



COMPLEX PROJECTS
REQUIRE RESOLVE
THRASHER'S GOT IT

**HATFIELD MCCOY REGIONAL RECREATION AUTHORITY
MCDOWELL COUNTY, WV
PROPOSED
ASHLAND RESORT TOURISM PARK DEVELOPMENT PROJECT
ADDENDUM #1**

**Monday November 9, 2020
Thrasher Project #030-10061**

TO WHOM IT MAY CONCERN:

A Pre-Bid Conference was held on Thursday November 5, 2020 on the above-referenced project, a copy of the sign in sheet is included in this Addendum. The following are clarifications and responses to questions posed by contractors for the above reference project.

CLARIFICATIONS:

- 1. THE BID FORM HAS BEEN REVISED. YOU MUST USE THE REVISED BID FORM WHEN PREPARING YOUR BID PACKAGE FOR THIS PROJECT.**
- Electrical plans and details have been added to the plan set. See Sheets #E1 and #E2 of the drawings for clarification.
- A deductive alternate has been included to not remove and re-install the existing 15,000 GPD WWTP. A clarification of the piping for the WWTP has been included as part of this Addendum. Please see plan sheet #18.
- The warranty for both the Welded Steel Water Tank and the Bolted Steel Water Tank have been changed to 5 years. Please see technical specification 434111.00 section 1.12 and technical specification 434113.00 section 1.12 for the warranty changes.

QUESTIONS AND RESPONSES:

QUESTION

- For Stream Crossing plans show a prefab W24 Bridge superstructure but no foundation plan. Will it be the responsibility of the contractor to have an adequate substructure and footing designed by a PE?

RESPONSE

A geotechnical investigation has been performed and a report is available upon request. A user waiver form will need to be created prior to delivery of the report. TTG will provide a foundation detail for the W24 Superstructure in Addendum #2. If the Contractor wishes to use an approved equal it will be their responsibility to provide and footing design signed by a WV PE.

QUESTION

2. At the stream crossing will the contractor have to perform a hydraulic study to determine the flowrate of the stream (or basically) Calculate the SF of opening required under the structure. Design Criteria Q100, Q50, or Q25 etc?

RESPONSE

A hydraulic analysis has been performed on TTG-Windmill Gap Branch (PER) and it has been determined that the cross-sectional area required is 95.5 SF. The design parameters can be viewed on Sheet 34 of the plans.

QUESTION

3. Will the contractor have to core drill for the bridge foundations? or will Thrasher perform the Geotechnical Analysis showing bedrock and bottom of footing elevation for bridge foundation.

RESPONSE

A geotechnical investigation has been performed and a report is available upon request. A user waiver form will need to be created prior to delivery of the report. TTG will provide a foundation detail for the W24 Superstructure in Addendum #2. If the Contractor wishes to use an approved equal it will be their responsibility to provide and footing design signed by a WV PE.

QUESTION

4. At the water tank foundation will the contractor have to hire a geotechnical engineer to design a foundation which will support the load of the tank?

RESPONSE

A geotechnical investigation has been performed and a report is available upon request. A user waiver form will need to be created prior to delivery of the report. The foundation designs for the Glass Lined Bolted Steel Tank can be found on Sheet 44 of the plans. The foundation designs for the Welded Steel Tank can be found on Sheet 47 of the plans.

QUESTION

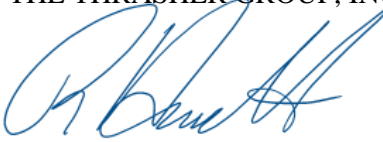
5. After the old sewer plant has been removed from the ground will the contractor has to clean inspect and possibly recoat the outer portion of the sewer plant with a paint system compatible with the existing paint on the tank?

RESPONSE

The Contractor will be required to inspect the unit and bring to the attention of the Engineer and manufacturer any areas that may be of concern. The Engineer or Engineer's Representative must also have the ability to inspect the unit prior to re-installation. The re-coating of the structure should not be included in the base bid, as this will not be required unless recommended upon inspection.

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 1:00 p.m. Tuesday November 10, 2020 at office of The Thrasher Group, Inc. located at **160 Association Drive**, Charleston, WV. Good luck to everyone and thank you for your interest in the project.

Sincerely,
THE THRASHER GROUP, INC.



Richard Hovatter, PE
Project Manager



HATFIELD MCCOY REGIONAL RECREATION AUTHORITY
 MCDOWELL COUNTY, WEST VIRGINIA
 FOR THE

ASHLAND RESORT TOURISM PARK DEVELOPMENT PROJECT

PRE-BID CONFERENCE

Thursday November 5, 2020

Thrasher Project #101-030-10061

Name	Representing	Phone #	Email Address
Eddie Lagne	Backmark Const. Co, Inc	304-881-2686	e.lagne@bmcwv.com <i>Phon PD</i>
BDA FALA	H-M TRAILS	304-785-2301	BFALA@HOTMAIL.COM <i>Phon</i>
Brandon Scarborough	Ampco	304-539-8570	ampco18@gmail.com <i>Phon PD</i>
RS Clemens	Main Street Builders	304-888-7718	rsclemens@earthlink.net <i>Phon PD</i>
Rusty Sauer	Main Street Builders		RustySauer@gmail.com <i>Phon PD</i>
Adam Sauer	Main Street Builders		M.A.Sauer@outlook.com <i>Phon PD</i>
Tammy Leonard	Eastern Arrow	304-414-0255	easternarrow@hotmail.com <i>Phon PD</i>
Dave Bowman	HMT	304-545-7678	DHB7222@yahoo.com <i>Phon PD</i>

**HATFIELD MCCOY REGIONAL RECREATION AUTHORITY
MCDOWELL COUNTY, WEST VIRGINIA
PROPOSED
ASHLAND RESORT TOURISM PARK DEVELOPMENT PROJECT
THRASHER PROJECT #101-030-10061
BID FORM**

ARTICLE 1 – BID RECIPIENT

- 1.01 This Bid is submitted to:
*Hatfield McCoy Regional Recreation Authority
PO Box 146
Man, WV 25635*
- 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:

<u>Addendum No.</u>	<u>Addendum Date</u>
_____	_____
_____	_____
_____	_____

- 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.

- 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 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 Ashland Resort Tourism Park Development Project. 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

ASHLAND RESORT TOURISM PARK DEVELOPMENT PROJECT

FOR THE

HATFIELD MCCOY REGIONAL RECREATION AUTHORITY

MCDOWELL COUNTY, WEST VIRGINIA

November 17, 2020

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 #	Qty.	UNIT	DESCRIPTION	UNIT PRICE	UNIT PRICE WRITTEN IN WORDS	TOTAL PRICE
1	1	LS	MOBILIZATION /DEMOBILIZATION (Shall Not Exceed to 10% of Total Bid)			

Item #	Qty.	UNIT	DESCRIPTION	UNIT PRICE	UNIT PRICE WRITTEN IN WORDS	TOTAL PRICE
2	1	LS	SITE CLEARING & GRUBBING (Shall Not Exceed to 10% of Total Bid)			
3	1	LS	EROSION & SEDIMENT CONTROL MAINTENANCE			
4	2	EA	STABILIZED CONSTRUCTION ENTRANCE			
5	1	LS	CONSTRUCTION STAKEOUT			
6	150	TN	ACCESS ROAD MAINTENANCE (3/4" CRUSHER RUN)			
7	1	LS	TRAFFIC CONTROL			
8	1	LS	SEEDING & MULCHING			
9	2,200	CY	TOTAL EARTHWORK (SITE CONSTRUCTION)			
10	290	LF	GROUTED RIP-RAP CHANNEL			
11	7,410	SY	SEPARATION FABRIC			

Item #	Qty.	UNIT	DESCRIPTION	UNIT PRICE	UNIT PRICE WRITTEN IN WORDS	TOTAL PRICE
12	298.5	LF	TYPE 1 GUARDRAIL, CLASS II			
13	4,370	LF	SMART FENCE			
14	1,770	CY	8" SUBBASE (3" MAX LIFTS) - WVDOH CLASS I			
15	1,720	LF	6" PVC C-900 DR-18 WATER PIPE			
16	1,440	LF	6" PVC C-900 DR-14 WATER PIPE			
17	75	LF	6" DUCTILE IRON CL-50 P. JT. WATER PIPE			
18	155	LF	1" POLYETHYLENE SERVICE TUBING (OPEN CUT), INCLUDING 6" SERVICE SADDLE, CORP. STOP & CURB BOX			
19	1	EA	PIPE SUPPORT			
20	2	EA	6" M.JT. GATE VALVE, COMPLETE W/ BOX AND LID			
21	2	EA	2' POST FLUSING HYDRANT ASSEMBLY, COMPLETE			

Item #	Qty.	UNIT	DESCRIPTION	UNIT PRICE	UNIT PRICE WRITTEN IN WORDS	TOTAL PRICE
22	1	EA	TIE-INTO EXISTING 4" WATER LINE, COMPLETE, TIE IN TO INCLUDE 6" M.JT. GATE VALVE, COMPLETE W/ BOX AND LID & 6" HYMAX COUPLING, COMPLETE			
23	1	LS	22,000 GALLON WATER TANK			
24	80	LF	EXISTING WATER TANK FENCE RELOCATION			
25	40	LF	6' CHAIN LINK FENCE INSTALLATION			
26	2,575	LF	8" PVC SDR-35 GRAVITY SEWER PIPE			
27	115	LF	8" DUCTILE IRON CL-50 P. JT. GRAVITY SEWER PIPE			
28	100	LF	2" HDPE IPS DR-9 FORCE MAIN			
29	2	EA	8" x 4" PVC SDR-35 GRAVITY SERVICE WYE CONNECTION, W/ SERVICE LATERAL PIPE			
30	14	EA	MANHOLE BASE, CONETOP & REGULAR CASTING, COMPLETE IN PLACE			
31	1	VF	48" DIAMETER CONCRETE MANHOLE RISER PIPE			

Item #	Qty.	UNIT	DESCRIPTION	UNIT PRICE	UNIT PRICE WRITTEN IN WORDS	TOTAL PRICE
32	1	EA	TIE-INTO EXISTING MANHOLE, COMPLETE			
33	1	LS	PROPOSED 20,000 GPD WASTE WATER TREATMENT PLANT, COMPLETE IN PLACE			
34	205	LF	12-IN HDPE OUTFALL PIPE			
35	1	LS	EXCAVATE, RELOCATE AND RE-INSTALL EXISTING 15,000 GPD PACKAGE WWTP, COMPLETE IN PLACE, INCLUDING ALL ASSOCIATED ITEMS			
36	1	LS	SEWER PUMP STATION, COMPLETE IN PLACE			
37	100	LF	12-IN STEEL CASING (BORE AND JACK), INCLUDING CASING SPACERS			
38	105	LF	16-IN STEEL CASING (BORE AND JACK), INCLUDING CASING SPACERS			
39	50	LF	12-IN STEEL CASING INCLUDING CASING SPACERS			
40	50	LF	16-IN STEEL CASING INCLUDING CASING SPACERS			
41	1	EA	12-IN PIPE WINGWALL			

Item #	Qty.	UNIT	DESCRIPTION	UNIT PRICE	UNIT PRICE WRITTEN IN WORDS	TOTAL PRICE
42	2	EA	DOUBLE BARREL 36-IN PIPE WINGWALL WITH APRON			
43	1	LS	STREAM CROSSING #1			
44	900	TN	D-50 18" RIP-RAP			
45	1	LS	PARKING SIGNAGE			
46	1	EA	STOP SIGN			
47	1	LS	AS-BUILT SURVEY			
48	1	LS	BLACK VINYL CHAINLINK FENCE CLOSURE			
49	68	LF	36-IN HDPE CULVERT			
50	1	EA	5'-0" DIA. BAR-SCREEN BASKET MANHOLE, COMPLETE IN PLACE			

TOTAL BASE BID:

_____ (\$ _____)

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

DEDUCTIVE ALTERNATE #1

Item #	Qty.	UNIT	DESCRIPTION	UNIT PRICE	UNIT PRICE WRITTEN IN WORDS	TOTAL PRICE
23	1	LS	22,000 Gallon Water Tank			

DEDUCTIVE ALTERNATE #1: _____

(\$ _____)

(Amounts are to be shown in both words and figures. In case of discrepancy, the amount shown in words will govern.) The unit price in the deductive alternate must be the same as shown in the base bid.

DEDUCTIVE ALTERNATE #2

Item #	Qty.	UNIT	DESCRIPTION	UNIT PRICE	UNIT PRICE WRITTEN IN WORDS	TOTAL PRICE
35	1	LS	Excavate, Relocate and Re-install existing 15,000 GPD package WWTP, complete in place, including all associated items			

DEDUCTIVE ALTERNATE BID #2: _____

(\$ _____)

(Amounts are to be shown in both words and figures. In case of discrepancy, the amount shown in words will govern.) The unit price in the deductive alternate must be the same as shown in the base bid.

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, as listed in contract does not exceed the amount of funds 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.

The Owner may award the contract on the total bid submitted by a qualified responsible bidder, less the amount(s) of the Deductive Alternate(s) subtracted in no particular order, as listed in the contract to produce the lowest bid within the funds available for financing.

- 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)

NOTE TO USER: Use in those states or other jurisdictions where applicable or required.

