WILSON LAW FIRM, PLLC

Marvin Lee Wilson ■ Dailey E. Wilson ■ Allen O. Wilson ■ Lee F. Wilson

ATTORNEYS AT LAW

June 9, 2023

Kent A. Chandler, Esq.
Executive Director
Kentucky Public Service Commission
Post Office Box 615
Frankfort, Kentucky 40602

RE: Case No. 2023-00096
Lyon County Water District

Dear Mr. Chandler:

Enclosed for filing in the above-referenced matter is Lyon County Water District's Application for Certificate of Public Convenience and Necessity and for Authorization to Issue An Evidence of Indebtedness. This filing replaces the previous filing in that it contains two parts. Part one is the last filing which has had its component parts combined and bookmarked in compliance with the Commission's deficiency letter dated May 24, 2023. Part two of this filing is a grouping of PDF documents to accompany the paper medium documents filed in this case, in compliance with numerical paragraphs 2 and 3 of the Commission's May 24, 2023 deficiency letter.

This letter and the enclosed documents are true and accurate copies in paper medium of the electronic version of the documents uploaded to the Public Service Commission's Electronic Filing System this date. There are currently no parties that the Public Service Commission has excused from participation by electronic means in this proceeding.

Very truly yours,

Wilson Law Firm, PLLC

Marvin Lee Wilson

enclosures

635 Trade Avenue ■ P.O. Box 460 ■ Eddyville, KY 42038 ■ Phone: 270/388-9951 ■ Fax: 270/388-9992 ■ www.wlflegal.com

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

ELECTRONIC APPLICATION OF LYON COUNTY WATER DISTRICT FOR CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY TO REHABILITATE AND IMPROVE TWO LYON COUNTY WATER DISTRICT ELEVATED AND STANDPIPE WATER STORAGE TANKS TO IMPROVE A CREEK WATERLINE CROSSING ON KENTUCKY HIGHWAY 274 AND TO UPGRADE AND REPLACE CERTAIN WATER SYSTEM LINES AND, AUTHORIZATION TO EXECUTE AN ASSISTANCE AGREEMENT WITH THE KENTUCKY INFRASTRUCTURE AUTHORITY, AND AUTHORIZATION TO DISBURSE SURCHARGE PROCEEDS	)	**CASE NO. 2023-00096**

RESPONSE OF LYON COUNTY WATER DISTRICT TO COMMISSION'S MAY 24, 2023 DEFICIENCY LETTER

Lyon County Water District submits its Response to the Commission's May 24, 2023 Deficiency Letter.

DATED: June 9, 2023

RESPECTFULLY SUBMITTED,

Wilson Law Firm, PLLC

Marvin Lee Wilson
Post Office Box 460
Eddyville, Kentucky 42038
270/388-9951
Fax: 270/388-9992
mwilson@wlflegal.com

CERTIFICATE OF SERVICE

In accordance with 807 KAR 5:001, Section 8, I certify that Lyon County District's electronic filing of this Response is a true and accurate copy of the previous electronic filing which has been combined and bookmarked in accordance with paragraph 1 of the Commission's May 24, 2023 letter; and is a true and accurate copy of the same documents being filed in paper medium in compliance with paragraphs 2 and 3 of the Commission's May 24, 2023 letter; and that there are currently no parties that the Public Service Commission has excused from participation by electronic means in this proceeding; and that the Response in paper medium will be delivered to the Public Service Commission by overnight delivery.

Marvin Lee Wilson
Counsel for Lyon County Water District

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

ELECTRONIC APPLICATION OF LYON COUNTY WATER DISTRICT FOR CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY TO REHABILITATE AND IMPROVE TWO LYON COUNTY WATER DISTRICT ELEVATED AND STANDPIPE WATER STORAGE TANKS TO IMPROVE A CREEK WATERLINE CROSSING ON KENTUCKY HIGHWAY 274 AND TO UPGRADE AND REPLACE CERTAIN WATER SYSTEM LINES AND, AUTHORIZATION TO EXECUTE AN ASSISTANCE AGREEMENT WITH THE KENTUCKY INFRASTRUCTURE AUTHORITY, AND AUTHORIZATION TO DISBURSE SURCHARGE PROCEEDS	)	**CASE NO. 2023-00096**

APPLICATION

Pursuant to KRS 278.020 and KRS 278.300, Lyon County Water District (LCWD), applies to the Public Service Commission (Commission) for a Certificate of Public Convenience and Necessity (Certificate) to rehabilitate and improve a LCWD elevated water storage tank located on Jack Thomason Road, (Jack Thomason Tank) to rehabilitate and improve a standpipe water distribution tank in

the Lamasco community (Lamasco Tank), to improve a waterline creek crossing at State Highway 274, and to upgrade two sections of water system lines, and for authorization to enter into an Assistance Agreement with the Kentucky Infrastructure Authority (KIA) to borrow an amount not to exceed $2,094,675 to finance the water storage tank and rehabilitation and waterline upgrades, and for authorization to disburse certain proceeds from LCWD revenue or loan funds.

In support of this Application, LCWD provides the following:

A. General Information

1. The full name and post office address of the Lyon County Water District is:

Lyon County Water District
Post Office Box 489
Kuttawa, Kentucky 42055

2. Copies of all orders, pleadings and other communication related to this proceeding should be directed to:

Mathew Blane, Superintendent
Lyon County Water District
Post Office Box 489
Kuttawa, Kentucky 42055
270/388-0271
blanemathewlcwd@gmail.com

Marvin Lee Wilson
Wilson Law Firm, PLLC
Post Office Box 460
Eddyville, Kentucky 42038
270/388-9951
Fax; 270/388-9992
mwilson@wlflegal.com

3. LCWD is not a corporation, limited liability company or partnership.

4. LCWD was created by the Lyon County Court on June 25, 1963. A copy of the creation document is attached hereto and labeled as **Exhibit 1**.

5. LCWD provides retail water service to 2,820 customers in Lyon County, Kentucky, and 87 customers in Caldwell County, Kentucky.

6. A copy of the action taken by LCWD's Board of Directors authorizing the herein addressed improvement, maintenance and repair projects, including the contract with HDR and the filing of this Application is attached hereto and labeled **Exhibit 2**.

B. Background

7. LCWD identified a leak situation on the elevated water storage tank located on Jack Thomason Road in Fall 2022. The leak was repaired by C & S Services, LLC on September 21, 2022. Attached and labeled **Exhibit 3** is a copy of the paid invoice for the repair. The LCWD implemented regular and continuous monitoring of the tank.

8. LCWD contacted contractor Jay Leslie Hoffman of Wet or Dry Tank Inspections Services, Inc. to address the leak. Recognizing there was a need to address the soundness of the tank standpipe the Board took action to have HDR

Engineering (HDR) evaluate the matter. HDR recommended biding a tank rehabilitation project. HDR prepared the bid documents.[1]

9. LCWD also considered periodic inspection and maintenance work on the Lamasco standpipe tank as a preemptive measure.

10. HDR was requested to provide specifications on recommended work to be done on the Lamasco tank. The bidding for the Lamasco tank work was included in the bidding for the Jack Thomason tank.

11. LCWD maintains a proactive posture dealing with the dependability and serviceability of its waterlines system.

12. LCWD has identified a waterline creek crossing on State Highway 274 that is in need of replacement due to erosion.

13. LCWD has identified two sections of its waterlines system in need of replacement and upgrading. These sections are in Indian Hills and Tinsley Creek Bay subdivisions. The Indian Hills component of the project has some service lines containing lead. The Tinsley Creek Bay component of the project has ageing and deteriorating lines. Additionally, much of the Tinsley Creek Bay component is made up of main lines that cannot support required pressures to provide adequate water service to the customers.

[1] HDR Project No. 10205112 construction documents project manual was previously provided to PSC by LCWD on or about October 2022.

14. The locations of the Thomason Road tank and the Lamasco tank, the Kentucky 274 crossing and the Indian Hills and Tinsley Creek Bay upgrade areas are depicted on four aerial photographs attached hereto and cumulatively labeled **Exhibit 4**.

15. On November 16, 2023, November 23, 2023 and November 30, 2023 in accordance with KRS 424.260, LCWD published in The Lyon County Herald Ledger an advertisement for bids on the Jack Thomason tank rehabilitation phase of the overall project. Copies of the affidavit of publication and tear sheets are attached and cumulatively labeled **Exhibit 5.**

16. LCWD received and opened two bids on the Jack Thomason tank and Lamasco tank projects. A copy of the certified bid tabulations is attached and labeled **Exhibit 6.**

17. After reviewing the bids, and after consideration of the recommendation received from HDR, LCWD took action to award the contract to Sam Estes Painting and Sandblasting, Inc. Copies of the project engineer's recommendation and LCWD Board minutes identifying said action is attached and labeled **Exhibit 7.**

18. The project engineer, HDR provided additional Construction Cost Estimates upon which the costs of the projects are based. A copy of the Summary of Construction Cost Estimates is attached and labeled **Exhibit 8.**

Certificate of Public Convenience and Necessity

19. LCWD restates and incorporates the information contained in paragraphs 7 through 18 of this Application.

20. The proposed tank and waterline phases of this project are located in Lyon County Kentucky, and in the Lyon County Water District's territory. Copies of aerial photographs depicting the general location of the projects is attached. SEE **Exhibit 4.**

21. The proposed projects will not compete with that of another public utility. The purchase and installation of the materials necessary to complete all phases of this project will not result in the wasteful duplication of utility facilities or inefficient investment.

22. A detailed description and specification for the entire project is set out in the general requirements and specifications HDR documents attached and labeled **Exhibit 9.**

23. No franchises, permits, easements, land acquisitions, or regulatory approvals will be required for any phase of this project.

24. LCWD owns the property where the water tanks are located and LCWD has access to said properties from public roads.

25. The total estimated cost of the Jack Thomason Tank and Lamasco Tank rehabilitation is $294,630, based on the Sam Estes Painting and Sandblasting, Inc. bid.

26. The total estimated cost of the balance of the project, inclusive of the estimated contingency, is $1,800,045.00 based on the project engineer's estimates. (see **Exhibit 8**.)

27. LCWD proposes to finance the cost through an Assistance Agreement with KIA through which LCWD will borrow up to $2,094,675.00.

28. There is no additional annual cost for the continued operation of the rehabilitated water tanks and upgraded waterlines.

Authorization to Enter Assistance Agreement

29. LCWD restates and incorporates the information contained in paragraphs 7 through 28 of this Application.

30. A description of Lyon County Water District's water system and its property, stated at original cost by accounts, is contained in *Annual Report of Lyon County Water District to the Public Service Commission for the Year Ending December 31, 2022 ("2022 Annual Report"),* of which Lyon County Water District has previously filed with the Commission and which is incorporated by reference into this Application. The accountant's Audit for year ending December 31, 2022 is not

yet available. Attached, labeled **Exhibit 10,** is a copy of the Audit for year ending December 31, 2021.

31. LCWD does not propose to issue any stock or bonds.

32. LCWD proposes to enter into an Assistance Agreement with KIA to borrow an amount not to exceed $2,094,675.00. The proposed loan will bear interest at the rate of 2.50% per annum and will be payable over a period not to exceed 20 years from the date of the last draw of the loan proceeds. In addition to interest, LCWD will be required to pay a loan servicing fee of 0.25% of the outstanding loan as a part of each interest payment. The Assistance Agreement will be secured by a pledge of Lyon County Water District's revenues.

33. The Kentucky Infrastructure Authority issued a letter approving this project on February 10, 2020. A copy of said letter is attached and labeled **Exhibit 11.**

34. The proceeds from the proposed loan will finance the proposed projects set out in I this application.

35. No real property will be acquired with proceeds from the Assistance Agreement.

36. No proceeds from the Assistance Agreement will be used to refund outstanding obligations.

37. A copy of Lyon County Water District's written notification to State Local Debt Officer is attached and labeled **Exhibit 12.**

38. For the twelve month period ending December 31, 2022, Lyon County Water District had less than $5,000,000 in gross annual revenues.

39. Pursuant to 807 KAR 5:001, §18(2)(a), the following information is provided:

40. Lyon County Water District's 2022 Annual Report is incorporated by reference into this Application. LCWD also incorporates into this Application its audited financial statements for the year ending December 31, 2022, which has previously been filed with the commission.

41. No material changes have occurred in Lyon County Water District's financial condition since December 31, 2022.

42. LCWD is not authorized to issue any stock.

43. There are no trust deeds or mortgages.

44. Plans and maps of the proposed project are attached as Exhibits attached to this application.

45. Detailed specifications and descriptions of the project are found at **Exhibit 9.**

46. The proposed loan will not require LCWD to seek an adjustment of its rates for service.

47. Lyon County Water District's execution of an Assistance Agreement with KIA to borrow $2,094,675.00 is for a lawful objective within Lyon County Water

District's purposes, is necessary, appropriate for, and consistent with Lyon County Water District's proper performance of its service to the public. It will not impair Lyon County Water District' ability to perform that service and is reasonably necessary and appropriate for such purpose.

48. If the Commission grants a Certificate authorizing LCWD to disburse to KIA or KIA's designated agent from the account containing the proceeds amounts necessary to make the debt service payments under the proposed Assistance Agreement. Such authorization will eliminate the need to LCWD to obtain separate Commission approval of individual project expenses and of each scheduled principal and interest payment.

Conclusion

WHEREFORE, Lyon County Water District requests that the Commission:

1. Place this application at the head of the Commission's docket as KRS 278.300(2) requires;

2. Enter an order that

a. Grants a Certificate of Public Convenience and Necessity to Lyon County Water District to rehabilitate and improve the Jack Thomason Road water tower and the Lamasco water tower, and upgrade and replace waterlines in the Indian Hills and Tinsley Creek Bay subdivisions.;

b. Authorizes Lyon County Water District to enter into and execute an Assistance Agreement with KIA and to borrow a sum no greater than $2,094,675.00.

c. Authorizes Lyon County Water District to disburse to KIA or KIA's designated agent from the loan proceeds amounts necessary to make the debt service payments under the proposed Assistance Agreement at the times prescribed by the Assistance Agreement; and

d. Grants the relief requested above without holding an evidentiary hearing in this matter and within 30 days of the filing of this Application; and

3. Grant any and all such other relief to which Lyon County Water District may be entitled.

RESPECTFULLY SUBMITTED,

Wilson Law Firm, PLLC

Marvin Lee Wilson
Post Office Box 460
Eddyville, Kentucky 42038
270/388-9951
Fax: 270/388-9992
mwilson@wlflegal.com

STATE OF KENTUCKY
COUNTY OF LYON

The undersigned, Charles D. Robertson, being duly sworn, deposes and states that he is the Chairman of the Lyon County Water District, the Applicant in the above proceedings; that he has read this Application and has noted his contents; that the same is true of his own knowledge, except as to matters which are therein stated on information or belief, and as to those matters, he believed same to be true.

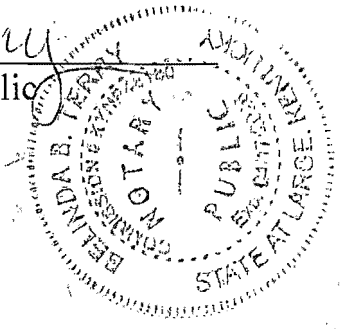
IN WITNESS WHEREOF, witness the signature of the undersigned on this the 15th day of May, 2023.

Charles D. Robertson
Chairman, Board of Commissioners
Lyon County Water District

Subscribed and sworn to before me by Charles D. Robertson in his capacity a Chairman of the Lyon County Water District this the 15th day of May, 2023.

My Commission expires: April 17, 2026
Commission ID number: KYNP48180

Belinda B. Terry, Notary Public



FILING REQUIREMENTS

FILING REQUIREMENTS FOR AN APPLICATION FOR A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY

Source Authority	Requirement	Location
807 KAR 5:001, § 14(1)	Applicant's name, mailing address and e-mail address	Page 2, ¶ 1
807 KAR 5:001, § 14(1)	Statutory Reference – KRS 278.020	Page 1
807 KAR 5:001, § 4(3)	Signature of Applicant's Attorney	Page 11
807 KAR 5:001, § 4(3)	Name Address, Telephone Number, Fax Number, and e-mail address of Applicant's Attorney	Page 2 and Page 11
807 KAR 5:001, § 14(2)	If Applicant is corporation: State and date of incorporation, attestation of good standing in state of incorporation, statement regarding authorization to transact business in Kentucky	Page 3, N/A
807 KAR 5:001, § 14(3)	If Applicant is a limited liability company: State and date of organization, attestation of good standing in state of incorporation, statement regarding authorization to transact business in Kentucky	Page 3, N/A
807 KAR 5:001, § 14(4)	If the Applicant is a limited partnership: a certified copy of limited partnership agreement and all amendments or statement identifying prior Commission proceedings in which limited partnership agreement and all amendments filed	Page 3, N/A
807 KAR 5:001, § 15(2)(a)	The facts relied upon to show that the public convenience and necessity requires the proposed construction	Pages 3-5, ¶ 7-18
807 KAR 5:001, § 15(2)(b)	Copies of franchises or permits for the proposed construction or extension	Page 6, ¶ 23, N/A
807 KAR 5:001, § 15(2)(c)	A full description of the proposed location, route, or routes of the proposed construction or extension, including a description of the manner in which same will be constructed, and the names of all public utilities, corporations, or persons with whom the proposed construction or extension is likely to compete	Page 3, ¶ 14 Exhibit 9 Page 6, ¶ 20 Exhibit 4
807 KAR 5:001, § 15(2)(d)1	Maps to suitable scale showing the location or route of the proposed construction or extension, as well as the location to scale of the facilities owned by others located anywhere within the map area with adequate identification as to the ownership of the other facilities (Only one copy submitted pursuant to 807 KAR 5:001, Section 8)	Page 6, ¶ 21
807 KAR 5:001, § 15(2)(d)2	Plans and specifications and drawings of the proposed plant, equipment, and facilities	Page 6, ¶ 22 Exhibit 9

Source Authority	Requirement	Location
807 KAR 5:001, § 15(2)(e)	The manner in detail in which the Applicant proposes to finance the proposed construction or extension.	Page 7, ¶ 25-27
807 KAR 5:001, § 15(2)(f)	An estimated annual cost of operation after the proposed facilities are placed in service	Page 7, ¶ 28
807 KAR 5:001, § 4(13)	Engineering plans, specifications, drawings, plats and reports for the proposed construction or extension prepared by a registered engineer, must be signed, sealed, and dated by an engineer registered in Kentucky	Exhibit 9

FILING REQUIREMENTS FOR AN APPLICATION FOR A AUTHORITY TO ISSUE EVIDENCE OF INDEBTEDNESS

Source Authority	Requirement	Location
807 KAR 5:001, § 14(1)	Applicant's name, mailing address and e-mail address	Page 2, ¶ 2
807 KAR 5:001, § 14(1)	Statutory Reference – KRS 278.020	Page 1
807 KAR 5:001, § 4(3)	Signature of Applicant's Attorney	
807 KAR 5:001, § 4(3)	Name Address, Telephone Number, Fax Number, and e-mail address of Applicant's Attorney	Page 11
807 KAR 5:001, § 14(2)	If Applicant is corporation: State and date of incorporation, attestation of good standing in state of incorporation, statement regarding authorization to transact business in Kentucky	Page 3, N/A
807 KAR 5:001, § 14(3)	If Applicant is a limited liability company: State and date of organization, attestation of good standing in state of incorporation, statement regarding authorization to transact business in Kentucky	Page 3, N/A
807 KAR 5:001, § 14(4)	If the Applicant is a limited partnership: a certified copy of limited partnership agreement and all amendments or statement identifying prior Commission proceedings in which limited partnership agreement and all amendments filed	Page 3, N/A
KRS 278.300(2)	Application is made under oath and signed on utility's behalf by its president, or by a vice president, auditor, comptroller or other executive officer having knowledge of the matters set forth and duly designated by the utility	Page 12
807 KAR 5:001, § 18(1)(a)	Information required by 807 KAR 5:001, § 14	See above
807 KAR 5:001, § 18(1)(b)	Description of Applicant's property and the field of its operation	Page 3
807 KAR 5:001, § 18(1)(c)	Description of amount and kinds of stock to be issued	Page 8, N/A
807 KAR 5:001, § 18(1)(c)	Description of amount, terms and interest rate of bond or note	Page 8, ¶ 32
807 KAR 5:001, § 18(1)(c)	Description of how bond or note will be secured	Page 8, ¶ 32
807 KAR 5:001, § 18(1)(d)	Statement of how proceeds are to be used	Page 8, ¶ 34
807 KAR 5:001, § 18(1)(e)	If proceeds will be used to acquire, construct, improve, or extend property: a detailed description of property and all contracts	Page 6
807 KAR 5:001, § 18(1)(f)	Requirements if proceeds are to refund outstanding obligations	Page 8, ¶ 36
807 KAR 5:001, § 18(1)(g)	Applicant's written notification to state local debt officer regarding proposed issuance	Page 8, ¶ 37 Exhibit 12
807 KAR 5:001, § 18(2)(a) 807 KAR 5:001, § 12(1)(b)	Financial Exhibit	Page 9, ¶ 39

Source Authority	Requirement	Location
807 KAR 5:001, § 18(2)(b)	Copies of trust deeds or mortgages	Page 9, ¶ 43
807 KAR 5:001, § 12(2)(c)	If property acquired: maps and plans of property	Page 5, ¶ 14
807 KAR 5:001, § 12(2)(c)	If property acquired: detailed estimates by USoA account number	Page 8, ¶ 35

Exhibits

TABLE OF EXHIBITS

EXHIBIT NUMBER	DESCRIPTION
1	Copy of the creation document for Lyon County Water District
2	Copy of the minutes memorializing the action taken by Lyon County Water District to proceed with taking steps necessary to secure funds and complete water tank and waterline repairs and upgrades; and copy of the project contract with HDR Engineering, Inc.
3	Paid invoice and receipt for the initial repair to the Jack Thomason tank.
4	Aerial photographs showing the locations of the tank and waterline projects.
5	Publication affidavit and tear sheets showing the advertisements for bids on the water tank projects.
6	Certified bid tabulations on the water tank project bids.
7	Engineer's recommendation on the bids for the water tank projects.
8	Engineer's construction cost estimates on the tank and waterline components of the overall project.
9	Engineer's General Requirements and Specifications on the tank and waterline components of the overall project.
10	Audit for the year ending December 31, 2021.
11	Kentucky Infrastructure Authority project letter of commitment.
12	Notification of intent to finance and application for debt approval.

Exhibit 1

OB K/209

LYON COUNTY COURT

JUNE 25, 1963

IN RE: CREATION OF LYON COUNTY WATER DISTRICT

It appearing to the Court that a petition in writing has been made to this Court for the establishment and creation of a Water District to include the premises more fully described hereinafter, said petition being signed by more than seventyfive freeholders thereof; and it appearing that notice of the filing of said petition was given by publication in three issues of a newspaper of general circ/eation in Lyon County, said petition having been filed and advertised more than 30 days before today, and it appearing that no objection has been filed, and it further appearing that the establishment of the WaterDistrict is necessary to the public health, convenience, fire protection and comfort to the residents of the proposed Water District:

NOW, THEREFORE, it is ordered and adjudged that the establishment of the proposed Watr District is necessary for the public health, convenience, fire protection and comfort of the residents of the proposed district, and it is further ordered that a Water District known as the LYON COUNTY WATER DISTRICT, be and is hereby created and established, consisting of the following property located in Lyon County, Kentucky;

Being all that portion of Lyon County lying and being North and East of the Cumberland River and the Barkley Lake Reservoir being under construction except those areas served or to be served by the City of Kuttawa, the City of Eddyville the Fredonia Water District and the proposed force main to be constructed for the City of Princeton, the same covering those areas to be served.

/s/ Francis W. Utley
Judge, Lyon County Court

STATE OF KENTUCKY
COUNTY OF LYON
I, Jane DeFew, Clerk of Lyon County, Kentucky, certified the foregoing instrument to be a true, correct and complete copy of order as recorded in ORDER BOOK K, page 209, in my said office.
Given under my hand and seal this 25th day of July, 1986.

Jane DeFew
LYON COUNTY CLERK

Exhibit 2

Lyon County Water District
Minutes

The Lyon County Water District met in regular session on Tuesday, December 10, 2019 at 8AM at the Water District Office.

Board members present:	Others present:	
Charles Murphy	Stacy Boone	Dixie Cayce
Chris Sutton	Marvin Wilson	Elaina Bond
Don Robertson	Mike Henson	Cheryl Chino
	Scott Wright	

Meeting called to order by Don Robertson. Invocation gave by Charles Murphy.

Visitor present None

Motion to approve the October minutes. Motion by Charles. Seconded by Chris. Motion passed unanimously.

Water Issues:
Jeremy Hendrickson. Claims someone turned his water back on after he had winterized everything before they left. Board wants a written statement from the customer (see attached) and then the bill can be adjusted.

Bud Hastings: Rental Property: Adjust bill per board.

Sewer Issues:
None.

Mike gave an update on the new project going into effect. He provided the board with the engineering fees from HDR for the new project.

A motion was made to approve the engineering fees and to move forward with HDR on the new project. Motion by Charles. Seconded by Chris. Motion passed.

Elaina gave a report on the November financials. **Charles motioned to approve financial report, seconded by Chris. Motion passed unanimously.**

Elaina also presented budget amendments. See Attached.

There was a motion to approve the budget amendments based on the accountant's decision. Motion by Chris. Seconded by Charles.

Managers' Report: (See Attached)

Motion to approve managers' report. Motion by Chris. Seconded by Charles. Motion passed unanimously.

Old Business:
Suwanee Trailer Park: An update was given by Dixie that there are 12 customers and they are almost ready to start the meter sets.

PWWD Rate Increase: **Chris made a motion for Marvin to write a letter to object to the rate increase of Princeton Water. Seconded by Charles. Motion passed.**

New Business:
New Employee: David Anguish. The board stated his rate of pay will be $12 per hour and that his employment is contingent upon a back ground check.

Motion to adjourn. Motion made by Chris, second by Charles. Motion passed.

Sign_____

SHORT FORM AGREEMENT BETWEEN OWNER AND HDR ENGINEERING, INC. FOR PROFESSIONAL SERVICES

THIS AGREEMENT is made as of this 13th day of December, 2019, between **LYON COUNTY WATER DISTRICT** ("OWNER"), with offices at 5464 US 62, Kuttawa, KY 42005, and HDR ENGINEERING, INC., ("ENGINEER" or "CONSULTANT") for services in connection with the project known as **KIA SYSTEM IMPROVEMENTS** ("Project");

WHEREAS, OWNER desires to engage ENGINEER to provide professional engineering, consulting and related services ("Services") in connection with the Project; and

WHEREAS, ENGINEER desires to render these Services as described in SECTION I, Scope of Services.

NOW, THEREFORE, OWNER and ENGINEER in consideration of the mutual covenants contained herein, agree as follows:

SECTION I. SCOPE OF SERVICES

ENGINEER will provide Services for the Project, which consist of the Scope of Services as outlined on the attached Exhibit A.

SECTION II. TERMS AND CONDITIONS OF ENGINEERING SERVICES

The HDR Engineering, Inc. Terms and Conditions, which are attached hereto in Exhibit B, are incorporated into this Agreement by this reference as if fully set forth herein.

SECTION III. RESPONSIBILITIES OF OWNER

The OWNER shall provide the information set forth in paragraph 6 of the attached "HDR Engineering, Inc. Terms and Conditions for Professional Services."

SECTION IV. COMPENSATION

Compensation for ENGINEER'S services under this Agreement shall be on a Lump Sum basis. The amount of the lump sum is **Two Hundred Eleven Thousand Two Hundred Forty Dollars ($211,240)**.

Task Number	Design	Bidding	Construction Administration	Inspection Services	Total Fee *
1 - Water and Sewer Rate Study	$9,000				**$9,000**
2 – Tank Improvements		$3,375	$6,750	$26,400	**$36,525**
3 – Tinsley Creek Subdivision	$36,050	$5,151	$10,300	$37,000	**$88,501**
4 – Interconnects		$5,838	$11,676	$40,800	**$58,314**
5 – KY 274 Creek Crossing	$6,860	$980	$1,960	$9,100	**$18,900**

* Please note that our fees do not include and geotechnical services, environmental permits beyond a standard nationwide permit, or easement procurement. It is not anticipated that these services will be required for this project, but can be quoted upon request. In addition, it is assumed that the PADD office will provide all environmental documentation required by DOW and KIA.

SECTION V. PERIOD OF SERVICE

Upon receipt of written authorization to proceed, ENGINEER shall perform the services described in Exhibit A within a reasonable period of time.

Unless otherwise stated in this Agreement, the rates of compensation for ENGINEER'S services have been agreed to in anticipation of the orderly and continuous progress of the project through completion. If any specified dates for the completion of ENGINEER'S services are exceeded through no fault of the ENGINEER, the time for performance of those services shall be automatically extended for a period which may be reasonably required for their completion and all rates, measures and amounts of ENGINEER'S compensation shall be equitably adjusted.

SECTION VI. SPECIAL PROVISIONS

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the day and year first written above.

LYON COUNTY WATER DISTRICT
"OWNER"

BY: Don Robertson

NAME: Don Robertson

TITLE: Chairman

ADDRESS: 5464 US 62
Kuttawa, KY 42005

HDR ENGINEERING, INC.
"ENGINEER"

BY: By R Edelen

NAME: Ben R. Edelen, PE, PLS

TITLE: Sr. Vice President/Area Mgr

ADDRESS: 2517 Sir Barton Way
Lexington, KY 40509

EXHIBIT A

SCOPE OF SERVICES

December 8, 2019

Mr. Don Robertson
Chairman
Lyon County Water District
5464 US 62
Kuttawa, KY 42005

RE: KIA System Improvements

Dear Mr. Robertson,

HDR appreciates the opportunity to provide the Lyon County Water District with this proposal for engineering design, bidding, construction administration, and inspection services. In addition, we have included a fee to perform a Water & Sewer Rate Study. Please find below a scope of services for your consideration.

Task 1 - Water and Sewer Rate Study:

The Lyon County Water District Rate Study, will address the following objectives:

- User fees and charges are sufficient enough to meet the District's needs and reflect the true cost of service.
- Determine the Water District's cash needs and rates for services for operations, maintenance, replacement, capital projects and existing and future debt service.
- Maintain rates that align with required mandates and supports the objectives of the Water District.
- Determine what percent of funds should be allocated for day-to-day operations versus rehabilitation and or replacement of facilities.
- Develop a methodology to recover the costs from customers for system development.
- Review Wholesale Contracts that the Water District currently holds for purchasing water.

Task 1 Approach:

- Perform a complete system analysis to determine the Water District's cash needs and rates for services and operations, maintenance, replacement and capital projects and debt service.
- Define a rate structure to recover the costs from customers for system development.
- Benchmark Lyon County rates to other similar water districts and municipalities.
- Provide preliminary and final reports that include recommendations for rate changes and/or methodology modifications.
- Present findings to the Water District.

HDR will perform the scope of work detailed for Task 1 for a Lump Sum fee of **$9,000**

Task 2 – Tank Improvements

Lamasco Standpipe

The Lamasco glass lined standpipe needs coating on the interior to mitigate a rust problem that was observed during inspections. In addition to coating the tank, a mixing system is proposed to be installed, along with work at the exterior valve vault to install a bypass valve for better control at the tank site. HDR has completed the design of these improvements, only bidding, construction administration, and inspection services will be required for this portion of Task 2.

Jack Thompson Tank

The Jack Thompson 100,000 gallon elevated storage tank needs coating on the interior and exterior per the latest inspection. As with the Lamasco project, HDR has completed the design of these improvements, so this project can be put out for bid immediately.

It would be our recommendation to bid both the tank projects as one bid package.

HDR will perform the scope of work detailed for Task 2 for a Lump Sum fee as broken down in the following way:

Bidding = $3,375
Construction Administration = $6,750
Inspection Services = $26,400

Task 3 – Tinsley Creek Subdivision

The Tinsley Creek Subdivision was constructed approximately 50/60 years ago near Lake Barkley. The subdivision is currently served by an undersized 2" galvanized waterline. This waterline is undersized and creates pressure and water quality issues. The proposed project will replace the undersized line with an adequately sized waterline. This portion of the overall project has not been designed and HDR will provide the completed survey, design and specifications needed for construction. In addition, HDR will provide bidding, construction administration and inspection services needed.

HDR will perform the scope of work detailed for Task 3 for a Lump Sum fee as broken down in the following way:

Design = $36,050
Bidding = $5,150
Construction Administration = $10,300
Inspection Services = $37,000

Task 4 – Interconnects

The KY 295 interconnect projects will loop lines to allow the increase of circulation of water in the area and thereby improve water quality. This will include an 8" PVC interconnect between KY 295 & KY 373, and also an 8" PVC interconnect between US 62 and KY 295. The design of these interconnects are complete as well as all easements being procured.

The KY 373 to KY 295 Loop project is a project that loops a line that dead ends at the City of Eddyville's master meter valve. The line is also the first phase in allowing the Crittenden Livingston County Water District to serve the City of Kuttawa as a backup source or possibly a primary source. In addition the loop will allow additional water to be transmitted by the City of Eddyville to the City of Kuttawa as a backup water source.

The US 62 & KY 295 project provides another connection between the Lyon County Water District and the City of Kuttawa. Along with the KY 373 to KY 295 project described above, the project provides a means of allowing Kuttawa to receive water from the Crittenden Livingston County Water District and a higher volume feed from the City of Eddyville. The new feed will currently serve as a backup water supply for Kuttawa and could serve as Kuttawa's primary water supply in the event Kuttawa ceases operation of its water treatment plant.

These projects are part of an overall discussion regarding the proposed Lyon County consortium project. These projects primarily benefit the City of Kuttawa and Eddyville. Financial contribution from both municipalities would be expected to complete the project.

HDR will perform the scope of work detailed for Task 4 for a Lump Sum fee as broken down in the following way:

Bidding = $5,838
Construction Administration = $11,676
Inspection Services = $40,800

Task 5 – KY 274 Creek Crossing

The final portion of this project is a replacement of a creek crossing near KY 274. Per water superintendent, Dixie Cayce, this line is very shallow and in danger of immediate failure. HDR will again provide construction drawings, specifications and all necessary permits for this portion of the project. In addition to the design, HDR will provide bidding, construction administration, and construction inspection services for this proposed project.

HDR will perform the scope of work detailed for Task 5 for a Lump Sum fee as broken down in the following way:

Design = $6,860
Bidding = $980
Construction Administration = $1,960
Inspection Services = $9,100

The following table represents the fee breakdown by task:

Task Number	Design	Bidding	Construction Administration	Inspection Services	Total Fee
1 – Water and Sewer Rate Study	$9,000				**$9,000**
2 – Tank Improvements		$3,375	$6,750	$26,400	**$36,525**
3 – Tinsley Creek Subdivision	$36,050	$5,151	$10,300	$37,000	**$88,501**
4 – Interconnects		$5,838	$11,676	$40,800	**$58,314**
5 – KY 274 Creek Crossing	$6,860	$980	$1,960	$9,100	**$18,900**

Please note that our fees do not include and geotechnical services, environmental permits beyond a standard nationwide permit, or easement procurement. It is not anticipated that these services will be required for this project, but can be quoted upon request. In addition, it is assumed that the PADD office will provide all environmental documentation required by DOW and KIA.

We appreciate the opportunity to provide the Lyon County Water District with this proposal for engineering services. Given timely notice to proceed, we can begin immediately. If you should have questions, please do not hesitate to call.

Sincerely,
HDR Engineering, Inc.

Michael A. Hansen, P.E.
Project Manager

Ben R. Edelen, P.E., P.L.S.
Sr. Vice President/Area Manager

EXHIBIT B

TERMS AND CONDITIONS

HDR Engineering, Inc. Terms and Conditions for Professional Services

1. **STANDARD OF PERFORMANCE**
The standard of care for all professional engineering, consulting and related services performed or furnished by ENGINEER and its employees under this Agreement will be the care and skill ordinarily used by members of ENGINEER's profession practicing under the same or similar circumstances at the same time and in the same locality. ENGINEER makes no warranties, express or implied, under this Agreement or otherwise, in connection with ENGINEER's services.

2. **INSURANCE/INDEMNITY**
ENGINEER agrees to procure and maintain, at its expense, Workers' Compensation insurance as required by statute; Employer's Liability of $250,000; Automobile Liability insurance of $1,000,000 combined single limit for bodily injury and property damage covering all vehicles, including hired vehicles, owned and non-owned vehicles; Commercial General Liability insurance of $1,000,000 combined single limit for personal injury and property damage; and Professional Liability insurance of $1,000,000 per claim for protection against claims arising out of the performance of services under this Agreement caused by negligent acts, errors, or omissions for which ENGINEER is legally liable. If flying an Unmanned Aerial System (UAS or drone), ENGINEER will procure and maintain aircraft unmanned aerial systems insurance of $1,000,000 per occurrence. OWNER shall be made an additional insured on Commercial General and Automobile Liability insurance policies and certificates of insurance will be furnished to the OWNER. ENGINEER agrees to indemnify OWNER for third party personal injury and property damage claims to the extent caused by ENGINEER's negligent acts, errors or omissions. However, neither Party to this Agreement shall be liable to the other Party for any special, incidental, indirect, or consequential damages (including but not limited to loss of use or opportunity; loss of good will; cost of substitute facilities, goods, or services; cost of capital; and/or fines or penalties), loss of profits or revenue arising out of, resulting from, or in any way related to the Project or the Agreement from any cause or causes, including but not limited to any such damages caused by the negligence, errors or omissions, strict liability or breach of contract.

3. **OPINIONS OF PROBABLE COST (COST ESTIMATES)**
Any opinions of probable project cost or probable construction cost provided by ENGINEER are made on the basis of information available to ENGINEER and on the basis of ENGINEER's experience and qualifications, and represents its judgment as an experienced and qualified professional engineer. However, since ENGINEER has no control over the cost of labor, materials, equipment or services furnished by others, or over the contractor(s') methods of determining prices, or over competitive bidding or market conditions, ENGINEER does not guarantee that proposals, bids or actual project or construction cost will not vary from opinions of probable cost ENGINEER prepares.

4. **CONSTRUCTION PROCEDURES**
ENGINEER's observation or monitoring portions of the work performed under construction contracts shall not relieve the contractor from its responsibility for performing work in accordance with applicable contract documents. ENGINEER shall not control or have charge of, and shall not be responsible for, construction means, methods, techniques, sequences, procedures of construction, health or safety programs or precautions connected with the work and shall not manage, supervise, control or have charge of construction. ENGINEER shall not be responsible for the acts or omissions of the contractor or other parties on the project. ENGINEER shall be entitled to review all construction contract documents and to require that no provisions extend the duties or liabilities of ENGINEER beyond those set forth in this Agreement. OWNER agrees to include ENGINEER as an indemnified party in OWNER's construction contracts for the work, which shall protect ENGINEER to the same degree as OWNER. Further, OWNER agrees that ENGINEER shall be listed as an additional insured under the construction contractor's liability insurance policies.

5. **CONTROLLING LAW**
This Agreement is to be governed by the law of the state where ENGINEER's services are performed.

6. **SERVICES AND INFORMATION**
OWNER will provide all criteria and information pertaining to OWNER's requirements for the project, including design objectives and constraints, space, capacity and performance requirements, flexibility and expandability, and any budgetary limitations. OWNER will also provide copies of any OWNER-furnished Standard Details, Standard Specifications, or Standard Bidding Documents which are to be incorporated into the project.

OWNER will furnish the services of soils/geotechnical engineers or other consultants that include reports and appropriate professional recommendations when such services are deemed necessary by ENGINEER. The OWNER agrees to bear full responsibility for the technical accuracy and content of OWNER-furnished documents and services.

In performing professional engineering and related services hereunder, it is understood by OWNER that ENGINEER is not engaged in rendering any type of legal, insurance or accounting services, opinions or advice. Further, it is the OWNER's sole responsibility to obtain the advice of an attorney, insurance counselor or accountant to protect the OWNER's legal and financial interests. To that end, the OWNER agrees that OWNER or the OWNER's representative will examine all studies, reports, sketches, drawings, specifications, proposals and other documents, opinions or advice prepared or provided by ENGINEER, and will obtain the advice of an attorney, insurance counselor or other consultant as the OWNER deems necessary to protect the OWNER's interests before OWNER takes action or forebears to take action based upon or relying upon the services provided by ENGINEER.

7. **SUCCESSORS, ASSIGNS AND BENEFICIARIES**
OWNER and ENGINEER, respectively, bind themselves, their partners, successors, assigns, and legal representatives to the covenants of this Agreement. Neither OWNER nor ENGINEER will assign, sublet, or transfer any interest in this Agreement or claims arising therefrom without the written consent of the other. No third party beneficiaries are intended under this Agreement.

8. **RE-USE OF DOCUMENTS**
All documents, including all reports, drawings, specifications, computer software or other items prepared or furnished by ENGINEER pursuant to this Agreement, are instruments of service with respect to the project. ENGINEER retains ownership of all such documents. OWNER may retain copies of the documents for its information and reference in connection with the project; however, none of the documents are intended or represented to be suitable for reuse by OWNER or others on extensions of the project or on any other project. Any reuse without written verification or adaptation by ENGINEER for the specific purpose intended will be at OWNER's sole risk and without liability or legal exposure to ENGINEER, and OWNER will defend, indemnify and hold harmless ENGINEER from all claims, damages, losses and expenses, including attorney's fees, arising or resulting therefrom. Any such verification or adaptation will

entitle ENGINEER to further compensation at rates to be agreed upon by OWNER and ENGINEER.

9. **TERMINATION OF AGREEMENT**
OWNER or ENGINEER may terminate the Agreement, in whole or in part, by giving seven (7) days written notice to the other party. Where the method of payment is "lump sum," or cost reimbursement, the final invoice will include all services and expenses associated with the project up to the effective date of termination. An equitable adjustment shall also be made to provide for termination settlement costs ENGINEER incurs as a result of commitments that had become firm before termination, and for a reasonable profit for services performed.

10. **SEVERABILITY**
If any provision of this agreement is held invalid or unenforceable, the remaining provisions shall be valid and binding upon the parties. One or more waivers by either party of any provision, term or condition shall not be construed by the other party as a waiver of any subsequent breach of the same provision, term or condition.

11. **INVOICES**
ENGINEER will submit monthly invoices for services rendered and OWNER will make payments to ENGINEER within thirty (30) days of OWNER's receipt of ENGINEER's invoice.

ENGINEER will retain receipts for reimbursable expenses in general accordance with Internal Revenue Service rules pertaining to the support of expenditures for income tax purposes. Receipts will be available for inspection by OWNER's auditors upon request.

If OWNER disputes any items in ENGINEER's invoice for any reason, including the lack of supporting documentation, OWNER may temporarily delete the disputed item and pay the remaining amount of the invoice. OWNER will promptly notify ENGINEER of the dispute and request clarification and/or correction. After any dispute has been settled, ENGINEER will include the disputed item on a subsequent, regularly scheduled invoice, or on a special invoice for the disputed item only.

OWNER recognizes that late payment of invoices results in extra expenses for ENGINEER. ENGINEER retains the right to assess OWNER interest at the rate of one percent (1%) per month, but not to exceed the maximum rate allowed by law, on invoices which are not paid within thirty (30) days from the date OWNER receives ENGINEER's invoice. In the event undisputed portions of ENGINEER's invoices are not paid when due, ENGINEER also reserves the right, after seven (7) days prior written notice, to suspend the performance of its services under this Agreement until all past due amounts have been paid in full.

12. **CHANGES**
The parties agree that no change or modification to this Agreement, or any attachments hereto, shall have any force or effect unless the change is reduced to writing, dated, and made part of this Agreement. The execution of the change shall be authorized and signed in the same manner as this Agreement. Adjustments in the period of services and in compensation shall be in accordance with applicable paragraphs and sections of this Agreement. Any proposed fees by ENGINEER are estimates to perform the services required to complete the project as ENGINEER understands it to be defined. For those projects involving conceptual or process development services, activities often are not fully definable in the initial planning. In any event, as the project progresses, the facts developed may dictate a change in the services to be performed, which may alter the scope. ENGINEER will inform OWNER of such situations so that changes in scope and adjustments to the time of performance and compensation can be made as required. If such change, additional services, or suspension of services results in an increase or decrease in the cost of or time required for performance of the services, an equitable adjustment shall be made, and the Agreement modified accordingly.

13. **CONTROLLING AGREEMENT**
These Terms and Conditions shall take precedence over any inconsistent or contradictory provisions contained in any proposal, contract, purchase order, requisition, notice-to-proceed, or like document.

14. **EQUAL EMPLOYMENT AND NONDISCRIMINATION**
In connection with the services under this Agreement, ENGINEER agrees to comply with the applicable provisions of federal and state Equal Employment Opportunity for individuals based on color, religion, sex, or national origin, or disabled veteran, recently separated veteran, other protected veteran and armed forces service medal veteran status, disabilities under provisions of executive order 11246, and other employment, statutes and regulations, as stated in Title 41 Part 60 of the Code of Federal Regulations § 60-1.4 (a-f), § 60-300.5 (a-e), § 60-741 (a-e).

15. **HAZARDOUS MATERIALS**
OWNER represents to ENGINEER that, to the best of its knowledge, no hazardous materials are present at the project site. However, in the event hazardous materials are known to be present, OWNER represents that to the best of its knowledge it has disclosed to ENGINEER the existence of all such hazardous materials, including but not limited to asbestos, PCB's, petroleum, hazardous waste, or radioactive material located at or near the project site, including type, quantity and location of such hazardous materials. It is acknowledged by both parties that ENGINEER's scope of services do not include services related in any way to hazardous materials. In the event ENGINEER or any other party encounters undisclosed hazardous materials, ENGINEER shall have the obligation to notify OWNER and, to the extent required by law or regulation, the appropriate governmental officials, and ENGINEER may, at its option and without liability for delay, consequential or any other damages to OWNER, suspend performance of services on that portion of the project affected by hazardous materials until OWNER: (i) retains appropriate specialist consultant(s) or contractor(s) to identify and, as appropriate, abate, remediate, or remove the hazardous materials; and (ii) warrants that the project site is in full compliance with all applicable laws and regulations. OWNER acknowledges that ENGINEER is performing professional services for OWNER and that ENGINEER is not and shall not be required to become an "arranger," "operator," "generator," or "transporter" of hazardous materials, as defined in the Comprehensive Environmental Response, Compensation, and Liability Act of 1990 (CERCLA), which are or may be encountered at or near the project site in connection with ENGINEER's services under this Agreement. If ENGINEER's services hereunder cannot be performed because of the existence of hazardous materials, ENGINEER shall be entitled to terminate this Agreement for cause on 30 days written notice. To the fullest extent permitted by law, OWNER shall indemnify and hold harmless ENGINEER, its officers, directors, partners, employees, and subconsultants from and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) caused by, arising out of or resulting from hazardous materials, provided that (i) any such cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or injury to or destruction of tangible property (other than completed Work), including the loss of use resulting therefrom, and (ii) nothing in this paragraph shall obligate OWNER to indemnify any individual or entity from and against the consequences of that individual's or entity's sole negligence or willful misconduct.

16. **EXECUTION**
This Agreement, including the exhibits and schedules made part hereof, constitute the entire Agreement between ENGINEER and OWNER, supersedes and controls over all prior written or oral

understandings. This Agreement may be amended, supplemented or modified only by a written instrument duly executed by the parties.

17. **ALLOCATION OF RISK**
OWNER AND ENGINEER HAVE EVALUATED THE RISKS AND REWARDS ASSOCIATED WITH THIS PROJECT, INCLUDING ENGINEER'S FEE RELATIVE TO THE RISKS ASSUMED, AND AGREE TO ALLOCATE CERTAIN OF THE RISKS, SO, TO THE FULLEST EXTENT PERMITTED BY LAW, THE TOTAL AGGREGATE LIABILITY OF ENGINEER (AND ITS RELATED CORPORATIONS, SUBCONSULTANTS AND EMPLOYEES) TO OWNER AND THIRD PARTIES GRANTED RELIANCE IS LIMITED TO THE LESSER OF $1,000,000 OR ITS FEE, FOR ANY AND ALL INJURIES, DAMAGES, CLAIMS, LOSSES, OR EXPENSES (INCLUDING ATTORNEY AND EXPERT FEES) ARISING OUT OF ENGINEER'S SERVICES OR THIS AGREEMENT REGARDLESS OF CAUSE(S) OR THE THEORY OF LIABILITY, INCLUDING NEGLIGENCE, INDEMNITY, OR OTHER RECOVERY.

18. **LITIGATION SUPPORT**
In the event ENGINEER is required to respond to a subpoena, government inquiry or other legal process related to the services in connection with a legal or dispute resolution proceeding to which ENGINEER is not a party, OWNER shall reimburse ENGINEER for reasonable costs in responding and compensate ENGINEER at its then standard rates for reasonable time incurred in gathering information and documents and attending depositions, hearings, and trial.

19. **NO THIRD PARTY BENEFICIARIES**
No third party beneficiaries are intended under this Agreement. In the event a reliance letter or certification is required under the scope of services, the parties agree to use a form that is mutually acceptable to both parties.

20. **UTILITY LOCATION**
If underground sampling/testing is to be performed, a local utility locating service shall be contacted to make arrangements for all utilities to determine the location of underground utilities. In addition, OWNER shall notify ENGINEER of the presence and location of any underground utilities located on the OWNER's property which are not the responsibility of private/public utilities. ENGINEER shall take reasonable precautions to avoid damaging underground utilities that are properly marked. The OWNER agrees to waive any claim against ENGINEER and will indemnify and hold ENGINEER harmless from any claim of liability, injury or loss caused by or allegedly caused by ENGINEER's damaging of underground utilities that are not properly marked or are not called to ENGINEER's attention prior to beginning the underground sampling/testing.

21. **UNMANNED AERIAL SYSTEMS**
If operating UAS, ENGINEER will obtain all permits or exemptions required by law to operate any UAS included in the services. ENGINEER's operators have completed the training, certifications and licensure as required by the applicable jurisdiction in which the UAS will be operated. OWNER will obtain any necessary permissions for ENGINEER to operate over private property, and assist, as necessary, with all other necessary permissions for operations.

22. **OPERATIONAL TECHNOLOGY SYSTEMS**
OWNER agrees that the effectiveness of operational technology systems ("OT Systems") and features designed, recommended or assessed by ENGINEER are dependent upon OWNER's continued operation and maintenance of the OT Systems in accordance with all standards, best practices, laws, and regulations that govern the operation and maintenance of the OT Systems. OWNER shall be solely responsible for operating and maintaining the OT System in accordance with applicable industry standards (i.e. ISA, NIST, etc.) and best practices, which generally include but are not limited to, cyber security policies and procedures, documentation and training requirements, continuous monitoring of assets for tampering and intrusion, periodic evaluation for asset vulnerabilities, implementation and update of appropriate technical, physical, and operational standards, and offline testing of all software/firmware patches/updates prior to placing updates into production. Additionally, OWNER recognizes and agrees that OT Systems are subject to internal and external breach, compromise, and similar incidents. Security features designed, recommended or assessed by ENGINEER are intended to reduce the likelihood that OT Systems will be compromised by such incidents. However, ENGINEER does not guarantee that OWNER's OT Systems are impenetrable and OWNER agrees to waive any claims against ENGINEER resulting from any such incidents that relate to or affect OWNER's OT Systems.

Exhibit 3

INVOICE

C & S Quality Services,LLC

1042 Forest Hill
Lawrenceburg, KY 40342
859-265-0907
[redacted]

INVOICE NO. 22-17
DATE 9/21/2022
CUSTOMER ID LCWD
PURCHASE ORDER #

TO Lyon County Water District
5464 US 62
Kuttawa, KY 42055

JOB Water Tank Leak Repair

TERMS Net 30

DESCRIPTION	TOTAL
Repair Leak in water storage tank	$4,000.00
TOTAL DUE	$4,000.00

Thank You for your Business!

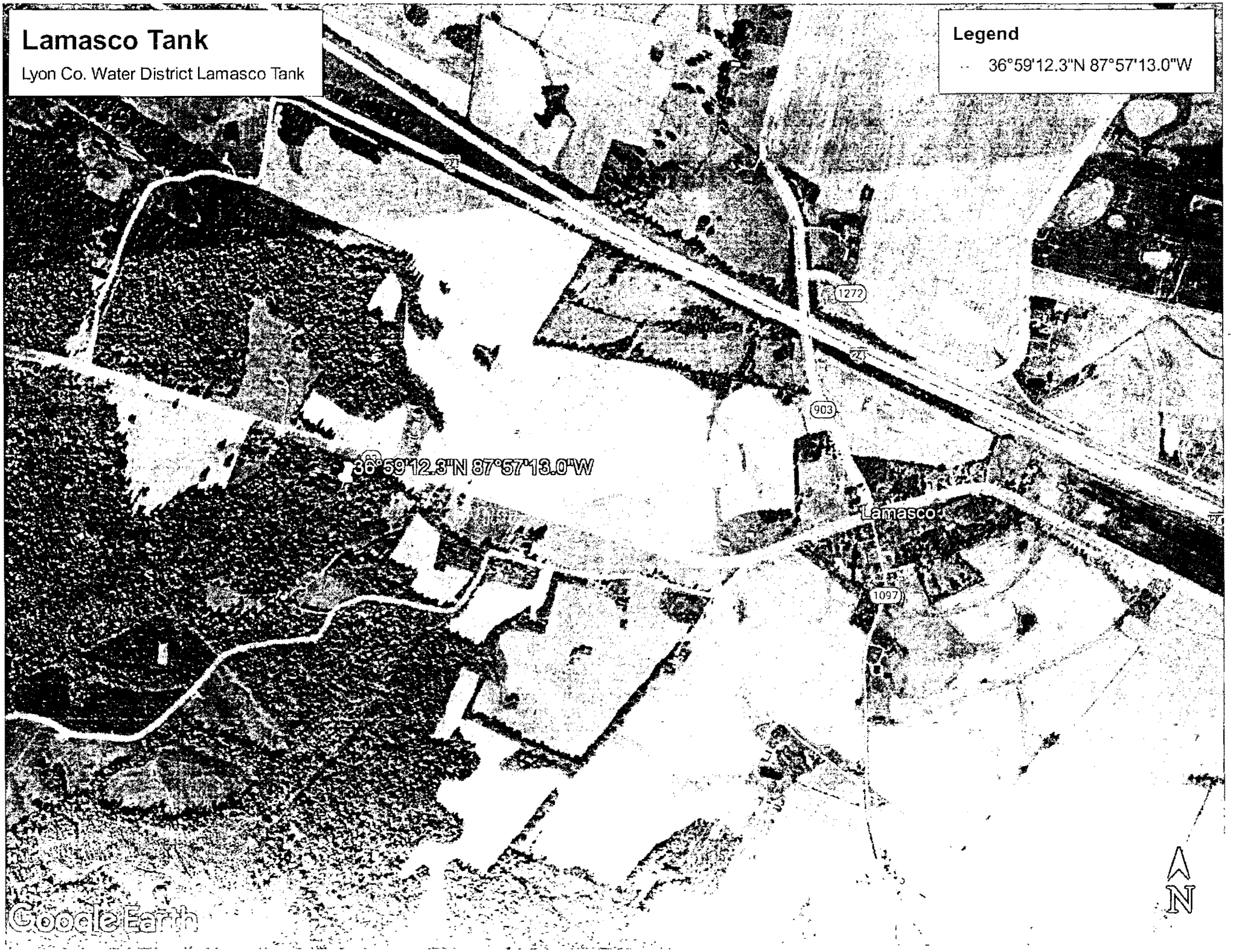
Submitted By	Jeff Hildebrandt

Jeff Hildebrandt

MAB 9/21/22

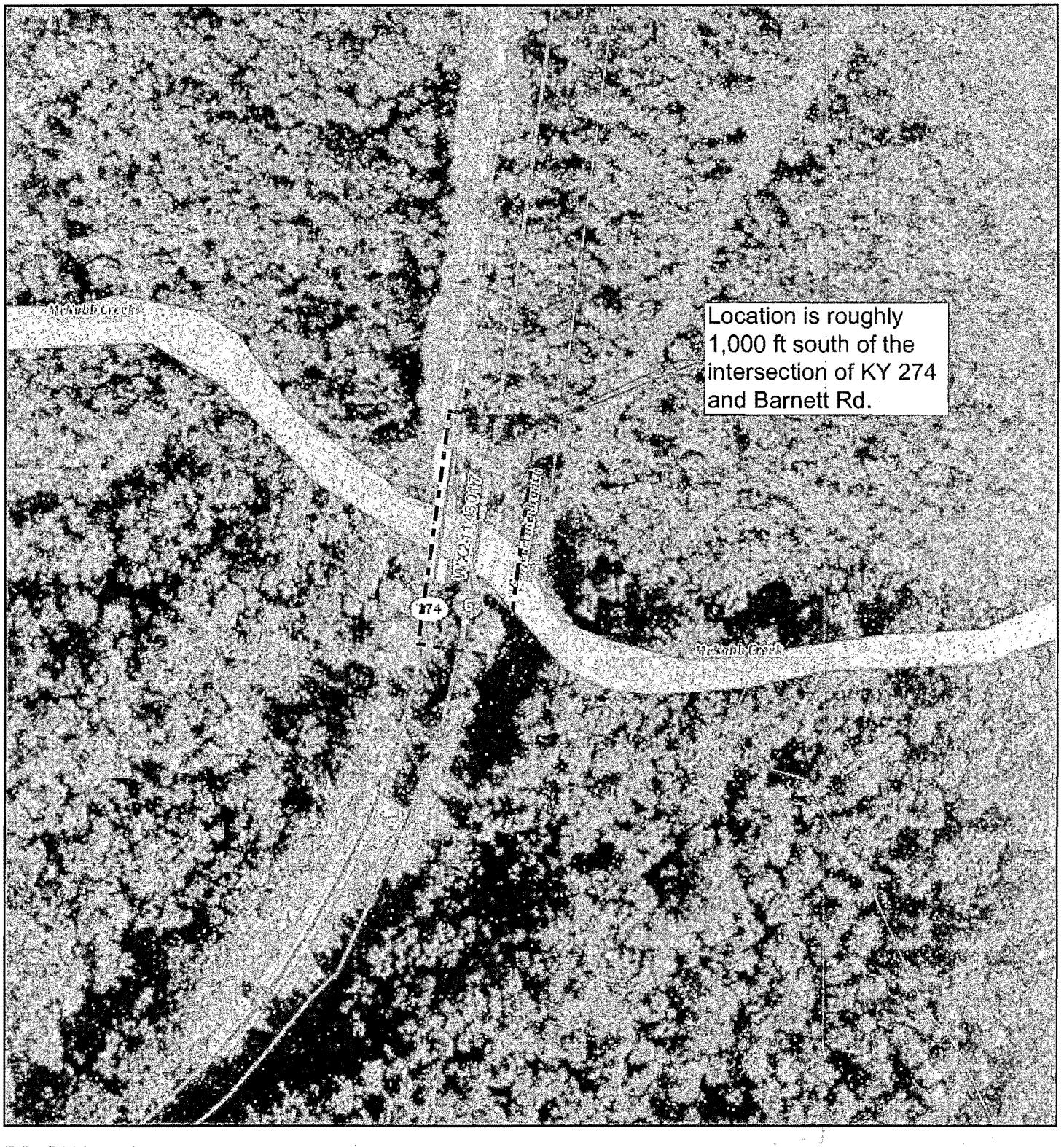
Exhibit 4


Thomason Tank
Lyon Co. Water District Thomason Tank
Legend
37°06'13.9"N 88°08'05.5"W
Glen Chapel Rd
Jack Thomason Rd
Jack Thomason Rd
State Hwy 293 N
37°06'13.9"N 88°08'05.5"W
N
Google Earth


Lamasco Tank
Lyon Co. Water District Lamasco Tank
Legend
36°59'12.3"N 87°57'13.0"W
1272
24
903
36°59'12.3"N 87°57'13.0"W
Lamasco
1097
Google Earth
N

KY 274 Crossing

ArcGIS Web Map



7/26/2022, 11:05:31 AM

- Proposed Water Extensions
- Water Lines
- Non-Community Points
- Proposed Water Improvements
- Well Sources
- Water Treatment Plants
- Water Tanks
- Pump Stations
- Water Meters
- Surface and Spring Sources
- Purchase Sources
- Water Pumps

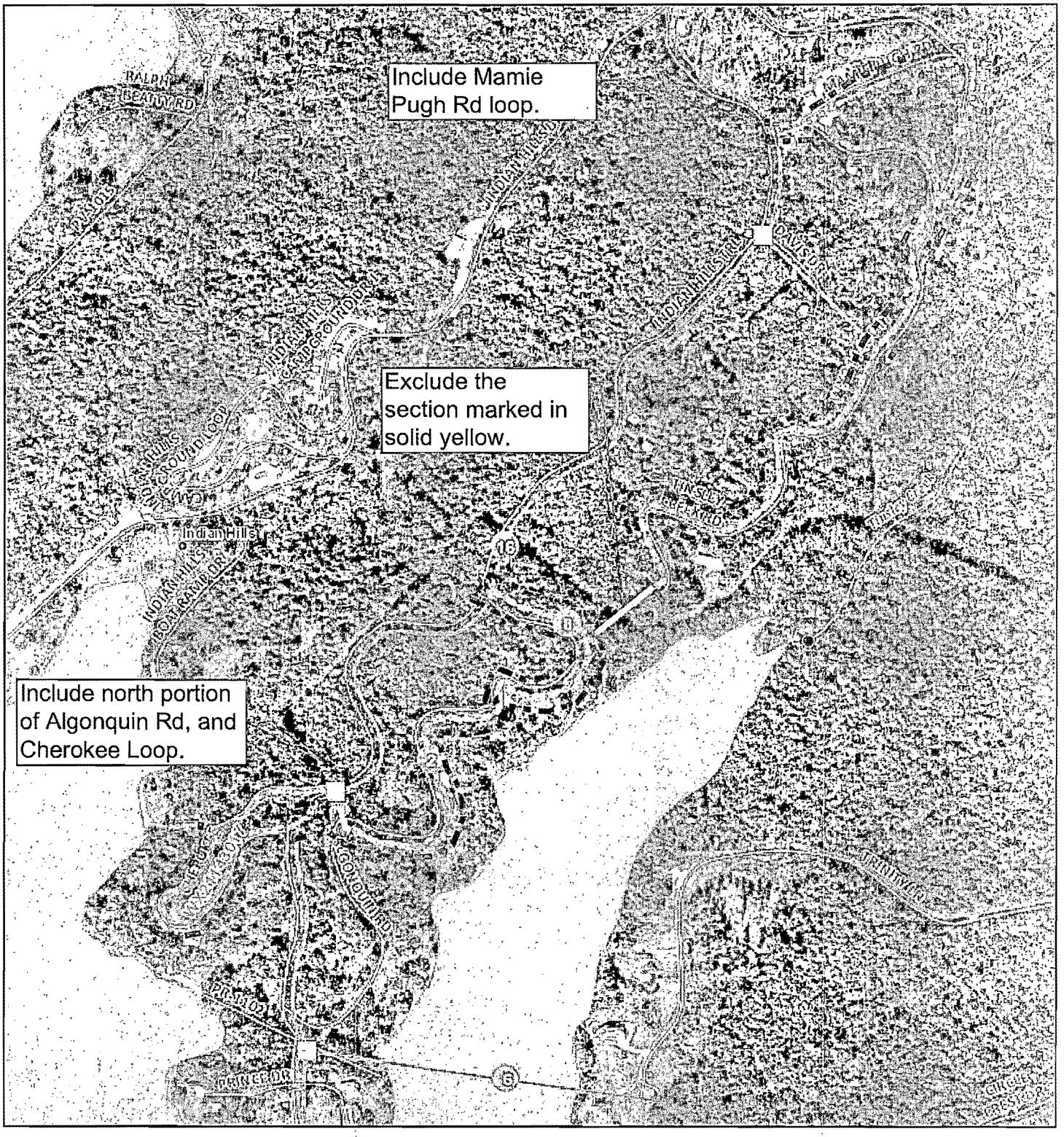
1:2,257

0 0.01 0.03 0.06 mi

0 0.02 0.04 0.09 km

Tinsley Creek Rd.

ArcGIS Web Map



6/24/2022, 9:21:03 AM

1:9,028

0 0.05 0.1 0.2 mi

0 0.07 0.15 0.3 km

- Water Lines
- Proposed Water Extensions
- Well Sources
- Water Treatment Plants
- Water Tanks
- Pump Stations
- Water Meters
- Surface and Spring Sources
- Purchase Sources
- Water Pumps
- Non-Community Points
- Proposed Water Improvements

Esri, HERE, Garmin, GeoTechnologies, Inc., Intermap, USGS, METI/NASA, EPA, USDA, Kentucky Infrastructure Authority (KIA), Kentucky Division of Geographic Information (DGI)

Exhibit 5

I, Shelia Brennan, office manager of the Herald Ledger, a newspaper of general circulation, published in the City of Eddyville, County of Lyon, State of Kentucky, do hereby affirm this legal advertisement emailed electronically to your company was published in the Nov. 16. 2022, Nov. 23, 2022, and Nov. 30, 2022 editions of the Herald Ledger per electronic tear sheets attached to this email.

Shelia Brennan

Shelia Brennan

3/10/2023

Subscribed and sworn to me, a Notary Public within the State and County aforesaid, by Shelia Brennan, to me personally known, this 3rd day of March 2023

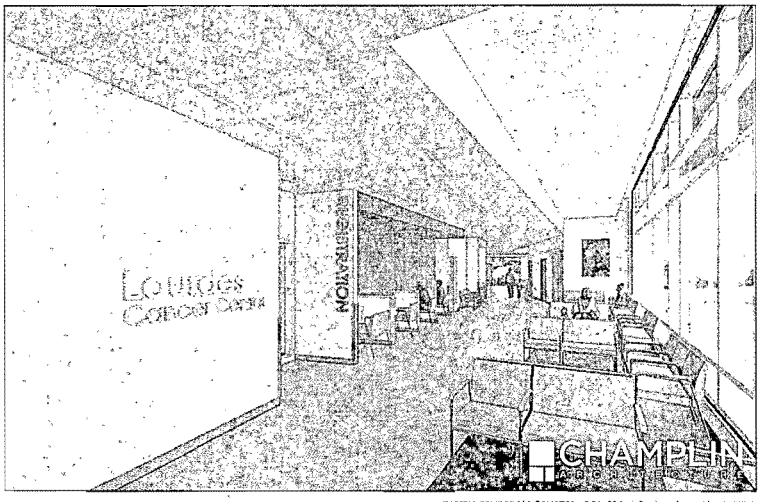
My Commission expires the 14th day of June (year) 2025

County of Caldwell Notary Public Rachel Chandler #KYMP31433

RACHEL A. CHANDLER
NOTARY PUBLIC
STATE AT LARGE KENTUCKY
#KYMP31433
MY COMMISSION EXPIRES JUNE 14, 2025

Mercy Health-Lourdes plans new cancer center

BY HANNAH SAAD
HSAAD@PADUCAHSUN.COM



DIGITAL RENDERING COURTESY OF MERCY HEALTH-LOURDES HOSPITAL

This digital rendering shows a layout for part of the new Mercy Health-Lourdes Hospital cancer center, a $12.5 million project. The 19,000-square-foot facility is scheduled to be completed in mid-2024.

PADUCAH — Mercy Health-Lourdes Hospital plans to build a new $12.5 million, 19,000 square foot facility to serve as a full-service cancer center for all of the hospital's oncology-related services, officials announced last week.

The new comprehensive, full-service cancer center is being designed to house all of the cancer treatment and oncology patient services the hospital offers all under one roof, as opposed to its current setup throughout the Mercy Health-Lourdes Hospital campus.

This new center is planned for the open space in between Lourdes Hospital and the Paducah Medical Pavilion on Lone Oak Road in Paducah. Mercy Health has scheduled groundbreaking for the new cancer center for Dec. 13, and anticipates construction being completed during the second quarter of 2024.

"We have a very, very busy cancer program at Mercy Health-Lourdes Hospital. This is going to allow us to consolidate all of our services into one convenient location for patients to get care," Mercy Health-Lourdes Hospital Oncology Service Line Director John Montville told The Paducah Sun.

The planned cancer center will provide medical practice space for three medical oncologists/hematologists and three advanced practice providers working from 21 exam rooms and one procedure room. There will also be an infusion room with 22 infusion bays that allows for flexible configurations; an oncology pharmacy and laboratory; a community resource room; a prayer and meditation room; and space for all integrative and ancillary cancer services like oncology nurse navigation, oncology social workers, oncology financial counselors and other oncology-related support services.

For Montville, this new cancer center is one way the hospital can keep patients and the comfort of patients at the forefront of Mercy Health-Lourdes Hospital's mission. Patients battling cancer often sacrifice control over many elements of their lives to doctors and medical professionals to help get the best treatment, Montville said. His goal for the new cancer center is to provide a patient-centric environment.

"We're trying to focus heavily on making patients who have to access these services as comfortable as possible, putting them in an environment where they're comfortable, they're not overwhelmed, and they can have some control over their disease and their disease course," Montville said.

Looking for ways to incorporate sustainable energy in its practices, Mercy Health-Lourdes Hospital's cancer center will also be Bon Secours Mercy Health's first facility in its network that will have a geothermal system, which uses heat from within the earth to act as a heating and cooling system.

Mercy Health-Lourdes Hospital Chief Operating Officer Rick Goins said while the geothermal system costs more up front than a typical heating and cooling system, it should cost less over time to maintain and manage because it will use less energy over time.

"It will be a good way for Bon Secours Mercy Health to really get a sense of how well this works, as well as what kind of energy savings and energy consumption reduction we can really achieve," Goins said.

Champlin Architecture is the project's architect, and Ray Black & Son is the project's construction firm. A virtual walkthrough of the cancer center is available on YouTube at youtube.com/watch?v=RyefymS-Ino.

A full list of Mercy Health oncology services it offers is available at mercy.com/health-care-services/cancer-care-oncology.

Follow Hannah Saad on Twitter, @ByHannahSaad or on Facebook at facebook.com/hannahsaadpaducahsun.

A day of thanks

BY SEN. JASON HOWELL

As the 2022 Interim draws to a close, the Kentucky General Assembly is preparing for the upcoming 2023 Regular Session, a short, 30-day session scheduled to begin Tuesday, Jan. 3.

Fortunately, election season is in the rearview mirror and your attention is likely now fully on what makes the holiday season so special — family, friends and the people who make our local communities so special. Each Thanksgiving, I enjoy being home in my district, hearing from constituents and creating memories with those I love.

In the spirit of the season of giving, let's remember those most in need as we prepare our Thanksgiving meals. Consider reaching out to a community food bank or other organization to help feed the hungry, especially during cold fall and winter months. As Americans and Kentucky residents, we have so much to be thankful for, and volunteering time and resources can make an incredible difference in our less fortunate neighbors' lives.

Remember our service members, many of whom will be apart from their families this Thanksgiving, as they are away serving our country. The unique freedoms we enjoy in the United States are because of their sacrifices.

This time of year also presents an excellent opportunity to support local businesses. Please consider your locally-owned stores as you check gifts off your list; small businesses remain the heartbeat of our economy.

This Thanksgiving, I am incredibly proud of the Republican-led legislature and the many successes we have had over the last several years. We in the Senate majority are pleased to welcome new members to our caucus.

They are:

Sen.-Elect Lindsay Tichenor, Senate District 6

Sen.-Elect Gary Boswell, Senate District 8

Sen.-Elect Matthew Deneen, Senate District 10

Sen.-Elect Amanda Mays Bledsoe, Senate District 12

Sen.-Elect Gex "Jay" Williams, Senate District 20

Sen.-Elect Shelley Funke Frommeyer, Senate District 24

Whether it is with food, football, family, or a combination of all of these, have a blessed Thanksgiving.

Sen. Jason Howell, R-Murray, represents the 1st District including Calloway, Crittenden, Fulton, Graves, Hickman, Lyon and Trigg counties.

Be thankful

BY CHIP HUTCHESON

Journalists often have stories they are obligated to write.

But at Thanksgiving, that is not the case. Reflecting on things I am thankful for is something I look forward to, counting it a privilege to reflect on the Lord's blessings.

Early in our school years, we are taught about the Pilgrims and that first Thanksgiving. But offering thanks to the Lord goes back much further.

The Bible instructs us to "give thanks in all circumstances" (1 Thes. 5:18). The word "thanks" appears 151 times in scripture, but there are numerous other instances that speak of being grateful. Perhaps a church sign we saw a decade ago sums it up well: "Do The Math: Count Your Blessings."

Studies reveal that the more Americans have, the less contentment we find. But Thanksgiving provides the perfect opportunity to focus on those blessings from the Lord that cannot be measured in dollars. The Pilgrims faced a hard winter in a strange land, yet they set aside time to give thanks to God for His provision — certainly that is what we should do as we gather around tables of plenty this Thanksgiving.

As believers in the Living God, we know that contentment and security are not found in the material world, but in Jesus Christ. Our celebration of Thanksgiving is meaningless unless our primary focus is on what the Lord has done for us.

One of my favorite songs is "Give Thanks," and its lyrics sum it up quite well ...

Give thanks with a grateful heart

Give thanks to the Holy One

Give thanks because He's given Jesus Christ, His Son

And now let the weak say, "I am strong

Let the poor say, "I am rich

Because of what the Lord has done for us."

As I count my blessings, they include ...

• The truth of Eph. 2:8-9: "For by grace are you saved through faith, and this not from yourselves; it is God's gift — not of works so that no one can boast" (ESV).

• Those times when every chair is filled in the Sunday school class.

• God's amazing provision in healing our daughter of Stage IV melanoma 15 years ago.

• My wife — my best friend. She said she would never leave Princeton, where we lived for 43 years, but willingly moved to Louisville when the Lord opened this door of ministry for me.

• The best co-workers at KBC that anyone could ever ask for.

• The family that follows the Lord's leading in adopting a child.

• The overturning of Roe v. Wade.

• Grandchildren. Words are inadequate to describe the multitude of blessings they provide.

• Making new friends and spending time with old friends.

• The opportunities the Lord gives to bear witness to His saving power.

• Knowing you've done the right thing, no matter what others may think.

• Opportunities the Lord has provided for me to be involved as an interim or supply preacher in a number of churches and the wonderful relationships that have been formed.

• The blue lights that appear in my rear view mirror, but are not meant for me.

• Being old enough that my son doesn't expect me to ride a roller coaster again.

• The faith of this country's Founding Fathers, whose words of reliance upon God are inspirational

• The young person who says, "yes, sir," or "no, sir."

• The solemnity of a man and woman standing at the altar, saying "I do."

• The end of the month arriving and there's still a little money left in the checking account.

• For amazingly good health, including not having COVID.

• My adult children, who have an elevated (yet undeserved) opinion of me.

• The Bible, which is profitable for doctrine, reproof, correction and instruction in righteousness.

• Parents, now deceased, who taught me the difference between right and wrong.

• Utility bills — that way I know I can stay warm in winter and cool in summer.

• The person who can laugh at himself or herself.

• The person who is quick to welcome any visitor to church.

• The brave men and women who wear the uniform and serve in our Armed Forces.

• That beauty is all around me. After all, there are some whose world is always dark.

• That I can hear music playing, because there are those whose entire life is spent in silence.

• That I can work, because there are others who must depend on others for their most basic needs.

• That I am loved, because there are those for whom no one has ever cared.

• That I can cry, because roses have thorns. Or I can celebrate, because thorns have roses.

THE CLASSIFIED SECTION

CALL 270-601-4115 TO PLACE AN AD!

INVITATION TO BID

RECEIPT OF PROPOSALS: The City of Eddyville will receive bids for the Water Metering System Improvements project until 11:00 am (local time) Wednesday, November 30, 2022, in Eddyville City Hall, 153 Main Street, Eddyville, KY 42038, at which time all bids will be publicly opened and read aloud.

PROJECT: Includes material supply and installation of approximately 1,200, 5/8" x ¾" ultrasonic water meters, 30, 1" ultrasonic water meters, 40, 2" ultrasonic water meters, 2, 4" ultrasonic water meters, and 2, 6" ultrasonic water meters, complete with electronic encoders and fully functional radio read system.

OBTAINING CONTRACT DOCUMENTS: Electronic copies of bid documents may be obtained from the City of Eddyville at the address listed above at no charge. Contact City Hall at 270-388-2226 or email eddyville@vci.net for copies of the bid documents.

OWNER'S RIGHTS RESERVED: The City of Eddyville reserves the right to reject any or all bids or waive any informalities in the bidding. No bid shall be withdrawn for a period of thirty (30) days subsequent to the opening of bids without the consent of the City of Eddyville.

CITY OF EDDYVILLE, KY
By John Choat
Title Mayor

ADVERTISEMENTS FOR BIDS
Lyon County Water District
Contract III Tank Improvements
Kuttawa, Kentucky

A mandatory Pre-Bid Conference and site visit will be held 22 November 2022 @ 10:00am CDT. The conference will commence at Lyon County Water District, at 5464 US-62, Kuttawa, Kentucky 42055, and will include a site visit to both Tank Sites.

Separate sealed bids will be received for Contract III Water Tank Improvements by the Owner, Lyon County Water District, at 5464 US-62, Kuttawa, Kentucky 42055 until 1 :00 pm CDT on December 6th, 2022. Bids will then be opened and read aloud at this location, at that time.

This project consists of rehabilitation and improvements for two existing water storage tanks. The Lamasco Tank is a 169,000-gallon standpipe water storage tank located along KY Highway 93 in Lamasco, Kentucky and the Jack Thomason Tanks is a 100,000-gallon elevated water storage tank located in Eddyville, Kentucky. Work to be performed includes, but is not limited to, repair, cleaning, and painting of the Jack Thomason Tank, as well as the installation of a mixing system, anti-corrosion system, and altitude valve assembly at the Lamasco Tank, and all other Work required in accordance with the Contract Documents.

Bidding documents may be obtained from:
• Paducah Blueprint and Supply Co., Inc.
999 Broadway St, Paducah, Kentucky 42001
270.444.6171

All bidders shall submit with their bid an acceptable bid bond or a certified check in the amount of five percent (5%) of the bid, payable to the Owner.

The Owner reserves the right to waive any informalities or to reject any and all bids. No bidder may withdraw their bid within 30 days after the date of the bid opening.
The award of this project will be to the lowest, responsive, responsible bidder.

This project is funded with funds provided by the Kentucky Drinking Water State Revolving Fund (SRF) with federal funds provided by the Environmental Protection Agency. SRF requirements (including American Iron and Steel and Davis-Bacon) and provisions must be met by the Bidder and all subcontractors.

Bidders must comply with the President's Executive Order No. 11246 as amended, which prohibits the discrimination in employment regarding race, creed, color, sex or national origin. The project shall be in compliance with Executive Order 11246 as amended. All contractors/subcontractors shall comply with 41 CFR 60-4, in regard to affirmative action, to ensure equal opportunity to females and minorities and will apply the timetables and goals set forth in 41 CFR 60-4.

Small and Disadvantaged Business Enterprises are encouraged to bid on this project. Lyon County Water District is an Equal Opportunity Employer.

Honorable Chairman
Don Robertson

Herald Ledger publishes birth announcements free of charge.

Because little things are a big deal.

LYON COUNTY EMERGENCY PLANNING COMMITTEE

Pursuant to Section 324, Title II of the 1986 Federal Superfund Amendments and Reauthorization Act (SARA) of 1986, 42 U.S.C. 11001 et. seq., the following information is provided in compliance with the Community Right to Know requirements of the SARA Law, 61.805, 61.810, 61.823, 61.825, 61.835. Members of the public may contact the Lyon County Emergency Planning Committee by writing Randy Wright, Chairman of the Lyon County Emergency Planning Committee, 500 E. Dale, Eddyville, KY 42038, or contact by telephone at 270-210-0846. The Lyon County Emergency Planning Committee conducts meetings in the Fiscal Court room (500 E. Dale, Eddyville, KY) or at other locations, in accordance with the Kentucky Open Meetings Law.

Members of the public may request to be notified of regular or special-called meetings as provided in KRS 61.820. Records of the Planning Committee, including the county emergency response plan, material safety data sheets, and inventory forms, or any follow-up emergency notices as may subsequently be issued, are open for inspection, and members of the public who wish to review these records may do so by request at Lyon County Emergency Management, 500 E. Dale, Eddyville, KY, as required by the Kentucky Open Records Law. The local 24-hour telephone number for purposes of emergency notification, as required by SARA Law is 270-388-0911.

The Times Leader and Herald Ledger newspapers will be closed Thursday, Nov. 24, and Friday, Nov. 25, in observance of the Thanksgiving holiday. Regular office hours will resume on Monday, Nov. 28.
The staff wishes everyone a Happy and Safe Thanksgiving.

Wedgewood, Robertson lead Stars to win over Blues

BY THE ASSOCIATED PRESS

ST. LOUIS — Scott Wedgewood made 23 saves in an unexpected start and Wyatt Johnston broke a scoreless tie with a second-period goal to lead the Dallas Stars over the St. Louis Blues 4-1 on Monday night.

Jason Robertson, Ty Dellandrea and Miro Heiskanen also scored for Dallas, which has earned at least one point in eight of its last nine games.

Brandon Saad scored for St. Louis, which has lost three of four.

Jamie Benn had two assists for the Stars, who lead the Central Division with 30 points.

Wedgewood was scheduled to serve as Jake Oettinger's backup, but moved into the starting role after Oettinger became ill right before the game.

"As a backup, you've got to prepare in case of anything like this," Wedgewood said. "I took my nap, I ate my pregame meal. You've got to be ready."

Dallas coach Pete DeBoer was impressed with Wedgewood's ability to adapt at the last minute.

"It takes a lot of character to be able to turn yourself on like that and then give us a game like he did in a critical moment," DeBoer said. "He didn't know he was starting until essentially warmup game time. A last-minute illness came over (Oettinger) and he just couldn't go."

Robertson extended his point streak to 16 games with a goal that made it 3-1 late in the third. Robertson has 17 goals and 12 assists during the run. He leads the NHL with 19 goals.

Heiskanen added an empty-netter to seal it.

"This was a playoff-type game for both teams," DeBoer said.

Johnston, who had his first multipoint game of the season, said Wedgewood set an early tone.

"He was able to close the door for us," Johnston said. "That was big. We were able to play with the lead and gain a lot of confidence."

Johnston whipped a wrist shot past Jordan Binnington at 3:51 of the middle period for his sixth goal of the season and second in three games. It capped an odd-man rush that began when St. Louis center Brayden Schenn misfired at the other end.

Dellandrea converted a pass from Johnston to make it 2-0 with 12:03 left in the third.

Saad trimmed the deficit in half by deflecting a drive from Josh Leivo from along the right wing.

Wedgewood made a diving glove save of a shot by Pavel Buchnevich in the first.

"Sometimes you've got to be good and lucky," Wedgewood said.

The Stars improved to 11-0 when leading after two periods.

St. Louis has still won eight of 11.

"We were solid. We played 40 minutes," coach Craig Berube said. "We need more of an attack mentality in the third period."

INJURY NOTE

St. Louis C Robert Thomas missed the game with a lower-body injury sustained in the third period of Friday's 5-4 win over Florida. He is day-to-day. Thomas leads the team with 15 assists.

RIVAL

FROM PAGE B7

Earlier, J.J. Weaver stripped Domann of the football on a second-quarter sack and returned it to the 6, setting up Ruffolo's second field goal from 29 yards to make it 13-0.

"Our team responded how I believed they would," coach Mark Stoops said. "This game is important and recognized that from the moment I walked in the door. ... It's important for our football players and our staff, and I really appreciate the way we dug in, competed and finished the season."

Levis was 11 of 19 passing for 188 yards and also tossed an 8-yard TD pass to Dane Key on Kentucky's second possession. His pass to wide-open tight end Josh Kattus turned into a 70-yard catch-and-run and set the stage for his first score three plays later.

The Wildcats never trailed, even though it took another Levis TD pass for the Wildcats to really feel comfortable with Bluegrass bragging rights — again.

"Great way to end the year at home," said Levis, who beat Louisville for the second consecutive year. "The season didn't go the way we wanted and we needed the win and got it."

Chris Rodriguez Jr. rushed 24 times for 120 yards and broke the school record with his 20th 100-yard performance.

Ruffolo converted from 43, 29, 35 and 40 yards along with making both extra points for Kentucky on the way to becoming the first kicker to earn the Howard Schnellenberger Award as Most Valuable Player.

Louisville's Jawhar Jordan rushed 22 times for 145 yards, both career bests for the Syracuse transfer.

Cunningham, a four-year starter at QB, relieved an ineffective Domann in the second quarter and got Louisville (7-5, No. 25 CFP) within 13-7 just before halftime with a 6-yard TD run. His participation was somewhat surprising considering he missed last week's win over North Carolina State with an injured shoulder, and coach Scott Satterfield said afterward that Cunningham hadn't taken many snaps the past two weeks.

"Malik comes in and not fully healthy, but I felt we needed a spark," the coach added. "I appreciate the effort and the toughness."

Domann returned when Cunningham was injured again on the interception and threw a 27-yard TD pass to Tyler Hudson midway through the fourth cut the deficit to 26-13. Officials ruled that his two-point conversion run came up short after review.

Both struggled to get anything going offensively for the Cardinals, who played catch-up all night after winning five of six coming in and entering the College Football Playoff rankings last week.

"We just did not have enough offensive firepower," Satterfield said.

FAREWELL

Before the game Kentucky honored 28 seniors including Levis, a Penn State transfer who is projected to be a first-round selection in next year's NFL draft.

Wildcats linebacker Chris Oats, whose career was ended by a stroke in May 2020, received loud cheers and an ovation. The Cincinnati native played in 25 games over the 2018 and '19 seasons with two bowl games before he was stricken. He thanked teammates and fans in a Twitter post this week.

THE TAKEAWAY

Louisville: Everything that worked offensively during the Cardinals' 5-1 surge coming in failed miserably, whether Domann or Cunningham was behind center. Allowing a tight end to break an explosive was the first sign their defense would have a long day, and it never got better.

Kentucky: Besides out-gaining Louisville 346-309 overall, the Wildcats came up just six yards short of one of the nation's top rushing teams (164-158). Ruffolo had struggled at times this season but made every chance he got in the game that mattered — especially for teammates seeking to climb from a second-half swoon.

ADVERTISEMENTS FOR BIDS
Lyon County Water District
Contract II Tank Improvements
Kuttawa, Kentucky

A mandatory Pre-Bid Conference and site visit will be held 22 November 2022 @ 10:00am CDT. The conference will commence at Lyon County Water District, at 5464 US-62, Kuttawa, Kentucky 42055, and will include a site visit to both Tank Sites.

Separate sealed bids will be received for Contract II Water Tank Improvements by the Owner, Lyon County Water District, at 5464 US-62, Kuttawa, Kentucky 42055 until 1:00 pm CDT on December 6th, 2022. Bids will then be opened and read aloud at this location, at that time.

This project consists of rehabilitation and improvements for two existing water storage tanks. The Lamasco Tank is a 189,000-gallon standpipe water storage tank located along KY Highway 93 in Lamasco, Kentucky and the Jack Thomason Tank is a 100,000-gallon elevated water storage tank located in Eddyville, Kentucky. Work to be performed includes, but is not limited to, repair, cleaning, and painting of the Jack Thomason Tank, as well as the installation of a mixing system, anti-corrosion system, and altitude valve assembly at the Lamasco Tank, and all other Work required in accordance with the Contract Documents.

Bidding documents may be obtained from:
• Paducah Blueprint and Supply Co., Inc.
999 Broadway St, Paducah, Kentucky 42001
270.444.6171

All bidders shall submit with their bid an acceptable bid bond or a certified check in the amount of five percent (5%) of the bid, payable to the Owner.

The Owner reserves the right to waive any informalities or to reject any and all bids. No bidder may withdraw their bid within 30 days after the date of the bid opening.
The award of this project will be to the lowest, responsive, responsible bidder.

This project is funded with funds provided by the Kentucky Drinking Water State Revolving Fund (SRF) with federal funds provided by the Environmental Protection Agency. SRF requirements (including American Iron and Steel and Davis-Bacon) and provisions must be met by the Bidder and all subcontractors.

Bidders must comply with the President's Executive Order No. 11246 as amended, which prohibits the discrimination in employment regarding race, creed, color, sex or national origin. The project shall be in compliance with Executive Order 11246 as amended. All contractors/subcontractors shall comply with 41 CFR 60-4, in regard to affirmative action, to ensure equal opportunity to females and minorities and will apply the timetables and goals set forth in 41 CFR 60-4.

Small and Disadvantaged Business Enterprises are encouraged to bid on this project. Lyon County Water District is an Equal Opportunity Employer.

Honorable Chairman
Don Robertson

Notice of Vacant Lyon County Board of Education Seat

The Lyon County School District is seeking applications for appointment to the Lyon County Board of Education. Individuals interested in being appointed to the vacant seat in educational district #5 are encouraged to submit a letter of intent to Superintendent Russ Tilford. Applicants must meet the eligibility requirements established by KRS 160.180 and shall submit with the application complete with evidence of a high school diploma or a GED certificate.

This appointment is effective until the end of the term, ending December 31, 2022. This appointment is a public service position. The appointee shall not be employed by the Lyon County School District.

Requirement for board members must be:

- At least 24 years old
- A Kentucky citizen for the last three years,
- A registered voter in educational district #5.
- Have a high school diploma or GED certificate.
- Meet all other qualifications set forth in law (KRS 160.180).

Letters of intent and supporting documentation may be submitted by mail to Superintendent Russ Tilford, 217 Jenkins Road, Eddyville, KY 42038 or by email at russ.tilford@lyon.kyschools.us

Letters of interest will be accepted until December 12. Interviews to fill the vacancy will be conducted by the Board of Education after the deadline has passed.

Exhibit 6

Bid Tabulation
2022 KIA Contract III Tank Improvements
Lyon County Water District

Unit Price Work Base Bid Items				Engineer Estimate		C & S Quality Services, LLC		Sam Estes Painting and Sandblasting, Inc.	
Item No.	Description	Unit	Est Qty	Unit Price	Extended Price	Unit Price	Extended Price	Unit Price	Extended Price
1	Repair, Cleaning, Painting of 100,000 Gallon Tank (Jack Thomason)	LS	1	$ 200,000	$ 200,000	$ 164,100	$ 164,100	$ 176,120	$ 176,120
2	Replacement of Manway (Jack Thomason)	LS	1	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 6,900	$ 6,900
3	Level Indicator Replacement (Jack Thomason)	LS	1	$ 5,000	$ 5,000	$ 7,000	$ 7,000	$ 4,600	$ 4,600
4	Installation of Stiffener Ring (Jack Thomason)	LS	1	$ 10,000	$ 10,000	$ 7,500	$ 7,500	$ 4,600	$ 4,600
5	Roof Screen Replacement (Jack Thomason)	LS	1	$ 2,500	$ 2,500	$ 2,500	$ 2,500	$ 1,150	$ 1,150
6	Grout Base of Tank (Jack Thomason)	LS	1	$ 1,500	$ 1,500	$ 500	$ 500	$ 1,725	$ 1,725
7	Safety Climb & Hardware Replacement (Jack Thomason)	LS	1	$ 5,000	$ 5,000	$ 3,500	$ 3,500	$ 5,175	$ 5,175
8	Repair, Cleaning, Painting of 189,000 Gallon Tank (Lamasco)	LS	1	$ 100,000	$ 100,000	$ 74,000	$ 74,000	$ 23,600	$ 23,600
9	Installation of Mixing System and Appurtenances (Lamasco)	LS	1	$ 35,000	$ 35,000	$ 26,000	$ 26,000	$ 21,420	$ 21,420
10	Installation of Anti-Corrosion System (Lamasco)	LS	1	$ 5,000	$ 5,000	$ 2,500	$ 2,500	$ -	$ -
11	Installation of Altitude Valve and Appurtenances (Lamasco)	LS	1	$ 10,000	$ 10,000	$ 7,500	$ 7,500	$ 5,175	$ 5,175
12	Replacement of Manway Gaskets and Bolts (Lamasco)	LS	1	$ 10,000	$ 10,000	$ 400	$ 400	$ 1,150	$ 1,150
13	Roof Screen Replacement (Lamasco)	LS	1	$ 2,500	$ 2,500	$ 300	$ 300	$ 575	$ 575
14	Grout Base of Tank (Lamasco)	LS	1	$ 1,500	$ 1,500	$ 500	$ 500	$ 1,725	$ 1,725
15	Safety Climb & Hardware Replacement (Lamasco)	LS	1	$ 5,000	$ 5,000	$ 3,500	$ 3,500	$ 3,450	$ 3,450
16	Mobilization / Demobilization	EA	1	$ 10,000	$ 10,000	$ 3,000	$ 3,000	$ 4,600	$ 4,600
17	Site Restoration	EA	1	$ 5,000	$ 5,000	$ 1,500	$ 1,500	$ 1,725	$ 1,725
Subtotal of Extended Prices for Base Bid Unit Price Work				$ 418,000		$ 314,300		$ 263,690	

Unit Price Work Alternate Bid Items - Jack Thomason Tank				Engineer Estimate		C & S Quality Services, LLC		Sam Estes Painting and Sandblasting, Inc.	
Item No.	Description	Unit	Estimat	Unit Price	Extended Price	Unit Price	Extended Price	Unit Price	Extended Price
1	Installation of Mixing System and Appurtenances	LS	1	$ 35,000	$ 35,000	$ 31,000	$ 31,000	$ 30,940	$ 30,940

	Engineer Estimate	C & S Quality Services, LLC	Sam Estes Painting and Sandblasting, Inc.
Total of all Extended Prices for Base Bid Items and Alternate Bid Items Unit Price Work	$ 453,000	$ 345,300	$ 294,630

I hereby certify that this is a true and correct tabulation of the bids

Savannah Wing, PE/Project Manager
HDR Engineering, Inc.

hdrinc.com

120 Brentwood Commons Way, Suite 525
Brentwood, TN 37027

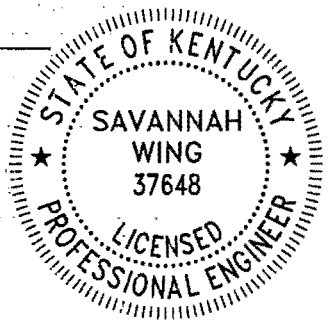


Exhibit 7

December 7, 2022

Mathew Blane
Superintendent
Lyon County Water District
5464 US-62, Kuttawa, KY 42055

RE: Bid Evaluation and Justification – 2022 KIA Contract III Tank Improvements Project

Dear Mr. Blane,

Please find attached herewith certified bid tabulations for the two (2) bids received on December 06, 2022 for the referenced project. The following two (2) bids were received:

- Sam Estes Painting and Sandblasting, Inc. -
  - Base Bid: $263,690
  - Alternate Bid Item: $30,940
  - Total for Base and Alternate: $294,630

- C & S Quality Services, LLC -
  - Base Bid: $314,300
  - Alternate Bid Item: $31,000
  - Total for Base and Alternate: $345,300

Bid Tab Review

The complete bid tabulation is attached to this letter. In review of the two (2) bids, both bidders remained under the total of the engineer estimate. Both bids provided line item costs that are reasonable estimates to complete the work as expected. The table below provides a brief summary of the Contractor's bids, broken down by each tank and the alternate bid item.

	C & S Quality Services	Sam Estes Painting and Sandblasting
Jack Thomason Tank – Painting and Improvements	$ 195,100	$ 200,270
Lamasco Standpipe – Painting and Improvements	$ 114,700	$ 57,095
Mob/Demob/Restoration	$ 4,500	$ 6,325
Alternate – Jack Thomason Mixing System	$ 31,000	$ 30,940
Total	**$ 345,300**	**$ 294,630**

Bid Conformance

The following items are outlined in the Bid Form to be submitted with the Bid:

- Bid Form
- Bid Bond
- List of Proposed Subcontractors
- List of Proposed Suppliers
- Evidence of Authority to do business in Kentucky
- Contractor's License Number
- Qualifications Statement

The Table below summarizes the documentation provided by each Contractor in respect to the items listed above and in the Bid Form.

