

ADDENDUM NO. 04

TO: All Plan Holders
FROM: Public Utility District No. 1 of Skamania County
PROJECT: CARSON WATER TREATMENT PLANT UPGRADE
DATE ISSUED: 7/10/2026

This Addendum modifies the Contract Documents for the above-referenced project as follows. All other terms and conditions remain unchanged. Bidders shall acknowledge receipt of this Addendum on the Bid Form.

Note: Modifications to the bid documents provided as attachments to this addendum are shown in red text. Deletions are shown as red-line strikeouts.

Addendum No. 04 to Bid Document is comprised of the items listed below:

ITEM NO. 1 – ADDENDUM NO. 2 CORRECTIONS

- Revise drawing 30I-604 Addendum No. 2 language to be, “**ADD** “BPV-0410” downstream from 30-VB-0413. **ADD** “BPV-0420” downstream from 30-VB-0423. ~~**DELETE** “PI-0210B”, “PI-0220B”, and “PI-0230B”.~~”

ITEM NO. 2 – BID, VOLUME 1 – CONTRACTING REQUIREMENTS REVISIONS

- Section C-410 Bid Form, **REPLACE** in its entirety **WITH** the attached.

ITEM NO. 3 – VOLUME 2 – TECHNICAL SPECIFICATION REVISIONS

- 23 70 00 Central HVAC Equipment
 - REPLACE** the section in its entirety **WITH** the updated version attached to this addendum.
- 31 63 33 Drilled Micropiles
 - 1.04 J-3. **REPLACE** “Load test data shall be signed and sealed by a Professional Engineer registered in the State of California.” **WITH** “Load test data shall be signed and sealed by a Professional Engineer registered in the State of Washington.”.
 - 1.07. **ADD** “C. The design micropile loads are as follows: 198.1 kips (axial compression); 109.3 kips (axial tension); 12 kips (lateral). Note that these loads are based upon ASCE 7-16 strength level (LRFD) seismic load combinations, with the governing load combination as 1.2D + 1.0E for micropile compression and 0.9D + 1.0E for tension. The adjusted micropile loads for service level conditions are as-follows: 151.7 kips (axial compression); 80.1 kips (axial tension); 8.4 kips (lateral).”
 - 2.03.D.2. **ADD** “or Type IL” **AFTER** “Type V”.
 - 2.03.G.3. **ADD** “or at least the required compressive, tensile, and/or bending strength used in the design of the micropile” **AFTER** “of the casing sections.”.
 - 3.08.A.15. **ADD** “or load / pressure calibration for the hydraulic jack and pump” **AFTER** “load cell”.
 - 3.09 B. **REPLACE** “Location of verification test piles shall be as indicated on the Contract Drawings.” **WITH** “One successful verification test pile shall be constructed and load tested in tension only.”.

- 3.09 H. **DELETE** "Where indicated,."
- 3.09 I. **DELETE** "Where indicated,."
- 3.10 A. **REPLACE** "The Contractor shall perform proof load tests on a minimum of 8 production micropiles." **WITH** "The Contractor shall perform proof load tests on a minimum of 6 production micropiles."
- 3.10 A-1. **REPLACE** "Four proof tests shall be done in accordance with the Cyclic Load Test Schedule." **WITH** "Four proof tests shall be done in accordance with the Cyclic Load Test Schedule (compression only)."
- 3.10 D. **DELETE** "Where indicated,."
- 3.10 E. **DELETE** "Where indicated,."
- Section 40 90 10 Sodium Hypochlorite Generation System
 - Attachment A Instrument List, Row with Instrument Tag LIT-0350. **REPLACE** "Pressure Differential" **WITH** "Radar" in two locations.
- Section 43 40 09 Double Walled HDPE Tanks.
 - 2.3 A. **REPLACE** "Ultrasonic Level Indicator" paragraph **WITH** "Not Used".
- Section 46 32 00 Sodium Hypochlorite Generation System
 - 1.1 B. **ADD** "0.7% or" **BEFORE** "0.8%".
 - 2.1-B 1. **ADD** "electropolished Type 304 stainless steel or" **AFTER** "corrosion resistant".
 - 2.1-B 2. **ADD** "or electropolished Type 304 stainless steel" **AFTER** "epoxy coated steel".
 - 2.3 A-4. **DELETE** "and not be designed to operate in overdrive". **ADD** last sentence "Size each vessel to handle 100% of peak flow during regeneration of the other vessel".
 - 2.4-A 3 b. **ADD** "or OptixPanel 2800S-070DS-N1S" **AFTER** "PanelView Plus 1000".
 - 2.5 A-1. **REPLACE** "An SCR-type transformer/rectifier shall be furnished to provide DC power to each hypochlorite generator." **WITH** "An SCR-type, Switchmode (High-Frequency SMPS), or Bridge-Type transformer/rectifier shall be furnished to provide DC power to each hypochlorite generator. Supplier shall demonstrate compliance with IEEE 519 harmonics limits."
 - 2.5 A-2. **REPLACE** "Input to transformer/rectifier shall be 240 V +/-5%, 3 PH, 60 Hz." **WITH** "The design basis for the OSHG UNITS (30-OSHG-0810 & 30-OSHG-0820) including the rectifier is 120VAC power. Alternate available power supplies from PP-210 or LP-200 that could be used by the Contractor to power the Blower include: 120VAC 1 phase, 208VAC 1 & 3 phase, 277VAC 1 & 3 phase, and 480VAC 1 & 3 phase. 240VAC power is not available is not acceptable. If a Contractor selects equipment using an alternate available power supply then it shall provide and install additional circuit breakers, conduit, and wire to supply the alternate power supply at no additional cost to the Owner."
 - 2.5 A-3. **DELETE** "Output from transformer/rectifier shall be 1500 A @ 24 V DC."
 - 2.5 C-3. **ADD** "Voltmeter not required for bridge-type fixed-voltage transformer/rectifier."
 - 2.5 C-3. **ADD** "or adjustment through HMI" **AFTER** "built-in potentiometer".

ITEM NO. 4 – VOLUME 3 – APPENDIX REVISIONS

- None

ITEM NO. 5 – VOLUME 4 – CONTRACT DRAWING REVISIONS

- S-001 General Note for Concrete. **ADD** "Non-shrink grout not required for micropiles, neat cement grout mix to be used for micropiles in accordance with 03 60 00/2.02." **AFTER** "All grout shall be non-shrink grout, unless indicated otherwise".
- S-008, Detail S-901. **ADD** Notes "3. 4" SQ Washer at cap shall be ¾" THK" and "4. Use of API N80 mill secondary material, in lieu of ASTM A519 / A106, is acceptable"

- 25S-101, **REPLACE** “8” DIA Micropile (TYP)” **WITH** “8” DIA Micropile (10.75” OD per DET S-901 on DWG S-008) (TYP)”.
- E-601, **REPLACE** Keynote A in its entirety **WITH** “Provide new 480/277VAC PUD electrical service with solidly grounded wye. Contractor shall provide all components not provided by the PUD, mounting hardware, etc., to provide a complete and operable system. Primary and most of secondary conduit by PUD. Primary and secondary cables by PUD. Provide 1,200 amps secondary conduits where not provided by PUD, metering, service disconnect and switchgear rated for 750kVA transformer. Provide service disconnect trip rating to match transformer provided.
- E-602, **ADD** General Sheet Note “6. The design basis for the SHC STORAGE TANK BLOWER 30-BL-0340 is 480VAC 3 phase power. Alternate available power supplies from PP-210 or LP-200 that could be used by the Contractor to power the Blower include: 120VAC 1 phase, 208VAC 1 & 3 phase, 277VAC 1 & 3 phase, and 480VAC 1 phase. 240VAC power is not available and is not acceptable. If a Contractor selects equipment using an alternate available power supply then it shall provide and install additional circuit breakers, conduit, and wire to supply the alternate power supply at no additional cost to the Owner.”
- E-603, **ADD** General Sheet Note “6. The design basis for the OSHG UNITS (30-OSHG-0810 & 30-OSHG-0820) is 120VAC power. Alternate available power supplies from PP-210 or LP-200 that could be used by the Contractor to power the Blower include: 120VAC 1 phase, 208VAC 1 & 3 phase, 277VAC 1 & 3 phase, and 480VAC 1 & 3 phase. 240VAC power is not available is not acceptable. If a Contractor selects equipment using an alternate available power supply then it shall provide and install additional circuit breakers, conduit, and wire to supply the alternate power supply at no additional cost to the Owner.”
- 30I-603, **MOVE** LIT-0350 to top of tank and **ADD** label instrument as “Radar”. **ADD** “LAH-0350” output to SCADA. **ADD** General Sheet Note “3. Brine storage tank (30-TK-0310) to include automatic level control float valve on inlet (not shown) per Specification Section 46 32 00.”
- M-601 Equipment Schedule – **REPLACE** with the updated version attached to this addendum.

