NEMA electrical standards. For ease of servicing and maintenance, all wiring shall be color coded. The wire color code shall be clearly shown on the drawings, with each wire's color indicated.

B. All control wiring shall be contained within plastic/PVC wiring duct covers. Where dimensional constraints prevent the use of wiring duct, wires shall be trained to panel components in groupings. The wire groupings shall be bundled and tied not less than every 3 inches with nylon self-locking cable ties as manufactured by Panduit or equal.

C. Every other cable tie shall be fastened to the enclosure door or inner device panel with a cable tie mounting plate with pressure tape. Where wiring crosses hinged areas such as when trained from the inner device panel to the enclosure door, spiral wrap shall be used.

D. The installation of the equipment described herein is provided by the electrical contractor in accordance with the electrical specification section of this project, and according to the detailed project drawings. Final equipment test, supervision and certification supplied by a trained representative.

3.2 NAMEPLATES

A. All major components and sub-assemblies shall be identified as to function with laminated, nameplates.

PART 4 - EXECUTION

4.1 FIELD INSTALLATION

A. The services of a factory trained, qualified representative shall be provided to certify the completed system, make all adjustments necessary to place the system in trouble-free operation and instruct the operating personnel in the proper care and operation of the equipment

4.2 GUARANTEE

A. All equipment shall be guaranteed against detects in material and workmanship for a period of one year from the date of Owner's final inspection and acceptance to the effect that any defective equipment shall be repaired or replaced without cost or obligation to the Owner.

END OF SECTION 265619

This page intentionally left blank.

SECTION 263200 - TRANSFER SWITCHES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes nonautomatic transfer switches rated 600 V and less.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings:

1. Include plans, elevations, sections, details showing minimum clearances, conductor entry provisions, gutter space, and installed features and devices.
2. Single-Line Diagram: Show connections between transfer switch, power sources, and load.

1.3 INFORMATIONAL SUBMITTALS

A. Seismic Qualification Data: Certificates, for transfer switches, accessories, and components, from manufacturer.

B. Source quality control reports.

C. Field quality-control reports.

1.4 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.

1.5 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to repair or replace components of transfer switch or transfer switch components that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Three years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with NEMA ICS 1.

C. Comply with NFPA 99.

D. Comply with NFPA 110.

E. Comply with UL 1008 unless requirements of these Specifications are stricter.

F. Indicated Current Ratings: Apply as defined in UL 1008 for continuous loading and total system transfer, including tungsten filament lamp loads not exceeding 30 percent of switch ampere rating, unless otherwise indicated.

G. Tested Fault-Current Closing and Short-Circuit Ratings: Adequate for duty imposed by protective devices at installation locations in Project under the fault conditions indicated, based on testing according to UL 1008.

1. Where transfer switch includes internal fault-current protection, rating of switch and trip unit combination shall exceed indicated fault-current value at installation location.
2. Short-time withstand capability for three cycles.

H. Repetitive Accuracy of Solid-State Controls: All settings shall be plus or minus 2 percent or better over an operating temperature range of minus 20 to plus 70 deg C.

I. Resistance to Damage by Voltage Transients: Components shall meet or exceed voltage-surge withstand capability requirements when tested according to IEEE C62.62. Components shall meet or exceed voltage-impulse withstand test of NEMA ICS 1.

J. Electrical Operation: Accomplish by a nonfused, momentarily energized solenoid or electric-motor-operated mechanism. Switches for emergency or standby purposes shall be mechanically and electrically interlocked in both directions to prevent simultaneous connection to both power sources unless closed transition.

K. Service-Rated Transfer Switch:

1. Comply with UL 869A and UL 489.
2. Provide terminals for bonding the grounding electrode conductor to the grounded service conductor.
3. In systems with a neutral, the bonding connection shall be on the neutral bus.
4. Provide removable link for temporary separation of the service and load grounded conductors.
5. Surge Protective Device: Service rated.
6. Ground-Fault Protection: Comply with UL 1008 for normal bus.
7. Service Disconnecting Means: Externally operated, manual actuated.

L. Neutral Switching: Where four-pole switches are indicated, provide neutral pole switched simultaneously with phase poles.

M. Neutral Terminal: Solid and fully rated unless otherwise indicated.

N. Oversize Neutral: Ampacity and switch rating of neutral path through units indicated for oversize neutral shall be double the nominal rating of circuit in which switch is installed.

O. Factory Wiring: Train and bundle factory wiring and label, consistent with Shop Drawings, by color-code or by numbered or lettered wire and cable tape markers at terminations. Color-coding and wire and cable markers are specified in Section 260553 "Identification for Electrical Systems."

1. Designated Terminals: Pressure type, suitable for types and sizes of field wiring indicated.
2. Power-Terminal Arrangement and Field-Wiring Space: Suitable for top, side, or bottom entrance of feeder conductors as indicated.
3. Control Wiring: Equipped with lugs suitable for connection to terminal strips.
4. Accessible via front access.

P. Enclosures: General-purpose NEMA 250, Type 3R, complying with NEMA ICS 6 and UL 508, unless otherwise indicated.

2.2 NONAUTOMATIC TRANSFER SWITCHES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Kohler Co.
2. Cummins, Power Generation.
3. Russelectric, Inc.
4. Caterpillar
5. Engineer's Approved Equal

B. Electrically Operated: Electrically actuated by push buttons designated "Normal Source" and "Alternative Source." Switch shall be capable of transferring load in either direction with either or both sources energized.

C. Manual and Electrically Operated: Electrically actuated by push buttons designated "Normal Source" and "Alternative Source." Manual handle provides quick-make, quick-break manual-switching action. Switch shall be capable of electrically or manually transferring load in either direction with either or both sources energized. Control circuit disconnects from electrical operator during manual operation.

D. Double-Throw Switching Arrangement: Incapable of pauses or intermediate position stops during switching sequence.

E. Pilot Lights: Indicate source to which load is connected.

F. Source-Available Indicating Lights: Supervise sources via transfer-switch normal- and alternative-source sensing circuits.

1. Normal Power Supervision: Green light with nameplate engraved "Normal Source Available."
2. Emergency Power Supervision: Red light with nameplate engraved "Alternative Source Available."

G. Unassigned Auxiliary Contacts: Switch shall have one set of normally closed contacts for each switch position, rated 10 A at 240-V ac.

H. Switch Characteristics: Designed for continuous-duty repetitive transfer of full-rated current between active power sources.

1. Switch Action: Double throw; mechanically held in both directions.
2. Contacts: Silver composition or silver alloy for load-current switching.
3. Conductor Connectors: Suitable for use with conductor material and sizes.
4. Material: Hard-drawn copper, 98 percent conductivity.
5. Main and Neutral Lugs: Mechanical type.
6. Ground Lugs and Bus-Configured Terminators: Mechanical type.
7. Ground bar.
8. Connectors shall be marked for conductor size and type according to UL 1008.

2.3 SOURCE QUALITY CONTROL

A. Factory Tests: Test and inspect components, assembled switches, and associated equipment according to UL 1008. Ensure proper operation. Check transfer time and voltage, frequency, and time-delay settings for compliance with specified requirements. Perform dielectric strength test complying with NEMA ICS 1.

B. Prepare test and inspection reports.

1. For each of the tests required by UL 1008, performed on representative devices, for emergency systems. Include results of test for the following conditions:

a. Overvoltage.
b. Undervoltage.
c. Loss of supply voltage.
d. Reduction of supply voltage.
e. Alternative supply voltage or frequency is at minimum acceptable values.
f. Temperature rise.
g. Dielectric voltage-withstand; before and after short-circuit test.
h. Overload.
i. Contact opening.
j. Endurance.
k. Short circuit.
l. Short-time current capability.
m. Receptacle withstand capability.

n. Insulating base and supports damage.

PART 3 - EXECUTION

3.1 CONNECTIONS

A. Wiring to Remote Components: Match type and number of cables and conductors to generator sets, motor controls, control, and communication requirements of transfer switches as recommended by manufacturer. Increase raceway sizes at no additional cost to Owner if necessary to accommodate required wiring.

B. Wiring Method: Install cables in raceways and cable trays except within electrical enclosures. Conceal raceway and cables except in unfinished spaces.

1. Comply with requirements for raceways and boxes specified in Section 260533 "Raceways and Boxes for Electrical Systems."

C. Wiring within Enclosures: Bundle, lace, and train conductors to terminal points with no excess and without exceeding manufacturer's limitations on bending radii.

D. Ground equipment according to Section 260526 "Grounding and Bonding for Electrical Systems."

E. Route and brace conductors according to manufacturer's written instructions. Do not obscure manufacturer's markings and labels.

F. Final connections to equipment shall be made with liquidtight, flexible metallic conduit no more than 18 inches (457 mm) in length.

3.2 FIELD QUALITY CONTROL

A. Perform the following tests and inspections with the assistance of a factory-authorized service representative:

1. Visual and Mechanical Inspection:

a. Compare equipment nameplate data with Drawings and Specifications.
b. Inspect physical and mechanical condition.
c. Inspect anchorage, alignment, grounding, and required clearances.
d. Verify that the unit is clean.
e. Verify appropriate lubrication on moving current-carrying parts and on moving and sliding surfaces.
f. Verify that manual transfer warnings are attached and visible.
g. Verify tightness of all control connections.
h. Inspect bolted electrical connections for high resistance using one of the following methods, or both:

1) Use of low-resistance ohmmeter.
2) Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method according to manufacturer's published data.

i. Perform manual transfer operation.
j. Verify positive mechanical interlocking between normal and alternate sources.
k. Perform visual and mechanical inspection of surge arresters.
l. Inspect control power transformers.