SECTION 012200 - UNIT PRICES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for unit prices.
- B. Related requirements:
 - 1. Section 013300 – Submittal Procedures

1.2 DEFINITIONS

- A. Unit price is an amount incorporated into the Agreement, applicable during the duration of the Work as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, added to or deducted from the Contract Sum by appropriate modification, if the scope of Work or estimated quantities of Work required by the Contract Documents are increased or decreased.
- B. Contract Documents include all specifications, plan drawings and referenced specifications.
- C. Units of Measure:
 - a. AC – Acre
 - b. EA – Each
 - c. CY – Cubic Yard
 - d. DA – Per Day
 - e. DY/24 HR – Per Day (24 hours)
 - f. LBS - Pounds
 - g. LF – Linear Foot
 - h. LS – Lump Sum
 - i. SF – Square Foot
 - j. SY – Square Yard
 - k. TN – Ton
 - l. VF – Vertical Foot
 - m. GAL – Gallon
 - n. MO - Month

1.3 PROCEDURES

- A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.
- B. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.
- C. List of Unit Prices: A schedule of unit prices is included in Part 3. Specification Sections referenced in the schedule contain requirements for materials described under each unit price.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF UNIT PRICES

1. MOBILIZATION / DEMOBILIZATION

- a. This bid item shall include payment of all bonding costs incurred by the contractor. It shall also consist of the performance and construction preparatory operations, including the movement of personnel to the project site and the unloading, transporting and reloading of materials and equipment to the project site. The total lump sum item bid shall not exceed 10% of the total bid price for the contract. The mobilization cost submitted with the first pay application may not exceed 50% of the total Mobilization / Demobilization lump sum item bid. The balance of the lump sum item bid shall be considered demobilization and shall be paid at contract close out with the final pay application.
- b. Unit of Measure: LS

2. SITE CLEARING & GRUBBING

- a. This bid item shall include clearing, grubbing, and windrowing existing vegetation. The payment request for site clearing & grubbing in the first pay estimate shall not exceed 10% of the total bid price for the contract.
- b. This bid item shall also include the collection and removal of existing trash and debris within the project site.
- c. Vegetation shall be windrowed in the areas identified on the plan drawings or as directed by the Owner or Engineer.
- d. Trash and debris shall be stockpiled or removed as specified on the plan drawings or as directed by the Owner or Engineer.
- e. Specification Section: Contract Documents
- f. Unit of Measure: LS

3. EROSION & SEDIMENT CONTROL MAINTENANCE

- a. This bid item shall constitute full compensation for all labor, materials, equipment and other costs associated with maintaining the erosion and sediment controls.
- b. Specification Section: 312500 and WVDOH Standard Specifications Roads and Bridges Section 642
- c. Unit of Measure: LS

4. STABILIZED CONSTRUCTION ENTRANCE

- a. This bid item shall constitute full compensation for all labor, materials, equipment and other costs associated with providing a stabilized construction entrance as specified in the contract documents.
- b. Specification Section: 312500
- c. Unit of Measure: EA

5. CONSTRUCTION STAKEOUT

- a. This bid item shall constitute full compensation for all labor, materials, equipment, and other costs associated with providing construction stakeout as specified in the contract documents.
- b. This bid item shall not exceed 3% of the total bid price.
- c. Specification Section: 017300
- d. Unit of Measure: LS

6. ACCESS ROAD MAINTENANCE (3/4" CRUSHER RUN)

- a. This bid item shall constitute full compensation for all labor, materials, equipment and other costs associated with furnishing and placing clean 3/7" crusher run aggregate for access road maintenance in accordance with the contract documents.
- b. No stone shall be placed for access road maintenance without prior approval from onsite engineer.
- c. Weigh tickets from the commercial supplier for imported access road maintenance stone that is delivered and placed shall be submitted with pay applications.
- d. Specification Section: Plan drawings
- e. Unit of Measure: TN

7. TRAFFIC CONTROL

- a. This bid item shall constitute full compensation for all labor, materials, equipment and other costs associated with coordinating and providing traffic control within public right-of-way in accordance with WVDOH requirements.
- b. Specification Section: WVDOH Standard Specifications
- c. Unit of Measure: LS

8. SEEDING & MULCHING

- a. This bid item shall constitute full compensation for all labor, materials, equipment and other costs associated to furnish and install seeding & mulching as specified in the contract documents and in accordance with the plan specifications and notes and in reasonable close conformity the lines and grades shown on the Plans or established by the Engineer.
- b. Specification Section: Plan Drawings
- c. Unit of Measure: LS

9. TOTAL EARTHWORK (SITE CONSTRUCTION)

- a. This bid item shall constitute full compensation for all labor, materials, equipment and other costs associated with total earthwork (site construction) in accordance with the contract documents and in reasonably close conformity with the lines, grades, weights or thicknesses, and cross sections shown on the plan drawings or established by the Engineer.
- b. This bid item shall apply to the excavation, blending, placing, and compacting of materials available on the project site in accordance with the contract documents.
- c. This bid item shall also include the stripping, stockpiling, and stabilization of topsoil.

- d. Specification Section: 312000
- e. Unit of Measure: CY
 - i. Measurement of total earthwork will be computed on the total quantity shown on the plan drawings.
 - ii. Contractor may compute total earthwork based on field placement if the following conditions are met:
 - 1. Contractor must submit existing topographic survey data of the project site to the Engineer for review and verification prior to beginning excavation.
 - 2. Upon completion of total earthwork operations, Contractor must submit topographic survey data of the project site to the Engineer for review and verification.
 - 3. Upon receipt of the required survey data from the Contractor, the Engineer will digitally model the survey data to review and verify the Contractor's computed total earthwork quantity.

10. GROUTED RIP-RAP CHANNEL

- a. This bid item shall constitute full compensation for all labor, materials, equipment and other costs associated to construct grouted rip-rap channel in accordance with the contract documents.
- b. Specification Section: 312500
- c. Unit of Measure: LF

11. SEPARATION FABRIC

- a. This bid item shall constitute full compensation for all labor, materials, equipment and other costs associated to furnish and install separation fabric in accordance with the contract documents.
- b. This bid item shall include to subgrade preparation and all materials required to install separation fabric in accordance with the contract documents.
- c. Specification Section: Plan Drawings
- d. Unit of Measure: SY

12. TYPE 1 GUARDRAIL, CLASS II

- a. This bid item shall constitute full compensation for all labor, materials, equipment and other costs associated to furnish and install type 1 guardrail, class II in accordance with the contract documents.
- b. The quantity of work completed shall be measure in linear feet of guardrail of the type specified on the plan drawings, complete in place and accepted, measured along the face of the rail from center to center of end posts.
- c. Specification Section: WVDOH Standard Specifications Roads and Bridges
- d. Unit of Measure: LF

13. SMART FENCE

- a. This bid item shall constitute full compensation for all labor, materials, equipment and other costs associated with furnishing and installing smart fence as specified in the contract documents.
- b. Specification Section: 312500 & Plan Drawings
- c. Unit of Measure: LF

14. 8" SUBBASE (3" MAX LIFTS) WVDOH CLASS 1

- a. This bid item shall constitute full compensation for all labor, materials, equipment and other costs associated with placing 8" sub base (3" max lifts) WVDOH Class 1 in accordance with the contract documents and in reasonable close conformity with the lines, grades, weights or thicknesses, and cross sections shown on the Plans or established by the Engineer.
- b. Specification Section: 312000
- c. Unit of Measure: CY

15. 6" PVC C-900 DR-18 WATER PIPE

- a. This bid item shall include excavation, bedding material, backfilling, and furnishing all materials and doing all the work including all labor, tools, equipment, supplies, testing and incidentals necessary to complete the work.
- b. The pipe installed under this item shall be measured and paid for by the linear feet of pipe for each of the types as specified in the contract documents or as directed by the Engineer and installed complete in place. The measurements 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.
- c. Fittings are considered incidental to installation.
- d. Incidental repair and/or replacement of 6" PVC C-900 DR-18 water pipe, as may be necessary, throughout warranty period.
- e. Specification Section: WVDOH Standard Specifications Roads and Bridges Section 606
- f. Unit of Measure: LF

16. 6" PVC C-900 DR-14 WATER PIPE

- a. This bid item shall include excavation, bedding material, backfilling, and furnishing all materials and doing all the work including all labor, tools, equipment, supplies, testing and incidentals necessary to complete the work.
- b. The pipe installed under this item shall be measured and paid for by the linear feet of pipe for each of the types as specified in the contract documents or as directed by the Engineer and installed complete in place. The measurements 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.
- c. Fittings are considered incidental to installation.
- d. Incidental repair and/or replacement of 6" PVC C-900 DR-14 water pipe, as may be necessary, throughout warranty period.
- e. Specification Section: WVDOH Standard Specifications Roads and Bridges Section 606
- f. Unit of Measure: LF

17. 6" DUCTILE IRON CL-50 P. JT. WATER PIPE

- a. This bid item shall include excavation, bedding material, backfilling, and furnishing all materials and doing all the work including all labor, tools, equipment, supplies, testing and incidentals necessary to complete the work.
- b. The pipe installed under this item shall be measured and paid for by the linear feet of pipe for each of the types as specified in the contract documents or as directed by the Engineer

and installed complete in place. The measurements 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.

- c. Fittings are considered incidental to installation.
 - d. Incidental repair and/or replacement of 6" Ductile Iron CL-50 P. JT. water pipe, as may be necessary, throughout warranty period.
 - e. Specification Section: WVDOH Standard Specifications Roads and Bridges Section 606
 - f. Unit of Measure: LF
18. 1" POLYETHYLENE SERVICE TUBING (OPEN CUT), INCLUDING 6" SERVICE SADDLE, CORP. STOP & CURB BOX
- a. This bid item shall include excavation, bedding material, backfilling, and furnishing all materials and doing all the work including all labor, tools, equipment, supplies, testing and incidentals necessary to complete the work.
 - b. The pipe installed under this item shall be measured and paid for by the linear feet of pipe for each of the types as specified in the contract documents or as directed by the Engineer and installed complete in place. The measurements 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.
 - c. Fittings are considered incidental to installation.
 - d. Incidental repair and/or replacement of 1" polyethylene Service tubing, as may be necessary, throughout warranty period.
 - e. Specification Section: WVDOH Standard Specifications Roads and Bridges Section 606
 - f. Unit of Measure: LF
19. PIPE SUPPORT
- a. This bid item shall constitute full compensation for all labor, materials, equipment and other costs associated with furnishing and installing pipe support as specified in the contract documents.
 - b. Specification Section: Plan Drawings
 - c. Unit of Measure: EA
20. 6" M.JT. GATE VALVE, COMPLETE W/ BOX AND LID
- a. This bid item shall include excavation, bedding material, backfilling, and furnishing all materials and doing all the work including all labor, tools, equipment, supplies, testing and incidentals necessary to complete the work.
 - b. Fittings are considered incidental to installation.
 - c. Incidental repair and/or replacement of gate valve, as may be necessary, throughout warranty period.
 - d. Specification Section: 331216
 - e. Unit of Measure: EA

21. 2' POST FLUSING HYDRANT ASSEMBLY, COMPLETE

- a. This bid item shall constitute full compensation for all labor, materials, equipment and other costs associated with furnishing and installing 2' post flushing hydrant as specified in the contract documents.
- b. Specification Section: Contract Documents
- c. Unit of Measure: EA

22. TIE-INTO EXISTING 4" WATER LINE, COMPLETE, TIE IN TO INCLUDE 6" M.JT. GATE VALVE, COMPLETE W/ BOX AND LID & 6" HYMAX COUPLING, COMPLETE

- a. This bid item shall constitute full compensation for all labor, materials, equipment and other costs to perform the tie-in or hot tap as specified in the contract documents.
- b. Specification Section: Contract Documents
- c. Unit of Measure: EA

23. 22,000 GALLON WATER TANK

- a. This bid item shall include all labor, material and incidentals required for final design and selection of 22,000 gallon water tank meeting the project requirements.
- b. This bid item shall include excavation, bedding material, backfilling, and furnishing all materials and doing all the work including all labor, tools, equipment, supplies, testing and incidentals necessary to purchase, deliver, off-load, and install 22,000 gallon water tank and required foundation complete in place.
- c. This bid item shall include all labor, tools, equipment, material, fittings, supplies, testing and incidentals necessary to install and connect supply, discharge, and overflow piping as shown on the plan drawings.
- d. Specification Section: Contract Documents
- e. Unit of Measure: LS

24. EXISTING WATER TANK FENCE RELOCATION

- a. This bid item shall constitute full compensation for all labor, materials, equipment and other costs associated for existing water tank fence relocation.
- b. This bid item shall constitute full compensation for all labor, materials, equipment and other costs associated for the legal and lawful disposal of all waste materials associated with the relocation of existing water tank fence material.
- c. Specification Section: 017419 and Contract Drawings
- d. Unit of Measure: LF

25. 6' CHAIN LINK FENCE INSTALLATION

- a. This bid item shall constitute full compensation for all labor, materials, equipment and other costs associated to furnish and install 6' chain link fence. This shall include posts, concrete foundations, bracing, truss rods and take ups, caps, tension bands, fence fabric and all other materials and fasteners required to complete installation of 6' chain link fence in reasonably close conformity with the Plans or as established by the Engineer.
- b. Specification Section: 323113 and Contract Drawings
- c. Unit of Measure: LF

26. 8" PVC SDR-35 GRAVITY SEWER PIPE

- a. This bid item shall include excavation, bedding material, backfilling, and furnishing all materials and doing all the work including all labor, tools, equipment, supplies, testing and incidentals necessary to complete the work.
- b. The pipe installed under this item shall be measured and paid for by the linear feet of pipe for each of the types as specified in the contract documents or as directed by the Engineer and installed complete in place. The measurements 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.
- c. Fittings are considered incidental to installation.
- d. Incidental repair and/or replacement of 8" PVC SDR-35 gravity sewer pipe, as may be necessary, throughout warranty period.
- e. Specification Section: WVDOH Standard Specifications Roads and Bridges Section 606
- f. Unit of Measure: LF

27. 8" DUCTILE IRON CL-50 P. JT. GRAVITY SEWER PIPE

- a. This bid item shall include excavation, bedding material, backfilling, and furnishing all materials and doing all the work including all labor, tools, equipment, supplies, testing and incidentals necessary to complete the work.
- b. The pipe installed under this item shall be measured and paid for by the linear feet of pipe for each of the types as specified in the contract documents or as directed by the Engineer and installed complete in place. The measurements 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.
- c. Fittings are considered incidental to installation.
- d. Incidental repair and/or replacement of 8" Ductile Iron CL-50 P. JT. Gravity sewer pipe, as may be necessary, throughout warranty period.
- e. Specification Section: WVDOH Standard Specifications Roads and Bridges Section 606
- f. Unit of Measure: LF

28. 2" HDPE IPS DR-9 FORCE MAIN

- a. This bid item shall include excavation, bedding material, backfilling, and furnishing all materials and doing all the work including all labor, tools, equipment, supplies, testing and incidentals necessary to complete the work.
- b. Fittings are considered incidental to installation.
- c. Specification Section: WVDOH Standard Specifications Roads and Bridges Section 606
- d. Unit of Measure: LF

29. 8" x 4" PVC SDR-35 GRAVITY SERVICE WYE CONNECTION, W/ SERVICE LATERAL PIPE

- a. This bid item shall include excavation, bedding material, backfilling, and furnishing all materials and doing all the work including all labor, tools, equipment, supplies, testing and incidentals necessary to complete the work.

