MOUNT PLEASANT CITY
LAGOON IMPROVEMENTS PROJECT

ADDENDUM NO. 1
September 26, 2025

To All Plan Holders:

You are hereby notified that the following changes, clarifications, and/or corrections have been made to the Drawings, Specifications, or Contract Documents for the above referenced project.

The bid opening date, location, and time are NOT changed by this addendum.

- The last day for questions is end of day, Friday October 3.
- Bids Due: Thursday October 9, 2025 @ 2:00 PM at Mt Pleasant City Hall.

ADDENDUM NO. 1 consists of the following:

1. **Questions**
   a. What is the estimated project cost?
      i. The Engineer's Opinion of Probable Cost is $2.5 Million.
   b. Is BABA required?
      i. Buy America Build America (BABA) compliance is not required for this project. However, American Iron and Steel (AIS) compliance is required.
   c. Is DBE required?
      i. Disadvantaged Business Enterprise (DBE) is not required for this project.
   d. What Liner Installation companies are allowed?
      i. Specification section 31 05 19.16 outlines requirements necessary (see item 1.7 Qualifications). Requirements must be met by the installer if not listed as an "Engineer Approves Equal".
   e. Cost of permits 01 52 00 Construction Facilities
      i. Fees are waived for permits with SanPete County and Mt Pleasant City.
   f. Site Security required?
      i. Contractor shall provide a padlock for gate access. Gate must be locked when contractor is not on site.
   g. Is flow required in the channel during construction?
      i. Yes. Contractor shall allow flows through the existing channel during construction or provide bypass pumping.
   h. Where is the Gate schedule referenced in 40 05 59?
      i. No Gate schedule will be provided. See revisions to Section 40 05 59 below. Only one slide gate with an operator is included in the project on sheet D-302.

i. Bid Schedule C, what are Crews "B-10C" and "B-10A"?
    i. Crews have been clarified in the measurement and payment, see revisions below.

j. Are you planning on switching the A3 Cushion Layer, 6" Sand to be 12 once Fabric? I think the fabric will be faster and less expensive.
    i. The cushion layer has been swapped following discussions at the Prebid meeting, see changes to the bid form and measurement and payment listed below.

k. How do you want to handle the compaction testing (if required) for Bid Item C2? Do we need to incorporate this in the Hourly Rate?
    i. Yes, compaction testing should be included in bid item C2.

2. Changes to contract document

a. C410 Bid Form
    i. Changes to Bid form A and C to include the Geotextile Fabric in the base bid and the 6" sand cushion layer as a bid alternate.
    ii. Added crew information for bid items C1 and C2.

3. Changes to specifications

a. Section 01 12 16 Work Sequence
    i. Added requirements for continuous flow measurement during construction.
    ii. Removed maximum down time for Biolynseus Dosing System. Pump may be down for entirety of construction period.
    iii. Removed contractor responsibility for maintaining cell 3 empty.
    iv. Added installation window for Geomembrane Installation.

b. Section 01 22 00 Measurement and Payment
    i. Remove and replace bid items A3 and C3 in their entirety.
    ii. Added crew information for bid items C1 and C2.

c. Section 31 05 19.16 Geomembrane Liner
    i. Updated Representative for Colorado Lining International
    ii. Added H2J Liners as an Engineer Approved Equal.
    iii. Added 45 mil LLDPE-R as an accepted geomembrane liner material.

d. Section 40 05 59 Stainless Steel Slide Gates and Weir Gates
    i. Removed references to a Gate Schedule.

e. Section 46 21 00 Screening Equipment
    i. Table 1-3: Update the maximum allowable cleaning time from 6 seconds to **60 seconds**.

4. Changes to the drawings

a. Sheet G-006

i. The elevation of the bottom of the channel, the incoming pipe invert, and the outgoing pipe inverts are incorrect in sheet G-006. Refer to sheet D-301 for correct elevations.

ii. The Water Surface Elevations before the new screen is updated to 5776.52' and after the new screen is updated to 5776.02'.

b. Sheet C-101

i. Added thickness and reinforcement for concrete apron and sidewalk.

c. Sheet C-501

i. Added reinforcement for inlet and outlet structures.

d. Sheet C-502

i. Added note on the use of noncontinuous ballast tubing.

e. Sheet E-002

i. Updated Power Conduit Schedule. Tag P002 now includes wiring and reduced conduit size. Tag P100 now includes GND conductor for meter grounding. Added missing tag P301.

ii. Updated Control Conduit Schedule to include missing tag C003.

f. Sheet E-100

i. Added the Utility transformer and associated connections to the Site Plan.

ii. Connection between meter and Utility transformer moved to Site Plan from Power Plan.

iii. Added note about conduit burial requirements.

iv. Updated note about the conduit, conductors, transformer, and pad scope.

v. Removed existing service conduit routing. Now shown as homerun from the Utility transformer.

g. Sheet E-110

i. Moved the connection between meter and Utility transformer to the Site Plan.

h. Sheet E-111

i. Added controls wiring between the screen and controller.

i. Sheet E-601

i. Updated short circuit current values due to the Utility transformer moving closer to the building.

5. Attachments

a. Prebid Meeting Minutes

b. Prebid Meeting Attendance Sheet

c. C410 Bid Form

d. 01 12 16 Work Sequence

e. 01 22 00 Measurement and Payment

f. 31 05 19.16 Geomembrane Liner
g. 40 05 59 Stainless Steel Slide Gates and Weir Gates
h. Updated Sheets
    i. C-101
    ii. C-501
    iii. C-502
    iv. E-002
    v. E-100
    vi. E-110
    vii. E-111
    viii. E-601

This ADDENDUM #1 shall become a part of the Contract and all provisions of the Contract shall apply thereto. BIDDERS shall acknowledge receipt of this ADDENDUM in the space provided in the BID FORM.

Sincerely,

J-U-B ENGINEERS, INC.