1) Inspect for physical damage, cracked insulation, broken leads, tightness of connections, defective wiring, and overall general condition.
2) Verify that primary and secondary fuse or circuit-breaker ratings match Drawings.
3) Verify correct functioning of drawout disconnecting contacts, grounding contacts, and interlocks.

2. Electrical Tests:

a. Perform insulation-resistance tests on all control wiring with respect to ground.
b. Perform a contact/pole-resistance test. Compare measured values with manufacturer's acceptable values.
c. Verify settings and operation of control devices.
d. Calibrate and set all relays and timers.
e. Verify phase rotation, phasing, and synchronized operation.
f. Perform automatic transfer tests.
g. Verify correct operation and timing of the following functions:

1) Normal source voltage-sensing and frequency-sensing relays.
2) Engine start sequence.
3) Time delay on transfer.
4) Alternative source voltage-sensing and frequency-sensing relays.
5) Automatic transfer operation.
6) Interlocks and limit switch function.
7) Time delay and retransfer on normal power restoration.
8) Engine cool-down and shutdown feature.

3. Measure insulation resistance phase-to-phase and phase-to-ground with insulation-resistance tester. Include external annunciation and control circuits. Use test voltages and procedure recommended by manufacturer. Comply with manufacturer's specified minimum resistance.

a. Check for electrical continuity of circuits and for short circuits.
b. Inspect for physical damage, proper installation and connection, and integrity of barriers, covers, and safety features.
c. Verify that manual transfer warnings are properly placed.
d. Perform manual transfer operation.

4. Ground-Fault Tests: Coordinate with testing of ground-fault protective devices for power delivery from both sources.

a. Verify grounding connections and locations and ratings of sensors.

B. Coordinate tests with tests of generator and run them concurrently.

C. Report results of tests and inspections in writing. Record adjustable relay settings and measured insulation and contact resistances and time delays. Attach a label or tag to each tested component indicating satisfactory completion of tests.

D. Transfer switches will be considered defective if they do not pass tests and inspections.

E. Remove and replace malfunctioning units and retest as specified above.

F. Prepare test and inspection reports.

G. Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each switch. Remove all access panels so joints and connections are accessible to portable scanner.

1. Instrument: Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.
2. Record of Infrared Scanning: Prepare a certified report that identifies switches checked and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.
3. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan of each switch 11 months after date of Substantial Completion.

3.3 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain transfer switches and related equipment.

B. Training shall include testing ground-fault protective devices and instructions to determine when the ground-fault system shall be retested. Include instructions on where ground-fault sensors are located and how to avoid negating the ground-fault protection scheme during testing and circuit modifications.

C. Coordinate this training with that for generator equipment.

3.4 CLEANING

A. After completing equipment installation, inspect unit components. Remove paint splatters and other spots, dirt, and debris. Repair damaged finish to match original finish.

B. Clean equipment internally, on completion of installation, according to manufacturer's written instructions.

END OF SECTION 263200

SECTION 432540.02 – FLEA MARKET LIFT STATION

PART 1 - GENERAL

1.1 SUMMARY

A. This section includes the work associated with the construction of the proposed Flea Market Lift Station.

B. The Contractor shall furnish labor, materials, equipment, and all necessary appurtenances to construct the Flea Market Lift Station including, but not limited to, gravel surfacing, fencing, site lighting, control panel structure, pumps, motors, drives, controls, lifting chains, anchors, level control system, piping, valves, fittings, wet well, valve vault, access hatches, electrical conduit and wiring, and all other associated appurtenances.

C. Section Includes:

1. Pumps
2. Controls
3. Valves
4. Concrete Structures
5. Accessories

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Wiring Diagrams: For power, signal, and control wiring.

C. Shop Drawings

D. Performance Data

1. Based on actual tests of similar equipment and include sufficient data to demonstrate suitability of both the pump and driver for the conditions specified.
2. The data shall include the type and make of pump, size, capacity, motor horsepower, motor speed, and performance curve, with design duty points clearly indicated.

E. Submittals shall be submitted based on the requirements in Section 013300 - Submittal Procedures. Submittals shall include the following:

1. A copy of this specification section and the referencing section and all other applicable specification sections governing the pump, drive and driver, supports and specified appurtenances. The specification copies shall be complete with addendum updates included, with each paragraph check-marked to indicate specification compliance or

marked to indicate requested deviations from specification requirements. Check marks shall denote full compliance with a paragraph as a whole. If deviations from the specifications are indicated and, therefore requested by the Contractor, each deviation shall be underlined and denoted by a number in the margin to the right of the identified paragraph. The remaining portions of the paragraph not underlined will signify compliance on the part of the Contractor with the specifications. The submittal shall be accompanied by a detailed, written justification for each deviation. Failure to include a copy of the marked-up specification sections, along with justification(s) for any requested deviations to the specification requirements, with the submittal shall be sufficient cause for rejection of the entire submittal with no further consideration

2. Submit pump type and capacity.
3. Submit certified pump curves showing pump performance characteristics with pump and system operating point plotted, including NPSH curve when applicable.
4. Submit electrical characteristics and connection requirements.
5. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
6. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.
7. Manufacturer Reports: Certify that pumps have been installed according to manufacturer's instructions.
8. Qualifications Statement:

    a. Submit qualifications for manufacturer.

1.3 CLOSEOUT SUBMITTALS

A. Closeout Submittals must be received by Engineer and Owner before the equipment specified in this Section can be considered Substantially Complete.

B. Operation and maintenance data.

C. Provide duplicate or photocopies of stamped nameplates of each pump provided.

D. Manufacturer's representative reports from equipment start-up.

E. Spare parts: Repair kit for each pump containing at a minimum the following:

1. O-ring kit
2. Bearings
3. Upper and Lower Seals

1.4 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70 (NEC), by a qualified testing agency, and marked for intended location and application.

B. UL Compliance: Comply with UL 674 for submersible sewage pumps suitable for use in classified locations.

C. Materials and Workmanship shall be in accordance with the following standards as referenced herein.

1. ANSI - American National Standards Institute.
2. ASTM - American Society for Testing and Materials.
3. AWS - American Welding Society.
4. HI - Hydraulic Institute.
5. IEEE - Institute of Electrical and Electronics Engineers.
6. NEMA - National Electrical Manufacturers Association.
7. AFBMA - Anti-Friction Bearing Manufacturers Association.
8. API - American Petroleum Institute.

D. Shop Pump Test

1. Submit performance test data based on testing of each pump furnished that is 30 HP and over, unless noted otherwise.
2. Perform performance tests in accordance with the Test Code of the HI except as modified herein, and demonstrate compliance with the operating conditions specified.
3. Notify and afford the Engineer the opportunity to witness the test on pumps larger than 100 hp.
4. Base the pump test acceptance criteria on HI Level 11A11 performance.

E. Shop Motor Tests

1. Tests shall be performed in accordance with ANSI/IEEE Standard 112 and ANSI C52.1, parts 12 and 20 (NEMA MGl).

1.5 DELIVERY, STORAGE, AND HANDLING

A. Delivery

1. Ship all units assembled as much as practical.
2. Label all units with all labeling intact and legible with item name, model number, size, and manufacturer's name.

B. Storage

1. Store all units, accessories, and components in the manufacturer's original package, under cover and protected from damage.
2. Maintain a grease coating on all bearings and shafts to prevent corrosion.
3. Turn pump shafts at intervals recommended by the pump manufacturer.

C. Handling

1. Handle all units and components in accordance with the manufacturer's instructions.
2. Use lifting rings and canvas harnesses for lifting to prevent scratching or abrading finished surfaces.

D. WARRANTY

1. Section 017000 - Execution and Closeout Requirements: Requirements for warranties.
2. All equipment provided under this Section shall be furnished with a two (2) year warranty on materials and workmanship from the date of Substantial Completion. The Owner will return any equipment found defective to the manufacturer for inspection and validation of the defect. Defective equipment will be repaired or replaced at manufacturer's discretion and shipped back to Owner at no charge.

PART 2 - PRODUCTS

2.1 PUMPS

A. Manufacturer

1. The Owner and Engineer believe the following manufacturers are capable of producing equipment and products, which will satisfy the requirements of this Section. This statement, however, shall not be construed as an endorsement of a particular manufacturer's product, nor shall it be construed that a named manufacturer's standard product will comply with the requirements of this Section. It shall be the responsibility of the contractor to coordinate with the "selected" equipment manufacturer by use of this specification and all related design drawings for any necessary adjustments, modifications or alterations to standard products to ensure that the product complies with all sections of this specification. Candidate manufacturers include Flygt, Grundfos, or Engineer Approved Equal

B. Description:

1. Submersible, Non-Clog, Factory-assembled and -tested Sewage Pumps mounted in a wet well application:

2. See Editing Instruction No. 1 in the Evaluations for cautions about naming manufacturers. Retain one of first two subparagraphs and list of manufacturers below. See Section 016000 "Product Requirements."