- b. The connection and pipe installed under this item shall be paid for by each individual connection for each of the types as specified in the contract documents or as directed by the Engineer and installed complete in place.
- c. Fittings are considered incidental to installation.
- d. Incidental repair and/or replacement of connection and service lateral pipe, as may be necessary, throughout warranty period.
- e. Specification Section: WVDOH Standard Specifications Roads and Bridges Section 606
- f. Unit of Measure: EA

30. MANHOLE BASE, CONETOP & REGULAR CASTING, COMPLETE IN PLACE

- a. This bid item shall constitute full compensation for labor, materials, equipment, and other costs associated with the furnishing and installation of a sanitary manhole including frame and cover, fittings, pipe connector system, grout, link seal, and core drilling per Contract Documents as shown on plans.
- b. This bid item shall also include all excavation, bedding, and backfill required for complete installation, up to a depth of six (6) feet.
- c. Unit of Measure: EA

31. 48" DIAMETER CONCRETE MANHOLE RISER PIPE

- a. This bid item shall constitute full compensation for labor, materials, equipment, and other costs associated with the furnishing and installation of a concrete manhole riser pipe including frame and cover, fittings, pipe connector system, grout, link seal, and core drilling per Contract Documents as shown on plans.
- b. Riser sections are required for depths over six (6) feet.
- c. Unit of Measure: VF

32. TIE-INTO EXISTING MANHOLE, COMPLETE

- a. This bid item shall constitute full compensation for labor, materials, excavation, core drilling, neoprene gasket, non-shrink concrete grout, existing manhole channel work and all other costs associated with the tie-in to the existing manhole as indicated in the drawings.
- b. Unit of Measure: EA

33. PROPOSED 20,000 GPD WASTE WATER TREATMENT PLANT, COMPLETE IN PLACE

- a. This bid item shall be based on the proposed waste water treatment plant layout of Economy Tank Company 20,000 GPD plant or an engineer approved equal. This shall include complete 20,000 gpd waste water treatment facility including, but not limited to, tankage, compressors, blowers, backwash systems, piping, valves, pumps, controls, and instrumentation. This facility must be able to only treat 20,000 gpd during "off-peak" seasonal times of the year at the site without adversely affecting treatment.
- b. This bid item shall include all labor, material and incidentals required for final design and selection of prepackaged waste water treatment plant meeting the project requirements and specifications.
- c. This bid item shall include excavation, bedding material, backfilling, and furnishing all materials and doing all the work including all labor, tools, equipment, supplies, testing and incidentals necessary to purchase, deliver, off-load, store, and install prepackaged waste water treatment plant complete in place.

- d. Shop drawings, operation and maintenance manuals, testing, dry and wet start-up of systems, initial performance demonstration, providing written report, and providing training owner's staff shall also be included with this bid item.
- e. Specification Section: 460753, Contract Documents
- f. Unit of Measure: LS

34. 12-IN HDPE OUTFALL PIPE

- a. The pipe installed under this bid item shall be measured and paid for by the linear feet of pipe for each of the types and sizes as specified in the contract documents or as directed by the Engineer and installed complete in place. The measurements under this item shall be the length of the various sizes and classes 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.
- b. The measurements under this section shall include excavation, bedding, anchors, backfilling, and furnishing all materials and doing all the work including all labor, tools, equipment, supplies, testing and incidentals necessary to complete the work.
- c. Fittings, concrete encasement, and/or concrete pipe anchors if required by field conditions are considered incidental to pipe installation.
- d. Specification Section: WVDOH Standard Specifications Roads and Bridges Section 714
- e. Unit of Measure: LF

35. EXCAVATE, RELOCATE AND RE-INSTALL EXISTING 15,000 GPD PACKAGE WWTP, COMPLETE IN PLACE, INCLUDING ALL ASSOCIATED ITEMS

- a. This bid item shall constitute full compensation for all labor, materials, equipment and other costs associated with excavating, relocating, and re-installing existing package WWTP as specified in the contract documents.
- b. Specification Section: Contract Documents
- c. Unit of Measure: LS

36. SEWER PUMP STATION, COMPLETE IN PLACE

- a. This bid item shall include all labor, material and incidentals required for final design and selection of pump station meeting the project requirements.
- b. This bid item shall include excavation, bedding material, backfilling, and furnishing all materials and doing all the work including all labor, tools, equipment, supplies, testing and incidentals necessary to purchase, deliver, off-load, and install pump station complete in place.
- c. This bid item shall include all labor, tools, equipment, material, fittings, supplies, testing and incidentals necessary to install and connect supply, discharge, and overflow piping as shown on the plan drawings.
- d. This bid item shall include the furnishing and installation of all required vaults, bedding, grout, access doors, couplings, fittings, and piping.
- e. This bid item shall include the furnishing, installation and connection of all components required to provide electrical service.
- f. Testing, start-up and training shall also be included with this bid item.
- g. Specification Section: Contract Documents
- h. Unit of Measure: LS

37. 12-IN STEEL CASING (BORE AND JACK), INCLUDING CASING SPACERS

- a. The pipe installed under this bid item shall be measured and paid for by the linear feet of pipe for each of the types and sizes as specified in the contract documents or as directed by the Engineer and installed complete in place. The measurements under this item shall be the length of the various sizes and classes 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.
- b. The measurements under this section shall include all labor and material 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. Payment shall be for casing pipe only; carrier pipe shall be paid by the bid unit per linear foot.
- d. Compensation for unauthorized casing footage beyond that which was called for in the Drawings and Specifications will not be made.
- e. Specification Section: 260543
- f. Unit of Measure: LF

38. 16-IN STEEL CASING (BORE AND JACK), INCLUDING CASING SPACERS

- a. The pipe installed under this bid item shall be measured and paid for by the linear feet of pipe for each of the types and sizes as specified in the contract documents or as directed by the Engineer and installed complete in place. The measurements under this item shall be the length of the various sizes and classes 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.
- b. The measurements under this section shall include all labor and material 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. Payment shall be for casing pipe only; carrier pipe shall be paid by the bid unit per linear foot.
- d. Compensation for unauthorized casing footage beyond that which was called for in the Drawings and Specifications will not be made.
- e. Specification Section: 260543
- f. Unit of Measure: LF

39. 12-IN STEEL CASING, INCLUDING CASING SPACERS

- a. The pipe installed under this bid item shall be measured and paid for by the linear feet of pipe for each of the types and sizes as specified in the contract documents or as directed by the Engineer and installed complete in place. The measurements under this item shall be the length of the various sizes and classes 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.
- b. The measurements under this section shall include all labor and material 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. Payment for this bid item shall be paid for the overall length of the casing pipe satisfactorily installed.
- d. Payment shall be for casing pipe only; carrier pipe shall be paid by the bid unit per linear foot.

- e. Compensation for unauthorized casing footage beyond that which was called for in the Drawings and Specifications will not be made.
- f. Specification Section: 260543
- g. Unit of Measure: LF

40. 16-IN STEEL CASING, INCLUDING CASING SPACERS

- a. The pipe installed under this bid item shall be measured and paid for by the linear feet of pipe for each of the types and sizes as specified in the contract documents or as directed by the Engineer and installed complete in place. The measurements under this item shall be the length of the various sizes and classes 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.
- b. The measurements under this section shall include all labor and material 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. Payment for this bid item shall be paid for the overall length of the casing pipe satisfactorily installed.
- d. Payment shall be for casing pipe only; carrier pipe shall be paid by the bid unit per linear foot.
- e. Compensation for unauthorized casing footage beyond that which was called for in the Drawings and Specifications will not be made.
- f. Specification Section: 260543
- g. Unit of Measure: LF

41. 12-IN PIPE WINGWALL

- a. This bid item shall constitute full compensation for furnishing the excavation, backfill, concrete, aggregate, reinforcing steel and all other materials required for doing all the work, including all labor, tools, equipment, supplies and incidentals necessary to install 12-in pipe wingwall complete in place as shown on the Contract Plans.
- b. Specification Section: 033000 and WVDOH Standard Specifications Roads and Bridges Section 620
- c. Unit of Measure: EA

42. DOUBLE BARREL 36-IN PIPE WINGWALL W/ APRON

- a. This bid item shall constitute full compensation for furnishing the excavation, backfill, concrete, aggregate, reinforcing steel and all other materials required for doing all the work, including all labor, tools, equipment, supplies and incidentals necessary to install double barrel 36-in pipe wingwall w/ apron complete in place as shown on the Contract Plans.
- b. Specification Section: 033000 and WVDOH Standard Specifications Roads and Bridges Section 620
- c. Unit of Measure: EA

43. STREAM CROSSING #1

- a. This bid item shall include all labor, material and incidentals required for final design and selection of material to install stream crossing #1 in accordance with the project requirements and specifications.

- b. This bid item shall constitute full compensation for all labor, materials, equipment and other costs associated to provide installation of stream crossing #1 in accordance with the contract documents and in reasonably close conformity with the Plans or as established by the Engineer.
- c. Specification Section: 323410 and Contract Documents
- d. Unit of Measure: LS

44. D-50 18" RIP-RAP

- a. This bid item shall constitute full compensation for all labor, materials, equipment and other costs associated with D-50 18" riprap placement in accordance with the contract documents.
- b. This bid item shall apply to subgrade preparation and furnishing and placing clean d-50 18" riprap aggregate in the areas identified on the plan drawings.
- c. Specification Section: Plan Drawings
- d. Unit of Measure: TN

45. PARKING SIGNAGE

- a. This bid item shall constitute full compensation for all labor, materials, equipment and other costs associated to provide installation of parking signage in accordance with the contract documents and in reasonably close conformity with the Plans or as established by the Engineer.
- b. Specification Section: WVDOH Standard Specifications Road and Bridges Section 663 & Plan Drawings
- c. Unit of Measure: LS

46. STOP SIGN

- a. This bid item shall constitute full compensation for all labor, materials, equipment and other costs associated to provide installation of stop sign in accordance with the contract documents and in reasonably close conformity with the Plans or as established by the Engineer.
- b. Specification Section: WVDOH Standard Specifications Road and Bridges Section 661 & Plan Drawings
- c. Unit of Measure: EA

47. AS-BUILT SURVEY

- a. This bid item shall constitute full compensation for all labor, materials, equipment, and other costs associated with providing as-built survey of underground utilities installed as part of this contract.
- b. Specification Section: Plan Drawings
- c. Unit of Measure: LS

48. BLACK VINYL CHAINLINK FENCE

- a. This bid item shall include all labor, materials, equipment, and other costs associated with furnishing and installing black vinyl chainlink fence. This item shall include all posts, concrete foundations, anchors, bracing, truss rods and takeups, caps, tension bands, fence

fabric and all other required materials and fasteners required to complete the fencing installation as specified in the contract drawings.

- b. Specification Section: 323113
- c. Unit of Measure: LS

49. 36-IN HDPE CULVERT

- a. The pipe installed under this bid item shall be measured and paid for by the linear feet of pipe for each of the types and sizes as specified in the contract documents or as directed by the Engineer and installed complete in place. The measurements under this item shall be the length of the various sizes and classes 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.
- b. The measurements under this section shall include excavation, bedding, anchors, backfilling, and furnishing all materials and doing all the work including all labor, tools, equipment, supplies, testing and incidentals necessary to complete the work.
- c. Fittings, concrete encasement, and/or concrete pipe anchors if required by field conditions are considered incidental to pipe installation.
- d. Specification Section 334200 and WVDOH Standard Specifications Roads and Bridges Section 714
- e. Unit of Measure: LF

50. 5'-0" DIA. BAR-SCREEN BASKET MANHOLE, COMPLETE IN PLACE

- a. This bid item shall constitute full compensation for labor, materials, equipment, and other costs associated with the furnishing and installation of a sanitary manhole including frame and cover, bar screen basket, guide rails, watertight access hatch, fittings, pipe connector system, grout, link seal, and core drilling per Contract Documents and as shown on the plans.
- b. The bid item shall also include all excavation, bedding, and backfill required for complete installation, up to a depth of six (6) feet.
- c. Unit of Measure: EA

END OF SECTION 012200

SECTION 434111 - BOLTED STEEL TANKS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Ground-mounted flat-bottom glass lined bolted steel water storage tank(s) of the size and dimensions indicated in the Water Storage Tank Schedule at the end of this Specification Section. The tank will store potable water.

B. Scope of Work

1. The work required under this Specification Section shall consist of all necessary materials, tools, equipment, and labor for the construction and successful operation of a ground-mounted flat-bottom glass lined bolted steel water storage tank with tank foundation and all appurtenances shown in the Drawings. All tanks furnished and installed under this Section shall meet or exceed the minimum requirements of AWWA Standard D103, latest revision (AWWA D103), all requirements of this Specification Section, and any and all of the requirements of any and all federal, state, and local agencies having jurisdiction.

C. Related Requirements:

1. Section 012000 – Price and Payment Procedures
2. Section 033000 – Cast-In-Place Concrete
3. Section 323113 – Chain Link Fences and Gates
4. Section 330517 – Pre-Cast Concrete Valve Vaults
5. Section 331113 – Water Distribution Piping
6. Section 331300 – Disinfecting of Water Utility Distribution
7. Section 331313 – Water Storage Tank Disinfection

1.2 DEFINITIONS

A. Purchaser: Owner, as used in AWWA D103.

B. Tank Low Level: Level when emptied through specified discharge fittings unless otherwise indicated on Drawings.

1.3 REFERENCE STANDARDS

A. ASTM International:

1. ASTM A53 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.

B. American Water Works Association:

1. AWWA D103 - Factory-Coated Bolted Carbon Steel Tanks for Water Storage.
2. AWWA D106 – Sacrificial Anode Cathodic Protection Systems for the Interior Submerged Surfaces of Steel Water Storage Tanks.

C. NSF International:

1. NSF 61 - Drinking Water System Components - Health Effects.
2. NSF 372 - Drinking Water System Components - Lead Content.

D. Occupational Safety and Health Administration:

1. OSHA 29 CFR 1910 - Occupational Safety and Health Standards.

1.4 COORDINATION

- A. Section 013000 - Administrative Requirements: Requirements for coordination.
- B. Coordinate Work with Owner and other Contractors for related contracts.

1.5 SCHEDULING

- A. Provide and update schedule on a regular basis. Coordinate schedule with Owner and Contractor(s) for other Contract(s).

1.6 SUBMITTALS

- A. Section 013300 - Submittal Procedures: Requirements for submittals.
- B. Product Data:
 1. Submit data for expansion joint fittings and other pipe specialty fittings.
 2. Submit data for ladder and ladder safety devices.
 3. Submit information concerning materials of construction, fabrication, and coatings.
- C. Shop Drawings:
 1. Signed and sealed by professional engineer.
 2. Tank Shop Drawings shall include, but not be limited to, the following:
 - a. Complete plan, elevation, and sectional Drawings showing critical dimensions.
 - b. Tank foundation details.
 - c. Inlet and outlet piping,
 - d. Structural plate thickness.
 - e. Details of all weld types and sizes.
 - f. Inlet pipe with removable silt stop, outlet pipe with removable silt stop, and overflow piping details, including fittings, expansion joints, pipe support methods.

- g. Ladder and ladder safety device details.
- h. Handrail details.
- i. Shell access hatch details.
- j. Roof hatch details.
- k. Pressure-vacuum vent details.
- l. Water level indicator.
- m. Valve pit details.
- n. Tank Manufacturer identification details.
- o. Cathodic protection.

D. Manufacturer's Certificate:

- 1. Certify that products meet or exceed specified requirements.
- 2. Submit certified list of glass lined bolted steel water tank installations storing potable water, in service for period of not less than five years. Provide Owner name and contact information for each.

E. Delegated Design Submittals: Submit signed and sealed Shop Drawings with design calculations and assumptions for tank, tank foundation, and cathodic protection.

F. Test and Evaluation Reports:

- 1. Submit mill test reports.
- 2. Written Report Certifying Work: Prepare and submit as indicated in AWWA D103.
- 3. Submit Installation Certificate from equipment manufacturer's representative as described in PART 3.

G. Manufacturer Instructions: Submit detailed instructions on installation requirements, including tank component handling procedures, anchoring, and layout.

H. Source Quality-Control Submittals: Indicate results of shop and/or factory tests and inspections.

I. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.