Gary Vance

Gary Vance, P.E.
Project Engineer

Prebid Meeting Agenda

MT PLEASANT CITY

Subject: Lagoon Improvements Project– Prebid Meeting Agenda

DATE AND TIME:	09/23/25 at 2:00 pm (MST)
LOCATION:	Mt Pleasant City Hall

ATTENDEES/TEAM:

ENGINEER: J-U-B

☒ Gary Vance, Project Manager
☒ Braxton Porter, Design Engineer
☐ Archana Dahal, Design Engineer

Heath Engineering, Inc.

☐ Bob Hillyer, Electrical Engineer
☐ Karson Halverson, HVAC Engineer

OWNER: Mt Pleasant City

☒ Michael Olsen, Mayor
☐ Dave Oxman, Finance Director
☒ Colter Allen, Public Works Director

Note: During the pre-bid walk-through meeting, all conversations are considered informal and are not contractually binding unless stated in the contract manual, drawings, or modified by a written addendum.

PROJECT DESCRIPTION

The Mt Pleasant Lagoon Improvements Project (Hereafter referred to as "Project") consists of lining lagoon 3 and construction of a new headworks building, including installation of a mechanical screen, HVAC and plumbing, electrical, instrumentation, site work, yard piping, septage receiving station, and all other equipment and infrastructure needed to make the new facilities complete and operational. Project is in Sanpete County, Utah.

BIDDING AND CONTRACT CONSIDERATIONS

1. Plan accessed through QuestCDN document **#9873471**
2. All questions to Engineer in writing, final day for questions.
    i. Gary Vance
    ii. gvance@jub.com
    iii. 801-750-4771
    b. Responses posted as an Addendum
    c. Email notification to planholders
    d. Has anyone had any issues downloading the Contract Documents?
        i. QuestCDN was down earlier this week. Reach out if you have any issues going forward.
3. Bid Form – Lump Sum Bids

4. Bids due: **Mount Pleasant City Hall 115 W Main St**. Bids will be publicly opened and evaluated. Bids being delivered by mail or more than an hour before the opening should be left with City staff at 106 W Main St.

SCHEDULE

Item	Date
Bid Advertisement	Tuesday, September 9, 2025
Prebid	Tuesday, September 23, 2pm
Last day for Questions	Friday, October 3, 2025
Bids Due	Thursday, October 9, 2025, 2pm
Substantial Completion	TBD. Estimated October 9, 2026
Final Completion	TBD. Estimated November 9, 2026

BID FORM

1. Schedule A – Base Bid
2. Schedule B – Manufacturers and Suppliers of Major Equipment and Material Items
    a. Add/deduct for alternative screening manuf. The cost for Lakeside is to be included in the base bid.
3. Schedule C – Additive Alternatives
    a. Lagoon 3 subgrade preparation
    b. Lagoon 3 geotextile cushion layer add/deduct
4. Lowest Bidder will be selected using Base Bid Only

DISCUSSION ITEMS

1. Interested Parties
    a. Mt Pleasant City
    b. Division of Water Quality - Funding
2. DWQ Funding
    a. Bidding Requirements
        i. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion -- Lower Tier Covered Transactions
        ii. Certification of Non-Segregated Facilities
    b. Davis-Bacon Wages
        i. Updated wage rates will be posted 10 days prior to bidding
    c. American Iron and Steel (AIS)
3. Standard EJCDC Contract Documents – Bid security, performance and payment bonds, insurance, etc.
4. Liquidated damages
    a. Substantial Completion: $500/day

   b. Final Completion: $500/day
5. Site access – Coordinate gate access with City
   a. Contractor shall provide their own lock at the gate.
6. Work hours
   a. Coordinate with City
   b. Mon-Fri 7am-5:30pm
7. Temporary Power and Water
   a. Power – City to provide.
   b. Water – Can use nearby hydrant at no cost, coordinate with City for meter.
8. Permits
   a. Construction Permit – DWQ; Completed
   b. Mt Pleasant City – Fee waived
   c. SanPete County – Fee Waived. City will notify County of the project.
9. Submittals
   a. See Section 01 33 00
   b. Proposed Product List 15 days after NTP
   c. Anticipated construction schedule before preconstruction meeting
10. Utilities
   a. Water – City to provide 1" service line up to fence, coordinate with City on handoff location. Exact location TBD, but should be within a few feet of what is shown in the plans.
   b. Power – City to bring 3 phase power to headworks building transformer (primary line). Contractor is responsible for the secondary side and pad for the transformer, City Power Department will provide the transformer at no cost to the contractor.
   c. Sewer lines – Contractor to verify tie-ins for septage receiving
11. Construction Staging/Stock piling – See plans
12. Geotechnical Report
   a. Included in documents
   b. Dewatering not anticipated, water expected to be 20-ft below grade at headworks building.
13. Inspections
   a. County inspections are to be done Monday-Thursday.
   b. Contractor is responsible for third party inspections.
14. Materials Testing – Contractor responsible, see Section 01 40 00.
15. Warranty – Failure of the constructed product before the end of the warranty period is the responsibility of the Contractor.
16. Safety – The Contractor is responsible for safety on the project as directed by federal, state and local governments.
17. Work Sequencing
18. SCADA Integrator

a. Contractor is responsible for the contract with SCADA Integrator, Dorsett. City will get a quote for the project that will be provided via addendum prior to bid opening.

19. Geomembrane Liner
    a. Installation window
        i. Cell 3 will need to remain empty if installed in the spring. Flows will need to be pumped to well 4, coordinate with the City.
    b. Subgrade preparation
        i. City to clear and grub and compact to 90%. Coordinate with City if bid alternate is needed.
    c. Cushion Layer
        i. Base bid is currently 6" Sand layer. However, City reserves right to use Add/Deduct for 12 oz. Geotextile.
        ii. Addendum 1 will reverse the order, making the 12 oz. Geotextile base bid and 6" sand layer as an add/deduct alternate.
    d. Geomembrane
        i. Currently 60 Mil HDPE is allowed, addendum #1 will address the use of rLLDPE.
    e. Ballast Tubing
        i. Addendum #1 to clarify spacing of non-continuous ballast tubing.
    f. Liner Installers
        i. Preapproved list or meet requirements, see spec
            1. Northwest Linings
            2. Industrial and Environmental Covers
            3. Colorado Linings
20. Headworks
    a. Protect in place:
        i. Dosing system
        ii. Channel and grating
        iii. Level Sensor
    b. NFPA 820 Area classification
        i. Required seal-offs
    c. Conduit for influent screen to be addressed in Addendum #1.
    d. During construction the influent flow meter must remain online. The dosing system may be taken offline.