ITEM NO. 6 – RFP QUESTIONS/CLARIFICATIONS

- Q1. Does the Hypo Pump Skid have any written specifications (46 32 00 Part 1.1.5)?
- A1. **Refer to Sections 46 30 00 Chemical Feeding Equipment General and 46 33 50 Peristaltic Metering Pumps, revised as part of Addendum 2.**
- Q2. Please confirm that 30-BL-0340 Dilution Blower require a 1/2HP 480VAC Motor.
- A2. **The project design includes a 480VAC 3 phase power feed to the 30-BL-0340 motor. Alternate available power supplies that could be used by the Bidder to power the Dilution Blower include: 120VAC 1 phase, 208VAC 1 & 3 phase, 277VAC 1 & 3 phase, and 480VAC 1 & 3 phase. 240VAC power is not available and is not acceptable. If a bidder selects equipment using an alternate available power supply, the bid price shall include the cost of circuit breakers, conduit, and wire to supply the alternate power supply and the work shall be completed at no additional cost to the Owner.**
- Q3. The rectifier electrical input required indicates 240VAC (46 32 00 Part 2.5). Drawings E-603 and 30I-608 imply an electrical input of 120VAC. Please confirm whether the available supply is going to be 120VAC or 240VAC
- A3. **The specification Section 46 32 00 2.5 A-2 is revised above. The project design includes a 120VAC power feed to the OSHG UNITS (30-OSHG-0810 & 30-OSHG-0820) including the rectifier. Alternate available power supplies that could be used by the Bidder to power the Dilution Blower include: 120VAC 1 phase, 208VAC 1 & 3 phase, 277VAC 1 & 3 phase, and 480VAC 1 & 3 phase. 240VAC power is not available and is not acceptable. If a bidder selects equipment using an alternate available power supply then it shall include the cost of circuit breakers, conduit, and wire to supply the**

alternate power supply in its bid and the work shall be completed at no additional cost to the Owner.

- Q4. Are switchmode type rectifiers acceptable? (46 32 00 Part 2.5).
A4. **Yes. Section 46 32 00, Part 2.5 has been revised by this Addendum to allow both SCR-type and switchmode (high-frequency SMPS) rectifiers, provided the proposed rectifier meets all performance, harmonics (IEEE 519), efficiency, ripple, environmental, and warranty requirements.**
- Q5. A Softener manufacturer suggested an overdrive duplex setup for uninterrupted flowrate that can treat 11-15 gpm. Please confirm this is acceptable (46 32 00 Part 2.3).
A5. **An overdrive duplex setup for uninterrupted flowrate in accordance with 46 32 00 Part 2.3 as revised in this addendum is acceptable.**
- Q6. Please confirm that the electrical input to 30-VCP-0810, 0820 & 0830 is going to be 120VAC.
A6. **Confirmed.**
- Q7. Are there any specifications for the 30-LIT-0350 and 30-LSL-0350 Leak detection instruments?
A7. **Refer to Specification Sections 40 72 00 – Level Measurement and 40 72 76 – Level Switches, 40 90 00-A Instrument List, 40 90 00-B I/O List for additional information on 30-LIT-0350 and 30-LSL-0350. Refer to 40 90 10-3.6 for Control Strategies.**
- Q8. Can the Brine Pumps 30-P-0810 and 30-P-0820 be located outside of the OSHG enclosure/skid within the premise of the chemical building (indoors)?
A8. **No, brine pumps shall be mounted within the OSHG skid.**
- Q9. Will you please provide the micropile service loads (axial compression, axial tension, and lateral)?
A9. **The design micropile loads are as follows: 198.1 kips (axial compression); 109.3 kips (axial tension); 12 kips (lateral). Note that these loads are based upon ASCE 7-16 strength level (LRFD) seismic load combinations, with the governing load combination as 1.2D + 1.0E for micropile compression and 0.9D + 1.0E for tension. The adjusted micropile loads for service level conditions are as-follows: 151.7 kips (axial compression); 80.1 kips (axial tension); 8.4 kips (lateral).**
- Q10. How many micropile verification load tests are required?
A10. **One successful Verification Load Test pile is required per the specification revisions above.**
- Q11. The Project Manual requires micropile compression load testing "where indicated." Will compression load testing be required or can all load tests be completed in tension?
A11. **Compression load testing requirements are described in 31 63 33 Drilled Micropiles, as revised in this addendum.**
- Q12. Plan sheet S-008 Composite Micropile Section – Please clarify required thickness of the 4" square washer.
A12. **Washer thickness to be ¾" based upon AISC 360-16/Table 14-1, see S-008, Detail S-901 drawing revision above.**
- Q13. Plan sheet S-008 Composite Micropile Section – Detail specifies ASTM A519 / A106 – 80 KSI pipe for the micropile permanent casing. Please clarify that the use of API N80 mill secondary material for the micropile casing is acceptable as inferred in the drilled micropile specification 2.03.G.

- A13. Use of API N80 mill secondary material is acceptable, see S-008, Detail S-901 drawing revision above.**
- Q14. Plan sheet S-008 Composite Micropile Section – Detail specifies 10.75" OD permanent casing. Plan sheet 25S-101 notes 8" dia micropile (typ). Please clarify the required outside dimension of the micropile permanent casing.
- A14. Outer diameter of micropiles to be 10.75", see 25S-101 drawing revision above.**
- Q15. Drilled Micropile specification 1.04.J.3 requires load test data to be signed and sealed by a Professional Engineer registered in the state of California. Is it acceptable for the load test results to be signed and sealed by a Professional Engineer registered in the state of Washington?
- A15. Load test results shall be signed and sealed by a Professional Engineer registered in the state of Washington, see revision to 31 63 33 Drilled Micropiles above.**
- Q16. Drilled Micropile specification 2.03.D.2 requires all cement conform to ASTM C150 Type II or Type V. Is the use of Type 1L cement acceptable for the micropile grout? Type I/II is not readily available anymore.
- A16. Type 1L cement is acceptable for micropile grout.**
- Q17. Plan sheet S-001 General Notes state "All grout shall be non-shrink grout unless indicated otherwise". Please clarify that the use of non-shrink grout for the micropiles is not required.
- A17. Non-shrink grout not required for micropiles, neat cement grout mix to be used for micropiles in accordance with 03 60 00 Grouting Section 2.02.**
- Q18. Drilled Micropile specification 2.03.F.1 – Please clarify the required steel grade for the micropile threadbars. If grade 75 or 80 is required, they would conform to ASTM A615. If grade 150 is required, they would conform to ASTM A722.
- A18. Threadbars shall conform to ASTM A722 Grade 75.**
- Q19. Drilled Micropile specification 2.03.F.2 – Does the typical Dywidag rolled coarse thread meet the requirements of this specification section?
- A19. Dywidag Threadbar meets the requirements of 31 63 33 Drilled Micropiles Section 2.03.F.2.**
- Q20. Drilled Micropile specification 2.03.G.3 requires the micropile casing section connections develop the ultimate tensile strength of the casing sections. Is it acceptable for the casing threaded connections to develop at least the required compressive, tensile, and/or bending strength used in the design of the micropile as allowed in the referenced FHWA Micropile design and construction report?
- A20. Yes, this is acceptable.**
- Q21. Drilled Micropile specification 3.08 Please provide the service design loads for the micropiles. Please clarify whether the verification test loads are to be applied in tension or compression.
- A21. Loads and verification test loads are described in the 31 63 33 Drilled Micropiles specification revisions above.**
- Q22. Drilled Micropile specification 3.08.A.15 states Use a load cell at (as) the primary load measurement system. Can the load / pressure calibration for the hydraulic jack and pump be used as the primary load measurement system as is typical?
- A22. Yes, this is acceptable.**
- Q23. Drilled Micropile specification 3.09.B – We cannot see where the location of the verification test piles are indicated in the contract drawings.

