ADDENDUM
PAGE 1 OF 2

OWNER:	City of Grand Ledge 310 Greenwood Street, Grand Ledge, MI 48837
ENGINEER:	Fishbeck 1515 Arboretum Drive, SE Grand Rapids, MI 49546
DRAWING REVISION NO.:	N/A
ISSUED HEREWITH:	
SPECIFICATION SECTIONS:	00 41 13, 00 73 40, 01 22 00, 33 16 15, 33 34 00, 43 21 13.55, 46 51 36
SHEETS:	P210
BIDS DUE:	Tuesday, January 9, 2024, 11:00 a.m. local time

This Addendum is issued to all Bid Set Holders, is a part of the Contract Documents, and modifies the previously issued Bidding Documents. Acknowledge receipt of this Addendum in the space provided on the Bid form; failure to do so may result in rejection of the Bid.

ITEM NO. 1:
Section: 00 41 13 – Bid – Stipulated Sum (reissued)
A. See attached reissued section.

ITEM NO. 2:
Section: 00 73 40 – Standard Contract Requirement: Clean Water State Revolving Fund (reissued)
A. See attached reissued section for updated prevailing federal wage rates to be used in bidding.

ITEM NO. 3:
Section: 01 22 00 – Unit Prices – Measurement and Payment (reissued)
A. See attached reissued section.

ITEM NO. 4:
Section: 33 16 15 – Aboveground Glass-Lined Steel Tanks (reissued)
A. See attached reissued section.

ITEM NO. 5:
Section: 33 34 00 – Sanitary Utility Sewerage Force Mains (reissued)
A. See attached reissued section.

ITEM NO. 6:
Section: 43 21 13.55 – Self Priming Centrifugal Pumps (reissued)
A. See attached reissued section to update the design capacity.

ITEM NO. 7:
Section: 46 51 36 – Fine Bubble Air Diffusers (reissued)
A. See attached reissued section.

ITEM NO. 8:
Sheet: P210 – Solids Handling and Odor Control (reissued)
A. See attached reissued sheet.

ITEM NO. 9:
Questions Received from Potential Bidders:

A. Question: Regarding the schedule and project duration of 1,250 days. With the bid date being pushed to January 9, 2024, our assumed NTP is 120 days thereafter to May 9, 2024. We used 120 days because that is how long our price is valid. This start day pushes the construction of the precast storage tank to the following year in spring 2025 because the vendors do not do winter concrete. This has caused the tank to be a part of the critical path and reduced the float of the project for a high number of activities, which was available when the tank could be built in 2024. In addition to this, we have missed the window to clear trees in spring of 2024. The next item that has impact is the ability to hit the first window of opportunity to get the force main in place in summer 2024. The pipe lead time is 12 weeks in addition to submittal lead time, which pushes us into the window available to do this work in the roadway that year. Because of these items we are requesting the City of Grand Ledge to consider extending the project construction duration 120 days.

   Answer: The project duration of 1,250 days will not be changed.

END OF ADDENDUM

SECTION 00 41 13 – BID - STIPULATED SUM

Bid of _____ hereinafter called Bidder, organized and existing under the laws of or a resident of the State of _____, doing business as _____.*

*Insert as applicable: "a corporation", "a partnership" or "an individual".

To City of Grand Ledge, hereinafter called Owner.

ARTICLE 1 – BID RECIPIENT

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

ARTICLE 2 – BIDDER'S ACKNOWLEDGEMENTS

2.01 Bidder accepts all of the terms and conditions of the Advertisement for Bids and Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for 120 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

ARTICLE 3 – BIDDER'S REPRESENTATIONS

3.01 In submitting this Bid, Bidder represents that:

A. Bidder has examined and carefully studied the Bidding Documents, other related data identified in the Bidding Documents, and the following Addenda, receipt of all which is hereby acknowledged:

Addendum Number	Addendum Date
_____	_____
_____	_____
_____	_____
_____	_____

B. Bidder has visited the Site and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

C. Bidder is familiar with and is satisfied as to Laws and Regulations that may affect cost, progress, and performance of the Work.

D. Bidder has carefully studied all:

(1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) that have been identified in the Supplementary Conditions as provided in paragraph 5.03 of the General Conditions, as containing reliable "technical data," and

(2) reports and drawings of Hazardous Environmental Conditions, if any, at the Site that have been identified in the Supplementary Conditions as provided in paragraph 5.06 of the General Conditions as containing reliable "technical data."

E. Bidder has considered the information known to Bidder; 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 Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on:

(1) the cost, progress, and performance of the Work;

(2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, including applying the specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents; and

(3) Bidder's safety precautions and programs.

F. Based on the information and observations referred to in Paragraph 3.01.E above, Bidder does not consider that further examinations, investigations, explorations, tests, studies or data are necessary for the determination of this Bid for performance of the Work at the price(s) bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents.

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

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

I. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work for which this Bid is submitted.

ARTICLE 4 – BIDDER'S CERTIFICATION

4.01 Bidder certifies that:

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

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

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

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

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

(2) "fraudulent practice" means an intentional misrepresentation of facts made

(a) to influence the bidding process to the detriment of Owner,

(b) to establish bid prices at artificial non-competitive levels, or

(c) to deprive Owner of the benefits of free and open competition;

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

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

ARTICLE 5 – BASIS OF BID

5.01 Bidder will complete the Work in accordance with the Contract Documents for the following prices:

Base Bid _____ ($_____)
(use words) (figures)

All specific cash allowances are included in the price(s) set forth above and have been computed in accordance with paragraph 13.02 of the General Conditions.

All Work items are included in the prices set forth above. Provide unit prices for changes to noted quantities which may occur during construction for items in the following table. Payment for said items will be according to the criteria in Division 01, Section "Unit Prices – Measurement and Payment."

ITEM NUMBER	ITEM DESCRIPTION	UNIT	ESTIMATED QTY	UNIT PRICE
1	Bituminous Surface, Remove	SYD	9,725	
2	Sidewalk, Remove	SYD	108	
3	Driveway, Concrete, Remove	SYD	159	
4	Curb and Gutter, Concrete, Remove	FT	767	
5	Tree, Remove, 7 to 18-inch dia.	EA	19	
6	Tree, Remove, 19 to 36-inch dia.	EA	12	
7	Tree, Remove, 37-inch or Larger dia.	EA	1	
8	Clearing, For Sanitary Sewer System	ACRE	0.6	
9	Sewer, Remove, Less than 24-inch dia.	FT	363	
10	Sewer, Remove, 24-inch to 48-inch dia.	FT	35	
11	Structure, Remove	EA	14	
12	Sign, Remove and Salvage	EA	12	
13	Post, Remove	EA	1	
14	Boulder, Remove, Salvage and Replace	EA	3	
15	Culvert, Remove, Partial, Less than 24-inch dia.	FT	15	

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Bidder (Firm or Corporation Name)

ITEM NUMBER	ITEM DESCRIPTION	UNIT	ESTIMATED QTY	UNIT PRICE
16	Culvert, Remove, Less than 24-inch dia.	FT	35	
17	Culvert, End Section, Remove, Less than 24-inch dia.	EA	3	
18	Flowable Fill	CYD	7	
19	Pavement Marking, Symbol, Remove	SFT	242	
~~20~~	~~Sewer, Sanitary, 18-inch dia., Ductile Iron, Ceramic Coated~~	~~FT~~	~~4,847~~	
20	Sewer, Sanitary, _____ (see below for Sanitary Sewer Force Main Pipe Material)			
21	Sewer, Sanitary, 24-inch dia.	FT	2,290	
22	Sewer, Sanitary, 30-inch dia.	FT	266	
23	Sewer, Sanitary, Lining, 24-inch dia.	FT	122	
24	Sewer, Sanitary, Lining, 30-inch dia.	FT	50	
25	Sewer, Sanitary, Connection, 18-inch to 20-inch dia.	EA	1	
26	Sanitary Service Lead, Reconnect	EA	51	
27	Structure, Sanitary, 48-inch, dia.	EA	7	
28	Structure, Sanitary, 60-inch,dia.	EA	9	
29	Structure, Sanitary, 84-inch, dia.	EA	2	
30	Structure, Sanitary, Lining, 48-inch, dia.	FT	23	
31	Structure, Sanitary, Lining, 84-inch, dia.	FT	35	
32	Structure, Sanitary, Internal Drop	FT	17	
33	Sanitary Sewer, Air and Vacuum Valve, 18-inch dia.	EA	5	
34	Sanitary Sewer, Valve, 18-inch dia.	EA	2	
35	Steel Casing Pipe, Bore and Jack, 30-inch dia.	FT	120	
36	Sewer, Storm, 12-inch dia., RCP, Class IV	FT	623	
37	Sewer, Storm, 18-inch dia., RCP, Class IV	FT	46	
38	Sewer, Storm, 30-inch dia., RCP, Class IV	FT	35	

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Bidder (Firm or Corporation Name)

ITEM NUMBER	ITEM DESCRIPTION	UNIT	ESTIMATED QTY	UNIT PRICE
39	Culvert, 12-inch dia., CSP	FT	50	
40	Culvert, End Section, 12-inch dia., CSP	EA	3	
41	Structure, Catch Basin, 24-inch, dia.	EA	8	
42	Structure, Catch Basin, 48-inch, dia.	EA	2	
43	Structure, Storm, 48-inch, dia.	EA	2	
44	Structure, Storm, 60-inch, dia.	EA	3	
45	Structure, Tap, 18-inch dia.	EA	1	
46	Structure, Tap, 30-inch dia.	EA	1	
47	Sewer, Tap, 12-inch dia.	EA	1	
48	Sewer, Tap, 30-inch dia.	EA	1	
49	Trench Drain	FT	28	
50	Valve Box, Adjust	EA	1	
51	Water Service, Reconnect (up to 2-inch dia.)	EA	51	
52	Roadway Grading	STA	47	
53	Aggregate Base, 6-inch	SYD	9,050	
54	Aggregate Base, Conditioning	SYD	900	
55	Structure Casting, Adjust	EA	38	
56	Structure Casting	EA	32	
57	Bituminous Pavement, 5EMH	TON	1,200	
58	Bituminous Pavement, 3EMH	TON	3,200	
59	Bituminous Pavement, Approach	TON	30	
60	Driveway, Concrete, 6-inch	SYD	157	
61	Aggregate Surface Course, 6-inch	SYD	72	
62	Curb and Gutter, Concrete	FT	654	

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Bidder (Firm or Corporation Name)

ITEM NUMBER	ITEM DESCRIPTION	UNIT	ESTIMATED QTY	UNIT PRICE
63	Curb and Gutter, Concrete, Detail M	FT	114	
64	Curb, Bituminous	FT	51	
65	Sidewalk, Concrete, 4-inch	SFT	355	
66	Sidewalk, Concrete 6-inch	SFT	104	
67	Sidewalk, Concrete, Ramp, 6-inch	SFT	540	
68	Sidewalk, Detectable Warning Surface	FT	25	
69	Pavement Marking, Waterborne, 6-inch, White	FT	7,200	
70	Pavement Marking, Ovly Cold Plastic, 6-inch, Crosswalk	FT	250	
71	Pavement Marking, Ovly Cold Plastic, 12-inch, Special Emphasis Crosswalk	FT	225	
72	Pavement Marking, Ovly Cold Plastic, School, Symbol	EA	4	
73	Sign, Reinstall	EA	12	
74	Sign, Post, Steel, 3 lb.	FT	112	
75	Sign, Post, 4-inch by 6-inch	FT	48	
76	Restoration, Lawn	SYD	8,750	
77	Tree, 3-inch caliper	EA	17	
78	Contaminated Soil Excavation and Removal	CYD	250	

Sanitary Sewer Force Main Pipe Material				
ITEM NUMBER	ITEM DESCRIPTION	UNIT	ESTIMATED QTY	UNIT PRICE
20A[1]	Sewer, Sanitary, 18-inch dia., Ductile Iron, Ceramic Coated	FT	4,847	
20B[1]	Sewer, Sanitary, 20-inch dia., HDPE, DIPS, DR 11	FT	4,847	

[1] *Provide separate unit prices for constructing the Sanitary Sewer Force Main using 18-inch diameter ceramic coated ductile iron pipe OR 20-inch diameter HDPE DR 11 pipe, as described. The Base Bid amount listed above includes the most cost-effective sanitary sewer force main pipe material, unless noted below:*

_____.

_____
Bidder (Firm or Corporation Name)

ARTICLE 6 – TIME OF COMPLETION

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

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

6.03 Work impacting traffic on Jefferson Street must be completed when local schools are not in session (mid-June thru early-September), unless otherwise requested and approved by the Owner.

6.04 Work impacting public traffic (south of the northern most parking lot in Fitzgerald Park) on Fitzgerald Park Drive must be completed between March 1 and May 15, unless otherwise requested and approved by the Owner. Material deliveries through Fitzgerald Park outside this timeframe are acceptable.

ARTICLE 7 – ATTACHMENTS TO THIS BID

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

A. Required Bid security.

B. Evidence of authority to sign Bid, if Bid is submitted by a corporation, partnership or joint venture;

C. List of Proposed Subcontractors;

D. List of Proposed Suppliers;

E. List of Project References;

F. Evidence of authority to do business in the state in which the Project is located; or a written covenant to obtain such license prior to the award of the Contract.

G. Evidence of Bidder's ability to obtain a State Contractor's License and a covenant by Bidder to obtain said license prior to the award of the Contract.

H. Required Bidder Qualification Statement with Supporting Data; and

I. Certification Regarding Debarment, Suspension, and Other Responsibility Matters form.

J. Preliminary schedule of values in accordance with Division 01, "Schedule of Values".

ARTICLE 8 – DEFINED TERMS

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

ARTICLE 9 – BID SUBMITTAL

9.01 This Bid is submitted by:

SUBMITTED on_____, 20___ (Date*)

BY: _____ (Name of Bidder*)

_____ (Business Street Address*)

_____ (Signature)

_____ (City, State, and Zip*)

_____ (Name and Title of Signatory*)

_____ (Telephone Number*)

_____ (E-mail Address*)

*Typed or printed in ink.

END OF SECTION 00 41 13

SECTION 00 73 40 – STANDARD CONTRACT REQUIREMENT: CLEAN WATER STATE REVOLVING FUND

PART 1 - GENERAL

A. RELATED DOCUMENT Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. American Iron and Steel Contract Language.
   1. The Contractor acknowledges to and for the benefit of the City of Grand Ledge ("Purchaser") and the Michigan Department of Environment, Great Lakes, and Energy (the "State") that it understands the goods and services under this Agreement are being funded with monies made available by the Clean Water State Revolving Fund and/or the Drinking Water State Revolving Fund and such laws contain provisions commonly known as "American Iron and Steel (AIS);" that requires all iron and steel products used in the project be produced in the United States ("AIS Requirements") including iron and steel provided by the Contractor pursuant to this Agreement. The Contractor hereby represents and warrants to and for the benefit of the Purchaser and the State that (a) the Contractor has reviewed and understands the AIS Requirements, (b) all iron and steel used in the project will be and/or have been produced in the United States in a manner that complies with the AIS Requirements, unless a waiver of the requirements is approved or the State made the determination in writing that the AIS Requirements do not apply to the project, and (c) the Contractor will provide any further verified information, certification, or assurance of compliance with this paragraph, or information necessary to support a waiver of the AIS requirements, as may be requested by the Purchaser.

      Notwithstanding any other provision of this Agreement, any failure to comply with this paragraph by the Contractor shall permit the Purchaser or State to recover as damages against the Contractor any loss, expense, or cost (including without limitation attorney's fees) incurred by the Purchaser or State resulting from any such failure (including without limitation any impairment or loss of funding, whether in whole or in part, from the State or any damages owed to the State by the Purchaser). While the Contractor has no direct contractual privity with the State, as a lender to the Purchaser for the funding of its project, the Purchaser and the Contractor agree that the State is a third-party beneficiary and neither this paragraph (nor any other provision of this Agreement necessary to give this paragraph force or effect) shall be amended or waived without the prior written consent of the State.

