ADDENDUM NO. 1

TO PROSPECTIVE BIDDERS UNDER
CONSTRUCTION CONTRACT TP-4 EAST FACILITY
AND CLARIFIERS REHABILITATION PROJECT
Timpanogos Special Service District Water Reclamation Facility

RECEIPT OF THIS ADDENDUM MUST BE ACKNOWLEDGED IN THE BID FORM

This addendum will be attached to the Agreement and is a Contract Document

Addendum No. 1 consists of:

1. **Answers to Bidder's Questions:**

Q-1. Bid form: Would you consider revising / consolidating the bid form to make it more accommodating to the Contractors and Subcontractors?

A. The Bid Form has been revised to consolidate most items, bid alternates have been clarified, and as per the Owner's request an Allowances line item has been added, see attached revised Bid Form.

Q-2. Work Hours?

Work hours are 6:30 am to 5:00 pm, five days a week, Monday through Friday. Other hours may be requested with 2-working days written notice to the Owner.

Q-3. What is the engineer estimate?

A. The engineer estimate is 5.7 million.

Q-4. Dewatering, why can the Owner drain and not dewater and the Contractor is required to do so?

A. All process water inside of the clarifiers is to be drained and removed by TSSD operations staff. TSSD operations staff to clean clarifiers prior to turning them over to the Contractor. Contractor is responsible for dewatering control around and under the east clarifiers and process piping to be lined and repaired as per Specification Section 01 57 28.

Q-5. Do clarifiers 1, 3 & 3 contain PRVs?

A. No

Q-6. What is the Single Entity Unit (SEU)? Please explain. Usually this would be covered by the GC regardless of what happens. Then be the GC job to get the corrective action out of the supplier

or applicator. The specification lists the Designer, Manufacturer and Installer. Please explain how this relationship works and if the General is a part of it.

A. The SEU consists of the CRFP designer, manufacturer, and CFRP installer. The SEU does not include the general contractor. The SEU requirement protects the general contractor and Owner in case there is an issue with the CFRP installation to ensure single unit responsibility and liability for the CFRP installation. The general contractor still has overall responsibility for any corrective action.

Q-7. The SEU calls for the Manufacturer, Installer, Designer and or Joint Venture to complete the work. I'm (the Contractor) still struggling to understand this. Also, the bonded warranty. Who provides this?

A. The SEU is an agreement between the CFRP designer, manufacturer, and installer for single entity responsibility. Due to CFRP being highly specialized work, the SEU requirement requires single unit responsibility and liability for the CFRP installation. The bonded 5-year warranty for the CFRP work is provided by the CFRP Installer.

Q-8. Do the existing clarifier lift gates leak? Will bypass pumping be allowed?

A. Yes, the existing clarifier lift gates do leak. Bypass of treatment units is not allowed by the Contractor, only by the Owner. Contractor to control nuisance flows from closed gates may be directed or pumped back into the process as directed by the Owner.

Q-9. Where is the point repair for the 16-inch DIP RAS pipe for Clarifier 3 indicated on Plan sheet PM-08-1001?

A. The point repair location is indicated by Keynote No. 2. See revised plan sheet PM-08-1001, Revision 1.

Q-10. Where should the crack monitors be placed? How many are required?

A. Section 31 09 00, Part 3 Execution, 3.03: Install six (6) crack monitors, at the approximate locations of the settlement monitors (SMP) and as directed by the CONSTRUCTION MANAGER. Actual locations to be determined on field walk with the Owner at the start of the project.

Q-11. Groundwater is approximately 5-feet below grade. How deep should the site be dewatered?

A. See attached revised Dewatering Specification Section 01 57 28.

Q-12. Where is the temporary power point location? Is there 480 volts, 3-phase available? If so, how many amps?

A. Temporary power will be made available from the southeast side / corner of RAS Pump Station No. 1. The power available will be 460 volts, 3-phase, 60 amps. Contractor(s) to provide power pedestal(s) as required by the specifications.

Q-13. In reading through the specifications for this project, it states that there must be (is or can be) an engineer approved equal for the launder covers. Currently one name is listed. We would like to request to have CST (be) considered as an approved equal.

B. Alternative launder cover manufacturer's will be considered if they are equivalent to what is specified. Alternative manufacturer's must submit catalog information and proposed design for approval per the instructions to bidders. See attached revised Launder Cover Specification Section 46 43 21.11.

Q-14. Please provide clarification on where to terminate the 4/0 bare copper ground(s) that detail E-0001 (on Drawing Sheet E-08-5001) which indicate being installed in the concrete ductbanks. The conduits route up into the overall conduit rack but there is no direction on where to take the ductbank grounds.

A. The Contractor is to terminate the bare 4/0 ground conductor at both the base of the clarifier stairs and also on the conduit rack steel supports. The termination point on the conduit rack steel supports may vary depending on if the bid alternate to remove the conduit rack is selected. The termination point on the conduit rack steel supports to be coordinated with the Owner.

Q-15. Would the Owner consider, or would they want any dewatering wells installed by the Contractor(s) left in place at the conclusion of the project?

A. Yes, the Owner would like to keep these wells once the work is complete. The wells need to contain a sealable / removable well cap, fitted with a concrete traffic box with a cast iron AASHTO, H-20 lid labeled "Dewatering Well" appropriately sized for the well casing, easily identifiable, located below grade to not interfere with lawn maintenance, and properly marked (surveyed) on the final project as-built plan. Contractor to follow all State, Federal and permit requirements.

Q-16. How are the anchors removed from inside the clarifiers that currently support the weirs, baffles, etc. to be patched? Are the anchors to be cut flush, drilled out and then patched? Please provide a detail for the demolition of any existing steel bolts/embeds in the concrete.

A. Yes, the anchors for items to be removed and replaced on the clarifier walls are to be cut, drilled out to two to three inches and then the holes are to be patched using non-shrink grout as per the Concrete Repair Specification 03 01 00.

Q-17. For Alternate Item 6, Furnish painted carbon steel (for the clarifiers) vs. 304 stainless steel. What coating system do you require for the clarifier. Will you accept the factory coated system with in-field touch up, or are we required to sand blast, prime and then paint the clarifiers in the field?

A. If Bid Alternate Item 6 is chosen, the Contactor is to coat and test the steel surfaces as per Division 09 90 00, using coating system E-9 for the submerged steel surfaces and EU-1 for the walkways and drives. Finish coat color of drives and walkways to be selected by the Owner. Engineer will accept a factory coating system for the clarifier steel with the option of having the Owner's representative visit the fabrication facility to observe the surface preparation and coating process. Polyurethane coating for the bridge walkways and clarifier drives can be shop applied. Factory and field touch up coating to be per manufactures recommendations. Shop applying coating does not relive Contractor of testing and inspection as required by Section 09 90 00.

Q-18. For Alternate Item 4, Rebuild and reinstall the clarifier drives. Please specify to what extent we are to "rebuild" the drive units. Does this include new motors, new gear boxes, etc., or just refurbish the existing items? Are other manufactures acceptable for the rebuild (of) the existing units, or does the Owner want the original supplier to be the only source?

A. See the attached revised Bid Form

Q-19. Ovivo/Eimco has asked for the serial number of the units that are to be repaired (as an option). Can you have a photo of the nameplate (located on the drive) or provide these number(s)?

A. The EIMCO Process Equipment Serial Numbers are as follows:

East Clarifier 1 (E-1):

EIMCO Process Equipment Serial Number:
BAP1649-200A 1-03
3-phase induction motor:
Model No.: BY154FLC2AMH02
Serial No.: 020901740
Syncrogear Module:
Model No.: E458/E0723842N

East Clarifier 2 (E-2):

EIMCO Process Equipment Serial Number:
BAP1649-200B 1-03
3-phase induction motor:
Model No.: BY154FLC2AMH02
Serial No.: 020703930
Syncrogear Module:
Model No.: E458/F0833017N

East Clarifier 3 (E-3):

EIMCO Process Equipment Serial Number:

BAP1649-100A 12-02
3-phase induction motor:
Model No.: BY154FLC2AMH02
Serial No.: 001209482
Syncrogear Module:
Model No.: E458/E0925054N

2. **Directives / Clarifications:**

   a. Bids are to be delivered by UPS, FedEx, or by hand to the following address:

   Timpanogos Special Service District
   Attn: Rich Mickelson
   6400 N., 5050 W.
   American Fork, UT 84003

   (Note: Packages delivered by the United States Postal Service will not be delivered to this address and will be routed to the TSSD PO Box address, which may not arrive, or be obtained in time for the bid opening.)

3. **Specifications:**
   a. Delete 00 41 00 – Bid Form in its entirety and replace with updated attached 00 41 00 0 - Bid Form.

   b. Delete 01 57 28 – Dewatering in its entirety and replace with updated attached 01 57 28 – Dewatering

   c. Delete 43 05 13 Rigid Equipment Mounts in its entirety and replace with updated attached 43 05 13 Rigid Equipment Mounts

   d. Delete 46 43 21.11 Circular Clarifier Launder Covers and replace with updated attached 46 43 21.11 Circular Clarifier Launder Covers

4. **Drawings:**

   a. Replace or add the following drawings with the attached drawings:

      - Replace Sheet PM-08-1001 with revised Sheet PM-08-1001 that shows pipe point repair location labeled as Key Note 2.

5. **Pre-Bid meeting notes:**

Pre-bid Agenda and Discussion Points and sign-in sheet for Pre-bid meeting on August 2, 2023 are attached.

6. **Attachments:**

Attachment A – Revised Drawings (replace original or add these new drawings)

PM-08-1001

ED-08-8001

ED-08-8002

PM-08-5001

PM-08-5002

PM-08-5003

PM-08-5004

E-08-3001

E-08-3002

Attachment B – Revised Specifications (replace original or add these new specifications)

00 41 00 – Bid Form

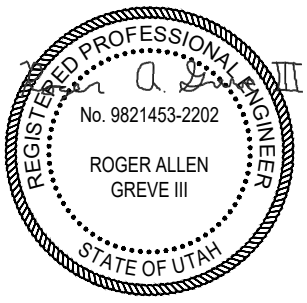
01 57 28 - Dewatering

43 05 13 - Rigid Equipment Mounts

46 43 21.11 – Circular Clarifier Launder Covers

Attachment C – Photos of interior of the east clarifier splitter box

Date: August 16, 2023



END OF SECTION

TIMPANOGOS SPECIAL SERVICE DISTRICT
Planning-Building-Serving

Pre-Bid Meeting Notes

Project:	TP-4 East Facility Utilities and Clarifiers Rehabilitation Project	**Project No:**	157492
Engineer:	Brown and Caldwell	**Location:**	Timpanogos Special Service District
Description:	Pre-bid Conference	**Date & Time:**	Wednesday August 2, 2023, 2 PM

INTRODUCTION

A. **Owner Representatives:**
   i. District Manager: Rich Mickelson
   ii. District Engineer: David Barlow
   iii. District Staff Engineer: Matt Redmon
   iv. Lead Operator: Sam Grimes
   v. Lead Operator: Alan Robinson
   vi. Lead Electrical Operator: Brad Christensen
   vii. Client Service Manager: Trevor Lindley
   viii. Project Manager: Roger Greve
   ix. Construction Manager: Brown & Caldwell

B. **Communication:**
   i. Send Questions to Project Engineer, Roger Greve (rgreve@brwncald.com).

ATTENDEES

A. Contractors:
   a. Alder Construction
   b. Gerber Construction
   c. COP Construction
   d. Archer Western Construction
   e. Ellsworth Paulsen Construction

(see attached attendance sign in sheet)

BRIEF DESCRIPTION OF THE WORK

A. East Clarifier Splitter Box:
   i. Removal and disposal of the three clarifier gate operator pedestals.
   ii. Furnish and install of three new clarifier gate operator pedestals, gear boxes and Rotork electric actuators per the drawings and specs.
   iii. Furnish and install new lighting on the top of the East Clarifier Splitter box, per drawings and specifications.

B. East Clarifiers 1, 2 and 3:

Project:	TP-4 East Facility Utilities and Clarifiers Rehabilitation Project	**Project No:**	157492
Engineer:	Brown and Caldwell	**Location:**	Timpanogos Special Service District
Description:	Pre-bid Conference	**Date & Time:**	Wednesday August 2, 2023, 2 PM

i. Ground water control and site dewatering is required to prevent clarifier uplift or subsidence and to perform the pipe repair work. Dewater east facility site using groundwater control prior to and during the clarifier and pipe rehabilitation work.
ii. Remove East clarifier internals and replace with stainless steel components, per plans and specifications. See sequencing specification for removal and replacement constraints.
iii. Drive conduit and wiring to be temporarily removed and then reinstalled.
iv. Electrical re-feed of East Clarifiers 1 and 3. Sidewalk repairs corresponding to the electrical refeed work as outlined on the plans. Scum system spray water piping to be removed and replaced along clarifier walkways
v. Remove and replace Feed wells. Feed wells shall be a stainless-steel support frame with FRP panels, see plans and specifications.
vi. Remove and replace East clarifier walkways, handrail, and grating, see plans and specifications (3 total):
vii. Walkway lights, light poles and corresponding switches, conduit and wiring to be temporarily removed and reinstalled.

C. Furnish and install launder covers on the east facility clarifiers.

D. East Clarifier 1, 2 and 3 piping:

i. Carbon fiber lining repairs of 30-inch RCP Mixed Liquor pipe (East Clarifiers 1, 2 center feed pipes).
ii. Pipe joint repair in 16-inch DIP RAS pipe, East Clarifier 3.

BID ALTERNATES

A. Bid form contains a bid alternates section:

i. After the bid's have been reviewed and the Notice of Award has been issued, and at the Owner's discretion, Owner may elect to add or remove the bid alternates listed in the Bid Form schedule. Owner may elect to add or deduct some, all, or none of these bid alternate items.

INSTRUCTION TO BIDDERS

A. **Instructions to Bidders:**

i. Bids shall be received no later than **2 p.m. on Wednesday, August 29, 2023 at the offices of the Owner** per the Advertisement to Bid and shall be enclosed in a plainly marked package with the Project title, the name and address of Bidder, and shall be accompanied by the Bid security and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid shall be enclosed in a separate package plainly marked on the outside with the notation "BID ENCLOSED." A mailed Bid shall be addressed **to [_Timpanogos Special Service**

Pre-Bid Meeting Notes

Project:	TP-4 East Facility Utilities and Clarifiers Rehabilitation Project	**Project No:**	157492
Engineer:	Brown and Caldwell	**Location:**	Timpanogos Special Service District
Description:	Pre-bid Conference	**Date & Time:**	Wednesday August 2, 2023, 2 PM

District (TSS) Reclamation Facility, Attention: Rich Mickelson, 6400 N., 5050 W., American Fork, UT. 84003_] Address listed above for Fed-Ex, UPS or hand deliveries, only. United States Postal Service mail delivery is offsite at a PO box and may not be checked before the bid opening on bid day.

B. **Bid Package questions:**

i. Direct questions to Roger Greve (Brown & Caldwell) up to a week prior to the bid due date.

ii. Addendum(s) to be issued to all Contractors as needed up to a week prior to the bid date.

C. **Bid Opening:**

i. Sealed Bids for the construction of the **TP-4 East Facility Utilities and Clarifiers Rehabilitation Project** will be received, **from prequalified Bidders only**, by the **Timpanogos Special Service District (TSSD) Reclamation Facility**, at the office of the **Timpanogos Special Service District (TSSD) Reclamation Facility, 6400 N., 5050 W., American Fork, UT 84003** until **2:00 p.m.** local time on **Tuesday, August 29, 2023**, at which time the Bids received will be **publicly** opened and read.

The Issuing Office for the Bidding Documents is: Brown and Caldwell, contact Roger Greve, P.E. 6975 Union Park Center, Suite 490, Midvale, UT 84047, phone: 410-733-1751 email: rgreve@brwncald.com.

The Bid shall contain an acknowledgement of receipt of all Addenda. The addenda numbers must be filled in on the Bid Form.

D. **Contract Time:**

i. As per Agreement Section 00 52 00, 4.02 of the Project Manual – The work shall be Substantially Complete within **365** calendar days after the Notice to Proceed.

ii. Anticipated Notice to Proceed – 9/21/2023.

iii. Anticipated Substantial Completion – 9/21/2024.

E. **Liquidated Damages:**

i. As per Agreement Section 00 52 00, 4.03 of the Project Manual, the following Liquidated Damages shall apply:

i. **Late Completion: $1,000** for each day or part thereof that expires after the Contract Time until the Work is Substantially Complete.

ii. **Interruption of Services:** No interruption of services shall be caused by Contractor, its agents, or employees without the Owner's prior written approval.

B. **Insurance:**

i. Review the Supplemental Conditions for changes with insurance requirements. When Owner issues a Notice of Award to the Successful Bidder, it shall be accompanied by the unexecuted counterparts of the Agreement along with the other Contract Documents as identified in the Agreement. Within 15 days thereafter, Successful Bidder shall execute and deliver the required number of counterparts of the Agreement (and any bonds, insurance documentation, and proof of a

Project:	TP-4 East Facility Utilities and Clarifiers Rehabilitation Project	**Project No:**	157492
Engineer:	Brown and Caldwell	**Location:**	Timpanogos Special Service District
Description:	Pre-bid Conference	**Date & Time:**	Wednesday August 2, 2023, 2 PM

Utah General Contractor's License) required to be delivered by the Contract Documents to the Owner.

C. **Schedule of Values:**

i. Provide Schedule of Values within 24 hours after award. See bid form.

GENERAL DISCUSSION

A. **Regular Working Hours:**

i. As per 00 72 00, 7.02B and 00 80 00, work hours are 6:30 a.m. to 5:00 p.m., five days per week, Monday through Friday. Other hours may be requested with 48-hours (two working days) written notice to the Owner.

B. **The Contractor shall observe the following restrictions:**

i. The Contractor is responsible for ensuring that treatment processes and plant operations are not compromised by Contractor's actions. The treatment plant is to remain operational during the execution of this contract.

ii. The Contractor shall not adjust or operate serviceable or functioning equipment or systems except as specifically required by this contract.

iii. Equipment presently installed in the treatment plant must always be available to plant personnel for use, maintenance, and repair.

iv. Contractor equipment, materials or any material included in the work shall be placed in areas which do not interfere with the plant operations.

v. The Contractor shall not schedule any outages or testing and commissioning events without prior approval of the Construction Manager. The Contractor shall notify the Construction Manager 14 days in advance of any required shutdown or service. Written authority from the Construction Manager is required for all intentional power interruptions.

vi. The Contractor is to provide whatever temporary piping, pumping, power, and control facilities required to maintain continuous plant operations and complete treatment.

vii. The integrity of the existing plant utilities shall always be maintained by the Contractor.

C. **Work Sequence: -** Section 01 12 16

i. **Clarifiers out of service:** Contractor to have one of the east facility clarifiers in service at all times. May have east clarifiers 1 (E-1), and 2 (E-2) out of service simultaneously. Owner to drain and clean clarifiers prior to turning them over to the Contractor.

ii. **East clarifier splitter box:** Contractor to isolate sections in the east clarifier splitter box as required by the work. Only the Owner is to operate the east clarifier splitter box lift gates. Contractor to coordinate isolation activities with Owner installation of a fourth lift gate in this structure. The Owner to install a fourth lift gate is to aid with the isolation of the 42-inch influent pipe.

