City of Flint

Department of Purchases & Supplies

Sheldon A. Neeley

TO: All Proposers

FROM: Jennifer Ryan
Deputy Finance Director

DATE: **July 16, 2021**

SUBJECT: **Addendum #03 –** Bid# 22000047 – CWSRF Project Battery B Grit and Primary Settling Tanks

This addendum has been issued because of the following:

1. Bidding Documents Update

All other bidding terms, requirements, and conditions continue as indicated in the remaining original bid documents.

The Deputy Finance Director, Jennifer Ryan, is an officer for the City of Flint with respect to this RFP.

In the submission of their proposal, Proposer must acknowledge receipt of this addendum. Proposer shall acknowledge this addendum by signing and returning one copy of this notice with their submission.

Company Name: _____

Address: _____

City / State / Zip: _____

Telephone: _____ Fax: _____ Email: _____

Print Name: _____ Title: _____

Signature: _____ Date: _____

Thank you,

Jennifer Ryan
Deputy Finance Director

CITY OF FLINT, MICHIGAN
Water Pollution Control
Grit Battery B System and Primary Tank Improvements
Contract Number 200-156238-21001-S-1
SRF No. 5709-01

Addendum No. 3
July 15, 2021

To Prospective Bidders:

Information disclosed and/or questions raised since issuing Bidding Documents require that changes in or interpretations of these Bidding Documents be made as noted below. This Addendum No. 3 forms a part of the Contract Documents and modifies the original Bidding Documents dated June 2021. All provisions of the Bidding Documents, which are not so amended, remain in full force and effect.

CHANGES TO CONTRACT FORMS

1. Section 00400, BID FORM, delete and replace with Section 00400 BID FORM included as part of Addendum No. 3.

2. Section 00400, page 1, paragraph 3.01.A Bidder must acknowledge receipt of Addendum No. 1, 2 and 3 in space provided on Bid Form.

3. Section 00500, AGREEMENT, delete and replace with Section 00500 AGREEMENT included as part of Addendum No. 3

CHANGES TO SPECIFICATIONS

4. Section 05500, page 5, Paragraph 2.09.B, add the following;

   C. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A153/A153M for steel and iron hardware and with ASTM A123/A123M for other steel and iron products.

5. Section 05521, page 1, Paragraph 1.03.A, add the following;

   1. Uniform load of 50 lbf/ft applied in any direction.
   2. Concentrated load of 200 lbf applied in any direction.
   3. Uniform and Concentrated loads need not be assumed to act concurrently.

6. Section 09961, HIGH PERFORMANCE PAINTS AND COATINGS, delete section and replace with 09961 HIGH PERFORMANCE PAINTS AND COATINGS included as part of Addendum No. 3.

7. Section 11330, Page 3, Paragraph 2.04.A.2. add sentence as follows;

"Bearing shall be greased Timken tapered roller bearing"

8. Section 11335, Page 2, Paragraph 1.05, A. Delete this paragraph in its entirety and replace with new paragraph as follows:

   A. The equipment shall be packaged and shipped to prevent damage but still be convenient for handling. Unless manufacturer determines that partial assembly of some parts prior to shipping is possible, the part will arrive to the site individually except as noted in the following paragraphs.

9. Section 11335, Page 7, RECTANGULAR SLUDGE COLLECTOR MECHANISM SCHEDULE, Rotary scum pipes, In the "No. of Units" row change from "10" to read "20, 2 Scum pipes per Tank".

10. Section 14551, Page 4, Paragraph 2.04.C.3, delete sentence "Periodically, water shall be introduced into the collection chamber under Press Zone to flush organics and other fines. Flushing with water shall be five (5) seconds in duration once every operating cycle" replace as follows;

    "Wash water shall be continuously introduced during operation"

11. Section 14551, Page 4, Paragraph 2.04.D.4, delete sentence and replace as follows;

    "Auger shaft shall be 2" stainless steel schedule 40 pipe with 2" solid stainless steel stub shaft"

12. Section 14551, Page 4, Paragraph 2.04.D.6, delete sentence and replace as follows;

    "Auger and drain pan shall be self-cleaning and shall not be equipped with brushes or wipers"

13. Section 15110, Page 6, Paragraph 2.05.B.1.q add subparagraph as follows;

    r. All electrical motor actuators to be provided by local actuator servicing representative. Local actuator servicing representative to provide mounting and all adaptors required for a complete functioning valve and/or gate system. Actuator supplier shall verify all size and torque requirements with gate and valves manufacturer to ensure proper range of operation and coordinate these items prior to shop drawing submittals. Actuator supplier to coordinate and provide seamless equipment warranty. Contractor to install valve, gate, adaptors, and electrical actuator on site.

14. Section 15110, Page 8, Paragraph 2.05.B.2.l add subparagraph as follows;

    m. All electrical motor actuators to be provided by local actuator servicing representative. Local actuator servicing representative to provide mounting and all adaptors required for a complete functioning valve and/or gate system. Actuator supplier shall verify all size and torque requirements with gate and valves manufacturer to ensure proper range of operation and coordinate these items prior to shop drawing submittals. Actuator supplier to coordinate and provide seamless equipment warranty. Contractor to install valve, gate, adaptors, and electrical actuator on site.

CHANGES TO DRAWINGS

1. Sheet A-002, GENERAL NOTES, add note as follows;

   "4. ALL NEW RAILING SHALL BE ALUMINUM TWO-LINE RAIL DESIGN"

   "5. NEW MATERIAL AND EQUIPMENT WITH GALVANIZED COATING DOES NOT REQUIRE ADDITIONAL IN FIELD FINISH COATING UNLESS SURFACE IS DAMAGED."

2. Sheet A-102, KEYNOTE, delete Note No. 10 and replace as follows; "10 NEW ALUMINUM STAIRS BY CONTRACTOR"

3. Sheet A-102, KEYNOTE, delete Note No. 11 and replace as follows; "11 FRP GRATING PLATFORM"

4. Sheet A-102, KEYNOTE, delete Note No. 37 and replace as follows; "37 GALV STEEL TUBE POST EACH SIDE OF WINDOW"

5. Sheet A-102, FLOOR PLAN – MAIN LEVEL – NEW WORK make following changes;
   Key note call out "22" shall be changed to "24"

   Key note call out "1" shall be changed to "6"

   Delete key note call out "12"

6. Sheet A-301, SECTION 2, change keynote call out "18" to "28".

7. Sheet S-001, STRUCTURAL GENERAL NOTES, add note as follows;

   "7. ALL NEW RAILING SHALL BE ALUMINUM TWO-LINE RAIL DESIGN"

8. Sheet A-401, SECTION 8, add note "SEE SHEET S-304 SECTION M FOR STAIR THREAD AND RISER INFORMATION, AND CLARIFICATION OF INFORMATION IN THIS SECTION."

9. Sheet S-103, delete sheet and replace with revised Sheet S-103, attached, to address image of Electrical Room pads over grit tank area.

10. Sheet S-105, GRIT B BUILDING ADDITION EL. 729.25, Add Note as follows;

    "SUPPORT FRAME TO BE GALVANIZED STEEL MEMBERS, GRATING TO BE FRP."

11. Sheet S-105, GRIT BUILDING B ADDITION FOUNDATION AND SLAB PLAN, at call out "STEEL SKID PLATE", add "SEE SECTION U SHEET S-305 FOR DETAILS"

12. Sheet S-304, SECTION L, add note ""SEE SHEET A-401 SECTION 9 FOR STAIR THREAD AND RISER INFORMATION, AND CLARIFICATION OF INFORMATION IN THIS SECTION."

13. Sheet S-304, SECTION H, add note ““SEE SHEET A-401 SECTION 7 FOR STAIR THREAD AND RISER INFORMATION, AND CLARIFICATION OF INFORMATION IN THIS SECTION.”

14. Sheet S-503, DETAIL 2, change “FRP” to “GALV STEEL”, two locations.

15. Sheet D-003, add note for clarification as follows;

    3. CONTRACTOR SHALL PROVIDE 1-1/2” TAP ON 6-INCH PUMP SUCTION PIPE BETWEEN PLUG VALVE AND WALL FOR CONNECTION OF PEW FLUSHING LINE. SEE SHEET DETAILS ON D-500 FOR CONNECTION. TYPICAL OF FOUR LOCATIONS.

    4. CONTRACTOR SHALL PROVIDE 1-1/2” TAP ON 4-INCH PUMP DISCHARGE PIPE AS SHOWN ON D-104 AND D-301 FOR CONNECTION OF PEW FLUSHING LINE. SEE SHEET DETAILS ON D-500 FOR CONNECTION. TYPICAL OF TWO LOCATIONS.

16. Sheet D-102, delete sheet and replace with revised Sheet D-102, attached, to address image of Electrical Room pads over grit tank area.

17. Sheet D-104, GRIT PUMPS SUCTION PIPING PLAN, change valves “P.20X.1” thru “P.20X.4” to “P.203.1” thru “P.203.4”.

18. Sheet D-600, VALVE SCHEDULE, PLUG VALVES, valves P.203.1-4, in “SIZE” change from “6” to “4”.

19. Sheet M-201, delete sheet and replace with Sheet M-201 included as part of Addendum No. 3.

20. Sheet M-601, Add schedule as follows;

CONTROL DAMPER SCHEDULE						
MARK	DESCRIPTION	DUCT SIZE (IN)	AIRFLOW (CFM)	MATERIAL	ACTUATOR	NOTES
CD-1	SUPPLY DAMPER	24"	4200 CFM	FIBERGLASS	ELECTRIC - SPRING RETURN	

21. Sheet M-701, add Sheet M-701 included as part of Addendum No. 3.

22. Sheet P-601, PLUMBING FIXTURE SCHEDULE, TD-1, change “3” to “6”.

23. Sheet E-004, Add note as follows,“INSTALL YELLOW JACKETED POLYEHYLENE NO.10AWG SOLID TRACER WIRE OVER ALL DUCT BANKS”.

24. Sheet E-102

    Delete the following notes, “NEMA 3R/4 STAINLESS STEEL ENCLOSURE, 5KV LOAD INTERRUPTER SWITCH. 38 KA RMS SYM. BRACING”.

Replace as follows, "NEMA 3R/4 ENCLOSURE, 5KV LOAD INTERRUPTER SWITCH. 38 KA RMS SYM. BRACING".

25. Sheet E-106, Add following clarification notes to drawings:

    Note:

    No. 1 – AT EXHAUST FAN NO. 1 (ADDITION), AN AIR FLOW SWITCH IS BEING PROVIDED. THE AIR FLOW SWITCH IS TO BE WIRED TO GIOP-1 SPARE INPUT AS DESCRIBED HEREIN. THE AIR FLOW SWITCH SHOULD BE SHOWN ON THE ONE-LINE DIAGRAM TO THE RIGHT OF THE PUSHBUTTON AND THERMOSTAT.

26. Sheet E-111, Add notes as follows:

    1. AN AIR FLOW SWITCH IS BEING PROVIDED WITH THE MAU UNIT. THIS IS TO BE WIRED TO GIOP-1 SPARE INPUT. PROVIDE A 1 INCH CONDUIT WITH 8#14 FROM THE MAU-1 UNIT TO THE AIR FLOW SWITCH. PROVIDE PVC-RMC CONDUIT AND SEAL FITTINGS AS REQUIRED.

    2. FROM MAU-1 FURNISH AND INSTALL A 1 INCH CONDUIT WITH SEAL FITTING AND 2-2/C#18SH CABLES. CONNECT TO ANALOG INPUTS SHOWN FOR FAN MOTOR AMPERAGE.

    3. CONNECT FROM MAU-1 TO GIOP-1 INPUTS FOR MAU-1 RUNNING, IN AUTO, FAULT, NO AIR FLOW, SMOKE AND FREEZESTAT. CONNECT TO SPARE INPUTS AT GIOP-1 AS DESCIBED HEREIN.

27. Sheet E-307, Add notes as follows,

    "AN ALARM LIGHT/HORN IS TO BE SHOWN IN THE SE CORNER OF THE UNLOADING ROOM (NEMA 7 RATED) AND JUST OUTSIDE THE LOADING ROOM (NEMA 7 RATED). FURNISH AND INSTALL FROM EACH LIGHT/HORN A 1 INCH CONDUIT WITH 6#12 WIRES, SEAL FITTING TO GIOP-1. CONNECT TO SPARE OUTPUTS AS DESCRIBED HEREIN".

28. Sheet E-307, Delete note in center of page regarding existing lighting and replace as follows,

    "EXISITNG LED INTERIOR LIGHTING REMAIN. CONTRACTOR SHALL INCLUDE IN BID LABOR AND MATERIALS TO REMOVE AND REINSTALL UP TO 25 EXISTING LIGHT FIXTURES DURING THE PROCESS FOR INTERIOR PENDANT MOUNTED FIXTURES AND THE EXTERIOR POLE MOUNTED FIXTURES. INCLUDE FOR EACH FIXTURE TO REWORK SEAL FITTINGS, AND PROVIDE 10 FEET OF NEW PVC-RMC CONDUIT NEMA 7 BOXES AND NEW SEAL FITTINGS. AND WIRE AS REQUIRED. (TYP. FOR 25 FIXTURES)".

29. Sheet E-308, Add note as follows,

"CONTRACTOR SHALL INCLUDE IN BID TO REMOVE THE EXISTING EXTERIOR POLE MOUNTED FIXTURES SHOWN TO SUIT THE NEW CONSTRUCTION AND REINSTALL IN SAME LOCATION AFTER COMPLETION OF TANKS. REFER TO NOTE ON SHEET E-307. CONDUIT TO BE PVC-RMC".

30. Sheet E-312, Add note as follows:

    4. AN ALARM LIGHT/HORN IS TO BE SHOWN ON THE WEST WALL OF THE ELECTRICAL ROOM (NEMA 4 RATED). FURNISH AND INSTALL A 1 INCH CONDUIT WITH 6#12 WIRES TO GIOP-1. CONNECT TO SPARE OUTPUTS AS DESCRIBED HEREIN.

31. Sheet E-314, Add note as follows,

    "FIELD LOCATE INSTALLATION OF THE TWO NEW ADDITONAL MCC-XP2A SECTIONS TO AVOID EXISTING ROOF DRAIN".

32. Sheet I-325, Add following clarification note to drawings:

    "AT RACK 4 SLOT 6, PROVIDE FUSING FOR EACH OF THE FOLLOWING INPUTS AND CONNECT AS FOLLOWS: INPUTS 9-14 ARE MAU-1 RUNNING, IN AUTO, FAULT, NO AIR FLOW, SMOKE, AND FREEZE STAT. AT INPUT NO.15, PROVIDE FUSE AND CONNECT INPUT FOR EXHAUST FAN NO. 1 (ADDITION) NO AIR FLOW."

33. Sheet I-326, Add following clarification note to drawings:

    "AT RACK 4 SLOT 8, CONNECT OUTPUTS 13, 14, AND 15 FOR THE ALARM LIGHT/HORN FOR THE THREE UNITS ADDED ABOVE. OUTPUT 13 IS FOR LOADING ROOM, OUTPUT 14 IS THE EXTERIOR LOADING ROOM, OUTPUT 15 IS THE ELECTRICAL ROOM. FURNISH AND INSTALL AN INTERPOSING RELAY AT EACH OF THESE OUTPUTS FOR PROVIDING 120VAC POWER FOR THESE THREE LIGHT/HORNS. WIRE A NORMALLY OPEN CONTACT OFF EACH RELAY TO SWITCH 120VAC POWER TO EACH LIGHT/HORN. POWER FROM SPARE 5A BREAKER AT LINE 39 SHEET I-317."