3. Pumps shall be heavy duty, suitable for continuous, efficient, and dependable service under operating conditions imposed by the installation and specific pump specification

   a. All castings shall be free of warp, fins, gas and pit holes, and other defects that might impair strength or appearance.
   b. All welding shall be in accordance with the standards of the American Welding Society.

4. Pump type: Submersible non-clog, meeting the requirements for Class 1, Division 1, explosion-proof, end-suction, single-stage, close-coupled, overhung-impeller, centrifugal sewage pump modified to be mounted in a dry well application.

5. Pump Casing: Cast iron, with open inlet, and discharge fittings for connection to guide-rail support. Castings shall have a minimum tensile strength of 30,000 pounds per square inch (psi) and conform to ASTM A-48, Class 35B.

    a. All exposed steel shall be type 316 stainless.
    b. Pumps and motor casing shall have O-ring gaskets at all casing and motor cover joints.
    c. Provide the casing with a replaceable wearing ring.
    d. All metal surfaces coming into contact with the pump age, other than stainless steel or brass, shall be protected by a factory applied spray coating of acrylic dispersion zinc phosphate primer with a polyester resin paint finish on the exterior of the pump.

6. Impeller: Cast iron, statically and dynamically balanced, non-clog, open, or semi-open design for solids handling, and keyed and secured to shaft.

    a. Provide with replaceable impeller wear ring constructed of stainless steel dissimilar to casing wear ring.

7. Pump and Motor Shaft: 420 Stainless steel, with factory-sealed, grease-lubricated ball bearings.

8. Bearings: Properly lubricated, antifriction type, and capable of withstanding all radial and thrust loads.

    a. Bearing housings shall be rigidly supported, and exclude dirt and foreign matter from the bearings.
    b. Designed for a minimum L10 life of 50,000 hours at the operating point in accordance with ABMA.

9. Seals: Mechanical.

    a. Equip each pump with two independent mechanical seals separated by an oil reservoir.
    b. The lower seals shall be tungsten carbide.

10. Pump Bases

    a. Mount pump and motor on a common cast iron or fabricated steel base unless noted otherwise.
    b. Sufficiently reinforce and brace the base to withstand all shock loads and resist all wearing and buckling during pump operation.

11. Nameplate: Attach a stamped stainless steel nameplate to each pump in a clearly visible, easily accessible location. Stamp each nameplate with the following for each pump.

    a. Manufacturer's name.
    b. Model number.
    c. Serial number.

d. Design capacity, gallons per minute (gpm). This shall be in a larger font size from the other information.
e. Design head, feet.
f. Design speed, revolutions per minute (rpm).
g. Voltage
h. Hertz
i. Full load amps

12. Guide-Rail Supports: 316 Stainless Steel

a. Standard: SWPA's "Submersible Sewage Pumping Systems (SWPA) Handbook."
b. Guide Rails: Vertical pipes made of Type 316 Stainless Steel, attached to baseplate and wet well opening. Provide intermediate stainless steel guide rail brackets for guide rails greater than 20 feet in length.
c. Baseplate: Type 316 Stainless Steel plate, attached to basin floor, supporting guide rails and stationary elbow.
d. Pump Yoke: Motor-mounted or casing-mounted yokes or other attachments for aligning pump during connection of flanges.
e. Movable Elbow: Pump discharge-elbow fitting with flange, seal, and positioning device.
f. Stationary Elbow: Fixed discharge-elbow fitting with flange those mates to movable-elbow flange and support attached to baseplate.
g. Lifting Chain: Stainless steel; attached to pump and cover at wet well opening.

13. Capacities and Characteristics:

a. NPSHR/NPSHA ratio shall be the minimum recommended by ANSI/HI 9.6.1 American National Standard for Centrifugal and Vertical Pumps for NPSH Margin.
b. Number of Pumps: Two Pumps.
c. Each Pump:

1) Solids Handling Capability: 3 inches minimum.
2) Discharge Pipe Size: 3 15/16-inch.
3) Motor Horsepower: 10 hp
4) Minimum efficiency: 51%
5) Maximum Speed: 1720 rpm
6) Electrical Characteristics:

1) Phases: 3
2) Hertz: 60
3) Volts: 230

14. Duty Points/Performance Requirements

a. Operating Condition:

1) Condition

	1 Pump Operating
Capacity, gpm	335
Total Head, feet	60
Static Head, feet	33

2.2 MOTORS

A. Motor: Hermetically sealed, with built-in thermal overload protection, leak detection, and lifting eye or lug.

B. Pump motor power and control cable shall be a single unit, and be suitable for submersible pump applications, which shall be indicated by a code embossed on the cable.

1. Provide cable strain relief assemblies as indicated on the Drawings
2. Cable shall be sized in conformance with NEC; shall be of adequate length; and include a grounding plug and cable-sealing assembly for connection at pump.

C. Motors shall be provided with a soft starter located in the pump control panel.

D. Performance

1. Rated for variable speed, soft start, or continuous duty and normal starting torque, unless otherwise specified or shown.
2. Temperature rise shall be in accordance with NEMA limits for the class of insulation, service factor, and enclosure specified.
3. Performance shall conform to the requirements of NEMA MGl Part 12 and shall be expressed as indicated in NEMA MGl-12.30, and a report for routine tests shall be submitted based on IEEE Test Procedure 112, Method B.
4. Minimum 1.15 service factor rating unless noted otherwise.
5. The pump brake horsepower (bhp) requirements shall not exceed the motor nameplate horsepower (hp) under the operating conditions.
6. NEMA Premium Efficiency type except for submersible motors.
7. Inverter Duty: All motors shall have the following features in addition to those listed above.

    a. Designed for use with soft starters.
    b. Inverter-grade, NEMA Design B, 1,600-volt, Class F insulated moisture resistant windings.
    c. Normally closed thermostat on stator windings.
    d. Meeting requirements of NEMA MG1 Part 31.

8. Designed for intermittent or continuous 24 hours per day operation.
9. Capable of sustaining a minimum of 10 starts per hour.

E. Cooling System

1. Motors are sufficiently cooled by the surrounding environment or pumped media.
2. A water jacket is not required.

F. Assembly and Fabrication

1. Minimum NEMA Class F insulation.
2. Enclosure shall have liquid cooled outer jacket
3. Provide and mark motor terminals as required for the application described in NEMA MG1 Section 2 and required in Division 26, "Electrical."

G. Motor Nameplate

1. Attach a stamped stainless steel nameplate to each motor clearly visible showing operational data in accordance with NEMA MG-1.

2.3 SWING CHECK VALVES

A. See Specification 400565.23 "Swing Check Valves"

2.4 PLUG VALVES

A. See Specification 400562.00: "Plug Valves"

2.5 CONCRETE STRUCTURES

A. Concrete shall be constructed according to Specification 033000: "Cast-In-Place Concrete" or Section 330513: "Manholes and Structures"

2.6 CONTROLS

A. Performance Requirements

1. Sequence of Operation:

a. Operate two pumps in lead/lag mode.
b. Control pumps by individual Hand-Off-Auto selector switches located on pump control panel. Provide manual start-stop control of pumps using "hand" and "off" positions of each Hand-Off-Auto switch. Automatically control pumps in "auto" position with level transducer as follows:

1) When liquid level in wet well rises to elevation of "lead pump start", start lead pump. When lead pump is started, run pump until liquid level in wet well is drawn down to "pump stop" elevation, and then shut down lead pump.
2) When lead pump cannot keep up with influent flow, liquid level in wet well rises to "lag 1 pump start" elevation that starts lag pump. When lag pump is started, run pump until liquid level in wet well is pumped down to "pump stop" elevation and shut down lead and lag pumps.

3) Automatically alternate lead/lag status of pumps after each pumping cycle. Provide manual selection of lead pump.

c. When thermal switches are provided in motor windings to detect high temperature in motor, wire switch to relay located in pump control panel. Provide normally open contact on relay wired in series with pump starter, and normally closed contact on relay wired to "Motor High Temperature" alarm light located on control panel. When high temperature occurs in motor windings, shut down pump and energize high temperature alarm light.

d. When pump seal leak sensor is provided and located in pump housing, wire sensor to seal failure relay located in pump control panel. Wire normally open contact on relay to "Seal Failure" alarm light located on control panel. When seal leak occurs, energize seal failure alarm light.

e. Provide a pair of dry contacts in pump control panel for each of following:

1) Surge Protection Failure
2) Phase Loss
3) Pump No. 1 Auto
4) Pump No. 2 Auto
5) Pump No. 1 Motor High Temperature/Seal Failure Alarm
6) Pump No. 2 Motor High Temperature/Seal Failure Alarm
7) Wet Well Level
8) Wet Well High Level Alarm.
9) Intrusion Switch Alarm

f. Provide one (1) spare pair of dry contacts.

B. Components

1. Control Panel Enclosure:

a. Enclosure shall be NEMA 4X rated consisting of a continuous hinged outer door with 3-point, padlockable hasp and aluminum inner door for mounting of H-O-A switches, indicating lights, time meters, etc.

b. Enclosure shall be fabricated of heavy 14 gauge stainless steel and shall be sized to properly accommodate all equipment and include a thermostat control.