Project:	TP-4 East Facility Utilities and Clarifiers Rehabilitation Project	**Project No:**	157492
Engineer:	Brown and Caldwell	**Location:**	Timpanogos Special Service District
Description:	Pre-bid Conference	**Date & Time:**	Wednesday August 2, 2023, 2 PM

iii. **East Clarifier pipe rehabilitation:** The center columns on both clarifiers E-1 and E-2 will have to be removed to access the 30-inch RCP pipes. Dewatering required to complete lining repairs. Piping to be removed in the clarifier E-3 valve vault to access the point repair for the 16-inch RAS pipe.

iv. **East facility INDENSE pilot:** Contractor to work around, protect, and not interfere with the operation of the INDENSE hydrocyclone pilot located at the RAS Pump Station No. 1 wet well.

D. **Utility Coordination:**

i. Contractor is responsible to locate, pothole, save and protect all utilities as required.

E. **Dewatering:** - Section 01 57 28

i. Contractor is responsible for all dewatering permitting, equipment, and operation activities. Owner will provide power as per the specifications.

F. **Permitting:**

i. Contractor responsible to obtain all required permits including but not limited to UPDES, SWPP, State of Utah, Utah County entities.

G. **Testing & Certification Requirement:** - Section 01 45 00

i. Contractor is required to have their own quality control program, see Standard Specification Section 01 45 00 of the Project Manual.

H. **Safety:**

i. Contractor is responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the work.

I. **Environmental Conditions:** – Section 01 11 80

i. Winter and Summer Conditions

ii. Pathogens

J. **Temporary Facilities and Controls:** – Section 01 51 00

i. Availability of non-potable plant water (3W)

ii. No sediment, debris or other substance will be permitted to enter the facility sanitary and storm water systems

K. **Demolition and Salvage**: - Section 02 41 00

i. Removed clarifier drives to be turned over to the Owner

ii. Removed controls (skimmer system) to be removed and disposed of by the Contractor

iii. Clarifier mechanism components removed and disposed of by the Contractor

L. **Concrete Repairs:** - Division 3

i. Sidewalk sections removed for clarifier refeed work

ii. Sidewalk sections shaded on plans for removal and replacement

Pre-Bid Meeting Notes

Project:	TP-4 East Facility Utilities and Clarifiers Rehabilitation Project	**Project No:**	157492
Engineer:	Brown and Caldwell	**Location:**	Timpanogos Special Service District
Description:	Pre-bid Conference	**Date & Time:**	Wednesday August 2, 2023, 2 PM

M. **Anchor Bolts:** - Section 05 05 20
    i. Contractor to provide loading information and bolt design with clarifier shop drawings for review

N. **Aluminum railings:** - Section 05 52 10
    i. New railing to be installed on new clarifier bridge walkways
    ii. Railing on clarifier stairs to be replaced, stairs to remain

O. **Metal Grating:** - Section 05 53 10
    i. 1-1-1/4" serrated bar grating (non-slip)

P. **Electrical:** - Division 26
    i. New lighting on clarifier splitter box
    ii. Remove, re-install existing lighting on clarifier bridge walkways
    iii. Removal and reuse of as much electrical wiring and conduit as possible
        i. Clarifier bridge walkways
            1. Clarifier drives
            2. Clarifier lighting
        ii. Clarifiers 1 and 3 electrical re-feed
    iv. Electrical refeed of clarifiers 1 and 3
        i. Reuse of some of the electrical conduit on the (conduit rack) – field walk

Q. **Geotechnical Instrumentation and Monitoring:** – Section 31 09 00
    i. For dewatering operations monitoring

R. **Fiber Reinforced Polymer Composite Repairs for Pipelines** – Section 33 39 30
    i. Review single entity unit (SEU) requirements, qualifications, submittal requirements

S. **Bid Supplemental information provided:**
    i. East Facility assessment technical memo
    ii. East Facility record drawings
    iii. Facility yard piping drawing
    iv. Overall TSSD site geotechnical report
    v. CCTV pipe inspection videos

QUESTIONS:

(Questions addressed in Addendum No.1):

Pre-Bid Meeting Notes

Project:	TP-4 East Facility Utilities and Clarifiers Rehabilitation Project	**Project No:**	157492
Engineer:	Brown and Caldwell	**Location:**	Timpanogos Special Service District
Description:	Pre-bid Conference	**Date & Time:**	Wednesday August 2, 2023, 2 PM

1) The bid form is lengthy, can it be revised? Revise / clarify items with an **" * "**.Brown and Caldwell will review Bid form and clarify in Addendum 1.

2) Is a Utah County building permit required? Brown and Caldwell will review and respond in an Addendum.

3) Dewatering – If the Owner does not dewater to drain the east clarifiers, why should it be required by the Contractor? BC to respond in Addendum 1

4) Are there PRVs in the east facility clarifiers? No. BC to respond in Addendum 1

5) What is the Engineer Estimate? BC to respond in Addendum 1

6) Please provide further explanation of the Single Entity Unit (SEU) for the carbon fiber pipe lining work. BC to respond in Addendum 1

7) Please clarify the location of the pipe point repair on the 16-inch DIP RAS pipe associated with East Clarifier 3 on Drawing PM-08-1001. BC to respond in Addendum 1

8) Will bypass pumping be allowed? Yes. BC to respond in Addendum 1.

9) Do the existing clarifier gates leak? Yes. BC to respond in Addendum 1.

SITE WALK:

Toured clarifier site, interior of the east clarifier 3 valve vault (building), interior of the RAS Pump Station No. 1. Site walk interrupted by a rainstorm. Site walk rescheduled for 8/8/2023.

8/8/2023: Second site walk conducted:

Attendees:

Contractors:

COP Construction

Subcontractors:

New Moon Controls

Silver Electric

Pre-Bid Meeting Notes

Project:	TP-4 East Facility Utilities and Clarifiers Rehabilitation Project	**Project No:**	157492
Engineer:	Brown and Caldwell	**Location:**	Timpanogos Special Service District
Description:	Pre-bid Conference	**Date & Time:**	Wednesday August 2, 2023, 2 PM

Reviewed electrical work scope, clarifier refeed scope, locations of conduits, base bid and bid alternate electrical work and for the overhead conduit rack, toured the interior of the east clarifier 3 valve vault. Site potholing will be required for utilities work.

Questions:

1) Please provided clarification on where to terminate the 4/0 bare copper grounds that detail E-0001 indicates being installed in the concrete ductbanks. The conduits route up into the overhead conduit rack but there is no direction on where to take the ductbank grounds. BC to respond in Addendum 1.
2) In section 33 39 30 3.02
   The SEU calls for the Manufacture , Installer, Designer and or Joint Venture to complete the work. I'm still struggling to understand this. Also, the bonded warranty, who provides this? BC to respond in Addendum 1.
3) Please provide a detail for the demolition of any existing steel bolts/embeds in the concrete. BC to respond in Addendum 1.
4) Will the Owner consider leaving the dewatering wells in place once the work is complete? Yes. BC to respond in Addendum 1.

Comments:

1) Brown & Caldwell to provide photos of the interior of the east clarifier splitter box.

End

TSSD Water Reclamation Facility

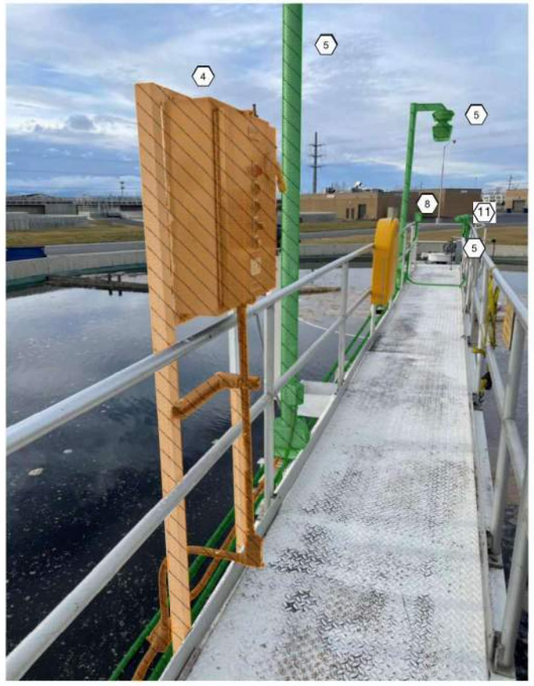
TP-4 East Facility Utilities and Clarifiers Rehabilitation Project

Pre - Bid Meeting
Date: August 2, 2023
Time: 2:00 pm - 4:00 pm

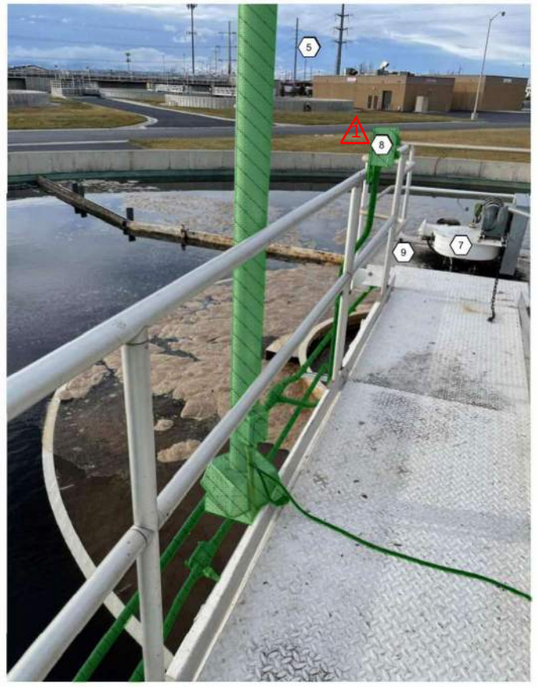
Last	First	Phone	Email	Company
Miller	Stan	(801) 301-9654	smiller@alderconstruction.com	Alder Construction
Anderson	Mark	(801) 266-8856	manderson@alderconstruction.com	Alder Construction
Bills	Tyler	(801) 674-6044	tyler.bills@skyline.us	Skyline Electric
Broshear	Justin	(801) 884-3145	jsbroshear@copconstruction.com	COP Construction
Clark	Shay	(801) 380-0083	shayc@1gerber.com	Gerber Construction
Thorn	Justin	(801) 503-6954	jthorne@walshgroup.com	Archer Western Construction
Romney	Brain	(801) 319-4481	bromney@e-p.com	Ellsworth Paulsen
Bowles	Keith	(801) 851-4249	kbowles@walshgroup.com	Archer Western Construction
Perry	Scott	(780) 491-7400	sperry@miscowater.com	MISCO Water
Moe	Michael	(801) 842-7704	mmoe@miscowater.com	MISCO Water
Morris	Justin	(801) 836-0210	justin@nmcontrols.com	New Moon Controls
Snell	Shay	(801) 762-7129	ShaySnell66@gmail.com	Silver Electric

ATTACHMENT A

EAST CLARIFIER E-1, VIEW NORTH



EAST CLARIFIER E-1, VIEW NORTHWEST



EAST CLARIFIER E-1, VIEW NORTHWEST

EAST CLARIFIER E-2, VIEW SOUTH

EAST CLARIFIER E-2, VIEW NORTH

EAST CLARIFIER E-2, VIEW SOUTH

GENERAL NOTES

1. PHOTOS NOT TO SCALE. CONTRACTOR TO FIELD VERIFY REQUIRED MATERIALS, MATERIAL LENGTHS, DIMENSIONS, LOCATIONS, AND QUANTITIES.

KEY NOTES

1. REMOVE EXISTING CLARIFIER DRIVE CONDUIT ONCE WALWAY REPLACEMENT IS COMPLETE, REINSTALL NEW CONDUIT AND CORRESPONDING CABLE. ~~BID ALTERNATE: REINSTALL EXISTING CONDUIT AND WIRING WITH DRIVE REBUILD.~~
2. REMOVE AND DISPOSE OF SCUM SKIMMER WIRING.
3. REMOVE AND DISPOSE OF SKIMMER SPRAY PIPING FROM THIS LOCATION.
4. REMOVE AND DISPOSE OF SKIMMER CONTROL PANELS, ACTUATORS, (CONDUIT FROM KEYNOTE 2 LOCATION), AND WIRING.
5. REMOVE LIGHT POSTS, LUMINARIES, LUMINAIRE SWITCHES AND CORRESPONDING CABLE, CONDUIT, AND REINSTALL ONCE WALKWAY REPLACEMENT IS COMPLETE. ~~BID ALTERNATE: REMOVE AND REPLACE.~~
6. ~~BID ALTERNATE: REMOVE DRIVE CONDUIT AND CORRESPONDING CABLE UNDER WALKWAY, AND REINSTALL WITH REBUILT DRIVES ONCE WALKWAY REPLACEMENT IS COMPLETE.~~
7. REMOVE AND THEN REPLACE CLARIFIER DRIVES, CORRSPONDING CONDUIT AND WIRING ONCE WALKWAY REPLACEMENT IS COMPLETE. CONTRACTOR TO COORDINATE WITH OWNER REGARDING SALVAGE OF EXISTING CLARIFIER DRIVES. ~~BID ALTERNATE: REMOVE, REBUILD AND REINSTALL CLARIFIER DRIVES.~~
8. ~~BID ALTERNATE: REMOVE AND REINSTALL CLARIFIER DRIVE CONTROLS WITH REBUILT DRIVES ONCE WALKWAY REPLACEMENT IS COMPLETE.~~
9. REMOVE EXISTING CLARIFIER DRIVE CONDUIT, ONCE WALWAY REPLACEMENT IS COMPLETE, REINSTALL NEW CONDUIT AND CORRESPONDING CABLE. ~~BID ALTERNATE: REINSTALL EXISTING CONDUIT AND WIRING WITH DRIVE REBUILD.~~
10. DEMOLISH EXISTING CONDUIT FOR E-1 CLARIFIER REFEED. REPLACE WITH NEW CONDUIT. REPLACE PORTIONS OF THE SIDEWALK REMOVED FOR CONDUIT DEMOLITION AND REINSTALLATION.
11. REMOVE PROCESS CONTROL PANELS AND CORRESPONDING CABLE (I.E. YSI). REINSTALL ONCE WALKWAYS HAVE BEEN REPLACED.

ELECTRICAL ITEMS TO BE REMOVED, DISPOSED

ELECTRICAL ITEMS TO BE REMOVED AND REINSTALLED

Brown AND Caldwell

Salt Lake City, UT

BID SET

TSSD Clean Water

TP-4 EAST FACILITY UTILITIES AND CLARIFIERS REHABILITATION PROJECT

REVISIONS

REV	DATE	DESCRIPTION
1	8/14/23	Revised Keynotes 1, 5, 7, 9
		Deleted Keynotes 6, 8.

LINE IS 2 INCHES AT FULL SIZE

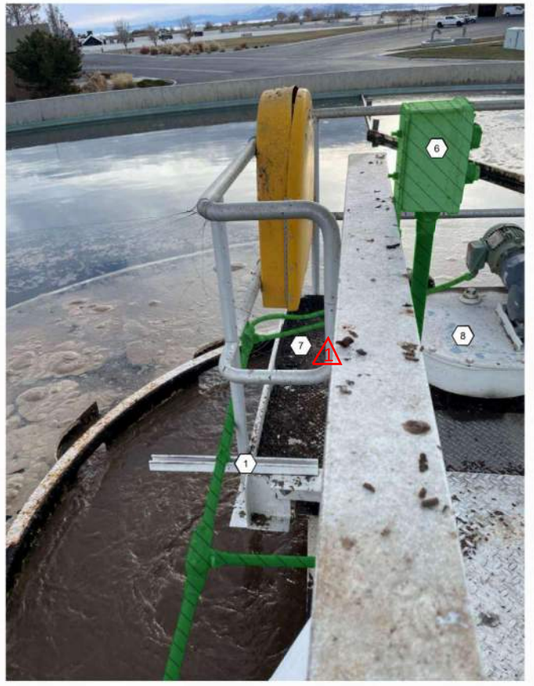
DESIGNED: N.ANDERSON
DRAWN: B.NURSUWITO
CHECKED: M.PAGENDARM
CHECKED:
APPROVED: N.ANDERSON
FILENAME ED-08-8001.DWG
CONSULTANT PROJECT NUMBER 157492
TSSD PROJECT NUMBER 157492
ELECTRICAL

EAST CLARIFIERS E-1, E-2 ELECTRICAL DEMOLITION DETAILS

DRAWING NUMBER
ED-08-8001

EAST CLARIFIER E-3, VIEW SOUTHWEST

EAST CLARIFIER E-3, VIEW EAST



EAST CLARIFIER E-3, VIEW SOUTHWEST

GENERAL NOTES

1. PHOTOS NOT TO SCALE. CONTRACTOR TO FIELD VERIFY REQUIRED MATERIALS, MATERIAL LENGTHS, DIMENSIONS, LOCATIONS, AND QUANTITIES.

KEY NOTES

1. REMOVE EXISTING CLARIFIER DRIVE CONDUIT. ONCE WALWAY REPLACEMENT IS COMPLETE, REINSTALL NEW CONDUIT AND CORRESPONDING CABLE. ~~BID ALTERNATE: REINSTALL EXISTING CONDUIT AND WIRING WITH DRIVE REBUILD.~~
2. REMOVE AND DISPOSE OF SCUM SKIMMER WIRING.
3. REMOVE AND DISPOSE OF SKIMMER SPRAY PIPING FROM THIS LOCATION.
4. REMOVE AND DISPOSE OF SKIMMER CONTROL PANELS, ACTUATORS, (CONDUIT FROM KEYNOTE 2 LOCATION) AND WIRING.
5. REMOVE LIGHT POSTS, LUMINARIES, LUMINAIRE SWITCHES AND CORRESPONDING CABLE AND CONDUIT ONCE WALKWAY REPLACEMENT IS COMPLETE. REINSTALL LIGHT POSTS, LUMINARIES, LUMINAIRE SWITCHES AND CORRESPONDING CALBE AND CONDUIT. ~~BID ALTERNATE: REMOVE AND REPLACE.~~
6. BID ALTERNATE: REMOVE AND REPLACE CLARIFIER DRIVE CONTROLS ONCE WALKWAY REPLACEMENT IS COMPLETE.
7. ~~BID ALTERNATE: REMOVE DRIVE CONDUIT AND CORRESPONDING CABLE UNDER WALKWAY. ONCE WALKWAY REPLACEMENT IS COMPLTE WITH THE REBUILT DRIVES, REINSTALL EXISTING DRIVE CONDUIT AND CORRESPONDING CABLE UNDER WALKWAY.~~
8. REMOVE, AND REPLACE CLARIFIER DRIVES, CORRSPONDING CONDUIT AND WIRING ONCE WALKWAY REPLACEMENT IS COMPLETE. CONTRACTOR TO COORDINATE WITH OWNER REGARDING SALVAGE OF EXISTING CLARIFIER DRIVES. ~~BID ALTERNATE: REMOVE, REBUILD AND REINSTALL CLARIFIER DRIVES.~~
9. DEMOLISH EXISTING CONDUIT FOR CLARIFIER E-3 REFEED. REPLACE WITH NEW CONDUIT. REPLACE PORTIONS OF THE SIDWALK REMOVED FOR CONDUIT DEMOLITION AND REINSTALLATION.

ELECTRICAL ITEMS TO BE REMOVED, DISPOSED

ELECTRICAL ITEMS TO BE REMOVED AND REINSTALLED

Brown AND Caldwell

Salt Lake City, UT

BID SET

TSSD Clean Water

TP-4 EAST FACILITY UTILITIES AND CLARIFIERS REHABILITATION PROJECT

REVISIONS

REV	DATE	DESCRIPTION
1	8/14/23	Revised Keynotes 1, 5, 8
		Deleted Keynote 7.