	C & S Quality Services	Sam Estes Painting and Sandblasting
Bid Form	Yes	Yes
Bid Bond	Yes	Yes
List of Proposed Subcontractors	Yes	No
List of Proposed Suppliers	Yes	No
Evidence of Authority to do business in Kentucky	Yes	Yes
Contractor's License Number	N/A	N/A
Qualifications Statement	Yes	Partial – Financial Missing

Supplemental Information

The attached bid tabulation has a full breakdown of the bids provided. Item No. 10, Anti-Corrosion System for Lamasco, may be removed from the scope of the project. C & S provided a unit price for the item while Same Estes did not. Comparing the two bids with that line item cost ($2,500) removed from the total has no effect on which contractor will be considered the low bidder.

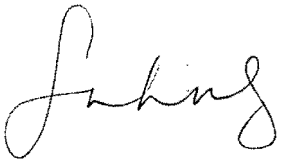
Recommendation

Both bidding Contractors provided bids below the estimated total cost and both Contractors provided Qualifications that are more than adequate to afford a recommendation to complete the work. Due to the fact that the low bid was missing a couple of minor items requested for the bid, it is the Engineer's recommendation that the low bidder, Sam Estes Painting and Sandblasting, be awarded the contract on either one of two conditions:

1) The Contractor provides the missing information listed in the table above prior to an agreed upon date set by the Water District, or
2) The Water District waives the submission of these items.

Please let me know if you have any questions, comments, or need additional information.

Sincerely,
HDR Engineering, Inc.



Savannah Wing, PE
Water/Wastewater Engineer

Lyon County Water District
Minutes

The Lyon County Water District met in special called session on Thursday, December 27th, 2022 at 9AM at the Water District Office.

Board members present:	Others present:
Chris Sutton	Mat Blane
Don Robertson	Kasey Oliver
	Marvin Wilson

The board met to make a decision on the two contractor bids placed for the tank restoration project. They discussed the two bid packages in which were both complete. Marvin will look over the documents before Donnie signs off on them.

Chris made a motion to select Sam Estes Painting. Seconded by Donnie. Motion passed unanimously.

Motion to adjourn. Motion made by Donnie second by Chris. Motion passed.

Sign_____

Exhibit 8

Lyon County Water District
Water System and Storage Tank Improvements Project
Summary of Construction Cost Estimates*

5/8/2023

	Project	Details	Cost Estimate
Part I: Tanks	Lamasco Standpipe Interior and Exterior Coating, Installation of Mixing System and Bypass Valve	100,000 Gallon Capacity, 8-inch bypass Line	$ 63,420
	Jack Thompson Tank Interior and Exterior Coating	189,000 Galllon Capacity	$ 231,210
Part 2: Waterlines	Tinsley Creek Subdivision Undersized Line Replacement	7,431 LF of 4-inch PVC	$ 1,307,473
	KY 274 Creek Crossing Line Replacement	199 LF of 6-inch PVC	$ 73,638
Estimated Construction Costs			**$ 1,675,740**
Contingency (25%)			**$ 418,935**
Total Estimated Cost of Construction			**$ 2,094,675**

* Note that these cost estimates are based upon 60% plans and will become better defined once 90% plans have been completed.

Exhibit 9

DIVISION 01

GENERAL REQUIREMENTS

00 01 07
SEALS AND SIGNATURES

Owner Name: Lyon County Water District
Facility or Site Name: Contract III Water Tank Improvements
Project Name: LCWD Water Quality and System Improvements
Project or Contract Designation: _____
Engineer: HDR

Savannah Wing, PE License No. 37648  	The seal and signature to the left applies to the following Specifications divisions and sections of this project manual: • Division 01. • Division 31. • Division 33. • Division 40. • Division 46.

Engineer's seal and signature does not apply to the documents that comprise Division 00, Bidding and Contracting Requirements.

It is a violation of applicable laws and regulations governing professional licensing and registration for any person, unless acting under the direction of the licensed and registered design professional(s) indicated above, to alter in any way the Specifications in this project manual.

END OF SEALS AND SIGNATURES

Contract Drawings For

Lyon Co. Water District Water Quality and System Improvements

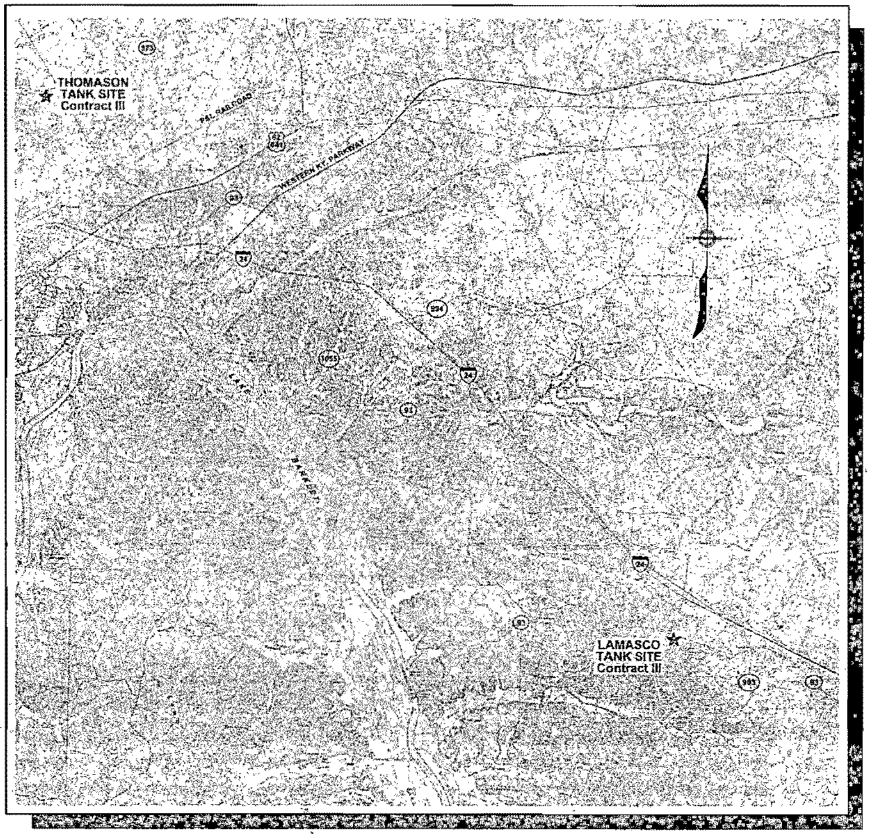
CONTRACT III WATER TANK IMPROVEMENTS

Kuttawa, Kentucky

Civil

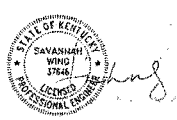
Project No.
10205112

Lyon Co., Kentucky
November 2022

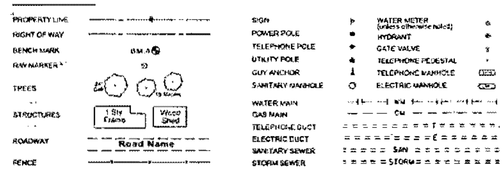


VICINITY MAP
1"=5000'

RE-SUBMITTED FOR APPROVAL 11/22



LEGEND



UTILITY OWNERS

A) LYON COUNTY WATER DISTRICT 270-388-0272
B) AT&T 270-210-3563
C) ANR PIPELINE CO. 800-447-8066
B.U.D. 800-752-6007
CALL BUD TO HAVE UNDERGROUND UTILITIES LOCATED. PROPER NOTICE MUST BE GIVEN 48 HOURS IN ADVANCE OF INITIATING WORK.

INDEX OF DRAWINGS

SECTION 01 11 00
SUMMARY OF WORK

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Location and description of Work and prior uses of the Site.
   2. Construction Contracts for this Project.

1.2 LOCATION AND DESCRIPTION OF WORK

A. The Work is located in Lyon County, Kentucky at two existing water storage tanks. The Lamasco Tank is a 189,000 gallon standpipe water storage tank located along KY Highway 93 in Lamasco, Kentucky and the Jack Thomason Tanks is a 100,000 gallon elevated water storage tank located in Eddyville, Kentucky.

B. Work to be performed under this Contract includes, but is not limited to, repair, cleaning, and painting of the Jack Thomason and Lamasco Tanks, Repair and Replacement of various tank components and appurtenances as shown in the Plan Drawings, as well as the installation of a mixing system, anti-corrosion system, bypass line, and altitude valve assembly at the Lamasco Tank, and all other Work required in accordance with the Contract Documents.

C. The Contractor shall be responsible for the general overall coordination of the work. Each Sub-Contractor shall carefully check the Drawings, Specifications, and the Project Site in order to advise and coordinate their phase of the Work. Each Subcontractor shall leave the required space and clearances for the work of others, field check all dimensions and file a written report to the Engineer where discrepancies occur between the work to be performed and the Drawings, Specifications, or Project Site conditions. If no report is filed prior to approvals of Shop Drawings and Samples, it will be assumed that no conflict occurs. Resolutions of conflicts after Shop Drawings and Sample approvals shall be resolved by the Engineer and the conflict corrected in the field at no increase in the Contract Sum.

D. All contractors, subcontractors, suppliers, and other employers involved with work at the Project Site shall be responsible for compliance with all federal, state, local, and Project Owner's regulations, standards, and codes in effect during the Contract Time.

E. All notices, demands, requests, instructions, reports, approvals, proposals, Change Orders, Field Orders, and claims shall be in writing.

F. The Contractor shall perform all required testing of installed piping, equipment, etc. as required by these Technical Specifications and the owing utility specifications. Adjustments of process equipment will be the responsibility of the Contractor and/or equipment supplier. All systems shall be adjusted and balanced to the approval of the Engineer prior to project closeout.

G. Contracting Method: The Project will be constructed under a single prime construction Contract

1.3 CONSTRUCTION CONTRACTS FOR THIS PROJECT

A. Single Prime Construction Contract: The Contract requires all the Work for the Project not expressly allocated to Owner or others in the Contract Documents.

1.4 OTHERS RETAINED BY OWNER FOR THE PROJECT

A. Engineer:
   1. Engineer is identified in the Agreement.
   2. Engineer's responsibilities for the Project, relative to Contractor, are indicated throughout the Contract Documents.

3. Whether the Engineer will furnish the services of a Resident Project Representative (RPR) for the Project is indicated in the Supplementary Conditions.

1.5 SEQUENCE AND PROGRESS OF WORK

A. Sequencing:
   1. Incorporate sequencing of the Work into the Progress Schedule.
   2. Sequencing Requirements:
      a. Owner must be provided with 72 hours advanced notice before Work commences to allow for the tank to be drained.
      b. Only one tank may be out of service at a time. At least one tank must be operational at all times.
      c. Work at either tank site may not commence on a Friday, Saturday, Sunday, or Holiday Monday.

1.6 CONTRACTOR'S USE OF SITE

A. Use of Site - General:
   1. Relocate stored materials and equipment that interfere with operations of Owner, other contractors, and others performing work for Owner.

B. The Contractor shall immediately upon entering the Project Site for the purpose of beginning the work, locate all general reference points and take such action as necessary to prevent their destruction; layout his own and be responsible for, all lines, elevations, and measurements of all work to be executed under the Contract.

C. The Contractor shall exercise proper precautions to verify fixtures shown on the Drawings before laying out the work, and will be held responsible for any error resulting from his failure to exercise such precautions.

1.7 EASEMENTS AND RIGHTS-OF-WAY

A. Easements and Rights-of-Way - General:
   1. Easements and rights-of-way required for the permanent improvements included in the Work will be provided by Owner in accordance with the General Conditions and Supplementary Conditions.
   2. Confine construction operations within Owner's property, public rights-of-way, easements obtained by Owner, and limits shown, and property for which Contractor has made arrangements directly with property owner(s).
   3. Use care in placing construction tools, machinery and equipment, excavated materials, and materials and equipment to be incorporated into the Work to avoid damaging property and interfering with traffic.
   4. Do not enter private property outside the construction limits without permission from the owner of the property.

PART 2 - PRODUCTS - (NOT USED)

PART 3 - EXECUTION - (NOT USED)

END OF SECTION

SECTION 01 22 00
MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. General requirements applicable to all bid/pay items.
   2. General provisions on unit prices and quantities.
   3. General provisions on lump sums.
   4. Listing of the various bid/pay items in the Project, together with criteria for measuring Unit Price Work for payment.

B. Related Requirements:
   1. Include but are not necessarily limited to:
      a. Section 00 41 13 – Bid Form.

1.2 REQUIREMENTS APPLICABLE TO ALL BID/PAY ITEMS

A. In this Section and elsewhere in the Contract Documents, the terms "bid item", "pay item", "bid/pay item", "Item" followed by a number designation, "this item", and the like all have the same meaning, and refer to one or more specific elements of the Contract, established for pricing and payment, as indicated in the Bid Form and in the Agreement (or exhibit to the Agreement) at the time the Contract was signed by the parties.

B. This Article applies to all bid/pay items in the Contract.

C. Prices – General:
   1. The bid/pay items listed starting with Article 1.5 of this Section refer to and are the same bid items listed in the Bid Form and included in the Contract, and constitute all bid/pay items for the Work at the time the Contract was signed by the parties.

2. No direct or separate payment will be made, outside of the bid/pay items in the Contract, for the following: providing miscellaneous temporary or accessory materials or equipment, temporary works, temporary construction facilities, Contractor's project management, superintendence, and similar costs for Subcontractors or Suppliers; [bonds and] insurance; schedules and schedule updates; coordination (with: Owner's [and facility manager's (if other than Owner)] operations (including, but not limited to, lockout/tag-out procedures), other contractors, utility owners, owners of transportation facilities, adjacent property owners and occupants, authorities having jurisdiction, Subcontractors and Suppliers, and others with whom Contractor is to coordinate the Work); information technology systems required by the Contract Documents; Submittals; photographic documentation; Project meetings; Contractor's hazard communication program; Contractor's compliance with environmental procedures for Constituents of Concern (including spill control and countermeasures plans and implementation); professional services (required for Contractor's means and methods of construction, and for delegated designs required by the Contract Documents); obtaining and complying with permits and licenses; temporary utilities (including electric power, water supply and disposal, fuel, and communications); temporary lighting; temporary fire protection; temporary enclosures and HVAC; temporary sanitary facilities; temporary first-aid facilities and services; ; Contractor's field offices and sheds, Engineer's field offices (when required elsewhere in the Contract Documents); temporary vehicular access and parking (including access to the Site, temporary access roads and parking, onsite traffic controls for construction traffic, and offsite haul routes); traffic control of non-construction vehicular and pedestrian traffic; temporary controls (including temporary erosion and sediment controls, noise control, control of storm water, surface water, and groundwater, pollution controls (including solid waste control, water pollution control, and control of atmospheric pollution), dust control, pest and rodent controls, odor controls, and other temporary controls required by the Contract Documents); temporary security for the Work; temporary barriers; Project signage (when required elsewhere in the Contract Documents); delivering, handling, and storing materials and equipment to be incorporated into the Work; layouts and surveys for the Work; construction equipment, machinery, tools, and vehicles; safety and protection; Site maintenance during construction; cleaning and removal and disposal of waste and debris; checkout and startup; testing and other quality control activities required by the Contract Documents; record documents, operation and maintenance data; warranties; spare parts and extra materials required by the Contract Documents; instruction of facility personnel as required by the Contract Documents; commissioning (when required elsewhere in the Contract Documents); Contractor's correction period, Contractor's general warranty and guarantee; Contractor's indemnification obligations; other labor, cost, or effort required by the General Conditions and Supplementary Conditions, Division 01 Specifications, and other requirements of the Contract Documents.
3. Price Escalation:
   a. Unless expressly indicated otherwise in the Contract Documents, Owner is not obligated to change the stipulated prices (including lump sums, unit prices, and allowances) that are all or part of the Contract Price because of escalation of costs when there is no corresponding change in the Contract Times.
   b. Changes in the Contract Times do not necessarily entitle Contractor to a change in Contract Price due to escalation.
   c. Should Contractor claim a change in Contract Price for one or more stipulated price pay items without a corresponding change in scope, extent, or quality in the associated Work, prior to receiving any such change in Contract Price, Contractor shall submit with Contractor's associated Change Proposal, documentation satisfactory to Engineer supporting and documenting that Contractor's costs have increased because of delays beyond Contractor's control within the associated change in Contract Times included in such Change Proposal.
4. Compensation for all services, labor, materials, and equipment shall be included in prices stipulated for the unit price bid/pay items in the Contract.

5. Each unit price in the Contract shall include an amount considered by Contractor as sufficient for all overhead and profit for each separately identified bid/pay item.

D. Contract Price, Payment Procedures, and Related Matters:
   1. Contract Price: The Contract Price, as apportioned among bid/pay items in the Contract, is indicated in the Agreement and any associated exhibits thereto and may be modified by Change Order.
   2. Payments to Contractor: Refer to the General Conditions (as may be modified by the Supplementary Conditions), the Agreement (including provisions on retainage, if any), among other applicable Contract Documents.
   3. Schedule of Values: Refer to the General Conditions (as may be modified by the Supplementary Conditions).
   4. Procedures for Changes in Contract Price: Refer to the General Conditions (as may be modified by the Supplementary Conditions)..
   5. Alternates: The scope and limits of alternates, when contemplated for or included in the Contract, may be addressed, in whole or in part, in Section 01 23 00 - Alternates.
   6. Defective Work is not eligible for payment.

1.3 GENERAL PROVISIONS ON UNIT PRICES AND QUANTITIES

A. Quantities:
   1. Quantities of Unit Price Work indicated in the Bid Form and in the Contract (at the time the Agreement was signed by the parties) are estimates for purposes of pricing and comparison of Bids.
   2. Owner does not represent, either expressly or by implication, or agree that the nature of materials encountered below ground surface or in concealed areas, or actual quantities of Unit Price Work required, will correspond with the quantities in the Contract at the time the Agreement was signed by the parties. Owner reserves the right to increase or decrease quantities, and to eliminate quantities, as Owner may deem necessary or as may be necessary due to Site conditions encountered.
   3. Adjustment of Unit Prices Due to Variation in Quantities:
      a. Provisions, if any, regarding adjustment of unit prices due to variations in actual quantities (eligible for payment) from the estimated quantities in the Contract (including quantities at the time the Agreement was signed by the parties and as subsequently modified by Change Order) are in the General Conditions, as may be modified by the Supplementary Conditions.
         1) Engineer's review for possible unit price adjustment, when provision for such adjustment is expressly indicated in the Contract, will be at a time Engineer deems reasonable and proper.
         2) When the Supplementary Conditions establish that, to be eligible for an adjustment in the unit price, a pay item of Unit Price Work must have a total computed, extended price (at the time the Agreement was signed by the parties) equal to or greater than a specified percentage (stipulated in the Supplementary Conditions) of the total Contract Price (at the time the Agreement was signed by the parties), and the total extended price of such pay item does not exceed the stipulated percentage of the Contract Price, then the associated pay item will be paid at the unit price in the Contract without adjustment for variations in actual quantity.
   4. Quantities eligible for payment will be actual quantities furnished and installed (as applicable) in accordance with the Contract Documents, within the pay limits shown or indicated, as measured by Engineer (or other entity so empowered in the Contract Documents), and recommended for payment by Engineer.
   5. At Contractor's expense, Contractor may independently verify quantities measured by Engineer for payment. Should Contractor disagree with quantities measured and recommended for payment by Engineer, submit appropriate Change Proposal (appealing Engineer's measurements) indicating the specific reasons for Contractor's appeal, with detailed reasons therefor and associated calculations and estimates, in accordance with the Contract Documents.

6. Quantity Overruns:
   a. When the quantity of a pay item of Unit Price Work eligible for payment exceeds the pay item's quantity included in the Contract, Owner will pay for quantities that exceed those in the Contract only while the estimated total payments to Contractor under the Contract will not exceed the Contract Price. Otherwise, a Change Order is required to modify the associated quantity in the Contract, thus changing the Contract Price.
7. Except as may be established elsewhere in the Contract Documents, make no claim for anticipated profit, loss of profit, damages, or additional compensation arising from difference between quantities of Unit Price Work eligible for payment and the estimated quantities in the Contract.

B. Measuring for Payment:
1. At Engineer's option, Engineer may delegate to Resident Project Representative (RPR) (if any), some or all of Engineer's responsibilities for measuring Unit Price Work eligible for payment.
2. Unless expressly indicated otherwise in the Contract Documents, measurements will be in United States standard measurements.
3. Unless indicated otherwise elsewhere in the Contract Documents, quantities of Unit Price Work eligible for payment will be rounded to the nearest whole number.
4. In the event of conflict between this Section and the measurement criteria in the Specifications of Divisions 02-49, the measurement criteria in this Section will govern. Typical intent when measurement criteria are in both this Section and the associated Division 02-49 Specifications section, is for the criteria to be interpreted together.
5. Assistance with Measurements:
   a. Assist Engineer and Resident Project Representative (RPR) (if any), by providing measuring equipment, labor, and survey personnel necessary to measure quantities eligible for payment.
6. Quantities eligible for payment can be adjusted by Engineer to correct quantities included in Contractor's prior payment requests, and for incomplete or defective Unit Price Work. Such corrections are at Engineer's sole discretion.

1.4 GENERAL PROVISIONS ON LUMP SUM ITEMS

A. Progress payments for Work paid on a lump sum basis will based on Engineer's estimate of the Work (in accordance with the Contract Documents) performed through the end of the associated pay period, based on the Schedule of Values accepted by Engineer in accordance with the Contract Documents.

B. At its sole discretion, Engineer may correct amounts of lump sum Work included in prior payment requests based on improved data or information available to Engineer, or Engineer's knowledge or reasonable belief that Work is incomplete or defective.

1.5 BID/PAY ITEMS – GENERAL CONTRACT

A. Item 1 – Repair, Cleaning, and Painting of 100,000 gallon Jack Thomason Tank:
1. Measurement: Lump Sum.
2. Item Includes:
   a. Coordination with Owner to isolate and drain tank.
   b. Thorough inspection of tank and reporting of conditions.
   c. Preparation of all surfaces to be cleaned and receive finishes.
   d. Collection, handling, and disposal of debris.
   e. Completion of all tank repairs.
   f. Finishing of all surfaces.
   g. Testing, cleaning, and disinfection of tanks.
3. Payment: Per completion of all work associated with the cleaning, repair, and finishing of the Jack Thomason Tank.

B. Item 2 – Replacement of Manway for Jack Thomason Tank:
1. Measurement: Lump Sum.

2. Item Includes:
    a. Thorough inspection of manway and hardware.
    b. Removal/Demo of existing manway and hardware.
    c. Installation of new, round, multi-bolt type manway.
3. Payment: Per completion of all work associated with the removal and replacement of the manway.

C. Item 3 – Replacement of Level Indicator for Jack Thomason Tank:
1. Measurement: Lump Sum.
2. Item Includes:
    a. Removal/Demo of level indicator.
    b. Installation of new level indicator.
3. Payment: Per completion of all work associated with the replacement of the level indicator.

D. Item 4 – Installation of Stiffener Ring for Jack Thomason Tank:
1. Measurement: Lump Sum.
2. Item Includes:
    a. Installation of stiffener ring at joint between riser and tank bowl.
3. Payment: Per completion of all work associated with the installation of the stiffener ring.

E. Item 5 – Roof Screen Replacement for Jack Thomason Tank:
1. Measurement: Lump Sum.
2. Item Includes:
    a. Removal/Demo of existing roof screens.
    b. Installation of new frost-free type roof screens.
3. Payment: Per completion of all work associated with the removal and replacement of roof screens.

F. Item 6 – Grouting of Tank Base for Jack Thomason Tank:
1. Measurement: Lump Sum.
2. Item Includes:
    a. Preparation of surface and joint for grouting.
    b. Installation of grout around entire base of tank
3. Payment: Per completion of all work associated with the grouting of the tank base.

G. Item 7 – Replacement of Safety Climb and Hardware for Jack Thomason Tank:
1. Measurement: Lump Sum.
2. Item Includes:
    a. Removal/Demo of existing safety climb and hardware.
    b. Installation of new safety climb.
3. Payment: Per completion of all work associated with the installation of new safety climb.

H. Item 8 – Repair, Cleaning, and Painting of 189,000 gallon Lamasco Tank:
1. Measurement: Lump Sum.
2. Item Includes:
    a. Coordination with Owner to isolate and drain tank.
    b. Thorough inspection of tank and reporting of conditions.
    c. Preparation of all surfaces to be cleaned and receive finishes.
    d. Collection, handling, and disposal of debris.
    e. Completion of all tank repairs.
    f. Finishing of all surfaces.
    g. Testing, cleaning, and disinfection of tanks.
3. Payment: Per completion of all work associated with the cleaning, repair, and finishing of the Lamasco Tank.

I. Item 9 – Installation of Hydrodynamic Mixing System for Lamasco Tank:
1. Measurement: Lump Sum.
2. Item Includes:
    a. Provide all submittals for mixing system in accordance with contract documents.

b. Provide all equipment and appurtenances needed to install the mixing system.
c. Install mixing system.
d. Start-up and test per contract documents

3. Payment: Per completion of all work associated with the installation of the mixing system for the Lamasco Tank.

J. Item 10 – Installation of Anti-Corrosion System for Lamasco Tank:
1. Measurement: Lump Sum.
2. Item Includes:
a. Provide all equipment suitable for potable water system
b. Consult glass lined tank manufacturer for required procedures for installation of all equipment and penetrations made through the tank sidewalls.
c. Install Anti-corrosion system
3. Payment: Per completion of all work associated with the installation of the anti-corrosion system for the Lamasco Tank.

K. Item 11 – Installation of 8-inch Bypass Line for Lamasco Tank:
1. Measurement: Lump Sum.
2. Item Includes:
a. Construction of new 8 inch DIP bypass line and appurtenances around existing valve vault as shown on drawings.
b. Installation of new flush hydrant.
3. Payment: Per completion of all work associated with the installation of new bypass line, valves, and flush hydrant.

L. Item 12 – Assembly and Installation of Altitude Valve for Lamasco Tank:
1. Measurement: Lump Sum.
2. Item Includes:
a. Installation of new altitude valve and appurtenances as shown on Plan Drawings
3. Payment: Per completion of all work associated with the installation of altitude valve assembly for the Lamasco Tank.

M. Item 13 – Replacement of Manway Gaskets and Bolts for Lamasco Tank:
1. Measurement: Lump Sum.
2. Item Includes:
a. Removal/demo of existing gaskets and bolts.
b. Installation of new gaskets and bolts for manway.
3. Payment: Per completion of all work associated with the replacement of manway gaskets and bolts.

N. Item 14 – Roof Screen Replacement for Lamasco Tank:
1. Measurement: Lump Sum.
2. Item Includes:
a. Removal/Demo of existing roof screens.
b. Installation of new frost-free type roof screens.
3. Payment: Per completion of all work associated with the removal and replacement of roof screens.

O. Item 15 – Grouting of Tank Base for Lamasco Tank:
1. Measurement: Lump Sum.
2. Item Includes:
a. Preparation of surface and joint for grouting.
b. Installation of grout around entire base of tank
3. Payment: Per completion of all work associated with the grouting of the tank base.

P. Item 16 – Replacement of Safety Climb and Hardware for Lamasco Tank:
1. Measurement: Lump Sum.
2. Item Includes:
a. Removal/Demo of existing safety climb and hardware.

b. Installation of new safety climb.

3. Payment: Per completion of all work associated with the installation of new safety climb.

Q.

R. Item 17 – Mobilization and Demobilization:

1. Measurement: Lump Sum.
2. Item Includes:
   a. Work and activities indicated in this provision are intended as illustrative for purposes of scope and payment and do not represent a complete list of all preconstruction activities and Submittals, or all Work or activities required by the contract for mobilization and demobilization.
   b. Mobilization Work paid under this item will include:
      1) Furnishing required performance bond and payment bond.
      2) Furnishing required insurance and associated documentation.
      3) Obtaining Owner's acceptance of proposed Subcontractors and Suppliers and entering into subcontracts and purchase orders needed to start the Work.
      4) Preparing and obtaining Engineer's approval of Shop Drawings as required.
      5) Preparing and obtaining Engineer's acceptance of schedules, including Progress Schedule, Schedule of Submittals, and Schedule of Values.
      6) Preconstruction conference(s) required by the Contract Documents.
      7) Preconstruction photographic documentation.
      8) Establishing Contractor's Site-specific health and safety plan, preconstruction activities needed to start implementing Contractor's safety programs, and verifying status of training of construction workers and personnel and condition of construction equipment, machinery, and tools.
      9) Submitting acceptable emergency contact information
      10) Obtaining required permits needed to start the Work.
      11) Initial establishment of temporary utilities and temporary facilities.
      12) Establishing Contractor's field office and sheds, [Engineer's field office,] Contractor's storage areas, staging and laydown areas, and other areas necessary to perform the Work.
      13) Initial establishment of construction vehicular access to the Site, parking needed for construction, and offsite haul routes.
      14) Establishing construction equipment, machinery, and tools at the Site.
      15) Providing initial temporary controls.
      16) Temporary security needed to start Work at the Site.
      17) Other mobilization acceptable to Engineer.
   c. Demobilization Work paid under this item will include:
      1) Removal from the Site and adjacent areas of excess materials and equipment.
      2) Removal of temporary controls, temporary facilities, temporary barriers, and similar materials and equipment.
      3) Removal of temporary access roads and parking areas not part of permanent pavement or otherwise allowed to remain by Owner, including temporary traffic controls established for construction vehicles and equipment.
      4) Removal of all field office and sheds, storage areas, staging and laydown areas, and other areas needed to perform the Work and restoration of such areas.
      5) Removal from the Site of all construction equipment, machinery, tools, Contractor's containers, temporary fuel storage tanks, and similar items.
      6) Closeout of permits on which Contractor is a permittee or co-permittee.
      7) Final cleaning.
      8) Furnishing required closeout documents.
      9) Other costs and effort by Contractor for demobilization.
   d. Other cost and Work are under other bid/pay items in the Contract.
3. Payment: Lump sum price for this item will be full compensation for all mobilization and demobilization required and needed for the Contract, not included under other bid/pay items or contracts.

S. Item 18 – Site Restoration:
   1. Measurement: Lump Sum.
   2. Item Includes (all in accordance with the Contract Documents):
      a. Rough grading, providing appropriate topsoil (whether originally removed and stockpiled by contractor or from offsite sources), and final grading (appropriately transitioning to proposed grades at completion of Work), without ponding of water.
      b. Soil stabilization.
      c. Reinstalling existing materials and systems removed and properly preserved by Contractor, such as hardscape features (such as, stone patios, walkways, retaining walls and terrace gardens, pools, water features, shoreline and beach protection, and others), benches and outdoor furniture, mailboxes, fencing, signs, ornaments, appurtenances, and the like.
      d. Repairing or replacing materials and systems damaged or destroyed by Contractor, such as hardscape features, benches and outdoor furniture, mailboxes, fencing, signs, ornaments, appurtenances, and the like.
      e. Landscaping restoration for areas (unpaved and not subject to vehicular traffic) disturbed by Contractor outside of the pay limits shown or indicated.
      f. Other Work required and necessary for landscaping restoration not expressly included in other bid/pay items.
   3. Payment: Lump sum payment per full restoration of sites to pre-construction conditions.

PART 2 - PRODUCTS - (NOT USED)

PART 3 - EXECUTION - (NOT USED)

END OF SECTION

SECTION 01 78 36
WARRANTIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. General requirements for warranties required in the various Specifications.
   2. Provisions addressing:
      a. Suppliers' standard warranties.
      b. Suppliers' special or extended warranties.
      c. Commencement and duration of warranties.

1.2 SUBMITTALS

A. General:
   1. For each item of equipment furnished under the Contract, submit Supplier's standard warranty, regardless of whether such warranty or Submittal thereof is required by the associated Specifications for that item. Submit such warranties for materials where such Submittal is required in the Specifications for the material.
   2. For each item of material or equipment where Supplier's special (or extended) warranty is required by the Contract Documents, submit appropriate special warranty that complies with the Contract Documents.
   3. Supplier's warranties shall be specifically endorsed to Owner, Contractor, and the entity purchasing the item (if other than Contractor) by the entity issuing such warranty.
   4. Submit Suppliers' standard warranties and special warranties as Submittals in accordance with the Schedule of Submittals accepted by Engineer.

1.3 CONTRACTOR'S GENERAL WARRANTY AND CORRECTION PERIOD OBLIGATIONS

A. Contractor's General Warranty and Guarantee: Comply with requirements of the General Conditions, as may be modified by the Supplementary Conditions.

B. Contractor's Warranty of Title: Comply with requirements of the General Conditions, as may be modified by the Supplementary Conditions.

C. Correction Period: Comply with requirements of the General Conditions, as may be modified by the Supplementary Conditions.

1.4 SUPPLIERS' WARRANTIES FOR MATERIALS AND EQUIPMENT

A. Warranty Types:
   1. Required by the General Conditions:
      a. Warranties specified for materials and equipment shall be in addition to, and run concurrent with, Contractor's general warranty and guarantee and requirements for the Contract's correction period.
      b. Disclaimers and limitations in specific materials and equipment warranties do not limit Contractor's general warranty and guarantee, nor does such affect or limit Contractor's performance obligations under the correction period.
   2. Material or equipment manufacturer's standard warranty is pre-printed, written warranty published by item's manufacturer and specifically endorsed by manufacturer to the entities indicated in this Specifications Section's Article 1.2.
   3. Special warranty is written warranty that either extends the duration of material or equipment manufacturer's standard warranty or provides other, increased rights to Owner and other beneficiaries (if any) of such warranty. Where the Contract Documents indicate specific requirements for warranties that differ from the manufacturer's standard warranty for that item, special warranty is implied.

B. Requirements for Special Warranties:
   1. Submit written special warranty document that contains appropriate provisions and identification, ready for signature by material or equipment manufacturer, Owner, and other beneficiaries indicated in Article 1.2 of this Specifications Section. Submit draft warranty with Submittals required prior to fabrication and shipment of the item from the Supplier's facility.
   2. Manufacturer's Standard Form: Modified to include Project-specific information and properly signed by product manufacturer and other entities as appropriate.
   3. Specified Form: When specified forms for special warranties are included in the Contract Documents, prepare written document, properly signed by item manufacturer, Owner, and other beneficiaries indicated in Article 1.2 of this Specifications Section, using the required form.
   4. Refer to the Specifications for content and requirements for submitting special warranties.

1.5 COMMENCEMENT AND DURATION OF WARRANTIES

A. Commencement of Warranties:
   1. Contract correction period and Contractor's general warranty commence as indicated in the General Conditions, as may be modified by the Supplementary Conditions.
   2. Suppliers' standard warranties and special warranties commence running on the date that the associated item is certified by Engineer as substantially complete in accordance with the Contract Documents. In no event shall special warranties commence running prior to Engineer's review and acceptance of special warranty Submittal for the item.
   3. Implied warranties commence in accordance with Laws and Regulations.

B. Duration of Warranties:
   1. Duration of correction period is set forth in the General Conditions, as may be modified by the Supplementary Conditions.
   2. Duration of Contractor's general warranty and guarantee is in accordance with Laws and Regulations.
   3. Duration of Suppliers' standard warranties is in accordance with the applicable standard warranty document accepted for the Project by Engineer.
   4. Duration of required Suppliers' special warranties shall be in accordance with the requirements of the Contract Documents for the subject item.

PART 2 - PRODUCTS - (NOT USED)

PART 3 - EXECUTION - (NOT USED)

END OF SECTION

DIVISION 31

EARTHWORK

SECTION 31 23 00
EARTHWORK

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Excavate, backfill, compact, and grade the site to the elevations shown on the Drawings, as specified herein, and as needed to meet the requirements of the construction shown in the Contract Documents. All excavation shall comply also with Kentucky OSHA 29 CFR Part 1926, Subpart P. Failure to comply with Subpart P will justify the issuance of a stop work order by the Owner.

B. Related Specification Sections include but are not necessarily limited to:
   1. Section 31 23 33 – Trenching, Backfill, and Compacting for Utilities.

1.2 QUALITY ASSURANCE

A. Referenced Standards:
   1. ASTM International (ASTM):
      a. C33/C33M, Standard Specification for Concrete Aggregates.
      b. D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 FT-LBF/FT^3).
      c. D1557, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 FT-LBF/FT^3(2,700 kN-M/M^3)).
      d. D2487, Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).
      e. D3786, Standard Test Method for Bursting Strength of Textile Fabrics--Diaphragm Bursting Strength Tester Method.
      f. D4253, Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.
      g. D4254, Standard Test Methods for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density.
      h. D4632, Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.
   2. Occupational Safety and Health Administration (OSHA):
      a. 29 CFR Part 1926.650, Safety and Health Regulations for Construction - Excavations, referred to herein as OSHA Standards.

B. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

C. Use equipment adequate in size, capacity, and numbers to accomplish the work of this Section in a timely manner.

D. In addition to complying with requirements of governmental agencies having jurisdiction, comply with the directions of the soil engineer.

1.3 DEFINITIONS

A. Excavation:
   1. Consists of removal of material encountered to subgrade elevations required or indicated.
   2. Includes excavation of soils; pavements and other obstructions visible on surface; underground structures, utilities, and other items indicated to be demolished and removed; boulders; and rock.

B. Foundations: Footings, base slabs, foundation walls, mat foundations, grade beams, piers and any other support placed directly on soil or rock.

C. Geotechnical Engineer: Independent geotechnical specialist providing field quality control for the project.

D. Non-Structural Fill/Backfill: Soil materials placed and compacted to achieve finish grade elevations that do NOT support foundations, slabs, paving, or other flatwork.

E. Structure: Buildings, foundations, slabs, tanks, curbs, or other man-made stationary features occurring above or below ground surface.

F. Subgrade: The earth or soil layer immediately below foundation bearing elevation, subbase material, fill material, backfill material, or topsoil materials.

G. Unauthorized Excavation:
   1. Consists of removal of materials beyond indicated subgrade elevations or dimensions without specific direction of Engineer.
      a. Unauthorized excavation, as well as associated remedial work as directed by Engineer or Geotechnical Engineer, shall be at Contractor's expense.
   2. Unsuitable Soil Materials: Soil materials encountered at or below subgrade elevation of insufficient strength and stiffness to support construction as determined by the Geotechnical Engineer.

1.4 SUBMITTALS

A. Shop Drawings:
   1. Product technical data including:
      a. Acknowledgement that products submitted meet requirements of standards referenced.
      b. Manufacturer's installation instructions.
   2. Certifications.

1.5 PROJECT CONDITIONS

A. Salvageable Items: Carefully remove items to be salvaged, and store on Owner's premises unless otherwise directed.

B. Dispose of waste materials, legally, off site.
   1. Burning, as a means of waste disposal, is not permitted.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. Fill and Backfill:
   1. Provide soil materials free from organic matter and deleterious substances, containing no rocks or lumps over 6" in greatest dimension, and with not more than 15% of the rocks or lumps larger than 2-3/8" in their greatest dimension.
   2. Fill material is subject to the approval of the soil engineer, and is that material removed from excavations or imported from off-site borrow areas, predominantly granular, non-expansive soils free from roots and other deleterious matter.
   3. Provide fill material free of rocks having a dimension greater than 1" in the upper 12" of fill or embankment.

2.2 TOPSOIL

A. Where and if shown on the Drawings or otherwise required, provide topsoil consisting of friable, fertile soil of loamy character, containing an amount of organic matter normal to the region, capable of sustaining healthy plant life, and reasonably free from subsoil, roots, heavy or stiff clay, stones, noxious weeds, sticks, brush, litter, and other deleterious matter.

B. Obtain topsoil from sources within the project limits, or provide imported topsoil obtained from approved sources outside the project limits, or from both sources.

2.3 SELECT BACKFILL

A. Use select backfill only as directed by the Engineer or as shown on the drawings.

B. Materials utilized for select fill shall be subject to the Engineer's approval. Provide select fill meeting the following requirements:
   1. Compacted Limestone. Provide and place limestone dense graded aggregate conforming to Section 805 of the Kentucky Department of Highways Standard Specifications.

C. Payment will be made to the Contractor for the amount of select fill installed at the field engineer's request. Payment will not be made to the Contractor for select fill utilized in the replacement of defective work.

2.4 80 PSI FLOWABLE FILL CONCRETE

A. General. Provide flowable fill meeting the requirements specified in the following sections of the Kentucky Highway Department's current Standard Specifications for Road and Bridge Construction:

Portland Cement, Type I, Section 801
Sand, Section 804
Fly Ash, Class F, Section 844
Water, Section 803

Unless otherwise approved by the Engineer, proportion flowable fill as follows, per cubic meter (cubic yard):

Cement, 14 kg (30 lbs.)
Fly Ash, Class F, 136 kg (300 lbs.)
Sand (S.S.D.), 1360 kg (3000 lbs.)
Water (Maximum), 250 kg (550 lbs)

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not pro\ceed until unsatisfactory conditions are corrected.

3.2 PROCEDURES

A. Utilities:
   1. Unless shown to be removed, protect active utility lines shown on the Drawings or otherwise made known to the Contractor prior to excavating. If damaged, repair or replace at no additional cost to the Owner.
   2. If active utility lines are encountered, and are not shown on the Drawings or otherwise made known to the Contractor, promptly take necessary steps to assure that service is not interrupted.
   3. If service is interrupted as a result of work under this Section, immediately restore service by repairing the damaged utility at no additional cost to the Owner.
   4. If existing utilities are found to interfere with the permanent facilities being constructed under this Section, immediately notify the Engineer and secure his instructions.
   5. Do not proceed with permanent relocation of utilities until written instructions are received from the Engineer.

B. Placing Flowable Fill Concrete

1. Unless otherwise approved by the Engineer, deliver flowable fill in revolving drum truck mixers in accordance with Section 601 of the Kentucky Highway Department's current Standard Specifications for Road and Bridge Construction to ensure that the mixture is in suspension when placed. Agitation will be required during transportation and waiting time. Subsidence may occur if the mixer is not agitated. Place flowable fill by discharging directly from truck chutes into the trench or by means of conveyors, buckets or pumps.
2. Place flowable fill a minimum of eight (8) hours prior to the addition and compaction of any material above it unless other wise directed by the Engineer.
3. Unless otherwise indicated on the Drawings or in these Specifications, or unless otherwise directed by the Owner or Engineer, do not place flowable fill concrete directly on or around buried pipes. Any newly installed or existing pipelines located in a trench or other excavation to be backfilled with flowable fill concrete is to be bedded in granular material in keeping with the Drawing details from four (4) inches below to twelve (12) inches above the pipe for the entire trench width before placement of the flowable fill concrete.

C. Protection of persons and property:
1. Barricade open holes and depressions occurring as part of the Work, and post warning lights on property adjacent to or with public access.
2. Operate warning lights during hours from dusk to dawn each day and as otherwise required.
3. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, washout, and other hazards created by operations under this Section.

D. Dewatering:
1. Remove all water, including rain water, encountered during construction to an approved location by pumps, drains, and other approved methods.
2. Keep excavations and site construction area free from water.

E. Use means necessary to prevent dust becoming a nuisance to the public, to neighbors, and to other work being performed on or near the site.

F. Maintain access to adjacent areas at all times.

3.3 PROTECTION

A. Erosion Control:
1. Clean paved roadways daily of any spillage of dirt, rocks or debris from vehicles and equipment entering or leaving site.
2. Conduct work to minimize erosion of site. Remove eroded material washed off site.
   a. If necessary or requested by Engineer, construct stilling areas to settle and detain eroded material.

B. Protect existing surface and subsurface features on-site and adjacent to site as follows:
1. Provide barricades, coverings, or other types of protection necessary to prevent damage to existing items indicated to remain in place.
2. Protect and maintain benchmarks, monuments or other established reference points and property corners.
   a. If disturbed or destroyed, replace at own expense to full satisfaction of Owner and controlling agency.
3. Verify location of utilities.
   a. Omission or inclusion of utility items does not constitute nonexistence or definite location.
   b. Secure and examine local utility records for location data.
   c. Take necessary precautions to protect existing utilities from damage due to any construction activity.
      1) If utilities are indicated to remain in place, provide adequate means of support and protection during earthwork operations.

2) Do not interrupt existing utilities serving facilities occupied by Owner or others, during occupied hours, except when permitted in writing by Owner and then only after acceptable temporary utility services have been provided.
3) Obtain Owner's approval prior to disconnecting any utility service.

d. Repair damages to utility items at own expense.
e. In case of damage, notify Engineer at once so required protective measures may be taken.

4. Maintain free of damage, existing sidewalks, structures, and pavement, not indicated to be removed.
   a. Protect new and existing structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
   b. Any item known or unknown or not properly located that is inadvertently damaged shall be repaired to original condition.
   c. All repairs to be made and paid for by Contractor.
5. Provide full access to public and private premises, fire hydrants, street crossings, sidewalks and other points as designated by Owner to prevent serious interruption of travel.
6. Maintain stockpiles and excavations in such a manner to prevent inconvenience or damage to structures on-site or on adjoining property.
7. Avoid surcharge or excavation procedures which can result in heaving, caving, or slides.

3.4 SITE EXCAVATION AND GRADING

A. The site excavation and grading work includes the offsite disposition of all material:
   1. That exceed quantities required for earthwork on the project.
   2. That the Geotechnical engineer classifies as unclassified excavation.
   3. That the Geotechnical engineer classifies as unacceptable.
   4. That the Geotechnical engineer classifies as potentially contaminated.

B. Excavation and Grading:
   1. Perform as required by the Contract Drawings.
   2. Excavate trenches in open cut, by a trencher or backhoe of sufficient depth and width to meet the requirements of the installation section of these specifications. Provide no abrupt changes in grade of the main.
   3. Contract Drawings may indicate both existing grade and finished grade required for construction of Project.
      a. Stake all units, structures, piping, roads, parking areas and walks and establish their elevations.
      b. Perform other layout work required.
      c. Replace property corner markers to original location if disturbed or destroyed.
   4. Preparation of ground surface for embankments or fills:
      a. Before fill is started, scarify to a minimum depth of 6 IN in all proposed embankment and fill areas.
      b. Where ground surface is steeper than one vertical to four horizontal, plow surface in a manner to bench and break up surface so that fill material will bind with existing surface.
   5. Uniformly grade the areas within limits of grading under this Section, including adjacent transition areas.
   6. Smooth the finished surfaces within specified tolerance.
   7. Compact with uniform levels or slopes between points where elevations are shown on the Drawings, or between such points and existing grades.
   8. Where a change of slope is indicated on the Drawings, construct a rolled transition section having a minimum radius of approximately 8'0", unless adjacent construction will not permit such a transition, or if such a transition defeats positive control of drainage
   9. Grade areas adjacent to buildings to achieve drainage away from the structures, and to prevent ponding.
   10. Finish the surfaces to be free from irregular surface changes, and:

a. Shape the surface of areas scheduled to be under walks to line, grade, and cross-section, with finished surface not more than 0.10 ft above or below the required subgrade elevation.
b. Shape the surface of areas scheduled to be under pavement to line, grade, and cross-section, with finished surface not more than 0.05 ft above or below the required subgrade elevation.

11. Protection of finish grade:
    a. During construction, shape and drain embankment and excavations.
    b. Maintain ditches and drains to provide drainage at all times.
    c. Protect graded areas against action of elements prior to acceptance of work.
    d. Reestablish grade where settlement or erosion occurs.

C. Borrow:
1. Provide necessary amount of approved fill compacted to density equal to that indicated in this Specification.
2. Include cost of all borrow material in original proposal.
3. Fill material to be approved by Geotechnical Engineer prior to placement.

D. Construct embankments and fills as required by the Contract Drawings:
1. Construct embankments and fills at locations and to lines of grade indicated.
    a. Completed fill shall correspond to shape of typical cross section or contour indicated regardless of method used to show shape, size, and extent of line and grade of completed work.
2. Provide approved fill material which is free from roots, organic matter, trash, frozen material, and stones having maximum dimension greater than 6 IN.
    a. Ensure that stones larger than 4 IN are not placed in upper 6 IN of fill or embankment.
    b. Do not place material in layers greater than 8 IN loose thickness.
    c. Place layers horizontally and compact each layer prior to placing additional fill.
3. Compact soils as required to obtain specified density. Selection of appropriate equipment is the Contractor's responsibility.
    a. In general, compact cohesive soils by sheepsfoot, and granular soils by pneumatic rollers, vibrators, or by other equipment as required to obtain specified density.
    b. Control moisture for each layer necessary to meet requirements of compaction.

3.5 EXCAVATION, FILLING, AND BACKFILLING FOR STRUCTURES

A. General:
1. In general, work includes, but is not necessarily limited to, excavation for structures and retaining walls, removal of underground obstructions and undesirable material, backfilling, filling, and fill, backfill, and subgrade compaction.
2. Obtain fill and backfill material necessary to produce grades required.
    a. Materials and source to be approved by Geotechnical Engineer.
    b. Excavated material approved by Geotechnical Engineer may also be used for fill and backfill.
3. In the paragraphs of this Specification Section, the word "soil" also includes any type of rock subgrade that may be present at or below existing subgrade levels.

B. Trenching Operations
1. Conduct the excavation in such a manner as to cause the least interruption or hazard to traffic. Exercise caution to avoid damage to surfaced roadways and repair any such damage to an equal of its original condition. Restore drainage structures damaged during the work, or obstructed by operations, to satisfactory condition as soon as possible. Where traffic must cross open trenches, provide suitable bridges and flagmen.

C. Line Excavation

1. Make the excavation so that the entire length of the main shall lie upon the bottom of the trench. Excavation around all connections shall be of sufficient size to admit a free access for making the required connection. Where noted on the Plans, remove excavated material from the trench by loading directly into a truck, and hauling to a predetermined dump site not located within the realm of the project.

D. Length
   1. Do not advance the excavation of the trench more than 50 FT ahead of the pipe work, except where it is necessary to drain wet ground. The Contractor must assume the risk of meeting water, quicksand, hardpan, boulder clay, and existing utility lines.

E. Excavated Material
   1. Store excavated materials to be used as backfill in a neat pile adjacent to the excavation. Do not endanger the work, traffic, or obstruct drainage unnecessarily. Remove excavated materials not suitable for backfilling, or surplus backfill and suitably dispose of within a twenty-four (24) hour period. Where noted on the Plans, remove excavated material from the trench, load directly into a truck, and haul to a predetermined dump site not located within the realm of the project

F. Open Trench
   1. Do not open more than 100 linear feet of trench at any one time, including sections partially backfilled and being tested.

G. Ditch Protection
   1. To prevent caving or to protect existing roadways, utilities, or structures, sheet or brace the trench as necessary. Sheeting, where required, shall remain in place until the pipe has been laid and tested. Where sheeting is place, the earth above the pipe shall be well tamped for a depth of at least 6 IN above the pipe barrel.

H. Dewatering
   1. Keep trenches and other excavations adequately dewatered. Place discharge from pumps, drains, or bailing in such a way as to not introduce turbidity, sediments, or other pollutants into ditches, storm drains or natural drainage ways.

I. Trench Bottoms
   1. Follow uniform grades. Trench dimensions shall conform to the typical details of the plans, with additional excavation at the couplings to allow full pipe bearing.

J. Pipe Bearing Surface
   1. Dress the trench so that the barrel of the pipe bears evenly for its full length. Dig bell holes at each joint, dimensions of the holes to be sufficient to permit proper jointing.

K. Excavation Requirements for Structures:
   1. General:
      a. Do not commence excavation for foundations for structures until Geotechnical Engineer approves:
         1) The removal of topsoil and other unsuitable and undesirable material from existing subgrade.
         2) Density and moisture content of site area compacted fill material meets requirements of specifications.
         3) Site surcharge or mass fill material can be removed from entire construction site or portion thereof.
         4) Surcharge or mass fill material has been removed from construction area or portions thereof.
      b. Engineer grants approval to begin excavations.
   2. Dimensions:
      a. Excavate to elevations and dimensions indicated or specified.
      b. Allow additional space as required for construction operations and inspection of foundations.

c. Slope sides of excavations to comply with local codes, ordinances, and requirements of agencies having jurisdiction.
d. Maintain sides and slopes of excavations in safe condition until completion of backfilling.

3. Removal of obstructions and undesirable materials in excavation includes, but is not necessarily limited to, removal of old foundations, existing construction, unsuitable subgrade soils, expansive type soils, and any other materials which may be concealed beneath present grade, as required to execute work indicated on Contract Drawings.
   a. If undesirable material and obstructions are encountered during excavation, remove material and replace as directed by Geotechnical Engineer.
   b. Remove unsuitable subgrade soils located below foundations. The bottom of the overexcavation shall be located outside the exterior limits of foundations around the perimeter of structure the following horizontal distance, whichever is greater:
      1) Distance equal to depth of overexcavation below bottom of foundations.
      2) 5 FT.
      3) As directed by Geotechnical Engineer.
   c. When excavation has reached required subgrade elevations, notify Geotechnical Engineer, who will make an inspection of conditions.
      1) If Geotechnical Engineer determines that bearing materials at required subgrade elevations are unsuitable, provide Subgrade Stabilization as specified herein.
4. Level off bottoms of excavations to receive foundations, floor slabs, equipment support pads, or compacted fill.
   a. Remove loose materials and bring excavations into approved condition to receive concrete or fill material.
   b. Where compacted fill material must be placed to bring subgrade elevation up to underside of construction, scarify existing subgrade upon which fill material is to be placed to a depth of 6 IN and then compact to density stated in this Specification Section before fill material can be placed thereon.
   c. Do not carry excavations lower than shown for foundations except as directed by Geotechnical Engineer or Engineer.
   d. If any part of excavations is carried below required depth without authorization, notify Engineer and correct unauthorized excavation as directed. Corrections may include:
      1) Under soil supported footings, foundation bases, or retaining walls, fill unauthorized excavation by extending indicated bottom elevation of footing or base to excavation bottom, without altering required top elevation.
         a) Concrete fill may be used to bring elevations to proper position.
      2) In locations other than those above, including slabs on grade and pile supported foundations, backfill and compact unauthorized excavations as specified for authorized excavations of same classification, unless otherwise directed by Geotechnical Engineer.
      3) No extra compensation will be made to Contractor for correcting unauthorized excavations.
5. Make excavations large enough for working space, forms, dampproofing, waterproofing, and inspection.
6. Notify Geotechnical Engineer and Engineer as soon as excavation is completed in order that subgrades may be inspected.
   a. Do not commence further construction until subgrade under compacted fill material, under foundations, under floor slabs-on-grade, under equipment support pads, and under retaining wall footings has been inspected and approved by the Geotechnical Engineer as being free of undesirable material, being of compaction density required by this specification, and being capable of supporting the allowable foundation design bearing pressures and superimposed foundation, fill, and building loads to be placed thereon.
   b. Geotechnical Engineer shall be given the opportunity to inspect subgrade below fill material both prior to and after subgrade compaction.

c. Place fill material, foundations, retaining wall footings, floor slabs-on-grade, and equipment support pads as soon as weather conditions permit after excavation is completed, inspected, and approved and after forms and reinforcing are inspected and approved.
d. Before concrete or fill material is placed, protect approved subgrade from becoming loose, wet, frozen, or soft due to weather, construction operations, or other reasons.

7. Dewatering:
   a. Where groundwater is or is expected to be encountered during excavation, install a dewatering system to prevent softening and disturbance of subgrade below foundations and fill material, to allow foundations and fill material to be placed in the dry, and to maintain a stable excavation side slope.
   b. Groundwater shall be maintained at least 3 FT below the bottom of any excavation.
   c. Review Geotechnical investigation before beginning excavation and determine where groundwater is likely to be encountered during excavation.
   d. Employ dewatering specialist for selecting and operating dewatering system.
   e. Keep dewatering system in operation until dead load of structure exceeds possible buoyant uplift force on structure.
   f. Dispose of groundwater to an area which will not interfere with construction operations or damage existing construction.
      1) Install groundwater monitoring wells as necessary.
   g. Shut off dewatering system at such a rate to prevent a quick upsurge of water that might weaken the subgrade.
8. Subgrade stabilization:
   a. If subgrade under foundations, fill material, floor slabs-on-grade, or equipment support pads is in a frozen, loose, wet, or soft condition before construction is placed thereon, remove frozen, loose, wet, or soft material and replace with approved compacted material as directed by Geotechnical Engineer.
   b. Provide compaction density of replacement material as stated in this Specification Section.
   c. Loose, wet, or soft materials, when approved by Geotechnical Engineer, may be stabilized by a compacted working mat of well graded crushed stone.
   d. Compact stone mat thoroughly into subgrade to avoid future migration of fines into the stone voids.
   e. Remove and replace frozen materials as directed by Geotechnical Engineer.
   f. Method of stabilization shall be performed as directed by Geotechnical Engineer.
   g. Do not place further construction on the repaired subgrades, until the subgrades have been approved by the Geotechnical Engineer.
9. Do not place floor slabs-on-grade including equipment support pads until subgrade below has been approved, piping has been tested and approved, reinforcement placement has been approved, and Contractor receives approval to commence slab construction.
   a. Do not place building floor slabs-on-grade including equipment support pads when temperature of air surrounding the slab and pads is or is expected to be below 40 DEGF before structure is completed and heated to a temperature of at least 50 DEGF.
10. Protection of structures:
    a. Prevent new and existing structures from becoming damaged due to construction operations or other reasons.
    b. Prevent subgrade under new and existing foundations from becoming wet and undermined during construction due to presence of surface or subsurface water or due to construction operations.
11. Shoring:
    a. Shore, slope, or brace excavations as required to prevent them from collapsing.
    b. Remove shoring as backfilling progresses but only when banks are stable and safe from caving or collapse.
    c. Construct shoring that is required to retain water as part of the dewatering system, using non-permeable details such as interlock sealant for sheet piles.
12. Drainage:

a. Control grading around structures so that ground is pitched to prevent water from running into excavated areas or damaging structures.
b. Maintain excavations where foundations, floor slabs, equipment support pads or fill material are to be placed free of water.
c. Provide pumping required to keep excavated spaces clear of water during construction.
d. Should any water be encountered in the excavation, notify Engineer and Geotechnical Engineer.
e. Provide free discharge of water by trenches, pumps, wells, well points, or other means as necessary and drain to point of disposal that will not damage existing or new construction or interfere with construction operations.

13. Frost protection:
    a. Do not place foundations, slabs-on-grade, equipment support pads, or fill material on frozen ground.
    b. When freezing temperatures may be expected, do not excavate to full depth indicated, unless foundations, floor slabs, equipment support pads, or fill material can be placed immediately after excavation has been completed and approved.
    c. Protect excavation from frost if placing of concrete or fill is delayed.
    d. Where a concrete slab is a base slab-on-grade located under and within a structure that will not be heated, protect subgrade under the slab from becoming frozen until final acceptance of the Project by the Owner.
    e. Protect subgrade under foundations of a structure from becoming frozen until structure is completed and heated to a temperature of at least 50 DEGF.

L. Fill and Backfill Inside of Structure and Below Foundations, Base Slabs, Floor Slabs, Equipment Support Pads and Piping:
1. General:
    a. Subgrade to receive fill or backfill shall be free of undesirable material as determined by Geotechnical Engineer and scarified to a depth of 6 IN and compacted to density specified herein.
    b. Surface may be stepped by at not more than 12 IN per step or may be sloped at not more than 2%.
    c. Do not place any fill or backfill material until subgrade under fill or backfill has been inspected and approved by Geotechnical Engineer or RPR as being free of undesirable material and compacted to specified density.
2. Obtain approval of fill and backfill material and source from Geotechnical Engineer prior to placing the material.
3. Fill and backfill placement:
    a. Prior to placing fill and backfill material, optimum moisture and maximum density properties for proposed material shall be obtained from Geotechnical Engineer.
    b. Place fill and backfill material in 8 IN lifts.
    c. Compact material by means of equipment of sufficient size and proper type to obtain specified density.
    d. Use hand operated equipment for filling and backfilling within 5 FT of walls and less than 3 FT above pipes.
        1) Compaction equipment exceeding 3000 LBS dead weight shall not be used within 5 FT of the wall as a minimum
        2) Contractor is responsible for method of compaction so as not to damage wall.
    e. Use hand operated equipment for filling and backfilling next to walls.
    f. Do not place fill and backfill when the temperature is less than 40 DEGF and when subgrade to receive fill and backfill material is frozen, wet, loose, or soft.
    g. Use vibratory equipment to compact granular material; do not use water.
4. Where fill material is required below foundations, place fill material, conforming to the required density and moisture content as required to fill the specified overexcavation to bottom of foundation.

M. Filling and Backfilling Outside of Structures:

1. This paragraph of this Specification applies to fill and backfill placed outside of structures above bottom level of both foundations and piping but not under paving.
2. Provide material as approved by Geotechnical Engineer for filling and backfilling outside of structures.
3. Fill and backfill placement:
    a. Prior to placing fill and backfill material, obtain optimum moisture and maximum density properties for proposed material from Geotechnical Engineer.
    b. Place fill and backfill material to maximum allowable lift thickness indicated in Paragraph 3.5, C, 5, b of this Section.
    c. Compact material with equipment of proper type and size to obtain density specified.
    d. Use hand operated equipment for filling and backfilling within 5 FT of walls and less than 3 FT above pipes.
        1) Compaction equipment exceeding 3000 LBS dead weight shall not be used within 5 FT of the wall as a minimum
        2) Contractor is responsible for method of compaction so as not to damage wall.
    e. Use only hand operated equipment for filling and backfilling next to walls and retaining walls.
    f. Do not place fill or backfill material when temperature is less than 40 DEGF and when subgrade to receive material is frozen, wet, loose, or soft.
    g. Use vibratory equipment for compacting granular material; do not use water.
4. Backfilling against walls:
    a. Do not backfill around any part of structures until each part has reached specified 28-day compressive strength and backfill material has been approved.
    b. Do not start backfilling until concrete forms have been removed, trash removed from excavations, pointing of masonry work, concrete finishing, damp-proofing and waterproofing have been completed.
    c. Do not place fills against walls until floor slabs at top, bottom, and at intermediate levels of walls are in place and have reached 28-day required compressive strength to prevent wall movement.
        1) See Contract Drawings for specific exceptions.
    d. Bring backfill and fill up uniformly around the structures and individual walls, piers, or columns.

N. Backfilling Outside of Structures Under Piping or Paving:
1. When backfilling outside of structures requires placing backfill material under piping or paving, the material shall be placed from bottom of excavation to underside of piping or paving at the density required for fill under piping or paving as indicated in this Specification Section.
2. This compacted material shall extend transversely to the centerline of piping or paving a horizontal distance each side of the exterior edges of piping or paving equal to the depth of backfill measured from bottom of excavation to underside of piping or paving.
3. Provide special compacted bedding or compacted subgrade material under piping or paving as required by other Specification Sections for the Project.
4. Do not lay pipe resting on rock, blocking, or other unyielding objects. Where the trench bottom uncovered at subgrade is rock, cut the trench and lay the pipe on an evenly spread and compacted cushion. The cushion shall be at least 4 IN and not more than 8 IN in depth above bottom of trench and shall uniformly support the barrel of the pipe. Construct the cushion from material indicted for use as pipe bedding.
5. Where the trench bottom is soft and in the opinion of the Engineer, cannot support the pipe, cut the trench as directed and install a suitable cradle. In general, the cradle shall be of pit run sand and gravel, or of small crushed stone or chips.

3.6 GRADING

A. General:
1. Uniformly grade the areas within limits of grading under this Section, including adjacent transition areas.

2. Smooth the finished surfaces within specified tolerance.
3. Compact with uniform levels or slopes between points where elevations are shown on the Drawings, or between such points and existing grades.
4. Where a change of slope is indicated on the Drawings, construct a rolled transition section having a minimum radius of approximately 8'0", unless adjacent construction will not permit such a transition, or if such a transition defeats positive control of drainage.

B. Grading outside building lines:
1. Grade areas adjacent to buildings to achieve drainage away from the structures, and to prevent ponding.
2. Finish the surfaces to be free from irregular surface changes, and:
   a. Shape the surface of areas scheduled to be under walks to line, grade, and cross-section, with finished surface not more than 0.10 ft above or below the required subgrade elevation.
   b. Shape the surface of areas scheduled to be under pavement to line, grade, and cross-section, with finished surface not more than 0.05 ft above or below the required subgrade elevation.

3.7 COMPACTING

A. Control soil compaction during construction to provide the minimum percentage of density specified for each area as determined according to ASTM D698.

B. Provide not less than the following maximum density of soil material compacted at plus or minus 2% of optimum moisture content for the actual density of each layer of soil material in place, and as approved by the Engineer.
1. Structures: Compact each layer of fill material or backfill material at 95% of maximum density.
2. Lawn and Unpaved Areas: Compact each layer of fill material or backfill material at 90% of maximum density.
3. Walks: Compact each layer of fill material or backfill material at 92% of maximum density or the minimum percent of maximum density as required by the governmental agency having jurisdiction over the work, whichever is more stringent.
4. Pavements: Compact each layer of fill material or backfill material at 95% of maximum density or the minimum percent of maximum density as required by the governmental agency having jurisdiction over the work, whichever is more stringent.

C. Moisture control:
1. Where layer of soil material must be moisture-conditioned before compacting, uniformly apply water to layer of soil material to prevent free water appearing on surface during or subsequent to compacting operations.
2. Remove and replace, or scarify and air dry, soil material that is too wet to permit compacting to the specified density.
3. Soil material that has been removed because it is too wet to permit compacting may be stockpiled or spread and allowed to dry. Assist drying by discing, harrowing, or pulverizing until moisture content is reduced to a satisfactory value as determined by moisture density relation tests approved by the Engineer.

3.8 FIELD QUALITY CONTROL

A. All excavation, trenching, and related sheeting, bracing, etc. shall comply with the requirements of OSHA Standards, and state requirements. Where conflict between OSHA and state regulations exists, the more stringent requirements shall apply.

B. Secure the Engineer's inspection and approval of fill layers before subsequent construction is permitted thereon.

C. Density testing will be required on all fill layers located under structures and paved surfaces or as directed by the Engineer. All testing shall be in accordance with ASTM D2922

D. Provide at least the following tests to the approval of the Engineer:

1. At paved areas, at least one field density test for every 2000 sq ft of paved area, but not less than three tests;
2. In each compacted fill layer, one field density test for every 2000 sq ft of overlaying paved area, but not less than three tests.

E. If, in the Engineer's opinion based on reports of the testing laboratory, subgrade or fills which have been placed are below specified density, provide additional compacting and testing under the provisions of these Specifications.

3.9 MAINTENANCE

A. Protection of newly graded areas:
1. Protect newly graded areas from traffic and erosion, and keep free from trash and weeds;
2. Repair and reestablish grades in settled, eroded, and rutted areas to the specified tolerances.

B. Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify the surface, reshape, and compact to the required density prior to further construction.

END OF SECTION

SECTION 31 23 33
TRENCHING, BACKFILLING, AND COMPACTING FOR UTILITIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Excavation, trenching, backfilling and compacting for all underground utilities.

B. Related Specification Sections include but are not necessarily limited to:
   1. Section 31 23 00 - Earthwork.
   2. Section 31 23 33 - Trenching, Backfilling, and Compacting for Utilities.
   3. Section 33 11 13 - Water Main Construction.

1.2 QUALITY ASSURANCE

A. Referenced Standards:
   1. ASTM International (ASTM):
      a. D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 FT-LBF/FT^3 (600 kN-M/M^3)).
      b. D4253, Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.
      c. D4254, Standard Test Methods for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density.

B. Qualifications: Hire an independent soils laboratory to conduct in-place moisture-density tests for backfilling to assure that all work complies with this Specification Section.

1.3 DEFINITIONS

A. Excavation: All excavation will be defined as unclassified.

1.4 SUBMITTALS

A. Shop Drawings:
   1. Product technical data including:
      a. Acknowledgement that products submitted meet requirements of standards referenced.
      b. Manufacturer's installation instructions.
   2. Submit respective pipe or conduit manufacturer's data regarding bedding methods of installation and general recommendations.
   3. Submit sieve analysis reports on all granular materials.

B. Informational Submittals:
   1. Trench shield (trench box) certification if employed:
      a. Specific to Project conditions.
      b. Re-certified if members become distressed.
      c. Certification by registered professional structural engineer, registered in the state where the Project is located.
      d. Engineer is not responsible to, and will not, review and approve.

1.5 SITE CONDITIONS

A. Avoid overloading or surcharge a sufficient distance back from edge of excavation to prevent slides or caving.
   1. Maintain and trim excavated materials in such manner to be as little inconvenience as possible to public and adjoining property owners.

B. Provide full access to public and private premises and fire hydrants, at street crossings, sidewalks and other points as designated by Owner to prevent serious interruption of travel.

C. Protect and maintain bench marks, monuments or other established points and reference points and if disturbed or destroyed, replace items to full satisfaction of Owner and controlling agency.

D. Verify location of existing underground utilities

PART 2 - PRODUCTS

2.1 MATERIALS

A. Backfill Material:
   1. As approved by Engineer.
      a. Free of rock cobbles, roots, sod or other organic matter, and frozen material.
      b. Moisture content at time of placement: ±3% of optimum moisture content as specified in accordance with ASTM D698.

B. Bedding Materials:
   1. As approved by the Geotechnical Engineer.
   2. Granular bedding materials:
      a. ASTM D2321 Class 1B.
         1) Well-graded crushed stone.
   3. Flowable fill:
      a. Description: Flowable fill shall be a mixture of cement, fly ash, fine sand, water, and air having a consistency which will flow under a very low head.
      b. Material characteristics:
         1) The approximate quantities of each component per cubic yard of mixed material shall be as follows:
            a) Cement (Type I or II): 50 LBS.
            b) Fly ash: 200 LBS.
            c) Fine sand: 2,700 LBS.
            d) Water: 420 LBS.
            e) Air content: 10%.
         2) Actual quantities shall be adjusted to provide a yield of 1 cubic yard with the materials used.
         3) Approximate compressive strength should be 85 to 175 PSI.
         4) Fine sand shall be an evenly graded material having not less than 95% passing the No. 4 sieve and not more than 5% passing the No. 200 sieve.
         5) Mixing and handling of the material shall be in accordance with Specification Section 03 31 31.

PART 3 - EXECUTION

3.1 GENERAL

A. Remove and dispose of unsuitable materials as directed by the Owner or Owner's Representative.

3.2 EXCAVATION

A. Unclassified Excavation: Remove rock excavation, clay, silt, gravel, hard pan, loose shale, and loose stone as directed by Geotechnical Engineer.

B. Excavation for Appurtenances:
   1. 12 IN (minimum) clear distance between outer surface and embankment.
   2. See Specification Section 31 23 00 for applicable requirements.

C. Groundwater Dewatering:

1. Where groundwater is, or is expected to be, encountered during excavation, install a dewatering system to prevent softening and disturbance of subgrade to allow subgrade stabilization, pipe, bedding and backfill material to be placed in the dry, and to maintain a stable trench wall or side slope.
2. Groundwater shall be drawn down and maintained at least 3 FT below the bottom of any trench or manhole excavation prior to excavation.
3. Review soils investigation before beginning excavation and determine where groundwater is likely to be encountered during excavation.
   a. Employ dewatering specialist for selecting and operating dewatering system.
4. Keep dewatering system in operation until dead load of pipe, structure and backfill exceeds possible buoyant uplift force on pipe or structure.
5. Dispose of groundwater to an area which will not interfere with construction operations or damage existing construction.
6. Install groundwater monitoring wells as necessary.
7. Shut off dewatering system at such a rate to prevent a quick upsurge of water that might weaken the subgrade.
8. Cost of groundwater dewatering shall be included in the lineal foot unit price of the pipe installation.

D. Trench Excavation:
   1. Excavate trenches by open cut method to depth shown on Drawings and necessary to accommodate work.
      a. Support existing utility lines [and yard piping] where proposed work crosses at a lower elevation.
         1) Stabilize excavation to prevent undermining of existing utility and yard piping.
   2. Open trench outside buildings, units, and structures:
      a. No more than the distance between two manholes, structures, units, or 300 LF, whichever is less.
      b. Field adjust limitations as weather conditions dictate.
   3. Trenching within buildings, units, or structures:
      a. No more than 100 LF at any one time.
   4. Any trench or portion of trench, which is opened and remains idle for [seven] calendar days, or longer, as determined by the Owner, may be directed to be immediately refilled, without completion of work, at no additional cost to Owner.
      a. Said trench may not be reopened until Owner is satisfied that work associated with trench will be prosecuted with dispatch.
   5. Observe following trenching criteria:
      a. Trench size:
         1) Excavate width to accommodate free working space.
         2) Maximum trench width at top of pipe or conduit may not exceed outside diameter of utility service by more than the following dimensions:

OVERALL DIAMETER OF UTILITY SERVICE	EXCESS DIMENSION
33 IN and less	18 IN
more than 33 IN	24 IN

         3) Cut trench walls vertically from bottom of trench to 1 FT above top of pipe, conduit, or utility service.
         4) Keep trenches free of surface water runoff.
            a) Include cost in Bid.
            b) No separate payment for surface water runoff pumping will be made.

E. Flowable Fill:
   1. Flowable fill shall be:

a. Discharged from a mixer by any means acceptable to the Engineer into the area to be filled.
b. Placed in 4 FT maximum lifts to the elevations indicated.
1) Allow 12 HR set-up time before placing next lift or as approved by the Engineer.
2) Place flowable fill lifts in such a manner as to prevent flotation of the pipe.

2. Flowable fill shall not be placed on frozen ground.
3. Subgrade on which flowable fill is placed shall be free of disturbed or softened material and water.
4. Conform to appropriate requirements of Specification Section 31 23 00.
5. Flowable fill batching, mixing, and placing may be started if weather conditions are favorable, and the air temperature is 34 DEGF and rising.
6. At the time of placement, flowable fill must have a temperature of at least 40 DEGF.
7. Mixing and placing shall stop when the air temperature is 38 DEGF or less and falling.
8. Each filling stage shall be as continuous an operation as is practicable.
9. Prevent traffic contact with flowable fill for at least 24 HRS after placement or until flowable fill is hard enough to prevent rutting by construction equipment.
10. Flowable fill shall not be placed until water has been controlled or groundwater level has been lowered in conformance with the requirements of the preceding Groundwater Dewatering paragraph in PART 3 of this Specification Section.

3.3 PREPARATION OF FOUNDATION FOR PIPE LAYING

A. Over-Excavation:
1. Backfill and compact to 90% of maximum dry density per ASTM D698.
2. Backfill with granular bedding material as option.

B. Rock Excavation:
1. Excavate minimum of 6 IN below bottom exterior surface of the pipe or conduit.
2. Backfill to grade with suitable earth or granular material.
3. Form bell holes in trench bottom.

C. Subgrade Stabilization:
1. Stabilize the subgrade when directed by the Owner.
2. Observe the following requirements when unstable trench bottom materials are encountered.
a. Notify Owner when unstable materials are encountered.
1) Define by drawing station locations and limits.
b. Remove unstable trench bottom caused by Contractor failure to dewater, rainfall, or Contractor operations.
1) Replace with subgrade stabilization with no additional compensation.

3.4 BACKFILLING METHODS

A. Do not backfill until tests to be performed on system show system is in full compliance with specified requirements.

B. Carefully Compacted Backfill:
1. Furnish where indicated on Drawings, specified for trench embedment conditions and for compacted backfill conditions up to 12 IN above top of pipe or conduit.
2. Comply with the following:
a. Place backfill in lifts not exceeding 8 IN (loose thickness).
b. Hand place, shovel slice, and pneumatically tamp all carefully compacted backfill.
c. Observe specific manufacturer's recommendations regarding backfilling and compaction.
d. Compact each lift to specified requirements.

C. Common Trench Backfill:
1. Perform in accordance with the following:
a. Place backfill in lift thicknesses capable of being compacted to densities specified.
b. Observe specific manufacturer's recommendations regarding backfilling and compaction.

c. Avoid displacing joints and appurtenances or causing any horizontal or vertical misalignment, separation, or distortion.

D. Water flushing for consolidation is not permitted.

3.5 COMPACTION

A. General:
1. Place and assure bedding, backfill, and fill materials achieve an equal or higher degree of compaction than undisturbed materials adjacent to the work.
2. In no case shall degree of compaction below minimum compactions specified be accepted.

B. Compaction Requirements:
1. Unless noted otherwise on Drawings or more stringently by other Specification Sections, comply with following minimum trench compaction criteria.
a. Bedding material:

LOCATION	SOIL TYPE	COMPACTION DENSITY
All locations	Cohesionless soils	75% relative density by ASTM D4253 and ASTM D4254

b. Carefully compacted backfill:

LOCATION	SOIL TYPE	COMPACTION DENSITY
All applicable areas	Cohesive soils	95% of maximum dry density by ASTM D698
	Cohesionless soils	75% relative density by ASTM D4253 and ASTM D4254

c. Toe drain bedding and backfill:

LOCATION	SOIL TYPE	COMPACTION DENSITY
All locations	Cohesionless soils	60% relative density by ASTM D4253 and ASTM D4254

d. Common trench backfill:

LOCATION	SOIL TYPE	COMPACTION DENSITY
Under pavements, roadways, surfaces within highway right-of-ways	Cohesive soils	95% of maximum dry density by ASTM D698
	Cohesionless soils	60% of relative density by ASTM D4253 and ASTM D4254
Under turfed, sodded, plant seeded, nontraffic areas	Cohesive soils	85% of maximum dry density by ATM D698
	Cohesionless soils	40% of relative density by ASTM D4253 and ASTM D4254

3.6 FIELD QUALITY CONTROL

A. Testing:
1. Perform in-place moisture-density tests as directed by the Owner.
2. Perform tests through recognized testing laboratory approved by Owner.
3. Costs of "Passing" tests paid by Owner.
4. Perform additional tests as directed until compaction meets or exceeds requirements.
5. Cost associated with "Failing" tests shall be paid by Contractor.

6. Reference to Engineer in this Specification Section will imply Geotechnical Engineer when employed by Owner and directed by Engineer to undertake necessary inspections as approvals as necessary.
7. Assure Owner has immediate access for testing of all soils related work.
8. Ensure excavations are safe for testing personnel.

END OF SECTION

DIVISION 33

UTILITIES

SECTION 33 11 13
WATER MAIN CONSTRUCTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Coordination and interface with existing facilities and utilities.
   2. Connections to existing water mains.
   3. Testing, flushing and disinfection.

B. Related Specification Sections include but are not necessarily limited to:
   1. Section 32 91 13 - Topsoiling and Finished Grading.
   2. Section 33 12 19 - Fire Hydrant.
   3. Section 40 05 00 - Pipe and Pipe Fittings - Basic Requirements.
   4. Section 40 05 51 - Valves - Basic Requirements.
   5. Section 40 05 61 - Gate Valves.

1.2 QUALITY ASSURANCE

A. Referenced Standards:
   1. American Water Work Association (AWWA):
      a. B300, Standard for Hypochlorites.
      b. B301, Standard for Liquid Chlorine.
      c. C651, Standard for Disinfecting Water Mains.

1.3 SUBMITTALS

A. Submit results of the leakage tests, identifying the specific length of pipe tested, the test pressure, the duration of test and the amount of leakage.

B. Submit satisfactory bacteriological test reports on disinfection requirements.

C. Submit qualifications for lab performing disinfection analysis.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Pipe: Refer to Specification Section 40 05 00.

B. In-Line Valves:
   1. Refer to Specification Section 40 05 51, Specification Section 40 05 52, and Specification Section 40 05 61.
   2. Provide adjustable valve boxes.
      a. Include price of valve boxes in price of valve installed complete.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Install water main to the line and grade on the Drawings.
   1. Water mains to be staked at a minimum 100 FT interval with depth of cuts monitored.

C. Field verify depth of utilities that will be crossed.
   1. Adjust water main elevation as required during construction.

2. No separate payment will be made for field verification or adjustment of main depths as required.

D. Contractor will restore all existing structures or services damaged by Contractor's operations at no cost to Owner.

3.2 INTERRUPTION OF SERVICE

A. Interruption of service to water users shall not exceed 4 HRS.
   1. Notify property owners of interruption a minimum of 24 HRS in advance.

3.3 UNDERGROUND SERVICES

A. Notify utility representative prior to construction to obtain available information on location of existing utilities.
   1. Contractor shall be responsible for locating all utilities.

3.4 DRIVEWAY REMOVAL AND REPLACEMENT

A. All Portland cement concrete and asphalt noted for removal and replacement shall be cut prior to removal.
   1. Cut by sawing, vertical cut to be 1 IN minimum.
   2. The remaining depth of section may be broken out in a manner subject to Engineers approval.
   3. Width of section removed to be either a width not greater than the outside diameter of the water main plus 4 FT-0 IN or broken out to the nearest joint.

B. Replace Portland cement concrete and asphalt equal to or better than original paving plus 2 IN.

C. Debris resulting from the above operations shall be removed and hauled as directed by the Engineer.

D. Include driveway removal and replacement in cost of the bid unit price of the water main.

3.5 GRAVEL SURFACED DRIVES AND ROADWAYS

A. Restore all damaged gravel surfaced drives and roadways to a condition equal to or better than original.
   1. Payment to be at bid unit price for this item.
   2. Replacement gravel gradation.

3.6 PROTECTION OF EXISTING UTILITIES

A. Contractor to verify the location of all underground utilities.
   1. Omission from, or the inclusion of utility locations on the plans is not to be considered as the nonexistence of or a definite location of existing underground utilities.

B. A representative of the underground utilities shall be notified 24 HRS in advance of crossings.

3.7 CONNECTIONS TO EXISTING WATER MAINS

A. Make connections to existing water mains as shown on Drawings, by attaching to existing or changed fitting.
   1. Cost for making connections shall include cost of all fittings including flexible couplings, and shall be included in the bid unit price of the water main.

B. Where the connection is made to an existing water main which can be adequately isolated from the distribution system, it shall be termed a "dry connection."

C. Contractor is responsible for controlling and disposing of water in the trench at no additional cost to the Owner.

3.8 SEWER CROSSINGS

A. Water mains crossing house sewers, storm sewers or sanitary sewers shall be laid to provide a vertical separation of at least 18 IN between the bottom of the water main and the top of the sewer, whenever possible.
   1. A water main may be laid closer than 10 FT if the crown of the sewer is at least 18 IN below the water main invert.
   2. In the event 18 IN of vertical separation cannot be provided at a sewer crossing, the sewer shall be removed for a distance of 10 FT on each side of the water main and replaced with one 20 FT length of ductile iron pipe of the same size.

B. Concrete collars shall be provided at each end of the ductile iron pipe to connect to the existing sewer pipe as shown on the Drawings.

C. Payment for crossings shall be included in the bid unit price of the water main.

3.9 TREES

A. Do not remove trees without written instructions from the Engineer unless tree removal is shown on drawings.
   1. No separate payment will be made for tree removal and the cost shall be included in the bid unit price for transmission main.

3.10 FENCES, SIGNS, MAILBOXES, ETC.

A. Restore all damaged fences, signs, mailboxes, etc., to their original conditions.
   1. No separate payment will be made for these items.

3.11 FIELD QUALITY CONTROL

A. Sealing, Flushing, and Disinfection of Potable Water Systems:
   1. Maintain interior of all pipes, fittings and other accessories free from dirt and foreign material at all times.
      a. If, in the opinion of the Engineer, the pipe contains dirt that will not be removed by flushing, the pipe interior shall be cleaned and swabbed with bactericidal solution.
      b. At close of day's work or whenever workmen are absent from jobsite, plug, cap or otherwise provide watertight seal from open ends of pipe to prevent ingress of foreign material.
      c. If water is in trench, seal shall remain in place until trench is pumped dry.
   2. After favorable performance of pressure test and prior to final acceptance, thoroughly flush the entire potable water piping system and perform disinfection as prescribed.
      a. Perform all work including preventative measures during construction in full compliance to AWWA C651.
   3. Flush each segment of the system to provide a flushing velocity of not less than 2.5 FT per second.
   4. Drain flushing water to location approved by the Owner.
   5. Perform disinfection using one of the following forms:
      a. Application of chlorine gas-water mixture by means of solution-feed chlorinating device.
         1) Liquid chlorine shall comply with AWWA B301.
      b. Application of calcium hypochlorite, or sodium hypochlorite.
         1) Chlorine compounds shall comply with AWWA B300.
   6. Disinfect pipe with chlorinated water as per AWWA C651.
      a. Method of application of chlorine shall be by continuous feed method or slug method.
      b. During disinfection procedure, ensure that initial and residual chlorine concentrations meet AWWA C651 requirements by testing by an approved method as directed by the Owner.
      c. Cost of testing shall be included in the Bid Unit Price for water mains and no separate payment will be made for this item.
   7. Tag the system during the disinfection procedure.

8. Following disinfection for required contact period, neutralize chlorine residual in water by treating with reducing agent.
    a. Refer to AWWA C651.
    b. Flush all treated water from pipeline at its extremities until replacement water throughout pipe, upon test is proved comparable in quality to water in existing system.
    c. Take two samples to test for bacteriological quality as directed by Engineer.
    d. Repeat disinfection procedure until two satisfactory results are obtained.
    e. Quality of water delivered by the new water main to remain satisfactory for a minimum period of two days.
9. Secure satisfactory bacteriological reports on samples from the system.
    a. Ensure all sampling and testing procedures are in full compliance to AWWA C651, and applicable requirements of the location the Site is in.
        1) No separate payment will be made for this item.
10. The Owner will provide the water required to fill the main initially and will pay for the water required to flush the main once.
    a. Filling and flushing shall be performed during periods of low usage, between the hours of midnight and 4:00 AM.
    b. Flushing water will be based on a maximum of 8 HRS total.
    c. Any additional refilling or reflushing to be at the Contractor's expense at the City's commercial water rates.

END OF SECTION

SECTION 33 16 23
LAMASCO TANK REHABILITATION AND IMPROVEMENTS
STEEL TANK – GLASS COATED

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. This specification covers, the retrofit of a glass lined tank corrosion protection system (including removal of the existing protection system), miscellaneous tank repairs, preparation of surfaces, performance and completion of touch up work of all deteriorated interior surfaces of a 189,000 gallon standpipe water storage tank located along KY Highway 93 in Lamasco, Lyon County, Kentucky.
   2. The Aquastore glass lined standpipe was manufactured in 1986 by A.O. Smith Harvestore Products, Inc. The following are some general design criteria for the tank:

Overall Height:	Approximately 90'
Shape:	Cylinder
Standpipe Diameter:	20'-0"
Head Range:	83'-0"
Capacity:	189,000 gallons

   3. The CONTRACTOR shall be responsible for all costs associated with sampling, worker protection, environmental pollution control, handling of debris, laboratory analysis, waste disposal, in addition to those items listed in the following specification.

B. Related Specification Sections include but are not necessarily limited to:
   1. Division 03 - Concrete.
   2. Section 31 23 00 - Earthwork.
   3. Division 33 – Utilities.
   4. Division 40 - Process Interconnections.
   5. Section 46 41 00 - Mixers.

1.2 WORK INCLUDED

A. Coordination with Owner for isolating and draining of the tank.

B. Preparation of surfaces, which are to receive sealing finishes.

C. Collection, handling and disposal of debris.

D. Removal of the existing corrosion protection system

E. Tank repairs (including installation of corrosion protection system).

F. Finish surfaces.

G. Testing and cleaning.

H. Installation of mixing system.

I. Construction of 8-inch bypass line.

J. Assembly and Installation of altitude valve, flush hydrant, and check valve.

K. Grouting of Tank Base.

L. Replacement of manway gaskets and bolts.

M. Roof screen replacement.

N. Safety climb and hardware replacement.

1.3 QUALITY ASSURANCE

A. Referenced Standards:
   1. American Institute of Steel Construction (AISC).
   2. American Iron and Steel Institute (AISI).
   3. American Society of Civil Engineers (ASCE):
      a. 7, Minimum Design Loads for Buildings and Other Structures.
   4. ASTM International (ASTM):
      a. A36, Standard Specification for Carbon Structural Steel.
      b. A325, Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 KSI Minimum Tensile Strength.
      c. A992, Standard Specification for Structural Steel Shapes.
      d. A1008, Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable.
      e. A1011, Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
      f. D1751, Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
      g. F593, Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.
   5. American Water Works Association (AWWA):
      a. D103, Standard for Factory-Coated Bolted Steel Tanks for Water Storage.
   6. Code of Federal Regulations (CFR):
      a. Food and Drug Administration (FDA):
         1) Title 21, Food and Drugs.
   7. National Sanitation Foundation International (NSF):
      a. 61, Drinking Water System Component.
   8. Occupational, Safety and Health Administration (OSHA).
   9. Society of Automotive Engineers (SAE).
      a. J429, Mechanical and Material Requirements for Externally Threaded Fasteners.
   10. Society for Protective Coatings/NACE International (SSPC/NACE):
      a. SP 10/NACE No. 2, Near-White Blast Cleaning.

B. Qualifications:
   1. Coating manufacturer's technical representative shall be a NACE Certified Coatings Inspector, Level 3 minimum.
   2. Applicators shall have minimum of 10 years of experience in application of similar products on similar project.
      a. Provide references for minimum of three different coating rehabilitation projects completed in last five years with similar scope of work.
      b. Include name and address of project, size of project in value (coating) and contact person.
   3. NACE inspector – This service will be provided by the Owner's representative.
   4. Furnish coating through one manufacturer unless noted otherwise.

C. Material shall not be thinned unless approved, in writing, by coating manufacturer's technical representative.

1.4 SUBMITTALS

A. Shop Drawings:
   1. Product technical data including:

a. Before any materials are delivered to the job site, submit to the Consultant a complete list of all materials proposed to be furnished including quantities, types and descriptions of paint for each part of the project. Material list shall refer to the specified paint systems and the paint schedule for each paint product proposed to be used. In cases where paint materials other than those described in the Specifications are proposed, a materials list will not be considered as acceptance of such substitute materials; further data will be required as specified herein.
b. Acknowledgement that product submitted meet requirements of standards referenced.
c. Manufacturer's installation instructions.

2. Manufacturer's descriptive data describing each product to include solids by volume, performance data and manufacturer's recommendations for mixing, thinning and curing.
3. Manufacturer's certified test reports confirming compliance with the specified performance requirements under Section 2.01.
4. Coating information.
   a. Color cards showing color availability for each finish coat.
5. Certifications:
   a. Certificates of compliance with standards specified for all major components incorporated into work.
6. Test reports.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to job site in factory-sealed, original-labeled containers, as applicable.

B. Store materials in a protected area, at temperatures in accordance with manufacturer's recommended temperatures.

1.6 ENVIRONMENTAL CONDITIONS

A. Provide adequate continuous ventilation and sufficient heating facilities to maintain temperatures above the minimum shown on the manufacturer's product data sheets.

B. Provide minimum 25-foot candles (270 lx.) of lighting on surfaces to be finished.

C. The crew will always have on site, certificated mil gauges, and environmental monitoring gauges.

D. Ventilation
   1. Ventilation is essential to remove vapors during application and curing of coatings.
   2. Ventilation shall be exhausted from lowest portion of tank with top openings kept clear.
   3. During coating applications the capacity of the ventilating fans shall be at least 400 cfm per gallon of coating applied per hour.
   4. The ventilation requirements are to ensure proper curing of the applied coatings and are not to be taken as requirements to ensure worker safety.
   5. Following the application of the final interior coating the tank shall be force ventilated by mechanical means from the lowest possible point for a minimum of 48 hours, ventilation shall be such that it creates a total turn-over on the interior of the tank a least once per hour.

E. Apply paints only when temperature of surfaces to be painted and surrounding air temps are between 55- and 90-degrees Fahrenheit unless otherwise permitted by paint manufactures printed instructions.

F. Application of coatings will not be permitted in snow, rain, fog, mist or when the relative humidity exceeds 85%; or when the surface temp of substrate is less than 5 degrees Fahrenheit above the dew point; or to damp or wet surfaces.

G. Painting will not be allowed during periods of inclement weather.

1.7 PROTECTION AND SAFETY PRECAUTIONS

A. All of the CONTRACTOR'S activities shall comply with federal, state and local requirements for environmental pollution control.

B. Plug and protect the tank inlet/outlet and overflow pipe at all times during the execution of the work.

C. Adequately protect the level controls from damage. Repair damage as a result of inadequate or unsuitable protection.

D. All of the CONTRACTOR'S activities and equipment used on the job site must be in compliance with federal, state and local law. Defective or substandard equipment shall not be used. Hoists, ladders, electrical equipment, scaffolding and hand or powered tools must meet safety standards.

E. Inspect all tank surfaces, ladders, and rigging connections before they are used. Any excessively deteriorated parts shall be repaired or replaced before use.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with the Contract Documents, the following manufacturers are acceptable:
   1. Provide products manufactured by the following:
      a. Rust-Oleum Industrial
      b. KY Glass Lined Tanks
      c. Specified accepted products are outlined in section 2.2.
   2. Alternate products may be considered, Contractor shall submit in writing detailed explanation for requesting product change, along with pricing of product. If product is accepted all savings shall revert to owner. Contractor shall bear any, and all costs associated with evaluation of product by consultant, which may include but not limited to research, and testing by independent laboratories for product performance, and equality of those specified.
   3. Only approved thinners from coatings manufacture shall be always used.

2.2 MATERIALS

A. All materials utilized for the completion of surface repair work and installation of the anti-corrosion system shall be of non-corrosive materials, suitable for use in potable water applications.

2.3 COMPATIBILITY

A. The Contractor shall be responsible for the compatibility of all paints used in the Work. A compatible paint will be considered a paint which precludes adverse effects related to bonding, drying delamination, scaling, lifting, and bleeding.

B. In cases where shop-applied primers and coatings on materials and equipment furnished by suppliers are products different from those described in the Specifications, the Contractor shall verify compatibility with the specified field-applied coating system.

C. Where thinning is necessary, only the products of the manufacturer furnishing the paint, and products for thinning purposes only, will be allowed.

2.4 MATERIAL PREPARATION

A. Mix and thin materials according to manufacturer's latest printed instructions.

B. Do not use materials beyond manufacturer's recommended shelf life.

C. Do not use mixed materials beyond manufacturer's recommended pot life.

PART 3 - EXECUTION

3.1 RESIDENT PROJECT REPRESENTATIVE (RPR) INSPECTION

1. Oversight of the work will be performed by the Engineer RPR, to be a NACE-certified Inspector, or an NACE-certified Inspector-in-Training under the supervision of a NACE-certified Senior Inspector.

3.2 PRE-WORK INSPECTION

A. Examine surfaces to be repaired and report conditions that would adversely affect appearance or performance of the proposed systems, and which cannot be put into an acceptable condition by preparatory work.

B. Do not proceed with work until authorization to proceed is given by the OWNER.

3.3 SURFACE PREPARATION

A. Interior Surface Preparation:
   1. Remove all visible oil, wax, grease, soil, dirt and other soluble contaminants. All surfaces shall be cleaned by power washing and/or use of non-powered hand tools, removing all scale, rust, dirt, or foreign matter.
   2. The interior shall be high pressure washed to remove all loose, or failed plate sealer, rust nodes and rust.
   3. Once the surface has been prepared, all remaining loose sealer shall be removed by hand or power tool. Care is to be taken as to not damage any of the intact glass surfaces.
   4. All rusted areas are to be power tool cleaned to a SSPC-SP3(wire cup brushes are not allowed). Rusted areas are to be chased to a point where the solid glass coating is still intact.
   5. All prepared areas shall be with sealed products listed in article 3.4.

B. All particles shall be collected and removed from the tank site by the CONTRACTOR in accordance with federal, state and local requirements.

C. All dust, debris and contaminants shall be removed from the surface prior to sealing.

3.4 REPAIRS

A. Immediately after cleaning the tank interior surfaces, an inspection shall be made by the ENGINEER/OWNER or Representative in the presence of the CONTRACTOR to determine if any additional repair items will be authorized by the OWNER as additional work to be paid for at the Unit Bid prices for tank repair.