1) Furnish appropriately sized means of heating and cooling to maintain internal temperatures between 40°F and 98°F

c. Enclosure outer door shall be provided with a positive stop to hold open at 90°.

d. Identify control panel components with engraved nameplate mounted on inside of panel.

e. Mount components, not mounted on front of inner door, on removable back panel secured to enclosure with collar studs.

f. Install wiring in neat, workmanlike manner and group, bundle, support and route horizontally and vertically for neat appearance.

g. Terminate wires leaving panel at terminal strips inside enclosure.

h. Identify terminals and wires in accordance with panel wiring diagrams.

i. Furnish copper grounding plate inside control panel for terminating ground wires.

2. All components shall be DIN Rail mounted or secured to back panel with bolts in threaded holes.
3. Transient Voltage Surge Suppressor: Furnish three (3) modular three-phase transient voltage surge suppressors (TVSS), one for each VFD, in control panel to protect panel components from potential damage from transient voltages caused by lightning or surges on incoming power line.
4. Three Phase Monitor:

   a. Furnish three phase monitor in pump control panel to monitor incoming power and sense loss of any one of three phases.

      1) Inhibit pump operation when phase loss occurs.
      2) DIN Rail mounted.

5. Motor Circuit Protector Type Circuit Breakers:
   a. Furnish properly sized motor circuit protector type, molded case circuit breaker for each pump motor starter.

      1) Type: Quick-make, quick-break, individually mounted.
      2) Minimum Interrupting Capacity: 22,000 amperes rms symmetrical at 480 volts.
      3) Motor circuit protector type circuit breakers shall be Square D FAL Series or equal.

6. Control Transformer: Furnish 480 volt to 120 volt control transformer in pump control panel to provide 120 VAC control power. Size transformer to power connected devices and protect with primary and secondary fusing.
7. Circuit Breakers:

   a. Furnish quick-make, quick-break, thermal-magnetic, molded case type, individually mounted and identified, as shown on the Drawings.
   b. Circuit breakers to be Square D QOU series or equal.

8. Selector Switches:

   a. NEMA Type 4X, 30.5 mm, heavy-duty, industrial, non-illuminated, maintained contact type with double-break silver contacts and metal mounting collar.
   b. Selector switches to be manufactured by Square D, KS Series or equal.

9. Pilot Lights:

   a. NEMA Type 4X, 30.5 mm, heavy-duty, industrial, transformer type, LED push-to-test with metal mounting collar.

      1) Voltage Rating: 120 volts AC.
      2) Color Caps: Green for "run" and red for "alarm".

b. Furnish "run" pilot light for each pump. Energize each light through auxiliary contact on pump motor starter.
c. Furnish "motor high temperature" and "seal failure" alarm pilot light for each pump.
d. Pilot lights to be manufactured by Square D, KT Series or equal.

10. Legend Plates for Pilot Devices:

a. Furnish 2-1/4 inch square plastic legend plate for each selector switch, push button and pilot light.
b. Color: Gray with white lettering.

11. Relays:

a. Heavy-duty, general purpose type, with 15 amp contacts.

1) PIN type terminals that plug-in to socket.
2) DIN rail mounted to inside of panel enclosure.
3) Contact Configuration: As required for proper operation of control logic.
4) Operating Power: 120 volts AC or 24 volts DC, as shown on Drawings.
5) Relays shall be provided with test flags and LED indicators
6) DPDT or 3PDT, as required by Drawings.
7) Relays to be manufactured by Square D, Zelio RPM Series or equal.

12. Elapsed Time Meters:

a. Manufacturer: ENM Counting System Designs or equal.
b. Resettable, time totalizer type.

1) Furnish synchronous motor to drive set of six digit readout wheels to indicate total time pump motor starter is energized.
2) Readout: Six-digit including 1/10 digit.
3) Range: 0 to 99999.9 hours.
4) Voltage Rating: 120 volts.

c. Furnish elapsed time meter for each pump. Energize each elapsed time meter through auxiliary contact on pump motor starter.

13. Terminal Blocks:

a. Furnish terminal blocks in control panel for field wiring.

1) NEMA type, rated for 600 volts AC, 35 Amp.
2) Identify with permanent machine printed marking in accordance with terminal numbers shown on panel wiring diagrams.
3) Furnish 12 spare terminal blocks in control panel.

14. Wiring:

a. Furnish pump control panel completely wired by manufacturer.
b. Furnish wiring, workmanship, and schematic wiring diagrams in compliance with UL 508. Isolate wiring and terminal blocks by voltage levels to greatest extent possible.
c. Wiring: Stranded tinned copper, Type MTW or THW, 600 volts, color coded as follows:

1) Line and Load Circuits, AC Power: Black.
2) AC Control Circuit Less than Line Voltage: Red.
3) DC Control Circuit: Blue.
4) Interlock Control Circuits from External Source: Yellow.
5) Equipment Grounding Conductor: Green.
6) Current Carrying Ground: White.

d. Minimum Size of Control Wiring: Number 16.
e. Tag control wiring at both ends in control panel with legible permanent coded wire marking sleeve. Mark with white PVC tubing sleeves with machine printed black marking. Mark in accordance with wire numbers shown on control wiring diagrams and terminal strip numbers.

15. Nameplates:

a. Furnish laminated phenolic nameplates on front of inner panel.
b. Color: White with black engraved letters.
c. Minimum Size of Engraving: 1/4 inch.

C. Liquid Level Control System

1. The level control system shall start and stop the pump motors in response to changes in wet well level, as set forth herein.
2. The level control system shall operate as a submersible transducer type system.
3. The level control system shall utilize alternation to select first one pump, then the second pump, then the third pump to run as lead pump for a pumping cycle. Alternation shall occur at the end of a pumping cycle, or in the event of excessive run time.
4. The level control system shall utilize an electronic pressure switch which shall continuously monitor the wet well level, permitting the operator to read wet well level at any time. Upon operator selection of automatic operation, the electronic pressure switch shall start the motor for one pump when the liquid level in the wet well rises to the "lead pump start level". When the liquid is lowered to the "lead pump stop level", the electronic pressure switch shall stop this pump. These actions shall constitute one pumping cycle. Should the wet well level continue to rise, the electronic pressure switch shall start the second and/or third pump (if required) when the liquid reaches the "lag pump start level", or "standby pump start level" so that all pumps are operating. These levels shall be adjustable.
5. Panel manufacturer will supply one 115 volt AC alarm light fixture with vapor-tight red globe, guard, conduit box, and mounting base. The design must prevent rain water from collecting in the gasketed area of the fixture, between the base and globe. The alarm light will be shipped loose for installation by the contractor.

6. Panel manufacturer will supply one 115 volt AC weatherproof alarm horn with projector, conduit box, and mounting base. The design must prevent rain water from collecting in any part of the horn. The alarm horn will be shipped loose for installation by the contractor.
7. Duplex Control Sequence:

   a) As basin liquid level increases to LEAD PUMP START elevation, switch energizes lead pump.
   b) When basin liquid level decreases to PUMPS STOP elevation, switch de-energizes lead pump.
   c) When lead pump is de-energized, alternating relay indexes such that Lag Pump starts on next rise in basin liquid level.
   d) If basin liquid level continues to rise to LAG PUMP START elevation, switch energizes lag pump.
   e) When basin liquid level decreases to PUMPS STOP elevation, switch de-energizes both pumps.
   f) If basin liquid level continues to rise to HIGH LEVEL elevation, alarm switch energizes alarm signal.

8. Pump Level System:

   a. The Flea Market Lift Station shall be provided with a pump level system consisting of a level transducer and redundant back-up float switches. The pump manufacturer shall provide all necessary cabling and relays for the system to operate.

      1) Description: Steel shell encased in polyurethane foam with cast-iron weight for LEAD PUMP ON, LAG PUMP ON, PUMPS OFF (common), and HIGH ALARM.
      2) Type: Mercury.

D. Source Quality Control and Tests

1. Perform a factory test of completed control panel by demonstrating operation of control functions. Provide certified test results.
2. Factory assemble and test each control and alarm function.

2.7 ODOR CONTROL - DRUM SCRUBBER

A. Manufacturers

1. The Owner and Engineer believe the following manufacturers are capable of producing equipment and products, which will satisfy the requirements of this Section. This statement, however, shall not be construed as an endorsement of a particular manufacturer's product, nor shall it be construed that a named manufacturer's standard product will comply with the requirements of this Section. It shall be the responsibility of the contractor to coordinate with the "selected" equipment manufacturer by use of this

specification and all related design drawings for any necessary adjustments, modifications or alterations to standard products to ensure that the product complies with all sections of this specification. Candidate manufacturers include Purafil, Inc. or Engineer Approved Equal.

B. Performance

1. The drum scrubber will operate at 99.5% contaminant removal efficiency until media is depleted. This can be verified with gas concentration testing at the inlet and outlet.
2. The Drum Scrubber shall be able to process 300 cfm of air without exceeding a filtration area of 4.9 ft^2 and a terminal pressure drop of 6.2 IWG.

    a. Filtration area is defined as the internal cross-sectional area of the unit perpendicular to airflow.