LINE IS 2 INCHES AT FULL SIZE

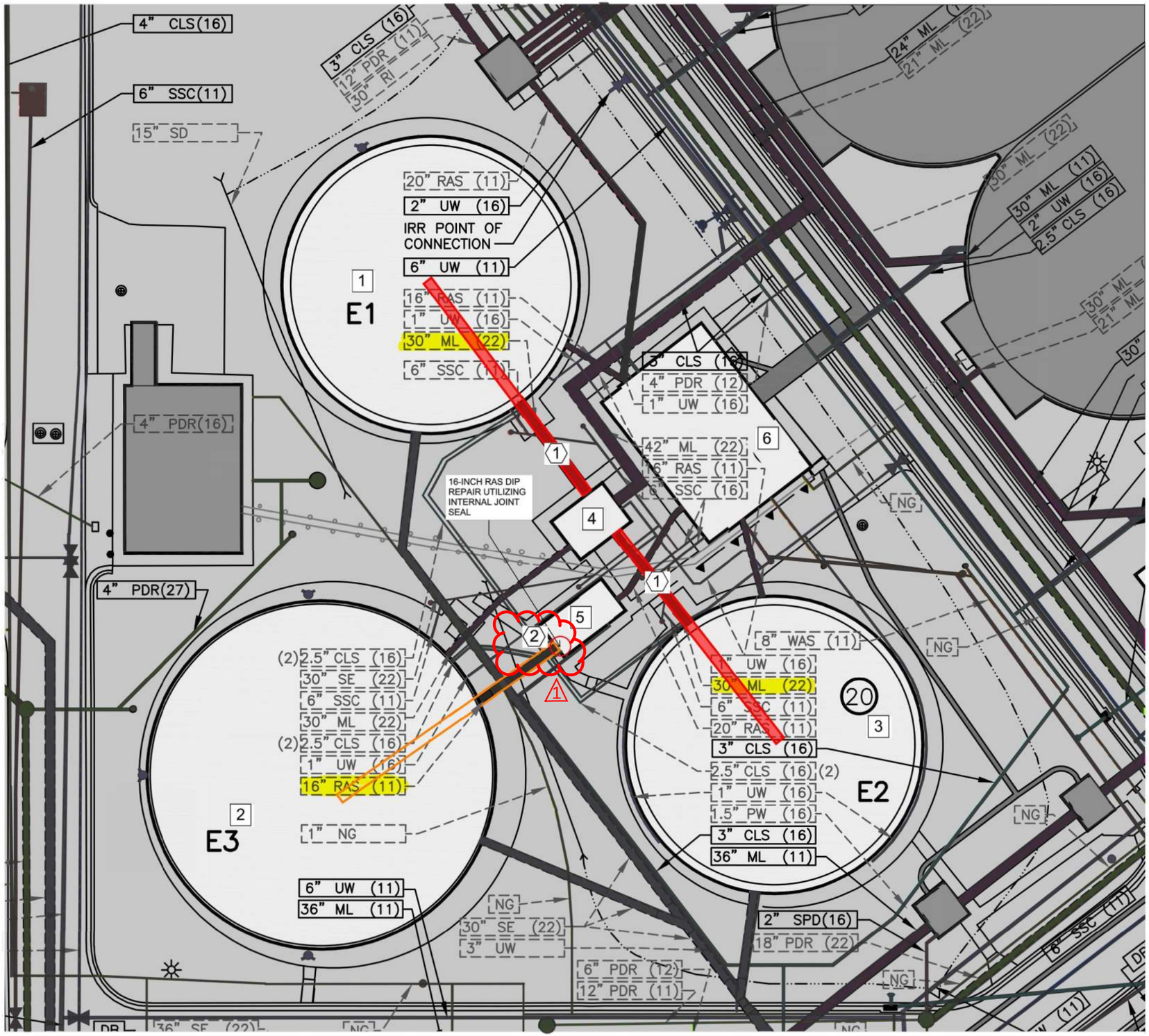
DESIGNED: N.ANDERSON
DRAWN: B.NURSUWITO
CHECKED: M.PAGENDARM
CHECKED:
APPROVED: N.ANDERSON
FILENAME ED-08-8002.DWG
CONSULTANT PROJECT NUMBER 157492
TSSD PROJECT NUMBER 157492

ELECTRICAL

EAST CLARIFIERS E-3 ELECTRICAL DEMOLITION DETAILS

DRAWING NUMBER
ED-08-8002

Path: C:\BCPWD2345536 FILENAME: ED-08-8002.DWG PLOT DATE: 7/21/2023 3:23 PM CAD USER: NATE ANDERSON



GENERAL NOTES

1. EAST CLARIFIER 1 (E-1)
2. EAST CLARIFIER 2 (E-2)
3. EAST CLARIFIER 3 (E-3)
4. EAST CLARIFIER SPLITTER BOX
5. CLARIFIER 3 (E-3) VALVE VAULT
6. RAS PUMP STATION NO. 1 (EAST)

PIPE REHABILITATION KEY NOTES

1. CLARIFIERS 1 AND 2 (E-1, E-2), 30-INCH MIXED LIQUOR PIPES TO BE REHABILITATED WITH CARBON FIBER REINFORCED POLYMER (CFRP) LINING SYSTEM. SEE SPECIFICATIONS FOR REPAIR DETAILS AND RECORD DRAWINGS FOR APPROXIMATE PIPE LENGTHS. PIPE CCTV VIDEO INFORMATION PROVIDED IN BID PACKAGE SUPPLEMENTAL INFORMATION.
2. CLARIFIER 3 (E-3), 16-INCH RAS PIPE TO BE REPAIRED UTILIZING INTERNAL JOINT SEAL AND IS NOT TO BE LINED. SEE SPECIFICATIONS FOR REPAIR DETAILS AND RECORD DRAWINGS FOR APPROXIMATE PIPE LENGTHS. PIPE CCTV VIDEO INFORMATION PROVIDED IN BID PACKAGE SUPPLEMENTAL INFORMATION.
3. ALL PIPELINES TO BE REHABILITATED OR REPAIRED ARE REQUIRED TO BE ISOLATED, DEWATERED, AND CLEANED BY THE CONTRACTOR.
4. SITE PLAN NOT TO SCALE. CONTRACTOR TO FIELD VERIFY REQUIRED MATERIALS, MATERIAL LENGTHS, LOCATIONS, AND QUANTITIES. PIPE PROFILES PROVIDED ON SHEET PM-08-4001. CCTV PIPE INSPECTION VIDEOS, RECORD DRAWINGS PROVIDED IN BID PACKAGE SUPPLEMENTAL INFORMATION.
5. PIPES, UTILITIES, AND STRUCTURES SHADED GRAY, DARK GRAY, AND BLACK ARE EXISTING AND ARE NOT NEW TO THIS PROJECT. PIPES TO BE REHABED ARE SHADED IN RED.

Brown AND Caldwell

Salt Lake City, UT

BID SET

TSSD Clean Water

TP-4 EAST FACILITY UTILITIES AND CLARIFIERS REHABILITATION PROJECT

REVISIONS

REV	DATE	DESCRIPTION
1	8/14/23	Revised location of Keynote 2

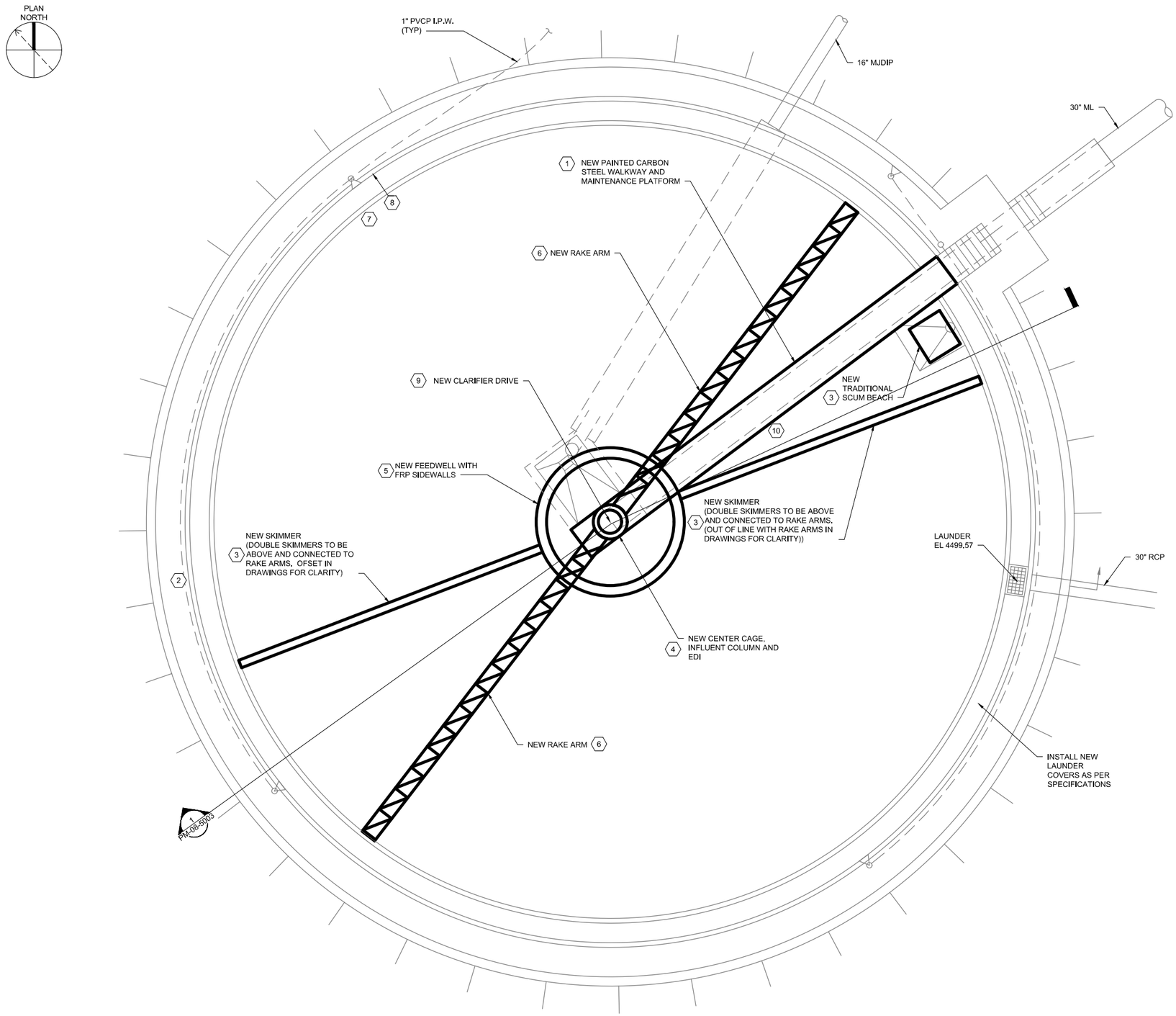
LINE IS 2 INCHES AT FULL SIZE

DESIGNED: M. POPPE
DRAWN: D. JACKSON
CHECKED: G. SKIPPER
CHECKED:
APPROVED: T. LINDLEY
FILENAME PM-08-1001.DWG
CONSULTANT PROJECT NUMBER 157492
TSSD PROJECT NUMBER 157492

PROCESS MECHANICAL

EAST CLARIFIERS E-1, E-2, E-3 PIPE REHAB PLAN VIEW

DRAWING NUMBER
PM-08-1001



PLAN - CLARIFIER (TYPICAL)

SCALE: NTS

KEY NOTES

1. INSTALL PAINTED CARBON STEEL WALKWAY WITH THREE RAIL ALUMINUM HANDRAIL, RECTANGULAR ALUMINUM SERRATED BAR GRATING AND CLARIFIER DRIVE PLATFORM, WALKWAY STAIRS TO REMAIN BUT HANDRAIL TO BE REPLACED AS PER WALKWAY, SEE SPECIFICATIONS.
2. CHLORINE SYSTEM PIPING AND ASSOCIATE EQUIPMENT TO REMAIN IN PLACE AND PROTECTED DURING CONSTRUCTION ACTIVITIES.
3. INSTALL 304 STAINLESS STEEL 4-FOOT SCUM BEACH AND DOUBLE SKIMMERS, SEE SPECIFICATIONS. BID ALTERNATE: SCUM SYSTEM TO BE PAINTED CARBON STEEL.
4. INSTALL 304 STAINLESS STEEL CENTER CAGE, INFLUENT COLUMN AND EDI FEEDWELL. SEE SPECIFICATIONS. BID ALTERNATE: INSTALL ITEMS AS PAINTED CARBON STEEL.
5. INSTALL 304 STAINLESS STEEL FEEDWELL WITH FRP SIDEWALLS. SEE SPECIFICATIONS. BID ALTERNATE: INSTALL AS PAINTED CARBON STEEL WITH FRP SIDEWALLS.
6. INSTALL 304 STAINLESS STEEL RAKE ARMS, SPIRAL BLADE SCRAPERS. SEE SPECIFICATIONS. BID ALTERNATE: INSTALL ITEMS AS PAINTED CARBON STEEL.
7. INSTALL 304 STAINLESS STEEL CURRENT DENSITY (STAMFORD) BAFFLES. BID ALTERNATE: INSTALL AS FRP.
8. INSTALL 304 STAINLESS STEEL WEIRS AND BAFFLES. BID ALTERNATE: INSTALL AS FRP.
9. INSTALL NEW CLARIFIER DRIVES. SEE SPECIFICATIONS. ~~BID ALTERNATE: REMOVE, REBUILD AND REINSTALL CLARIFIER DRIVES.~~ 1
10. REPLACE SCUM SPRAY SYSTEM. INSTALL NEW 304 SCHEDULE 10 STAINLESS STEEL PIPE WITH 316 STAINLESS STEEL HANGERS. BID ALTERNATE: POLYURETHANE COATED SCHEDULE 40 CARBON STEEL PIPING WITH GALVANIZED CARBON STEEL HANGERS.
11. PLAN NOT TO SCALE. CONTRACTOR TO FIELD VERIFY REQUIRED MATERIALS, MATERIAL LENGTHS, DIMENSIONS, LOCATIONS, AND QUANTITIES. RECORD DRAWINGS PROVIDED IN BID PACKAGE SUPPLEMENTAL INFORMATION. CONTRACTOR TO FIELD VERIFY ALL REQUIRED DESIGN AND MATERIAL INFORMATION PRIOR TO SUBMITTAL PREPARATION AND SUBMISSION, AND PRIOR TO SITE DELIVERY OF MATERIALS.

NOTE:
DRAWING FOR ILLUSTRATIVE PURPOSES ONLY AND IS TO REPRESENT DESIGN INTENT. CLARIFIER MANUFACTURE TO SUBMIT DESIGN PER SPECIFICATIONS FOR REVIEW AND APPROVAL.

Brown AND Caldwell

Salt Lake City, UT

BID SET

TSSD Clean Water

TP-4 EAST FACILITY UTILITIES AND CLARIFIERS REHABILITATION PROJECT

REVISIONS

REV	DATE	DESCRIPTION
1	8/14/23	Revised Keynote 9.

LINE IS 2 INCHES AT FULL SIZE

DESIGNED: R. GREVE
DRAWN: R. GREVE
CHECKED: S. O'CONNELL
CHECKED: N. KUNZ
APPROVED: T. LINDLEY

FILENAME
PM-08-5001.DWG

CONSULTANT PROJECT NUMBER
157492

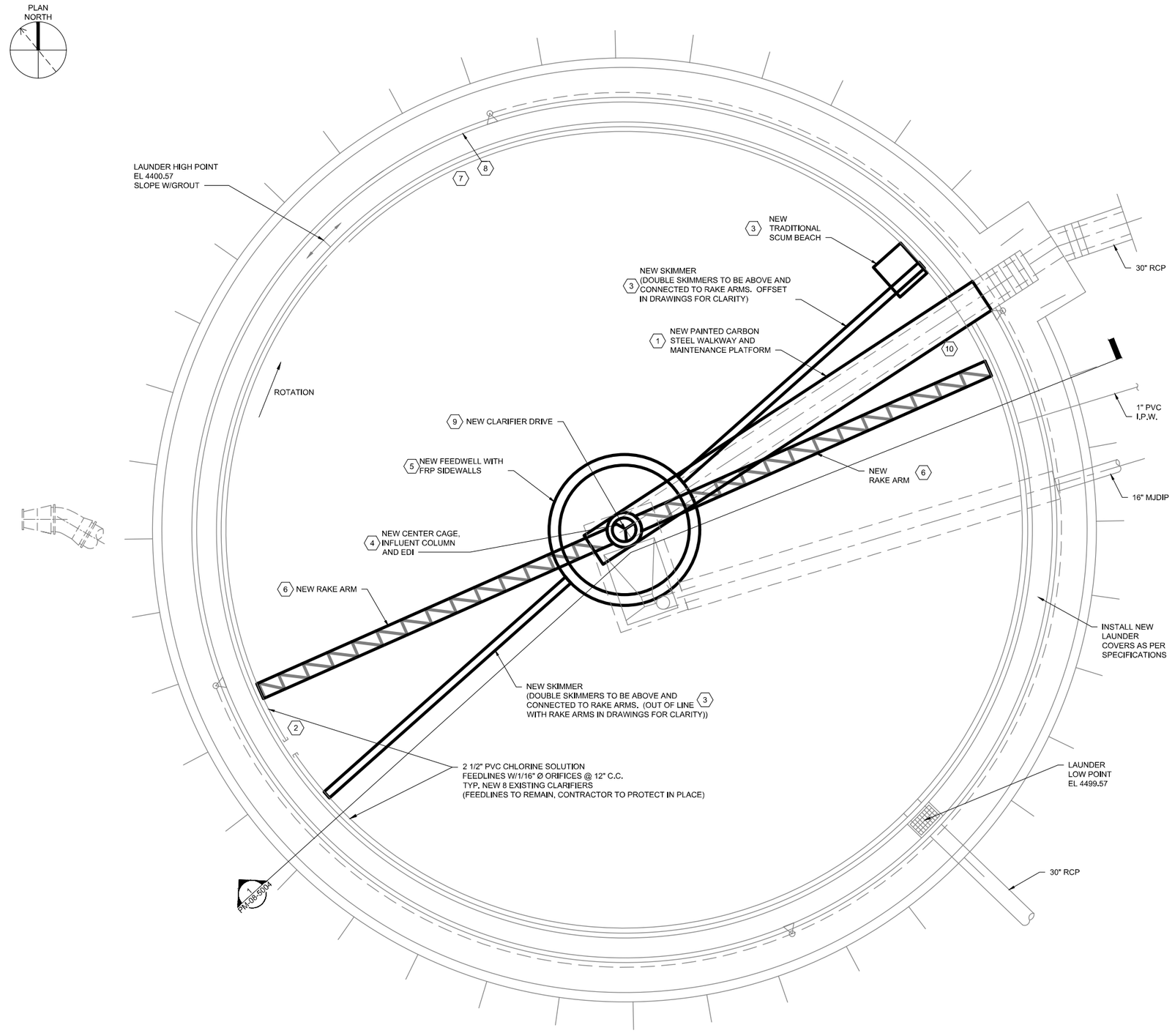
TSSD PROJECT NUMBER
157492

PROCESS MECHANICAL

EAST CLARIFIERS E-1, E-2 INSTALLATION SCHEMATIC PLAN

DRAWING NUMBER
PM-08-5001

Path: C:\BCPW\D2345528 FILENAME: PM-08-5001.DWG PLOT DATE: 7/20/2023 2:10 PM CAD USER: ANDREW STRANGE



PLAN - CLARIFIER (TYPICAL)

SCALE: NTS

KEY NOTES

1. INSTALL PAINTED CARBON STEEL WALKWAY WITH THREE RAIL ALUMINUM HANDRAIL, RECTANGULAR ALUMINUM SERRATED BAR GRATING AND CLARIFIER DRIVE PLATFORM. WALKWAY STAIRS TO REMAIN BUT HANDRAIL TO BE REPLACED AS PER WALKWAY. SEE SPECIFICATIONS.
2. CHLORINE SYSTEM PIPING AND ASSOCIATE EQUIPMENT TO REMAIN IN PLACE AND PROTECTED DURING CONSTRUCTION ACTIVITIES.
3. INSTALL 304 STAINLESS STEEL 4-FOOT SCUM BEACH AND DOUBLE SKIMMERS. SEE SPECIFICATIONS. BID ALTERNATE: SCUM SYSTEM TO BE PAINTED CARBON STEEL.
4. INSTALL 304 STAINLESS STEEL CENTER CAGE, INFLUENT COLUMN AND EDI FEEDWELL. SEE SPECIFICATIONS. BID ALTERNATE: INSTALL ITEMS AS PAINTED CARBON STEEL.
5. INSTALL 304 STAINLESS STEEL FEEDWELL WITH FRP SIDEWALLS. SEE SPECIFICATIONS. BID ALTERNATE: INSTALL AS PAINTED CARBON STEEL WITH FRP SIDEWALLS.
6. INSTALL 304 STAINLESS STEEL RAKE ARMS, SPIRAL BLADE SCRAPERS. SEE SPECIFICATIONS. BID ALTERNATE: INSTALL ITEMS AS PAINTED CARBON STEEL.
7. INSTALL 304 STAINLESS STEEL CURRENT DENSITY (STAMFORD) BAFFLES. BID ALTERNATE: INSTALL AS FRP.
8. INSTALL 304 STAINLESS STEEL WEIRS AND BAFFLES. BID ALTERNATE: INSTALL AS FRP.
9. INSTALL NEW CLARIFIER DRIVES. SEE SPECIFICATIONS. BID ALTERNATE: ~~REMOVE, REBUILD AND REINSTALL CLARIFIER DRIVES.~~ (1)
10. REPLACE SCUM SPRAY SYSTEM. INSTALL NEW 304 SCHEDULE 10 STAINLESS STEEL PIPE WITH 316 STAINLESS STEEL HANGERS. BID ALTERNATE: POLYURETHANE COATED SCHEDULE 40 CARBON STEEL PIPING WITH GALVANIZED CARBON STEEL HANGERS.
11. PLAN NOT TO SCALE. CONTRACTOR TO FIELD VERIFY REQUIRED MATERIALS, MATERIAL LENGTHS, DIMENSIONS, LOCATIONS, AND QUANTITIES. RECORD DRAWINGS PROVIDED IN BID PACKAGE SUPPLEMENTAL INFORMATION. CONTRACTOR TO FIELD VERIFY ALL REQUIRED DESIGN AND MATERIAL INFORMATION PRIOR TO SUBMITTAL PREPARATION AND SUBMISSION, AND PRIOR TO SITE DELIVERY OF MATERIALS.