B. Davis-Bacon and Related Acts/Prevailing Federal Wages.
   1. P.L. 111-88 requires compliance with the Davis Bacon Act and adherence to the current U.S. Department of Labor Wage Decision. Attention is called to the fact that not less than the minimum salaries and wages as set forth in the Contract Documents (see Wage Decision included herein) must be paid on this project. The Wage Decision, including modifications, must be posted by the Contractor on the job site. The "Contracting Agency" or "Contracting Officer" for Davis-Bacon Wage Decision posters on jobsites is the loan applicant/bond issuer. A copy of the Labor Standard Provisions for Federally Assisted Projects is included and is hereby a part of this contract.
   2. Davis-Bacon Wage Decision for Eaton County, Michigan:
      a. The Wage Decision that will apply are those which are published at https://sam.gov/content/wage-determinations 10 days prior to Bid opening.
   3. Questions regarding prevailing wage and labor standards provisions should be directed to the Department of Labor.
   4. See additional Attachment to this Section, provided for information only.

C. Certification Regarding Debarment, Suspension, and Other Responsibility Matters:
   1. The prime Contractor must provide a completed Certification Regarding Debarment Suspension, and Other Responsibility Matters Form with its Bid or proposal package to the Owner. See Division 00 Section "Bid – Stipulated Sum."

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION 00 73 40

§5.5 Contract provisions and related matters.

(a) The Agency head shall cause or require the contracting officer to insert in full in any contract in excess of $2,000 which is entered into for the actual construction, alteration and/or repair, including painting and decorating, of a public building or public work, or building or work financed in whole or in part from Federal funds or in accordance with guarantees of a Federal agency or financed from funds obtained by pledge of any contract of a Federal agency to make a loan, grant or annual contribution (except where a different meaning is expressly indicated),and which is subject to the labor standards provisions of any of the acts listed in Sec. 5.1, the following clauses (or any modifications thereof to meet the particular needs of the agency, *Provided,* That such modifications are first approved by the Department of Labor):

(1) Minimum wages. (i) All laborers and mechanics employed or working upon the site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the project), will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics. Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (a)(1)(iv) of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in Sec. 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph (a)(1)(ii) of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

(ii)(A) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination, and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(2) The classification is utilized in the area by the construction industry; and

(3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(B) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(C) In the event the contractor, the laborers, or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-dayperiod that additional time is necessary.

(D) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs (a)(1)(ii) (B) or (C) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fid fringe benefit or an hourly cash equivalent thereof.

(iv) If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside, in a separate account, assets for the meeting of obligations under the plan or program.

(2) *Withholding.* The City of Grand Ledge shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work (or under the United States Housing Act of 1937 or under the Housing Act of 1949 in the construction or development of the project), all or part of the wages required by the contract, the (Agency) may, after written notice to the contractor, sponsor, applicant, or owner, take such action

as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

(3) *Payrolls and basic records.* (i) Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work (or under the United States Housing Act of 1937, or under the Housing Act of 1949, in the construction or development of the project). Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made, and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

(ii)(A) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the (write in name of appropriate federal agency) if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit the payrolls to the applicant, sponsor, or owner, as the case may be, for transmission to the (write in name of agency). The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead, the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at dol.gov/agencies/whd/government-contracts/construction/forms or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the (write in name of appropriate federal agency) if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit them to the applicant, sponsor, or owner, as the case may be, for transmission to the (write in name of agency), the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the sponsoring government agency (or the applicant, sponsor, or owner).

(B) Each payroll submitted shall be accompanied by a “Statement of Compliance”, signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(1) That the payroll for the payroll period contains the information required to be provided under Sec. 5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under Sec. 5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

(2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

(3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(C) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the “Statement of Compliance" required by paragraph (a)(3)(ii)(B) of this section.

(D) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

(iii) The contractor or subcontractor shall make the records required under paragraph (a)(3)(i) of this section available for inspection, copying, or transcription by authorized representatives of the Michigan Department of Environment, Great Lakes, and Energy or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the Federal agency may, after written notice to the contractor, sponsor, applicant, or owner, take such action as maybe necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

(4) *Apprentices and trainees*- (i) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the jobsite in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates

(expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(ii) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(iii) Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

(5) *Compliance with Copeland Act requirements.* The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

(6) *Subcontracts*. The contractor or subcontractor shall insert in any subcontracts the clauses contained in 29 CFR 5.5(a)(1) through (10) and such other clauses as the (write in the name of the Federal agency) may by appropriate instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

(7) *Contract termination: debarment*. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

(8) *Compliance with Davis-Bacon and Related Act requirements.* All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

(9) *Disputes concerning labor standards.* Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

(10) *Certification of eligibility.* (i) By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C.1001.

(b) Contract Work Hours and Safety Standards Act. The Agency Head shall cause or require the contracting officer to insert the following clauses set forth in paragraphs (b)(1), (2), (3), and (4) of this section in full in any contract in an amount in excess of $100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by Sec. 5.5(a) or 4.6 of part 4 of this title. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

(1) Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

(c) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (b)(1) of this section the contractor and any subcontractor responsible there for shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (b)(1) of this section, in the sum of $10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (b)(1) of this section.

(3) Withholding for unpaid wages and liquidated damages. The City of Grand Ledge shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (b)(2) of this section.

(4) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (b)(1) through (4) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (b)(1) through (4) of this section.

(5) In addition to the clauses contained in paragraph (b), in any contract subject only to the Contract Work Hours and Safety Standards Act and not to any of the other statutes cited in Sec.5.1, the Agency Head shall cause or require the contracting officer to insert a clause requiring that the contractor or subcontractor shall maintain payrolls and basic payroll records during the course of the work and shall preserve them for a period of three years from the completion of the contract for all laborers and mechanics, including guards and watchmen, working on the contract. Such records shall contain the name and address of each such employee, social security number, correct classifications, hourly rates of wages paid, daily and weekly number of hours worked, deductions made, and actual wages paid. Further, the Agency Head shall cause or require the contracting officer to insert in any such contract a clause providing that the records to be maintained under this paragraph shall be made available by the contractor or subcontractor for inspection, copying, or transcription by authorized representatives of the Michigan Department of Environment, Great Lakes, and Energy and the Department of Labor, and the contractor or subcontractor will permit such representatives to interview employees during working hours on the job.

"General Decision Number: MI20230056 12/15/2023

Superseded General Decision Number: MI20220056

State: Michigan

Construction Type: Heavy

County: Eaton County in Michigan.

Heavy, Includes Water, Sewer Lines and Excavation (Excludes Hazardous Waste Removal; Coal, Oil, Gas, Duct and other similar Pipeline 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 $16.20 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 2023.
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 $12.15 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 2023.

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 http://www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/06/2023

1	02/03/2023
2	02/17/2023
3	07/21/2023
4	08/11/2023
5	08/25/2023
6	09/01/2023
7	10/06/2023
8	11/17/2023
9	12/15/2023

CARP0525-007 06/01/2023

Townships of Bellevue, Kalamo, Vermontville & Walton

	Rates	Fringes
CARPENTER, Includes Form Work	$ 28.29	21.42

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* CARP1004-015 06/01/2023

Remainder of County

	Rates	Fringes
CARPENTER, Includes Form Work	$ 31.38	20.91

ELEC0445-009 06/01/2023

Townships of Bellevue, Brookfield, Kalamo, Sunfield, Vermontville & Walton

	Rates	Fringes
ELECTRICIAN	$ 35.97	24.49

ELEC0665-013 05/31/2023

Townships of Benton, Carmel, Chester, Delta, Eaton, Eaton Rapids, Hamlin, Oneida, Roxand and Windsor

	Rates	Fringes
ELECTRICIAN	$ 26.07	5.5%+26.07

ENGI0325-009 09/01/2023

POWER EQUIPMENT OPERATORS: Underground Construction (Including Sewer)

	Rates	Fringes
POWER EQUIPMENT OPERATOR		
GROUP 1	$ 39.27	25.25
GROUP 2	$ 34.38	25.25
GROUP 3	$ 33.88	25.25
GROUP 4	$ 33.60	25.25

POWER EQUIPMENT OPERATOR CLASSIFICATIONS

GROUP 1: Backhoe/ Excavator, Boring Machine, Bulldozer, Crane, Grader/ Blade, Loader, Roller, Scraper, Trencher (over 8 ft. digging capacity)

GROUP 2: Trencher (8-ft digging capacity and smaller)

GROUP 3: Boom Truck (non-swinging, non- powered type boom)

GROUP 4: Broom/ Sweeper, Fork Truck, Tractor, Bobcat/ Skid Steer /Skid Loader

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ENGI0326-011 06/01/2023

EXCLUDES UNDERGROUND CONSTRUCTION

	Rates	Fringes
OPERATOR: Power Equipment		
Group 1	$ 45.48	25.25
Group 2	$ 42.18	25.25
Group 3	$ 39.53	25.25
Group 4	$ 37.82	25.25
Group 5	$ 37.82	25.25
Group 6	$ 31.96	25.25

FOOTNOTES:

Crane operator with main boom and jib 300' or longer: $1.50 per hour above the group 1 rate.
Crane operator with main boom and jib 400' or longer: $3.00 per hour above the group 1 rate.

PAID HOLIDAYS: New Year's Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day and Christmas Day.

POWER EQUIPMENT OPERATOR CLASSIFICATIONS

GROUP 1: Crane operator with main boom and jib 400', 300', or 220' or longer.

GROUP 2: Crane operator with main boom and jib 140' or longer, tower crane, gantry crane, whirley derrick

GROUP 3: Backhoe/Excavator; Boring Machine; Bulldozer; Crane; Grader/Blade; Loader; Roller; Scraper; Tractor; Trencher

GROUP 4: Bobcat/Skid Loader; Broom/Sweeper; Fork Truck (over 20' lift)

GROUP 5: Boom truck (non-swinging)

GROUP 6: Fork Truck (20' lift and under for masonry work)

IRON0025-011 06/01/2023

	Rates	Fringes
IRONWORKER (REINFORCING)	$ 31.43	34.77
IRONWORKER (STRUCTURAL)	$ 34.85	38.44

LABO0334-014 09/01/2022

SCOPE OF WORK:
OPEN CUT CONSTRUCTION: Excavation of earth and sewer, utilities, and improvements, including underground piping/conduit (including inspection, cleaning, restoration,

and relining)

	Rates	Fringes
LABORER		
(2) Mason Tender-Cement/Concrete	$ 23.53	13.15
(4) Grade Checker	$ 23.70	13.15
(5) Pipelayer	$ 23.84	13.15

LABO0499-023 06/01/2023

EXCLUDES OPEN CUT CONSTRUCTION

	Rates	Fringes
LABORER		
Grade Checker; Mason Tender - Cement/Concrete; Pipelayer	$ 30.58	13.45

PAIN0845-017 05/21/2014

	Rates	Fringes
PAINTER: Brush, Roller and Spray	$ 21.89	11.85

PLAS0016-027 04/01/2014

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER	$ 24.64	12.88

PLUM0333-020 06/01/2022

	Rates	Fringes
PLUMBER/PIPEFITTER	$ 42.29	23.94

TEAM0007-011 06/01/2023

	Rates	Fringes
TRUCK DRIVER		
Lowboy/Semi-Trailer Truck	$ 31.55	.75 + a+b
Tractor Haul Truck	$ 31.30	.75 + a+b

FOOTNOTE:
a. $470.70 per week.
b. $68.70 daily.

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* SUMI2010-054 11/09/2010

	Rates	Fringes
LABORER: Common or General	$ 17.75	6.40
LABORER: Landscape	$ 12.25 **	0.00
TRUCK DRIVER: Dump Truck	$ 18.00	6.43
TRUCK DRIVER: Off the Road Truck	$ 20.82	3.69

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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** Workers in this classification may be entitled to a higher minimum wage under Executive Order 14026 ($16.20) or 13658 ($12.15). Please see the Note at the top of the wage determination for more information.

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.

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END OF GENERAL DECISION
"

"General Decision Number: MI20230082 12/22/2023

Superseded General Decision Number: MI20220082

State: Michigan

Construction Type: Building

County: Eaton County in Michigan.

BUILDING CONSTRUCTION PROJECTS (does not include single family homes or apartments up to and including 4 stories).

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 $16.20 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 2023.
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 $12.15 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 2023.

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 http://www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/06/2023
1	02/03/2023

2	02/10/2023
3	02/17/2023
4	04/07/2023
5	04/14/2023
6	05/05/2023
7	07/21/2023
8	08/11/2023
9	09/08/2023
10	10/27/2023
11	11/17/2023
12	12/15/2023
13	12/22/2023

ASBE0047-002 07/01/2023

	Rates	Fringes
ASBESTOS WORKER/HEAT & FROST INSULATOR	$ 36.62	19.78

BOIL0169-001 06/01/2023

	Rates	Fringes
BOILERMAKER	$ 39.95	35.38

BRMI0009-009 08/01/2023

	Rates	Fringes
BRICKLAYER		
Bricklayer	$ 34.89	25.43
Terrazzo and Tile Finisher	$ 26.35	20.74
Terrazzo and Tile Setter	$ 30.25	22.98

FOOTNOTE:

Paid Holiday: Fourth of July, if the worker was employed by the contractor in any period of seven working days before said holiday within the current calendar year.

CARP0525-012 06/01/2023

Townships of Bellevue, Kalamo, Vermontville & Walton

	Rates	Fringes
CARPENTER (Including Acoustical Ceiling Installation, Drywall Hanging, Form Work & Metal Stud Installation)	$ 28.29	21.42

CARP0525-016 06/01/2023

Townships of Bellevue, Kalamo, Vermontville & Walton

	Rates	Fringes
CARPENTER (Soft Floor Layer, Including Carpet & Resilient Flooring)	$ 28.29	21.42

CARP1004-005 06/01/2023

Remainder of County

	Rates	Fringes
CARPENTER (Soft Floor Layer, Including Carpet & Resilient Flooring)	$ 31.38	20.91

CARP1004-020 06/01/2023

Remainder of County

	Rates	Fringes
CARPENTER (Including Acoustical Ceiling Installation, Drywall Hanging, Form Work & Metal Stud Installation)	$ 31.38	20.91

CARP1102-002 06/01/2020

	Rates	Fringes
MILLWRIGHT	$ 35.30	34.10

ELEC0445-003 06/01/2021

Townships of Bellevue, Brookfield, Kalamo, Sunfield, Vermontville & Walton

	Rates	Fringes
ELECTRICIAN		
Alarm Installation & Low Voltage Wiring	$ 34.30	22.16
Excludes Alarm Installation & Low Voltage Wiring	$ 34.30	22.16

ELEC0665-003 05/31/2022

Townships of Benton, Carmel, Chester, Delta, Eaton, Eaton Rapids, Hamlin, Oneida, Roxand and Windsor

	Rates	Fringes
ELECTRICIAN		
Alarm Installation & Low Voltage Wiring	$ 30.43	9.25+5.5%
Excludes Alarm Installation & Low Voltage Wiring	$ 36.90	9.25+5.5%

ENGI0324-010 06/01/2023

	Rates	Fringes
OPERATOR: Power Equipment		
GROUP 1	$ 45.48	25.25
GROUP 2	$ 42.18	25.25
GROUP 3	$ 39.53	25.25

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     GROUP 4.....................$ 37.82            25.25
     GROUP 5.....................$ 37.82            25.25
     GROUP 6.....................$ 31.96            25.25
     GROUP 7.....................$ 29.48            25.25

FOOTNOTES:

  Crane operator with main boom and jib 300' or longer: $1.50
  per hour above the group 1 rate. Crane operator with main
  boom and jib 400' or longer: $3.00 per hour above the group
  1 rate.

  PAID HOLIDAYS: New Year's Day, Memorial Day, Fourth of July,
  Labor Day, Thanksgiving Day and Christmas Day.

POWER EQUIPMENT OPERATOR CLASSIFICATIONS

  GROUP 1: Crane operator with main boom and jib 400', 300', or
  220' or longer.