C. General Requirements

1. The Drum Scrubber shall contain a vertically oriented media bed measuring a minimum of 2 ft. in depth.
2. The Drum Scrubber shall contain dry chemical media selected for the application.
3. The airflow capacity shall be 300 CFM at a terminal pressure drop of 6.2 IWG through any mist eliminators, media bed, and exhaust. This includes 1 IWG external static pressure.

D. Configuration

1. The configuration shall be arranged so that the contaminated air shall flow through the inlet plenum and through the Mist Eliminator. Then the contaminated air shall flow through a HDPE diffuser column, plastic tower packing media, polymedia filter, and pass upward through the media bed. Treated air shall discharge out of the top of the vessel.

E. Components

1. The Drum Scrubber shall be a cylindrical container with the tub approximately having dimensions of 30.8 inches in diameter by 66.8 inches in height.
2. 7 ft^3 of Odorcarb Ultra media
3. 3 ft^3 of Odormix SP media
4. Direct-drive Blower with slide-gate damper on outlet to adjust airflow
5. Mist Eliminator (ME) filter in an LDPE housing
6. 8 inch diameter Fernco inlet to drum
7. Capped sample ports on vessel side - Quantity: 3
8. 0.75 inch diameter drain connector
9. Dwyer Series 2000 Magnehelic Pressure Gauge for the Mist Eliminator (ME) filter
10. Hold down brackets

F. Materials

1. The Drum Scrubber drum shall be fabricated of low-density polyethylene (LDPE).
2. Housing materials shall be weatherproof and suitable for outdoor operation.

3. The drum shall be provided with 3 media sampling ports, each measuring 1.5 inches in diameter on the vessel side complete with PVC cap.
4. Polymedia filter shall be synthetic polyester fibers bonded with fire retardant resin.
5. Tower packing media shall be thermoplastic.
6. Aluminum nameplate with order number and serial number.
7. Fasteners shall be stainless steel.

G. Mist Eliminator (ME)
1. A mist eliminator housing of LDPE construction shall be provided with the Drum Scrubber.
2. The mist eliminator shall be a polypropylene mesh filter consisting of 6 layers of 16/96 KIMRE mesh.
3. Pressure taps and gages shall be installed to permit a local read out of the pre-filter pressure drop.
4. An inlet transition shall be provided by the vessel manufacturer, the size shall be determined by the Engineer/Owner.

H. Blower
1. The blower, shall be externally mounted, aluminum construction, direct-drive and sized to deliver 300 CFM through the scrubber at 6.2 IWG.
2. The Drum Scrubber shall be designed for outdoor operation.
3. The motor shall be a 1 hp, 115 volt / 1 phase / 60 Hz TEFC motor.
4. The motor shall be pre-wired with an 8 ft. grounded power cord.

I. Media Bed Section

1. A media bed measuring at least 2 ft deep shall be contained in the vessel (tub) housing. The bed shall include 7 cu. ft. (280 lbs.) of Odorcarb Ultra media and 3 cu. ft. (120 lbs.) of Odormix SP media.
2. Media 1: 7 ft^3 of Odorcarb Ultra media as manufactured by Purafil, Inc. Odorcarb Ultra has the following characteristics:

a. Minimum Removal Capacities:

Contaminant Gas	**g/cc**	**Weight (%)**
Hydrogen Sulfide (H_2S)	0.3008	47.00

b. Density 40 lbs. per cubic ft. (0.64 g/cc) +/- 5%
c. Air Speed up to 100 fpm (0.51 m/s) in bulk fill applications
d. 99.5% (min.) initial removal efficiency

3. Media 2: 3 ft^3 of Odormix SP media made from an equal mix (by volume) of Odoroxidant SP media and Odorkol media. Odormix SP has the following characteristics:

a. Minimum Removal Capacities:

Contaminant Gas	**g/cc**	**Weight (%)**
Sulfur Dioxide (SO_2)	0.0520	8.13
Nitrogen Dioxide (NO_2)	0.1434	22.41
Toluene ($C_6H_5CH_3$)	0.0792	12.38

b. Density 40 lbs. per cubic ft (0.64 g/cc) +/- 5%
c. Air Speed up to 100 fpm (0.51 m/s) in bulk fill applications
d. 99.5% (min) initial removal efficiency

4. All media shall be non-toxic and non-hazardous before and after it is spent.
5. All media shall be UL classified for flammability.
6. All media shall have proof that is made and produced in the United States for additional verification of product performance.
7. All media shall be testable for capacity and life.
8. All media shall be thoroughly tested prior to shipment according to ISO 9001-2015 approved processes.
9. Impregnates shall be applied during pellet formation, such that the impregnate is uniformly distributed throughout the pellet volume.

J. Instrumentation

1. Differential Pressure: One (1) gauge is included with the scrubber to permit local read-out of pressure drop through the mist eliminator.

K. Monitoring

1. For odor applications that involve hydrogen sulfide (H_2S), it is recommended to monitor the H2S concentration levels at the outlet of the scrubber with a Purafil OnGuard IOT.

L. Analytical Services

1. The manufacturer shall be able to provide in-house lab analysis for media samples to predict the remaining service life of system media. Media analysis and report will be provided as needed.

2.8 ACCESSORIES

A. Anchor Rods

1. Anchor rods, washers, and nuts shall be Type 316 stainless steel and shall be of ample size and strength for the intended purpose. Size and number shall be as recommended by the manufacturer.

B. Suction Hand Hole Reducer

1. Pump shall come complete with a suction mounted, flanged cast iron eccentric reducer with a large hand hole.

C. Thermal Motor Protection. Include temperature switches for all size motors.

1. Temperature Switches

a. Equip the motor with three embedded temperature switches in the stator.

b. Temperature switches shall be normally closed (NC) configuration.
c. Connect temperature switch wiring to terminals in the motor conduit compartment.
d. Incorporate temperature switch operation with the motor control.
e. Provide motor terminal box of adequate size to allow installation of motor terminal kits without interfering with terminals or damaging control wiring.

D. Moisture Sensor: Include a leakage sensor in the stator housing.

E. Shaft Seals (as required)

1. Split-Face Mechanical Seals

a. A temperature rating of 250 degrees Fahrenheit (°F) or higher.
b. Hydraulically balanced.
c. Materials of Construction.

1) Seal Faces. Silicon carbide/silicon carbide or tungsten carbide/silicon carbide.
2) Hardware, Glands, and Sleeves. 316 stainless steel.
3) Elastomers. EPR, Viton.
4) Springs. Hastelloy C, ElgHoy, or Equal.

2. Cartridge Single Seals.

a. A temperature rating of 250° F. or higher.
b. Hydraulically balanced.
c. Materials of Construction.

1) Seal Faces: Silicon carbide/silicon carbide or tungsten carbide/silicon carbide.
2) Hardware, Glands, and Sleeves. 316 stainless steel.
3) Elastomers. EPR or EPDM.
4) Springs. Hastelloy C or Equal.

3. Throat Bushings

a. Provide a close-fit throat bushing.

PART 3 - EXECUTION

3.1 EXAMINATION

A. A. Site Verification of Conditions. Before installation of equipment, verify that:

1. All clearances have been met.
2. Bases, anchors, supports, and openings are located correctly and are of the proper size and material.

B. Variations: Correct any variations from the requirements shown or required by the manufacturer at no additional cost to the Owner. Submit all methods of correction in writing.

3.2 PREPARATION

A. Protect all surface areas from damage. Protect all finished floors with a waterproof, oil-resistant cover to prevent staining from oil and/or grease.

3.3 INSTALLATION

A. General: Install all pumps and components in accordance with the manufacturer's instructions and the conforming Shop Drawings, including all gasket seals, isolation dampeners, cleanouts, drains, gauges, motors, controls, and power wiring.

B. Piping as shown is typical for the specified pump. Actual pump piping connections shall vary among pump manufacturers. Coordinate pump piping connections with pump supplier and piping supplier.

C. Set anchor rods in accordance with the approved manufacturer's conforming submittals.

D. Lubrication: Furnish and apply an initial supply of grease and oil as recommended by the manufacturer. Grease and oil the equipment throughout all testing until substantial completion.

E. Base: Anchor and grout the base in accordance with the manufacturer's recommendations. Connect base drain to nearest floor drain.

F. Interface with Other Products

1. Complete all electrical power and control connections under Division 26 – Electrical.
2. Paint the equipment in accordance with Section 099010.01 - Coating Systems For Wastewater Equipment
3. Install and connect all piping.
4. Perform field quality control as specified in this specification.

3.4 REPAIRS AND RESTORATION

A. Repair or replace any damage to the pump or motor or chips, dents, scratches, stains, or other disfiguring of surrounding floors, walls and/or accessories to the satisfaction of the Owner and/or Engineer at no additional cost to the Owner.

3.5 FIELD QUALITY CONTROL

A. Manufacturer's Field Service and Start-Up

1. A qualified representative of each equipment manufacturer shall start up the pumps in accordance with Section 019100, "Commissioning".

2. Representative shall spend at least 1 day performing the required services for each type of pump.

B. Noise and Vibration limitations. For an acceptable installation, the pump and motor combination shall operate without excessive vibration, noise, or bearing temperatures, under the specified conditions. Guidelines to establish excessive pump vibration shall be as described in ANSI/HI 9.6.4.