PRE-BID MEETING

NAME	REPRESENTING	OFFICE PHONE	CELL PHONE	EMAIL
MATT MCCOY	RAIN FOR RENT	801-797-4204	801-797-4204	MMCCoy@rainforrent.com
Tyler Clifford	Wasatch West	801-820-5320	801-647-3121	Tyler.C@wasatchwestLLC.com
Kyle MacArthur	COP Construction		406-600-2167 Braydon Karnstedt	utbid@copconstruction.com
Brock Petersen	Sage Const. ~~435-2~~		435-224-1843	brock@sageconstructiongroup.com
Allison Wilcox	JCI 435-	462-2815	—	jci@cut.net
Colby Mellor	Condie Construction	801-489-3070	435-851-1902	cmellor@condieconstruction.com
Scott Batterson	Terry R. Batterson EXC	4354625380	435469-0167	Jade.trb exc@gmail.com Scott.trb exc@gmail.com
LEE REDD	NELSON BROS CONST CO	801-487-5401 EXT 107	801.244.5205	lredd@nelsonbros.com
David Lancaster	Van Con	385-224-6738	385-224-6738	bid@wedigutah.com

BID FORM FOR CONSTRUCTION CONTRACT

ADDENDUM 1

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

ARTICLE 1—OWNER AND BIDDER

1.01 This Bid is submitted to:

Mount Pleasant City Hall

115 W Main Street

Mount Pleasant, Utah, 84647

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

ARTICLE 2—ATTACHMENTS TO THIS BID

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

A. Required Bid security;

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

C. Contractor's license number as evidence of Bidder's State Contractor's License or a covenant by Bidder to obtain said license within the time for acceptance of Bids;

D. Required Bidder Qualification Statement with supporting data; and

ARTICLE 3—BASIS OF BID—LUMP SUM BID AND UNIT PRICES

3.01 *Base Bid*

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

ARTICLE 1—SCHEDULE A – BASE BID

Item No.	Item Description	Estimated Quantity	Unit	Unit Price	Total Price
A1	Mobilization, PM, OH&P	1	LS	$	$
A2	Lagoon 3 Geomembrane Liner	1	LS	$	$

A3	Lagoon 3 Cushion Layer, 12 oz. Geotextile	1	LS	$	$
A4	Septage Receiving Station and Tank	1	LS	$	$
A5	Headworks Building	1	LS	$	$
TOTAL OF SCHEDULE A (BASE BID)					

B. Bidder acknowledges that:

1. each Bid Unit Price includes an amount considered by Bidder to be adequate to cover Contractor's overhead and profit for each separately identified item, and

2. estimated quantities are not guaranteed, and are solely for the purpose of comparison of Bids, and final payment for all Unit Price Work will be based on actual quantities, determined as provided in the Contract Documents.

3.02 *Major Equipment Items Alternates*

Certain items of major equipment to be provided under this Contract are tabulated in the Schedule of Manufacturers and Suppliers of Major Equipment and Material Items. In connection with the tabulation of major items of equipment included in the lump sum base bid, the following shall apply:

A. The lump sum bid shall include the installed prices from those manufacturers listed by the Owner as "Base Bid."

B. Bidder may include prices for listed alternate manufacturers or add additional manufacturers with corresponding prices, but only the manufacturers listed by the Owner as "Base Bid" will be considered in determining the low bid. Listing of alternate equipment is optional and will not result in submitting a non-responsible bid if none is entered.

C. The Owner may select the Base Bid equipment or items of equipment of any alternate manufacturer listed, at Owner's discretion.

D. After the Date of Agreement and prior to the selection of the major equipment items, the Contractor, if requested by the Engineer, shall provide information in sufficient detail to allow the Owner and the Engineer to determine whether or not the proposed alternate equipment is equivalent to that specified. The selection of any alternate equipment by the Owner does not relieve the Contractor of his/her responsibility to meet the requirements of the Contract Documents and Specifications.

E. Items of equipment selected by the Owner shall be installed at a contract price equal to the Base Bid lump sum adjusted by the add or deduct shown for the items selected by the Owner if different from the Base Bid items. The Owner will select major equipment items within thirty (30) days after the date of the Notice to Proceed, provided Contractor has provided sufficient information to Owner/Engineer as noted above.

F. The Bidder understands that equipment of a proposed alternate manufacturer must meet or exceed the requirements of the Contract Documents and Specifications, be of equal or better quality, and be of equal function to the base bid equipment.

G. The price add/deduct for all items of equipment other than base bid items shall include the preparation and submission to the Owner of complete submittals, including detailed drawings showing all modifications, if any, necessary to accommodate such equipment.

H. The price add/deduct for all items of equipment other than base bid items shall cover a complete operating installation, including any and all buildings, mechanical and electrical work, controls and accessories necessary to accommodate the selected equipment. Upon request, contractor shall provide work breakdown of additional items.

I. The Bidder further understands that the Engineer will review said detailed Drawings or modifications and either approve them or indicate thereon changes necessary to comply with the project requirements in accordance with Article 6.05 of the General Conditions. Detailed drawings which are not approved will be revised and then resubmitted to the Engineer. The deduct and add amounts listed are "installed" prices and take into consideration and include any cost of the design or construction changes that may be required as a result of using the alternate equipment. Unless listed separately, the amount listed shall apply to the additive items also if they are awarded by the Owner.