  GROUP 2: Crane operator with main boom and jib 140' or
  longer, tower crane, gantry crane, whirley derrick

  GROUP 3: Concrete Pump; Crane; Highlift; Hoist; Roller;
  Scraper; Stiff Leg Derrick; Trencher

  GROUP 4: Bobcat/Skid Loader; Broom/Sweeper; Fork Truck (over
  20' lift)

GROUP 5: Boom Truck (non-swinging)

GROUP 6: Fork Truck (20' lift and under for masonry work)

GROUP 7: Oiler

----------------------------------------------------------------
 IRON0025-012 06/01/2022

                                  Rates          Fringes

IRONWORKER
     REINFORCING.................$ 31.43            34.77
     STRUCTURAL (Excluding
     Metal Building Erection)....$ 34.50            38.44
----------------------------------------------------------------
 LABO0499-013 06/01/2023

                                  Rates          Fringes

LABORER
     Common or General; Grade
     Checker; Mason Tender -
     Cement/Concrete;
     Pipelayer; Sandblaster......$ 30.58            13.45
----------------------------------------------------------------
 PAIN0845-005 06/01/2022

Does not include the townships of Bellevue and Olivet

                                  Rates          Fringes

PAINTER:  Brush, Roller,
Spray and Paperhanging..........$ 24.45            15.64
PAINTER:  Drywall
Finishing/Taping................$ 27.21            17.43
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PLAS0016-011 04/01/2014

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER	$ 24.64	12.88

PLUM0333-006 06/01/2023

	Rates	Fringes
PIPEFITTER, Includes HVAC Pipe and Unit Installation	$ 43.29	24.94
PLUMBER, Excludes HVAC Pipe and Unit Installation	$ 43.29	24.94

FOOTNOTE:

Paid Holidays: Memorial Day, Independence Day and Labor Day, if the employee works the work day preceding and following the holiday unless proven illness or injury prevents the employee from working.

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* SFMI0669-001 04/01/2023

	Rates	Fringes
SPRINKLER FITTER (Fire Sprinklers)	$ 40.48	25.80

SHEE0007-004 05/01/2023

	Rates	Fringes
SHEET METAL WORKER (Including HVAC Duct Installation; Excluding HVAC System Installation)	$ 38.09	19.66

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* SUMI2011-007 02/01/2011

	Rates	Fringes
IRONWORKER, ORNAMENTAL	$ 18.48	7.93
LABORER: Landscape & Irrigation	$ 10.38 **	0.50
LABORER: Mason Tender - Brick	$ 16.75	4.75
METAL BUILDING ERECTOR	$ 16.92	6.32
OPERATOR: Backhoe/Excavator/Trackhoe	$ 21.94	8.72
OPERATOR: Bulldozer	$ 19.73	7.02
OPERATOR: Grader/Blade	$ 22.00	6.29
OPERATOR: Tractor	$ 19.10	8.48
OPERATOR: Loader	$ 19.75	9.98
ROOFER	$ 15.00 **	0.58

TRUCK DRIVER: Dump Truck.....$ 16.00 **   7.26

TRUCK DRIVER: Lowboy Truck.....$ 14.50 **   0.44

TRUCK DRIVER: Tractor Haul
Truck.....$ 13.57 **   1.18

WELDERS - Receive rate prescribed for craft performing
operation to which welding is incidental.

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** Workers in this classification may be entitled to a higher
minimum wage under Executive Order 14026 ($16.20) or 13658
($12.15). Please see the Note at the top of the wage
determination for more information.

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.

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END OF GENERAL DECISION
"

SECTION 01 22 00 - UNIT PRICES - MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes descriptions of the method of measurement and the basis of payment for Unit Price Work under this Contract shown on the following sheets, unless otherwise noted:
   1. C231 Typical Cross Section – Jefferson Street Partial Replacement
   2. C232 Typical Cross Section – Jefferson Street Partial Replacement
   3. C233 Typical Cross Section – Jefferson Street Partial Replacement
   4. C234 Typical Cross Section – River Street Full Replacement
   5. C235 Typical Cross Section – River Street Full Replacement
   6. C236 Typical Cross Section – River Street Full Replacement
   7. C241 Removal & Construction STA 500+00 to STA 504+00
   8. C242 Removal & Construction STA 91+00 to STA 96+00
   9. C243 Removal & Construction STA 96+00 to STA 101+50
   10. C244 Removal & Construction STA 101+50 to STA 107+00
   11. C245 Removal & Construction STA 107+00 to STA 111+50
   12. C246 Removal & Construction STA 111+50 to STA 116+50
   13. C247 Removal & Construction STA 116+50 to STA 122+00
   14. C248 Removal & Construction STA 122+00 to STA 127+50
   15. C249 Removal & Construction STA 127+50 to STA 300+00
   16. C250 Removal & Construction STA 300+00 to STA 304+50
   17. C431 Sanitary Force Main – STA 500+00 to STA 504+00
   18. C432 Sanitary Force Main – STA 91+00 to STA 96+00
   19. C433 Sanitary Force Main – STA 96+00 to STA 101+50
   20. C434 Sanitary Force Main – STA 101+50 to STA 107+00
   21. C435 Sanitary Force Main – STA 107+00 to STA 111+50
   22. C436 Sanitary Force Main – STA 111+50 to STA 116+50
   23. C437 Sanitary Force Main – STA 116+50 to STA 122+00
   24. C438 Sanitary Force Main – STA 122+00 to STA 127+50
   25. C439 Sanitary Force Main – STA 127+50 to STA 300+00
   26. C440 Sanitary Force Main – STA 300+00 to STA 304+50
   27. C441 Sanitary Gravity Sewer Main – STA 503+50 to STA 508+00
   28. C442 Sanitary Gravity Sewer Main – STA 508+00 to STA 512+50
   29. C443 Sanitary Gravity Sewer Main – STA 512+50 to STA 517+00
   30. C444 Sanitary Gravity Sewer Main – STA 517+00 to STA 522+00
   31. C445 Sanitary Gravity Sewer Main – STA 522+00 to STA 525+25
   32. C446 Sanitary Gravity Sewer Main – STA 525+25 to STA 529+00
   33. C447 Sanitary Gravity Sewer Main – Diversion Chamber
   34. C701 Permanent Pavement Markings – STA 90+50 to STA 116+50
   35. C702 Permanent Pavement Markings – STA 116+50 to STA 132+43

B. Work shown on other sheets including, but not limited to, soil erosion and sedimentation control measures and maintenance of traffic needed to complete contract work, site work at the West River Pump Station site and work at the WWTP site is not included in unit price work.

C. Basis of Contract Payments:
   1. Final Contract Price shall be determined by actual quantities installed at unit prices stated in Contractor's Bid.
   2. Engineer shall determine actual as-built quantities.

3. All work identified on the Drawings, but not included as a Bid item shall be considered incidental to construction and not paid for directly, except Work that would be considered additional Work due to unforeseen conditions.
4. Unit price payments for individual items shall include everything necessary for such item to function as intended in the system.
5. Owner reserves the right to increase, decrease or eliminate any quantities for items listed in Contractor's Bid or which become a part of the Contract Documents.

D. Items included as incidental to Unit Prices for systems and appurtenances. Unless there is a specific pay item identified, the unit price payment shall include, but not be limited to:
1. Clear, excavate, trench, bedding, trench backfill, compaction, disposal of items for clearing and unsuitable or excess excavated materials.
2. Drainage of excavations including by-pass pumping of sewers if necessary.
3. Temporary sheeting, bracing and shoring of excavations.
4. Support, relocation, replacement, connection or reconnection of existing pipelines and utilities.
5. Cleanup and surface restoration.
6. Water service repair.
7. Sewer lead repair.
8. Bulk head of pipes to be abandoned.
9. Removal of pipes, valves, structures and appurtenances located within the excavation limits of new utilities whether identified on the removal Drawings or not.
10. Coordination of mail delivery and refuse removal with residents, post office, and refuse collectors.
11. Dewatering for the installation of sanitary sewer, water main and storm sewer.
12. Support of utility poles and existing underground utilities during excavation and installation of sanitary sewer, water main and storm sewer.
13. Remove, salvage, and replace street signs.
14. Remove and dispense of trees less than 6-inches in diameter, as indicated in the Drawings.
15. Temporary removal and reinstallation of utilities to allow concrete restoration.
16. Temporary removal and reinstallation of utilities to allow concrete restoration.
17. Concrete steel reinforcement.
18. Temporary enclosures and sources of heat and humidity control to allow construction activity to proceed during cold weather and adverse conditions.
19. Abandoning sanitary manholes, sanitary sewers and flowable fill for abandoned manholes or sanitary sewers.
20. Rock excavation.
21. Core and Boot Sanitary Sewer into Sewer or Manhole
22. Landscaping, including but not limited to lawn restoration, roadside restoration, repair or replacement of irrigation systems, and repair or replacement of fencing.

1.3 DEMOLITION AND REMOVALS

A. Item No. 1 – Bituminous Surface, Remove:
1. Includes the following in accordance with Division 31 Sections – Grading and Excavation and Fill for Utilities:
   a. Sawcut, remove (full depth) and dispose of existing bituminous pavement materials, including bituminous curbs.
2. Unit of Measure: Square yard.

B. Item No. 2 - Sidewalk, Remove:
1. Includes the following in accordance with Division 31 Sections – Grading and Excavation and Fill for Utilities:
   a. Sawcut, remove, and dispose of existing concrete walks and remove base materials to obtain proposed grade.
2. Unit of Measure: Square yard.

C. Item No. 3 – Driveway, Concrete, Remove:
   1. Includes the following in accordance with Division 31 Sections – Grading and Excavation and Fill for Utilities:
      a. Sawcut, remove, and dispose of existing concrete drive approach and remove base materials to obtain proposed grade.
   2. Unit of Measure: Square yard.

D. Item No. 4 – Curb and Gutter, Concrete, Remove:
   1. Includes the following in accordance with Division 31 Sections – Grading and Excavation and Fill for Utilities:
      a. Sawcut, remove, and dispose of existing concrete curbs and gutter pans.
   2. Unit of Measure: Linear foot.

E. Item No. 5 – Tree, Remove, 7 to 18-inch dia.:
   Item No. 6 – Tree, Remove, 19 to 36-inch dia.:
   Item No. 7 – Tree, Remove, 37-inch or Larger dia.:
   1. Includes the following in accordance with Division 31 Section – Grading:
      a. Remove trees, including stumps and roots, to 2 feet below finished grade, dispose of stumps and roots.
      b. Dispose of all tree material not specifically retained by property owner.
   2. The size of trees shall be determined by the average diameter of the tree trunk, measured to the nearest full inch, at a point 4-1/2 feet above the base of the tree from the ground line. Trees having major limbs lower than 4-1/2 feet from the ground shall be measured at the smallest diameter below such limbs.
   3. Does not include the removal of trees in designated clearing areas.
   4. Unit of Measure: Each.
      a. Several trees originating from the same ground level trunk shall be measured separately.
      b. Removal and disposal of trees 6-inches in diameter or less, as indicated in the Drawings is considered incidental and will not be paid for separately.

F. Item No. 8 – Clearing, For Sanitary Sewer System:
   1. Includes the following in accordance with Division 31 Section – Grading:
      a. Remove all plants, including shrubs, brush, trees and stumps in clearing area.
      b. Protect all vegetation not designated for removal adjacent to clearing area.
      c. Dispose of removed materials.
   2. Unit of Measure: Acre.
      a. Pay Item No. 8 only includes clearing for the sanitary sewer as shown on the identified sheets and does not include clearing that may be required for the installation or grading around the Influent Wastewater Storage Tank or other work at the West River Pump Station site or at WWTP site.

G. Item No. 9 – Sewer, Remove, Less than 24-inch dia.:
   Item No. 10 – Sewer, Remove, 24-inch to 48-inch dia.:
   1. Includes the following in accordance with Division 31 Section – Excavation and Fill for Utilities:
      a. Remove and dispose of existing sewer.
      b. Backfill and compact.
   2. Unit of Measure: Linear foot.

H. Item No. 11 – Structure, Remove:
   1. Includes the following in accordance with Division 31 Section – Excavation and Fill for Utilities:
      a. Excavate, remove and dispose of existing concrete or brick storm, sanitary, or water manholes or storm catch basins not within the excavation limits of new construction.
      b. Backfill and compaction.
   2. Unit of measure: Each.

I. Item No. 12 – Sign, Remove and Salvage:
   1. Includes the following in accordance with Division 01 Section – Traffic Control:
      a. Inventory existing sign condition and location, deliver report to Engineer.
      b. Remove and salvage sign.
      c. Protect and store salvaged sign.
      d. Remove and dispose of existing sign post(s) and sign post foundation(s).
   2. Unit of Measure: Each.

J. Item No. 13 – Post, Remove:
   1. Includes the following in accordance with Division 31 Section – Grading:
      a. Remove and dispose of existing post and post foundation.
   2. Unit of Measure: Each.

K. Item No. 14 – Boulder, Remove, Salvage and Replace
   1. Includes the following in accordance with Division 31 Section – Grading:
      a. Carefully remove, as not to damage, existing boulder.
      b. Transport, protect from damage, store, on site outside of the active work area.
      c. Replace in existing location after other contract work is complete.
   2. Unit of Measure: Each.
      a. Boulder size varies from approximately 12” diameter to 36” diameter.

L. Item No. 15 – Culvert, Remove, Partial, Less than 24-inch dia.:
   1. Includes the following in accordance with Division 31 Section - Excavation and Fill for Utilities:
      a. Sawcut, remove, and dispose of portion(s) of existing culverts.
   2. Unit of Measure: Linear foot.

M. Item No. 16 – Culvert, Remove, Less than 24-inch dia.:
   1. Includes the following in accordance with Division 31 Section – Excavation and Fill for Utilities:
      a. Remove and dispose of existing culvert.
   2. Unit of Measure: Linear foot.

N. Item No. 17 - Culvert, End Section, Remove, Less than 24-inch dia.:
   1. Includes the following in accordance with Division 31 Section – Excavation and Fill for Utilities:
      a. Remove and dispose of culvert end section and/or concrete headwalls.
   2. Unit of Measure: Each.

O. Item No. 18 – Flowable Fill:
   1. Includes the following in accordance with Division 31 Sections – Excavation and Fill for Utilities and Flowable Fill:
      a. Expose and bulkhead ends of existing pipe.
      b. Fill the piping or structure with flowable fill.
      c. Plug ends of pipes.
   2. Unit of measure: Cubic yard.

P. Item No. 19 – Pavement Marking, Symbol, Remove:
   1. Includes the following in accordance with Division 32 Section – Pavement Markings:
      a. Remove existing pavement marking by grinding or blasting.
      b. Clean up and dispose of removed material.
   2. Unit of measure: Square foot.

1.4 SANITARY SEWER SYSTEM

A. Item No. 20A – Sewer~~- Sewer~~, Sanitary, 18-inch dia., Ductile Iron, Ceramic Coated:
   Item No. 20B – Sewer, Sanitary, 20-inch dia., HDPE, DIPS, DR 11:
   1. Includes the following in accordance with Division 31 Section – Excavation and Fill for Utilities and Division 33 Sections – Sanitary Sewerage Utilities and Sanitary Utility Sewerage Force Mains:
      a. Furnish, install and test sanitary sewer.
      b. Furnish and install all pipe fittings and bends, whether specified or not specified to complete the installation.

c. Furnish and install all concrete cradles, whether specified or not specified to complete the installation.
d. Provide bypass pumping.
e. Excavate backfill and compact trench.
f. Provide pipe bedding and trench backfill material.
g. Furnish and install casing spacers and grout void between casing pipe and carrier pipe.
h. Provide internal television inspection on all sections which cannot be air tested.
i. Complete air testing on all sewers that can be installed without connecting laterals.

2. Unit of Measure: Linear foot.
   a. Measured along horizontal centerline of pipe, in plan view.
      1) Additional linear footage needed to avoid vertical conflicts, whether specified or not, will not be included in the linear foot measurement of the pipe.

B. Item No. 21 – Sewer, Sanitary, 24-inch dia.:
Item No. 22 – Sewer, Sanitary, 30-inch dia.:
1. Includes the following in accordance with Division 31 Section – Excavation and Fill for Utilities and Division 33 Section – Sanitary Sewerage Utilities:
   a. Furnish and install sanitary sewer and all fittings.
   b. Excavate, backfill and compact trench.
   c. Provide pipe bedding and trench backfill material.
   d. Connect to proposed sanitary structure.
2. Unit of Measure: Linear foot.
   a. Measure from centerline of sanitary structure to centerline of sanitary structure or end of pipe along the centerline.