3.6 CLEANING

A. Clean the pump, motor, accessories, and surrounding areas of all foreign material, grease, and oil stains.

B. Remove all rags, sticks, debris, and construction materials. Replace damaged equipment components in like kind at no additional cost.

C. After cleaning, provide protective covering for each piece of equipment.

3.7 SPARE PARTS

A. Spare parts shall be submitted by Contractor before the equipment will be considered Substantially Complete.

B. Spare parts shall include the following:

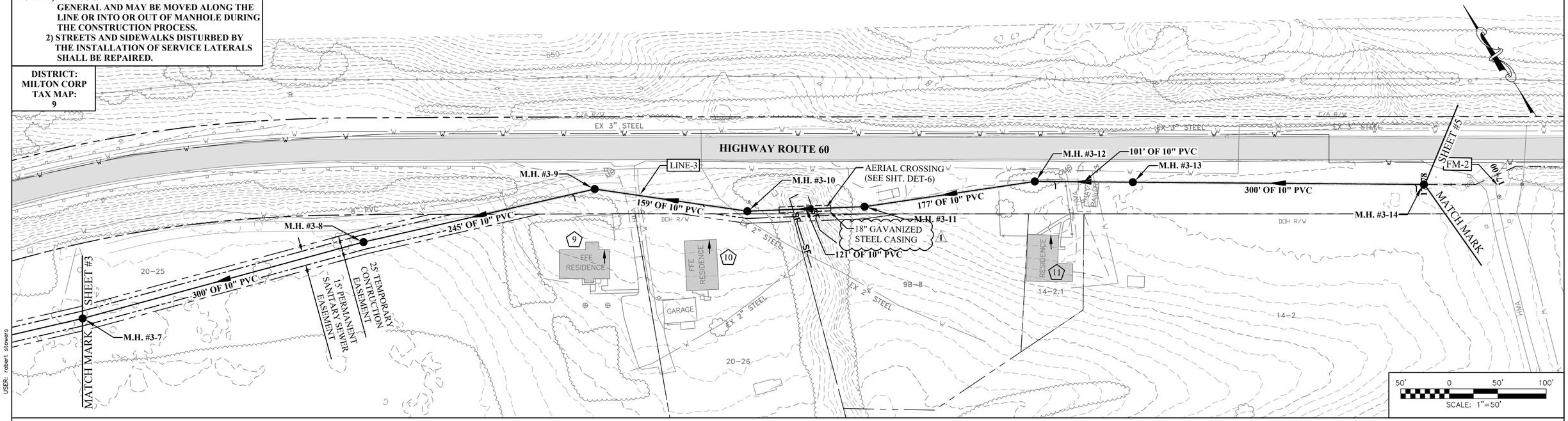
1. O-Ring kit
2. Bearings
3. Upper and Lower Seals

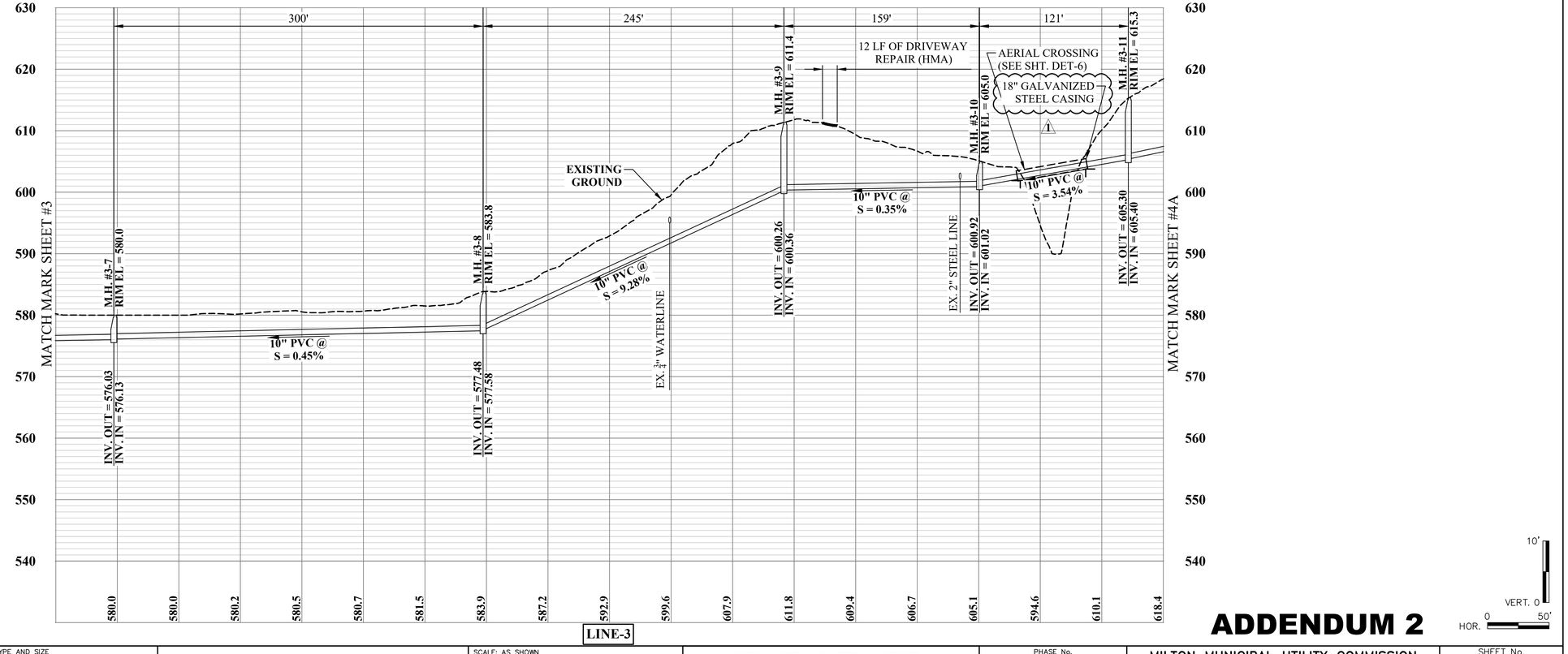
END OF SECTION 432520.02

This page intentionally left blank.

NOTE: 1) THE LOCATIONS OF SERVICE LATERALS ARE GENERAL AND MAY BE MOVED ALONG THE LINE OR INTO OR OUT OF MANHOLE DURING THE CONSTRUCTION PROCESS.
2) STREETS AND SIDEWALKS DISTURBED BY THE INSTALLATION OF SERVICE LATERALS SHALL BE REPAIRED.

DISTRICT: MILTON CORP
TAX MAP: 9





ADDENDUM 2

NO.	BY	DATE	DESCRIPTION
1	CAS	2/2022	ADDENDUM 2 – CASING TYPE AND SIZE

SCALE: AS SHOWN	
DRAWN: K. PHILLIPS	DATE: APRIL 2021
CHECKED: J. CARPENTER	DATE: APRIL 2021
APPROVED: C. SMITH	DATE: APRIL 2021
SURVEY DATE:	
SURVEY BY:	
FIELD BOOK No.:	

THRASHER
300 ASSOCIATION DRIVE
CHARLESTON, WV 25311
www.thrasherenq.com
PHONE (304)-343-7601
FAX (304)-343-7604

PHASE No.
CONTRACT No. 1
PROJECT No. 020-1526

MILTON MUNICIPAL UTILITY COMMISSION
CABELL COUNTY, WEST VIRGINIA
MORRIS MEMORIAL
SANITARY SEWER EXTENSION
PLAN AND PROFILE

SHEET No. 4

NOTES

1. (A) ELECTRICAL SOURCE POLE WITH LIGHT.
   (B) LIQUID TIGHT STAINLESS STEEL JUNCTION BOX FOR PUMPS.
   (C) LIQUID TIGHT STAINLESS STEEL JUNCTION BOX FOR FLOATS.

CONDUIT AND CONDUCTORS SCHEDULE

CONDUIT NO.	USE	SERVING	CONDUIT		CONDUCTORS SIZE/CONDUIT		FROM	CIRCUIT NO.	NOTES
			NO.	SIZE	WIRE	GROUND			
P-1	POWER	METER	1	2"	4-#2	-----	POWER CO. POLE	-------	---
P-2	POWER	PUMP NO. 1	1	1"	3-#8	1-#10	PUMP CONTROL PANEL	-------	---
P-3	POWER	PUMP NO. 2	1	1"	3-#8	1-#10	PUMP CONTROL PANEL	-------	---
P-4	POWER	POLE LIGHT	1	1"	2-#10	1-#10	SAFETY SWITCH 2	-------	---
P-5	POWER	NOT USED	---	---	-------	----	-----	-------	---
C-1	CONTROL	FLOATS	1	1"	-------	----	PUMP CONTROL PANEL	-------	1

NOTE:
1. CONDUIT WITH CONTROL CONDUCTOR PER MANUFACTURER.