J. Manufacturer Reports: Submit certification that tank has been installed according to manufacturer instructions.

K. Qualifications Statements:

- 1. Submit qualifications for manufacturer, erector, and licensed professional.
- 2. Submit manufacturer's approval of erector.

1.7 MAINTENANCE MATERIAL SUBMITTALS

A. Section 017000 - Execution and Closeout Requirements: Requirements for maintenance materials.

1.8 CLOSEOUT SUBMITTALS

- A. Section 017000 - Execution and Closeout Requirements: Requirements for submittals.
- B. Project Record Documents: Record actual location and orientation of tank and appurtenances.
- C. Operations and Maintenance Data: Submit maintenance instructions for tanks and accessories.

1.9 QUALITY ASSURANCE

- A. Perform Work according to AWWA D103.
- B. Materials in Contact with Potable Water: Certified to NSF Standards 61 and 372.

1.10 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum ten (10) years' documented experience.
- B. Fabricator: Company specializing in fabricating products specified in this Section with minimum ten (10) years' documented experience.
- C. Erector: Company specializing in performing Work of this Section with minimum ten (10) years' documented experience and approved by manufacturer.
- D. Licensed Professional: Professional engineer experienced in design of specified Work and actively licensed in the state where the tank is located. The licensed professional shall furnish a copy of the Certificate of Authorization (or equivalent) for his/her company to practice engineering in the state of licensure.

1.11 DELIVERY, STORAGE, AND HANDLING

- A. Section 016000 - Product Requirements: Requirements for transporting, handling, storing, and protecting products.
- B. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- C. Storage:
 - 1. Store materials in areas protected from weather and moisture and according to manufacturer instructions.
 - 2. Do not store products directly on ground.
- D. Handling: Handle materials in a manner to prevent damage to interior or exterior surfaces.
- E. Protection:

1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
2. Provide additional protection according to manufacturer instructions.

1.12 WARRANTY

- A. Section 017000 - Execution and Closeout Requirements: Requirements for warranties.
- B. The Tank Manufacturer shall include a warranty on tank materials and workmanship for a specified period. As a minimum, the warranty shall provide assurance against defects in material, coatings, workmanship, and tank interior lining for a period of **five (5) years**, starting at the date of Substantial Completion.

PART 2 - PRODUCTS

2.1 TANKS

- A. Steel: The American Iron and Steel Requirement does not apply to this project.
- B. Manufacturers:
 1. PermaStore.
 2. AquaStore.
- C. Substitutions:
 1. Substitutions: Substitute and “or-equal: products will be considered in accordance with Article 11 – Substitute and “Or-Equal” Items of the Instructions to Bidders. The minimal required information for consideration shall include the following:
 - a. Typical structure and foundation drawings.
 - b. List of tank materials and appurtenances
 - c. Tank coating specifications.
 - d. Certification from tank manufacturer that the proposed substitute meets all of the design standards of this Specification and AWWA C103.
 - e. Acceptance as a substitute or “or-equal” does not constitute approval of submittals required in this and other Specification Sections.
- D. Description:
 1. Design, fabricate, and erect ground-level, glass lined bolted steel water storage tank and accessories.
- E. Performance and Design Criteria:
 1. Design in conformance with requirements listed in AWWA D103, unless supplemented or modified in this Section:

- a. The tank coating shall conform solely to Section 12.4 of AWWA D103.
- b. The glass coating on the tank, bolt head encapsulation material, and joint sealant shall have been approved for listing under ANSI/NSF Standard 61 for Indirect Additives.
- c. The Tank Manufacturer shall be ISO-9001 certified to assure product quality.
- d. The Tank Manufacturer shall undergo an annual FM (Factory Mutual) inspection of their glass-coated, bolted-steel tank factory & provide written proof thereof to assure quality.
- e. Roof Design shall conform to ANSI/AWWA Standard D108-10, effective June 2010.
- f. Bottom capacity level (BCL) and top capacity level (TCL) above top of foundation: As indicated on Drawings as Base Elevation and Overflow Elevation or other terms describing the same.
- g. Specific Gravity: 1.00 for Water
- h. Roof: As indicated on Drawings. Tanks up to 75 feet diameter shall be a self-supporting all butt-welded umbrella dome roof or an elliptical steel dome roof. Column supported roofs or roofs requiring any type of rafter/bracing will not be accepted.
- i. Snow Loading: Minimum 30 psf or as required in the latest edition of the International Building Code, whichever is greater. No corrections for roof slopes or lowest one-day mean temperature shall be made.
- j. Minimum Roof Design Live Load: 15 psf or as specified in AWWA D100, whichever is greater.
- k. Wind Load Requirements: Basic wind speed of 100 mph or as required in AWWA D103, whichever is greater
- l. Shape Factor: 0.6 Std.
- m. Allowable Soil Bearing: Capacity: 3000 psf or as indicated in the Geotechnical Report, whichever is less.
- n. Earthquake Design: As specified in AWWA D103 Section 5.2.5. In the absence of 100 vertical foot geological profile, use Site Class D.

2.2 TANK CONSTRUCTION

A. Comply with requirements listed in AWWA D103, unless supplemented or modified below:

1. Pipe and Fittings for Fluid Conductors: Modify to indicate only welded joints for conductors are acceptable.
2. Roof Support: According to AWWA D103, self-supporting, only, and as indicated on Drawings.
3. Corrosion Allowance: According to AWWA D103.
4. Balcony: As indicated on Drawings.
5. Pipe and Pipe Connections:
 - a. Silt Stop: Provide removable stainless-steel silt stop and mechanical joint gland.
 - b. Provide other accessories as indicated on Drawings.
6. Overflow:

- a. Provide external welded joint steel overflow pipe as indicated on Drawings, suitably supported and extending to grade level.
 - b. Diameter of overflow as indicated on Drawings.
 - c. Terminate overflow pipe at 3 feet above finished grade to provide air break.
 - d. Provide aluminum or bronze mesh insect screen and screen holder over air break opening.
7. Roof Ladder: As indicated on Drawings.
8. Safety Devices:
- a. Furnish safety rail along entire ladder length and extending 42 inches above tank roof.
 - b. Comply with OSHA standards.
9. Special Vent Required for Screening of Tank Vent: Provide total free and open vent area of 452 sq. in. Provide insect screen as indicated on drawings.
10. Pile-Supported Foundation: When required according to fabricator's/manufacture's design.
11. Concrete: ACI 318
12. Reinforcing Steel: Use only Grade 60.
13. Vertical Distance from Finished Ground Level to Crown of Inlet and Outlet Pipes (Earth Cover) at Tank Foundation: As indicated on Drawings.
14. Specification Sheet for Seismic Data: According to AWWA D103.

2.3 INLET AND OUTLET PIPE

- A. Inlet and Outlet Pipe: ANSI/AWWA C151/A21.5 Ductile Iron Pipe, Pressure Class 350 unless otherwise indicated on Drawings and ASTM A53, Grade B, Schedule 40, steel pipe, welded joints as indicated on Drawings.

2.4 OVERFLOW PIPE

- A. Description: ASTM A53, Grade B, Schedule 40, steel pipe, welded joints.

2.5 MATERIALS

- A. Furnish materials complying with this Section, as indicated on Drawings, and according to AWWA D103.
- B. Plates and Sheets
1. Plates and sheets used in the construction of the tank shell, tank floor (optional) or tank roof (optional), shall comply with the minimum standards of AWWA D103, Section 4.4.
 2. Design requirements for mild strength steel shall be ASTM A1011 Grade 30 with a maximum allowable tensile stress of 14,566 psi per AWWA D103.
 3. Design requirements for high strength steel shall be ASTM A607 Grade 50 with a maximum allowable tensile stress of 25,400 psi per AWWA D103.

4. The annealing effect created from the glass coated firing process shall be considered in determining ultimate steel strength. In no event shall a yield strength greater than 50,000 psi be utilized for calculations detailed in AWWA D103, Section 5.4 and 5.5.
5. Multiple vertical bolt line sheets and plates of ASTM A607 Grade 50 only shall be manufactured such that holes are staggered in the vertical bolt lines and that no two adjoining holes are in-line horizontally, except at the center of the sheet of plate.
6. Bolt seam design shall generally be in accordance with the requirements of AWWA D103 Section 5.5; bolt spacing may be adjusted in the vertical bolt lines to increase the net and improve joint efficiency to a maximum of 85%.
7. Double sheeting of tank panels shall not be permitted to achieve structural sidewall thickness requirements.

C. Rolled Structural Shapes

1. A material shall conform to minimum standards of ASTM A36 or AISI 1010.

D. Horizontal Wind Stiffeners

1. Design requirements for intermediate horizontal wind stiffeners shall be of the “web truss” design with extended tail to create multiple layers of stiffener, permitting wind load to transfer around tank.
2. Web truss stiffeners shall be of steel with hot dipped galvanized coating.
3. Rolled steel angle stiffeners are not permitted for intermediate stiffeners.

E. Bolt Fasteners

1. Bolts used in tank lap joints shall be ½” – 13 UNC – 2A rolled thread, and shall meet the minimum requirements of AWWA D103, Section 4.2.
2. Bolt Material
 - a. SAE J429 Grade 2 (1” bolt length)
 - 1) Tensile Strength – 74,000 psi min.
 - 2) Proof Load – 55,000 psi min.
 - 3) Allowable shear stress – 18,164 psi (AWWA D103)
 - b. SAE J429 Grade 8/ASTM A325 (>1 “ bolt length) heat treated to:
 - 1) Tensile Strength – 150,000 psi min.
 - 2) Proof Load – 120,000 psi min.
 - 3) Allowable shear stress – 36,818 psi (AWWA D103)
 - c. Bolt Finish – Zinc, mechanically deposited.
 - 1) 2.0 miles minimum – under bolt head, on shank and threads OR JS1000 electro—plated.
 - d. Bolt Head Encapsulation
 - 1) High impact polypropylene co-polymer encapsulation of entire bolt head up to the splines of the shank.

- 2) Natural resin with UV (ultraviolet) light inhibitor. Color to be black.
 - e. All tank shell bolts shall be installed such that the head portion is located inside the tank, and the washer and nut are on the exterior.
 - f. All lap joint bolts shall be properly selected such that threaded portions will not be exposed in the “shear plane” between tank sheets. Also, bolt lengths shall be sized as to achieve a neat and uniform appearance. Excessive threads extending beyond the nut after torqueing will not be permitted.
 - g. All lap joint bolts shall include a minimum of four (4) splines on the underside of the bolt head at the shank in order to resist rotation during torqueing.
 - h. All exterior nuts, washers, and bolt threads will be covered with sealer-filled protective plastic cover. Color to match tank shell.
3. Sealant
- a. The lap joint sealant shall be a one component, moisture cured, polyurethane compound. The sealant shall be suitable for contact with potable water and meet applicable FDA Title 21 regulations, as well as, ANSI/NSF Additives Standard 61.
 - b. The sealant shall be used to seal lap joints, bolt connections and sheet edges. The sealant shall cure to a rubber like consistency, have excellent adhesion to the glass coating, have low shrinkage, and be suitable for interior and exterior exposure.
 - c. Sealant curing rate of 73° F and 50% RH.
 - 1) Tack-free time: 6 to 8 hours.
 - 2) Final cure time: 10 to 12 days.
 - d. Neoprene gaskets and tape type sealer shall not be used in liquid contacting surfaces.

2.6 GLASS COATING SPECIFICATION

A. Color

1. The finished exterior color shall be dark blue and approved by Owner.

B. Inspection

1. All coated sheets shall be inspected for 10 mil minimum glass thickness (Mikrotest or equal).
2. All coated sheets shall be checked for color uniformity by an electronic colorimeter.
3. An electrical “holiday” detection test shall be performed on the inside surface after fabrication of the sheet. Sheets with excessive “holidays” shall be rejected so as to minimize field touch up (See Section 3.1.C of this Specification).

C. Packaging

1. All approved sheets shall be protected from damage prior to packing for shipment.
2. Heavy paper or plastic foam sheets shall be placed between each panel to eliminate sheet-to-sheet abrasion during shipment.

3. Individual stacks of panels will be wrapped in heavy mil black plastic and steel banded to special wood pallets built to the roll-radius of the tank panels. This procedure eliminates contact or movement of finished panels during shipment.
4. Shipment from the factory to the job site will be by truck, hauling the tank components exclusively. No common carrier, drop, or transfer shipments.

2.7 FABRICATION

- A. Materials, Design, and Fabrication: According to AWWA D103.

2.8 SOURCE QUALITY CONTROL

- A. Provide shop inspection and testing of component parts.
- B. Certificate of Compliance:
 1. If fabricator is approved by authorities having jurisdiction, submit certificate of compliance indicating Work performed at fabricator's facility conforms to Contract Documents.
 2. Specified shop tests are not required for Work performed by approved fabricator.

PART 3 - ERECTION

3.1 Foundation

1. The tank foundation shall be designed by the manufacturer to safely sustain the structure and its live loads.
2. Tank footing design shall be based on the allowable soil bearing capacity indication in Section 2.1 of this Specification.

B. Tank Floor

1. Concrete Floor
 - a. The floor design is of reinforced concrete with an embedded glass coated steel starter sheet per AWWA D103 Section 13.4.1.6 and the manufacturer's design, and is an integral element of the tank assembly: therefore the tank foundation and floor slab (performed in two separate pours) with embedded starter sheet shall be constructed by the tank supplier using manufacturer trained personnel regularly engaged in this type of tank construction.
 - b. Leveling of the starter ring shall be required and the maximum differential elevation within the ring shall not exceed one-eighth (1/8) inch, nor exceed one-sixteenth (1/16) inch within any ten (10) feet of length.
 - c. A leveling plate assembly consisting of two 18" anchor rods (3/4" diameter) and a slotted plate (3 1/2" X 11" X 3/8" thick) shall be used to secure the starter ring, prior to encasement in concrete. Installation of the starter ring on concrete blocks

or bricks, using shims for adjustment, is not permitted. The foundation with anchor bolts/leveling plates shall be a separate pour from the concrete floor.

- d. Two water stop seals made of butyl rubber elastomer special for this application shall be placed on the inside surface of the starter ring below the concrete floor line. These materials shall be installed as specified by the Tank Manufacturer.

C. Sidewall Structure

1. Field erection of the glass-coated, bolted-steel tank shall be in strict accordance with the procedures outlined in the manufacturer's erection manual, and performed by an authorized dealer of Tank Manufacturer, regularly engaged in erection of these tanks.
2. Particular care shall be taken in handling and bolting of the tank panels and members to avoid abrasion of the coating system. Prior to liquid test, all surface areas shall be visually inspected by the Engineer.
3. An electrical holiday test shall be performed during erection using a nine (9) volt leak detection device. All electrical leak points found on the inside surface shall be repaired in accordance with manufacturer's published touch up procedure using urethane sealer.
4. The placement of sealant on each panel may be inspected prior to placement of adjacent panels. However, the Engineer's inspection shall not relieve the bidder from his responsibility for liquid tightness.
5. No backfill shall be placed against the tank sidewall without prior written approval and design review of the Tank Manufacturer. Any backfill shall be placed according to the strict instructions of the Tank Manufacturer.