C. Item No. 23 – Sewer, Sanitary, Lining, 24-inch dia.:
Item No. 24 – Sewer, Sanitary, Lining, 30-inch dia.:
1. Includes the following in accordance with Division 33 Sections – Rehabilitation of Sewer Utilities and Sanitary Sewerage Utilities:
   a. Furnish and install CIPP sewer lining covering the entire interior of the sanitary sewer.
2. Unit of Measure: Linear foot.
   a. Use item when Item No. 21 and Item No. 22 are concrete pipe. Do not line PVC sanitary sewer.

D. Item No. 25 – Sewer, Sanitary, Connection, 18-inch to 20-inch dia.:
1. Includes the following in accordance with Division 31 Section – Excavation and Fill for Utilities and Division 33 Sections – Sanitary Sewerage Utilities and Sanitary Utility Sewerage Force Mains:
   a. Remove and dispose of existing 20-inch plug/cap.
   b. Furnish and install all pipe and pipe fittings and bends, whether specified or not specified on the drawings, necessary to make the connection.
2. Unit of Measure: Each.

E. Item No. 26 – Sanitary Service Lead, Reconnect:
1. Includes the following in accordance with Division 31 Section – Excavation and Fill for Utilities and Division 33 Section – Sanitary Sewerage Utilities.
   a. Remove and dispose of existing sanitary service lead in conflict with proposed sanitary force main.
   b. Furnish and install sanitary service lead.
   c. Furnish and install wye connection at sanitary main.
   d. Excavate, backfill and compact trench.
   e. Provide pipe bedding and trench backfill material.
   f. Connect to existing sewer lead.
2. Unit of Measure: Each.

F. Item No. 27 – Structure, Sanitary, 48-inch, dia.:
Item No. 28 – Structure, Sanitary, 60-inch, dia.:
Item No. 29 – Structure, Sanitary, 84-inch, dia.:
1. Includes the following in accordance with Division 31 Section – Excavation and Fill for Utilities and Division 33 Section – Sanitary Sewerage Utilities:
    a. Furnish and install precast concrete structure, including steps, flow channel, and pipe connections.
    b. Proposed or temporary sewer connections.
    c. Excavate, install foundation material and backfill around manhole.
    d. Provide resilient connector between pipe and manhole.
2. Unit of Measure: Each.

G. Item No. 30 – Structure, Sanitary, Lining, 48-inch, dia.:
Item No. 31 – Structure, Sanitary, Lining, 84-inch, dia.:
1. Includes the following in accordance with Division 33 Section – Sanitary Sewerage Utilities:
    a. Furnish and install structure lining covering the entire interior of the sanitary structure, including the structure interior bottom and flow channel.
2. Unit of Measure: Vertical foot.
    a. Measured from the lowest point in the flow channel to the bottom of the casting.

H. Item No. 32 – Structure, Sanitary, Internal Drop:
1. Includes the following in accordance with Division 33 Section – Sanitary Sewerage Utilities:
    a. Furnish and install drop bowl of the size specified on the Drawings.
    b. Furnish and install drop pipe of the size specified on the Drawings.
    c. Furnish and install all fittings, bends, and straps/brackets.
    d. Secure drop pipe to internal edge of structure, per manufacturers recommendations.
2. Unit of Measure: Vertical foot.
    a. Measured from incoming sewer pipe invert to outgoing sewer pipe invert.
    b. Diameter of drop pipe and size of drop bow as specified on the Drawings.
    c. Internal drop structure in Influent Wastewater Storage Tank is not included in unit price work.

I. Item No. 33 – Sanitary Sewer, Air and Vacuum Valve, 18-inch dia.:
1. Includes the following in the accordance with Division 31 Section – Excavation and Fill for Utilities and Division 33 Section – Sanitary Utility Sewerage Force Mains:
    a. Excavate, backfill, and compact.
    b. Furnish and install valve.
2. Unit of Measure: Each.

J. Item No. 34 – Sanitary Sewer, Valve, 18-inch dia.:
1. Includes the following in accordance with Division 31 Section – Excavation and Fill for Utilities and Division 33 Section – Sanitary Utility Sewerage Force Mains:
    a. Excavate, backfill, and compact.
    b. Furnish and install valve of the size specified.
2. Unit of Measure:
    a. Each.

K. Item No. 35 – Steel Casing Pipe, Bore and Jack, 30-inch dia.:
1. Includes the following in accordance with Division 33 Sections – Utility Pipe Jacking, Sanitary Sewerage Utilities, and Sanitary Utility Sewerage Force Mains:
    a. Excavate pits.
    b. Provide and install sheeting, bracing, and other safety devices.
    c. Excavate, furnish and install steel casing.
    d. Remove all equipment, backfill and compact excavation.
    e. Clean up.
2. Unit of Measure: Linear foot.
    a. Measured along centerline of casing pipe.
    b. The limits of payment for “Steel Casing Pipe, Bore and Jack, 30-inch” are shown in the Drawings. Additional length will not be paid for separately but may be used at the Contractor’s discretion.

1.5 STORM SEWER SYSTEM

A. Item No. 36 – Sewer, Storm, 12-inch dia., RCP, Class IV:
Item No. 37 – Sewer, Storm, 18-inch dia., RCP, Class IV:
Item No. 38 – Sewer, Storm, 30-inch dia., RCP, Class IV:
1. Includes the following in accordance with Division 31 Section – Excavation and Fill for Utilities and Division 33 Section – Storm Drainage Utilities:
    a. Furnish and install storm sewer and all fittings.
    b. Excavate, backfill and compact trench.
    c. Provide pipe bedding and trench backfill material.
    d. Connect to existing storm sewer, including geotextile fabric wrap.
    e. Connect to proposed storm structure or catch basin.
2. Unit of Measure: Linear foot.
    a. Measure from centerline of drainage structure to centerline of drainage structure or end of pipe along the centerline.

B. Item No. 39 – Culvert, 12-inch dia., CSP:
1. Includes the following in accordance with Division 31 Section – Excavation and Fill for Utilities and Division 33 Section – Storm Drainage Utilities:
    a. Furnish and install culvert.
    b. Excavate, backfill and compact trench.
    c. Provide pipe bedding and trench backfill material.
    d. Connect to existing culvert.
2. Unit of Measure: Linear foot.
    a. Measured along the pipe centerline from end of pipe to end of pipe.

C. Item No. 40 – Culvert, End Section, 12-inch dia., CSP:
1. Includes the following in accordance with Division 31 Section – Excavation and Fill for Utilities and Division 33 Section – Storm Drainage Utilities:
    a. Furnish and install flared end section and fittings.
    b. Geotextile wrap.
    c. Excavate, backfill, and compact trench.
    d. Provide culvert end section bedding and trench backfill material.
2. Unit of Measure: Each.

D. Item No. 41 – Structure, Catch Basin, 24-inch, dia.:
Item No. 42 – Structure, Catch Basin, 48-inch, dia.:
Item No. 43 – Structure, Storm, 48-inch, dia.:
Item No. 44 – Structure, Storm, 60-inch, dia.:
1. Includes the following in accordance with Division 31 Section – Excavation and Fill for Utilities and Division 33 Section – Storm Drainage Utilities:
    a. Furnish and install precast concrete drainage structure, including steps, and sump.
    b. Provide stone and geotextile fabric.
    c. Proposed or temporary sewer connections and existing roadway underdrain connections.
    d. Excavate, install foundation material and backfill around manhole.
    e. Provide resilient connector between pipe and manhole.
2. Unit of Measure: Each.

E. Item No. 45 – Structure, Tap, 18-inch dia.:
Item No. 46 – Structure, Tap, 30-inch dia.:
1. Includes the following in accordance with Division 31 Section – Excavation and Fill for Utilities and Division 33 Section – Storm Drainage Utilities:
    a. Furnish equipment and material necessary to tap proposed sewer into an existing structure.
    b. Core or cut existing structure to accommodate proposed sewer.
    c. Excavation, backfill, compaction, and disposal of core or cut pieces of existing drainage structure.
2. Unit of Measure: Each.

F. Item No. 47 – Sewer, Tap, 12-inch dia.:
Item No. 48 – Sewer, Tap, 30-inch dia.:
1. Includes the following in accordance with Division 31 Section – Excavation and Fill for Utilities and Division 33 Section – Storm Drainage Utilities:
    a. Furnish equipment and material necessary to tap existing sewer into a proposed structure.
    b. Core or cut proposed structure to accommodate existing sewer.
    c. Excavation, backfill, compaction, and disposal of core or cut pieces of proposed drainage structure.
    d. Provide stone, proposed sewer and geotextile wrap.
2. Unit of Measure: Each.

G. Item No. 49 – Trench Drain:
1. Includes the following in accordance with Division 31 Section – Excavation and Fill for Utilities and Division 33 Section – Storm Drainage Utilities:
    a. Furnish and install trench drain.
    b. Connect trench drain to existing or proposed storm sewer.
2. Unit of Measure: Linear foot.

1.6 WATER MAIN

A. Item No. 50 - Valve Box, Adjust:
1. Includes the following in accordance with Division 33 Section – Water Utilities:
    a. Sawcut existing pavement, curb, curb and gutter, and sidewalk where required.
    b. Adjust the existing valve box up or down to the finish grade.
    c. Replace the pavement adjacent to the adjusted valve box.
2. Unit of Measure: Each.

B. Item No. 51 – Water Service, Reconnect (up to 2-inch dia.):
1. Includes the following in accordance with Division 31 Section – Excavation and Fill for Utilities and Division 33 Section – Water Utilities:
    a. Excavate, backfill, and compact trench.
    b. Notify resident/business of water service disruption.
    c. Provide pipe bedding and trench backfill material.
    d. Remove and dispose of existing water service pipe within the sanitary sewer force main trench.
    e. Provide and disinfect copper water service pipe and fittings to match the existing service size and reconnect the existing service.
    f. Connect copper water service pipe to existing water service pipe.
    g. Identify and document existing water service material at connections.
2. Unit of Measure:
    a. Each.

1.7 EARTHWORK AND GRADING

A. Item No. 52 – Roadway Grading:
1. Includes the following in accordance with Division 31 Section – Grading:
    a. Clear site and dispose of unsuitable materials within grading limits.
    b. Remove and stockpile topsoil.
    c. Cut, fill, shape, grade, compact, or otherwise prepare all finish subgrade, including but not limited to:
        1) Roadway.
        2) Driveways.
        3) Sidewalks.
        4) Trenches.
    d. Proof roll subgrade to meet density requirements.
    e. Shape, grade, and compact onsite subbase material.
    f. Protect, salvage, or replace private irrigation systems in the project limits.
2. Unit of Measure: Station.
    a. Measured along centerline of roadway.

B. Item No. 53 – Aggregate Base, 6-inch:
   1. Includes the following in accordance with Division 32 Section – Aggregate Base Courses:
      a. Furnish, place, shape, grade, and compact aggregate base material for bituminous or concrete pavement.
   2. Unit of measure: Square yard, compacted in place.

C. Item No. 54 – Aggregate Base, Conditioning:
   1. Includes the following in accordance with Division 32 Section – Aggregate Base Courses:
      a. Shape, grade, and compact onsite aggregate base material for bituminous or concrete pavement.
      b. Furnish, place, shape, grade, and compact additional aggregate material necessary to obtain desired bituminous or concrete pavement thickness.
   2. Unit of measure: Square yard, compacted in place.

D. Item No. 55 – Structure Casting, Adjust:
   1. Includes the following in accordance with Division 33 Section – Water Utilities, Sanitary Sewerage Utilities, and Storm Drainage Utilities:
      a. Sawcut existing pavement, curb, and curb and gutter where required.
      b. Remove and dispose of concrete collar.
      c. Adjust the existing or proposed casting up or down to the finish grade.
      d. Replace the pavement adjacent to the adjusted cover.
      e. Replace the concrete collar adjacent to the adjusted cover.
   2. Unit of Measure: Each.

E. Item No. 56 – Structure Casting:
   1. Includes the following in accordance with Division 33 Section – Water Utilities, Sanitary Sewerage Utilities, and Storm Drainage Utilities:
      a. Furnish and install casting.
      b. Adjust the casting up or down to the finish grade.
   2. Unit of Measure: Each.

1.8 PAVING

A. Item No. 57 – Bituminous Pavement, 5EMH:
   Item No. 58 – Bituminous Pavement, 3EMH:
   Item No. 59 – Bituminous Pavement, Approach:
   1. Includes the following in accordance with Division 32 Section – Asphalt Paving:
      a. Furnish, place, and compact bituminous mixture.
   2. Unit of measure: Ton.
      a. Bituminous Pavement, Approach and Bituminous Pavement, Hand Patching locations are indicated on the Drawings.

B. Item No. 60 – Driveway, Concrete, 6-inch:
   1. Includes the following in accordance with Division 32 Section – Concrete Walks:
      a. Prepare subgrade.
      b. Furnish, place, and compact base material to a minimum depth of 6 inches.
      c. Furnish and place concrete paving.
   2. Unit of measure: Square yard.

C. Item No. 61 – Aggregate Surface Course, 6-inch:
   1. Includes the following in accordance with Division 32 Section – Aggregate Surfacing:
      a. Prepare subgrade.
      b. Furnish, place, shape, grade, and compact aggregate material.
   2. Unit of measure: Square yard, compacted in place.
      a. Removal of existing aggregate surface course is incidental, occurring during trench excavation for proposed sanitary sewer installation.

D. Item No. 62 – Curb and Gutter, Concrete:
Item No. 63 – Curb and Gutter, Concrete, Detail M:
1. Includes the following in accordance with Division 32 Section – Concrete Curbs and Gutters:
   a. Furnish and place concrete curb and gutter, gutter pans, curb radii.
   b. Provide longitudinal reinforcement.
   c. Provide ADA compliant curb cuts at sidewalk ramps locations.
2. Unit of measure: Linear foot.
   a. Measured along the face of the curb, radii and gutter pans.

E. Item No. 64 – Curb, Bituminous:
1. Includes the following in accordance with Division 32 Section – Asphalt Paving:
   a. Shape bituminous curb as detailed on the Drawings.
2. Unit of measure: Linear foot.
   a. Bituminous material used for Curb, Bituminous paid for as Bituminous Pavement, 5EMH.

F. Item No. 65 – Sidewalk, Concrete, 4-inch:
Item No. 66 – Sidewalk, Concrete, 6-inch:
Item No. 67 – Sidewalk, Concrete, Ramp, 6-inch:
1. Includes the following in accordance with Division 32 Section – Concrete Walks:
   a. Prepare subgrade.
   b. Furnish, place, and compact base material.
   c. Furnish and place concrete sidewalks.
2. Unit of measure: Square feet.

G. Item No. 68 – Sidewalk, Detectable Warning Surface:
1. Includes the following in accordance with Division 32 Section – Concrete Walks:
   a. Furnish and place 24-inch-wide detectable warning surface across the entire width of the sidewalk ramp roadway opening.
2. Unit of measure: Linear foot.

H. Item No. 69 – Pavement Marking, Waterborne, 4-inch, White:
1. Includes the following in accordance with Division 32 Section – Pavement Markings:
   a. Furnish and place white pavement marking paint.
2. Unit of measure: Linear foot.

I. Item No. 70 – Pavement Marking, Ovly Cold Plastic, 6-inch, Crosswalk:
1. Includes the following in accordance with Division 32 Section – Pavement Markings:
   a. Furnish and place cold plastic pavement markings.
2. Unit of measure: Linear foot.

J. Item No. 71 – Pavement Marking, Ovly Cold Plastic, 12-inch, Special Emphasis Crosswalk:
1. Includes the following in accordance with Division 32 Section – Pavement Markings:
   a. Furnish and place cold plastic pavement markings.
2. Unit of measure: Linear foot.

K. Item No. 72 – Pavement Marking, Ovly Cold Plastic, School, Symbol:
1. Includes the following in accordance with Division 32 Section – Pavement Markings:
   a. Furnish and place cold plastic pavement markings.
2. Unit of measure: Each.