B. All repairs shall be made in a manner to affect a permanent repair. Only qualified personnel shall perform WORK. Care shall be taken to avoid damage to seams, plates and pipe connections, which could result in leakage. The CONTRACTOR shall guarantee the water tank to be free from leakage upon completion of his work.

3.5 SEALER

A. Original Sealer from manufacturer is the preferred sealer.
   1. Sealer shall be applied to a clean dry surface, to a minimum of a ¼-in bead along all seams.
   2. Larger areas may need to be trowel graded to a point where the new product meets the intact glass. The overlap onto the glass should be a minimum of ½-in in all directions, to create a continuous surface

B. CIM Industries 1061 Potable Water
   1. Following cleaning and prior to application apply the supplied bonding agent for the product and allow to flash off for a few moments.
   2. Apply sealer to a clean dry surface, to a minimum of a ¼-in bead along all seams.
   3. Larger areas may need to be trowel graded to a point where the new product meets the intact glass. The overlap onto the glass should be a minimum of ½-in in all directions, to create a continuous surface

3.6 THICKNESS AND SPREADING RATES

A. Minimum dry mil thickness per coat (MDMTPC) and/or spreading rates in square feet per gallon shall be governed by the manufacturer's current data sheets or literature containing recommendations or instructions regarding these values. These recommended dry mil thickness and/or spreading rate values will be considered requirements to be met same as if set out herein these Specifications and Contract Documents and must be included with material list submittals before Consultant grants approval to use any paint materials. Do not exceed manufacturer's recommended coverage rates.

B. The number of coats to be applied are specified herein and shall govern. Where the total dry film thickness is specified, this thickness shall govern over the MDMTPC

3.7 ANTI-CORROSION SYSTEM

A. The Cathodic protection (anti-corrosion) system for glass-lined water storage tanks with concrete foundations shall be installed as per the Plan Drawings.

B. All materials utilized for the anti-corrosion system shall be suitable for potable water applications.

C. Consult glass lined tank manufacturer for required procedures for installation of all equipment and penetrations made through the tank sidewalls.

3.8 INSPECTION

A. The CONTRACTOR shall maintain a contemporaneous daily inspection log to be used as a permanent record for the project and to compliment the periodic inspections by the OWNER'S representative. The contractor's inspection log shall include:
   1. Daily record of materials stored and used on-site.
   2. Ambient conditions.
   3. Production record: personnel on-site, hours worked, location of surface preparation and repaired areas and materials used at each work area.

B. The CONTRACTOR'S daily inspection log shall be made available at any time to the ENGINEER / OWNER or their representative and an updated copy shall be included with each pay request.

3.9 ACCEPTANCE OF WORK

A. All surface preparation and repairs shall be approved by the OWNER before tank is filled and payment is made to the CONTRACTOR. The CONTRACTOR shall request acceptance of all repair work, and shall correct work that is not acceptable and request re-inspection. All rigging to remain in place and CONTRACTOR shall aid in use of rigging for all inspections by OWNER'S Representative.

3.10 CLEANING AND DISINFECTION

A. Cleaning: After completing the WORK, remove all scaffolding, planks, tools, rags, media and all other materials not part of the structural or operating facilities of the tank. Thoroughly clean and wash the walls, floor, roof and operating facilities of the tank by use of a high-pressure water jet, sweeping, scrubbing or other effective means. Flush out and otherwise remove from the tank all water, debris, and foreign materials accumulated during this cleaning operation. Thoroughly clean and flush out the bottom of the tank and the inlet/outlet pipe.

B. Disinfecting: After cleaning, but before placing it in service, disinfect the inside of the tank in accordance with AWWA Standard C 652-latest edition, Section 4.3 by Chlorination Method 2.
   1. Jet wash the interior of the tank with a chlorine solution of minimum 200 PPM.
      a. Use a chlorine product free of acid components.
      b. Provide the mixing water and remove the chlorine solution that accumulates in the bottom of the tank the same workday it is applied.
      c. Rinsing with water is not required.

C. Sampling and Testing: After the chlorination is complete and before the tank is placed in service, water from the full facility shall be sampled and tested in accordance with AWWA Standard C652-latest edition, Section 4.4 & Section 5.1 Bacteriological.

D. Chemicals and Equipment: Provide all necessary chlorine bearing compounds, solution tank, pumps, hoses, mops and other items required for cleaning, disinfection and flushing operations.

E. Disposal of Heavily Chlorinated: Water from the disinfection process shall be in accordance with the KY EPPC Division of Water Requirements.

F. Samples: Two or more successive sets of bacteriological samples, taken at 24-hour intervals, shall be taken and reported (using the most expedient method) to the Division of Water following disinfection.

3.11 CLEAN-UP

A. Remove all debris and leave site in pre-project condition.

3.12 GUARANTEE

A. The CONTRACTOR shall guarantee his work for a period of two years to the extent that he shall repair any defects due to faulty workmanship or materials that may appear on the structure during this period.

B. A first anniversary inspection shall be conducted by the OWNER or Representative with the CONTRACTOR present in accordance with AWWA Standard D102-latest edition, Section 5.2.

END OF SECTION

SECTION 33 16 24
JACK THOMASON TANK REHABILITATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. This specification covers repair, preparation of surfaces, performance and completion of painting of all interior and exterior surfaces of a 100,000 gallon elevated water storage tank located in Eddyville, Lyon County, Kentucky.
2. The elevated steel tank was erected in 1995. The following are some general design criteria for the tank:

Overall Height:	145'	
	Shape:	Double Ellipsoid
	Bowl Diameter:	25'-0"
	Head Range:	28'-7"
	Capacity:	100,000 gallons

3. The intent of the exterior cleaning specification is to sweep blast all surfaces by blasting in accordance with SSPC–SP7. Rusted areas will be blasted to a commercial finish in accordance with SSPC-SP6.
4. The intent of the interior surface preparation is to remove all of the existing coating by blasting to a near-white metal finish in accordance with SSPC–SP10.
5. The CONTRACTOR shall be responsible for all costs associated with sampling, worker protection, environmental pollution control, handling of debris, laboratory analysis and waste disposal.

1.2 WORK INCLUDED

A. Preparation of surfaces, which are to receive finishes.

B. Collection, handling and disposal of debris.

C. Tank repairs.

D. Finish surfaces.

E. Testing and cleaning.

F. Replacement of manway.

G. Level indicator replacement.

H. Installation of stiffener ring.

I. Grouting of Tank Base.

J. Roof screen replacement.

K. Safety climb and hardware replacement.

1.3 QUALITY ASSURANCE

A. Referenced Standards:

1. American Society of Civil Engineers (ASCE):
   a. 7, Minimum Design Loads for Buildings and Other Structures.
2. ASTM International (ASTM):
   a. A36, Standard Specification for Carbon Structural Steel.
   b. A307, Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength.

c. A570, Hot-Rolled Sheet and Strip, Structural Quality.

3. American Water Works Association (AWWA):
   a. C652, Standard for Disinfection of Water Storage Facilities.
   b. D103, Standard for Factory-Coated Bolted Steel Tanks for Water Storage.
4. American Petroleum Institute (API):
   a. 12B, Bolted Tanks for Storage of Production Liquids.
5. National Sanitation Foundation International (NSF).
6. Occupational, Safety and Health Administration (OSHA).
7. Steel Structures Painting Council Standards/NACE International (SSPC/NACE):
   a. SP 10/NACE No. 2, Near-White Blast Cleaning.

1.4 SUBMITTALS

A. Shop Drawings:
   1. Product technical data including:
      a. Acknowledgement that product submitted meet requirements of standards referenced.
      b. Manufacturer's installation instructions.
   2. Manufacturer's descriptive data describing each product to include solids by volume, performance data and manufacturer's recommendations for mixing, thinning and curing.
   3. Manufacturer's certified test reports confirming compliance with the specified performance requirements under Section 2.01.
   4. Coating information.
      a. Color cards showing color availability for each finish coat.
   5. Certifications:
      a. Certificates of compliance with standards specified for all major components incorporated into work.
   6. Test reports.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to job site in factory-sealed, original-labeled containers.

B. Store materials in a protected area at a temperature between 35° F and 110° F.

C. Steel Members:
   1. Handle and store steel members above ground on platforms, skids, or other supports.
   2. Keep members free of dirt, grease and other foreign material.

1.6 ENVIRONMENTAL CONDITIONS

A. Provide adequate continuous ventilation and sufficient heating facilities to maintain temperatures above the minimum shown on the manufacturer's product data sheets.

B. Provide minimum 25-foot candles (270 lx.) of lighting on surfaces to be finished.

1.7 PROTECTION AND SAFETY PRECAUTIONS

A. Take all precautions necessary to avoid adversely affecting the surrounding environment with blast media or paint particle drift or overspray. All of the CONTRACTOR'S activities shall comply with federal, state and local requirements for environmental pollution control.

B. Plug and protect the tank inlet/outlet and overflow pipe at all times during the execution of the work to prevent damage and the entrance of blast media and debris.

C. Adequately protect the level controls from paint and damage. Repair damage as a result of inadequate or unsuitable protection.

D. All of the CONTRACTOR'S activities and equipment used on the job site must be in compliance with federal, state and local law. Defective or substandard equipment shall not be used. Hoists, ladders, electrical equipment, scaffolding and hand or powered tools must meet safety standards.

E. Inspect all tank surfaces, ladders, and rigging connections before they are used. Any excessively deteriorated parts shall be repaired or replaced before use.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Subject to compliance with the Contract Documents, the following manufacturers are acceptable:
   1. Provide products manufactured by the following:
      a. Rust-Oleum Industrial — Mark Sholtes 502-451-2226
      b. Carboline — Joel Womack 502-648-7802
      c. Tnemec — Nex Gen TN
   2. Specified accepted products are outlined in section 2.2.

B. Equivalent products by other manufacturers are acceptable, providing they meet or exceed all performance criteria of the specified materials. No products shall be considered that would decrease film thicknesses or offer a change in generic type of coating specified.

C. Before submitting a bid based on a coating other than the specified system, submit to the Owner for approval at least 10 days prior to the bid date all pertinent data on the substitution coating including performance data as determined by an independent testing laboratory.

D. Products for each specified function and system shall be of a single manufacturer.

2.2 MATERIALS

A. Interior Coating System

A. Rust-Oleum Industrial
   1. Prime Coat: Immediately after blasting and before any rusting occurs (12 hours maximum) apply Rust-Oleum W 9200 to a DFT of 5.0-8.0 Mils - White
   2. Seams: All weld seams shall receive an additional roll coat to a DFT of 5.0-8.0 Mils prior to finish application
   3. Intermediate Coat: Rust-Oleum W 9200 to a DFT of 5.0-8.0 Mils – Marlin Blue
   4. Finish Coat: Rust-Oleum W 923 to a DFT of 5.0-8.0 Mils - White

   *NOTE: Total DFT shall not be less than 15 Mils not including the weld seams which shall be a minimum of 5 mils greater.

   *NOTE: The roll coat is to be applied prior to the application of the finish coat. A minimum of one full day (24 hours) shall pass prior to the application of the finish coat.

B. Carboline Co.
   1. Prime Coat: Immediately after blasting and before any rusting occurs (12 hours maximum) apply Carboguard 891 VOC to a DFT of 5.0-8.0 Mils - White
   2. Seams: All weld seams shall receive an additional roll coat to a DFT of 5.0 mils prior to finish application
   3. Intermediate Coat: Carboguard 891 VOC to a DFT of 5.0-8.0 Mils - Gray
   4. Finish Coat: Carboguard 891 VOC to a DFT of 5.0-8.0 Mils - Gray

   *NOTE: Total DFT shall not be less than 15 Mils not including the weld seams which shall be a minimum of 5 Mils greater.

   *NOTE: The roll coat is to be applied prior to the application of the finish coat. A minimum of one full day (24 hours) shall pass prior to the application of the finish coat.

C. Tnemec Co
   1. Prime Coat: Immediately after blasting and before any rusting occurs (12 hours maximum) apply Tnemec Series 20 (or 21) to a DFT of 4.0-6.0 Mils - White
   2. Seams: All weld seams shall receive an additional roll coat to a DFT of 5.0 Mils prior to finish application
   3. Intermediate Coat: Tnemec Series 20 (or 21) to a DFT of 4.0-6.0 Mils - Beige
   4. Finish Coat: Tnemec Series 20 (or 21) to a DFT of 4.0-6.0 Mils - White

*NOTE: Total DFT shall not be less than 15 Mils not including the weld seams which shall be a minimum of 5 mils greater.
*NOTE: The roll coat is to be applied prior to the application of the finish coat. A minimum of one full day (24 hours) shall pass prior to the application of the finish coat.

D. Exterior Coating System
   1. Rust-Oleum Industrial Noxyde Overcoat
      a. Coating shall be spray applied as required by supplier.
      b. Prime Coat: Rust-Oleum Mathys Noxyde
      c. Spot Priming: Rust-Oleum 9100 Epoxy to a DFT of 3 Mils – White
      d. Intermediate: Full Coat Noxyde to a minimum DFT of 7 Mils – Color may vary)
      e. Secondary Coat: Full Coat Noxyde to a minimum DFT of 7 Mils – Color may vary)
      f. Noxyde shall be applied at approximately 14 Mils wet to achieve 7 Mils DFT
      g. Finish Coat: Rust-Oleum 9800 minimum 3-5 Mils DFT

2.3 COMPATIBILITY

A. The Contractor shall be responsible for the compatibility of all paints used in the Work. A compatible paint will be considered a paint which precludes adverse effects related to bonding, drying delamination, scaling, lifting, and bleeding.

B. In cases where shop-applied primers and coatings on materials and equipment furnished by suppliers are products different from those described in the Specifications, the Contractor shall verify compatibility with the specified field-applied coating system.

C. Where thinning is necessary, only the products of the manufacturer furnishing the paint, and products for thinning purposes only, will be allowed.

2.4 MATERIAL PREPARATION

A. Mix and thin materials according to manufacturer's latest printed instructions.

B. Do not use materials beyond manufacturer's recommended shelf life.

C. Do not use mixed materials beyond manufacturer's recommended pot life.

PART 3 - EXECUTION

3.1 RESIDENT PROJECT REPRESENTATIVE (RPR) INSPECTION

A. Oversight of the work will be performed by the Engineer RPR, to be a NACE-certified Inspector, or an NACE-certified Inspector-in-Training under the supervision of a NACE-certified Senior Inspector.

3.2 PRE-WORK INSPECTION

A. Examine surfaces to be coated and report conditions that would adversely affect appearance or performance of coating systems and which cannot be put into an acceptable condition by preparatory work specified in Section 3.02.

B. It shall be the contractor's responsibility to determine the most appropriate means for applying coatings to the exterior and interior of the tank (with exception of the specified roll coat to all interior welds).

C. Do not proceed with field surface preparation and coating application until surface is acceptable or authorization to proceed is given by the OWNER.Sidewall structure.

3.3 SURFACE PREPARATION

A. Interior Surface Preparation: Remove all visible oil, wax, grease, soil, dirt and other soluble contaminants in accordance with SSPC-SP1 prior to blast cleaning. All surfaces shall be cleaned by near-white blast cleaning, removing all mill scale, rust, dirt, paint or foreign matter by recommended methods outlined in the Steel Structures Painting Council's Specification SSPC-SP10 and NACE No. 2 to establish a blast profile of 1.5 to 2.5 mils. Once the surface has been prepared, all weld seams shall be investigated. Any welds found to be deficient or that could result in structural failure, or any pits discovered because of surface preparation. Shall be rewelded (followed by grinding of repair to create a flush, consistent surface with the existing steel), pits shall be welded if greater than one half the thickness of the steel wall.

B. Exterior Surface Preparation: The entire tank exterior shall be High Pressure washed 5000 psi minimum w/ a rotating tip. Injection* of surfactant (Simple Green 50/50 mix), to the entire tank surface, followed by a 100% clean water wash. All rusted areas shall be power washed (5K Rotating tip) no less than 6" from surface all loose paint chased until found to be sound. All rusted areas shall be cleaned to an SSPC-SP3 (no cup brushes allowed).

C. All paint particles and used blast media containing paint particles shall be collected and removed from the tank site by the CONTRACTOR in accordance with federal, state and local requirements.

D. Blasting shall not be performed when the surface temperature is less than 5°F above the dew point to prevent the formation of rust bloom.

E. The compressed air used for blasting shall be free of water and oil.

F. All dust, blasting debris and contaminants shall be removed from the surface prior to painting.

G. Where practical, the CONTRACTOR shall complete all welding and other interior and exterior repairs authorized by the ENGINEER/OWNER, except for the caulking, prior to applying the primer.

H. Interior or exterior welds, burning or repairs on or affecting previously blast-cleaned areas shall be re-blasted to duplicate the surrounding area.

3.4 APPLICATION

A. Prepare surface and touch-up welds, burned and abraded areas with specified primer before applying full field coats.

B. Mix, thin and apply each coating at the rate and manner specified by the manufacturer's current product data sheet.

C. If tank surfaces are rolled, roller nap inclusions in the coating shall not be allowed. All roller nap and other foreign objects shall be removed (scraped, sanded, ground...) Followed by the application of another coat of finish, primer or both if required. Any and all touched up areas shall color match exactly to the surrounding coatings.

D. All runs, drips, sags, curtains, etc. shall be brushed out during application or removed (scraped, sanded, ground...) Followed by the application of another coat of finish, primer or both if required. All touched up areas shall color match exactly to the surrounding coatings.

E. Finish coats shall be uniform in color and sheen without streaks, laps, runs, sags or missed areas.

F. Allow the interior coating to cure a minimum of 7 days before being subjected to immersion.

G. Paints and coatings shall not transfer any substance to the water which will be toxic or cause tastes or odors (following curing).

3.5 THICKNESS AND SPREADING RATES

A. Minimum dry mil thickness per coat (MDMTPC) and/or spreading rates in square feet per gallon shall be governed by the manufacturer's current data sheets or literature containing recommendations or instructions regarding these values. These recommended dry mil thickness and/or spreading rate values will be considered requirements to be met same as if set out herein these Specifications and Contract Documents and must be included with material list submittals before Consultant grants approval to use any paint materials. Do not exceed manufacturer's recommended coverage rates.

B. The number of coats to be applied are specified herein and shall govern. Where the total dry film thickness is specified, this thickness shall govern over the MDMTPC

3.6 VENTILATION

A. Ventilation is essential to remove vapors during application and curing of coatings.

B. Ventilation shall be exhausted from lowest portion of tank with top openings kept clear.

C. During coating applications the capacity of the ventilating fans shall be at least 400 cfm per gallon of coating applied per hour.

D. The ventilation requirements are to ensure proper curing of the applied coatings and are not to be taken as requirements to ensure worker safety.

E. Following the application of the final interior coating the tank shall be force ventilated by mechanical means from the lowest possible point for a minimum of 48 hours, ventilation shall be such that it creates a total turn-over on the interior of the tank a least once per hour.

3.7 INSPECTION

A. Degree of surface cleanliness and blast profile of steel surfaces shall conform to the specifications detailed in Sections 3.02 and 3.03. Reference SSPC or NACE visual standards and consult Testex tape to verify anchor pattern.

B. Wet film thickness readings for successive coats shall be taken as soon as possible at a frequency of at least one per 100 square feet.

C. Dry film thickness readings of steel surfaces shall be taken prior to the application of successive coats with a nondestructive magnetic type gauge in accordance with SSPC-PA-2.

D. All interior coated steel surfaces shall receive holiday testing with a Tinker Rasor Model M-1, or equivalent, low voltage holiday detector. Any areas failing this test shall be marked and receive an additional repair coat in accordance with Section 3.03 - INTERIOR COATING SYSTEM until satisfactory test results are achieved.

E. The final film is to be visually inspected and shall be free of sags, runs, wrinkles and other excessive film-build characteristics and surface defects.

F. The CONTRACTOR shall maintain a contemporaneous daily inspection log to be used as a permanent record for the project and to compliment the periodic inspections by the OWNER'S representative. The contractor's inspection log shall include:
   1. Daily record of materials stored and used on-site.
   2. Ambient conditions: min. of three measurements daily of air and surface temperature, dew point, wind speed and direction, precipitation, etc.
   3. Production record: personnel on-site, hours worked, location of surface preparation and painted areas and materials used at each work area.
   4. In-process quality control observations as described in this section to include surface cleanliness, surface profile, wet film thickness, dry film thickness, visual defects, time between cleaning and priming and time between coats.

G. The CONTRACTOR'S daily inspection log shall be made available at any time to the ENGINEER / OWNER or their representative and an updated copy shall be included with each pay request.

3.8 ACCEPTANCE OF WORK

A. All surface preparation and repairs shall be approved by the OWNER before primer is applied. The CONTRACTOR shall request acceptance of each coat before applying next coat and shall correct work that is not acceptable and request re-inspection. All rigging to remain in place, and CONTRACTOR shall aid in use of rigging for all inspections by OWNER'S Representative.

3.9 REPAIRS

A. Immediately after blast cleaning the tank interior surfaces, an inspection shall be made by the ENGINEER/OWNER or Representative in the presence of the CONTRACTOR to determine if any additional repair items will be authorized by the OWNER as additional work to be paid for at the Unit Bid prices for tank repair. This includes pit welding (sq. ft.), seam welding (lin. ft.) or patch welding (sq. ft.)

B. All repairs shall be made in a manner to affect a permanent repair. Qualified personnel shall perform welding. Care shall be taken to avoid damage to seams, plates and pipe connections, which could result in leakage. The CONTRACTOR shall guarantee the water tank to be free from leakage upon completion of his work.

C. Any welding on the tank shall be in conformance with requirements of AWWA Standard for welded steel tanks for water storage (AWWA D100-latest edition) Section 4.4 & Section 5.1 Bacteriological.

D. Caulk interior roof lapped seams with Sika Flex-1A.

E. Sharp edges can cause premature coating failure. All sharp edges, weld spatter and burrs should be ground flush.

F. Fill sharp edged pits and pits deeper than 1/16" with Tnemec series 63-1500 Filler and Surfacer.

3.10 CLEANING AND DISINFECTION

A. Cleaning: After painting, remove all scaffolding, planks, tools, rags, blast media and all other materials not part of the structural or operating facilities of the tank. Thoroughly clean and wash the walls, floor, roof and operating facilities of the tank by use of a high-pressure water jet, sweeping, scrubbing or other effective means. Flush out and otherwise remove from the tank all water, debris, and foreign materials accumulated during this cleaning operation. Thoroughly clean and flush out the bottom of the tank and the inlet/outlet pipe.

B. Disinfecting: After cleaning, but before placing it in service, disinfect the inside of the tank in accordance with AWWA Standard C 652-latest edition, Section 4.3 by Chlorination Method 2.

C. Sampling and Testing: After the chlorination is complete and before the tank is placed in service, water from the full facility shall be sampled and tested in accordance with AWWA Standard C652-latest edition, Section 4.4 & Section 5.1 Bacteriological.

D. Chemicals and Equipment: Provide all necessary chlorine bearing compounds, solution tank, pumps, hoses, mops and other items required for cleaning, disinfection and flushing operations.

E. Disposal of Heavily Chlorinated: Water from the disinfection process shall be in accordance with the KY EPPC Division of Water Requirements.

F. Samples: Two or more successive sets of bacteriological samples, taken at 24-hour intervals, shall be taken and reported (using the most expedient method) to the Division of Water following disinfection.

3.11 CLEAN-UP

A. Remove all debris and leave site in pre-project condition.

3.12 GUARANTEE

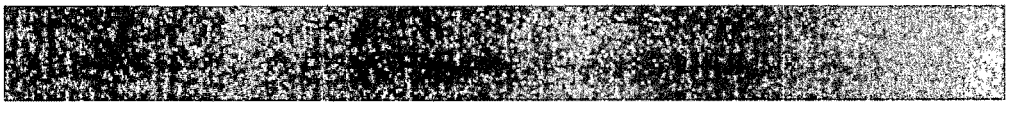
A. The CONTRACTOR shall guarantee his work for a period of two years to the extent that he shall repair any defects due to faulty workmanship or materials that may appear on the structure during this period.

B. A first anniversary inspection shall be conducted by the OWNER or Representative with the CONTRACTOR present in accordance with AWWA Standard D102-latest edition, Section 5.2.

END OF SECTION

DIVISION 40

PROCESS INTERCONNECTIONS



SECTION 40 05 00
PIPE AND PIPE FITTINGS - BASIC REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Process piping systems.
   2. Utility piping systems.
   3. Plumbing piping systems.

B. Work Included:
   1. Provide treated water distribution system as shown on the Drawings, specified herein, and needed for a complete and proper installation.

C. Related Specification Sections include but are not necessarily limited to:
   1. Section 31 23 33 - Trenching, Backfilling, and Compacting for Utilities.
   2. Section 40 05 51 - Valves - Basic Requirements.

1.2 QUALITY ASSURANCE

A. Referenced Standards:
   1. American Association of State Highway and Transportation Officials (AASHTO):
      a. M36, Corrugated Steel Pipe, Metallic-Coated, for Sewers and Drains (Equivalent ASTM A760).
      b. M190, Standard Specification for Bituminous Coated Corrugated Metal Culvert Pipe and Pipe Arches.
      c. M252, Standard Specification for Corrugated Polyethylene Drainage Tubing.
      d. M294, Interim Specification for Corrugated Polyethylene Pipe 12 to 24 Inch Diameter.
   2. American Iron and Steel Institute (AISI).
   3. American Society of Mechanical Engineers (ASME):
      a. B16.3, Malleable Iron Threaded Fittings.
      b. B16.5, Pipe Flanges and Flanged Fittings.
      c. B16.9, Factory-Made Wrought Steel Butt-Welding Fittings.
      d. B16.22, Wrought Copper and Bronze Solder - Joint Pressure Fittings.
      e. B16.26, Cast Copper Alloy Fittings for Flared Copper Tubes.
      f. B36.19, Stainless Steel Pipe.
      g. B40.100, Pressure Gauges and Gauge Attachments.
   4. ASTM International (ASTM):
      a. A53, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
      b. A74, Standard Specification for Cast Iron Soil Pipe and Fittings.
      c. A106, Standard Specification for Seamless Carbon Steel Pipe for High-Temperature Service.
      d. A126, Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.
      e. A182, Standard Specification for Forged or Rolled Alloy-Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High-Temperature Service.
      f. A197, Standard Specification for Cupola Malleable Iron.
      g. A234, Standard Specification for Pipe Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service.
      h. A269, Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
      i. A312, Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes.
      j. A518, Standard Specification for Corrosion-Resistant High-Silicon Iron Castings.

k. A536, Standard Specification for Ductile Iron Castings.
l. A587, Standard Specification for Electric-Resistance-Welded Low-Carbon Steel Pipe for the Chemical Industry.
m. A760, Standard Specification for Corrugated Steel Pipe, Metallic-Coated for Sewers and Drains.
n. A774, Standard Specification for As-Welded Wrought Austenitic Stainless Steel Fittings for General Corrosive Service at Low and Moderate Temperatures.
o. A778, Standard Specification for Welded, Unannealed Austenitic Stainless Steel Tubular Products.
p. B88, Standard Specification for Seamless Copper Water Tube.
q. C14, Standard Specification for Concrete Sewer, Storm Drain, and Culvert Pipe.
r. C76, Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe.
s. C425, Standard Specification for Compression Joints for Vitrified Clay Pipe and Fittings.
t. C443, Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets.
u. C564, Standard Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings.
v. C700, Standard Specification for Vitrified Clay Pipe, Extra Strength, Standard Strength and Perforated.
w. D1785, Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.
x. D2466, Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40.
y. D2467, Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.
z. D4101, Standard Specification for Polypropylene Plastic Injection and Extrusion Materials.
aa. F439, Standard Specification for Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80.
bb. F441, Standard Specification for Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe, Schedules 40 and 80.

5. American Water Works Association (AWWA):
   a. B300, Standard for Hypochlorites.
   b. C200, Standard for Steel Water Pipe - 6 IN and Larger.
   c. C207, Standard for Steel Pipe Flanges for Waterworks Service - Sizes 4 IN through 144 IN.
   d. C208, Standard for Dimensions for Fabricated Steel Water Pipe Fittings.
   e. C606, Standard for Grooved and Shouldered Joints.
   f. C651, Standard for Disinfecting Water Mains.
   g. C800, Standard for Underground Service Line Valves and Fittings.
6. American Water Works Association/American National Standards Institute (AWWA/ANSI):
   a. C110/A21.10, Standard for Ductile-Iron and Gray-Iron Fittings.
   b. C111/A21.11, Standard for Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
   c. C115/A21.15, Standard for Flanged Ductile-Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges.
   d. C151/A21.51, Standard for Ductile-Iron Pipe, Centrifugally Cast, for Water.
   e. C153/A21.53, Standard for Ductile-Iron Compact Fittings for Water Service.
7. Chlorine Institute, Inc. (CI):
   a. Pamphlet 6, Piping Systems for Dry Chlorine.
8. Cast Iron Soil Pipe Institute (CISPI):
   a. 301, Standard Specification for Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications.
9. International Plumbing Code (IPC).

10. National Fire Protection Association (NFPA):
    a. 54, National Fuel Gas Code.
    b. 69, Standard on Explosion Prevention Systems.
11. Underwriters Laboratories, Inc. (UL).

B. Coordinate flange dimensions and drillings between piping, valves, and equipment.

1.3 DEFINITIONS

A. Hazardous Gas Systems: Digester gas, chlorine gas, sulfur dioxide gas, carbon dioxide gas, lab gases.

B. HPIC: High performance industrial coating.

C. PVDF: Polyvinylidene fluoride.

1.4 SYSTEM DESCRIPTION

A. Piping Systems Organization and Definition:
1. Piping services are grouped into designated systems according to the chemical and physical properties of the fluid conveyed, system pressure, piping size and system materials of construction.
2. See PIPING SYSTEMS SCHEDULE in PART 3.

1.5 SUBMITTALS

A. Submit six copies of product data sheets on material to be used.

B. Shop Drawings:
1. Product technical data including:
    a. Acknowledgement that products submitted meet requirements of standards referenced.
    b. Copies of manufacturer's written directions regarding material handling, delivery, storage and installation.
    c. Separate schedule sheet for each piping system scheduled in this Specification Section showing compliance of all system components.
        1) Attach technical product data on gaskets, pipe, fittings, and other components.
2. Fabrication and/or Layout Drawings:
    a. Exterior yard piping drawings (minimum scale 1 IN equals 10 FT) with information including:
        1) Dimensions of piping lengths.
        2) Invert or centerline elevations of piping crossings.
        3) Acknowledgement of bury depth requirements.
        4) Details of fittings, tapping locations, thrust blocks, restrained joint segments, harnessed joint segments, hydrants, and related appurtenances.
        5) Acknowledge designated valve or gate tag numbers, manhole numbers, instrument tag numbers, pipe and line numbers.
        6) Line slopes and vents.
3. Names and addresses of the nearest service and maintenance organization that readily stocks repair parts.
4. Manufacturer's recommended installation procedures which, when approved by the Engineer, will become the basis for accepting or rejecting actual installation procedures used on the Work.

C. Informational Submittals:
1. Qualifications of lab performing disinfection analysis on water systems.
2. Test reports:
    a. Copies of pressure test results on all piping systems.
    b. Reports defining results of dielectric testing and corrective action taken.
    c. Disinfection test report.
    d. Notification of time and date of piping pressure tests.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Protect pipe coating during handling using methods recommended by manufacturer.
   1. Use of bare cables, chains, hooks, metal bars or narrow skids in contact with coated pipe is not permitted.

B. Prevent damage to pipe during transit.
   1. Repair abrasions, scars, and blemishes.
   2. If repair of satisfactory quality cannot be achieved, replace damaged material immediately.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with the Contract Documents, the following manufacturers are acceptable:
   1. Insulating unions:
      a. "Dielectric" by Epco.
   2. Dirt strainers (Y type):
      a. Mueller (#351).
      b. Sarco.
      c. Armstrong.
   3. Chemical strainers (Y type):
      a. Chemtrol.
      b. Asahi.
   4. Dry disconnect couplings:
      a. Kamlock.
   5. Dielectric flange kit:
      a. PSI.
      b. Maloney.
      c. Central Plastics.
   6. Pipe saddles (for gage installation):
      a. Dresser Style 91 (steel and ductile iron systems).
      b. Dresser Style 194 (nonmetallic systems).
   7. Expansion joint at FRP and poly tanks:
      a. PROCO.
      b. Garlock, Style 215.
   8. Elastomeric bellows type expansion joints:
      a. Garlock, Guardian 200/204.
      b. PROCO, equivalent model.
      c. Red Valve, equivalent model.
      d. Or equal.
   9. Dismantling Joint
      a. Romac DJ400.
      b. Smith Blair 972.

2.2 PIPING SYSTEMS SCHEDULE

A. Piping system materials, fittings and appurtenances are subject to requirements of specific piping systems schedule located at the end of PART 3 of this Specification Section.

2.3 COMPONENTS AND ACCESSORIES

A. General – Provide pipe, fittings, and accessories complying with the following requirements:

B. Pipe
   1. DIP (Ductile Iron Pipe)
      a. Ductile iron push on joint
         1) Comply with ANSI A-21.11 (AWWA C111).

b. Ductile iron flanged joint
   1) Comply with either ANSI A-21.15 (AWWA C115) with a 125 pound flanged joint or ANSI B-16.1 - ANSI B16.5 with a 125 pound cast iron "Uni-Flange" adapter as manufactured by Uni-Flange Corporation.

2. PVC (Polyvinyl Chloride) Pipe
   a. Use rigid unplasticized polyvinyl chloride (PVC) complying with ASTM D1784 and D2241. The PVC compound used in the manufacture of this pipe shall meet or exceed the requirements for class 12454-A or 12454-B as defined by ASTM D1784. Provide pipe with a standard dimension ratio (SDR) of 21 with pressure rating of 200 psi complying with ASTM D2241. Provide an NSF approved pipe for potable water service.
   b. In addition, Pipe shall be tested and inspected at the factory. Testing shall be accomplished in conformance with the following ASTM specifications utilizing the test methods specified therein:
      1) Dimensions ASTM D 3034-81 or ASTM F679-80 and D 2122-81
      2) Extrusion Quality ASTM D 2152-80
      3) Pipe Stiffness (5%) ASTM D 2412-77
      4) Impact Resistance ASTM D 2444-80
3. HDPE (High Density Polyethylene) Pipe – Use HDPE with a standard dimension ratio (DR) of 11 with a working pressure rating of 160 psi and conforming to ASTM F714 and D3035. The pipe shall be sized with standard iron pipe size (IPS) and shall be DriscoPlex 4100 or approved equal.
4. Restrained-Joint PVC Pipe – Use Certa-Lok C900/RJ PVC pipe with a working pressure rating of 200 psi (DR 14) as manufactured by Certain Teed Pipe and Plastics Group or approved equal.

C. Joints
1. DI (Ductile Iron) Push-On-Joint – Comply with ANSI A-21.11 (AWWA C111)
2. DI (Ductile Iron) Flanged Joint – Comply with either ANSI A-21.15 (AWWA C115) with a 125-lb flanged joint or ANSI B-16.1 - ANSI B16.5 with a 125-lb cast iron "Uni-Flange" adapter as manufactured by Uni-Flange Corporation.
3. PVC (Polyvinyl-Chloride) Joint
   a. Provide a push on type joint with a continuous elastomeric ring gasket compressed into the annular space between bell and spigot end of pipe complying with ASTM D3139.
   b. A typical joint assembly shall be tested by a qualified independent laboratory per test requirements of ASTM D3212-81. The manufacturer shall submit to the Engineer sufficient copies of certification and test results by shipment to the job site that will permit the Owner to retain two copies.
4. HDPE (High Density Polyethylene) Joint – Form joints by heat fusion method in accordance with the manufacturer's recommendations and ASTM D3261.

D. Fittings
1. Use mechanical joint fittings for all exterior below grade pressure piping complying with AWWA C153.
2. Use cement lining complying with ANSI A-21.4 (AWWA C104) with a bituminous seal coat.
3. All fittings must be manufactured in the United States of America unless otherwise approved by the Engineer.
4. Double wrap all fittings with 8-mil polyethylene wrap prior to placing concrete thrust blocking. Tape polyethylene wrapping around pipe barrels to provide a water tight seal around the fittings
5. HDPE Fittings – Use HDPE fittings conforming to AWWA C906 requirements. Provide mechanical joint adapter kits at transition points to other pipe types.

E. Valves
1. Gate Valves
   a. Provide gate valves in accordance with Section 40 05 00 of these specifications.

b. Provide connections as required for the piping in which they are installed.
c. Provide all exterior below grade valves with standard operating nut and all interior valve with handwheel. Provide tee handle socket operating wrenches of suitable size.
d. Provide below grade valves with valve boxes of the screw type adjustable pattern with a lid marked water.
e. Valves 3" and smaller
    1) Provide all bronze, screwed, single wedge disc, screw in bonnet, packing gland, and nut, with a non-rising stem.
    2) Provide below grade valves with a suitable precast concrete box with a lid marked water.

2. Butterfly Valves
    a. With the exception of tapping valves, all valves 16" and larger shall be butterfly valves unless otherwise noted on the drawings.
    b. Provide butterfly valves in accordance with Section 40 05 00 of these specifications.
3. Tapping Valves – Use tapping valves meeting the general operating and material requirements of Section E.1. of this specification. Use Mueller RWGV tapping valve, or approved equal.
4. Valve Boxes
    a. For butterfly valves, use cast iron, slip type adjustable pattern, similar and equal to Bingham & Taylor or Utility Pipe Model CVB562. For gate valves, use cast iron screw type adjustable pattern, similar and equal to Bingham & Taylor 4905.
    b. The boxes shall have a lid marked "water" similar and equal to Bingham & Taylor 4905-L1.5.
    c. The valve boxes shall be of sufficient length to permit the valve to set at the depth indicated by required cover on the pipe shown on the Drawings. Provide cast iron valve box extensions, as necessary, similar or equal to Bingham & Taylor 4905-X.
    d. Provide valve stem extensions on all water lines greater than 6 feet deep. Valve stem extensions shall be similar or equal to Bingham & Taylor 5051.

F. Restraint Joint Gaskets – Use restrained joint gaskets in all DIP installation within steel encasement. In addition, use restrained joint gaskets in all pipe joints within creek crossings and roadway crossings and within one DIP pipe joint connection either side of steel encasement. Use "Field Lok" gaskets as manufactured by U.S. Pipe and Foundry Company.

G. Thrust Restraint Glands for Ductile Iron Pipe – Use thrust restraint glands ensuring 360□ contact between the gland and the pipe wall. Uni-Flange Series 1300 joint restraint devices as manufactured by Ford Meter Box Company, Inc. or approved other. Use thrust restraint glands on each mechanical joint connection 6" in diameter and larger.

H. Thrust Restraint Glands for PVC Pipe – Use thrust restraint glands ensuring 360° contacts between the gland and the pipe wall. Use Uni-flange Series 1300 joint restraint devices as manufactured by Ford Meter Box Company, Inc. or approved other. Use thrust restraint glands for PVC pipe on each mechanical joint connection 6" in diameter and larger.
    1. SO-EZ MJ Gland Snap-On Gaskets, as manufactured by Ford Meter Box Company, Inc. shall not be accepted for use on any mechanical joint piping or restraint

I. Joint Restraint Glands for PVC Pipe – Use joint restraint glands ensuring 360□ contact between the gland and the pipe wall. Use Uni-Flange Series 1390 joint restraint devices as manufactured by Ford Meter Box Company, Inc., or approved other. Use joint restraint glands at field engineer's discretion or as shown on the Plans.

J. Petroleum -Resistant Gaskets – Where noted on the drawings, provide petroleum-resistant gaskets for push-on and mechanical joint fittings. Petroleum-resistant gaskets shall be manufactured from Nitrile in accordance with AWWA C111.

K. Stainless Steel All-thread Rods – Use 3/4" diameter stainless steel all-thread rods complying with ASTM Type 303 stainless steel. Use rods at field engineer's discretion or as shown on the Plans. Cost associated with contractor installation, equipment, materials, etc., is incidental to the cost for pipe.

L. Service Saddles – Use service saddles as manufactured by Ford Meter Box Company with all service connections made on PVC or asbestos cement pipe.

M. Tapping Sleeves – Use stainless steel tapping sleeves as manufactured by Romac Industries, Inc., Seattle, Washington, or approved equal.

N. Steel Casing Pipe – Use steel casing pipe conforming to ASTM A139. All encasement shall have a minimum yield strength of 35,000 psi and a minimum thickness of .25 inches for casing diameter of 16 inches and less, 0.312 inch thickness for casing diameters of 18, 20, and 22 inches, and 0.344 inch thickness for casing diameter of 24 inches. Coat the outside of all steel encasement pipe with either an epoxy or bituminous coating. Casing spacers and end seals are considered incidental to the unit price of the steel encasement.

O. Fire Hydrants
   1. General
      a. Use fire hydrants complying in all respects with the latest revision for AWWA C502. use fire hydrants with one (1) 4½" pumper nozzle with National Standard Thread and two (2) 2½" bronze hose nozzles with National Standard Thread. Secure all caps with long heavy chains. Use hydrants with a one piece bronze operating nut to be opened in a counterclockwise direction. Use hydrants with a compression main valve, bronze seat ring with bronze seating. Bronze upper plate, high tensile steel stem, and O-ring seals. The inlet valve opening shall be 5¼" diameter with 6½" ID standpipe section and a 6" high strength cast iron inlet connection.
      b. Use hydrants with replaceable, breakable sections, or components such that in the event the barrel is broken off, the valve will remain closed, the barrel will not be damaged, and the stem will not be bent.
      c. Furnish hydrants from the factory with one shop coat of bright red Inertol Rust Inhibitive Primer No. 621 with a minimum dry mil thickness of 1.5.
      d. Use Mueller Super Centurion 250, Kennedy, or approved other.
   2. Hydrant Valves – Equip all 5¼" hydrants with 6" gate valves as shown on the drawings.
   3. Anchoring Tee – Use standard mechanical joint anchoring tees with a split ductile iron rotating gland on the branch. Use trim tyte ductile iron mechanical joint anchoring tees as manufactured by U.S. Pipe and Foundry Company, Birmingham, Alabama, or an approved equal.
   4. Hydrant Connecting Pieces – Use hydrant connecting pieces with integrally cast standard mechanical joint on one end and a split ductile iron rotating gland on the other. Use hydrant connecting pieces as manufactured by American Cast Iron Pipe Company, Birmingham, Alabama, No. A108954 or an approved equal.

P. Copper Pipe
   1. Pipe – Use Type "K" soft copper tubing complying with ASTM Specifications B 88 and AWWA Specification C800. Install service lines with a continuous run of pipe from the main to the meter.
   2. Fittings – All fittings or unions for the copper service lines shall be of standard brass compression stop type for flared connections. Threads on fittings shall conform to AWWA C800, "Standard Threads for Underground Service Line Fittings."
   3. Verification – Verify the size of existing service lines prior to installation of replacement or relocated service lines. Notify the Engineer prior to installation of any discrepancies between plan information and field verified information.

Q. Polyethylene Pipe
   1. Pipe – Use copper tubing size P.E. Municipal Service tubing complying with ASTM Specifications ASTM D2737. Install service lines with a continuous run of pipe from the main to the meter. All PE service lines shall be installed with a continuous run of tracer wire.
   2. Fittings – All fittings or unions for the P.E. service lines shall be of standard brass type for pack joint connections. Threads on fittings shall conform to AWWA C800, "Standard Threads for Underground Service Line Fittings."

3. Verification – Verify the size of existing service lines prior to installation of replacement or relocated service lines. Notify the Engineer prior to installation of any discrepancies between plan information and field verified information.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 FIELD MEASUREMENTS

A. Make necessary measurements in the field to assure precise fit of items in accordance with the approved design.

3.3 HANDLING

A. Handle pipe accessories so as to ensure delivery to the trench in sound, undamaged condition:
   1. Carry pipe into position; do not drag.
   2. Use pinch bars or tongs for aligning or turning the pipe only on the bare end of the pipe.

B. Thoroughly clean interior of pipe and accessories before lowering pipe into trench. Keep clean during laying opera¬tions by plugging or other method approved by the Engineer.

C. Before installation, inspect each piece of pipe and each fitting for defects: Material found to be defective before or after laying: Replace with sound material meeting the specified re¬quirements, and without additional cost to the Owner.

D. Store rubber gaskets in a-cool dark place until just prior to time of installation.

3.4 EXTERIOR BURIED PIPING INSTALLATION

A. Unless otherwise shown on the Drawings, provide a minimum of [4] FT and maximum of [8] FT earth cover over exterior buried piping systems and appurtenances conveying water, fluids, or solutions subject to freezing.

B. Enter and exit through structure walls, floors, and ceilings by using penetrations and seals specified in Specification Section 01 73 20 and as shown on Drawings.

C. When entering or leaving structures with buried [mechanical] joint piping, install joint within 2 FT of point where pipe enters or leaves structure.
   1. Install second joint not more than 6 FT nor less than 4 FT from first joint.

D. Install expansion devices as necessary to allow expansion and contraction movement.

E. Laying Pipe In Trench:
   1. Excavate and backfill trench in accordance with Specification Section 31 23 33.
   2. Clean each pipe length thoroughly and inspect for compliance to specifications.
   3. Grade trench bottom and excavate for pipe bell and lay pipe on trench bottom.
   4. Install gasket or joint material according to manufacturer's directions after joints have been thoroughly cleaned and examined.
   5. Except for first two joints, before making final connections of joints, install two full sections of pipe with earth tamped alongside of pipe or final with bedding material placed.
   6. Lay pipe in only suitable weather with good trench conditions.
      a. Never lay pipe in water except where approved by Engineer.
   7. Seal open end of line with watertight plug if pipe laying stopped.
   8. Remove water in trench before removal of plug.

F. Lining Up Push-On Joint Piping:
   1. Lay piping on route lines shown on Drawings.
   2. Deflect from straight alignments or grades by vertical or horizontal curves or offsets.

3. Observe maximum deflection values stated in manufacturer's written literature.
4. Provide special bends when specified or where required alignment exceeds allowable deflections stipulated.
5. Install shorter lengths of pipe in such length and number that angular deflection of any joint, as represented by specified maximum deflection, is not exceeded.

G. Anchorage and Blocking:
1. Provide reaction blocking, anchors, joint harnesses, or other acceptable means for preventing movement of piping caused by forces in or on buried piping tees, wye branches, plugs, or bends.
2. Place concrete blocking so that it extends from fitting into solid undisturbed earth wall.
a. Concrete blocks shall not cover pipe joints.
3. Provide bearing area of concrete in accordance with drawing detail.

H. Install underground hazard warning tape per Specification Section 10 14 00.

I. Install insulating components where dissimilar metals are joined together.

3.5 INTERIOR AND EXPOSED EXTERIOR PIPING INSTALLATION

A. Install piping in vertical and horizontal alignment as shown on Drawings.

B. Alignment of piping smaller than 4 IN may not be shown; however, install according to Drawing intent and with clearance and allowance for:
1. Expansion and contraction.
2. Operation and access to equipment, doors, windows, hoists, moving equipment.
3. Headroom and walking space for working areas and aisles.
4. System drainage and air removal.

C. Enter and exit through structure walls, floor and ceilings using penetrations and seals specified in Specification Section 01 73 20 and as shown on the Drawings.

D. Install vertical piping runs plumb and horizontal piping runs parallel with structure walls.

E. Pipe Support:
1. Use methods of piping support as shown on Drawings and as required in Specification Section 40 05 07.
2. Where pipes run parallel and at same elevation or grade, they may be grouped and supported from common trapeze-type hanger, provided hanger rods are increased in size as specified for total supported weight.
a. The pipe in the group requiring the least maximum distance between supports shall set the distance between trapeze hangers.
3. Size pipe supports with consideration to specific gravity of liquid being piped.

F. Locate and size sleeves and castings required for piping system.
1. Arrange for chases, recesses, inserts or anchors at proper elevation and location.

G. Use reducing fittings throughout piping systems.
1. Bushings will not be allowed unless specifically approved.

H. Equipment Drainage and Miscellaneous Piping:
1. Provide drip pans and piping at equipment where condensation may occur.
2. Hard pipe stuffing box leakage to nearest floor drain.
3. Avoid piping over electrical components such as motor control centers, panelboards, etc.
a. If piping must be so routed, utilize 16 GA, 316 stainless steel drip pan under piping and over full length of electrical equipment.
b. Hard pipe drainage to nearest floor drain.
4. Collect system condensate at drip pockets, traps and blowoff valves.
5. Provide drainage for process piping at locations shown on Drawings in accordance with Drawing details.
6. For applications defined above and for other miscellaneous piping which is not addressed by a specific piping service category in PART 1, provide 304 stainless steel piping and fittings.

a. Size to handle application with 3/4 IN being minimum size provided.

I. Unions:
   1. Install in position which will permit valve or equipment to be removed without dismantling adjacent piping.
   2. Mechanical type couplings may serve as unions.
   3. Additional flange unions are not required at flanged connections.

J. Install expansion devices as necessary to allow expansion/contraction movement.

K. Provide full face gaskets on all systems.

L. Anchorage and Blocking:
   1. Block, anchor, or harness exposed piping subjected to forces in which joints are installed to prevent separation of joints and transmission of stress into equipment or structural components not designed to resist those stresses.

M. Equipment Pipe Connections:
   1. Equipment - General:
      a. Exercise care in bolting flanged joints so that there is no restraint on the opposite end of pipe or fitting which would prevent uniform gasket pressure at connection or would cause unnecessary stresses to be transmitted to equipment flanges.
      b. Where push-on joints are used in conjunction with flanged joints, final positioning of push-on joints shall not be made until flange joints have been tightened without strain.
      c. Tighten flange bolts at uniform rate which will result in uniform gasket compression over entire area of joint.
         1) Provide tightening torque in accordance with manufacturer's recommendations.
      d. Support and match flange faces to uniform contact over their entire face area prior to installation of any bolt between the piping flange and equipment connecting flange.
      e. Permit piping connected to equipment to freely move in directions parallel to longitudinal centerline when and while bolts in connection flange are tightened.
      f. Align, level, and wedge equipment into place during fitting and alignment of connecting piping.
      g. Grout equipment into place prior to final bolting of piping but not before initial fitting and alignment.
      h. To provide maximum flexibility and ease of alignment, assemble connecting piping with gaskets in place and minimum of four bolts per joint installed and tightened.
         1) Test alignment by loosening flange bolts to see if there is any change in relationship of piping flange with equipment connecting flange.
         2) Realign as necessary, install flange bolts and make equipment connection.
      i. Provide utility connections to equipment shown on Drawings, scheduled or specified.
   2. Plumbing and HVAC equipment:
      a. Make piping connections to plumbing and HVAC equipment, including but not limited to installation of fittings, strainers, pressure reducing valves, flow control valves and relief valves provided with or as integral part of equipment.
      b. Furnish and install sinks, fittings, strainers, pressure reducing valves, flow control valves, pressure relief valves, and shock absorbers which are not specified to be provided with or as integral part of equipment.
      c. For each water supply piping connection to equipment, furnish and install union and gate or angle valve.
         1) Provide wheel handle stop valve at each laboratory sink water supply.
         2) Minimum size: 1/2 IN.
      d. Furnish and install "P" trap for each waste piping connection to equipment if waste is connected directly to building sewer system.
         1) Size trap as required by IPC.
      e. Stub piping for equipment, sinks, lavatories, supply and drain fittings, key stops, "P" traps, miscellaneous traps and miscellaneous brass through wall or floor and cap and protect until such time when later installation is performed.

N. Provide insulating components where dissimilar metals are joined together.

O. Instrument Connections:
   1. See drawing details.

3.6 CONNECTIONS WITH EXISTING PIPING

A. Where connection between new work and existing work is made, use suitable and proper fittings to suit conditions encountered.

B. Perform connections with existing piping at time and under conditions which will least interfere with service to customers affected by such operation.

C. Undertake connections in fashion which will disturb system as little as possible.

D. Provide suitable equipment and facilities to dewater, drain, and dispose of liquid removed without damage to adjacent property.

E. Where connections to existing systems necessitate employment of past installation methods not currently part of trade practice, utilize necessary special piping components.

F. Where connection involves potable water systems, provide disinfection methods as prescribed in this Specification Section.

G. Once tie-in to each existing system is initiated, continue work continuously until tie-in is made and tested.

3.7 ACCESS PROVISIONS

A. Provide access doors or panels in walls, floors, and ceilings to permit access to valves, piping and piping appurtenances requiring service.

B. Size of access panels to allow inspection and removal of items served, minimum 10 x 14 IN size.

C. Fabricate door and frame of minimum 14 GA, stretcher leveled stock, cadmium plated or galvanized after fabrication and fitted with screw driver lock of cam type.

D. Provide with key locks, keyed alike, in public use areas.

E. Furnish panels with prime coat of HPIC. See Specification Section 09 96 00.

F. Style and type as required for material in which door installed.

G. Where door is installed in fire-rated construction, provide door bearing UL label required for condition.

3.8 FIELD QUALITY CONTROL

A. Pipe Testing - General:
   1. The Contractor shall furnish all materials, equipment, tools and labor necessary to perform all of the tests called for and required herein. The hydrostatic tests shall consist of a pressure test and leakage test. The Contractor may backfill the pipe at his discretion; however, if the pipe has to be repaired it shall be uncovered, repaired and backfilled at no expense to the Owner
   2. Test piping systems as follows:
      a. Test exposed, non-insulated piping systems upon completion of system.
      b. Test exposed, insulated piping systems upon completion of system but prior to application of insulation.
      c. Test concealed interior piping systems prior to concealment and, if system is insulated, prior to application of insulation.
      d. Test buried piping (insulated and non-insulated) prior to backfilling and, if insulated, prior to application of insulation.
   3. Isolate equipment which may be damaged by the specified pressure test conditions.
   4. Perform pressure test using calibrated pressure gages and calibrated volumetric measuring equipment to determine leakage rates.

a. Select each gage so that the specified test pressure falls within the upper half of the gage's range.
b. Notify the Engineer 24 HRS prior to each test.

5. Completely assemble and test new piping systems prior to connection to existing pipe systems.
6. Acknowledge satisfactory performance of tests and inspections in writing to Engineer prior to final acceptance.
7. Bear the cost of all testing and inspecting, locating and remedying of leaks and any necessary retesting and re-examination.

B. Pressure Testing:
1. Testing medium: Unless otherwise specified in the PIPING SYSTEMS SCHEDULE, utilize the following test media.
a. Process systems:

PIPE LINE SIZE	SPECIFIED TEST PRESSURE	TESTING MEDIUM
2 IN and smaller	75 PSI or less	Water
2 IN and smaller	Greater than 75 PSI	Water
Greater than 2 IN	3 PSI or less	Water
Greater than 2 IN	Greater than 3 PSI	Water

b. Laboratory gases and natural gas systems: Cylinder nitrogen.
c. Liquid systems:

PIPE LINE SIZE (DIA)	GRAVITY OR PUMPED	SPECIFIED TEST PRESSURE	TESTING MEDIUM
Up to and including 48 IN	Gravity	25 PSIG or less	Water
Above 48 IN	Gravity	25 PSIG or less	Water
All sizes	Pumped	250 PSIG or less	Water

2. Allowable leakage rates:
a. Hazardous gas systems, all exposed piping systems, all pressure piping systems and all buried, insulated piping systems which are hydrostatically pressure tested shall have zero leakage goal at the specified test pressure throughout the duration of the test.
b. Hydrostatic exfiltration and infiltration for sanitary and stormwater sewers (groundwater level is below the top of pipe):
1) Leakage rate: 200 GAL per inch diameter per mile of pipe per day at average head on test section of 3 FT.
2) Average head is defined from groundwater elevation to average pipe crown.
3) Acceptable test head leakage rate for heads greater than 3 FT: Acceptable leakage rate (gallons per inch diameter per mile per day) equals 115 by (actual test head to the 1/2 power).
c. Hydrostatic infiltration test for sanitary and stormwater sewers (groundwater level is above the top of pipe):
1) Allowable leakage rate: 200 GAL per inch diameter per mile of pipe per day when depth of groundwater over top of pipe is 2 to 6 FT.
2) Leakage rate at heads greater than 6 FT: Allowable leakage rate (gallons per inch diameter per mile of pipe per day) equals 82 by (actual head to the 1/2 power).
d. Large diameter (above 48 IN) gravity plant piping systems shall have a maximum exfiltration of 25 GPD per inch-mile.
e. Non-hazardous gas and air systems which are tested with air shall have a maximum pressure drop of 5% of the specified test pressure throughout the duration of the test.

f. For low pressure (less than 25 PSIG) air testing, the acceptable time for loss of 1 PSIG of air pressure shall be:

PIPE SIZE (IN DIA)	TIME, MINUTES/100 FT
4	0.3
6	0.7
8	1.2
10	1.5
12	1.8
15	2.1
18	2.4
21	3.0
24	3.6
27	4.2
30	4.8
33	5.4
36	6.0
42	7.3
48	7.6

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

3.9 CLEANING, DISINFECTION AND PURGING

A. Cleaning:

1. Clean interior of piping systems thoroughly before installing.
2. Maintain pipe in clean condition during installation.
3. Before jointing piping, thoroughly clean and wipe joint contact surfaces and then properly dress and make joint.
    a. Pig high pressure air piping before connecting to valves or instruments.
4. At completion of work and prior to Final Acceptance, thoroughly clean work installed under these Specifications.
    a. Clean equipment, fixtures, pipe, valves, and fittings of grease, metal cuttings, and sludge which may have accumulated by operation of system, from testing, or from other causes.
    b. Repair any stoppage or discoloration or other damage to parts of building, its finish, or furnishings, due to failure to properly clean piping system, without cost to Owner.
5. All completed water mains, valves, tees, crosses, etc., shall be disinfected in accordance with "AWWA Standard for Disinfecting Water Mains ANSI/AWWA C651-99" and in accordance with the following requirements:
    a. The mains shall be thoroughly disinfected before being placed in service by the use of chlorine or chlorine compounds in such amount as to produce a concentration of at least 50 PPM and a residual of at least 25 PPM at the end of 24 hours.
    b. The chlorine residual at the end of the 24 hour period will be verified by the Contractor in the presence of the Engineer and a representative of the County Health Department. If the chlorine residual in the main is less than 25 ppm, the main shall be disinfected again.
    c. After the chlorine residual has been verified, the main shall be thoroughly flushed until the chlorine concentration is found to be at levels equal to levels within the surrounding water system. A water sample shall be taken at that time for a bacteria test to be performed by a state certified laboratory. The Contractor will be responsible for sampling and testing at his own expense.
    d. All water used in disinfection shall be dechlorinated and approved by the Engineer prior to discharge to surface water or surrounding area
6. Purge all neat liquid polymer tubing or piping between the neat polymer storage tank or tote and the polymer blending units with mineral oil to remove residual water prior to introducing neat polymer. Following purging, drain as much of the mineral oil out of the system as possible. Dispose of purged fluids and waste mineral oil in accordance with local environmental regulations.

B. Disinfection of Potable Water Systems:
1. After favorable performance of pressure test and prior to Final Acceptance, thoroughly flush entire potable water piping system including supply, source and any appurtenant devices and perform disinfection as prescribed.
2. Perform work, including preventative measures during construction, in full compliance with AWWA C651.
3. Perform disinfection using sodium hypochlorite complying with AWWA B300.
4. Flush each segment of system to provide flushing velocity of not less than 2.5 FT per second.
5. Drain flushing water to sanitary sewer.
    a. Do not drain flushing water to receiving stream.
6. Use continuous feed method of application.
    a. Tag system during disinfection procedure to prevent use.
7. After required contact period, flush system to remove traces of heavily chlorinated water.
8. After final flushing and before placing water in service, obtain an independent laboratory approved by the Owner to collect samples and test for bacteriological quality.
    a. Repeat entire disinfection procedures until satisfactory results are obtained.
9. Secure and deliver to Owner, satisfactory bacteriological reports on samples taken from system.
    a. Ensure sampling and testing procedures are in full compliance to AWWA C651, local water purveyor and applicable requirements of State of Kentucky.

3.10 LOCATION OF BURIED OBSTACLES

A. Furnish exact location and description of buried utilities encountered and thrust block placement.

B. Reference items to definitive reference point locations such as found property corners, entrances to buildings, existing structure lines, fire hydrants and related fixed structures.

C. Include such information as location, elevation, coverage, supports and additional pertinent information.

D. Incorporate information on "As-Recorded" Drawings.

3.11 PIPE INSULATION

A. Insulate pipe and pipe fittings in accordance with contract documents.

3.12 PIPING SYSTEM SCHEDULES

A. Piping System 10 – Buried and Exposed Potable Water Piping.
   1. General:
      a. Test requirements:
         1) Test medium: Water.
         2) Pressure: 1.25 x working pressure.
         3) Duration: 6 HRS.
      b. Gaskets and O-rings:
         1) O-rings: Neoprene or rubber.
         2) Flanged, push-on and mechanical joints (ductile iron): Rubber, AWWA/ANSI C111/A21.11.
         3) Flanged joints (steel): Rubber, AWWA C207.
         4) Grooved coupling joints (ductile and steel): Rubber, AWWA C606.
   2. System components:
      a. Pipe size to 3 IN:
         1) Exposed service:
            a) Material: Copper tubing, Type L.
            b) Solder: Cadmium and lead-free solder compatible with tubing and fittings materials.
            c) Reference: ASTM B88.
            d) Lining: None.
            e) Coating: HPIC; See Specification Section 09 96 00.
            f) Fittings: Wrought copper or bronze fittings meeting ASME B16.22.
            g) Joints: Soldered or brazed with unions at valves and equipment.
         2) Buried service:
            a) Material: Copper tubing, Type K.
            b) Reference: ASTM B88.
            c) Lining: None.
            d) Coating: None.
            e) Fittings: AWWA C800.
            f) Joints: Flared.
      b. Pipe size 3 IN through 24 IN:
         1) Exposed service:
            a) Materials:
               (1) Flanged: Ductile iron
               (2) Grooved type joint system: Use pipe thickness per AWWA C606.
               (3) With both systems, provide screwed on flanges at equipment, valves and structural penetrations.
            b) Reference: AWWA/ANSI C115/A21.15.
            c) Lining: Cement.
            d) Coating: HPIC; See Specification Section 09 96 00.
            e) Fittings: Either AWWA/ANSI C110/A21.10 ductile or gray iron.

f) Joints:
(1) Flanged or grooved type mechanical coupling (AWWA C606) joints.
(2) With both systems, provide screwed-on flanges at valves, equipment, and structure penetration.

2) Buried service:
a) Materials: Ductile iron, Class
b) Reference: AWWA/ANSI C151/A21.51.
c) Lining: Cement.
d) Coating: Bituminous.
e) Fittings:
(1) Either AWWA/ANSI C110/A21.10 ductile or gray iron.
(2) Optional: AWWA/ANSI C153/A21.53 ductile iron compact fittings for sizes 3 to 16 IN.
f) Joints: Push-on with mechanical (stuffing box type) joints at fittings and valves.

c. Pipe size greater than 24 IN:
1) Exposed service:
a) Material: Steel, fabricated pipe.
b) Reference: AWWA C200.
c) Lining: Cement.
d) Coating: HPIC; See Specification Section 09 96 00.
e) Fittings: AWWA C208.
f) Joints: Butt welded with rigid AWWA C207 flanges at equipment, valves, and structure penetrations.

2) Buried service:
a) Material: Steel, fabricated pipe.
b) Reference: AWWA C200.
c) Lining: Cement.
d) Coating: Bituminous.
e) Fittings: AWWA C208.
f) Joints: Butt welded.

3. Install drain tees with capped nipples of IPS brass 3 IN long at low points.
a. If low point occurs in concealed piping, provide approved flush access panel.
b. These drains are not shown on Drawings.
4. Slope water lines down to drain points not less than 1 IN in 60 FT.
5. Install all threaded piping with clean-cut tapered threads and with ends thoroughly reamed after cutting to remove burrs.
a. Pipe joint cement permitted only on external threads.
6. For screwed nipples for connections to flush valves, lavatory supplies, and other equipment with threaded connections use iron, copper, or brass pipe.
7. Install ball, butterfly and plug valves where indicated or required to adequately service all parts of system and equipment.
a. Install valves on each branch serving restroom.
b. Install valves on inlet and outlet connections of heat exchangers and on other equipment connected to water lines.
8. Install unions between valves and connections to each piece of equipment and install sufficient number of unions throughout piping system to facilitate installation and servicing.
a. On copper pipelines, install wrought, solder-joint, copper to copper unions for lines 2 IN and smaller and, for lines 2-1/2 IN and over install brass flange unions.
9. Construct and equip plumbing fixtures and equipment with anti-siphon devices as to entirely eliminate any danger of siphoning waste material into potable water supply system.
10. Where exposed pipes 6 IN in size and smaller pass through floors, finished walls, or finished ceilings, fit with nickel or chrome-plated plates large enough to completely close hole around pipes.
a. Secure plates to pipe by set screw in approved manner.
11. Size supply branches to individual fixtures as scheduled or indicated on Drawings.

12. Install piping so as to be free to expand with proper loops, anchors and joints without injury to system or structure.
13. Provide branches to wall hydrants or hose bibbs in exterior locations with interior shutoff and drain valves.
14. Provide approved type vacuum breaker and backflow preventer installations indicated or as required by Code.
15. Install concealed in finished structures such as administration and office facilities and at locations shown on Drawings. The following Table B is a summary of the piping services currently available. It is anticipated that most projects would include piping symbols on the drawings, so leave the table as optional text, unless the piping symbology is not listed on the drawings. If this table is used, make the table normal text and modify it based on client and project requirements.

3.13 SERVICE SYSTEM SUMMARY

A. Service Systems as defined in the Drawings.

END OF SECTION

SECTION 40 05 51
VALVES - BASIC REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Valving, actuators, and valving appurtenances.

B. Related Sections include but are not necessarily limited to:
   1. Section 40 05 00 - Pipe and Pipe Fittings - Basic Requirements.

1.2 QUALITY ASSURANCE

A. Referenced Standards:
   1. American Society of Mechanical Engineers (ASME):
      a. B1.20.1, Pipe Threads, General Purpose.
      b. B16.1, Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250.
      c. B16.18, Cast Copper Alloy Solder Joint Pressure Fittings.
   2. ASTM International (ASTM):
      a. A126, Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.
      b. D256, Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics.
      c. D638, Standard Test Method for Tensile Properties of Plastics.
      d. D648, Standard Test Method for Deflection Temperature of Plastics Under Flexural Load in the Edgewise Position.
      e. D695, Standard Test Method for Compressive Properties of Rigid Plastics.
      f. D2240, Standard Test Method for Rubber Property-Durometer Hardness.
   3. American Water Works Association (AWWA):
      a. C207, Standard for Steel Pipe Flanges for Waterworks Service - Sizes 4 IN through 144 IN.
      b. C500, Standard for Metal-Seated Gate Valves for Water Supply Service.
      c. C504, Standard for Rubber-Seated Butterfly Valves.
      d. C507, Standard for Ball Valves, 6 IN through 48 IN (150 MM through 1200 MM).
      e. C509, Standard for Resilient-Seated Gate Valves for Water Supply Service.
      f. C550, Standard for Protective Coatings for Valves and Hydrants.
      g. C606, Standard for Grooved and Shouldered Joints.
   4. American Water Works Association/American National Standards Institute (AWWA/ANSI):
      a. C111/A21.11, Standard for Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
   5. National Electrical Manufacturers Association (NEMA):
      a. 250, Enclosures for Electrical Equipment (1000 Volts Maximum).
      b. MG 1, Motors and Generators.
   6. National Fire Protection Association (NFPA):
      a. 70, National Electrical Code (NEC).

1.3 DEFINITIONS

A. The following are definitions of abbreviations used in this Specification Section or one of the individual valve sections:
   1. CWP: Cold water working pressure.
   2. SWP: Steam working pressure.
   3. WOG: Water, oil, gas working pressure.
   4. WWP: Water working pressure.

1.4 SUBMITTALS

A. Shop Drawings:
   1. Product technical data including:
      a. Acknowledgement that products submitted meet requirements of standards referenced.
      b. Manufacturer's installation instructions.
      c. Valve pressure and temperature rating.
      d. Valve material of construction.
      e. Special linings.
      f. Valve dimensions and weight.
      g. Valve flow coefficient.
      h. Wiring and control diagrams for electric or cylinder actuators.
      i. Short Circuit Current Rating (SCCR) nameplate marking per NFPA 70. Include any required calculations per Section 01 61 03.
   2. Test reports.

B. Contract Closeout Information:
   1. Operation and Maintenance Data:
      a. See Section 01 78 23 for requirements for the mechanics, administration, and the content of Operation and Maintenance Manual submittals.

C. Informational Submittals:
   1. Verification from valve actuator manufacturer that actuators have been installed properly, that all limit switches and position potentiometers have been properly adjusted, and that the valve actuator responds correctly to the valve position command.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with the Contract Documents, refer to individual valve Specification Sections for acceptable manufacturers.

2.2 MATERIALS

A. Refer to individual valve Specification Sections.

2.3 VALVE ACTUATORS

A. Valve Actuators - General:
   1. Provide actuators as shown on Drawings or specified.
   2. Counter clockwise opening as viewed from the top.
   3. Direction of opening and the word OPEN to be cast in handwheel or valve bonnet.
   4. Size actuator to produce required torque with a maximum pull of 80 LB at the maximum pressure rating of the valve provided and withstand without damage a pull of 200 LB on handwheel or chainwheel or 300 FT-pounds torque on the operating nut.
   5. Unless otherwise specified, actuators for valves to be buried, submerged or installed in vaults or manholes shall be sealed to withstand at least 20 FT of submergence.
   6. Extension stem:
      a. Install where shown or specified.
      b. Solid steel with actuator key and nut, diameter not less than stem of valve actuator shaft.
      c. Pin all stem connections.
      d. Center in valve box or grating opening band with guide bushing.

B. Buried Valve Actuators:
   1. Provide screw or slide type adjustable cast iron valve box, 5 IN minimum diameter, 3/16 IN minimum thickness, and identifying cast iron cover rated for traffic load.
   2. Box base to enclose buried valve gear box or bonnet.
   3. Provide 2 IN standard actuator nuts complying with AWWA C500, Section 3.16.

4. Provide at least two tee handle keys for actuator nuts, with 5 FT extension between key and handle.
5. Extension stem:
   a. Provide for buried valves greater than 4 FT below finish grade.
   b. Extend to within 6 IN of finish grade.
6. Provide concrete pad encasement of valve box as shown for all buried valves unless shown otherwise.

C. Plastic Valve Vault:
1. Provide in non-traffic areas only on valve applications 3-1/2 IN and less.
2. Nominal 7-1/2 IN DIA top section.
3. Design unit for screw type extension section having nominal 9 IN DIA bell.
4. Cast iron ring and lid.
5. Constructed of injection molded polyolefin compound with fibrous inorganic component reinforcing and UV stabilization.
6. Armor Access Boxes.

D. Exposed Valve Manual Actuators:
1. Provide for all exposed valves not having electric or cylinder actuators.
2. Provide handwheels for gate and globe valves.
   a. Size handwheels for valves in accordance with AWWA C500.
3. Provide lever actuators for plug valves, butterfly valves and ball valves 3 IN DIA and smaller.
   a. Lever actuators for butterfly valves shall have a minimum of five intermediate lock positions between full open and full close.
   b. Provide at least two levers for each type and size of valve furnished.
4. Gear actuators required for plug valves, butterfly valves, and ball valves 4 IN DIA and larger.
5. Provide gearing for gate valves 20 IN and larger in accordance with AWWA C500.
6. Gear actuators to be totally enclosed, permanently lubricated and with sealed bearings.
7. Provide chain actuators for valves 6 FT or higher from finish floor to valve centerline.
   a. Cadmium-plated chain looped to within 3 FT of finish floor.
   b. Equip chain wheels with chain guides to permit rapid operation with reasonable side pull without "gagging" the wheel.
   c. For smaller valves with lever or handle operators, provide offset tee handles with attached chain for operation from the operating floor.
8. Provide cast iron floor stands where shown on Drawings.
   a. Stands to be furnished by valve manufacturer with actuator.
   b. Stands or actuator to include thrust bearings for valve operation and weight of accessories.

E. Submerged Actuators:
1. Mount the valve actuator on top of an extension bonnet 3 FT above any adjacent personnel access.
2. The valve and bonnet connection shall be flanged and watertight.
3. Provide a top brace support for the bonnet.
   a. Mount the brace 6 IN below the top of the wall as shown.
4. Materials:
   a. Extension bonnet: Cast iron ASTM A126 or steel.
   b. Brace and anchor bolts: Type 304 stainless steel.

F. Electric Actuators (480 V, 3 PH):
1. Electric Motor Actuators - General:
   a. Provide electric motor actuators for valves and gates so indicated: on the Drawings, in valve schedule in the Specifications, or elsewhere in the Contract Documents.

b. Unless otherwise specified, provide each electric motor actuator with integral control devices for operation, including pushbuttons. When actuator's integral control station would be 6 FT or more above the nearest operating floor, or when integral control station would be out of reach of facility personnel standing on the nearest operating floor: (1) integral control station on actuator is not required; and (2) provide remotely-located control station, with pushbuttons, in accordance with this Section.

2. Furnish electric actuator integral with valve consisting of:
   a. Motor.
   b. Gearing.
   c. Handwheel.
   d. Limit and torque switches.
   e. Lubricants.
   f. Heating elements.
   g. Wiring.
   h. Terminals for motor power and controls.
   i. Drive nut.
3. Housing/enclosure:
   a. Provide cast iron gear housing and cast iron load bearing enclosure.
   b. Non load bearing enclosure and housing: Aluminum or cast iron.
   c. Rated for area classification shown on Drawings.
   d. Provide O-ring seals for covers and entries.
   e. Terminal and limit switch compartment covers are to be fastened to gear housing by stainless steel fasteners with capture device to prevent loss.
4. Motors:
   a. Provide motors that are totally enclosed, high torque design made expressly for valve actuator service and capable of operating the valve under full differential pressure for complete open-close and reverse cycle of travel at least twice in immediate succession without overheating.
   b. Design motors in accordance with NEMA MG 1 standards, with Class B insulation, and to operate successfully at any voltage within 10% above or below rated voltage.
   c. Provide positive method to ensure motor bearings are permanently lubricated.
   d. Provide three thermal switches imbedded in windings:
      1) 120 DEG apart.
      2) Provide motor shutdown at high temperature.
   e. Motor housing:
      1) Aluminum or cast iron.
      2) Totally enclosed nonventilated with cooling fins.
   f. Provide motor capable of operating in any position.
   g. Provide motor sealed from gearcase to allow any mounting position.
   h. Provide motors suitable for 480 V, 3 PH, 60 Hz.
5. Gearing:
   a. Provide power gearing consisting of heat treated steel helical gears, carburized and hardened alloy steel worm, and alloy bronze worm gear, all grease or oil bath lubricated, designed for 100% overload, and effectively sealed against entrance of foreign matter.
   b. Provide gearing mechanism constructed to permit field changes of reduction gear ratio.
   c. Design actuators so that motor comes up to speed before stem load is encountered in either opening or closing operation.
   d. Limit switch gearings and feedback device reduction gearing:
      1) Steel or bronze.
   e. Support rotating shafts with anti-friction bearings.
   f. Provide separate drive nut/thrust bearing assembly:
      1) Mounted to base of actuator.
      2) High tensile bronze.
      3) Quarter turn actuator: Provide 90 DEG mounting intervals.
      4) Provide grease fitting on drive assembly.

6. Handwheel:
   a. Permanently attached for manual operation.
   b. Positive declutch mechanism to engage and disengage handwheel.
   c. Handwheel shall not rotate during motor operation.
   d. Inoperable motor shall not prevent manual operation.
7. Limit torque and thrust loads in both closing and opening directions by torque limit switches.
   a. Provide torque switches with micrometer adjustment and reference setting indicator.
      1) Assure adjustment variation of approximately 40% in torque setting.
   b. Provide switches having rating of not less than 6 A at 120 VAC and 2.2 A at 115 VDC.
   c. Limit and torque switches shall have totally sealed contacts.
8. Furnish electric actuator with two geared limit switch assemblies with each switch assembly having four separate limit switches:
   a. Assure each limit switch assembly is geared to driving mechanism and is independently adjustable to trip at any point at and between the fully open and fully closed valve position.
   b. Provide minimum of two normally open contacts and two normally closed contacts at each end of valve travel.
   c. Provide switches with inductive contact rating of not less than 6 A at 120 VAC, 3 A at 240 VAC, 1.5 A at 480 VAC, 2.2 A at 115 VDC and 1.1 A at 230 VDC.
   d. Limit switches shall be fully adjustable when power is applied to actuator.
9. Provide space heating elements sized to prevent condensation in both motor and geared limit switch compartment(s).
   a. Furnish heating elements rated at 120 VAC with heaters continuously energized.
10. Open-close actuator controls:
   a. Provide control assembly with necessary holding relays, reversing starter, control transformers of sufficient capacity to provide control power, space heating element power and valve position transmitter.
   b. Provide control assembly in an enclosure rated for the defined area classification.
   c. Controls for open/close actuator:
      1) Provide remote pushbutton station with enclosure rated for area classification shown on Drawings with:
         a) Open pushbutton.
         b) Close pushbutton.
         c) Stop pushbutton.
         d) Remote/local switch.
         e) Full open light.
         f) Full close light.
         g) Open and close relays as required.
      2) Provide control enclosure to accept:
         a) Remote open/close switches.
      3) Provide contacts in control enclosure:
         a) Remote/local contact.
         b) Full open contact.
         c) Full close contact.
      4) Wire all components to an internal terminal strip and include mounted wiring diagram inside enclosure.
11. Additional requirements for modulating valve actuators:
   a. Proportional position servo-amplifier mounted integral with the actuator control compartment.
   b. Positioning of valve shall be proportional to a 4-20 mA signal input to the position servo-amplifier when remote control has been selected.
   c. Servo-amplifier adjustments shall include zero, span, gain, and dead-band.
   d. Provide 4-20 mA signal position control as shown on the Drawings that interfaces with the position control/position feedback instrumentation wiring to and from [remote control device] [PLC].

12. Provide equipment or control panels with Short Circuit Current Rating (SCCR) labeling as required by NFPA 70 and other applicable codes. See Section 01 61 03 for information on how to determine the available fault current, such that, the SCCR rating meets or exceeds the available fault current.

G. Electric Actuators (120 V, 1 PH):
   1. Electric Motor Actuators - General:
      a. Provide electric motor actuators for valves and gates so indicated: on the Drawings, in valve schedule in the Specifications, or elsewhere in the Contract Documents.
      b. Unless otherwise specified, provide each electric motor actuator with integral control devices for operation, including pushbuttons. When actuator's integral control station would be 6 FT or more above the nearest operating floor, or when integral control station would be out of reach of facility personnel standing on the nearest operating floor: (1) integral control station on actuator is not required; and (2) provide remotely-located control station, with pushbuttons, in accordance with this Section.
   2. General:
      a. Self contained including motor, gearing, torque switch, limit switches and cast housing.
      b. Electrical enclosure: NEMA 4 or NEMA 7 to comply with area rating classification shown on Drawings.
      c. Factory assembled requiring only field connection of power and control wires.
      d. Comply with Section 01 61 03.
   3. Motors:
      a. Produce 1.5 times the required torque.
      b. Sized for two complete open-close cycles without overheating.
      c. One fully closed to fully open cycle to occur within 60 SEC.
      d. Class F insulation.
      e. Operate at plus or minus 10% voltage.
      f. 120 Volt, single phase, 60 Hz.
      g. Provide thermal cutout switch and internal heater for actuator enclosure.
      h. Control wiring as shown on Drawing control diagrams.
   4. Remote pushbutton station:
      a. Enclosure: NEMA 4 stainless steel.
      b. Control relays shall include:
         1) Open relay.
         2) Closed relay.
         3) [Remote control device] [PLC] interface relay.
      c. Push-to-test indicating lights shall include:
         1) Open.
         2) Closed.
         3) Remote.
      d. Selector switches shall include:
         1) Local-Remote.
         2) Open-Close.
      e. Space heater for enclosure.
      f. Control wiring as shown on control diagrams.
      g. Wire all components to an internal terminal strip and include mounted wiring diagram inside enclosure.
   5. Provide equipment or control panels with Short Circuit Current Rating (SCCR) labeling as required by NFPA 70 and other applicable codes. See Section 01 61 03 for information on how to determine the available fault current, such that, the SCCR rating meets or exceeds the available fault current.

H. Cylinder Actuators:
   1. General:
      a. Self-contained unit including actuator and controls.
      b. Electrical enclosure to meet area classification shown on Drawings.
      c. Factory assembled requiring field supply connection and control wires.

2. Cylinders:
   a. Conform to [AWWA C541] [AWWA C542], [hydraulic] [pneumatic] cylinders.
   b. Cylinder barrel: [Fiberglass-reinforced plastic] [Stainless steel].
   c. Heads and caps: [Suitable nonmetallic material] [Ductile iron].
   d. Cylinder pistons: [Suitable nonmetallic material] [Ductile iron].
   e. Double acting and operate on 60 PSIG water or air supply.
   f. Cylinder rated for 150 PSIG.
   g. Any hoses between control and cylinder to be oil resistant and arranged to avoid sharp bending from hose weight.
   h. Provide supply filter.
   i. Position cylinder above or to side of valve.
   j. For pneumatically operated pump check service provide air-oil tandem cylinder actuator with speed control valves on oil cylinder.
3. Controls:
   a. Provide pre-piped, pre-wired control:
      1) Pipe with corrosion-resistant metal.
      2) Provide four-way, two-position, 110 V solenoid valve in weatherproof enclosure.
      3) Provide open-closed signal limit switches.
      4) Speed control valves, to independently control opening and closing speed between 10 and 60 SEC.
      5) Manual-automatic selector valve on supply to solenoid.
      6) For modulating valves, provide a positioner, input signal 4-20 mA, including signal converter.
      7) For modulating valves, provide valve position transmitter, 4-20 mA, including signal converter, where shown.
      8) For pump check valves, provide additional two-way solenoid valve with speed control to allow rapid close on loss of electric power.

I. Valve Lockout Devices:
   1. Device manufactured from same material as valve operator, preventing access to valve operator, to accept lock shackle.

2.4 FABRICATION

A. End Connections:
   1. Provide the type of end connections for valves as required in the Piping Schedules presented in Section 40 05 00 or as shown on the Drawings.
   2. Comply with the following standards:
      a. Threaded: ASME B1.20.1.
      b. Flanged: ASME B16.1, Class 125 unless otherwise noted or AWWA C207.
      c. Bell and spigot or mechanical (gland) type: AWWA/ANSI C111/A21.11.
      d. Soldered: ASME B16.18.
      e. Grooved: Rigid joints per Table 5 of AWWA C606.

B. Refer to individual valve Specification Sections for specifications of each type of valve used on Project.

C. Nuts, Bolts, and Washers:
   1. Wetted or internal to be bronze or stainless steel.
      a. Exposed to be zinc or cadmium plated.

D. On Insulated Piping: Provide valves with extended stems to permit proper insulation application without interference from handle.

E. Epoxy Interior Coating: Provide epoxy interior coating for all ferrous surfaces in accordance with AWWA C550.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Painting Requirements: Comply with Section 09 96 00 for High Performance Industrial Coatings.

C. Setting Buried Valves:
   1. Locate valves installed in pipe trenches where buried pipe indicated on Drawings.
   2. Set valves and valve boxes plumb.
   3. Place valve boxes directly over valves with top of box being brought to surface of finished grade.
   4. Install in closed position.
   5. Place valve on firm footing in trench to prevent settling and excessive strain on connection to pipe.
   6. After installation, backfill up to top of box for a minimum distance of 4 FT on each side of box.

D. Support exposed valves and piping adjacent to valves independently to eliminate pipe loads being transferred to valve and valve loads being transferred to the piping.

E. For grooved coupling valves, install rigid type couplings [or provide separate support to prevent rotation of valve from installed position].

F. Install electric or cylinder actuators above or horizontally adjacent to valve and gear box to optimize access to controls and external handwheel.

G. For threaded valves, provide union on one side within 2 FT of valve to allow valve removal.

H. Install valves accessible for operation, inspection, and maintenance.

3.2 ADJUSTMENT

A. Adjust valves, actuators and appurtenant equipment to comply with Section 01 75 00.
   1. Operate valve, open and close at system pressures.

B. For all 120 VAC and 480 VAC electric actuators, employ and pay for services of valve actuator manufacturer's field service representative to:
   1. Inspect valve actuators covered by this Specification Section.
   2. Supervise adjustments and installation checks:
      a. Open and close valves electrically under local manual and demonstrate that all limit switches are properly adjusted and that switch contacts are functioning properly by verifying the inputs are received at the remote input/output (RIO) panels or local control panel as appropriate.
      b. Position modulating valves electrically under local manual control and demonstrate that the valve position feedback potentiometer is properly adjusted and that the feedback signal is received at the RIO panels or local control panel as appropriate.
      c. Simulate a valve position command signal at the RIO panel or local control panel as appropriate and demonstrate that the valve is controlled to the desired position without excessive hunting.
   3. Provide Owner with a written statement that the valve actuator manufacturer has verified that the actuators have been installed properly, that all limit switches and position potentiometers have been properly adjusted and that the valve actuator responds correctly to the valve position command.

3.3 VALVE SCHEDULE

END OF SECTION

SECTION 40 05 52
MISCELLANEOUS VALVES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Automatic control valves:
      a. Altitude valves.

B. Related Specification Sections include but are not necessarily limited to:
   1. Section 40 05 51 - Valves - Basic Requirements.

1.2 QUALITY ASSURANCE

A. Referenced Standards:
   1. American Society of Mechanical Engineers (ASME):
      a. B16.1, Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250.
   2. American Water Works Association (AWWA):
      a. C512, Standard for Air-Release, Air-Vacuum, and Combination Air Valves for Waterworks Service.
      b. C550, Standard for Protective Interior Coatings for Valves and Hydrants.
   3. Canadian Standards Association (CSA).
   4. National Electrical Manufacturers Association (NEMA):
      a. 250, Enclosures for Electrical Equipment (1000 Volts Maximum).

1.3 SUBMITTALS

A. Shop Drawings:
   1. See Specification Section 40 05 51.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with the Contract Documents, the manufacturers listed in the applicable Articles below are acceptable.

2.2 AUTOMATIC CONTROL VALVES FOR WATER SERVICE

A. Basic Valve:
   1. Type:
      a. Diaphragm-actuated hydraulically operated.
         1) Acceptable manufacturers (Model as shown for specific valve):
            a) Cla-val.
            b) Singer.
         2) Materials:
            a) Body: Ductile iron.
            b) Seat insert: Stainless steel.
            c) Disc: Buna-N.
            d) Diaphragm: Nylon fabric bonded with synthetic rubber.
         3) Design requirements: Do not use diaphragm as seating surface.
      b. Differential piston hydraulically operated:
         1) Acceptable manufacturer:
            a) GA Industries.
         2) Materials:
            a) Body: Cast iron.

b) Piston, liner and seat crown: Bronze.
c) Piston cup and liner cup: Leather or Buna-N.

3) Design requirements: Valve liner with vee-port openings.

2. Design requirements:
   a. Size: [_____] IN.
   b. Operating pressure:
      1) Maximum [_____] PSI.
      2) Minimum [_____] PSI.
   c. Flow range:
      1) Normal maximum [_____] GPM.
      2) Normal minimum [_____] GPM.

B. Control:
   1. Type:
      a. Altitude control:
         1) Acceptable manufacturers:
            a) Cla-val.
            b) GA Industries.
            c) Watts ACV 127 Series.
            d) Singer Model 106-A-2.
         2) Design requirements:
            a) Modulate basic valve to control high water level in the reservoir.
            b) Close valve at high water level and open when water level lowers.
      b. Electric check control:
         1) Acceptable manufacturers:
            a) GA Industries, Figure 1730-D.
            b) Cla-val, Model 60-31.
            c) Watts ACV 413-21.
            d) Singer, Model 106-PG-BPC.
         2) Design requirements:
            a) Control opening and closing speed of basic valve to minimize surge associated with starting and stopping of a pump.
            b) Design normal opening and closing to be concurrent with pump operation.
            c) Provide for a more rapid valve closure in event of power outage.
            d) Provide adjustable controlled rates for all opening and closing speeds.
      c. Float controlled:
         1) Acceptable manufacturers:
            a) Cla-val, Model CFI.
            b) GA Industries, Figure 5600-D.
            c) Watts ACV 110-14.
            d) Singer, Model 106-F-5.
         2) Design requirements:
            a) Float-operated pilot valve to open or close basic valve at a controlled rate.
            b) Connect float to pilot with parallel linkage to provide vertical float travel.
            c) Design float to move freely on float rod between adjustable collars to allow 18 IN of float travel before activating pilot valve.
   2. Design requirements:
      a. Assembles all control features and hardware on basic valve at factory.
      b. Use corrosion-resistant metal for all exposed portions of the control.
      c. Include with valve control:
         1) Stop valves.
         2) Strainer.
         3) Valves for opening and closing speed control.
         4) Pilot valves.
         5) Solenoid valves.
         6) Pressure switches as necessary to provide control function.

d. Electric components:
   1) 110 V, 1 PH.
   2) In weatherproof enclosure unless shown otherwise on the Drawings.

2.3 ACCESSORIES

A. Furnish any accessories required to provide a completely operable valve.

2.4 FABRICATION

A. Completely shop assemble unit including any interconnecting piping, speed control valves, control isolation valves and electrical components.

B. Provide internal epoxy coating suitable for potable water for all iron body valves in accordance with AWWA C550.

2.5 SOURCE QUALITY CONTROL

A. Shop hydrostatically test to piping system test pressure.

2.6 MAINTENANCE MATERIALS

A. Provide one set of any special tools or wrenches required for operation or maintenance for each type valve.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: See Specification Section 40 05 51.

B. Float-Operated Valves: Install baffle around float to minimize turbulence adjacent to float.

3.2 FIELD QUALITY CONTROL

A. Clean, inspect, and operate valve to ensure all parts are operable and valve seats properly.

B. Check and adjust valves and accessories in accordance with manufacturer's instructions and place into operation.

END OF SECTION

SECTION 40 05 61
GATE VALVES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Gate valves.

B. Related Specification Sections include but are not necessarily limited to:
   1. Section 40 05 51 - Valves - Basic Requirements.

1.2 QUALITY ASSURANCE

A. Referenced Standards:
   1. ASTM International (ASTM):
      a. A126, Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.
   2. American Water Works Association (AWWA):
      a. C500, Standard for Metal-Seated Gate Valves for Water Supply Service.
      b. C504, Standard for Rubber-Seated Butterfly Valves.
      c. C550, Standard for Protective Epoxy Interior Coatings for Valves and Hydrants.
   3. Manufacturers Standardization Society of the Valve and Fittings Industry Inc. (MSS):
      a. SP-9, Spot Facing for Bronze, Iron and Steel Flanges.
      b. SP-70, Cast Iron Gate Valves, Flanged and Threaded Ends.
      c. SP-80, Bronze Gate, Globe, Angle and Check Valves.

1.3 DEFINITIONS

A. OS&Y: Outside Screw and Yoke.

B. NRS: Non-rising Stem.

C. RS: Rising Stem.

1.4 SUBMITTALS

A. Shop Drawings:
   1. See Specification Section 40 05 51.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with the Contract Documents, the manufacturers listed in the applicable Articles below are acceptable.

2.2 VALVES: WATER (HOT, COLD, HEATING, COOLING, SERVICE, PROCESS, POTABLE, NON-POTABLE, AND WASTEWATER)

A. Double Disc Gate Valve, 3 to 12 IN (Water Application):
   1. Comply with AWWA C500.
   2. Materials:
      a. Seating surfaces, stems, stem nut: Bronze.
      b. Body, disc: Cast iron.
   3. Design requirements:
      a. 200 PSI working pressure.
      b. Buried: NRS, O-ring stem seal, 2 IN operation nut.

c. Exposed: [NRS, O-ring stem seal, handwheel] [OS&Y, RS, stuffing box stem seals, handwheel].

4. Manufacturers:
   a. American Flow Control.
   b. Clow.
   c. M&H.
   d. Mueller.

B. Resilient Wedge Gate Valves, 2 to 48 IN (Water, Wastewater Application):
1. Comply with AWWA C509.
2. Materials:
   a. Stem and stem nut: Bronze.
      1) Wetted bronze parts in low zinc bronze.
      2) Aluminum bronze components: Heat treated per AWWA C504.
   b. Body, gate: Cast iron or Ductile iron.
   c. Resilient wedge: Fully encapsulated rubber wedge. Styrene Butadiene Rubber (SBR).
3. Design requirements:
   a. Minimum 200 PSIG working pressure.
   b. Buried: NRS, O-ring stem seal, 2 IN square operating nut.
   c. Exposed: OS&Y, stuffing box stem seal, handwheel or NRS, O-ring, stem seal, handwheel.
   d. Counter clockwise open rotation.
   e. Fusion bonded epoxy coating interior and exterior except stainless steel and bearing surfaces.
      1) Comply with AWWA C550.
      2) Wetted bronze parts in low zinc bronze.
      3) Aluminum bronze components: Heat treated per AWWA C504.
4. Manufacturers:
   a. Clow.
   b. Mueller.
   c. American Flow Control.
   d. M & H.

C. Double Disc Gate Valves, 14 to 48 IN (Water, Wastewater Application):
1. Comply with AWWA C500.
2. Materials:
   a. Seating surfaces, stem, stem nut: Bronze.
   b. Body, discs: Cast iron.
3. Design requirements:
   a. 150 PSI working pressure.
   b. NRS O-ring stem seal.
   c. Provide gear actuator, 20 IN and larger valves.
   d. Provide roller tracks and scrapers for horizontal valves size 16 IN and larger.
   e. Provide bypass valve sized per AWWA C500.
4. Manufacturers:
   a. Clow.
   b. Mueller.
   c. American Flow Control.
   d. M & H.

2.3 ACCESSORIES

A. Refer to Drawings and valve schedule for type of actuators.
1. Furnish actuator integral with valve.

B. Refer to Specification Section 40 05 51 for actuator requirements.

2.4 FABRICATION

A. General:
   1. Provide valves with clear waterways the full diameter of the valve.

B. Spot valves in accordance with MSS SP-9.

PART 3 - EXECUTION

3.1 INSTALLATION

A. See Specification Section 40 05 51.

B. Where larger buried valves utilize smaller bypass valves, provide a second valve box installed over the bypass valve operating nut.

C. Do not install gate valves inverted or with the stems sloped more than 45 DEG from the upright unless the valve was ordered and manufactured specifically for this orientation.

END OF SECTION

DIVISION 46

WATER AND WASTEWATER EQUIPMENT

SECTION 46 41 00
MIXERS

PART 1 - GENERAL

1.1 SUMMARY

A. The Hydrodynamic Mixing System (HMS) is defined as a supplemental system installed within a potable water storage reservoir which passively utilizes the energy provided by the inlet water supply (via pumped or gravity head) and generates a sufficient inlet momentum to achieve a complete homogeneous blending of the water volume within the reservoir with the inlet supply flow. Determination of Complete Homogeneous Blending shall be defined by the modeling requirements and supporting hydraulic analysis as conducted by each individual manufacturer for their specific system configuration as defined within these specifications. System submittals not providing this validation shall not be considered as a viable Hydrodynamic Mixing System (HMS) and shall not be accepted as an equivalent to this system specification.