SCHEDULE B - MANUFACTURERS & SUPPLIERS OF MAJOR EQUIPMENT & MATERIAL ITEMS

Item No.	Item Description		Amount
B1	Section 46 21 00 Screening Equipment		
	a. Lakeside		Included in Base Bid #A4
	b. _____ (Manufacturer)	Add/Deduct from Base Bid	
TOTAL OF SCHEDULE B			

Note: The Bidder shall circle the word "Add" or "Deduct" to indicate that the amount for the Alternate Equipment or Material is to be added to or deducted from the Base Bid Lump Sum. This Schedule may be photocopied and attached to the Proposal if additional space for alternates is required.

3.03 *Additive Alternatives*

A. Bidder will complete the Work in accordance with the Contract Documents for the following price(s), see Section 01 22 00 Measurement and Payment for additional information.

B. Unit Price Labor or Lump Sum, as designated below.

SCHEDULE C – ADDITIVE ALTERNATIVES

Item No.	Item Description	Estimated Quantity	Unit	Unit Price	Total Price
C1	Lagoon 3 clear and grub	80	HR	$	$
C2	Lagoon 3 Subgrade Compaction	40	HR	$	$
C3	Lagoon 3 Cushion Layer, 6" Sand layer	1	LS	$	$
TOTAL OF SCHEDULE C					$

ARTICLE 4—TIME OF COMPLETION

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

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

ARTICLE 5—BIDDER'S ACKNOWLEDGEMENTS: ACCEPTANCE PERIOD, INSTRUCTIONS, AND RECEIPT OF ADDENDA

5.01 *Bid Acceptance Period*

A. This Bid will remain subject to acceptance for 60 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

5.02 *Instructions to Bidders*

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

5.03 *Receipt of Addenda*

A. Bidder hereby acknowledges receipt of the following Addenda:

Addendum Number	Addendum Date

ARTICLE 6—BIDDER'S REPRESENTATIONS AND CERTIFICATIONS

6.01 *Bidder's Representations*

A. In submitting this Bid, Bidder represents the following:

1. Bidder has examined and carefully studied the Bidding Documents, including Addenda.
2. Bidder has visited the Site, conducted a thorough visual examination of the Site and adjacent areas, and become familiar with the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
3. Bidder is familiar with all Laws and Regulations that may affect cost, progress, and performance of the Work.
4. Bidder has carefully studied the reports of explorations and tests of subsurface conditions at or adjacent to the Site and the drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, with respect to the Technical Data in such reports and drawings.
5. Bidder has carefully studied the reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, with respect to Technical Data in such reports and drawings.

6. Bidder has considered the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Technical Data identified in the Supplementary Conditions or by definition, with respect to the effect of such information, observations, and Technical Data on (a) the cost, progress, and performance of the Work; (b) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, if selected as Contractor; and (c) Bidder's (Contractor's) safety precautions and programs.

7. Based on the information and observations referred to in the preceding paragraph, Bidder agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.

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

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

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

11. The submission of this Bid constitutes an incontrovertible representation by Bidder that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

6.02 *Bidder's Certifications*

A. The Bidder certifies the following:

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

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

3. Bidder has not solicited or induced any individual or entity to refrain from bidding.

4. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 8.02.A:

a. Corrupt practice means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process.

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

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

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

BIDDER hereby submits this Bid as set forth above:

Bidder:

_____

(typed or printed name of organization)

By: _____

(individual's signature)

Name: _____

(typed or printed)

Title: _____

(typed or printed)

Date: _____

(typed or printed)

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

Attest: _____

(individual's signature)

Name: _____

(typed or printed)

Title: _____

(typed or printed)

Date: _____

(typed or printed)

Address for giving notices:

_____

_____

Bidder's Contact:

Name: _____

(typed or printed)

Title: _____

(typed or printed)

Phone: _____

Email: _____

Address:

_____

_____

_____

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

SECTION 01 12 16
WORK SEQUENCE
Addendum 1

PART 1. GENERAL

1.1 SUMMARY

A. Section Includes:

1. Existing Conditions
2. Major Work Elements
3. Submittals
4. Work Sequence

B. Related Sections:

1. Section 01 22 00 Measurement and Payment
2. Section 01 23 00 Schedule of Values

1.2 EXISTING LAGOON INFRASTRUCTURE

A. The headworks facility receives raw sewage from the collection system before it enters the lagoons. The existing headworks facility has no building to protect the channel, no screening equipment, and has failing chemical dosing pumps. These issues have resulted in reduced performance while increasing O&M requirements. The existing headworks is made up with a series of unit processes:

1. Influent Flow Measurement
2. Dosing pump

B. The Total Containment Lagoons receive influent from the headworks facility. The lagoon consists of a total of 4 cells, with 2 currently in use. Cells 3 and 4 have remained empty and dry, resulting in cracking of the clay liner. Increasing wastewater flows not require the use of cell 3, which has a liner unsuitable to contain sewage.

1.3 OPERATING PERMIT CONDITIONS

A. The lagoons are a total containment system and must meet:

1. The Owner's Operating Permit (#UTOP00128). Compliance with the operating Permit shall be maintained at all times during construction. A copy of the permit

may be obtained at: https://deq.utah.gov/water-quality/wastewater-treatment-facilities-operating-permits

B. Owner will notify Contractor immediately if permit is violated.

C. If Contractor's actions result in a violation of the Operating Permit or an imminent violation as determined by Owner and/or Engineer, Contractor shall mitigate any damages, suspend certain aspects of work if deemed necessary by Owner and Engineer, and fully cooperate with Owner and Engineer to bring facility into compliance with Operating Permit at no cost to Owner.

D. Penalties and any and all related costs, including but not limited to legal and engineering expenses, imposed on or incurred by Owner as a result of any bypass or operating permit violation caused by the actions or inactions of the Contractor, its employees, subcontractors or agents, are to be borne in full by the Contractor.