L. Item No. 73 - Sign, Reinstall:
1. Includes the following in accordance with Current Version of the MUTCD:
   a. Furnish and install all hardware and connections necessary.
   b. Reinstall salvaged sign on proposed steel or wood post.
   c. Furnish and install new signs to replace those damaged by construction or stolen.
2. Unit of measure: Each.

M. Item No. 74 – Sign, Post, Steel, 3 lb:
   1. Includes the following in accordance with Current Version of the MUTCD:
      a. Furnish and install sign post.
   2. Unit of measure: Linear foot.

N. Item No. 75 – Sign, Post, 4-inch by 6-inch:
   1. Includes the following in accordance with Current Version of the MUTCD:
      a. Furnish and install sign post.
      b. Furnish, place and install concrete sign post foundation.
   2. Unit of measure: Linear foot.

1.9 LANDSCAPING

A. Item No. 76 – Restoration, Lawn:
   1. Includes the following in accordance with Division 31 Section – Grading and Division 32 Section – Turf and Grasses:
      a. Furnish, place, and grade topsoil.
      b. Seed.
      c. Maintain until final completion.
   2. Does not include restoration of any areas disturbed due to Contractor's operation that are outside the limits of normal construction.
   3. Unit of measure: Square yard.

B. Item No. 77 – Tree, 3-inch caliper:
   1. Includes the following in accordance with Division 32 Section – Planting:
      a. Furnish and install tree of the species specified by the Owner.
      b. Furnish and install mulch around planting trees.
      c. Water and maintain until final completion.
   2. Unit of measure: Each.

1.10 MISCELLANEOUS

A. Item No. 78 – Contaminated Soil Excavation and Removal
   1. Includes the following in accordance with Division 00 Sections – Environmental Assessment Information and Existing Hazardous Material Information:
      a. Stockpile material on Site for testing by Engineer.
      b. Remove and dispose of contaminated material at an appropriate accepting landfill.
      c. Provide any necessary documentation (manifest) required to haul excavated material.
      d. Pay disposal fees charged at the accepting landfill.
      e. Backfill void with material compacted in accordance with specifications.
   2. Unit of measure: Cubic yard.
      a. Item to be used at the discretion and direction of the Engineer or Owner.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION 01 22 00

SECTION 33 16 15 – ABOVEGROUND GLASS-LINED STEEL TANKS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the design, furnishing and installation of a glass-lined ground level steel storage tank.

B. Division of Work:
1. In accordance with the General Conditions, Contractor is responsible for dividing the Work among the Subcontractors and Suppliers and for delineating the work to be performed by specific trades.
2. The following are suggestions as to how the Work may be divided. This is not a complete list of all the work:
a. Earthwork Subcontractor: Performs earthwork and grading at tank location.
b. Tank Subcontractor:
1) Furnishes and installs floor slab.
2) Furnishes and installs tank.
3) Furnishes and installs aluminum dome.
4) Provides and attaches pipe stubs or flanged connections that are attached to tank shell.
c. Mechanical Subcontractor: Provides and installs all piping inside and outside the tank.
d. General Contractor: Coordinates all trades.

1.3 REFERENCES

A. Except as herein specified or as indicated on the Drawings, the work of this Section shall comply with the following:
1. ASME - American Society of Mechanical Engineers: Boiler and Pressure Vessel Code.
2. AWWA D103 - Factory-Coated Bolted Steel Tanks for Water Storage.
3. OSHA - Occupational Safety and Health Administration.
4. AIS – American Iron and Steel

1.4 SYSTEM DESCRIPTION

A. Vertical cylindrical glass-lined steel tank with reinforced concrete conical floor slab and gasketed, weather-tight aluminum Geodesic dome roof or knuckle roof.

B. Minimum Size: 16.78 feet in diameter by 19.26 feet actual sidewall height.

C. Slope bottom of tank 1:27.

D. Clear span dome or knuckle roof from tank walls.

E. Tank Accessories:
1. The location of the following accessories will be confirmed by the Owner and Engineer during construction:
a. (1) 30-inch diameter shell manway
b. (1) Ladder door assembly
c. (1) Standard manway observation platform
d. (1) ~~Dome s~~Step-off platform
~~d.~~e. (1) 18-inch x 24-inch minimum roof access hatch.
~~e.~~f. (1) Aluminum outside ladder with galvanized steel safety cage, lockable hoop entry and safety swing

~~f.~~g. (1) Personal fall arrest system with guide and large / extra large harness for aluminum outside ladder
~~g.~~h. (1) Standard anodes based on assumed resistivity of 1,000 ohm-cm.
~~h.~~i. (1) 8-inch stainless steel overflow nozzle

1.5 DESIGN AND PERFORMANCE REQUIREMENTS

A. Contractor shall design the tank, slab and foundations. Designer shall be a professional engineer licensed in the State of Michigan.

B. Design Loads:
1. Dead:
   a. Steel: 490 pcf.
   b. Concrete: 144 pcf.
2. Live:
   a. Internal: Pressure due to fluid level at overflowing using unit weight of 65 pcf per foot of depth.
   b. External: 27.5 psf roof load. Ground snow load 30 psf.
3. Wind: Design in accordance with AWWA.

C. Design and supply anchor bolts as required by structural analysis.

D. Design tank walls to support loads of roof system used.

1.6 SUBMITTALS

A. Shop Drawings: For glass-lined steel tanks.
1. Dimensions.
2. Details of construction and installation.
3. Anchor bolt sizes and locations.
4. Joint details.
5. Materials.
6. Required field measurements.
7. Foundation details.

B. Calculations: For glass-lined steel tanks.
1. Indicate structural analysis and design of members and connections.

C. Manufacturer's certification that design and materials meet Specification requirements.

1.7 QUALITY ASSURANCE

A. Fabrication and Installation Personnel Qualifications:
1. Trained and experienced in the fabrication and installation of the materials and equipment.
2. Knowledgeable of the design and the reviewed Shop Drawings.

1.8 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in original, unbroken, brand marked containers or wrapping.

B. Handle and store materials in a manner which will prevent deterioration or damage, contamination with foreign matter, damage by weather or elements and in accordance with Manufacturer's directions.

C. Reject damaged, deteriorated or contaminated material and immediately remove from the Site. Replace rejected materials with new materials at no additional cost to Owner.

1.9 WARRANTY

A. Provide Manufacturer's warranty that tank will not leak due to hydrostatic design head for a minimum of 5 years.

B. Provide Manufacturer's warranty that glass coating will not chip, crack or spall for a minimum of 5 years.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Glass-Lined Steel Tank: Aquastore; or Engineer Approved Equal.

B. Dome: In accordance with Division 13 Section “Aluminum Domes.”

2.2 MATERIALS

A. Tank:
   1. In accordance with AWWA D103.
   2. Steel Plate: Totally encased in a two coat glass system using Cobalt Glass frit.
   3. Lap Sealants:
      a. One component polyurethane compound.
      b. Neoprene gaskets and tape type sealers: Not allowed.
   4. Bolts:
      a. Zinc-plated with high impact co-polymer encapsulation on bolt head.
      b. Provide polypropylene caps on exterior.
   5. Color: Cobalt blue.

B. Concrete Foundations and Floor Slab:
   1. In accordance with Division 03 Sections.
   2. Concrete sump. See Drawings for dimensions.

C. Dome: In accordance with Division 13 Section “Aluminum Domes.”

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install glass-lined steel tank in conformance with:
   1. The Shop Drawings reviewed by Engineer.
   2. The Manufacturer's recommendations.

B. Concrete Floor Slabs: In conformance with Division 03 Section “Structural Concrete.”

C. Dome: In conformance with Division 13 Section “Aluminum Domes.”

3.2 FIELD QUALITY CONTROL

A. Field Repair of Coating: In accordance with Manufacturer's recommendations.

B. Leak Testing:
   1. In accordance with AWWA D103.
   2. Water: Furnished by Owner.

3.3 CLEANING

A. Clean materials installed under this Section in accordance with Division 01 Section “Cleaning and Waste Management.”

END OF SECTION 33 16 15

SECTION 33 34 00 – SANITARY UTILITY SEWERAGE FORCE MAINS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the furnishing and installation of a force main sewer system.

B. The system design is based on the use of ductile iron force main pipe: The use of other pipe materials may require adjustments to other system components.

1.3 REFERENCES

A. Except as herein specified or as indicated on the Drawings, the work of this Section shall comply with the following:
   1. ASTM Standard Specifications:
      a. A48 - Gray Iron Castings.
      b. A126 - Gray Iron Casting for Valves, Flanges, and Pipe Fittings.
      c. C76 - Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe.
      d. C478 - Precast Concrete Manhole Sections.
      e. D429 - Rubber Property - Adhesion to Rigid Substrates.
      f. D449 - Asphalt used in Dampproofing and Waterproofing.
      g. D1248 - Polyethylene Plastics Molding and Extrusion Materials.
      h. D1784 - Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds.
      i. D1785 - Poly(Vinyl Chloride)(PVC) Plastic Pipe, Schedules 40, 80, and 120.
      j. D2241 - Poly(Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR-Series).
      k. D2464 - Threaded Poly(Vinyl Chloride)(PVC) Plastic Pipe Fittings, Schedule 80.
      l. D2467 - Poly(Vinyl Chloride)(PVC) Plastic Pipe Fittings, Schedule 80.
      m. D2564 - Solvent Cements for Poly(Vinyl Chloride)(PVC) Plastic Piping Systems.
      n. D2657 – Standard Practice for Heat Fusion Joining of Polyolefin Pipe.
      o. D2774 - Underground Installation of Thermoplastic Pressure pipe.
      p. D3035 - Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Controlled Outside Diameter.
      q. D3139 - Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals.
      r. D3261 - Butt Heat Fusion Polyethlyene (PE), Plastic Fittings for Polyethlyene (PE) Plastic Pipe and Tubing.
      s. D3350 - Polyethylene Plastics Pipe and Fittings Materials.
      t. F477 - Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
      u. F656 - Primers for Use in Solvent Cement Joints for Poly(Vinyl Chloride)(PVC) Plastic Pipe and Fittings.
      v. F714 - Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter.
      w. F2164 – Standard Practice for Field Leak Testing of Polyethylene (PE) Pressure Piping Systems Using Hydrostatic Pressure.
   2. AWWA/ANSI - American National Standards Institute:
      a. C104/A21.4 - Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.
      b. C105/A21.5 - Polyethylene Encasement for Ductile-Iron Piping for Water and Other Liquids.
      c. C110/A21.10 - Ductile-Iron and Gray-Iron Fittings, 3-inch through 48-inch, for Water and Other Liquids.
      d. C111/A21.11 - Rubber-Gasket Joints for Ductile-Iron and Gray-Iron Pressure Pipe and Fittings.
      e. C150/A21.50 - Thickness Design of Ductile-Iron Pipe.
      f. C151/A21.51 - Ductile-Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds for Water or Other Liquids.
      g. C153/A21.53 - Ductile-Iron Compact Fittings, 3-inch through 12-inch (75 mm through 300 mm), for Water and Other Liquids.

3. AWWA Standards:
   a. C500 - Gate Valves for Water and Sewerage Systems.
   b. C504 - Rubber-Seated Butterfly Valves.
   c. C509 - Resilient-Seated Gate Valves for Water and Sewerage Systems.
   d. C600 - Installation of Ductile-Iron Water Mains and Their Appurtenances.
   e. C605 - Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings for Water.
   f. C900 - Polyvinyl Chloride (PVC) Pressure Pipe, 4-inch through 12-inch, for Water Distribution.
   g. C905 - Polyvinyl Chloride (PVC) Water Transmission Pipe, Nominal Diameters 14-inch through 36- inch.
   h. C906 - Standard for Polyethylene (PE) Pressure Pipe and Fittings, 4-inch through 63-inch, for Water Distribution.
   i. M23 - PVC Pipe - Design and Installation.
4. State DOT Current Standards:
   a. Specifications for Construction.
   b. Standard Plans.
5. National Sanitation Foundation:
   a. NSF 60 - Drinking Water Treatment Chemicals - Health Effects.
   b. NSF 61 - Drinking Water System Components - Health Effects.

1.4 DEFINITIONS

A. Abbreviations:
   1. DI: Ductile iron.
   2. PVC: Polyvinyl chloride.
   3. HDPE: High density polyethylene.

1.5 SUBMITTALS

A. Action Submittals: For Product Data:
   1. Pipe.
   2. Pipe coating.
   3. Gaskets.
   4. Valves.
   5. Valve boxes.
   6. Manholes, vaults and chambers
   7. Fittings.
   8. Thrust control method.
   9. Mandrel.

B. Informational Submittals: Submit Manufacturer's sworn statements that the pipe materials furnished comply with this Specification.

1.6 QUALITY ASSURANCE

A. Installation Personnel Qualifications:
   1. Trained and experienced in the installation of the materials.
   2. Knowledgeable of the design and the reviewed Shop Drawings.

B. Piping System: Pressure and leak tests.

1.7 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in original, unbroken, brand marked containers.

B. Handle and store materials in a manner which will prevent deterioration, damage, contamination with foreign matter, damage by weather or elements, and in accordance with Manufacturer's directions.

C. Reject damaged, deteriorated or contaminated material and immediately remove from the Site. Replace rejected materials with new materials at no additional cost to Owner.

PART 2 - PRODUCTS

2.1 PIPE AND FITTING MATERIALS

A. Ductile Iron Pipe:
1. AWWA/ANSI C150/A21.50 and C151/A21.51.
2. Thickness Class: CL 56.
3. Pipe Coatings:
   a. Ceramic Epoxy: Protecto 401; or equal.
4. Joints:
   a. AWWA/ANSI C111/A21.11.
   b. Push-on.
   c. Mechanical joint with ductile iron glands.
   d. Restrained:
      1) U.S. Pipe: T.R. Flex Restrained Joint; Field Lok gasket.
      2) American: Flex-Ring Restrained Joint; Fast Grip gasket.
      3) Clow: Super-Lock Restrained Joint.
      4) Griffin Pipe: Snap-lok restrained joint.
      5) Mechanical joint restraint with Megalugs by Ebaa Iron Sales; or equal.
      6) For pipe sizes greater than 24-inch, joints requiring restraint shall be by restrained joint pipe.
   e. Lubricant: Provide in accordance with Manufacturer's recommendation.
   f. Electrical Continuity:
      1) Wedges:
         a) Serrated silicon bronze.
         b) Two per joint.
      2) External Conductor Connection:
         a) U.S. Pipe: Electro-bond.
         b) Erico: Cadweld.
         c) Clow: Cable-bond.
         d) American: Copper strip conductor.
         e) Conduction cable or strap capable of carrying 600 amperes for an extended period without overheating.
         f) Conductor permanently fastened to both sides of joint by shop or field weld.
         g) Epoxy coat field installed jumper strip and connections with Kopper's 300M or equivalent.
      3) Conductive Gaskets:
         a) American: Fastite Conductive Gasket.
         b) Enclosed and protected contact between pipe sections.

5. Polyethylene Encasement: AWWA/ANSI C105/A21.5.
6. Field Cut Pipe:
   a. U.S. Pipe: T.R. Flex Gripper.
   b. American: Flex-Ring with set screw spigot ring.
   c. Clow: Super-Lock.
   d. Griffin Pipe: Bolt-Lok FC restrained joint.
   e. Mechanical joint restraint with Megalugs by Ebaa Iron Sales; or equal.

B. Polyvinyl Chloride (PVC) Pipe 14-Inch to 36-Inch:
1. AWWA C909: DR 18, 235 psi.
2. Cell classification PVC-12454-B, ASTM D1784.
3. Joints:
   a. Push on:
      1) Wall thickness in accordance with ASTM D3139.
      2) Elastomeric ring in accordance with ASTM F477.
   b. Restrained:
      1) Series 2800 by Ebaa Iron Sales.
      2) Series 1350/1390 by Uni-flange Corporation.
      3) Manufactured and marked for use on PVC.
4. Outside diameter shall be same as ductile iron.
5. Lubricant: Provide in accordance with Manufacturer's recommendation.