- A23. Pre-production verification load testing shall be conducted on a sacrificial (non-production) pile away from the pile cap foundation located in agreement with the Resident Project Representative.**
- Q24.** Drilled Micropile specification 3.10.A – For the 6 of the 8 proof load tests not performed in accordance with ASTM D3689, please clarify whether the proof test loads are to be applied in tension or compression.
- A24. Proof test loads not performed in accordance with ASTM D3689 are to be applied in compression.**
- Q25.** The Microclor (PSI) 20 PPD (MC-20) system produces sodium hypochlorite at a concentration of 0.7% ($\pm 0.05\%$). Despite the lower concentration, the system satisfies the specified chlorine production capacity and treatment performance requirements. Given this, is the MC-20 OSHG acceptable for this application? If not, the larger MC-40 (40 ppd) system will be required, which has a higher cost.
- A25. A 0.7% concentration system that satisfies the specified chlorine production capacity and treatment performance requirements is acceptable.**
- Q26.** Please clarify if the sodium hypochlorite pumps need to be provided by the OSHG system supplier or if the pumps shall be provided by others/by the Contractor? Although the OSHG scope of work includes the peristaltic metering pumps, Section 46 33 50 - 1.1 A. states that the contractor shall provide the peristaltic metering pumps. Please clarify who is providing the pumps.
- A26. The brine pumps, 30-P-0810 and 30-P-0820 are to be provided through the OSHG system supplier. The sodium hypochlorite feed pumps, 30-P-0420 and 30-P-0410, may be shall be supplied by the Contractor. Sodium hypochlorite transfer pump, 30-P-0430, is provided and shipped loose by the membrane system supplier.**
- Q27.** The Microclor (PSI) system utilizes an electropolished Type 304 stainless steel skid frame rather than epoxy-coated carbon steel. Stainless steel construction provides superior corrosion resistance, eliminates coating maintenance requirements, and is commonly used in municipal water treatment applications. Will the electropolished 304 SS skid frame be accepted as an equal alternative?
- A27. Yes, this is acceptable.**
- Q28.** The Microclor (PSI) system utilizes stainless steel equipment supports and mounting hardware in lieu of epoxy-coated steel components. Will stainless steel supports and mounting members be accepted as an equal alternative to epoxy-coated steel supports?
- A28. Yes, this is acceptable.**
- Q29.** The P&ID is contradicts this specification requirement. The P&ID shows multiple local control panels on pages 30I-603 and 30I-608 for the blower, brine pump, rectifier, and more. Please confirm these local control panels are not needed. Please confirm that local control of these devices will be handled through the HMI of the OSHG system control panel,
- A29. Local control of the devices shall be through the OSHG vendor control panel.**
- Q30.** The HMI mentioned is obsolete. In its place, we recommend Allen Bradley OptixPanel 2800S-070DS-N1S. Will this be acceptable?
- A30. Yes, it is acceptable.**
- Q31.** The specified SCR transformer/rectifier technology is not compatible with the standard Microclor (PSI) OSHG system design. The Microclor (PSI) OSHG system uses a bridge-type fixed-voltage transformer/rectifier design that provides high-efficiency DC power conversion and has been successfully deployed in numerous municipal installations. Will the bridge-type be accepted as an equivalent in lieu of the specified SCR-type transformer/rectifier?

- A31. **Yes, the bridge-type is acceptable transformer/rectifier technology.**
- Q32. Is a transformer operating at up to 40A max at 60VDC acceptable.
A32. **Yes**
- Q33. The Microclor (PSI) system utilizes type 304 stainless steel enclosure, which provides excellent corrosion resistance. Please advise if this is acceptable
A33. **304 stainless steel enclosure is acceptable.**
- Q34. The standard dimensions of the Microclor (PSI) OSHG transformer/rectifier is 24" L x 14" W x 14" D. This is skid-mounted. Please confirm if this standard size is acceptable. The size is not clearly identified on the drawings.
A34. **Standard dimensions are acceptable.**
- Q35. As noted above, the Microclor (PSI) OSHG system uses a bridge-type fixed-voltage transformer/rectifier design. The output voltage is fixed therefore, the voltmeter is not required. Please advise if the omission of the voltmeter is acceptable.
A35. **Yes, omission of the voltmeter is acceptable for bridge-type fixed-voltage transformer/rectifier.**
- Q36. On the Microclor (PSI) OSHG System, the current adjustment is via HMI only. A potentiometer is not provided for this activity. Please confirm that this is acceptable.
A36. **Acceptable.**
- Q37. As a result of lower amp requirement, the cable provided will be #4AWG.
A37. **Acceptable if compliant with applicable codes.**
- Q38. The standard Microclor (PSI) OSHG system includes two different piping arrangements. One 2" SCH 80 PVC piping from the generators to the hypo tank inlet, and another 2" SCH 80 PVC piping from the generator vent header to the hypo tank vent. The two piping arrangements are connected by a 2" SCH 80 PVC vent riser for each electrolytic cell with a 48" minimum riser height. This minimum height requirement and piping arrangement is integral to the OSHG system and hydrogen gas lift effect.
A38. **Noted.**
- Q39. This conflicts with spec section 46.32.00 2.5.A.1 which indicates 240VAC 3 Phase. Please confirm the correct rectifier input voltage.
A39. **120VAC is the designed power supply. See above specification revisions for power supply options available.**
- Q40. The brine pump is integral to the Microclor (PSI) OSHG system and runs at 24VDC with a 0-5VDC controller. Controls are via HMI soft key and integral to the system operation. Control of the brine pump is automatically operated by the Microclor PLC program. Please advise if this is acceptable.
A40. **Yes, this is acceptable.**
- Q41. Section 40 72 00 contains conflicting requirements for the sodium hypochlorite storage tank level instrumentation. Specifically, Section 43 40 09 2.3.A specifies a Flowline ultrasonic level transmitter, while Section 40 72 00 -2.01 A & B specifies a radar level transmitter, listing acceptable manufacturers/models including the Endress+Hauser Micropilot FMR5x Series and Rosemount 5408 Series. Please clarify the intended level transmitter required for the sodium hypochlorite storage tank. Additionally, will PSI's standard Icon Level Pro 200C series submersible level transmitter be accepted as an acceptable alternate? The proposed submersible level transmitter provides continuous and reliable level measurement and has

been successfully utilized in numerous municipal sodium hypochlorite storage tank installations.