END OF ADDENDUM

Tetra Tech

This Addendum No. 3 consists of:

6 Pages of Addendum Text
1 – Section 00400 Bid Form
1 – Section 00500 Agreement
1 – Section 09961 High Performance Paints and Coatings

1 - Revised Sheet S-103
1 - Revised Sheet D-102
1 - Revised Sheet M-201
1 - Revised Sheet M-701

SECTION 00400 - BID FORM

City of Flint
Water Pollution Control
Grit Battery "B" System and Primary Tank Improvements
SRF No. 5709-01

Contract 200-156238-21001

THIS BID IS SUBMITTED TO:

City of Flint – Finance Department Division of Purchase and Supplies
Owner
1101 S. Saginaw St., Room 203, 2nd Floor
Address
Flint, MI 48502
City, State, Zip

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.

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

3.01 In submitting this Bid, Bidder represents, as set forth in the Agreement, that:

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

Addendum No.	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 all Federal, State, and local 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) which have been identified in the Supplementary Conditions as provided in Paragraph 4.02 of the General Conditions, and

2. Reports and drawings of a Hazardous Environmental Condition, if any, which has been identified in the Supplementary Conditions as provided in Paragraph 4.06 of the General Conditions.

E. Bidder has obtained and carefully studied (or assumes responsibility for having done so) all additional or supplementary examinations, investigations, explorations, tests, studies and data concerning conditions (surface, subsurface and Underground Facilities) at or contiguous to the Site which may affect cost, progress, or performance of the Work or which relate to any aspect of 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 to be employed by Bidder, and safety precautions and programs incident thereto.

F. Bidder does not consider that any 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 and in accordance with the other terms and conditions of the Bidding Documents.

G. Bidder has correlated the information known to Bidder, information and observations obtained from visits to the Site, reports and drawings identified in the Bidding Documents, and all additional examinations, investigations, explorations, tests, studies, and data with 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.

J. In preparation of this Bid, Bidder acknowledges that it will not discriminate against any employee or applicant for employment with respect to hire, tenure, conditions, or privileges of employment, or a matter directly or indirectly related to employment, because of race, color, religion, national origin, age, sex, height, weight, marital status, or a disability that can be reasonable accommodated. OWNER will require this covenant be placed in the Contract with any subcontractor employed in the performance of this Contract.

K. OWNER will utilize funds from the State Revolving Loan Fund (SRF) on the Project. Bidders acknowledge that they must:

1. Revolving Loan Fund projects require the use of Prevailing Wages as explained in Section 00450.

2. Revolving Loan Fund projects require the use of the Buy American Contract requirements as explained in Section 00458.

3. Complete the Certification Regarding Debarment, Suspension and Other Responsibility Matters form in Section 00450, or explanation why it cannot certify the terms included in the certification, within seven (7) days after a request from OWNER.
    a. In addition, each prospective subcontractor and supplier must submit a completed certification or explanation to CONTRACTOR for all procurement transactions of $25,000 or more. The submission of the certification or explanation is also required for all subtier subcontractors.

L. OWNER will require the use of prevailing wage rates on this Project. Bidders acknowledge that

M. All claims and disputes arising from related Work at Site by other contractors shall be settled in accordance with Paragraph 7.03 of the Supplementary Conditions.

4.01 Bidder further represents that 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 agreement or rules of any group, association, organization or corporation; Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid; Bidder has not solicited or induced any individual or entity to refrain from bidding; and Bidder has not sought by collusion to obtain for itself any advantage over any other Bidder or over OWNER.

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

A. BASE BID PRICE _____ ($_____)
(use words) (figures)

B. All specific allowances are included in the price(s) set forth above and have been computed in accordance with Paragraph 11.02 of the General Conditions.
    1. Included in the Bid Price is a Lump Sum Allowance for WPC system integration programming in the amount of $ 150,000.
    2. Included in the Bid Price is a Lump Sum Allowance for Unforeseen Conditions in the amount of $125,000.

C. Unit Price Adjustments to the Lump Sum Bid Price for this Contract are set forth in the Specifications. The cost for installing quantities listed below shall be included in the Lump Sum Bid Price. If increases or decreases in these quantities occur, the Contract Price will be adjusted by Change Order on the basis of the following:

Item and Location in Specifications	Number of Units to be Included with Bid	Unit for Adjustment	Adjustment Price Per Unit
Equipment Demolition			
Primary Tank Mechanisms, scum pipe and trough	1	Lump Sum	
Grit removal tank screw collector, grit bucket elevator, and washer	1	Lump Sum	
Concrete Repair			

Item and Location in Specifications	Number of Units to be Included with Bid	Unit for Adjustment	Adjustment Price Per Unit
Concrete Repair, Type A	10,500	Ft	
Concrete Repair, Type B	2,200	Cft	
Concrete Repair, Type C	1,100	Cft	
Pipe Asbestos Gasket Removal and Disposal			
6”-12” Diameter	20	EA	

1. Adjustment prices are subject to acceptance by OWNER, and rejections of one or more adjustment prices will not invalidate acceptance of this Bid.
2. Bidder acknowledges that estimated quantities are not guaranteed, and are solely for the purpose of comparison of Bids, and final payment for all Unit Price Bid items will be based on actual quantities provided, determined as provided in the Contract Documents.
3. Pipe gasket removal is for additional cost above removal of standard non-asbestos gaskets.

6.01 Equipment Evaluation. OWNER reserves the right to evaluate the "EQUIPMENT EVALUATION" data and prices received for the products listed below in accordance with Paragraphs 14.04 and 19.07 of the Instructions to Bidders.

Section	Equipment Item	Manufactured By	Price
11322	Grit Equipment		$
11330	Screen Equipment		$
11335	Primary Sludge Collector		$

7.01 CONTRACTOR shall list subcontractors proposed for the following Work.

Discipline	Subcontractor Name
Demolition	_____
Concrete	_____
Concrete Repair	_____
Painting	_____
Process Piping and Equipment	_____
HVAC	_____
Electrical	_____
Instrumentation	_____

8.01 Bidder agrees that the Work will be substantially completed and completed and ready for final payment in accordance with Paragraph 14.07.B of the General Conditions on or before the dates or within the number of calendar days indicated in the Agreement.

9.01 Bidder accepts the provisions of the Agreement as to liquidated damages in the event of failure to complete the Work within the times specified above, which shall be stated in the Agreement.

10.01 The following documents are attached to and made a condition of this Bid:

A. Evidence of Bidder's qualification to do business in the state where the Project is located or covenant to obtain such qualification prior to award of the Contract; and

B. Required Bid Security in the form of a certified check, bank check, or a Bid Bond; and

C. Section 00450 – Certificate Regarding Debarment, suspension, and other Responsibility Matters

D. Section 00450 – Complete Good Faith Effort Worksheet.

11.01 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.

SUBMITTED on _____, 20___.

State Contractor License No. _____ (If applicable)

If Bidder is:

An Individual

Name (typed or printed): _____

By: _____ (SEAL)

(Individual's signature)

Doing business as: _____

Business address: _____

_____

Phone No.: _____ FAX No.: _____

A Partnership

Partnership Name: _____ (SEAL)

By: _____

(Signature of general partner -- attach evidence of authority to sign)

Name (typed or printed): _____

Business address: _____

Phone No.: _____ FAX No.: _____

A Corporation

Corporation Name: _____ (SEAL)

State of Incorporation: _____

Type (General Business, Professional, Service, Limited Liability):_____

By: _____

(Signature -- attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

(CORPORATE SEAL)

Attest _____

(Signature of Corporate Secretary)

Business address: _____

_____

Phone No.: _____ FAX No.: _____

Date of Qualification to do business is _____

A Joint Venture

Joint Venturer Name: _____ (SEAL)

By: _____
(Signature of joint venture partner -- attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

Business address: _____

_____

Phone No.: _____ FAX No.: _____

Joint Venturer Name: _____ (SEAL)

By: _____
(Signature -- attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

Business address: _____

_____

Phone No.: _____ FAX No.: _____

Phone and FAX Number, and Address for receipt of official communications:

_____

_____

(Each joint venturer must sign. The manner of signing for each individual, partnership, and corporation that is a party to the joint venture should be in the manner indicated above.)

END OF SECTION

SECTION 00500 - AGREEMENT

THIS AGREEMENT is by and between City of Flint, MI

(hereinafter called OWNER) and _____

(hereinafter called CONTRACTOR).

OWNER and CONTRACTOR, in consideration of the mutual covenants hereinafter set forth, agree as follows:

ARTICLE 1 - WORK

1.01 CONTRACTOR shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows:

A. The Work consists of improvements to the primary clarifiers and Grit Battery B at the City of Flint Water Pollution Control Facility. The work includes improvements to the ten primary clarifiers including replacement of existing primary clarifier sludge collection mechanisms, primary clarifier influent gates, effluent trough, and concrete rehabilitation. The work also includes improvements to the Grit Battery B including replacement of the aerated grit removal system with four stacked plate grit settlers, installation of two mechanical bar screens with washer compactor units, installation of grit washer and classifier units, replacement of existing 60-inch influent pipe, gate replacement, building addition to house screenings and grit dumpster, building improvements, concrete rehabilitation and electrical system improvements.

ARTICLE 2 - THE PROJECT

2.01 The Project for which the Work under the Contract Documents may be the whole or only a part is generally described as follows:

City of Flint

Water Pollution Control

Aeration System Improvements

SRF No. 5709-01

Contract 200-156238-21001

ARTICLE 3 - ENGINEER

3.01 The Project has been designed by Tetra Tech, Inc., 3497 Coolidge Rd, East Lansing, Michigan 48823, who is hereinafter called ENGINEER and who is to act as OWNER's representative, assume all duties and responsibilities, and have the rights and authority assigned to ENGINEER in the Contract Documents in connection with the completion of the Work in accordance with the Contract Documents.

ARTICLE 4 - CONTRACT TIMES

4.01 Time of the Essence

A. All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

4.02 Days to Achieve Substantial Completion and Final Payment

A. The Work will be substantially completed within 600 days after the date when the Contract Times commence to run as provided in Paragraph 2.03 of the General Conditions, and completed and ready for final payment in accordance with Paragraph 14.07 of the General Conditions within 630 days after the date when the Contract Times commence to run.

4.03 Liquidated Damages

A. CONTRACTOR and OWNER recognize that time is of the essence of this Agreement and that OWNER will suffer financial loss if the Work is not completed within the times specified in Paragraph 4.02 above, plus any extensions thereof allowed in accordance with Article 12 of the General Conditions. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by OWNER if the Work is not completed on time. Accordingly, instead of requiring any such proof, OWNER and CONTRACTOR agree that as liquidated damages for delay (but not as a penalty), CONTRACTOR shall pay OWNER one thousand dollars ($1,000) for each day that expires after the time specified in Paragraph 4.02 for Substantial Completion until the Work is substantially complete. After Substantial Completion, if CONTRACTOR shall neglect, refuse, or fail to complete the remaining Work within the Contract Time or any proper extension thereof granted by OWNER, CONTRACTOR shall pay OWNER one thousand dollars ($1,000) for each day that expires after the time specified in Paragraph 4.02 for completion and readiness for final payment until the Work is completed and ready for final payment.

ARTICLE 5 - CONTRACT PRICE

5.01 OWNER will pay CONTRACTOR for completion of the Work in accordance with the Contract Documents an amount in current funds equal to the sum of the amounts determined pursuant to this Paragraph 5.01 in the amount listed below:

A. For all Work, a Lump Sum of:

_____ ($_____)
(use words) (figure)

B. All specific allowances are included in the price(s) set forth above and have been computed in accordance with Paragraph 11.02 of the General Conditions.

1. Included in the Bid Price is a Lump Sum Allowance for WPC system integration programming in the amount of $ 150,000.
2. Included in the Bid Price is a Lump Sum Allowance for Unforeseen Conditions in the amount of $125,000.

C. Lump Sum Price Adjustments have been established for this Contract. If increases or decreases in these quantities occur, the Contract Price is to be adjusted by Change Order on the basis of the following:

Item and Location in Specifications	Number of Units to be Included with Bid	Unit for Adjustment	Adjustment Price Per Unit
Equipment Demolition			
Primary Tank Mechanisms, scum pipe and trough	1	Lump Sum	
Grit removal tank screw collector, grit bucket elevator, and washer	1	Lump Sum	
Concrete Repair			
Concrete Repair, Type A	10,500	Ft	
Concrete Repair, Type B	2,200	Cft	
Concrete Repair, Type C	1,100	Cft	
Pipe Asbestos Gasket Removal and Disposal			
6”-12” Diameter	20	EA	

1. Adjustment prices are subject to acceptance by OWNER, and rejections of one or more adjustment prices will not invalidate acceptance of this Bid.
2. Bidder acknowledges that estimated quantities are not guaranteed, and are solely for the purpose of comparison of Bids, and final payment for all Unit Price Bid items will be based on actual quantities provided, determined as provided in the Contract Documents.
3. Pipe gasket removal is for additional cost above removal of standard non-asbestos gaskets

D. All specific allowances are included in the above price and have been computed in accordance with Paragraph 11.02 of the General Conditions.

E. All specific OWNER-selected alternates are included in the price(s) set forth above, and have been computed in accordance with Paragraph 11.01 of the General Conditions.

ARTICLE 6 - PAYMENT PROCEDURES

6.01 Submittal and Processing of Payments

A. CONTRACTOR shall submit Applications for Payment in accordance with Article 14 of the General Conditions. Applications for Payment will be processed by ENGINEER as provided in the General Conditions.

6.02 Retainage

A. OWNER will make progress payments on account of the Contract Price on the basis of CONTRACTOR’s Applications for Payment in accordance with Paragraph 14.02.C of the General Conditions during performance of the Work as provided in Paragraph 6.02.A.1 below. All such payments will be measured by the schedule of values established in Paragraph 2.07.A of the General

Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no schedule of values, as provided in the General Requirements:

1. The provisions set forth in Michigan Public Acts of 1980, Act No. 524, shall be adhered to by OWNER and CONTRACTOR for retainage. A copy of the Act is included in Section 00615, Act No. 524, Michigan P.A. 1980.
2. The OWNER shall pay up to 70 percent on equipment and material that has been delivered to the site but is not yet installed. Items shall be properly stored per manufacturers guidelines.
3. The OWNER shall pay up to 90 percent on equipment and material that has been installed but is not yet operational.

6.03 Final Payment

A. Upon final completion and acceptance of the Work in accordance with Paragraph 14.07 of the General Conditions, OWNER shall pay the remainder of the Contract Price as recommended by ENGINEER as provided in said Paragraph 14.07.

ARTICLE 7 - INTEREST

7.01 All moneys not paid when due as provided in Article 14 of the General Conditions shall bear interest at the prevailing passbook savings rate at the place of the Project.

ARTICLE 8 - CONTRACTOR'S REPRESENTATIONS

8.01 In order to induce OWNER to enter into this Agreement CONTRACTOR makes the following representations:

A. CONTRACTOR has examined and carefully studied the Contract Documents and the other related data identified in the Bidding Documents.