1.2 QUALITY ASSURANCE

A. Referenced Standards:
   1. American Bearing Manufacturers Association (ABMA).
   2. American Gear Manufacturers Association (AGMA):
      a. 390.03a, Gear Handbook - Gear Classification, Materials and Measuring Methods for Bevel, Hypoid, Fine Pitch Wormgearing and Racks Only as Unassembled Gears.
   3. American National Standards Institute (ANSI)
      a. B16.1 – Cast Iron Pipe Flanges and Flanged Fittings
      b. B16.5 – Pipe Flanges and Flanged Fittings
      c. B36.10 – American National Standard Weights and Dimensions of Welded and Seamless Wrought Steel Pipe
   4. American Society for Testing and Materials (ASTM)
      a. A53 – Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-
      b. Coated, Welded and Seamless
      c. A234 – Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service
      d. A240 – Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
      e. A351 – Standard Specification for Castings, Austenitic, Austenitic-Ferritic (Duplex), for Pressure-Containing Parts
      f. A536 – Standard Specification for Ductile Iron Castings
      g. C110 – Ductile Iron and Gray-Iron Fittings, 3 In. through 48 In. for Water
      h. D1330 – Standard Specification for Rubber-Sheet Gaskets
      i. D1784 – PVC/CPVC Pipe Compounds
      j. D1785 – PVC Pipe, Schedules 40, 80 & 120
      k. D2466 – PVC Solvent Cement
      l. D2855 – PVC Solvent Joints
      m. D3261 – Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Fittings
      n. D3915 – PVC Pipe Fitting Compounds
   5. American Iron and Steel Institute (AISI)
      a. AISI 304 – 304 Stainless Steel Plate
      b. AISI 316 – 316 Stainless Steel Plate
      c. AISI 1040 – Carbon Steel Plate
   6. American Water Works Association (AWWA)
      a. C104 – Cement-Mortar Lining of Ductile Iron Pipe and fittings for Water
      b. C110 – Ductile-Iron and Gray-Iron Fittings, 3 In. through 48 In. for Water
      c. C115 – Flange Ductile Iron Pipe with Ductile Iron or Gray Iron Threaded Flanges

d. C200 - AWWA Standard for Steel Water Pipe 6" and Larger
e. C207 – Standard for Steel Pipe Flanges for Waterworks Service – Size 4 In. to 144 In.
f. C220 – AWWA Standard for Stainless Steel Pipe, 4" and Larger
g. C900 – AWWA Standard for Polyvinyl Chloride (PVC) Pressure Pipe, 4 In. Through 12 In. for Water Distribution
h. C905 – AWWA Standard for Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 14 In Through 48 In. for Water Transmission and Distribution
i. C906 – AWWA Standard for Polyethylene (PE) Pressure Pipe and Fittings, 4 In. Through 63 In. for Water Distribution

7. American Water Works Association Research Foundation (AwwaRF)
   a. Project No. E20-J08 – Physical Modeling of Mixing in Water Storage Tanks (Forthcoming)
8. National Sanitation Foundation (NSF)
   a. NSF Standard 14 – Plastic Piping System Components and Related Materials
   b. NSF Standard 61 – Drinking Water System Components – Health Effects

1.3 SUBMITTALS

A. Independent CFD Modeling Validation
   1. The mixing system designer/supplier must supply data or report from at least one project where an independent company conducted CFD modeling on their mixing system design and the modeling results verified the design achieved complete mixing.

B. Full Scale Tracer Study Validation
   1. The mixing system designer/supplier must supply data or report from at least one project where a full scale tracer study using calcium chloride was conducted on a circular reservoir and the tracer study verified their mixing system design achieved complete mixing.

C. NSF61 Certification
   1. Copy of the NSF61 Certified listing for the valves used in the Hydraulic Mixing System (HMS).
   2. The valves themselves must be NSF61 certified, not just the elastomer used in construction of the valves. NSF61 approved/certified materials will not be accepted in lieu of valve certification.

D. Test Report on Elastomer Exposure to Chlorine and Chloramine
   1. Copy of test report from an accredited independent laboratory that confirmed there is no degradation in the elastomer when exposed to chlorine and chloramine per the ASTM D471-98 "Standard Test Method for Rubber Property – Effect of Liquids."

E. System Installation Drawings
   1. The HMS manufacturer shall be responsible for providing engineering installation drawings of the complete manifold piping system as supplied by the manufacturer. These drawings shall include plan view piping arrangement, sections and elevations as required, support bracket installation details, duckbill nozzle orientation details, and all dimensions required for locating the system within the specified dimensions of the tank.
   2. Six (6) sets of plans shall be provided to the Engineer for review and approval.
   3. Two (2) sets of final fabrication and installation drawings shall be included with the shipment of the manifold piping equipment.

F. Design Calculations
   1. All Design Calculations, curves, and reference information listed below must originate and be submitted by the duckbill valve manufacturer. Calculations, curves, and reference information provided by contractors relating to the HMS are not allowed. The duckbill valve manufacturer MUST include within the submittal package the following design calculations, curves, and reference information:

a. Calculations showing the fill time required, under isothermal conditions, for the HMS system to achieve complete mix of the reservoir volume at minimum, average and peak fill rates. Complete mixing defined as 95% homogenous solution. The theory and equations used in calculating the mixing times must be as described in the Rossman, L.A. and W.M. Grayman (1999) reference.
b. A representative Computational Fluid Dynamics (CFD) model evaluation of the proposed HMS system configuration applied within a reservoir of similar geometry. Model output documentation shall include all design variables applied for the simulation, plot of the 3-D geometry showing the mesh definition, velocity magnitude vector and contour plots at different cross-sections throughout the water volume, simulated tracer animations showing the spatial and temporal distribution of inlet water in real time during the fill cycle.
c. Hydraulic calculations showing the resulting jet velocities of each inlet nozzle at minimum, average, and peak fill rates.
d. Hydraulic calculations showing the flow distribution among all inlet ports at minimum, average, and peak fill rates.
e. Manifold hydraulic calculations showing the total headloss of the HMS at minimum, average, and peak fill and draw rates. Headloss shall include all minor losses and headloss of nozzles and outlet check valves.
f. Hydraulic curves showing thrust vs. flow for the inlet nozzles.
g. Hydraulic curves for each outlet check valves showing headloss vs. flow.
h. Calculations showing the terminal rise height of the jets that discharge at an angle above horizontal. The terminal rise height shall be calculated assuming 10°F and 20°F colder inlet water and calculated at minimum, average and peak fill rates. The theory and equations used to calculate the terminal rise height shall be included.
i. If the calculations and supporting data provided do not show compliance with the hydrodynamic requirements of the system as interpreted by the Engineer or Owner then the submittal shall be rejected.

G. Installation, Operation and Maintenance Manuals
1. Within 30 days of final approval of the installation drawings, by the Engineer, the HMS valve manufacturer shall provide four (4) sets of the installation portion of the Installation, Operation and Maintenance (IOM) Manuals for the applicable system. Within 30 days of final approval, by the Engineer, of the installed system the manufacturer shall provide six (6) copies of the complete Installation, Operation and Maintenance (IOM) Manual for final review and approval.
2. The manuals shall be in the following format and include the listed required information as a minimum:
3. Enclosed in a 3-ring binder with project title and system designation shown on the front cover and side binder.
4. Table of contents
   a. Copy of design calculations for the manifold system as defined in the previous section.
   b. Copy of complete set of the installation plans.
   c. Copy of NSF61 Certified Listing for the valves
   d. Parts and equipment list with specification numbers for ordering of replacement parts.
   e. Product specification sheets for nozzles, outlet valves, expansion joints, concrete anchors, and any other specialized items supplied with the system.
   f. Installation guidelines for the HMS manifold system.
   g. Operational procedures for the HMS manifold system.
   h. Guidelines for repair of system components.
   i. Schedule for suggested periodic maintenance of the manifold system.

H. Contract Closeout Information:
1. Operation and Maintenance Data:
   a. Provide Operation and Maintenance Manuals.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Approved manufacturer is Tideflex Technologies, Carnegie, PA 15106.

2.2 PERFORMANCE AND DESIGN REQUIREMENTS

A. The specifications in this section include all components of the Reservoir Hydrodynamic Mixing System (HMS) consisting of a bi-directional flow manifold equipped with variable orifice duckbill inlet nozzles and outlet flow check valves that are NSF61 certified. The HMS manufacturer shall be responsible for designing the system in accordance with the hydrodynamic criteria defined within these specifications and submit design calculations verifying compliance in accordance with the submittal requirements. The following is a description of the Hydrodynamic Mixing System.

B. All modeling and hydraulic and mixing calculations pertaining to the HMS shall originate from the duckbill valve manufacturer. Modeling and calculations provided by parties other than the duckbill valve manufacturer are not allowed.

C. The complete Hydrodynamic Mixing System shall be supplied by the variable orifice nozzle manufacturer to maintain single source responsibility for the system. The complete system shall be defined as all piping and appurtenances within the tank downstream of the tank penetration. Appurtenances include pipe, fittings, horizontal and vertical pipe supports, expansion joints, variable orifice duckbill check valves, and any other equipment specified within this section of the specifications.

D. The following describes the design principles of the Hydrodynamic Mixing System and the validation of its effectiveness:
   1. To only require one tank penetration for reservoirs that operate in fill-then-draw unless a separate outlet pipe is required.
   2. To comprise one manifold pipe with duckbill inlet nozzles and outlet check valves in order to minimize the amount of pipe, fittings and appurtenances required to separate the inlet and outlet.
   3. To not have any horizontal piping that requires bracing to the tank shell other than at the bottom of the reservoir.
   4. To be passive operating and not require any outside energy source.
   5. To utilize the existing differential pressure between distribution system pressure and tank head to fill the reservoir thru the inlet nozzles and draw fluid from the reservoir thru the outlet check valves.
   6. To achieve complete mixing via multiple turbulent inlet jets (Jet-induced mixing). Scale modeling has shown that multiple ports provide faster mixing than a single inlet port [Roberts, et al (2005)].
   7. To utilize variable orifice inlet nozzles that provides a non-linear jet velocity vs. flow characteristic. This maximizes the inlet momentum at all flow rates. The inlet momentum is the kinetic energy solely responsible for mixing. This also ensures the rise height of negatively buoyant inlet jets will be maximized when the inlet water is colder than the tank water.
   8. To have less than ten (10) inlet ports. Scale modeling has shown diminishing returns with greater port quantities [Roberts, et al (2005)].
   9. To have inlet ports that discharge an elliptically shaped jet that provides faster mixing and dilution of the inlet water into the tank water.
   10. To have outlet check valves separated spatially from the inlet nozzles to mitigate short circuiting.
   11. To have a configuration based on Computational Fluid Dynamics (CFD) modeling, conducted by the manufacturer, of a similar configuration in the same tank style.
   12. To have multiple sampling studies conducted by water utilities that have conducted "before" and "after" spatial sampling of disinfectant residual and/or temperature that have proven the effectiveness of the HMS. Data can be submitted based upon the request of the engineer.

2.3 FABRICATION AND MANUFACTURE

A. Approved manufacturer is Tideflex Technologies, Carnegie, PA 15106.

B. Variable Orifice Duckbill Inlet Nozzles
   1. Inlet ports/nozzles shall be duckbill-style check valves that allow fluid to enter the reservoir during fill cycles and prevent flow in the reverse direction through the nozzle during draw periods. Inlet ports/nozzles may not be fixed-diameter ports or pipes.
   2. The duckbill valves shall be NSF61 Certified. NSF61 approved/Certified materials will not be accepted in lieu of valve certification.
   3. Inlet ports/nozzles shall have a variable diameter vs. flow hydraulic profile that provides a non-linear jet velocity vs. flow characteristic and a linear headloss vs. flow characteristic.
   4. The inlet ports/nozzles shall discharge an elliptically shaped jet. The nozzle must have been modeled by an independent laboratory using Laser Induced Fluorescence (LIF).
   5. Manufacturer shall have conducted independent hydraulic testing to determine headloss and jet velocity characteristics on a minimum of eight (8) sizes of duckbill valves ranging from 2" through 48". The testing must include multiple constructions (stiffness) within each size and must have been conducted for free discharge (discharge to atmosphere) and submerged conditions.
   6. Manufacturer shall have conducted an independent hydraulic test where multiple valves (at least four) of the same size and construction (stiffness) were tested to validate the submitted headloss characteristics and to prove the repeatability of the manufacturing process to produce the same hydraulic characteristics.
   7. Manufacturer shall have conducted independent hydraulic testing to study the flow distribution characteristics of duckbill valves installed on multiport manifolds.
   8. Manufacturer to have conducted Finite Element Analysis (FEA) on various duckbill valves to determine deflection, stress, and strain characteristics under various load conditions. Modeling must have been done for flowing conditions (positive differential pressure) and reverse differential pressure.
   9. Manufacturer must have conducted in-house backpressure testing on duckbill valves ranging from ¾" to 48".
   10. Manufacturer shall have at least ten (10) years' experience in the manufacturing of "duckbill" style elastomeric valves.
   11. Manufacturer must have duckbill valves installed on manifold piping systems in at least 50 distribution system reservoirs.
   12. Manufacturer must have representative inspection videos showing the duckbill valves discharging water into the reservoir during an initial fill (unsubmerged). Manufacturer must also have representative underwater inspection videos showing the operation of the valves when submerged. Representative videos can be submitted upon request from the engineer.
   13. The duckbill style nozzles shall be one-piece elastomer matrix with internal fabric reinforcing designed to produce the required discharge velocity and minimum headloss requirements as stipulated in the Submittals section. The flange portion shall be an integral portion of the nozzle with fabric reinforcing spanning across the joint between the flange and nozzle body.
   14. The elastomer used in construction of the duckbill valves must have been tested by an accredited independent laboratory that confirmed there is no degradation in the elastomer when exposed to chlorine and chloramine per the ASTM D471-98 "Standard Test Method for Rubber Property – Effect of Liquids."
   15. The manufacturer's name, plant location, serial number and product part number which designate nozzle size, material and construction specifications shall be bonded onto the surface of the nozzle.

C. Outlet Check Valves
   1. The outlet flow valves shall be perforated disc type with elastomeric membrane.
   2. The valves shall be NSF61 Certified. NSF61 approved/Certified materials will not be accepted in lieu of valve certification.

3. The perforated disc shall be fabricated of stainless steel plate with welded support gussets. The disc shall be flanged and drilled to mate with ANSI B16.1, Class 125/ANSI B16.5 Class 150 flanges. The disc shall have three (3) tapped holes used for fastening the membrane and support rod to the disc with stainless steel bolts, nuts, and lock washers. The top of the disc shall be tapped and supplied with lifting eyebolt for installation.
4. The membrane shall be circular, one piece rubber construction with fabric reinforcement. The diameter of the membrane shall allow adequate clearance between the membrane O.D. and the pipe I.D. The membrane shall be vulcanized with a specified convex radius to produce a compression set to allow the membrane to seal against the perforated disc at low reverse differential pressure.
5. The support rod shall be stainless steel and drilled with three (3) longitudinal holes to allow fastening of rod to membrane and perforated disc.
6. When line pressure inside the valve exceeds the backpressure outside the valve, the line pressure forces the membrane to open, allowing flow to pass through the perforations in the disc. When backpressure exceeds the line pressure, the membrane seats on the perforated disc preventing backflow.
7. The valve allows flow out of the reservoir during draw cycles and prevents flow into the reservoir during fill cycles.
8. The elastomer used in construction of the membrane must have been tested by an accredited independent laboratory that confirmed there is no degradation in the elastomer when exposed to chlorine and chloramine per the ASTM D471-98 "Standard Test Method for Rubber Property – Effect of Liquids."
9. The manufacturer's name, plant location, serial number and product part number which designate membrane size, material and construction specifications shall be bonded onto the surface of the membrane.

D. Polyvinyl Chloride (PVC) Pipe and Fittings
1. All PVC pipe and PVC fittings shall be a minimum Schedule 80 in accordance with ASTM D1785-83.
2. PVC pipe and fittings shall be NSF61 approved for potable water.
3.
4. PVC pipe compounds shall be in accordance with the standards listed in Section 3.0: Referenced Standards.
5. PVC solvent and solvent joints shall be in accordance with the standards listed in Section 3.0: Referenced Standards.
6. Field solvent welding will not be allowed unless approved by the Engineer.
7. All pipe joints that are to be field connected shall be PVC type flanges. Flange drilling to be in accordance with ANSI B16.1/B16.5.
8. All fittings shall have the same pressure rating as the pipe unless otherwise noted.

E. Flange Gaskets
1. Flange gaskets shall be full-faced and shall be in accordance with ASTM D1330.
2. Flange gasket drilling pattern shall conform to ANSI B16.1/B16.5.
3. Flange gaskets shall be 1/8" thick.
4. Gasket material shall be EPDM.

F. Fasteners
1. Hex head bolts and nuts shall be stainless steel 304 conforming to ANSI/ASME B18.2.1 and ANSI/ASME B18.2.2.

G. Pipe Supports
1. All components of the bracket assembly shall be stainless steel 304 in accordance with the associated standards.
2. The bracket assemblies shall consist of four components:
   a. A base plate (when required). For glass-lined tanks with concrete floors, the base plate will have four thru holes for expansion anchors.
   b. A top-works weldment that consists of structural channel and angle iron. The TMS piping shall rest on the angle iron. The angle iron has predrilled holes for the U-bolt.

c. U-bolt with four hex nuts.
d. An 1/8" thick EPDM strip with a length equivalent to the circumference of the pipe. The strip shall be placed between the pipe and the angle iron and U-bolt.
e. Lateral support bracket assemblies shall be installed at locations noted on the Drawings.
f. Lateral supports shall be fastened to the tank sidewall by bolted connections. Bolted connections shall be installed in coordination with tank manufacturer's recommendations.

3. The channel of the top-works weldment shall be field fit and modified to the required length. The channel shall then be field welded to the base plate.
4. For glass-lined tanks with concrete floor slabs, the support shall be anchored to the concrete floor with stud type expansion anchors, the pull-out rating of the combined anchors shall be a minimum of 10 times greater than the static weight of the vertical pipe section.

H. Coatings
1. Following installation of the manifold system, all carbon steel and ductile iron pipe, fittings, bolted connections, pipe supports, and appurtenances shall be coated according to the interior tank paint specification as specified by the Engineer.
2. Surface preparation and coating procedures shall be provided by the Engineer and the coating supplier.
3. Tideflex and Waterflex Valves shall not be coated. The valves shall either be masked or be mounted after coating of the tank and piping. Contractor to ensure masking materials are removed after coating.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Installation of the manifold system shall be in accordance with the installation plans and guidelines provided by the HMS manufacturer and as specified in the installation section of the IOM manual. Refer to section on Submittals for quantities and delivery schedules of the documents.

3.2 FIELD QUALITY CONTROL

A. Provide manufacturer's field services.

3.3 DELIVERY, STORAGE, AND MATERIAL HANDLING

A. Individual nozzles and outlet valves shall be packaged separately from the piping equipment.

B. All flanges shall be protected by using plastic inserts or plank wood, pipe sections are to be fully supported to prevent pipe deflection or damage to fittings or connections.

C. All equipment shall be shipped on pallets capable of fully supporting the pipe sections across their entire length. Pallets should be accessible for fork lift transport or strap and hoist means without causing any load to the pipe equipment.

D. All stainless steel components shall be stored separately away from any carbon steel components or other materials that could stain or deface the stainless steel finish from run-off of oxidized ferrous materials.

E. All pipe equipment should be covered and stored in areas free from contact with construction site sediment erosion to prevent accumulation of materials within the pipe and fittings.

F. Duckbill nozzles should be protected from contact with rigid objects during handling and storage. The contractor shall be responsible for replacing any duckbill nozzles or elastomeric components that are damaged after arrival on the site through installation and start-up of the system.

3.4 START-UP AND TESTING PROCEDURE

A. The TMS manufacturer shall provide one (1) day start-up services by a factory representative to verify that the system has been installed in accordance with the design specifications and requirements listed within this section.

B. Start-Up Flow Testing
   1. Following installation of the complete manifold piping system, the contractor shall open the upstream isolation valve to allow flow into the tank through the manifold system. The isolation valve must be opened slowly to prevent surge or over-pressurization of the manifold system. The isolation valve must be fully opened to inspect the flow characteristics of the manifold system.
   2. The contractor and factory representative shall visually inspect the entire piping system for leakage.
   3. The contractor and factory representative shall visually inspect all of the inlet nozzles to ensure flow is being discharged into the tank through all nozzles.

3.5 SPARE PARTS

A. Spare parts are not required, unless otherwise specified.

3.6 WARRANTY

A. The complete manifold piping system shall be supplied by the HMS manufacturer to maintain single source responsibility for the system. The complete system shall be defined as all piping and appurtenances within the tank downstream of the tank penetration. Appurtenances include pipe, fittings, horizontal and vertical pipe supports, expansion joints, duckbill valves, and any other equipment specified within this section of the specifications.

B. All piping, pipe support brackets, joint connections, expansion joints, and anchors shall be warranted by the HMS manufacturer against failure under design conditions for a period on one (1) year from the date of final installation approval by the Engineer.

C. Inlet nozzles and outlet valves shall be warranted by the manufacturer against failure under design operating conditions for a period of one (1) year from the date of final installation approval by the Engineer. Elastomer components damaged as a result of maintenance activities, foreign debris, or excessive exposure to direct ultraviolet and thermal radiation shall be excluded warranted coverage.

END OF SECTION

Lyon County Water District

Contract III Water Line Improvements

Construction Documents
Project Manual

August 2022

HDR Project No. 10205112

60% SUBMITTAL

00 01 07
SEALS AND SIGNATURES

Owner Name: Lyon County Water District
Facility or Site Name: Contract III Water Service Line Extensions
Project Name: LCWD Water Quality and System Improvements
Project or Contract Designation: _____
Engineer: HDR

[*insert licensee*], PE License No. [____]	The seal and signature to the left applies to the following Specifications divisions and sections of this project manual: • [____]. • [____].
[*insert licensee*], PE License No. [____]	The seal and signature to the left applies to the following Specifications divisions and sections of this project manual: • [____]. • [____].

[*insert licensee*], PE License No. [____]	The seal and signature to the left applies to the following Specifications divisions and sections of this project manual: • [____]. • [____].
[*insert licensee*], PE License No. [____]	The seal and signature to the left applies to the following Specifications divisions and sections of this project manual: • [____]. • [____].

Engineer's seal and signature does not apply to the documents that comprise Division 00, Bidding and Contracting Requirements.

It is a violation of applicable laws and regulations governing professional licensing and registration for any person, unless acting under the direction of the licensed and registered design professional(s) indicated above, to alter in any way the Specifications in this project manual.

END OF SEALS AND SIGNATURES

TABLE OF CONTENTS

SECTION 00 11 13
ADVERTISEMENTS FOR BIDS

Lyon County Water District
Contract III Water Service Line Extensions
Kuttawa, Kentucky

Separate sealed bids will be received for Contract III Water Tank Improvements by the Owner, Lyon County Water District, at 5464 US-62, Kuttawa, Kentucky 42055 until [BID TIME] on [BID DATE]. Bid will then be opened and read aloud at this location.

This project consists of the replacement of undersized lines and extension of existing lines in various locations throughout the County. In addition, the project will install new flush hydrants and create at least two loops, and all other Work required in accordance with the Contract Documents.

Bidding documents may be obtained from:

- Paducah Blueprint and Supply Co., Inc.
  999 Broadway St, Paducah, Kentucky 42001
  270.444.6171

All bidders shall submit with their bid an acceptable bid bond or a certified check in the amount of five percent (5%) of the bid, payable to the Owner.

The Owner reserves the right to waive any informalities or to reject any and all bids.

No bidder may withdraw their bid within 30 after the date of the bid opening.

The award of this project will be to the lowest, responsive, responsible bidder.

This project is funded with funds provided by the Kentucky Drinking Water State Revolving Fund (SRF) with federal funds provided by the Environmental Protection Agency. SRF requirements (including American Iron and Steel and Davis-Bacon) and provisions must be met by the Bidder and all subcontractors.

Bidders must comply with the President's Executive Order No. 11246 as amended, which prohibits the discrimination in employment regarding race, creed, color, sex or national origin. The project shall be incompliance with Executive Order 11246 as amended. All contractors/subcontractors shall comply with 41 CFR 60-4, in regard to affirmative action, to insure equal opportunity to females and minorities and will apply the time tables and goals set forth in 41 CFR 60-4.

Small and Disadvantaged Business Enterprises are encouraged to bid on this project. Lyon County Water District is an Equal Opportunity Employer.

INSTRUCTIONS TO BIDDERS

FOR CONSTRUCTION CONTRACT

TABLE OF CONTENTS

ARTICLE 1—DEFINED TERMS

1.01 Terms used in these Instructions to Bidders have the meanings indicated in the General Conditions and Supplementary Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below:

A. *Issuing Office*—The office from which the Bidding Documents are to be issued, and which registers plan holders.

ARTICLE 2—BIDDING DOCUMENTS

2.01 Bidder shall obtain a complete set of Bidding Requirements and proposed Contract Documents (together, the Bidding Documents). See the Agreement for a list of the Contract Documents. It is Bidder's responsibility to determine that it is using a complete set of documents in the preparation of a Bid. Bidder assumes sole responsibility for errors or misinterpretations resulting from the use of incomplete documents, by Bidder itself or by its prospective Subcontractors and Suppliers.

2.02 Bidding Documents are made available for the sole purpose of obtaining Bids for completion of the Project and permission to download or distribution of the Bidding Documents does not confer a license or grant permission or authorization for any other use, nor does it grant or confer ownership or any property interest in the Bidding Documents and other documents distributed for the Project. Authorization to download documents, or other distribution, includes the right for Bidding Documents holders to print documents solely for their use, and the use of their prospective Subcontractors and Suppliers, provided the Bidding Documents holder pays all costs associated with printing or reproduction. Paper or other types of printed documents may not be re-sold under any circumstances.

2.03 Owner has established Paducah Blueprint as the Plan Holders.. Bidders may rely that sets of Bidding Documents obtained from the Bidding Documents Holder are complete, unless an omission is blatant. Registered Bidding Documents holders will receive Addenda issued by Owner or Issuing Office.

2.04 *Electronic Documents*

A. When the Bidding Requirements indicate that electronic (digital) copies of the Bidding Documents are available, such documents will be made available to prospective Bidders as Electronic Documents in the manner specified.

1. Bidding Documents will be provided in Adobe PDF (Portable Document Format) (.pdf) that is readable by Adobe Acrobat Reader Version [insert version number] or later. It is the intent of the Engineer and Owner that such Electronic Documents are to be exactly representative of the paper copies of the documents. However, because the Owner and Engineer cannot totally control the transmission and receipt of Electronic Documents nor any bidder's or the Contractor's means of reproduction of such documents, the Owner and Engineer cannot and do not guarantee that Electronic Documents and reproductions prepared from those versions are identical in every manner to the paper copies.

B. Unless otherwise stated in the Bidding Documents, the Bidder may use and rely upon complete sets of Electronic Documents of the Bidding Documents, described in Paragraph 2.06.A above. However, Bidder assumes all risks associated with differences arising from

transmission/receipt of Electronic Documents versions of Bidding Documents and reproductions prepared from those versions and, further, assumes all risks, costs, and responsibility associated with use of the Electronic Documents versions to derive information that is not explicitly contained in paper versions of the documents, and for Bidder's reliance upon such derived information.

ARTICLE 3—QUALIFICATIONS OF BIDDERS

3.01 To demonstrate Bidder's qualifications to perform the Work, after submitting its Bid and within 15 days of Owner's or Engineer's request, Bidder must submit the following information:

A. Written evidence establishing its qualifications such as financial data, previous experience, and present commitments.

B. A written statement that Bidder is authorized to do business in the state where the Project is located, or a written certification that Bidder will obtain such authority prior to the Effective Date of the Contract. Such statement or certification, as applicable, shall be signed by the same officer of Bidder's company that signed the Bid.

C. Bidder's state (or other issuing entity) contractor license number, if applicable.

D. Subcontractor and Supplier qualification information.

E. Other required information regarding qualifications.

3.02 A Bidder's failure to submit required qualification information within the times indicated may disqualify Bidder from receiving an award of the Contract.

3.03 No requirement in this Article 3 to submit information will prejudice the right of Owner to seek additional pertinent information regarding Bidder's qualifications.

3.04 Bidders shall be experienced in the kind of Work to be performed, shall have the or be able to obtain construction equipment necessary for the Work, and shall possess sufficient capital to properly perform the Work within the time allowed. Bids received from Bidders who have previously failed to complete work within the time required, or who have previously performed similar work in an unsatisfactory manner, may be rejected. A Bid may be rejected if Bidder cannot show and document to Owner's satisfaction that Bidder has the necessary ability, facilities, equipment, and resources to commence the Work at the time prescribed and thereafter to prosecute and complete the Work at the rate or within the times specified. A Bid may be rejected if Bidder is already obligated for the performance of other work which would delay the commencement, prosecution or completion of the Work.

ARTICLE 4—PRE-BID CONFERENCE

4.01 A pre-bid conference will not be conducted for this Project.

ARTICLE 5—SITE AND OTHER AREAS; EXISTING SITE CONDITIONS; EXAMINATION OF SITE; OWNER'S SAFETY PROGRAM; OTHER WORK AT THE SITE

5.01 *Site and Other Areas*

A. The Site is identified in the Bidding Documents, including in Specifications Section 01 11 00 – Summary of Work. By definition, the Site includes rights-of-way, easements, and other lands

furnished by Owner for the use of the Contractor. Any additional lands required for temporary construction facilities, construction equipment, or storage of materials and equipment, and any access needed for such additional lands, are to be obtained and paid for by Contractor.

5.02 *Existing Site Conditions*

A. *Subsurface and Physical Conditions; Hazardous Environmental Conditions*

1. If the Supplementary Conditions do not identify Technical Data, the default definition of Technical Data set forth in Article 1 of the General Conditions will apply.

B. *Underground Facilities:* Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data.

5.03 *Site Visit and Testing by Bidders*

A. Bidder is required to coordinate with the Water District to visit the Site and conduct a thorough visual examination of the Site and adjacent areas. During the visit the Bidder must not disturb any ongoing operations at the Site.

B. Bidders visiting the Site are required to: (1) arrange their own transportation to the Site; and (2) each Bidder visiting the Site is responsible for providing and using its own personal protective equipment appropriate for the Site and conditions, and in accordance with posted requirements, if any. At minimum, each visitor to the Site should have an appropriate hardhat, steel-toed boots, eye and hearing protection (other than ordinary eyewear), and a high-visibility reflective safety vest. Comply with Paragraph 5.05 of these Instructions to Bidders.

C. All access to the Site, other than during a regularly scheduled Site visit, must be coordinated through the following Owner or Engineer contact for visiting the Site:

Mat Blane – blanemathewlcwd@gmail.com, 270.388.0271

Bidder must conduct the required Site visit during normal working hours, Mondays through Fridays.

D. Bidder is not required to conduct any subsurface testing, or exhaustive investigations of Site conditions.

E. On request, and to the extent Owner has control over the Site, and schedule permitting, the Owner will provide Bidder general access to the Site to conduct such additional examinations, investigations, explorations, tests, and studies as Bidder deems necessary for preparing and submitting a successful Bid. Owner will not have any obligation to grant such access if doing so is not practical because of existing operations, security or safety concerns, or restraints on Owner's authority regarding the Site. Bidder is responsible for establishing access needed to reach specific selected test sites.

F. Bidder must comply with Laws and Regulations regarding excavation and location of utilities, obtain necessary permits, and comply with all terms and conditions established by Owner or by property owners or other entities controlling the Site with respect to schedule, access, existing operations, security, liability insurance, and applicable safety programs.

G. Bidder must fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies.

5.04 *Owner's Safety Program*

A. Site visits and work at the Site may be governed by an Owner safety program. If an Owner safety program exists, it will be indicated in the Supplementary Conditions. Where the Bidding Documents indicate an Owner's safety program, visitors to the Site during the bidding phase and at other times shall comply with Owner's safety programs.

5.05 *Other Work at the Site*

A. Reference is made to Specifications Section 01 11 00 – Summary of Work, for the identification of the general nature of other work of which Owner is aware (if any) that is to be performed at the Site by Owner or others (such as utilities and other prime contractors) and relates to the Work contemplated by these Bidding Documents. If Owner is party to a written contract for such other work, then on request, Owner will provide to each Bidder access to examine such contracts (other than portions thereof related to price and other potentially confidential matters), if any.

ARTICLE 6—BIDDER'S REPRESENTATIONS AND CERTIFICATIONS

6.01 *Express Representations and Certifications in Bid Form, Agreement*

A. The Bid Form that each Bidder will complete and submit contains express representations regarding the Bidder's examination of Project documentation, Site visit, and preparation of the Bid, and certifications regarding lack of collusion or fraud in connection with the Bid. Bidder should review these representations and certifications, and assure that Bidder can make the representations and certifications in good faith, before executing and submitting its Bid.

B. If Bidder is awarded the Contract, Successful Bidder (as Contractor) will make similar express representations and certifications when it signs the Agreement.

ARTICLE 7—INTERPRETATIONS AND ADDENDA

7.01 Owner on its own initiative may issue Addenda to clarify, correct, supplement, or change the Bidding Documents.

7.02 Bidder shall submit all questions about the meaning or intent of the Bidding Documents to Engineer in writing. Contact information and submittal procedures for such questions are as follows:

A. Savannah Wing PE, HDR engineering Inc. at savannah.wing@hdrinc.com or 850-501-5457

7.03 Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda delivered to all Bidding Documents holders registered with the Issuing Office. Questions received less than seven days prior to the date for opening of Bids may not be answered.

7.04 Only responses set forth in an Addendum will be binding. Oral and other interpretations or clarifications will be without legal effect. Responses to questions are not part of the Contract

Documents unless set forth in an Addendum that expressly modifies or supplements the Bidding Documents.

7.05 Addenda that engineer judges to have a material or significant effect on Bidders' preparation of pricing and other requirement element of the Bid will be transmitted via Addendum for Bidders' receipt not less than three days prior to the scheduled date for receipt of the Bids. Clarifications or modifications that Engineer deems will not have a material or substantial effect on the preparation of Bids may be transmitted for Bidders' receipt later, for receipt prior to the deadline for receipt of Bids.

ARTICLE 8—BID SECURITY

8.01 *Required Form and Amount of Bid Security*

A. A Bid must be accompanied by bid security made payable to Owner in an amount of five (5) percent of Bidder's maximum Bid price (determined by adding the base bid and all alternates) and in the form of a bid bond issued by a surety meeting the requirements of Paragraph 6.01 of the General Conditions.

B. Such bid bond will be issued in the form included in the Bidding Documents.

8.02 *Bid Security of Successful Bidder*

A. The Bid security of the apparent Successful Bidder will be retained until Owner awards the Contract to such Bidder, and such Bidder has signed the Contract, furnished the required Contract security, and met the other conditions of the Notice of Award, whereupon the Successful Bidder's bid security will be released.

B. If the Successful Bidder fails to sign and deliver the Contract and furnish the required Contract security within the number of days, indicated in Paragraph 20.01 of these Instructions to Bidders, after the Notice of Award, Owner may consider Bidder to be in default, annul the Notice of Award, and the bid security of that Bidder will be forfeited.

C. Upon Successful Bidder's default:

1. When the bid security is a penal sum bid bond, the entire penal sum amount of the bid bond will be forfeit and due Owner.

2. When the bid security is a damages form of bid bond, to the extent of Owner's damages will be forfeit and due Owner.

3. If a type of bid security other than a bid bond is allowed and is furnished, the amount that will be forfeit and due Owner will be the same as for the form of bid bond included in the Bidding Documents. Owner will so notify the defaulting Bidder in writing of the annulment and the amount of the forfeiture, with documentation of the amount forfeited.

D. Such forfeiture will be Owner's exclusive remedy if Bidder defaults.

8.03 *Bid Security of Bidders other than the Successful Bidder*

A. The bid security of other Bidders that Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of seven days after the Effective Date of the Contract or 61 days after the Bid opening, whereupon bid security furnished by such Bidders will be released.

B. Bid security of other Bidders that Owner believes do not have a reasonable chance of receiving the award will be released within seven days after the bid opening.

C. Release of Bid Security: Owner may release any Bidder's bid security by returning such bid security to the associated Bidder. When bid security is in the form of a bid bond, Owner may dispose of or destroy the bid bond and so advice the associated Bidder in writing that the bid bond has been released.

ARTICLE 9—CONTRACT TIMES

9.01 The number of days within which, or the dates by which, the Work is to be (a) substantially completed and (b) ready for final payment, and (c) Milestones (if any), are to be achieved are set forth in the Agreement.

9.02 Bidder must set forth in the Bid the time by which Bidder must achieve Substantial Completion, subject to the restrictions established in these Instructions to Bidders. Owner will take Bidder's time commitment regarding Substantial Completion into consideration during the evaluation of Bids, and it will be necessary for the apparent Successful Bidder to satisfy Owner that Successful Bidder will be able to achieve Substantial Completion within the time such Bidder has designated in the Bid.

9.03 Provisions for liquidated and special damages, if any, for failure to timely attain a Milestone, Substantial Completion, or completion of the Work in readiness for final payment, are set forth in the Agreement.

ARTICLE 10—SUBSTITUTE AND "OR EQUAL" ITEMS

10.01 The Contract for the Work, as awarded, will be on the basis of materials, equipment, and procedures specified or described in the Bidding Documents without consideration during the bidding and Contract award process of possible substitute or "or-equal" items or procedures. In cases in which the Contract allows the Contractor to request that Engineer authorize the use of a substitute or "or-equal" item of material or equipment or procedure, application for such acceptance may not be made to and will not be considered by Engineer until after the Effective Date of the Contract.

10.02 All prices that Bidder sets forth in its Bid will be based on the presumption that the Contractor will furnish the materials and equipment specified or described in the Bidding Documents, and will perform the Work in accordance with procedures indicated in the Bidding Documents, as supplemented by Addenda, if any. Assumptions regarding the possibility of post-bid approvals of "or-equal" or substitution requests are made at Bidder's sole risk.

ARTICLE 11—SUBCONTRACTORS, SUPPLIERS, AND OTHERS

11.01 A Bidder must be prepared to retain specific Subcontractors and Suppliers for the performance of the Work if required to do so in the Specifications or elsewhere in the Bidding Documents. If a

prospective Bidder objects to retaining any such Subcontractor or Supplier and the concern is not relieved by an Addendum, then the prospective Bidder should not submit a Bid.

11.02 The apparent Successful Bidder, and any other Bidder so requested by Owner or Engineer, must submit to Owner (with a copy to Engineer) a list of the Subcontractors and Suppliers proposed for portions of the Work within five days after the bid opening.

11.03 If requested by Owner or Engineer, such list must be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor or Supplier. If Owner or Engineer, after due investigation, has reasonable objection to any proposed Subcontractor or Supplier, Owner may, before the Notice of Award is given, request apparent Successful Bidder to submit an acceptable substitute, in which case apparent Successful Bidder will submit a substitute, Bidder's Bid price will be increased (or decreased) by the difference in cost occasioned by such substitution, and Owner may consider such price adjustment in evaluating Bids and awarding the Contract.

11.04 If apparent Successful Bidder declines to make a requested substitution, Owner may award the Contract to another Bidder, consistent with the basis for evaluating the Bids for award as set forth in these Instructions to Bidders, that proposes to use acceptable Subcontractors and Suppliers. Declining to make requested substitutions will constitute grounds for forfeiture of the bid security of any Bidder. Any Subcontractor or Supplier, so listed and against which Owner or Engineer makes no written objection prior to issuance of the Notice of Award will be deemed acceptable to Owner and Engineer subject to subsequent revocation of such acceptance as provided in Paragraph 7.07 of the General Conditions.

ARTICLE 12—PREPARATION OF BID

12.01 The Bid Form is included with the Bidding Documents.

A. All blanks on the Bid Form must be completed in ink and the Bid Form signed in ink. Erasures or alterations must be initialed in ink by the person signing the Bid Form. A Bid price must be indicated for each section, Bid item, alternate, adjustment unit price item, and unit price item listed therein.

B. If the Bid Form expressly indicates that submitting pricing on a specific alternate item is optional, and Bidder elects to not furnish pricing for such optional alternate item, then Bidder may enter the words "No Bid" or "Not Applicable."

12.02 If Bidder has obtained the Bidding Documents as Electronic Documents, then Bidder shall prepare its Bid on a paper copy of the Bid Form printed from the Electronic Documents version of the Bidding Documents. The printed copy of the Bid Form must be clearly legible, printed on 8.5inch by 11-inch paper and as closely identical in appearance to the Electronic Document version of the Bid Form as may be practical. The Owner reserves the right to accept Bid Forms which nominally vary in appearance from the original paper version of the Bid Form, providing that all required information and submittals are included with the Bid.

12.03 A Bid by a corporation must be signed in the corporate name by a corporate officer (whose title must appear under the signature), accompanied by evidence of authority to sign. The corporate address and state of incorporation must be shown.

12.04 A Bid by a partnership must be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by evidence of authority to sign. The official address of the partnership must be shown.

12.05 A Bid by a limited liability company must be signed in the name of the firm by a member or other authorized person and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm must be shown.

12.06 A Bid by an individual must show the Bidder's name and official address.

12.07 A Bid by a joint venture must be signed by an authorized representative of each joint venturer in the manner indicated on the Bid Form. The joint venture must have been formally established prior to submittal of a Bid, and the official address of the joint venture must be shown.

12.08 All names must be printed in ink below the signatures.

12.09 The Bid must contain an acknowledgment of receipt of all Addenda, the numbers of which must be filled in on the Bid Form.

12.10 Postal and e-mail addresses and telephone number for communications regarding the Bid must be indicated on the Bid Form.

12.11 The Bid must contain evidence of Bidder's authority to do business in the state where the Project is located, or Bidder must certify in writing that it will obtain such authority within the time for acceptance of Bids and attach such certification to the Bid.

12.12 If Bidder is required to be licensed to submit a Bid or perform the Work in the state where the Project is located, the Bid must contain evidence of Bidder's licensure, or Bidder must certify in writing that it will obtain such licensure within the time for acceptance of Bids and attach such certification to the Bid. Bidder's state contractor license number, if any, must also be shown on the Bid Form.

ARTICLE 13—BASIS OF BID

13.01 *Unit Price*

A. Bidders must submit a Bid on a unit price basis for each item of Work listed in the unit price section of the Bid Form.

B. The "Bid Price" (sometimes referred to as the extended price) for each item of Unit Price Work will be the product of the "Estimated Quantity", which Owner or its representative has set forth in the Bid Form, for the item and the corresponding "Bid Unit Price" offered by the Bidder. The total of all unit price bid items will be the sum of these "Bid Prices"; such total will be used by Owner for Bid comparison purposes. The final quantities and final Contract Price will be determined in accordance with Paragraph 13.03 of the General Conditions.

C. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.

13.02 *Cash Allowances*

A. For cash allowances the bid price (for items other than cash allowances) must include such amounts as Bidder deems proper for Contractor's overhead, handling and installation costs,

profit, and other expenses on account of cash allowances, if any, named in the Contract Documents, in accordance with Paragraph 13.02.B of the General Conditions.

ARTICLE 14—SUBMITTAL OF BID

14.01 The Bidding Documents include one separate, unbound copy of the Bid Form, and, where required, the Bid Bond Form and other supplements to the Bid Form. The unbound copy of the Bid Form and supplements (if any) is to be completed and submitted with the Bid security and the other documents required with the Bid by Article 2 of the Bid Form.

14.02 A Bid must be received no later than the date and time prescribed and at the place indicated in the Advertisement or invitation to bid and must be enclosed in a plainly marked package with the Project title, and, if applicable, the designated portion of the Project for which the Bid is submitted, and the name and address of Bidder, and must be accompanied by the Bid security and other required documents. If a Bid is sent by mail or other delivery method, the sealed envelope containing the Bid must be enclosed in a separate package plainly marked on the outside with the notation "BID ENCLOSED." A mailed Bid must be addressed to the location designated in the Advertisement or invitation to bid.

14.03 Bids received after the date and time prescribed for the opening of Bids, or not submitted at the correct location or in the designated manner, will not be accepted and will be returned to the Bidder unopened. Owner accepts no responsibility for delays in returning Bids submitted or delivered to the incorrect location.

ARTICLE 15—MODIFICATION AND WITHDRAWAL OF BID

15.01 An unopened Bid may be withdrawn by an appropriate document duly signed in the same manner that a Bid must be signed and delivered to the place where Bids are to be submitted, prior to the date and time established in the Bidding Documents for the receipt of Bids. Upon receipt of such notice, the unopened Bid will be returned to the Bidder.

15.02 If a Bidder wishes to modify its Bid prior to Bid opening, Bidder must withdraw its initial Bid in the manner specified in Paragraph 15.01 of this Article and submit a new Bid prior to the date and time for established in the Bidding Documents the receipt of Bids.

15.03 If, within 24 hours after Bids are opened, any Bidder files a duly signed, written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a

material and substantial mistake in the preparation of its Bid, the Bidder may withdraw its Bid, and the bid security will be returned.

ARTICLE 16—OPENING OF BIDS

16.01 Bids will be opened at the time and place indicated in the Advertisement or invitation to bid and, unless obviously non-responsive, will be read aloud publicly. An abstract of the amounts of the base Bids and major alternates, if any, will be made available to Bidders after the opening of Bids.

16.02 Bids will be opened privately.

ARTICLE 17—BIDS TO REMAIN SUBJECT TO ACCEPTANCE

17.01 All Bids will remain subject to acceptance for the period of time stated in the Bid Form, but Owner may, in its sole discretion, release any Bid and return the Bid security prior to the end of this period.

ARTICLE 18—EVALUATION OF BIDS AND AWARD OF CONTRACT

18.01 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner also reserves the right to waive all minor Bid informalities not involving price, time, or changes in the Work.

18.02 Owner will reject the Bid of any Bidder that Owner finds, after reasonable inquiry and evaluation, to not be responsible. Owner may reject the Bid of any Bidder that fails to demonstrate appropriate qualifications, experience, and resources for the Work, in accordance with Article 3 of these Instructions to Bidders.

18.03 If Bidder purports to add terms or conditions to its Bid, takes exception to any provision of the Bidding Documents, or attempts to alter the contents of the Contract Documents for purposes of the Bid, whether in the Bid itself or in a separate communication to Owner or Engineer, then Owner will reject the Bid as nonresponsive.

18.04 *Basis for Award of Contract*

A. If Owner awards the contract for the Work, such award will be to the responsible Bidder submitting the lowest-priced, responsive Bid that has not otherwise been disqualified.

18.05 *Evaluation of Bids*

A. In evaluating Bids, Owner will consider whether the Bids comply with the prescribed requirements, and such alternates, unit prices, and other data, as may be requested in the Bid Form or elsewhere in the Bidding Documents, or prior to the Notice of Award.

B. *Based Bid with Alternates*: In the comparison of Bids, alternates will be applied in the same order of priority as listed in the Bid Form. To determine the Bid prices for purposes of comparison, Owner will announce to all Bidders, present at the opening of Bids, a "Base Bid plus alternates" budget after receiving all Bids, but prior to opening the Bids; Bidders no present for the opening of Bids may obtain the announced budget amount from Owner or Engineer. For comparison purposes, alternates will be accepted, following the order of priority established in the Bid Form, until doing so would cause the budget to be exceeded.

After determination of the Successful Bidder based on this comparative process and on the responsiveness, responsibility, and other factors set forth in these Instructions to Bidders, the award may be made to said Successful Bidder on its base Bid and any combination of its additive alternate bid prices for which Owner determines funds will be available at the time of award.

C. *Sectional Bids*: For determination of the apparent low Bidder(s) when sectional Bids are submitted, Bids will be compared on the basis of the aggregate of the Bids for separate sections and the Bids for combined sections that result in the lowest total amount for all of the Work.

D. *Unit Price Work*: For the determination of the apparent low-price Bid when unit price bids are submitted, Bids will be compared on the basis of the total of the products of the estimated quantity of each item and unit price bid for that item, together with amount(s) of lump sum items (if any).

E. *Cost-Plus-a-Fee Bidding*: For the determination of the apparent low-priced Bid when cost-plus-fee Bids are submitted, Bids will be compared on the basis of the Guaranteed Maximum Price set forth by Bidder on the Bid Form.

F. *Price-Plus-Time Bidding*: Bid prices will be compared after adjusting for differences in time of Substantial Completion (total number of calendar days to substantially complete the Work) designated by Bidder. The adjusting amount will be determined at the rate set forth in the Agreement for liquidated damages for failing to achieve Substantial Completion, or such other amount that Owner has designated in the Bid Form.

1. The method for calculating the lowest-priced Bid for comparison will be the summation of the bid price shown in the Bid Form plus the product of the Bidder-specified time of Substantial Completion in calendar days multiplied by Owner-designated daily rate in dollars per day.

2. This procedure is only used to determine the lowest-priced Bid for comparison and Contractor selection purposes. The Contract Price for compensation and payment purposes remains the bid price shown in the Bid Form, unless duly modified in accordance with the Contract.

18.06 In evaluating whether a Bidder is responsible, Owner will consider the qualifications, experience, and resources of the Bidder and may consider the qualifications, experience, and resources of Subcontractors and Suppliers proposed for those portions of the Work for which the identity of Subcontractors and Suppliers must be submitted as provided in the Bidding Documents.

18.07 Owner, with or without Engineer's assistance, may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders and any proposed Subcontractors or Suppliers.

ARTICLE 19—BONDS AND INSURANCE

19.01 Paragraph 2.01 and Article 6 of the General Conditions, as may be modified by the Supplementary Conditions, set forth Owner's requirements as to performance and payment bonds, other required bonds (if any), and insurance. When the Successful Bidder delivers the signed Agreement

to Owner (or Owner's representative), it must be accompanied by required bonds and insurance documentation.

19.02 Article 8 ("Bid Security") of these Instructions to Bidders addresses any requirements for providing bid bonds as part of the bidding process.

ARTICLE 20—SIGNING OF AGREEMENT

20.01 When Owner issues a Notice of Award to the Successful Bidder, it will be accompanied by the unsigned counterparts of the Agreement, along with the other Contract Documents as identified in the Agreement. Within 15 days thereafter, Successful Bidder must execute and deliver the required number of counterparts of the Agreement and required bonds and insurance documentation (as required by the Contract Documents) to Owner. Within 10 days thereafter, Owner will deliver one fully signed counterpart of the Agreement to Successful Bidder, together with printed and electronic copies of the Contract Documents as stated in Paragraph 2.02 of the General Conditions.

BID FORM

FOR CONSTRUCTION CONTRACT

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 1—OWNER AND BIDDER

1.01 This Bid is submitted to:

Lyon County Water District, 5464 US 62 W, Kuttawa, Kentucky 42055

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—ATTACHMENTS TO THIS BID

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

A. Required Bid security;

B. List of Proposed Subcontractors;

C. List of Proposed Suppliers;

D. Evidence of authority to do business in the state of the Project; or a written covenant to obtain such authority within the time for acceptance of Bids;

E. Contractor's license number as evidence of Bidder's State Contractor's License or a covenant by Bidder to obtain said license within the time for acceptance of Bids;

F. Required Bidder Qualification Statement with supporting data; and

ARTICLE 3—BASIS OF BID—LUMP SUM BID AND UNIT PRICES

3.01 *Unit Price Bids*

A. Bidder will perform the following Work at the indicated unit prices:

Item No.	Description	Unit	Estimated Quantity	Bid Unit Price	Bid Amount
1	6-in PVC Water Line Replacement	LF	200	$	$
2	4-in PVC Water Line Replacement	LF	7500	$	$
3	Stream Diversion	LS	1	$	$
4	Mobilization/Demobilization	LS	1	$	$
5	Site Restoration	LS	1	$	$
Total of All Unit Price Bid Items					$

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

3.02 *Total Bid Price (Unit Prices)*

Total Bid Price (Total of all Unit Price Bids)	$

ARTICLE 4—TIME OF COMPLETION

4.01 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 days indicated in the Agreement.

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

ARTICLE 5—BIDDER'S ACKNOWLEDGEMENTS: ACCEPTANCE PERIOD, INSTRUCTIONS, AND RECEIPT OF ADDENDA

5.01 *Bid Acceptance Period*

A. This Bid will remain subject to acceptance for 60 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

5.02 *Instructions to Bidders*

A. Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security.

5.03 *Receipt of Addenda*

A. Bidder hereby acknowledges receipt of the following Addenda:

Addendum Number	Addendum Date

ARTICLE 6—BIDDER'S REPRESENTATIONS AND CERTIFICATIONS

6.01 *Bidder's Representations*

A. In submitting this Bid, Bidder represents the following:

1. Bidder has examined and carefully studied the Bidding Documents, including Addenda.
2. Bidder has visited the Site, conducted a thorough visual examination of the Site and adjacent areas, and become familiar with the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
3. Bidder is familiar with all Laws and Regulations that may affect cost, progress, and performance of the Work.
4. Bidder has carefully studied the reports of explorations and tests of subsurface conditions at or adjacent to the Site and the drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, with respect to the Technical Data in such reports and drawings.
5. Bidder has carefully studied the reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, with respect to Technical Data in such reports and drawings.
6. 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 the Technical Data identified in the Supplementary Conditions or by definition, with respect to the effect of such information, observations, and Technical Data on (a) the cost, progress, and performance of the Work; (b) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, if selected as Contractor; and (c) Bidder's (Contractor's) safety precautions and programs.
7. Based on the information and observations referred to in the preceding paragraph, Bidder agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.
8. 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.

9. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and of discrepancies between Site conditions and the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.

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

11. The submission of this Bid constitutes an incontrovertible representation by Bidder that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

6.02 *Bidder's Certifications*

A. The Bidder certifies the following:

1. 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.

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

3. Bidder has not solicited or induced any individual or entity to refrain from bidding.

4. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 8.02.A:

a. Corrupt practice means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process.

b. 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.

c. 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.

d. 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.

BIDDER hereby submits this Bid as set forth above:

Bidder:

_____

(typed or printed name of organization)

By: _____

(individual's signature)

Name: _____

(typed or printed)

Title: _____

(typed or printed)

Date: _____

(typed or printed)

If Bidder is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.

Attest: _____

(individual's signature)

Name: _____

(typed or printed)

Title: _____

(typed or printed)

Date: _____

(typed or printed)

Bidder's Address for giving notices:

_____

_____

Bidder's Contact Person:

Name: _____

(typed or printed)

Title: _____

(typed or printed)

Phone: _____

Email: _____

Address:

_____

_____

_____

Bidder's Contractor License No.: (if applicable) _____

BID BOND (PENAL SUM FORM)

Bidder	**Surety**
Name: [Full formal name of Bidder] Address *(principal place of business)*: [Address of Bidder's principal place of business]	Name: [Full formal name of Surety] Address *(principal place of business)*: [Address of Surety's principal place of business]
Owner	**Bid**
Name: [Full formal name of Owner] Address *(principal place of business)*: [Address of Owner's principal place of business]	Project *(name and location)*: [Owner project/contract name, and location of the project] Bid Due Date: [Enter date bid is due]

Bond

Penal Sum: [Amount]

Date of Bond: [Date]

Surety and Bidder, intending to be legally bound hereby, subject to the terms set forth in this Bid Bond, do each cause this Bid Bond to be duly executed by an authorized officer, agent, or representative.

Bidder	Surety
(Full formal name of Bidder)	*(Full formal name of Surety) (corporate seal)*
By: _____ *(Signature)*	By: _____ *(Signature) (Attach Power of Attorney)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title: _____	Title: _____
Attest: _____ *(Signature)*	Attest: _____ *(Signature)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title:	Title:

Notes: (1) Note: Addresses are to be used for giving any required notice. (2) Provide execution by any additional parties, such as joint venturers, if necessary.

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Bidder's and Surety's liability. Recovery of such penal sum under the terms of this Bond will be Owner's sole and exclusive remedy upon default of Bidder.
2. Default of Bidder occurs upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.
3. This obligation will be null and void if:
   3.1. Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or
   3.2. All Bids are rejected by Owner, or
   3.3. Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).
4. Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.
5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions does not in the aggregate exceed 120 days from the Bid due date without Surety's written consent.
6. No suit or action will be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety, and in no case later than one year after the Bid due date.
7. Any suit or action under this Bond will be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder must be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Postal Service registered or certified mail, return receipt requested, postage pre-paid, and will be deemed to be effective upon receipt by the party concerned.
9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.
10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond will be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute governs and the remainder of this Bond that is not in conflict therewith continues in full force and effect.
11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

BID BOND (DAMAGES FORM)

Bidder	**Surety**
Name: [Full formal name of Bidder] Address *(principal place of business)*: [Address of Bidder's principal place of business]	Name: [Full formal name of Surety] Address *(principal place of business)*: [Address of Surety's principal place of business]
Owner	**Bid**
Name: [Full formal name of Owner] Address *(principal place of business)*: [Address of Owner's principal place of business]	Project *(name and location)*: [Owner project/contract name, and location of the project] Bid Due Date: [Enter date bid is due]
Bond	
Bond Amount: [Amount] Date of Bond: [Date]	

Surety and Bidder, intending to be legally bound hereby, subject to the terms set forth in this Bid Bond, do each cause this Bid Bond to be duly executed by an authorized officer, agent, or representative.

Bidder	Surety
_____ *(Full formal name of Bidder)*	_____ *(Full formal name of Surety) (corporate seal)*
By: _____ *(Signature)*	By: _____ *(Signature) (Attach Power of Attorney)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title: _____	Title: _____
Attest: _____ *(Signature)*	Attest: _____ *(Signature)*
Name: _____ *(Printed or typed)*	Name: _____ *(Printed or typed)*
Title: _____	Title: _____

Notes: (1) Note: Addresses are to be used for giving any required notice. (2) Provide execution by any additional parties, such as joint venturers, if necessary.

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder any difference between the total amount of Bidder's Bid and the total amount of the Bid of the next lowest, responsible Bidder that submitted a responsive Bid, as determined by Owner, for the work required by the Contract Documents, provided that:
   1.1. If there is no such next Bidder, and Owner does not abandon the Project, then Bidder and Surety shall pay to Owner the bond amount set forth on the face of this Bond, and
   1.2. In no event will Bidder's and Surety's obligation hereunder exceed the bond amount set forth on the face of this Bond.
   1.3. Recovery under the terms of this Bond will be Owner's sole and exclusive remedy upon default of Bidder.
2. Default of Bidder occurs upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.
3. This obligation will be null and void if:
   3.1. Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or
   3.2. All Bids are rejected by Owner, or
   3.3. Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).
4. Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.
5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions will not in the aggregate exceed 120 days from Bid due date without Surety's written consent.
6. No suit or action will be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety, and in no case later than one year after the Bid due date.
7. Any suit or action under this Bond must be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder must be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Postal Service registered or certified mail, return receipt requested, postage pre-paid, and will be deemed to be effective upon receipt by the party concerned.
9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.
10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond will be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute governs and the remainder of this Bond that is not in conflict therewith continues in full force and effect.
11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

QUALIFICATIONS STATEMENT

ARTICLE 1—GENERAL INFORMATION

1.01 Provide contact information for the Business:

Legal Name of Business:			
Corporate Office			
Name:		Phone number:	
Title:		Email address:	
Business address of corporate office:			
Local Office			
Name:		Phone number:	
Title:		Email address:	
Business address of local office:			

1.02 Provide information on the Business's organizational structure:

Form of Business:	☐ Sole Proprietorship ☐ Partnership ☐ Corporation		
☐ Limited Liability Company ☐ Joint Venture comprised of the following companies:			
	1.		
	2.		
	3.		
Provide a separate Qualification Statement for each Joint Venturer.			
Date Business was formed:		State in which Business was formed:	
Is this Business authorized to operate in the Project location?	☐ Yes ☐ No ☐ Pending		

1.03 Identify all businesses that own Business in whole or in part (25% or greater), or that are wholly or partly (25% or greater) owned by Business:

Name of business:		Affiliation:	
Address:			
Name of business:		Affiliation:	
Address:			

Name of business:		Affiliation:	
Address:			

1.04 Provide information regarding the Business's officers, partners, and limits of authority.

Name:		Title:	
Authorized to sign contracts: ☐ Yes ☐ No		Limit of Authority:	$
Name:		Title:	
Authorized to sign contracts: ☐ Yes ☐ No		Limit of Authority:	$
Name:		Title:	
Authorized to sign contracts: ☐ Yes ☐ No		Limit of Authority:	$
Name:		Title:	

ARTICLE 2—LICENSING

2.01 Provide information regarding licensure for Business:

Name of License:			
Licensing Agency:			
License No:		Expiration Date:	
Name of License:			
Licensing Agency:			
License No:		Expiration Date:	

ARTICLE 3—DIVERSE BUSINESS CERTIFICATIONS

3.01 Provide information regarding Business's Diverse Business Certification, if any. Provide evidence of current certification.

Certification	Certifying Agency	Certification Date
☐ Disadvantaged Business Enterprise		
☐ Minority Business Enterprise		
☐ Woman-Owned Business Enterprise		
☐ Small Business Enterprise		
☐ Disabled Business Enterprise		
☐ Veteran-Owned Business Enterprise		
☐ Service-Disabled Veteran-Owned Business		
☐ HUBZone Business (Historically Underutilized) Business		

☐ Other			
☐ None			

ARTICLE 4—SAFETY

4.01 Provide information regarding Business's safety organization and safety performance.

Name of Business's Safety Officer:		
Safety Certifications		
Certification Name	Issuing Agency	Expiration

4.02 Provide Worker's Compensation Insurance Experience Modification Rate (EMR), Total Recordable Frequency Rate (TRFR) for incidents, and Total Number of Recorded Manhours (MH) for the last 3 years and the EMR, TRFR, and MH history for the last 3 years of any proposed Subcontractor(s) that will provide Work valued at 10% or more of the Contract Price. Provide documentation of the EMR history for Business and Subcontractor(s).

Year									
Company	EMR	TRFR	MH	EMR	TRFR	MH	EMR	TRFR	MH

ARTICLE 5—FINANCIAL

5.01 Provide information regarding the Business's financial stability. Provide the most recent audited financial statement, and if such audited financial statement is not current, also provide the most current financial statement.

Financial Institution:		
Business address:		
Date of Business's most recent financial statement:		☐ Attached
Date of Business's most recent audited financial statement:		☐ Attached
Financial indicators from the most recent financial statement		
Contractor's Current Ratio (Current Assets ÷ Current Liabilities)		
Contractor's Quick Ratio ((Cash and Cash Equivalents + Accounts Receivable + Short Term Investments) ÷ Current Liabilities)		

ARTICLE 6—SURETY INFORMATION

6.01 Provide information regarding the surety company that will issue required bonds on behalf of the Business, including but not limited to performance and payment bonds.

Surety Name:			
Surety is a corporation organized and existing under the laws of the state of:			
Is surety authorized to provide surety bonds in the Project location?	☐ Yes ☐ No		
Is surety listed in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" published in Department Circular 570 (as amended) by the Bureau of the Fiscal Service, U.S. Department of the Treasury? ☐ Yes ☐ No			
Mailing Address (principal place of business):			
Physical Address (principal place of business):			
Phone (main):		Phone (claims):	

ARTICLE 7—INSURANCE

7.01 Provide information regarding Business's insurance company(s), including but not limited to its Commercial General Liability carrier. Provide information for each provider.

Name of insurance provider, and type of policy (CLE, auto, etc.):	
Insurance Provider	Type of Policy (Coverage Provided)
Are providers licensed or authorized to issue policies in the Project location?	☐ Yes ☐ No
Does provider have an A.M. Best Rating of A-VII or better?	☐ Yes ☐ No
Mailing Address (principal place of business):	
Physical Address (principal place of business):	

Phone (main):		Phone (claims):	

ARTICLE 8—CONSTRUCTION EXPERIENCE

8.01 Provide information that will identify the overall size and capacity of the Business.

Average number of current full-time employees:	
Estimate of revenue for the current year:	
Estimate of revenue for the previous year:	

8.02 Provide information regarding the Business's previous contracting experience.

Years of experience with projects like the proposed project:				
As a general contractor:		As a joint venturer:		
Has Business, or a predecessor in interest, or an affiliate identified in Paragraph 1.03:				
Been disqualified as a bidder by any local, state, or federal agency within the last 5 years? ☐ Yes ☐ No				
Been barred from contracting by any local, state, or federal agency within the last 5 years? ☐ Yes ☐ No				
Been released from a bid in the past 5 years? ☐ Yes ☐ No				
Defaulted on a project or failed to complete any contract awarded to it? ☐ Yes ☐ No				
Refused to construct or refused to provide materials defined in the contract documents or in a change order? ☐ Yes ☐ No				
Been a party to any currently pending litigation or arbitration? ☐ Yes ☐ No				
Provide full details in a separate attachment if the response to any of these questions is Yes.				

8.03 List all projects currently under contract in Schedule A and provide indicated information.

8.04 List a minimum of three and a maximum of six projects completed in the last 5 years in Schedule B and provide indicated information to demonstrate the Business's experience with projects similar in type and cost of construction.

8.05 In Schedule C, provide information on key individuals whom Business intends to assign to the Project. Provide resumes for those individuals included in Schedule C. Key individuals include the Project Manager, Project Superintendent, Quality Manager, and Safety Manager. Resumes may be provided for Business's key leaders as well.

ARTICLE 9—REQUIRED ATTACHMENTS

9.01 Provide the following information with the Statement of Qualifications:

A. If Business is a Joint Venture, separate Qualifications Statements for each Joint Venturer, as required in Paragraph 1.02.

B. Diverse Business Certifications if required by Paragraph 3.01.

C. Certification of Business's safety performance if required by Paragraph 4.02.

D. Financial statements as required by Paragraph 5.01.

E. Attachments providing additional information as required by Paragraph 8.02.

F. Schedule A (Current Projects) as required by Paragraph 8.03.

G. Schedule B (Previous Experience with Similar Projects) as required by Paragraph 8.04.

H. Schedule C (Key Individuals) and resumes for the key individuals listed, as required by Paragraph 8.05.

I. Additional items as pertinent.

This Statement of Qualifications is offered by:

Business: _____
(typed or printed name of organization)

By: _____
(individual's signature)

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Date: _____
(date signed)

(If Business is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)

Attest: _____
(individual's signature)

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Address for giving notices:

_____

_____

_____

Designated Representative:

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Address:

_____

_____

_____

Phone: _____

Email: _____

Schedule A—Current Projects

Name of Organization					
Project Owner			Project Name		
General Description of Project					
Project Cost			Date Project Completed		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					
Project Owner			Project Name		
General Description of Project					
Project Cost			Date Project Completed		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					
Project Owner			Project Name		
General Description of Project					
Project Cost			Date Project Completed		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Schedule B—Previous Experience with Similar Projects

Name of Organization				
Project Owner		Project Name		
General Description of Project				
Project Cost		Date Project Completed		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager
Name				

Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Project Owner		Project Name		
General Description of Project				
Project Cost		Date Project Completed		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager
Name				

Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Project Owner		Project Name		
General Description of Project				
Project Cost		Date Project Completed		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager
Name				

Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Schedule B—Previous Experience with Similar Projects

Name of Organization				
Project Owner		Project Name		
General Description of Project				
Project Cost		Date Project Completed		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager
Name				

Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)

	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Project Owner		Project Name		
General Description of Project				
Project Cost		Date Project Completed		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager
Name				

Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)

	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Project Owner		Project Name		
General Description of Project				
Project Cost		Date Project Completed		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager
Name				

Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)

	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Schedule C—Key Individuals

Project Manager			
Name of individual			
Years of experience as project manager			
Years of experience with this organization			
Number of similar projects as project manager			
Number of similar projects in other positions			
Current Project Assignments			
Name of assignment		Percent of time used for this project	Estimated project completion date
Reference Contact Information (listing names indicates approval to contact named individuals as a reference)			
Name		Name	
Title/Position		Title/Position	
Organization		Organization	
Telephone		Telephone	
Email		Email	
Project		Project	
Candidate's role on project		Candidate's role on project	
Project Superintendent			
Name of individual			
Years of experience as project superintendent			
Years of experience with this organization			
Number of similar projects as project superintendent			
Number of similar projects in other positions			
Current Project Assignments			
Name of assignment		Percent of time used for this project	Estimated project completion date
Reference Contact Information (listing names indicates approval to contact named individuals as a reference)			
Name		Name	
Title/Position		Title/Position	
Organization		Organization	
Telephone		Telephone	
Email		Email	
Project		Project	
Candidate's role on project		Candidate's role on project	

Safety Manager			
Name of individual			
Years of experience as project manager			
Years of experience with this organization			
Number of similar projects as project manager			
Number of similar projects in other positions			
Current Project Assignments			
Name of assignment		Percent of time used for this project	Estimated project completion date
Reference Contact Information (listing names indicates approval to contact named individuals as a reference)			
Name		Name	
Title/Position		Title/Position	
Organization		Organization	
Telephone		Telephone	
Email		Email	
Project		Project	
Candidate's role on project		Candidate's role on project	
Quality Control Manager			
Name of individual			
Years of experience as project superintendent			
Years of experience with this organization			
Number of similar projects as project superintendent			
Number of similar projects in other positions			
Current Project Assignments			
Name of assignment		Percent of time used for this project	Estimated project completion date
Reference Contact Information (listing names indicates approval to contact named individuals as a reference)			
Name		Name	
Title/Position		Title/Position	
Organization		Organization	
Telephone		Telephone	
Email		Email	
Project		Project	
Candidate's role on project		Candidate's role on project	

AGREEMENT

BETWEEN OWNER AND CONTRACTOR
FOR CONSTRUCTION CONTRACT (STIPULATED PRICE)

This Agreement is by and between Lyon County Water District ("Owner") and [name of contracting entity] ("Contractor").

Terms used in this Agreement have the meanings stated in the General Conditions and the Supplementary Conditions.

Owner and Contractor hereby agree as follows:

ARTICLE 1—WORK

1.01 Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows: [Brief description of the Work—sufficient only to broadly indicate the type of construction]

ARTICLE 2—THE PROJECT

2.01 The Project, of which the Work under the Contract Documents is a part, is generally described as follows: Lyon County Water District Contract III Water Tank Improvements

ARTICLE 3—ENGINEER

3.01 The Owner has retained HDR, Inc. ("Engineer") to act as Owner's representative, assume all duties and responsibilities of Engineer, and have the rights and authority assigned to Engineer in the Contract.

3.02 The part of the Project that pertains to the Work has been designed by HDR, Inc.

ARTICLE 4—CONTRACT TIMES

4.01 *Time is of the Essence*

A. All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

4.02 *Contract Times: Dates*

A. The Work will be substantially complete on or before 12/15/2022, and completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before 1/15/2023

4.04 *Milestones*

A. Parts of the Work must be substantially completed on or before the following Milestone(s):

1. Milestone 1 KY 274 Creek Crossing Water Line Replacement, 6/15/2023
2. Milestone 2 Tinsley Creek Subdivision Water Line Replacement, 8/15/2022

4.05 *Liquidated Damages*

A. Contractor and Owner recognize that time is of the essence as stated in Paragraph 4.01 above and that Owner will suffer financial and other losses if the Work is not completed and Milestones not achieved within the Contract Times, as duly modified. The parties also recognize the delays, expense, and difficulties involved in proving, in a legal or arbitration proceeding, the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty):

1. *Substantial Completion:* Contractor shall pay Owner $250 for each day that expires after the time (as duly adjusted pursuant to the Contract) specified above for Substantial Completion, until the Work is substantially complete.

2. *Completion of Remaining Work:* After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Times (as duly adjusted pursuant to the Contract) for completion and readiness for final payment, Contractor shall pay Owner $250 for each day that expires after such time until the Work is completed and ready for final payment.

3. *Milestones:* Contractor shall pay Owner $250 for each day that expires after the time (as duly adjusted pursuant to the Contract) specified above for achievement of Milestone 1, until Milestone 1 is achieved, or until the time specified for Substantial Completion is reached, at which time the rate indicated in Paragraph 4.05.A.1 will apply, rather than the Milestone rate.

4. Liquidated damages for failing to timely attain Milestones, Substantial Completion, and final completion are not additive, and will not be imposed concurrently.

B. If Owner recovers liquidated damages for a delay in completion by Contractor, then such liquidated damages are Owner's sole and exclusive remedy for such delay, and Owner is precluded from recovering any other damages, whether actual, direct, excess, or consequential, for such delay, except for special damages (if any) specified in this Agreement.

4.06 *Special Damages*

A. Contractor shall reimburse Owner (1) for fines and penalties (if any) imposed on Owner as a direct result of Contractor's failure to attain Substantial Completion according to the Contract Times, (2) for fines and penalties (if any) imposed on Owner by an authority having jurisdiction for actions or inaction of Contractor arising from Contractor's performance of the Work (regardless of whether such event was connected with any delay in compliance with the Contract Times), and (3) for the actual costs reasonably incurred by Owner for engineering, construction observation, inspection, and administrative services needed after the time specified in Paragraph 4.02 for Substantial Completion (as duly adjusted pursuant to the Contract), until the Work is substantially complete.

B. After Contractor achieves Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Times, Contractor shall reimburse Owner for the actual costs reasonably incurred by Owner for engineering, construction observation, inspection, and administrative services needed after the time specified in Paragraph 4.02 for Work to be completed and ready for final payment (as duly adjusted pursuant to the Contract), until the Work is completed and ready for final payment.

C. The special damages imposed in this paragraph are supplemental to any liquidated damages for delayed completion established in this Agreement.

4.07 Owner reserves the right to withhold from payments due Contractor under the Contract amounts for liquidated damages (if any), special damages (if any), and performance damages (if any) in accordance with the Contract.

ARTICLE 5—CONTRACT PRICE

5.01 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents, the amounts that follow, subject to adjustment under the Contract:

A. For all Work other than Unit Price Work, a lump sum of $[number].

All specific cash allowances are included in the above price in accordance with Paragraph 13.02 of the General Conditions.

B. For all Unit Price Work, an amount equal to the sum of the extended prices (established for each separately identified item of Unit Price Work by multiplying the unit price times the actual quantity of that item).

Unit Price Work					
Item No.	**Description**	**Unit**	**Estimated Quantity**	**Unit Price**	**Extended Price**
1	6-in PVC Water Line Replacement	LF	200	$	$
2	4-in PVC Water Line Replacement	LF	7500	$	$
3	Stream Diversion	LS	1	$	$
4	Mobilization/Demobilization	LS	1	$	$
5	Site Restoration	LS	1	$	$
Total of all Extended Prices for Unit Price Work (subject to final adjustment based on actual quantities)					$

The extended prices for Unit Price Work set forth as of the Effective Date of the Contract are based on estimated quantities. As provided in Paragraph 13.03 of the General Conditions, estimated quantities are not guaranteed, and determinations of actual quantities and classifications are to be made by Engineer.

C. Total of Lump Sum Amount and Unit Price Work (subject to final Unit Price adjustment) $[amount].

D. For all Work, at the prices stated in Contractor's Bid, attached hereto as an exhibit.

ARTICLE 6—PAYMENT PROCEDURES

6.01 *Submittal and Processing of Payments*

A. Contractor shall submit Applications for Payment in accordance with Article 15 of the General Conditions. Applications for Payment will be processed by Engineer as provided in the General Conditions.

6.02 *Progress Payments; Retainage*

A. Owner shall make progress payments on the basis of Contractor's Applications for Payment on or about the [ordinal number, such as 5th] day of each month during performance of the Work as provided in Paragraph 6.02.A.1 below, provided that such Applications for Payment have been submitted in a timely manner and otherwise meet the requirements of the Contract. All such payments will be measured by the Schedule of Values established as provided in the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no Schedule of Values, as provided elsewhere in the Contract.

1. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as Owner may withhold, including but not limited to liquidated damages, in accordance with the Contract.

a. 20 percent of the value of the Work completed (with the balance being retainage).

1) If 50 percent or more of the Work has been completed, as determined by Engineer, and if the character and progress of the Work have been satisfactory to Owner and Engineer, then as long as the character and progress of the Work remain satisfactory to Owner and Engineer, there will be no additional retainage; and

b. 20 percent of cost of materials and equipment not incorporated in the Work (with the balance being retainage).

B. Upon Substantial Completion, Owner shall pay an amount sufficient to increase total payments to Contractor to [number] percent of the Work completed, less such amounts set off by Owner pursuant to Paragraph 15.01.E of the General Conditions, and less [number] percent of Engineer's estimate of the value of Work to be completed or corrected as shown on the punch list of items to be completed or corrected prior to final payment.

6.03 *Final Payment*

A. Upon final completion and acceptance of the Work, Owner shall pay the remainder of the Contract Price in accordance with Paragraph 15.06 of the General Conditions.

6.04 *Consent of Surety*

A. Owner will not make final payment, or return or release retainage at Substantial Completion or any other time, unless Contractor submits written consent of the surety to such payment, return, or release.

6.05 *Interest*

A. All amounts not paid when due will bear interest at the rate of [number] percent per annum.

ARTICLE 7—CONTRACT DOCUMENTS

7.01 *Contents*

A. The Contract Documents consist of all of the following:

1. This Agreement.
2. Bonds:
    a. Performance bond (together with power of attorney).
    b. Payment bond (together with power of attorney).
3. General Conditions.
4. Supplementary Conditions.
5. Wage Determination Schedule.
6. Statutory and Funding-Financing Entity Requirements.
7. Specifications as listed in the table of contents of the project manual (copy of list attached).
8. Drawings (not attached but incorporated by reference) consisting of [number] sheets with each sheet bearing the following general title: [title on Drawings].
9. Drawings listed on the attached sheet index.
10. Addenda (numbers [number] to [number], inclusive).

12. The following which may be delivered or issued on or after the Effective Date of the Contract and are not attached hereto:
    a. Notice to Proceed.
    b. Work Change Directives.
    c. Change Orders.
    d. Field Orders.
    e. Warranty Bond, if any.

B. The Contract Documents listed in Paragraph 7.01.A are attached to this Agreement (except as expressly noted otherwise above).

C. There are no Contract Documents other than those listed above in this Article 7.

D. The Contract Documents may only be amended, modified, or supplemented as provided in the Contract.

ARTICLE 8—REPRESENTATIONS, CERTIFICATIONS, AND STIPULATIONS

8.01 *Contractor's Representations*

A. In order to induce Owner to enter into this Contract, Contractor makes the following representations:

1. Contractor has examined and carefully studied the Contract Documents, including Addenda.
2. Contractor has visited the Site, conducted a thorough visual examination of the Site and adjacent areas, and become familiar with the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
3. Contractor is familiar with all Laws and Regulations that may affect cost, progress, and performance of the Work.
4. Contractor has carefully studied the reports of explorations and tests of subsurface conditions at or adjacent to the Site and the drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, with respect to the Technical Data in such reports and drawings.
5. Contractor has carefully studied the reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, with respect to Technical Data in such reports and drawings.
6. Contractor has considered the information known to Contractor itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents; and the Technical Data identified in the Supplementary Conditions or by definition, with respect to the effect of such information, observations, and Technical Data on (a) the cost, progress, and performance of the Work; (b) the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor; and (c) Contractor's safety precautions and programs.
7. Based on the information and observations referred to in the preceding paragraph, Contractor agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.
8. Contractor 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 Contract Documents.
9. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and of discrepancies between Site conditions and the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.
10. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.
11. Contractor's entry into this Contract constitutes an incontrovertible representation by Contractor that without exception all prices in the Agreement are premised upon performing and furnishing the Work required by the Contract Documents.

8.02 *Contractor's Certifications*

A. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 8.02:

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

2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to establish Bid or Contract 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.

8.03 *Standard General Conditions*

A. Owner stipulates that if the General Conditions that are made a part of this Contract are EJCDC® C-700, Standard General Conditions for the Construction Contract (2018), published by the Engineers Joint Contract Documents Committee, and if Owner is the party that has furnished said General Conditions, then Owner has plainly shown all modifications to the standard wording of such published document to the Contractor, through a process such as highlighting or "track changes" (redline/strikeout), or in the Supplementary Conditions.

IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement.

This Agreement will be effective on [indicate date on which Contract becomes effective] (which is the Effective Date of the Contract).

	Contractor:
_____	_____
(typed or printed name of organization)	*(typed or printed name of organization)*
By: _____	By: _____
(individual's signature)	*(individual's signature)*
Date: _____	Date: _____
(date signed)	*(date signed)*
Name: _____	Name: _____
(typed or printed)	*(typed or printed)*
Title: _____	Title: _____
(typed or printed)	*(typed or printed)*
	*(If **[Type of Entity]** is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)*
Attest: _____	Attest: _____
(individual's signature)	*(individual's signature)*
Title: _____	Title: _____
(typed or printed)	*(typed or printed)*
Address for giving notices:	Address for giving notices:
_____	_____
_____	_____
_____	_____
Designated Representative:	Designated Representative:
Name: _____	Name: _____
(typed or printed)	*(typed or printed)*
Title: _____	Title: _____
(typed or printed)	*(typed or printed)*
Address:	Address:
_____	_____
_____	_____
_____	_____
Phone: _____	Phone: _____
Email: _____	Email: _____
*(If **[Type of Entity]** is a corporation, attach evidence of authority to sign. If **[Type of Entity]** is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of this Agreement.)*	License No.: _____ *(where applicable)*
	State: _____

SECTION 00 53 12
NOTICE OF AWARD

TO: _____
(Contractor)

PROJECT: CONTRACT III WATER LINE IMPROVEMENTS

After consideration of all Bids received for the above referenced **PROJECT**, you are hereby notified that your Bid dated _____, has been accepted as the responsive bid with the lowest bid price in accordance with the specifications. This Award is contingent upon final approval of the City of Paducah Board of Commissioners.

You are hereby required by the Information for Bidders to execute and deliver the Contract Agreement and to furnish the required Bond(s) and Certificate of Insurance within **Ten (10) calendar days** from the date of this Notice to you.

If you fail to execute said Agreement and to furnish said Bond(s) and Certificate of Insurance within the stipulated time period, said OWNER will be entitled to consider all your rights arising out of the OWNER'S acceptance of your bid as abandoned and as a forfeiture of your Bid Bond. The OWNER will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this NOTICE OF AWARD to the OWNER.

OWNER
Lyon County Water District

By: _____
City Engineer

Date: _____

ACCEPTANCE OF NOTICE

Receipt of this NOTICE is hereby acknowledged by: _____

of _____(Name of Company), this the _____ day of _____, 20___.

By _____

Title _____

SECTION 00 53 13
NOTICE TO PROCEED

TO: _____
(Contractor)

PROJECT: Contract III Water Tank Improvements

You are hereby notified to commence work in accordance with the Agreement dated _____ ___,
(Month Day)
_____, on or before _____ ___, _____, and you are to complete the WORK within
(Year) (Month Day) (Year)
_____ (_____) **consecutive calendar days** thereafter. The date of completion of all
(Written NUMBER of DAYS) (###)
WORK is therefore _____ ___, _____. The contract completion date shall be adjusted for
(Month Day) (Year)
all documented shut down periods and approved extensions as outlined in the specifications.

You are required to return an acknowledged copy of this NOTICE TO PROCEED to the OWNER.

OWNER
Lyon County Water District

By: _____
City Engineer

Date: _____

ACCEPTANCE OF NOTICE

Receipt of this NOTICE is hereby acknowledged by: _____

of _____(Name of Company), this the _____ day of _____, 20___.

By _____

Title _____

GUIDELINES FOR USE OF EJCDC® C-700, STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

See HDR's "C-000": HDR Guidelines for using the 2018 EJCDC Construction Documents for an introduction on how to use this document.

PURPOSE AND INTENDED USE OF THE DOCUMENT

EJCDC® C-700, Standard General Conditions of the Construction Contract (2018), is the foundation document for the EJCDC Construction Series. The General Conditions define the basic rights, responsibilities, risk allocations, and contractual relationship of the Owner and Contractor, and establish how the Contract is to be administered.

2.0 OTHER DOCUMENTS

EJCDC documents are intended to be used as a system and changes in one EJCDC document may require a corresponding change in other documents. Other EJCDC documents may also serve as a reference to provide insight or guidance for the preparation of this document.

These General Conditions have been prepared for use with either EJCDC® C-520, Agreement Between Owner and Contractor for Construction Contract (Stipulated Price), or EJCDC® C-525, Agreement Between Owner and Contractor for Construction Contract (Cost-Plus-Fee) (2018 Editions). The provisions of the General Conditions and the Agreement are interrelated, and a change in one may necessitate a change in the other.

To prepare supplementary conditions that are coordinated with the General Conditions, use EJCDC® C-800, Supplementary Conditions of the Construction Contract (2018).

The full EJCDC Construction series of documents is discussed in the EJCDC® C-001, Commentary on the 2018 EJCDC Construction Documents (2018).

3.0 ORGANIZATION OF INFORMATION

All parties involved in a construction project benefit significantly from a standardized approach in the location of subject matter throughout the documents. Experience confirms the danger of addressing the same subject matter in more than one location; doing so frequently leads to confusion and unanticipated legal consequences. Careful attention should be given to the guidance provided in EJCDC® N-122/AIA® A521, Uniform Location of Subject Matter (2012 Edition) when preparing documents. EJCDC® N-122/AIA® A521 is available at no charge from the EJCDC website, www.ejcdc.org, and from the websites of EJCDC's sponsoring organizations.

If CSI MasterFormat™ is used for organizing the Project Manual, consult CSI MasterFormat™ for the appropriate document number (e.g., under 00 11 00, Advertisements and Invitations), and accordingly number the document and its pages.

4.0 EDITING THIS DOCUMENT

HDR's ENG MSS team has already removed the cover page and made the Guidelines for Use hidden text.

Although it is permissible to revise the Standard EJCDC Text of C-700 (the content beginning at page 1 and continuing to the end), it is common practice to leave the Standard EJCDC Text of C-700 intact and unaltered, with modifications and supplementation of C-700's provisions set forth in EJCDC® C-800, Supplementary Conditions of the Construction Contract (2018). If the Standard Text itself is revised, the user must comply with the terms of the License Agreement, Paragraph 4.0, Document-Specific Provisions, concerning the tracking or highlighting of revisions. The following is a summary of the relevant License Agreement provisions:

1. The term "Standard EJCDC Text" for C-700 refers to all text prepared by EJCDC in the main body of the document. Document covers, logos, footers, instructions, or copyright notices are not Standard EJCDC Text for this purpose.
2. During the drafting or negotiating process for C-700, it is important that the two contracting parties are both aware of any changes that have been made to the Standard EJCDC Text. Thus, if a draft or version of C-700 purports to be or appears to be an EJCDC document, the user must plainly show all changes to the Standard EJCDC Text, using "Track Changes" (redline/strikeout), highlighting, or other means of clearly indicating additions and deletions.
3. If C-700 has been revised or altered and is subsequently presented to third parties (such as potential bidders, grant agencies, lenders, or sureties) as an EJCDC document, then the changes to the Standard EJCDC Text must be shown, or the third parties must receive access to a version that shows the changes.
4. Once the document is ready to be finalized (and if applicable executed by the contracting parties), it is no longer necessary to continue to show changes to the Standard EJCDC Text. The user may produce a final version of the document in a format in which all changes are accepted, and the document at that point does not need to include any "Track Changes," redline/strikeout, highlighting, or other indication of additions and deletions to the Standard EJCDC Text.

5.0 LICENSE AGREEMENT

This document is subject to the terms and conditions of the **License Agreement, 2018 EJCDC® Construction Series Documents**. A copy of the License Agreement was furnished at the time of purchase of this document, and is available for review at www.ejcdc.org and the websites of EJCDC's sponsoring organizations, and HDR's ENG MSS portal.

STANDARD GENERAL CONDITIONS

OF THE CONSTRUCTION CONTRACT

TABLE OF CONTENTS

STANDARD GENERAL CONDITIONS

OF THE CONSTRUCTION CONTRACT

ARTICLE 1—DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

A. Wherever used in the Bidding Requirements or Contract Documents, a term printed with initial capital letters, including the term's singular and plural forms, will have the meaning indicated in the definitions below. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.

1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.

2. *Agreement*—The written instrument, executed by Owner and Contractor, that sets forth the Contract Price and Contract Times, identifies the parties and the Engineer, and designates the specific items that are Contract Documents.

3. *Application for Payment*—The document prepared by Contractor, in a form acceptable to Engineer, to request progress or final payments, and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

4. *Bid*—The offer of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

5. *Bidder*—An individual or entity that submits a Bid to Owner.

6. *Bidding Documents*—The Bidding Requirements, the proposed Contract Documents, and all Addenda.

7. *Bidding Requirements*—The Advertisement or invitation to bid, Instructions to Bidders, Bid Bond or other Bid security, if any, the Bid Form, and the Bid with any attachments.

8. *Change Order*—A document which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, or other revision to the Contract, issued on or after the Effective Date of the Contract.

9. *Change Proposal*—A written request by Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment in Contract Price or Contract Times; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; challenging a set-off against payments due; or seeking other relief with respect to the terms of the Contract.

10. *Claim*

a. A demand or assertion by Owner directly to Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment of Contract Price or Contract Times; contesting an initial decision by Engineer concerning the

requirements of the Contract Documents or the acceptability of Work under the Contract Documents; contesting Engineer's decision regarding a Change Proposal; seeking resolution of a contractual issue that Engineer has declined to address; or seeking other relief with respect to the terms of the Contract.

b. A demand or assertion by Contractor directly to Owner, duly submitted in compliance with the procedural requirements set forth herein, contesting Engineer's decision regarding a Change Proposal, or seeking resolution of a contractual issue that Engineer has declined to address.

c. A demand or assertion by Owner or Contractor, duly submitted in compliance with the procedural requirements set forth herein, made pursuant to Paragraph 12.01.A.4, concerning disputes arising after Engineer has issued a recommendation of final payment.

d. A demand for money or services by a third party is not a Claim.

11. *Constituent of Concern*—Asbestos, petroleum, radioactive materials, polychlorinated biphenyls (PCBs), lead-based paint (as defined by the HUD/EPA standard), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to Laws and Regulations regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.

12. *Contract*—The entire and integrated written contract between Owner and Contractor concerning the Work.

13. *Contract Documents*—Those items so designated in the Agreement, and which together comprise the Contract.

14. *Contract Price*—The money that Owner has agreed to pay Contractor for completion of the Work in accordance with the Contract Documents.

15. *Contract Times*—The number of days or the dates by which Contractor shall: (a) achieve Milestones, if any; (b) achieve Substantial Completion; and (c) complete the Work.

16. *Contractor*—The individual or entity with which Owner has contracted for performance of the Work.

17. *Cost of the Work*—See Paragraph 13.01 for definition.

18. *Drawings*—The part of the Contract that graphically shows the scope, extent, and character of the Work to be performed by Contractor.

19. *Effective Date of the Contract*—The date, indicated in the Agreement, on which the Contract becomes effective.

20. *Electronic Document*—Any Project-related correspondence, attachments to correspondence, data, documents, drawings, information, or graphics, including but not limited to Shop Drawings and other Submittals, that are in an electronic or digital format.

21. *Electronic Means*—Electronic mail (email), upload/download from a secure Project website, or other communications methods that allow: (a) the transmission or communication of Electronic Documents; (b) the documentation of transmissions, including sending and receipt; (c) printing of the transmitted Electronic Document by the

recipient; (d) the storage and archiving of the Electronic Document by sender and recipient; and (e) the use by recipient of the Electronic Document for purposes permitted by this Contract. Electronic Means does not include the use of text messaging, or of Facebook, Twitter, Instagram, or similar social media services for transmission of Electronic Documents.

22. *Engineer*—The individual or entity named as such in the Agreement.

23. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but does not change the Contract Price or the Contract Times.

24. *Hazardous Environmental Condition*—The presence at the Site of Constituents of Concern in such quantities or circumstances that may present a danger to persons or property exposed thereto.

    a. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated into the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, is not a Hazardous Environmental Condition.

    b. The presence of Constituents of Concern that are to be removed or remediated as part of the Work is not a Hazardous Environmental Condition.

    c. The presence of Constituents of Concern as part of the routine, anticipated, and obvious working conditions at the Site, is not a Hazardous Environmental Condition.

25. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and binding decrees, resolutions, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

26. *Liens*—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.

27. *Milestone*—A principal event in the performance of the Work that the Contract requires Contractor to achieve by an intermediate completion date, or by a time prior to Substantial Completion of all the Work.

28. *Notice of Award*—The written notice by Owner to a Bidder of Owner's acceptance of the Bid.

29. *Notice to Proceed*—A written notice by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work.

30. *Owner*—The individual or entity with which Contractor has contracted regarding the Work, and which has agreed to pay Contractor for the performance of the Work, pursuant to the terms of the Contract.

31. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising Contractor's plan to accomplish the Work within the Contract Times.

32. *Project*—The total undertaking to be accomplished for Owner by engineers, contractors, and others, including planning, study, design, construction, testing, commissioning, and start-up, and of which the Work to be performed under the Contract Documents is a part.

33. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative (RPR) includes any assistants or field staff of Resident Project Representative.

34. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and that establish the standards by which such portion of the Work will be judged.

35. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer's review of the submittals.

36. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

37. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information that are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work. Shop Drawings, whether approved or not, are not Drawings and are not Contract Documents.

38. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements, and such other lands or areas furnished by Owner which are designated for the use of Contractor.

39. *Specifications*—The part of the Contract that consists of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable to the Work.

40. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work.

41. *Submittal*—A written or graphic document, prepared by or for Contractor, which the Contract Documents require Contractor to submit to Engineer, or that is indicated as a Submittal in the Schedule of Submittals accepted by Engineer. Submittals may include Shop Drawings and Samples; schedules; product data; Owner-delegated designs; sustainable design information; information on special procedures; testing plans; results of tests and evaluations, source quality-control testing and inspections, and field or Site quality-control testing and inspections; warranties and certifications; Suppliers' instructions and reports; records of delivery of spare parts and tools; operations and maintenance data; Project photographic documentation; record documents; and other such documents required by the Contract Documents. Submittals, whether or not approved or accepted by Engineer, are not Contract Documents. Change Proposals, Change Orders, Claims, notices, Applications for Payment, and requests for interpretation or clarification are not Submittals.

42. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion of such Work.

43. *Successful Bidder*—The Bidder to which the Owner makes an award of contract.

44. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.

45. *Supplier*—A manufacturer, fabricator, supplier, distributor, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or a Subcontractor.

46. *Technical Data*

    a. Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (1) existing subsurface conditions at or adjacent to the Site, or existing physical conditions at or adjacent to the Site including existing surface or subsurface structures (except Underground Facilities) or (2) Hazardous Environmental Conditions at the Site.

    b. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then Technical Data is defined, with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06, as the data contained in boring logs, recorded measurements of subsurface water levels, assessments of the condition of subsurface facilities, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical, environmental, or other Site or facilities conditions report prepared for the Project and made available to Contractor.

    c. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data, and instead Underground Facilities are shown or indicated on the Drawings.

47. *Underground Facilities*—All active or not-in-service underground lines, pipelines, conduits, ducts, encasements, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or systems at the Site, including but not limited to those facilities or systems that produce, transmit, distribute, or convey telephone or other communications, cable television, fiber optic transmissions, power, electricity, light, heat, gases, oil, crude oil products, liquid petroleum products, water, steam, waste, wastewater, storm water, other liquids or chemicals, or traffic or other control systems. An abandoned facility or system is not an Underground Facility.

48. *Unit Price Work*—Work to be paid for on the basis of unit prices.

49. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction; furnishing, installing, and incorporating all materials and equipment into such construction; and may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.

50. *Work Change Directive*—A written directive to Contractor issued on or after the Effective Date of the Contract, signed by Owner and recommended by Engineer, ordering an addition, deletion, or revision in the Work.

1.02 *Terminology*

A. The words and terms discussed in Paragraphs 1.02.B, C, D, and E are not defined terms that require initial capital letters, but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.

B. *Intent of Certain Terms or Adjectives*: The Contract Documents include the terms "as allowed," "as approved," "as ordered," "as directed" or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives "reasonable," "suitable," "acceptable," "proper," "satisfactory," or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Article 10 or any other provision of the Contract Documents.

C. *Day*: The word "day" means a calendar day of 24 hours measured from midnight to the next midnight.

D. *Defective*: The word "defective," when modifying the word "Work," refers to Work that is unsatisfactory, faulty, or deficient in that it:

1. does not conform to the Contract Documents;

2. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or

3. has been damaged prior to Engineer's recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 15.03 or Paragraph 15.04).