NOTE:
DRAWING FOR ILLUSTRATIVE PURPOSES ONLY AND IS TO REPRESENT DESIGN INTENT. CLARIFIER MANUFACTURE TO SUBMIT DESIGN PER SPECIFICATIONS FOR REVIEW AND APPROVAL.

Brown AND Caldwell

Salt Lake City, UT

BID SET

TSSD Clean Water

TP-4 EAST FACILITY UTILITIES AND CLARIFIERS REHABILITATION PROJECT

REVISIONS

REV	DATE	DESCRIPTION
1	8/14/23	Revised Keynote 9.

LINE IS 2 INCHES AT FULL SIZE

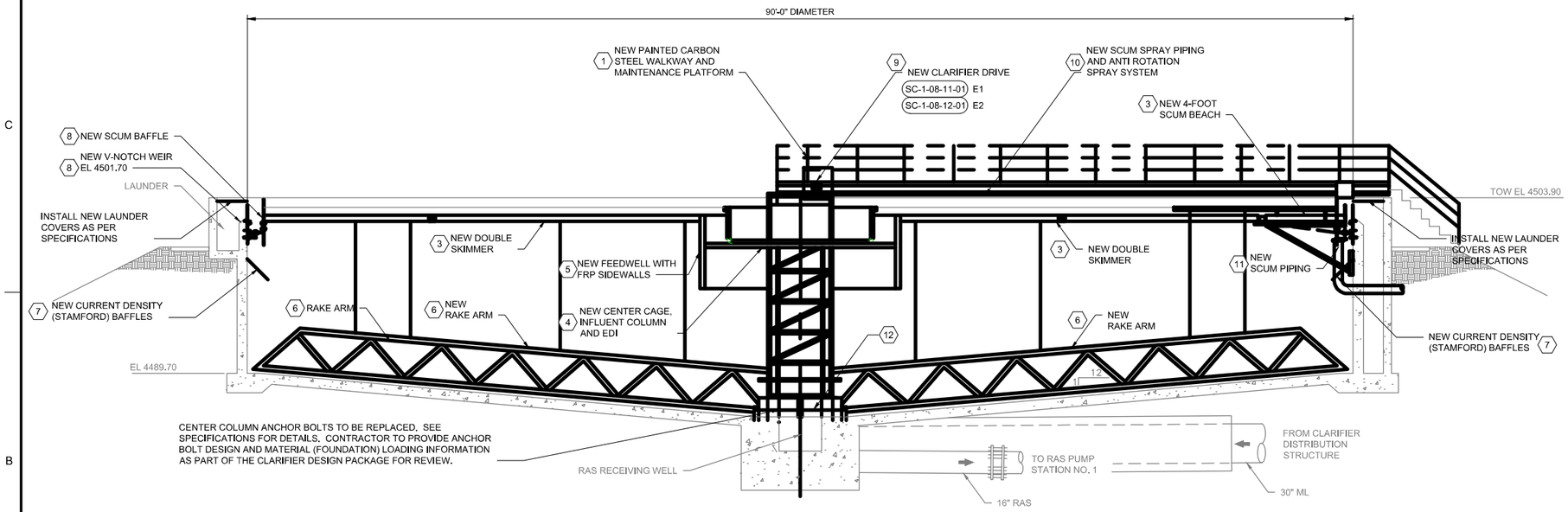
DESIGNED: R. GREVE
DRAWN: R. GREVE
CHECKED: S. O'CONNELL
CHECKED: N. KUNZ
APPROVED: T. LINDLEY
FILENAME PM-08-5002.DWG
CONSULTANT PROJECT NUMBER 157492
TSSD PROJECT NUMBER 157492

PROCESS MECHANICAL

EAST CLARIFIER E-3 INSTALLATION SCHEMATIC PLAN

DRAWING NUMBER
PM-08-5002

Path: C:\BCPW\D2345528 FILENAME: PM-08-5002.DWG PLOT DATE: 5/26/2023 3:14 PM CAD USER: ANDREW STRANGE



1 PM-08-5001 SECONDARY CLARIFIER ILLUSTRATIVE SECTION
SCALE: NTS

ABBREVIATIONS:
ML = MIXED LIQUOR
RAS = RETURN ACTIVATED SLUDGE
RI = RAW INFLUENT
SE = SECONDARY INFLUENT
UV = ULTRA VIOLET (DISINFECTION)
WAS = WASTE ACTIVATED SLUDGE

NOTE:
DRAWING FOR ILLUSTRATIVE PURPOSES ONLY AND IS TO REPRESENT DESIGN INTENT. CLARIFIER MANUFACTURE TO SUBMIT DESIGN PER SPECIFICATIONS FOR REVIEW AND APPROVAL.

KEY NOTES

1. INSTALL PAINTED CARBON STEEL WALKWAY WITH THREE RAIL ALUMINUM HANDRAIL, RECTANGULAR ALUMINUM SERRATED BAR GRATING AND CLARIFIER DRIVE PLATFORM. WALKWAY STAIRS TO REMAIN BUT HANDRAIL TO BE REPLACED AS PER WALKWAY. SEE SPECIFICATIONS.
2. NOT USED
3. INSTALL 304 STAINLESS STEEL 4-FOOT SCUM BEACH AND DOUBLE SKIMMERS. SEE SPECIFICATIONS. BID ALTERNATE: SCUM SYSTEM TO BE PAINTED CARBON STEEL.
4. INSTALL 304 STAINLESS STEEL CENTER CAGE, INFLUENT COLUMN AND EDI FEEDWELL. SEE SPECIFICATIONS. BID ALTERNATE: INSTALL ITEMS AS PAINTED CARBON STEEL.
5. INSTALL 304 STAINLESS STEEL FEEDWELL WITH FRP SIDEWALLS. SEE SPECIFICATIONS. BID ALTERNATE: INSTALL AS PAINTED CARBON STEEL WITH FRP SIDEWALLS.
6. INSTALL 304 STAINLESS STEEL RAKE ARMS, SPIRAL BLADE SCRAPERS. SEE SPECIFICATIONS. BID ALTERNATE: INSTALL ITEMS AS PAINTED CARBON STEEL.
7. INSTALL 304 STAINLESS STEEL CURRENT DENSITY (STAMFORD) BAFFLES. BID ALTERNATE: INSTALL AS FRP.
8. INSTALL 304 STAINLESS STEEL WEIRS AND BAFFLES. BID ALTERNATE: INSTALL AS FRP.
9. INSTALL NEW CLARIFIER DRIVES. SEE SPECIFICATIONS. ~~BID ALTERNATE: REMOVE, REBUILD AND REINSTALL CLARIFIER DRIVES.~~ (1)
10. REPLACE SCUM SPRAY SYSTEM, INSTALL NEW 304 SCHEDULE 10 STAINLESS STEEL PIPE AND 316 STAINLESS STEEL HANGERS. BID ALTERNATE: POLYURETHANE COADED SCHEDULE 40 CARBON STEEL PIPING WITH GALVANIZED CARBON STEEL HANGERS.
11. REPLACE SCUM PIPING WITH SCHEDULE 10, 304 STAINLESS STEEL AND SUPPORTS WITH 216 STAINLESS STEEL. SEE SPECIFICATIONS. BID ALTERNATE: PAINTED CARBON STEEL
12. SEE SPECIFICATIONS FOR ANCHOR BOLT REQUIREMENTS.
13. SECTION NOT TO SCALE. CONTRACTOR TO FIELD VERIFY REQUIRED MATERIALS, MATERIAL LENGTHS, DIMENSIONS, LOCATIONS, AND QUANTITIES. RECORD DRAWINGS PROVIDED IN BID PACKAGE SUPPLEMENTAL INFORMATION. CONTRACTOR TO FIELD VERIFY ALL REQUIRED DESIGN AND MATERIAL INFORMATION PRIOR TO SUBMITTAL PREPARATION AND SUBMISSION, AND PRIOR TO SITE DELIVERY OF MATERIALS.

Brown AND Caldwell
Salt Lake City, UT

BID SET

TSSD Clean Water

TP-4 EAST FACILITY UTILITIES AND CLARIFIERS REHABILITATION PROJECT

REVISIONS

REV	DATE	DESCRIPTION
1	8/14/23	Revised Keynote 9.

LINE IS 2 INCHES AT FULL SIZE

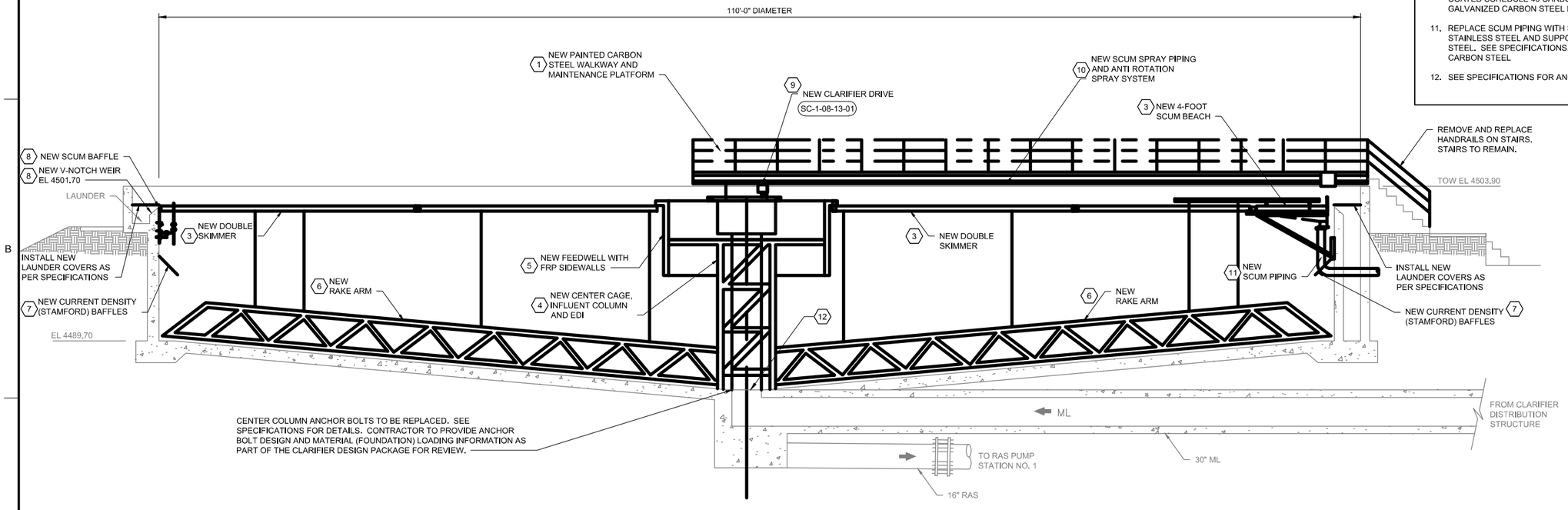
DESIGNED: R. GREVE
DRAWN: R. GREVE
CHECKED: S. O'CONNELL
CHECKED: N. KUNZ
APPROVED: T. LINDLEY
FILENAME PM-08-5003.DWG
CONSULTANT PROJECT NUMBER 157492
TSSD PROJECT NUMBER 157492

PROCESS MECHANICAL

EAST CLARIFIERS E-1, E-2 INSTALLATION SCHEMATIC SECTION

DRAWING NUMBER
PM-08-5003

Path: C:\BCPWD2345528 FILENAME: PM-08-5003.DWG PLOT DATE: 7/20/2023 2:09 PM CAD USER: ANDREW STRANGE



1 PM-08-5002 SECONDARY CLARIFIER ILLUSTRATIVE SECTION
SCALE: NTS

ABBREVIATIONS:
ML = MIXED LIQUOR
RAS = RETURN ACTIVATED SLUDGE
RI = RAW INFLUENT
SE = SECONDARY INFLUENT
UV = ULTRA VIOLET (DISINFECTION)
WAS = WASTE ACTIVATED SLUDGE

KEY NOTES

1. INSTALL PAINTED CARBON STEEL WALKWAY WITH THREE RAIL ALUMINUM HANDRAIL, RECTANGULAR ALUMINUM SERRATED BAR GRATING AND CLARIFIER DRIVE PLATFORM. WALKWAY STAIRS TO REMAIN BUT HANDRAIL TO BE REPLACED AS PER WALKWAY. SEE SPECIFICATIONS.
2. SECTION NOT TO SCALE. CONTRACTOR TO FIELD VERIFY REQUIRED MATERIALS, MATERIAL LENGTHS, DIMENSIONS, LOCATIONS, AND QUANTITIES. RECORD DRAWINGS PROVIDED IN BID PACKAGE SUPPLEMENTAL INFORMATION. CONTRACTOR TO FIELD VERIFY ALL REQUIRED DESIGN AND MATERIAL INFORMATION PRIOR TO SUBMITTAL PREPARATION AND SUBMISSION, AND PRIOR TO SITE DELIVERY OF MATERIALS.
3. INSTALL 304 STAINLESS STEEL 4-FOOT SCUM BEACH AND DOUBLE SKIMMERS. SEE SPECIFICATIONS. BID ALTERNATE: SCUM SYSTEM TO BE PAINTED CARBON STEEL.
4. INSTALL 304 STAINLESS STEEL CENTER CAGE, INFLUENT COLUMN AND EDI FEEDWELL. SEE SPECIFICATIONS. BID ALTERNATE: INSTALL ITEMS AS PAINTED CARBON STEEL.
5. INSTALL 304 STAINLESS STEEL FEEDWELL WITH FRP SIDEWALLS. SEE SPECIFICATIONS. BID ALTERNATE: INSTALL AS PAINTED CARBON STEEL WITH FRP SIDEWALLS.
6. INSTALL 304 STAINLESS STEEL RAKE ARMS, SPIRAL BLADE SCRAPERS. SEE SPECIFICATIONS. BID ALTERNATE: INSTALL ITEMS AS PAINTED CARBON STEEL.
7. INSTALL 304 STAINLESS STEEL CURRENT DENSITY (STAMFORD) BAFFLES. BID ALTERNATE: INSTALL AS FRP.
8. INSTALL 304 STAINLESS STEEL WEIRS AND BAFFLES. BID ALTERNATE: INSTALL AS FRP.
9. INSTALL NEW CLARIFIER DRIVES. SEE SPECIFICATIONS. ~~BID ALTERNATE: REMOVE, REBUILD AND REINSTALL CLARIFIER DRIVES.~~ (1)
10. REPLACE SCUM SPRAY SYSTEM, INSTALL NEW 304 SCHEDULE 10 STAINLESS STEEL PIPE AND 316 STAINLESS STEEL HANGERS. BID ALTERNATE: POLYURETHANE COATED SCHEDULE 40 CARBON STEEL PIPING WITH GALVANIZED CARBON STEEL HANGERS.
11. REPLACE SCUM PIPING WITH SCHEDULE 10, 304 STAINLESS STEEL AND SUPPORTS WITH 316 STAINLESS STEEL. SEE SPECIFICATIONS. BID ALTERNATE: PAINTED CARBON STEEL
12. SEE SPECIFICATIONS FOR ANCHOR BOLT INFORMATION.

NOTE:
DRAWING FOR ILLUSTRATIVE PURPOSES ONLY AND IS TO REPRESENT DESIGN INTENT. CLARIFIER MANUFACTURE TO SUBMIT DESIGN PER SPECIFICATIONS FOR REVIEW AND APPROVAL.

Brown AND Caldwell
Salt Lake City, UT

BID SET

TSSD Clean Water

TP-4 EAST FACILITY UTILITIES AND CLARIFIERS REHABILITATION PROJECT

REVISIONS

REV	DATE	DESCRIPTION
1	8/14/23	Revised Keynote 9.