- A41. **See related drawing and specification revisions above. The sodium hypochlorite storage tank (30-TK-350) shall include a radar level indicating transmitter (LIT-0350) mounted in a nozzle in the top of the tank with signal routed to the 30-VCP-0820 OSHG control panel. PSI's standard Icon Level Pro 200C series submersible level transmitter is not acceptable.**
- Q42. The 30-WP-1010 Sample Panel (sheet I-026) is estimated to be approx. five, (5) feet in height by eight, (8) feet wide minimum. There does not appear to be enough room allocated on sheet 30E-101 location C4 or provisions to accommodate wiring on the back side.
- A42. **The sample panel wraps around the corner of the wall. It is not installed on just one face of the wall. See also the process mechanical sheets. Rear access is not required as typically all the cables drop down to their termination points on the panel from a cable tray, wire way, etc. mounted above the sample panel. See the General Sheet Notes regarding combining cables in conduits.**
- Q43. Is there an electrical conduit and wiring schedule list available, as the one line drawings show several references to P, S and C type conduits and wiring?.
- A43. **No, there is not a cable/conduit schedule, all the information is shown on the one-line and conduit development. The P, S and C are just descriptors for Power, Signal and Control to help differentiate their usage. Note that for conduits with a mix of wires are designated with the most restrictive type, which is S, then C, with P being the least restrictive.**
- Q44. Spec and drawings call out our standard level 1 paint Alkyd Enamel(500 hrs salt spray rating ASTM B117-11) for the exterior of the unit. This will not hold up very long IF the area is corrosive. The selection I provided had our level 3(2,500 hrs salt spray rating) two component epoxy w/ polyurethane topcoat that is highly resistant to a corrosive environment. Do you not need the higher-level paint for this unit?
- A44. **Provide level 3 paint (2,500 hrs salt spray rating) two component epoxy w/ polyurethane topcoat**
- Q45. Spec calls out for galvanized metal liner for unit interior(no corrosion protection). Selection I provided called out for the floors and liner to be 304 S.S. What is required?
- A45. **Keep galvanized metal liner for unit interior without any paint as the fan will be epoxy coated and heating coil will be SS sheathed.**
- Q46. Spec near the fan section calls out to provide an inlet screen is that an inlet screen for the heating coil or are you wanting a belt guard for the supply motor or something else?
- A46. **We need OSHA belt guard for supply motor.**
- Q47. NEMA 3R is called out for the disconnect rating, no NEMA rating is called out for the other electrical components or control panel. No corrosion-resistant components required?
- A47. **Provide NEMA 4X disconnect switch, electrical components and control panel since they will be exposed to exterior environment**
- Q48. Stainless steel sheathed heating coil is also called out which sounds like potential NEMA 4X rating is required. Is that level of corrosion protection required on the coil?
- A48. **Yes, provide SS sheathed heating coil.**
- Q49. Please clarify the electrical service scope performed by the PUD and the Contractor.
- A49. **PUD will supply and install the primary and secondary electrical facilities (including transformer, conduit and wire) and meter. Contractor responsibilities include:**

- **Provide and install the meter base. This includes the PVC conduit and a 36-inch radius sweep that will be pointed in the direction of the trench.**
- **Provide all trenching and backfill per PUD standard drawing (18" min. wide by 36" deep measured to top of conduit).**

ATTACHMENTS TO ADDENDUM:

- Revised Section C-410 Bid Form
- Revised Section 23 70 00 Central HVAC Equipment
- Drawing M-601 Equipment Schedule

SECTION C410 – BID FORM FOR CONSTRUCTION CONTRACT

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

ARTICLE 1—OWNER AND BIDDER

- 1.01 This Bid is submitted to: **Skamania County PUD No. 1, 1492 Wind River Hwy, Carson, Washington 98610.**
- 1.02 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.
- 1.03 This project will be partially funded with Federal funds from the United States Department of Agriculture, Rural Development and the US Environmental Protection Agency and therefore is subject to the Federal laws and regulations associated with these programs. By submitting a bid, the bidder agrees to comply with these programs.

ARTICLE 2—ATTACHMENTS TO THIS BID

- 2.01 The following documents are submitted with and made a condition of this Bid:
 - A. Required Bid security;
 - B. List of Proposed Subcontractors in accordance with RCW 39.30.060;
 - C. Proposed Supplier/Subcontractor for the welded steel tank;
 - D. Evidence of authority to do business in the state of the Project; or a written covenant to obtain such authority within the time for acceptance of Bids;
 - E. Contractor's license number as evidence of Bidder's State Contractor's License or a covenant by Bidder to obtain said license within the time for acceptance of Bids;
 - F. Required Bidder Qualification Statement C-451 with supporting data;
 - G. If Bid amount exceeds \$10,000, signed Compliance Statement (RD 400-6, **Attachment DIV0_A_USDA 01**). Refer to specific equal opportunity requirements set forth in the Supplementary Conditions of the Construction Contract (EJCDC C-800);
 - H. If the Bid amount exceeds \$25,000, signed Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transactions (AD-1048, **Attachment DIV0_A_USDA 02**);
 - I. If the Bid amount exceeds \$100,000, signed RD Instruction 1940-Q Exhibit A-1 (**Attachment DIV0_A_USDA 03**), Certification for Contracts, Grants, and Loans.
 - J. If the public works contract is awarded after July 1, 2024 and the contract price is in excess of \$2,000,000, provisions of the Washington State Apprenticeship Act which includes minimum Apprenticeship Utilization Requirements (AURs), incentives and penalties as described in RCW 39.04.320, RCW 39.04.340 and RCW 39.04.350 apply.
 - K. Bidder acknowledgment of DBE Good Faith Efforts requirements per Instructions to Bidders Article 27, executed as Article 8.02.A.8 of this Bid Form. Detailed DBE outreach documentation is NOT required with bid and shall be submitted within 30 days of Notice to Proceed.
 - L. Not Used.

- M. Signed Certification Regarding Lobbying Activities (**Attachment DIV0_B_EPA 04**)
- N. Signed certification letter stating that the Containerized Membrane Filtration System as specified in 46 61 34 complies with the American Iron and Steel and BABAA requirements. Note: no waivers will be granted for this equipment.

ARTICLE 3—BASIS OF BID—BASE BID LUMP SUM AND ADDITIVE ALTERNATE LUMP SUM BIDS

Bidders must submit lump sum prices for each Base Bid Item and each Additive Alternate Bids. The award of the Bid will be to a single contractor and will be based on the lowest total responsive and responsible Base Bid. The Owner may or may not choose to award an Additive Alternate.

A. Base Bid - Lump Sum Bids

Item 1: Lump Sum Bid Price	\$
Item 2: Trench Excavation Safety Systems Lump Sum Price (See Section 31 23 16.13)	\$
Item 3: Washington State Sales & Use Taxes (7.7%) Lump Sum Price	\$
Total Base Bid Price	\$

B. Additive Alternate Lump Sum Bids (see description in 01 10 00 Summary of Work)

Alternate A – Canopy (Additive)	\$
Alternate A - Washington State Sales & Use Taxes	\$
Total Additive Alternate A Bid Price	\$
Alternate B – Standby Generator (Additive)	\$
Alternate B - Washington State Sales & Use Taxes	\$
Total Additive Alternate B Bid Price	\$

ARTICLE 4—DELETED

ARTICLE 5—DELETED

ARTICLE 6—TIME OF COMPLETION

- 6.01 Bidder agrees that the Work will be substantially complete and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions within the number of calendar days indicated in the Agreement.
- 6.02 Deleted.
- 6.03 Deleted.
- 6.04 Bidder accepts the provisions of the Agreement as to liquidated damages.

ARTICLE 7—BIDDER’S ACKNOWLEDGEMENTS: ACCEPTANCE PERIOD, INSTRUCTIONS, AND RECEIPT OF ADDENDA

7.01 *Bid Acceptance Period*

- A. This Bid will remain subject to acceptance for **90** days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner **if additional USDA funding is required**.

7.02 *Instructions to Bidders*

- A. Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security.

7.03 *Receipt of Addenda*

- A. Bidder hereby acknowledges receipt of the following Addenda: **Add rows as needed. Bidder is to complete table.**

Addendum Number	Addendum Date

ARTICLE 8—BIDDER’S REPRESENTATIONS AND CERTIFICATIONS

8.01 *Bidder’s Representations*

- A. In submitting this Bid, Bidder represents the following:
1. Bidder has examined and carefully studied the Bidding Documents, including Addenda.
 2. Bidder has visited the Site, conducted a thorough visual examination of the Site and adjacent areas, and become familiar with the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
 3. Bidder is familiar with all Laws and Regulations that may affect cost, progress, and performance of the Work including all Domestic Preference requirements and Washington State Apprenticeship Utilization Requirements.
 4. Bidder has carefully studied the reports of explorations and tests of subsurface conditions at or adjacent to the Site and the drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, with respect to the Technical Data in such reports and drawings.
 5. Bidder has carefully studied the reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, with respect to Technical Data in such reports and drawings.
 6. Bidder has considered the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Technical Data identified in the Supplementary Conditions or by definition, with respect to the effect of such information, observations, and Technical Data on (a) the cost, progress, and performance of the Work; (b) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, if selected as Contractor; and (c) Bidder’s (Contractor’s) safety precautions and programs.
 7. Based on the information and observations referred to in the preceding paragraph, Bidder agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.
 8. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.

9. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and of discrepancies between Site conditions and the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.
10. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.
11. The submission of this Bid constitutes an incontrovertible representation by Bidder that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

8.02 *Bidder's Certifications*

A. The Bidder certifies the following:

1. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation.
2. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid.
3. Bidder has not solicited or induced any individual or entity to refrain from bidding.
4. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 8.02.A:
 - a. Corrupt practice means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process.
 - b. Fraudulent practice means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition.
 - c. Collusive practice means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels.
 - d. Coercive practice means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.
5. BIDDER CERTIFICATIONS (RCW 39.04.350)
[] Bidder (or designated employee _____) completed WA prevailing wage training approved by L&I.
OR
[] Bidder qualifies for training exemption: ≥3 public works projects completed in WA AND ≥3 years WA business license held.
 - a. Bidder acknowledges false certification may result in disqualification and debarment.
6. BUILD AMERICA, BUY AMERICA ACT (BABAA) CERTIFICATION
 - a. Bidder certifies:

- 1) Bidder has reviewed Build America, Buy America Act (BABAA) requirements in Section 01 42 18 and Appendix [Vol 3, Attachments A & B].
- 2) Bidder understands that all iron, steel, manufactured products, and construction materials incorporated into the Work must comply with BABAA (produced in the United States) unless a waiver is obtained from USDA/EPA.
- 3) Bidder's Base Bid price and Additive Alternate prices include full cost of BABAA-compliant materials and products.
- 4) Bidder identifies the following products (if any) that do NOT comply with BABAA and for which Bidder requests Owner to pursue waiver:

Product Description:

Manufacturer/Country of Origin:

Reason for Noncompliance:

Estimated Cost Premium if U.S.-Compliant Product Required: \$_____

(Attach additional sheets if needed)

- 5) If no products listed above, Bidder certifies that all products proposed for the Work are BABAA-compliant to the best of Bidder's knowledge based on manufacturer representations.
- 6) Bidder acknowledges that false certification may result in bid rejection, contract termination, or debarment from future public works contracts.

7. MEMBRANE FILTRATION SYSTEM ACKNOWLEDGMENT

- a. Bidder acknowledges that the containerized membrane filtration system is based on the Aria Filtra T96 trailer, which includes integrated filtrate storage tank and filtrate forwarding pumps. If Bidder's price is based on an alternate membrane system, Bidder confirms that the Base Bid price includes ALL costs for: Redesign and engineering (stamped by Washington-licensed PE); Additional equipment required for equivalent functionality (e.g., external filtrate pump station if alternate system does not include integrated filtrate pumps); Integration with site layout, electrical, controls, and SCADA systems; Regulatory review and permitting updates.
- b. Bidder understands that NO CHANGE ORDERS or additional compensation will be granted for redesign or equipment required to implement an alternate membrane system.

BIDDER'S PROPOSED MEMBRANE SYSTEM MANUFACTURER:

(IF ARIA FILTRA T96, WRITE "ARIA FILTRA – BASIS OF DESIGN")

8. DISADVANTAGED BUSINESS ENTERPRISE (DBE) GOOD FAITH EFFORTS ACKNOWLEDGMENT

- a. Bidder acknowledges that this project is funded in part by EPA and USDA grants requiring compliance with Disadvantaged Business Enterprise (DBE) Good Faith Efforts per 40 CFR Part 33.301.
- b. Bidder has reviewed DBE Good Faith Efforts requirements in Instructions to Bidders Article 27 and Appendix, Attachment B (EPA Funding Exhibits).
- c. Bidder understands that the six good faith efforts must be documented and made available to Owner for EPA/USDA reporting, even if no specific DBE participation goal is established.
- d. Bidder certifies that DBE firms from Washington, Oregon, or any state with valid DBE/MBE/WBE certification and Washington contractor licensing are eligible for participation in this project.
- e. Bidder will maintain DBE outreach documentation (solicitation lists, emails, quotes, declinations) and submit DBE Outreach Log and Participation Summary to Owner within 30 days of Notice to Proceed per Instructions to Bidders Article 27.06.

BIDDER hereby submits this Bid as set forth above:

Bidder:

(typed or printed name of organization)

By:

(individual's signature)

Name:

(typed or printed)

Title:

(typed or printed)

Date:

(typed or printed)

If Bidder is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.

Attest:

(individual's signature)

Name:

(typed or printed)

Title:

(typed or printed)

Date:

(typed or printed)

Address for giving notices:

Bidder's Contact:

Name:

(typed or printed)

Title:

(typed or printed)

Phone:

Email:

Address:

Bidder's Contractor License No.: (if applicable)

SECTION 23 70 00– CENTRAL HVAC EQUIPMENT

PART 1 -- GENERAL

1.01 THE SUMMARY

- A. Provide the air handling units and appurtenances, complete and operable, as indicated in accordance with the Contract Documents.
- B. Single Manufacturer: Where 2 or more air handling units or appurtenances of the same type or size are to be provided, they shall be furnished by the same manufacturer.

1.02 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

- A. This project is subject to the Build America, Buy America (BABA) provisions under the Infrastructure Investment and Jobs Act (IIJA). See Section 01 33 00 – Submittal Procedures for submittal requirements pertaining to BABA compliance.

B. Reference Specifications

01 33 00	Submittal Procedures
23 05 00	Common Work Results for HVAC

C. Reference Standards

Air-Conditioning, Heating and Refrigeration Institute (AHRI)	
AHRI 410	Forced-Circulation Air Cooling and Air Heating Coils
AHRI 430	Standard for Application of Central-Station Air Handling Units
AHRI 260	Sound Rating of Ducted Air Moving and Conditioning Equipment
Air Movement and Control Association International, Inc. (AMCA)	
AMCA 99	Standard Handbook
AMCA 210	Laboratory Methods of Testing Fans for Rating Purposes
AMCA 300	Test Code for Sound Rating Air Moving Devices
AMCA 301	Method of Publishing Sound Ratings for Air Moving Devices
AMCA 500	Test Methods for Louvers, Dampers, and Shutters
AMCA 611-95	Methods of Testing Airflow Measurement Stations for Rating
American Bearing Manufacturers Association (ABMA)	
ABMA STD 9	Load Ratings and Fatigue Life for Ball Bearings
American National Standards Institute (ANSI)	
ANSI Z223.1	Natural Fuel Gas Code Handbook
American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)	
ASHRAE 52.1/52.2	Method of Testing General Ventilation Air Cleaning Devices for Removal Efficiency by Particle Size

ASHRAE 62	Ventilation for Acceptable Indoor Air Quality
ASHRAE 90.1	Energy Standard for Buildings Except Low-Rise Residential Buildings
Canadian Electric Code (CEC)	
Canadian Gas Association (CGA)	
CGA B149.1	Natural Gas Installation Code
American Society of Mechanical Engineers (ASME)	
ASTM International (ASTM)	
ASTM A653	Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM A924	Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process
ETL Testing Laboratories (ETL)	
International Organization for Standardization (ISO)	
ISO-9002	Quality Standard
National Electrical Manufacturers Association (NEMA)	
National Fire Protection Association (NFPA)	
NFPA 90A	Installation of Air Conditioning and Ventilation Systems
Sheet Metal and Air Conditioning Contractors' National Association (SMACNA)	
SMACNA	Low Pressure Duct Construction Standards
Underwriters Laboratories (UL)	
UL 181	UL Standard for Safety Factory-Made Air Ducts and Air Connectors
ANSI/UL 900	Test Performance of Air Filter Units

1.03 CONTRACTOR SUBMITTALS

- A. Furnish submittals in accordance with the requirements of Section 01 33 00 – Submittal Procedures.
- B. The submittals shall include operation, maintenance, and inspection data, replacement part numbers and availability, and service depot location and telephone number.
- C. Furnish a certified fan curve for each fan.