E. *Furnish, Install, Perform, Provide*

1. The word "furnish," when used in connection with services, materials, or equipment, means to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.

2. The word "install," when used in connection with services, materials, or equipment, means to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

3. The words "perform" or "provide," when used in connection with services, materials, or equipment, means to furnish and install said services, materials, or equipment complete and ready for intended use.

4. If the Contract Documents establish an obligation of Contractor with respect to specific services, materials, or equipment, but do not expressly use any of the four words "furnish," "install," "perform," or "provide," then Contractor shall furnish and install said services, materials, or equipment complete and ready for intended use.

F. *Contract Price or Contract Times*: References to a change in "Contract Price or Contract Times" or "Contract Times or Contract Price" or similar, indicate that such change applies to (1) Contract Price, (2) Contract Times, or (3) both Contract Price and Contract Times, as warranted, even if the term "or both" is not expressed.

G. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2—PRELIMINARY MATTERS

2.01 *Delivery of Performance and Payment Bonds; Evidence of Insurance*

A. *Performance and Payment Bonds*: When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner the performance bond and payment bond (if the Contract requires Contractor to furnish such bonds).

B. *Evidence of Contractor's Insurance*: When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each additional insured (as identified in the Contract), the certificates, endorsements, and other evidence of insurance required to be provided by Contractor in accordance with Article 6, except to the extent the Supplementary Conditions expressly establish other dates for delivery of specific insurance policies.

C. *Evidence of Owner's Insurance*: After receipt of the signed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each additional insured (as identified in the Contract), the certificates and other evidence of insurance required to be provided by Owner under Article 6.

2.02 *Copies of Documents*

A. Owner shall furnish to Contractor four printed copies of the Contract (including one fully signed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction.

B. Owner shall maintain and safeguard at least one original printed record version of the Contract, including Drawings and Specifications signed and sealed by Engineer and other design professionals. Owner shall make such original printed record version of the Contract available to Contractor for review. Owner may delegate the responsibilities under this provision to Engineer.

2.03 *Before Starting Construction*

A. *Preliminary Schedules*: Within 10 days after the Effective Date of the Contract (or as otherwise required by the Contract Documents), Contractor shall submit to Engineer for timely review:

1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract;

2. a preliminary Schedule of Submittals; and

3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work

into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.04 *Preconstruction Conference; Designation of Authorized Representatives*

A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work, and to discuss the schedules referred to in Paragraph 2.03.A, procedures for handling Shop Drawings, Samples, and other Submittals, processing Applications for Payment, electronic or digital transmittals, and maintaining required records.

B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit and receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.05 *Acceptance of Schedules*

A. At least 10 days before submission of the first Application for Payment a conference, attended by Contractor, Engineer, and others as appropriate, will be held to review the schedules submitted in accordance with Paragraph 2.03.A. No progress payment will be made to Contractor until acceptable schedules are submitted to Engineer.

1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.

2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.

3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to the component parts of the Work.

4. If a schedule is not acceptable, Contractor will have an additional 10 days to revise and resubmit the schedule.

2.06 *Electronic Transmittals*

A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may send, and shall accept, Electronic Documents transmitted by Electronic Means.

B. If the Contract does not establish protocols for Electronic Means, then Owner, Engineer, and Contractor shall jointly develop such protocols.

C. Subject to any governing protocols for Electronic Means, when transmitting Electronic Documents by Electronic Means, the transmitting party makes no representations as to long-term compatibility, usability, or readability of the Electronic Documents resulting from the recipient's use of software application packages, operating systems, or computer hardware differing from those used in the drafting or transmittal of the Electronic Documents.

ARTICLE 3—CONTRACT DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 *Intent*

A. The Contract Documents are complementary; what is required by one Contract Document is as binding as if required by all.

B. It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents.

C. Unless otherwise stated in the Contract Documents, if there is a discrepancy between the electronic versions of the Contract Documents (including any printed copies derived from such electronic versions) and the printed record version, the printed record version will govern.

D. The Contract supersedes prior negotiations, representations, and agreements, whether written or oral.

E. Engineer will issue clarifications and interpretations of the Contract Documents as provided herein.

F. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation will be deemed stricken, and all remaining provisions will continue to be valid and binding upon Owner and Contractor, which agree that the Contract Documents will be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

G. Nothing in the Contract Documents creates:

1. any contractual relationship between Owner or Engineer and any Subcontractor, Supplier, or other individual or entity performing or furnishing any of the Work, for the benefit of such Subcontractor, Supplier, or other individual or entity; or

2. any obligation on the part of Owner or Engineer to pay or to see to the payment of any money due any such Subcontractor, Supplier, or other individual or entity, except as may otherwise be required by Laws and Regulations.

3.02 *Reference Standards*

A. *Standards Specifications, Codes, Laws and Regulations*

1. Reference in the Contract Documents to standard specifications, manuals, reference standards, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, means the standard specification, manual, reference standard, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Contract if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.

2. No provision of any such standard specification, manual, reference standard, or code, and no instruction of a Supplier, will be effective to change the duties or responsibilities of Owner, Contractor, or Engineer from those set forth in the part of the Contract Documents prepared by or for Engineer. No such provision or instruction shall be effective to assign to Owner or Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility

inconsistent with the provisions of the part of the Contract Documents prepared by or for Engineer.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies*

1. *Contractor's Verification of Figures and Field Measurements*: Before undertaking each part of the Work, Contractor shall carefully study the Contract Documents, and check and verify pertinent figures and dimensions therein, particularly with respect to applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy that Contractor discovers, or has actual knowledge of, and shall not proceed with any Work affected thereby until the conflict, error, ambiguity, or discrepancy is resolved by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract issued pursuant to Paragraph 11.01.

2. *Contractor's Review of Contract Documents*: If, before or during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) actual field conditions, (c) any standard specification, manual, reference standard, or code, or (d) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 7.15) until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract issued pursuant to Paragraph 11.01.

3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. *Resolving Discrepancies*

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the part of the Contract Documents prepared by or for Engineer take precedence in resolving any conflict, error, ambiguity, or discrepancy between such provisions of the Contract Documents and:

a. the provisions of any standard specification, manual, reference standard, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference as a Contract Document); or

b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Requirements of the Contract Documents*

A. During the performance of the Work and until final payment, Contractor and Owner shall submit to the Engineer in writing all matters in question concerning the requirements of the Contract Documents (sometimes referred to as requests for information or interpretation—RFIs), or relating to the acceptability of the Work under the Contract Documents, as soon as possible after such matters arise. Engineer will be the initial interpreter of the requirements of the Contract Documents, and judge of the acceptability of the Work.

B. Engineer will, with reasonable promptness, render a written clarification, interpretation, or decision on the issue submitted, or initiate an amendment or supplement to the Contract Documents. Engineer's written clarification, interpretation, or decision will be final and binding on Contractor, unless it appeals by submitting a Change Proposal, and on Owner, unless it appeals by filing a Claim.

C. If a submitted matter in question concerns terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work under the Contract Documents, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly notify Owner and Contractor in writing that Engineer is unable to provide a decision or interpretation. If Owner and Contractor are unable to agree on resolution of such a matter in question, either party may pursue resolution as provided in Article 12.

3.05 *Reuse of Documents*

A. Contractor and its Subcontractors and Suppliers shall not:

1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media versions, or reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer; or

2. have or acquire any title or ownership rights in any other Contract Documents, reuse any such Contract Documents for any purpose without Owner's express written consent, or violate any copyrights pertaining to such Contract Documents.

B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein precludes Contractor from retaining copies of the Contract Documents for record purposes.

ARTICLE 4—COMMENCEMENT AND PROGRESS OF THE WORK

4.01 *Commencement of Contract Times; Notice to Proceed*

A. The Contract Times will commence to run on the 30th day after the Effective Date of the Contract or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Contract. In no event will the Contract Times commence to run later than the 60th day after the day of Bid opening or the 30th day after the Effective Date of the Contract, whichever date is earlier.

4.02 *Starting the Work*

A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work may be done at the Site prior to such date.

4.03 *Reference Points*

A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the

established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.04 *Progress Schedule*

A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.05 as it may be adjusted from time to time as provided below.

1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.05) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times.

2. Proposed adjustments in the Progress Schedule that will change the Contract Times must be submitted in accordance with the requirements of Article 11.

B. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work will be delayed or postponed pending resolution of any disputes or disagreements, or during any appeal process, except as permitted by Paragraph 16.04, or as Owner and Contractor may otherwise agree in writing.

4.05 *Delays in Contractor's Progress*

A. If Owner, Engineer, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times.

B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor. Delay, disruption, and interference attributable to and within the control of a Subcontractor or Supplier shall be deemed to be within the control of Contractor.

C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times. Such an adjustment will be Contractor's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:

1. Severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;

2. Abnormal weather conditions;

3. Acts or failures to act of third-party utility owners or other third-party entities (other than those third-party utility owners or other third-party entities performing other work at or adjacent to the Site as arranged by or under contract with Owner, as contemplated in Article 8); and

4. Acts of war or terrorism.

D. Contractor's entitlement to an adjustment of Contract Times or Contract Price is limited as follows:

1. Contractor's entitlement to an adjustment of the Contract Times is conditioned on the delay, disruption, or interference adversely affecting an activity on the critical path to completion of the Work, as of the time of the delay, disruption, or interference.

2. Contractor shall not be entitled to an adjustment in Contract Price for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor. Such a concurrent delay by Contractor shall not preclude an adjustment of Contract Times to which Contractor is otherwise entitled.

3. Adjustments of Contract Times or Contract Price are subject to the provisions of Article 11.

E. Each Contractor request or Change Proposal seeking an increase in Contract Times or Contract Price must be supplemented by supporting data that sets forth in detail the following:

1. The circumstances that form the basis for the requested adjustment;

2. The date upon which each cause of delay, disruption, or interference began to affect the progress of the Work;

3. The date upon which each cause of delay, disruption, or interference ceased to affect the progress of the Work;

4. The number of days' increase in Contract Times claimed as a consequence of each such cause of delay, disruption, or interference; and

5. The impact on Contract Price, in accordance with the provisions of Paragraph 11.07.

Contractor shall also furnish such additional supporting documentation as Owner or Engineer may require including, where appropriate, a revised progress schedule indicating all the activities affected by the delay, disruption, or interference, and an explanation of the effect of the delay, disruption, or interference on the critical path to completion of the Work.

F. Delays, disruption, and interference to the performance or progress of the Work resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was not shown or indicated by the Contract Documents, or not shown or indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5, together with the provisions of Paragraphs 4.05.D and 4.05.E.

G. Paragraph 8.03 addresses delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.

ARTICLE 5—SITE; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

5.01 *Availability of Lands*

A. Owner shall furnish the Site. Owner shall notify Contractor in writing of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work.

B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which permanent improvements are to be made and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.

C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

5.02 *Use of Site and Other Areas*

A. *Limitation on Use of Site and Other Areas*

1. Contractor shall confine construction equipment, temporary construction facilities, the storage of materials and equipment, and the operations of workers to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and such other adjacent areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for (a) damage to the Site; (b) damage to any such other adjacent areas used for Contractor's operations; (c) damage to any other adjacent land or areas, or to improvements, structures, utilities, or similar facilities located at such adjacent lands or areas; and (d) for injuries and losses sustained by the owners or occupants of any such land or areas; provided that such damage or injuries result from the performance of the Work or from other actions or conduct of the Contractor or those for which Contractor is responsible.

2. If a damage or injury claim is made by the owner or occupant of any such land or area because of the performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible, Contractor shall (a) take immediate corrective or remedial action as required by Paragraph 7.13, or otherwise; (b) promptly attempt to settle the claim as to all parties through negotiations with such owner or occupant, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or in a court of competent jurisdiction; and (c) to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from and against any such claim, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused directly or indirectly, in whole or in part by, or based upon, Contractor's performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible.

B. *Removal of Debris During Performance of the Work*: During the progress of the Work the Contractor shall keep the Site and other adjacent areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris will conform to applicable Laws and Regulations.

C. *Cleaning*: Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site and adjacent areas all tools, appliances, construction equipment

and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

D. *Loading of Structures*: Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent structures or land to stresses or pressures that will endanger them.

5.03 *Subsurface and Physical Conditions*

A. *Reports and Drawings*: The Supplementary Conditions identify:

1. Those reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data;

2. Those drawings of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data; and

3. Technical Data contained in such reports and drawings.

B. *Underground Facilities*: Underground Facilities are shown or indicated on the Drawings, pursuant to Paragraph 5.05, and not in the drawings referred to in Paragraph 5.03.A. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data.

C. *Reliance by Contractor on Technical Data*: Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely upon the accuracy of the Technical Data as defined in Paragraph 1.01.A.46.b.

D. *Limitations of Other Data and Documents*: Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto;

2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings;

3. the contents of other Site-related documents made available to Contractor, such as record drawings from other projects at or adjacent to the Site, or Owner's archival documents concerning the Site; or

4. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions, or information.

5.04 *Differing Subsurface or Physical Conditions*

A. *Notice by Contractor*: If Contractor believes that any subsurface or physical condition that is uncovered or revealed at the Site:

1. is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate;

2. is of such a nature as to require a change in the Drawings or Specifications;

3. differs materially from that shown or indicated in the Contract Documents; or

4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so.

B. *Engineer's Review*: After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine whether it is necessary for Owner to obtain additional exploration or tests with respect to the condition; conclude whether the condition falls within any one or more of the differing site condition categories in Paragraph 5.04.A; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and advise Owner in writing of Engineer's findings, conclusions, and recommendations.

C. *Owner's Statement to Contractor Regarding Site Condition*: After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.

D. *Early Resumption of Work*: If at any time Engineer determines that Work in connection with the subsurface or physical condition in question may resume prior to completion of Engineer's review or Owner's issuance of its statement to Contractor, because the condition in question has been adequately documented, and analyzed on a preliminary basis, then the Engineer may at its discretion instruct Contractor to resume such Work.

E. *Possible Price and Times Adjustments*

1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or interference, causes an increase or decrease in

Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

a. Such condition must fall within any one or more of the categories described in Paragraph 5.04.A;

b. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03; and,

c. Contractor's entitlement to an adjustment of the Contract Times is subject to the provisions of Paragraphs 4.05.D and 4.05.E.

2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times with respect to a subsurface or physical condition if:

a. Contractor knew of the existence of such condition at the time Contractor made a commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract, or otherwise;

b. The existence of such condition reasonably could have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas expressly required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such commitment; or

c. Contractor failed to give the written notice required by Paragraph 5.04.A.

3. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, then any such adjustment will be set forth in a Change Order.

4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the subsurface or physical condition in question.

F. *Underground Facilities; Hazardous Environmental Conditions*: Paragraph 5.05 governs rights and responsibilities regarding the presence or location of Underground Facilities. Paragraph 5.06 governs rights and responsibilities regarding Hazardous Environmental Conditions. The provisions of Paragraphs 5.03 and 5.04 are not applicable to the presence or location of Underground Facilities, or to Hazardous Environmental Conditions.

5.05 *Underground Facilities*

A. *Contractor's Responsibilities*: Unless it is otherwise expressly provided in the Supplementary Conditions, the cost of all of the following are included in the Contract Price, and Contractor shall have full responsibility for:

1. reviewing and checking all information and data regarding existing Underground Facilities at the Site;

2. complying with applicable state and local utility damage prevention Laws and Regulations;

3. verifying the actual location of those Underground Facilities shown or indicated in the Contract Documents as being within the area affected by the Work, by exposing such Underground Facilities during the course of construction;

4. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and

5. the safety and protection of all existing Underground Facilities at the Site, and repairing any damage thereto resulting from the Work.

B. *Notice by Contractor*: If Contractor believes that an Underground Facility that is uncovered or revealed at the Site was not shown or indicated on the Drawings, or was not shown or indicated on the Drawings with reasonable accuracy, then Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing regarding such Underground Facility.

C. *Engineer's Review*: Engineer will:

1. promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated on the Drawings, or was not shown or indicated with reasonable accuracy;

2. identify and communicate with the owner of the Underground Facility; prepare recommendations to Owner (and if necessary issue any preliminary instructions to Contractor) regarding the Contractor's resumption of Work in connection with the Underground Facility in question;

3. obtain any pertinent cost or schedule information from Contractor; determine the extent, if any, to which a change is required in the Drawings or Specifications to reflect and document the consequences of the existence or location of the Underground Facility; and

4. advise Owner in writing of Engineer's findings, conclusions, and recommendations.

During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

D. *Owner's Statement to Contractor Regarding Underground Facility*: After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the Underground Facility in question addressing the resumption of Work in connection with such Underground Facility, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations in whole or in part.

E. *Early Resumption of Work*: If at any time Engineer determines that Work in connection with the Underground Facility may resume prior to completion of Engineer's review or Owner's issuance of its statement to Contractor, because the Underground Facility in question and conditions affected by its presence have been adequately documented, and analyzed on a preliminary basis, then the Engineer may at its discretion instruct Contractor to resume such Work.

F. *Possible Price and Times Adjustments*

1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, to the extent that any existing Underground Facility at the Site that was not shown

or indicated on the Drawings, or was not shown or indicated with reasonable accuracy, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

a. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03;

b. Contractor's entitlement to an adjustment of the Contract Times is subject to the provisions of Paragraphs 4.05.D and 4.05.E; and

c. Contractor gave the notice required in Paragraph 5.05.B.

2. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, then any such adjustment will be set forth in a Change Order.

3. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.

4. The information and data shown or indicated on the Drawings with respect to existing Underground Facilities at the Site is based on information and data (a) furnished by the owners of such Underground Facilities, or by others, (b) obtained from available records, or (c) gathered in an investigation conducted in accordance with the current edition of ASCE 38, Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data, by the American Society of Civil Engineers. If such information or data is incorrect or incomplete, Contractor's remedies are limited to those set forth in this Paragraph 5.05.F.

5.06 *Hazardous Environmental Conditions at Site*

A. *Reports and Drawings*: The Supplementary Conditions identify:

1. those reports known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site;

2. drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and

3. Technical Data contained in such reports and drawings.

B. *Reliance by Contractor on Technical Data Authorized*: Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely on the accuracy of the Technical Data as defined in Paragraph 1.01.A.46.b. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures

of construction to be employed by Contractor, and safety precautions and programs incident thereto;

2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions or information.

C. Contractor shall not be responsible for removing or remediating any Hazardous Environmental Condition encountered, uncovered, or revealed at the Site unless such removal or remediation is expressly identified in the Contract Documents to be within the scope of the Work.

D. Contractor shall be responsible for controlling, containing, and duly removing all Constituents of Concern brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible, and for any associated costs; and for the costs of removing and remediating any Hazardous Environmental Condition created by the presence of any such Constituents of Concern.

E. If Contractor encounters, uncovers, or reveals a Hazardous Environmental Condition whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, then Contractor shall immediately: (1) secure or otherwise isolate such condition; (2) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 7.15); and (3) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 5.06.F. If Contractor or anyone for whom Contractor is responsible created the Hazardous Environmental Condition in question, then Owner may remove and remediate the Hazardous Environmental Condition, and impose a set-off against payments to account for the associated costs.

F. Contractor shall not resume Work in connection with such Hazardous Environmental Condition or in any affected area until after Owner has obtained any required permits related thereto, and delivered written notice to Contractor either (1) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (2) specifying any special conditions under which such Work may be resumed safely.

G. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, as a result of such Work stoppage, such special conditions under which Work is agreed to be resumed by Contractor, or any costs or expenses incurred in response to the Hazardous Environmental Condition, then within 30 days of Owner's written notice regarding the resumption of Work, Contractor may submit a Change Proposal, or Owner may impose a set-off. Entitlement to any such adjustment is subject to the provisions of Paragraphs 4.05.D, 4.05.E, 11.07, and 11.08.

H. If, after receipt of such written notice, Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special

conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work, following the contractual change procedures in Article 11. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 8.

I. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court, arbitration, or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition (1) was not shown or indicated in the Drawings, Specifications, or other Contract Documents, identified as Technical Data entitled to limited reliance pursuant to Paragraph 5.06.B, or identified in the Contract Documents to be included within the scope of the Work, and (2) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.I obligates Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

J. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the failure to control, contain, or remove a Constituent of Concern brought to the Site by Contractor or by anyone for whom Contractor is responsible, or to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.J obligates Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

K. The provisions of Paragraphs 5.03, 5.04, and 5.05 do not apply to the presence of Constituents of Concern or to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 6—BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

A. Contractor shall furnish a performance bond and a payment bond, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of Contractor's obligations under the Contract. These bonds must remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the terms of a prescribed bond form, the Supplementary Conditions, or other provisions of the Contract.

B. Contractor shall also furnish such other bonds (if any) as are required by the Supplementary Conditions or other provisions of the Contract.

C. All bonds must be in the form included in the Bidding Documents or otherwise specified by Owner prior to execution of the Contract, except as provided otherwise by Laws or

Regulations, and must be issued and signed by a surety named in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Department Circular 570 (as amended and supplemented) by the Bureau of the Fiscal Service, U.S. Department of the Treasury. A bond signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority must show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.

D. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue bonds in the required amounts.

E. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer in writing and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which must comply with the bond and surety requirements above.

F. If Contractor has failed to obtain a required bond, Owner may exclude the Contractor from the Site and exercise Owner's termination rights under Article 16.

G. Upon request to Owner from any Subcontractor, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, Owner shall provide a copy of the payment bond to such person or entity.

H. Upon request to Contractor from any Subcontractor, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, Contractor shall provide a copy of the payment bond to such person or entity.

6.02 *Insurance—General Provisions*

A. Owner and Contractor shall obtain and maintain insurance as required in this article and in the Supplementary Conditions.

B. All insurance required by the Contract to be purchased and maintained by Owner or Contractor shall be obtained from insurance companies that are duly licensed or authorized in the state or jurisdiction in which the Project is located to issue insurance policies for the required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.

C. Alternative forms of insurance coverage, including but not limited to self-insurance and "Occupational Accident and Excess Employer's Indemnity Policies," are not sufficient to meet the insurance requirements of this Contract, unless expressly allowed in the Supplementary Conditions.

D. Contractor shall deliver to Owner, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Contractor has obtained and is maintaining the policies and coverages required by the Contract. Upon request by Owner or any other insured, Contractor shall also furnish other evidence of such required insurance, including but not limited to copies of policies, documentation of applicable self-insured retentions (if allowed) and deductibles, full disclosure of all relevant exclusions, and evidence of insurance required to be purchased and maintained by

Subcontractors or Suppliers. In any documentation furnished under this provision, Contractor, Subcontractors, and Suppliers may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those applicable to this Contract.

E. Owner shall deliver to Contractor, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Owner has obtained and is maintaining the policies and coverages required of Owner by the Contract (if any). Upon request by Contractor or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies, documentation of applicable self-insured retentions (if allowed) and deductibles, and full disclosure of all relevant exclusions. In any documentation furnished under this provision, Owner may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those relevant to this Contract.

F. Failure of Owner or Contractor to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner or Contractor to identify a deficiency in compliance from the evidence provided, will not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.

G. In addition to the liability insurance required to be provided by Contractor, the Owner, at Owner's option, may purchase and maintain Owner's own liability insurance. Owner's liability policies, if any, operate separately and independently from policies required to be provided by Contractor, and Contractor cannot rely upon Owner's liability policies for any of Contractor's obligations to the Owner, Engineer, or third parties.

H. Contractor shall require:

   1. Subcontractors to purchase and maintain worker's compensation, commercial general liability, and other insurance that is appropriate for their participation in the Project, and to name as additional insureds Owner and Engineer (and any other individuals or entities identified in the Supplementary Conditions as additional insureds on Contractor's liability policies) on each Subcontractor's commercial general liability insurance policy; and

   2. Suppliers to purchase and maintain insurance that is appropriate for their participation in the Project.

I. If either party does not purchase or maintain the insurance required of such party by the Contract, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage.

J. If Contractor has failed to obtain and maintain required insurance, Contractor's entitlement to enter or remain at the Site will end immediately, and Owner may impose an appropriate set-off against payment for any associated costs (including but not limited to the cost of purchasing necessary insurance coverage), and exercise Owner's termination rights under Article 16.

K. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect (but is in no way obligated) to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Contract Price will be adjusted accordingly.

L. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests. Contractor is responsible for determining whether such coverage and limits are adequate to protect its interests, and for obtaining and maintaining any additional insurance that Contractor deems necessary.

M. The insurance and insurance limits required herein will not be deemed as a limitation on Contractor's liability, or that of its Subcontractors or Suppliers, under the indemnities granted to Owner and other individuals and entities in the Contract or otherwise.

N. All the policies of insurance required to be purchased and maintained under this Contract will contain a provision or endorsement that the coverage afforded will not be canceled, or renewal refused, until at least 10 days prior written notice has been given to the purchasing policyholder. Within three days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured and Engineer.

6.03 *Contractor's Insurance*

A. *Required Insurance*: Contractor shall purchase and maintain Worker's Compensation, Commercial General Liability, and other insurance pursuant to the specific requirements of the Supplementary Conditions.

B. *General Provisions*: The policies of insurance required by this Paragraph 6.03 as supplemented must:

1. include at least the specific coverages required;

2. be written for not less than the limits provided, or those required by Laws or Regulations, whichever is greater;

3. remain in effect at least until the Work is complete (as set forth in Paragraph 15.06.D), and longer if expressly required elsewhere in this Contract, and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work as a warranty or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract;

4. apply with respect to the performance of the Work, whether such performance is by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable; and

5. include all necessary endorsements to support the stated requirements.

C. *Additional Insureds*: The Contractor's commercial general liability, automobile liability, employer's liability, umbrella or excess, pollution liability, and unmanned aerial vehicle liability policies, if required by this Contract, must:

1. include and list as additional insureds Owner and Engineer, and any individuals or entities identified as additional insureds in the Supplementary Conditions;

2. include coverage for the respective officers, directors, members, partners, employees, and consultants of all such additional insureds;

3. afford primary coverage to these additional insureds for all claims covered thereby (including as applicable those arising from both ongoing and completed operations);

4. not seek contribution from insurance maintained by the additional insured; and

5. as to commercial general liability insurance, apply to additional insureds with respect to liability caused in whole or in part by Contractor's acts or omissions, or the acts and omissions of those working on Contractor's behalf, in the performance of Contractor's operations.

6.04 *Builder's Risk and Other Property Insurance*

A. *Builder's Risk*: Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the Work's full insurable replacement cost (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). The specific requirements applicable to the builder's risk insurance are set forth in the Supplementary Conditions.

B. *Property Insurance for Facilities of Owner Where Work Will Occur*: Owner is responsible for obtaining and maintaining property insurance covering each existing structure, building, or facility in which any part of the Work will occur, or to which any part of the Work will attach or be adjoined. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, providing coverage consistent with that required for the builder's risk insurance, and will be maintained until the Work is complete, as set forth in Paragraph 15.06.D.

C. *Property Insurance for Substantially Complete Facilities*: Promptly after Substantial Completion, and before actual occupancy or use of the substantially completed Work, Owner will obtain property insurance for such substantially completed Work, and maintain such property insurance at least until the Work is complete, as set forth in Paragraph 15.06.D. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, and provide coverage consistent with that required for the builder's risk insurance. The builder's risk insurance may terminate upon written confirmation of Owner's procurement of such property insurance.

D. *Partial Occupancy or Use by Owner*: If Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work, as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Contractor) will provide advance notice of such occupancy or use to the builder's risk insurer, and obtain an endorsement consenting to the continuation of coverage prior to commencing such partial occupancy or use.

E. *Insurance of Other Property; Additional Insurance*: If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, then the entity or individual owning such property item will be responsible for insuring it. If Contractor elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.04, it may do so at Contractor's expense.

6.05 *Property Losses; Subrogation*

A. The builder's risk insurance policy purchased and maintained in accordance with Paragraph 6.04 (or an installation floater policy if authorized by the Supplementary Conditions), will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against

Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors.

1. Owner and Contractor waive all rights against each other and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from any of the perils, risks, or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Engineer, its consultants, all individuals or entities identified in the Supplementary Conditions as builder's risk or installation floater insureds, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, under such policies for losses and damages so caused.

2. None of the above waivers extends to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Contractor as trustee or fiduciary, or otherwise payable under any policy so issued.

B. Any property insurance policy maintained by Owner covering any loss, damage, or consequential loss to Owner's existing structures, buildings, or facilities in which any part of the Work will occur, or to which any part of the Work will attach or adjoin; to adjacent structures, buildings, or facilities of Owner; or to part or all of the completed or substantially completed Work, during partial occupancy or use pursuant to Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03, or after final payment pursuant to Paragraph 15.06, will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them, and that the insured is allowed to waive the insurer's rights of subrogation in a written contract executed prior to the loss, damage, or consequential loss.

1. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from fire or any of the perils, risks, or causes of loss covered by such policies.

C. The waivers in this Paragraph 6.05 include the waiver of rights due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other insured peril, risk, or cause of loss.

D. Contractor shall be responsible for assuring that each Subcontract contains provisions whereby the Subcontractor waives all rights against Owner, Contractor, all individuals or entities identified in the Supplementary Conditions as insureds, the Engineer and its consultants, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, relating to, or resulting from fire or other peril, risk, or cause of loss covered by builder's risk insurance, installation floater, and any other property insurance applicable to the Work.

6.06 *Receipt and Application of Property Insurance Proceeds*

A. Any insured loss under the builder's risk and other policies of property insurance required by Paragraph 6.04 will be adjusted and settled with the named insured that purchased the policy. Such named insured shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.

B. Proceeds for such insured losses may be made payable by the insurer either jointly to multiple insureds, or to the named insured that purchased the policy in its own right and as fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. A named insured receiving insurance proceeds under the builder's risk and other policies of insurance required by Paragraph 6.04 shall maintain such proceeds in a segregated account, and distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Contract or applicable Laws and Regulations.

C. If no other special agreement is reached, Contractor shall repair or replace the damaged Work, using allocated insurance proceeds.

ARTICLE 7—CONTRACTOR'S RESPONSIBILITIES

7.01 *Contractor's Means and Methods of Construction*

A. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction.

B. If the Contract Documents note, or Contractor determines, that professional engineering or other design services are needed to carry out Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures, or for Site safety, then Contractor shall cause such services to be provided by a properly licensed design professional, at Contractor's expense. Such services are not Owner-delegated professional design services under this Contract, and neither Owner nor Engineer has any responsibility with respect to (1) Contractor's determination of the need for such services, (2) the qualifications or licensing of the design professionals retained or employed by Contractor, (3) the performance of such services, or (4) any errors, omissions, or defects in such services.

7.02 *Supervision and Superintendence*

A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents.

B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who will not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

7.03 *Labor; Working Hours*

A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall maintain good discipline and order at the Site.

B. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of Contractor's employees; of Suppliers and Subcontractors, and their employees; and of any other individuals or entities performing or furnishing any of the Work, just as Contractor is responsible for Contractor's own acts and omissions.

C. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site will be performed during regular working hours, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with Owner's written consent, which will not be unreasonably withheld.

7.04 *Services, Materials, and Equipment*

A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start up, and completion of the Work, whether or not such items are specifically called for in the Contract Documents.

B. All materials and equipment incorporated into the Work must be new and of good quality, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications will expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.

C. All materials and equipment must be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

7.05 *"Or Equals"*

A. *Contractor's Request; Governing Criteria*: Whenever an item of equipment or material is specified or described in the Contract Documents by using the names of one or more proprietary items or specific Suppliers, the Contract Price has been based upon Contractor furnishing such item as specified. The specification or description of such an item is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or equal" item is permitted, Contractor may request that Engineer authorize the use of other items of equipment or material, or items from other proposed Suppliers, under the circumstances described below.

1. If Engineer in its sole discretion determines that an item of equipment or material proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer will deem it an "or equal" item. For the purposes of this paragraph, a proposed item of equipment or material will be considered functionally equal to an item so named if:

a. in the exercise of reasonable judgment Engineer determines that the proposed item:

1) is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;

2) will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;

3) has a proven record of performance and availability of responsive service; and

4) is not objectionable to Owner.

b. Contractor certifies that, if the proposed item is approved and incorporated into the Work:

1) there will be no increase in cost to the Owner or increase in Contract Times; and

2) the item will conform substantially to the detailed requirements of the item named in the Contract Documents.

B. *Contractor's Expense*: Contractor shall provide all data in support of any proposed "or equal" item at Contractor's expense.

C. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each "or-equal" request. Engineer may require Contractor to furnish additional data about the proposed "or-equal" item. Engineer will be the sole judge of acceptability. No "or-equal" item will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an "or-equal," which will be evidenced by an approved Shop Drawing or other written communication. Engineer will advise Contractor in writing of any negative determination.

D. *Effect of Engineer's Determination*: Neither approval nor denial of an "or-equal" request will result in any change in Contract Price. The Engineer's denial of an "or-equal" request will be final and binding, and may not be reversed through an appeal under any provision of the Contract.

E. *Treatment as a Substitution Request*: If Engineer determines that an item of equipment or material proposed by Contractor does not qualify as an "or-equal" item, Contractor may request that Engineer consider the item a proposed substitute pursuant to Paragraph 7.06.

7.06 *Substitutes*

A. *Contractor's Request; Governing Criteria*: Unless the specification or description of an item of equipment or material required to be furnished under the Contract Documents contains or is followed by words reading that no substitution is permitted, Contractor may request that Engineer authorize the use of other items of equipment or material under the circumstances described below. To the extent possible such requests must be made before commencement of related construction at the Site.

1. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is functionally equivalent to that named and an acceptable substitute therefor. Engineer will not accept requests for review of proposed substitute items of equipment or material from anyone other than Contractor.

2. The requirements for review by Engineer will be as set forth in Paragraph 7.06.B, as supplemented by the Specifications, and as Engineer may decide is appropriate under the circumstances.

3. Contractor shall make written application to Engineer for review of a proposed substitute item of equipment or material that Contractor seeks to furnish or use. The application:

   a. will certify that the proposed substitute item will:

      1) perform adequately the functions and achieve the results called for by the general design;

      2) be similar in substance to the item specified; and

      3) be suited to the same use as the item specified.

   b. will state:

      1) the extent, if any, to which the use of the proposed substitute item will necessitate a change in Contract Times;

      2) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item; and

      3) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty.

   c. will identify:

      1) all variations of the proposed substitute item from the item specified; and

      2) available engineering, sales, maintenance, repair, and replacement services.

   d. will contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including but not limited to changes in Contract Price, shared savings, costs of redesign, and claims of other contractors affected by any resulting change.

B. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each substitute request, and to obtain comments and direction from Owner. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No substitute will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an acceptable substitute. Engineer's determination will be evidenced by a Field Order or a proposed Change Order accounting for the substitution itself and all related impacts, including changes in Contract Price or Contract Times. Engineer will advise Contractor in writing of any negative determination.

C. *Special Guarantee*: Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.

D. *Reimbursement of Engineer's Cost*: Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.

E. *Contractor's Expense*: Contractor shall provide all data in support of any proposed substitute at Contractor's expense.

F. *Effect of Engineer's Determination*: If Engineer approves the substitution request, Contractor shall execute the proposed Change Order and proceed with the substitution. The Engineer's denial of a substitution request will be final and binding, and may not be reversed through an appeal under any provision of the Contract. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.06.D, by timely submittal of a Change Proposal.

7.07 *Concerning Subcontractors and Suppliers*

A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner. The Contractor's retention of a Subcontractor or Supplier for the performance of parts of the Work will not relieve Contractor's obligation to Owner to perform and complete the Work in accordance with the Contract Documents.

B. Contractor shall retain specific Subcontractors and Suppliers for the performance of designated parts of the Work if required by the Contract to do so.

C. Subsequent to the submittal of Contractor's Bid or final negotiation of the terms of the Contract, Owner may not require Contractor to retain any Subcontractor or Supplier to furnish or perform any of the Work against which Contractor has reasonable objection.

D. Prior to entry into any binding subcontract or purchase order, Contractor shall submit to Owner the identity of the proposed Subcontractor or Supplier (unless Owner has already deemed such proposed Subcontractor or Supplier acceptable during the bidding process or otherwise). Such proposed Subcontractor or Supplier shall be deemed acceptable to Owner unless Owner raises a substantive, reasonable objection within 5 days.

E. Owner may require the replacement of any Subcontractor or Supplier. Owner also may require Contractor to retain specific replacements; provided, however, that Owner may not require a replacement to which Contractor has a reasonable objection. If Contractor has submitted the identity of certain Subcontractors or Suppliers for acceptance by Owner, and Owner has accepted it (either in writing or by failing to make written objection thereto), then Owner may subsequently revoke the acceptance of any such Subcontractor or Supplier so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor or Supplier.

F. If Owner requires the replacement of any Subcontractor or Supplier retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, with respect to the replacement; and Contractor shall initiate a Change Proposal for such adjustment within 30 days of Owner's requirement of replacement.

G. No acceptance by Owner of any such Subcontractor or Supplier, whether initially or as a replacement, will constitute a waiver of the right of Owner to the completion of the Work in accordance with the Contract Documents.

H. On a monthly basis, Contractor shall submit to Engineer a complete list of all Subcontractors and Suppliers having a direct contract with Contractor, and of all other Subcontractors and Suppliers known to Contractor at the time of submittal.

I. Contractor shall be solely responsible for scheduling and coordinating the work of Subcontractors and Suppliers.

J. The divisions and sections of the Specifications and the identifications of any Drawings do not control Contractor in dividing the Work among Subcontractors or Suppliers, or in delineating the Work to be performed by any specific trade.

K. All Work performed for Contractor by a Subcontractor or Supplier must be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract for the benefit of Owner and Engineer.

L. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor for Work performed for Contractor by the Subcontractor or Supplier.

M. Contractor shall restrict all Subcontractors and Suppliers from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed in this Contract.

7.08 *Patent Fees and Royalties*

A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If an invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights will be disclosed in the Contract Documents.

B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.

C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

7.09 *Permits*

A. Unless otherwise provided in the Contract Documents, Contractor shall obtain and pay for all construction permits, licenses, and certificates of occupancy. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of the submission of Contractor's Bid (or when Contractor became bound under a negotiated contract). Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

7.10 *Taxes*

A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

7.11 *Laws and Regulations*

A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.

B. If Contractor performs any Work or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all resulting costs and losses, and shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work or other action. It is not Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this does not relieve Contractor of its obligations under Paragraph 3.03.

C. Owner or Contractor may give written notice to the other party of any changes after the submission of Contractor's Bid (or after the date when Contractor became bound under a negotiated contract) in Laws or Regulations having an effect on the cost or time of performance of the Work, including but not limited to changes in Laws or Regulations having an effect on procuring permits and on sales, use, value-added, consumption, and other similar taxes. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times resulting from such changes, then within 30 days of such written notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

7.12 *Record Documents*

A. Contractor shall maintain in a safe place at the Site one printed record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, written interpretations and clarifications, and approved Shop Drawings. Contractor shall keep such record documents in good order and annotate them to show changes made during construction. These record documents, together with all approved Samples, will be available to Engineer for reference. Upon completion of the Work, Contractor shall deliver these record documents to Engineer.

7.13 *Safety and Protection*

A. Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations.

B. Contractor shall designate a qualified and experienced safety representative whose duties and responsibilities are the prevention of Work-related accidents and the maintenance and supervision of safety precautions and programs.

C. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to:

1. all persons on the Site or who may be affected by the Work;

2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and

3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, other work in progress, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.

D. All damage, injury, or loss to any property referred to in Paragraph 7.13.C.2 or 7.13.C.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor at its expense (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).

E. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection.

F. Contractor shall notify Owner; the owners of adjacent property; the owners of Underground Facilities and other utilities (if the identity of such owners is known to Contractor); and other contractors and utility owners performing work at or adjacent to the Site, in writing, when Contractor knows that prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property or work in progress.

G. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. Any Owner's safety programs that are applicable to the Work are identified or included in the Supplementary Conditions or Specifications.

H. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.

I. Contractor's duties and responsibilities for safety and protection will continue until all the Work is completed, Engineer has issued a written notice to Owner and Contractor in accordance with Paragraph 15.06.C that the Work is acceptable, and Contractor has left the Site (except as otherwise expressly provided in connection with Substantial Completion).

J. Contractor's duties and responsibilities for safety and protection will resume whenever Contractor or any Subcontractor or Supplier returns to the Site to fulfill warranty or correction obligations, or to conduct other tasks arising from the Contract Documents.

7.14 *Hazard Communication Programs*

A. Contractor shall be responsible for coordinating any exchange of safety data sheets (formerly known as material safety data sheets) or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

7.15 *Emergencies*

A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused by an emergency, or are required as a result of Contractor's response to an emergency. If Engineer determines that a change in the Contract Documents is required because of an emergency or Contractor's response, a Work Change Directive or Change Order will be issued.

7.16 *Submittals*

A. *Shop Drawing and Sample Requirements*

1. Before submitting a Shop Drawing or Sample, Contractor shall:

a. review and coordinate the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;

b. determine and verify:

1) all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect to the Submittal;

2) the suitability of all materials and equipment offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and

3) all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto;

c. confirm that the Submittal is complete with respect to all related data included in the Submittal.

2. Each Shop Drawing or Sample must bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review of that Submittal, and that Contractor approves the Submittal.

3. With each Shop Drawing or Sample, Contractor shall give Engineer specific written notice of any variations that the Submittal may have from the requirements of the Contract Documents. This notice must be set forth in a written communication separate from the Submittal; and, in addition, in the case of a Shop Drawing by a specific notation made on the Shop Drawing itself.

B. *Submittal Procedures for Shop Drawings and Samples*: Contractor shall label and submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals.

   1. *Shop Drawings*

      a. Contractor shall submit the number of copies required in the Specifications.

      b. Data shown on the Shop Drawings must be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide, and to enable Engineer to review the information for the limited purposes required by Paragraph 7.16.C.

   2. *Samples*

      a. Contractor shall submit the number of Samples required in the Specifications.

      b. Contractor shall clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the Submittal for the limited purposes required by Paragraph 7.16.C.

   3. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.

C. *Engineer's Review of Shop Drawings and Samples*

   1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the accepted Schedule of Submittals. Engineer's review and approval will be only to determine if the items covered by the Submittals will, after installation or incorporation in the Work, comply with the requirements of the Contract Documents, and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.

   2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction, or to safety precautions or programs incident thereto.

   3. Engineer's review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

   4. Engineer's review and approval of a Shop Drawing or Sample will not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 7.16.A.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer will

document any such approved variation from the requirements of the Contract Documents in a Field Order or other appropriate Contract modification.

5. Engineer's review and approval of a Shop Drawing or Sample will not relieve Contractor from responsibility for complying with the requirements of Paragraphs 7.16.A and B.

6. Engineer's review and approval of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, will not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.

7. Neither Engineer's receipt, review, acceptance, or approval of a Shop Drawing or Sample will result in such item becoming a Contract Document.

8. Contractor shall perform the Work in compliance with the requirements and commitments set forth in approved Shop Drawings and Samples, subject to the provisions of Paragraph 7.16.C.4.

D. *Resubmittal Procedures for Shop Drawings and Samples*

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous Submittals.

2. Contractor shall furnish required Shop Drawing and Sample submittals with sufficient information and accuracy to obtain required approval of an item with no more than two resubmittals. Engineer will record Engineer's time for reviewing a third or subsequent resubmittal of a Shop Drawing or Sample, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due Contractor to secure reimbursement for such charges.

3. If Contractor requests a change of a previously approved Shop Drawing or Sample, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

E. *Submittals Other than Shop Drawings, Samples, and Owner-Delegated Designs*

1. The following provisions apply to all Submittals other than Shop Drawings, Samples, and Owner-delegated designs:

   a. Contractor shall submit all such Submittals to the Engineer in accordance with the Schedule of Submittals and pursuant to the applicable terms of the Contract Documents.

   b. Engineer will provide timely review of all such Submittals in accordance with the Schedule of Submittals and return such Submittals with a notation of either Accepted or Not Accepted. Any such Submittal that is not returned within the time established in the Schedule of Submittals will be deemed accepted.

   c. Engineer's review will be only to determine if the Submittal is acceptable under the requirements of the Contract Documents as to general form and content of the Submittal.

d. If any such Submittal is not accepted, Contractor shall confer with Engineer regarding the reason for the non-acceptance, and resubmit an acceptable document.

2. Procedures for the submittal and acceptance of the Progress Schedule, the Schedule of Submittals, and the Schedule of Values are set forth in Paragraphs 2.03. 2.04, and 2.05.

F. Owner-delegated Designs: Submittals pursuant to Owner-delegated designs are governed by the provisions of Paragraph 7.19.

7.17 *Contractor's General Warranty and Guarantee*

A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer is entitled to rely on Contractor's warranty and guarantee.

B. Owner's rights under this warranty and guarantee are in addition to, and are not limited by, Owner's rights under the correction period provisions of Paragraph 15.08. The time in which Owner may enforce its warranty and guarantee rights under this Paragraph 7.17 is limited only by applicable Laws and Regulations restricting actions to enforce such rights; provided, however, that after the end of the correction period under Paragraph 15.08:

1. Owner shall give Contractor written notice of any defective Work within 60 days of the discovery that such Work is defective; and

2. Such notice will be deemed the start of an event giving rise to a Claim under Paragraph 12.01.B, such that any related Claim must be brought within 30 days of the notice.

C. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:

1. abuse, or improper modification, maintenance, or operation, by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or

2. normal wear and tear under normal usage.

D. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents is absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents, a release of Contractor's obligation to perform the Work in accordance with the Contract Documents, or a release of Owner's warranty and guarantee rights under this Paragraph 7.17:

1. Observations by Engineer;

2. Recommendation by Engineer or payment by Owner of any progress or final payment;

3. The issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;

4. Use or occupancy of the Work or any part thereof by Owner;

5. Any review and approval of a Shop Drawing or Sample submittal;

6. The issuance of a notice of acceptability by Engineer;

7. The end of the correction period established in Paragraph 15.08;

8. Any inspection, test, or approval by others; or

9. Any correction of defective Work by Owner.

E. If the Contract requires the Contractor to accept the assignment of a contract entered into by Owner, then the specific warranties, guarantees, and correction obligations contained in the assigned contract will govern with respect to Contractor's performance obligations to Owner for the Work described in the assigned contract.

7.18 *Indemnification*

A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from losses, damages, costs, and judgments (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising from third-party claims or actions relating to or resulting from the performance or furnishing of the Work, provided that any such claim, action, loss, cost, judgment or damage is attributable to bodily injury, sickness, disease, or death, or to damage to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom, but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable.

B. In any and all claims against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 7.18.A will not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

7.19 *Delegation of Professional Design Services*

A. Owner may require Contractor to provide professional design services for a portion of the Work by express delegation in the Contract Documents. Such delegation will specify the performance and design criteria that such services must satisfy, and the Submittals that Contractor must furnish to Engineer with respect to the Owner-delegated design.

B. Contractor shall cause such Owner-delegated professional design services to be provided pursuant to the professional standard of care by a properly licensed design professional, whose signature and seal must appear on all drawings, calculations, specifications, certifications, and Submittals prepared by such design professional. Such design professional must issue all certifications of design required by Laws and Regulations.

C. If a Shop Drawing or other Submittal related to the Owner-delegated design is prepared by Contractor, a Subcontractor, or others for submittal to Engineer, then such Shop Drawing or other Submittal must bear the written approval of Contractor's design professional when submitted by Contractor to Engineer.

D. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, and approvals performed or provided by the design professionals retained or employed by Contractor under an Owner-delegated design, subject to the professional standard of care and the performance and design criteria stated in the Contract Documents.

E. Pursuant to this Paragraph 7.19, Engineer's review, approval, and other determinations regarding design drawings, calculations, specifications, certifications, and other Submittals furnished by Contractor pursuant to an Owner-delegated design will be only for the following limited purposes:

1. Checking for conformance with the requirements of this Paragraph 7.19;

2. Confirming that Contractor (through its design professionals) has used the performance and design criteria specified in the Contract Documents; and

3. Establishing that the design furnished by Contractor is consistent with the design concept expressed in the Contract Documents.

F. Contractor shall not be responsible for the adequacy of performance or design criteria specified by Owner or Engineer.

G. Contractor is not required to provide professional services in violation of applicable Laws and Regulations.

ARTICLE 8—OTHER WORK AT THE SITE

8.01 *Other Work*

A. In addition to and apart from the Work under the Contract Documents, the Owner may perform other work at or adjacent to the Site. Such other work may be performed by Owner's employees, or through contracts between the Owner and third parties. Owner may also arrange to have third-party utility owners perform work on their utilities and facilities at or adjacent to the Site.

B. If Owner performs other work at or adjacent to the Site with Owner's employees, or through contracts for such other work, then Owner shall give Contractor written notice thereof prior to starting any such other work. If Owner has advance information regarding the start of any third-party utility work that Owner has arranged to take place at or adjacent to the Site, Owner shall provide such information to Contractor.

C. Contractor shall afford proper and safe access to the Site to each contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work.

D. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected.

E. If the proper execution or results of any part of Contractor's Work depends upon work performed by others, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

F. The provisions of this article are not applicable to work that is performed by third-party utilities or other third-party entities without a contract with Owner, or that is performed without having been arranged by Owner. If such work occurs, then any related delay, disruption, or interference incurred by Contractor is governed by the provisions of Paragraph 4.05.C.3.

8.02 *Coordination*

A. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, to perform other work at or adjacent to the Site with Owner's employees, or to arrange to have utility owners perform work at or adjacent to the Site, the following will be set forth in the Supplementary Conditions or provided to Contractor prior to the start of any such other work:

1. The identity of the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors;

2. An itemization of the specific matters to be covered by such authority and responsibility; and

3. The extent of such authority and responsibilities.

B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

8.03 *Legal Relationships*

A. If, in the course of performing other work for Owner at or adjacent to the Site, the Owner's employees, any other contractor working for Owner, or any utility owner that Owner has arranged to perform work, causes damage to the Work or to the property of Contractor or its Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Work, through actions or inaction, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times. Contractor must submit any Change Proposal seeking an equitable adjustment in the Contract Price or the Contract Times under this paragraph within 30 days of the damaging, delaying, disrupting, or interfering event. The entitlement to, and extent of, any such equitable adjustment will take into account information (if any) regarding such other work that was provided to Contractor in the Contract Documents prior to the submittal of the Bid or the final negotiation of the terms of the Contract, and any remedies available to Contractor under Laws or Regulations concerning utility action or inaction. When applicable, any such equitable adjustment in Contract Price will be conditioned on Contractor assigning to Owner all Contractor's rights against such other contractor or utility owner with respect to the damage, delay, disruption, or interference that is the subject of the adjustment. Contractor's entitlement to an adjustment of the Contract Times or Contract Price is subject to the provisions of Paragraphs 4.05.D and 4.05.E.

B. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site.

1. If Contractor fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due Contractor, and assign to such other contractor or utility owner the Owner's contractual rights against Contractor with respect to the breach of the obligations set forth in this Paragraph 8.03.B.

2. When Owner is performing other work at or adjacent to the Site with Owner's employees, Contractor shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of Contractor's failure to take reasonable and customary measures with respect to Owner's other work. In response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due Contractor.

C. If Contractor damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Contractor's failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Contractor's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Contractor, Owner, or Engineer, then Contractor shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claims, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such damage, delay, disruption, or interference.

ARTICLE 9—OWNER'S RESPONSIBILITIES

9.01 *Communications to Contractor*

A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

9.02 *Replacement of Engineer*

A. Owner may at its discretion appoint an engineer to replace Engineer, provided Contractor makes no reasonable objection to the replacement engineer. The replacement engineer's status under the Contract Documents will be that of the former Engineer.

9.03 *Furnish Data*

A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

9.04 *Pay When Due*

A. Owner shall make payments to Contractor when they are due as provided in the Agreement.

9.05 *Lands and Easements; Reports, Tests, and Drawings*

A. Owner's duties with respect to providing lands and easements are set forth in Paragraph 5.01.

B. Owner's duties with respect to providing engineering surveys to establish reference points are set forth in Paragraph 4.03.

C. Article 5 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of conditions at the Site, and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

9.06 *Insurance*

A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 6.

9.07 *Change Orders*

A. Owner's responsibilities with respect to Change Orders are set forth in Article 11.

9.08 *Inspections, Tests, and Approvals*

A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 14.02.B.

9.09 *Limitations on Owner's Responsibilities*

A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

9.10 *Undisclosed Hazardous Environmental Condition*

A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 5.06.

9.11 *Evidence of Financial Arrangements*

A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract (including obligations under proposed changes in the Work).

9.12 *Safety Programs*

A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed.

B. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

ARTICLE 10—ENGINEER'S STATUS DURING CONSTRUCTION

10.01 *Owner's Representative*

A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract.

10.02 *Visits to Site*

A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe, as an experienced and qualified design professional, the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.

B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 10.07. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

10.03 *Resident Project Representative*

A. If Owner and Engineer have agreed that Engineer will furnish a Resident Project Representative to represent Engineer at the Site and assist Engineer in observing the progress and quality of the Work, then the authority and responsibilities of any such Resident Project Representative will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in the Supplementary Conditions and in Paragraph 10.07.

B. If Owner designates an individual or entity who is not Engineer's consultant, agent, or employee to represent Owner at the Site, then the responsibilities and authority of such individual or entity will be as provided in the Supplementary Conditions.

10.04 *Engineer's Authority*

A. Engineer has the authority to reject Work in accordance with Article 14.

B. Engineer's authority as to Submittals is set forth in Paragraph 7.16.

C. Engineer's authority as to design drawings, calculations, specifications, certifications and other Submittals from Contractor in response to Owner's delegation (if any) to Contractor of professional design services, is set forth in Paragraph 7.19.

D. Engineer's authority as to changes in the Work is set forth in Article 11.

E. Engineer's authority as to Applications for Payment is set forth in Article 15.

10.05 *Determinations for Unit Price Work*

A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor as set forth in Paragraph 13.03.

10.06 *Decisions on Requirements of Contract Documents and Acceptability of Work*

A. Engineer will render decisions regarding the requirements of the Contract Documents, and judge the acceptability of the Work, pursuant to the specific procedures set forth herein for initial interpretations, Change Proposals, and acceptance of the Work. In rendering such decisions and judgments, Engineer will not show partiality to Owner or Contractor, and will not be liable to Owner, Contractor, or others in connection with any proceedings, interpretations, decisions, or judgments conducted or rendered in good faith.

10.07 *Limitations on Engineer's Authority and Responsibilities*

A. Neither Engineer's authority or responsibility under this Article 10 or under any other provision of the Contract, nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer, will create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.

D. Engineer's review of the final Application for Payment and accompanying documentation, and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Contractor under Paragraph 15.06.A, will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals, that the results certified indicate compliance with the Contract Documents.

E. The limitations upon authority and responsibility set forth in this Paragraph 10.07 also apply to the Resident Project Representative, if any.

10.08 *Compliance with Safety Program*

A. While at the Site, Engineer's employees and representatives will comply with the specific applicable requirements of Owner's and Contractor's safety programs of which Engineer has been informed.

ARTICLE 11—CHANGES TO THE CONTRACT

11.01 *Amending and Supplementing the Contract*

A. The Contract may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.

B. If an amendment or supplement to the Contract includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order.

C. All changes to the Contract that involve (1) the performance or acceptability of the Work, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, must be supported by Engineer's recommendation. Owner and Contractor may amend other terms and conditions of the Contract without the recommendation of the Engineer.

11.02 *Change Orders*

A. Owner and Contractor shall execute appropriate Change Orders covering:

1. Changes in Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;

2. Changes in Contract Price resulting from an Owner set-off, unless Contractor has duly contested such set-off;

3. Changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.05, (b) required because of Owner's acceptance of defective Work under Paragraph 14.04 or Owner's correction of defective Work under Paragraph 14.07, or (c) agreed to by the parties, subject to the need for Engineer's recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise) or other engineering or technical matters; and

4. Changes that embody the substance of any final and binding results under: Paragraph 11.03.B, resolving the impact of a Work Change Directive; Paragraph 11.09, concerning Change Proposals; Article 12, Claims; Paragraph 13.02.D, final adjustments resulting from allowances; Paragraph 13.03.D, final adjustments relating to determination of quantities for Unit Price Work; and similar provisions.

B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of Paragraph 11.02.A, it will be deemed to be of full force and effect, as if fully executed.

11.03 *Work Change Directives*

A. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the modification ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order, following negotiations by the parties as to the Work Change Directive's effect, if any, on the Contract Price and Contract Times; or, if negotiations are unsuccessful, by a determination under the terms of the Contract Documents governing adjustments, expressly including Paragraph 11.07 regarding change of Contract Price.

B. If Owner has issued a Work Change Directive and:

1. Contractor believes that an adjustment in Contract Times or Contract Price is necessary, then Contractor shall submit any Change Proposal seeking such an adjustment no later than 30 days after the completion of the Work set out in the Work Change Directive.

2. Owner believes that an adjustment in Contract Times or Contract Price is necessary, then Owner shall submit any Claim seeking such an adjustment no later than 60 days after issuance of the Work Change Directive.

11.04 *Field Orders*

A. Engineer may authorize minor changes in the Work if the changes do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Such changes will be accomplished by a Field Order and will be binding on Owner and also on Contractor, which shall perform the Work involved promptly.

B. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

11.05 *Owner-Authorized Changes in the Work*

A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work. Changes involving the design (as set forth in the Drawings, Specifications, or otherwise) or other engineering or technical matters will be supported by Engineer's recommendation.

B. Such changes in the Work may be accomplished by a Change Order, if Owner and Contractor have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved; or, in the case of a deletion in the Work, promptly cease construction activities with respect to such deleted Work. Added or revised Work must be performed under the applicable conditions of the Contract Documents.

C. Nothing in this Paragraph 11.05 obligates Contractor to undertake work that Contractor reasonably concludes cannot be performed in a manner consistent with Contractor's safety obligations under the Contract Documents or Laws and Regulations.

11.06 *Unauthorized Changes in the Work*

A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents, as amended, modified, or supplemented, except in the case of an emergency as provided in Paragraph 7.15 or in the case of uncovering Work as provided in Paragraph 14.05.C.2.

11.07 *Change of Contract Price*

A. The Contract Price may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Price must comply with the provisions of Paragraph 11.09. Any Claim for an adjustment of Contract Price must comply with the provisions of Article 12.

B. An adjustment in the Contract Price will be determined as follows:

1. Where the Work involved is covered by unit prices contained in the Contract Documents, then by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 13.03);

2. Where the Work involved is not covered by unit prices contained in the Contract Documents, then by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.07.C.2); or

3. Where the Work involved is not covered by unit prices contained in the Contract Documents and the parties do not reach mutual agreement to a lump sum, then on the basis of the Cost of the Work (determined as provided in Paragraph 13.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 11.07.C).

C. *Contractor's Fee*: When applicable, the Contractor's fee for overhead and profit will be determined as follows:

1. A mutually acceptable fixed fee; or

2. If a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:

a. For costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2, the Contractor's fee will be 15 percent;

b. For costs incurred under Paragraph 13.01.B.3, the Contractor's fee will be 5 percent;

c. Where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 11.07.C.2.a and 11.07.C.2.b is that the Contractor's fee will be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2 by the Subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Contractor itself and to any Subcontractors of a tier higher than that of the Subcontractor that actually performs the Work, a fee of 5 percent of the amount (fee plus underlying costs incurred) attributable to the next lower tier Subcontractor; provided, however, that for any such subcontracted Work the maximum total fee to be paid by Owner will be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the Work;

d. No fee will be payable on the basis of costs itemized under Paragraphs 13.01.B.4, 13.01.B.5, and 13.01.C;

e. The amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in Cost of the Work will be the amount of the actual net decrease in Cost of the Work and a deduction of an additional amount equal to 5 percent of such actual net decrease in Cost of the Work; and

f. When both additions and credits are involved in any one change or Change Proposal, the adjustment in Contractor's fee will be computed by determining the sum of the costs in each of the cost categories in Paragraph 13.01.B (specifically, payroll costs, Paragraph 13.01.B.1; incorporated materials and equipment costs, Paragraph 13.01.B.2; Subcontract costs, Paragraph 13.01.B.3; special consultants costs, Paragraph 13.01.B.4; and other costs, Paragraph 13.01.B.5) and applying to each such cost category sum the appropriate fee from Paragraphs 11.07.C.2.a through 11.07.C.2.e, inclusive.

11.08 *Change of Contract Times*

A. The Contract Times may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Times must comply with the provisions of Paragraph 11.09. Any Claim for an adjustment in the Contract Times must comply with the provisions of Article 12.

B. Delay, disruption, and interference in the Work, and any related changes in Contract Times, are addressed in and governed by Paragraph 4.05.

11.09 *Change Proposals*

A. *Purpose and Content*: Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; contest an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; challenge a set-off against payment due; or seek other relief under the Contract. The Change Proposal will specify any proposed change in Contract Times or Contract Price, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents. Each Change Proposal will address only one issue, or a set of closely related issues.

B. *Change Proposal Procedures*

1. *Submittal*: Contractor shall submit each Change Proposal to Engineer within 30 days after the start of the event giving rise thereto, or after such initial decision.

2. *Supporting Data*: The Contractor shall submit supporting data, including the proposed change in Contract Price or Contract Time (if any), to the Engineer and Owner within 15 days after the submittal of the Change Proposal.

    a. Change Proposals based on or related to delay, interruption, or interference must comply with the provisions of Paragraphs 4.05.D and 4.05.E.

    b. Change proposals related to a change of Contract Price must include full and detailed accounts of materials incorporated into the Work and labor and equipment used for the subject Work.

    The supporting data must be accompanied by a written statement that the supporting data are accurate and complete, and that any requested time or price adjustment is the entire adjustment to which Contractor believes it is entitled as a result of said event.

3. *Engineer's Initial Review*: Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal. If in its discretion Engineer concludes that additional supporting data is needed before conducting a full review and making a decision regarding the Change Proposal, then Engineer may request that Contractor submit such additional supporting data by a date specified by Engineer, prior to Engineer beginning its full review of the Change Proposal.

4. *Engineer's Full Review and Action on the Change Proposal*: Upon receipt of Contractor's supporting data (including any additional data requested by Engineer), Engineer will conduct a full review of each Change Proposal and, within 30 days after such receipt of the Contractor's supporting data, either approve the Change Proposal in whole, deny it in whole, or approve it in part and deny it in part. Such actions must be in writing, with a copy provided to Owner and Contractor. If Engineer does not take action on the Change

Proposal within 30 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of Engineer's inaction the Change Proposal is deemed denied, thereby commencing the time for appeal of the denial under Article 12.

5. *Binding Decision*: Engineer's decision is final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.

C. *Resolution of Certain Change Proposals*: If the Change Proposal does not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters, then Engineer will notify the parties in writing that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice will be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.

D. *Post-Completion*: Contractor shall not submit any Change Proposals after Engineer issues a written recommendation of final payment pursuant to Paragraph 15.06.B.

11.10 *Notification to Surety*

A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

ARTICLE 12—CLAIMS

12.01 *Claims*

A. *Claims Process*: The following disputes between Owner and Contractor are subject to the Claims process set forth in this article:

1. Appeals by Owner or Contractor of Engineer's decisions regarding Change Proposals;

2. Owner demands for adjustments in the Contract Price or Contract Times, or other relief under the Contract Documents;

3. Disputes that Engineer has been unable to address because they do not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters; and

4. Subject to the waiver provisions of Paragraph 15.07, any dispute arising after Engineer has issued a written recommendation of final payment pursuant to Paragraph 15.06.B.

B. *Submittal of Claim*: The party submitting a Claim shall deliver it directly to the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto; in the case of appeals regarding Change Proposals within 30 days of the decision under appeal. The party submitting the Claim shall also furnish a copy to the Engineer, for its information only. The responsibility to substantiate a Claim rests with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, Contractor shall certify that the Claim is made in good faith, that the supporting data are accurate and complete, and that to the best of Contractor's knowledge

and belief the amount of time or money requested accurately reflects the full amount to which Contractor is entitled.

C. *Review and Resolution*: The party receiving a Claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the Claim through the exchange of information and direct negotiations. The parties may extend the time for resolving the Claim by mutual agreement. All actions taken on a Claim will be stated in writing and submitted to the other party, with a copy to Engineer.

D. *Mediation*

1. At any time after initiation of a Claim, Owner and Contractor may mutually agree to mediation of the underlying dispute. The agreement to mediate will stay the Claim submittal and response process.

2. If Owner and Contractor agree to mediation, then after 60 days from such agreement, either Owner or Contractor may unilaterally terminate the mediation process, and the Claim submittal and decision process will resume as of the date of the termination. If the mediation proceeds but is unsuccessful in resolving the dispute, the Claim submittal and decision process will resume as of the date of the conclusion of the mediation, as determined by the mediator.

3. Owner and Contractor shall each pay one-half of the mediator's fees and costs.

E. *Partial Approval*: If the party receiving a Claim approves the Claim in part and denies it in part, such action will be final and binding unless within 30 days of such action the other party invokes the procedure set forth in Article 17 for final resolution of disputes.

F. *Denial of Claim*: If efforts to resolve a Claim are not successful, the party receiving the Claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the Claim within 90 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of the inaction, the Claim is deemed denied, thereby commencing the time for appeal of the denial. A denial of the Claim will be final and binding unless within 30 days of the denial the other party invokes the procedure set forth in Article 17 for the final resolution of disputes.

G. *Final and Binding Results*: If the parties reach a mutual agreement regarding a Claim, whether through approval of the Claim, direct negotiations, mediation, or otherwise; or if a Claim is approved in part and denied in part, or denied in full, and such actions become final and binding; then the results of the agreement or action on the Claim will be incorporated in a Change Order or other written document to the extent they affect the Contract, including the Work, the Contract Times, or the Contract Price.

ARTICLE 13—COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

13.01 *Cost of the Work*

A. *Purposes for Determination of Cost of the Work*: The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:

1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or

2. When needed to determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.

B. *Costs Included*: Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work will be in amounts no higher than those commonly incurred in the locality of the Project, will not include any of the costs itemized in Paragraph 13.01.C, and will include only the following items:

1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor in advance of the subject Work. Such employees include, without limitation, superintendents, foremen, safety managers, safety representatives, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work will be apportioned on the basis of their time spent on the Work. Payroll costs include, but are not limited to, salaries and wages plus the cost of fringe benefits, which include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, sick leave, and vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, will be included in the above to the extent authorized by Owner.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts will accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment will accrue to Owner, and Contractor shall make provisions so that they may be obtained.

3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, which will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee will be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 13.01.

4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed or retained for services specifically related to the Work.

5. Other costs consisting of the following:

a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.

b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, which are

consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.

1) In establishing included costs for materials such as scaffolding, plating, or sheeting, consideration will be given to the actual or the estimated life of the material for use on other projects; or rental rates may be established on the basis of purchase or salvage value of such items, whichever is less. Contractor will not be eligible for compensation for such items in an amount that exceeds the purchase cost of such item.

c. *Construction Equipment Rental*

1) Rentals of all construction equipment and machinery, and the parts thereof, in accordance with rental agreements approved by Owner as to price (including any surcharge or special rates applicable to overtime use of the construction equipment or machinery), and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs will be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts must cease when the use thereof is no longer necessary for the Work.

2) Costs for equipment and machinery owned by Contractor or a Contractor-related entity will be paid at a rate shown for such equipment in the equipment rental rate book specified in the Supplementary Conditions. An hourly rate will be computed by dividing the monthly rates by 176. These computed rates will include all operating costs.

3) With respect to Work that is the result of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price ("changed Work"), included costs will be based on the time the equipment or machinery is in use on the changed Work and the costs of transportation, loading, unloading, assembly, dismantling, and removal when directly attributable to the changed Work. The cost of any such equipment or machinery, or parts thereof, must cease to accrue when the use thereof is no longer necessary for the changed Work.

d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.

e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.

f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of builder's risk or other property insurance established in accordance with Paragraph 6.04), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses will be included in the Cost of the Work for the purpose of determining Contractor's fee.

g. The cost of utilities, fuel, and sanitary facilities at the Site.

h. Minor expenses such as communication service at the Site, express and courier services, and similar petty cash items in connection with the Work.

i. The costs of premiums for all bonds and insurance that Contractor is required by the Contract Documents to purchase and maintain.

C. *Costs Excluded*: The term Cost of the Work does not include any of the following items:

1. Payroll costs and other compensation of Contractor's officers, executives, principals, general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expediters, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.

2. The cost of purchasing, renting, or furnishing small tools and hand tools.

3. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.

4. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.

5. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.

6. Expenses incurred in preparing and advancing Claims.

7. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.

D. *Contractor's Fee*

1. When the Work as a whole is performed on the basis of cost-plus-a-fee, then:

a. Contractor's fee for the Work set forth in the Contract Documents as of the Effective Date of the Contract will be determined as set forth in the Agreement.

b. for any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work, Contractor's fee will be determined as follows:

1) When the fee for the Work as a whole is a percentage of the Cost of the Work, the fee will automatically adjust as the Cost of the Work changes.

2) When the fee for the Work as a whole is a fixed fee, the fee for any additions or deletions will be determined in accordance with Paragraph 11.07.C.2.

2. When the Work as a whole is performed on the basis of a stipulated sum, or any other basis other than cost-plus-a-fee, then Contractor's fee for any Work covered by a Change

Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work will be determined in accordance with Paragraph 11.07.C.2.

E. *Documentation and Audit*: Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor and pertinent Subcontractors will establish and maintain records of the costs in accordance with generally accepted accounting practices. Subject to prior written notice, Owner will be afforded reasonable access, during normal business hours, to all Contractor's accounts, records, books, correspondence, instructions, drawings, receipts, vouchers, memoranda, and similar data relating to the Cost of the Work and Contractor's fee. Contractor shall preserve all such documents for a period of three years after the final payment by Owner. Pertinent Subcontractors will afford such access to Owner, and preserve such documents, to the same extent required of Contractor.

13.02 *Allowances*

A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.

B. *Cash Allowances*: Contractor agrees that:

1. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and

2. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment for any of the foregoing will be valid.

C. *Owner's Contingency Allowance*: Contractor agrees that an Owner's contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.

D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor for Work covered by allowances, and the Contract Price will be correspondingly adjusted.

13.03 *Unit Price Work*

A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.

B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Payments to Contractor for Unit Price Work will be based on actual quantities.

C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.

D. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision

thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, and the final adjustment of Contract Price will be set forth in a Change Order, subject to the provisions of the following paragraph.

E. *Adjustments in Unit Price*

1. Contractor or Owner shall be entitled to an adjustment in the unit price with respect to an item of Unit Price Work if:

   a. the quantity of the item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and

   b. Contractor's unit costs to perform the item of Unit Price Work have changed materially and significantly as a result of the quantity change.

2. The adjustment in unit price will account for and be coordinated with any related changes in quantities of other items of Work, and in Contractor's costs to perform such other Work, such that the resulting overall change in Contract Price is equitable to Owner and Contractor.

3. Adjusted unit prices will apply to all units of that item.

ARTICLE 14—TESTS AND INSPECTIONS; CORRECTION, REMOVAL, OR ACCEPTANCE OF DEFECTIVE WORK

14.01 *Access to Work*

A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and authorities having jurisdiction have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply with such procedures and programs as applicable.

14.02 *Tests, Inspections, and Approvals*

A. Contractor shall give Engineer timely notice of readiness of the Work (or specific parts thereof) for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.

B. Owner shall retain and pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required by the Contract Documents to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Work will be governed by the provisions of Paragraph 14.05.

C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.

D. Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required:

1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;

2. to attain Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work;

3. by manufacturers of equipment furnished under the Contract Documents;

4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and

5. for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

Such inspections and tests will be performed by independent inspectors, testing laboratories, or other qualified individuals or entities acceptable to Owner and Engineer.

E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.

F. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering will be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to cover the same and Engineer had not acted with reasonable promptness in response to such notice.

14.03 *Defective Work*

A. *Contractor's Obligation*: It is Contractor's obligation to assure that the Work is not defective.

B. *Engineer's Authority*: Engineer has the authority to determine whether Work is defective, and to reject defective Work.

C. *Notice of Defects*: Prompt written notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.

D. *Correction, or Removal and Replacement*: Promptly after receipt of written notice of defective Work, Contractor shall correct all such defective Work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective Work, remove it from the Project and replace it with Work that is not defective.

E. *Preservation of Warranties*: When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

F. *Costs and Damages*: In addition to its correction, removal, and replacement obligations with respect to defective Work, Contractor shall pay all claims, costs, losses, and damages arising out of or relating to defective Work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective Work, fines levied against Owner by governmental authorities because the Work is defective, and the costs of repair or replacement of work of others resulting from defective Work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs,

losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

14.04 *Acceptance of Defective Work*

A. If, instead of requiring correction or removal and replacement of defective Work, Owner prefers to accept it, Owner may do so (subject, if such acceptance occurs prior to final payment, to Engineer's confirmation that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety). Contractor shall pay all claims, costs, losses, and damages attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness), and for the diminished value of the Work to the extent not otherwise paid by Contractor. If any such acceptance occurs prior to final payment, the necessary revisions in the Contract Documents with respect to the Work will be incorporated in a Change Order. If the parties are unable to agree as to the decrease in the Contract Price, reflecting the diminished value of Work so accepted, then Owner may impose a reasonable set-off against payments due under Article 15. If the acceptance of defective Work occurs after final payment, Contractor shall pay an appropriate amount to Owner.

14.05 *Uncovering Work*

A. Engineer has the authority to require additional inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.

B. If any Work is covered contrary to the written request of Engineer, then Contractor shall, if requested by Engineer, uncover such Work for Engineer's observation, and then replace the covering, all at Contractor's expense.

C. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, then Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, and provide all necessary labor, material, and equipment.

1. If it is found that the uncovered Work is defective, Contractor shall be responsible for all claims, costs, losses, and damages arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and pending Contractor's full discharge of this responsibility the Owner shall be entitled to impose a reasonable set-off against payments due under Article 15.

2. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, then Contractor may submit a Change Proposal within 30 days of the determination that the Work is not defective.

14.06 *Owner May Stop the Work*

A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, then Owner may order Contractor to stop the Work,

or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work will not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

14.07 *Owner May Correct Defective Work*

A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace defective Work as required by Engineer, then Owner may, after 7 days' written notice to Contractor, correct or remedy any such deficiency.

B. In exercising the rights and remedies under this Paragraph 14.07, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this paragraph.

C. All claims, costs, losses, and damages incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.

D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 14.07.

ARTICLE 15—PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD

15.01 *Progress Payments*

A. *Basis for Progress Payments*: The Schedule of Values established as provided in Article 2 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments for Unit Price Work will be based on the number of units completed during the pay period, as determined under the provisions of Paragraph 13.03. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.

B. *Applications for Payments*

1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents.

2. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment must also be accompanied by: (a) a bill of sale, invoice, copies of subcontract or purchase order payments, or other documentation

establishing full payment by Contractor for the materials and equipment; (b) at Owner's request, documentation warranting that Owner has received the materials and equipment free and clear of all Liens; and (c) evidence that the materials and equipment are covered by appropriate property insurance, a warehouse bond, or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.

3. Beginning with the second Application for Payment, each Application must include an affidavit of Contractor stating that all previous progress payments received by Contractor have been applied to discharge Contractor's legitimate obligations associated with prior Applications for Payment.

4. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

C. *Review of Applications*

1. Engineer will, within 10 days after receipt of each Application for Payment, including each resubmittal, either indicate in writing a recommendation of payment and present the Application to Owner, or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.

2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:

   a. the Work has progressed to the point indicated;

   b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 13.03, and any other qualifications stated in the recommendation); and

   c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.

3. By recommending any such payment Engineer will not thereby be deemed to have represented that:

   a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract; or

   b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.

4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:

    a. to supervise, direct, or control the Work;

    b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto;

    c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work;

    d. to make any examination to ascertain how or for what purposes Contractor has used the money paid by Owner; or

    e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.

5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 15.01.C.2.

6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer's opinion to protect Owner from loss because:

    a. the Work is defective, requiring correction or replacement;

    b. the Contract Price has been reduced by Change Orders;

    c. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;

    d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible; or

    e. Engineer has actual knowledge of the occurrence of any of the events that would constitute a default by Contractor and therefore justify termination for cause under the Contract Documents.

D. *Payment Becomes Due*

1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended (subject to any Owner set-offs) will become due, and when due will be paid by Owner to Contractor.

E. *Reductions in Payment by Owner*

1. In addition to any reductions in payment (set-offs) recommended by Engineer, Owner is entitled to impose a set-off against payment based on any of the following:

    a. Claims have been made against Owner based on Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages resulting from Contractor's conduct in the performance or furnishing of the Work, including but not limited to claims, costs, losses, or damages from workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;

b. Contractor has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;

c. Contractor has failed to provide and maintain required bonds or insurance;

d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible;

e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;

f. The Work is defective, requiring correction or replacement;

g. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;

h. The Contract Price has been reduced by Change Orders;

i. An event has occurred that would constitute a default by Contractor and therefore justify a termination for cause;

j. Liquidated or other damages have accrued as a result of Contractor's failure to achieve Milestones, Substantial Completion, or final completion of the Work;

k. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens; or

l. Other items entitle Owner to a set-off against the amount recommended.

2. If Owner imposes any set-off against payment, whether based on its own knowledge or on the written recommendations of Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and the specific amount of the reduction, and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, if Contractor remedies the reasons for such action. The reduction imposed will be binding on Contractor unless it duly submits a Change Proposal contesting the reduction.

3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld will be treated as an amount due as determined by Paragraph 15.01.D.1 and subject to interest as provided in the Agreement.

15.02 *Contractor's Warranty of Title*

A. Contractor warrants and guarantees that title to all Work, materials, and equipment furnished under the Contract will pass to Owner free and clear of (1) all Liens and other title defects, and (2) all patent, licensing, copyright, or royalty obligations, no later than 7 days after the time of payment by Owner.

15.03 *Substantial Completion*

A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete and request that Engineer issue a certificate of Substantial Completion. Contractor shall at the same time

submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.

B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.

C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a preliminary certificate of Substantial Completion which will fix the date of Substantial Completion. Engineer shall attach to the certificate a punch list of items to be completed or corrected before final payment. Owner shall have 7 days after receipt of the preliminary certificate during which to make written objection to Engineer as to any provisions of the certificate or attached punch list. If, after considering the objections to the provisions of the preliminary certificate, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the preliminary certificate to Owner, notify Contractor in writing that the Work is not substantially complete, stating the reasons therefor. If Owner does not object to the provisions of the certificate, or if despite consideration of Owner's objections Engineer concludes that the Work is substantially complete, then Engineer will, within said 14 days, execute and deliver to Owner and Contractor a final certificate of Substantial Completion (with a revised punch list of items to be completed or corrected) reflecting such changes from the preliminary certificate as Engineer believes justified after consideration of any objections from Owner.

D. At the time of receipt of the preliminary certificate of Substantial Completion, Owner and Contractor will confer regarding Owner's use or occupancy of the Work following Substantial Completion, review the builder's risk insurance policy with respect to the end of the builder's risk coverage, and confirm the transition to coverage of the Work under a permanent property insurance policy held by Owner. Unless Owner and Contractor agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the Work.

E. After Substantial Completion the Contractor shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Contractor may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.

F. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the punch list.

15.04 *Partial Use or Occupancy*

A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without

significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:

1. At any time, Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 15.03.A through 15.03.E for that part of the Work.

2. At any time, Contractor may notify Owner and Engineer in writing that Contractor considers any such part of the Work substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.

3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 15.03 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 6.04 regarding builder's risk or other property insurance.

15.05 *Final Inspection*

A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work, or agreed portion thereof, is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

15.06 *Final Payment*

A. *Application for Payment*

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, annotated record documents (as provided in Paragraph 7.12), and other documents, Contractor may make application for final payment.

2. The final Application for Payment must be accompanied (except as previously delivered) by:

   a. all documentation called for in the Contract Documents;

   b. consent of the surety, if any, to final payment;

   c. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.

d. a list of all duly pending Change Proposals and Claims; and

e. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.

3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.

B. *Engineer's Review of Final Application and Recommendation of Payment*: If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract have been fulfilled, Engineer will, within 10 days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the final Application for Payment to Owner for payment. Such recommendation will account for any set-offs against payment that are necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

C. *Notice of Acceptability*: In support of its recommendation of payment of the final Application for Payment, Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to stated limitations in the notice and to the provisions of Paragraph 15.07.

D. *Completion of Work*: The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment and issuance of notice of the acceptability of the Work.

E. *Final Payment Becomes Due*: Upon receipt from Engineer of the final Application for Payment and accompanying documentation, Owner shall set off against the amount recommended by Engineer for final payment any further sum to which Owner is entitled, including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions of this Contract with respect to progress payments. Owner shall pay the resulting balance due to Contractor within 30 days of Owner's receipt of the final Application for Payment from Engineer.

15.07 *Waiver of Claims*

A. By making final payment, Owner waives its claim or right to liquidated damages or other damages for late completion by Contractor, except as set forth in an outstanding Claim,

appeal under the provisions of Article 17, set-off, or express reservation of rights by Owner. Owner reserves all other claims or rights after final payment.

B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted as a Claim, or appealed under the provisions of Article 17.

15.08 *Correction Period*

A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the Supplementary Conditions or the terms of any applicable special guarantee required by the Contract Documents), Owner gives Contractor written notice that any Work has been found to be defective, or that Contractor's repair of any damages to the Site or adjacent areas has been found to be defective, then after receipt of such notice of defect Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:

1. correct the defective repairs to the Site or such adjacent areas;
2. correct such defective Work;
3. remove the defective Work from the Project and replace it with Work that is not defective, if the defective Work has been rejected by Owner, and
4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others, or to other land or areas resulting from the corrective measures.

B. Owner shall give any such notice of defect within 60 days of the discovery that such Work or repairs is defective. If such notice is given within such 60 days but after the end of the correction period, the notice will be deemed a notice of defective Work under Paragraph 7.17.B.

C. If, after receipt of a notice of defect within 60 days and within the correction period, Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. Contractor shall pay all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others). Contractor's failure to pay such costs, losses, and damages within 10 days of invoice from Owner will be deemed the start of an event giving rise to a Claim under Paragraph 12.01.B, such that any related Claim must be brought within 30 days of the failure to pay.

D. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.

E. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

F. Contractor's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph are not to be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

ARTICLE 16—SUSPENSION OF WORK AND TERMINATION

16.01 *Owner May Suspend Work*

A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times directly attributable to any such suspension. Any Change Proposal seeking such adjustments must be submitted no later than 30 days after the date fixed for resumption of Work.

16.02 *Owner May Terminate for Cause*

A. The occurrence of any one or more of the following events will constitute a default by Contractor and justify termination for cause:

1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment, or failure to adhere to the Progress Schedule);
2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;
3. Contractor's disregard of Laws or Regulations of any public body having jurisdiction; or
4. Contractor's repeated disregard of the authority of Owner or Engineer.

B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) 10 days' written notice that Owner is considering a declaration that Contractor is in default and termination of the Contract, Owner may proceed to:

1. declare Contractor to be in default, and give Contractor (and any surety) written notice that the Contract is terminated; and
2. enforce the rights available to Owner under any applicable performance bond.

C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and complete the Work as Owner may deem expedient.

D. Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within 7 days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.

E. If Owner proceeds as provided in Paragraph 16.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects,

attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses, and damages exceeds such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this paragraph, Owner shall not be required to obtain the lowest price for the Work performed.

F. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue, or any rights or remedies of Owner against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.

G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond will govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

16.03 *Owner May Terminate for Convenience*

A. Upon 7 days' written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):

1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;

2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses; and

3. other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.

B. Contractor shall not be paid for any loss of anticipated profits or revenue, post-termination overhead costs, or other economic loss arising out of or resulting from such termination.

16.04 *Contractor May Stop Work or Terminate*

A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (3) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon 7 days' written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the contract and recover from Owner payment on the same terms as provided in Paragraph 16.03.

B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, 7 days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The

provisions of this paragraph are not intended to preclude Contractor from submitting a Change Proposal for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this paragraph.

ARTICLE 17—FINAL RESOLUTION OF DISPUTES

17.01 *Methods and Procedures*

A. *Disputes Subject to Final Resolution*: The following disputed matters are subject to final resolution under the provisions of this article:

1. A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full, pursuant to Article 12; and

2. Disputes between Owner and Contractor concerning the Work, or obligations under the Contract Documents, that arise after final payment has been made.

B. *Final Resolution of Disputes*: For any dispute subject to resolution under this article, Owner or Contractor may:

1. elect in writing to invoke the dispute resolution process provided for in the Supplementary Conditions;

2. agree with the other party to submit the dispute to another dispute resolution process; or

3. if no dispute resolution process is provided for in the Supplementary Conditions or mutually agreed to, give written notice to the other party of the intent to submit the dispute to a court of competent jurisdiction.

ARTICLE 18—MISCELLANEOUS

18.01 *Giving Notice*

A. Whenever any provision of the Contract requires the giving of written notice to Owner, Engineer, or Contractor, it will be deemed to have been validly given only if delivered:

1. in person, by a commercial courier service or otherwise, to the recipient's place of business;

2. by registered or certified mail, postage prepaid, to the recipient's place of business; or

3. by e-mail to the recipient, with the words "Formal Notice" or similar in the e-mail's subject line.

18.02 *Computation of Times*

A. When any period of time is referred to in the Contract by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

18.03 *Cumulative Remedies*

A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract. The provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

18.04 *Limitation of Damages*

A. With respect to any and all Change Proposals, Claims, disputes subject to final resolution, and other matters at issue, neither Owner nor Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project.

18.05 *No Waiver*

A. A party's non-enforcement of any provision will not constitute a waiver of that provision, nor will it affect the enforceability of that provision or of the remainder of this Contract.

18.06 *Survival of Obligations*

A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract, as well as all continuing obligations indicated in the Contract, will survive final payment, completion, and acceptance of the Work or termination of the Contract or of the services of Contractor.

18.07 *Controlling Law*

A. This Contract is to be governed by the law of the state in which the Project is located.

18.08 *Assignment of Contract*

A. Unless expressly agreed to elsewhere in the Contract, no assignment by a party to this Contract of any rights under or interests in the Contract will be binding on the other party without the written consent of the party sought to be bound; and, specifically but without limitation, money that may become due and money that is due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract.

18.09 *Successors and Assigns*

A. Owner and Contractor each binds itself, its successors, assigns, and legal representatives to the other party hereto, its successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

18.10 *Headings*

A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

SUPPLEMENTARY CONDITIONS

OF THE CONSTRUCTION CONTRACT

TABLE OF CONTENTS

SUPPLEMENTARY CONDITIONS

OF THE CONSTRUCTION CONTRACT

These Supplementary Conditions amend or supplement EJCDC® C-700, Standard General Conditions of the Construction Contract (2018). The General Conditions remain in full force and effect except as amended.

The terms used in these Supplementary Conditions have the meanings stated in the General Conditions. Additional terms, if any, used in these Supplementary Conditions have the meanings stated below, which are applicable to both the singular and plural thereof.

The paragraph address system used in these Supplementary Conditions is the same as the paragraph address system used in the General Conditions, with the prefix "SC" added—for example, "Paragraph SC-4.05."

ARTICLE 1—DEFINITIONS AND TERMINOLOGY

SC-1.01.A.40 Add the following to Paragraph 1.01.A.40:

Trucking, shipping, delivery firms, consultants, and entities performing testing or inspection retained by Contractor or any Subcontractor are considered to be Subcontractors.

SC-1.01.A.45 Add the following to Paragraph 1.01.A.45:

Entities that rent construction equipment or machinery, but are not incorporated into the Work, are considered to be Suppliers. If such rental entity furnishes both equipment and one or more personnel to operate and maintain the equipment, such entity is a Subcontractor.

ARTICLE 2—PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

SC-2.01 Delete Paragraphs 2.01.B. and C. in their entirety and insert the following in their place:

B. *Evidence of Contractor's Insurance:* When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner copies of the policies (including all endorsements, and identification of applicable self-insured retentions and deductibles) of insurance required to be provided by Contractor in this Contract. Contractor may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

2.02 *Copies of Documents*

SC-2.02 Amend the first sentence of Paragraph 2.02.A to read as follows:

Owner shall furnish to Contractor [number] paper copies of the Contract Documents (including one fully signed counterpart of the Agreement), and [one copy] [none] in electronic portable document format (PDF).

SC-2.02 Delete Paragraph 2.02.A in its entirety and insert the following new paragraph in its place:

A. Owner shall furnish to Contractor [number] paper copies of conformed Contract Documents incorporating and integrating all Addenda and amendments, if any, negotiated prior to the Effective Date of the Contract (including one fully signed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional paper copies of the conformed Contract Documents will be furnished upon request at the cost of reproduction.

2.06 *Electronic Transmittals*

SC-2.06 Delete in its entirety Paragraph 2.06.B and replace with the following new paragraph:

B. *Electronic Document Protocol*: Comply with Specifications Section 01 31 26 – Electronic Communication Protocols.

ARTICLE 3—CONTRACT DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 *Intent*

SC-3.01 Delete Paragraph 3.01.C in its entirety.

SC-3.01 Add the following new paragraphs immediately after Paragraph 3.01.E:

F. The Specifications and other verbal components of the Contract Documents may vary in form, format, and style. Some Specification sections are written in varying degrees of streamlined or declarative style and some Specifications sections may, in comparison, employ a more-narrative style. Omissions of such words and phrases as "Contractor shall," "in conformity with," "as shown," or "as specified" are intentional in streamlined language in the Contract Documents. Omitted words and phrases are incorporated by inference. Similar types of provisions may appear in various parts of a Specifications section or elsewhere in the Contract Documents. Contractor shall not attempt to take advantage of any variation of form, format or style in Change Proposal(s) and Claim(s).

G. Cross referencing of Specification sections in a Specifications section's heading "Related Sections includes, but are not necessarily limited to: "and elsewhere within each Specifications section is provided as an aid and convenience to Contractor. Contractor shall not rely on cross referencing indicated and is responsible for coordinating the entire Work and providing a complete Project whether or not cross referencing is provided in each Specifications section or whether or not cross referencing is complete.

ARTICLE 4—COMMENCEMENT AND PROGRESS OF THE WORK

4.05 *Delays in Contractor's Progress*

SC-4.05.C Amend Paragraph 4.05.C by adding the following subparagraphs:

5. *Weather-Related Delays*

a. If "abnormal weather conditions" as set forth in Paragraph 4.05.C.2 of the General Conditions are the basis for a request for an equitable adjustment in the Contract Times, such request must be documented by data substantiating each of the following: (1) that weather conditions were abnormal for the period of time in which the delay occurred, (2) that such weather conditions could not have been

reasonably anticipated, and (3) that such weather conditions had an adverse effect on the Work on the critical path at the time of the delay.

b. The existence of abnormal weather conditions will be determined on a month-by-month basis in accordance with the following:

1) Every workday on which one or more of the following conditions exist will be considered a "bad weather day":

i) Total precipitation (as rain equivalent) occurring between 7:00 p.m. on the preceding day (regardless of whether such preceding day is a workday) through 7:00 p.m. on the workday in question equals or exceeds [threshold precipitation quantity] of precipitation (as rain equivalent, based on the snow/rain conversion indicated in Table SC-4.05.C-1—Foreseeable Bad Weather Days .

ii) Ambient outdoor air temperature at 11:00 a.m. is equal to or less than the following low temperature threshold: [temperature] degrees Fahrenheit; or, at 3:00 p.m. the ambient outdoor temperature is equal to or greater than the following high temperature threshold: [temperature] degrees Fahrenheit.

2) Determination of actual bad weather days during performance of the Work will be based on the weather records measured and recorded by [name of the entity operating the weather station] weather monitoring station at [location of the weather monitoring station].

3) Contractor shall anticipate the number of foreseeable bad weather days per month indicated in Table SC-4.05-C-1—Foreseeable Bad Weather Days.

4) In each month, every bad weather day exceeding the number of foreseeable bad weather days established in Table SC-4.05.C-1—Foreseeable Bad Weather Days, will be considered as "abnormal weather conditions." The existence of abnormal weather conditions will not relieve Contractor of the obligation to demonstrate and document that delays caused by abnormal weather are specific to the planned work activities or that such activities thus delayed were on Contractor's then-current Progress Schedule's critical path for the Project.

Table SC-4.05.C-1—Foreseeable Bad Weather Days

Month	Number of Foreseeable Bad Weather Days in Month Based on Precipitation as Rain Equivalent (inches) [1]	Ambient Outdoor Air Temperature (degrees F)	
		Number of Foreseeable Bad Weather Days in Month Based on Low Temperature (at 11:00 a.m.)	Number of Foreseeable Bad Weather Days in Month Based on High Temperature (at 3:00 p.m.)
January			
February			
March			
April			
May			

Month	Number of Foreseeable Bad Weather Days in Month Based on Precipitation as Rain Equivalent (inches) [1]	Ambient Outdoor Air Temperature (degrees F)	
		Number of Foreseeable Bad Weather Days in Month Based on Low Temperature (at 11:00 a.m.)	Number of Foreseeable Bad Weather Days in Month Based on High Temperature (at 3:00 p.m.)
June			
July			
August			
September			
October			
November			
December			

Notes:

1. Two inches of sleet equal one inch of rain. Five inches of wet, heavy snow equal one inch of rain. Fifteen inches of "dry" powder snow equals one inch of rain.

ARTICLE 5—SITE, SUBSURFACE AND PHYSICAL CONDITIONS, HAZARDOUS ENVIRONMENTAL CONDITIONS

5.03 *Subsurface and Physical Conditions*

SC-5.03 Add the following new paragraphs immediately after Paragraph 5.03.D:

E. The following table lists the reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data, and specifically identifies the Technical Data in the report upon which Contractor may rely: [If there are no such reports, edit this paragraph to indicate that, and delete the table.]

Report Title	Date of Report	Technical Data
		[Identify Technical Data]

F. The following table lists the drawings of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data, and specifically identifies the Technical Data upon which Contractor may rely: [If there are no such drawings, edit this paragraph to indicate that, and delete the table.]

Drawings Title	Date of Drawings	Technical Data
		[Identify Technical Data]

Drawings Title	Date of Drawings	Technical Data

G. Contractor may examine copies of reports and drawings identified in SC-5.03.E and SC-5.03.F that were not included with the Bidding Documents at [location] during regular business hours, or may request copies from Engineer.

SC-5.04.A Add the following new paragraph immediately after Paragraph 5.04.A.4:

5. Contractor encounters human remains, recognizes the existence of burial markers, archaeological sites, historical sites, artifacts of potential archaeological or historical interest, or wetlands not shown or indicated in the Contract Documents, Contractor shall immediately cease operations that may disturb such area(s) and secure the adjacent Work; and Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations (Contractor shall continue to suspend such operations until otherwise instructed by Owner but shall continue with all other operations that do not affect those remains or features);

SC-5.03 and SC-5.04 Delete in their entirety Paragraphs 5.03 and 5.04. Provisions on subsurface and physical conditions at the Site, and differing subsurface or physical conditions, are in Specifications Section 02 06 13 – Geotechnical Baseline Report.

5.06 *Hazardous Environmental Conditions*

SC-5.06 Add the following new paragraphs immediately after Paragraph 5.06.A.3:

4. The following table lists the reports known to Owner relating to Hazardous Environmental Conditions at or adjacent to the Site, and the Technical Data (if any) upon which Contractor may rely: [If there are no such reports, edit this paragraph to indicate that, and delete in the table.]

Report Title	Date of Report	Technical Data
		[Identify Technical Data]

5. The following table lists the drawings known to Owner relating to Hazardous Environmental Conditions at or adjacent to the Site, and Technical Data (if any) contained in such Drawings upon which Contractor may rely: [If there are no such drawings, edit this paragraph to indicate that, and delete in the table.]