D. Roof Options

1. Tanks with diameters of 14 to 31 ft. shall include a radially sectioned roof fabricated from glass-coated, bolted steel panels, as produced by the Tank Manufacturer, and shall be assembled in a similar manner as the sidewall panels utilizing the same sealant and bolting techniques, so as to assure a water/air tight assembly. The roof shall be clear span and self-supporting. Both live and dead loads shall be carried by the tank walls. The exterior coating finish shall be cobalt blue glass. The manufacturer shall furnish a roof opening which shall be placed near the outside tank ladder and which shall be provided with a hinged cover and a hasp for locking. The opening shall have a clear dimension of at least twenty-four (24") inches in one direction and eighteen (18") inches in the other direction. The opening shall have a gasketed weather-tight cover.
2. Roofs for tanks greater than 31 ft. diameter shall be constructed of non-corrugated triangular aluminum panels which are sealed and firmly clamped in an interlocking manner to a fully triangulated aluminum space truss system of wide flange extrusions, thus forming a spherical dome structure.
 - a. Primary horizontal forces into the tank shell shall be contained by an integral aluminum tension ring (unless otherwise specified). The frame shall consist of aluminum structural members with the joints arrayed on the surface of a sphere. The arrangement of members shall result in a pattern of triangular spaces. These spaces shall be closed with light gauge aluminum panels. The members shall be joined by means of bolting their flanges to aluminum gusset plates.
 - b. All metal components of the aluminum dome structure shall be aluminum or 300 series stainless steel. No galvanized, aluminized, painted, or plated steel shall be used anywhere in the dome above the mounting bracket base plates. Dissimilar

- materials in the supporting structure shall be isolated from the aluminum dome by means of compatible elastomeric gasket.
- c. The entire structure shall be designed as a watertight system under all design load and temperature conditions. The design shall include sealant to be completely encapsulated by applying it to the gusset covers' inner circumferences, beneath the gusset covers' top closure plates.
 - d. The aluminum closure panels shall be attached continuously along their edges to the structural members by means of batten bars, which engage the panels in an interlocking joint. Designs that incorporate raised battens, overlapping panels and/or designs that incorporate fasteners which penetrate panels and attach to structural members are expressly prohibited. The roof panels shall be fabricated from continuous 3003-H16 aluminum sheeting.
 - e. Connection forces shall be transferred through gusset plates connected to the top and bottom flanges of the beam struts. The connections shall be designed as moment connections; a minimum of four bolts shall be used to connect the gusset plate to each strut flange. The structural analysis shall be performed using non-linear, second order, stiffness analysis models in accordance with ADM 2010 Chapter C. Stability shall be provided for the structure as a whole and for each of its components. The available strengths of members and connections determined in accordance with Section C.3 shall equal or exceed the required strengths determined in accordance with Section C.2.
 - f. Fasteners shall be designed with a factor of safety of 2.34 on ultimate strength and 1.65 on yield strength.
3. Experience and Qualifications:
- a. No equipment shall be supplied by any manufacturer not regularly engaged in the manufacturing and production of domes in the size and character herein specified. The manufacturer must have designed, manufactured and installed at least one (1) dome of the same size as the unit(s) specified herein. This dome must be in satisfactory use for a period not else than ten (10) years.
 - b. The cover manufacturer must own and operate its own US-based manufacturing facility, and the use of a fabrication facility that is not US-based and/or owned and operated by the cover manufacturer is expressly prohibited. Manufacturers that do not meet these qualifications will not be considered.
 - c. The cover manufacturer must be ISO 9001 certified.
4. Materials:
- a. Bolts and Fasteners – Threaded fasteners shall be 300 series stainless steel per ASTM F593, Alloy Group 1. Lockbolts shall be 7075-T73 aluminum, 304 or 305 stainless steel. Triangulated space truss: 6061-T6 aluminum struts and gussets.
 - b. Plates and Sheets – Plate and sheet material shall be aluminum alloy 3003-H16, 3105-H154, 6061-T6, 5052-H32, or +5052-H36; mill finish AA – M10 as fabricated. Minimum thickness for gussets shall be 5/16". Sheet materials shall be 0.05" minimum thickness. Triangular closure panels: 0.050"t 3003-H16 aluminum sheet.
 - c. Structural Shapes – Aluminum structural shapes shall be alloy 6061-T6 aluminum. The aluminum structural members shall be a minimum of 6 inches deep. To

- improve torsional stability, the dome's structural members must incorporate a double web. The use of I-beams with only a single web is expressly prohibited.
- d. Tension Ring – Tension ring structural shapes shall be 6061-T6 aluminum. Design of the tension ring shall be based on the net cross section of the members and shall not include top flange protrusions used for panel attachment, bolt holes, or outstanding legs that are not connected through the joints.
 - e. Miscellaneous Shapes – Miscellaneous aluminum shapes shall be alloy 6061-T6 or 6063-T5.
 - f. Gaskets – All gaskets shall be ozone resistant Silicone only. The gaskets must have a 1/8 minimum thickness.
 - g. Sealant – All sealants shall be silicone and resistant to ozone and ultraviolet light and conform to Federal Specification TT-S-00230C.
 - h. Support Bearings – Acceptable bearing surfaces for sliding bearing are Teflon to stainless steel only. In order to avoid damage to the Teflon and to reduce the coefficient of bearing friction, Teflon shall not bear on aluminum surfaces. Dome supports shall utilize only bolted connections. The use of aluminum structural welding at the dome supports is expressly prohibited.
 - i. Dormers, doors, vents and hatches: 6061-T6, 5086-H34 or 3003-H16 aluminum.
5. Roof Vent
- a. A properly sized vent assembly in accordance with AWWA D103 shall be furnished and installed above the maximum water level of sufficient capacity so that at maximum possible rate of water fill or withdrawal, the resulting interior pressure or vacuum will not exceed 0.5" water column.
 - b. The overflow pipe shall not be considered to be a tank vent.
 - c. The vent shall be constructed of aluminum.
 - d. The vent shall be designed in construction as to prevent the entrance of birds and/or animals by including an expanded aluminum screen (1/2 inch) opening. An insect screen of 23 to 25 mesh polyester monofilament shall be provided and designed to open should the screen become plugged by ice formation.

PART 4 - EXECUTION

4.1 EXAMINATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for erection examination.
- B. Verify layout and orientation of tank accessories and piping connections.

4.2 PREPARATION

- A. Section 017000 - Execution and Closeout Requirements: Requirements for erection preparation.
- B. Support Pad:
 - 1. Thoroughly clean tank pad, removing loose concrete, dust, and other debris.

2. Place building paper on pad according to Tank Manufacturer's recommendations prior to placing tank.

4.3 INSTALLATION

- A. According to AWWA D103, as indicated on Drawings, and according to manufacturer instructions.
- B. Connect piping to tank.
- C. To complete installation, install tank accessories not factory mounted.
- D. Touch-up Painting and Coating: According to manufacturer instructions and according to AWWA D103.

4.4 FIELD QUALITY CONTROL

- A. Section 014000 and Section 017000
- B. Inspection and Testing:
 1. Hydrostatic Testing:
 - a. Test completed and cleaned tank for liquid tightness by filling tank to its overflow elevation with water provided by Owner.
 - b. Correct leaks disclosed by this test.
 - c. Drain and legally dispose of test water off Site.
- C. Furnish installation certificate from equipment manufacturer's representative attesting that equipment has been properly installed and is ready for startup and testing.

4.5 TANK SCHEDULE

- A. 22,000 Gallon Tank:
 1. Minimum Storage Capacity: 22,000 Gallons.
 2. Nominal Diameter: As per Drawings.
 3. Base Elevation or Bottom Capacity Level: As per Drawings.
 4. Overflow Elevation or Top Capacity Level: As per Drawings.
 5. Minimum Free Board Above Overflow Elevation or Top Capacity Elevation: As per Drawings
 - a. Exterior Color: Color to be selected by Owner from Supplier's least expensive color chart.

END OF SECTION 434111

SECTION 434113 - WELDED STEEL TANKS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Ground-mounted flat-bottom welded steel water storage tank(s) of the size and dimensions indicated in the Water Storage Tank Schedule at the end of this Specification Section. The tank will store potable water.

B. Scope of Work

1. The work required under this Specification Section shall consist of all necessary materials, tools, equipment, and labor for the construction and successful operation of a ground-mounted flat-bottom welded steel water storage tank with tank foundation and all appurtenances shown in the Drawings. All tanks furnished and installed under this Section shall meet or exceed the minimum requirements of AWWA Standard D100, latest revision (AWWA D100), all requirements of this Specification Section, and any and all of the requirements of any and all federal, state, and local agencies having jurisdiction.

C. Related Requirements:

1. Section 012000 – “Price and Payment Procedures”
2. Section 099714 – “Steel Water Storage Tank Painting”
3. Section 033000 – “Cast-In-Place Concrete”
4. Section 323113 – “Chain Link Fences and Gates”
5. Section 330517 – “Pre-Cast Concrete Valve Vaults and Meter Boxes”
6. Section 331113 – “Water Distribution Piping”
7. Section 331300 – “Disinfecting of Water Utility Distribution”
8. Section 331313 – “Water Storage Tank Disinfection”

1.2 DEFINITIONS

- A. Purchaser: As used in AWWA D100, refers to Owner.

1.3 REFERENCE STANDARDS

A. ASTM International:

1. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.

B. American Water Works Association:

1. AWWA D100 - Welded Carbon Steel Tanks for Water Storage.
2. AWWA D106 – Sacrificial Anode Cathodic Protection Systems for the Interior Submerged Surfaces of Steel Water Storage Tanks.

C. American Welding Society:

1. AWS QC1 - Standard for AWS Certification of Welding Inspectors.

D. Occupational Safety and Health Administration (OSHA).

E. NSF/ANSI 61, Drinking Water System Components – Health Effects

1.4 COORDINATION

A. Section 013000 – “Administrative Requirements”: Requirements for coordination.

B. Coordinate Work with Owner and other Contractor(s) for other related Contract(s).

1.5 SCHEDULING

A. Provide and update schedule on a regular basis. Coordinate schedule with Owner and Contractor(s) for other Contract(s).

1.6 SUBMITTALS

A. Section 013300 – “Submittal Procedures”: Requirements for submittals.

B. Product Data:

1. Submit data for expansion joint fittings and other pipe specialty fittings.
2. Submit data for ladder and ladder safety devices.
3. Submit information concerning materials of construction, fabrication, and protective coatings.

C. Shop Drawings:

1. Signed and sealed by professional engineer.
2. Tank Shop Drawings shall include, but not be limited to, the following:
 - a. Complete plan, elevation, and sectional Drawings showing critical dimensions.
 - b. Tank foundation details.
 - c. Inlet and outlet piping,
 - d. Structural plate thickness.
 - e. Details of all weld types and sizes.
 - f. Inlet pipe with removable silt stop, outlet pipe with removable silt stop, and overflow piping details, including fittings, expansion joints, pipe support methods..
 - g. Ladder and ladder safety device details.
 - h. Handrail details.
 - i. Shell access hatch details.

- j. Roof hatch details.
 - k. Pressure-vacuum vent details.
 - l. Water level indicator.
 - m. Valve pit details.
 - n. Tank Manufacturer identification details.
 - o. Cathodic protection.
- D. Manufacturer's Certificate:
- 1. Certify that products meet or exceed specified requirements.
 - 2. Submit certified list of welded steel water tank installations storing potable water, in service for period of not less than five years. Provide Owner name and contact information for each. A minimum of five successful installations is required. Successful installations are those in service longer than five years with minimal maintenance issues as described by the Owners of those installations and/or as observed by the Engineer.
- E. Details of Welded Joints: Submit according to AWWA D100.
- F. Delegated Design Submittals: Submit signed and sealed design calculations and assumptions for structural calculations for tank, tank foundation, and cathodic protection
- G. Test and Evaluation Reports:
- 1. Submit mill test reports.
 - 2. Submit certified factory test results.
 - 3. Written Report Certifying Work: Prepare and submit as indicated in AWWA D100.
 - 4. Submit radiographic film and test segments, identified to shell plate diagrams, at completion of Work.
 - 5. Submit Installation Certificate from equipment manufacturer's representative, as described in PART 3 of this Section.
- H. Manufacturer's Instructions: Submit detailed instructions on installation requirements, including tank handling procedures, anchoring, and layout.
- I. Source Quality-Control Submittals: Indicate results of shop and/or factory tests and inspections.
- J. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.
- K. Manufacturer Reports: Submit certification that tank has been installed according to manufacturer's instructions.
- L. Qualifications Statements:
- 1. Submit qualifications for manufacturer, fabricator, erector, and licensed professional.
 - 2. Submit manufacturer's approval of erector.
 - 3. Submit names and qualifications of welders, welding operators, and tackers before performing welding.
 - 4. Submit qualifications of certified welding inspector.

1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Section 017000 – “Execution and Closeout Requirements”: Requirements for maintenance materials.

1.8 CLOSEOUT SUBMITTALS

- A. Section 017000 – “Execution and Closeout Requirements”: Requirements for closeout procedures.
- B. Project Record Documents: Record actual locations and final orientation of tank and accessories.
- C. Operation and Maintenance Data: Submit maintenance instructions for tank and accessories.

1.9 QUALITY ASSURANCE

- A. Perform Work according to AWWA D100.

1.10 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum five years' documented experience.
- B. Fabricator: Company specializing in fabricating products specified in this Section with minimum five years' documented experience.
- C. Erector: Company specializing in performing Work of this Section with minimum five years' documented experience and approved by manufacturer.
- D. Licensed Professional: Professional engineer experienced in design of specified Work and actively licensed in the state where the tank is located. The licensed professional shall furnish a copy of the Certificate of Authorization (or equivalent) for his/her company to practice engineering in the state of licensure.
- E. Welders, Welding Operators, and Tackers: ASME Section IX qualified within previous 12 months.
- F. Certified Welding Inspector: Certified according to requirements of AWS QC1.

1.11 DELIVERY, STORAGE, AND HANDLING

- A. Section 016000 – “Product Requirements”: Requirements for transporting, handling, storing, and protecting products.
- B. Inspection: Accept tanks on-Site. Inspect tanks for damage.

- C. Store products in areas protected from weather, moisture, or possible damage; do not store products directly on ground; handle products to prevent damage to interior or exterior surfaces.

1.12 WARRANTY

- A. Section 017000 – “Execution and Closeout Requirements”: Requirements for warranties.
- B. Furnish **five (5) year** manufacturer’s warranty for welded steel tanks from date of Substantial Completion, warranting that the tank shall be free of defects in materials and workmanship and that the interior and exterior coatings shall remain free of chips, cracks, fading and/or peeling resulting from normal usage. Should these defects and/or coating problems be encountered, the contractor shall repair and replace as necessary at the discretion of the engineer.