B. CONTRACTOR 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. CONTRACTOR is familiar with and is satisfied as to all Federal, State, and local Laws and Regulations that may affect cost, progress, and performance of the Work.

D. CONTRACTOR 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) which have been identified in the Supplementary Conditions as provided in Paragraph 4.02 of the General Conditions, and
2. Reports and drawings of a Hazardous Environmental Condition, if any, at the Site which has been identified in the Supplementary Conditions as provided in Paragraph 4.06 of the General Conditions.

E. CONTRACTOR has obtained and carefully studied (or assumes responsibility for having done so) all additional or supplementary examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface, and Underground Facilities) at or contiguous to the Site

which may affect cost, progress, or performance of the Work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed by CONTRACTOR, including applying the specific means, methods, techniques, sequences, and procedures of construction, if any, expressly required by the Contract Documents to be employed by CONTRACTOR, and safety precautions and programs incident thereto

F. CONTRACTOR does not consider that any further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract Documents.

G. All claims and disputes arising from related Work at Site by other contractors shall be settled in accordance with Paragraph 7.03 of the Supplementary Conditions.

H. CONTRACTOR has correlated the information known to CONTRACTOR, information and observations obtained from visits to the Site, reports and drawings identified in the Contract Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Contract Documents.

I. CONTRACTOR has given ENGINEER written notice of all conflicts, errors, ambiguities, or discrepancies that CONTRACTOR has discovered in the Contract Documents, and the written resolution thereof by ENGINEER is acceptable to CONTRACTOR.

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

K. CONTRACTOR acknowledges that it shall not discriminate against any employee or applicant for employment with respect to hire, tenure, conditions, or privileges of employment, or a matter directly or indirectly related to employment, because of race, color, religion, national origin, age, sex, height, weight, marital status, or a disability that can be reasonable accommodated. OWNER will require this covenant be placed in the Contract with any subcontractor employed in the performance of this Contract. A breach of this covenant shall be regarded as a material breach of the Contract.

L. OWNER will require the use of prevailing wage rates on this Project. CONTRACTOR must comply with:

1. Section 00450 - Prevailing Wage Rates, General Decision Number MI20210083, dated 05/14/2021.
2. Section 00458 – Buy American Contract Language

ARTICLE 9 - CONTRACT DOCUMENTS

9.01 Contents

A. The Contract Documents consist of the following:

1. This Agreement (Pages 00500-1 to 8, inclusive);
2. Performance Bond (Pages 00613-1 to 2, inclusive);
3. Payment Bond (Pages 00614-1 to 2, inclusive);
4. General Conditions (Pages 00700-1 to 39, inclusive);

5. Supplementary Conditions (Pages 00800-1 to 13, inclusive);

6. Specifications as listed in the table of contents of the Project Manual;

7. Drawings consisting of a cover sheet and sheets enumerated as follows:

Volume I	Drawing No.	Volume II	Drawing No.
General	G-1 through _____, inclusive	Pipework	P-1 through _____, inclusive
Architectural	A-1 through _____, inclusive	Mechanical	M-1 through _____, inclusive
Structural	S-1 through _____, inclusive		

Volume III	Drawing No.
Electrical	E-1 through _____, inclusive
Instrumentation	I-1 through _____, inclusive

With each sheet bearing the following general title:

City of Flint
Water Pollution Control
Aeration System Improvements
SRF No. 5709-01
Contract 200-156238-21001

7. Addenda (numbers _____ to _____, inclusive);

8. Exhibits to this Agreement (enumerated as follows):
   a. Notice to Proceed (Page 00550-1);
   b. CONTRACTOR's Bid (Pages 00400-1 to _____, inclusive);
   c. Documentation submitted by CONTRACTOR prior to Notice of Award (pages _____ to _____, inclusive);
   d. _____;

9. The following which may be delivered or issued on or after the Effective Date of the Agreement and are not attached hereto:
   a. Written Amendments;
   b. Work Change Directives;
   c. Change Order(s).

B. The documents listed in Paragraph 9.01.A are attached to this Agreement (except as expressly noted otherwise above).

C. There are no Contract Documents other than those listed above in this Article 9.

D. The Contract Documents may only be amended, modified, or supplemented as provided in Paragraph 3.04 of the General Conditions.

ARTICLE 10 - MISCELLANEOUS

10.01 Terms

A. Terms used in this Agreement will have the meanings indicated in the General Conditions.

10.02 Assignment of Contract

A. No assignment by a party hereto of any rights under or interests in the Contract will be binding on another party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

10.03 Successors and Assigns

A. OWNER and CONTRACTOR each binds itself, its partners, successors, assigns, and legal representatives to the other party hereto, its partners, successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

10.04 Severability

A. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon OWNER and CONTRACTOR, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

IN WITNESS WHEREOF, OWNER and CONTRACTOR have signed this Agreement in duplicate. One counterpart each has been delivered to OWNER and CONTRACTOR. All portions of the Contract Documents have been signed or identified by OWNER and CONTRACTOR or on their behalf.

This Agreement will be effective on _____, _____ (which is the Effective Date of the Agreement).

OWNER:

_____

By: _____

[CORPORATE SEAL]

Attest _____

Address for giving notices:

_____

_____

_____

(If OWNER is a corporation, attach evidence of authority to sign. If OWNER is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of OWNER-CONTRACTOR Agreement.)

Designated Representative:

Name: _____

Title: _____

Address: _____

_____

Phone: _____

Facsimile: _____

CONTRACTOR:

_____

By: _____

[CORPORATE SEAL]

Attest _____

Address for giving notices:

_____

_____

_____

License No. _____
(Where applicable)

Agent for service of process: _____

_____
(If CONTRACTOR is a corporation or a partnership, attach evidence of authority to sign.)

Designated Representative:

Name: _____

Title: _____

Address: _____

_____

Phone: _____

Facsimile: _____

END OF SECTION

SECTION 09961 - HIGH PERFORMANCE PAINTS AND COATINGS

PART 1 - GENERAL

1.01 REFERENCES

A. The following is a list of standards which may be referenced in this section:
1. American Water Works Association (AWWA):
a. C203, Coal-Tar Protective Coatings and Linings for Steel Water Pipelines-Enamel and Tape-Hot-Applied.
b. C209, Cold-Applied Tape Coatings for the Exterior of Special Sections, Connections, and Fittings for Steel Water Pipelines.
c. C213, Fusion-Bonded Epoxy Coating for the Interior and Exterior of Steel Water Pipelines.
d. C214, Tape Coating Systems for the Exterior of Steel Water Pipelines.
2. Environmental Protection Agency (EPA).
3. International Concrete Repair Institute (ICRI) Guideline No. 310.2 - Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymer Overlays.
4. NACE International (NACE): SP0188, Discontinuity (Holiday) Testing of New Protective Coatings on Conductive Substrates.
5. ANSI / NSF International (NSF): 61, Drinking Water System Components-Health Effects.
6. National Association of Pipe Fabricators (NAPF)
a. 500-03-04, Abrasive Blast Cleaning for Ductile Iron Pipe.
7. Occupational Safety and Health Act (OSHA).
8 The Society for Protective Coatings (SSPC):
a. PA 2, Measurement of Dry Coating Thickness with Magnetic Gages.
b. PA 3, Guide to Safety in Paint Applications.
c. SP 1, Solvent Cleaning.
d. SP 2, Hand Tool Cleaning.
e. SP 3, Power Tool Cleaning.
f. SP 5, White Metal Blast Cleaning.
g. SP 6, Commercial Blast Cleaning.
h. SP 7, Joint Surface Preparation Standard Brush-Off Blast Cleaning.
i. SP 10, Near-White Blast Cleaning.
j. SP 11, Power Tool Cleaning to Bare Metal.
k. SP 12, Surface Preparation and Cleaning of Metals Waterjetting Prior to Recoating.
l. SP 13, Surface Preparation of Concrete.
m. SP 16, Brush-off Blast cleaning of Coated and Uncoated Galvanized Steel, Stainless Steels, and Non-Ferrous Metals.
n. Guide 15, Field Methods for Retrieval and Analysis of Soluble Sa1ts on Steel and Other Nonporous Substrates.
o. TU 11, Inspection of Fluorescent Coating Systems.
9. National Fire Protection Association (NFPA).
10. American Society for Testing and Materials (ASTM International).

1.02 SUMMARY

A. Section Includes: Field painting as shown and/or herein required. See specific items not requiring field painting under Work Not Included.

B. Provide all labor, materials, equipment, and services for furnishing and installing the finishes as indicated on drawings and schedules, and as herein specified.

C. All paints are to be low VOC paint. Paint shall not exceed a VOC content limit 250 g/L.

D. In general, exposed surfaces of factory and/or shop-primed work that are delivered to Site without a final finish shall be painted. The shop priming and intermediate shop coatings shall not be considered as included in the number of field coats specified under Part 2, Field Painting Systems Article, Finish Paints paragraph in this Section.

E. Ferrous metal surfaces, excluding stainless steel surfaces that will be exposed in the completed Work, shall be sandblasted either at the point of fabrication or under this Section prior to placement of primers. Field fabrication, including welds and cuts, shall be sandblasted, primed, and painted as herein specified.

F. Ferrous metal items that will be in contact with precast concrete slabs, masonry, etc., shall be finish painted.

G. Galvanized steel items that are not included under "Work Not Included," shall be prepared, primed, and finish painted as herein specified.

H. Bruises, mars, and/or scratches in the shop painting due to handling, shall be immediately touched up in the field by Contractor prior to any storage or installation.

I. Work includes field painting of exposed bare and covered pipes and ducts (including color coding), and of hangers, exposed steel and iron work, and primed metal surfaces of equipment installed under mechanical and electrical work, except as otherwise indicated.

J. "Paint" as used herein means all coating systems materials, including primers, emulsions, enamels, stains, sealers and fillers, and other applied materials whether used as prime, intermediate or finish coats.

K. Surfaces to be Painted: Except where natural finish of material is specifically noted as a surface not to be painted, paint exposed surfaces whether or not colors are designated in "schedules". Where items or surfaces are not specifically mentioned, paint the same as similar adjacent materials or areas. If color or finish is not designated, ENGINEER will select these from standard colors or finishes available.

L. Painting of piping includes pipe hangers, valves, and piping accessories, and also includes surfaces that will be in contact with piping supports. ALL PIPING SHALL BE COMPLETELY PAINTED.

M. Existing surfaces shall be painted where shown and/or called for. Preparation for repainting and priming shall be as herein specified.

N. Altered existing Work or damaged surfaces that are a result of the revisions shall be painted under this item of Work. The finishes shall match the existing adjacent coatings.

O. Miscellaneous equipment shipped to Site with factory-applied coatings as follows, shall be painted under this Work as specified:
   1. No Factory Finish: Surface preparation, priming, and finish painting.
   2. Prime Coat: Surface preparation, touch-up, and finish painting.
   3. Intermediate Coat: Surface preparation, touch-up, and finish painting.
   4. Pre-finished Equipment: Touch-up as required. Equipment manufacturer shall furnish necessary touch-up paint.
   5. Factory finish coats, not matching the approved finish colors, that are provided in lieu of the shop prime specified shall be properly prepared and receive a final field coat to match the adjacent related Work.

P. Painting as called for on Drawings is for guidance only and does not limit the requirements for painting.

Q. Work Not Included: Unless specifically called for on Drawings or specified in this Section, the following are not included:
   1. Exterior exposed concrete surfaces and exterior exposed concrete surfaces below the ground floor plan.
   2. Nonferrous metals and stainless steel, except copper and brass.
   3. Conduits below the main floor, except in rooms that are painted.
   4. Exterior gratings with a hot-dipped galvanized finish.
   5. Manufacturer's name and identification plates, such as Underwriters' Laboratories and Factory Mutual, or any equipment identification, performance rating, name or nomenclature plates.
   6. Overhead sectional doors - shall have a factory finish on both interior and exterior exposed surfaces.
   7. All interior and exterior sealant and caulking unless adjacent to latex-coated surfaces and approved by Engineer.
   8. Interior concrete surfaces of tanks and basins, immersed and exposed not to be painted.
   9. Operating Parts: Unless otherwise indicated, moving parts of operating units, mechanical and electrical parts, such as valve and damper operators, linkages, sensing devices, motors, and fan shafts will not require finish painting.

1.03 DEFINITIONS

A. Terms used in this section:
   1. ASTM D 16, unless otherwise specified.
   2. Coverage: total-minimum dry film thickness in mils or square feet per gallon.
   3. FRP: Fiberglass Reinforced Plastic.
   4. HCl: Hydrochloric Acid.
   5. MDFT: Minimum Dry Film Thickness, mils.
   6. MDFTPC: Minimum Dry Film Thickness per Coat, mils.
   7. Mil: Thousandth of an inch.
   8. PDS: Product Data Sheet.
   9. PSDS: Paint System Data Sheet.
   10. PVC: Polyvinyl Chloride.
   11. SFPG: Square Feet per Gallon.

12. SFPGPC: Square Feet per Gallon per Coat.
13. SP: Surface Preparation.
14. Potable Water Use Defined: Paint or coatings in contact with water anywhere within the potable water system (including intake/treatment/storage/distribution), shall be tested and certified by the National Sanitation Foundation (NSF) or Underwriter's Laboratory (UL) as a protective (barrier) material as per ANSI/NSF Standard 61 (Listed Drinking Water System Components - Health Effects).

1.04 SUBMITTALS

A. Action Submittals:
1. Shop Drawings: Submit in accordance with Division 1 Submittal Procedures.
a. Data Sheets:
1) For each product, furnish a Product Data Sheet (PDS), the manufacturer's technical data sheets, and paint colors available (where applicable). The PDS form is appended to the end of this section.
2) For each paint system, furnish a Paint System Data Sheet (PSDS). The PSDS form is appended to the end of this section.
3) Technical and performance information that demonstrates compliance with Specification.
4) Furnish copies of paint system submittals to the coating applicator.
5) Indiscriminate submittal of only manufacturer's literature is not acceptable.
b. Detailed chemical and gradation analysis for each proposed abrasive material.
2. Samples:
a. Proposed Abrasive Materials: Minimum 5-pound sample for each type.
b. Reference Panel:
1) Surface Preparation:
a) Prior to start of surface preparation, furnish a 4-inch by 4-inch steel panel for each grade of sandblast specified herein, prepared to specified requirements.
b) Provide panel representative of the steel used; prevent deterioration of surface quality.
c) Panel to be reference source for inspection upon approval by Engineer.
2) Paint:
a) Unless otherwise specified, before painting work is started, prepare minimum 8-inch by 10-inch sample with type of paint and application specified on similar substrate to which paint is to be applied.
b) Furnish additional samples as required until colors, finishes, and textures are approved.
c) Approved samples to be the quality standard for final finishes.

B. Informational Submittals:

1. Typewritten schedule of Painting Operations. This schedule shall include for each surface to be painted, the brand name, generic type, solids by volume, application method, the coverage and number of coats in order to achieve the specified dry film thickness, and color charts.
2. Coating manufacturer's Certificate of Compliance, in accordance with Division 1, Manufacturers' Field Services.
3. Factory Applied Coatings: Manufacturer's certification stating factory applied coating system meets or exceeds requirements specified.
4. Manufacturer's written verification that submitted material is suitable for the intended use.
5. If the manufacturer of finish coating differs from that of shop primer, provide finish coating manufacturer's written confirmation that materials are compatible.
6. Manufacturer's written instructions and special details for applying each type of paint.