C. HDPE Pipe:
   1. Material:
      a. High density polyethylene pipe compound with extra high molecular weight greater than 0.941.
      b. Material Designation: PE 3408.
      c. Material Classification: Type III, Class C, Category 5, Grade P34; ASTM D1248.
      d. Cell Classification: 345546C; ASTM D3350.
      e. Manufacturing Standard: ASTM D3350-02.
      f. Pipe shall contain no recycled compounds except that generated in the Manufacturer's own plant from resin of the same specification from the same raw material.
   2. Manufacturers: Poly Pipe, Inc., Performance Pipe, ISCO Industries; or equal.
   3. Size: Ductile iron pipe size for sizes indicated on Drawings.
   4. Dimension Ratio: DR 11.
   5. Pressure Rating: 2016~~0~~0 psi.
   6. Length: 50 feet minimum.
   7. Pipe Joining:
      a. Butt fused joints using equipment and methods in strict accordance with the pipe Manufacturer's recommendations and ASTM D3261 and ASTM D2657.
      b. Joining process shall utilize data logging equipment to document the fusion process.

D. Fittings:
   1. Ductile Iron Fittings:
      a. 6-Inch Through 24-Inch:
         1) AWWA/ANSI C153/A21.53, compact fittings.
         2) Mechanical joints.
         3) Ductile iron glands.
         4) 350 psi pressure rating.
         5) Ceramic Epoxy: Protecto 401; or equal.
      b. Joint Restraint for Ductile Iron Fittings to Ductile Iron Pipe:
         1) 6-Inch Through 24-Inch Pipe:
            a) Mechanical joints with Megalugs by Ebaa Iron Sales; or equal.
            b) Restrained joints, as indicated on Drawings, to match restrained joint pipe.
         2) 30-Inch Through 48-Inch Pipe: Restrained joints.
      c. Joint Restraint for Ductile Iron Fittings to PVC Pipe:
         1) 14-Inch Through 24-Inch Pipe:
            a) Series 2800 by Ebaa Iron Sales.
            b) Series 1350/1390 by Uni-flange Corporation.
            c) Manufactured and marked for use on PVC.
      d. Electrical Continuity:
         1) Wedges:
            a) Serrated silicon bronze.
            b) Two per joint.
         2) External Conductor Connection:
            a) U.S. Pipe: Electro-bond.
            b) Erico: Cadweld.
            c) Clow: Cable-bond.
            d) American: Copper strip conductor.
            e) Conduction cable or strap capable of carrying 600 amperes for an extended period without overheating.
            f) Conductor permanently fastened to both sides of joint by shop or field weld.
            g) Epoxy coat field installed jumper strip and connections with Kopper's 300M or equivalent.
         3) Conductive Gaskets:
            a) American: Fastite Conductive Gasket.
            b) Enclosed and protected contact between pipe sections.
      e. Polyethylene Encasement: AWWA/ANSI C105/A21.5.
   2. HDPE Fittings:
      a. Molded or fabricated from polyethylene compound having a cell classification equal to or exceeding the cell classification of the pipe.
      b. Molded Fittings:
         1) Pressure rated to match the pipe SDR pressure rating to which they are connected.

c. Fabricated Fittings:
   1) Made from pipe with a pressure rating at least 25% greater than the pipe to which they are connected.
   2) Angle of bends to have tolerance of ±1% of required angle.
d. Pipe Joining:
   1) Pipe to Fitting Joining: Butt fused using equipment and methods in strict accordance with the pipe Manufacturer's recommendations.
   2) Joining Segments of Fabricated Fittings: Butt fused using equipment and methods in strict accordance with the pipe Manufacturer's recommendations.
e. Transitions from HDPE Pipe to Other Materials:
   1) AWWA C906:
      a) Mechanical Joint adapter.
   2) Obtain Engineer's approval.
   3) Manufacturers: Phillips Driscopipe, Inc.; Chevron Chemical Company, Plexco; or equal.

E. Gaskets:
1. AWWA/ANSI C111/A21.11 for ductile iron pipe.
2. ASTM F477 for plastic pipe.

2.2 VALVES AND VALVE BOXES

A. 6-Inch Through 24-Inch Valves:
1. Resilient-Seated Gate Valves; AWWA C509:
   a. Manufacturer: Mueller; Clow; Waterous; American Flow Control; Metroseal; or equal.
   b. Nonrising stem (NRS).
   c. Wrench Nut: 2 inches square.
   d. Open left (counter clockwise).
   e. Mechanical joint end connections.
   f. Stem Seal: Buna-N O-rings.
   g. Stem and Stem Nut: Bronze.
   h. Body and Operating Nut: Ductile iron.
   i. Wedge: Urethane rubber coated cast iron in accordance with ASTM D429.
   j. Fusion-bonded epoxy coating.

B. Valve Boxes:
1. Manufacturers and Models:
   a. East Jordan Iron Works E3002 with No. 6 base.
   b. Mueller 10357 with No. 160 base.
   c. Clow F2450 with No. 160 base.
2. Three section cast iron.
3. Cast iron lid marked "SEWER".
4. Adjustable:
   a. By means of threaded top and center sections.
   b. Height: 51 inches to 72 inches.

C. Sewage Air and Vacuum Valve:
1. Manufacturer: Apco, Combination Sewage Air/Vacuum Valve, Model 402C; or approved equal.
2. Size: 2-inch x 2-inch outlet.
3. Orifice: 1/4-inch.
4. Additional Components:
   a. Inlet valve.
   b. Blowoff valve.
   c. Back flushing valve.
   d. Back flushing hose with quick-disconnect fittings; 15 feet long.

2.3 MANHOLES, VAULTS AND CHAMBERS

A. General:
   1. Grade Rings: ASTM C478.
   2. Joints:
      a. 1-inch butyl gasket in flexible rope form.
      b. E.Z. Stik; Butyl-Lok; or equal.
   3. Steps:
      a. Manufacturers: MA Industries, PS-1-PF; or equal.
      b. Steel rod, 1/2-inch, encapsulated in copolymer polypropylene.
   4. Casting:
      a. Manufacturers and Models: Neenah, R-1670; East Jordan Iron Works, 1045.
      b. Solid, gasketed, self-sealing cover.
      c. Imprinted on cover: "SEWER".

B. Valve Manholes and Air Release Chambers:
   1. Precast Sections: ASTM C478.
   2. Corporation Stops: Mueller, H-15000; Hays Co., 5200.

C. Force Main Air Release Chamber:
   1. Precast Sections: ASTM C76 Class III, flat end.
   2. Casting:
      a. Manufacturer and Model: East Jordan Iron Works 1040.
      b. Bolt down cover, no gasket.
      c. Solid cover with 6 drilled 3/4-inch holes.

2.4 MISCELLANEOUS

A. Tracer Wire:
   1. 12 gage copper.
   2. Brown or black insulation.
   3. Splice Wrap: Scotch 2200, vinyl mastic pads.

B. Pipe Installation Tape:
   1. Polyethylene material intended for buried use.
   2. 6-inch width, 3.5 mils thick.
   3. American Public Works Association on color code green with imprinted “Caution Sanitary Force Main.”
   4. Indentoline by Brady; Pro-Line; or equal.

PART 3 - EXECUTION:

3.1 EARTHWORK

A. In accordance with Division 31 Section “Excavation and Fill for Utilities.”

3.2 LINE AND GRADE

A. Lay pipe to the grades and elevations indicated on the Drawings.

B. Where No Grades are Indicated;
   1. Lay pipe with a typical 7 feet (5 feet minimum) of cover below finish grade.
   2. Lay pipe at constant uphill and downhill grades to and from air release and vacuum valves.
   3. Avoid high points except at air release and vacuum valves.

3.3 INSTALLATION

A. General:
1. Except as Herein Provided or Indicated on the Drawings, Install in Accordance With:
   a. DI: AWWA C600.
   b. PVC: AWWA M23.
   c. HDPE: ASTM D2774.
2. Protect all materials before, during and after installation.
3. Install pipe, fittings and appurtenances in accordance with Manufacturer's recommendations except as indicated herein or on the Drawings.
4. Prevent entrance of foreign materials.
5. Restrain pipe, fittings, valves and couplings as necessary to comply with this specification.

B. Placement of Pipe:
1. Bearing: Support entire length of pipe barrel evenly with extra excavation at joints.
2. Bell and Spigot: Clean and lubricate immediately prior to assembly.
3. Jointing:
   a. Mechanical: Tighten evenly to 75 to 90 foot-pounds of torque.
   b. Restrained: Manufacturer's recommended method.
   c. HDPE Pipe to HDPE Pipe:
      1) Thermal Butt Fusion: Follow Manufacturer’s recommended method and ASTM D3261.
      2) Mechanical Joint/Flanged Joint Connection:
         a) Thermal butt fuse adapter to HDPE pipe.
         b) Tighten bolts evenly to 75 to 90-foot pounds of torque on slip on ductile flanges.
   d. HDPE Pipe to Other Pipe Materials:
      1) Mechanical Joint:
         a) Thermal butt fuse adapter to HDPE pipe.
         b) Tighten bolts evenly to 75 to 90-foot pounds of torque on slip on ductile flanges.
         c) Provide restraint at mechanical joint as required by conditions.
4. Cutting Pipe:
   a. Power saw.
   b. Ductile Iron and PVC Pipe: Taper cut end by grinding or filing back at least 1/8-inch on a 30 degree bevel.
   c. HDPE Pipe:
      1) Cut end shall be smooth with no jagged edges or loose material.
      2) Face of cut end shall be perpendicular to pipe wall.
5. Thoroughly clean gasket seating surfaces in the socket and on the plain end of the pipe to remove all coating rust and foreign material before use of conductive gasket.

C. Setting Valves and Valve Boxes:
1. Set plumb on 4 inches of compacted MDOT 902, Granular Material, Class II, or MDOT 902 Open Graded Aggregate 34R.
2. Valve Boxes:
   a. Shall not transmit shock to valve.
   b. Plumb over operating nut.
   c. Set cover to finished grade.
   d. Witness.
3. Pressure Tap Sleeve and Valve:
   a. Set at the direction of tapping Subcontractor.
   b. Set and remove tapping machine.

D. Thrust Control:
1. Provide at all fittings and valves.
2. Installation in Accordance With:
   a. Shop Drawings reviewed by Engineer.
   b. Manufacturer's instructions.

3. Restrain all pipe joints within given distance from each fitting (both directions):

Table 1
Length of Restrained Pipe Required

Pipe Diameter	22-1/2 Degree Bends and Less	45 Degree Bends	90 Degrees Bends, Plugs	Tee Run	Tee Branch
6-inch	5-foot	10-foot	15-foot	10-foot	5-foot
8-inch	5-foot	10-foot	20-foot	10-foot	5-foot
10-inch	5-foot	15-foot	25-foot	10-foot	10-foot
12-inch	10-foot	15-foot	30-foot	10-foot	15-foot
16-inch	10-foot	20-foot	40-foot	10-foot	25-foot
18-inch	10-foot	20-foot	40-foot	10-foot	25-foot

E. Electrical Continuity:
1. Test ductile iron pipe for continuity.
2. Repair breaks.
3. Thoroughly clean gasket seating surfaces in the socket and on the plain end of the pipe to remove all coating rust and foreign material before use of conductive gasket.

F. Polyethylene Encasement:
1. AWWA/ANSI C105/A21.5.
2. Method A (Polyethylene tube for each length of pipe, overlapped at joint).

G. Air Release Valve and Cleanout Chambers:
1. Set on 4 inches compacted MDOT 902, Granular Material, Class II.
2. Repair visible leaks.
3. Joints: Mortar with brushed finish.
4. Center of Casting: As indicated on Drawings.
5. Grade:
   a. Paved Areas: To finished grade.
   b. Gravel Areas:
      1) Air release valve chambers: To finished grade.
      2) Cleanout chambers: 6-inch below finished grade.
   c. Outside of Roadway: To finished grade or as designated by Engineer.
6. Install chamber and related piping prior to testing of force main.

H. Pipe Taps for Combination Air Valves: Tap prior to pressure testing of force main.

I. Placement of Tracer Wire and Pipe Identification Tape:
1. Bury 12 inches above force main.
2. Solder and wrap wire splices.
3. Splice pipe identification tape to ensure continuity of metal foil.
4. Bring wire or tape to surface in valve boxes or as directed by Engineer.

3.4 TESTING AND INSPECTION

A. Observation: By Engineer.

B. Notification: Pressure Testing: Arrange with Engineer following successful pretesting.

C. Equipment and Manpower: Provide everything required for testing.

D. Pressure and Leakage Tests for Ductile Iron and PVC Pipe:
1. AWWA C600.
2. Duration: 2 hours.
3. Pressure:
   a. Maintain 150 pounds per square inch at the highest point on the segment being tested.
   b. Do not exceed the pipe's rated test pressure.

4. Water:
   a. To be provided by OWNER.
   b. Contractor shall be responsible for providing temporary connections and backflow preventor from municipal water system to force main or for hauling water.
5. Maximum Allowable Leakage:

   $L = \frac{SDP^{0.5}}{133,200}$ plus 0.0078 gal/hr/in of diameter for each closed valve tested against.

   L = Leakage in gallons per hour.
   S = Length of pipe tested in feet, maximum value 2,000. When length of pipe tested exceeds 2,000 feet, the allowable leakage will be based on 2,000 feet.
   D = Pipe diameter in inches.
   P = Average pressure point in the segment being tested.

6. Repair leaks and repeat tests until acceptable results are achieved.
7. Pressure testing against existing valves not allowed.

E. Preinstallation Pressure Test for HDPE Pipe Using Low Pressure Air:
1. Test Duration: 2 hours.
2. Test Pressure: 4 psi.
3. Perform prior to burying of pipe.
4. Restrain the test section and associated piping and components against sudden uncontrolled movement in the event of failure.
5. Pressurize the test section to the test pressure and maintain the pressure for the test duration.
6. Check all joints using a brush and mild soap solution; bubbling shall be considered indicative of a leak.
7. Carefully depressurize the test section.
8. Repair all leaking joints.
9. Repeat test until all joints are leak free.

F. Post-Installation Hydrostatic Test for HDPE Pipe:
1. Fill test section slowly with water.
   a. Purge all air from test section.
   b. Take all appropriate precautions to ensure that no air is trapped in the test section.
   c. Flow velocities during filling should not exceed the capacities of air release devices or other openings used to release entrapped air.
2. Allow the test section and the test liquid to equalize to a common temperature.
3. Initial Expansion Phase:
   a. When the test section is completely filled and purged of air, gradually increase the pressure in the test section to the test pressure.
   b. Add makeup water as necessary to maintain the test pressure for 4 hours.
4. Test Phase:
   a. Reduce pressure by 10 pounds per square inch.
   b. Monitor pressure for 1 hour.
   c. Do not increase pressure or add makeup water.
   d. Pass/Fail Criteria:
      1) No visible leakage is observed.
      2) Pressure During the Test Phase:
         a) Remains steady.
         b) Remains within 5% of test phase pressure for 1 hour.
5. Retesting:
   a. Carefully depressurize the test section.
   b. Correct any faults or leaks in the test section.
   c. Do not attempt to correct faults or leaks while the test section is pressurized.
   d. Allow the test section to relax for 8 hours before re-pressurizing.
   e. After the relaxation period, repeat the initial expansion phase and test phase.
6. Remove and replace pipe if acceptable test results cannot be achieved.

G. Flushing:
   1. Sequence: After pressure and leakage tests.
   2. Normal Procedure: Will occur during testing of pump station.

H. Electrical Continuity:
   1. Test ductile iron pipe for continuity using pipe locating equipment by Metrotech or similar method.
   2. Repair breaks.

I. Deflection Test for PVC and HDPE Pipe:
   1. Pull Go, No Go Gage Through Each Section:
      a. At least 30 days after completion of backfill for piping installed by open cut.
      b. Pulled by one person with no mechanical advantage.
   2. If Go, No Go Gage Will Not Pass:
      a. Remove and replace section.
      b. Undamaged pipe may be reused.
   3. Vibratory Re-Rounding Device:
      a. Use not permitted.

END OF SECTION 33 34 00

SECTION 43 21 13.55 – SELF PRIMING CENTRIFUGAL PUMPS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the furnishing and installation of self priming centrifugal pumps.