LINE IS 2 INCHES AT FULL SIZE

DESIGNED: R. GREVE
DRAWN: R. GREVE
CHECKED: S. O'CONNELL
CHECKED: N. KUNZ
APPROVED: T. LINDLEY
FILENAME PM-08-5004.DWG
CONSULTANT PROJECT NUMBER 157492
TSSD PROJECT NUMBER 157492

PROCESS MECHANICAL

EAST CLARIFIER E-3 INSTALLATION SCHEMATIC SECTION

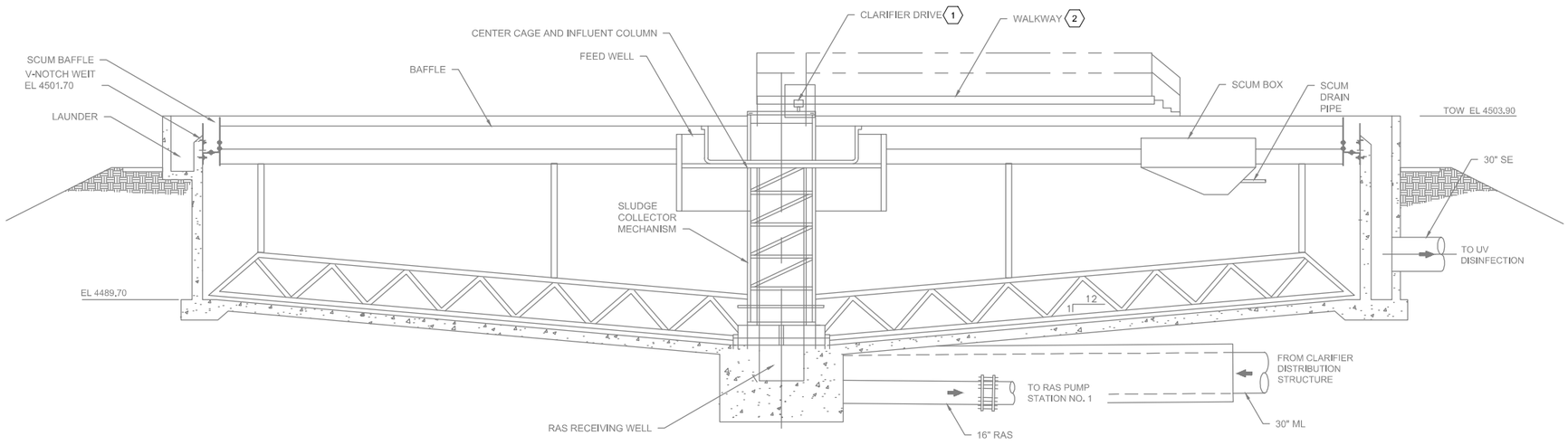
DRAWING NUMBER
PM-08-5004

GENERAL NOTES

1. SECTION NOT TO SCALE. CONTRACTOR TO FIELD VERIFY REQUIRED MATERIALS, MATERIAL LENGTHS, DIMENSIONS, LOCATIONS, AND QUANTITIES.

KEY NOTES

1. CLARIFIER DRIVES TO BE REPLACED. ~~BID ALTERNATIVE: REMOVE, REBUILD, AND REINSTALL EXISTING CLARIFIER DRIVES.~~
2. EXISTING LIGHTING TO BE REINSTALLED. ~~BID ALTERNATIVE: FURNISH AND INSTALL NEW WALKWAY LUMINAIRES, EATON CROUSE HINDS PART NUMBER "VMVL 3-N-P-R3-UNV1" OR EQUAL.~~



SECONDARY CLARIFIER ILLUSTRATIVE SECTION

SCALE: NTS

Brown AND Caldwell

Salt Lake City, UT

BID SET

TSSD Clean Water

TP-4 EAST FACILITY UTILITIES AND CLARIFIERS REHABILITATION PROJECT

REVISIONS

REV	DATE	DESCRIPTION
1	8/14/23	Revised Keynotes 1, 2.

LINE IS 2 INCHES AT FULL SIZE

DESIGNED: N.ANDERSON
DRAWN: B.NURSUWITO
CHECKED: M.PAGENDARM
CHECKED:
APPROVED: N.ANDERSON
FILENAME E-08-3001.DWG
CONSULTANT PROJECT NUMBER 157492
TSSD PROJECT NUMBER 157492

ELECTRICAL

EAST CLARIFIERS E-1, E-2 ELECTRICAL SECTION

DRAWING NUMBER

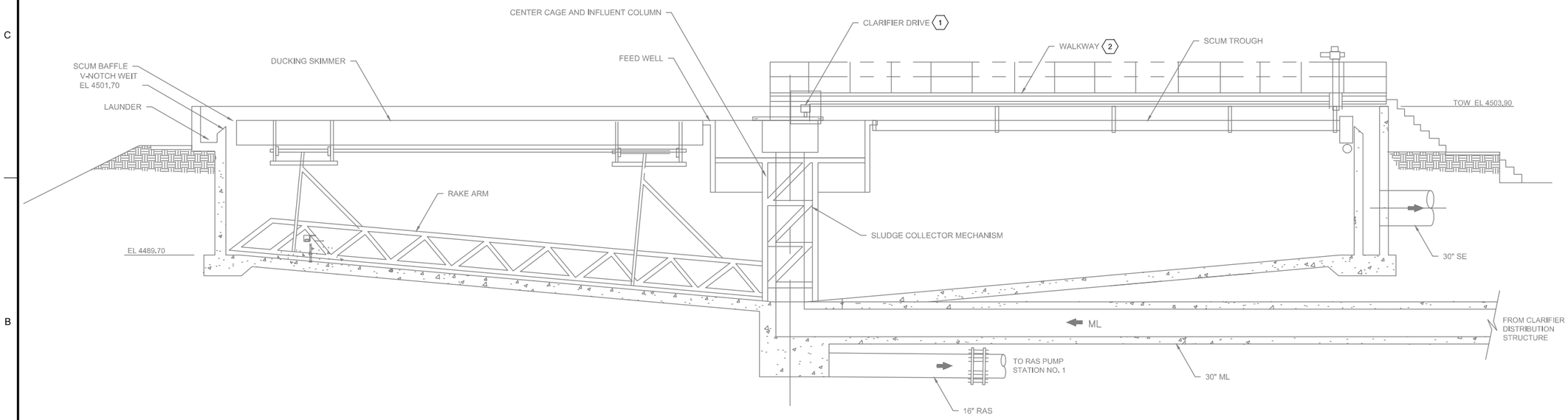
E-08-3001

GENERAL NOTES

1. SECTION NOT TO SCALE. CONTRACTOR TO FIELD VERIFY REQUIRED MATERIALS, MATERIAL LENGTHS, DIMENSIONS, LOCATIONS, AND QUANTITIES.

KEY NOTES

1. CLARIFIER DRIVES TO BE REPLACED. ~~BID ALTERNATIVE: REMOVE, REBUILD, AND REINSTALL EXISTING CLARIFIER DRIVES.~~
2. EXISTING LIGHTING TO BE REINSTALLED. ~~BID ALTERNATIVE: FURNISH AND INSTALL NEW WALKWAY LUMINAIRES, EATON CROUSE HINDS PART NUMBER "VMVL-3-N-P-R3-UNV1" OR EQUAL.~~



SECONDARY CLARIFIER ILLUSTRATIVE SECTION

SCALE: NTS

Brown AND Caldwell

Salt Lake City, UT

BID SET

TSSD Clean Water

TP-4 EAST FACILITY UTILITIES AND CLARIFIERS REHABILITATION PROJECT

REVISIONS

REV	DATE	DESCRIPTION
1	8/14/23	Revised Keynotes 1, 2.

LINE IS 2 INCHES AT FULL SIZE

DESIGNED: N.ANDERSON
DRAWN: B.NURSUWITO
CHECKED: M.PAGENDARM
CHECKED:
APPROVED: N.ANDERSON
FILENAME E-08-3002.DWG
CONSULTANT PROJECT NUMBER 157492
TSSD PROJECT NUMBER 157492

ELECTRICAL

EAST CLARIFIERS E-3 ELECTRICAL SECTION

DRAWING NUMBER

E-08-3002

ATTACHMENT B

00 41 00

BID FORM

Timpanogos Special Service District Water Reclamation Facility

6400 N., 5050 W. Utah County, UT 84119

TP-4 EAST FACILITY UTILITIES AND CLARIFIERS REHABILITATION PROJECT

(BID FORM REPLACED IN ITS ENTIRETY IN ADDENDUEM NO. 1)

TABLE OF CONTENTS

Page

ARTICLE 1 – BID RECIPIENT

1.01 This Bid is submitted to:

Timpanogos Special Service District Water Reclamation Facility, 6400 N. 5050 W., Utah County, UT 84003

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

ARTICLE 2 – BIDDER'S ACKNOWLEDGEMENTS

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

ARTICLE 3 – BIDDER'S REPRESENTATIONS

3.01 In submitting this Bid, Bidder represents that:

A. Bidder has examined and carefully studied the Bidding Documents, and any data and reference items identified in the Bidding Documents, and hereby acknowledges receipt of the following Addenda:

Addendum No.	Addendum, Date

B. Bidder has visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfied itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

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

D. Bidder has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings, and (2) reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, especially with respect to Technical Data in such reports and drawings.

E. Bidder has considered the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and any Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and

performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder; and (3) Bidder's safety precautions and programs.

F. Bidder agrees, based on the information and observations referred to in the preceding paragraph, that no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents.

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

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

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

J. The submission of this Bid constitutes an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, and that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

ARTICLE 4 – BIDDER'S CERTIFICATION

4.01 Bidder certifies that:

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

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

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

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

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

2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;

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

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

ARTICLE 5 – BASIS OF BID

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

East Clarifier Splitter Box:		
Item No.	**Description***	**Lump Sum Bid Price (numerals)**
1	Remove and replace the three existing lift gate pedestals and gear boxes with three new lift gate pedestals and gear boxes and Rotork actuators per specification 43 05 11 and 40 05 57.23. Furnish and install new lighting, light posts, and power supply on the top of the east clarifier splitter box (2 lights total). Install power supply for and to the new lift gate electric actuators and lighting.	
East Clarifiers E-1, E-2, E-3:		
Item No.	**Description***	**Lump Sum Bid Price (numerals)**
2	Furnish and install new clarifier mechanisms and associated equipment per specification 46 43 21.13, and as per the contract drawings. All material 1'-0 above, or below the water line shall be 304 stainless-steel. Pipe to be Schedule 10, 304 stainless-steel, pipe supports to be 316 stainless-steel. Furnish and install painted carbon steel walkways per specification 46 43 21.13. Remove and reinstall existing walkway lighting, light posts, and local lighting controls. Electrical re-feed of East Clarifiers 1 and 3.	
3	Furnish and install aluminum launder covers with 304 stainless steel supports per specification 46 43 23.	

East Facility Pipe Repairs		
Item No.	**Description***	**Lump Sum Bid Price (numerals)**
4	**East Clarifiers 1 and 2:** 30-inch RCP Mixed Liquor Pipes CFRP lining repairs. **East Clarifier 3:** 16-inch RAS pipe joint repair.	
Balance of Remaining Work		
5	Balance of remaining work:	
6	Allowance	$250,000
Base Bid Total (Items 1 – 6		

Notes:

1) Allowance is at Owner's discretion. Allowance item may be fully, partially, or not be fully used. Allowance items to be reviewed and approved by Engineer and Owner.

ALTERNATES

5.02 The Basis of Bid and Notice of Award is shown in 5.01. After the bid's have been reviewed and a Notice of Award has been issued, and at Owner's discretion, Owner may elect to add or remove the following items from the Work. Owner may elect to add or deduct some, all or none of the items shown in the schedule below.

Item No.	**Description***	**Bid Price (Deduct – negative Add – positive)**
East Clarifiers E-1, E-2, E-3:		
1	Furnish and install painted carbon steel clarifier components 1'-0 above and below the waterline, in lieu of 304 stainless steel materials, and painted carbon steel walkways per specification 46 43 21.13 and 09 90 00, and weirs, baffles, scum beaches, scum spray system as per the contract drawings. Furnish and install new scum spray piping as polyurethane coating Schedule 40 carbon steel in lieu of stainless-steel materials. Scum system to contain galvanized carbon steel hangers with manually controlled anti-rotation, full cone jet spray nozzle	

	system. Electrical re-feed of East Clarifiers 1 and 3. Remove and reinstall existing walkway lighting, light posts, and local lighting controls.	
2	Remove and dispose of existing conduit rack, relocate existing generator building conduit (1 total), electrical refeed of East Clarifier 2 to be included with electrical refeed of Clarifiers 1 and 3.	

ARTICLE 6 - TIME OF COMPLETION

6.01 Bidder agrees that the Work will be substantially complete within 365 days from the date the Contract times commence to run and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions within 425 days from the date the Contract times commence to run.

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

ARTICLE 7 – ATTACHMENTS TO THIS BID

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

A. Required Bid security;

B. List of Proposed Subcontractors;

C. List of Proposed Suppliers;

D. List of Project References;

E. Single Entity Unit Team (SEU) submittal information as outlined in specification section 33 39 30 for pipe rehabilitation work;

F. Evidence of authority to do business in the state of the Project; or a written covenant to obtain such license within the time for acceptance of Bids;

G. Contractor's License No.: _____ **[or]** Evidence of Bidder's ability to obtain a State Contractor's License and a covenant by Bidder to obtain said license within the time for acceptance of Bids;

H. Required Bidder Qualification Statement with supporting data;

I. Within 24 hours of Bid Opening, the Bidder with the lowest Bid shall submit a Schedule of Values for further review by the Owner. The Schedule of Values shall include at a minimum the following Work allocations: Mobilization/demobilization and related General Requirements, Civil Site Work, Structural, Electrical, Process Piping and Related Process Work

ARTICLE 8 – DEFINED TERMS

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

ARTICLE 9 – BID SUBMITTAL

BIDDER: *[Indicate correct name of bidding entity]*

_____

By:
[Signature] _____

[Printed name] _____
(If Bidder is a corporation, a limited liability company, a partnership, or a joint venture, attach evidence of authority to sign.)

Attest:
[Signature] _____

[Printed name] _____

Title: _____

Submittal Date: _____

Address for giving notices:

_____

Telephone Number: _____

Fax Number: _____

Contact Name and e-mail address: _____

Bidder's License No.: _____

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 01 57 28

DEWATERING

PART 1 GENERAL

1.01 REQUIREMENTS

A. CONTRACTOR shall provide all labor, equipment, materials and services necessary to dewater trench, pits and structure excavations as necessary to complete the Work.

B. CONTRACTOR may be able to discharge to the OWNER's facility at location within the plant's storm drain system not connected to the process piping or plant drain system at a location approved by the Owner. The Contractor is not allowed to discharge to the plant drain system.

C. The CONTRACTOR shall be responsible to identify how to dewater to the defined locations.

D. Sand and grit may not be discharged to the OWNER's storm water facilities. Sand and grit are to be collected in a frac tank type system and disposed of properly.

E. The CONTRACTOR shall satisfy himself as to the level of effort necessary to dewater where required. Analysis of groundwater levels, quality sampling nor pump tests have not been performed for this project. CONTRACTOR shall utilize the services of a geotechnical engineer to develop a dewatering plan. Groundwater data is available in the geotechnical report in the Technical Data included with the bid package.

1. Preliminary Geotechnical Engineering Report – TO 2022-01 MP Ph 1-Program Management, TSSD Capital Improvements (Shannon & Wilson)

F. All dewatering is incidental to the Work and shall be included in the lump sum pricing for the Work.

1.02 DEFINITIONS

A. Aquifer – rock or sediment in a formation, group of formations, or part of a formation that is saturated and sufficiently permeable to transmit water to pumped wells, wellpoints, eductors and sumps.

B. Confining layer – a body of material of low hydraulic conductivity/permeability that is stratigraphically adjacent to one or more aquifer. It may lie above or below the aquifer and has a permeability lower than the adjacent aquifer.

C. Dewatering System – a system that will lower the water table, piezometric or potentiometric surface adequately to permit safe and dry construction.

D. Ground water – water that is found in fully saturated soils, sediments and rocks below the surface of the ground and which flows primarily in response to gravitational forces.

E. Confined Ground Water – ground water under pressure that is greater than atmospheric pressure. Confined ground water is separated from direct contact with atmospheric

pressure because of overlying impermeable or relatively low permeability layers (confining layers) of sediments or rock.

F. Ground Water Table – is a particular potentiometric surface for an unconfined aquifer.

G. Incidental Sump Pumping – Sump pumping of perched or pocketed ground water in an excavation where the static ground water table has already been lowered below subgrade using wells or vacuum wellpoints.

H. Hydrostatic head – the difference in elevation between the surface of the static head of groundwater in a confined or unconfined confined aquifer and the elevation of target drawdown.

I. Perched groundwater – Groundwater separated from an underlying body of groundwater by unsaturated or relatively low permeability soil.

J. Potentiometric surface/Piezometric level – theoretical (imaginary) surface of the static head of ground water in an aquifer. The water table is a particular potentiometric surface for an unconfined aquifer.

K. Sand/Gravel pack – a sand or gravel material which is placed in the annular space between a drilled hole and the well casing and/or well screen.

L. Screen (well screen) – a cylinder of steel or plastic material with slots or perforations used to allow water to enter a well while preventing sediment or rock particles from entering the well.

M. Specific Capacity – The volume in gallons per minute of a pumped well's discharge divided by the concurrent drawdown of the pumped well's water level in feet during pumping.

N. Piezometric level/head – the level representing the total hydraulic head of groundwater in a confined aquifer.

O. Piezometric pressure – pore water pressure at a specific point.

P. Pumped well – A hole in the ground with a casing and screen that includes its own motorized pump in the casing or screen to lift water to the surface.

Q. Pumping Level – the level of water in a well casing or screen when pumping is in progress.

R. Observation Well – a non-pumping well used to observe changes in the elevation of the water table or the potentiometric surface/piezometric head.

S. Subgrade – the finished grade level of an excavation as shown on the drawings, below any slab including excavation for foundation materials.

T. Sump – Shallow hole in the ground adjacent to or in excavation trench with a slotted or perforated casing containing a pump and surrounded by filter sand or gravel to prevent the pumping of formation material.

U. Unconfined Ground Water – water in an aquifer that has a water table that is at atmospheric pressure.

V. Vacuum Wellpoints – small diameter wells installed in 6- to 8-inch diameter holes typically less than 25 feet (constrained by the limits of the vacuum to suck water out of the ground). Well points typically have a 3 foot length of slotted well screen at the bottom and are spaced 2 to 10 feet apart with the closer spacing for finer grained soils (i.e. silt and clay). Wellpoints are connected to a common vacuum header and typically operate using a single pump for the whole system.

W. Well Development – The method of using swabbing, surging, jetting, resonance and / or pumping techniques to:
   1. Clean drilling debris from the well and the surrounding formation.
   2. Repair damage done by drilling to the formation.
   3. Remove biological or chemical encrustation from the well screen.
   4. Improve the efficiency.
   5. Enhance the hydraulic connection between the well screen and the formation by bringing a percentage of the fines in the aquifer formation into the properly sized well screen so that a more open filter pack is obtained around the well screen.
   6. A technique to move water or air out through the screen and then back into the well quickly is common. Also, a means to remove or control the fines is required.

1.03 SUBMITTALS

A. Submittals in accordance with the General Conditions and Section 01 33 00.

B. The CONTRACTOR shall submit a dewatering plan containing drawings and complete design data showing methods and equipment the CONTRACTOR proposes for dewatering, including relief of hydrostatic head, groundwater monitoring, management of other water, and in maintaining the east facility clarifier site in a dewatered, hydrostatically controlled condition. CONTRACTOR shall provide a Ground Water Control Plan (GWCP). The CONTRACTOR shall submit information sufficient for the Engineer to understand the dewatering system including, but not limited to, the following:
   1. Specifications and manufacturer's literature of the materials and a description of the methods proposed for use in the construction of dewatering system.
   2. Drawings indicating the location and size of berms, dikes, ditches, wells, vacuum wellpoints, sumps, monitoring wells, gravel drains, treatment facilities, frac tank(s), discharge lines, flow meters and outfall design. The drawings shall include, at a minimum, all dewatering system elements.
   3. Capacities of pumps, prime movers, and standby equipment.
   4. Information supporting the location, size, adequacy and number of any wells, vacuum wellpoints, gravel drains, sumps and discharge lines, and the adequacy and suitability of discharge pipe sizes, pumps, frac tank(s), filters/gravel packs, screens and treatment facilities.
   5. Information supporting the design of the dewatering wells, vacuum wellpoints, gravel packs, water treatment and disposal, frac tank(s), systems.
   6. Groundwater monitoring plan and monitoring well logs.
   7. Dewatering schedule, operation, maintenance, and abandonment procedures.