E. Bypassing untreated or partially treated wastewater to surface waters is prohibited.

1.4 MAJOR WORK ELEMENTS

A. The new headworks building will include the following processes:

1. Influent Screen

   a. An automatic mechanical influent screen will be installed in the existing channel.

   b. Contractor shall maintain sewer flow entering the lagoons during construction. The incoming flow would need to bypass the existing channel during screen installation.

2. Influent flow measurement

   a. Existing flume and related instrumentations, used for flow measurement, shall be protected during construction.

   b. Flow meter shall remain in operation during construction. Contactor is responsible for providing power and an enclosure for the flow measurement instrumentation. SCADA is not required for the operation of the flow meter.

   c. Contractor shall provide flow measurements of the influent channel if bypass pumping for longer than 2 weeks.

3. Biolynceus dosing system

a. The existing dosing pump will be replaced. The biolyneceus drums and the new pump shall be moved to a new location inside, as shown in the plans.

i. Long term outage of the biolynceus dosing system ~~for up to 6 months is allowed~~ during construction of the new headworks building.

B. Septage receiving station will include the following:

1. Concrete dump pad and septage storage tank per plans.

2. Connection to main influent line shall not interrupt flows to the influent channel. Design includes the use of a doghouse manhole to install the connection with minimal impacts. Bypass pumping is not anticipated, the contractor is responsible for any needed bypass pumping at no cost to the owner.

C. Lagoon Cell 3 improvements will include the following:

1. Modifications to inlet and outlet structures for HDPE liner integration.

2. Installation of a ~~60 mil thickness HDPE~~ Geomembrane Liner. This includes subgrade preparation to be done by owner, any deficiencies will be addressed by the contractor. Contactor shall coordinate with owner the date subgrade preparation is finished by owner.

~~3. Contractor shall coordinate with owner to keep cell 3 empty for the duration of the modifications.~~

4. Geomembrane installation shall occur during June 1st to October 31st 2026. Owner shall be responsible for maintaining lagoon cell 3 empty until liner installation.

1.5 SUBMITTALS

A. Provide detailed outage and time schedule plan for each work item that may impact plant operation. Provide long-range and short-range plans, as appropriate for coordinating work with Owner.

B. Submit in accordance with Section 01 33 00.

PART 2. PRODUCTS – NOT USED

PART 3. EXECUTION – NOT USED

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SECTION 01 22 00
MEASUREMENT AND PAYMENT
Addendum 1

PART 1. GENERAL

1.1 SUMMARY

A. Section Includes:

1. Authority
2. Payment
3. Defect Assessment
4. Non-Payment for Rejected Products
5. General Description of Measurement and Payment
6. Alternates
7. Schedule of Bid Items

B. Related Sections

1. Section 00 41 00 Bid Form
2. Section 00 70 00 General Conditions
3. Section 01 11 00 Summary of Work

1.2 AUTHORITY

A. See EJCDC C-700 General Conditions 10.07 and 10.08

1.3 PAYMENT

A. See EJCDC C-700 General Conditions 15.01

1.4 DEFECT ASSESSMENT

A. EJCDC C-700 General Conditions 10.04 – Rejecting Defective Work

1. See EJCDC C-700 General Conditions and Article 14

B. The authority of the Engineer to assess the defect and identify payment adjustment is final.

1.5 NON-PAYMENT FOR REJECTED PRODUCTS

A. Payment will not be made for any of the following:

1. Products wasted or disposed of in a manner that is not acceptable.

2. Products determined as unacceptable before or after placement.

3. Products not completely unloaded from the transporting vehicle.

4. Products placed beyond the lines and levels of the required Work.

5. Products remaining on hand after completion of the Work.

6. Loading, hauling and disposing of rejected Products.

7. Removing rejected materials and/or work and replacing with materials and/or work in compliance with these specifications.

1.6 GENERAL DESCRIPTION OF MEASUREMENT AND PAYMENT

A. Measurement and Payment for the bid items listed in Base Bid shall be on the basis of the description in the Technical Specifications and Drawings. Unless the work to be done is so specifically called out to be measured and paid for in Base Form, payment for such work shall be included in other applicable items, and there shall be no separate measurement and payment for the work.

B. Items listed in EJCDC C-410 – Bid Form as lump sum (L.S.) shall include all work for the complete installation as generally described in the Drawings and the Technical Specifications.

C. Payment shall be made at the contract bid price listed in the Bid Form. Progress payments based on Schedule of Values, reference Section 01 23 00.

D. Partial payment for unit price bid items and lump sum bid items only partially completed at the end of monthly pay periods shall be made based upon the Engineers interpretation of the percentage of work completed. Partial payment for materials delivered and stored will be considered, if said materials have been submitted to the Engineer for review per Section 01 33 00 – Submittal Procedures and supporting invoices and documentation have been provided.

E. Quantities indicated in the Bid Form are for bidding and contract purposes only, unless specified otherwise in the Technical Specifications.

F. If the actual work requires more or fewer quantities than those quantities indicated in the Bid Form, the Contractor shall provide the required quantities.

G. Payment Includes: Full compensation for all required labor, products, tools, equipment, materials, transportation, services and incidentals, erection, application or installation of an item of the Work, including mobilization, demobilization, supervision, overhead and profit.

H. Final payment for Work governed by unit prices will be made on the basis of the actual measurements and quantities accepted by the Engineer multiplied by the unit price for work which is incorporated in or made necessary by the Work unless specified otherwise.

1.7 ALTERNATES

A. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at Owner's option. Accepted Alternates will be identified in Owner-Contractor Agreement.

B. Coordinate related work and modify surrounding work.

1.8 SCHEDULE OF BID ITEMS

A. Schedule A: BASE BID

1. Item A1: Mobilization, PM, OH&P

   a. Basis of Measurement: Lump Sum

   b. Basis of Payment: Unless otherwise itemized separately in the Unit Price Schedule, Payment will be made at the contract lump sum price based on agreed upon Schedule of Values submitted by the Contractor. Included in this item are all costs relating to mobilization, demobilization, permitting, project management, environmental compliance, quality control, inspections, testing, submittals, contractor overhead and profit, and other construction management related activities and shall include coordination with the Owner, vendors, and other Contractors noted in the Contract Documents; progress meetings, and project administration.