1.3 DESIGN AND PERFORMANCE REQUIREMENTS

A. Design:
   1. Horizontal, V-belt driven, self priming centrifugal type.
   2. Complete with motor, adjustable motor base, pump mounting base, sheaves and belt guard.
   3. Capable of handling 3-inch diameter solids.
   4. Rated for continuous duty.
   5. Hydrostatically tested at 1.5 times the operating point or 1.25 times the shut-off head, whichever is greater.
   6. See Drawings for orientations.
   7. Suction and discharge connections: 10-inch flange.

B. Performance: West River Pump Station - Wet Weather Pumps (P-911, P-912, P-913):
   1. Pump operating speed: Sheaved to match design point using a nominal 1,800 rpm motor.
   2. Design Capacity:
      a. Single pump: 2,200 gpm at 64 feet TDH (does not include losses internal to pump).
      b. Two pumps in parallel: 3,800 gpm at ~~79~~ 81 ft TDH
   3. Efficiency: Greater than 75% at design operating conditions.
   4. Reprime Lift: 8.5 feet at operating speed.
   5. Maximum NPSHr: 12.4 feet at 2,700 gpm and operating speed.

1.4 SUBMITTALS

A. Shop Drawings: For pumps, motors and supports.
   1. General:
      a. Dimensions.
      b. Details of construction and installation.
   2. Pump Data:
      a. Manufacturer.
      b. Model.
      c. Performance curves includes capacity, head, NPSH required, efficiency, brake horsepower (over entire curve), impeller diameter, design point and shutoff head.
      d. Materials of construction.
      e. Pump orientation.
      f. Bearing types and lubrication equipment information.
      g. Seal types.
      h. Weight.
   3. Motor Data:
      a. Manufacturer.
      b. Model.
      c. Rated horsepower.
      d. Efficiency.
      e. Service factor.
      f. Current and load data.
      g. Bearing type.
      h. Weight.

B. Operation and Maintenance Manuals: For all pumping equipment.
   1. Equipment function, normal operating characteristics and limiting conditions.
   2. Assembly, installation, alignment, adjustment and checking instructions.
   3. Operating instructions for start-up, routine and normal operating, regulation and control, and shutdown and emergency conditions.
   4. Lubrication and maintenance instructions.
   5. Guide to "troubleshooting".
   6. Parts lists and predicted life of parts subject to wear.
   7. Outline, cross-sections, assembly drawings, engineering data and wiring diagrams.
   8. Test data and performance curves.
   9. Copies of all approved Shop Drawings submitted.

1.5 QUALITY ASSURANCE

A. Fabrication and Installation Personnel Qualifications:
   1. Trained and experienced in the fabrication and installation of the materials and equipment.
   2. Knowledgeable of the design and the reviewed Shop Drawings.

B. Manufacturer's Services:
   1. Submit Manufacturer's sworn statement that the equipment furnished complies with this Specification.
   2. Provide Manufacturer's field service.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in original, unbroken, brand marked containers or wrapping as applicable.

B. Handle and store materials in a manner which will prevent deterioration or damage, contamination with foreign matter, damage by weather or elements and in accordance with Manufacturer's directions.

C. Reject damaged, deteriorated or contaminated material and immediately remove from the Site. Replace rejected materials with new materials at no additional cost to Owner.

1.7 WARRANTY

A. Provide warranty against defects in material and workmanship for the entire pump and accessories for a period of 5 years after approved start-up of the equipment. Upon warranty occurrence the Manufacturer or authorized service center shall remove the pump, repair, reinstall and provide start-up on the repaired pump.

PART 2 - PRODUCTS:

2.1 PUMP MANUFACTURERS

A. Self priming centrifugal pumps shall be the product of:
   1. Gorman-Rupp, Super T series with Eradicator, Model T10C60SC-B.
   2. Or Engineer approved equal.

2.2 PUMP

A. Impeller:
   1. Dynamically balanced prior to shipment.
   2. Material: Ductile iron.
   3. Continuous, semi-open type, 2 vane.
   4. Trimmed to match design point (if necessary).
   5. Self-cleaning wear plate:
      a. With integral laser cut notches and tooth to dislodge solids.
      b. To constantly clear the impeller without use of blades or cutters.

B. Suction Elbow/Volute/Casing:
   1. Material: Cast iron Class 30.
   2. Equipped with 1 1/4-inch drain plug, 1/2-inch suction gauge plug, and 1/2-inch discharge gauge plug.
   3. Suction and Discharge Connections: 150-pound ANSI flat faced flange.
   4. Internal suction check valve.
   5. Provide clean out cover (upper) on suction elbow.

C. Impeller Shaft: AISI 17-4 pH stainless steel.

D. Shaft Seal Assembly:
   1. Balanced mechanical seal.
   2. Stationary member and the mated rotating member: Tungsten-titanium carbide alloy.
   3. Surfaces must be ground and polished to produce a flatness tolerance not to exceed 35 millionths of an inch.
   4. Stationary seal seat must be double floating with dual O-rings (internal and external) and self-aligning during periods of shock loads that will cause deflection, vibration, and axial or radial movement of the pump shaft.
   5. Removable and replaceable through the cover plate opening.
   6. Installed within a separate oil filled reservoir on the pump pedestal, the oil being both lubricating and cooling media.

E. Bearing Frame:
   1. Material: Grey iron No. 30.
   2. Bearing Lubrication: Oil.
   3. Oil level site glass.
   4. Provide 3/4-inch oil fill and drain plugs.

F. Pump Base:
   1. Base: Fabricated steel.
   2. Suitably constructed to support the full weight of the pump and motor under normal operation. Vibration-free under normal operation.

G. Motor Base:
   1. Materials of Construction: Fabricated steel.
   2. Adjustable for belt removal.
   3. Equipped with belt guard.

H. Motor:
   1. Power: 480 VAC, 60 Hz, 3 phase.
   2. Horsepower: 75.
   3. Speed: 1,750.
   4. Belt and sheave type.
   5. Bearings: Grease lubricated.
   6. Lifting Lugs: Capable of lifting the weight of the pump and motor.
   7. Enclosure: OPD.
   8. Inverter-duty rated.
   9. Premium efficiency, greater than 90% at full load.
   10. Insulation: NEMA Class F.
   11. Service Factor: 1.15.

I. Anchor Bolts:
   1. Stainless steel.
   2. Adequately sized for all anticipated forces and vibration that may occur during normal operation.

J. Automatic Air Release Valves
   1. With diaphragm and spring for self-priming cycle.
   2. 1-inch NPT.
   3. Materials:
      a. Valve body and inspection cover: Cast iron.
      b. O-ring: Buna-N
      c. Plunger rod: 304 stainless steel.
      d. Internal hardware: 304 stainless steel.
   4. Size valve and spring compression for static discharge head.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install equipment in conformance with:
   1. The Shop Drawings reviewed by Engineer.
   2. The Manufacturer's recommendations.

B. Drawings indicate suction and discharge centerline elevations common to a particular Manufacturer. Centerline elevations differ between manufacturers. Coordinate piping elevations and equipment pad heights according to pumps submitted.

C. Paint materials and equipment in accordance with Division 09 Section “Painting.”

3.2 MANUFACTURER’S FIELD SERVICES

A. General:
   1. Arrange and pay for Manufacturer's engineer to provide the services indicated below for a minimum onsite time of 2 days. Schedule the following as soon as practicable after installation and at times approved by Engineer and Owner.
   2. Manufacturer's Engineer: Check work, assist in start-up, demonstrate operation and maintenance to Owner's personnel and review operation and maintenance manual with Owner's personnel.
   3. Start-up services and operation/maintenance training services may or may not occur on the same Site visit. Coordinate schedules with Owner.

B. Installation Assistance:
   1. Services to include:
      a. Verify pump installation in accordance with Manufacturer’s recommendations.
      b. Submit written notice to Owner and Engineer of all deficiencies, changes, or additions.
      c. Start-up and shut-down procedures and requirements.
      d. Start-up and shut-down operational oversight and assistance.
      e. Operation and maintenance training on all equipment specified under this Section.
   2. Schedule: Coordinate with the Engineer, Owner, and any Subcontractors to complete the installation procedure.
      a. The Manufacturer's service representative shall review recommended operation and maintenance procedures with the Owner's personnel.
      b. The Owner shall be provided with 1 additional training day that can be used at no cost to the Owner within the first year of startup.

C. Promptly make all changes and additions required by Manufacturer's engineer.

3.3 CLEANING

A. Prior to acceptance of the work of this Section, thoroughly clean all installed materials, equipment and related areas in accordance with Division 01 Section “Cleaning and Waste Management.”

END OF SECTION 43 21 13.55

SECTION 46 51 36 – FINE BUBBLE AIR DIFFUSERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:
1. Drop legs.
2. Submerged manifolds and supports.
3. Diffuser element holders and gaskets.
4. Anchor bolts.
5. Expansion couplings.
6. Fine bubble membrane disc diffusers.

1.3 DESIGN AND PERFORMANCE REQUIREMENTS

A. Aeration:
1. Design:
a. Furnish fine bubble diffused air aeration equipment for 3 activated sludge aeration tanks with the following dimensions:
1) Aeration Tank 1 and 2:
a) Length = ~~69'-10" to 68'6",~~ see Drawings.
b) Width = see Drawings~~21'-11".~~
c) Tank Height = 17'-10".
d) Submergence Depth = 15'-0"
2) Aeration Tank 3:
a) Length = ~~69'-10".~~see Drawings.
b) Width = ~~19'-11".~~see Drawings.
c) Tank Height = 17'-10".
d) Submergence Depth = 15'-0".
b. Aeration system shall be arranged with 1 to 3 grid per tank.
1) Basis of Design is a 3 grid per tank system. Alterations in the Work required to accommodate the equipment differing in dimensions, required clearances, or other characteristics from that used as the basis of design herein and on the Drawings shall be provided as required to provide a complete system at no extra cost to the project.
c. Activated sludge aeration tanks consist of 1 existing tank and 2 new tanks.
d. Design characteristics of blowers for air supply to the fine bubble aeration system are as follows:
1) Ambient Air: 100 degrees F, 14.3 psig barometric pressure.
2) Discharge Pressure: 8 psig maximum.
3) Maximum Standard Air Rate: 8,400 SCFM at standard conditions and maximum blower speed (200% of average day required air flow).
4) Standard air range available from variable speed blowers is 700 to 6,800 SCFM.
2. Performance:
a. Aeration systems shall maintain a minimum dissolved oxygen concentration of 2.0 mg/l in the aeration basin and satisfy the following standard oxygen transfer rate and oxygen demand design conditions of the activated sludge system:
1) Average Condition: Total All 3 Tanks:
a) Standard Oxygen Requirement = 31,850 lbs/day.
b) Side Water Depth = 16 ft.
2) Peak Condition: Total All 3 Tanks:
a) Standard Oxygen Requirement = 42,350 lbs/day.
b) Side Water Depth = 16 ft.

b. The following equation shall be used to calculate the field correction factor (FCF) to convert standard oxygen transfer rates to actual oxygen transfer in wastewater:

$$FCF = \frac{ALPHA * (BETA * 10.24 - C_o)}{10.24}$$

Where: $$FCF = \frac{\text{Actual oxygen transfer rate (AOR)}}{\text{Standard oxygen transfer rate (SOR)}}$$

ALPHA = 0.55
BETA = 0.9
C_o = 2.0 mg/l minimum dissolved oxygen concentration in aeration tank

B. Reaeration:
1. Design:
   a. Furnish fine bubble diffused air aeration equipment for 2 reaeration tanks with a 208.5 square foot surface area (per tank) and with a 10.59 foot side water depth.
   b. Maximum diffuser submergence shall be 9.59 feet.
   c. Aeration system shall be arranged with 1 grid per tank.
   d. Reaeration system shall consist of 2 tanks operated in series. Two existing chlorine contact tanks shall be converted to reaeration tanks.
   e. Air supply to the fine bubble aeration system shall be dedicated reaeration blower and must provide the following:
      1) Blower Pressure: 5.45 PSIG.
      2) Pressure @ Top of Dropleg 4.80 PSIG.
      3) Total Airflow (SOR): 41 SCFM.
2. Performance:
   a. Aeration systems shall maintain a minimum dissolved oxygen concentration of 4.0 mg/l at the outlet of the reaeration tanks and satisfy the following standard oxygen transfer rate and oxygen demand design conditions of the reaeration system:

Design Condition	Total Airflow (SCFM)	Treatable SOR (lbs O_2/hr)
Design Peak Hour	41	9.44

1.4 SUBMITTALS

A. General: Ensure all submittals are in accordance with Division 01 Section “Submittal Procedures.” Submittals shall include a detailed drawing showing plan, elevation and appropriate cross-sections of aeration equipment and all anchor and support locations.

B. Shop Drawings: Submit 8 copies of Shop Drawings showing dimensions, and details of construction and installation for all aeration equipment.

C. Operations and Maintenance (O&M) Manuals: Submit 8 copies of O&M Manuals for all aeration equipment in accordance with Division 01 Section “Submittal Procedures.”

D. Performance Test Data:
1. Provide certified clean water test data performed by an independent testing agency to demonstrate standard oxygen transfer rate (SOR) and efficiency of the aeration diffusers.
2. Test procedures shall be in accordance with ASCE July 1984 publication: Standard for the Measurement of Oxygen Transfer in Clean Water.
3. Test shall be conducted in a tank with a minimum surface area of 100 square feet and diffuser submergence and density equal to that of the design conditions.

E. Design Calculations:
1. Provide design calculations to demonstrate that aeration equipment achieves performance criteria specified at field conditions.

2. Provide complete air headloss calculations for aeration equipment and complete air distribution network to demonstrate that system design is compatible with existing aeration blower pressure and capacity. Headloss calculations shall be derived using air at standard conditions and at a maximum air flow rate per diffuser.

1.5 QUALITY ASSURANCE

A. For fabrication and installation of the Work of this Section, use only personnel completely trained and experienced in fabrication and installation of the materials and equipment, and thoroughly familiar with the original design and reviewed Shop Drawings.

1.6 MANUFACTURER'S SERVICES

A. General: Provide the services of an engineer of the Manufacturer to check out aeration equipment after it has been installed and to instruct wastewater treatment plan personnel in the proper operation and maintenance of equipment installed under this Section.

B. Schedules and Duration:
1. Provide 3 trips of the Manufacturer's engineer.
2. Each trip shall result in a minimum of one 8-hour working day at the wastewater treatment plant site.
3. Each trip shall be in accordance with a schedule approved by Owner.

PART 2 - PRODUCTS

2.1 TYPE

A. Fine bubble aeration system shall be a fixed grid, membrane disc type.

B. Manufacturer:
1. SSI Aeration.
2. Sanitaire Aeration.
3. Environmental Dynamics International (EDI).
4. Or Engineer approved equal.

2.2 MATERIALS AND FABRICATION

A. Disk Diffusers:
1. 9-inch diameter.
2. Fabricate disc base and retainer nut from polypropylene.

B. Saddles:
1. Quick connect or pre-assembled header style.
2. EPDM gaskets.
3. Polypropylene construction.

C. Diffuser Membrane:
1. Circular diffuser membrane with integral O-ring of PTFE coated EPDM synthetic rubber compound with precision die formed slits.
2. One piece injection molded diffuser with minimum thickness of 0.080-inch for 9-inch diameter unit.
3. Incorporate integral check valve into membrane diffuser.
4. Design and test diffusers for a dynamic wet pressure (DWP) of 12 inches ± 20% water column at 1.0 SCFM/diffuser and 2 inches submergence.
5. Visual Uniformity: Observe diffusers for uniform air distribution across the active surface of the diffuser at 1.0 SCFM/diffuser and 2 inches submergence. Active surface is defined as the perforated horizontal projected area of the diffuser.
6. Maximum Tensile Strength of Diffuser: 10 psi at 2.4 SCFM/sq. ft. of material.
7. Quality Control: Test diffuser using primary sampling criteria outlined in Military Standard 105E.