8. Dewatering well logs.

1.04 CONTROLS

A. It shall be the sole responsibility of the CONTRACTOR to control the rate and effect of the dewatering in such a manner as to avoid all objectionable settlement and subsidence.

B. All dewatering operations shall be adequate to assure the integrity of the finished project and shall be the responsibility of the CONTRACTOR.

C. Critical structures and facilities exist immediately adjacent to areas of proposed dewatering, Reference points shall be established and observed at daily intervals by a Professional Land Surveyor of the State of Utah to detect settlement that may develop.
   1. Conduct dewatering operation in a manner that will protect adjacent structures and facilities.
   2. Repair damage to adjacent structures and restore facilities at no expense to OWNER.
   3. Comply with Section 31 09 00 Geotechnical Instrumentation and Monitoring.

PART 2 PRODUCTS

2.01 REQUIREMENTS

A. The dewatering system shall be designed using accepted and professional methods of design and engineering consistent with the best modern practice. The dewatering system shall include any trench dikes, deep wells, well points, sumps, frac tank(s) and other equipment, appurtenances, and related earthwork or soil modification necessary to complete the Work. The CONTRACTOR shall be or employ the services of a subcontractor who is generally acknowledges as experienced in dewatering design, installation, operation and maintenance.

B. Provide and maintain equipment necessary for dewatering. Standby equipment shall be kept available at all times to insure efficient dewatering and maintenance of dewatering operation during power failure.

2.02 DISCHARGE SITES

A. Discharge sites shall be coordinated with the OWNER.

PART 3 EXECUTION (ADDENDUM 1)

3.01 GENERAL

A. Dewatering operations shall continue throughout construction to maintain the groundwater level a minimum of 2 feet below bottom of the floor of the clarifier for the clarifier mechanism work. The groundwater level shall be maintained at an elevation 2 feet below the flow line of the clarifier influent pipe during the influent pipe lining repairs. ~~A lower groundwater elevation might be required to facilitate clarifier pipe repairs.~~

B. Site grading shall promote drainage. Surface runoff shall be diverted from excavations. Maintain a trench bottom free from standing water.

C. Owner will provide 3 phase 460 V temporary power for construction at the plant site. The Contractor shall make arrangements with the Owner for power takeoff points, voltage and phasing requirements, and transformers. The Contractor shall provide the special connections required for this work. The Contractor is not required to use on site Owner provided electrical power. Contractor shall provide continuous power for dewatering operations. Repairs to Owners facilities including the clarifiers due to damage caused as a result of a loss of dewatering shall be paid for by the Contractor.

D. Dewatering, if determined to be necessary by the CONTRACTOR, shall be conducted in such a manner as to preserve the undisturbed bearing capacity of the sub-grade soils at the bottom of excavation.

E. Flotation of clarifiers and surrounding structures is not permitted and shall be prevented by maintaining a positive and continuous removal of ground water. CONTRACTOR shall be fully responsible and liable for all damages to the clarifiers and surrounding structures that may result from failure to adequately keep the clarifier site dewatered. Floatation mitigation strategies are to be included in the dewatering plan. Strategies are to include groundwater level and clarifier structure monitoring, monitoring locations on the structures, frequency of monitoring, triggers for immediate remedial action, items to prevent and stop floatation, mitigation of damage to surrounding structures, and repair plans if clarifiers or surrounding structures are damaged.

F. The CONTRACTOR shall design, construct, operate, and maintain the dewatering system such that the fine fraction of the clarifier foundation soils will not be removed upon pumping.

3.02 WATER DISPOSAL

A. Dispose of water in suitable manner without damage to adjacent property.

B. No water shall be drained into work built or under construction.

C. Under no conditions shall debris be allowed to enter into any facilities of the OWNER.

D. All debris accumulated in pipeline or manhole shall be removed and the structure thoroughly cleaned prior to testing and acceptance.

E. Water shall be filtered using an approved method, frac tank(s), to remove sand and fine sized soil particles before disposal.

F. The return of groundwater to its static level shall be performed in such a manner as to maintain the undisturbed state of the natural foundation soils, prevent disturbance of compacted backfill and prevent flotation or movement of clarifiers, structures, pipelines, and sewers.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

SECTION 43 05 13

RIGID EQUIPMENT MOUNTS

PART 1 GENERAL

1.01 SUMMARY

1. Section includes: This Section specifies requirements for rigid equipment mounts. Rigid equipment mounts consist of equipment pads, equipment anchors, and mounting plates (baseplates, soleplates, or fabricated steel frames) set in grout.
2. Conform to the requirements specified in the Equipment Mounting Schedule (Part 4 of this Section) or equipment mounting configuration requirements specified in individual equipment specifications . Where equipment mounting requirements are not specifically identified, the default mounting configuration for equipment consists of Pad Anchored Equipment Pads per Process Mechanical Details with adhesive dowels anchoring the equipment pad to the foundation, equipment and driver mounted on a common mounting plate, mounting plate leveled within 0.005 inch/foot, equipment anchored to the equipment pad with cast-in-place equipment anchors per Process Mechanical Details, equipment anchor sleeve length is 10 times the bolt diameter, and the mounting plate is grouted in position using non-shrink grout.
3. If a conflict exists between this Section and requirements of individual equipment manufacturers, the more restrictive requirements shall prevail.
4. Requirements for non-rigid equipment mounts (vibration isolation systems) are specified in the associated equipment specification. Furnish rigid equipment mounts conforming to the requirements of this Section for the equipment pad and other equipment mounting components supporting the vibration isolation system.

1.02 RELATED SECTIONS

A. This Section contains specific references to the following related sections. Additional related sections may apply that are not specifically listed below.
   1. Section 01 61 45 – Area Exposure Designations
   2. Section 01 73 23 - Structural Design and Anchorage Requirements for Nonstructural Components and Non-Building Structures
   3. Section 01 99 90 - Reference Forms
   4. Section 03 60 00 – Grouting
   5. Section 05 05 20 – Anchor Bolts
   6. Section 09 90 00 – Painting and Coating
   7. Section 43 05 11 – General Requirements for Equipment
   8. Section 43 05 14 – Machine Alignment
   9. Section 43 05 17 – Vibration and Critical Speed Limitations

1.03 REFERENCES

A. This Section contains references to the following documents. They are a part of this Section as specified and modified. Where a referenced document contains references to other standards, those documents are included as references under this Section as if

referenced directly. In the event of conflict between the requirements of this Section and those of the listed documents, the requirements of this Section prevail.

Reference	Title
ACI 318, Appendix D	Building Code and Commentary, Anchorage to Concrete
HI 14.3	Rotodynamic Pumps –for Design and Application
HI 14.4	Rotodynamic Pumps –for Installation, Operation and Maintenance
API RECOMMENDED PRACTICE 686	Recommended Practices for Machinery Installation and Installation Design
ASCE 7	Minimum Design Loads and Associated Criteria for Buildings and Other Structures
ASME B1.1	Unified Inch Screw Threads (UN and UNR Thread Form)
ASTM E329	Inspection and Testing Agencies for Concrete, Steel, and Bituminous Materials as Used in Construction
ASTM F593	Stainless Steel Bolts, Hex Cap Screws, and Studs
ASTM F1554	Anchor Bolts, Steel, 36, 55 and 105 ksi Yield Strength
MIL-PRF-907E	Anti-Seize Thread Compound, High Temperature
SSPC	Society for Protective Coatings Specifications, Vol. 2
IBC	International Building Code (including local amendments)

1.04 DEFINITIONS

A. Terminology used in this Section conforms to the following definitions:

1. Baseplate: A mounting plate configured with a top plate and a perimeter edge of the mounting plate that is below the top plate. Baseplates have a cavity between the top plate and a horizontal plane at the bottom edge of the perimeter of the mounting plate.
2. Soleplate: A machined or pre-formed mounting plate with a uniform horizontal surface across the entire underside of the mounting plate, excepting shear lugs/keys, grout pour holes, vent holes, and attachment hardware (nuts, bolts, tapped holes, etc.). Soleplates have a top plate but lack the perimeter bottom edge that extends below the underside of the top plate that is a defining feature of baseplates.
3. Fabricated Steel Frame: An equipment mounting plate constructed of rolled steel shapes and plates welded into a frame. Fabricated steel frames do not have top plates.
4. Equipment Pad: Concrete foundation (block or slab) supporting and elevating mounting plates above the supporting structural floor slab or local grade.
5. Mounting Pads: Milled/machined areas of baseplates, soleplates, and fabricated steel frames where the feet or mounting surfaces of mounted equipment and drivers are bolted to the baseplate, soleplate, or fabricated steel frame.
6. Leveling Blocks: Steel blocks temporarily placed under baseplates, soleplates, or fabricated steel frames at leveling positions (at equipment anchors) for the purpose of leveling baseplates, soleplates, or fabricated steel frames prior to grouting.
7. Shims: Thin stainless steel plates of uniform thickness used for fine adjustment of level. Shims are used on top of leveling blocks for mounting plate leveling or used between equipment drivers and baseplates, soleplates, or fabricated steel frames for equipment alignment.

8. Wedges: Pairs of uniformly tapered metal blocks that are stacked with the tapered surfaces reversed (relative to the other wedge) so that the top and bottom surfaces of the wedges are parallel. Wedges are used between equipment pads and baseplates, soleplates, or fabricated steel frames for the purpose of leveling mounting plates.
9. Mounting Stud: Threaded rod or bolts anchored to baseplates, soleplates, or fabricated steel frames for the purpose of mounting equipment or ancillary devices onto baseplates, soleplates, or fabricated steel frames.
10. Reinforcement Dowels or Reinforcement Hooks: Steel reinforcement rods embedded in concrete, across a cold joint, for the purpose of transferring loads or force across the joint.
11. Leveling Position: A location on the top of a concrete equipment pad where leveling tools and equipment will be temporarily installed or used for the purpose of leveling baseplates, soleplates, and fabricated steel frames prior to grouting.
12. Grout Manufacturer: Refers to the manufacturer of the grout product used for installation of rigid equipment mounts.
13. Grout Manufacturer's Technical Representative(s): Refers to the technical representative(s) of the Grout Manufacturer. The Grout Manufacturer's Technical Representative shall not be an employee of the Contractor.

1.05 ADMINISTRATIVE REQUIREMENTS

A. Pre-installation Meetings:
   1. Conduct a pre-installation meeting with the Construction Manager's representative prior to installation of equipment mounts.
   2. Schedule a pre-installation meeting for the equipment mounts associated with each system or group of identical equipment items.
   3. Where equipment anchors are cast in the floor slab or foundation, schedule the pre-installation meeting prior to pouring the floor slab or foundation.

1.06 SUBMITTALS

A. Action Submittals:
   1. Procedures: Section 01 33 00.
   2. A copy of this Section, including addendum updates, (referenced sections need not be included for this Section) with each paragraph check-marked to indicate compliance or marked to indicate requested deviations from specification requirements. Check marks denote full compliance with a paragraph as a whole. Underline each deviation and denote with a number in the margin to the right of the identified paragraph, referenced to a detailed written explanation of the reasons for requesting the deviation. Mark copies of this Section with the specification number and equipment number for inclusion (filing) with submittal materials furnished for individual equipment specifications.
   3. Name, employer, and a copy of the employee's Qualified Millwright card or other equivalent certificate of journeyman qualifications for millwrights who will install rigid equipment mounts, as specified in paragraph 3.02, Leveling.
   4. Certificates or other documentation issued by the epoxy grout manufacturer that demonstrates that the grout manufacturer's technical representative has been

factory trained on installation of epoxy grout for equipment mounts, as specified in paragraph 1.07 Quality Control by Contractor.

5. List of Contractor's equipment installation staff that have completed epoxy grout manufacturer's grout installation training specified in paragraph 3.03, Manufacturer's Services.
6. Shop drawings for equipment pads, equipment anchors, and baseplate, soleplate or fabricated steel frame depict size and location of equipment pads and reinforcement; equipment drains; equipment anchor, size, location, and projection; expansion joint locations; grout formwork; elevation of top of grout and grout thickness; elevation of top of baseplate, soleplate, or mounting block; size and location of electrical conduits; and any other equipment mounting features embedded in equipment pads. Shop drawings for equipment pads, equipment anchors, and baseplate, soleplate, or fabricated steel frames to be numbered and marked (specification number and equipment number) for inclusion (filing) with the associated equipment submittal requirements.

B. Informational Submittals:
   1. Procedures: Section 01 33 00
   2. Submit equipment anchor calculations demonstrating compliance with paragraph 2.04, Equipment Anchor Design. Submit equipment anchor calculations with submittal information specified in the associated equipment specification.
   3. Results of grout strength tests, as specified in paragraph 3.02, Grouting.
   4. Completed Rigid Equipment Mount Installation Inspection Checklist Forms (43 05 13-A), as specified in paragraph 3.03, Manufacturer's Services.

1.07 QUALITY ASSURANCE

A. Quality Control By Contractor:
   1. Except where union rules require installation by another trade, all machinery to be mounted and leveled by journeyman millwrights.
   2. Epoxy grout installation performed by employees that have completed the epoxy grout manufacturer's grout installation training specified in this Section.
   3. Provide the services of an independent testing laboratory that complies with the requirements of ASTM E329. Testing laboratory to sample and test materials installed as part of rigid equipment mounts specified in this Section. Testing laboratory services costs borne by the Contractor.
   4. Where epoxy grout is specified for bedding mounting plates, furnish the services of a grout manufacturer's technical representative who has been factory trained by the grout manufacturer. The grout manufacturer's technical representative performs training and quality control for epoxy grout installation for rigid equipment mounts as specified in paragraph 3.03, Manufacturer's Services.

B. Special Inspection for Equipment Anchors:
   1. Equipment anchors shall comply with special inspection requirements specified in Section 05 05 20.

PART 2 PRODUCTS

2.01 GENERAL

A. Configure rigid equipment mounts as specified in the Equipment Mounting Schedule (See Part 4 of this specification) or as specified in individual equipment specifications. Equipment mounting configuration requirements in individual equipment specifications govern over configuration requirements specified in the Equipment Mounting Schedule. In the absence of equipment mounting configuration requirements in either of these locations, mount equipment per the default requirements specified in paragraph 1.01.

B. Pumps installed in accordance with this Section, HI 14.3, and HI 14.4.

2.02 MATERIALS FOR EQUIPMENT MOUNTING

A. Equipment pads: Reinforced concrete as specified in Process Mechanical Details.

B. Mounting Plates: Cast iron, cast steel, plate steel, fabricated steel frame, polymer concrete, or FRP as specified in the equipment specification.

C. Grout type for equipment mounting as specified in the Equipment Mounting Schedule or in individual equipment specification.

1. Epoxy Grout for Equipment Mounting: Where epoxy grout is specified in the Equipment Mounting Schedule or in individual equipment specifications, provide Epoxy Grout for Equipment Mounting as specified in Section 03 60 00. Where the term epoxy grout is used in the context of details and specifications for equipment mounting it means Epoxy Grout for Equipment Mounting as specified in Section 03 60 00.
2. Cementitious Nonshrink Grout: Where non-shrink grout is specified in the Equipment Mounting Schedule or in individual equipment specifications, Cementitious Non-shrink Grout, specified in Section 03 60 00, may be used for setting bearing surfaces of baseplates, soleplates, or fabricated steel frames. Where the term non-shrink grout or cementitious grout is used in the context of details and specifications for equipment mounting it means Cementitious Non-shrink Grout as specified in Section 03 60 00.

D. Equipment anchors: Materials per the following table and per the area exposure condition where the equipment is installed. Section 01 61 45 specifies area exposure conditions.

Area Exposure	Equipment Anchor Materials
Indoor, Dry	Carbon Steel, ASTM F1554, Grade 36, weldable per S1 for threaded rod
Indoor, Wet	Galvanized Carbon Steel, ASTM F1554, Grade 36, weldable per S1 for threaded rod
Outdoor	304 Stainless, ASTM F593, Cond. CW
Submerged, Immersed	316 Stainless, ASTM F593, Cond. CW
Process Corrosive	316 Stainless, ASTM F593, Cond. CW
Chemical Corrosive	316 Stainless, ASTM F593, Cond. CW

E. Anchor sleeves: Flexible polyurethane foam, steel cylinder/tubes, or corrugated/ribbed plastic sleeves.

F. Epoxy Primer: High-strength, lead free, chrome free, rust inhibiting two-component epoxy primer specifically designed for use on metal substrates and in conjunction with epoxy grout. Bond strength to sandblasted metal not less than 1500 psi.
    a. ITW Performance Polymer MS-7CZ primer
    b. Approved equal.

G. Anti-seize/Anti-galling compound: Molybdenum disulfide and graphite combination in aluminum complex base grease conforming to MIL-PRF-907E.
    a. Jet Lube 550 by Jet Lube, Inc.
    b. E-Z Break by LA-CO
    c. or approved equal.

2.03 EQUIPMENT PADS

A. Minimum dimensions for equipment pads are shown on structural drawings where a minimum equipment pad mass is required for vibration dampening/control.

B. Equipment Pad Drainage:
    1. Furnish equipment pads with 2-inch drains.
    2. Locate equipment pad drains at drainage outlets from equipment or mounting plates
    3. Route equipment drainage outlets or mounting plate drainage outlets to equipment pad drains
    4. Route equipment pad drains to the floor drainage collection system.
    5. Drainage piping for equipment pads shall be routed below the finished floor elevation.
    6. Exposed drain lines mounted on the floor are not acceptable.

2.04 EQUIPMENT ANCHORS:

A. Equipment Anchors:
    1. All thread rod with heavy hex welded nuts, heavy hex bolts, post-installed anchors (wedge, sleeve, undercut, expansion, and adhesive anchors), or adjustable canister anchors as specified in the Equipment Mounting Schedule or in individual equipment specifications.
    2. Bolt length as required for the specified embedment and sleeve length. Reduce equipment anchor sleeve length as necessary to fit within finished height of equipment pad if equipment pad height is insufficient to provide specified equipment anchor sleeve length. Unified Coarse Thread Series per ASME B1.1.
    3. Post-installed anchors (wedge, sleeve, undercut, expansion, and adhesive anchors) conforming to the requirements of Section 05 05 20.
    4. Adjustable canister anchors consist of cast-in-place pre-manufactured adjustable anchor inserts. Provide a minimum of 6 inches of vertical bolt height adjustment and lateral adjustment of the anchor bolt while maintaining the anchor bolt in a true vertical orientation.
        a. Jakebolts as manufactured by Unisorb
        b. Heavy Duty Adjustable Anchors as manufactured by Deco

c. Rowan Adjustable Canister Anchor Bolt
d. or approved equal.

B. Equipment Anchor Design:
1. Size (diameter) of anchors for clamping/fastening mounting plates to equipment pads determined by the equipment manufacturer.
2. Comply with Local, Governing Building Code for equipment anchor size, embedment, and edge distance. Provide equipment anchors that are sufficient to resist the maximum lateral and vertical forces specified.
3. Resistance to lateral (horizontal) loads based on the static friction between the mounting plate and its supporting grout pad. Include the clamping force applied by equipment anchors and the weight of the equipment for calculating static friction resistance to lateral loads. Do not include lateral (shear) loading on equipment anchors or adhesion between mounting plates and supporting grout in lateral loading resistance calculations.
4. Furnish equipment anchor calculation submittals for all equipment unless one of the following exceptions is applicable:
a. The importance factor, I_p, for the equipment is equal to 1.0, flexible connections are provided for all electrical and mechanical connections to the equipment, the center of mass of the equipment is less than 48 inches above the floor when it is mounted or attached to the structure, and the equipment weighs less than 400 pounds.
b. The importance factor, I_p, for the equipment is equal to 1.0, flexible connections are provided for all electrical and mechanical connections to the equipment, and the equipment weighs less than 20 pounds.
5. Equipment anchor calculations sealed by a registered structural or civil engineer licensed in the State of Utah.