P2,3
C1

P1,4

ADDENDUM 2

5' 0 5' 10'
SCALE: 1"=5'

NO.	BY	DATE	DESCRIPTION
1	KMP	1/2022	ADDENDUM 1 – UPDATED LIFT STATION CHANGES PER SHEET LS-1
2	FD	2/2022	ADDENDUM 2 – UPDATED WIRE SIZE

SCALE: AS SHOWN	
DRAWN: F. DELDUQUE	DATE: APRIL 2021
CHECKED: C. SMITH	DATE: APRIL 2021
APPROVED: C. SMITH	DATE: APRIL 2021
SURVEY DATE:	
SURVEY BY:	
FIELD BOOK No.:	

THRASHER
300 ASSOCIATION DRIVE
CHARLESTON, WV 25311
www.thrashereng.com
PHONE (304)-343-7601
FAX (304)-343-7604

PHASE No.

CONTRACT No. 1

PROJECT No. 020-1526

MILTON MUNICIPAL UTILITY COMMISSION
CABELL COUNTY, WEST VIRGINIA
MORRIS MEMORIAL
SANITARY SEWER EXTENSION
FLEA MARKET SITE UTILITY PLAN

SHEET No. E-1

CAD FILE: R:\020\020-1526 COLLECTION REHAB-MILTON- -Chas\Drawing\Contract 1\C1-New Lift Station Plans Electrical.dwg LAYOUT: Flea Market USER: robert stowers PLOT DATE/TIME: 2/9/2022 3:23 PM

START STEPS FOR PORTABLE GENERATOR

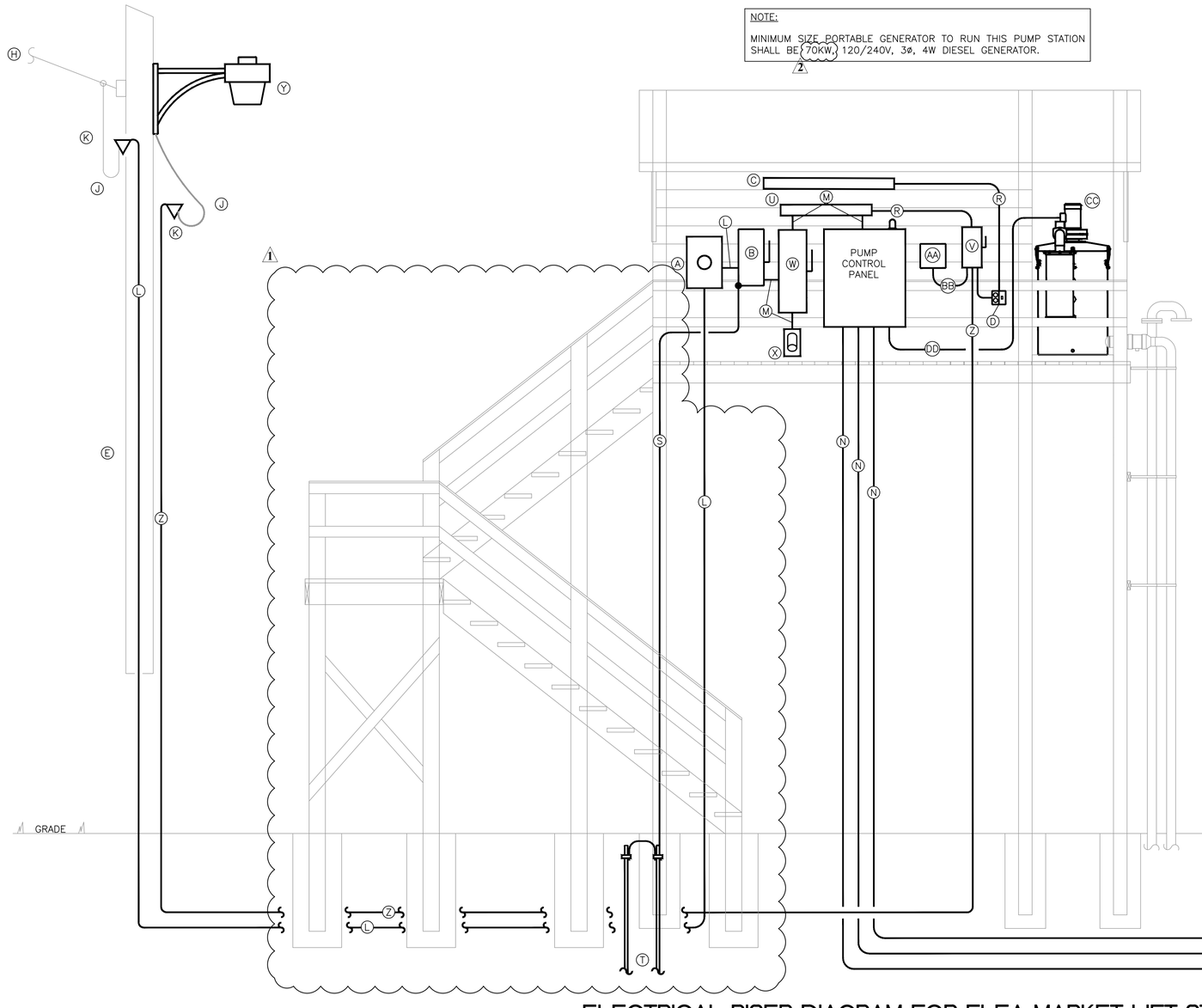
STEP–1: (0 SEC. DELAY)
1. LIGHTING, RECEPTACLES AND MISCELLANEOUS
2. PUMP NO. 1

STEP–2: (10 SEC. DELAY)
1. PUMP NO. 2

NOTE:

MINIMUM SIZE PORTABLE GENERATOR TO RUN THIS PUMP STATION SHALL BE 70KW, 120/240V, 3ø, 4W DIESEL GENERATOR.

2



ELECTRICAL RISER DIAGRAM FOR FLEA MARKET LIFT STATION

SCHEMATIC

RISER NOTES:

(A) METER.

(B) MAIN SWITCH: 3P–100A, 120/240V, 3ø, 4W HEAVY DUTY NEMA–4X STAINLESS STEEL SERVICE RATED FUSED SAFETY SWITCH WITH 100A FUSES.

(C) CANOPY LIGHT: LITHONIA #FEML48 4000LM IMAFL 4' LED ENCLOSED AND GASKETED ACRYLIC LINEAL RIBBED LENS.

(D) GFI RECEPTACLE WITH WEATHERPROOF COVER AND SINGLE POLE SWITCH WITH WEATHERPROOF COVER.

(E) 25' TREATED POLE.

(F) LIQUID TIGHT STAINLESS STEEL JUNCTION BOX.

(G) SEAL–OFF FITTINGS.

(H) 120/240V, 3ø, 4W OVERHEAD SERVICE BY POWER CO.

(J) DRIP LOOP.

(K) WEATHERPROOF HEAD.

(L) 2" CONDUIT WITH 4–#2 CABLES.

(M) 1 1/2" CONDUIT WITH 4–#2, 1–#6 GROUND.

(N) 1" CONDUIT WITH CONTROLS CONDUCTORS FOR FLOATS.

(P) 1" CONDUIT WITH 3–#8, 1–#10 GROUND.

(R) 3/4" CONDUIT WITH 2–#12, 1–#12 GROUND.

(S) #4 SOLID COPPER GROUND WIRE.

(T) GROUND RODS WITH CLAMPS PER N.E.C.

(U) 4"x4" NEMA–4X STAINLESS STEEL WIREWAY.

(V) 3P–30A, 120/240V, 1ø, 2W HEAVY DUTY NEMA–4X FUSED SAFETY SWITCH WITH 20A FUSES. ONE FUSE FOR POLE LIGHT, ONE FUSE FOR RECEPTACLE AND CANOPY LIGHT, ONE FUSE FOR TELEMETRY CONTROL BOX.

(W) MANUAL TRANSFER SWITCH: 3P–100A, 120/240V, 3ø, 4W NEMA–3R STAINLESS STEEL NON–FUSED DOUBLE THROW SWITCH.

(X) WEATHERPROOF TWIST LOCK GENERATOR HOOK–UP RECEPTACLE. MATCH WITH OWNER GENERATOR PLUG.

(Y) POLE LIGHT: HUBBELL # DDL–140L–1 LED DUSK–TO DAWN WITH PHONE CELL.

(Z) 1" CONDUIT WITH 2–#10, 1–#10 GROUND.

(AA) OMNISITE OMNIBEACON TELEMETRY CONTROL BOX.

(BB) 3/4" CONDUIT WITH 2–#12, 1–#12 GROUND.

(CC) PURAFIL ACTIVE DS300.

(DD) 3/4" CONDUIT WITH 2–#12, 1–#12 GROUND. PROVIDE A SWITCH INSIDE OF PUMP CONTROL PANEL.