PART 2 - PRODUCTS

2.1 TANK

- A. Steel: All steel shall be American Made.
- B. Substitutions:
 - 1. Substitutions: Substitute and “or-equal: products will be considered in accordance with Article 11 – Substitute and “Or-Equal” Items of the Instructions to Bidders. The minimal required information for consideration shall include the following:
 - a. Typical structure and foundation drawings.
 - b. List of tank materials and appurtenances
 - c. Tank coating specifications.
 - d. Certification from Tank Manufacturer that the proposed substitute meets all of the design standards of this Specification and AWWA C100.
 - e. Acceptance as a substitute or “or-equal” does not constitute approval of submittals required in this and other Specification Sections.
- C. Description:
 - 1. Design, fabricate, and erect ground-level, flat-bottom, welded steel water storage tank and accessories.
- D. Performance and Design Criteria:
 - 1. Design in conformance with requirements listed in AWWA D100, unless supplemented or modified in this Section:
 - a. Bottom capacity level (BCL) and top capacity level (TCL) above top of foundation: As indicated on Drawings as Base Elevation and Overflow Elevation or other terms describing the same.
 - b. Specific Gravity: 1.00 for Water
 - c. Roof: As indicated on Drawings. Tanks up to 75 feet diameter shall be a self-supporting all butt-welded umbrella dome roof or an elliptical steel dome roof.

Column supported roofs or roofs requiring any type of rafter/bracing will not be accepted.

- d. Snow Loading: Minimum 30 psf or as required in the latest edition of the International Building Code, whichever is greater. No corrections for roof slopes or lowest one-day mean temperature shall be made.
- e. Minimum Roof Design Live Load: 15 psf or as specified in AWWA D100, whichever is greater.
- f. Wind Load Requirements: Basic wind speed of 100 mph or as required in AWWA D100, whichever is greater
- g. Allowable Soil Bearing: Capacity: 3000 psf or as indicated in the Geotechnical Report, whichever is less.
- h. Earthquake Design: As specified in AWWA D100. In the absence of 100 vertical foot geological profile, use Site Class D.
- i. Provide plate thickness a minimum of 1/16th inch on the inside and 1/16th inch on the outside for a total of 1/8th inch more than required to allow for future sandblasting and repainting.

2.2 TANK CONSTRUCTION

- A. In conformance with requirements listed in AWWA D100, unless supplemented or modified below:
 1. Pipe and Fittings for Fluid Conductors: Modify to indicate only welded joints for conductors are acceptable.
 2. Roof Support: According to AWWA D100, self-supporting, only, and as indicated on Drawings.
 3. Provide plate thickness a minimum of 1/16th inch on the inside and 1/16th inch on the outside for a total of 1/8th inch more than required for standard strength to allow for future sandblasting and repainting. (Must be demonstrated in engineer's calculations and drawings).
 4. Balcony: As indicated on Drawings.
 5. Pipe and Pipe Connections:
 - a. Provide removable stainless-steel silt stop and mechanical joint gland.
 - b. Provide other accessories as indicated on Drawings.
 6. Overflow:
 - a. Provide external welded joint steel overflow pipe as indicated on Drawings, suitably supported and extending to grade level.
 - b. Diameter of overflow as indicated on Drawings.
 - c. Terminate overflow pipe at 3 feet above finished grade to provide air break.
 - d. Provide aluminum or bronze mesh insect screen and screen holder over air break opening.
 7. Roof Ladder: As indicated on Drawings.
 8. Safety Devices: Provide safety rail, complying with OSHA Standards, along entire ladder length and extending 42 inches above tank roof.
 9. Special Vent Required for Screening of Tank Vent: Provide total free open vent area of 452 sq. in. Provide insect screen as indicated on drawings.

10. Welded-Shell Butt Joints: Required at joints in base metals of thicknesses greater than 3/8 inch; complete joint penetration.
11. Butt Joint Welds: Lap welds tack welded on one side are not permitted. Seal welding is required.
12. Surface Preparation: As specified in Section 099714 – “Steel Water Storage Tank Painting”.
13. Seal Welding: Provide seal welds for lap joints in wet areas, including interior roof surfaces.
14. Pile-Supported Foundation: When required, according to fabricator's/manufacturer's design.
15. Concrete: ACI 318.
16. Vertical Distance from Finished Ground Level to Crown of Inlet and Outlet Pipes (Earth Cover) at Tank Foundation: As indicated on Drawings.
17. Specification Sheet for Seismic Data: According to AWWA D100.
18. Reinforcing Steel: Use only Grade 60.

2.3 INLET AND OUTLET PIPE

- A. Inlet and Outlet Pipe: ANSI/AWWA C151/A21.5 Ductile Iron Pipe, Pressure Class 350 unless otherwise indicated on Drawings and ASTM A53, Grade B, Schedule 40, steel pipe, welded joints as indicated on Drawings.

2.4 OVERFLOW PIPE

- A. Overflow Pipe: ASTM A53, Grade B, Schedule 40, steel pipe, welded joints.

2.5 MATERIALS

- A. Furnish materials complying with this Section, as indicated on Drawings, and according to standards specified in AWWA D100.

2.6 FABRICATION

- A. Materials, Design, and Fabrication: According to AWWA D100.

2.7 SOURCE QUALITY CONTROL

- A. Section 014000 – “Quality Requirements”: Requirements for testing, inspection, and analysis.
- B. Inspection and Testing of Welds:
 1. Examine weld joints according to AWWA D100.
 2. Comply with procedure requirements of AWWA D100 prior to proceeding with radiographic Work.
 3. Immediately notify Architect/Engineer of weld locations failing to meet standards of AWWA D100.

4. Repair and re-inspect defective welds until acceptable.
- C. Certificate of Compliance:
1. When fabricator is approved by authorities having jurisdiction, submit certificate of compliance indicating Work performed at fabricator's facility conforms to Contract Documents
 2. Specified shop tests are not required for Work performed by approved fabricator.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Section 017000 – “Execution and Closeout Requirements”: Requirements for installation examination.
- B. Verify layout and orientation of tank accessories and piping connections.

3.2 PREPARATION

- A. Section 017000 – “Execution and Closeout Requirements”: Requirements for installation preparation.
- B. Thoroughly clean chemical storage tank pad, removing loose concrete, dust, and other debris. Place building paper on pad according to Tank Manufacturer's recommendations prior to placing tank.

3.3 INSTALLATION

- A. According to AWWA D100, as indicated on Drawings, and according to manufacturer's instructions.
- B. Connect piping to tank.
- C. Install tank accessories not factory mounted to complete installation.
- D. Field Painting:
 1. As specified in Section 099714 – “Steel Water Storage Tank Painting”.

3.4 FIELD QUALITY CONTROL

- A. Section 014000 “Quality Requirements” and Section 017000 "Execution and Closeout Requirements".
- B. Inspection and Testing:

1. Hydrostatic Testing:
 - a. Test completed and cleaned tank for liquid tightness by filling tank to its overflow elevation with water provided by Owner.
 - b. Correct leaks disclosed by this test.
 - c. Drain and legally dispose test water off-Site.
 2. Field Welds: Tested and inspected according to AWWA D100.
 - C. Furnish a certified welding inspector responsible for all weld inspections, as indicated in AWWA D100.
 - D. Manufacturer Services:
 1. Furnish field representative experienced in installation of tank to supervise installation.
 - E. Furnish Installation Certificate from equipment manufacturer's representative attesting equipment has been properly installed and is ready for startup and testing.
- 3.5 TANK SCHEDULE
- A. 22,000 Gallon Tank:
 1. Minimum Storage Capacity: 22,000 Gallons.
 2. Nominal Diameter: As per Drawings.
 3. Base Elevation or Bottom Capacity Level: As per Drawings.
 4. Overflow Elevation or Top Capacity Level: As per Drawings.
 5. Minimum Free Board Above Overflow Elevation or Top Capacity Elevation: As per Drawings
 6. Exterior Color: Color to be selected by Owner from Supplier's least expensive color chart.

END OF SECTION 434113

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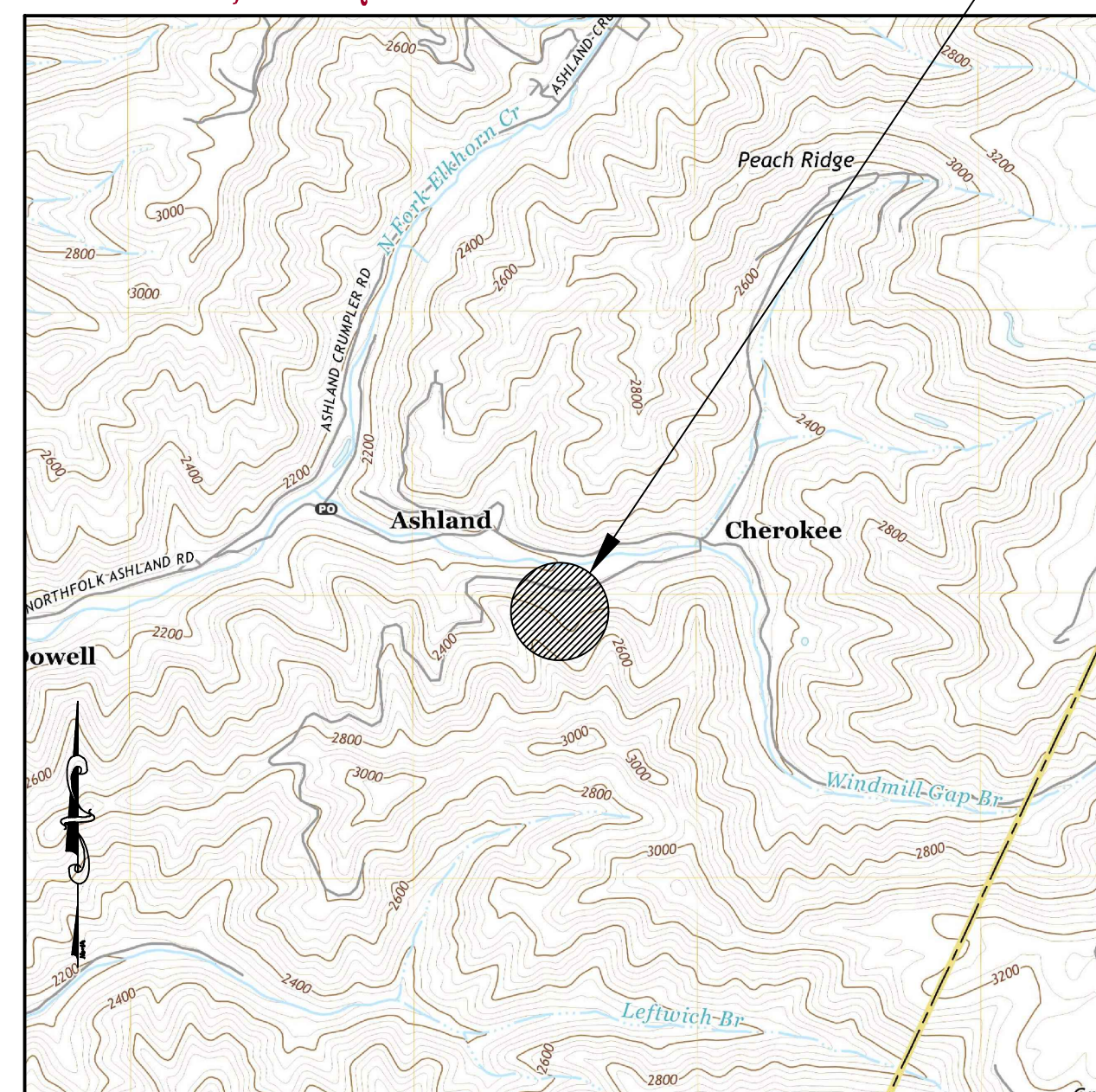
HATFIELD McCOY REGIONAL RECREATION AUTHORITY ASHLAND RESORT EXPANSION McDOWELL COUNTY, WEST VIRGINIA NOVEMBER, 2020

SHEET INDEX

SHEET	DESCRIPTION
1	COVER
2	GENERAL NOTES
3	QUANTITIES
4	EXISTING CONDITIONS
5	OVERALL
6	GEOMETRIC LAYOUT
7-9	GRADING PLAN (1 - 3)
10	GRADING POINT TABLE
11-15	DETAILED SITE PLAN (1 - 5)
16	TANK PAD PLAN
17	TANK PAD PROFILES
18	SEWER PLANT PLAN
19	INTERSECTION DETAIL
20-22	SEWER LINE PLAN & PROFILE (1 - 3)
23	WATER LINE STREAM CROSSING PROFILES
24-25	ASHLAND ROAD PROFILE (1 - 2)
26-29	ASHLAND ROAD SECTIONS (1 - 4)
30	SEWER PLANT ACCESS ROAD PROFILE
31	STREAM BANK STABILIZATION PLAN
32-33	STREAM BANK STABILIZATION SECTIONS (1 - 2)
34	STREAM CROSSING #1 PLAN & PROFILE
35-62	DETAILS
E1	ELECTRICAL SITE UTILITY PLAN
E2	ELECTRICAL RISER DIAGRAM

REVISION NUMBER	REVISED SHEETS	BY	DATE	DESCRIPTION
1	1,3,18,E1,E2	BY	DATE	ADDED ELECTRICAL SHEETS, ITEM TO QUANTITIES, BID ALTERNATE DESCRIPTIONS