C. Equipment Anchor Tension:
1. Unless alternate bolt torque/tension requirements are specified by the equipment manufacturer, tighten equipment anchors to provide a final clamping force that produces a tensile stress of 15,000 psi in each equipment anchor. Tighten adjustable canister anchors to the manufacturer's maximum safe working load. Tighten post-installed anchors to manufacturer's recommendations.
2. Bolt torque values required to produce the specified bolt tension based on well lubricated plain finish national coarse thread bolts are presented in the following table. Revise bolt torque values per equipment manufacturer's recommendations for alternate thread patterns, thread lubrication, bolt material, or bolt finish.

Bolt Diam. (in)	3/8	1/2	5/8	3/4	7/8	1	1-1/8	1-1/4	1-1/2
Final bolt torque for 15,000 psi bolt stress (ft*lbs)	8	15	30	50	80	125	180	250	400

3. Prior to leveling and grouting mounting plates, pull test grouted equipment anchors to the values specified in the following table.

Anchor Diam. (in)	3/8	1/2	5/8	3/4	7/8	1	1-1/8	1-1/4	1-1/2

Pull test load (kips)	2.1	3.8	6.1	9.1	13	17	22	28	43

D. Anchor Sleeves:
   1. Provide sleeves for equipment anchors as specified in the Equipment Mounting Schedule or in individual equipment specifications.
   2. Adjust equipment anchor length/embedment depth shown in Process Mechanical Details if sleeves are not required.
   3. Sleeves may be installed at the Contractor's option if not specified in the Equipment Mounting Schedule or in individual equipment specifications provided they do not interfere with specified embedment lengths.
   4. Fill steel cylinders/tubes and ribbed plastic sleeves with a flexible room temperature vulcanizing (RTV) sealant prior to embedment/installation.

2.05 MOUNTING PLATES

A. General:
   1. Round edges of surfaces of baseplates, soleplates, and fabricated steel frames that bear on grout to a radius of not less than 0.25 inch.
   2. Round perimeter corners of baseplates, soleplates, or fabricated steel frames to a radius of not less than 2.0 inches to avoid producing stress risers on the grouted foundation.
   3. Provide grout pouring holes (minimum 4 inches in diameter for epoxy grout, minimum 2.5 inches in diameter for cementitious non-shrink grout) and air release holes in all baseplates and soleplates.
   4. Provide grout relief or vent holes (minimum 1 inch in diameter) in all baseplates and soleplates.
   5. Drill mounting holes for equipment anchors through baseplates, soleplates, and fabricated steel frames. Open slots or burned out holes for equipment anchors are not permitted.
   6. Provide acorn nuts welded to the underside of the baseplate or soleplate or nuts welded to the underside of the baseplate or soleplate and plugged with cork, plastic plugs or grease where terminations to baseplates and soleplates are required.
   7. Where fasteners terminate only into the baseplate, soleplate, or fabricated steel frame, threaded lengths (tapped or embedded in mounting plates) shall be not less than the bolt diameter.
   8. Where baseplates, soleplates, or fabricated steel frames are leveled using jackscrews, tap jackscrew threads in thickened pads or otherwise in sufficient metal to provide ease in adjusting level.
   9. Mill mounting pads and/or mounting surfaces of baseplates, soleplates, and fabricated steel frames flat and coplanar within 0.0005 inch per foot in all directions after all welding and stress relieving.
   10. Pre-grout baseplates prior to milling.
   11. Baseplates, soleplates, and fabricated steel frames provide common support for the equipment and driver (and flywheel, if one is specified).

12. For equipment with drivers 20 horsepower and greater, provide transverse alignment (horizontal) positioning jackscrews for alignment of equipment drivers on horizontal surfaces of baseplates, soleplates, and fabricated steel frames.
13. Provide alignment/positioning jackscrews in perpendicular directions in a horizontal plane at the mounting position for each corner or foot of the equipment driver. (Additional jackscrews provided for transverse alignment of the flywheel, if flywheels are specified in the equipment specification.)
14. Where specified in individual equipment specifications; baseplates, soleplates, and fabricated steel frames fitted with RK Fixators as manufactured by Unisorb, or approved equal.
    a. Fixators installed at mounting surfaces for drivers.
    b. Fixators consist of a three-piece wedge leveling adjustment device incorporating a spherical washer assembly to provide true level height adjustment at each mounting surface for the equipment driver.

B. Fabricated Steel Frames:
1. Fabricated steel frames consist of structural steel shapes welded to form mounting plates.
2. Fabricated steel frames to be rectangular in shape, excepting fabricated steel frames for centrifugal refrigeration machines and pumps which may be T- or L-shaped to accommodate the equipment driver and accessories.
3. Fabricated steel frames for split case pumps include supports for suction and discharge elbows, if required by the specified configuration.
4. Perimeter members consist of I-beams or C-channel with a minimum depth equal to 1/10 of the longest dimension of the fabricated steel frame. Beam depth need not exceed 14 inches provided that the deflection and misalignment is kept within acceptable limits as determined by the manufacturer.
5. Fabricated steel frames furnished with thickened steel mounting pads welded to the fabricated steel frame for bolting equipment to the mounting plate.
6. Sandblast surfaces of fabricated steel frames in contact with grout to white metal per SSPC SP-5.
7. Apply a high-strength epoxy primer as specified in paragraph 2.02 within 8 hours of sandblasting the fabricated steel frame.

C. Baseplates:
1. Baseplates may be welded steel, cast steel, or cast iron with thickened mounting pads for bolting equipment to the baseplate.
2. Provide internal stiffeners on all cast and fabricated baseplates. Stiffeners designed to allow free flow of grout from one section of the baseplate to another.
3. Provide a minimum 2 inches high by 6 inches wide opening in cross bracing and stiffeners for grout flow between sections of the baseplate.
4. All welds continuous and free from skips, blowholes, laps and pockets.
5. Pre-grout baseplates at the factory after all welding has been completed and prior to machining the mounting pads on the baseplate. Pre-grout baseplates in the field if they have not been pre-grouted at the factory. Remove the equipment from the baseplate, invert the baseplate, and pre-grout as specified in this Section.

6. Prior to pre-grouting, sandblast the underside of baseplates to white metal per SSPC SP-5.
7. Complete pre-grouting within 8 hours of sandblasting.
8. Fill the underside of the baseplate to the bottom edges of the baseplate.
9. Seal cast iron baseplates to prevent surface bleeding prior to shipment to the project site.

D. Plate Steel Soleplates:
1. Not less than 1.0 inch thick for equipment with drivers greater than 30 horsepower.
2. Furnished with grout keys/lugs or stiffeners on the underside of the soleplate.
3. Flat uniform horizontal surface on underside of plate steel soleplates, excepting grout keys, grout pour holes, vent holes, and attachment hardware (nuts, bolts, tapped holes, etc.).
4. Prior to milling the mounting pads for equipment or mounting surfaces, scribe the words “THIS SIDE DOWN”, using welding rod material, on the underside of plate steel soleplates.
5. Plate steel soleplates without grout pouring holes are acceptable provided that no dimension of the soleplate (width or length) exceeds 18 inches.
6. Sandblast surfaces of plate steel soleplates in contact with grout to white metal per SSPC-SP-5, prior to shipment to the project site.
7. Apply a high-strength epoxy primer as specified in paragraph 2.02 within 8 hours of sandblasting the underside of plate steel soleplates.
8. Where equipment is fabricated or cast with feet or mounting surfaces that are not fastened to a common baseplate or soleplate, as in dry-pit bottom-suction pumps, the equipment may be supported on individual concrete piers or equipment pads in lieu of mounting on a common equipment pad and soleplate. In such instances, support the equipment at the feet or mounting surfaces on individual plate steel soleplates. Level individual plate steel soleplates and grout into place on the individual piers or equipment pads as specified in this Section. Where multiple soleplates are installed to support one piece of equipment, soleplates shall be coplanar within 0.002 inch/foot.

E. Polymer Concrete Soleplates:
1. Pre-cast soleplates consisting of polymer concrete with stainless steel inserts for equipment mounting.
2. Mounting surfaces shall be coplanar within 0.002 inch/foot.
3. Furnished with a uniform horizontal surface over the entire underside of the mounting plate, excepting grout keys, grout pour holes and vent holes.
    a. PoxyBase as manufactured by Basetek
    b. Chembase as manufactured by Goulds
    c. Approved equal.

F. Corrosion Resistant FRP Baseplates:
1. Pre-formed fiber reinforced plastic fabrications.
2. Product of the manufacturer of the equipment that is mounted on the baseplate.

PART 3 EXECUTION

3.01 PREPARATION

A. Concrete Equipment Pad Preparation:
   1. Roughen the top of the equipment pad after the concrete has reached its 28-day compressive strength.
   2. Remove all laitance and defective or weak concrete.
   3. Roughen surface profile to 0.25 inch amplitude, minimum.
   4. Expose broken aggregate without dislodging unbroken aggregate from the cement matrix and without fracturing concrete and aggregate below the concrete surface.
   5. Roughen using a light-duty (15 pounds or less), hand-held chipper with a chisel type tool.
   6. Abrasive blast, bush-hammer, jack hammers with sharp chisels, heavy chipping tools, or needle gun preparation of concrete surfaces to be grouted are not acceptable.
   7. Demonstrate removal of defective or weak concrete to the Construction Manager prior to leveling.
   8. Chip the surface of the concrete such that the final elevation of the equipment pad provides the grout manufacturer's recommended thickness between the surface of the equipment pad and the lower baseplate flange, underside of the soleplate, or underside of the fabricated steel frame.
   9. Remove all dust, dirt, chips, oil, water, and any other contaminants and protect the surface with plastic sheeting until grout is installed.
   10. Protect concrete equipment pad surfaces that have been finished smooth and level for use as leveling positions. Protect from damage during chipping activities. Alternatively, leveling positions may be restored on chipped surfaces. Restore leveling positions by installing leveling blocks or leveling plates for jackscrews on a high compressive strength epoxy putty (Philadelphia Resins, Phillybond Blue 6A, or equal). Leveling blocks and leveling plates installed level on the epoxy putty.

B. Grout Form Construction:
   1. Design forms for a minimum of 6 inches hydrostatic head above the final elevation of the grout and manufacturer's recommendations for form edge clearance for intended pour scheme, but not less than two inches.
   2. Install grout expansion joints at 4 to 6 foot intervals, perpendicular to the centerline of baseplates. Design expansion joints in accordance with the grout manufacturer's written instructions.
   3. Coat forms with three coats of paste wax on all areas of the forms that will be in contact with the grout.
   4. Wax forms before assembly.
   5. Prevent accidental application of wax to surfaces where the grout is to bond.
   6. Remove any foreign material, such as oil, sand, water, wax, grease, etc., from concrete surfaces that will contact grout before forms are installed.
   7. Forms must be liquid tight. Seal any open spaces or cracks in forms, or at the joint between forms and the foundation using sealant, putty, or caulking compound.

8. Chamfer vertical and horizontal edges of the grout with 45-degree chamfers as specified in equipment pad details. Locate 45-degree perimeter chamfer strips at the final elevation of the grout.
9. Match chamfers in concrete portions of the equipment pad.
10. Install block outs at all leveling positions to allow removal of leveling equipment and leveling nuts to be backed off after the grout has cured.
11. Coat jackscrews with a light oil or other acceptable bond-breaking compound prior to grouting.
12. Seal equipment anchor sleeves to protect the sleeved length of the anchor from contact with grout.
13. Wrap exposed portions of equipment anchors with duct tape to protect them from grout splatter and to prevent bonding to grout.

C. Mounting Plate Preparation:
1. Roughen the underside of soleplates and fabricated steel frames and wipe with a residue-free solvent as recommended by the epoxy primer manufacturer before placement of the baseplate, soleplate, or fabricated steel frames on the equipment pad for leveling. Roughen surfaces of mounting plates that will be in contact with grout by power tool cleaning. Cleaning performed by power wire brushing, power sanding, power grinding, power tool chipping or power tool descaling. Impart a minimum profile of 1.0 mil.
2. Prior to placement on the equipment pad for leveling, roughen exposed grout surfaces of pre-grouted baseplates and wipe with a residue-free solvent as recommended by the manufacturer of the epoxy grout used for pre-grouting.
3. Prepare the underside of corrosion-resistant FRP baseplates and polymer concrete baseplates per the baseplate manufacturer's recommendations and prior to placement of the baseplate on the equipment pad for leveling.
4. Grouting for installation of mounting plates on equipment pads completed prior to connecting any field piping or electrical and instrumentation systems.
5. Unless the Construction Manager accepts an alternate installation procedure in writing, baseplates, soleplates, and fabricated steel frames leveled and grouted with the equipment removed.

3.02 INSTALLATION

A. Leveling:
1. Except where union rules require installation by another trade, all equipment and machinery mounted and leveled by a Qualified Millwright.
2. Use precision surveying equipment for leveling.
3. Machinists' spirit levels will not be permitted for leveling purposes for any baseplate, soleplate, or fabricated steel frame with a plan dimension greater than 4 feet.
4. Baseplates, soleplates, and fabricated steel frames leveled to the tolerance specified in the Equipment Mounting Schedule, in the individual equipment specification, or as otherwise required by the equipment manufacturer, if more stringent.
5. Apply an anti-seize or anti-galling compound, specified in paragraph 2.02, to all equipment anchor threads prior to beginning baseplate, soleplate, or fabricated steel frame leveling.

6. Level all baseplates, soleplates, and fabricated steel frames against steel surfaces (jackscrew plates, leveling blocks, leveling nuts, support plates, or other steel surfaces). Use of other materials for leveling purposes is strictly and specifically prohibited.
7. Use stainless steel leveling blocks and shims, steel wedges, or jackscrews bearing on leveling plates.
8. Leveling nuts may be used for leveling baseplates, soleplates, and fabricated steel frames weighing less than 200 pounds (inclusive of the weight of the equipment if leveled with the equipment on the mounting plate).
9. Leveling blocks shall be stainless steel, 4 inches square and 1.5 inches thick with an open-ended slot terminating in the center for the equipment anchor.
10. Machine leveling blocks flat on all horizontal surfaces and place under the baseplate or soleplate at each equipment anchor.
11. Provide pre-cut stainless steel shims, slotted for removal after grouting. Coat leveling blocks and shims with a light oil just prior to beginning the leveling and grouting work. Place shims so the tabs on the shims are easily accessible.
12. Clamp baseplates, soleplates, or fabricated steel frames in position (after leveling) by installing the equipment anchor nuts and washers.
13. Apply bolt tension to fix the position of mounting plates during grouting (30 to 60 percent of the final clamping force applied to clamp the mounting plate to the equipment pad).
14. Prior to grouting, verify that the correct level and position of the baseplate, soleplate, or fabricated steel frame has been maintained after clamping it to the equipment pad.

B. Grouting:
1. Adjust ambient temperature to maintain mounting plate, foundation, and grout temperatures to grout manufacturer's recommended temperature.
2. Mix grout for equipment mounting in accordance with the grout manufacturer's written recommendations.
3. Place epoxy grout using a method that avoids air entrapment.
4. Place grout at one end of the baseplate or soleplate and work grout toward the opposite end to force the air out from beneath the baseplate or soleplate.
5. Pour grout through a head box into grout pouring holes.
6. When the head box is moved to the next grout hole, place a 6 inch standpipe over the grout hole and fill with grout.
7. Pour grout to the top of the lower flange of the perimeter I-beams or C-channel of fabricated steel frames.
8. Pour grout at least 0.125 inch but not more than 0.5 inch above the bottom or underside of the perimeter edge of a baseplate or soleplate.
9. Use of vibrating tools and/or jarring (rapping or tapping) forms to facilitate grout flow is not permitted during placement of epoxy grout.
10. Never allow the grout in the head box to fall below the top of the baseplate or soleplate once the grout has made contact with the baseplate or soleplate.
11. Grout placement applied in one continuous pour, until all portions of the space beneath the baseplate, soleplate, or fabricated steel frame have been filled.
12. Prepare subsequent batches of grout prior to depleting the preceding batch.

13. Maintain grout height in standpipes after the space under the baseplate, soleplate, or fabricated steel frame has been filled.
14. When the grout has started to take an initial set (typically this is determined by a noticeable increase in temperature and no flow of grout at the vent holes) remove the standpipes and clean excess grout from all surfaces.
15. Check for leaks throughout grout pours. Repair leaks immediately to prevent formation of voids.
16. Check baseplate, soleplate, or fabricated steel frame level and elevation before the grout sets.
17. Cure grout in accordance with the grout manufacturer's written instructions.
18. Collect at least one grout sample from each grout pour. Where specified in the individual equipment specifications, collect a grout sample from the grout pour for each equipment pad.
    a. Place samples in a cylinder of sufficient size to yield three 2-inch cubes as test samples.
    b. Label samples with project name, date, time, the equipment number, and ambient temperature at the time of placement.
    c. Place samples next to the foundation of the equipment being grouted and cure for 48 hours.
    d. Test grout samples in accordance with the grout manufacturer's recommendations.
    e. Grout samples tested by the independent testing laboratory specified in paragraph 1.07 Quality Control by Contractor.
    f. Report test results directly to the Construction Manager.

C. Completion:
1. Upon acceptance by the Construction Manager and the equipment manufacturer's representative and after the grout has reached sufficient strength, remove grout forms and block outs at leveling positions. Remove leveling blocks and shims or wedges and support plates. Back off leveling nuts and jack screws to allow the grout to fully support the baseplate, mounting block, or soleplate. Take care not to damage the grout during removal of extended shimming material or leveling equipment and tools.
2. Tighten equipment anchor nuts using calibrated indicating torque wrenches, to develop the full bolt tension specified in paragraph 2.04 Equipment Anchor Tension.
3. Tighten equipment anchor nuts in increments of not more than 25 percent of the final torque value in an alternating pattern to avoid stress concentration on the grout surface. After tightening equipment anchor nuts to final values, apply additional wax, grease, or mastic to all exposed portions of the equipment anchor beneath the baseplate, soleplate, or mounting block.
4. After applying additional wax or mastic to exposed portions of equipment anchors and tightening to final torque values, fill and point block outs (pockets) for access to leveling nuts, leveling blocks, shims, or wedges with the grout material installed under baseplates, soleplates, or fabricated steel frames. Remove jackscrews and fill holes in the baseplate, soleplate, or fabricated steel frame with a flexible sealant (silicone rubber) or a short cap screw.
5. Check for baseplate, soleplate, or fabricated steel frame movement (soft foot) by individually loosening and re-tightening each equipment anchor. Measure and record

vertical movement at each equipment anchor during loosening and retightening. Measure vertical movement using a magnetic-based dial indicator on the baseplate, soleplate, or fabricated steel frame referenced to the epoxy grout surface of the equipment pad, or other approved method. Vertical movement exceeding 25 micrometers (0.001 inch) indicates a soft foot condition. Soft foot conditions are sufficient cause for removal and reinstallation of grout and baseplates, soleplates, or fabricated steel frames.

6. Check for grout voids by tapping along the upper surfaces of the baseplate, soleplate, or mounting block. Mark grout voids. A grout void is sufficient cause for removal and reinstallation of grout and baseplate, soleplate, or fabricated steel frame. At the discretion of the Construction Manager, grout voids may be repaired as specified in Chapter 5, Section 3.16 of API RP 686.