ADDENDUM 2

NO.	BY	DATE	DESCRIPTION
1	KMP	1/2022	ADDENDUM 1 – ADDED REVISED STAIR ACCESS
2	FD	2/2022	ADDENDUM 2 – GENERATOR SIZE

SCALE: 1/2" = 1'–0"	
DRAWN: F. DELDUQUE	DATE:APRIL 2021
CHECKED: C. SMITH	DATE:APRIL 2021
APPROVED: C. SMITH	DATE:APRIL 2021
SURVEY DATE:	
SURVEY BY:	
FIELD BOOK No.:	

THRASHER
300 ASSOCIATION DRIVE
CHARLESTON, WV 25311
www.thrashereng.com
PHONE (304)–343–7601
FAX (304)–343–7604

PHASE No.	
CONTRACT No.	1
PROJECT No.	020–1526

MILTON MUNICIPAL UTILITIES COMMISSION
CABELL COUNTY, WEST VIRGINIA
MORRIS MEMORIAL
SANITARY SEWER EXTENSION
FLEA MARKET LS ELECTRICAL RISER DIAGRAGM

SHEET No. **E-2**

LAYOUT TAB: Flea Market LS
CAD FILE: R:\020\020–1526 COLLECTION REHAB–MILTON– –Chas\Drawing\Contract 1\C1––PS Sheet Electrical Diagram.dwg
PLOT DATE/TIME: 2/7/2022 10:30 AM
USER: robert stowers

START STEPS FOR PORTABLE GENERATOR

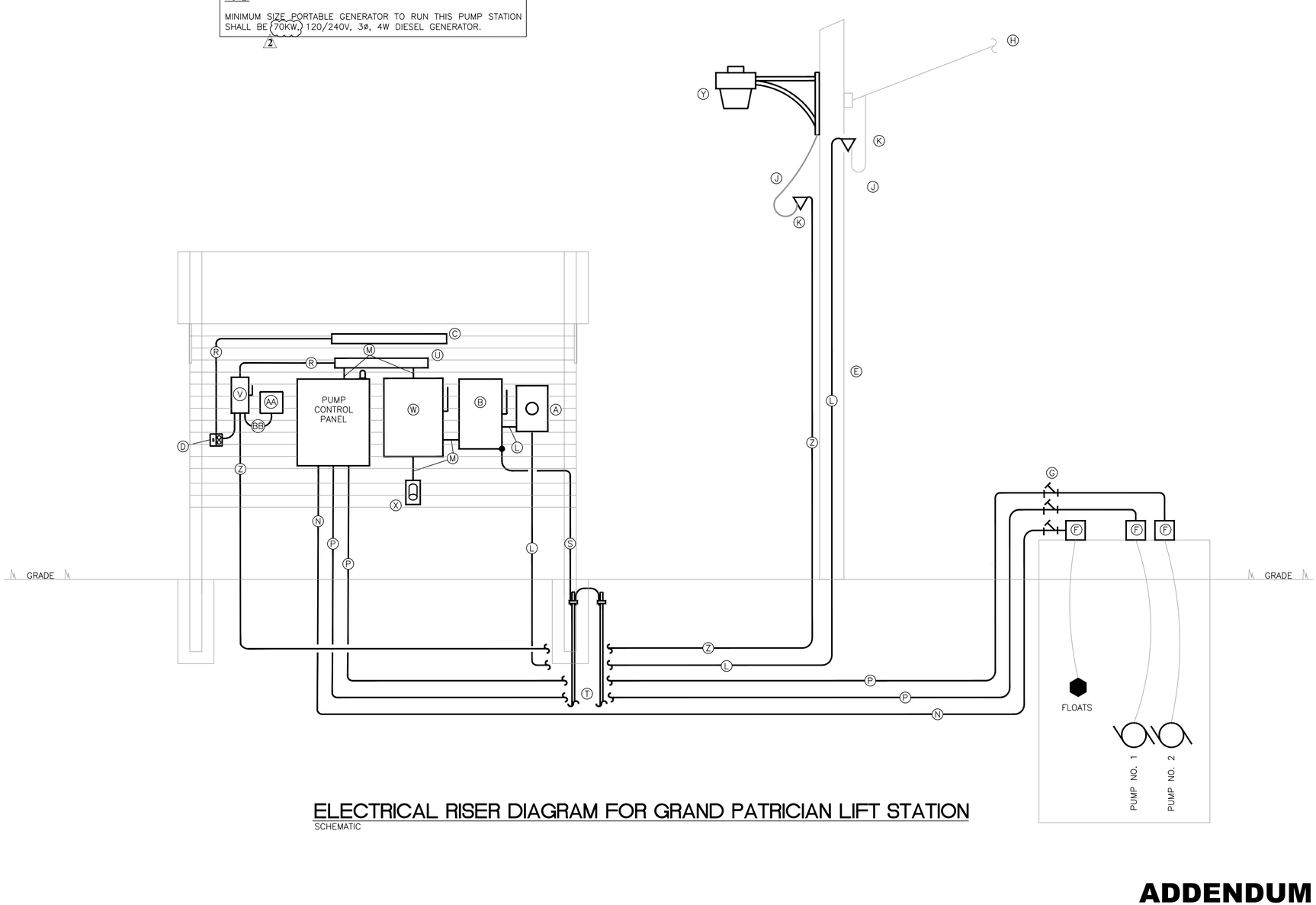
STEP–1: (0 SEC. DELAY) 1. LIGHTING, RECEPTACLES AND MISCELLANEOUS
2. PUMP NO. 1

STEP–2: (10 SEC. DELAY) 1. PUMP NO. 2

NOTE:

MINIMUM SIZE PORTABLE GENERATOR TO RUN THIS PUMP STATION SHALL BE (70KW,) 120/240V, 3ø, 4W DIESEL GENERATOR.

2.



ELECTRICAL RISER DIAGRAM FOR GRAND PATRICIAN LIFT STATION

SCHEMATIC

RISER NOTES:

(A) METER.

(B) MAIN SWITCH: 3P–200A, 120/240V, 3ø, 4W HEAVY DUTY NEMA–4X STAINLESS STEEL SERVICE RATED FUSED SAFETY SWITCH WITH 150A FUSES.

(C) CANOPY LIGHT: LITHONIA #FEML48 4000LM IMAFL 4' LED ENCLOSED AND GASKETED ACRYLIC LINEAL RIBBED LENS.

(D) GFI RECEPTACLE WITH WEATHERPROOF COVER AND SINGLE POLE SWITCH WITH WEATHERPROOF COVER.

(E) 25' TREATED POLE.

(F) LIQUID TIGHT STAINLESS STEEL JUNCTION BOX.

(G) SEAL–OFF FITTINGS.

(H) 120/240V, 3ø, 4W OVERHEAD SERVICE BY POWER CO.

(J) DRIP LOOP.

(K) WEATHERPROOF HEAD.

(L) 3" CONDUIT WITH 4–1/0 CABLES.

(M) 2" CONDUIT WITH 4–1/0, 1–#6 GROUND.

(N) 1" CONDUIT WITH CONTROLS CONDUCTORS FOR FLOATS.

(P) 1 1/4" CONDUIT WITH 3–#4, 1–#8 GROUND.

(R) 3/4" CONDUIT WITH 2–#12, 1–#12 GROUND.

(S) #4 SOLID COPPER GROUND WIRE.

(T) GROUND RODS WITH CLAMPS PER N.E.C.

(U) 4"x4" NEMA–4X STAINLESS STEEL WIREWAY.

(V) 3P–30A, 120/240V, 1ø, 2W HEAVY DUTY NEMA–4X FUSED SAFETY SWITCH WITH 20A FUSES. ONE FUSE FOR POLE LIGHT, ONE FUSE FOR RECEPTACLE AND CANOPY LIGHT, ONE FUSE FOR TELEMETRY CONTROL BOX.

(W) MANUAL TRANSFER SWITCH: 3P–200A, 120/240V, 3ø, 4W NEMA–3R STAINLESS STEEL NON–FUSED DOUBLE THROW SWITCH.

(X) WEATHERPROOF TWIST LOCK GENERATOR HOOK–UP RECEPTACLE. MATCH WITH OWNER GENERATOR PLUG.

(Y) POLE LIGHT: HUBBELL # DDL–140L–1 LED DUSK–TO DAWN WITH PHONE CELL.

(Z) 1" CONDUIT WITH 2–#10, 1–#10 GROUND.

(AA) OMNISITE OMNIBEACON TELEMETRY CONTROL BOX.

(BB) 3/4" CONDUIT WITH 2–#12, 1–#12 GROUND.

ADDENDUM 2

NO.	BY	DATE	DESCRIPTION
2	FD	2/2022	ADDENDUM 2 – GENERATOR SIZE

SCALE: 1/2" = 1'–0"	
DRAWN: F.DELDUQUE	DATE:APRIL 2021
CHECKED: C. SMITH	DATE:APRIL 2021
APPROVED: C. SMITH	DATE:APRIL 2021
SURVEY DATE:	
SURVEY BY:	
FIELD BOOK No.:	

THRASHER
300 ASSOCIATION DRIVE
CHARLESTON, WV 25311
www.thrashereng.com
PHONE (304)–343–7601
FAX (304)–343–7604

PHASE No.

CONTRACT No. 1

PROJECT No. 020–1526

MILTON MUNICIPAL UTILITIES COMMISSION
CABELL COUNTY, WEST VIRGINIA
MORRIS MEMORIAL
SANITARY SEWER EXTENSION
GRAND PATRICIAN LS ELECTRICAL RISER DIAGRAM

SHEET No. E-4

LAYOUT TAB: Grand Patrician LS
CAD FILE: R:\020\020–1526 COLLECTION REHAB–MILTON– –Chas\Drawing\Contract 1\C1––PS Sheet Electrical Diagram.dwg PLOT DATE/TIME: 2/7/2022 10:28 AM USER: robert stowers