2. Item A2: Lagoon 3 Liner Support

   a. Basis of Measurement: Lump Sum

   b. Basis of Payment: Unless otherwise itemized separately in the Unit Price Schedule, Payment will be made at the contract lump sum price based on agreed upon Schedule of Values submitted by the Contractor. Included in this item are all costs relating to equipment and operator for staging and storing the liner, excavating a trench for liner installation, removing and replacing the inlet pad, installing the outlet pad, liner installation, and any other support needed to install the liner. This item excludes subgrade preparation and work included in C1, C2, C3, and C4.

3. Item A3: Lagoon 3 Cushion Layer, 12 oz. Geotextile

   a. Basis of Measurement: Lump Sum

   b. Basis of Payment: Unless otherwise itemized separately in the Unit Price Schedule, Payment will be made at the contract lump sum price based on agreed upon Schedule of Values submitted by the Contractor. Included in this item are all costs to furnish and install a 12 oz. geotextile fabric layer as a cushion layer for the Geomembrane

liner. After bid award, Owner reserves the right to replace item A3 with item C3 in its entirety to reduce project costs.

4. Item A4: Septage Receiving Station and Tank

    a. Basis of Measurement: Lump Sum

    b. Basis of Payment: Unless otherwise itemized separately in the Unit Price Schedule, Payment will be made at the contract lump sum price based on agreed upon Schedule of Values submitted by the Contractor. Included in this item are all costs relating to the furnishing and installation of the septage receiving pad, precast holding tank, doghouse manhole on the main sewer line, and all other items necessary for a complete and functional septage receiving station.

5. Item A5: Headworks Building and Equipment

    a. Basis of Measurement: Lump Sum

    b. Basis of Payment: Unless otherwise itemized separately in the Unit Price Schedule, Payment will be made at the contract lump sum price based on agreed upon Schedule of Values submitted by the Contractor. Included in this item are all costs to manufacture, construct, deliver, install, etc. all components of the headworks building and equipment depicted in volumes I-III and shall include building excavation, subgrade preparation, compliance with geotechnical engineering report, building foundation, floors, walls, roof systems, metals, finishes, coatings, thermal and moisture protections, piping, valves, fixtures, mechanical HVAC/plumbing/odor control piping, mechanical equipment, furnishings, and all building related architectural, structural, mechanical equipment, and process components including coordination with the Owner, vendors, and other Contractors noted in the Contract Documents; and all other items of expense for a complete and functional headworks building per the Contract Documents. All other items not specifically mentioned within previous categories but required for a complete and fully functional headworks facility to be included in this item, including project startup, commissioning, compliance, training, and testing. Excluded in this item are electrical, controls, and instrumentation. See item B1.

B. Schedule B: MANUFACTURERS & SUPPLIERS OF MAJOR EQUIPMENT & MATERIAL ITEMS

1. Item B1: Screening Equipment

    a. Basis of Measurement: Lump Sum

    b. Basis of Payment: Unless otherwise itemized separately in the Unit Price Schedule, Payment will be made at the contract lump sum price based on agreed upon Schedule of Values submitted by the Contractor. The deduct and add amounts listed are “installed” prices and take into consideration and include any cost of the design or construction changes that may be required as a result of using the alternate equipment, in addition to the cost of furnishing the alternate equipment.

C. Schedule C: ADDITIVE ALTERNATIVES

1. Item C1: Lagoon 3 Clear and Grub

   a. Basis of Measurement: Standard Union Crew Daily Hours

      i. Crew Type: D6 Dozer with operator and foreman, daily hours

   b. Basis of Payment: Unless otherwise itemized separately in the Unit Price Schedule, Payment will be made at the unit price based on agreed upon Schedule of Values submitted by the Contractor. City staff will clear and grub to the best of their ability. Contractor shall perform additional clearing and grubbing at an hourly rate as required by the liner supplier to address any deficiencies prior to liner installation. Included in this item are all costs to clear and grub Lagoon cell 3 for preparation of the geomembrane liner including equipment and labor.

2. Item C2: Lagon 3 Subgrade Compaction

   a. Basis of Measurement: Standard Union Crew Daily Hours

      i. Crew Type: 10 ton roll.er with operator and foreman, daily hours

   b. Basis of Payment: Unless otherwise itemized separately in the Unit Price Schedule, Payment will be made at the unit price based on agreed upon Schedule of Values submitted by the Contractor. City staff will prepare and compact subgrade to the best of their ability. Contractor shall perform additional subgrade preparation at an hourly rate as required by the liner supplier to address any deficiencies prior to liner installation. Included in this item are all costs to compact the subgrade to a minimum of 90% compaction or as otherwise required by the liner installer including equipment and labor.

3. Item C3: Lagoon 3 Cushion Layer, 6” Sand

   a. Basis of Measurement: Lump Sum

   b. Basis of Payment: Unless otherwise itemized separately in the Unit Price Schedule, Payment will be made at the contract lump sum price based on agreed upon Schedule of Values submitted by the Contractor. Included in this item are all costs to furnish and install a sand layer of 6” depth as a cushion layer for the Geomembrane liner.