C. Warranty:
   1. Submit manufacturer's standard warranty in accordance with requirements of Division 1, warranties covering the items included under this Section.

1.05 QUALITY ASSURANCE

A. Applicator Qualifications: Minimum 5 years' experience in application of specified products.

B. Regulatory Requirements:
   1. Meet federal, state, and local requirements limiting the emission of volatile organic compounds.
   2. Perform surface preparation and painting in accordance with recommendations of the following:
      a. Paint manufacturer's instructions.
      b. SSPC PA 3, Guide to Safety in Paint Applications.
      c. Federal, state, and local agencies having jurisdiction.

C. Mockup:
   1. Before proceeding with Work under this section, finish one complete space or item of each color scheme required showing selected colors, finish texture, materials, quality of work, and special details.
   2. After Engineer approval, sample spaces or items shall serve as a standard for similar work throughout the Project.

D. Pre-application Meeting:
   1. Convene a pre-application meeting two [2] weeks before start of application of coating systems. Require attendance of parties directly affecting work of this section, including Contractor, Engineer, applicator, and manufacturer's representative. Review the following:
      a. Environmental requirements.
      b. Protection of surfaces not scheduled to be coated.
      c. Surface preparation.
      d. Application.
      e. Repair.

f. Field quality control.
g. Cleaning.
h. Protection of coating systems.
i. One-year inspection.
j. Coordination with other work.

E. Single Source Responsibility: Provide primers and other undercoat paint produced by same manufacturer as finish coats. Use only thinners approved by paint manufacturer, and use only within recommended limits.

F. Coordination of Work: Review other sections of these Specifications in which prime paints are to be provided to ensure compatibility of total coatings systems for various substrates. Upon request from other trades, furnish information or characteristics of finish materials provided for use, to ensure compatible prime coats are used.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Shipping:
1. Where precoated items are to be shipped to the Site, protect coating from damage. Batten coated items to prevent abrasion.
2. Protect shop painted surfaces during shipment and handling by suitable provisions including padding, blocking, and use of canvas or nylon slings.

B. Deliver materials to job site in original, new and unopened packages and containers bearing manufacturer's name and label, and following information:
1. Name or title of material.
2. Fed. Spec. number, if applicable.
3. Manufacturer's stock number, batch number, and date of manufacturer.
4. Manufacturer's name.
5. Contents by volume, for major pigment and vehicle constituents.
6. Thinning instructions.
7. Application instructions.
8. Color name and number.

C. Storage:
1. Store products not in use in tightly covered containers in a protected, well ventilated, area that is heated (minimum ambient temperature of 45 degrees F) or cooled to maintain temperatures within the range recommended by paint manufacturer.
2. Primed surfaces shall not be exposed to weather for more than 2 months before being topcoated, or less time if recommended by coating manufacturer.
3. Handling: Protect materials during handling and application to prevent damage or contamination.
4. Keep storage area neat and orderly. Remove oily rags and waste daily. Take all precautions to ensure that workmen and work areas are adequately protected from fire hazards and health hazards resulting from handling, mixing and application of paints.

1.07 PROJECT CONDITIONS

A. Environmental Requirements:
   1. Do not apply paint in temperatures or moisture conditions outside of manufacturer's recommended maximum or minimum allowable.
   2. Do not perform final abrasive blast cleaning whenever relative humidity exceeds 85 percent, or whenever surface temperature is less than 5 degrees F above dew point of ambient air.
   3. Apply water-base paints only when temperature of surfaces to be painted and surrounding air temperatures are between 50 degrees F (10 degrees C) and 90 degrees F (32 degrees C), unless otherwise permitted or restricted by paint manufacturer's printed instructions.
   4. Apply solvent-thinned paints only when temperature of surfaces to be painted and surrounding air temperatures are between 45 degrees F (7 degrees C) and 95 degrees F (35 degrees C), unless otherwise permitted or restricted by paint manufacturer's printed instructions.
   5. Do not apply paint in snow, rain, fog or mist, or when relative humidity exceeds 85%, or to damp or wet surfaces, unless otherwise permitted or restricted by paint manufacturer's printed instructions. Painting may be continued during inclement weather if areas and surfaces to be painted are enclosed and heated within temperature limits specified by paint manufacturer during application and drying periods.
   6. Paint only when the surface temperature is at least 5 degrees F above the dew point, unless otherwise permitted by paint manufacturer’s printed instructions.

B. Status of Existing Coatings:
   1. Perform tests as required to verify condition of existing coatings and substrate conditions.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Nationally recognized manufacturers of paints and protective coatings who are regularly engaged in the production of such materials for essentially identical service conditions.

B. Minimum of 5 years' verifiable experience in manufacture of specified product.

C. Each of the following manufacturers is capable of supplying most of the products specified herein. **Basis of design products listed for Tnemec Company, all other manufacturers shall provide equivalent product subject to ENGINEER approval:**
   1. TNEMEC Company, Inc.
   2. The Sherwin-Williams Company.
   3. PPG Industries.
   4. Carboline.

2.02 ABRASIVE MATERIALS

A. Abrasives for blasting shall be sharp, washed, salt free, angular, and free from feldspar or other constituents that tend to breakdown and remain on the surface.

B. Select abrasive type and size to produce surface profile that meets coating manufacturer's recommendations for specific primer and coating system to be applied.

2.03 PAINT MATERIALS

A. General:
1. Manufacturer's highest quality products suitable for intended service. Materials not displaying manufacturer's identification as a standard, best-grade product will not be acceptable.
2. Compatibility: Only compatible materials from a single manufacturer shall be used in the Work. Particular attention shall be directed to compatibility of primers and finish coats.
3. Thinners, Cleaners, Driers, and Other Additives: As recommended by coating manufacturer.
4. Color Pigments: Pure, non fading, applicable types to suit substrates and service indicated.
a. Lead content in pigment, if any, is limited to contain not more than 0.06% lead, as lead metal based on the total non volatile (dry film) of paint by weight.

B. Products:

Product	Definition
Acrylic Latex	Single-component, 100% acrylic finish as required
Block Filler	Primer-sealer designed for rough masonry surfaces, acrylic emulsion, cementitious acrylic, or epoxy
Coal-Tar Epoxy	Amine, polyamide, or phenolic epoxy type, suitable for immersion service
Epoxy Filler/Surfacer	100% solids epoxy trowel grade filler and surface, nonshrinking, suitable for application to concrete and masonry
Epoxy Nonskid (Aggregated)	100% solids two-component catalyzed epoxy aggregated; aggregate may be packaged separately
Epoxy Primer- Ferrous Metal	High-build, two component catalyzed epoxy primer.
Epoxy Primer- Other	Epoxy primer, high-build, as recommended by coating manufacturer for specific galvanized metal, copper, or nonferrous metal alloy to be coated
Fusion Bonded Coating	100% solids, thermosetting, fusion bonded, dry powder epoxy, suitable for the intended service
Fusion Bonded, TFE Lube or Grease Lube	Tetrafluoroethylene, liquid coating, or open gear grease as supplied by McMaster-Carr Supply Corporation, Elmhurst, IL; RL 736 manufactured by Amrep, Inc., Marietta, GA
High Build Epoxy	High-build, two component catalyzed epoxy, capability of 3 to 5 MDFT per coat
Latex Primer Sealer	Waterborne vinyl acrylic primer/sealer for interior gypsum board and plaster. Capable of providing uniform seal and suitable for use with specified finish coats.
Gloss Polyurethane -	Two-component, aliphatic acrylic based polyurethane; high gloss finish

Product	Definition
Multipolymeric Matrix Coating	Heat resistant single component inert multipolymeric matrix coating for high heat applications under insulation.
Water Base Epoxy	Two-component, polyamide epoxy emulsion, finish as required.

2.04 MIXING

A. Multiple-Component Coatings:
   1. Prepare using each component as packaged by paint manufacturer.
   2. No partial batches will be permitted.
   3. Do not use multiple-component coatings that have been mixed beyond their pot life.
   4. Furnish small quantity kits for touchup painting and for painting other small areas.
   5. Mix only components specified and furnished by paint manufacturer.
   6. Do not intermix additional components for reasons of color or otherwise, even within the same generic type of coating.

B. Maintain containers used in mixing and application of paint in a clean condition, free of foreign materials and residue.

C. Stir materials before application to produce a mixture of uniform density, and stir as required during application. Do not stir surface film into material. Remove film and, if necessary, strain material before using.
   1. Colors: Formulate paints with colorants for reasons of color or other materials that might be affected by presence of hydrogen sulfide or other gas likely to be present at Site.

2.05 SHOP FINISHES

A. Shop Blast Cleaning: Reference Paragraph, Shop Coating Requirements.

B. Surface Preparation: Provide Engineer minimum 7 days' advance notice to start of shop surface preparation work and coating application work.

C. Shop Coating Requirements:
   1. When required by equipment Specifications, such equipment shall be primed and finish coated in shop by manufacturer and touched up in field with identical material after installation.

   2. Where manufacturer's standard coating is not suitable for intended service condition, Engineer may approve use of a tie-coat to be used between manufacturer's standard coating and specified field finish. In such cases, tie-coat shall be surface tolerant epoxy as recommended by manufacturer of specified field finish coat. Coordinate details of equipment manufacturer's standard coating with field coating manufacturer.

D. Pipe:
   1. Steel and Ductile Iron Pipe:

a. Prepare steel surfaces in accordance with SSPC SP-6, Commercial Blast Cleaning with a surface profile of 2 to 3 MILS.
   1). Prepare ductile or cast iron surfaces in accordance with NAPF 500-03-04 Abrasive Blast Cleaning with the exception that ALL rust and mold coating be removed. Only tightly adherent annealing oxide may remain. Bituminous coated pipe shall NOT be allowed if field painting is required.
   2). Bituminous coated pipe shall NOT be allowed if field painting is required.
   3). Ensure surfaces are clean, dry, and free of oil, grease, dirt, dust, and other contaminants.

b. The surface preparation and application of the primer shall be performed by pipe manufacturer.

c. Prior to blast cleaning, grind smooth surface imperfections, including, but not limited to delaminating metal or oxide layers.

PART 3 - EXECUTION

3.01 GENERAL

A. Provide Engineer minimum 7 days' advance notice to start of field surface preparation work and coating application work.

B. Perform the Work only in presence of Engineer or their representative, unless Engineer grants prior approval to perform the Work in Engineer's absence.

C. Schedule inspection of cleaned surfaces and all coats prior to succeeding coat in advance with Engineer.

D. Protection: Protect work of other trades, whether to be painted or not, against damage by painting and finishing work. Correct any damage by cleaning, repairing or replacing, and repainting, as acceptable to Engineer. Provide "Wet Paint" signs as required to protect newly painted finishes. Remove temporary protective wrappings provided by others for protection of their work, after completion of painting operations. At completion of work of other trades, touch up and restore all damaged or defaced painted surfaces.

3.02 EXAMINATION

A. Factory Finished Items:
   1. Scheduling Inspection with Engineer before repairing damaged factory finished items delivered to Site.
   2. Repair abraded or otherwise damaged areas on factory-finished items as recommended by coating manufacturer. Carefully blend repaired areas into original finish. If required to match colors, provide full finish coat in field.

B. Surface Preparation Verification: Inspect and provide substrate surfaces prepared in accordance with these Specifications and printed directions and recommendations of paint manufacturer whose product is to be applied. The more stringent requirements shall apply.

C. Starting of painting work will be construed as acceptance of surfaces and conditions within any particular area.

D. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions otherwise detrimental to formation of a durable paint film.

3.03 PROTECTION OF ITEMS NOT TO BE PAINTED

A. Remove, mask, or otherwise protect hardware, lighting fixtures, switchplates, aluminum surfaces, machined surfaces, couplings, shafts, bearings, nameplates on machinery, and other surfaces not specified elsewhere to be painted.

B. Provide drop cloths to prevent paint materials from falling on or marring adjacent surfaces.

C. Protect working parts of mechanical and electrical equipment from damage during surface preparation and painting process.

D. Mask openings in motors to prevent paint and other materials from entering.

E. Protect surfaces adjacent to or downwind of Work area from overspray.

3.04 SURFACE PREPARATION

A. General: Perform preparation and cleaning procedures in accordance with paint manufacturer's instructions and as herein specified, for each particular substrate condition, or as required by this specification, the more stringent requirements shall apply.

1. Provide barrier coats over incompatible primers or remove and re-prime as required. Notify Architect-Architect-Engineer in writing of any anticipated problems in using the specified coating systems with substrates primed by others.
2. Remove hardware, hardware accessories, machined surfaces, plates, lighting fixtures, and similar items in place and not to be finish-painted, or provide surface-applied protection prior to surface preparation and painting operations. Remove, if necessary, for complete painting of items and adjacent surfaces. Following completion of painting of each space or area, reinstall removed items.
3. Clean surfaces to be painted before applying paint or surface treatments. Remove oil and grease prior to mechanical cleaning per SSPC SP-1. Program cleaning and painting so that contaminants from cleaning process will not fall onto wet, newly-painted surfaces.
4. Abrasives for blasting shall be sharp, washed, salt free, angular, and free from feldspar or other constituents that tend to breakdown and remain on the surface.
5. Concrete floors shall be dry as indicated by testing in accordance with ASTM D4263, Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.

B. Field Abrasive Blasting:

1. Perform blasting for items and equipment where specified and as required to restore damaged surfaces previously shop or field blasted and primed or coated.

2. Refer to coating systems for degree of abrasive blasting required.
3. Where the specified degree of surface preparation differs from manufacturer's recommendations, the more stringent shall apply.

C. Metal Surface Preparation:
1. Where indicated, meet requirements of SSPC Specifications summarized below:
   a. SP 1, Solvent Cleaning: Removal of visible oil, grease, soil, drawing and cutting compounds, and other soluble contaminants by cleaning with solvent.
   b. SP 2, Hand Tool Cleaning: Removal of loose rust, loose mill scale, loose paint, and other loose detrimental foreign matter, using nonpower hand tools.
   c. SP 3, Power Tool Cleaning: Removal of loose rust, loose mill scale, loose paint, and other loose detrimental foreign matter, using power-assisted hand tools.
   d. SP 5, White Metal Blast Cleaning: Removal of visible oil, grease, dust, dirt, mill scale, rust, coatings, oxides, corrosion products, and other foreign matter by blast cleaning.
   e. SP 6, Commercial Blast Cleaning: Removal of visible oil, grease, dust, dirt, mill scale, rust, coatings, oxides, corrosion products, and other foreign matter, except for random staining limited to no more than 33 percent of each unit area of surface which may consist of light shadows, slight streaks, or minor discolorations caused by stains of rust, stains of mill scale, or stains of previously applied coatings.
   f. SP 7, Brush-Off Blast Cleaning: Removal of visible rust, oil, grease, soil, dust, loose mill scale, loose rust, and loose coatings. Tightly adherent mill scale, rust, and coating may remain on surface.
   g. SP 10, Near-White Blast Cleaning: Removal of visible oil, grease, dust, dirt, mill scale, rust, coatings, oxides: corrosion products, and other foreign matter, except for random staining limited to no more than 5 percent of each unit area of surface which may consist of light shadows, slight streaks, or minor discolorations caused by stains of rust, stains of mill scale, or stains of previously applied coatings.
   h. SP 11, Power Tool Cleaning to Bare Metal: Removal of visible oil, grease, dirt, dust, mill scale, rust, paint, oxide, corrosion products, and other foreign matter using power-assisted hand tools capable of producing suitable surface profile. Slight residues of rust and paint may be left in lower portion of pits if original surface is pitted.
   i. SP 12, Surface Preparation and Cleaning of Metals by Waterjetting Prior to Recoating: Surface preparation using high- pressure and ultrahigh-pressure water jetting to achieve specified surface cleanliness condition. Surface cleanliness conditions are defined in SSPC SP 12 and are designated WJ-1 through WJ-4 for visual surface preparation definitions and SC-1 through SC-3 for nonvisual surface preparation definitions.
2. The words "solvent cleaning", "hand tool cleaning", "wire brushing", and "blast cleaning", or similar words of equal intent in these Specifications or in paint manufacturer's specification refer to the applicable SSPC Specification.
3. Where OSHA or EPA regulations preclude standard abrasive blast cleaning, wet or vacu-blast methods may be required. Coating manufacturers' recommendations for wet blast additives and first coat application shall apply.