Drawings Title	Date of Drawings	Technical Data
		[Identify Technical Data]

ARTICLE 6—BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

SC-6.01 Add the following paragraphs immediately after Paragraph 6.01.A:

1. *Required Performance Bond Form:* The performance bond that Contractor furnishes will be in the form of EJCDC® C-610, Performance Bond (2010, 2013, or 2018 edition).
2. *Required Payment Bond Form:* The payment bond that Contractor furnishes will be in the form of EJCDC® C-615, Payment Bond (2010, 2013, or 2018 edition).

SC-6.01 Add the following paragraphs immediately after Paragraph 6.01.B:

1. The correction period specified as one year after the date of Substantial Completion in Paragraph 15.08.A of the General Conditions is hereby revised to be [number—either "two", "three", or other] years after Substantial Completion.
2. After Substantial Completion, Contractor shall furnish a warranty bond issued in the form of EJCDC® C-612, Warranty Bond (2018). The warranty bond must be in a bond amount of [amount—either 10, 15, or other] percent of the final Contract Price. The warranty bond period will extend to a date [number—either "two", "three" or other] years after Substantial Completion of the Work. Contractor shall deliver the fully executed warranty bond to Owner prior to or with the final Application for Payment, and in any event not later than 11 months after Substantial Completion.
3. The warranty bond must be issued by the same surety that issues the performance bond required under Paragraph 6.01.A of the General Conditions.

6.02 *Insurance—General Provisions*

Make changes only when directed by the OwnerSC-6.02 Add the following paragraph immediately after Paragraph 6.02.B:

1. Contractor may obtain worker's compensation insurance from an insurance company that has not been rated by A.M. Best, provided that such company (a) is domiciled in the state in which the Project is located, (b) is certified or authorized as a worker's compensation insurance provider by the appropriate state agency, and (c) has been accepted to provide worker's compensation insurance for similar projects by the state within the last 12 months.

The Owner shall direct all HDR revisions in this provision, if anySC-6.02 Add the following paragraph immediately after Paragraph 6.02.H.2 of the General Conditions:

3. For the following Subcontractors, Suppliers, or categories of Subcontractor or Supplier, Contractor shall require the following specified insurance, with policy limits as stated: [Identify Subcontractors, Suppliers, or categories of same, and insert specific insurance requirements and policy limits]

6.03 *Contractor's Insurance*

SC-6.03 Supplement Paragraph 6.03 with the following provisions after Paragraph 6.03.C:

D. *Other Additional Insureds:* As a supplement to the provisions of Paragraph 6.03.C of the General Conditions, the commercial general liability, automobile liability, umbrella or excess,

pollution liability, and unmanned aerial vehicle liability policies must include as additional insureds (in addition to Owner and Engineer) the following: [Here list by legal name (not Project role or classification) other persons or entities to be included as additional insureds. See GC-6.03.C.]

E. *Workers' Compensation and Employer's Liability:* Contractor shall purchase and maintain workers' compensation and employer's liability insurance, including, as applicable, United States Longshoreman and Harbor Workers' Compensation Act, Jones Act, stop-gap employer's liability coverage for monopolistic states, and foreign voluntary workers' compensation (from available sources, notwithstanding the jurisdictional requirement of Paragraph 6.02.B of the General Conditions).

Workers' Compensation and Related Policies	Policy limits of not less than:
Workers' Compensation	
State	Statutory
Applicable Federal (e.g., Longshoreman's)	Statutory
Foreign voluntary workers' compensation (employer's responsibility coverage), if applicable	Statutory
Jones Act (if applicable)	
Bodily injury by accident—each accident	$
Bodily injury by disease—aggregate	$
Employer's Liability	
Each accident	$
Each employee	$
Policy limit	$
Stop-gap Liability Coverage	
For work performed in monopolistic states, stop-gap liability coverage must be endorsed to either the worker's compensation or commercial general liability policy with a minimum limit of:	$

F. *Commercial General Liability—Claims Covered:* Contractor shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Contractor, on an occurrence basis, against claims for:

1. damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees,
2. damages insured by reasonably available personal injury liability coverage, and
3. damages because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.

G. *Commercial General Liability—Form and Content:* Contractor's commercial liability policy must be written on a 1996 (or later) Insurance Services Organization, Inc. (ISO) commercial

general liability form (occurrence form) and include the following coverages and endorsements:

1. Products and completed operations coverage.
    a. Such insurance must be maintained for three years after final payment.
    b. Contractor shall furnish Owner and each other additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract) evidence of continuation of such insurance at final payment and three years thereafter.
2. Blanket contractual liability coverage, including but not limited to coverage of Contractor's contractual indemnity obligations in Paragraph 7.18.
3. Severability of interests and no insured-versus-insured or cross-liability exclusions.
4. Underground, explosion, and collapse coverage.
5. Personal injury coverage.
6. Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together). If Contractor demonstrates to Owner that the specified ISO endorsements are not commercially available, then Contractor may satisfy this requirement by providing equivalent endorsements.
7. For design professional additional insureds, ISO Endorsement CG 20 32 07 04 "Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured" or its equivalent.

H. *Commercial General Liability—Excluded Content:* The commercial general liability insurance policy, including its coverages, endorsements, and incorporated provisions, must not include any of the following:

1. Any modification of the standard definition of "insured contract" (except to delete the railroad protective liability exclusion if Contractor is required to indemnify a railroad or others with respect to Work within 50 feet of railroad property).
2. Any exclusion for water intrusion or water damage.
3. Any provisions resulting in the erosion of insurance limits by defense costs other than those already incorporated in ISO form CG 00 01.
4. Any exclusion of coverage relating to earth subsidence or movement.
5. Any exclusion for the insured's vicarious liability, strict liability, or statutory liability (other than worker's compensation).
6. Any limitation or exclusion based on the nature of Contractor's work.
7. Any professional liability exclusion broader in effect than the most recent edition of ISO form CG 22 79.

I. *Commercial General Liability—Minimum Policy Limits*

Commercial General Liability	Policy limits of not less than:
General Aggregate	$
Products—Completed Operations Aggregate	$
Personal and Advertising Injury	$
Bodily Injury and Property Damage—Each Occurrence	$

J. *Automobile Liability:* Contractor shall purchase and maintain automobile liability insurance for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle. The automobile liability policy must be written on an occurrence basis.

Automobile Liability	Policy limits of not less than:
Bodily Injury	
Each Person	$
Each Accident	$
Property Damage	
Each Accident	$
[or]	
Combined Single Limit	
Combined Single Limit (Bodily Injury and Property Damage)	$

K. *Umbrella or Excess Liability:* Contractor shall purchase and maintain umbrella or excess liability insurance written over the underlying employer's liability, commercial general liability, and automobile liability insurance described in the Paragraphs above. The coverage afforded must be at least as broad as that of each and every one of the underlying policies.

Excess or Umbrella Liability	Policy limits of not less than:
Each Occurrence	$
General Aggregate	$

L. *Using Umbrella or Excess Liability Insurance to Meet CGL and Other Policy Limit Requirements:* Contractor may meet the policy limits specified for employer's liability, commercial general liability, and automobile liability through the primary policies alone, or through combinations of the primary insurance policy's policy limits and partial attribution of the policy limits of an umbrella or excess liability policy that is at least as broad in coverage as that of the underlying policy, as specified herein. If such umbrella or excess liability policy

was required under this Contract, at a specified minimum policy limit, such umbrella or excess policy must retain a minimum limit of $[specify amount] after accounting for partial attribution of its limits to underlying policies, as allowed above.

M. *Contractor's Pollution Liability Insurance:* Contractor shall purchase and maintain a policy covering third-party injury and property damage, including cleanup costs, as a result of pollution conditions arising from Contractor's operations and completed operations. This insurance must be maintained for no less than three years after final completion.

Contractor's Pollution Liability	**Policy limits of not less than:**
Each Occurrence/Claim	$
General Aggregate	$

N. *Contractor's Professional Liability Insurance:* If Contractor will provide or furnish professional services under this *Contract*, through a delegation of professional design services or otherwise, then Contractor shall be responsible for purchasing and maintaining applicable professional liability insurance. This insurance must cover negligent acts, errors, or omissions in the performance of professional design or related services by the insured or others for whom the insured is legally liable. The insurance must be maintained throughout the duration of the Contract and for a minimum of two years after Substantial Completion. The retroactive date on the policy must pre-date the commencement of furnishing services on the Project.

Contractor's Professional Liability	**Policy limits of not less than:**
Each Claim	$
Annual Aggregate	$

O. *Railroad Protective Liability Insurance:* Prior to commencing any Work within 50 feet of railroad-owned and controlled property, Contractor shall (1) endorse its commercial general liability policy with ISO CG 24 17, removing the contractual liability exclusion for work within 50 feet of a railroad, (2) purchase and maintain railroad protective liability insurance meeting the following requirements, (3) furnish a copy of the endorsement to Owner, and (4) submit a copy of the railroad protective policy and other railroad-required documentation to the railroad, and notify Owner of such submittal.

[Insert additional specific requirements, commonly set by the railroad, here.]

Railroad Protective Liability Insurance	**Policy limits of not less than:**
Each Claim	$
Aggregate	$

P. *Unmanned Aerial Vehicle Liability Insurance:* If Contractor uses unmanned aerial vehicles (UAV—commonly referred to as drones) at the Site or in support of any aspect of the Work, Contractor shall obtain UAV liability insurance in the amounts stated; name Owner, Engineer, and all individuals and entities identified in the Supplementary Conditions as additional insureds; and provide a certificate to Owner confirming Contractor's compliance with this requirement. Such insurance will provide coverage for property damage, bodily injury or death, and invasion of privacy.

Unmanned Aerial Vehicle Liability Insurance	**Policy limits of not less than:**
Each Claim	$
General Aggregate	$

Q. *Other Required Insurance:* [Here list additional types and amounts of insurance that Contractor is required to carry; if none, delete this Paragraph Q.]

6.04 *Builder's Risk and Other Property Insurance*

SC-6.04 Delete Paragraph 6.04.A and insert the following in its place:

A. Owner shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the Work's full insurable replacement cost (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). The specific requirements applicable to the builder's risk insurance are set forth in the Supplementary Conditions.

SC-6.04 Supplement Paragraph 6.04 with the following provisions:

F. *Builder's Risk Requirements:* The builder's risk insurance must:

1. be written on a builder's risk "all risk" policy form that at a minimum includes insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment stored and in transit, and must not exclude the coverage of the following risks: fire; windstorm; hail; flood; earthquake, volcanic activity, and other earth movement; lightning; riot; civil commotion; terrorism; vehicle impact; aircraft; smoke; theft; vandalism and malicious mischief; mechanical breakdown, boiler explosion, and artificially generated electric current; collapse; explosion; debris removal; demolition occasioned by enforcement of Laws and Regulations; and water damage (other than that caused by flood).

    a. Such policy will include an exception that results in coverage for ensuing losses from physical damage or loss with respect to any defective workmanship, methods, design, or materials exclusions.

    b. If insurance against mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake, volcanic activity, and other earth movement; or flood, are not commercially available under builder's risk policies, by endorsement or otherwise, such insurance will be provided through other insurance policies acceptable to Owner and Contractor.

2. cover, as insured property, at least the following: (a) the Work and all materials, supplies, machinery, apparatus, equipment, fixtures, and other property of a similar nature that are to be incorporated into or used in the preparation, fabrication, construction, erection, or completion of the Work, including Owner-furnished or assigned property; (b) spare parts inventory required within the scope of the Contract; and (c) temporary works which are not intended to form part of the permanent constructed Work but which are intended to provide working access to the Site, or to the Work under construction, or which are intended to provide temporary support for the Work under construction, including scaffolding, form work, fences, shoring, falsework, and temporary structures.

3. cover expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of contractors, engineers, and architects).

4. extend to cover damage or loss to insured property while in temporary storage at the Site or in a storage location outside the Site (but not including property stored at the premises of a manufacturer or Supplier). If this coverage is subject to a sublimit, such sublimit will be a minimum of $[amount].

5. extend to cover damage or loss to insured property while in transit. If this coverage is subject to a sublimit, such sublimit will be a minimum of $[amount].

6. allow for the waiver of the insurer's subrogation rights, as set forth in this Contract.

7. allow for partial occupancy or use by Owner by endorsement, and without cancellation or lapse of coverage.

8. include performance/hot testing and start-up, if applicable.

9. be maintained in effect until the Work is complete, as set forth in Paragraph 15.06.D of the General Conditions, or until written confirmation of Owner's procurement of property insurance following Substantial Completion, whichever occurs first.

10 include as named insureds the Owner, Contractor, Subcontractors (of every tier), and any other individuals or entities required by this Contract to be insured under such builder's risk policy. For purposes of Paragraphs 6.04, 6.05, and 6.06 of the General Conditions, and this and all other corresponding Supplementary Conditions, the parties required to be insured will be referred to collectively as "insureds." In addition to Owner, Contractor, and Subcontractors of every tier, include as insureds the following:

    a. [Here list by legal name (not Project role or classification) other persons or entities to be insured on the builder's risk policy; see the "HDR Guidance Note" at the start of SC-6.04.F, above). It is generally recommended to list the insured's full legal/contractual name, address, contact person, telephone, and e-mail address. Include only persons or entities that have property at the Site that is to be insured by the builder's risk insurance. If applicable, separately identify any mortgagee or lender required to be named as a loss payee.]

11. include, in addition to the Contract Price amount, the value of the following equipment and materials to be installed by the Contractor but furnished by the Owner or third parties:

    a. [Here list or provide cross-reference to specific items of Owner-furnished (or third-party furnished) equipment, and purchase value; do not list items whose value is

already included in the Contract Price (as is the case when an equipment procurement contract is assigned to the Contractor). Contact HDR's ENG MSS team for guidance on this matter when necessary.]

12. If debris removal in connection with repair or replacement of insured property is subject to a coverage sublimit, such sublimit will be a minimum of $[amount].

13. In addition to the coverage sublimits stated above, the following coverages are also subject to sublimits, as follows:

    a. [Here list a specific coverage, or cause of loss, that has been determined to be likely to be subject to a sublimit. If not applicable, then delete Paragraph SC-6.04.F.13 in its entirety.] If this coverage is subject to a sublimit, such sublimit will be a minimum of $[amount].

SC-6.04 Supplement Paragraph 6.04 of the General Conditions with the following provision:

G. *Coverage for Completion Delays:* The builder's risk policy will include, for the benefit of Owner, loss of revenue and soft cost coverage for losses arising from delays in completion that result from covered physical losses or damage. Such coverage will include, without limitation, fixed expenses and debt service for a minimum of 12 months with a maximum deductible of 30 days, compensation for loss of net revenues, rental costs, and attorneys' fees and engineering or other consultants' fees, if not otherwise covered.

SC-6.04 Supplement Paragraph 6.04 of the General Conditions with the following provisions:

H. *Builder's Risk and Other Property Insurance Deductibles:* The purchaser of any required builder's risk, installation floater, or other property insurance will be responsible for costs not covered because of the application of a policy deductible.

1. The builder's risk policy (or if applicable the installation floater) will be subject to a deductible amount of not more than $[number] for direct physical loss in any one occurrence.

SC-6.04 Delete Paragraph 6.04.A and substitute the following in its place:

A. *Installation Floater*

1. Contractor shall provide and maintain installation floater insurance on a broad form or "all risk" policy providing coverage for materials, supplies, machinery, fixtures, and equipment that will be incorporated into the Work ("Covered Property"). Coverage under the Contractor's installation floater will include loss from covered "all risk" causes (perils) to Covered Property:

    a. of the Contractor, and Covered Property of others that is in Contractor's care, custody, and control;

    b. while in transit to the Site, including while at temporary storage sites;

    c. while at the Site awaiting and during installation, erection, and testing;

    d. continuing at least until the installation or erection of the Covered Property is completed, and the Work into which it is incorporated is accepted by Owner.

2. The installation floater coverage cannot be contingent on an external cause or risk, or limited to property for which the Contractor is legally liable.

3. The installation floater coverage will be in an amount sufficient to protect Contractor's interest in the Covered Property. The Contractor will be solely responsible for any deductible carried under this coverage.

4. This policy will include a waiver of subrogation applicable to Owner, Contractor, Engineer, all Subcontractors, and the officers, directors, partners, employees, agents and other consultants and subcontractors of any of them.

ARTICLE 7—CONTRACTOR'S RESPONSIBILITIES

7.02 *Supervision and Superintendence*

SC-7.02 Add the following to Paragraph 7.02, following Paragraph 7.02.B:

C. Unless Owner otherwise agrees in writing, the superintendent will be Contractor's representative at the Site and shall have authority to act on behalf of Contractor. All communications given to or received from the superintendent shall be binding on Contractor.

7.03 *Labor; Working Hours*

SC-7.03 Add the following new subparagraphs immediately after Paragraph 7.03.C:

1. Regular working hours will be [Here insert schedule of regular working hours].

2. Owner's legal holidays are [Here insert list of legal holidays].

SC-7.03 Amend the first and second sentences of Paragraph 7.03.C to state "...all Work at the Site must be performed during regular working hours, [day of the week] through [day of the week]. Contractor will not perform Work on a [day of the week], [day of the week], or any legal holiday." The balance of Paragraph 7.03.C remains unchanged except for the foregoing.

SC-7.03 Delete Paragraph 7.03.C in its entirety, and insert the following:

C. In the absence of any Laws or Regulations to the contrary, Contractor may perform the Work on holidays, during any or all hours of the day, and on any or all days of the week, at Contractor's sole discretion.

SC-7.03 Add the following new paragraph immediately after Paragraph 7.03.C:

D. [Contractor] [Owner] shall be responsible for the cost of overtime (premium) pay and other expense incurred by Owner for Engineer's services (including those of the Resident Project Representative, if any), Owner's representative, and construction observation services, occasioned by the performance of Work on Saturday, Sunday, any legal holiday, or as overtime on any regular work day. If Contractor is responsible but does not pay, or if the parties are unable to agree as to the amount owed, then Owner may impose a reasonable set-off against payments due under Article 15.

SC-7.03 Add the following new subparagraph immediately after Paragraph SC-7.03.D:

1. For purposes of administering the foregoing requirement, additional overtime costs are defined as [Here insert parameters for compensated overtime hours].

7.10 *Taxes*

SC-7.10 Add a new paragraph immediately after Paragraph 7.10.A:

A. Owner is exempt from payment of sales and compensating use taxes of the State of [name of state or jurisdiction where the Site is located] and of cities and counties thereof on all materials to be incorporated into the Work.

1. Owner will furnish the required certificates of tax exemption to Contractor for use in the purchase of materials and equipment to be incorporated into the Work.

2. Owner's exemption does not apply to construction tools or machinery, construction equipment, or other property purchased by or leased by Contractor, or to supplies or materials not incorporated into the Work.

7.11 *Laws and Regulations*

SC-7.11 Add the following new paragraph immediately after Paragraph 7.10.C:

D. Refer to Article SC-19 [and Document 00 73 73 – Statutory and Funding-Financing Entity Requirements], for Laws and Regulations that, by terms of said Laws and Regulations, are to be included in the Contract Documents. The failure to include in Article SC-19 [or Document 00 73 73 – Statutory and Funding-Financing Entity Requirements,] any Law or Regulation applicable to the performance of the Work does not diminish Contractor's responsibility to comply with all Laws and Regulations applicable to the performance of the Work.

7.13 *Safety and Protection*

SC-7.13 Insert the following after the second sentence of Paragraph 7.13.G:

The following Owner safety programs are applicable to the Work: [Here expressly identify by title and/or date, any such Owner safety programs. If Owner's safety programs are included in or addressed in the Specifications, SC-7.13 may be used to provide a cross-reference to the Specification section].

7.14 *Hazard Communication Programs*

SC-7.14 Add the following new paragraph immediately after Paragraph 7.14.A:

B *Single Prime Contract*: Contractor shall be responsible for coordinating exchange of safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws and Regulations. Contractor shall provide a centralized location for the maintenance of the safety data sheets or other hazard communication information required to be made available by any employer on the Site. Location of the material safety data sheets or other hazard communication information shall be readily accessible to the employees of employers on the Site.

B *Multiple Prime Contracts*: General Contractor shall be responsible for coordinating exchange of safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws and Regulations. General Contractor shall provide a centralized location for the maintenance of the material safety data sheets or other hazard communication information required to be made available by any employer on the Site. Location of the safety data sheets or other hazard communication information shall be readily accessible to the employees of employers on the Site. Each other Contractor ¬or employer shall furnish to the General Contractor

safety data sheets and other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws and Regulations.

ARTICLE 8—OTHER WORK AT THE SITE

8.02 *Coordination*

SC-8.02 Add the following new Paragraph 8.02.C immediately after Paragraph 8.02.B:

C. Owner intends to contract with others for the performance of other work at or adjacent to the Site, which is indicated in Specifications Section 01 11 00 – Summary of Work

1. [Here identify individual or entirety] shall have authority and responsibility for coordination of the various contractors and work forces at the Site;

2. The following specific matters are to be covered by such authority and responsibility: [Here itemize such matters];

3. The extent of such authority and responsibilities is: [Here provide the extent].

ARTICLE 9—OWNER'S RESPONSIBILITIES

9.13 *Owner's Site Representative*

SC-9.13 Add the following new paragraph immediately after Paragraph 9.12 of the General Conditions:

9.13 *Owner's Site Representative*

A. Owner will furnish an "Owner's Site Representative" (OSR) to represent Owner at the Site and assist Owner in observing the progress and quality of the Work. The Owner's Site Representative is not Engineer's consultant, agent, or employee. Owner's Site Representative will be [here identify individual or entity]. The authority and responsibilities of Owner's Site Representative follow: [Here describe the duties and activities of the Owner's Site Representative.]

ARTICLE 10—ENGINEER'S STATUS DURING CONSTRUCTION

10.03 *Resident Project Representative*

SC-10.03 Add the following new subparagraph immediately after Paragraph 10.03.A:

1. On this Project, by agreement with Owner, the Engineer will not furnish a Resident Project Representative to represent Engineer at the Site or assist Engineer in observing the progress and quality of the Work.

tSC-10.03 Add the following new paragraphs immediately after Paragraph 10.03.B:

C. The Resident Project Representative (RPR) will be Engineer's representative at the Site. RPR's dealings in matters pertaining to the Work in general will be with Engineer and Contractor. RPR's dealings with Subcontractors will only be through or with the full knowledge or approval of Contractor. The RPR will:

1. *Conferences and Meetings:* Attend meetings with Contractor, such as preconstruction conferences, progress meetings, job conferences, and other Project-related meetings (but not including Contractor's safety meetings), and as appropriate prepare and circulate copies of minutes thereof.

2. *Safety Compliance:* Comply with Site safety programs, as they apply to RPR, and if required to do so by such safety programs, receive safety training specifically related to RPR's own personal safety while at the Site.

3. *Liaison*

    a. Serve as Engineer's liaison with Contractor. Working principally through Contractor's authorized representative or designee, assist in providing information regarding the provisions and intent of the Contract Documents.

    b. Assist Engineer in serving as Owner's liaison with Contractor when Contractor's operations affect Owner's on-Site operations.

    c. Assist in obtaining from Owner additional details or information, when required for Contractor's proper execution of the Work.

4. *Review of Work; Defective Work*

    a. Conduct on-Site observations of the Work to assist Engineer in determining, to the extent set forth in Paragraph 10.02, if the Work is in general proceeding in accordance with the Contract Documents.

    b. Observe whether any Work in place appears to be defective. This does not impose on either RPR or Engineer any obligation to find all, or any specific element of, defective Work, for which Contractor remains solely responsible.

    b. Observe whether any Work in place should be uncovered for observation, or requires special testing, inspection or approval.

5. *Inspections and Tests*

    a. Observe Contractor-arranged inspections required by Laws and Regulations, including but not limited to (1) code-required tests and special inspections, and (2) those performed by public or other agencies having jurisdiction over the Work.

    b. Observe specific tests, inspections, and other field quality control required by the Contract Documents and performed by Contractor, Subcontractor, Supplier, or by testing or laboratories retained by any of them, .

    c. Accompany visiting inspectors representing public or other agencies having jurisdiction over the Work.

6. *Payment Requests:* Review Applications for Payment with Contractor and advise Contractor regarding quantities or extent of the Work eligible for payment.

7. *Completion*

    a. Participate in Engineer's visits regarding inspection for Substantial Completion.

    b. Assist in the augmenting or amending the punch list of items to be completed or corrected prior to final inspection.

c. *Final Inspection*: Participate in Engineer's visit to the Site, in the company of Owner and Contractor, regarding completion of the Work, and prepare a final punch list (if any) of items to be completed or corrected by Contractor.

d. Observe whether items on the final punch list have been completed or corrected.

d. *Record Documents*: Periodically during the Work, review with Contractor the status of Contractor's record documents required by the Contract Documents and advise Contractor on whether such record documents appear to comply with the Contract's requirements for record documents. Review final record documents submitted by Contractor.

D. The RPR will not:

1. Authorize any deviation from the Contract Documents or substitution of materials, equipment (including "or-equal" items), or procedures or sequences indicated in the Contract Documents.

2. Exceed limitations of Engineer's authority as set forth in the Contract Documents.

3. Undertake any of the responsibilities of Contractor, Subcontractors, or Suppliers.

4. Advise on, issue directions relative to, or assume control or responsibility over any aspect of the means, methods, techniques, sequences or procedures of construction.

5. Advise on, issue directions regarding, or assume control over security protection, or safety practices, precautions, and programs in connection with the activities or operations of Owner or Contractor.

6. Participate in specialized field or laboratory tests or inspections conducted off-site by others except as specifically authorized by Engineer.

7. Authorize Owner to occupy the Project in whole or in part.

ARTICLE 11—CHANGES TO THE CONTRACT

No Supplementary Conditions in this Article.

ARTICLE 12—CLAIMS

No Supplementary Conditions in this Article.

ARTICLE 13—COST OF WORK; ALLOWANCES, UNIT PRICE WORK

13.01 *Cost of the Work*

SC-13.01.B.5.c.(1) Supplement Paragraph 13.01.B.5.c.(1) by adding the following subparagraphs:

a) Prior to commencing Work at the Site, submit to Owner, through Engineer, copies of the equipment rental agreements for Owner's approval.

b) Should Contractor perform Work using rented construction equipment or machinery without Owner's written approval of the associated rental agreement and the parties subsequently disagree on the applicable rental rates, use of such construction

equipment and machinery will be compensated on the basis of the rental rate book indicated in Paragraph SC-13.01.B.5.c.(2).

c) When the rental rate book is used basis for determining compensation for construction equipment and machinery leased from a rental firm, the hourly rate for such equipment shall be determined in accordance with Paragraph 13.01.B.5.(2) of the General Conditions.

SC-13.01.B.5.c.(2) Supplement Paragraph 13.01.B.5.c.(2) by adding the following sentence:

The equipment rental rate book that governs the included costs for the rental of machinery and equipment owned by Contractor (or a related entity) under the Cost of the Work provisions of this Contract is the most current edition of [name of equipment rental rate book].

SC-13.01.B.5.c Supplement Paragraph 13.01.B.5.c by adding the following subparagraphs:

4) *Inactive Equipment and Machinery*: Rental of construction equipment and machinery shall cease when the use thereof is no longer necessary for the Work. Periods of inactivity for such construction equipment or machinery will not be compensable unless agreed upon in writing by Owner, unless the costs of disassembly, removal, transportation, reassembly, and remobilization, as submitted to and accepted by Owner (with advice of Engineer) would exceed the cost of continuing to rent the item(s) during the period(s) of inactivity. Contractor is responsible for obtaining Owner's written approval for compensation for construction equipment and machinery for periods of inactivity. Owner is not responsible for retroactively approving such inactivity. "Period of inactivity" for such items includes periods when the construction equipment or machinery is not used or necessary for the logical and efficient progression of the Work, or when other, available equipment or machinery is suitable for performing the given task.

5) *Condition of Equipment and Machinery*: Construction equipment and machinery will be compensable only for serviceable construction equipment and machinery capable of efficiently performing its intended function at the Site. Construction equipment and machinery not in compliance with this Paragraph SC-13.01.B.5.c.5) is not eligible for compensation.

6) *Capped Compensation*: Compensation paid Contractor for a given item of Contractor-owned construction equipment or machinery will be capped at, and shall not exceed, the comparable purchase price of such item of equal or comparable capacity and capability.

SC-13.01.C.2 Supplement Paragraph 13.01.C.2 by adding the following definition of small tools and hand tools:

a. For purposes of this paragraph, "small tools and hand tools" means items in one or more of the following categories: (1) Items that are ordinarily required for the performing worker's job function, including but not limited to equipment which ordinarily has no associated licensing, insurance, or substantive storage costs; such as hammers, wrenches, socket tools, manual saws, power saws, chainsaws, common power tools, impact drills, threaders, benders, transits and theodolites and related equipment, and other tools transportable by hand, regardless of ownership of such items; (2) Items such as gang-boxes, ladders, hand carts and similar wheeled items manually operated by workers, extension cords, and similar items; (3) common testing equipment such as insulation testers (megger-testing

equipment), amp meters, gas detectors, pressure gauges, and similar items; (4) A purchase price (if purchased new, at retail) of $500, although such limit is not absolute, and certain items may be deemed by Owner or Engineer as "small tools or hand tools" (and not eligible for compensation) even though such item may have a purchase price greater than the amount indicated in this Paragraph 13.01.C.2.

HDR Guidance Note—VEQ ClauseSC-13.03 Delete Paragraph 13.03.E in its entirety and insert the following in its place:

E. *Adjustments in Unit Price*

1. Contractor or Owner shall be entitled to an adjustment in the unit price with respect to an item of Unit Price Work if:

    a. the extended price of a particular item of Unit Price Work amounts to [number] percent or more of the Contract Price (based on estimated quantities at the time of Contract formation) and the variation in the quantity of that particular item of Unit Price Work actually furnished or performed by Contractor differs by more than [number] percent from the estimated quantity of such item indicated in the Agreement; and

    b. Contractor's unit costs to perform the item of Unit Price Work have changed materially and significantly as a result of the quantity change.

2. The adjustment in unit price will account for and be coordinated with any related changes in quantities of other items of Work, and in Contractor's costs to perform such other Work, such that the resulting overall change in Contract Price is equitable to Owner and Contractor.

3. Adjusted unit prices will apply to all units of that item.

E. *Adjustments in Unit Price*

1. Contractor or Owner shall be entitled to an adjustment in the unit price if the quantity on an individual bid item extends or fails to achieve [number] percent of the estimated quantity at the time of Contract formation plus any additions or deletions included in change orders to the contract.

2. The adjusted unit price will apply only to all units installed for that bid item.

ARTICLE 14—TESTS AND INSPECTIONS; CORRECTION, REMOVAL, OR ACCEPTANCE OF DEFECTIVE WORK

No Supplementary Conditions in this Article.

ARTICLE 15—PAYMENTS TO CONTRACTOR, SET OFFS; COMPLETIONS; CORRECTION PERIOD

15.01 *Progress Payments*

SC-15.01 Add the following new Paragraph 15.01.F:

F. For contracts in which the Contract Price is based on the Cost of Work plus a fee, if Owner determines that progress payments made to date substantially exceed the actual progress of the Work (as measured by reference to the Schedule of Values), or present a potential conflict with the Guaranteed Maximum Price, then Owner may require that Contractor

prepare and submit a plan for the remaining anticipated Applications for Payment that will bring payments and progress into closer alignment and take into account the Guaranteed Maximum Price (if any), through reductions in billings, increases in retainage, or other equitable measures. Owner will review the plan, discuss any necessary modifications, and implement the plan as modified for all remaining Applications for Payment.

15.03 *Substantial Completion*

SC-15.03.B Add the following new subparagraph to Paragraph 15.03.B:

1. If some or all of the Work has been determined by Engineer not to be at a point of Substantial Completion and will require re-inspection or re-testing by Engineer or other entity retained by Owner, the cost of such re-inspection or re-testing, including the cost of time, travel and living expenses, will be paid by Contractor to Owner. If Contractor does not pay, or the parties are unable to agree as to the amount owed, then Owner may impose a reasonable set-off against payments due under this Article 15.

15.08 *Correction Period*

SC-15.08.G Add the following new Paragraph 15.08.G:

G. The correction period specified as one year after the date of Substantial Completion in Paragraph 15.08.A of the General Conditions is hereby revised to be the number of years set forth in Paragraph SC-6.01.B.1; or if no such revision has been made in SC-6.01.B, then the correction period is hereby specified to be **[number]** years after the date of Substantial Completion established in Engineer's certificate of Substantial Completion.

ARTICLE 16—SUSPENSION OF WORK AND TERMINATION

No Supplementary Conditions in this Article.

ARTICLE 17—FINAL RESOLUTIONS OF DISPUTES

17.02 *Arbitration*

SC-17.02 Add the following new paragraph immediately after Paragraph 17.01.

SC-17.02 *Arbitration*

A. All matters subject to final resolution under this Article will be settled by arbitration administered by [the American Arbitration Association] in accordance with [its Construction Industry Arbitration Rules] (subject to the conditions and limitations of this Paragraph SC-17.02). Any controversy or claim in the amount of $100,000 or less will be settled in accordance with [the American Arbitration Association's supplemental rules for Fixed Time and Cost Construction Arbitration]. This agreement to arbitrate will be specifically enforceable under the prevailing law of any court having jurisdiction.

B. The demand for arbitration will be filed in writing with the other party to the Contract and with the selected arbitration administrator, and a copy will be concurrently sent to Engineer for information. The demand for arbitration will be made within the specific time required in Article 17, or, if no specified time is applicable, within a reasonable time after the matter in question has arisen, and in no event will any such demand be made after the date when

institution of legal or equitable proceedings based on such matter in question would be barred by the applicable statute of limitations.

C. The arbitration will be held in [indicate location, such as "the same locality as the Site" or "the same municipality as the Owner's principal office location", or other, as directed by the Owner].

D. The arbitrator(s) must be licensed engineers, contractors, attorneys, or construction managers. Hearings will take place pursuant to the standard procedures of the [Construction Arbitration Rules] that contemplate in-person hearings. The arbitrator(s) will have no authority to award punitive or other damages not measured by the prevailing party's actual damages, except as may be required by statute or the Contract. Any award in an arbitration initiated under this clause will be limited to monetary damages and include no injunction or direction to any party other than the direction to pay a monetary amount.

E. The Arbitrator(s) will have the authority to allocate the costs of the arbitration process among the parties, but will only have the authority to allocate attorneys' fees if a specific Law or Regulation or this Contract permits them to do so.

F. The award of the arbitrator(s) must be accompanied by a reasoned written opinion and a concise breakdown of the award. The written opinion will cite the Contract provisions deemed applicable and relied on in making the award.

G. The parties agree that failure or refusal of a party to pay its required share of the deposits for arbitrator compensation or administrative charges will constitute a waiver by that party to present evidence or cross-examine witness. In such event, the other party shall be required to present evidence and legal argument as the arbitrator(s) may require for the making of an award. Such waiver will not allow for a default judgment against the non-paying party in the absence of evidence presented as provided for above.

H. No arbitration arising out of or relating to the Contract will include by consolidation, joinder, or in any other manner any other individual or entity (including Engineer, and Engineer's consultants and the officers, directors, partners, agents, employees or consultants of any of them) who is not a party to this Contract unless:

   1. the inclusion of such other individual or entity will allow complete relief to be afforded among those who are already parties to the arbitration;

   2. such other individual or entity is substantially involved in a question of law or fact which is common to those who are already parties to the arbitration, and which will arise in such proceedings;

   3. such other individual or entity is subject to arbitration under a contract with either Owner or Contractor, or consents to being joined in the arbitration; and

   4. the consolidation or joinder is in compliance with the arbitration administrator's procedural rules.

I. The award will be final. Judgment may be entered upon it in any court having jurisdiction thereof, and it will not be subject to modification or appeal, subject to provisions of the Laws and Regulations relating to vacating or modifying an arbitral award.

J. Except as may be required by Laws or Regulations, neither party nor an arbitrator may disclose the existence, content, or results of any arbitration hereunder without the prior

written consent of both parties, with the exception of any disclosure required by Laws and Regulations or the Contract. To the extent any disclosure is allowed pursuant to the exception, the disclosure must be strictly and narrowly limited to maintain confidentiality to the extent possible.

17.03 *Attorneys' Fees*

SC-17.03 Add the following new paragraph immediately after Paragraph 17.02.

SC-17.03 *Attorneys' Fees*

A. For any matter subject to final resolution under this Article, the prevailing party shall be entitled to an award of its attorneys' fees incurred in the final resolution proceedings, in an equitable amount to be determined in the discretion of the court, arbitrator, arbitration panel, or other arbiter of the matter subject to final resolution, taking into account the parties' initial demand or defense positions in comparison with the final result.

ARTICLE 18—MISCELLANEOUS

18.08 *Assignment of Contract*

SC-18.08 Add the following new paragraph immediately after Paragraph 18.08.A:

B. The contract dated [date] between Owner as "buyer" and [identify seller] as "seller" for procurement of goods and special services ("procurement contract") [is hereby] [will be] assigned to Contractor by Owner, and Contractor [accepts] [will accept] such assignment. A form documenting the assignment is attached as an exhibit to this Contract.

1. This assignment will occur on the [Effective Date of the Contract], and will relieve the Owner as "buyer" from all further obligations and liabilities under the procurement contract.

2. Upon assignment, the "seller" will be a Subcontractor or Supplier of the Contractor, and Contractor will be responsible for seller's performance, acts, and omissions, as set forth in Paragraph 7.07 of the General Conditions just as Contractor is responsible for all other Subcontractors and Suppliers.

3. Notwithstanding this assignment, all performance guarantees and warranties required by the procurement contract will continue to run for the benefit of the Owner and, in addition, for the benefit of the Contractor.

4. Except as noted in the procurement contract, all rights, duties and obligations of Engineer to "buyer" and "seller" under the procurement contract will cease [upon the assignment to Contractor].

SC-18.11 Add a new paragraph immediately after Paragraph 18.10:

SC-18.11 *Confidential Information*

A. All Drawings, Specifications, technical data, and other information furnished to Contractor either by Owner or Engineer or developed by Contractor or others in connection with the Work are, and will remain, the property of Owner or Engineer, and shall not be copied or otherwise reproduced or used in any way except in connection with the Work, or disclosed to third parties or used in any manner detrimental to the interests of Owner or Engineer.

B. The following information is not subject to the above confidentiality requirements:

1. information in the public domain through no action of Contractor in breach of the Contract Documents; or

2. information lawfully possessed by Contractor before receipt from Owner or Engineer; or

3. information required to be disclosed by Laws or Regulations, or by a court or agency of competent jurisdiction. However, in the event Contractor shall be so required to disclose such information, Contractor shall, prior to disclosure, provide reasonable notice to Owner and Engineer, who shall have the right to interpose all objections Owner may have to the disclosure of such information.

SC-18.12 Add a new paragraph immediately after Paragraph 18.11, to read as follows:

SC-18.12 *Publicity*

A. Contractor shall not disclose to any third party the nature of its Work on the Project, nor engage in publicity or public media disclosures with respect to the Project without the prior written consent of Owner.

SC-19 Add new article immediately after Article 18, to read as follows:

ARTICLE SC-19 – STATUTORY REQUIREMENTS

SC-19.01 This article contains portions of certain Laws or Regulations which, by provision of Laws or Regulations, are required to be included in the Contract Documents. The matters addressed in this Article SC-19 may not be complete or current. Contractor's obligation to comply with all Laws and Regulations is set forth in Paragraph 7.11 of the General Conditions.

SC-19.02 [____]

EXHIBIT A—

00 73 46
WAGE DETERMINATION SCHEDULE

Kentucky Division of Water
Prevailing Wages -- Project Rates
(Comprised of 7 pages plus this cover page)

00 73 46
WAGE DETERMINATION SCHEDULE

Kentucky Division of Water
Prevailing Wages – Project Rates
(Comprised of 7 pages plus this cover page)

"General Decision Number: KY20220051 02/25/2022

Superseded General Decision Number: KY20210051

State: Kentucky

Construction Type: Heavy

County: Lyon County in Kentucky.

HEAVY CONSTRUCTION PROJECTS (including sewer/water construction).

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60).

If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022:	. Executive Order 14026 generally applies to the contract. . The contractor must pay all covered workers at least $15.00 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2022.
If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022:	. Executive Order 13658 generally applies to the contract. . The contractor must pay all covered workers at least $11.25 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2022.

The applicable Executive Order minimum wage rate will be

adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at https://www.dol.gov/agencies/whd/government-contracts.

Modification Number	Publication Date
0	01/07/2022
1	02/25/2022

ENGI0181-009 07/01/2021

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
GROUP 1	$ 34.80	17.85
GROUP 2	$ 31.94	17.85
GROUP 3	$ 32.39	17.85
GROUP 4	$ 31.62	17.85

OPERATING ENGINEER CLASSIFICATIONS

GROUP 1 - Backhoe/Excavator/Trackhoe; Bulldozer; Crane; Drill; Grader/Blade; Loader; Mechanic; Scraper

GROUP 2 - Bobcat/Skid Steer/Skid Loader; Forklift; Tractor (50 H.P. or over)

GROUP 3 - Articulating Truck Operator

GROUP 4 - Oiler; Tractor (under 50 H.P.)

Operators on cranes with booms 150 feet and over (including jib) shall receive $1.00 above Group 1 rate; 250 feet and over including jib shall receive $1.50 above Class 1 rate. Combination Rate: All crane operators operating cranes, where the length of the boom in combination with the length of the piling leads equal or exceeds 150 feet, shall receive $1.00 above the Group 1 rate.

Employees assigned to work below ground level are to be paid 10% above basic wage rate. This does not apply to open cut work.

IRON0782-010 08/01/2021

	Rates	Fringes
IRONWORKER (Reinforcing & Structural)		
Projects over $20,000,000.00	$ 30.83	25.52
Projects under $20,000,000.00	$ 29.24	23.22

LABO0189-001 07/01/2021

	Rates	Fringes
LABORER		
Concrete Saw (Hand Held/Walk Behind)	$ 23.76	16.22

LABO0561-003 10/20/2021

	Rates	Fringes
LABORER		
Form Worker	$ 24.26	16.60

LABO1214-001 07/01/2021

	Rates	Fringes
LABORER		
Backfiller, Carpenter Tender, Common or General, Concrete Worker, Dumpman, Fence Erection	$ 23.51	16.22
Pipelayer & Tamper (Hand Held/Walk Behind)	$ 23.76	16.22

---

* UAVG-KY-0001 01/01/2020

	Rates	Fringes
LABORER: Grade Checker	$ 24.08	14.93

SUKY2011-007 06/25/2014

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER	$ 20.96	10.53

ELECTRICIAN.....$ 32.35 2.18

LABORER: Flagger.....$ 18.31 8.89

OPERATOR: Boring Machine.....$ 25.35 13.00

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

==========

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at https://www.dol.gov/agencies/whd/government-contracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of ""identifiers"" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than ""SU"" or ""UAVG"" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the ""SU"" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour National Office because National Office has responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage

payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

==========

END OF GENERAL DECISIO"

CONTRACT III TANK IMPROVEMENTS

LYON COUNTY WATER DISTRICT
KUTTAWA, KENTUCKY

ADDENDUM NO. [1]
[Month] [Day], [Year]

TO: Prospective Bidders

FROM: HDR (Engineer)
[HDR project office street address]
[HDR project office city, state, postal code]

OWNER: [Owner's organization name]
[Owner's street address]
[Owner's city, state, postal code]

SUBJECT: [Site or facility name]
[Project title—same as on Drawings and project manual cover]
[Owner's contract designation, if any]

This Addendum is part of the Bidding Documents and the Contract Documents and modifies the original Bidding Documents dated [____], as indicated below. Acknowledge receipt of this Addendum in the space provided on the Bid Form. Failure to do so may subject the Bidder to disqualification for award of the associated Contract.

This Addendum consists of [____] pages and the attachments, if any, listed on the last page.

ADDENDUM NO. [1] SEALS AND SIGNATURES

[*insert licensee*], PE License No. [____]	The seal and signature to the left applies to the changes made via this Addendum for the Work in the following divisions, sections, and Drawings of the proposed Contract Documents: • [____]. • [____].
[*insert licensee*], PE License No. [____]	The seal and signature to the left applies to the changes made via this Addendum for the Work in the following divisions, sections, and Drawings of the proposed Contract Documents: • [____]. • [____].
[*insert licensee*], PE License No. [____]	The seal and signature to the left applies to the changes made via this Addendum for the Work in the following divisions, sections, and Drawings of the proposed Contract Documents: • [____]. • [____].

[*insert licensee*], PE License No. [____]	The seal and signature to the left applies to the changes made via this Addendum for the Work in the following divisions, sections, and Drawings of the proposed Contract Documents: • [____]. • [____].

Engineer's seal and signature does not apply to the documents, or changes thereto, that comprise Division 00, Bidding and Contracting Requirements, except for revisions to provisions of prior Addenda that modify the Specifications and Drawings.

It is a violation applicable laws and regulations governing professional licensing and registration for any person, unless acting under the direction of the licensed and registered design professional(s) indicated above, to alter in any way the proposed Specifications, Drawings, and Addenda for this Project.

CHANGES TO PRIOR ADDENDA

None

CHANGES TO INTRODUCTORY INFORMATION

[1].01 Document 00 01 10, Table of Contents: Delete the following:

43 27 76 Manually-Cleaned Process Liquid Strainers 43 27 76-1

[1].02 Document 00 01 10, Table of Contents: Add the following:

43 27 73 Automatic Self-Cleaning Process Liquid Strainers 43 27 73-1

CHANGES TO BIDDING REQUIREMENTS

None

CHANGES TO CONTRACTING REQUIREMENTS

None

CHANGES TO SPECIFICATIONS

[1].03 Section 01 14 16 - Coordination with Owner's Operations: In Paragraph 3.3.A, Table 01 14 16-A, delete the rows that indicate tie-in nos. 51 through 52, inclusive.

[1].04 Section 10 14 00 - Signage: In Table 10 14 00-C following Paragraph 2.5.C.5.b, delete the following rows:

Final Effluent Water	Strainer No. 3	Black	White
Final Effluent Water	Strainer No. 4	Black	White
Final Effluent Water	Strainer No. 5	Black	White
Final Effluent Water	Strainer No. 6	Black	White

[1].05 Section 43 27 73 - Automatic Self-Cleaning Process Liquid Strainers: Add Section 43 27 73, Automatic Self-Cleaning Process Liquid Strainers, which is Attachment 1 to this Addendum.

[1].06 Section 43 27 76 - Manually-Cleaned Process Liquid Strainers: Delete this Section in its entirety.

CHANGES TO DRAWINGS

[1].07 Drawing D1, Equipment Building Partial Basement Demolition Plan and Section: Modify the Drawing as shown and indicated on attached Sketch SK AD[1].1.

[1].08 Drawing M3, Blower Building Partial First Floor Plan: Add the following note to the Drawing:

"NOTE:

1. GENERAL CONTRACTOR SHALL FURNISH NEW VFD FOR RETURN SLUDGE PUMP NO. 3. DELIVER NEW VFD TO LOCATION AT THE TREATMENT PLANT AS DESIGNATED BY OWNER."

ATTACHMENTS

The items listed below and bound following this document's "End of Addendum" designation, are part of this Addendum.

[1].09 New Drawings attachments hereto are as follows:

- Drawing M26 – Equipment Building Basement Plan.
- Replacement Drawing M6 – Blower Building First Floor Plan.

[1].10 Other attachments hereto are as follows:

- Attachment 1 – Specifications Section 43 27 73, Automatic Self-Cleaning Process Liquid Strainers.
- Sketches SK AD[1].1 through SK AD[1].3.

END OF ADDENDUM NO. [1]

DIVISION 01

GENERAL REQUIREMENTS

SECTION 01 11 00
SUMMARY OF WORK

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Location and description of Work and prior uses of the Site.
   2. Construction Contracts for this Project.

1.2 LOCATION AND DESCRIPTION OF WORK

A. The Work is located in Lyon County, Kentucky at two sites, Tinsley Creek Subdivision and KY 274 Creek Crossing.

B. Work to be performed under this Contract includes, but is not limited to, the replacement of an undersized 2-in waterline in the Tinsley Creek Subdivision and the replacement of a 6-in waterline at the KY 274 Creek Crossing, and all other Work required in accordance with the Contract Documents.

C. The Contractor shall be responsible for the general overall coordination of the work. Each Sub-Contractor shall carefully check the Drawings, Specifications, and the Project Site in order to advise and coordinate their phase of the Work. Each Subcontractor shall leave the required space and clearances for the work of others, field check all dimensions and file a written report to the Engineer where discrepancies occur between the work to be performed and the Drawings, Specifications, or Project Site conditions. If no report is filed prior to approvals of Shop Drawings and Samples, it will be assumed that no conflict occurs. Resolutions of conflicts after Shop Drawings and Sample approvals shall be resolved by the Engineer and the conflict corrected in the field at no increase in the Contract Sum.

D. All contractors, subcontractors, suppliers, and other employers involved with work at the Project Site shall be responsible for compliance with all federal, state, local, and Project Owner's regulations, standards, and codes in effect during the Contract Time.

E. All notices, demands, requests, instructions, reports, approvals, proposals, Change Orders, Field Orders, and claims shall be in writing.

F. The Contractor shall perform all required testing of installed piping, equipment, etc. as required by these Technical Specifications and the owing utility specifications. Adjustments of process equipment will be the responsibility of the Contractor and/or equipment supplier. All systems shall be adjusted and balanced to the approval of the Engineer prior to project closeout.

G. Contracting Method: The Project will be constructed under a single prime construction Contract

1.3 CONSTRUCTION CONTRACTS FOR THIS PROJECT

A. Single Prime Construction Contract: The Contract requires all the Work for the Project not expressly allocated to Owner or others in the Contract Documents.

PART 2 - PRODUCTS - (NOT USED)

PART 3 - EXECUTION - (NOT USED)

END OF SECTION

SECTION 01 22 00
MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. General requirements applicable to all bid/pay items.
   2. General provisions on unit prices and quantities.
   3. General provisions on lump sums.
   4. Listing of the various bid/pay items in the Project, together with criteria for measuring Unit Price Work for payment.

B. Related Requirements:
   1. Include but are not necessarily limited to:
      a. Section 00 41 13 – Bid Form.

1.2 REQUIREMENTS APPLICABLE TO ALL BID/PAY ITEMS

A. In this Section and elsewhere in the Contract Documents, the terms "bid item", "pay item", "bid/pay item", "Item" followed by a number designation, "this item", and the like all have the same meaning, and refer to one or more specific elements of the Contract, established for pricing and payment, as indicated in the Bid Form and in the Agreement (or exhibit to the Agreement) at the time the Contract was signed by the parties.

B. This Article applies to all bid/pay items in the Contract.

C. Prices – General:
   1. The bid/pay items listed starting with Article 1.5 of this Section refer to and are the same bid items listed in the Bid Form and included in the Contract, and constitute all bid/pay items for the Work at the time the Contract was signed by the parties.
   2. Price Escalation:
      a. Unless expressly indicated otherwise in the Contract Documents, Owner is not obligated to change the stipulated prices (including lump sums, unit prices, and allowances) that are all or part of the Contract Price because of escalation of costs when there is no corresponding change in the Contract Times.
      b. Changes in the Contract Times do not necessarily entitle Contractor to a change in Contract Price due to escalation.
      c. Should Contractor claim a change in Contract Price for one or more stipulated price pay items without a corresponding change in scope, extent, or quality in the associated Work, prior to receiving any such change in Contract Price, Contractor shall submit with Contractor's associated Change Proposal, documentation satisfactory to Engineer supporting and documenting that Contractor's costs have increased because of delays beyond Contractor's control within the associated change in Contract Times included in such Change Proposal.
   3. Compensation for all services, labor, materials, and equipment shall be included in prices stipulated for the unit price bid/pay items in the Contract.
   4. Each unit price in the Contract shall include an amount considered by Contractor as sufficient for all overhead and profit for each separately identified bid/pay item.

D. Contract Price, Payment Procedures, and Related Matters:
   1. Contract Price: The Contract Price, as apportioned among bid/pay items in the Contract, is indicated in the Agreement and any associated exhibits thereto and may be modified by Change Order.
   2. Payments to Contractor: Refer to the General Conditions (as may be modified by the Supplementary Conditions), the Agreement (including provisions on retainage, if any), among other applicable Contract Documents.

3. Schedule of Values: Refer to the General Conditions (as may be modified by the Supplementary Conditions) and Section 01 29 73 - Schedule of Values.
4. Procedures for Changes in Contract Price: Refer to the General Conditions (as may be modified by the Supplementary Conditions) and Section 01 26 00 - Contract Modification Procedures.
5. Alternates: The scope and limits of alternates, when contemplated for or included in the Contract, may be addressed, in whole or in part, in Section 01 23 00 - Alternates.
6. Defective Work is not eligible for payment.

1.3 GENERAL PROVISIONS ON UNIT PRICES AND QUANTITIES

A. Quantities:
1. Quantities of Unit Price Work indicated in the Bid Form and in the Contract (at the time the Agreement was signed by the parties) are estimates for purposes of pricing and comparison of Bids.
2. Owner does not represent, either expressly or by implication, or agree that the nature of materials encountered below ground surface or in concealed areas, or actual quantities of Unit Price Work required, will correspond with the quantities in the Contract at the time the Agreement was signed by the parties. Owner reserves the right to increase or decrease quantities, and to eliminate quantities, as Owner may deem necessary or as may be necessary due to Site conditions encountered.
3. Adjustment of Unit Prices Due to Variation in Quantities:
   a. Provisions, if any, regarding adjustment of unit prices due to variations in actual quantities (eligible for payment) from the estimated quantities in the Contract (including quantities at the time the Agreement was signed by the parties and as subsequently modified by Change Order) are in the General Conditions, as may be modified by the Supplementary Conditions.
      1) Engineer's review for possible unit price adjustment, when provision for such adjustment is expressly indicated in the Contract, will be at a time Engineer deems reasonable and proper.
      2) When the Supplementary Conditions establish that, to be eligible for an adjustment in the unit price, a pay item of Unit Price Work must have a total computed, extended price (at the time the Agreement was signed by the parties) equal to or greater than a specified percentage (stipulated in the Supplementary Conditions) of the total Contract Price (at the time the Agreement was signed by the parties), and the total extended price of such pay item does not exceed the stipulated percentage of the Contract Price, then the associated pay item will be paid at the unit price in the Contract without adjustment for variations in actual quantity.
4. Quantities eligible for payment will be actual quantities furnished and installed (as applicable) in accordance with the Contract Documents, within the pay limits shown or indicated, as measured by Engineer (or other entity so empowered in the Contract Documents), and recommended for payment by Engineer.
5. At Contractor's expense, Contractor may independently verify quantities measured by Engineer for payment. Should Contractor disagree with quantities measured and recommended for payment by Engineer, submit appropriate Change Proposal (appealing Engineer's measurements) indicating the specific reasons for Contractor's appeal, with detailed reasons therefor and associated calculations and estimates, in accordance with the Contract Documents.
6. Quantity Overruns:
   a. When the quantity of a pay item of Unit Price Work eligible for payment exceeds the pay item's quantity included in the Contract, Owner will pay for quantities that exceed those in the Contract only while the estimated total payments to Contractor under the Contract will not exceed the Contract Price. Otherwise, a Change Order is required to modify the associated quantity in the Contract, thus changing the Contract Price.

7. Except as may be established elsewhere in the Contract Documents, make no claim for anticipated profit, loss of profit, damages, or additional compensation arising from difference between quantities of Unit Price Work eligible for payment and the estimated quantities in the Contract.

B. Measuring for Payment:
   1. At Engineer's option, Engineer may delegate to Resident Project Representative (RPR) (if any), some or all of Engineer's responsibilities for measuring Unit Price Work eligible for payment.
   2. Unless expressly indicated otherwise in the Contract Documents, measurements will be in United States standard measurements.
   3. Unless indicated otherwise elsewhere in the Contract Documents, quantities of Unit Price Work eligible for payment will be rounded to the nearest whole number.
   4. In the event of conflict between this Section and the measurement criteria in the Specifications of Divisions 02-49, the measurement criteria in this Section will govern. Typical intent when measurement criteria are in both this Section and the associated Division 02-49 Specifications section, is for the criteria to be interpreted together.
   5. Assistance with Measurements:
      a. Assist Engineer and Resident Project Representative (RPR) (if any), by providing measuring equipment, labor, and survey personnel necessary to measure quantities eligible for payment.
   6. Quantities eligible for payment can be adjusted by Engineer to correct quantities included in Contractor's prior payment requests, and for incomplete or defective Unit Price Work. Such corrections are at Engineer's sole discretion.

1.4 GENERAL PROVISIONS ON LUMP SUM ITEMS

A. Progress payments for Work paid on a lump sum basis will based on Engineer's estimate of the Work (in accordance with the Contract Documents) performed through the end of the associated pay period, based on the Schedule of Values accepted by Engineer in accordance with the Contract Documents.

B. At its sole discretion, Engineer may correct amounts of lump sum Work included in prior payment requests based on improved data or information available to Engineer, or Engineer's knowledge or reasonable belief that Work is incomplete or defective.

1.5 BID/PAY ITEMS – GENERAL CONTRACT

A. Item 1 – Replacement of 2-in Waterline:
   1. Measurement: Lump Sum.
   2. Item Includes:
      a. Coordination with Owner to locate and isolate waterline throughout the Work.
      b. Excavation and disposal of existing 2-in waterline.
      c. Installation of new 4-in waterline.
      d. Collection, handling, and disposal of debris.
      e. Traffic control and permitting as needed throughout the Work.
      f. Site maintenance and restoration.
      g. Testing, disinfection, and start-up of new waterline.
   3. Payment: Per completion of all work associated with the replacement of the existing undersized waterline at the Tinsley Creek Subdivision.

B. Item 2 – Replacement of 6-in Waterline:
   1. Measurement: Lump Sum.
   2. Item Includes:
      a. Coordination with Owner to locate and isolate waterline throughout the Work.
      b. Excavation and disposal of existing 6-in waterline.
      c. Installation of new 6-in waterline.
      d. Collection, handling, and disposal of debris.
      e. Traffic control and permitting as needed throughout the Work.

f. Site maintenance and restoration.
g. Testing, disinfection, and start-up of new waterline.

3. Payment: Per completion of all work associated with the replacement of the existing waterline at the KY 274 Creek Crossing.

C. Item 3 – Mobilization and Demobilization:
1. Measurement: Lump Sum.
2. Item Includes:
a. Work and activities indicated in this provision are intended as illustrative for purposes of scope and payment and do not represent a complete list of all preconstruction activities and Submittals, or all Work or activities required by the contract for mobilization and demobilization.
b. Mobilization Work paid under this item will include:
1) Furnishing required performance bond and payment bond.
2) Furnishing required insurance and associated documentation.
3) Obtaining Owner's acceptance of proposed Subcontractors and Suppliers and entering into subcontracts and purchase orders needed to start the Work.
4) Preparing and obtaining Engineer's approval of Shop Drawings as required.
5) Preparing and obtaining Engineer's acceptance of schedules, including Progress Schedule, Schedule of Submittals, and Schedule of Values.
6) Preconstruction conference(s) required by the Contract Documents.
7) Preconstruction photographic documentation.
8) Establishing Contractor's Site-specific health and safety plan, preconstruction activities needed to start implementing Contractor's safety programs, and verifying status of training of construction workers and personnel and condition of construction equipment, machinery, and tools.
9) Submitting acceptable emergency contact information
10) Obtaining required permits needed to start the Work.
11) Initial establishment of temporary utilities and temporary facilities.
12) Establishing Contractor's field office and sheds, [Engineer's field office,] Contractor's storage areas, staging and laydown areas, and other areas necessary to perform the Work.
13) Initial establishment of construction vehicular access to the Site, parking needed for construction, and offsite haul routes.
14) Establishing construction equipment, machinery, and tools at the Site.
15) Providing initial temporary controls.
16) Temporary security needed to start Work at the Site.
17) Other mobilization acceptable to Engineer.
c. Demobilization Work paid under this item will include:
1) Removal from the Site and adjacent areas of excess materials and equipment.
2) Removal of temporary controls, temporary facilities, temporary barriers, and similar materials and equipment.
3) Removal of temporary access roads and parking areas not part of permanent pavement or otherwise allowed to remain by Owner, including temporary traffic controls established for construction vehicles and equipment.
4) Removal of all field office and sheds, storage areas, staging and laydown areas, and other areas needed to perform the Work and restoration of such areas.
5) Removal from the Site of all construction equipment, machinery, tools, Contractor's containers, temporary fuel storage tanks, and similar items.
6) Closeout of permits on which Contractor is a permittee or co-permittee.
7) Final cleaning.
8) Furnishing required closeout documents.
9) Other costs and effort by Contractor for demobilization.
d. Other cost and Work are under other bid/pay items in the Contract.

3. Payment: Lump sum price for this item will be full compensation for all mobilization and demobilization required and needed for the Contract, not included under other bid/pay items or contracts.

PART 2 - PRODUCTS - (NOT USED)

PART 3 - EXECUTION - (NOT USED)

END OF SECTION

SECTION 01 78 36
WARRANTIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. General requirements for warranties required in the various Specifications.
   2. Provisions addressing:
      a. Suppliers' standard warranties.
      b. Suppliers' special or extended warranties.
      c. Commencement and duration of warranties.

1.2 SUBMITTALS

A. General:
   1. For each item of equipment furnished under the Contract, submit Supplier's standard warranty, regardless of whether such warranty or Submittal thereof is required by the associated Specifications for that item. Submit such warranties for materials where such Submittal is required in the Specifications for the material.
   2. For each item of material or equipment where Supplier's special (or extended) warranty is required by the Contract Documents, submit appropriate special warranty that complies with the Contract Documents.
   3. Supplier's warranties shall be specifically endorsed to Owner, Contractor, and the entity purchasing the item (if other than Contractor) by the entity issuing such warranty.
   4. Submit Suppliers' standard warranties and special warranties as Submittals in accordance with the Schedule of Submittals accepted by Engineer.

1.3 CONTRACTOR'S GENERAL WARRANTY AND CORRECTION PERIOD OBLIGATIONS

A. Contractor's General Warranty and Guarantee: Comply with requirements of the General Conditions, as may be modified by the Supplementary Conditions.

B. Contractor's Warranty of Title: Comply with requirements of the General Conditions, as may be modified by the Supplementary Conditions.

C. Correction Period: Comply with requirements of the General Conditions, as may be modified by the Supplementary Conditions.

1.4 SUPPLIERS' WARRANTIES FOR MATERIALS AND EQUIPMENT

A. Warranty Types:
   1. Required by the General Conditions:
      a. Warranties specified for materials and equipment shall be in addition to, and run concurrent with, Contractor's general warranty and guarantee and requirements for the Contract's correction period.
      b. Disclaimers and limitations in specific materials and equipment warranties do not limit Contractor's general warranty and guarantee, nor does such affect or limit Contractor's performance obligations under the correction period.
   2. Material or equipment manufacturer's standard warranty is pre-printed, written warranty published by item's manufacturer and specifically endorsed by manufacturer to the entities indicated in this Specifications Section's Article 1.2.
   3. Special warranty is written warranty that either extends the duration of material or equipment manufacturer's standard warranty or provides other, increased rights to Owner and other beneficiaries (if any) of such warranty. Where the Contract Documents indicate specific requirements for warranties that differ from the manufacturer's standard warranty for that item, special warranty is implied.

B. Requirements for Special Warranties:
   1. Submit written special warranty document that contains appropriate provisions and identification, ready for signature by material or equipment manufacturer, Owner, and other beneficiaries indicated in Article 1.2 of this Specifications Section. Submit draft warranty with Submittals required prior to fabrication and shipment of the item from the Supplier's facility.
   2. Manufacturer's Standard Form: Modified to include Project-specific information and properly signed by product manufacturer and other entities as appropriate.
   3. Specified Form: When specified forms for special warranties are included in the Contract Documents, prepare written document, properly signed by item manufacturer, Owner, and other beneficiaries indicated in Article 1.2 of this Specifications Section, using the required form.
   4. Refer to the Specifications for content and requirements for submitting special warranties.

1.5 COMMENCEMENT AND DURATION OF WARRANTIES

A. Commencement of Warranties:
   1. Contract correction period and Contractor's general warranty commence as indicated in the General Conditions, as may be modified by the Supplementary Conditions.
   2. Suppliers' standard warranties and special warranties commence running on the date that the associated item is certified by Engineer as substantially complete in accordance with the Contract Documents. In no event shall special warranties commence running prior to Engineer's review and acceptance of special warranty Submittal for the item.
   3. Implied warranties commence in accordance with Laws and Regulations.

B. Duration of Warranties:
   1. Duration of correction period is set forth in the General Conditions, as may be modified by the Supplementary Conditions.
   2. Duration of Contractor's general warranty and guarantee is in accordance with Laws and Regulations.
   3. Duration of Suppliers' standard warranties is in accordance with the applicable standard warranty document accepted for the Project by Engineer.
   4. Duration of required Suppliers' special warranties shall be in accordance with the requirements of the Contract Documents for the subject item.

PART 2 - PRODUCTS - (NOT USED)

PART 3 - EXECUTION - (NOT USED)

END OF SECTION

DIVISION 31

EARTHWORK

SECTION 31 23 10
EXCAVATION AND BACKFILL

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Earthwork - excavation, backfilling, compaction, disposal of waste and surplus materials, placing structural fill, placing crushed stone, sheeting, bracing, dewatering and other Earthwork related work.

B. Related Specification Sections include but are not necessarily limited to:
   1. Division 33 - Utilities

1.2 QUALITY ASSURANCE

A. Referenced Standards:
   1. ASTM International (ASTM):
      a. C33, Standard Specification for Concrete Aggregates.
      b. D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 FT-LBF/CUFT).
      c. D1241, Standard Specification for Material for Soil-Aggregate Subbase, Base, and Surface Courses.
      d. D1557, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 FT-LBF/CUFT(2,700 kN-M/M)).
      e. D2487, Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).
      f. D3786, Standard Test Method for Bursting Strength of Textile Fabrics--Diaphragm Bursting Strength Tester Method.
      g. D4253, Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.
      h. D4254, Standard Test Methods for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density.
      i. D4632, Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.
   2. American Association of State Highway and Transportation Officials (AASHTO)
      a. M 43, Standard Specification for Sizes of Aggregate for Road and Bridge Construction.
      b. M 57, Standard Specification for Materials for Embankment and Subgrades.
      c. M 147, Standard Specification for Materials for Aggregate and Soil-Aggregate Subbase, Base, and Surface Courses.

B. Federal Regulations:
   1. Occupational Safety and Health Administration (OSHA):
      a. 29 CFR Part 1926.650, Occupational Safety and Health Standards, referred to herein as OSHA Standards.

1.3 DEFINITIONS

A. Excavation:
   1. Consists of removal of material encountered to subgrade elevations required or indicated.
   2. Includes excavation of soils; pavements and other obstructions visible on surface; underground structures, utilities, and other items indicated to be demolished and removed; boulders; and rock.

B. Foundations: Footings, base slabs, foundation walls, mat foundations, grade beams, piers and any other support placed directly on soil or rock.

C. Geotechnical Engineer: Independent geotechnical specialist providing field quality control for the project.

D. Non-Structural Fill/Backfill: Soil materials placed and compacted to achieve finish grade elevations that do NOT support foundations, slabs, paving, or other flatwork.

E. Structure: Buildings, foundations, slabs, tanks, curbs, or other man-made stationary features occurring above or below ground surface.

F. Subgrade: The earth or soil layer immediately below foundation bearing elevation, subbase material, fill material, backfill material, or topsoil materials.

G. Unauthorized Excavation:
   1. Consists of removal of materials beyond indicated subgrade elevations or dimensions without specific direction of Engineer.
      a. Unauthorized excavation, as well as associated remedial work as directed by Engineer or Geotechnical Engineer, shall be at Contractor's expense.
   2. Unsuitable Soil Materials: Soil materials encountered at or below subgrade elevation of insufficient strength and stiffness to support construction as determined by the Geotechnical Engineer.

1.4 SUBMITTALS

A. Product Data:
   1. Acknowledgement that products submitted meet requirements of standards referenced.
   2. Manufacturer's installation instructions.
   3. Certifications.

B. Samples:
   1. Coordinate samples and testing for approval of off-site materials with the Geotechnical Engineer.

1.5 PROJECT CONDITIONS

A. Salvageable Items: Carefully remove items to be salvaged, and store on Owner's premises unless otherwise directed.

B. Dispose of waste materials, legally, off site.
   1. Burning, as a means of waste disposal, is not permitted.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Fill and Backfill:
   1. Selected material approved by Geotechnical Engineer [from site excavation or] from off site borrow.
   2. Structural Fill:
      a. May be low volume change cohesive or granular soil at Contractor's option.
      b. Free of organic matter, frozen material and debris.
      c. Low volume change cohesive soil:
         1) ASTM D2487 classification: [CL-ML or CL].
         2) Liquid limit: Less than [45].
         3) Maximum plasticity index: [20].
      d. Granular soil:
         1) ASTM D2487 classification: [GW, GP, GM, GC, SW, SP, SM or SC].
   3. Non-Structural Fill:
      a. ASTM D2487 classification: [GW, GP, GM, GC, SC, SW, SP, SM, CL-ML or CL].
      b. Liquid limit: Less than [45].
      c. Maximum plasticity index: [20].

PART 3 - EXECUTION

3.1 PROTECTION

A. Erosion Control:
   1. See Specification Section 31 25 00.
   2. Clean paved roadways daily of any spillage of dirt, rocks or debris from vehicles and equipment entering or leaving site.
   3. Conduct work to minimize erosion of site. Remove eroded material washed off site.
      a. If necessary or requested by Engineer, construct stilling areas to settle and detain eroded material.

B. Protect existing surface and subsurface features on-site and adjacent to site as follows:
   1. Provide barricades, coverings, or other types of protection necessary to prevent damage to existing items indicated to remain in place.
   2. Protect and maintain bench marks, monuments or other established reference points and property corners.
      a. If disturbed or destroyed, replace at own expense to full satisfaction of Owner and controlling agency.
   3. Maintain free of damage, existing sidewalks, structures, and pavement, not indicated to be removed.
      a. Protect new and existing structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
      b. Any item known or unknown or not properly located that is inadvertently damaged shall be repaired to original condition.
      c. All repairs to be made and paid for by Contractor.
   4. Provide full access to public and private premises, fire hydrants, street crossings, sidewalks and other points as designated by Owner to prevent serious interruption of travel.
   5. Maintain stockpiles and excavations in such a manner to prevent inconvenience or damage to structures on-site or on adjoining property.
   6. Avoid surcharge or excavation procedures which can result in heaving, caving, or slides.

3.2 EXCAVATION, FILLING, AND BACKFILLING FOR STRUCTURES

A. General:
   1. In general, work includes, but is not necessarily limited to, excavation for structures and retaining walls, removal of underground obstructions and undesirable material, backfilling, filling, and fill, backfill, and subgrade compaction.
   2. Obtain fill and backfill material necessary to produce grades required.
      a. Materials and source to be approved by Geotechnical Engineer.
      b. Excavated material approved by Geotechnical Engineer may also be used for fill and backfill.
   3. In the paragraphs of this Specification Section, the word "soil" also includes any type of rock subgrade that may be present at or below existing subgrade levels.

B. Filling and Backfilling Outside of Structures.
   1. This paragraph of this Specification applies to fill and backfill placed outside of structures above bottom level of both foundations and piping but not under paving.
   2. Provide material as approved by Geotechnical Engineer for filling and backfilling outside of structures.
   3. Fill and backfill placement:
      a. Prior to placing fill and backfill material, obtain optimum moisture and maximum density properties for proposed material from Geotechnical Engineer.
      b. Place fill and backfill material to maximum allowable lift thickness indicated in Paragraph 3.2, C, 5, b of this Section.
      c. Compact material with equipment of proper type and size to obtain density specified.

d. Use hand operated equipment for filling and backfilling within 5 FT of walls and less than 3 FT above pipes.
    1) Compaction equipment exceeding 3000 LBS dead weight shall not be used within 5 FT of the wall as a minimum.
    2) Contractor is responsible for method of compaction so as not to damage walls or buried commodities.
e. Use only hand operated equipment for filling and backfilling next to walls and retaining walls.
f. Do not place fill or backfill material when temperature is less than 40 DEGF and when subgrade to receive material is frozen, wet, loose, or soft.
g. Use vibratory equipment for compacting granular material; do not use water.

4. Backfilling against walls:
    a. Do not backfill around any part of structures until each part has reached specified 28-day compressive strength and backfill material has been approved.
    b. Do not start backfilling until concrete forms have been removed, trash removed from excavations, pointing of masonry work, concrete finishing, dampproofing and waterproofing have been completed.
    c. Do not place fills against walls until floor slabs at top, bottom, and at intermediate levels of walls are in place and have reached 28-day required compressive strength to prevent wall movement.
        1) See Contract Drawings for specific exceptions.
    d. Bring backfill and fill up uniformly around the structures and individual walls, piers, or columns.

C. Backfilling Outside of Structures Under Piping or Paving:
1. When backfilling outside of structures requires placing backfill material under piping or paving, the material shall be placed from bottom of excavation to underside of piping or paving at the density required for fill under piping or paving as indicated in this Specification Section.
2. This compacted material shall extend transversely to the centerline of piping or paving a horizontal distance each side of the exterior edges of piping or paving equal to the depth of backfill measured from bottom of excavation to underside of piping or paving.
3. Provide special compacted bedding or compacted subgrade material under piping or paving as required by other Specification Sections for the Project.

3.3 COMPACTION DENSITY REQUIREMENTS

A. Obtain approval from Geotechnical Engineer with regard to suitability of soils and acceptable subgrade prior to subsequent operations.

B. Provide dewatering system necessary to successfully complete compaction and construction requirements.

C. Remove frozen, loose, wet, or soft material and replace with approved material as directed by Geotechnical Engineer.

D. Stabilize subgrade with well graded granular materials as directed by Geotechnical Engineer.

1. Specific areas:

3.4 FIELD QUALITY CONTROL

A. All excavation, trenching, and related sheeting, bracing, etc. shall comply with the requirements of OSHA standards 29 CFR Part 1926.650 Subpart P, and state requirements. Where conflict between OSHA and state regulations exists, the more stringent requirements shall apply.

B. Responsibilities of Special Inspector:
   1. Review proposed materials for fill and backfill around structures.
   2. All testing, observation and work indicated as being performed by the Geotechnical Engineer in [this Specification Section] [Article 3.5 of this Specification Section].
   3. Services will include verification and documentation of satisfactory soil materials, subgrade quality, sampling, placement, moisture conditioning, compaction and testing of proposed soil materials, and field testing for quality control.
   4. Moisture density relations, to be established by the Geotechnical Engineer required for all materials to be compacted.
   5. Extent of compaction testing will be as necessary to assure compliance with specifications.
   6. Prepare and submit inspection and test reports to Engineer.
      a. Coordinate such work with other Special Inspectors.
   7. Test reports to include the following:
      a. Report and certification of aggregate fill and drainage fill.
      b. Test reports on borrow material.
      c. Verification of suitability of each footing subgrade material, in accordance with specified requirements.
      d. Field reports; in-place soil density and moisture tests.
      e. One optimum moisture-maximum density curve for each type of soil encountered.
      f. Report of actual unconfined compressive strength and/or results of bearing tests of each strata tested.
      g. Other documentation necessary for Geotechnical Engineer to approve earthwork.
      h. Assist Engineer to determine corrective measures necessary for defective work.

C. Responsibilities of Testing Agency for Excavation and Backfilling:
   1. All testing, observation and work indicated as being performed by the Geotechnical Engineer in other than Article 3.5 of this Specification Section.
   2. Services will include verification and documentation of satisfactory soil materials, subgrade quality, sampling, placement, moisture conditioning, compaction and testing of proposed soil materials, and field testing for quality control.
   3. Moisture density relations, to be established by the Geotechnical Engineer required for all materials to be compacted.
   4. Extent of compaction testing will be as necessary to assure compliance with specifications.

END OF SECTION

SECTION 31 23 33
TRENCHING, BACKFILLING, AND COMPACTING FOR UTILITIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Excavation, trenching, backfilling and compacting for all underground utilities.

B. Related Specification Sections include but are not necessarily limited to:
   1. Section 31 23 10 – Excavation and Backfill.
   2. Section 33 11 13 – Water Main Construction.

1.2 QUALITY ASSURANCE

A. Referenced Standards:
   1. ASTM International (ASTM):
      a. D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 FT-LBF/FT^3 (600 kN-M/M^3)).
      b. D4253, Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.
      c. D4254, Standard Test Methods for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density.

B. Qualifications: Hire an independent soils laboratory to conduct in-place moisture-density tests for backfilling to assure that all work complies with this Specification Section.

1.3 DEFINITIONS

A. Excavation: All excavation will be defined as unclassified.

1.4 SUBMITTALS

A. Shop Drawings:
   1. Product technical data including:
      a. Acknowledgement that products submitted meet requirements of standards referenced.
      b. Manufacturer's installation instructions.
   2. Submit respective pipe or conduit manufacturer's data regarding bedding methods of installation and general recommendations.
   3. Submit sieve analysis reports on all granular materials.

B. Informational Submittals:
   1. Trench shield (trench box) certification if employed:
      a. Specific to Project conditions.
      b. Re-certified if members become distressed.
      c. Certification by registered professional structural engineer, registered in the state where the Project is located.
      d. Engineer is not responsible to, and will not, review and approve.

1.5 SITE CONDITIONS

A. Avoid overloading or surcharge a sufficient distance back from edge of excavation to prevent slides or caving.
   1. Maintain and trim excavated materials in such manner to be as little inconvenience as possible to public and adjoining property owners.

B. Provide full access to public and private premises and fire hydrants, at street crossings, sidewalks and other points as designated by Owner to prevent serious interruption of travel.

C. Protect and maintain bench marks, monuments or other established points and reference points and if disturbed or destroyed, replace items to full satisfaction of Owner and controlling agency.

D. Verify location of existing underground utilities

PART 2 - PRODUCTS

2.1 MATERIALS

A. Crushed stone material shall conform with the requirements of the applicable sections of the Kentucky Bureau of Highways Standard Specifications and shall consist of clean, hard, and durable particles or fragments, free from dirt, vegetation or objectionable materials.

B. Two classes of crushed stone material are used in this Section. The type of material in each class is as follows:
   1. Class I - No. 9 Aggregate.
   2. Class II - Dense Graded Aggregate (DGA).

PART 3 - EXECUTION

3.1 GENERAL

A. Remove and dispose of unsuitable materials as directed by Engineer or Owner Representative to site provided by Owner.

3.2 EXCAVATION

A. Unclassified Excavation: Remove rock excavation, clay, silt, gravel, hard pan, loose shale, and loose stone.

B. Excavation for Appurtenances:
   1. 12 IN (minimum) clear distance between outer surface and embankment.
   2. See Specification Section 31 23 00 for applicable requirements.
   3. See Specification Section 33 05 16 for applicable requirements.

C. Groundwater Dewatering:
   1. Where groundwater is, or is expected to be, encountered during excavation, install a dewatering system to prevent softening and disturbance of subgrade to allow [subgrade stabilization,] pipe, bedding and backfill material to be placed in the dry, and to maintain a stable trench wall or side slope.
   2. Groundwater shall be drawn down and maintained at least 3 FT below the bottom of any trench or manhole excavation prior to excavation.
   3. Review soils investigation before beginning excavation and determine where groundwater is likely to be encountered during excavation.
      a. Employ dewatering specialist for selecting and operating dewatering system.
   4. Keep dewatering system in operation until dead load of pipe, structure and backfill exceeds possible buoyant uplift force on pipe or structure.
   5. Dispose of groundwater to an area which will not interfere with construction operations or damage existing construction.
   6. Install groundwater monitoring wells as necessary.
   7. Shut off dewatering system at such a rate to prevent a quick upsurge of water that might weaken the subgrade.

D. Trench Excavation:
   1. Excavate trenches by open cut method to depth shown on Drawings and necessary to accommodate work.
      a. Support existing utility lines and yard piping where proposed work crosses at a lower elevation.
         1) Stabilize excavation to prevent undermining of existing utility and yard piping.

2. Open trench outside buildings, units, and structures:
   a. No more than the distance between two manholes, structures, units, or 300 LF, whichever is less.
   b. Field adjust limitations as weather conditions dictate.
3. Any trench or portion of trench, which is opened and remains idle for seven calendar days, or longer, as determined by the Owner, may be directed to be immediately refilled, without completion of work, at no additional cost to Owner.
   a. Said trench may not be reopened until Owner is satisfied that work associated with trench will be prosecuted with dispatch.
4. Observe following trenching criteria:
   a. Trench size:
      1) Excavate width to accommodate free working space.
      2) Maximum trench width at top of pipe or conduit may not exceed outside diameter of utility service by more than the following dimensions:

OVERALL DIAMETER OF UTILITY SERVICE	EXCESS DIMENSION
33 IN and less	18 IN
more than 33 IN	24 IN

      3) Cut trench walls vertically from bottom of trench to 1 FT above top of pipe, conduit, or utility service.
      4) Keep trenches free of surface water runoff.
         a) Include cost in Bid.
         b) No separate payment for surface water runoff pumping will be made.

E. Trenching for Electrical Installations:
   1. Observe the preceding Trench Excavation paragraph in PART 3 of this Specification Section.
   2. Modify for electrical installations as follows:
      a. Open no more than 600 LF of trench in exterior locations for trenches more than 12 IN but not more than 30 IN wide.
      b. Any length of trench may be opened in exterior locations for trenches which are 12 IN wide or less.
      c. Do not over excavate trench.
      d. Cut trenches for electrical runs with minimum 30 IN cover, unless otherwise specified or shown on Drawings.
      e. See Division 26 for additional requirements.

F. Flowable Fill:
   1. Flowable fill must meet Tennessee DOT Standards.
   2. Flowable fill shall be:
      a. Discharged from a mixer by any means acceptable to the Engineer into the area to be filled.
      b. Placed in 4 FT maximum lifts to the elevations indicated.
         1) Allow 12 HR set-up time before placing next lift or as approved by the Engineer.
         2) Place flowable fill lifts in such a manner as to prevent flotation of the pipe.
   3. Flowable fill shall not be placed on frozen ground.
   4. Subgrade on which flowable fill is placed shall be free of disturbed or softened material and water.
   5. Flowable fill batching, mixing, and placing may be started if weather conditions are favorable, and the air temperature is 34 DEGF and rising.
   6. At the time of placement, flowable fill must have a temperature of at least 40 DEGF.
   7. Mixing and placing shall stop when the air temperature is 38 DEGF or less and falling.
   8. Each filling stage shall be as continuous an operation as is practicable.

9. Prevent traffic contact with flowable fill for at least 24 HRS after placement or until flowable fill is hard enough to prevent rutting by construction equipment.
10. Flowable fill shall not be placed until water has been controlled or groundwater level has been lowered in conformance with the requirements of the preceding Groundwater Dewatering paragraph in PART 3 of this Specification Section.

3.3 PREPARATION OF FOUNDATION FOR PIPE LAYING

A. Over-Excavation:
   1. Backfill and compact to 90% of maximum dry density per ASTM D698.
   2. Backfill with granular bedding material as option.

B. Rock Excavation:
   1. Excavate minimum of 6 IN below bottom exterior surface of the pipe or conduit.
   2. Backfill to grade with suitable earth or granular material.
   3. Form bell holes in trench bottom.

C. Subgrade Stabilization:
   1. Stabilize the subgrade when directed by the Owner.
   2. Observe the following requirements when unstable trench bottom materials are encountered.
      a. Notify Owner when unstable materials are encountered.
         1) Define by drawing station locations and limits.
      b. Remove unstable trench bottom caused by Contractor failure to dewater, rainfall, or Contractor operations.
         1) Replace with subgrade stabilization with no additional compensation.

3.4 BACKFILLING METHODS

A. Do not backfill until tests to be performed on system show system is in full compliance with specified requirements.

B. Carefully Compacted Backfill:
   1. Furnish where indicated on Drawings, specified for trench embedment conditions and for compacted backfill conditions up to 12 IN above top of pipe or conduit.
   2. Comply with the following:
      a. Place backfill in lifts not exceeding 8 IN (loose thickness).
      b. Hand place, shovel slice, and pneumatically tamp all carefully compacted backfill.
      c. Observe specific manufacturer's recommendations regarding backfilling and compaction.
      d. Compact each lift to specified requirements.

C. Common Trench Backfill:
   1. Perform in accordance with the following:
      a. Place backfill in lift thicknesses capable of being compacted to densities specified.
      b. Observe specific manufacturer's recommendations regarding backfilling and compaction.
      c. Avoid displacing joints and appurtenances or causing any horizontal or vertical misalignment, separation, or distortion.

D. Water flushing for consolidation is not permitted.

E. Backfilling for Electrical Installations:
   1. Observe the preceding Carefully Compacted Backfill paragraph or Common Trench Backfill paragraph in PART 3 of this Specification Section or when approved by the Engineer.
   2. Modify for electrical installation as follows:
      a. Observe notes and details on electrical drawings for fill in immediate vicinity of direct burial cables

3.5 COMPACTION

A. General:

1. Place and assure bedding, backfill, and fill materials achieve an equal or higher degree of compaction than undisturbed materials adjacent to the work.
2. In no case shall degree of compaction below minimum compactions specified be accepted.

B. Compaction Requirements:
1. Unless noted otherwise on Drawings or more stringently by other Specification Sections, comply with following minimum trench compaction criteria.
a. Bedding material:

LOCATION	SOIL TYPE	COMPACTION DENSITY
All locations	Cohesionless soils	75% relative density by ASTM D4253 and ASTM D4254

b. Carefully compacted backfill:

LOCATION	SOIL TYPE	COMPACTION DENSITY
All applicable areas	Cohesive soils	95% of maximum dry density by ASTM D698
	Cohesionless soils	75% relative density by ASTM D4253 and ASTM D4254

c. Toe drain bedding and backfill:

LOCATION	SOIL TYPE	COMPACTION DENSITY
All locations	Cohesionless soils	60% relative density by ASTM D4253 and ASTM D4254

d. Common trench backfill:

LOCATION	SOIL TYPE	COMPACTION DENSITY
Under pavements, roadways, surfaces within highway right-of-ways	Cohesive soils	95% of maximum dry density by ASTM D698
	Cohesionless soils	60% of relative density by ASTM D4253 and ASTM D4254
Under turfed, sodded, plant seeded, nontraffic areas	Cohesive soils	85% of maximum dry density by ATM D698
	Cohesionless soils	40% of relative density by ASTM D4253 and ASTM D4254

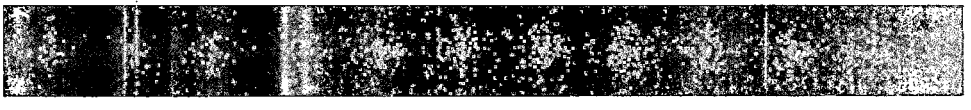
3.6 FIELD QUALITY CONTROL

A. Testing:
1. Perform in-place moisture-density tests as directed by the Owner.
2. Perform tests through recognized testing laboratory approved by Owner.
3. Costs of "Passing" tests paid by Owner.
4. Perform additional tests as directed until compaction meets or exceeds requirements.
5. Cost associated with "Failing" tests shall be paid by Contractor.
6. Reference to Engineer in this Specification Section will imply Geotechnical Engineer when employed by Owner and directed by Engineer to undertake necessary inspections as approvals as necessary.
7. Assure Owner has immediate access for testing of all soils related work.
8. Ensure excavations are safe for testing personnel.

END OF SECTION

DIVISION 32

EXTERIOR IMPROVEMENTS



SECTION 32 12 16
ASPHALTIC CONCRETE VEHICULAR PAVING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Asphaltic concrete vehicular paving.
   2. Line painting.

B. Related Specification Sections include but are not necessarily limited to:

1.2 QUALITY ASSURANCE

A. Referenced Standards:
   1. Federal Specifications (FS):
      a. TT-P-1952F, Paint, Traffic and Airfield Marking, Waterborne.
   2. Construction standards: Kentucky Transportation Cabinet Standards, as amended to date.

1.3 SUBMITTALS

A. Shop Drawings:
   1. Product technical data including:
      a. Acknowledgement that products submitted meet requirements of standards referenced.
      b. Manufacturer's installation instructions.
      c. Asphalt design mix.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Prime coat: Cut-back asphalt.

B. Tack coat: Emulsified asphalt.

C. Asphaltic cement: AASHTO M226 and as required by local authorities.

D. Aggregate: Crushed stone or crushed gravel.

E. Traffic paint: Quick-drying chlorinated-rubber alkyd type, color as approved.

F. Wheel-stops: Precast concrete of uniform color and texture with steel stakes.

2.2 MIXES

A. Comply with mix design as stated in KYTC Specification Divisions 400 and 500.

PART 3 - EXECUTION

3.1 NEW PAVEMENT INSTALLATION

A. Asphalt/aggregate Mixture: Comply with local DPW Standard Specifications for Highways and Bridges. Class as required by loading and use.

B. Remove loose material from existing pavement. Proof roll and check for areas requiring additional compaction. Report unsatisfactory conditions in writing. Beginning of work means acceptance of condition of existing pavement and subbase.

C. Apply prime coat to prepared surface. Apply tack coat to previous laid work and adjacent in place concrete surfaces.

D. Place bituminous concrete at minimum temperature of 225 degrees F in strips not less than 10' wide overlapping joints in previous courses. Complete entire base course thickness before beginning surface course.

E. Construct curbs, where required, to dimensions indicated or if not indicated to standard shapes. Provide tack coat between curb and pavement.

F. Begin rolling when pavement can withstand weight of roller. Roll while still hot to obtain maximum density and to eliminate roller marks.

G. Provide 4" lane and striping paint in uniform, straight lines. Provide wheelstops where indicated and securely dowel into pavement.

3.2 TRENCH WIDTH PAVEMENT REPLACEMENT

A. Sections of pavement shall be replaced as required to install the pipelines. Disturbed pavement shall be reconstructed to original lines and grades with bituminous binder as detailed on the Drawings and in such manner as to leave all such surfaces in fully as good or better condition than that which existed prior to these operations.

B. Prior to trenching, the pavement shall be scored or cut to straight edges along each side of the proposed trench to avoid unnecessary damage to the remainder of the paving. Edges of the existing pavement shall be recut and trimmed as necessary to square, straight edges after the pipe has been installed and prior to placement of the binder course or concrete.

C. Backfilling of trenches shall be in accordance with the applicable portions of Section 31 23 33.

D. Bituminous surface shall be one course construction of an appropriate surface JMF prepared and installed in accordance with the requirements of the Kentucky Department of Highways.
   1. Placement and compaction of surface course shall be in accordance with Section 403 of the Kentucky Department of Highways Standard Specifications. Minimum thickness after compaction shall be as detailed on the Drawings.

E. Dense graded aggregate base, as detailed on the drawings, shall conform to the applicable requirements of the Kentucky Department of Highways.

F. Bituminous pavement replacement is NOT separate pay item.

3.3 LINE PAINTING:

A. Thoroughly clean surfaces which are to receive paint.

B. Dry completely before paint is applied.

C. Do not paint until minimum of five days has elapsed from time surface is completed.
   1. A longer period may be required if directed by Engineer.

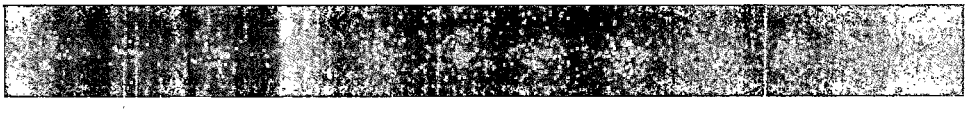
D. Do not apply paint over wet surfaces, during wet or damp weather, or when temperature is below 40 DEGF.

E. Lay out markings and striping in accordance with Drawings.
   1. Width of painted lines: 4 IN.

END OF SECTION

DIVISION 33

UTILITIES



SECTION 33 11 13
WATER MAIN CONSTRUCTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Coordination and interface with existing facilities and utilities.
   2. Connections to existing water mains.
   3. Testing, flushing and disinfection.

B. Related Specification Sections include but are not necessarily limited to:
   1. Section 32 12 16 – Asphaltic Concrete Vehicular Paving.
   2. Section 33 12 19 - Fire Hydrant.
   3. Section 40 05 00 - Pipe and Pipe Fittings - Basic Requirements.
   4. Section 40 05 51 - Valves - Basic Requirements.

1.2 QUALITY ASSURANCE

A. Referenced Standards:
   1. American Water Work Association (AWWA):
      a. B300, Standard for Hypochlorites.
      b. B301, Standard for Liquid Chlorine.
      c. C651, Standard for Disinfecting Water Mains.

1.3 SUBMITTALS

A. Submit results of the leakage tests, identifying the specific length of pipe tested, the test pressure, the duration of test and the amount of leakage.

B. Submit satisfactory bacteriological test reports on disinfection requirements.

C. Contract Closeout Information:
   1. Operation and Maintenance Data:
      a. See Contract Documents for requirements for the mechanics, administration, and the content of Operation and Maintenance Manual submittals.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Pipe: Refer to Specification Section 40 05 00 and Section 40 05 31.

B. In-Line Valves:
   1. Refer to Specification Section 40 05 61.
   2. Provide adjustable valve boxes.
      a. Include price of valve boxes in price of valve installed complete.

C. Fire Hydrants: Refer to Specification Section 33 12 19.

PART 3 - EXECUTION

3.1 INSTALLATION APPLICATION

A. Install water main to the line and grade on the Drawings.
   1. Water mains to be staked at a minimum 100 FT interval with depth of cuts monitored.

B. Field verify depth of utilities that will be crossed.
   1. Adjust water main elevation as required during construction.

2. No separate payment will be made for field verification or adjustment of main depths as required.

C. Contractor will restore all existing structures or services damaged by Contractor's operations at no cost to Owner.

3.2 INTERRUPTION OF SERVICE

A. Interruption of service to water users shall not exceed 4 HRS.
   1. Notify property owners of interruption a minimum of 24 HRS in advance.

3.3 UNDERGROUND SERVICES

A. Notify utility representative prior to construction to obtain available information on location of existing utilities.
   1. Contractor shall be responsible for locating all utilities.

B. Existing water services are to be connected to the new water mains as directed by Owner.
   1. Damage to existing water service to be repaired, using copper pipe and union the same size as existing service.

3.4 DRIVEWAY REMOVAL AND REPLACEMENT

A. All Portland cement concrete and asphalt noted for removal and replacement shall be cut prior to removal.
   1. Cut by sawing, vertical cut to be 1 IN minimum.
   2. The remaining depth of section may be broken out in a manner subject to Engineers approval.
   3. Width of section removed to be either a width not greater than the outside diameter of the water main plus 4 FT-0 IN or broken out to the nearest joint.

B. Replace Portland cement concrete and asphalt equal to or better than original paving plus 2 IN.

C. Debris resulting from the above operations shall be removed and hauled as directed by the Engineer.

D. Include driveway removal and replacement in cost of the bid unit price of the water main.

3.5 GRAVEL SURFACED DRIVES AND ROADWAYS

A. Restore all damaged gravel surfaced drives and roadways to a condition equal to or better than original.
   1. Payment to be at bid unit price for this item.
   2. Replacement gravel gradation.

3.6 PROTECTION OF EXISTING UTILITIES

A. Contractor to verify the location of all underground utilities.
   1. Omission from, or the inclusion of utility locations on the plans is not to be considered as the nonexistence of or a definite location of existing underground utilities.

B. A representative of the underground utilities shall be notified 24 HRS in advance of crossings.

3.7 CONNECTIONS TO EXISTING WATER MAINS

A. Make connections to existing water mains as shown on Drawings, by attaching to existing or changed fitting.
   1. Cost for making connections shall include cost of all fittings including flexible couplings, and shall be included in the bid unit price of the water main.

B. Where the connection is made to an existing water main which can be adequately isolated from the distribution system, it shall be termed a "dry connection."