1.04 CODE REQUIREMENTS

- A. Perform the Work in strict accordance with the State Mechanical Code, the State of Washington, City of Carson and other authorities having jurisdiction.
- B. Obtain the required certifications and become thoroughly familiar with the local codes.

C. Obtain and pay for all necessary permits.

PART 2 -- PRODUCTS

2.01 MAKE UP AIR HANDLING UNIT WITH ELECTRIC HEAT (MAU-01)

A. General

1. Air Handling Units shall be as indicated on the Air Handling Unit Schedule.
2. Unless otherwise indicated, air handling units are to be shipped to the Site in one piece, factory-assembled.
3. Modular units assembled to achieve a close approximation to the intent of this Section will not be considered.
4. Where indicated and applicable, equipment shall be pre-wired and factory-certified by an approved testing agency such as ETL, UL, or CSA prior to shipment.
5. Pre-wired air handling units shall bear an approved label with identification marks, electrical data, and necessary cautions as required by the National Electric Code
6. Electrical circuits shall undergo a dielectric strength test, and shall be factory-tested and checked as to proper function.
7. The air handling units and major components shall be products of manufacturers regularly engaged in the production of such equipment and with a minimum of 15 continuous years of proven production experience.

B. Seismic Design Criteria

1. The MAU and components shall be designed with a component importance factor (I_p) of 1.0.
2. The MAU components shall have sufficient strength and ductility to resist the specified seismic effects, and shall meet all of the design, proportioning, detailing, inspection, and quality assurance provisions of the specified building code and other referenced codes. Components shall be designed to during and following a design level seismic event without collapsing, breaking away from supports, creating an ignition hazard, or releasing any contents.
3. The MAU manufacturer shall be responsible for the seismic adequacy and certification of the equipment and factory-furnished accessories.
4. The installing contractor shall be responsible for the furnishing, and installation of all field-installed anchorage, attachments, supports, and connections required to secure the MAC to concrete pad and curb.

C. Construction

1. The casing shall be constructed of minimum 14-gauge satin coat galvanized sheet metal.
2. Clean the surfaces with a degreasing solvent to remove oil and metal oxides, and prime with a 2-part acid-based etching primer.
3. The unit casing shall be provided with a coating system consisting of a two-component epoxy primer with polyurethane topcoat. Coating system shall have a minimum 2,500 hour salt spray resistance rating.
4. Unprotected metal and welds shall be factory-coated.
5. Provide continuous high-pressure sealant between each panel.
6. Walls, roofs and floors shall be of formed construction, with at least 2 breaks at each joint.
7. Joints shall be secured by sheet metal screws or pop rivets.
8. Wall and floor joints shall be "broken in," and outdoor units roof joints shall be "broken out" (exposed) for rigidity.
9. Joints shall be caulked with a water-resistant sealant.
10. The following components shall be provided with a 22-gauge solid or 24-gauge perforated (40 percent free area) galvanized metal liner over insulated areas:
 - a. fan sections
 - b. coil sections
 - c. filter sections
 - d. access sections
 - e. humidifier sections
 - f. underside of unit (where visible)
11. Casing Floors in Walk-in Sections
 - a. Fabricate casing floors in walk-in sections from 14-gauge galvanized checker plate steel.
 - b. Provide reinforcing channels under the floor in order to minimize deflection.
12. Cooling Coil Drain Pans
 - a. Fabricate cooling coil drain pans from stainless steel to form an integral part of the floor paneling, a minimum of 2-in deep, with welded corners.

- b. Extend the drain pans a minimum of 6-in downstream of the coil face, and provide the pans with a 1 ½-in stainless steel M.P.T. drain connection.
- c. Provide the drain pans with a fast pan and slope and pitch such that there is no standing water.
- d. Provide intermediate fast pans between cooling coils where required for effective moisture removal.

D. Anchorage Design

- 1. The MAU shall have its anchorage to the supporting structure designed in accordance with ASCE 7, Chapter 13.
- 2. Components shall be attached so that seismic forces are transferred to the structural system. All structural attachments shall be bolted, welded, or otherwise positively fastened. Frictional resistance due to gravity shall not be considered in evaluating the required resistance to seismic forces.

E. Wash-down Liner

- 1. Screw and caulk the wash-down liner in order to allow for power washing without the risk of wetting the internal insulation.
- 2. Break the solid liner over a 2-in drain pan upturn in order to allow the water to shear into the pan.

F. Access Doors

- 1. Provide access doors to the following components:
 - a. fans and motors;
 - b. filters;
 - c. dampers and operators;
 - d. access plenums and humidifiers/wet cells;
 - e. electrical control panels; and,
 - f. burner compressor compartments.
- 2. Access doors shall be large enough for easy access.
- 3. The removal of screwed wall panels will not be accepted.
- 4. Provide hinged access doors with an extruded neoprene gasket, full lining, and a minimum of 2 Camlock-style fasteners for units up to 48-in high.

G. Marine Lights

1. Provide marine lights with Lexan, or equal, bulb covers, and glass globes with a metal protective cage in each section that is provided with an access door.
2. Wire the lights in an EMT conduit to a switch with a pilot light.

H. Insulation

1. The air handling units shall be internally insulated with 2-in thick 1 ½ lb./cu.ft. neoprene-coated fiberglass thermal insulation.
2. Cover longitudinal insulation joints and butt ends by a sheet metal break in order to prevent the erosion of exposed edges.
3. Drain pans and floor areas shall be insulated on the underside.

I. Drain Pan

1. The floor shall act as the drain pan (wash-down, interior) and shall be provided complete with 2-in upturn standing seams around its perimeter and welded corners in order to ensure the floor is watertight.
2. Provide 1 ½-in drain connections to completely drain the base pan.

J. Provide a galvanized drain under the complete fan section where the fan is located downstream of a humidifier.

K. Provide indoor suspended units with ½-in diameter holes in the base channels in order to accommodate hanger rods.

L. Service Platform

1. Provide a service platform, factory-fabricated, a minimum of 42-in wide.
2. Run the platform the entire unit length, located on the service access side.
3. Provide 3-lb metal grating, suitably reinforced and complete with angle iron side rails and 5-in kick plates.
4. Provide an access ladder to the platform.

M. Service Corridor

1. Insulate the service corridor (integral) with 1 -in thick, nominal 3 lb/cu ft. density, acoustic insulation.
2. Fully line the corridor with a 22-gauge solid liner.
3. Construct the floor from 14-gauge galvanized checker plate steel with welded seams.

N. Access Doors

1. Provide access doors to the service corridor complete with zinc-plated piano hinges and brass pins in welded steel frames.
2. Provide lockable **Leverlok**-style handles.
3. Provide access doors from the service corridor to internal unit components as indicated.

O. Electrical Appurtenances

1. Provide the corridor with marine lights with **Lexan**-style globes with a metal protective cage wired in EMT to a switch with a pilot light.
2. Provide the corridor with a 2 KW electric baseboard heater with integral wall-mounted thermostat, and a duplex service receptacle.
3. The electrical appurtenances shall be rated at 120v, 60 Hz, single-phase.

P. Reclaim Units

1. In air-to-air heat reclaim units, provide exhaust section drain pans as an integral part of the floor paneling,
2. Provide the drain pans a minimum of 2-in deep, with welded corners.
3. Extend the drain pans over the full exhaust fan plenum, and connect with a 1-in M.P.T. drain connection.