PART 2. PRODUCTS – NOT USED

PART 3. EXECUTION – NOT USED

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SECTION 31 05 19.16
GEOMEMBRANE LINER
Addendum 1

PART 1. GENERAL

1.1 SUMMARY

A. Section Includes:

1. Design, manufacturing, supply, installation, and testing of geomembrane liner.

1.2 REFERENCES

A. ASTM International:

1. ASTM D1238 - Test Method for Flow Rates of Thermoplastics by Extrusion Plastometer.
2. ASTM D1004 - Test Method for Initial Tear Resistance of Plastic Film and Sheeting.
3. ASTM D1603 - Test Method for Carbon Black in Olefin Plastics.
4. ASTM D792 - Specific Gravity (Relative Density) and Density of Plastics by Displacement.
5. ASTM D1505 - Test Method for Density of Plastics by the Density-Gradient Technique.
6. ASTM D3895 - Test Method for Oxidative Induction Time of Polyolefins by Thermal Analysis.
7. ASTM D4218 - Test Method for Determination of Carbon Black Content in Polyethylene Compounds by the Muffle-Furnace Technique.
8. ASTM D4833 - Test Method for Index Puncture Resistance of Geotextiles, Geomembranes and Related Products.
9. ASTM D5199 - Test Method for Measuring Nominal Thickness of Geotextiles and Geomembranes.
10. ASTM D5397 - Procedure to Perform a Single Point Notched Constant Tensile Load – (SP-NCTL) Test: Appendix.
11. ASTM D5596 - Test Method for Microscopic Evaluation of the Dispersion of Carbon Black in Polyolefin Geosynthetics.
12. ASTM D5641 – Geomembrane Scam Evaluation by Vacuum Chamber.

13. ASTM D5721 - Practice for Air-Oven Aging of Polyolefin Geomembranes.

14. ASTM D5820 – Pressurized Air Channel Evaluation of Dual Seamed Geomembranes.

15. ASTM D5885 - Test Method for Oxydative Induction Time of Polyolefin Geosynthetics by High Pressure Differential Scanning Calorimetry.

16. ASTM D6392 - Standard Test Method for Determining the Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods.

17. ASTM D7240 – Leak Location using Geomembranes with an Insulating Layer in Intimate Contact with a Conductive Layer via Electrical Capacitance Technique.

18. ASTM D751 - Standard Test Methods for Coated Fabrics.

B. EPA Standards

1. EPA 600/2.88/052 (NTIS PB-89-129670) of Waste Containment and Other Containment Facilities

2. U.S. Environmental Protection Agency Technical Guidance Document “Quality Control Assurance and Quality Control for Waste Containment Facilities,” EPA/600/R-93/182, September 1993, 305 pgs.

C. NSF Standards

1. NSF International Standard, Flexible Membrane Liners, NSF 54-1993 (depreciated)

D. GRI Standards

1. GM 10 - Specification for the Stress Crack Resistance of Geomembrane Sheet

2. GM 11 - Accelerated Weathering of Geomembranes Using a Fluorescent UVA-Condensation Exposure Device

3. GM 13 - Test Properties, Testing Frequency and Recommended Warranty for High Density Polyethylene (HDPE) Smooth and Textured Geomembranes

4. GM 14 - Selecting Variable Intervals for Taking Geomembrane Destructive Seam Samples Using the Method of Attributes

5. GM 25 Test Methods, Test Properties and Testing Frequency for Reinforced Linear Low-Density Polyethylene (LLDPE-R) Geomembranes

1.3 LINER DESIGN AND PERFORMANCE REQUIREMENTS

A. Compatibility with project site and stored water.

1. Project site located near Mount Pleasant City, UT.

2. The ponds are intended to store treated municipal effluent from existing wastewater treatment lagoons.

3. Water quality: Typical of treated municipal lagoon effluent.

B. Operating air temperature range: -40°F to 110°F.

C. Durable, long-lasting, weather resistant with 20-year design life.

D. Meet or exceed requirements of these specifications in order to meet design and performance requirements.

1.4 SUBMITTALS

A. Submit under provisions of Section 01 33 00. Document compliance with specifications. Indicate products are suitable for application.

B. Shop Drawings:

1. Submit proposed lining sheet layout with proposed size, number, position and sequence of placing of all sheets. Horizontal seams on slopes greater than 10% will not be allowed. Field changes to layout will require Engineer approval. Lining sheet layout must be approved prior to installation.

2. Show location, direction, and type of all field joints.

3. Show details and methods for anchoring the liner, making of field joints, seals at structures, air/gas vent configuration, safety ladders, repair of locations where samples are taken, ballast tubes, and liner penetrations.

C. Resin Data: Prior to shipment of liner, provide resin data including physical properties specified and certification stating that the resin meets the specification requirements.

D. Certification that no post-consumer resin of any type has been added to the formulation and that the resin contains no more than 10% rework of similar geomembrane parent material. Recycled product run is acceptable.

E. Prior to shipment of liner, provide test data for the geomembrane liner to document compliance with the technical specifications.

F. Manufacturer's Quality Assurance/Quality Control Program.

G. Samples: Submit two (2) typical samples of the geomembrane liner with each type of seam to be provided.

H. Documentation of installer's qualifications as specified.

I. Geosynthetic Field Installation Quality Assurance Plan.

J. Liner slack:

1. Contractor shall submit documentation identifying the coefficient of thermal expansion for the supplied liner material.

2. Contractor shall record on the panel layout and daily field reports the ambient temperature of the liner at the time of welding and the length of slack incorporated at the toe at that time.

3. Sufficient slack shall be incorporated into the installation to prevent bridging under anticipated operating temperatures specified.

K. Submit Daily Field Reports: Include results of inspections, subgrade acceptability, quality control program, liner slack information, and field tests for compliance or non-compliance with specified requirements.

L. Name and credentials of independent laboratory that will provide verification testing on destructive samples.

M. Certification that geomembrane has been installed in accordance with the Contract Documents.

N. Material and installation warranties.

1.5 PROJECT RECORD DOCUMENTS

A. Submit under provisions of Section 01 33 00.

B. Record actual locations of field seams, samples, repairs, tests, air/gas vents, and ladders.

1.6 OPERATION AND MAINTENANCE DATA

A. Submit under provisions of Section 01 78 23.

1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing of geomembrane liner material with minimum five (5) years documented experience and having manufactured a minimum of 5,000,000 square feet of geomembrane in the last year.

B. Fabricator or Installer:

1. Company specializing in installation of geomembrane liners with a minimum of five (5) years' documented experience and at least 10,000,000 square feet of installed liner.

2. Installer shall be approved by the manufacturer for installation of their product.

3. The installation supervisor shall have worked in a similar capacity on at least four projects of similar scope.

4. The installer shall provide at least one master seamer on the project who has completed a minimum of 1,000,000 square feet of geomembrane seaming work using the same type of welding apparatus proposed for use on this project.