4. Hand tool clean areas that cannot be cleaned by power tool cleaning.
5. Round or chamfer sharp edges and grind smooth burrs, jagged edges, and surface defects.
6. Welds and Adjacent Areas:
    a. Prepare such that there is:
        1) No undercutting or reverse ridges on weld bead.
        2) No weld spatter on or adjacent to weld or any area to be painted.
        3) No sharp peaks or ridges along weld bead.
    b. Grind embedded pieces of electrode or wire flush with adjacent surface of weld bead.
7. Pre-blast Cleaning Requirements:
    a. Remove oil, grease, welding fluxes, and other surface contaminants prior to blast cleaning.
    b. Cleaning Methods: Steam, open flame, hot water, or cold water with appropriate detergent additives followed with clean water rinsing.
    c. Clean small isolated areas as above or solvent clean with suitable solvent and clean cloth.
8. Blast Cleaning Requirements:
    a. Type of Equipment and Speed of Travel: Design to obtain specified degree of cleanliness. Minimum surface preparation is as specified herein and takes precedence over coating manufacturer's recommendations.
    b. Select type and size of abrasive to produce surface profile that meets coating manufacturer's recommendations for particular primer to be used.
    c. Use only dry blast cleaning methods.
    d. Do not reuse abrasive, except for designed recyclable systems.
    e. Meet applicable federal, state, and local air pollution and environmental control regulations for blast cleaning, confined space entry (if required), and disposition of spent aggregate and debris.
9. Post-Blast Cleaning and Other Cleaning Requirements:
    a. Clean surfaces of dust and residual particles from cleaning operations by dry (no oil or water vapor) air blast cleaning or other method prior to painting. Vacuum clean enclosed areas and other areas where dust settling is a problem and wipe with a tack cloth.
    b. Paint surfaces the same day they are blasted. Reblast surfaces that have started to rust before they are painted.

E. Concrete Surface Preparation:
1. Do not begin until 30 days after concrete has been placed.
2. Meet requirements of SSPC SP 13 and ICRI 310.2.
3. Remove grease, oil, dirt, salts or other chemicals, loose materials, or other foreign matter by solvent, detergent, or other suitable cleaning methods. Remove residual abrasives, dust, and loose particles by vacuuming or blowing with high pressure air.
4. Abrasive blast clean to remove loose concrete and laitance, and provide an ICRI CSP profile as required by paint manufacturer.
5. Secure coating manufacturer’s recommendations for additional preparation, if required, for excessive bug holes exposed after blasting.
6. Unless otherwise required for proper adhesion, ensure surfaces are dry

Prior to painting. Concrete floors shall be dry as indicated by testing in accordance with ASTM D4263, Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method, and, if necessary, ASTM F1869, Measuring Moisture Vapor Emission Rate of Concrete. Do not paint over surfaces where moisture content exceeds that permitted in manufacturer's printed directions.

7. If surfaces are found to be sufficiently alkaline to cause blistering and burning off of finish paint, correct this condition before application of paint.

F. Plastic and FRP Surface Preparation:
   1. Hand sand plastic surfaces to be coated with medium grit sandpaper to provide tooth for coating system.
   2. Large areas may be power sanded or brush-off blasted, provided sufficient controls are employed so surface is roughened without removing excess material.

G. Masonry Surface Preparation:
   1. Complete and cure masonry construction for 14 days or more before starting surface preparation work.
   2. Remove oil, grease, dirt, salts or other chemicals, loose materials, or other foreign matter by solvent, detergent washing, or other suitable cleaning methods.
   3. Clean masonry surfaces of mortar and grout spillage and other surface deposits using one of the following:
      a. Nonmetallic fiber brushes and commercial muriatic acid followed by rinsing with clean water.
      b. Brush-off blasting.
      c. Water blasting.
   4. Do not damage masonry mortar joints or adjacent surfaces.
   5. Leave surfaces clean and, unless otherwise required for proper adhesion, dry prior to painting.
   6. Masonry Surfaces to be Painted: Uniform texture and free of surface imperfections that would impair intended finished appearance.
   7. Masonry Surfaces to be Clear Coated: Free of discolorations and uniform in texture after cleaning.

K. Existing Painted Surfaces to be Repainted Surface Preparation:
   1. Detergent wash and freshwater rinse.
   2. Clean loose, abraded, or damaged coatings to substrate by band or power tool, SP 2 or SP 3.
   3. Feather surrounding intact coating.
   4. Apply one spot coat of specified primer to bare areas, overlapping prepared existing coating.
   5. Apply one full finish coat of specified primer to entire surface.
   6. If an aged, plural-component material is to be topcoated, contact coating manufacturer for additional surface preparation requirements.
   7. For ductile iron pipe with asphaltic varnish finish not specified to be abrasive blasted, apply coat of tar stop prior to application of cosmetic finish coat.
   8. Application of Cosmetic Coat:

a. It is assumed that existing coatings have oxidized sufficiently to prevent lifting or peeling when overcoated with paints specified.
b. Check compatibility by application to a small area prior to starting painting.

9. Perform blasting as required to restore damaged surfaces. Materials, equipment, procedures shall meet requirements of SSPC.

I. Shop Primed Surfaces: Prepare shop-applied prime coats wherever damaged or bare as required by other sections of these Specifications. Clean and touch-up with same type shop primer.

3.05 SURFACE CLEANING

A. Brush-off Blast Cleaning:
1. Equipment, procedure, and degree of cleaning shall meet requirements of SSPC SP 7.
2. Abrasive: Either wet or dry blasting sand, grit, or nutshell.
3. Select various surface preparation parameters, such as size and hardness of abrasive, nozzle size, air pressure, and nozzle distance from surface such that surface is cleaned without pitting, chipping, or other damage.
4. Verify parameter selection by blast cleaning a trial area that will not be exposed to view.
5. Engineer will review acceptable trial blast cleaned area and use area as a representative sample of surface preparation.
6. Repair or replace surface damaged by blast cleaning.

C. Solvent Cleaning:
1. Consists of removal of foreign matter such as oil, grease, soil, drawing and cutting compounds, and any other surface contaminants by using solvents, emulsions, cleaning compounds, steam cleaning, or similar materials and methods that involve a solvent or cleaning action.
2. Meet requirements of SSPC SP 1.

3.06 APPLICATION

A. General:
1. The intention of these Specifications is for existing and new interior masonryand metal and submerged metal surfaces to be painted, whether specifically mentioned or not, except as specified otherwise. Do not paint exterior concrete surfaces, unless specifically indicated.
2. Extent of Coating (Immersion): Coatings shall be applied to internal vessel and pipe surfaces, nozzle bores, flange gasket sealing surfaces, carbon steel internals, and stainless steel internals, unless otherwise specified.
3. For coatings subject to immersion, obtain full cure for completed system. Consult coatings manufacturer's written instructions for these requirements. Do not immerse coating until completion of curing cycle.
4. Apply coatings in accordance with these Specifications and paint manufacturers' printed recommendations and special details. The more stringent requirements shall apply. Allow sufficient time between coats to assure thorough drying of previously applied paint.

6. Vacuum clean surfaces free of loose particles. Use tack cloth just prior to applying next coat.
7. Fusion Bonded Coatings Method Application: Electrostatic, fluidized bed, or flocking.
8. Coat units or surfaces to be bolted together or joined closely to structures or to one another prior to assembly or installation.
9. On pipelines, terminate coatings along pipe runs to 1 inch inside pipe penetrations.
10. Keep paint materials sealed when not in use.
11. Where more than one coat is applied within a given system, alternate colors to provide a visual reference showing required number of coats have been applied.
12. Paint surfaces behind movable equipment same as similar exposed surfaces. Paint surfaces behind permanently fixed equipment with prime coat onl before final installation of equipment.
13. Paint back sides of access panels, and removable or hinged covers to match exposed surfaces.
14. Mechanical and Electrical Work: Painting of mechanical and electrical work is limited to those items exposed in mechanical equipment rooms and in occupied spaces.
    a. Piping, pipe hangers, supplementary steel and supports (except galvanized surfaces).
    b. Heat exchangers.
    c. Tanks.
    d. Ductwork, insulation
    e. Motor, mechanical equipment, and supports
    f. Accessory items
    g. Conduits and fittings (except galvanized surfaces).
    h. Switchgear.
    i. Hanger and support (except galvanized surfaces).
15. Provide finish coats which are compatible with prime paints used.
16. Mechanical and Electrical Work: Painting of mechanical and electrical work is limited to those items exposed in mechanical equipment rooms and in occupied spaces.
    a. Piping, pipe hangers, supplementary steel and supports (Except galvanized surfaces.)
    b.
17. Apply additional coats when undercoats, stains or other conditions show through final coat of paint, until paint film is of uniform finish, color and appearance. Give special attention to ensure that surfaces, including edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.
18. Pigmented (Opaque) Finishes: Completely cover to provide and opaque, smooth surface of uniform finish, color, appearance and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness or other surface imperfections will not be acceptable. Holiday test coated steel in immersion areas in accordance with NACE International RP 0188-90.
19. Complete Work: Match approved samples for color, texture and coverage. Remove, refinish or repaint work not in compliance with specified requirements.

C. Porous Surfaces, Such As Concrete and Masonry:
   1. Filler/Surfacer: Use coating manufacturer's recommended product to fill air holes, bug holes, and other surface voids or defects.
   2. Prime Coat: May be thinned to provide maximum penetration and adhesion.
      a. Type and Amount of Thinning: Determined by paint manufacturer and dependent on surface density and type of coating.
   3. Surface Specified to Receive Water Base Coating: Damp, but free of running water, just prior to application of coating.

D. Film Thickness and Coverage:
   1. Number of Coats:
      a. Minimum required without regard to coating thickness.
      b. Additional coats may be required to obtain minimum required paint thickness, depending on method of application, differences in manufacturers' products, and atmospheric conditions.
   2. Application Thickness:
      a. Do not exceed coating manufacturer's recommendations.
      b. Measure using a wet film thickness gauge to ensure proper coating thickness during application.
   3. Film Thickness Measurements and Electrical Inspection of Coated Surfaces:
      a. Perform with properly calibrated instruments.
      b. Recoat and repair as necessary for compliance with Specification.
      c. Coats are subject to inspection by Engineer and coating manufacturer's representative.

   4. Visually inspect concrete, masonry, nonferrous metal, plastic, and to ensure proper and complete coverage has been attained.
   5. Give particular attention to edges, angles, flanges, and other similar areas, where insufficient film thicknesses are likely to be present, and ensure proper millage in these areas.
   6. Apply additional coats as required to achieve complete hiding of underlying coats. Hiding shall be so complete that additional coats would not increase the hiding.

3.07 PROTECTIVE COATINGS SYSTEMS AND APPLICATION SCHEDULE

A. Unless otherwise shown or specified, paint surfaces in accordance with the following application schedule. In the event of discrepancies or omissions in the following, request clarification from Engineer before starting work in question.

B. The Finish Schedule on Architectural Drawings addresses walls, floors and ceilings for various buildings Additional requirements are included in the following schedule which addresses structural steel, prefabricated steel trusses, process equipment, pumps, piping and other items.

C. NSF International approval required for coatings used in contact with potable water.

D. System No. 1 Steel Submerged in Process or Wastewater:

Surface Prep	Paint Material	Min. Coats, Cover
SP 10, Near White Blast Cleaning	**1. Prime Coat (shop): Tnemec Series N140 Pota-Pox Plus** **2. Intermediate: Tnemec Series N140 Pota-Pox Plus** 3. **Finish: Tnemec Series N140 Pota-Pox PlusHigh** Build Chemical Resistant Epoxy (Flake-Filled preferred). Coal Tar Epoxy is NOT acceptable.	**1. 4.0-6.0 mils DFT** **2. 4.0-6.0 mils DFT** 3. **4.0-6.0 mils DFTOPTIONAL** Shop Primer 4. 2 coats, 8.0 – 12.0 MDFTPC

1. Use on the following items or areas:

   Metal surfaces new and existing below a plane 1 foot above the maximum liquid surface; metal surfaces above the maximum liquid surface that are a part of the immersed equipment; surfaces of metallic items, such as wall pipes, pipes, pipe sleeves, access manholes, gate guides and thimbles, and structural steel that are embedded in concrete.

E. System No. 2 Exposed Metal-: Exterior

Surface Prep	Paint Material	Min. Coats, Cover
SP 6, Commercial Blast Cleaning with a surface profile of 2 to 3 MILS.	**Prime: Tnemec Series 90-97 Tneme-Zinc**	**2.5-3.5 mils DFT**
	Intermediate: Tnemec Series 66 Hi-Build Epoxoline	**3.0-5.0 mils DFT**
	Finish: Tnemec Series 1074U Endura-Shield II	**2.0-3.0 mils DFT**

1. Use on the following items or areas:

   Exposed metal surfaces, new and existing located outside of structures and exposed to weather, and the following specific surfaces:

   1) Exposed metal surfaces, piping and equipment.
   2) Exposed process piping above grade and within structures or vaults.

F. System No. 3 Exposed Metal-: Interior

Surface Prep	Paint Material	Min. Coats, Cover
SP 6, Commercial Blast Cleaning with a surface profile of 2 to 3 MILS	**Prime: Tnemec Series 90-97 Tneme-Zinc**	**2.5-3.5 mils DFT**
	Intermediate: Tnemec Series 66 Hi-Build Epoxoline	**3.0-5.0 mils DFT**

	Finish: Tnemec Series 66 Hi-Build Epoxoline	**3.0-5.0 mils DFT**

1. Use on the following items or areas:

   Exposed metal surfaces, new and existing located inside of structures and the following specific surfaces:

   1) Exposed metal surfaces, piping and equipment.
   2) Exposed process piping above grade and within structures or vaults.

G. System No. 4 Buried Steel (Soil Side)

Surface Prep	Paint Material	Min. Coats, Cover
SP 10, Near White Blast Cleaning	**Tnemec Series 46H-413 H.B. Tneme-Tar**	**1 or 2 coats, 16.0 – 20.0 mils DFT**

H. System No. 6 Carbon Steel or Stainless Steel – Atmospheric or Insulated Service:: Ambient or Hot Steel up to 500 degrees F (260 degrees C)

Surface Prep.	Paint Material	Min. Coats, Cover
SP 10, Near-White Blast Cleaning	**Tnemec Series 1525 Endura-Heat DTM**	**2 coats, 3.0-5.0 mils DFT Total**

1. Use on the following items or areas:

   a. High heat applications for carbon steel or stainless steel.
   b. Application surface temperatures from ambient to 1,000 degrees F (537 degrees C).
   c. Operating surface temperatures cryogenic to 1200 degrees F (649 degrees F).
   d. Self priming, single component.