D. Piping Connections:

1. Anchor piping connecting to flexible connections and/or expansion joints such that the intended function of these connections/joints is maintained in the piping system without imposing strain on the equipment connections.
2. Where an equipment manufacturer's installation requirements include a rigid connection between the machine and connecting piping systems, delete any flexible coupling (including equipment connection fittings) shown on the drawings and install the equipment in the following manner, in lieu of installing the flexible coupling:
   a. Install equipment pad as shown in the detail specified in the Equipment Mounting Schedule or in the individual equipment specification.
   b. Install the baseplate, soleplate, or fabricated steel frame supporting the equipment and grouted in place as specified in this Section.
   c. Install and align the equipment in place as specified in Section 43 05 14.
   d. Install and align piping between equipment connections and field piping without welding one of the joints for one section of pipe between the equipment connection and the field piping and all valving. All flanged joints bolted up and pressure-tested.
   e. All piping must be fully supported by supports designed to accept their full weight and thrust forces.
   f. Install the final section of piping. Align the final section of pipe with the equipment and field connections without the use of jacks, chain falls, or other devices to force it into alignment.
   g. Do not weld the final piping joints until after the previous steps have been completed and accepted by the Construction Manager.

3.03 FIELD QUALITY CONTROL

A. Manufacturer's Services

1. Epoxy Grout Training: Prior to commencing rigid equipment mount installation work on equipment pads, furnish the services of a grout manufacturer's technical representative to conduct a training school for the workers who will be using epoxy grout for rigid equipment mount installations. Epoxy grout training school duration to be not less than 4 hours duration and covers all aspects of using the products, including form construction for each equipment installation, surface preparation, mixing, application, void prevention/elimination, and clean up. This requirement does not relieve the Contractor of overall responsibility for this portion of the work. Epoxy

grout manufacturer to furnish a list of school attendees who have been satisfactorily trained to perform epoxy grout installation for equipment mounting.

2. Epoxy Grout Quality Control: The epoxy grout manufacturer's technical representative provides quality control services for equipment mounted with epoxy grout. The epoxy grout manufacturer's technical representative must be present (on site) to inspect and verify that the installation personnel have successfully performed surface preparation, epoxy grout application, and Quality Control Inspection in accordance with these specifications for a representative portion of the epoxy grout installation work.
3. Epoxy grout manufacturer's technical representative performs the following services for at least one rigid equipment mount installation for each equipment type and size installed with epoxy grout:
    a. Inspect ambient conditions during various phases of epoxy grouting installation for conformance with the epoxy grout manufacturer's requirements.
    b. Inspect the surface preparation of concrete substrates onto which epoxy grout materials are to be applied. Inspect surface for conformance to the specified application criteria, including but not limited to substrate profile, degree of cleanliness, and moisture.
    c. Inspect the surface preparation of the metallic substrates onto which the epoxy primer is to be applied.
    d. Inspect the epoxy-primed metallic substrate for coverage and adhesion.
    e. Inspect preparation and application of epoxy grout form work for conformance to the specifications and manufacturer's recommendations for form edge clearance.
    f. Inspect and record that the "pot life" of epoxy grout materials is not exceeded during installation.
    g. Inspect epoxy grout for cure.
    h. Inspect and record that localized repairs made to grout voids conform to the specification requirements.
    i. Conduct a final review of completed epoxy grout installation for conformance to these specifications.
    j. Attest to conformance of the Contractor's work by signing appropriate entries in the "Rigid Equipment Mount Inspection Checklist," Form 43 05 13-A in Section 01 99 90.

B. Training and quality control by the grout manufacturer's technical representative is not required for rigid equipment mounts installed with cementitious non-shrink grout.

3.04 FINAL INSPECTION

A. The Construction Manager will conduct a final inspection with the Contractor for conformance to requirements of this Section.

PART 4 EQUIPMENT MOUNTING SCHEDULE (ADDENDUM 1)

Equipment Mounting Schedule

Equipment Number	Specification Section	Specification Title	Equipment Pad Detail	Mounting Plate Leveling Tolerance (inch/foot)	Equipment Anchor Type	Equipment Anchor Sleeve Length	Grout Type	Application Notes
Default Config.	Various	Various	D01007	0.005	D01002	10D	Non-shrink	Default equipment mounting configuration for all equipment not otherwise specified in this schedule
Freestanding floor-mounted electrical panels and equipment	Various	Various	D01006	Not applicable	D01004	Not required	Not required	
P 210,212 P 210,222 P 210,232 P 210,242	11328	Custom-Engineered Vertical Mixed Flow Pumps	Det. B/ 2109-M-201	0.0005	D01003	15D	Epoxy	The Equipment Pad Detail entry for this row refers to a project specific detail for the equipment pad detail rather than one of the standard details for equipment pads.
P 310,234 P 310,236 P 310,244 P 310,246	11325	Recessed Impeller Pumps	D01007	0.002	D01002	15D	Non-shrink	
T 625,401 T 625,501	13216	Cross-Linked Polyethylene Tanks	Existing	No mounting plate	D01003	Not required	None	Retrofit tank on existing equipment pad. See specification for special mounting requirements.
P 700,368	11342	Screw Centrifugal Pumps	D01007	0.002	D01003	10D	Epoxy	Retrofit equipment pad on existing foundation
P 710,257	11390	Progressing Cavity Pumps for Sludge Service	D01008	0.005	D01005	15D	Non-shrink	

Equipment Mounting Schedule

Equipment Number	Specification Section	Specification Title	Equipment Pad Detail	Mounting Plate Leveling Tolerance (inch/foot)	Equipment Anchor Type	Equipment Anchor Sleeve Length	Grout Type	Application Notes
P 840,861 P 840,862 P 840,863	11347	Submersible Non-Clog Pumps for Sewage Service	None	0.002	D01002	Not required	Epoxy	Grout discharge elbow base to slab at el. 2162.50
F 990,111 F 990,121 F 990,131	15828	Centrifugal Fiberglass Reinforced Plastic Fans	D01006	Not required	D01004	Not required	Not required	Mount vibration isolation system on equipment pad.

Equipment Mounting Schedule

Equipment Mounting System	Equipment Pad Detail	Mounting Plate Leveling Tolerance (inch/foot)	Equipment Anchor Bolt Detail	Equipment Anchor Sleeve Length	Grout Type	Application Notes
Default	D01007	0.005	D01002	10D	Non-shrink	The default equipment mounting configuration, unless this schedule or the equipment specifications specify another mounting configuration. (general purpose)
Group A	D01008	0.0005	D01003	15D	Epoxy	(critical service, existing space, in adequate mass in equipment pad)
Group B	D01007	0.0005	D01002	15D	Epoxy	(critical service w/ dampening mass in equipment pad)
Group C	D01006	0.02	D01004	Not required	Non-shrink	(static/non-critical, mounted on housekeeping pad)
Group D	D01007	No mounting plate	D01001	No sleeve	Non-shrink	Install anchor without sleeves. (tanks/scrubbers/ process vessels)
Group E	No pad	0.02	D01001 or D01002	Not required	Epoxy	(submersible pumps)
Group F	D01006	Not Applicable	D01004	Not required	Not required	(Freestanding floor mounted electrical panels and equipment)

END OF SECTION

SECTION 46 43 21.11

CIRCULAR SECONDARY CLARIFIER LAUNDER COVERS

PART 1 GENERAL

1.01 DESCRIPTION

A. Scope:

1. The work specified in this Section includes furnishing and installation of launder covers on the east secondary circular clarifiers 1, 2 and 3. Dimensions as per the Record Drawings are as follows. East clarifiers 1 and 2 each have inner diameters of 90 feet and outer diameters of 96'-8". East clarifier 3 has an inner diameter of 110 feet and an outer diameter of 116'-8". Contractor to field verify clarifier diameter and all required dimension information for proper launder cover design. The east facility clarifiers have outboard launders. Refer to the Record Drawing plans provided in the supplemental documents for more information. The purpose of the covers is to reducer/inhibit the growth of algae on the launder troughs and weirs of the tank by minimizing the incident sunlight on these surfaces. In addition, the cover is intended to assist in the containment of odors and keep airborne debris from entering the launder.

1.02 RELATED SECTIONS

A. This section contains specific references to the following related sections. Additional related sections may apply that are not specifically listed below.

1. Section 01 12 16: Work Sequence
2. Section 01 33 00: Submittal Procedures
3. Section 01 78 23: Operation and Maintenance Information
4. Section 05 05 14: Hot-Dip Galvanizing
5. Section 05 10 00: Structural Metal Framing
6. Section 05 50 00: Metal Fabrications
7. Section 09 90 00: Painting and Coating
8. Section 43 05 11: General Requirements for Equipment

1.03 SUBMITTALS

A. The following information shall be submitted in accordance with Section 01 33 00:

1. A copy of this specification section, with addendum updates included, and all referenced and applicable sections, with addendum updates included, with each paragraph check-marked to indicate specification compliance or marked to indicate requested deviations from specification requirements. Check marks (✓) shall denote full compliance with a paragraph as a whole. If deviations from the specifications are indicated, and therefore requested by the Contractor, each deviation shall be underlined and denoted by a number in the margin to the right of the identified paragraph, referenced to a detailed written explanation of the reasons for requesting the deviation. The Construction Manager shall be the final authority for determining acceptability of requested deviations. The remaining portions of the paragraph not underlined will signify compliance on the part of the Contractor with the specifications. Failure to include a copy of the marked-up specification sections,

along with justification(s) for any requested deviations to the specification requirements, with the submittal shall be sufficient cause for rejection of the entire submittal with no further consideration.

2. Detailed drawings using field verified existing condition showing all assemblies, equipment fabrication, cover dimensions, method of attachment, mounting configurations, number of cover units, locations, and size of brackets and fasteners, and weights of fabrications.
3. Manufacturer storage instructions, installation instructions and field trimming instructions.
4. Manufacturer's catalog information, descriptive literature, specifications, and identification of materials of construction.
5. Calculations and information ensuring that the design includes provisions for the expansion of aluminum without warping or buckling.
6. Design calculations stamped by an engineer registered in the State of Utah demonstrating the adequacy of the mounting brackets and supports to resist the weight of the launder covers and structural loads specified in 2.03 Performance/Design Criteria.
7. Certified test reports of the physical and mechanical properties of the products.
8. A list of at least 10 installations of similar size and scope that have been in continuous operation for 10 years.
9. Certificate of Unit Responsibility attesting that the Contractor has assigned, and that the manufacturer accepts, unit responsibility in accordance with the requirements of this Section and Section 43 05 11-1.02 Unit Responsibility. No other submittal material will be reviewed until the certificate has been received and found to be in conformance with these requirements.
10. Detailed drawings showing all assemblies. This shall include equipment fabricaition, dimensions, method of attachment including number, location and size of fasteners and weight of fabrications.
11. Proposed on-site testing and training procedures.
12. Quality Control Submittals:
    a. Maunfacture's Certificate of Compliance.
    b. Special shipping, storage, protection, and handling instructions.
    c. Manufacture's installation and maintenance instructions.
    d. Materials of construction to be 304/304L stainless steel for support arms and accessories, aluminum allow 5052 for covers.
    e. Covers shall be designed for a minimum wind load of 100 mph, dead loads, and capable of a live load of 250 lbs.
    f. Covers are to be manufactured in the USA and AIS (American Iron and Steel Step Certification) requirements.

B. Closeout Submittals
    1. Procedures: Section 01 33 00.
    2. Manufacturer's operation and maintenance information in accordance with Section 01 78 23.
    3. Spare parts:
        a. Procedures: Section 01 33 00

b. Provide the following spare parts:
   1) Cover sections, two of each type provided
   2) Cover hardware, two of each type provided

1.04 QUALITY ASSURANCE

A. Qualifications
   1. Manufacturer Experience
      a. The launder cover Manufacturer shall have at least 10 installations of launder covers of similar size and scope that have been in continuous operation for at least 10 years.

1.05 DELIVERY, STORAGE AND HANDLING

A. Launder covers shall be shipped, handled, stored, and installed in ways which will prevent damage to the items. Damaged items will not be permitted as part of the Work except in cases of minor damage that have been satisfactorily repaired and are acceptable to the Construction Manager.
   1. Store and protect launder covers per manufacturer instructions.
   2. Launder covers shall be covered and stored at least 6 inches above ground.

1.06 WARRANTY

A. Manufacture shall expressly warrant the launder cover system to be free of defects in materials and workmanship for a period of three years from the date of installation Installation Contractor shall be responsible for damage due to misuse, negligence, or accident on the part of the manufacture, shipping and installation contractor.

1.07 COORDINATION

A. The General Contractor shall coordinate the launder cover design and installation requirements with the clarifier mechanism, scum box, scum spray piping and launder effluent channel sizes, materials and configurations with the launder cover Manufacture.

PART 2 PRODUCTS

2.01 MANUFACTURES (ADDENDUM 1)

A. Materials, equipment, and components in this section shall be the product of the following approved manufacture.
   1. Rebuild-it Services Group
   2. Hallsten
   3. RPS Engineering
   4. CST

      or

   5. Engineer approved equal

2.02 DESIGN

A. The launder covers shall consist of a system of stainless steel support arms that are anchored to the tank wall at approximately PI spacing or spacing as per manufacture requirements, with removable aluminum panels that hook into the support arms. The arm and cover sections shall be designed to cover the launder trough, weir and come within 1" ± of the baffle within the clarifier. The covers shall be designed and manufactured to reduce/inhibit incident sunlight from striking the surface of the launder and weir. The cover is to extend over the trough and weir and within 1" ± of the baffle such that the cover does not interfere with the skimmer arm operation.

B. The covers are to be supported in such a manner that the panels are held securely in place; the panels are to be hinged to provide access to the launder and weir for inspection and maintenance. The cover or support arms shall not interfere with the effluent flow over the weir or within the trough. Cover supports that cantilever from the tank wall without a vertical support to the weir wall are unacceptable.

C. The cover system shall be designed to withstand code required wind and snow loads, in addition the cover shall be designed for a personnel load of 250 lbs. The covers even though designed for personnel loading are not intended to be walked on.

2.03 TYPE

A. Launder covers for secondary clarifiers shall have hinged non-walkable flat aluminum covers, Covers over the outboard launder are to open toward the center of the clarifier.

2.04 PERFORMANCE/DESIGN CRITERIA

A. Environmental Conditions
   1. Launder covers will be installed outdoors and shall be designed for a maximum temperature of 110 deg F and minimum temperature of -15 deg F.
   2. Launder covers shall be designed to resist the following structural loads:
      a. Snow Loads

Parameter	Value
Code:	IBC 2021 & ASCE 7-16
Risk Category:	III
Ground Snow Load (p_g):	30 psf
Exposure Factor (C_e):	C
Thermal Factor (C_t):	1.2
Importance Factor (I_s):	1.1
Flat Roof Snow Load (p_f):	27.7 psf
Drifting:	Per ASCE 7

      b. Wind Loads

Parameter	Value
Code:	IBC 2021 & ASCE 7-16
Risk Category:	III

Basic Wind Speed (Ultimate, 3-second gust) for Risk Category Shown Above:	109 mph
Exposure:	C
Topographic Factor (K_{zt})	1.0

c. Seismic Loads

Parameter	Value
Code:	IBC 2021 & ASCE 7-16
Risk Category:	III
0.2 Sec. Mapped Spectral Response, S_S:	1.29 g
1.0 Sec. Mapped Spectral Response, S_1:	0.53 g
Site Class:	E
0.2 Sec. Design Spectral Response, S_{DS}:	1.03 g
1.0 Sec. Design Spectral Response, S_{D1}:	0.76 g
Importance Factor (I_e):	1.5 (Intentionally higher than code minimum)
Component Importance Factor (I_p):	1.0, except I_p=1.5 for components identified in Section 13.1.3 of ASCE 7
Seismic Design Category	D

Notes:

1. *Calculate seismic loads on the basis of governing building code. Include equipment operating loads in structure dead load.*
2. *Check individual members for seismic and full member live load acting simultaneously, except that flooded equipment loads (infrequent occurrence) need not be combined with seismic loads. Combine equipment operating loads with seismic loads.*

2.05 MATERIALS

A. Cover support arms, prop rod, wall bracket, anchors, and all assembly fasteners to be 304 or 304L stainless steel.

B. Launder covers shall be made from 5052 alloy aluminum.

2.06 CONFIGURATION, COMPONENTS, FEATURES

A. Launder covers shall have the following configuration:
   1. Launder covers shall block sunlight from the surfaces of the launder and weir.
   2. Covers shall not impede personnel from entering or traversing the launder.
   3. Provide a cover system where adjacent panels are level and fit together properly. Ensure that the seams between panels are covered.
   4. Provide design that allows alternate panels to open independent of every other panel.
   5. Provide a hook to facilitate the opening of the launder covers that will be installed directly under walkways.
   6. Provide covers that allow for easy opening by the operators for inspection and maintenance.
   7. Provide mounting brackets that allow the launder covers to be fully supported over the launder. When the cover is closed, it shall rest on a support mounted to the

launder. No loads from the launder cover shall be transferred to the mechanical components of the clarifier.

8. Provide capability to lock the covers with a locking pin latch when in the closed position.
9. Provide tool to unlock and open covers from the clarifier walkway.
10. Provide a resting structure with locking mechanism to limit the travel of the cover.
11. Covers in opened or closed position and cover support system shall not impede travel of rotating clarifier scum collection arm.
12. The cover system must remain continuous around the entire tank.
13. Design with provisions for the expansion of aluminum without warping and buckling.
14. Cover systems supported by brackets that cantilever from the one launder wall without additional support at the other launder or clarifier wall are not acceptable.
15. Attachment design shall be based around the structural members and field verified by the Contractor.
16. Mounting brackets shall be provided with sufficient flexibility at the launder to permit adjustment for leveling and optimum fit. Slotted bolting holes shall be provided in the mounting brackets installed in the secondary clarifiers to allow +/- 2-inch vertical adjustment and leveling.

PART 3 EXECUTION

3.01 EXAMINATION

A. Contractor shall field verify existing conditions.
   1. Confirm critical elevations and dimensions required by the manufacturer for fabrication of launder covers.
   2. Field verification shall take place prior to shop drawing submittal preparation.

3.02 PREPARATION

A. Coordination
   1. Refer to Section 01 12 16 Work Sequence for construction sequencing requirements.
   2. Refer to Section 01 11 00 Summary of Work for dewatering requirements.

3.03 INSTALLATION

A. Align, connect, and install launder covers in accordance with the Manufacturer's written instructions.

B. Field cut panels to accommodate in-tank obstructions. Sand and coat all field cut or drilled edges per the manufacturer's recommendations.

C. Manufacturer to supply all of the fasteners required for installation. Install covers around entirety of the clarifier.

D. Provide a post-installation survey of launder cover mounting brackets installed on launder walls in Secondary Clarifier 3, verifying the brackets are level and documenting adjustments made.

E. The cover support arms shall be anchored to the tank wall with a support resting on the weir wall, used for leveling of the support arm. The tank wall closure piece is placed between the support arms to act as rest for the cover and block sunlight.

F. The cover then clips into the support arm and rotates towards the tank wall, the prop rod then locks into the wall bracket.

G. The installation contractor shall install the cover in accordance with the contract drawings, manufacturing drawings and manufacturer's recommendations.

3.04 TESTING

A. Installation contractor to demonstrate to the Owner and Engineer the following:
   1. Panels operate as designed and are free from binding
   2. Verify that the panels are set such that all open position lock features function as intended
   3. Verify that there are no interfearances with and not limited to the water surface, weirs, baffles, scum collection system

3.05 FIELD QUALITY CONTROL

A. Corrective Actions: Replace or repair work to eliminate defects, deficiencies, and irregularities.

END OF SECTION

THIS PAGE INTENTIONALLY LEFT BLANK

ATTACHMENT C