Q. Weatherproofing

1. Air handling units shall be weatherproofed and equipped for installation outdoors.
2. Provide 1-in galvanized inlet screens on louvers, air intake hoods, and exhaust openings.
3. Provide rain gutters or diverters over access doors.
4. Caulk joints with a water-resistant sealant.
5. Turn up roof joints 2-in, and provide a 3-break interlocking design.
6. Extend outer wall panels a minimum of ¼-in below the floor panel.
7. Provide drain trap connections for the field supply and installation of drain traps.

R. Roof Mounting Curb

S. Air Handler Cabinets

1. Construct air handling unit cabinets utilizing a framework of steel channels supporting composite insulated metal panels, 2 -in thick.

2. Construction

- a. Fabricate panels from roll-formed steel, chemically fused to a foamed-in-place rigid polyurethane expanded foam core.
- b. Unit shall be painted with earthy or dark earth tone. Paint sample shall be sent to Engineer, Architect and Owner for review and approval before fabrication. Panels shall be single-piece.
- c. Provide steel facing sheets at the longitudinal edges of the panel with roll-formed male and female interlocking geometry, fully supported by the foamed-in-place insulation core.
- d. Apply fasteners in the panels from the exterior panel face, concealed in the panel edge joint for positive connection to the structural support.

3. Facing and Liner Sheets

- a. Fabricate facing and liner sheets from galvanized steel with a stucco embossed pattern.
- b. Tension-level the steel and conform to ASTM A653 grade 33 (A) structural quality, and provide a hot-dipped galvanized coating to ASTM A924 and G-90 designation.
- c. Provide facing sheets with a low-profile shadow like rib repeating, running the longitudinal direction of the panel.

4. Core

- a. Provide core material of a foamed-in-place, multi-component polyurethane or isocyanurate polymeric insulation.
 - b. Provide the insulation core with a tongue-and-groove profile shape in order to allow positive insulation-to-insulation contact in the panels.
 - c. Laminated styrene panels will not be accepted.
5. Provide self-drilling or tapping fasteners to attach the panels to the structural frame shall be self drilling or tapping with neoprene washers and hex head. Sealants used in the internal panel joint shall be butyl based.
6. Finish for exterior and interior shall be factory applied silicone modified polyester of 0.2 mil primer and 0.8 mil top coat USDA, H of A approved for food contact areas.
- a. The cabinet panels shall comply with the following performance tests and properties:

- b. Design load/deflection criteria and fastening pattern with of limitation of 1/200th under positive and negative pressures, based on a test design loading of 20 PSF;
 - c. Withstand at least 2 million alternate cycles of 1/180 deflection without evidence of delamination, core cracking, or permanent deformation;
 - d. Air leakage not exceeding 0.0015 CFM/sq ft of wall area, at a pressure differential of 20 psi;
 - e. No uncontrolled water penetration through panel joints when tested at 20 psi;
 - f. Nominal thermal resistance of R = 7.8-in thickness; and,
 - g. the following standards of compliance for fire test, and labeled as such:
- 7. (FM) Factory Mutual Corp
 - 8. (WH) Warnock-Hersey
 - 9. (UL) Underwriters Laboratory, Inc.
 - 10. (ULC) Underwriters Laboratory Canada

T. FANS

- 1. Provide centrifugal fans rated in accordance with AMCA (Air Movement and Control Association) Standard Test Code, Bulletin 210.
- 2. The fan manufacturer shall be a member of AMCA.
- 3. Dynamically balance the fans and fan assemblies during the factory test run.
- 4. Fan Shafts
 - a. Select fan shafts for stable operation at least 20 percent below the first critical RPM.
 - b. Provide fan shafts with a rust-inhibiting coating.
- 5. Equip single, low-pressure, forward-curved fans of 18-in or less diameter with permanently lubricated cartridge ball bearings, supported by a 3-point "spider" bearing bracket in the fan inlets.
- 6. Equip other forward-curved fan assemblies with greaseable pillow block bearings, supported on a rigid structural steel frame.
- 7. Equip airfoil and BI fans with greaseable, self-aligning ball or roller-type pillow block bearings.
- 8. Provide airfoil and BI fans of a plenum-type configuration where indicated.

9. Provide thrust restraint isolators parallel to the shaft centerline when required to minimize axial movement and bending movements of the blower assembly.
10. Provide drive-side bearings on plenum fans of the adapter-style in order to ensure even clamping of the bearing sleeve to the shaft.
11. Provide standard belt guards on all units with walk in sections over 60-in high.
12. Fan-motor assemblies shall be provided with vibration isolators. Isolators shall be bolted to steel channel welded to unit floor, which is welded to the structural frame of the unit. The isolators shall be neoprene-in-shear type for single 9-in to 15-in diameters forward curve fans. All other fans shall incorporate vertical spring type isolators with leveling bolts, bridge bearing waffled pads with minimum 1-in 25mm static deflection designed to achieve high isolation efficiency. Provide seismic restraint type isolators containing compressed spring. Use of separate bumper or snubber is not acceptable. Fans shall be attached to the discharge panel by a polyvinyl chloride coated polyester woven fabric, with a sealed double locking fabric to metal connection.
13. All single-phase belt drive motor applications shall include rubber isolation for motors $\frac{1}{4}$ HP through $1 \frac{1}{2}$ HP. Provide internal spring isolation for single phase motors over $1 \frac{1}{2}$ HP.
14. Provide single extended grease line from far side to access side bearing.
15. Provide fan scroll access doors and drains.
16. Fan motors shall be TEFC (totally enclosed fan cooled).
 - a. Fan motor shall be provided with an OSHA-compliant belt guard.
17. Drives
 - a. General
 - 1) Provide adjustable drives on fans with motors of $7 \frac{1}{2}$ HP or less.
 - 2) Provide fixed drives on fans with larger motors.
 - 3) Provide the drives with a rust-inhibiting coating.
 - 4) Provide for drive changes, as required during the air balance procedure.
 - 5) Provide a brushless electrical coupling to the rotating coil; brushes will not be accepted.
 - 6) Locate pulley and sheaves on the motor shaft-entry side of the drive nearest the motor face.
 - 7) Locate drive bearings directly under the pulley grooves for uniform loading of bearings.

- 8) The internal surface of the drive drum shall be copper-lined for maximum efficiency.
- 9) Unit shall be capable of operating continuously at any output speed without causing any increase in motor heating.
- 10) The drive shall not cause or produce any harmonics or voltage distortion and consequently does not require filtering devices such as chokes.
- 11) Drive shall be factory supplied and installed.

18. Controls

a. Speed Controller

- 1) Provide a 115-volt, 3-amp speed controller to accept current, voltage, or pressure transducer signal input and interface to energy management system as required.
- 2) The controller shall be UL-approved and housed in a NEMA 1 enclosure, pre-wired with a HAND-OFF-AUTO selector, manual operator speed potentiometer on front cover, and optional speed meter.
- 3) The controller shall provide independent adjustable soft-start for pre-set ramp up of the drive.
- 4) In event of power failure or momentary interrupt, the unit shall automatically restart with preset ramp-up when power is restored.
- 5) Controls shall be UL-listed.

U. ELECTRIC HEAT

1. Electric resistance heaters shall be provided in the capacities, voltage, and steps of control as noted in the Schedules, and shall bear a listing or certification mark from an authorized agency.
2. Heater elements shall be installed a minimum of 12-in downstream from air filters.
3. Insulation in heating sections shall be fiber-reinforced and foil-faced.
4. Should discharge air exceed 105 deg F, use motors in air stream with Class F insulation.
5. If the discharge air temperature is greater than 150 deg F, mount motors out of the heated air stream.
6. Wiring
 - a. Terminate heater element wiring in a full-height enclosure at one end of the heater.