I. System No. 7 Skid-Resistant- Concrete:

Surface Prep	Paint Material	Min. Coats, Cover
SSPC-SP 13 to achieve ICRI CSP 2-3	**1. Prime: Tnemec Series 287 Enviro-Pox** **2. Intermediate: Tnemec Series 287 Enviro-Pox** **3. Finish: Tnemec Series 297 Enviro-Glaze**	**1. 2.0-4.0 mils DFT** **2. 2.0-4.0 mils DFT** **3. 2.0-3.0 mils DFT**

1. Use on the following items or areas:

   a. Use on floors per finish schedule except floors within chemical storage and feed areas.

J. System No. 8 Buried Concrete (Soil Side).

See Specification 07140 – Fluid Applied Waterproofing.

K. System No. 9 Skid-Resistant- Concrete for above grade slabs or where slab moisture content is unknown:

Surface Prep	Paint Material	Min. Coats, Cover
SSPC-SP 13 to achieve ICRI CSP 3-4	**1. Prime: Tnemec Series 208 Epoxoprime MVT** **2. Intermediate: Tnemec Series 237 Power-Tread** **3. Finish: Tnemec Series 297 Enviro-Glaze with Series 211 Glass Bead**	**1. 16.0-20.0 mils DFT** **2. 8.0-10.0 mils DFT** **3. 2.0-3.0 mils DFT**

L. System No. 10 Chemical Resistant Concrete Floor / Secondary Containment

Surface Prep	Paint Material	Min. Coats, Cover
SSPC-SP 13 to achieve ICRI CSP 3-5	**1. Prime: Tnemec Series 201 Epoxoprime** **2. Intermediate: Tnemec Series 237 Power-Tread** **3. Finish: Tnemec Series 282 Tneme-Glaze**	**1. 4.0-8.0 mils DFT** **2. 8.0-10.0 mils DFT** **3. 8.0-10.0 mils DFT**

Verify resistance to stored commodities and anticipated traffic load PRIOR to installation.

M. System No. 11 Chemical-Resistant Wall, Heavy-Duty- Concrete and Masonry:

Surface Prep.	Paint Material	Min. Coats, Cover
SSPC-SP 13 to achieve ICRI CSP 3-5	**Epoxy Filler/Surfacer. Tnemec Series 215 Surfacing Epoxy**	**1 coat, as required to fill voids and bugholes to provide a continuous substrate**
	1. Prime: Tnemec Series 282 Tneme-Glaze	**8.0-10.0 mils DFT**
	2. Finish: Tnemec Series 282 Tneme-Glaze	**8.0-10.0 mils DFT**

1. Use on the following items or areas:

   a. Walls and floors for chemical containment areas.
   b. Walls and floors for chemical storage and feed areas.
   c. Interior base slabs and walls for chemical piping pull boxes and chemical injection vault.

N. System No. 14 Aluminum and Dissimilar Metal Insulation:

Surface Prep.	Paint Material	Min. Coats, Cover
Solvent Clean (SP 1)	Prime in accordance with manufacturer's recommendations	
	Tnemec Series 46H-413 H.B. Tneme-Tar	**1 coat, 10 MDFT**

1. Use on aluminum surfaces embedded or in contact with concrete.

O. System No. 15 Interior Concrete and Masonry Walls, Non-immersion, excluding Floors:

Surface Prep.	Paint Material	Min. Coats, Cover
In accordance with Paragraph Concrete and Masonry Surface Preparation	**Block Filler: Tnemec Series 130 Envirofill**	**75-95 sq ft per gallon**
	1. Prime: Tnemec Series 113 H.B. Tneme-Tufcoat	**1. 4.0-6.0 mils DFT**
	2. Finish: Tnemec Series 113 H.B. Tneme-Tufcoat	**2. 4.0-6.0 mils DFT**

1. Use on the following items or areas:

   a. Concrete and concrete block walls, columns and supports.
   b. Concrete ceilings and beams.
   c. Non-corrosive room areas.

P. System No. 17 Exposed FRP, PVC Plastic Piping, Valves, Fittings, and Conduit, Interior and Exterior

Surface Prep	Paint Material	Min. Coats, Cover
In accordance with Paragraph 3.02 Surface Preparation, including cleaning and washing with detergent to remove all dirt and foreign material, and light surface abrasion using medium grade sandpaper. Remove dust, dirt and debris with	**1. Prime: Tnemec Series 66 Hi-Build Epoxoline**	**1. 2.0-4.0 mils DFT**
	2. Finish: Tnemec Series 66 Hi-Build Epoxoline	**2. 2.0-4.0 mils DFT**

clean rags prior to coating.		

1. For PVC or fiberglass piping or electrical systems requiring color coding, and for protection of exposed, exterior plastic components from the elements, and shall include the following:

    a. PVC and fiberglass piping, fittings, valves, and electrical conduits requiring color coding in accordance with Section 15050: Process and Utility Piping, Fittings, Valves, and Accessories.

    b. Exposed exterior plastic piping, valve, and fitting components subject to UV degradation and weathering by the elements.

Q. System No. 19 Exposed Interior Sealed Concrete Floors (where indicated on schedule only), Non-immersion.

Surface Prep	Paint Material	Min. Coats, Cover
SSPC-SP 13/NACE 6 with a surface profile of ICRI CSP 2 or 3. Clean and dry.	Sealer: Two-component High Solids Epoxy Primer / Sealer.	2 coats, 6.0 MDFT per coat Total min. system coating thickness: 10 - 12.0 MDFT

1. For exposed interior sealed concrete floors where indicated on schedule (non-immersion) at above grade Ground locations.

3.08 COLORS

A. Provide as shown for equipment and appurtenances and designated herein and shown in Piping Schedule.

B. Proprietary identification of colors is for identification only. Selected manufacturer may supply matches.

C. Equipment Colors:
1. Equipment includes the machinery or vessel itself plus the structural supports and fasteners and attached electrical conduits.
2. Paint equipment and piping one color as selected.
3. Paint nonsubmerged portions of equipment the same color as the piping it serves, except as itemized below:
    a. Dangerous Parts of Equipment and Machinery: OSHA Orange.
    b. Fire Protection Equipment and Apparatus: OSHA Red.
    c. Radiation Hazards: OSHA Purple.
    d. Physical hazards in normal operating area and energy lockout devices, including, but not limited to, electrical disconnects for equipment and

equipment isolation valves in air and liquid lines under pressure: OSHA Yellow.

D. Pipe Identification Painting:
1. Color code non-submerged metal piping, except electrical conduit. Paint fittings and valves the same color as pipe, except equipment isolation valves.
2. Piping Color Schedule: In accordance with Piping Schedule.
3. On exposed stainless steel piping, apply color 24 inches in length along pipe axis at connections to equipment, valves, or branch fittings, at wall boundaries, and at intervals along piping not greater than 9 feet on center.
4. Pipe Supports: Painted light gray, as approved by Owner.
5. Fiberglass reinforced plastic (FRP) pipe, polyvinylidene fluoride (PVDF), and polyvinyl chloride (PVC) pipe located inside of buildings and enclosed structures will not require painting, except as noted or scheduled.

3.09 FIELD QUALITY CONTROL

A. Testing Equipment:
1. Provide magnetic type dry film thickness gauge to test coating thickness specified in mils, as manufactured by Nordson Corp., Anaheim, CA, Mikrotest.
2. Provide low-voltage wet sponge electrical holiday detector to test completed coating systems, 20 mils dry film thickness or less, except zinc primer, high-build elastomeric coatings, and galvanizing, for pinholes, holidays, and discontinuities, as manufactured by Tinker and Rasor, San Gabriel, CA, Model M-1.
3. Provide high-voltage spark tester to test completed coating systems in excess of 20 mils dry film thickness. Unit as recommended by coating manufacturer.

B. Testing:
1. Thickness and Continuity Testing by Contractor:

a. Measure coating thickness specified in mils with a magnetic type, dry film thickness gauge, in accordance with SSPC PA 2. Check each coat for correct millage. Do not make measurement before a minimum of 8 hours after application of coating.
b. Holiday detect coatings 20 mils thick or less, except zinc primer and galvanizing, with low voltage wet sponge electrical holiday detector in accordance with NACE RP0188.
c. Holiday detect coatings in excess of 20 mils dry with high voltage spark tester as recommended by coating manufacturer and in accordance with NACE RP0188.
d. After repaired and recoated areas have dried sufficiently, retest each repaired area. Final tests may also be conducted by Engineer.

C. Inspection: Leave staging and lighting in place until Engineer has inspected surface or coating. Replace staging removed prior to approval by Engineer. Provide additional staging and lighting as requested by Engineer.

D. Unsatisfactory Application:

1. If item has an improper finish color or insufficient film thickness, clean surface and topcoat with specified paint material to obtain specified color and coverage. Obtain specific surface preparation information from coating manufacturer.
2. Evidence of runs, bridges, shiners, laps, or other imperfections is cause for rejection.
3. Repair defects in accordance with written recommendations of coating manufacturer.

E. Damaged Coatings, Pinholes, and Holidays:
1. Feather edges and repair in accordance with recommendations of paint manufacturer.
2. Hand or power sand visible areas of chipped, peeled, or abraded paint, and feather the edges. Follow with primer and finish coat. Depending on extent of repair and appearance, a finish sanding and topcoat may be required.
3. Apply finish coats, including touchup and damage-repair coats in a manner that will present a uniform texture and color-matched appearance.

F. The right is reserved by Owner to invoke the following material testing procedure at any time, and any number of times during period of field painting:
1. Engage services of an independent testing laboratory to sample paint being used. Samples of materials delivered to project site will be taken, identified and sealed, and certified in presence of Contractor.
2. Testing laboratory will perform appropriate tests for any or all of following characteristics: Abrasion resistance, apparent reflectivity, flexibility, washability, absorption, accelerated weathering, dry opacity, accelerated yellowness, recoating, skinning, color retention, alkali resistance and quantitative materials analysis.

G. If test results show that material being used does not comply with specified requirements, Contractor may be directed to stop painting work, and remove non-complying paint; pay for testing; repaint surfaces coated with rejected paint; remove rejected paint from previously painted surfaces if, upon repainting with specified paint, the two coatings are non-compatible.

3.10 MANUFACTURER'S SERVICES

A. In accordance with Division 1, Manufacturers' Field Services, coating manufacturer's representative shall be present at Site as follows:
1. On first day of application of any coating system.
2. A minimum of two additional Site inspection visits, each for a minimum of 4 hours, in order to provide Manufacturer's Certificate of Proper Installation.
3. As required to resolve field problems attributable to or associated with manufacturer's product.
4. To verify full cure of coating prior to coated surfaces being places into immersion service.
   a. Inspection Reports: Submit written reports to Engineer and Contractor describing inspections made and actions taken to correct nonconforming work. Report nonconforming work not corrected.

b. Manufacturer's Field Services: Manufacturer's representative shall provide technical assistance and guidance for surface preparation and application of coating systems.

3.11 CLEANUP

A. Place cloths and waste that might constitute a fire hazard in closed metal containers or destroy at end of each day.

B. Upon completion of the Work, remove staging, scaffolding, and containers from Site or destroy in a legal manner.

C. Remove paint spots, oil, or stains upon adjacent surfaces and floors and leave entire job clean.

D. As soon as painting Work is accepted by Contactor, it shall become its responsibility for protection, final cleaning, and tough-up. Recoat entire surface where touch-up result is visibly different, either in sheen, texture, or color. Repair coating defects in accordance with manufacturer's written instructions.

E. Upon completion of painting work, clean window glass and other paint spattered surfaces. Remove spattered paint by proper methods of washing and scraping, using care not to scratch or otherwise damage finished surfaces.

3.12 ONE-YEAR INSPECTION

A. Owner will set date for one-year inspection of coating systems.

B. Inspection shall be attended by Owner, Contractor, Engineer, and manufacturer's representative.

C. Repair deficiencies in coating systems as determined by Engineer in accordance with manufacturer's instructions.

3.13 SUPPLEMENTS

A. The supplements listed below, and following "End of Section," are a part of this Specification:
1. Piping Color Schedule – To facilitate identification of piping in Water Treatment Plants and Pumping Stations follow the Ten states Identification System unless otherwise noted.
2. Paint System Data Sheet (PSDS)
3. Product Data Sheet (PDS)

3.14 STENCILING

A. The Contractor shall supply all materials and labor necessary for stenciling of legends on pipes. The legend shall show the name of the contents. Review by the Engineer of legends will be required. Names shall be "plainly visible". Arrows showing direction of flow shall also be stenciled on pipes. The legends shall be located not more than 10 feet

apart and, in general, at each valve and piece of equipment. The size and location of the legend shall be in general accordance with ANSI A13.1-1981 "Scheme for the Identification of Piping Systems". All visible piping 6" in diameter and larger shall be color-coded and stenciled. "Stick-on" labels are not acceptable.

Size of Identification Letters

Outside Diameter of Pipe or Covering (inches)	Size of Letters (inches)
3/4 to 1-1/4	1/2
1-1/2 to 2	3/4
2-1/2 to 6	1-1/4
8 to 10	2-1/2
over 10	3-1/2

3.15 PLASTIC IDENTIFICATION MARKERS

A. All visible piping 3/4" and greater and less than 6" which is accessible for maintenance operations shall be color-coded and identified with semi-rigid plastic identification markers equal to SETMARK Pipe Markers as manufactured by Seton Name Plate Corporation, New Haven, Conn.; T & B/Westline, Los Angeles, California; or equal. Direction of flow arrows are to be included on each marker, unless otherwise specified.

B. Each marker background is to be appropriately color coded with a clearly printed legend to identify the contents of the pipe in conformance with the "Scheme for the Identification of Piping Systems" (ANSI A 13.1 - 1981).

C. For pipes under 3/4" O.D. (too small for color bands and legends), brass identification tags 1-1/2" in diameter with depressed 1/4" high black-filled letters above 1/3" blackfilled numbers shall be fastened securely at specified locations.

D. All electrical conduits, which are accessible for maintenance operations, shall be identified with semi-rigid identification markers similar to those specified above.

E. Each marker background is to be color-coded with a clearly printed legend to identify the conductor. Size of markers and sizes of lettering to generally conform to the "Scheme for Identification of Piping Systems" (ANSI A 13.1 - 1981)

F. Locations for pipe and electrical markers to be as follows:
   1. Adjacent to each valve and fitting (except on plumbing fixtures and equipment).
   2. Each branch and riser take-off.
   3. Each pipe passage through wall, floor and ceiling construction.
   4. Each pipe passage to underground.
   5. All horizontal pipe runs-marked every 25 feet.

Piping Color Schedule – City of Flint Wastewater Treatment

Color bands (stripes) will be 4" wide. There will be one (1) band (stripe) every six (6) feet or one (1) band (stripe) every pipe length, whichever is most frequent.

All pipes shall have direction of flow arrows.

Lettering information shall be Black on light colored backgrounds and White on dark backgrounds. Lettering shall be applied at the same frequency as color bands (stripes).