CRUMPLER, WV QUAD MAPS



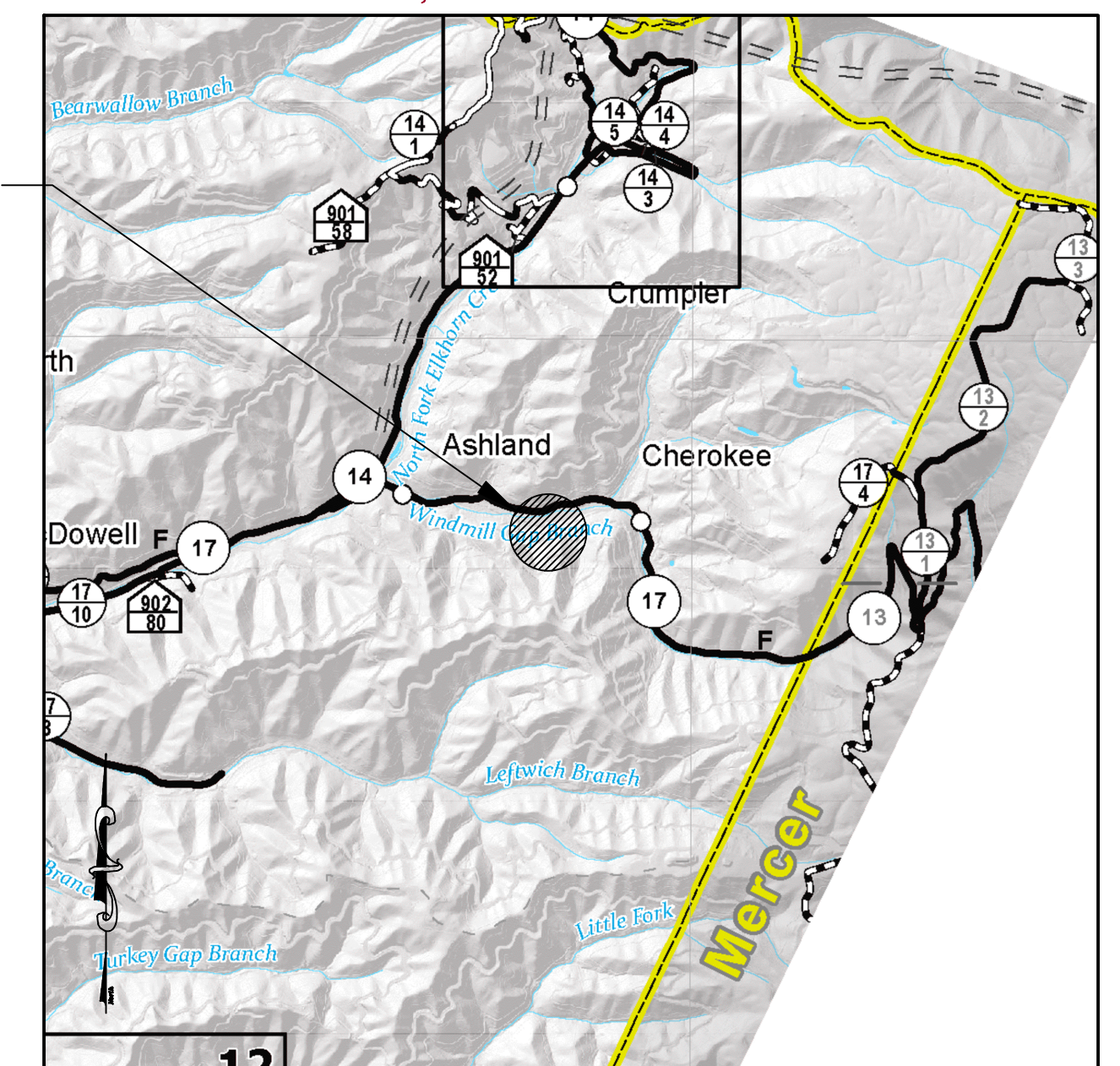
VICINITY MAP SCALE

PROJECT LOCATION



PROJECT LOCATION

McDOWELL COUNTY, WV HIGHWAY MAPS



VICINITY MAP SCALE

ONE CALL UTILITY SYSTEM CONTACT INFO



CONTRACTOR SHALL NOTIFY THE ONE-CALL SYSTEM OF THE INTENDED EXCAVATION OR DEMOLITION NOT LESS THAN FORTY-EIGHT (48) HOURS, EXCLUDING SATURDAYS, SUNDAYS AND LEGAL FEDERAL OR STATE HOLIDAYS, NOR MORE THAN TEN (10) WORK DAYS PRIOR TO THE BEGINNING OF SUCH WORK.



RICHARD G. HOVATTER, JR., PE

- APPROVED FOR PERMITS DATE: _____ BY: _____
- APPROVED FOR BIDS DATE: 11/9/2020 BY: RJH
- APPROVED FOR CONSTRUCTION DATE: _____ BY: _____

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LAYOUT TAB: 3-QUANTITIES

CAD FILE: R:\030\030-10061-Hatfield McCoy Regional Recreation-Drawing\10061-Quantities.dwg

PLOT DATE/TIME: 11/6/2020 1:59 PM

ITEM #	DESCRIPTION	UNIT	QUANTITY
1	MOBILIZATION/DEMOBILIZATION (Shall Not Exceed to 10% of Total Bid)	LS	1
2	SITE CLEARING & GRUBBING (Shall Not Exceed to 10% of Total Bid)	LS	1
3	EROSION & SEDIMENT CONTROL MAINTENANCE	LS	1
4	STABILIZED CONSTRUCTION ENTRANCE	EA	2
5	CONSTRUCTION STAKEOUT	LS	1
6	ACCESS ROAD MAINTENANCE (3/4" CRUSHER RUN)	TN	150
7	TRAFFIC CONTROL	LS	1
8	SEEDING & MULCHING	LS	1
9	TOTAL EARTHWORK (SITE CONSTRUCTION)	CY	2,200
10	GROUTED RIP-RAP CHANNEL	LF	290
11	SEPARATION FABRIC	SY	7,410
12	TYPE I GUARDRAIL, CLASS II	LF	298.5
13	SMART FENCE	LF	4,370
14	8" SUBBASE (3" MAX LIFTS) - WVDOH CLASS I	CY	1,770
15	6" PVC C-900 DR-18 WATER PIPE	LF	1,720
16	6" PVC C-900 DR-14 WATER PIPE	LF	1,440
17	6" DUCTILE IRON CL-50 P. JT. WATER PIPE	LF	75
18	1" POLYETHYLENE SERVICE TUBING (OPEN CUT), INCLUDING 6" SERVICE SADDLE, CORP. STOP & CURB BOX	LF	155
19	PIPE SUPPORT	EA	1
20	6" M.JT. GATE VALVE, COMPLETE W/ BOX AND LID	EA	2
21	2' POST FLUSING HYDRANT ASSEMBLY, COMPLETE	EA	2
22	TIE-INTO EXISTING 4" WATER LINE, COMPLETE, TIE IN TO INCLUDE 6" M.JT. GATE VALVE, COMPLETE W/ BOX AND LID & 6" HYMAX COUPLING, COMPLETE	EA	1
23	22,000 GALLON WATER TANK	LS	1
24	EXISTING WATER TANK FENCE RELOCATION	LF	80
25	6' CHAIN LINK FENCE INSTALLATION	LF	40
26	8" PVC SDR-35 GRAVITY SEWER PIPE	LF	2,575
27	8" DUCTILE IRON CL-50 P. JT. GRAVITY SEWER PIPE	LF	115
28	2" HDPE IPS DR-9 FORCE MAIN	LF	100
29	8" x 4" PVC SDR-35 GRAVITY SERVICE WYE CONNECTION, W/ SERVICE LATERAL PIPE	EA	2
30	MANHOLE BASE, CONETOP & REGULAR CASTING, COMPLETE IN PLACE	EA	14
31	48" DIAMETER CONCRETE MANHOLE RISER PIPE	VF	1
32	TIE-INTO EXISTING MANHOLE, COMPLETE	EA	1
33	PROPOSED 20,000 GPD WASTE WATER TREATMENT PLANT, COMPLETE IN PLACE	LS	1
34	12-IN HDPE OUTFALL PIPE	LF	205
35	EXCAVATE, RELOCATE AND RE-INSTALL EXISTING 15,000 GPD PACKAGE WWTP, COMPLETE IN PLACE, INCLUDING ALL ASSOCIATED ITEMS	LS	1
36	SEWER PUMP STATION, COMPLETE IN PLACE	LS	1
37	12-IN STEEL CASING (BORE AND JACK), INCLUDING CASING SPACERS	LF	100
38	16-IN STEEL CASING (BORE AND JACK), INCLUDING CASING SPACERS	LF	105
39	12-IN STEEL CASING, INCLUDING CASING SPACERS	LF	50
40	16-IN STEEL CASING, INCLUDING CASING SPACERS	LF	50
41	12-IN PIPE WINGWALL	EA	1
42	DOUBLE BARREL 36-IN PIPE WINGWALL WITH APRON	EA	2
43	STREAM CROSSING #1	LS	1
44	D-50 18" RIP-RAP	TN	900
45	PARKING SIGNAGE	LS	1
46	STOP SIGN	EA	1
47	AS-BUILT SURVEY	LS	1
48	BLACK VINYL CHAINLINK FENCE CLOSURE	LS	1
49	36-IN HDPE CULVERT	LF	68
50	5'-0" DIA. BAR-SCREEN BASKET MANHOLE, COMPLETE IN PLACE	EA	1



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PHASE No.	
CONTRACT No.	
PROJECT No.	101-030-10061

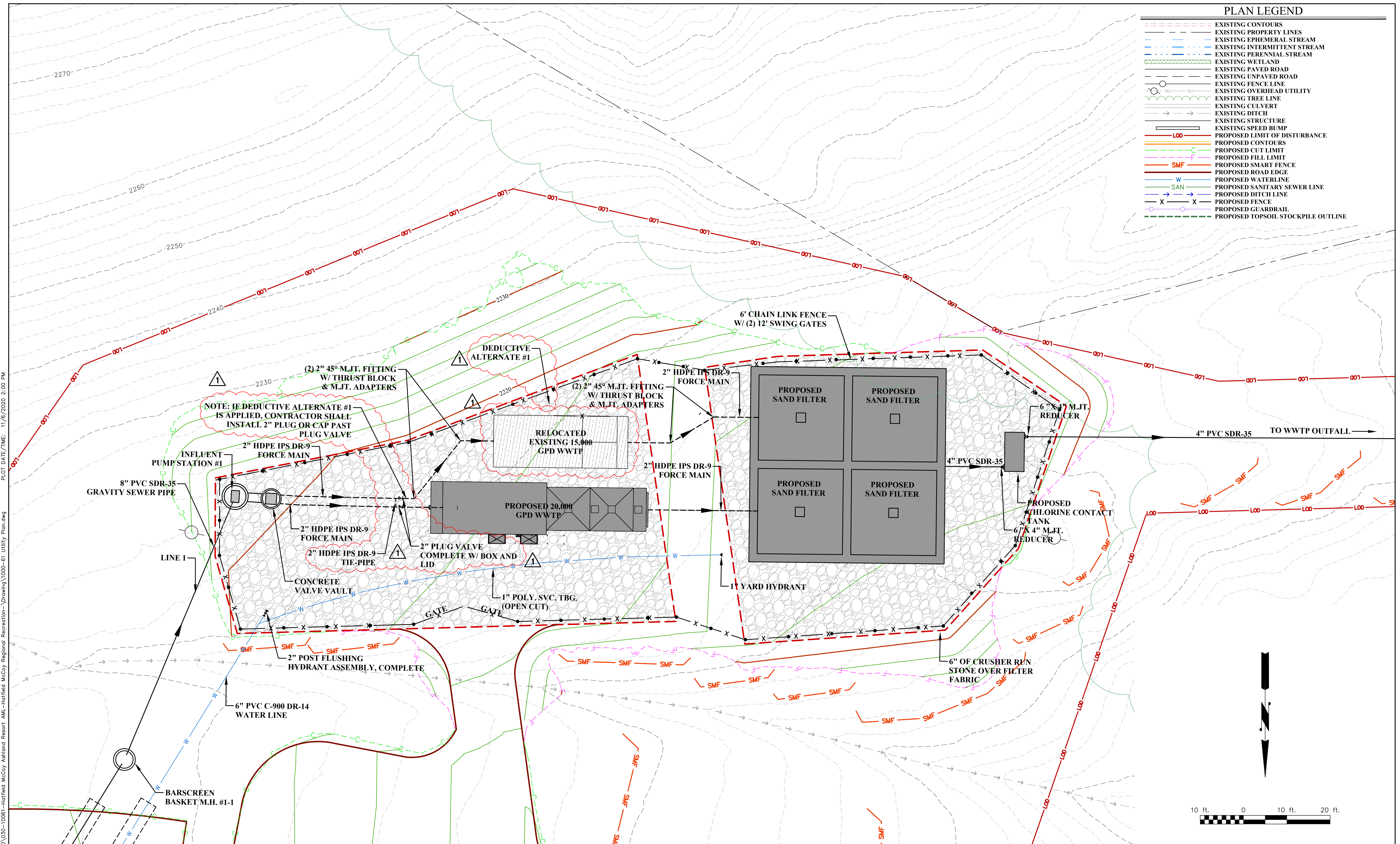
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ASHLAND RESORT EXPANSION
MCDOWELL COUNTY, WV
QUANTITIES

SHEET No.

3

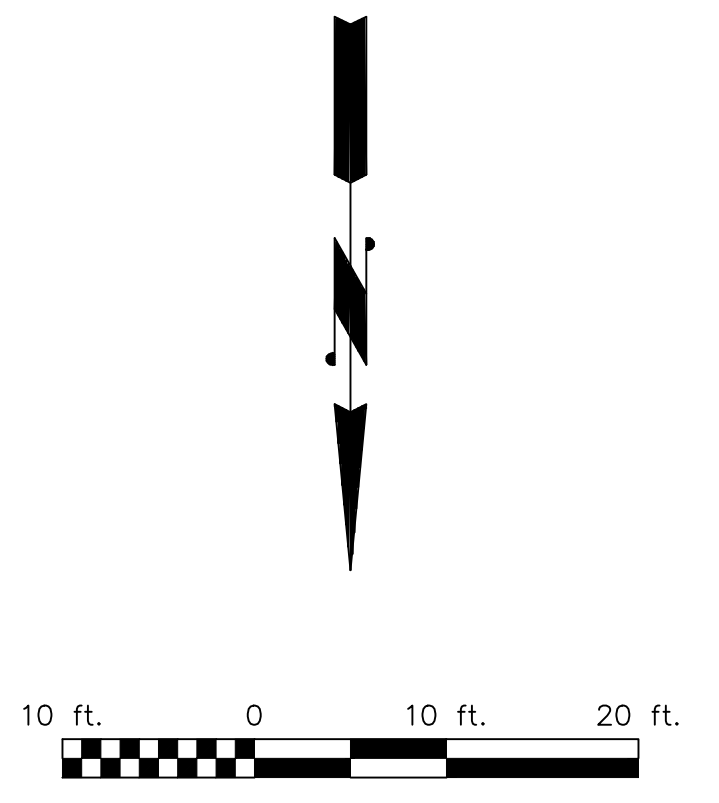
PLAN LEGEND

- EXISTING CONTOURS
- EXISTING PROPERTY LINES
- EXISTING EPHEMERAL STREAM
- EXISTING INTERMITTENT STREAM
- EXISTING PERENNIAL STREAM
- EXISTING WETLAND
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- EXISTING FENCE LINE
- EXISTING OVERHEAD UTILITY
- EXISTING TREE LINE
- EXISTING CULVERT
- EXISTING DITCH
- EXISTING STRUCTURE
- EXISTING SPEED BUMP
- LOD PROPOSED LIMIT OF DISTURBANCE
- PROPOSED CONTOURS
- PROPOSED CUT LIMIT
- PROPOSED FILL LIMIT
- SMF PROPOSED SMART FENCE
- PROPOSED ROAD EDGE
- W PROPOSED WATERLINE
- SAN PROPOSED SANITARY SEWER LINE
- PROPOSED DITCH LINE
- X PROPOSED FENCE
- PROPOSED GUARDRAIL
- PROPOSED TOPSOIL STOCKPILE OUTLINE