- b. Terminate internal wiring on clearly identified terminal blocks.
 - c. Furnish a wiring diagram on the enclosure cover.
7. Cut-outs
- a. Equip heaters with an automatic reset disc type thermal cut-out.
 - b. Heaters rated at 30 kW and less shall be equipped with an additional manual reset disc type thermal cut-out.
8. Heater elements shall be open type nickel-chromium construction, (2/3 Ni, 1/3 Cr) with a maximum rating of 22.5 kw/sq ft ; sheathed coils shall be provided with a maximum rating of 13 kw/sq ft.
9. Mechanically secure coil terminal pins and insulate from the frame by means of non-rotating ceramic bushings.
10. Electric heater elements mounted in a corrosive air stream, as indicated in the schedules, shall be of the open type of high nickel content: 80percent Ni, 20 percent Cr
11. Heating coil casings shall be corrosion resistant and constructed of galvanized steel of suitable gauge as required by the approval agency.
12. Provide heaters with aluminum protective screens on inlet and outlet sides.
13. SCR
- a. Provide the discharge air control with a silicon-controlled rectifier (SCR) performing time-based sine wave phase control.
 - b. The SCR shall be controlled by a factory-installed solid-state proportional integral controller.

V. ELECTRICAL

- 1. Electrical Components shall be prewired and UL/ULC listed, and shall meet the requirements of the National Electric Code.
- 2. Provide NEMA 4X-rated enclosures for the disconnect switch, control panel, and all exposed electrical components.

W. Electric Make-up Air Handling Units Manufacturer, or Equal

- a. Engineered Air Model LMK
- b. Greenheck

PART 3 -- EXECUTION

3.01 INSTALLATION

- A. All air handling equipment shall be installed by a qualified Contractor in strict accordance with the manufacturer's recommendations.

END OF SECTION

MAKE-UP AIR UNIT WITH ELECTRIC HEATING SCHEDULE																
EQUIPMENT NUMBER	SERVICE	LOCATION	DESIGN AIRFLOW (CFM)	FAN SECTION					HEATING SECTION (ELECTRIC RESISTANCE)		ELECTRICAL			WEIGHT (LBS) (EXCLUDING CURB)	MANUFACTURER MODEL NO	OPTIONS AND ACCESSORIES
				OPERATING BHP	MOTOR HP	ESP (IN WG)	SPEED (RPM)	MOTOR ENCLOSURE	OUTPUT (KW)	TEMP RISE (°F)	V/P/C	MCA	MAXIMUM BREAKER (AMPS)			
MAU-01	CHEMICAL ROOM	OUTDOOR	770	0.49	1	0.75	1470	TEFC	9.0	37	460/3/60	17.4	20	1100	ENGINEERED AIR -LM1/K/O	1-8

OPTIONS-ACCESSORIES:

- EPOXY COATED FAN
- STANDARD GALVANIZED STEEL CONSTRUCTION
- TWO COMPONENT EPOXY W/ POLYURETHANE TOPCOAT IN CUSTOM PAINT COLOR
- 2" MERV 8 PRE-FILTER
- STAINLESS STEEL SHEATHED HEATING COIL
- NEMA 4X NON-FUSED DISCONNECT SWITCH PROVIDED BY DIV 23
- GALVANIZED METAL LINER
- OSHA BELT GUARD FIR SUPPLY MOTOR

1

FAN SCHEDULE																		
EQUIPMENT NUMBER	SERVICE	LOCATION	TYPE	CFM	EXTERNAL STATIC PRESS (IN W G)	FAN RPM	DRIVE TYPE	MOTOR					INLET SOUND		WEIGHT (LBS)	MANUFACTURER AND MODEL	OPTIONS AND ACCESSORIES	
								BHP	HP	RPM	V/PH/CY	ENCL	Lwa	dBA				
EF-01	CHEMICAL ROOM	INDOOR	AXIAL	1465	0.4	1750	DIRECT	0.16	1/3	1770	460/3/60	TEFC	74	63	120	GREENHECK / AX41-160-0415-A3	1-5, 11	
EF-02	REST ROOM	INDOOR	CEILING MOUNTED	95	0.25	950	DIRECT	-	-	950	115/1/60	ODP	-	-	10	GREENHECK / SP-B110	6-10	
OPTIONS-ACCESSORIES: 1. NEMA PREMIUM EFFICIENT MOTOR WITH CLASS B OR GREATER INSULATION 2. QUICK OPENING INSPECTION DOOR 3. EXTENDED MOTOR LEADS 4. COMPANION FLANGE - INLET AND OUTLET, PUNCH 5. DISCONNECT SWITCH BY DIVISION 23 6. UL/ cUL 705 LISTED POWER VENTILATORS 7. SOLID STATE SPEED CONTROL 8. TIME DELAY SWITCH 9. STANDARD GRILLE 10. INTEGRATED CONTROL WITH LIGHT SWITCH 11. PROVIDE VFD																		

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EQUIPMENT NUMBER	SERVICE	AIR FLOW	CONDENSATE CONNECTION	REFRIGERANT PIPE SIZE		ELECTRICAL			WEIGHT (LBS)	MANUFACTURER OR EQUAL	MODEL	ASSOCIATED UNIT	OPTIONS AND ACCESSORIES
				LIQUID	GAS	V/P/C	MCA (A)	MOP (A)					
AC-01	CONTROL ROOM/OFFICE/LAB	283	5/8"	1/4"	3/8"	208/60/1	13.9	15	42.3	SAMSUNG	AC009DNLDCG	CU-01	1-2
OPTIONS-ACCESSORIES: 1. FILTER BOX 2. REFRIGERANT ISOLATION VALVES													

B	LOUVER SCHEDULE										MOTORIZED DAMPER SCHEDULE									
	EQUIPMENT TAG NUMBER	SERVICE	LOCATION	WIDTH (INCHES)	HEIGHT (INCHES)	AIRFLOW (CFM)	FREE AREA (SQ FT)	FREE AREA VELOCITY (FPM)	MANUFACTURER/ MODEL	OPTIONS & ACCESSORIES	EQUIPMENT TAG NUMBER	SERVICE	LOCATION	WIDTH (INCHES)	HEIGHT (INCHES)	AIRFLOW (CFM)	FREE AREA (SQ FT)	MANUFACTURER/ MODEL	OPTIONS & ACCESSORIES	
	LV-01	CHEMICAL ROOMS 30-100 AND 30-101 EXHAUST AIR	CHEMICAL ROOM 30-101	24	24	1465	1.89	777	RUSKIN/ ELF6375DXH	1-2	MD-01	CHEMICAL ROOMS 30-100 INTAKE AIR	CHEMICAL ROOM 30-100	24	24	1465	1.83	RUSKIN/ CD-50	1	
	LV-02	CONTROL ROOM/OFFICE - OUTSIDE AIR	CONTROL ROOM/ OFFICE	12	12	50	0.3	335	RUSKIN/ ELF6375DXH	1-2	<u>OPTIONS-ACCESSORIES:</u> 1. ALUMIMUM OPPOSED BLADE DAMPER WITH 120V MOTORIZED ACTUATOR (2 POSITION, SPRING OPEN, POWER CLOSE)									
	LV-03	CHEMICAL ROOM 30-100 INTAKE AIR	CHEMICAL ROOM 30-100	18	18	595	0.92	643	RUSKIN/ ELF6375DXH	1-2										
	<u>OPTIONS-ACCESSORIES:</u> 1. ALUMINUM CONSTRUCTION 2. BIRD SCREEN																			

AIR OUTLET SCHEDULE						
TAG NUMBER	SERVICE	MATERIAL	AIR OUTLET COLOR	FRAME	MANUFACTURER/ MODEL	MANUFACTURER/ MODEL
A	SUPPLY AIR REGISTER	ALUMINIUM	WHITE	RECTANGULAR SURFACE MOUNTED	TITUS 300FL	1
B	EXHAUST AIR REGISTER	ALUMINIUM	WHITE	RECTANGULAR SURFACE MOUNTED	TITUS 350FL	1

OPTIONS-ACCESSORIES:

1. ALUMINIUM OPPOSED BLADE VOLUME DAMPER

	Title EQUIPMENT SCHEDULE Revision: Drawing No. M-601
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