Air – clean	Safety Orange
Biogas (BG)	Stainless Steel Pipe w/ Alum Jacket w/ Safety Red stripes
Blended Sludge (BS)	Bolt Brown w/ Orange stripes
Caustic	Yellow w/ Green stripes
Chlorine – liquid	Safety Yellow w/ D 78 Blue stripes
Dewatered Sludge (DWS)	Walnut Brown w/ Red stripes
Digested Sludge (DS, MDS)	Walnut Brown w/ Orange stripes
Digested Sludge - Recycle (RCS)	Walnut Brown w/ Yellow stripes
Drainage piping	Black
Drive units, Gear reducers, Pumps, etc.	Battleship Grey
Electrical Box / Enclosure	D 94 Green
Electrical conduit	Match adjacent area color
Ferrous Chloride	Safety Orange
Glycol	Light Green w/ Red stripes
Grit	Dark Gray w/ Black stripes
Guards	Safety Yellow
Heat and exhaust pipes (HVAC type)	Match adjacent area color
Hydraulic lines	Granite Green w/ Safety Orange stripes
Handrails	Battleship Grey (where required)
Mixed Liquor (ML, MLR, CWSL)	Light Gray w/ D 94 Green stripes
Motors, Pumps, Blowers, etc.	Battleship Grey
Natural Gas Piping	Safety Yellow
Overflow (OF)	Match corresponding process color with designation
Primary Sludge (PS)	Bolt Brown w/ Black stripes
Polymer lines	Purple
Raw Sewage	Dark Gray
Recycle (RC)	Black
Return Activated Sludge (RAS)	Bolt Brown w/ Dark Gray stripes
Sample lines	Match piping sampled
Scum	Light Gold
Stairways and steps	New Silver Gray epoxy (where required)
Submerged equipment	Black epoxy (where required)
Thickened Sludge (THS)	Bolt Brown w/ Red stripes
Valves and Operators	Match adjacent piping color
Waste Activated Sludge (WAS)	Bolt Brown w/ Dark Gray stripes
Water – plant effluent (PEW)	Light Blue w/ Safety Red stripes

Color bands (stripes) will be 4" wide. There will be one (1) band (stripe) every six (6) feet or one (1) band (stripe) every pipe length, whichever is most frequent.

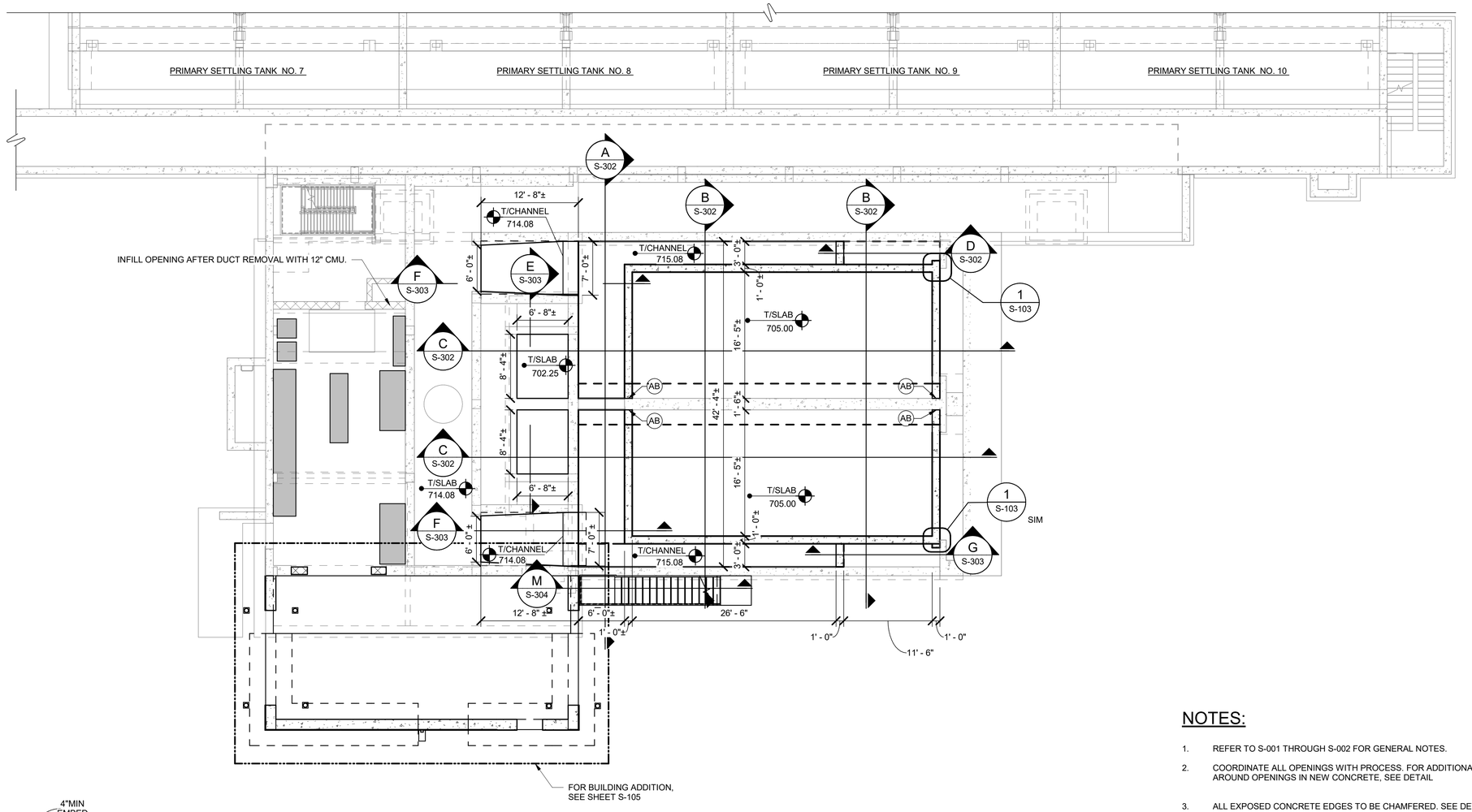
All pipes shall have direction of flow arrows.

Lettering information shall be Black on light colored backgrounds and White on dark backgrounds. Lettering shall be applied at the same frequency as color bands (stripes).

Water - flushing	Light Blue w/ Black stencil lettering "FLUSHING WATER"
Water - hydronic heating	Dark Blue w/ 4" Granite Green stripes with White lettering of "RETURN" or "SUPPLY" designation
Water - potable	Dark Blue
Water - potable, hot	Dark Blue w/ Red stripe
Water - potable, tempered	Dark Blue w/ White lettering "TEMPERED"
Water - service (non-potable)	Light Blue

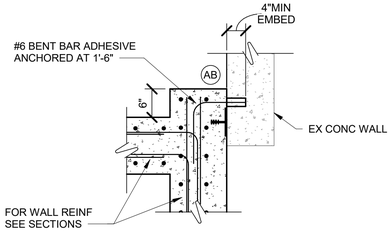
All pipes shall be painted. Review with Owner and Engineer pipe colors for any pipes that are not listed on this schedule.

END OF SECTION



GRIT BUILDING B AND TANKS FOUNDATION PLAN

SCALE: 1/8" = 1'-0"



1 S-103 WALL CONNECTION DETAIL

SCALE: 3/4" = 1'-0"

NOTES:

1. REFER TO S-001 THROUGH S-002 FOR GENERAL NOTES.
2. COORDINATE ALL OPENINGS WITH PROCESS. FOR ADDITIONAL REINF AROUND OPENINGS IN NEW CONCRETE, SEE DETAIL 2 S-501
3. ALL EXPOSED CONCRETE EDGES TO BE CHAMFERED. SEE DETAIL 1 S-501
4. FOR ALL NEW OPENINGS, CLEAN UP CONCRETE EDGES PER DETAIL 9 S-502
5. FOR WALL CORNER BARS FOR THIS STRUCTURE SEE DETAIL 6 S-501
6. FOR ALL EXISTING WALL OPENINGS TO BE FILLED SEE DETAIL 8 S-502
7. L-1 DENOTES WALL LINTEL, SEE DETAIL 1 S-505

LEGEND

(X) DENOTES JOINT TYPE, SEE SHEETS S-501 & S-502 FOR DETAILS

DENOTES CONCRETE EQUIPMENT PAD; SEE DETAIL 7 S-502

0 4' 8' 16'
SCALE: 1/8" = 1'-0"

0 8" 1'-4" 2'-8"
SCALE: 3/4" = 1'-0"

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1	06/22/21	ISSUED FOR BIDS	

CITY OF FLINT, MICHIGAN

FLINT WPC GRIT BAT "B" SYSTEM & PRIMARY TANKS IMPROVEMENTS

GRIT BUILDING B AND TANKS FOUNDATION PLAN

PROJ:	200-156238-21001
DESN:	AJF
DRWN:	JAT
CHKD:	PCP

S-103

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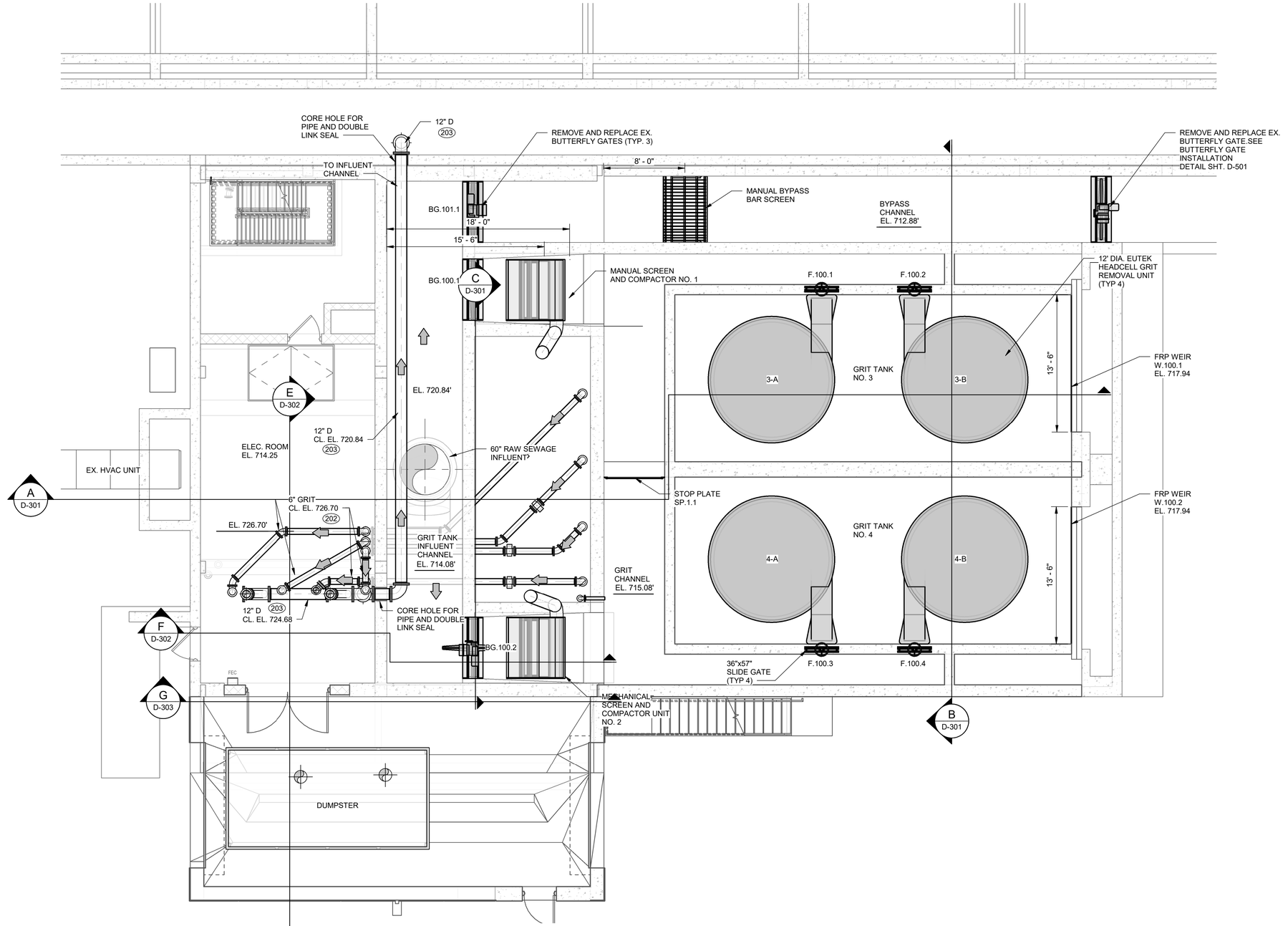

GRIT BLDG GRADE PLAN

SCALE: 3/16" = 1'-0"

4' 0' 4' 8' 12'

SCALE: 3/16" = 1'-0"

Bar measures 1 inch, otherwise drawing is not to scale

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CITY OF FLINT, MICHIGAN

FLINT WPC GRIT BAT "B" SYSTEM & PRIMARY TANKS IMPROVMENTS

GRIT BUILDING GRADE PLAN

PROJ:	200-156238-21001
DESN:	BGB
DRWN:	TJL
CHKD:	MAT

D-102

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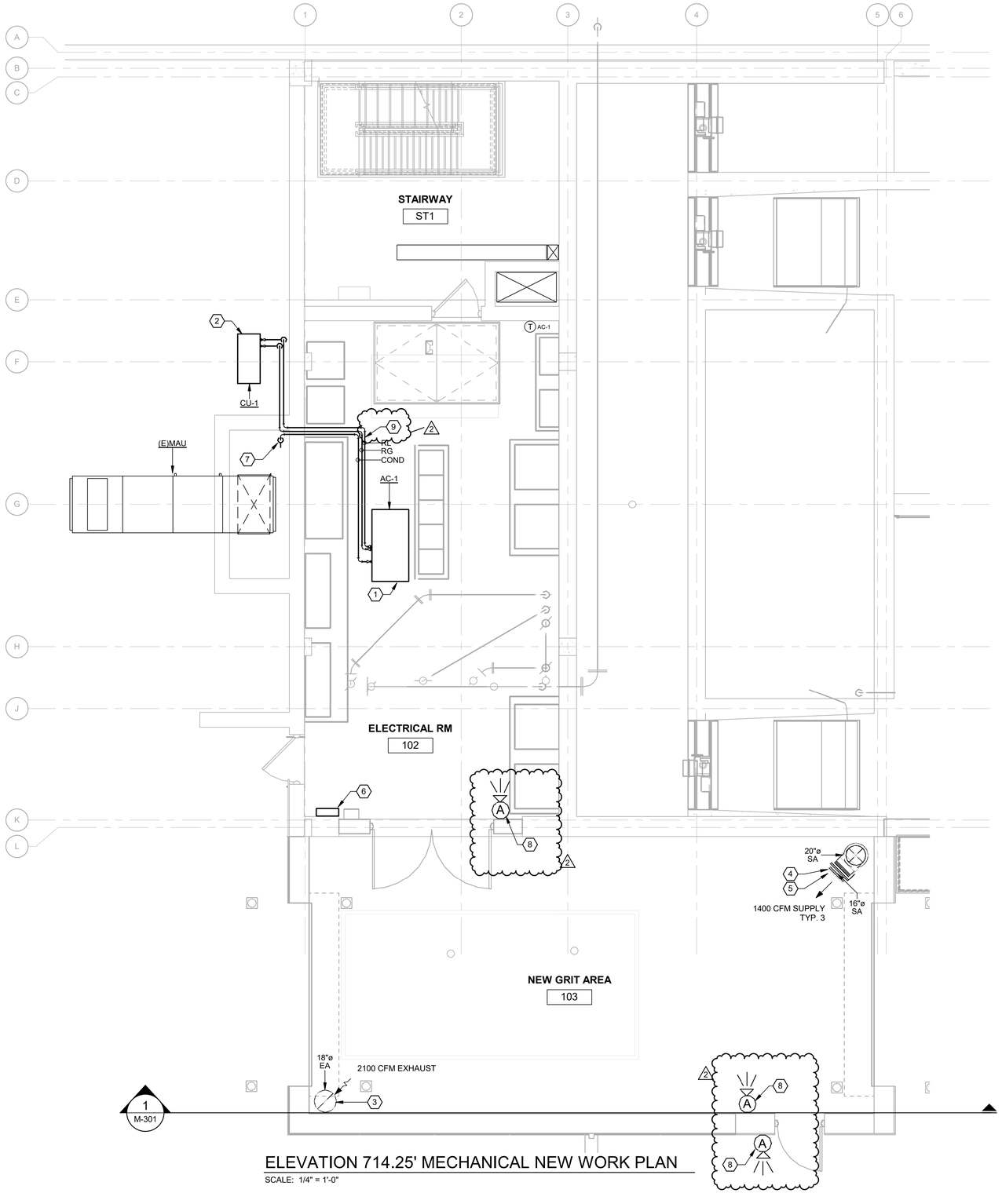