8. PTFE coated EPDM membranes shall conform to the following physical properties:

Parameter	Value	ASTM Std
Specific Gravity:	≤ 1.25	
US Resistance	Carbon Black	
Extractible Oil %:	Max 10%	
Ozone Resistance	Pass	D1171A
Tensile Stress:	≥ 1200 PSI	D412
Durometer:	≥ 58% +/- 5%	D2240A
Elong - % Ret 70 Hrs:	75%	D573
Elong - % Min at Break:	350%	D412

D. Air Distribution Piping:
   1. Drop Pipes:
      a. Provide 1 air drop pipe per grid.
      b. Drop pipes shall be Schedule 10, 304L stainless steel.
      c. Provide 125-pound flanged connection and 90 degree elbow at top of drop pipe.
      d. Support drop pipe from upper connection with intermediate supports to wall.
      e. Provide expansion type connections between pipe sections to allow independent rotation.
   2. Air Manifolds:
      a. Manifold piping shall be unplasticized polyvinyl chloride (UPVC) with at least 3% TiO_2 added for ultraviolet protection.
      b. Schedule 40.
      c. Design manifold, connections and supports to resist thrust generated by expansion or contraction of air distribution headers.
      d. Support manifolds with stainless steel supports with maximum spacing of 8 feet.
      e. Fabricate manifolds with 4-inch diameter fixed joint connection to each air distribution header.
      f. Provice SS couplings.
   3. Air Distribution Headers:
      a. Air distribution headers shall be 4-inch UPVC SDR of 32.5 minimum perpendicular to air manifold.
      b. All connections between pipe sections, pipe and fittings, or fittings shall be expansion type couplings.
      c. Distribution pipe shall be provided with factory installed PVC mounting paddles for diffuser assemblies.
      d. Support anchors shall be 304 stainless steel with maximum spacing of 7.5 feet. Distribution header supports, or guides, shall allow longitudinal movement of header section to prevent stress buildup in header due to thermal expansion/contraction forces. Guide supports that clamp or grip the header will be unacceptable.
      e. Fabricate distribution headers with diffuser element holders factory solvent welded to crown of header. Attach diffuser element holders to distribution headers to resist a dead load of 200 pounds applied vertically to outer most edge of diffuser holder.
         1) Factory pre-assembled headers are acceptable.
   4. Supports:
      a. Manifold Supports: Shall include manifold hold-down, guide straps, anchor bolts and supporting structure. Guide straps shall be a minimum 2 inches wide. Provide supports with a mechanism to provide for 2-inch vertical adjustment for alignment of manifold in the field. Allow for tank floor slope of 1-foot of vertical.
      b. Air Distribution Header Supports:
         1) Provide stainless steel air distribution header supports of both guide and fixed type to allow for expansion of system.
         2) Guide supports shall consist of a self-limiting hold-down and sliding mechanism. Hold-down and sliding mechanism shall provide 1.5-inch wide contoured bearing surface with chamfered leading edges to minimize binding of air distribution header. Sliding mechanism shall provide minimum resistance to movement of air distribution header under full buoyant uplift load. Mechanism shall provide 1/8-inch clearance around header and be self-limiting if the mechanism is overtightened.
         3) Fixed supports shall consist of a hold-down mechanism and self-limiting clamp device. Hold-down mechanism and clamp shall provide 1.5-inch wide contoured bearing surface for air distribution header. Clamping device shall positively grip the air distribution header when tight and be self-limiting to prevent overstressing header if clamp is overtightened.

4) Provide supports with a mechanism to provide for 2-inch vertical adjustment for alignment of air distribution headers in the field. Adjusting and aligning mechanism shall be infinitely adjustable within its limits to allow precise leveling of air distribution headers and diffuser assemblies to within 61/4-inch of a common horizontal plane without removing head from support.
5) Attach supports to tank floor with stainless steel expansion type anchor bolts designed for embedment in 3000 psi concrete. Size anchor bolts with pull-out strength, design safety factory of 4 or more.

5. Airlift Liquid Purging System:
   a. Each air distribution grid shall have a Schedule 80 PVC drain line, sump and airlift purge system to drain the entire submerged aeration piping system terminating at a sump.
   b. Sump bottom elevation shall be lower than the invert of air distribution headers and drain lines.
   c. Connect 1-inch airlift educator line to sump and extend to a point 18 inches above basin water level and terminate with a PVC ball valve.
   d. Support airlift educator with stainless steel brackets.
6. Stainless Steel Materials and Fabrication:
   a. Fabricate all welded parts and assemblies from sheets and plates of 304L stainless steel. Fabricate non-welded parts and pieces from sheets and plates of 304 stainless steel.
   b. Pickle all stainless surfaces after fabrication by completely immersing all stainless steel assemblies and parts after welding and brushing in a pickling solution of 10% nitric acid and 3% hydrofluoric acid in a water bath at 140 degrees F for a minimum of 15 minutes. Parts shall be free of iron particles or other foreign material after this procedure.
   c. Do all welding in the factory using MG, TIG or plasma-arc welding inert gas processes. Field welding will not be permitted.
7. PVC Materials and Fabrication:
   a. Produce all PVC pipe and fittings from PVC compound with a minimum tensile strength of 7000 psi.
   b. Provide lower drop pipes and manifolds of diameter indicated on the Drawings with a minimum hydrostatic design stress rating of 2000 psi.
   c. Provide 4-inch diameter distribution headers as indicated on the Drawings with a maximum outside diameter to wall thickness ratio of SDR 32.5, and a hydrostatic design stress rating of 2000 psi.
   d. Add 2 parts by weight of titanium dioxide per 100 parts of resin to PVC compounds for air distribution headers, diffuser element holders and retainer rings to minimize ultraviolet light degradation.
   e. Factory solvent weld all PVC joints. Field solvent welding will not be permitted.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install all equipment in strict accordance with the Manufacturer's recommendation and the Drawings as reviewed by Engineer.

3.2 FIELD QUALITY CONTROL

A. Manufacturer's Field Services: Arrange and pay for Manufacturer's engineer to provide the services indicated below for a minimum onsite time of 2 days. Schedule the following as soon as is practical after installation, and at times approved by Engineer and Owner.
   1. Manufacturer's Engineer: Check work, assist in start-up, demonstrate operation and maintenance to Owner's personnel, and review operation and maintenance manual with Owner's personnel.

B. Promptly make all changes and additions required by Manufacturer's engineer.

C. Submit Manufacturer's engineer's written approval of installation.

3.3 PRODUCT TESTING AND QUALITY CONTROL

A. Test ~~ceramic~~ diffuser elements in the Manufacturer's facility for the following:
   1. Permeability.
   2. Strength.
   3. Dynamic wet pressure.
   4. Dimensional tolerances.

B. ~~Ceramic d~~Diffuser elements shall meet or exceed requirements for permeability, strength, dynamic wet pressure and dimensional tolerances as specified.

C. Select sample units for permeability testing in accordance with Military Standard 105D, Table 1, Inspection Level II (Double Sampling Plan) to achieve a value of percent defective (AQL) of 1.5% or less.

D. Select sample units for strength, DWP and dimensional tolerance testing from sample of diffusers tested for permeability. Permeability sample size shall be the lot or batch size for subsequent testing.

3.4 INSTRUCTIONS

A. When all required approvals of this portion of the Work have been obtained, and at a time designated by Owner, have Manufacturer's engineer thoroughly demonstrate to wastewater treatment plant personnel the operation and maintenance of all items installed under Work of this Section, and demonstrate the contents of the manuals submitted under this Section.

3.5 GUARANTEE

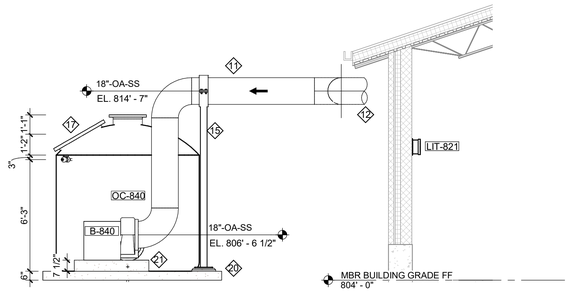
A. Guarantee air diffusion equipment shall perform in accordance with these Specifications when operated at specified design conditions.

3.6 WARRANTY

A. Warrant all parts to be free from defects in materials and workmanship for a period of 1 year, which shall begin at the project Substantial Completion date.

B. Provide installed replacement parts to Owner for any items found to be defective within the 1 year warranty period.

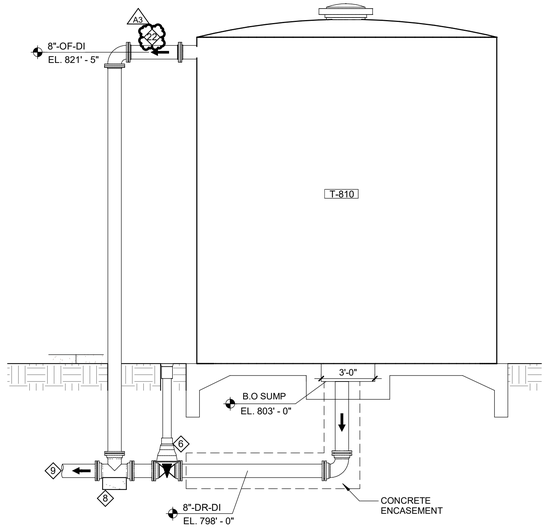
END OF SECTION 46 51 36



ODOR CONTROL VESSEL

3 SECTION

SCALE: 1/4" = 1'-0"



SOLIDS HOLDING TANK

2 SECTION

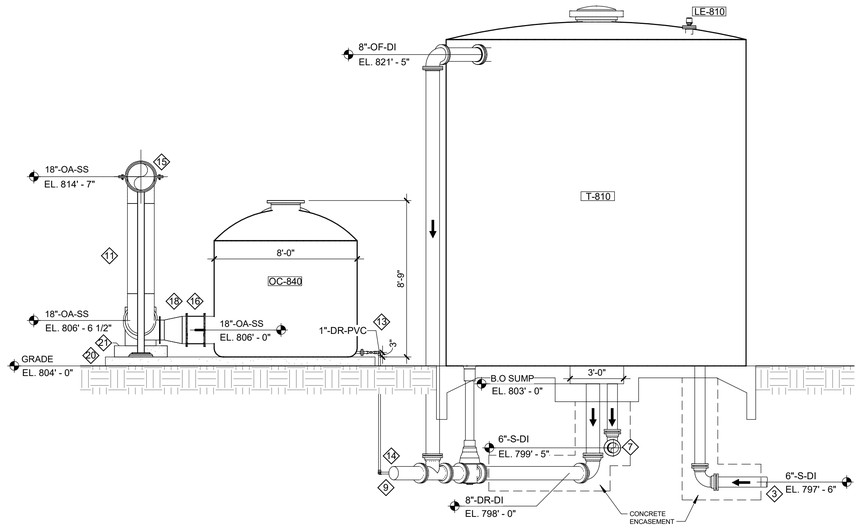
SCALE: 1/4" = 1'-0"

NOTES

1. SOLIDS HOLDING TANK TO BE EQUIPPED WITH THE FOLLOWING CONNECTION POINTS AND APPURTENANCES: ACCESS LADDER WITH FALL PROTECTION; 30"X30" ACCESS HATCH IN TANK COVER; 4" NOZZLE WITH BLIND FLANGE FOR LEVEL INDICATOR ON TANK DOME: 24" DIAMETER BOLTED MANWAY AT BASE OF TANK WALL; 24" DIAMETER VENT AT THE CENTER OF THE TANK DOME. FINAL LOCATIONS AND ORIENTATIONS TO BE COORDINATED WITH TANK MANUFACTURER AND CONTRACTOR. CONNECTIONS AND ANCHORS BY TANK MANUFACTURER.
2. CONCRETE ENCASE PIPING UNDER SOLIDS HOLDING TANK.
3. SEE CIVIL FOR PIPE CONTINUATION.

KEY NOTES

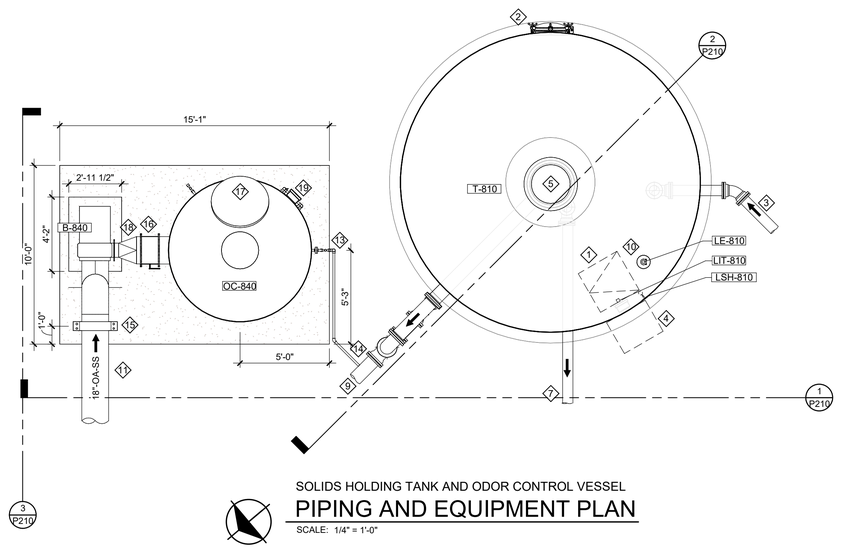
A3	1	DOME ACCESS HATCH, MINIMUM 18" x 24"
	2	30" DIAMETER TANK MANWAY.
	3	INLET SLUDGE PIPING.
	4	AREA FOR ACCESS LADDER WITH FALL PROTECTION.
	5	24" DIAMETER TANK DOME VENT.
	6	MECHANICAL JOINT PLUG VALVE WITH SHAFT IN HORIZONTAL.
	7	DISCHARGE SLUDGE PIPING.
	8	8" AGGREGATE FILL COMPACTED TO 95 PERCENT OF THE DENSITY.
	9	OVERFLOW PIPING CONNECTS INTO EXISTING 8" DRAIN PIPING. SEE CIVIL FOR CONTINUATION.
	10	4" NOZZLE WITH BLIND FLANGE FOR LEVEL INDICATOR.
	11	18-INCH ROUND STAINLESS STEEL DUCTWORK. SEE DIVISION 23 31 13 "METAL DUCTS" FOR DUCT REQUIREMENTS.
	12	SEE MECHANICAL FOR CONTINUATION.
	13	INSULATE ALL ABOVE GROUND DRAIN PIPING.
	14	TIE 1-INCH DRAIN LINE INTO 6-INCH DRAIN LINE FROM SOLIDS HANDLING TANK.
	15	FLOOR STAND WITH STRAP. SEE PROCESS DETAILS.
	16	18-INCH I.D. MANUAL CONTROL DAMPER.
	17	30-INCH DIAMETER ACCESS MANWAY.
	18	FRP TRANSITION PIECE.
	19	DIFFERENTIAL PRESSURE GAUGE.
	20	6" THICK REINFORCED CONCRETE SLAB ON 4" OF COMPACTED MDOT 21AA. REINFORCE SLAB WITH #5@12" O.C. EW AT MID-DEPTH.
	21	B-840 EQUIPMENT PAD. SEE STRUCTURAL FOR EQUIPMENT PAD ON CONCRETE SLAB DETAIL.
A3	22	8" OVERFLOW PIPE, TO BE DI, PVC, OR STAINLESS STEEL. TRANSITION AT GRADE TO BURIED DI PIPE.



SOLIDS HOLDING TANK AND ODOR CONTROL VESSEL

1 SECTION

SCALE: 1/4" = 1'-0"



NORTH

SOLIDS HOLDING TANK AND ODOR CONTROL VESSEL

PIPING AND EQUIPMENT PLAN

SCALE: 1/4" = 1'-0"

fishbeck
Engineers | Architects | Scientists | Constructors

City of Grand Ledge
Eaton County, Michigan

Wastewater Treatment Plant and
Sanitary Sewer System Improvements

REVISIONS

1/2/2024	A3	ADDENDUM NO. 3

10/10/2023 BIDS AND CONSTRUCTION

Drawn By	JEK
Designer	BAP
Reviewer	TDM
Manager	JWR

Hard copy is intended to be 24"x36" when plotted. Scale(s) indicated and graphic quality may not be accurate for any other size.

PROJECT NO.
201424

SHEET NO.

P210

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