C. Contractor is responsible for controlling and disposing of water in the trench at no additional cost to the Owner.

3.8 SEWER CROSSINGS

A. Water mains crossing house sewers, storm sewers or sanitary sewers shall be laid to provide a vertical separation of at least 18 IN between the bottom of the water main and the top of the sewer, whenever possible.
   1. A water main may be laid closer than 10 FT if the crown of the sewer is at least 18 IN below the water main invert.
   2. In the event 18 IN of vertical separation cannot be provided at a sewer crossing, the sewer shall be removed for a distance of 10 FT on each side of the water main and replaced with one 20 FT length of ductile iron pipe of the same size.

B. Concrete collars shall be provided at each end of the ductile iron pipe to connect to the existing sewer pipe as shown on the Drawings.

C. Payment for crossings shall be included in the bid unit price of the water main.

3.9 TREES

A. Do not remove trees without written instructions from the Engineer unless tree removal is shown on drawings.
   1. No separate payment will be made for tree removal and the cost shall be included in the bid unit price for transmission main.

3.10 FENCES, SIGNS, MAILBOXES, ETC.

A. Restore all damaged fences, signs, mailboxes, etc., to their original conditions.
   1. No separate payment will be made for these items.

3.11 FIELD QUALITY CONTROL

A. Hydrostatic Testing:
   1. All valves, hydrants, pipe and fittings shall be hydrostatically tested.
   2. Furnish all necessary apparatus to run hydrostatic test, including necessary taps into the pipe.
   3. Prior to pressure testing, expel air from the pipe.
   4. Install corporation cocks at all high points in water main to allow air to be expelled.
   5. After pipe has been laid and backfilled, slowly fill each valved section of pipe with water and apply a test pressure of 150 PSI.
   6. After air has been expelled, close corporation cocks and apply test pressure.
   7. The duration of each hydrostatic test to be a minimum of 2 HRS.
   8. Measure leakage from water main while test pressure is applied.
   9. Leakage is defined as the quantity of water that must be supplied into the pipe to maintain the specified leakage test pressure within 5 PSI of the initial 150 PSI test pressure.
   10. No pipe installation will be accepted if leakage is greater than the following:

PIPE SIZE	MAXIMUM ALLOWABLE LEAKAGE
6 IN	0.55 GAL per hour per 1000 FT
8 IN	0.74 GAL per hour per 1000 FT
10 IN	0.92 GAL per hour per 1000 FT
12 IN	1.10 GAL per hour per 1000 FT
24 IN	2.21 GAL per hour per 1000 FT
30 IN	2.76 GAL per hour per 1000 FT
36 IN	3.31 GAL per hour per 1000 FT

   11. For pipe with 20 FT nominal length, multiply the leakage calculated from above table by 0.9.

a. If pipe under test contains sections of various diameters, the allowable leakage will be the sum of the computed leakage for each size.

12. If the leakage is greater than the maximum allowable, at his own expense locate and repair the defective joints until leakage is within the specified allowances.
    a. No separate payment will be made for this item.

B. Sealing, Flushing, and Disinfection of Potable Water Systems:
1. Maintain interior of all pipes, fittings and other accessories free from dirt and foreign material at all times.
    a. If, in the opinion of the Engineer, the pipe contains dirt that will not be removed by flushing, the pipe interior shall be cleaned and swabbed with bactericidal solution.
    b. At close of day's work or whenever workmen are absent from jobsite, plug, cap or otherwise provide watertight seal from open ends of pipe to prevent ingress of foreign material.
    c. If water is in trench, seal shall remain in place until trench is pumped dry.
2. After favorable performance of pressure test and prior to final acceptance, thoroughly flush the entire potable water piping system and perform disinfection as prescribed.
    a. Perform all work including preventative measures during construction in full compliance to AWWA C651.
3. Flush each segment of the system to provide a flushing velocity of not less than 2.5 FT per second.
4. Drain flushing water to location approved by the Owner.
5. Perform disinfection using one of the following forms:
    a. Application of chlorine gas-water mixture by means of solution-feed chlorinating device.
        1) Liquid chlorine shall comply with AWWA B301.
    b. Application of calcium hypochlorite, or sodium hypochlorite.
        1) Chlorine compounds shall comply with AWWA B300.
6. Disinfect pipe with chlorinated water as per AWWA C651.
    a. Method of application of chlorine shall be by continuous feed method or slug method.
    b. During disinfection procedure, ensure that initial and residual chlorine concentrations meet AWWA C651 requirements by testing by an approved method as directed by the Owner.
    c. Cost of testing shall be included in the Bid Unit Price for water mains and no separate payment will be made for this item.
7. Tag the system during the disinfection procedure.
8. Following disinfection for required contact period, neutralize chlorine residual in water by treating with reducing agent.
    a. Refer to AWWA C651.
    b. Flush all treated water from pipeline at its extremities until replacement water throughout pipe, upon test is proved comparable in quality to water in existing system.
    c. Take two samples to test for bacteriological quality as directed by Engineer.
    d. Repeat disinfection procedure until two satisfactory results are obtained.
    e. Quality of water delivered by the new water main to remain satisfactory for a minimum period of two days.
9. Secure satisfactory bacteriological reports on samples from the system.
    a. Ensure all sampling and testing procedures are in full compliance to AWWA C651, and applicable requirements of the State of Kentucky.
        1) No separate payment will be made for this item.
10. The Owner will provide the water required to fill the main initially and will pay for the water required to flush the main once.
    a. Filling and flushing shall be performed during periods of low usage, between the hours of midnight and 4:00 AM.
    b. Flushing water will be based on a maximum of 8 HRS total.
    c. Any additional refilling or reflushing to be at the Contractor's expense at the City's commercial water rates.

END OF SECTION

SECTION 33 12 19
FIRE HYDRANT

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Dry-barrel fire hydrant.

B. Related Sections include but are not necessarily limited to:
   1. Section 40 05 00 - Pipe and Pipe Fittings - Basic Requirements.

1.2 QUALITY ASSURANCE

A. Referenced Standards:
   1. American Water Works Association (AWWA):
      a. C502, Standard for Dry-Barrel Fire Hydrants.
      b. M17, Installation, Operation and Maintenance of Fire Hydrants.

1.3 SUBMITTALS

A. Shop Drawings:
   1. Product technical data:
      a. Acknowledgement that products submitted meet the requirements of the standards referenced.
      b. Manufacturer's installation instructions.
      c. Acknowledge and verify dimensions and provide list of integral parts and materials.
   2. Prior to submission of shop drawings, submit one copy of complete submittal information direct to City of Kuttawa Fire Department, Attn: Fire Chief, and request and secure written approval of hydrant selection.
      a. Incorporate copies of written approval letter with submittals.

B. Contract Closeout Information:
   1. Operation and Maintenance Data:
      a. See Specification Section 01 78 23 for requirements for the mechanics, administration, and the content of Operation and Maintenance Manual submittals.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with the Contract Documents, the following manufacturers are acceptable:
   1. Mueller.
   2. American Flow Control.
   3. Waterous.

2.2 FIRE HYDRANT

A. Design and Fabrication:
   1. Conform to AWWA C502.
   2. Provide with either compression or gate design.
   3. Provide with a 5 IN valve opening, nozzle section consisting of two, 2-1/2 IN hose nozzles and one, 4-1/2 IN steamer.
   4. Provide with water passages to permit full flow of water to minimize friction loss.
   5. Furnish with multiple weep holes for positive draining to allow water to escape readily from standpipe when hydrant valve is closed.
   6. Designed to throttle flow when partially opened.

7. Designed to allow removal of valve and valve stem without digging up hydrant.
8. Suitable for 5 FT of bury.
9. Furnish with mechanical (gland type) joint inlet connections.
10. Design to break off at ground line when struck by a vehicle.
11. Furnish with O-ring packing only.
12. Furnish hose and steamer nozzles with threads conforming to standard threads used by local Fire Department.
13. Furnish with direction of opening as required by local Fire Department with direction of opening cast on dome.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install hydrants at locations indicated in accordance with AWWA M17 and the following:
   1. Remove foreign material from barrel of hydrant before placement.
   2. Install plumb and at same elevation as connecting pipe and main.
   3. Place each hydrant on a slab of concrete not less than 6 IN thick and 18 IN SQ.
   4. Block backside of hydrant, opposite pipe connection, with concrete firmly wedged between hydrant and vertical face of undisturbed trench.
   5. Place granular bedding material around base of hydrant to the dimensions shown in the Drawings.
   6. Firmly tamp carefully compacted backfill around hydrant to surface of ground and to a distance of 5 FT in front of hydrant.

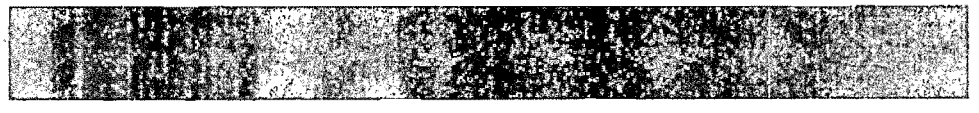
3.2 COATINGS AND FINISHES

A. Provide hydrant with below grade and above grade coatings as per Section 09 96 00.
   1. Paint above grade with color conforming to the requirements of the local Fire Department.

END OF SECTION

DIVISION 40

PROCESS INTERCONNECTIONS



SECTION 40 05 00
PIPE AND PIPE FITTINGS - BASIC REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Utility piping systems.
   2. Plumbing piping systems.

B. Related Specification Sections include but are not necessarily limited to:
   1. Section 31 23 33 - Trenching, Backfilling, and Compacting for Utilities.
   2. Section 40 05 31 - Pipe - Plastic
   3. Section 40 05 51 - Valves - Basic Requirements.

1.2 QUALITY ASSURANCE

A. Referenced Standards:
   1. American Association of State Highway and Transportation Officials (AASHTO):
   2. American Iron and Steel Institute (AISI).
   3. American Society of Mechanical Engineers (ASME):
      a. B16.5, Pipe Flanges and Flanged Fittings.
      b. B40.100, Pressure Gauges and Gauge Attachments.
   4. ASTM International (ASTM):
      a. A53, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
      b. A74, Standard Specification for Cast Iron Soil Pipe and Fittings.
      c. A106, Standard Specification for Seamless Carbon Steel Pipe for High-Temperature Service.
      d. A126, Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.
      e. A536, Standard Specification for Ductile Iron Castings.
      f. D1785, Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.
      g. D2466, Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40.
      h. D2467, Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.
      i. F439, Standard Specification for Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80.
      j. F441, Standard Specification for Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe, Schedules 40 and 80.
   5. American Water Works Association (AWWA):
      a. B300, Standard for Hypochlorites.
      b. C200, Standard for Steel Water Pipe - 6 IN and Larger.
      c. C207, Standard for Steel Pipe Flanges for Waterworks Service - Sizes 4 IN through 144 IN.
      d. C208, Standard for Dimensions for Fabricated Steel Water Pipe Fittings.
      e. C606, Standard for Grooved and Shouldered Joints.
      f. C651, Standard for Disinfecting Water Mains.
      g. C800, Standard for Underground Service Line Valves and Fittings.
   6. American Water Works Association/American National Standards Institute (AWWA/ANSI):
      a. C110/A21.10, Standard for Ductile-Iron and Gray-Iron Fittings.

b. C111/A21.11, Standard for Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
c. C115/A21.15, Standard for Flanged Ductile-Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges.
d. C151/A21.51, Standard for Ductile-Iron Pipe, Centrifugally Cast, for Water.
e. C153/A21.53, Standard for Ductile-Iron Compact Fittings for Water Service.

7. International Plumbing Code (IPC).
8. Underwriters Laboratories, Inc. (UL).

B. Coordinate flange dimensions and drillings between piping, valves, and equipment.

1.3 DEFINITIONS

A. HPIC: High performance industrial coating.

B. PVDF: Polyvinylidene fluoride.

1.4 SYSTEM DESCRIPTION

A. Piping Systems Organization and Definition:
1. Piping services are grouped into designated systems according to the chemical and physical properties of the fluid conveyed, system pressure, piping size and system materials of construction.
2. See PIPING SYSTEMS SCHEDULE in PART 3.

1.5 SUBMITTALS

A. Shop Drawings:
1. Product technical data including:
a. Acknowledgement that products submitted meet requirements of standards referenced.
b. Copies of manufacturer's written directions regarding material handling, delivery, storage and installation.
c. Separate schedule sheet for each piping system scheduled in this Specification Section showing compliance of all system components.
1) Attach technical product data on gaskets, pipe, fittings, and other components.
2. Fabrication and/or Layout Drawings:
a. Exterior/yard piping drawings (minimum scale 1 IN equals 10 FT) with information including:
1) Dimensions of piping lengths.
2) Invert or centerline elevations of piping crossings.
3) Acknowledgement of bury depth requirements.
4) Details of fittings, tapping locations, thrust blocks, restrained joint segments, harnessed joint segments, hydrants, and related appurtenances.
5) Acknowledge designated valve or gate tag numbers, manhole numbers, instrument tag numbers, pipe and line numbers.
6) Line slopes and vents.
b. Schedule of interconnections to existing piping and method of connection.

B. Informational Submittals:
1. Qualifications of lab performing disinfection analysis on water systems.
2. Test reports:
a. Copies of pressure test results on all piping systems.
b. Reports defining results of dielectric testing and corrective action taken.
c. Disinfection test report.
d. Notification of time and date of piping pressure tests.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Protect pipe coating during handling using methods recommended by manufacturer.
1. Use of bare cables, chains, hooks, metal bars or narrow skids in contact with coated pipe is not permitted.

B. Prevent damage to pipe during transit.
   1. Repair abrasions, scars, and blemishes.
   2. If repair of satisfactory quality cannot be achieved, replace damaged material immediately.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with the Contract Documents, the following manufacturers are acceptable:
   1. Insulating unions:
      a. "Dielectric" by Epco.
   2. Dirt strainers (Y type):
      a. Mueller (#351).
      b. Sarco.
      c. Armstrong.
   3. Chemical strainers (Y type):
      a. Chemtrol.
      b. Asahi.
   4. Dry disconnect couplings:
      a. Kamlock.
   5. Dielectric flange kit:
      a. PSI.
      b. Maloney.
      c. Central Plastics.
   6. Pipe saddles (for gage installation):
      a. Dresser Style 91 (steel and ductile iron systems).
      b. Dresser Style 194 (nonmetallic systems).
   7. Expansion joint at FRP and poly tanks:
      a. PROCO.
      b. Garlock, Style 215.
   8. Elastomeric bellows type expansion joints:
      a. Garlock, Guardian 200/204.
      b. PROCO, equivalent model.
      c. Red Valve, equivalent model.
      d. Or equal.
   9. Dismantling Joint
      a. Romac DJ400.
      b. Smith Blair 972.

2.2 PIPING SYSTEMS SCHEDULE

A. Piping system materials, fittings and appurtenances are subject to requirements of specific piping systems schedule located at the end of PART 3 of this Specification Section.

2.3 COMPONENTS AND ACCESSORIES

A. Insulating Components:
   1. Dielectric flange kits:
      a. Flat faced.
      b. 1/8 IN thick dielectric gasket, phenolic, non-asbestos.
      c. Suitable for 175 PSI, 210 DEGF.
      d. 1/32 IN wall thickness bolt sleeves.
      e. 1/8 IN thick phenolic insulating washers.
   2. Dielectric unions:
      a. Screwed end connections.
      b. Rated at 175 PSI, 210 DEGF.

c. Provide dielectric gaskets suitable for continuous operation at union rated temperature and pressure.

B. Dirt Strainers:
1. Y-type.
2. Composition bronze.
3. Rated for test pressure and temperature of system in which they are installed.
4. 20 mesh Monel screen.
5. Threaded bronze plug in the blowoff outlet.
6. Threaded NPT end connections.

C. Reducers:
1. Furnish appropriate size reducers and reducing fittings to mate pipe to equipment connections.
2. Connection size requirements may change from those shown on Drawings depending on equipment furnished.

D. Protective Coating and Lining:
1. Include pipe, fittings, and appurtenances where coatings, linings, coating, tests and other items are specified.
2. Field coating pipe in accordance with Specification Section 09 96 00.

E. Dry Disconnect Couplings:
1. Adapters:
a. Male adapters: Size shown on Drawings.
b. Adapters:
1) Female NPT end connection for sludge and flush applications.
2) Male NPT end connection for chemical applications.
c. Construct adapters for sludge applications from cast iron or steel.
d. Construct adapters for chemical and PVC system applications 3 IN and below from polypropylene.
1) Above 3 IN size, provide stainless steel units.
2. Couplers:
a. Built-in valve and spring loaded poppet which close automatically when disconnected.
b. Designed to remain with only one arm locked in closed position.
c. Construct couplers for sludge applications fabricated from material utilized for adapters.
d. Construct couplers for chemical and PVC system applications 3 IN and less from polypropylene with stainless steel arms and pins.
1) Above 3 IN, provide stainless steel units.
e. Gasket: Compatible with conveyed liquid.
3. Dust caps: For all adapters.

F. Sacrificial Anode Cathodic Protection:
1. 3 LB magnesium sacrificial anodes, prepackaged in a cloth bag containing 75% hydrated gypsum, 20% bentonite and 5% anhydrous sodium sulphate.
2. TW 600 V or an HMWPE insulated copper lead attached to the anode.

G. Valves:
1. See schematics and details for definition of manual valves used in each system under 4 IN in size.
a. See Drawings and Specification Section 40 05 51 schedule for valve types 4 IN and above and for automatic valves used in each system.
2. See Specification Section 40 05 51.

PART 3 - EXECUTION

3.1 EXTERIOR BURIED PIPING INSTALLATION

A. Unless otherwise shown on the Drawings, provide a minimum of 4 FT and maximum of 8 FT earth cover over exterior buried piping systems and appurtenances conveying water, fluids, or solutions subject to freezing.

B. Enter and exit through structure walls, floors, and ceilings by using penetrations and seals specified as shown on Drawings.

C. When entering or leaving structures with buried mechanical joint piping, install joint within 2 FT of point where pipe enters or leaves structure.
   1. Install second joint not more than 6 FT nor less than 4 FT from first joint.

D. Install expansion devices as necessary to allow expansion and contraction movement.

E. Laying Pipe In Trench:
   1. Excavate and backfill trench in accordance with Specification Section 31 23 33.
   2. Clean each pipe length thoroughly and inspect for compliance to specifications.
   3. Grade trench bottom and excavate for pipe bell and lay pipe on trench bottom.
   4. Install gasket or joint material according to manufacturer's directions after joints have been thoroughly cleaned and examined.
   5. Except for first two joints, before making final connections of joints, install two full sections of pipe with earth tamped alongside of pipe or final with bedding material placed.
   6. Lay pipe in only suitable weather with good trench conditions.
      a. Never lay pipe in water except where approved by Engineer.
   7. Seal open end of line with watertight plug if pipe laying stopped.
   8. Remove water in trench before removal of plug.

F. Lining Up Push-On Joint Piping:
   1. Lay piping on route lines shown on Drawings.
   2. Deflect from straight alignments or grades by vertical or horizontal curves or offsets.
   3. Observe maximum deflection values stated in manufacturer's written literature.
   4. Provide special bends when specified or where required alignment exceeds allowable deflections stipulated.
   5. Install shorter lengths of pipe in such length and number that angular deflection of any joint, as represented by specified maximum deflection, is not exceeded.

G. Anchorage and Blocking:
   1. Provide reaction blocking, anchors, joint harnesses, or other acceptable means for preventing movement of piping caused by forces in or on buried piping tees, wye branches, plugs, or bends.
   2. Place concrete blocking so that it extends from fitting into solid undisturbed earth wall.
      a. Concrete blocks shall not cover pipe joints.
   3. Provide bearing area of concrete in accordance with drawing detail.

H. Install insulating components where dissimilar metals are joined together.

3.2 CONNECTIONS WITH EXISTING PIPING

A. Where connection between new work and existing work is made, use suitable and proper fittings to suit conditions encountered.

B. Perform connections with existing piping at time and under conditions which will least interfere with service to customers affected by such operation.

C. Undertake connections in fashion which will disturb system as little as possible.

D. Provide suitable equipment and facilities to dewater, drain, and dispose of liquid removed without damage to adjacent property.

E. Where connections to existing systems necessitate employment of past installation methods not currently part of trade practice, utilize necessary special piping components.

F. Where connection involves potable water systems, provide disinfection methods as prescribed in this Specification Section.

G. Once tie-in to each existing system is initiated, continue work continuously until tie-in is made and tested.

3.3 PRESSURE GAGES

A. Provide at locations shown on the Drawings and specified.

3.4 FIELD QUALITY CONTROL

A. Pipe Testing - General:
   1. Test piping systems as follows:
      a. Test exposed, non-insulated piping systems upon completion of system.
      b. Test exposed, insulated piping systems upon completion of system but prior to application of insulation.
      c. Test concealed interior piping systems prior to concealment and, if system is insulated, prior to application of insulation.
      d. Test buried piping (insulated and non-insulated) prior to backfilling and, if insulated, prior to application of insulation.
   2. Isolate equipment which may be damaged by the specified pressure test conditions.
   3. Perform pressure test using calibrated pressure gages and calibrated volumetric measuring equipment to determine leakage rates.
      a. Select each gage so that the specified test pressure falls within the upper half of the gage's range.
      b. Notify the Engineer 24 HRS prior to each test.
   4. Completely assemble and test new piping systems prior to connection to existing pipe systems.
   5. Acknowledge satisfactory performance of tests and inspections in writing to Engineer prior to final acceptance.
   6. Bear the cost of all testing and inspecting, locating and remedying of leaks and any necessary retesting and re-examination.

B. Pressure Testing:
   1. Testing to be complete in accordance with Specification Section 33 11 13.

3.5 CLEANING, DISINFECTION AND PURGING

A. Cleaning:
   1. Clean interior of piping systems thoroughly before installing.
   2. Maintain pipe in clean condition during installation.
   3. Before jointing piping, thoroughly clean and wipe joint contact surfaces and then properly dress and make joint.
      a. Pig high pressure air piping before connecting to valves or instruments.
   4. At completion of work and prior to Final Acceptance, thoroughly clean work installed under these Specifications.
      a. Clean equipment, fixtures, pipe, valves, and fittings of grease, metal cuttings, and sludge which may have accumulated by operation of system, from testing, or from other causes.
      b. Repair any stoppage or discoloration or other damage to parts of building, its finish, or furnishings, due to failure to properly clean piping system, without cost to Owner.
   5. After erection of piping and tubing, but prior to installation of service outlet valves, blow natural gas [, liquefied petroleum gas] and digester gas systems clear of free moisture and foreign matter by means of air, nitrogen or carbon dioxide.
      a. Oxygen shall never be used.

6. Clean chlorine piping in accordance with CI Pamphlet 6.
7. Purge all neat liquid polymer tubing or piping between the neat polymer storage tank or tote and the polymer blending units with mineral oil to remove residual water prior to introducing neat polymer. Following purging, drain as much of the mineral oil out of the system as possible. Dispose of purged fluids and waste mineral oil in accordance with local environmental regulations.

B. Disinfection of Potable Water Systems:
1. After favorable performance of pressure test and prior to Final Acceptance, thoroughly flush entire potable water piping system including supply, source and any appurtenant devices and perform disinfection as prescribed.
2. Perform work, including preventative measures during construction, in full compliance with AWWA C651.
3. Perform disinfection using sodium hypochlorite complying with AWWA B300.
4. Flush each segment of system to provide flushing velocity of not less than 2.5 FT per second.
5. Drain flushing water to sanitary sewer.
   a. Do not drain flushing water to receiving stream.
6. Use continuous feed method of application.
   a. Tag system during disinfection procedure to prevent use.
7. After required contact period, flush system to remove traces of heavily chlorinated water.
8. After final flushing and before placing water in service, obtain an independent laboratory approved by the Owner to collect samples and test for bacteriological quality.
   a. Repeat entire disinfection procedures until satisfactory results are obtained.
9. Secure and deliver to Owner, satisfactory bacteriological reports on samples taken from system.
   a. Ensure sampling and testing procedures are in full compliance to AWWA C651, local water purveyor and applicable requirements of State of Kentucky.

3.6 LOCATION OF BURIED OBSTACLES

A. Furnish exact location and description of buried utilities encountered and thrust block placement.

B. Reference items to definitive reference point locations such as found property corners, entrances to buildings, existing structure lines, fire hydrants and related fixed structures.

C. Include such information as location, elevation, coverage, supports and additional pertinent information.

D. Incorporate information on "As-Recorded" Drawings.

3.7 PIPE INSULATION

A. Insulate pipe and pipe fittings in accordance with Drawings.

3.8 PIPING SYSTEM SCHEDULES

A. Piping System 10 – Buried and Exposed Potable Water Piping.
1. General:
   a. Test requirements:
      1) Test medium: Water.
      2) Pressure: 1.25 x working pressure.
      3) Duration: 6 HRS.
   b. Gaskets and O-rings:
      1) O-rings: Neoprene or rubber.
      2) Flanged, push-on and mechanical joints (ductile iron): Rubber, AWWA/ANSI C111/A21.11.
      3) Flanged joints (steel): Rubber, AWWA C207.
      4) Grooved coupling joints (ductile and steel): Rubber, AWWA C606.
2. System components:
   a. Pipe size to 3 IN:

1) Exposed service:
   a) Material: Copper tubing, Type L.
   b) Solder: Cadmium and lead-free solder compatible with tubing and fittings materials.
   c) Reference: ASTM B88.
   d) Lining: None.
   e) Coating: HPIC; See Specification Section 09 96 00.
   f) Fittings: Wrought copper or bronze fittings meeting ASME B16.22.
   g) Joints: Soldered or brazed with unions at valves and equipment.
2) Buried service:
   a) Material: Copper tubing, Type K.
   b) Reference: ASTM B88.
   c) Lining: None.
   d) Coating: None.
   e) Fittings: AWWA C800.
   f) Joints: Flared.

b. Pipe size 3 IN through 24 IN:
1) Exposed service:
   a) Materials:
      (1) Flanged: Ductile iron.
      (2) Grooved type joint system: Use pipe thickness per AWWA C606.
      (3) With both systems, provide screwed on flanges at equipment, valves and structural penetrations.
   b) Reference: AWWA/ANSI C115/A21.15.
   c) Lining: Cement.
   d) Coating: HPIC; See Specification Section 09 96 00.
   e) Fittings: Either AWWA/ANSI C110/A21.10 ductile or gray iron.
   f) Joints:
      (1) Flanged or grooved type mechanical coupling (AWWA C606) joints.
      (2) With both systems, provide screwed-on flanges at valves, equipment, and structure penetration.
2) Buried service:
   a) Materials: Ductile iron.
   b) Reference: AWWA/ANSI C151/A21.51.
   c) Lining: Cement.
   d) Coating: Bituminous.
   e) Fittings:
      (1) Either AWWA/ANSI C110/A21.10 ductile or gray iron.
      (2) Optional: AWWA/ANSI C153/A21.53 ductile iron compact fittings for sizes 3 to 16 IN.
   f) Joints: Push-on with mechanical (stuffing box type) joints at fittings and valves.

c. Pipe size greater than 24 IN:
1) Exposed service:
   a) Material: Steel, fabricated pipe.
   b) Reference: AWWA C200.
   c) Lining: Cement.
   d) Coating: HPIC; See Specification Section 09 96 00.
   e) Fittings: AWWA C208.
   f) Joints: Butt welded with rigid AWWA C207 flanges at equipment, valves, and structure penetrations.
2) Buried service:
   a) Material: Steel, fabricated pipe.
   b) Reference: AWWA C200.
   c) Lining: Cement.
   d) Coating: Bituminous.

e) Fittings: AWWA C208.
f) Joints: Butt welded.

3. Install drain tees with capped nipples of IPS brass 3 IN long at low points.
   a. If low point occurs in concealed piping, provide approved flush access panel.
   b. These drains are not shown on Drawings.
4. Slope water lines down to drain points not less than 1 IN in 60 FT.
5. Install all threaded piping with clean-cut tapered threads and with ends thoroughly reamed after cutting to remove burrs.
   a. Pipe joint cement permitted only on external threads.
6. For screwed nipples for connections to flush valves, lavatory supplies, and other equipment with threaded connections use iron, copper, or brass pipe.
7. Install ball, butterfly and plug valves where indicated or required to adequately service all parts of system and equipment.
   a. Install valves on each branch serving restroom.
   b. Install valves on inlet and outlet connections of heat exchangers and on other equipment connected to water lines.
8. Install unions between valves and connections to each piece of equipment and install sufficient number of unions throughout piping system to facilitate installation and servicing.
   a. On copper pipelines, install wrought, solder-joint, copper to copper unions for lines 2 IN and smaller and, for lines 2-1/2 IN and over install brass flange unions.
9. Construct and equip plumbing fixtures and equipment with anti-siphon devices as to entirely eliminate any danger of siphoning waste material into potable water supply system.
10. Where exposed pipes 6 IN in size and smaller pass through floors, finished walls, or finished ceilings, fit with nickel or chrome-plated plates large enough to completely close hole around pipes.
    a. Secure plates to pipe by set screw in approved manner.
11. Size supply branches to individual fixtures as scheduled or indicated on Drawings.
12. Install piping so as to be free to expand with proper loops, anchors and joints without injury to system or structure.
13. Provide branches to wall hydrants or hose bibbs in exterior locations with interior shutoff and drain valves.
14. Provide approved type vacuum breaker and backflow preventer installations indicated or as required by Code.
15. Install concealed in finished structures such as administration and office facilities and at locations shown on Drawings.

3.9 SERVICE SYSTEM SUMMARY

A. Service Systems as defined in the Drawings.

END OF SECTION

SECTION 40 05 31
PIPE - PLASTIC

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Plastic pipe.

B. Related Specification Sections include but are not necessarily limited to:
   1. Section 40 05 00 - Pipe and Pipe Fittings - Basic Requirements.

1.2 QUALITY ASSURANCE

A. See Specification Section 40 05 00.

B. Referenced Standards:
   1. ASTM International (ASTM):
      a. PVC (polyvinyl chloride) materials:
         1) D1784, Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds.
         2) D1785, Standard Specification for Poly(Vinyl Chloride) PVC Plastic Pipe, Schedules 40, 80 and 120.
         3) D2467, Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.
         4) D3034, Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
         5) D3139, Standard Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals.
         6) D3212, Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals.
         7) F593, Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.
         8) F679, Standard Specification for Poly(Vinyl Chloride) (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings.
         9) F794, Standard Specification for Poly(Vinyl Chloride) (PVC) Profile Gravity Sewer Pipe and Fittings Based on Controlled Inside Diameter.
         10) F949, Standard Specification for Poly(Vinyl Chloride) (PVC) Corrugated Sewer Pipe with a Smooth Interior and Fittings.
      b. Installation:
         1) D2321, Standard Practice for Underground Installation of Thermosplastic Pipe for Sewers and Other Gravity-Flow Applications.
   2. American Water Works Association (AWWA):
      a. PVC (polyvinyl chloride) materials:
         1) C900, Standard for Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 IN Through 12 IN, for Water Distribution.
         2) C905, Standard for Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 14 IN through 48 IN, for Water Transmission and Distribution.
      b. Polyethylene (PE) materials:
         1) C901, Standard for Polyethylene (PE) Pressure Pipe and Tubing, 1/2 IN through 3 IN, for Water Service.
   3. NSF International (NSF).

1.3 SUBMITTALS

A. See Specification Section 40 05 00.

PART 2 - PRODUCTS

2.1 PVC PRESSURE PIPING (EXPOSED)

A. General:
   1. Provide Schedule 80 pipe with Schedule 80 fittings and appurtenances to locations shown on Drawings.
   2. Furnish materials in full compliance to following material specifications:
      a. Manufacture pipe, fittings and appurtenances from polyvinyl chloride (PVC) compound which meets the requirements of Type 1, Grade 1 (12454-B) Polyvinyl Chloride as outlined in ASTM D1784.
      b. Manufacture pipe, fittings and valves from materials that have been tested and approved for conveying potable water by the NSF.

B. Pipe:
   1. Furnish pipe meeting requirements of ASTM D1785.
   2. Pipe 2 IN and less to be solvent welded.
   3. Pipe larger than 2 IN may be either flanged or solvent welded unless shown otherwise on Drawings.

C. Fittings: Provide ASTM D2467 PVC socket type fittings having the same pressure and temperature rating as the pipe.

D. Flanges/Unions:
   1. Furnish flanges and unions at locations shown on Drawings.
   2. Provide either flanges or unions at valves, penetrations through structures and equipment connections.
   3. For pipe larger than 2 IN, provide 150 LB socket type PVC flange.
   4. For pipe 2 IN and less, provide socket type PVC union with Buna O-rings.
   5. Use flat, full faced natural rubber gaskets at flanged connections.
      a. Furnish heavy hex head bolts, each with one heavy hex nut, ASTM F593 Type 316 stainless steel.
   6. Use spacers supplied by pipe manufacturer when mating raised-faced flanges to other flanges.

E. Installation:
   1. Field threading PVC will not be permitted.
      a. Perform required threaded connections or attachments by the use of factory molded socket by threaded adapters.
      b. Female adapters are not acceptable.
   2. Employ installation and pipe support practices and solvent welding all in compliance to the manufacturer's printed recommendation.
      a. Continuously support PVC piping at liquid operating temperatures in excess of 100 DEGF.
      b. For vertical piping, band the pipe at intervals to rigidly support load of twice vertical load.
      c. Support riser clamps on spring hangers.
      d. Do not clamp PVC tightly or restrict movement for expansion and contraction.

2.2 PRESSURE PIPING (UNDERGROUND)

A. Materials: Furnish materials in full compliance with following requirements:
   1. 1/2-3 IN: AWWA C901 PE.
   2. 4-12 IN: AWWA C900 PVC.
   3. Joints for polyethylene pipe shall be fusion type in accordance with AWWA C901.
   4. Joints for PVC pipe shall be the elastomeric-gasket type with a pressure rating not less than pipe pressure rating meeting performance requirements of ASTM D3139.

B. Installation:
   1. Field threading of PVC pipe will not be permitted.
   2. Perform installation procedures, handling, thrust blocking, connections, and other appurtenant operations in full compliance to the manufacturer's printed recommendations and in full observance to plan details when more stringent.

2.3 PVC DRAINAGE, SEWER PIPING AND UNDERGROUND AIR DUCTS

A. Materials:
   1. Furnish materials in full compliance to the following material specification.
   2. PVC pipe shall be rigid, unplasticized polyvinyl chloride (PVC) made of PVC plastic having a cell classification of 12454-B or 12454-C as described in specification ASTM D1784.
   3. The requirements of this Specification are intended to provide for pipe and fittings suitable for non-pressure drainage of wastewater and surface water.
   4. Joining systems shall consist of an elastomeric gasket joint meeting requirements of ASTM D3212.
   5. Supply to the Engineer all information and sample of joining method for his evaluation.
      a. Only jointing methods acceptable to the Engineer will be permitted.
   6. Provide pipe and fittings meeting or exceeding the following requirements:
      a. 4-27 IN DIA: ASTM D3034 and ASTM F679, SDR 35.
      b. 8-30 IN DIA: ASTM F794.
      c. 4-18 IN DIA: ASTM F949.
   7. Ensure impact strengths and pipe stiffnesses in full compliance to these Specifications.

B. Installation: Install pipe and fittings in accordance with ASTM D2321 and as recommended by the manufacturer.
   1. Provide for a maximum deflection of not more than 3%.

2.4 PVC TUBING

A. General: Provide nylon tubing with fittings and appurtenances as shown on Drawings.

B. Materials:
   1. Furnish clear outer braided tubing with braid outside the walls.
   2. Have tubing manufactured of nylon with working temperatures from 5 to 180 DEGF.
   3. Design tubing with a minimum safety factor of 4 to 1 ratio of burst pressure to working pressure at maximum temperature.
   4. Provide tubing with working pressure of 75 PSI at 180 DEGF.
   5. Ensure that tubing is self-extinguishing and fire resistant.

C. Fittings:
   1. Install tubing with nylon fittings and connectors.
   2. Use barbed type adapters with stainless steel clamps.
   3. Provide fittings capable of withstanding temperatures from a -70 to 250 DEGF.
   4. Ensure fittings have the same pressure and temperature rating as the tubing.

PART 3 - EXECUTION

3.1 IDENTIFICATION

A. Identify each length of pipe clearly at intervals of 5 FT or less.
   1. Include manufacturer's name and trademark.
   2. Nominal size of pipe, appurtenant information regarding polymer cell classification and critical identifications regarding performance specifications and NSF approvals when applicable.

3.2 PRESSURE PIPING (UNDERGROUND)

A. Installation:

1. Field threading of PVC pipe will not be permitted.
2. Perform installation procedures, handling, thrust blocking, connections, and other appurtenant operations in full compliance to the manufacturer's printed recommendations and in full observance to plan details when more stringent.

END OF SECTION

SECTION 40 05 51
VALVES - BASIC REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Valving, actuators, and valving appurtenances.

B. Related Sections include but are not necessarily limited to:
   1. Section 40 05 00 - Pipe and Pipe Fittings - Basic Requirements.

1.2 QUALITY ASSURANCE

A. Referenced Standards:
   1. American Society of Mechanical Engineers (ASME):
      a. B1.20.1, Pipe Threads, General Purpose.
      b. B16.1, Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250.
      c. B16.18, Cast Copper Alloy Solder Joint Pressure Fittings.
   2. ASTM International (ASTM):
      a. A126, Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.
      b. D256, Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics.
      c. D638, Standard Test Method for Tensile Properties of Plastics.
      d. D648, Standard Test Method for Deflection Temperature of Plastics Under Flexural Load in the Edgewise Position.
      e. D695, Standard Test Method for Compressive Properties of Rigid Plastics.
      f. D2240, Standard Test Method for Rubber Property-Durometer Hardness.
   3. American Water Works Association (AWWA):
      a. C207, Standard for Steel Pipe Flanges for Waterworks Service - Sizes 4 IN through 144 IN.
      b. C500, Standard for Metal-Seated Gate Valves for Water Supply Service.
      c. C504, Standard for Rubber-Seated Butterfly Valves.
      d. C507, Standard for Ball Valves, 6 IN through 48 IN (150 MM through 1200 MM).
      e. C509, Standard for Resilient-Seated Gate Valves for Water Supply Service.
      f. C550, Standard for Protective Coatings for Valves and Hydrants.
      g. C606, Standard for Grooved and Shouldered Joints.
   4. American Water Works Association/American National Standards Institute (AWWA/ANSI):
      a. C111/A21.11, Standard for Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
   5. National Electrical Manufacturers Association (NEMA):
      a. 250, Enclosures for Electrical Equipment (1000 Volts Maximum).
      b. MG 1, Motors and Generators.
   6. National Fire Protection Association (NFPA):
      a. 70, National Electrical Code (NEC).

1.3 DEFINITIONS

A. The following are definitions of abbreviations used in this Specification Section or one of the individual valve sections:
   1. CWP: Cold water working pressure.
   2. SWP: Steam working pressure.
   3. WOG: Water, oil, gas working pressure.
   4. WWP: Water working pressure.

1.4 SUBMITTALS

A. Shop Drawings:
   1. Product technical data including:
      a. Acknowledgement that products submitted meet requirements of standards referenced.
      b. Manufacturer's installation instructions.
      c. Valve pressure and temperature rating.
      d. Valve material of construction.
      e. Special linings.
      f. Valve dimensions and weight.
      g. Valve flow coefficient.
      h. Wiring and control diagrams for electric or cylinder actuators.
      i. Short Circuit Current Rating (SCCR) nameplate marking per NFPA 70. Include any required calculations per Section 01 61 03.
   2. Test reports.

B. Contract Closeout Information:
   1. Operation and Maintenance Data:
      a. See Contract Documents for requirements for the mechanics, administration, and the content of Operation and Maintenance Manual submittals.

C. Informational Submittals:
   1. Verification from valve actuator manufacturer that actuators have been installed properly, that all limit switches and position potentiometers have been properly adjusted, and that the valve actuator responds correctly to the valve position command.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with the Contract Documents, refer to individual valve Specification Sections for acceptable manufacturers.

2.2 MATERIALS

A. Refer to individual valve Specification Sections.

2.3 VALVE ACTUATORS

A. Valve Actuators - General:
   1. Provide actuators as shown on Drawings or specified.
   2. Counter clockwise opening as viewed from the top.
   3. Direction of opening and the word OPEN to be cast in handwheel or valve bonnet.
   4. Size actuator to produce required torque with a maximum pull of 80 LB at the maximum pressure rating of the valve provided and withstand without damage a pull of 200 LB on handwheel or chainwheel or 300 FT-pounds torque on the operating nut.
   5. Unless otherwise specified, actuators for valves to be buried, submerged or installed in vaults or manholes shall be sealed to withstand at least 20 FT of submergence.
   6. Extension stem:
      a. Install where shown or specified.
      b. Solid steel with actuator key and nut, diameter not less than stem of valve actuator shaft.
      c. Pin all stem connections.
      d. Center in valve box or grating opening band with guide bushing.

B. Buried Valve Actuators:
   1. Provide screw or slide type adjustable cast iron valve box, 5 IN minimum diameter, 3/16 IN minimum thickness, and identifying cast iron cover rated for traffic load.
   2. Box base to enclose buried valve gear box or bonnet.
   3. Provide 2 IN standard actuator nuts complying with AWWA C500, Section 3.16.

4. Provide at least two tee handle keys for actuator nuts, with 5 FT extension between key and handle.
5. Extension stem:
   a. Provide for buried valves greater than 4 FT below finish grade.
   b. Extend to within 6 IN of finish grade.
6. Provide concrete pad encasement of valve box as shown for all buried valves unless shown otherwise.

C. Plastic Valve Vault:
1. Provide in non-traffic areas only on valve applications 3-1/2 IN and less.
2. Nominal 7-1/2 IN DIA top section.
3. Design unit for screw type extension section having nominal 9 IN DIA bell.
4. Cast iron ring and lid.
5. Constructed of injection molded polyolefin compound with fibrous inorganic component reinforcing and UV stabilization.
6. Armor Access Boxes.

D. Exposed Valve Manual Actuators:
1. Provide for all exposed valves not having electric or cylinder actuators.
2. Provide handwheels for gate and globe valves.
   a. Size handwheels for valves in accordance with AWWA C500.
3. Provide lever actuators for plug valves, butterfly valves and ball valves 3 IN DIA and smaller.
   a. Lever actuators for butterfly valves shall have a minimum of five intermediate lock positions between full open and full close.
   b. Provide at least two levers for each type and size of valve furnished.
4. Gear actuators required for plug valves, butterfly valves, and ball valves 4 IN DIA and larger.
5. Provide gearing for gate valves 20 IN and larger in accordance with AWWA C500.
6. Gear actuators to be totally enclosed, permanently lubricated and with sealed bearings.
7. Provide chain actuators for valves 6 FT or higher from finish floor to valve centerline.
   a. Cadmium-plated chain looped to within 3 FT of finish floor.
   b. Equip chain wheels with chain guides to permit rapid operation with reasonable side pull without "gagging" the wheel.
   c. For smaller valves with lever or handle operators, provide offset tee handles with attached chain for operation from the operating floor.
8. Provide cast iron floor stands where shown on Drawings.
   a. Stands to be furnished by valve manufacturer with actuator.
   b. Stands or actuator to include thrust bearings for valve operation and weight of accessories.

E. Submerged Actuators:
1. Mount the valve actuator on top of an extension bonnet 3 FT above any adjacent personnel access.
2. The valve and bonnet connection shall be flanged and watertight.
3. Provide a top brace support for the bonnet.
   a. Mount the brace 6 IN below the top of the wall as shown.
4. Materials:
   a. Extension bonnet: Cast iron ASTM A126 or steel.
   b. Brace and anchor bolts: Type 304 stainless steel.

F. Electric Actuators (480 V, 3 PH):
1. Electric Motor Actuators - General:
   a. Provide electric motor actuators for valves and gates so indicated: on the Drawings, in valve schedule in the Specifications, or elsewhere in the Contract Documents.

b. Unless otherwise specified, provide each electric motor actuator with integral control devices for operation, including pushbuttons. When actuator's integral control station would be 6 FT or more above the nearest operating floor, or when integral control station would be out of reach of facility personnel standing on the nearest operating floor: (1) integral control station on actuator is not required; and (2) provide remotely-located control station, with pushbuttons, in accordance with this Section.

2. Furnish electric actuator integral with valve consisting of:
   a. Motor.
   b. Gearing.
   c. Handwheel.
   d. Limit and torque switches.
   e. Lubricants.
   f. Heating elements.
   g. Wiring.
   h. Terminals for motor power and controls.
   i. Drive nut.
3. Housing/enclosure:
   a. Provide cast iron gear housing and cast iron load bearing enclosure.
   b. Non load bearing enclosure and housing: Aluminum or cast iron.
   c. Rated for area classification shown on Drawings.
   d. Provide O-ring seals for covers and entries.
   e. Terminal and limit switch compartment covers are to be fastened to gear housing by stainless steel fasteners with capture device to prevent loss.
4. Motors:
   a. Provide motors that are totally enclosed, high torque design made expressly for valve actuator service and capable of operating the valve under full differential pressure for complete open-close and reverse cycle of travel at least twice in immediate succession without overheating.
   b. Design motors in accordance with NEMA MG 1 standards, with Class B insulation, and to operate successfully at any voltage within 10% above or below rated voltage.
   c. Provide positive method to ensure motor bearings are permanently lubricated.
   d. Provide three thermal switches imbedded in windings:
      1) 120 DEG apart.
      2) Provide motor shutdown at high temperature.
   e. Motor housing:
      1) Aluminum or cast iron.
      2) Totally enclosed nonventilated with cooling fins.
   f. Provide motor capable of operating in any position.
   g. Provide motor sealed from gearcase to allow any mounting position.
   h. Provide motors suitable for 480 V, 3 PH, 60 Hz.
5. Gearing:
   a. Provide power gearing consisting of heat treated steel helical gears, carburized and hardened alloy steel worm, and alloy bronze worm gear, all grease or oil bath lubricated, designed for 100% overload, and effectively sealed against entrance of foreign matter.
   b. Provide gearing mechanism constructed to permit field changes of reduction gear ratio.
   c. Design actuators so that motor comes up to speed before stem load is encountered in either opening or closing operation.
   d. Limit switch gearings and feedback device reduction gearing:
      1) Steel or bronze.
   e. Support rotating shafts with anti-friction bearings.
   f. Provide separate drive nut/thrust bearing assembly:
      1) Mounted to base of actuator.
      2) High tensile bronze.
      3) Quarter turn actuator: Provide 90 DEG mounting intervals.
      4) Provide grease fitting on drive assembly.

6. Handwheel:
   a. Permanently attached for manual operation.
   b. Positive declutch mechanism to engage and disengage handwheel.
   c. Handwheel shall not rotate during motor operation.
   d. Inoperable motor shall not prevent manual operation.
7. Limit torque and thrust loads in both closing and opening directions by torque limit switches.
   a. Provide torque switches with micrometer adjustment and reference setting indicator.
      1) Assure adjustment variation of approximately 40% in torque setting.
   b. Provide switches having rating of not less than 6 A at 120 VAC and 2.2 A at 115 VDC.
   c. Limit and torque switches shall have totally sealed contacts.
8. Furnish electric actuator with two geared limit switch assemblies with each switch assembly having four separate limit switches:
   a. Assure each limit switch assembly is geared to driving mechanism and is independently adjustable to trip at any point at and between the fully open and fully closed valve position.
   b. Provide minimum of two normally open contacts and two normally closed contacts at each end of valve travel.
   c. Provide switches with inductive contact rating of not less than 6 A at 120 VAC, 3 A at 240 VAC, 1.5 A at 480 VAC, 2.2 A at 115 VDC and 1.1 A at 230 VDC.
   d. Limit switches shall be fully adjustable when power is applied to actuator.
9. Provide space heating elements sized to prevent condensation in both motor and geared limit switch compartment(s).
   a. Furnish heating elements rated at 120 VAC with heaters continuously energized.
10. Open-close actuator controls:
   a. Provide control assembly with necessary holding relays, reversing starter, control transformers of sufficient capacity to provide control power, space heating element power and valve position transmitter.
   b. Provide control assembly in an enclosure rated for the defined area classification.
   c. Controls for open/close actuator:
      1) Provide remote pushbutton station with enclosure rated for area classification shown on Drawings with:
         a) Open pushbutton.
         b) Close pushbutton.
         c) Stop pushbutton.
         d) Remote/local switch.
         e) Full open light.
         f) Full close light.
         g) Open and close relays as required.
      2) Provide control enclosure to accept:
         a) Remote open/close switches.
      3) Provide contacts in control enclosure:
         a) Remote/local contact.
         b) Full open contact.
         c) Full close contact.
      4) Wire all components to an internal terminal strip and include mounted wiring diagram inside enclosure.
11. Additional requirements for modulating valve actuators:
   a. Proportional position servo-amplifier mounted integral with the actuator control compartment.
   b. Positioning of valve shall be proportional to a 4-20 mA signal input to the position servo-amplifier when remote control has been selected.
   c. Servo-amplifier adjustments shall include zero, span, gain, and dead-band.
   d. Provide 4-20 mA signal position control as shown on the Drawings that interfaces with the position control/position feedback instrumentation wiring to and from [remote control device] [PLC].

12. Provide equipment or control panels with Short Circuit Current Rating (SCCR) labeling as required by NFPA 70 and other applicable codes. See Section 01 61 03 for information on how to determine the available fault current, such that, the SCCR rating meets or exceeds the available fault current.

G. Electric Actuators (120 V, 1 PH):
   1. Electric Motor Actuators - General:
      a. Provide electric motor actuators for valves and gates so indicated: on the Drawings, in valve schedule in the Specifications, or elsewhere in the Contract Documents.
      b. Unless otherwise specified, provide each electric motor actuator with integral control devices for operation, including pushbuttons. When actuator's integral control station would be 6 FT or more above the nearest operating floor, or when integral control station would be out of reach of facility personnel standing on the nearest operating floor: (1) integral control station on actuator is not required; and (2) provide remotely-located control station, with pushbuttons, in accordance with this Section.
   2. General:
      a. Self contained including motor, gearing, torque switch, limit switches and cast housing.
      b. Electrical enclosure: NEMA 4 or NEMA 7 to comply with area rating classification shown on Drawings.
      c. Factory assembled requiring only field connection of power and control wires.
      d. Comply with Section 01 61 03.
   3. Motors:
      a. Produce 1.5 times the required torque.
      b. Sized for two complete open-close cycles without overheating.
      c. One fully closed to fully open cycle to occur within 60 SEC.
      d. Class F insulation.
      e. Operate at plus or minus 10% voltage.
      f. 120 Volt, single phase, 60 Hz.
      g. Provide thermal cutout switch and internal heater for actuator enclosure.
      h. Control wiring as shown on Drawing control diagrams.
   4. Remote pushbutton station:
      a. Enclosure: NEMA 4 stainless steel.
      b. Control relays shall include:
         1) Open relay.
         2) Closed relay.
         3) [Remote control device] [PLC] interface relay.
      c. Push-to-test indicating lights shall include:
         1) Open.
         2) Closed.
         3) Remote.
      d. Selector switches shall include:
         1) Local-Remote.
         2) Open-Close.
      e. Space heater for enclosure.
      f. Control wiring as shown on control diagrams.
      g. Wire all components to an internal terminal strip and include mounted wiring diagram inside enclosure.
   5. Provide equipment or control panels with Short Circuit Current Rating (SCCR) labeling as required by NFPA 70 and other applicable codes. See Section 01 61 03 for information on how to determine the available fault current, such that, the SCCR rating meets or exceeds the available fault current.

H. Valve Lockout Devices:
   1. Device manufactured from same material as valve operator, preventing access to valve operator, to accept lock shackle.

2.4 FABRICATION

A. End Connections:
   1. Provide the type of end connections for valves as required in the Piping Schedules presented in Section 40 05 00 or as shown on the Drawings.
   2. Comply with the following standards:
      a. Threaded: ASME B1.20.1.
      b. Flanged: ASME B16.1, Class 125 unless otherwise noted or AWWA C207.
      c. Bell and spigot or mechanical (gland) type: AWWA/ANSI C111/A21.11.
      d. Soldered: ASME B16.18.
      e. Grooved: Rigid joints per Table 5 of AWWA C606.

B. Refer to individual valve Specification Sections for specifications of each type of valve used on Project.

C. Nuts, Bolts, and Washers:
   1. Wetted or internal to be bronze or stainless steel.
      a. Exposed to be zinc or cadmium plated.

D. On Insulated Piping: Provide valves with extended stems to permit proper insulation application without interference from handle.

E. Epoxy Interior Coating: Provide epoxy interior coating for all ferrous surfaces in accordance with AWWA C550.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Setting Buried Valves:
   1. Locate valves installed in pipe trenches where buried pipe indicated on Drawings.
   2. Set valves and valve boxes plumb.
   3. Place valve boxes directly over valves with top of box being brought to surface of finished grade.
   4. Install in closed position.
   5. Place valve on firm footing in trench to prevent settling and excessive strain on connection to pipe.
   6. After installation, backfill up to top of box for a minimum distance of 4 FT on each side of box.

C. Support exposed valves and piping adjacent to valves independently to eliminate pipe loads being transferred to valve and valve loads being transferred to the piping.

D. For grooved coupling valves, install rigid type couplings or provide separate support to prevent rotation of valve from installed position.

E. Install electric or cylinder actuators above or horizontally adjacent to valve and gear box to optimize access to controls and external handwheel.

F. For threaded valves, provide union on one side within 2 FT of valve to allow valve removal.

G. Install valves accessible for operation, inspection, and maintenance.

3.2 ADJUSTMENT

A. Adjust valves, actuators and appurtenant equipment to comply with Section 01 75 00.
   1. Operate valve, open and close at system pressures.

B. For all 120 VAC and 480 VAC electric actuators, employ and pay for services of valve actuator manufacturer's field service representative to:

1. Inspect valve actuators covered by this Specification Section.
2. Supervise adjustments and installation checks:
   a. Open and close valves electrically under local manual and demonstrate that all limit switches are properly adjusted and that switch contacts are functioning properly by verifying the inputs are received at the remote input/output (RIO) panels or local control panel as appropriate.
   b. Position modulating valves electrically under local manual control and demonstrate that the valve position feedback potentiometer is properly adjusted and that the feedback signal is received at the RIO panels or local control panel as appropriate.
   c. Simulate a valve position command signal at the RIO panel or local control panel as appropriate and demonstrate that the valve is controlled to the desired position without excessive hunting.
3. Provide Owner with a written statement that the valve actuator manufacturer has verified that the actuators have been installed properly, that all limit switches and position potentiometers have been properly adjusted and that the valve actuator responds correctly to the valve position command.

END OF SECTION

Exhibit 10

LYON COUNTY WATER DISTRICT

FINANCIAL STATEMENTS

FOR THE YEAR ENDED DECEMBER 31, 2021

LYON COUNTY WATER DISTRICT

FINANCIAL STATEMENTS

FOR THE YEAR ENDED DECEMBER 31, 2021

TABLE OF CONTENTS

JESSICA K. DANIEL, CPA PSC
CERTIFIED PUBLIC ACCOUNTANT

INDEPENDENT AUDITORS' REPORT

To the Board of Commissioners
Lyon County Water District
Kuttawa, Kentucky

Opinions
We have audited the accompanying financial statements of the business-type activities of the Lyon County Water District as of and for the year ended December 31, 2021, and the related notes to the financial statements, which collectively comprise the District's basic financial statements as listed in the table of contents.

In our opinion, the financial statements referred to above present fairly, in all material respects, the respective position of the business-type activities of the Lyon County Water District as of December 31, 2021, and the respective changes in financial position and, where applicable, cash flows thereof for the year then ended in accordance with accounting principles generally accepted in the United States of America.

Basis for Opinions
We conducted our audit in accordance with auditing standards generally accepted in the United States of America (GAAS) and the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States. Our responsibilities under those standards are further described in the Auditor's Responsibilities for the Audit of the Financial Statements section of our report. We are required to be independent of the Lyon County Water District, and to meet our other ethical responsibilities, in accordance with the relevant ethical requirements relating to our audit. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinions.

Responsibilities of Management for the Financial Statements
Management is responsible for the preparation and fair presentation of these financial statements in accordance with accounting principles generally accepted in the United States of America, and for the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of the financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, management is required to evaluate whether there are conditions or events, considered in the aggregate, that raise substantial doubt about the District's ability to continue as a going concern for twelve months beyond the financial statement date, including any currently known information that may raise substantial doubt shortly thereafter.

140 COMMERCE ST.
PO BOX 909
EDDYVILLE, KY 42038

270-388-4114 OFFICE
270-388-2363 FAX

Auditor's Responsibilities for the Audit of the Financial Statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinions. Reasonable assurance is a high level of assurance but is not absolute assurance and therefore is not a guarantee that an audit conducted in accordance with GAAS and *Government Auditing Standards* will always detect a material misstatement when it exists. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from an error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal controls. Misstatements are considered material if there is a substantial likelihood that, individually or in the aggregate, they would influence the judgment made by a reasonable user based on the financial statements.

In performing an audit in accordance with GAAS and *Government Auditing Standards*, we:

- Exercise professional judgment and maintain professional skepticism throughout the audit.
- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, and design and perform audit procedures responsive to those risks. Such procedures include examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Lyon County Water District's internal control. Accordingly, no such opinion is expressed.
- Evaluate the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluate the overall presentation of the financial statements.
- Conclude whether, in our judgment, there are conditions or events, considered in the aggregate, that raise substantial doubt about the Lyon County Water District's ability to continue as a going concern for a reasonable period of time.

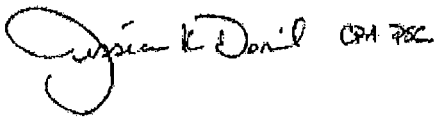
We are required to communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit, significant audit findings, and certain internal control-related matters that we identified during the audit.

Required Supplementary Information

Accounting principles generally accepted in the United States of America require that the management's discussion and analysis and budgetary comparison information, schedule of pension contributions, schedule of other postemployment benefits contributions, schedule of proportionate share of net pension liability, and schedule of proportionate share of other postemployment benefits liability be presented to supplement the basic financial statements. Such information is the responsibility of management and, although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board, who considers it to be an essential part of financial reporting for placing the basic financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the basic financial statements and other knowledge we obtained during our audit of the basic financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

Other Reporting Required by *Government Auditing Standards*

In accordance with *Government Auditing Standards*, we have also issued a report dated July 25, 2022, on our consideration of the Lyon County Water District's internal control over financial reporting and our tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements and other matters. The purpose of that report is to describe the scope of our testing of internal control over financial reporting and compliance and the results of that testing and not to provide an opinion on the effectiveness of the District's internal control over financial reporting or on compliance. That report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the District's internal control over financial reporting and compliance.



Eddyville, Kentucky
July 25, 2022

LYON COUNTY WATER DISTRICT
MANAGEMENT'S DISCUSSION AND ANALYSIS
DECEMBER 31, 2021
(UNAUDITED)

The Lyon County Water District ("District") offers Management's Discussion and Analysis to provide an overview and analysis of the District's financial activities for the year ended December 31, 2021. To fully understand the entire scope of the District's financial activities, this information should be read in conjunction with the financial statement provided in this document.

FINANCIAL HIGHLIGHTS

- The District's total assets and deferred outflows of resources exceeded its liabilities and deferred inflows of resources as of December 31, 2021, by $3,214,923 (Net Position).
- The District's total net position decreased by $39,222 during the year compared to a $207,121 decrease in the prior year.
- The District's operating revenues increased by $48,367 over the prior year from $1,265,460 to $1,313,827.

OVERVIEW OF THE FINANCIAL STATEMENTS

Lyon County Water District's basic financial statements include a statement of net position, statement of revenues, expenses and changes in net position, statement of cash flows, and notes to the financial statements.

The District's financial statements are prepared on the accrual basis of accounting in accordance with generally accepted accounting principles promulgated by the Governmental Accounting Standards Board (GASB).

Statement of net position. The statement of net position presents the financial position of the District. It presents information on the District's assets, deferred outflows, liabilities, and deferred inflows, with the difference between the two reported as net position. Over time, increases or decreases in net position may serve as a useful indicator of whether the financial position of the District is improving or deteriorating. The statement of net position can be found on page 8 of this report.

Statement of revenues, expenses and changes in net position. The statement of revenues, expenses and changes in net position presents information showing how the District's net position changed during the most recent fiscal year. All changes in net position are reported as soon as the underlying event giving rise to the change occurs, regardless of the timing of related cash flows. Revenues are recognized when they are earned, not when they are received. Expenses are recognized when incurred, not when they are paid. Thus, revenues and expenses are reported in this statement for some items that will only result in cash flows in future periods. The statement of revenues, expenses and changes in net position is on page 9 of this report.

Statement of cash flows. The statement of cash flows presents information on the effects changes in assets and liabilities have on cash during the course of the fiscal year and can be found on page 10 of this report.

Notes to the financial statements. The notes provide additional information that is essential to a full understanding of the data provided in the District's financial statements. The notes to the financial statements can be found on pages 11-30 of this report.

Required Supplementary Information. In addition to basic financial statements and accompanying notes, this report also presents certain required supplementary information which can be found on page 31-39.

OVERVIEW OF THE DISTRICT'S FINANCIAL POSITION AND RESULTS OF OPERATIONS

As noted earlier, net position may serve over time as a useful indicator of a government's financial position. In the case of the District, assets exceeded liabilities by $3,214,923 as of December 31, 2021.

The District's overall financial position and operations for the past two years are summarized as follows:

LYON COUNTY WATER DISTRICT'S NET POSITION

	2021	2020
Assets		
Current and other assets	$ 446,258	$ 486,677
Capital assets	7,618,453	7,851,576
Restricted assets	292,042	285,904
Total Assets	8,356,753	8,624,157
Deferred Outflows of Resources	97,806	157,393
Liabilities		
Other liabilities	121,636	127,751
Current portion of long-term debt	138,163	178,425
Long-term liabilities	4,723,426	5,076,676
Total Liabilities	4,983,225	5,382,852
Deferred Inflows of Resources	256,411	144,553
Net Position		
Net investment in capital assets	3,140,917	3,190,788
Restricted	310,392	305,004
Unrestricted	(236,386)	(241,647)
Total Net Position	$ 3,214,923	$ 3,254,145

The District's investments in capital assets (e.g., land and construction in progress, buildings, plants and facilities, machinery and equipment, system studies and mapping and infrastructure), less any debt used to acquire those assets that is still outstanding is $3,140,917. The District uses these capital assets to provide services to citizens; consequently, these assets are not available for future spending. Although the District's investment in its capital assets are reported net of related debt, it should be noted that the resources needed to repay this debt must be provided from other sources, since the capital assets themselves cannot be used to liquidate these liabilities.

An additional portion of the District's net position $310,392 represents resources that are subject to external restriction on how they may be used. These resources are to be used for debt restrictions, capital projects, and customer deposits.

The District's unrestricted net assets as of December 31, 2021 is a deficit of $236,386.

Analysis of the District's Operations – Overall the District had a decrease in net position of $39,222.

The following table provides a summary of the District's operations for the year ended December 31, 2021 and 2020.

LYON COUNTY WATER DISTRICT
CHANGES IN NET POSITION

	2021	2020
Revenues		
Operating revenues	$ 1,313,827	$ 1,265,460
Investment income	218	606
Capital grants and contributions	10,800	7,200
Total revenues	1,324,845	1,273,266
Expenses		
Water expenses	896,861	1,002,001
Depreciation and amortization	334,418	338,856
Interest expense	101,226	109,790
Wastewater expenses	20,917	17,391
Payroll and other taxes	10,645	12,349
Total Expenses	1,364,067	1,480,387
Change in net position	(39,222)	(207,121)
Net position - January 1	3,254,145	3,461,266
Net position - December 31	$ 3,214,923	$ 3,254,145

CAPITAL ASSETS AND DEBT ADMINISTRATION

The District's investment in capital assets for business-type activities as of December 31, 2021, amounts to $7,618,453 (net of accumulated depreciation). This investment in capital assets includes land, buildings, plants and facilities, machinery and equipment, and infrastructure.

	2021	2020
Business-type activities		
Capital assets, not being depreciated		
Land	$ 121,772	$ 121,772
Construction in progress	43,477	43,477
Total capital assets, not being depreciated	165,249	165,249
Capital assets, being depreciated		
Distribution lines	6,637,217	6,864,407
Sewer lines	617,828	639,522
Water tanks	22,596	32,885
Equipment	82,946	105,729
Building	25,501	27,351
Transportation	54,083	-
Improvements	13,033	16,433
Total capital assets, being depreciated	7,453,204	7,686,327
Business-type activities capital assets, net	$ 7,618,453	$ 7,851,576

During the year ended December 31, 2021, the District acquired assets totaling $101,295.

Additional information on the District's capital assets can be found in Note 5 of this report.

Long-term and other debt

At the end of the current year, the Lyon County Water District had total debt of $4,444,782. Long-term debt at December 31, 2021, was as follows:

	2021	2020
Long-Term Debt		
KY Rural Water	$ 980,000	$ 1,025,000
USDA Bond Series 2016	1,714,500	1,810,000
Kentucky Infrastructure Authority	1,704,886	1,791,311
Farmers Bank	45,397	-
Total Long-Term Debt	$ 4,444,783	$ 4,626,311

The District entered into a new loan agreement with Farmers Bank on December 15, 2021, for the purchase of a 2019 Dodge Ram 2500. The loan amount was for $45,397 with an interest rate of 2.25% and is payable in full on December 15, 2023.

Interest expense of $101,226 was incurred during the year ended December 31, 2021.

Additional information on the District's long-term debt can be found in Notes 6 and 7 of this report.

REQUEST FOR INFORMATION

This financial report is designated to provide a general overview of the Lyon County Water District's finances for all those with an interest in the government's finances. Questions or requests for additional information may be addressed to Don Robertson, Chairman, Lyon County Water District, 5464 US 62 W, Kuttawa, Kentucky 42055.

Lyon County Water District
Statement of Net Position
December 31, 2021

Assets	
Current Assets	
Cash equivalents	$ 194,956
Customer accounts receivable	120,235
Unbilled revenue	81,936
Inventory	32,930
Prepayments	15,641
Restricted assets	
Cash equivalents	292,042
Total Current Assets	737,740
Noncurrent Assets	
Capital assets, net of depreciation	7,618,453
Total Noncurrent Assets	7,618,453
Other Assets	
Deposits	560
Total Other Assets	560
Total Assets	8,356,753
Deferred Outflows of Resources	
Related to pensions	38,969
Related to other postemployment benefits	58,837
Total Deferred Outflows of Resources	97,806
Total Assets and Deferred Outflows of Resources	8,454,559
Liabilities	
Current Liabilities	
Accounts payable	71,565
Accrued interest on debt	17,618
Accrued liabilities	14,103
Customers' deposits	18,350
Long-term debt due in one year	138,163
Total Current Liabilities	259,799
Noncurrent Liabilities	
Compensated absences	4,239
Long-term debt due after one year	4,306,620
Net pension liability	317,323
Net other postemployment benefit liability	95,244
Total Noncurrent Liabilities	4,723,426
Total Liabilities	4,983,225
Deferred Inflows of Resources	
Related to debt	32,753
Related to pensions	140,835
Related to other postemployment benefits	82,823
Total Deferred Inflows of Resources	256,411
Total Liabilities Deferred Inflows of Resources	5,239,636
Net Position	
Net investment in capital assets	3,140,917
Restricted for	
Debt service	292,042
Customer deposits	18,350
Unrestricted	(236,386)
Total Net Position	$ 3,214,923

See accompanying notes to financial statements.

Lyon County Water District
Statement of Revenues, Expenses, and Changes in Net Position
For the Year Ended December 31, 2021

Operating Revenue	
Water revenues	$ 1,313,827
Total Operating Revenues	1,313,827
Operating Expenses	
Water expenses	896,861
Depreciation	334,418
Wastewater expenses	20,917
Payroll and other taxes	10,645
Total Operating Expenses	1,262,841
Operating Income (Loss)	50,986
Nonoperating Revenues (Expenses)	
Investment income	218
Interest on debt	(101,226)
Total Nonoperating Revenue (Expenses)	(101,008)
Net Income Before Capital Contributions	(50,022)
Capital Contributions	
Tap-on fees	10,800
Total Capital Contributions	10,800
Change in Net Position	(39,222)
Net Position-Beginning of Year	3,254,145
Net Position-End of Year	$ 3,214,923

See accompanying notes to financial statements.

Lyon County Water District
Statement of Cash Flows
For the Year Ended December 31, 2021

Cash Flows from Operating Activities		
Cash received from customers	$	1,313,561
Cash payments to suppliers for goods and services		(817,746)
Cash payments to employees for services		(140,547)
Net Cash Provided By Operating Activities		355,268
Cash Flows From Capital and Related Financing Activities		
Proceeds from capital debt		45,397
Contributed capital		10,800
Interest paid on debt		(123,467)
Principal paid on capital debt		(226,927)
Acquisition of property, plant, and equipment		(101,295)
Net Cash Used By Capital and Related Financing Activities		(395,492)
Cash Flows From Investing Activities		
Income received on investments		218
Net Cash Provided By Investing Activities		218
Net Increase (Decrease) in Cash Equivalents		(40,006)
Cash Equivalents-Beginning of Year		527,004
Cash Equivalents-End of Year	$	486,998
Reconciliation of Operating Income to Net Cash Provided By Operating Activities		
Operating Income (Loss)	$	50,986
Adjustments to reconcile operating income to net cash provided by operating activities:		
Depreciation		334,418
Change in assets and liabilities		
Accounts receivable		484
Inventory		(7,540)
Prepayments		1,330
Deferred outflows of resources		59,587
Accounts payable		10,396
Customer deposits		(750)
Accrued liabilities		5,607
Deferred pension and OPEB liabilities		(212,832)
Deferred inflows of pensions		113,582
Net Cash Provided By Operating Activities	$	355,268
Reconciliation of Total Cash		
Current Assets - Cash	$	194,956
Restricted Assets - Cash		292,042
Total Cash	$	486,998

Non-cash Investing, Capital and Related Financing Activities - None

See accompanying notes to financial statements.

Lyon County Water District
Notes to the Financial Statements
For the Year Ended December 31, 2021

1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Organization

The Lyon County Water District, (the District), is a county water district supported by funds derived from the sale of water and is operated by a District Board. The District is authorized under Kentucky Revised Statutes and constitutes a governmental subdivision of the Commonwealth of Kentucky. The District is located in Kuttawa, Kentucky and primarily serves the Lyon County, Kentucky area.

The accounting and reporting policies of the District relating to the accompanying basic financial statements conform to accounting principles generally accepted in the United States of America applicable to state and local governments. Generally accepted accounting principles for local governments include those principles prescribed by the Governmental Accounting Standards Board (GASB), the American Institute of Certified Public Accountants in the publication entitled Audits of State and Local Governmental Units and by the Financial Accounting Standards board (when applicable). The District follows GASB pronouncements as codified under GASB 62. The more significant accounting policies of the District are described below:

Principles Determining Scope of Reporting Entity

The District's financial report includes only the funds of the District. The District has no oversight responsibility for any other governmental entity and is not included in any other governmental "reporting entity" as defined by the Governmental Accounting Standards Board pronouncement. The District's Board members are appointed by the County Judge Executive, a publicly elected official, and they have decision making authority, the authority to set rates, the power to designate management, the ability to significantly influence operations, and primary accountability for fiscal matters.

Basis of Presentation

The accounts of the District are organized in accordance with the uniform system of accounts adopted by the Public Service Commission of Kentucky. Those accounts are organized on the basis of a proprietary fund type, specifically an enterprise fund. The operations of each fund are summarized by providing a separate set of self balancing accounts which include its assets, liabilities, net position, revenues and expenses. The following funds are used by the District:

Proprietary Fund Types

Proprietary funds are accounted for using the economic resources measurement focus and the accrual basis of accounting. The accounting objectives are determinations of net income, financial position, and cash flow. All assets and liabilities are included on the Statement of Net Position.

Measurement Focus/Basis of Accounting

Measurement focus refers to what is being measured; basis of accounting refers to when revenues and expenditures are recognized in the accounts and reported in the financial statements. Basis of accounting relates to the timing of the measurement made, regardless of the measurement focus applied. The accounting and financial statements for a proprietary fund are reported using the economic resources measurement focus and the accrual basis of accounting. The economic resources measurement focus means all assets and all liabilities (whether current or non-current) are included on the statement of net position, and the operating statements present increases (revenues) and decreases (expenses) in net total assets. Under the accrual basis of accounting, revenues are recognized when earned, including unbilled water services which are accrued. Expenses are recognized at the time the liability is incurred.

Reclassifications
Prior period financial statement amounts have been reclassified to conform to current period presentation. Operating income and net earnings for the prior period were not impacted by the reclassifications.

Sales of Water
Charges to customers for the sale of water are based on rates approved by the Kentucky Public Service Commission (PSC).

Budget
The District is required to follow budgetary guidelines established by the Public Service Commission and the Department of Rural Development. Those guidelines require:

1) The District to submit a proposed budget for the fiscal year commencing the following January 1. The operating budget includes proposed expenditures and the means of financing them for the upcoming year.

2) The District is required to submit a budget to the Department of Rural Development for each fiscal year as stipulated in the bond agreement.

For the year ended December 31, 2021, the District has complied with budgetary guidelines.

Cash Equivalents/ Investments
Cash and cash equivalents are deposited with Branch Banking and Trust Company and Regions Bank. District ordinances authorize the District to invest in obligations of the U.S. Government and its instrumentalities, mutual funds, repurchase agreements, and demand deposits. All investments must be purchased through brokers/dealers or deposited with local financial institutions.

For the purpose of the statement of cash flows, the District considers all cash in banks and certificates of deposit with stated maturities of three months or less or available for withdrawal by management to be cash and cash equivalents. Cash equivalents consist of funds held in a sweep account in a financial institution.

Accounts Receivable
The direct write-off method was used for recording uncollectible accounts. No allowance for uncollectible accounts was deemed to be needed. The District grants credit to customers, substantially all of whom are residents of Lyon County. Due to the large amount of small account balances, the District does not feel these are at risk for loss due to credit concentrations.

Prepaid Items
Payments made to vendors for services that will benefit periods beyond December 31, 2021 are recorded as prepaid items.

Capital Assets
Capital assets are stated at original cost as defined for regulatory purposes. The costs of additions to capital assets and replacement of retirement units are capitalized. Replacement of minor items of property is charged to expense as incurred. Depreciation is computed using the straight-line method. When assets are retired or otherwise disposed of, the cost and related accumulated depreciation are removed from the accounts, and any resulting gain or loss is recognized in income for the period. The cost of maintenance and repairs is charged to income as incurred; significant betterments are capitalized.

Contributions from customers for the purpose of purchasing service connections to the utility plant are recorded as income when they are received. Depreciation on contributed assets is recorded as an expense in the statement of revenue and expense. Capital assets are depreciated over the following useful lives:

Buildings	20 to 40 years
Equipment	5 to 10 years
Water and Sewer Lines	25 to 40 years

Unearned Revenue
The District recognizes certain revenue transactions as unearned revenue. Revenue cannot be recognized until it has been earned and is available to finance expenditures of the current fiscal period. Revenue that is earned but not available is reported as a current liability or deferred inflow of resources until such time as the revenue becomes available.

Inventory
Inventories are generally used for repair and replacement of infrastructure and connection of new services and are stated at average cost.

Restricted Assets
The restricted assets have been handled in accordance with the provisions of the various enterprise fund revenue bond resolutions, loan resolutions, loan agreements, or by state or federal laws and regulations. When both restricted and unrestricted resources are available for use, it is the District's policy to use restricted resources first, then unrestricted resources as needed. See Note 4 for information describing restricted assets.

Estimates
The preparation of the District's financial statements in conformity with generally accepted accounting principles requires management to make estimates and assumptions that affect certain reported amounts and disclosures. Accordingly, actual results could differ from those estimates.

Risk Management
The District is exposed to various risks of loss related to torts; theft of, damage to, and destruction of assets; errors and omissions; injuries to employees; and natural disaster. During the year ended December 31, 2021, the District contracted with commercial insurance carriers for coverage of all risks mentioned above. Settled claims resulting from these risks have not exceeded commercial insurance coverage in any of the past three years. There were no significant reductions in coverage during the past three years.

Pensions and Other Postemployment Benefits
For purposes of measuring the net pension and OPEB liabilities, deferred outflows of resources, and deferred inflows of resources related to pensions, pension expense, and other OPEB information about the fiduciary net position of the County Employees Retirement System in the Kentucky Public Pensions Authority (KPPA) and additions to/deductions from the plan's fiduciary net position have been determined on the same basis as they are reported by the KRS. For this purpose, benefits (including refunds of employee contributions) are recognized when due and payable in accordance with the benefit terms of the County Employees Retirement System. Investments are reported at fair value.

Net Position

In the financial statements, equity is classified as net position and displayed in three components.

- **Net investment in capital assets** - Capital assets, net of accumulated depreciation and reduced by the outstanding balance of any borrowings that are attributable to the acquisition, construction, or improvement of those assets net of unspent financing proceeds.
- **Restricted net position** - Net position with constraints placed on their use that are either (a) externally imposed by creditors, grantors, contributors, laws, or regulations of other governments; or (b) imposed by law through constitutional provisions or enabling legislation.
- **Unrestricted net position** - All other net position that does not meet the definition of "restricted" or "net investment in capital assets."

Deferred Outflows of Resources and Deferred Inflows of Resources

In addition to assets, the statement of net position will sometimes report a separate section for deferred outflows of resources. This separate financial statement element, *deferred outflows of resources*, represents the consumption of net position that applies to future periods and so will not be recognized as an outflow of resources (expense/expenditure) until then. The District has two items that qualify for reporting in the category, deferred charges - pension, and deferred charges - other post-employment benefits (OPEB).

A deferred charge on refunding results from the difference in the carrying value of refunded debt and its reacquisition price. This amount is deferred and amortized over the shorter of the life of the refunded or refunding debt. A deferred pension contribution results from pension contributions subsequent to the measurement date of the pension plan. This amount is deferred and recognized as a component of the change in pension plan liability in the next measurement period. Pension related deferred components include difference between expected and actual experience; the difference between projected and actuarial earnings on pension plan investments results from actual investment earnings above or below actuarial projected earnings; changes in assumptions; and changes in proportion and differences between employer contributions and proportionate share of contributions. These pension related items are deferred and amortized over 3-5 years as a component of the pension expense.

The deferred related pension and OPEB outflows results from pension and OPEB contributions subsequent to the measurement date of the pension plan and OPEB and various changes resulting from actuarial pension and OPEB measurements. The pension and OPEB contribution amounts are deferred and recognized as a component of the change in pension and OPEB plan liabilities in the next measurement period. The various changes resulting from actuarial pension and OPEB measurements are deferred and amortized in future periods as a component of the pension and OPEB expense.

In addition to liabilities, the statement of net position will sometimes report a separate section for deferred inflows of resources. This separate financial statement element, *deferred inflows of resources*, represents an acquisition of net position that applies to future periods and will not be recognized as an inflow of resources (revenue) until that time. The District has two types of items reported in this category, inflows related to the District's pension and OPEB plans that qualify for reporting in this category - deferred pension and OPEB related inflows. The various changes resulting from actuarial pension and OPEB measurements are deferred and amortized in future periods as a component of the pension and OPEB expense.

Recent Accounting Pronouncements

As of December 31, 2021, the GASB has issued the following statements not yet required to be adopted by the District.

GASB Statement No. 95

GASB Statement No. 95, *Postponement of the Effective Dates of Certain Authoritative Guidance*, was issued May 2020. The primary objective of this Statement is to provide temporary relief to governments and other stakeholders in light of the COVID-19 pandemic. That objective is accomplished by postponing the effective dates of certain provisions in Statements and Implementation Guides that first became effective or are scheduled to become effective for periods beginning after June 15, 2018, and later. The following statement information has been updated to reflect the new effective dates.

GASB Statement No. 87

GASB Statement No. 87, *Leases*, was issued in June 2017. The provisions of this Statement are effective for periods beginning after June 15, 2021. This Statement will increase the usefulness of governments' financial statements by required reporting of certain lease liabilities that currently are not required. It will enhance comparability of financial statements among governments by requiring lessees and lessors to report leases under a single method. This Statement also will enhance the decision-usefulness of the information provided to financial statement users by requiring notes to financial statements related to the timing, significance, and purpose of a government's leasing arrangements. The District's management has not yet determined the effect this statement will have on the financial statements.

GASB Statement No. 91

GASB Statement No. 91, *Conduit Debt Obligations,* was issued May 2019. The requirements of this Statement are effective for periods beginning after December 15, 2021. The primary objectives of this Statement are to provide a single method of reporting conduit debt obligations by issuers and eliminate diversity in practice associated with (1) commitments extended by issuers, (2) arrangements associated with conduit debt obligations, and (3) related note disclosures. This Statement achieves those objectives by clarifying the existing definition of a conduit debt obligation; establishing that a conduit debt obligation is not a liability of the issuer; establishing standards of accounting and financial reporting of additional commitments and voluntary commitments extended by issuers and arrangements associated with conduit debt obligations; and improving required note disclosures. The District's management has not yet determined the effect this Statement will have on the financial statements.

GASB Statement No. 92

GASB Statement No. 92, *Omnibus 2020*, was issued in January 2020. The requirements of this Statement are effective for periods beginning after June 15, 2021. The objectives of this Statement are to enhance comparability in accounting and financial reporting and to improve the consistency of authoritative literature by addressing practice issues that have been identified during implementation and application of certain GASB Statements. The District's management has not yet determined the effect this statement will have on the financial statements.

GASB Statement No. 93

GASB Statement No. 93, *Replacement of Interbank Offered Rates*, was issued March 2020. The requirements of this Statement are effective for periods beginning after June 15, 2021. The objective of this Statement is to address accounting and financial reporting implications that result from the replacement of an IBOR (interbank offered rate). The District's management has not yet determined the effect this statement will have on the financial statements.

Subsequent Events
The District has evaluated subsequent events through July 25, 2022, the date which the financial statements were available to be issued.

2. LEGAL COMPLIANCE

Deficit Net Position
There was not a deficit net position for the year ended December 31, 2021.

3. DEPOSITS AND INVESTMENTS

A. Net Position

The captions on the statement of net position for cash, investments, and restricted assets enumerated as to deposits and investments and the amounts in total are as follows:

	Deposits	Investments	Total
Cash equivalents	$ 194,956	$ -	$ 194,956
Restricted assets			
Cash equivalents	292,042	-	292,042
Total	$ 486,998	$ -	$ 486,998

B. Deposits

At year-end, the carrying amount of the District's deposits in financial institutions were $486,998, and the bank balances were $491,389. Of the bank balances, $491,389 was covered by federal depository insurance.

C. Investments

Interest Rate Risk
Interest rate risk is the risk that changes in interest rates will adversely affect the fair value of an investment. Investments held for longer periods are subject to increased risk of adverse interest rate changes. The District does not have a formal investment policy that limits investment maturities as a means of managing its exposure to fair value losses arising from increasing interest rates.

Credit Risk
Credit risk is the risk that an issuer or other counterparty to an investment will not fulfill its obligations. The custodial credit risk for investments is the risk that a government will not be able to recover the value of the investment or collateral securities that are in the possession of an outside party if the counterparty to the transaction fails.

Concentration of Credit Risk
Concentration of credit risk is the risk of loss attributed to the magnitude of the District's investment in a single issuer. The District does not place any limit on the amount that may be invested with one issuer.

4. RESTRICTED NET POSITION

Net Assets Restricted for Debt Retirement

	Depreciation Fund	Sinking Funds	KIA Loan Repayment	Total
Cash equivalents	$ 163,910	$ 123,335	$ 4,797	$ 292,042

Revenue Fund: All income and revenues derived from the operation of the system shall be deposited promptly and as received to the Lyon County Water Revenue Fund. The monies deposited into the Revenue Fund shall be expended only in the manner and order as follows:

1. Regions Sinking Fund
2. Depreciation Reserve Fund
3. Operation and Maintenance Fund

Regions Sinking Fund: The District holds cash deposits in the amount of $72,140 in the Regions Trust Cash Sweep III (RTCS). RTCS is a bank deposit account offered through Regions Institutional Services. The RTCS does not directly invest in securities. It is a deposit account that is collateralized by government securities. Collateral may include:

- Interest bearing obligations of the U.S. Government
- Senior debt obligations of any U.S. Government Agency,
- And/or municipal securities with an underlying rating of A or better.

RTCS is FDIC Insured up to $250,000. Deposit account amounts in excess of $250,000 are secured by perfected liens on Regions Bank's securities in an amount not less than 105% of the total excess deposits. In the event of a default, the collateral reverts to the Collateral Agent to be distributed to the account owners. RTCS deposits are identified as "cash" on client statements; there are no market value fluctuations. The sinking fund was established for the purpose of paying the principal and interest on the Kentucky Rural Water Finance Corporation Public Projects Revenue Bonds Series 2013 C. The ordinance requires that the amount deposited each month equals one-sixth of the next succeeding interest requirement of the next succeeding interest due date and one-twelfth of the principal requirements becoming due on the note on the next succeeding January 1. A separate sinking fund is to be established for the purpose of paying the principal and interest on the Waterworks Revenue Bonds Series 2016. The District is required to deposit $845 per month until the account reaches $101,400. The deposits are to be resumed any time the account falls below $101,400.

Depreciation Reserve: The ordinances requires Lyon County Water District to make monthly contributions to this fund after observing the priority of deposits into the KIA Loan Fund and the Sinking Fund. The funds in the Depreciation Fund can be expended for the purpose of paying the cost of unusual or extraordinary maintenance, repairs, renewals, or replacements, and the cost of constructing additions, and improvements to the system. The District is to make $510 monthly deposits until a required minimum balance of $61,200 is met. The District is to make $295 monthly deposits over the life of the loan. At December 31, 2020, the balance of the Depreciation Reserve Fund was $163,910.

Operations and Maintenance Fund: Transfers shall be made monthly from the Revenue Fund to the Operations and Maintenance Fund so that the various operation and maintenance expenses of such system are met and a two (2) month operating reserve established and maintained. Any funds remaining in Operation and Maintenance Fund after meeting the expenses of operating such system shall be transferred to the Revenue Fund and disbursed in accordance with the above provisions until such time as the Sinking Fund and Depreciation Fund are current and the required balances established; and then excess funds may be invested in direct obligations of or obligations which are fully guaranteed by the United States Government with such maturities so that moneys shall be available in the respective Funds for the purposes for which same are established.

The new Waterworks Revenue Bonds 2016 require the District to fund an account for short-lived assets by depositing a sum of $750 monthly into the account. The funds in the short-lived asset account may be used by the District as needed to replace or add short-lived assets in the District's water system. This short-lived assets reserve amount replaces any previous short-lived assets requirements previously set with any prior RUS loan.

5. CAPITAL ASSETS

A summary of proprietary fund property, plant, and equipment at December 31, 2021 for business-type activities follows:

	Beginning Balance	Increases	Decreases	Ending Balance
Business-type activities				
Capital assets, not being depreciated				
Land	$ 121,772	$ -	$ -	$ 121,772
Construction in progress	43,477	-	-	43,477
Total capital assets, not being depreciated	165,249	-	-	165,249
Capital assets, being depreciated				
Distribution lines	11,328,132	34,817	-	11,362,949
Sewer lines	867,725	-	-	867,725
Water tanks	422,707	-	-	422,707
Machinery and equipment	295,770	11,478	-	307,248
Building	73,976	-	-	73,976
Transportation	87,129	55,000	-	142,129
Improvement	34,000	-	-	34,000
Total capital assets, being depreciated	13,109,439	101,295	-	13,210,734
Less accumulated depreciation for				
Distribution lines	(4,463,725)	(262,007)	-	(4,725,732)
Sewer lines	(228,203)	(21,693)	-	(249,896)
Water tanks	(389,822)	(10,288)	-	(400,110)
Machinery and equipment	(190,041)	(34,262)	-	(224,303)
Building	(46,625)	(1,851)	-	(48,476)
Transportation	(87,129)	(917)	-	(88,046)
Improvement	(17,567)	(3,400)	-	(20,967)
Total accumulated depreciation	(5,423,112)	(334,418)	-	(5,757,530)
Total capital assets, being depreciated, net	7,686,327	(233,123)	-	7,453,204
Business-type activities capital assets, net	$ 7,851,576	$ (233,123)	$ -	$ 7,618,453

Depreciation charged to income was $334,418.

6. DEBT OBLIGATIONS

Revenue Bonds Payable

Description	Interest Rate	Maturity Date	Balance 12/31/2021	Due in One Year
Waterworks Revenue Bonds				
Regions - Series 2013 C	3.5%	2040	$ 980,000	$ 50,000
Kentucky Infrastructure Authority	1.875%	2046	1,704,886	88,163
USDA - Series 2016	2.0%	2046	1,714,500	-
Total			$ 4,399,386	$ 138,163

Principal and interest requirements of the revenue bonds payable as of December 31, 2021 are:

Year Ending December 31,	Principal	Premium Amortization	Total	Interest & Fees
2022	$ 138,163	$ 1,724	$ 73,419	$ 73,419
2023	189,936	1,724	100,829	100,829
2024	193,243	1,724	95,443	95,443
2025	201,587	1,724	90,007	90,007
2026	204,968	1,724	84,861	84,861
2027-2031	1,119,908	8,619	344,837	344,837
2032-2036	1,219,942	8,619	195,821	195,821
2037-2041	669,639	1,724	73,988	73,988
2042-2046	462,000	-	21,675	21,676
Total	$ 4,399,386	$ 27,582	$ 1,080,880	$ 1,080,881

Series 2013 C

In an ordinance of the Board of Commissioners, adopted on October 3, 1995, the District authorized and thereafter issued its $996,000 "Water Revenue Bonds, Series 1995" for the purpose of providing funds for the installation of major extensions and additions to the system. All bonds of this issue maturing on or after January 1, 1999, shall be subject to redemption or prepayment at the option of the District prior to maturity in whole, or from time to time, in part, in the inverse order at par plus accrued interest provided that Rural Economic Development is holder of the bonds.

In an ordinance of the Board of Commissioners, adopted on September 13, 2002, the District authorized and thereafter issued its $594,000 "Water Revenue Bonds, Series 2002" for the purpose of providing funds for the installation of major extensions and additions to the system. All bonds of this issue maturing on or after January 1, 1999, shall be subject to redemption or prepayment at the option of the District prior to maturity in whole, or from time to time, in part, in the inverse order at par plus accrued interest provided that Rural Economic Development is holder of the bonds.

Both bonds were refinanced for $1,305,000 under Kentucky Rural Water Finance Corporation Public Projects Refunding and Improvement Revenue Bonds Series 2013 C as of March 27, 2013.

The Series 2013 C bond, referred to above, mature as to principal in installments on January 1, in each of the years and shall bear interest from their issue dates until payment of principal. Interest is payable semiannually on June 1 and January 1, of each year as established by the ordinance.

All the Revenue Bonds are payable solely from, and secured by, a first pledge of the water revenues. So long as any of the bonds are outstanding and unpaid, the District shall continuously be maintained and operated in good condition. Rates and charges for services rendered will be imposed and collected so that gross revenues will be sufficient at all times, to provide for the payment of the operation and maintenance of the water plant, and to maintain the Depreciation and Sinking Funds described in Note 4.

If there is any default in the payment of the principal or interest on any of the outstanding bonds and suit is filed by a holder of said bond the court-having jurisdiction may appoint a receiver to administer the District with the power to charge and collect rates. These collected rates shall be sufficient to provide for the payment of the outstanding bonds and the operating and maintenance expenses. The income and revenues shall be in conformity with the bond resolution and the provisions of the applicable laws of Kentucky.

The bond covenants require that the rates for all utility services rendered by the District must be reasonable. The District must maintain adequate public liability insurance including fire, windstorm, fidelity bonds, and the hazards covered by a standard extended coverage policy. The bond covenant also requires an audit of the books of record and account pertinent to the system of the District within 60 days of year-end.

Series 2016

On December 31, 2016, the District issued $1,900,000 Waterworks Revenue Bonds, Series 2016, for the purpose of extensions, additions, and improvements to the existing waterworks system. The bonds have an interest rate of 1.875% and will mature on January 1, 2046. The bond issue calls for semiannual interest payments and annual principal payments. The bonds require the District to establish an additional sinking fund to pay the principal and interest on the bonds.

Kentucky Infrastructure Authority

The District entered into an agreement with Kentucky Infrastructure Authority to finance a system upgrade totaling $2,000,000. The bonds have an interest rate of 2.0% and will mature on June 1, 2038. The bond issue calls for semiannual interest payments and annual principal payments. The bonds require the District to establish a replacement reserve account. The annual replacement cost is $5,000 and should be added to the replacement account each December 1 until the balance reaches $50,000 and maintained for the life of the loan.

Note Payable

The District entered into a new loan agreement with Farmers Bank on December 15, 2021, to purchase a Dodge truck. The amount financed was $45,397 with an interest rate of 2.25%. The loan payments will be interest only with one principal payment due on December 15, 2023.

Changes in Business-Type Activities Debt

A summary of changes in the business-type activities debt for the year ended December 31, 2021 follows:

	Balance 12/31/2020	Debt Proceeds	Principal Payments	Balance 12/31/2021	Due Within One Year
Business-Type Activities					
Note Payable - Farmers Bank	$ -	$ 45,397	$ -	$ 45,397	$ -
Revenue Bonds Payable	4,626,311	-	226,925	4,399,386	138,163
Total Business-Type Activities	$4,626,311	$ 45,397	$ 226,925	$4,444,783	$ 138,163

Interest expense for the year was $101,226.

7. EMPLOYEES' RETIREMENT PLAN

County Employees' Retirement System

Plan description. The District is a participant in the Commonwealth of Kentucky's County Employees' Retirement System (CERS), a cost-sharing multiple-employer defined benefit pension plan administered by the Kentucky Public Pensions Authority (KPPA). The CERS pension plan has two categories: Hazardous for sworn police and fire employees and Nonhazardous for general employees. The KPPA is the successor to Kentucky Retirement Systems and was created by state statute under Kentucky Revised Statute ("KRS") Sections 61.645, as amended by House Bill 484 and House Bill 9 of the 2020 and 2021 regular sessions, respectively, of the Kentucky General Assembly. These amendments transferred governance of the CERS to a separate nine member board of trustees. The CERS Board of Trustees is responsible for the proper operation and administration of the CERS. The KPPA issues a publicly available annual comprehensive financial containing CERS information that can be obtained from https://kyret.ky.gov.

Benefits provided. CERS provides retirement, health insurance, and death and disability benefits to plan employees and beneficiaries. Employees are vested in the plan after five years service. For retirement purposes, nonhazardous employees are grouped into three tiers, based on hire date.

Nonhazardous members

Tier 1	Participation date	Prior to September 1, 2008
	Unreduced retirement	27 years of service or 65 years old Minimum 5 years of service and 55 years old
	Reduced retirement	Minimum 25 years of service and any age
Tier 2	Participation date	September 1, 2008 and December 31, 2013
	Unreduced retirement	Minimum 5 years of service and 65 years old Age of 57 or older and sum of service years plus age equal 87
	Reduced retirement	Minimum 10 years of service and 60 years old
Tier 3	Participation date	After December 31, 2013
	Unreduced retirement	Minimum 5 years of service and 65 years old Age of 57 or older and sum of service years plus age equal 87
	Reduced retirement	Not available

Plan Funding. State statute requires active members to contribute a percentage of creditable compensation based on the tier:

	Required Contributions
Tier 1	5%
Tier 2	5% plus 1% for insurance
Tier 3	5% plus 1% for insurance

Employers are required by state statute (KRS 78.545(33)) to contribute the remaining amounts necessary to pay benefits when due. These contribution rates are determined by the Board of Trustees annually based upon actuarial valuations. For the year ended December 31, 2021, the employer contribution rate was 19.30% for the period January 1, 2021 to June 30, 2021; and 21.17% for the period July 1, 2021 to December 31, 2021, respectively of members' nonhazardous salaries. The employer contribution when combined with employee contributions are expected to finance the costs of benefits earned by employees during the year, with an additional amount to finance any unfunded accrued liability. The contribution requirements and the amounts

contributed to CERS for the year ending December 31, 2021, were $31,491. Of this amount, $25,024 is considered contributed to the pension requirement and $6,467 is considered contributed to the health insurance requirement.