NOTE: IF DEDUCTIVE ALTERNATE #1 IS APPLIED, CONTRACTOR SHALL INSTALL 2" PLUG OR CAP PAST PLUG VALVE

LAYOUT TAB: 18 SEWER PLANT PLAN
 CAD FILE: R:\030\030-10061-Hatfield McCoy Regional Recreation-Ashland Resort AMI-Hatfield McCoy Regional Recreation-Drawing\1000-61 Utility Plan.dwg
 PLOT DATE/TIME: 11/6/2020 2:00 PM



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HATFIELD MCCOY
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 McDOWELL COUNTY, WV
 SEWER PLANT PLAN

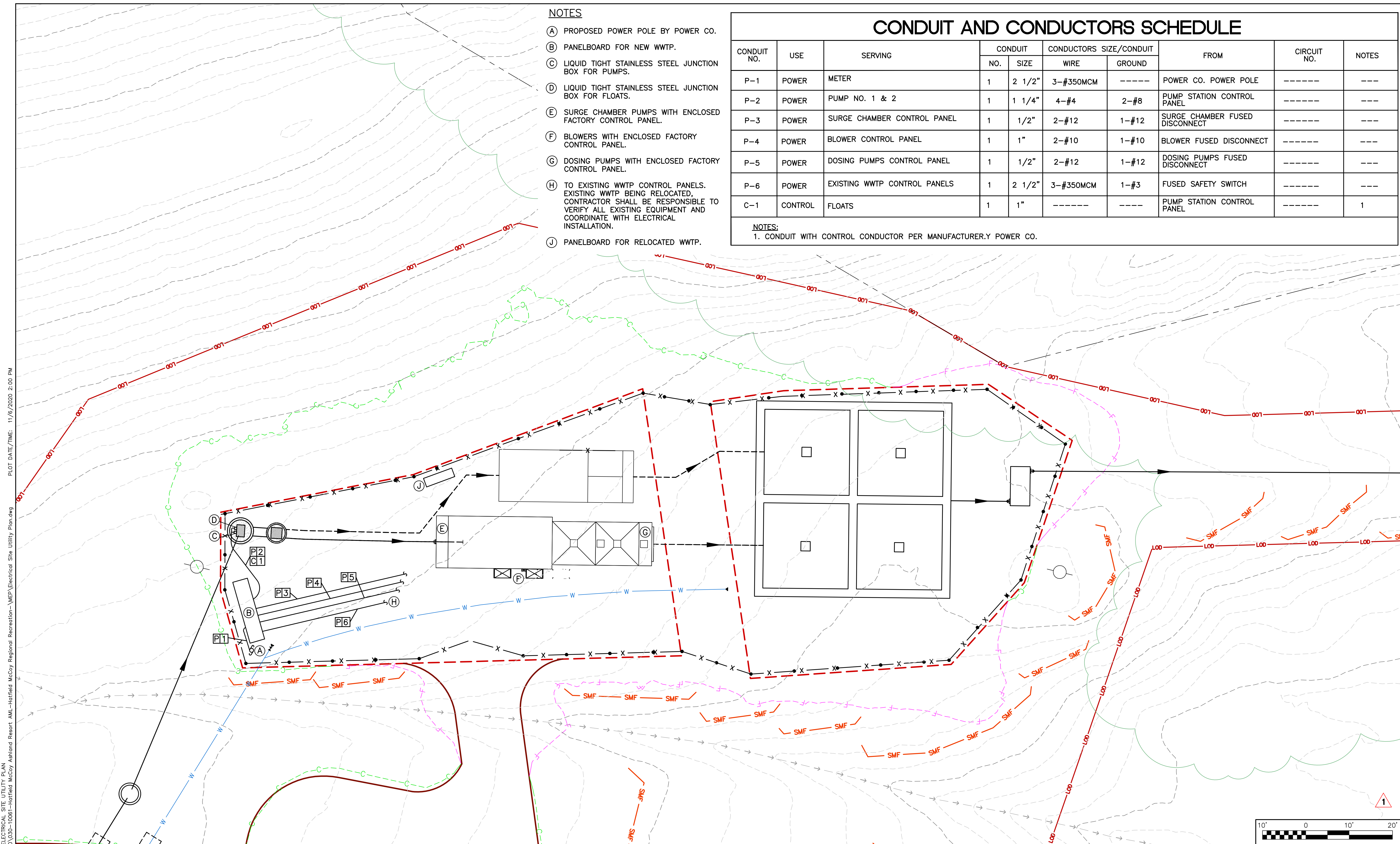
NOTES

- (A) PROPOSED POWER POLE BY POWER CO.
- (B) PANELBOARD FOR NEW WWTP.
- (C) LIQUID TIGHT STAINLESS STEEL JUNCTION BOX FOR PUMPS.
- (D) LIQUID TIGHT STAINLESS STEEL JUNCTION BOX FOR FLOATS.
- (E) SURGE CHAMBER PUMPS WITH ENCLOSED FACTORY CONTROL PANEL.
- (F) BLOWERS WITH ENCLOSED FACTORY CONTROL PANEL.
- (G) DOSING PUMPS WITH ENCLOSED FACTORY CONTROL PANEL.
- (H) TO EXISTING WWTP CONTROL PANELS. EXISTING WWTP BEING RELOCATED. CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY ALL EXISTING EQUIPMENT AND COORDINATE WITH ELECTRICAL INSTALLATION.
- (J) PANELBOARD FOR RELOCATED WWTP.

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 1/2"	3-#350MCM	-----	POWER CO. POWER POLE	-----	---
P-2	POWER	PUMP NO. 1 & 2	1	1 1/4"	4-#4	2-#8	PUMP STATION CONTROL PANEL	-----	---
P-3	POWER	SURGE CHAMBER CONTROL PANEL	1	1/2"	2-#12	1-#12	SURGE CHAMBER FUSED DISCONNECT	-----	---
P-4	POWER	BLOWER CONTROL PANEL	1	1"	2-#10	1-#10	BLOWER FUSED DISCONNECT	-----	---
P-5	POWER	DOSING PUMPS CONTROL PANEL	1	1/2"	2-#12	1-#12	DOSING PUMPS FUSED DISCONNECT	-----	---
P-6	POWER	EXISTING WWTP CONTROL PANELS	1	2 1/2"	3-#350MCM	1-#3	FUSED SAFETY SWITCH	-----	---
C-1	CONTROL	FLOATS	1	1"	-----	-----	PUMP STATION CONTROL PANEL	-----	1

NOTES:
1. CONDUIT WITH CONTROL CONDUCTOR PER MANUFACTURER.Y POWER CO.



LAYOUT TAB: E1 ELECTRICAL SITE UTILITY PLAN
 CAD FILE: R:\030\030-10061-Hatfield McCoy Regional Recreation-AMEP\Electrical Site Utility Plan.dwg
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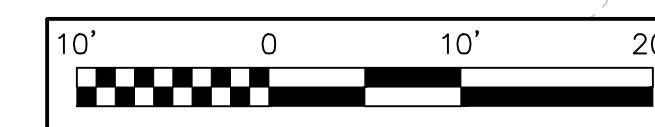
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 ELECTRICAL SITE UTILITY PLAN



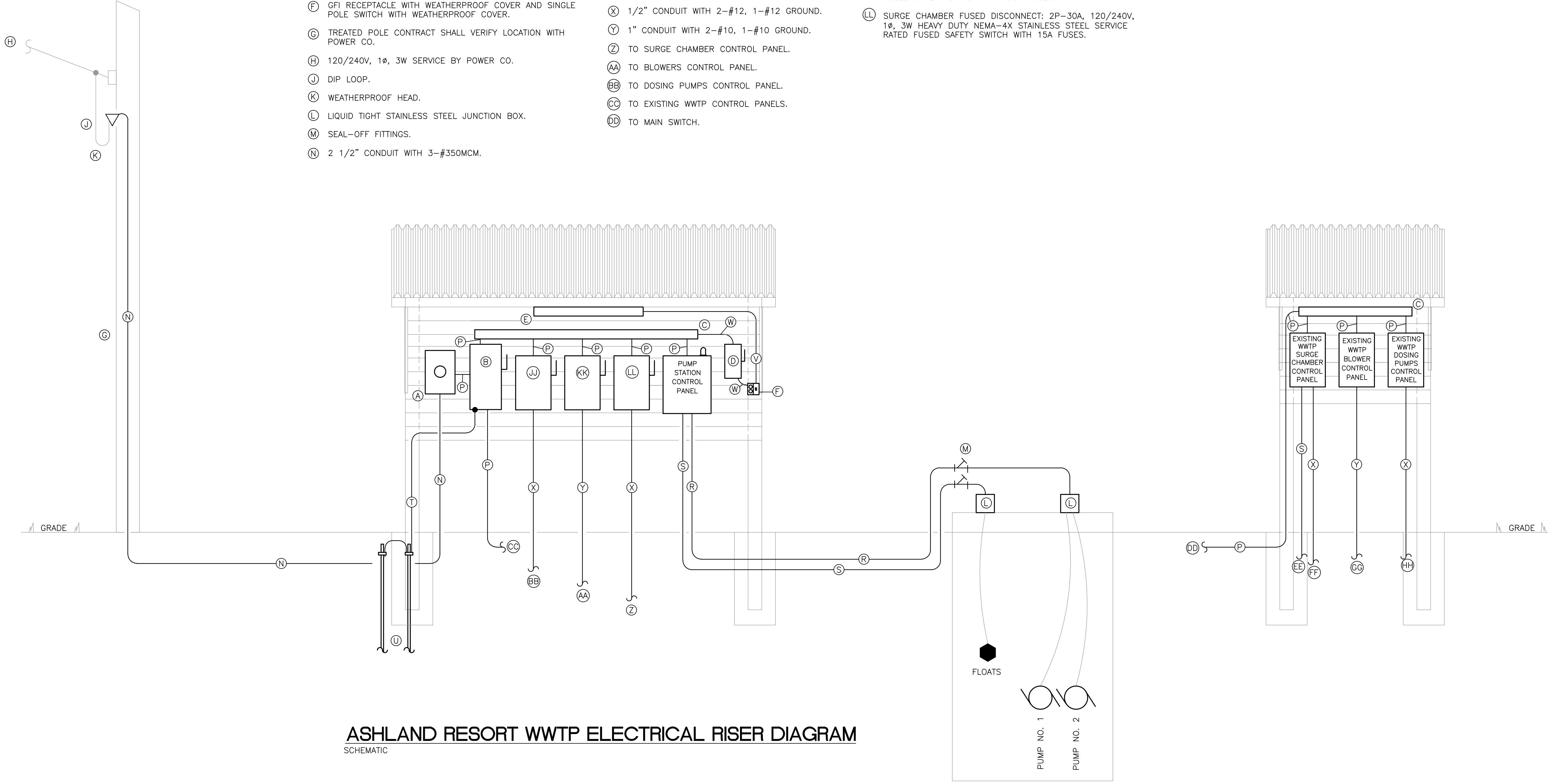
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E1

RISER NOTES:

- (A) METER.
- (B) MAIN SWITCH: 2P-400A, 120/240V, 1Ø, 3W HEAVY DUTY NEMA-4X STAINLESS STEEL SERVICE RATED FUSED SAFETY SWITCH WITH 300A FUSES.
- (C) NEMA-4X STAINLESS STEEL WIREWAY.
- (D) 2P-30A, 120/240V, 1Ø, 3W HEAVY DUTY NEMA-4X FUSED SAFETY SWITCH WITH 20A FUSES. ONE FUSE FOR LIGHTS AND RECEPTACLE.
- (E) CANOPY LIGHT: LITHONIA #FEML48 4000LM IMAFL 4' LED ENCLOSED AND GASKETED ACRYLIC LINEAL RIBBED LENS.
- (F) GFI RECEPTACLE WITH WEATHERPROOF COVER AND SINGLE POLE SWITCH WITH WEATHERPROOF COVER.
- (G) TREATED POLE CONTRACT SHALL VERIFY LOCATION WITH POWER CO.
- (H) 120/240V, 1Ø, 3W SERVICE BY POWER CO.
- (J) DIP LOOP.
- (K) WEATHERPROOF HEAD.
- (L) LIQUID TIGHT STAINLESS STEEL JUNCTION BOX.
- (M) SEAL-OFF FITTINGS.
- (N) 2 1/2" CONDUIT WITH 3-#350MCM.
- (P) 2 1/2" CONDUIT WITH 3-#350MCM, 1-#3 GROUND.
- (R) 1 1/4" CONDUIT WITH 4-#4, 2-#8 GROUND.
- (S) 1" CONDUIT WITH CONTROL CONDUCTORS PER MANUFACTURER.
- (T) #3 COPPER GROUND WIRE.
- (U) GROUNDING RODS WITH CLAMPS PER N.E.C.
- (V) 3/4" CONDUIT WITH 2-#12, 1-#12 GROUND.
- (W) 3/4" CONDUIT WITH 3-#10, 1-#10 GROUND.
- (X) 1/2" CONDUIT WITH 2-#12, 1-#12 GROUND.
- (Y) 1" CONDUIT WITH 2-#10, 1-#10 GROUND.
- (Z) TO SURGE CHAMBER CONTROL PANEL.
- (AA) TO BLOWERS CONTROL PANEL.
- (BB) TO DOSING PUMPS CONTROL PANEL.
- (CC) TO EXISTING WWTP CONTROL PANELS.
- (DD) TO MAIN SWITCH.
- (EE) TO EXISTING WWTP SURGE CHAMBER CONTROL FLOATS.
- (FF) TO EXISTING WWTP SURGE CHAMBER PUMPS.
- (GG) TO EXISTING WWTP BLOWERS.
- (HH) TO EXISTING WWTP DOSING PUMPS.
- (JJ) DOSING PUMPS FUSED DISCONNECT: 2P-30A, 120/240V, 1Ø, 3W HEAVY DUTY NEMA-4X STAINLESS STEEL SERVICE RATED FUSED SAFETY SWITCH WITH 15A FUSES.
- (KK) BLOWERS FUSED DISCONNECT: 2P-60A, 120/240V, 1Ø, 3W HEAVY DUTY NEMA-4X STAINLESS STEEL SERVICE RATED FUSED SAFETY SWITCH WITH 50A FUSES.
- (LL) SURGE CHAMBER FUSED DISCONNECT: 2P-30A, 120/240V, 1Ø, 3W HEAVY DUTY NEMA-4X STAINLESS STEEL SERVICE RATED FUSED SAFETY SWITCH WITH 15A FUSES.

NOTE:
CONTRACTOR SHALL DOWNSIZE WIRES AND CONDUITS FROM MAIN SWITCH TO EACH FUSED DISCONNECT ACCORDING TO N.E.C. TO ACCOMMODATE LUG SIZE.

NOTE:
CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY ALL EXISTING EQUIPMENT AND COORDINATE WITH ELECTRICAL INSTALLATION.



ASHLAND RESORT WWTP ELECTRICAL RISER DIAGRAM
SCHEMATIC

LAYOUT TAB: E2 ELECTRICAL RISER DIAGRAM
CAD FILE: R:\030\030-10061-Hatfield McCoy Ashland Resort AML-Hatfield McCoy Regional Recreation-VMEP\Electrical Riser Diagram.dwg
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