ELEVATION 714.25' MECHANICAL NEW WORK PLAN

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

KEYNOTES

1. SPLIT SYSTEM AIR CONDITIONING UNIT SERVING THE ELECTRICAL ROOM IS TO BE SUPPORTED FROM THE CEILING PER MANUFACTURER SPECIFICATIONS. UNIT IS TO BE SUPPORTED WITH THE TOP OF THE UNIT AT MINIMUM 2'-0" BELOW THE SLAB ABOVE. COORDINATE LOCATION OF UNIT WITH EXISTING PLUMBING AND PROCESS PIPING. COORDINATE LOCATION OF UNIT WITH NEW ELECTRICAL EQUIPMENT.
2. NEW SPLIT SYSTEM CONDENSING UNIT IS TO BE PROVIDED WITH A CONCRETE PAD, ON GRADE. COORDINATE LOCATION OF CONDENSING UNIT WITH EXTERIOR TRANSFORMER.
3. PROVIDE 18" OPEN EXHAUST AIR DUCT INLET WITH MANUAL VOLUME DAMPER. BOTTOM OF EXHAUST INTLET IS TO BE AT MINIMUM 1'-6" A.F.F.
4. PROVIDE 16" OPEN SUPPLY AIR DUCT OUTLET WITH MANUAL VOLUME DAMPER. BOTTOM OF SUPPLY OUTLET IS TO BE AT MINIMUM 2'-0" A.F.F.
5. PROVIDE 16" OPEN SUPPLY AIR DUCT OUTLET WITH MANUAL VOLUME DAMPER. BOTTOM OF SUPPLY OUTLET IN CENTER OF BRANCH IS TO BE AT MINIMUM 13'-6" A.F.F. TOP SUPPLY AIR OUTLET AT THE TOP OF VERTICAL BRANCH IS TO BE MOUNTED AT MOST 2'-0" BELOW ROOF LEVEL.
6. PROVIDE MAKE UP AIR UNIT REMOTE TEMPERATURE SUPPLY CONTROL PANEL WITH DISCHARGE TEMPERATURE CONTROL SUITABLE FOR NEMA-12 ENVIRONMENTS.
7. ROUTE CONDENSATE PIPING FROM AC-1 TO FLOOR DRAIN IN EXTERIOR DUCT CHASE. COORDINATE PIPE ROUTING IN ELECTRICAL ROOM TO AVOID ELECTRICAL EQUIPMENT AND EXISTING PIPING.
8. PROVIDE NEMA 4X VISUAL AND AUDIBLE ALARMS. ALARMS SHALL BE INITIATED IF NO FLOW IS DETECTED BY EITHER THE MAKEUP AIR SUPPLY OR EXHAUST FLOW SWITCHES.
9. REFRIGERANT GAS AND LIQUID PIPING IS TO BE 5/8" AND 3/8" DIAMETER, RESPECTIVELY. VERIFY FINAL SIZING WITH EQUIPMENT MANUFACTURER.

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2	07/08/21	BID ADDENDUM	

CITY OF FLINT, MICHIGAN

FLINT WPC GRIT BAT "B" SYSTEM & PRIMARY TANKS IMPROVEMENT

MECHANICAL NEW WORK FLOOR PLAN - 714.25'

PROJ:	200-156238-21001
DESN:	MJG
DRWN:	JRJ
CHKD:	MJG

M-201

4' 0' 4' 8'

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

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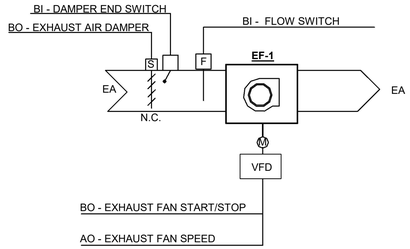
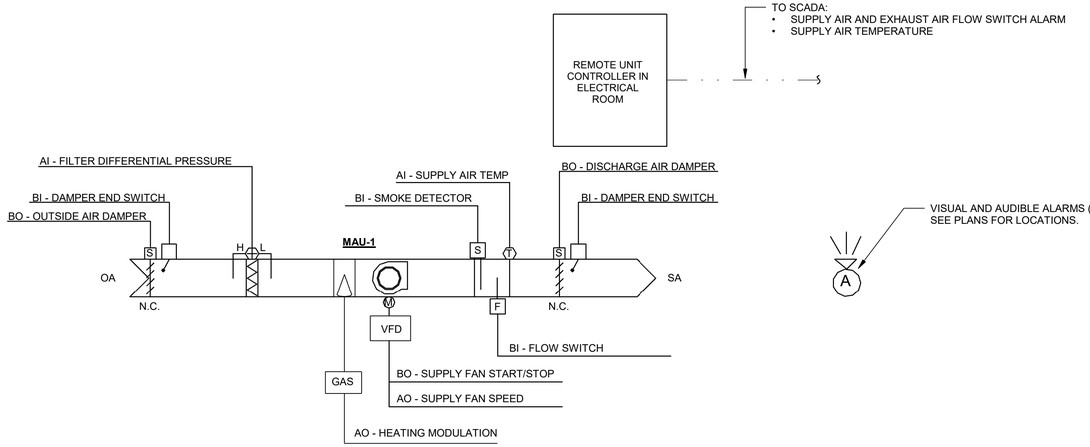




GRIT BUILDING DUMPSTER ADDITION HEATING AND VENTILATION (MAU-1, EF-1)

SEQUENCE SUMMARY:
MAU-1 IN CONJUNCTION WITH EF-1 SHALL PROVIDE HEATING AND VENTILATION TO THE SOLIDS HANDLING AREA AND SOLIDS LOADING ADDITION. BOTH THE SOLIDS HANDLING AREA AND SOLIDS LOADING ADDITION ARE SPACES GOVERNED BY NFPA 820. MAU-1 SHALL RUN CONTINUOUSLY IN CONJUNCTION WITH EF-1 TO MAINTAIN 12 AIR CHANGES PER HOUR (ACH), 24 HOURS A DAY, 7 DAYS A WEEK. THE MAU-1 INDIRECT NATURAL GAS FIRED HEATING SECTION SHALL ENGAGE WHENVEVER THE OUTSIDE AIR TEMPERATURE IS BELOW 55 °F AND SHALL MODULATE TO MAINTAIN A SUPPLY DISCHARGE AT 70 °F (ADJUSTABLE). ALL INPUTS AND OUTPUTS TO BE WIRED BACK TO MAIN HVAC CONTROL PANEL IN ELECTRICAL ROOM.

THE CONTROL OF MAU-1, EF-1, INSTRUMENTS, GAUGES, CONTROL VALVES, AND ACCESSORIES SHALL UTILIZE THE CONTROL SYSTEM PROVIDED BY THE CONTRACTOR. CONTRACTOR SHALL PROVIDE ALL NECESSARY WIRING AND CONDUIT, DEVICES, CONTROLLERS, INTERLOCKS, AND SWITCHES AS NECESSARY TO MEET THE INTENT OF THESE SEQUENCES AND THE CONTROL DIAGRAMS SHOWN. CONTRACTOR SHALL SHALL COORDINATE FOR A FULLY FUNCTIONAL SYSTEM.

RUN CONDITIONS
MAU-1, EF-1, SHALL RUN CONTINUOUSLY UNLESS SHUT DOWN ON SAFETIES OR TURNED OFF MANUALLY AT THE UNIT CONTROLLERS, MOTOR STARTERS, OR DISCONNECTS.

STATUS = ON (DEFAULT): OUTSIDE AIR DAMPERS OPEN, MAU-1 FAN ON, EF-1 ON, GAS BURNER MODULATES AS INITIALIZED BY DISCHARGE TEMPERATURE SENSOR.

STATUS = OFF: ALL DAMPERS CLOSED, ALL FANS OFF.

FILTER DIFFERENTIAL PRESSURE MONITOR:
THE CONTROLLER SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS THE FILTER.

ALARMS SHALL BE PROVIDED AS FOLLOWS:
FILTER CHANGE REQUIRED: WHEN THE DIFFERENTIAL PRESSURE ACROSS THE FILTER EXCEEDS THE MEAN PRESSURE DROP (150% OF THE CLEAN FILTERPRESSURE DROP).

FAN STATUS FLOW SWITCH:
PROVIDE A FLOW SWITCH IN THE DISCHARGE OF THE MAU AND ON THE INTAKE OF THE EXHAUST FAN. FLOW SWITCH SHALL BE WIRED TO CONTROLLER AND IF NO FLOW IS DETECTED VISUAL AND AUDIBLE ALARMS SHALL BE INITIATED AT THE THREE LOCAL ALARMS AT ENTRANCES TO THE GRIT DUMPSTER BUILDING AND INSIDE THE ROOM AND ALSO COMMUNICATED TO THE SCADA OPERATOR DISPLAY.

FREEZE PROTECTION:
IF THE SUPPLY AIR TEMPERATURE IS BELOW 30 °F AND THE FAN HAS BEEN RUNNING FOR 5 MINUTES THE OUTSIDE AIR DAMPER SHALL CLOSE, THE UNIT SHALL SHUT DOWN AND AN ALARM SHALL BE PROVIDED. UNITS SHALL REQUIRE MANUAL RESTART ON FREEZE PROTECTION.

SMOKE DETECTION:
THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM UPON RECEIVING A SMOKE DETECTOR STATUS. UNIT SHALL REQUIRE A MANUAL RESTART.

OUTSIDE AND DISCHARGE AIR DAMPER:
THE OUTSIDE AND DISCHARGE AIR DAMPERS SHALL OPEN ANYTIME MAU-1 RUNS AND SHALL CLOSE ANYTIME THE UNIT STOPS. THE SUPPLY FAN SHALL START ONLY AFTER THE STATUS OF BOTH DAMPERS IS "OPEN". THE OUTSIDE AIR DAMPER SHALL CLOSE 15 SEC (ADJ.) AFTER THE SUPPLY FAN STOPS.

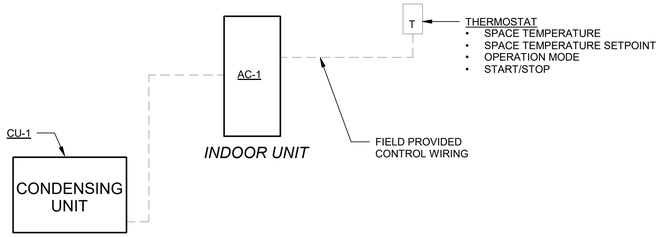
SUPPLY FAN:
THE SUPPLY FAN SHALL RUN CONTINUOUSLY UNLESS SHUT DOWN ON SAFETIES AND SHALL DEFAULT TO RUN AT 100% DESIGN SPEED.

ALARMS SHALL BE PROVIDED AS FOLLOWS:
- OUTSIDE OR DISCHARGE AIR DAMPER FAILURE: COMMANDED OPEN BUT THE STATUS IS CLOSED.
- OUTSIDE OR DISCHARGE AIR DAMPER IN HAND: COMMANDED CLOSED, BUT THE STATUS IS OPEN.
- HIGH SUPPLY AIR TEMP: IF THE SUPPLY AIR TEMPERATURE IS GREATER THAN 110 °F (ADJ.).
- LOW SUPPLY AIR TEMP: IF THE SUPPLY AIR TEMPERATURE IS LESS THAN 40 °F (ADJ.) AFTER 5 MINUTES.
- SUPPLY FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
- SUPPLY FAN IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.

EXHAUST FAN (EF-1):
THE EXHAUST FAN SHALL RUN WHENEVER MAU-1 IS RUNNING AND SHALL DEFAULT TO RUN AT 100% OF DESIGN SPEED. IF OUTSIDE AIR TEMPERATURE IS LESS THAN 10 °F THAN FAN SPEED SHALL BE ALLOWED TO REDUCE SPEED TO 50% OF DESIGN SPEED PER NFPA 820 - 2020, PARAGRAPH 9.3.2.

ALARMS SHALL BE PROVIDED AS FOLLOWS:
- EXHAUST FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
- EXHAUST FAN IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.

SUPPLY AIR TEMPERATURE:
THE CONTROLLER SHALL MONITOR THE SUPPLY AIR TEMPERATURE AND SHALL RELAY THIS POINT TO THE SCADA OPERATOR WORKSTATION.



SPLIT SYSTEM SEQUENCE OF OPERATIONS (AC-1 & CU-1)

THE SPLIT SYSTEM AC UNIT SHALL MONITOR SPACE TEMPERATURE THROUGH THE SPACE THERMOSTAT. THE UNIT SHALL AUTOMATICALLY SWITCH OVER FROM COOLING TO HEATING BASED ON THE COOLING AND HEATING SET POINTS AND THE SPACE TEMPERATURE. THE OUTDOOR UNIT SHALL MODULATE THE COMPRESSOR IN ACCORDANCE WITH MANUFACTURER SEQUENCES TO MAINTAIN SPACE TEMPERATURE. IF SPACE TEMPERATURE IS SATISFIED AND THE COMPRESSOR IS RUNNING AT MINIMUM SPEED BOTH THE INDOOR AND OUTDOOR UNIT SHALL BE OFF.

THE THERMOSTAT SHALL HAVE THE FOLLOWING MINIMUM FEATURES/FUNCTIONS:

OPERATION:
- START/STOP
- OPERATION MODE
- SPACE TEMPERATURE SET POINT (64 °F - 90 °F)

MONITORING:
- STATUS
- SPACE ACTUAL TEMPERATURE

SCHEDULING:
- ONE TIME TIMER
- DAILY TIMER

FEATURES:
- 4-WIRE VINYL SHEATHED CABLE
- LCD DISPLAY
- 2-HR BATTERY BACKUP

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CITY OF FLINT, MICHIGAN
FLINT WPC GRIT BAT "B" SYSTEM & PRIMARY TANKS IMPROVEMENT
MECHANICAL CONTROLS

PROJ: 200-156238-21001
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DRWN: JRJ
CHKD: MJG

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