Pension liabilities, pension expense, and deferred outflows of resources and deferred inflows of resources related to pensions. At December 31, 2021, the District reported a liability of $317,323 for its proportionate share of the net pension liability. The net pension liability was measured as of June 30, 2021. House Bill 8 passed during the 2021 legislative session changed how employer contributions are allocated and collected form the participating employers in the KERS Nonhazardous plan. Therefore, the calculation of the proportionate share of the Collective Pension Amounts for employers that participate in the KERS Nonhazardous pension plan has been updated since June 30, 2020. The proportionate share of the Collective Pension Amounts for employers that participate in KERS Nonhazardous plan is based upon their allocation of the amortization cost, as specified under the revised statutes. It is further based upon their allocation of the normal cost portion of the required contribution, as allocated by actual salary for fiscal year ending June 30, 2021. The final proportionate share calculation, which represents an employer's share of the long-term contribution effort assumes the amortization cost is approximately 90% of the aggregate required contribution for the fund. Employer contributions are accrued when earned and the employer has made a formal commitment to provide the contributions. At June 30, 2021, the District's proportion was .004977%.

Pension expense. As a result of its requirement to contribute to CERS, the District recognized a negative pension expense of ($9,318) for the year ended December 31, 2021. At December 31, 2021, the District reported deferred outflows of resources and deferred inflows of resources from the following sources as a result of its requirements to contribute to CERS:

	Deferred Outflows of Resources	Deferred Inflows of Resources
Net differences between expected and actual experience	$ 3,644	$ 3,080
Net differences between projected and actual investment earnings	12,310	54,604
Change of assumption	4,259	-
Changes in proportion and differences between employer contributions and share of contributions	5,402	83,151
Contributions subsequent to the measurement date	13,354	-
Totals	$ 38,969	$ 140,835

Deferred Outflows of Resources. The $13,354 reported as deferred outflows of resources related to pensions resulting from the District's contributions subsequent to the measurement date will be recognized as a reduction of the net pension liability in the year ending December 31, 2022. Other amounts reported as deferred outflows of resources and deferred inflows of resources related to pensions will be recognized in pension expense as follows:

Years Ending	Amortization/ (Accretion)
December 31, 2022	$ (49,670)
December 31, 2023	(40,865)
December 31, 2024	(11,440)
December 31, 2025	(13,245)
Total	$ (115,220)

Actuarial assumptions. The total pension liability, net pension liability, and sensitivity information as of June 30, 2021 were based on an actuarial valuation date of June 30, 2020. The total pension liability was rolled forward from the valuation date (June 30, 2020) to the plan's fiscal year ending June 30, 2021, using generally accepted actuarial principles.

The actuarial assumptions used in the June 30, 2021 valuation was based on the results of an actuarial experience study for the period July 1, 2013 - June 30, 2018.

There have been no actuarial assumption or method changes since June 30, 2020. Senate Bill 169 passed during the 2021 legislative session increased the disability benefits for certain qualifying members who become "totally and permanently disabled" in the line of duty or as a result of a duty-related disability. The total pension liability as of June 30, 2021, is determined using these updated benefit provisions.

House Bill 8 passed during the 2021 legislative session changed how employer contributions are allocated and collected from the participating employer in the KERS Nonhazardous plan. This change does not impact the calculation of the total pension liability but does impact the allocation of required contributions amongst the participating employers. As a result of this legislation, there are several employers that will experience a relatively large change in proportionate share of the Collective Pension Amounts in the KERS Nonhazardous pension plan from 2020 to 2021.

House Bill 1 passed during the 2019 legislative session and allowed certain agencies in the KERS Nonhazardous plan to elect to cease participating in the fund as of June 30, 2020, under different provisions than were previously established. Senate Bill 249 passed during the 2020 legislative session delayed the effective date of cessation for these provisions to June 30, 2021. Only one employer elected to cease participation under these provisions and freeze benefit accruals for their employees. As such, there is no material impact on the total pension liability due to this legislation. There were no other material plan provision changes.

Senate Bill 249 passed during the 2020 Legislative Session changed the funding period for the amortization of the unfunded liability to 30 years as of June 30, 2019. Gains and losses incurring in future years will be amortized over separate 20 year amortization bases. This change does not impact the calculation of total pension liability and only impacts the calculation of the contribution rates that would be payable starting July 1, 2020.

The actuarial assumptions are:

Inflation	2.30%
Payroll growth rate	2.00% for CERS Nonhazardous
Salary increases	3.30% to 10.30%, varies by service
Investment rate of return	6.25%

The mortality table used for active members was Pub-2010 General Mortality Table, projected with the ultimate rates from the MP-2014 mortality improvement scale using a base year of 2010. The mortality table used for non-disabled retired members was a system-specific mortality table based on mortality experience from 2013-2018, projected with the ultimate rates from MP-2014 mortality improvement scale using a base year of 2019. The mortality table used for the disabled members was Pub-2010 Disabled Mortality table, with a 4-year set-forward for both male and female rates, projected with the ultimate rates from the MP-2014 mortality improvement scale using a base year of 2010.

The long-term expected rate of return on plan assets is reviewed as part of the regular experience studies prepared every five years. The long-term(10-year) expected rates of return were determined by using a building block method in which best estimated ranges of expected future real rates of returns are developed for each asset class. The ranges were combined by weighting the expected future real rate of return by the target asset allocation percentage. The target allocation and best estimates of arithmetic real rate of return for each major asset class are summarized in the following table:

Asset Class	Target Allocation	Long-Term Nominal Rate of Return
Growth	**68.50%**	
US Equity	21.75%	5.70%
Non US Equity	21.75%	6.35%
Private Equity	10.00%	9.70%
Specialty Credit/High Yield	15.00%	2.80%
Liquidity	**11.50%**	
Core Bonds	10.00%	0.00%
Cash	1.50%	(0.60)%
Diversifying Strategies	**20.00%**	
Real Estate	10.00%	5.40%
Opportunistic	0.00%	N/A
Real Return	10.00%	4.55%
Total	**100.00%**	
Expected real return		5.00%
Long-term inflation assumption		2.30%

Discount Rate. The single discount rate used to measure the total pension liability for the fiscal plan year ending June 30, 2021, was 6.25% for nonhazardous and hazardous employees. The projection of cash flows used to determine the single discount rate for each plan must include an assumption regarding actual employer contributions made each future year. Except where noted

below, future contributions are projected assuming that each participating employer in each pension plan contributes the actuarially determined employer contribution each future year calculated in accordance with the current funding policy, as most recently revised by House Bill 8, passed during the 2021 legislative session. The assumed future employee contributions reflect the provisions of House Bill 362 (passed during the 2018 legislative session) which limit the increases to the employer contribution rates to 12% over the prior fiscal year through June 30, 2028. The discount rate determination does not use a municipal bond rate.

Sensitivity of the District's proportionate share of the net pension liability to changes in the discount rate. The following presents the District's proportionate share of the net pension liability calculated using the discount rate of 6.25%, as well as what the District's proportionate share of the net pension liability would be if it were calculated using a discount rate that is 1-percentage-point lower (5.25%) or 1-percentage-point higher (7.25%) than the current rate:

	1% Decrease 5.25%	Current Discount Rate 6.25%	1% Increase 7.25%
The District's proportionate share of the net pension liability	$ 406,982	$ 317,323	$ 243,132

Payables to the pension plan. At December 31, 2021, the financial statements include $3,116 in contractually required employee pension contributions primarily for the month ended December 31, 2021. The obligation was paid within prescribed time limits.

Pension Plan Fiduciary Net Position. Detailed information about the pension plan's fiduciary net position is available in the separately issued annual comprehensive financial report issued by the Kentucky Public Pensions Authority and can be found at https://kyret.ky.gov.

Other Postemployment Benefit Plan (OPEB)

CERS Medical Insurance Plan

Plan description. The District is a participant in the Commonwealth of Kentucky's County Employees' Retirement System (CERS), a cost-sharing multiple-employer defined benefit postemployment benefit plan (OPEB) administered by the Kentucky Public Pensions Authority (KPPA). The KPPA is the successor to Kentucky Retirement Systems and was created by state statute under Kentucky Revised Statute ("KRS") Sections 61.645, as amended by House Bill 484 and House Bill 9 of the 2020 and 2021 regular sessions, respectively, of the Kentucky General Assembly. These amendments transferred governance of the CERS to a separate nine member board of trustees. The CERS Board of Trustees is responsible for the proper operation and administration of the CERS. The KPPA issues a publicly available annual comprehensive financial containing CERS information that can be obtained from https://kyret.ky.gov.

Benefits provided. The CERS Nonhazardous Insurance Fund is a cost-sharing multiple-employer defined benefit OPEB plan that covers substantially all regular full-time members employed in positions of each participating county, city, and school board, and any additional eligible local agencies electing to participate in the System. The plan provides for health insurance benefits to plan members. OPEB may be extended to beneficiaries of plan members under certain circumstances.

Contributions. Per Kentucky Revised Statutes 78.545 (33), contribution requirements are established and may be amended by the KPPA Board. The District's required contribution rate for non-hazardous employees was 4.76% for the period January 1, 2021 to June 30, 2021; and 5.78% for the period July 1, 2021 to December 31, 2021.

Employees hired after September 1, 2008, are required to contribute an additional 1% of their covered payroll to the insurance fund. Contributions are deposited to an account created for the payment of health insurance benefits under 26 USC Section 401(h). These members are classified in the Tier 2/Tier 3 structure of benefits and the 1% contribution to 401(h) account is non-refundable.

OPEB Liabilities, Expense, Deferred Outflows of Resources, and Deferred Inflows of Resources. At December 31, 2021, the District reported a net OPEB liability of $95,244 for its proportionate share of the CERS net OPEB liability. The net OPEB liability was measured as of June 30, 2021, and the total OPEB liability used to calculate the net OPEB liability was determined by an actuarial valuation as of June 30, 2020, rolled forward to June 30, 2021. At June 30, 2021, the District's proportion was .004975% for nonhazardous classified employees.

For the year ended December 31, 2021, the District recognized OPEB expense of $4,489. At December 31, 2021, the District reported deferred outflows of resources and deferred inflows of resources related to pensions from the following sources:

	Deferred Outflows of Resources	Deferred Inflows of Resources
Net difference between projected & actual earnings on pension plan investments	$ 14,977	$ 28,437
Changes of assumptions	25,251	89
Net difference between projected and actual earnings on plan investments	4,799	19,698
Changes in proportion and differences between employer contributions and proportionate share of contributions	7,217	34,599
Contributions subsequent to the measurement date, including implicit subsidy	6,593	-
Totals	$ 58,837	$ 82,823

The $6,593 of deferred outflows of resources resulting from the District's contributions subsequent to the measurement date and the December 31, 2021 implicit subsidy will be recognized as a reduction of the net OPEB liability in the year ending December 31, 2022.

Other amounts reported as deferred outflows of resources and deferred inflows of resources related to pensions will be recognized in pension expense as follows:

Fiscal Year Ending June 30,	Amortization/ (Accretion)
2022	$ (5,839)
2023	(8,090)
2024	(7,182)
2025	(9,468)
	$ (30,579)

Actuarial Assumptions The total OPEB liability, net OPEB liability, and sensitivity information as of June 30, 2021, were based on an actuarial valuation date of June 30, 2020. The total OPEB liability was rolled-forward from the valuation date (June 30, 2020) to the plan's fiscal year ending June 30, 2021, using the generally accepted actuarial principles.

The following actuarial assumptions were used in performing the actuarial valuation as of June 30, 2021:

Inflation	2.30%
Payroll Growth Rate	2.0% CERS Non-hazardous
Salary Increase	3.30% - 10.30%, varies by service
Investment Rate of Return	6.25%
Healthcare Trend Rates	
Pre-65	Initial trend starting at 6.30% as January 1, 2023, and gradually decreasing to an ultimate trend rate of 4.05% over a period of 13 years.
Post-65	Initial trend starting at 6.30% in 2023, then gradually decreasing to an ultimate trend rate of 4.05% over a period of 13 years.
Mortality	
Pre-retirement	Pub-2010 General Mortality table, for the Nonhazardous Plans, projected with the ultimate rates from the MP-2014 mortality improvement scale using a base year of 2010.
Post-retirement (non-disabled)	System-specific mortality table based on mortality experience form 2013-2018, projected with the ultimate rates from MP-2014 mortality improvement sale using a base year of 2019.
Post-retirement (disabled)	Pub-2010 Disabled Mortality table, with a 4-year set-forward for both male and female rates, projected with the ultimate rates from the MP-2014 mortality improvement scale using a base year of 2010.

The single discount rates used to calculate the total OPEB liability within each plan changed since the prior year. The assumed increase in future health care costs, or trend assumption, was reviewed during the June 30, 2020, valuation process and was updated to better reflect the plan's anticipated long-term healthcare costs. There were no other material assumption changes.

House Bill 1 passed during the 2019 Special Legislative Session allows certain employers in the KERS Nonhazardous plan to elect to cease participating in the KERS Nonhazardous Plan as of June 30, 2020, under different provisions than were previously established. Senate Bill 249 passed during the 2020 legislative session delayed the effective date of cessation for these provisions to June 30, 2021. Only one employer elected to cease participation under these provisions and freeze benefit accruals for their current employees. As such, there is no material impact on the total OPEB liability due to this legislation.

Senate Bill 249 passed during the 2020 legislative session changed the funding period for the amortization of the unfunded liability to 30 years as of June 30, 2019. Gains and losses incurring in future years will be amortized over separate 20-year amortization bases. This change does not

impact the calculation of the Total OPEB Liability and only impacts the calculation of the contribution rates that were payable starting July 1, 2020.

Senate Bill 169 passed during the 2021 legislative session and increased the disability benefits for certain qualifying members who become "totally and permanently disabled" in the line of duty or as a result of a duty-related disability. The total OPEB liability as of June 30, 2021, is determined using these updated benefit provisions.

Additionally, House Bill 8 passed during the 2021 legislative session changed how employer contributions are allocated and collected from the participating employers in the KERS Nonhazardous Plan. This change does not impact the calculation of the total OPEB liability but does impact the allocation of required contributions amongst the participating employers. As a result of this legislation, there are several employers that will experience a relatively large change in proportionate share of the Collective OPEB Amounts in the KERS Nonhazardous insurance plan from 2020 to 2021. Additional information is provided in Section 1 of the GASB 75 KERS report. There were no other material plan provision changes.

The target allocation and best estimates of arithmetic real rate of return for each major asset class is summarized in the table below.

Asset Class	Target Allocation	Long-Term Nominal Rate of Return
Growth	**68.50%**	
US Equity	21.75%	5.70%
Non US Equity	21.75%	6.35%
Private Equity	10.00%	9.70%
Specialty Credit/High Yield	15.00%	2.80%
Liquidity	**11.50%**	
Core Bonds	10.00%	0.00%
Cash	1.50%	(0.60)%
Diversifying Strategies	**20.00%**	
Real Estate	10.00%	5.40%
Opportunistic	0.00%	N/A
Real Return	10.00%	4.55%
Total	**100.00%**	
Expected real return		5.00%
Long-term inflation assumption		2.30%

Discount Rate. The single discount rate of 5.20% for CERS nonhazardous plans were used to calculate the total OPEB liability as of June 30, 2021. The single discount rate is based on the expected rate of return on OPEB plan investments of 6.25%, and a municipal bond rate of 1.92%, as reported in Fidelity Index's "20-Year Municipal GO AA Index" as of June 30, 2021. Based on the stated assumptions and the projection of cash flows as of each fiscal year ending, each plan's fiduciary net position and future contributions were projected to be sufficient to finance the future benefit payments of the current plan members. Therefore, the long-term expected rate of return on insurance plan investments was applied to all periods of the projected benefit payments paid from the plan. However, the cost associated with the implicit employer subsidy was not included in the calculation of the plans actuarial determined contributions, and any cost associated with the implicit subsidy will not be paid out of the plan's trust. Therefore, the municipal bond rate was applied to future expected benefit payments associated with the implicit subsidy.

Implicit Subsidy. The fully-insured premiums paid for Kentucky Employee's Health Plan are

blended rates based on the combined experience of the active and retired members. Because the average cost of providing health care benefits to retirees under age 65 is higher than the average cost of providing health care benefits to active employees, there is an implicit employer subsidy for non-Medicare eligible retirees. GASB Statement No. 75 requires that the liability associated with this implicit subsidy be included in the calculation of the Total OPEB Liability. The District's implicit subsidy for the year ended December, 31, 2021, was $3,134.

Sensitivity of the District's proportionate share of the net OPEB liability to changes in the discount rate. The following presents the District's proportionate share of the net OPEB liability calculated using the discount rate of present, as well as what the plan's net position liability would be if it were calculated using a discount rate that is one percentage point lower (4.20%) or one percentage point higher (6.20%) than the current rate (5.20%):

	1% Decrease 4.20%	Current Discount Rate 5.20%	1% Increase 6.20%
The District's proportionate share of the net OPEB liability	$ 130,769	$ 95,244	$ 66,090

Sensitivity of the net OPEB liability to changes in the healthcare cost trend rate. The following presents the District's proportionate share of the net OPEB liability calculated using the current healthcare cost trend rates (see details in Actuarial Assumptions above), as well as, what the District's proportionate share of the net OPEB liability would be if it were calculated using healthcare cost trend rates that are one percentage point lower or one percentage point higher than the current rates.

	1% Decrease	Current Healthcare Cost Trend Rate	1% Increase
The District's proportionate share of the net OPEB liability	$ 68,564	$ 95,244	$ 127,447

Payables to the OPEB plan. At December 31, 2021, the financial statements include $828 in contractually required employee OPEB contributions primarily for the month ended December 31, 2021. The obligation was paid within prescribed time limits.

8. COMMITMENTS

Contracts for Water Supply

The District entered into contracts with the City of Eddyville, the City of Kuttawa, the City of Princeton, and the Crittenden-Livingston Water District which states that the Cities and Water District will provide water to the District.

9. CONTINGENCIES

The District participates in federal and state assisted grant programs for construction of water lines. These programs are subject to review by grantors or their representatives. As of December 31, 2021, there have been no material questioned or disallowed costs as a result of grant audits. As construction is completed, amounts due from grant funds are recognized and are recorded as revenue.

10. PUBLIC SERVICE COMMISSION REGULATIONS

The District is required to file with the Public Service Commission (PSC) a report of its gross earnings or receipts derived from intra-state business for the preceding calendar year. The District has satisfied this requirement. The District has also filed the 2021 annual PSC Report as required. Further, the PSC requires that all customer deposit refunds be paid with interest. This requirement has been fulfilled.

11. ECONOMIC DEPENDENCIES

The majority of the District's revenue consists of charges for water-related services to customers in Lyon County, Kentucky. For the year ended December 31, 2021, the revenues from these sources totaled $1,313,827. The District also receives monies from the United States Department of Agriculture and the Kentucky Infrastructure Authority whenever funds are available.

12. COMPENSATED ABSENCES

The District grants employees vacation time based on years of service. Full-time employee are entitled to vacation pay according to the following schedule:

1 to 5 years	12 days
6+ years	15 days

Employees are allowed to carryforward 80 hours of vacation time. Upon termination of employment, an employee will be paid for all unused vacation leave. The liability for unused vacation time at December 31, 2021 was $3,239.

The District's policy on sick pay states that employees will be granted 1/2 sick day per month. Employees are allowed to carryforward 240 hours of sick time. Sick leave is forfeited upon termination of employment. The liability for unused sick time at December 31, 2021 was $1,000.

13. LITIGATION

The District is not aware of any pending or threatened litigation in which it is involved which would have a material effect on these financial statements.

REQUIRED SUPPLEMENTARY INFORMATION

Lyon County Water District
Schedule of Revenues, Expenses, and
Changes in Net Position - Budget and Actual
For the Year Ended December 31, 2021

	Budgeted Amounts			Variance with Final Budget Positive
Revenues	Original	Final	Actual	(Negative)
Water revenues	$ 1,450,000	$ 1,450,000	$ 1,313,827	$ (136,173)
Other	850	850	-	(850)
Total Operating Revenues	1,450,850	1,450,850	1,313,827	(137,023)
Operating Expenses				
Water expenses	965,700	965,700	896,861	68,839
Depreciation	342,000	342,000	334,418	7,582
Wastewater expenses	20,500	20,500	20,917	(417)
Payroll and other taxes	12,000	12,000	10,645	1,355
Total Operating Expenses	1,340,200	1,340,200	1,262,841	77,359
Operating Income (Loss)	110,650	110,650	50,986	(59,664)
Nonoperating Revenues (Expenses)				
Investment income	3,500	3,500	218	(3,282)
Interest on debt	(115,000)	(115,000)	(101,226)	13,774
Total Nonoperating Revenue (Expenses)	(111,500)	(111,500)	(101,008)	10,492
Net Income before Capital Contributions	(850)	(850)	(50,022)	(49,172)
Capital Contributions				
Tap-on fees	10,500	10,500	10,800	300
Total Capital Contributions	10,500	10,500	10,800	300
Change in Net Position	$ 9,650	$ 9,650	(39,222)	$ (48,872)
Net Position-Beginning of Year			3,254,145	
Net Position-End of Year			$ 3,214,923	

Lyon County Water District
Schedule of the Proportionate Share of the Net Pension Liability
For the Years Ended December 31
Last Ten Measurement Dates (1)

Year Ended	District's proportion of the net pension liability	District's proportionate share of the net pension liability (asset)	District's covered employee payroll	District's share of the net pension liability (asset) as a percentage of its covered employee payroll	Plan fiduciary net position as a percentage of the total pension liability (2)
CERS Nonhazardous					
2021	0.004977%	$317,323	$123,352	257.25%	57.33%
2020	0.006202%	$475,688	$143,895	330.58%	47.81%
2019	0.007366%	$518,054	$175,603	295.01%	50.45%
2018	0.006546%	$398,671	$181,770	219.33%	53.54%
2017	0.006997%	$409,556	$158,492	258.41%	53.30%
2016	0.00639%	$314,713	$175,888	178.92%	55.50%
2015	0.00551%	$237,005	$139,779	169.55%	59.97%
2014	0.005572%	$180,777	$150,398	169.55%	66.80%

Note to Schedule:

(1) The amounts presented were determined as of the measurement date June 30. District payroll is reported for its' covered employees on a calendar year ending December 31.

(2) This will be the same percentage for all participant employers in the CERS plan.

Schedule is intended to show information for 10 years. Additional years of supplemental information will be provided as this information becomes available.

Lyon County Water District
Schedule of Pension Contributions
For the Years Ended December 31
Last Ten Years (1)

Year Ended	Contractually required contribution	Contributions relative to contractually required contribution	Contribution deficiency (excess)	District's covered employee payroll	Contributions as a percentage of covered employee payroll
CERS Nonhazardous					
2021	$25,024	$25,024	$ -	$123,352	19.30% / 21.17%
2020	$27,697	$27,697	$ -	$143,895	19.30% / 19.30%
2019	$31,073	$31,073	$ -	$175,603	16.22% / 19.30%
2018	$27,925	$27,925	$ -	$181,770	14.48% / 16.22%
2017	$28,030	$28,030	$ -	$158,492	13.95% / 14.48%
2016	$28,511	$28,511	$ -	$175,888	12.42% / 13.95%
2015	$22,637	$22,637	$ -	$139,779	12.75% / 12.42%
2014	$22,229	$22,229	$ -	$150,398	13.74% / 12.75%

Note to Schedule:

(1) Schedule is intended to show information for 10 years. Additional years of supplemental information will be provided as this information becomes available.

Contractually required employer contributions exclude the portion of contributions paid to CERS but allocated to the insurance fund of CERS. The above contributions only include those allocated directly to the CERS pension fund.

Lyon County Water District
Schedule of Changes in Benefits and Assumptions Pension
For the Year Ended December 31, 2021

Note A - Changes of Assumptions:
The following changes were made by the Kentucky Legislature and reflected in the valuation performed as of June 30, listed below:

2015:
The assumed investment rate of return was decreased from 7.75% to 7.50%.
The assumed rate of inflation was reduced from 3.50% to 3.25%.
The assumed rate of wage inflation was reduced from 1.00% to 0.75%.
Payroll growth assumption was reduced from 4.50% to 4.00%.
The mortality table used for active members is RP-2000 Combined Mortality Table projected with Scale BB to 2013 (multiplied by 50% for males and 30% for females).

For healthy retired members and beneficiaries, the mortality table used is the RP-2000 Combined Mortality Table projected with Scale BB to 2013 (set back 1 year for females). For disabled members, the RP-2000 Combined Disabled Mortality Table projected with Scale BB to 2013 (set back 4 years for males) is used for the period after disability retirement. There is some margin in the current mortality tables for possible future improvement in mortality rates and that margin will be reviewed again when the next experience investigation is conducted.

The assumed rates of Retirement, Withdrawal, and Disability were updated to more accurately reflect experience.

2017:
The actuarial valuation as of June 30, 2017, was performed by Gabriel Roeder Smith. Subsequent to the actuarial valuation date (June 30, 2016), but prior to the measurement date the KRS Board of Trustees reviewed investment trends, inflation, and payroll growth historical trends. Based on this review the Board adopted the following updated actuarial assumptions which were used in performing the actuarial valuation as of June 30, 2017, which were also used to determine the Total Pension Liability and Net Pension Liability as of June 30, 2017.

Inflation	2.30%
Salary increases	3.05%, average
Investment rate of return	6.25%, net of pension plan investment expense including inflation

2018:
There have been no changes in actuarial assumption since June 30, 2017.

2019:
Payroll growth rate was reduced to 2.00% from 4.00%.
The assumed salary increases were increased to 3.30% to 11.55%, from 3.05% to 18.55%.

2020:
There have been no changes in actuarial assumptions since June 30, 2019.

2021:
The assumed salary increases were decreased to 3.30% to 10.30%, from 3.30% to 11.55%.

Lyon County Water District
Schedule of Changes in Benefits and Assumptions Pension
For the Year Ended December 31, 2021

Note B - Method and assumptions used in calculations of actuarially determined contribution
The total pension liability, net pension liability, and sensitivity information as of June 30, 2021, were based on an actuarial valuation date of June 30, 2020. The total pension liability was rolled forward from the valuation date of June 30, 2020, to the plan's fiscal year ending June 30, 2021, using the generally accepted actuarial principles. The following actuarial methods and assumptions used to calculate the required contributions are below.

Valuation date	June 30, 2019
Experience study	July 1, 2013 - June 30, 2018
Actual cost method	Entry age normal
Amortization method	Level percent of pay
Amortization period	30-year closed period at June 30, 2019. *Gains/losses incurring after 2019 will be amortized over separate closed 20-year amortization bases.*
Payroll growth rate	2.00%
Asset valuation method	20% of the difference between the market value of assets and the expected actuarial value of assets is recognized
Inflation	2.30%
Salary increases	3.30% to 10.30%, varies by service for CERS
Investment Rate of Return	6.25%
Mortality	System-specific mortality table based on mortality experience from 2013-2018, projected with the ultimate rates from MP-2014 mortality improvement scale using a base year of 2019.
Phase-In provision	Board certified rate is phased into the actuarially determined rate in accordance with HB362 enacted in 2018.

Note C - Changes in benefits:
2009: A new benefit tier for members who first participate on or after September 1, 2008, was introduced which included the following changes:

1. Tiered structure for benefit accrual rates.
2. New retirement eligibility requirements.
3. Different rules for the computation of final average compensation.

2014: A cash balance plan was introduced for members whose participation date is on or after January 1, 2014.

2018: House Bill 185 was enacted, which updated benefit provisions for active members who die in the line of duty.

2019: House Bill 1 passed during the 2019 legislative session and allowed certain agencies in the KERS Nonhazardous plan to elect to cease participating in the fund as of June 30, 2020, under different provisions than were previously established.

2020: Senate Bill 249 passed during the 2020 legislative session delayed the effective date of cessation for these provisions to June 30, 2021.

2021: Senate Bill 169 passed during 2021 legislative session increased the disability benefits for certain qualifying members who become "total and permanently disabled" in the line of duty or as a result of a duty-related disability.

House Bill 8 passed during the 2021 legislative session changed how employer contributions are allocated and collected from the participating employer in the KERS Nonhazardous plan.

Lyon County Water District
Schedule of the Proportionate Share of the Net OPEB Liability
For the Years Ended December 31
Last Ten Measurement Dates (1)

Year Ended	District's proportion of the net OPEB liability	District's proportionate share of the net OPEB liability (asset)	District's covered employee payroll	District's share of the net OPEB liability (asset) as a percentage of its covered employee payroll	Plan fiduciary net position as a percentage of the total OPEB liability (2)
CERS Nonhazardous					
2021	0.004975%	$ 95,244	$123,352	77.21%	62.91%
2020	0.006200%	$149,711	$143,895	104.04%	51.67%
2019	0.007364%	$123,859	$175,603	70.53%	60.44%
2018	0.006546%	$116,223	$181,770	63.94%	57.62%
2017	0.006997%	$140,664	$158,492	88.75%	52.40%

Note to Schedule:

(1) The amounts presented were determined as of the measurement date June 30. District payroll is reported for its' covered employees on calendar years ending December 31.

(2) This will be the same for all participant employers in the CERS plan.

Schedule is intended to show information for 10 years. Additional years of supplemental information will be provided as this information becomes available.

Lyon County Water District
Schedule of OPEB Contributions
For the Years Ended December 31
Last Ten Years (1)

Year Ended	Contractually required contribution	Contributions relative to contractually required contribution	Contribution deficiency (excess)	District's covered employee payroll	Contributions as a percentage of covered employee payroll
CERS Nonhazardous					
2021	$6,467	$6,467	$ -	$123,352	4.76% / 5.78%
2020	$6,924	$6,924	$ -	$143,895	4.76% / 4.76%
2019	$8,748	$8,748	$ -	$ 175,603	5.26% / 4.76%
2018	$9,046	$9,046	$ -	$181,770	4.70% / 5.26%
2017	$9,311	$9,311	$ -	$158,492	4.73% / 4.70%

Note to Schedule:

Contributions in relation to statutorily required OPEB contributions are the contributions an employer actually made to the OPEB Plan, as distinct from the statutorily required contributions.

Contractually required employer contributions exclude the portion of contributions paid to CERS but allocated to the pension fund of CERS. The above contributions only include those allocated directly to the CERS insurance fund.

(1) Schedule is intended to show information for 10 years. Additional years of supplemental information will be provided as this information becomes available.

Lyon County Water District
Schedule of Changes in Benefits and Assumptions OPEB
For the Year Ended December 31, 2021

Note A - Changes of Assumptions:

2017:

The actuarial valuation was performed as of June 30, 2016. Gabriel Roeder Smith Retirement Consulting rolled forward from the valuation date to the plan's fiscal year end of June 30, 2017 using generally accepted actuarial principles. Subsequent to the actuarial valuation date (June 30, 2016), but prior to the measurement date the KRS Board of Trustees reviewed investment trends, inflation, and payroll growth historical trends. Based on this review the Board adopted the following updated actuarial assumptions which were used in performing the actuarial valuation as of June 30, 2017, which were also used to determine the Total Pension Liability and Net Pension Liability as of June 30, 2017. Specifically, a 2.30% price inflation assumption and an assumed rate of return of 6.25%.

2018:

There have been no changes in actuarial assumptions since June 30, 2017.

2019:

The payroll growth rate was reduced to 2.0% from 4.0%.
The inflation rate was reduced to 2.30% from 3.25%.
The investment rate of return was reduced to 6.25% from 7.50%.

2020:

There have been no changes in actuarial assumptions since June 30, 2019.

2021:

Salary increases were reduced to 3.30% to 10.30% from 3.30% to 11.55%.

Note B - Method and assumptions used in calculations of actuarially determined contributions.

The total OPEB liability, net OPEB liability, and sensitivity information as of June 30, 2021, were based on an actuarial valuation date of June 30, 2020. The total OPEB liability was rolled forward from the valuation date of June 30, 2020 to the plan's fiscal year ending June 30, 2021 using generally accepted actuarial principles. The actuarial methods and assumptions used to calculate the required contributions are below.

Valuation date	June 30, 2019
Experience study	July 1, 2013 - June 30, 2018
Actual cost method	Entry age normal
Amortization method	Level percent of pay
Amortization period	30-year closed period at June 30, 2019. *Gains/losses incurring after 2019 will be amortized over separate closed 20-year amortization bases.*
Asset valuation method	20% of the difference between the market value of assets and the expected actuarial value of assets is recognized
Inflation	2.30%
Salary increases	3.30% to 10.30%, varies by service for CERS
Payroll growth rate	2.00%
Investment Return	6.25%
Healthcare Trend Rates	
Pre-65	Initial trend starting at 5.50% at January 1, 2021, then gradually decreasing to an ultimate trend rate of 4.05% over a period of 14 years.
Post-65	Initial trend starting at 5.50% at January 1, 2021, then gradually decreasing to an ultimate trend rate of 4.05% over a period of 14 years.
Mortality	System-specific mortality table based on mortality experience from 2013-2018, projected with the ultimate rates from MP-2014 mortality improvement scale using a base year of 2019.

Lyon County Water District
Schedule of Changes in Benefits and Assumptions OPEB
For the Year Ended December 31, 2021

Phase-In provision	Board certified rate is phased into the actuarially determined rate in accordance with HB362 enacted in 2018.

Notes C - Changes of Benefits:

2019: House Bill 1 passed during the 2019 legislative session and allowed certain agencies in the KERS Nonhazardous plan to elect to cease participating in the fund as of June 30, 2020, under different provisions than were previously established.

2020: Senate Bill 249 passed during the 2020 legislative session delayed the effective date of cessation for these provisions to June 30, 2021.

2021: Senate Bill 249 passed during the 2020 legislative session changed the funding period for the amortization of the unfunded liability to 30 years as of June 30, 2019. Gains and losses incurring in future years will be amortized over separate 20-year amortization bases.

Senate Bill 169 passed during 2021 legislative session increased the disability benefits for certain qualifying members who become "total and permanently disabled" in the line of duty or as a result of a duty-related disability.

House Bill 8 passed during the 2021 legislative session changed how employer contributions are allocated and collected from the participating employer in the KERS Nonhazardous plan.

JESSICA K. DANIEL, CPA PSC
CERTIFIED PUBLIC ACCOUNTANT

INDEPENDENT AUDITOR'S REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING AND ON COMPLIANCE AND OTHER MATTERS BASED ON AN AUDIT OF FINANCIAL STATEMENTS PERFORMED IN ACCORDANCE WITH *GOVERNMENT AUDITING STANDARDS*

To the Board of Commissioners
Lyon County Water District
Kuttawa, Kentucky

We have audited, in accordance with the auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards* issues by the Comptroller General of the United States, the financial statements of the Lyon County Water District, as of and for the year ended December 31, 2021 and the related notes to the financial statements, which collectively comprise the Lyon County Water District's basic financial statements, and have issued our report thereon dated July 25, 2022.

Report on Internal Control Over Financial Reporting
In planning and performing our audit of the financial statements, we considered the Lyon County Water District's internal control over financial reporting (internal control) to determine the audit procedures that are appropriate in the circumstances for the purpose of expressing our opinions on the financial statements, but not for the purpose of expressing an opinion on the effectiveness of the District's internal control. Accordingly, we do not express an opinion on the effectiveness of the District's internal control.

A *deficiency in internal control* exists when the design or operation of a control does not allow management or employees, in the normal course of performing their assigned functions, to prevent, or detect and correct misstatements on a timely basis. A *material weakness* is a deficiency, or a combination of deficiencies, in internal control such that there is a reasonable possibility that a material misstatement of the entity's financial statements will not be prevented, or detected and corrected on a timely basis. A *significant deficiency* is a deficiency, or combination of deficiencies, in internal control that is less severe than a material weakness, yet important enough to merit attention by those charged with governance.

Our consideration of internal control was for the limited purpose described in the first paragraph of this section and was not designed to identify all deficiencies in internal control that might be material weaknesses or significant deficiencies and therefore, material weaknesses or significant deficiencies may exist that have not been identified. Given these limitations, during out audit we did not identify any deficiencies in internal control that we consider to be material weaknesses. We did identify certain deficiencies in internal control, described in the accompanying schedule of findings and questioned costs that we consider to be significant deficiencies. (2021-1).

140 COMMERCE ST.
PO BOX 909
EDDYVILLE, KY 42038

270-388-4114 OFFICE
270-388-2363 FAX

Report on Compliance and Other Matters

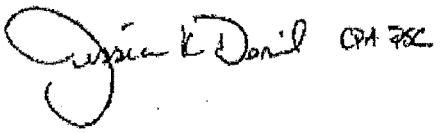
As part of obtaining reasonable assurance about whether the Lyon County Water District's financial statements are free of material misstatement, we performed tests of its compliance with certain provisions of laws, regulations, contracts, and grant agreements, noncompliance with which could have a direct and material effect on the determination of financial statement amounts. However, providing an opinion on compliance with those provisions was not an objective of our audit, and accordingly, we do not express such an opinion. The results of our tests disclosed no instances of noncompliance that are required to be reported under *Government Auditing Standards*.

Lyon County Water District's Response to Findings

Lyon County Water District's response to findings identified in our audit described in the accompanying schedule of findings and responses. The District's response was not subjected to the auditing procedures applied in the audit of the financial statements, and, accordingly, we express no opinion on it.

Purpose of this Report

The purpose of this report is solely to describe the scope of our testing of internal control and compliance and the results of that testing, and not to provide an opinion on the effectiveness of the entity's internal control or on compliance. This report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the entity's internal control and compliance. Accordingly, this communication is not suitable for any other purpose.



Eddyville, Kentucky
July 25, 2022

Lyon County Water District
Schedule of Findings and Responses
For The Year Ended December 31, 2021

2021-1 Segregation of Duties

Condition

There is an absence of appropriate segregation of duties consistent with appropriate control objectives.

Criteria

A prudent control environment requires various functions of internal control be allocated among various employees.

Effect

Although no instances were noted, lack of segregation of duties can create situations where assets are not properly safeguarded and errors and irregularities may go undetected.

Cause

Lack of personnel.

Recommendation

We recommend that management review its financial operation for opportunities to separate incompatible functions. Where segregation of duties cannot be achieved due to the size of the staff, management should maintain its awareness of the weakness and compensate with other controls.

Response

We agree with the finding and have put in place certain compensating controls to help alleviate exposure. A third party accounting firm has been contracted to provide office staff, bookkeeping, payroll, and preparing monthly reports for Board review.

Lyon County Water District
Schedule of Prior Year Findings and Responses
For The Year Ended December 31, 2020

2020-1 Segregation of Duties

Condition

There is an absence of appropriate segregation of duties consistent with appropriate control objectives.

Criteria

A prudent control environment requires various functions of internal control be allocated among various employees.

Effect

Although no instances were noted, lack of segregation of duties can create situations where assets are not properly safeguarded and errors and irregularities may go undetected.

Cause

Lack of personnel.

Recommendation

We recommend that management review its financial operation for opportunities to separate incompatible functions. Where segregation of duties cannot be achieved due to the size of the staff, management should maintain its awareness of the weakness and compensate with other controls.

Response

We agree with the finding and have put in place certain compensating controls to help alleviate exposure. A third party accounting firm has been contracted to provide office staff, bookkeeping, payroll, and preparing monthly reports for Board review.

Year End: December 31, 2021
Adjusting journal entries
Date: 1/1/2021 To 12/31/2021

Prepared by	Reviewed by
JKD 7/22/2022	JKD 7/25/2022

B-2

Number	Date	Type	Name	Account No	Reference	Annotation	Debit	Credit	Recurrence	Misstatement
AJE 01	12/31/2021	N	Deferred Outflows - Pension	1900				47,571.00		
AJE 01	12/31/2021	N	Net Pension Liability	2700			158,365.00			
AJE 01	12/31/2021	N	Deferred Inflows - Pension	2900				80,168.00		
AJE 01	12/31/2021	N	Pension Contra	5031				30,626.00		
			GASB 65 adjustment							
AJE 02	12/31/2021	N	Deferred Outflows - OPEB	1901				17,435.00		
AJE 02	12/31/2021	N	Net OPEB Liability	2701			54,467.00			
AJE 02	12/31/2021	N	Deferred Inflows - OPEB	2901				33,414.00		
AJE 02	12/31/2021	N	Pension Contra	5031				3,618.00		
			GASB 75 adjustment							
AJE 03	12/31/2021	N	Accrued Interest	2300			20,516.60			
AJE 03	12/31/2021	N	Current Portion LT Debt	2500			48,500.00			
AJE 03	12/31/2021	N	Long Term Debt - R/D	2621				48,500.00		
AJE 03	12/31/2021	N	Interest Expense	5800				20,516.60		
			To adjust current portion of debt - January 2022 payment was made in December 2021.							
AJE 04	12/31/2021	N	Retirement Payable	2310				3,275.92		
AJE 04	12/31/2021	N	Employee Pension Expense	5030			3,275.92			
			Adjust retirement payable							
							285,124.52	285,124.52		

Net Income (Loss) **(39,221.15)**

Year End: December 31, 2021
Trial balance

Prepared by	Reviewed by
JKD 7/22/2022	JKD 7/25/2022

B-1

Account	Prelim	Adj's	Rep	Ann.	Rep 12/20	Amount Chg	%Chg
105 Cash	**194,955.50**	**0.00**	**194,955.50**		**241,099.75**	**(46,144.25)**	**(19)**
1000 Cash - Operating	19,911.18	0.00	19,911.18	1-0	64,863.61	(44,952.43)	(69)
1002 Cash - Revenue	28,518.78	0.00	28,518.78	1-0	33,079.84	(4,561.06)	(14)
1003 Cash - Project #2	73,141.05	0.00	73,141.05	1-0	72,941.05	200.00	0
1005 Cash - Lyon Co Loan Fund	7,240.30	0.00	7,240.30	1-0	7,240.30	0.00	0
1007 Cash - Sewer Operation	66,144.19	0.00	66,144.19	1-0	62,974.95	3,169.24	5
110 Accounts recivable	**120,235.37**	**0.00**	**120,235.37**		**121,166.82**	**(931.45)**	**(1)**
1100 Customer Receivables	120,235.37	0.00	120,235.37	2-1	121,166.82	(931.45)	(1)
115 Unbilled revenue	**81,935.71**	**0.00**	**81,935.71**		**81,487.93**	**447.78**	**1**
1175 Unbilled Revenue	81,935.71	0.00	81,935.71	2-2	81,487.93	447.78	1
125 Prepayments	**15,641.10**	**0.00**	**15,641.10**		**16,971.33**	**(1,330.23)**	**(8)**
1300 Prepaid Expenses	15,641.19	0.00	15,641.19	3-2	16,971.42	(1,330.23)	(8)
1350 Prepaid KIA Principal	(0.09)	0.00	(0.09)		(0.09)	0.00	0
130 Inventory	**32,930.05**	**0.00**	**32,930.05**		**25,390.14**	**7,539.91**	**30**
1200 Inventory	32,930.05	0.00	32,930.05	5-1	25,390.14	7,539.91	30
135 Restricted Assets - Cash	**292,042.14**	**0.00**	**292,042.14**		**285,904.22**	**6,137.92**	**2**
1001 Cash - Depreciation	163,910.01	0.00	163,910.01	1-0	160,288.98	3,621.03	2
1006 Cash - KIA Loan Repayment Fd	4,796.80	0.00	4,796.80	1-0	4,796.80	0.00	0
1008 Regions - Sinking Fund	72,139.89	0.00	72,139.89	1-0	68,095.63	4,044.26	6
1009 Revenue Bond & Int Sinking Fd	51,195.44	0.00	51,195.44	1-0	52,722.81	(1,527.37)	(3)
136 Customer Deposit Cash	**560.00**	**0.00**	**560.00**		**560.00**	**0.00**	**0**
1650 Deposits	560.00	0.00	560.00	1	560.00	0.00	0
145 Capital Assets	**7,618,454.55**	**0.00**	**7,618,454.55**		**7,851,578.13**	**(233,123.58)**	**(3)**
145.100 Land	**121,772.32**	**0.00**	**121,772.32**		**121,772.32**	**0.00**	**0**
1700 Land	121,772.32	0.00	121,772.32	4-1	121,772.32	0.00	0
145.200 Construction in Progress	**43,477.40**	**0.00**	**43,477.40**		**43,477.40**	**0.00**	**0**
1795 Construction In Process	9,081.40	0.00	9,081.40	4-1	9,081.40	0.00	0
1796 Construction In Process - RD	29,980.00	0.00	29,980.00	4-1	29,980.00	0.00	0
1797 Construction In Progress Sewer	4,416.00	0.00	4,416.00	4-1	4,416.00	0.00	0
145.300 Plants and Facilities	**12,687,380.26**	**0.00**	**12,687,380.26**		**12,652,563.58**	**34,816.68**	**0**
1720 Distribution Line #1	2,635,028.77	0.00	2,635,028.77	4-1	2,600,212.09	34,816.68	1
1730 Distribution Line #2	8,563,709.92	0.00	8,563,709.92	4-1	8,563,709.92	0.00	0
1740 Lake Barkley Line	164,209.83	0.00	164,209.83	4-1	164,209.83	0.00	0
1750 Water Tank	422,706.87	0.00	422,706.87	4-1	422,706.87	0.00	0
1780 Improvements	34,000.00	0.00	34,000.00	4-1	34,000.00	0.00	0

Account	Prelim	Adj's	Rep	Ann.	Rep 12/20	Amount Chg	%Chg
1790 Sewer Line	867,724.87	0.00	867,724.87	4-1	867,724.87	0.00	0
145.400 Buildings	**73,976.27**	**0.00**	**73,976.27**		**73,976.27**	**0.00**	**0**
1760 Building	73,976.27	0.00	73,976.27	4-1	73,976.27	0.00	0
145.500 Vehicles and Equipment	**449,376.27**	**0.00**	**449,376.27**		**382,898.21**	**66,478.06**	**17**
1710 Equipment	307,247.10	0.00	307,247.10	4-1	295,769.04	11,478.06	4
1770 Vehicles	142,129.17	0.00	142,129.17	4-1	87,129.17	55,000.00	63
145.650 Accumulated Depreciation	**(5,757,527.97)**	**0.00**	**(5,757,527.97)**		**(5,423,109.65)**	**(334,418.32)**	**6**
1799 Accumulated Depreciation	(5,757,527.97)	0.00	(5,757,527.97)	4-1	(5,423,109.65)	(334,418.32)	6
170 Deferred Outflows	**162,812.33**	**(65,006.00)**	**97,806.33**		**157,392.69**	**(59,586.36)**	**(38)**
1900 Deferred Outflows - Pension	86,540.07	(47,571.00)	38,969.07	6-9	82,192.65	(43,223.58)	(53)
1901 Deferred Outflows - OPEB	76,272.26	(17,435.00)	58,837.26	6-9	75,200.04	(16,362.78)	(22)
205 Trade Accounts Payable	**(71,565.17)**	**0.00**	**(71,565.17)**		**(61,171.32)**	**(10,393.85)**	**17**
2000 Accounts Payable	(71,565.17)	0.00	(71,565.17)	6-1	(61,171.32)	(10,393.85)	17
213 Payroll Liabilities	**(3,551.26)**	**0.00**	**(3,551.26)**		**(2,731.97)**	**(819.29)**	**30**
2200 Federal Withholding	(835.21)	0.00	(835.21)	6-8	(719.00)	(116.21)	16
2201 FICA Withholding	(1,126.32)	0.00	(1,126.32)	6-8	(791.04)	(335.28)	42
2202 Kentucky Withholding	(559.20)	0.00	(559.20)	6-7	(430.89)	(128.31)	30
2203 Payroll Liabilities	(1,030.53)	0.00	(1,030.53)	6-8	(791.04)	(239.49)	30
215 Accrued liabilities	**(11,515.05)**	**(3,275.92)**	**(14,790.97)**		**(10,003.64)**	**(4,787.33)**	**48**
2100 Sales Tax Payable	(281.31)	0.00	(281.31)	6-6	(279.36)	(1.95)	1
2110 School Tax Payable	(3,493.42)	0.00	(3,493.42)	6-5	(2,885.56)	(607.86)	21
2305 Accrued Payroll	(2,634.73)	0.00	(2,634.73)	6-3	(2,683.28)	48.55	(2)
2310 Retirement Payable	(668.56)	(3,275.92)	(3,944.48)	6-10	(566.42)	(3,378.06)	596
2315 AFLAC Payable	(197.82)	0.00	(197.82)		(197.82)	0.00	0
2320 Accrued Vacation	(4,239.21)	0.00	(4,239.21)	6-3	(3,391.20)	(848.01)	25
220 Accrued interest on debt	**(38,135.07)**	**20,516.60**	**(17,618.47)**		**(38,135.07)**	**20,516.60**	**(54)**
2300 Accrued Interest	(38,135.07)	20,516.60	(17,618.47)	7-1	(38,135.07)	20,516.60	(54)
225 Customers' deposits	**(18,350.00)**	**0.00**	**(18,350.00)**		**(19,100.00)**	**750.00**	**(4)**
2400 Customer Deposits	(18,350.00)	0.00	(18,350.00)	6-4	(19,100.00)	750.00	(4)
235 Long-term debt due in one year	**(186,663.32)**	**48,500.00**	**(138,163.32)**		**(178,426.15)**	**40,262.83**	**(23)**
2500 Current Portion LT Debt	(186,663.32)	48,500.00	(138,163.32)	7-1	(178,426.15)	40,262.83	(23)
240 Long-term debt due after one ye	**(4,258,119.31)**	**(48,500.00)**	**(4,306,619.31)**		**(4,447,885.62)**	**141,266.31**	**(3)**
2610 Long-Term Debt Bonds	(930,000.00)	0.00	(930,000.00)	7-1	(980,000.00)	50,000.00	(5)
2620 Long Term Debt - KIA	(1,616,722.31)	0.00	(1,616,722.31)	7-1	(1,704,885.62)	88,163.31	(5)

Year End: December 31, 2021
Trial balance

Prepared by	Reviewed by
JKD 7/22/2022	JKD 7/25/2022

B-1-2

Account	Prelim	Adj's	Rep Ann.	Rep 12/20	Amount Chg	%Chg
2621 Long Term Debt - R/D	(1,666,000.00)	(48,500.00)	(1,714,500.00) 7-1	(1,763,000.00)	48,500.00	(3)
2622 Farmers Bank - Dodge Ram	(45,397.00)	0.00	(45,397.00) 7-1	0.00	(45,397.00)	0
245 Net Pension Liability	**(625,399.00)**	**212,832.00**	**(412,567.00)**	**(625,399.00)**	**212,832.00**	**(34)**
2700 Net Pension Liability	(475,688.00)	158,365.00	(317,323.00) 6-9	(475,688.00)	158,365.00	(33)
2701 Net OPEB Liability	(149,711.00)	54,467.00	(95,244.00) 6-9	(149,711.00)	54,467.00	(36)
270 Deferred Inflows	**(142,829.49)**	**(113,582.00)**	**(256,411.49)**	**(144,553.33)**	**(111,858.16)**	**77**
2630 Premium on Refinance	(32,752.75)	0.00	(32,752.75) 7-1	(34,476.59)	1,723.84	(5)
2900 Deferred Inflows - Pension	(60,667.40)	(80,168.00)	(140,835.40) 6-9	(60,667.40)	(80,168.00)	132
2901 Deferred Inflows - OPEB	(49,409.34)	(33,414.00)	(82,823.34) 6-9	(49,409.34)	(33,414.00)	68
305 Invested in capital assets, net of	**(3,275,818.29)**	**0.00**	**(3,275,818.29)**	**(3,275,818.29)**	**0.00**	**0**
3100 Invested Net of Related Debt	(3,275,818.29)	0.00	(3,275,818.29)	(3,275,818.29)	0.00	0
310 Restricted for debt service	**(201,828.00)**	**0.00**	**(201,828.00)**	**(201,828.00)**	**0.00**	**0**
3010 Restricted for Debt Service	(201,828.00)	0.00	(201,828.00)	(201,828.00)	0.00	0
315 Unrestricted	**223,501.38**	**0.00**	**223,501.38**	**16,381.39**	**207,119.99**	**1264**
3000 Unrestricted Net Position	223,501.38	0.00	223,501.38	16,381.39	207,119.99	1264
405 Water Revenues	**(1,313,827.37)**	**0.00**	**(1,313,827.37)**	**(1,264,850.15)**	**(48,977.22)**	**4**
4000 Residential Water Sales	(1,220,889.03)	0.00	(1,220,889.03) 10-01	(1,160,087.11)	(60,801.92)	5
4010 Commercial Water Sales	(71,974.83)	0.00	(71,974.83) 10-01	(82,442.19)	10,467.36	(13)
4020 Flat Rate Revenues - General Re	(13,704.97)	0.00	(13,704.97) 10-01	(13,344.05)	(360.92)	3
4030 Flat Rate Revenues - General Co	(9,978.04)	0.00	(9,978.04) 10-01	(12,026.81)	2,048.77	(17)
4900 Returns and Allowances	2,719.50	0.00	2,719.50	3,050.01	(330.51)	(11)
410 Other	**0.00**	**0.00**	**0.00**	**(610.00)**	**610.00**	**(100)**
4200 Miscellaneous Charges	0.00	0.00	0.00	(610.00)	610.00	(100)
415 Capital Contributions	**(10,800.00)**	**0.00**	**(10,800.00)**	**(7,200.00)**	**(3,600.00)**	**50**
4550 Contributed Capital	(10,800.00)	0.00	(10,800.00)	(7,200.00)	(3,600.00)	50
420 Investment Income	**(217.85)**	**0.00**	**(217.85)**	**(606.04)**	**388.19**	**(64)**
4500 Interest Income	(217.85)	0.00	(217.85)	(606.04)	388.19	(64)
501 Water Expenses	**927,828.63**	**(30,968.08)**	**896,860.55**	**1,002,000.60**	**(105,140.05)**	**(10)**
5000 Salaries	140,595.98	0.00	140,595.98	159,640.92	(19,044.94)	(12)
5001 Salaries Contra	(48.55)	0.00	(48.55)	621.48	(670.03)	(108)
5010 Employee Dental Insurance	667.96	0.00	667.96	602.08	65.88	11
5020 Employee Health Insurance	15,432.10	0.00	15,432.10	21,192.12	(5,760.02)	(27)
5021 Health Contra	0.00	0.00	0.00	6,045.00	(6,045.00)	(100)
5030 Employee Pension Expense	26,139.17	3,275.92	29,415.09	69,140.47	(39,725.38)	(57)
5031 Pension Contra	0.00	(34,244.00)	(34,244.00)	0.00	(34,244.00)	0

Account	Prelim	Adj's	Rep	Ann.	Rep 12/20	Amount Chg	%Chg
5100 PSC Assessment	2,491.48	0.00	2,491.48		2,451.03	40.45	2
5120 Utilities & Phone	28,814.98	0.00	28,814.98		25,216.55	3,598.43	14
5130 Materials & Supplies	88,240.39	0.00	88,240.39		41,830.85	46,409.54	111
5140 Office Supplies	15,086.17	0.00	15,086.17		13,083.29	2,002.88	15
5150 Purchased Water	421,654.85	0.00	421,654.85		410,229.52	11,425.33	3
5160 Replacement to Lines	0.00	0.00	0.00		18,743.25	(18,743.25)	(100)
5170 Contract Services	2,500.00	0.00	2,500.00		551.00	1,949.00	354
5175 Contract Labor	7,137.00	0.00	7,137.00		6,280.00	857.00	14
5180 Professional Fees	103,696.00	0.00	103,696.00		155,340.00	(51,644.00)	(33)
5190 Insurance Expense	23,634.26	0.00	23,634.26		24,569.29	(935.03)	(4)
5300 Miscellaneous Expense	51,786.84	0.00	51,786.84		46,463.75	5,323.09	11
502 Wastewater Expenses	**20,916.70**	**0.00**	**20,916.70**		**17,390.50**	**3,526.20**	**20**
5330 Miscellaneous Supplies & Expens	20,916.70	0.00	20,916.70		17,390.50	3,526.20	20
515 Depreciation	**334,418.32**	**0.00**	**334,418.32**		**338,856.29**	**(4,437.97)**	**(1)**
5900 Depreciation	334,418.32	0.00	334,418.32	4-1	338,856.29	(4,437.97)	(1)
535 Payroll and other taxes	**10,644.99**	**0.00**	**10,644.99**		**12,349.01**	**(1,704.02)**	**(14)**
5600 Payroll Taxes	10,690.72	0.00	10,690.72		12,377.81	(1,687.09)	(14)
5610 Sales Tax	(70.41)	0.00	(70.41)		(24.33)	(46.08)	189
5620 Local School Tax	24.68	0.00	24.68		(4.47)	29.15	(652)
545. 10 Interest on Debt	**121,742.41**	**(20,516.60)**	**101,225.81**		**109,789.78**	**(8,563.97)**	**(8)**
5800 Interest Expense	123,016.25	(20,516.60)	102,499.65	7-1	111,063.62	(8,563.97)	(8)
5810 Loan Cost Expense	450.00	0.00	450.00		450.00	0.00	0
5910 Amortization	(1,723.84)	0.00	(1,723.84)		(1,723.84)	0.00	0
	0.00	**0.00**	**0.00**		**0.00**	**0.00**	**0**
Net Income (Loss)	**(90,705.83)**		**(39,221.15)**		**(207,119.99)**	**167,898.84**	**(81)**

1. Client

Lyon County Water District
P.O. Box 489
5464 U.S. Hwy 62 West
Kuttawa, KY 42055
270-388-0271

July 25, 2022

Jessica K Daniel, CPA PSC
PO Box 909
Eddyville, KY 42038

This representation letter is provided in connection with your audit of the financial statements of Lyon County Water District, which comprise the respective financial position of the business-type activities as of December 31, 2021, and the respective changes in financial position and, where applicable, cash flows for the year then ended, and the disclosures (collectively, the "financial statements"), for the purpose of expressing opinions as to whether the financial statements are presented fairly, in all material respects, in accordance with accounting principles generally accepted in the United States of America (U.S. GAAP).

Certain representations in this letter are described as being limited to matters that are material. Items are considered material, regardless of size, if they involve an omission or misstatement of accounting information that, in light of surrounding circumstances, makes it probable that the judgment of a reasonable person relying on the information would be changed or influenced by the omission or misstatement. An omission or misstatement that is monetarily small in amount could be considered material as a result of qualitative factors.

We confirm, to the best of our knowledge and belief, as of July 25, 2022, the following representations made to you during your audit.

Financial Statements

1) We have fulfilled our responsibilities, as set out in the terms of the audit engagement letter dated January 13, 2022, including our responsibility for the preparation and fair presentation of the financial statements in accordance with U.S. GAAP and for preparation of the supplementary information in accordance with the applicable criteria.
2) The financial statements referred to above are fairly presented in conformity with U.S. GAAP and include all properly classified funds and other financial information of the primary government and all component units required by generally accepted accounting principles to be included in the financial reporting entity.
3) We acknowledge our responsibility for the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.
4) We acknowledge our responsibility for the design, implementation, and maintenance of internal control to prevent and detect fraud.
5) Significant assumptions we used in making accounting estimates, including those measured at fair value, are reasonable.
6) Adjustments or disclosures have been made for all events, including instances of noncompliance, subsequent to the date of the financial statements that would require adjustment to or disclosure in the financial statements.

7) The effects of all known actual or possible litigation, claims, and assessments have been accounted for and disclosed in accordance with U.S. GAAP.

8) Guarantees, whether written or oral, under which the water district is contingently liable, if any, have been properly recorded or disclosed.

Information Provided

9) We have provided you with:

   a) Access to all information, of which we are aware, that is relevant to the preparation and fair presentation of the financial statements, such as records, documentation, and other matters.

   b) Additional information that you have requested from us for the purpose of the audit.

   c) Unrestricted access to persons within the water district from whom you determined it necessary to obtain audit evidence.

   d) Minutes of the meetings of Board of Commissioners or summaries of actions of recent meetings for which minutes have not yet been prepared.

10) All material transactions have been recorded in the accounting records and are reflected in the financial statements.

11) We have disclosed to you the results of our assessment of the risk that the financial statements may be materially misstated as a result of fraud.

12) We have no knowledge of any fraud or suspected fraud that affects the water district and involves—

   - Management,
   - Employees who have significant roles in internal control, or
   - Others where the fraud could have a material effect on the financial statements.

13) We have no knowledge of any allegations of fraud or suspected fraud affecting the water district's financial statements communicated by employees, former employees, regulators, or others.

14) We have no knowledge of instances of noncompliance or suspected noncompliance with provisions of laws, regulations, contracts, or grant agreements, or abuse, whose effects should be considered when preparing financial statements.

15) We have disclosed to you all known actual or possible litigation, claims, and assessments whose effects should be considered when preparing the financial statements.

16) We have disclosed to you the identity of the water district's related parties and all the related party relationships and transactions of which we are aware.

Government-specific

17) There have been no communications from regulatory agencies concerning noncompliance with, or deficiencies in, financial reporting practices.

18) We have a process to track the status of audit findings and recommendations.

19) We have identified to you any previous audits, attestation engagements, and other studies related to the audit objectives and whether related recommendations have been implemented.

20) We have identified to you any investigations or legal proceedings that have been initiated with respect to the period under audit.

21) We have provided our views on reported findings, conclusions, and recommendations, as well as our planned corrective actions, for the report.

Lyon County Water District
P.O. Box 489
5464 U.S. Hwy 62 West
Kuttawa, KY 42055
270-388-0271

22) The water district has no plans or intentions that may materially affect the carrying value or classification of assets, deferred outflows of resources, liabilities, deferred inflows of resources, and net positon.

23) We are responsible for compliance with the laws, regulations, and provisions of contracts and grant agreements applicable to us, including tax or debt limits and debt contracts, and legal and contractual provisions for reporting specific activities in separate funds.

24) We have appropriately disclosed all information for conduit debt obligations in accordance with GASBS No. 91.

25) We have identified and disclosed to you all instances of identified and suspected fraud and noncompliance with provisions of laws, regulations, contracts, and grant agreements that we believe have a material effect on the financial statements.

26) There are no violations or possible violations of budget ordinances, laws and regulations (including those pertaining to adopting, approving, and amending budgets), provisions of contracts and grant agreements, tax or debt limits, and any related debt covenants whose effects should be considered for disclosure in the financial statements, or as a basis for recording a loss contingency, or for reporting on noncompliance.

27) As part of your audit, you assisted with preparation of the financial statements and related notes. We acknowledge our responsibility as it relates to those nonaudit services, including that we assume all management responsibilities; oversee the services by designating an individual, preferably within senior management, who possesses suitable skill, knowledge, or experience; evaluate the adequacy and results of the services performed; and accept responsibility for the results of the services. We have reviewed, approved, and accepted responsibility for those financial statements and disclosures.

28) The water district has satisfactory title to all owned assets, and there are no liens or encumbrances on such assets nor has any asset been pledged as collateral.

29) The water district has complied with all aspects of contractual agreements that would have a material effect on the financial statements in the event of noncompliance.

30) The financial statements include all component units as well joint ventures with an equity interest, and properly disclose all other joint ventures and other related organizations.

31) The financial statements include all fiduciary activities required by GASBS No. 84.

32) The financial statements properly classify all funds and activities in accordance with GASBS No. 34, as amended.

33) All funds that meet the quantitative criteria in GASBS Nos. 34 and 37 for presentation as major are identified and presented as such and all other funds that are presented as major are particularly important to financial statement users.

34) Components of net position (net investment in capital assets; restricted; and unrestricted) and classifications of fund balance (nonspendable, restricted, committed, assigned, and unassigned) are properly classified and, if applicable, approved.

35) Investments, derivative instruments, and land and other real estate held by endowments are properly valued.

36) Provisions for uncollectible receivables have been properly identified and recorded.

37) Expenses have been appropriately classified in or allocated to functions and programs in the statement of activities, and allocations have been made on a reasonable basis.

38) Revenues are appropriately classified in the statement of activities within program revenues, general revenues, contributions to term or permanent endowments, or contributions to permanent fund principal.

39) Interfund, internal, and intra-entity activity and balances have been appropriately classified and reported.

40) Deposits and investment securities and derivative instruments are properly classified as to risk and are properly disclosed.

41) Capital assets, including infrastructure and intangible assets, are properly capitalized, reported, and, if applicable, depreciated.

42) We have appropriately disclosed the water district's policy regarding whether to first apply restricted or unrestricted resources when an expense is incurred for purposes for which both restricted and unrestricted net position is available and have determined that net position is properly recognized under the policy.

43) We are following our established accounting policy regarding which resources (that is, restricted, committed, assigned, or unassigned) are considered to be spent first for expenditures for which more than one resource classification is available. That policy determines the fund balance classifications for financial reporting purposes.

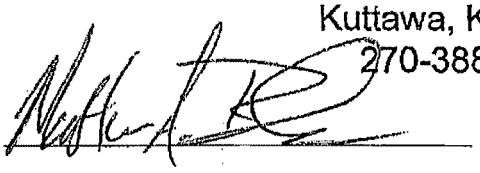
44) We acknowledge our responsibility for the required supplementary information (RSI). The RSI is measured and presented within prescribed guidelines and the methods of measurement and presentation have not changed from those used in the prior period. We have disclosed to you any significant assumptions and interpretations underlying the measurement and presentation of the RSI.

45) With respect to the water district's required supplementary information:

    1) We acknowledge our responsibility for presenting the required supplementary information(RSI) in accordance with accounting principles generally accepted in the United States of America, and we believe the RSI, including its form and content, is fairly presented in accordance with accounting principles generally accepted in the United States of America. The methods of measurement and presentation of the RSI have not changed from those used in the prior period, and we have disclosed to you any significant assumptions or interpretations underlying the measurement and presentation of the supplementary information.

    2) If the required supplementary information is not presented with the audited financial statements, we will make the audited financial statements readily available to the intended users of the supplementary information no later than the date we issue the supplementary information and the auditor's report thereon.

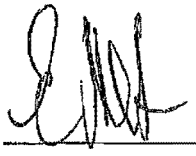
Lyon County Water District
P.O. Box 489
5464 U.S. Hwy 62 West
Kuttawa, KY 42055
270-388-0271

Signature: 

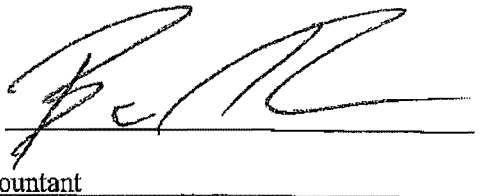
Title: Superintendent

Signature: 

Title: Chair

Signature: 

Title: Office Manager

Signature: 

Title: Accountant

8/20/2021 8:24:45 AM - We received a call from Sanctuary on Tuesday that the AC was out. Sure enough, it was. It was low on freon. Matt recharged it and it is working fine. We were told the worker would not be back in the office until Friday (today). This morning I noticed a vehicle parked there so I went to talk to Kayla about the AC. It was not her. It was **Leann Brummett.** She said she works Lyon Caldwell and another county. She said this is only her 2d week on the job and that Kayla is no longer with the cabinet. I told her if there are more problems with the AC to let us know. mlw

8/23/21 - Matt came by w/ the service call bill for charging the unit at 625. He said we need to keep a record so if it gets low again he can measure the rate of the leak. A copy of the invoice w/ the amount of freon is scanned in the HVAC folder. Mlw

5/31/2022 3:01:13 PM - Lee received an email that the A/C was not working. I went to the door but it was locked. Rae Ann Brummett called from **270/348-3515** and said she was back in the office. I went there. The thermostat was set on 68 and it was 74 in the unit. I checked the filter. It was black and was last changed five years ago. I went to Akridge's and bought two 20x20 filters. Got back about one hour after taking the old filter out. It had dropped from 74 to 72. Put one in and gave the other to Rae Ann to have as a spare. I asked her to let us know in the morning if it was not cooled out. Mlw

Exhibit 11

KENTUCKY INFRASTRUCTURE AUTHORITY

Andy Beshear
Governor

100 Airport Road
Frankfort, Kentucky 40601
(502) 573-0260
(502) 696-0676 (fax)
kia.ky.gov

Edith Halbleib
Executive Director

February 10, 2020

The Honorable Don Robertson, Chairman
Lyon County Water District
PO Box 489
Kuttawa, KY 42055

KENTUCKY INFRASTRUCTURE AUTHORITY
FEDERALLY ASSISTED DRINKING WATER REVOLVING LOAN FUND
CONDITIONAL COMMITMENT LETTER (F20-034)

Dear Chairman Robertson:

The Kentucky Infrastructure Authority ("the Authority") commends your efforts to improve public service facilities in your community. On February 6, 2020, the Authority approved your loan for the Water System and Storage Tank Improvements project subject to the conditions stated in Attachment A to this letter. The total cost of the project shall not exceed $2,094,675 without prior authorization, of which the Authority is the sole source of the funding. The final loan amount will be equal to the amount of funds disbursed for the project. Attachment B incorporated herein by reference fully describes the project.

An Assistance Agreement will be executed between the Authority and "the Lyon County Water District" upon satisfactory performance of the conditions set forth in Attachment A. You must meet the conditions set forth in Attachment A and enter into an Assistance Agreement by February 10, 2021 (twelve months from the date of this letter). A one-time extension of up to six months may be granted for applicants that experience extenuating circumstances. Funds will be available for disbursement only after execution of the Assistance Agreement.

Please inform the Authority of any changes in your financing plan as soon as possible. We wish you every success for this project which will benefit both your community and the Commonwealth as a whole.

Sincerely,

Linda Bridwell

Linda Bridwell, PE
Deputy Executive Director
Kentucky Infrastructure Authority

Attachments

cc: Kyle Cunningham, PEADD
HDR, Mike Hansen

Please sign and return a copy of this letter indicating your acceptance of this commitment and its terms along with the completed "Transparency Act Reporting Information Form". Complete the attached "Authorization for Electronic Deposit of Vendor Payment Form" and the "ACH Debit Authorization Form" **and return to the US Bank address at the bottom of each form.** Also included are the "Legal Counsel Certification Letter" sample and the "Statement of Approval of Projections of Revenue and Expenses" for you to complete at the appropriate time.

We have attached an SRF loan checklist to use as a guide.

Jim Robertson
Accepted

8/11/2020
Date

The Assistance Agreement and this commitment shall be subject, but not limited to, the following terms:

1. The Authority project loan shall not exceed $2,094,675 without prior authorization.

2. This loan was not eligible for principal forgiveness.

3. The loan shall bear interest at the rate of 2.50% per annum commencing with the first draw of funds.

4. Interest shall be payable on the amount of actual funds received. The first payment shall be due on June 1, or December 1, immediately succeeding the date of the initial draw of funds, provided that if such June 1, or December 1, shall be less than three months since the date of the initial draw of funds, then the first interest payment date shall be the June 1, or December 1, which is at least six months from the date of the initial draw of funds. Interest payments will be due each six months thereafter until the loan is repaid. KIA requires the use of Automated Clearing House (ACH) debits for payment of all balances due on the loan. This will ensure that payments are credited timely to your account without the risk of incurring late payment fees. If the due date falls on a weekend or holiday your account will be debited on the next business day. Please complete and return the attached authorization form to U.S. Bank for processing.

5. Full principal payments will commence on the appropriate June 1, or December 1, within twelve months from initiation of operation. Full payments will be due each six months thereafter until the loan is repaid.

6. The loan shall be repaid over a period not to exceed 20 years from the date of initiation of operation for the project.

7. A loan servicing fee of 0.25% of the outstanding loan balance shall be payable to the Authority as a part of each interest payment.

8. Loan funds will only be disbursed after execution of the Assistance Agreement as project costs are incurred.

9. The Authority loan funds must be expended within six months of the official date of initiation of operation.

10. Fund "F" loan funds may be considered to be federal funds. OMB Circular A-133, "Audits of States, Local Governments and Non-Profit Organizations,

requires that all recipients and sub-recipients **expending $750,000 or more in a year in federal awards must have a single or program-specific audit conducted for that year** in accordance with the Circular. If the federal amount expended plus all other federal funds expended exceeds the threshold, you are required to arrange for an A-133 audit to be performed by an independent, licensed CPA, or in special cases, the Auditor of Public Accounts of the Commonwealth of Kentucky. Please note that the guidance for single audit requirements has changed for fiscal or calendar year 2016 audits. Please consult with your independent auditor as soon as possible to understand how the changes will affect you.

11. The Authority requires that an annual financial audit be provided for the life of the loan.

12. The final Assistance Agreement must be approved by ordinance or resolution, as applicable, of the city council or appropriate governing board.

13. The Borrower must maintain a 1.1 debt coverage ratio throughout the life of the KIA loan. All borrowers are subject to at least an annual financial review for compliance.

The following is a list of the standard conditions to be satisfied prior to execution of the Assistance Agreement or incorporated in the Assistance Agreement. Any required documentation must be submitted to the party designated.

1. The Authority to Award (bid) package must be submitted to the Division of Water for approval within 14 days of bid opening.

2. The Assistance Agreement must be executed within six (6) months from bid opening.

3. The loan must undergo review by the Capital Projects and Bond Oversight Committee of the Kentucky Legislature prior to the State's execution of the Assistance Agreement. The committee meets monthly on the third Tuesday. Any special conditions listed in Attachment B must be satisfied before the project is presented before the Committee.

4. Any required adjustment in utility service rates shall be adopted by ordinance, municipal order or resolution by the appropriate governing body of the Borrower. Public hearings as required by law shall be held prior to the adoption of the service rate ordinance, order, or resolution. Any required approvals by the Kentucky Public Service Commission shall be

obtained.

5. The Borrower must complete and return the attached "Authorization for Electronic Deposit of Vendor Payment" form to U.S. Bank.

6. The Borrower must provide documentation of Eclearinghouse Endorsement and Eclearinghouse Comments.

7. Prior to the project bid, an environmental review shall be conducted by the Division of Water for all construction projects receiving State Revolving Funds ("SRF") money.

8. Technical plans and specifications and a complete SRF specifications checklist shall be approved by the Division of Water prior to project bid.

9. All easements or purchases of land shall be completed prior to commencement of construction. Clear Site Certification of all land or easement acquisitions shall be provided to the Division of Water. DOW representatives shall be notified for attendance of the pre-construction conference.

10. Project changes or additions deviating from the original scope of work described in the Project Profile may require a new or amended environmental review and change order review before they can be included in the SRF loan project.

11. The Borrower must provide certification from their legal counsel stating that they have prepared construction specifications in accordance with all applicable state or federal wage rate laws, and that the procurement procedures, including those for construction, land, equipment and professional services that are a part of the project, are in compliance with applicable federal, state and local procurement laws.

12. The Borrower shall implement the Kentucky Uniform System of Accounting (KUSoA), or an alternative approved by the Authority and assure that rates and charges for services are based upon the cost of providing such service.

13. The Borrower shall comply with all Davis Bacon related monitoring and reporting and require all contractors to pay wages pursuant to applicable prevailing wage rates for all work relating to the subject Project.

14. The project shall comply with the reporting requirements of the

Transparency Act, and shall complete the attached Transparency Act Reporting Information Form and provide to the Authority no later than 30 days after the KIA Board approval date of your loan.

15. Based on the final "as-bid" project budget, the Borrower must provide satisfactory proof, based on then existing conditions, that the revenue projections in the attached descriptions are still obtainable and that the projections of operating expenses have not materially changed. The "as bid" project budget shall be reviewed and approved by the consulting engineer.

16. The project shall comply with American Iron and Steel requirements of The Consolidated Appropriations Act of 2014 (H.R. 3547), which became effective January 17, 2014, unless engineering plans and specifications were approved by the Division of Water prior to the effective date.

Any special conditions stated in Attachment B must be resolved.

ATTACHMENT B

Lyon County Water District
F20-034

EXECUTIVE SUMMARY
KENTUCKY INFRASTRUCTURE AUTHORITY
FUND F, FEDERALLY ASSISTED DRINKING WATER
REVOLVING LOAN FUND

Reviewer	Ashley Adams
Date	February 6, 2020
KIA Loan Number	F20-034
WRIS Number	WX21143017

BORROWER	LYON COUNTY WATER DISTRICT LYON COUNTY

BRIEF DESCRIPTION

This project will help to improve water quality and resolve pressure issues throughout the system by rehabilitating 2 water tanks, building an interconnect to loop lines for better water circulation, upsizing a line in the Tinsley Creek Subdivision, and replacing a creek crossing near KY 274 that is in danger of failure.

PROJECT FINANCING		PROJECT BUDGET	RD Fee %	Actual %	
Fund F Loan	$2,094,675	Administrative Expenses			$50,000
		Legal Expenses			15,000
		Eng - Design / Const	7.8%	4.4%	81,150
		Eng - Insp	4.8%	5.8%	106,025
		Construction			1,675,000
		Contingency			167,500
TOTAL	$2,094,675	TOTAL			$2,094,675

REPAYMENT	Rate	2.50%	Est. Annual Payment	$138,967
	Term	20 Years	1st Payment	6 Mo. after first draw
PROFESSIONAL SERVICES	Engineer	HDR		
	Bond Counsel	Rubin & Hays		
PROJECT SCHEDULE	Bid Opening	Mar-20		
	Construction Start	Apr-20		
	Construction Stop	Aug-21		
DEBT PER CUSTOMER	Existing	$1,891		
	Proposed	$2,473		
OTHER DEBT		See Attached		
OTHER STATE-FUNDED PROJECTS LAST 5 YRS		See Attached		

RESIDENTIAL RATES		Users	Avg. Bill	
	Current	2,649	$46.24	(for 4,000 gallons)
	Additional	0	$46.24	(for 4,000 gallons)

REGIONAL COORDINATION This project is consistent with regional planning recommendations.

CASHFLOW	Cash Flow Before Debt Service	Debt Service	Cash Flow After Debt Service	Coverage Ratio
Audited 2016	278,617	120,909	157,708	2.3
Audited 2017	401,254	126,621	274,633	3.2
Audited 2018	281,165	224,090	57,075	1.3
Projected 2019	281,165	261,542	19,623	1.1
Projected 2020	281,165	253,720	27,445	1.1
Projected 2021	281,165	254,044	27,121	1.1
Projected 2022	476,894	398,446	78,448	1.2
Projected 2023	457,441	398,781	58,660	1.1

Reviewer: Ashley Adams
Date: February 6, 2020
Loan Number: F20-034

KENTUCKY INFRASTRUCTURE AUTHORITY
DRINKING WATER STATE REVOLVING FUND (FUND F)
LYON COUNTY WATER DISTRICT, LYON COUNTY
PROJECT REVIEW
WX21143017

I. PROJECT DESCRIPTION

The Lyon County Water District is requesting a Fund F loan in the amount of $2,094,675 for the Water System and Storage Tank Improvements project. This project will address several areas throughout the distribution system to help improve water age, water quality, pressure issues, and maintenance in the system.

Two water tanks will be rehabilitated including the Lamasco glass lined standpipe tank and the Jack Thompson tank. The Lamasco tank needs coating on the interior to mitigate a rust problem as well as installation of a mixing system and work on the exterior valve vault to install a bypass valve for better control at the tank site. The Jack Thompson elevated storage tank needs coating on the interior and exterior per the latest inspection.

The project will also loop several lines in the KY 295 area in order to increase circulation of water and improve water quality. This includes an interconnect between KY 295 and KY 373 and another between US 62 and KY 295. The KY 373 to KY 295 Loop project is a project that loops a line that dead ends at the City of Eddyville's master meter valve. The line is also the first phase in allowing the Crittenden Livingston County Water District to serve the City of Kuttawa as a backup source or possibly a primary source. In addition, the loop will allow additional water to be transmitted by the City of Eddyville to the City of Kuttawa as a backup water source.

The US 62 & KY 295 project provides another connection between the Lyon County Water District and the City of Kuttawa. Along with the KY 373 to KY 295 project described above, the project provides a means of allowing Kuttawa to receive water from the Crittenden Livingston County Water District and a higher volume feed from the City of Eddyville. The new feed will currently serve as a backup water supply for Kuttawa and could serve as Kuttawa's primary water supply in the event Kuttawa ceases operation of its water treatment plant.

In addition, an undersized 2" line in the Tinsley Creek Subdivision will be replaced with an adequately sized line to resolve water quality and pressure issues in the area and a creek crossing near KY 274 will also be replaced as the line is very shallow and in danger of immediate failure.

The Lyon County Water District is a PSC regulated distribution system that does not produce water. The District purchases approximately 111 MG of water annually

primarily from the Kuttawa Water Department (41 MG) and Princeton Water (41 MG) in addition to the Crittenden-Livingston County Water District (12 MG), and the Eddyville Water Department (6 MG).

II. PROJECT BUDGET

	Total
Administrative Expenses	$ 50,000
Legal Expenses	15,000
Engineering Fees - Design	50,000
Engineering Fees - Construction	31,150
Engineering Fees - Inspection	106,025
Construction	1,675,000
Contingency	167,500
Total	**$ 2,094,675**

III. PROJECT FUNDING

	Amount	%
Fund F Loan	$ 2,094,675	100%
Total	**$ 2,094,675**	**100%**

IV. KIA DEBT SERVICE

Construction Loan	$ 2,094,675
Less: Principal Forgiveness	0
Amortized Loan Amount	$ 2,094,675
Interest Rate	2.50%
Loan Term (Years)	20
Estimated Annual Debt Service	$ 133,730
Administrative Fee (0.25%)	5,237
Total Estimated Annual Debt Service	**$ 138,967**

V. PROJECT SCHEDULE

Bid Opening	March 2020
Construction Start	April 2020
Construction Stop	August 2021

VI. CUSTOMER COMPOSITION AND RATE STRUCTURE

A) Customers

	Current
Residential	2,607
Commercial	42
Total	**2,649**

B) Rates

	Current	Prior
Date of Last Rate Increase	01/07/16	04/23/15
Minimum (2,000 gallons)	$25.00	$20.02
Next 3,000 Gallons	10.62	8.50
Cost for 4,000 gallons	**$46.24**	**$37.02**
Increase %	24.9%	
Affordability Index (Rate/MHI)	1.1%	

VII. DEMOGRAPHICS

Based on current Census data from the American Community Survey 5-Year Estimate 2013-2017, the Utility's service area population was 4,039 with a Median Household Income (MHI) of $51,086. The median household income for the Commonwealth is $46,535. The project will qualify for a 2.5% interest rate based on MHI.

Population			County Unemployment	
Year	County	% Change	Date	Rate
1980	6,490		June 2005	7.0%
1990	6,624	2.1%	June 2010	10.1%
2000	8,080	22.0%	June 2015	5.2%
2010	8,314	2.9%	June 2019	5.1%
Current	8,268	-0.6%		
Cumulative %		27.4%		

VIII. 2019 CAPITALIZATION GRANT EQUIVALENCIES

1) Green Project Reserve - The Drinking Water capitalization grant does not contain a "green" requirement.

2) Additional Subsidization – This project does not qualify for additional subsidization.

IX. FINANCIAL ANALYSIS

Financial information was obtained from the audited financial statements for the years ended June 30, 2016 through June 30, 2018. The non-cash impact of GASB 68, Accounting and Financial Reporting for Pensions, has been removed from fiscal 2016-2018 operating expenses and GASB 75, Accounting and Financial Reporting for Postemployment Benefits Other Than Pensions, has been removed from 2018 operating expenses. Percentage references in the History section below are based on whole dollar amounts and not the rounded amounts presented.

HISTORY

Revenues have averaged approximately $1.2 million from 2016 to 2018 while operating expenses have increased 3.4% from $922,389 in 2016 to $953,566 in 2018. The District's last rate increase occurred in 2016 when rates jumped 25%. The District is currently undergoing a rate study by their engineering firm in order to apply for another rate increase at the PSC which will include projected revenue needs for this project as well as several other necessary capital projects for the system. Debt coverage was 2.3 in 2016, 3.2 in 2017, and 1.3 in 2018. Debt service was adjusted in 2017 to remove an interim financing payoff to Kentucky Rural Water Association which was replaced with KIA loan F12-02 for another water quality system improvement project to normalize the debt coverage ratio.

The balance sheet reflects a current ratio of 2.0, a debt to equity ratio of 1.6, 52.5 days sales in accounts receivable, and 5.4 months operating expenses in unrestricted cash.

PROJECTIONS

Projections are based on the following assumptions:

1) Revenues will increase at least $220,000 or 18% annually upon approval of the PSC in order to support inflation and debt service for this loan.
2) Expenses will increase 2% for inflation starting in the year debt service begins on this pending loan. Inflation expense has been removed from projections in 2019-2021 as this is the only thing driving rate increase needs during that time period.
3) Debt service coverage is 1.2 in 2022 when principal and interest repayments begin.

Based on the pro forma assumptions, the utility shows adequate cash flow to repay the KIA Fund F loan.

REPLACEMENT RESERVE

The replacement reserve will be 5% ($104,000 total) of the final amount borrowed (prior to principal forgiveness, if any) to be funded annually ($5,200 yearly) each December 1 for 20 years and maintained for the life of the loan.

X. DEBT OBLIGATIONS

		Outstanding	Maturity
Regions - Series 2013 C	$	1,115,000	2040
USDA - Series 2016		1,900,000	2046
KIA Loan (F12-02)		1,959,089	2038
Capital Lease		34,774	2020
Total	**$**	**5,008,863**	

XI. CONTACTS

Legal Applicant	
Entity Name	Lyon County Water District
Authorized Official	Don Robertson (Chairman)
County	Lyon
Email	lyoncountyw24787@bellsouth.net
Phone	270-388-0271
Address	PO Box 489 Kuttawa, KY 42055

Applicant Contact	
Name	Dixie Cayce
Organization	Lyon County Water District
Email	dixie.cayce@att.net
Phone	270-388-0271
Address	PO Box 489 Kuttawa, KY 42055

Project Administrator	
Name	Kyle Cunningham
Organization	PEADD
Email	kyle.cunningham@ky.gov
Phone	270-886-9484
Address	300 Hammond Dr Hopkinsville, KY 42240

Consulting Engineer	
PE Name	Mike Hansen
Firm Name	HDR
Email	mike.hansen@hdrinc.com
Phone	270-443-7600
Address	2550 Irvin Cobb Rd Paducah, KY 42003

XII. RECOMMENDATIONS

KIA staff recommends approval of the loan with the standard conditions:

1) By March 1, 2020, the District will need to apply to the Public Service Commission (PSC) for debt authorization for the $2,094,675 million loan. This debt authorization application should include a forecast for meeting debt service projected through no less than 2025.

2) By March 1, 2020, the District will need a resolution from the Lyon County Water District Board, demonstrating their intentions to increase revenues as necessary and authorized by the PSC to meet the loan requirements over the life of the loan. KIA Staff review indicates that revenues would need to increase by $220,000 annually which equates to an approximate 18% rate increase by January 1, 2022 to meet expenses and debt service in the first full year of repayment.

3) Prior to the assistance agreement being executed, the District must receive a Certificate of Public Convenience and Necessity from the PSC for any portion of the project that may be necessary or provide an opinion from the staff of the PSC that a CPCN is not required for any portion of the assets to be constructed as part of the loan agreement.

LYON COUNTY WATER DISTRICT

FINANCIAL SUMMARY (DECEMBER YEAR END)

	Audited 2016	Audited 2017	Audited 2018	Projected 2019	Projected 2020	Projected 2021	Projected 2022	Projected 2023
Balance Sheet								
Assets								
Current Assets	469,955	712,802	652,731	656,625	662,114	667,538	714,927	726,659
Other Assets	11,167,361	9,253,211	8,836,080	8,393,442	9,134,704	9,875,706	9,558,066	9,224,595
Total	11,637,316	9,966,013	9,488,811	9,050,067	9,796,818	10,543,244	10,272,993	9,951,254
Liabilities & Equity								
Current Liabilities	4,415,176	2,346,033	333,446	311,515	316,118	325,755	469,395	474,095
Long Term Liabilities	3,431,550	3,656,711	5,443,627	4,642,067	5,510,979	6,371,653	6,042,750	5,710,647
Total Liabilities	7,846,726	6,002,744	5,777,073	4,953,582	5,827,097	6,697,408	6,512,145	6,184,742
Net Assets	3,790,590	3,963,269	3,711,738	4,096,485	3,969,721	3,845,836	3,760,848	3,766,512
Cash Flow								
Revenues	1,200,355	1,244,269	1,231,775	1,231,775	1,231,775	1,231,775	1,451,775	1,451,775
Operating Expenses	922,389	844,700	953,566	953,566	953,566	953,566	977,837	997,290
Other Income	651	1,685	2,956	2,956	2,956	2,956	2,956	2,956
Cash Flow Before Debt Service	278,617	401,254	281,165	281,165	281,165	281,165	476,894	457,441
Debt Service								
Existing Debt Service	120,909	126,621	224,090	261,542	253,720	254,044	259,479	259,814
Proposed KIA Loan	0	0	0	0	0	0	138,967	138,967
Total Debt Service	120,909	126,621	224,090	261,542	253,720	254,044	398,446	398,781
Cash Flow After Debt Service	157,708	274,633	57,075	19,623	27,445	27,121	78,448	58,660
Ratios								
Current Ratio	0.1	0.3	2.0	2.1	2.1	2.0	1.5	1.5
Debt to Equity	2.1	1.5	1.6	1.2	1.5	1.7	1.7	1.6
Days Sales in Accounts Receivable	47.1	54.9	52.5	52.5	52.5	52.5	52.5	52.5
Months Operating Expenses in Unrestricted Cash	3.6	6.9	5.4	5.4	5.5	5.6	5.7	5.7
Debt Coverage Ratio	2.3	3.2	1.3	1.1	1.1	1.1	1.2	1.1

Exhibit 12

Submit by Email | Print Form

Page 1

NOTIFICATION OF INTENT TO FINANCE AND APPLICATION FOR DEBT APPROVAL

Form # SLDO-1
Revised 1/1/2011

For DLG staff use only:
File #_____
Received_____

Completion and delivery of this form to the address below shall satisfy the requirements of KRS 65.117, which prohibits any city, county, urban-county, consolidated local government, charter county, special district, or taxing district from entering into any financing obligation of any nature, except leases under $200,000, without first notifying the state local debt officer in writing. This form shall also serve as application for approval of debt issuance when applicable. An electronic version of the form is available at www.dlg.ky.gov.

✓ Type of debt to be issued (must check one):	SLDO Approval Required	Complete Sections
☐ Short Term Borrowing - KRS 65.7701 et seq.	No	A, B, C
☐ Lease from $200,000 - $500,000 - KRS 65.940 et seq.	No	A, B, D
☐ Lease exceeding $500,000 - KRS 65.940 et seq.	Yes (Counties only)	A, B, D
☐ General Obligation Bond - KRS Chapter 66	Yes (Counties only)	A, B, E
☐ Public Project Rev. Bond - KRS Chapter 58	No	A, B, E
☐ Public Project Rev. Bond w/Lease - KRS 66.310(2)	Yes (Counties only)	A, B, D, E
☐ Industrial Revenue Bond - KRS Chapter 103	Yes (All Borrowers)	A, B, F
☐ Other Bonds (True Revenue, Utility Assessment, TIF)	No	A, B, E

☑ ASSISTANCE AGREEMENT [KENTUCKY INFRASTRUCTURE AUTHORITY]

Section A - Borrower Information

Agency Name: Lyion County Water District
Governing Body: Lyon County Water District Board of Commissioners
Street Address:
P.O. Box #: 489 City: Kuttawa
County: Lyon Zip: 42055
Authorized Official: Charles D. Robertson

Section B - Terms of Financial Obligation

Please provide all relevant information. Fields in bold are mandatory.

Principle Amount: $2,094,675.00 **Date of Issue:** 8/1/2023
Maturity Date(s): 8/1/2043 **Payment Schedule:** (must attach schedule)
Term: 20 years **Number of Renewal Periods:** 0
Interest Rate(s): 2.50 **Type of Interest (fixed or variable):** fixed
Retirement Method: periodic interest and principal payments on a fully amortized loan
Lender's Name: Kentucky Infrastructure Authority
Lender's Address: 100 Airport Road, Frankfort, Kentucky 40601
Right of Termination: yes
Termination Penalties: none
Prepayment Provisions: none
Trustee or Paying Agent: none
AOC Funded Percentage: 0.00

NOTIFICATION OF INTENT TO FINANCE AND APPLICATION FOR DEBT APPROVAL

Form # SLDO-1
Revised 1/1/2011

Section C - Note (Loan) Information/Documentation

Purpose - Briefly explain the documented need that necessitates this note (loan) and the public purpose it is intended to address. (Attach additional information if necessary):

Pledge of Taxes/Description:

None

Pledge of Revenue/Description:

The Water District's revenues from water sales will be pledged as collateral for the loan.

Pledge of Project Revenues (Attach documentation which substantiates the revenue projections):

Have bids been sought by the local governments to determine the financial and programmatic competitiveness of the note (loan) proposal? ○ Yes ◉ No

If No, explain what steps were taken to ensure adequate competition.

Loan was obtained from the Kentucky Infrastructure Authority, a public corporation and an agency of the Commonwealth of Kentucky.

Required Attachments

1. Certification from local government attesting to the ability to meet additional financial commitments necessitated by the note and statement as to taxes and revenues to be collected during the term of the note.

Section D - Lease Information/Documentation

Describe the real or personal property to be acquired or constructed:

N/A - no real or personal property will be leased.

Type of Lease : ☐ General Obligation ☐ Revenue

Is Lease Annually Renewable? ○ Yes ○ No

Does Agency seek approval without a hearing? ○ Yes ○ No Justification: ☐ Revenue ☐ Refunding

If yes, must attach certification from counsel regarding county obligation.

Does this lease refund a prior lease? ○ Yes ○ No

If yes, please state the name, date and principal amount of original issue(s) being refunded:

Required Attachments (If lease requires SLDO approval)

1. Minutes from the local public hearing
2. Affidavit of publication of SLDO hearing (if hearing is required) and newspaper advertisement tear sheet
3. Copy of lease.
4. Executed copy of ordinance/resolution of fiscal court authorizing the lease
5. Certification from local government attesting to the ability to meet additional financial commitments necessitated by the lease and statement as to taxes and revenues to be collected during the term of the lease.

Please continue to the next page

NOTIFICATION OF INTENT TO FINANCE AND APPLICATION FOR DEBT APPROVAL

Form # SLDO-1
Revised 1/1/2011

Section E - Bond Information/Documentation

Please provide all relevant information. Fields in bold are mandatory

Describe the purpose of the bond:

No bonds will be issued

Bond Counsel:

Counsel Address:

Financial Advisor:

Advisor Address:

Bond Series:

Call Date:

Does this bond refund a prior bond? ○ Yes ○ No

If yes, please state the name, date and principal amount of original issue(s) being refunded:

Required Attachments (If SLDO Approval is Required)

1. Minutes from the local public hearing
2. Affidavit of publication of SLDO hearing and newspaper advertisement tear sheet
3. Executed copy of ordinance/resolution of fiscal court authorizing financial plan for the issuance of the bonds
4. Proposed plan of financing
5. Preliminary official statement (if applicable)
6. Sources and uses table

Additional Required Attachments for KRS Chapter 103 Bonds

1. Documentation in an appropriate form substantiating the project's eligibility under KRS 103.2101(1)(a)-(e).
2. If the project requires approval of the reduction in property taxes, attach any documentation provided to agency responsible for approval.

******

By signing below, the Authorized Official certifies that the foregoing is true and accurate to the best of his or her knowledge.

Name (please print) Charles D. Robertson Date: 5/16/2028

Title: Board Chairman Signature: Charles D. Robertson

Mail to:
Department for Local Government
Attn: State Local Debt Officer
1024 Capital Center Drive, Suite 340
Frankfort, KY 40601

Fax to: 502-573-3712