5. Engineer Approved Equal:

   a. Northwest Linings and Geotextile Products, Inc.

      i. Representative:

         Rick Newton
         Phone: (253) 872-0244
         Email: rickn@northwestlinings.com

   b. Industrial and Environmental Concepts, Inc.

      i. Representative:

         Michael Moe
         Phone: (801) 842-7702
         Email: mmoe@miscowater.com

   c. Colorado Lining International, Inc.

      i. Representative:

         Steve Johnson
         Phone: (303) 951-5930
         Email: steve.johnson@viaflex.com

   d. H2J Liners, LLC

      i. Representative:

         Matt Johnson
         Phone: (801) 592-6325
         Email: h2jliners@gmail.com

1.8 MATERIAL LABELING, DELIVERY, STORAGE AND HANDLING

A. Deliver, store, protect and handle liner at site in accordance with manufacturer's guidelines and recommendations and Section 01 12 16.

B. Coordinate delivery of liner sheets to project site with Owner.

C. Inspect shipment with Engineer and Owner.

D. Liner materials shall be delivered to the site in rolls covered in a watertight wrapping. If liner is delivered without an adequate protective wrapping, the outer wrap and any damaged liner of roll will be removed and discarded, based on a visual inspection of entire roll, prior to installation of liner. The geomembrane shall be rolled onto a substantial core or core segments and held firm by straps/slings or other means.

E. Provide equipment and personnel to unload liner and place liner on the site in an acceptable position for storage pending installation.

F. Support bars and straps designed to protect the liner from damage shall be utilized in the handling and transportation of the rolls of liner on the site. Transportation of the liner with loader buckets or other methods, which place the liner in direct contact with metal or other surfaces that could damage the liner, are unacceptable.

G. Store geomembrane and protect from punctures, abrasions, and excessive dirt and moisture in the areas indicated on the plans. Storage areas shall be level (no pallets or block-style supports), smooth, and dry.

H. Labeling: Each roll of geomembrane liner delivered to the site shall have a manufacturer's label identifying:

1. Manufacturer's name.

2. Product identification.

3. Thickness.

4. Length.

5. Width.

6. Roll number.

1.9 SEQUENCING AND SCHEDULING

A. Sequence and schedule work under provisions of Section 01 12 16.

B. Manufacture, deliver, and unload liner sheet for storage at the site until installed.

C. Coordinate installation of liner with earthwork activities.

D. Provide at least five (5) days advance notice to Engineer prior to beginning any major work activities for coordination of construction observation.

E. Coordinate with Owner regarding Owner-provided leakage test and any necessary repairs after pond is filled and tested.

PART 2. PRODUCTS

2.1 REINFORCED LINEAR LOW-DENSITY POLYETHELYNE (LLDPE-R) LINER

A. New first quality product designed and manufactured specifically for the purpose of this Work.

B. Resin: New, first quality, compounded and manufactured specifically for producing geomembranes. Natural resin shall meet the following requirements:

Property	Test Method	Units	Required
Density	ASTM D1505	g/cm^3	≤0.939
OIT	ASTM D8117	minutes	≥100

2.2 HIGH DENSITY POLYETHYLENE (HDPE) LINER

A. New first quality product designed and manufactured specifically for the purpose of this Work.

B. Resin: New, first quality, compounded and manufactured specifically for producing geomembranes. Natural resin (without carbon black) shall meet the following requirements:

Property	Test Method	Units	Required
Density	ASTM D1505	g/cm^3	≥0.932
Melt Flow Index	ASTM D1238	g/10 min	≤1.0
OIT	ASTM D3895 (1atm/200°C)	minutes	≥100

2.3 LINER SHEET:

A. Smooth 60 mil HPDE or 45 mil LLDPE-R liner.

B. Durable, watertight, free of pinholes and contaminants.

C. Will not degrade under operating conditions.

D. Minimum width of sheet of twenty-two feet.

E. The geomembrane shall conform to the test property requirements prescribed in the table included in Appendix A at the end of this section titled “Table 31 05 19.16-1” for 60 mils thickness.

1. The values listed in Table 31 05 19.16-1 of this specification are to be interpreted according to the designated test method. The values provided are not to be interpreted as minimum average roll values or maximum average roll values.

2. The ~~HDPE~~ geomembrane properties shall be tested at the minimum frequencies indicated in Table 31 05 19.16-1. If a specific manufacturer’s quality control guide is more stringent, it should be followed.

3. Sampling shall be in accordance with specific test methods listed in Table 31 05 19.16-1 and Table 31 05 19.16-2. If no sampling protocol is stipulated, test specimens shall be taken along evenly spaced intervals across the entire roll width.

4. The number of tests shall be in accordance with the appropriate test methods listed in Table 31 05 19.16-1 and Table 31 05 19.16-2.

5. The average of the test results should be calculated per the particular standard cited and compared to the minimum value listed in Table 31 05 19.16-1 and Table 31 05 19.16-2, hence the values listed are the minimum average values and are designated as “min. ave”.

6. If the results of any tests do not conform to the requirements of this specification, retesting to determine conformance or rejection should be done in accordance with the manufacturing protocol as set forth in the manufacturer’s quality manual.

F. HDPE liner to not exceed a combined maximum total of 1% by weight of additives other than carbon black.

G. Geomembrane shall be free of holes, bubbles, blisters, contamination by foreign matter, and nicks and cuts on roll edges.

2.4 CLEANING SOLVENT

A. As recommended by manufacturer of the liner.

2.5 EXTRUDATE ROD OR BEAD

A. High density polyethylene the same as the sheet resin with the same physical characteristics.

B. Additives shall be thoroughly mixed.

C. Materials shall be free of contamination by moisture of foreign matter.

2.6 CONNECTIONS

A. Closed Cell Neoprene: Garlock rubber neoprene with a durometer of 40.

B. Neoprene Contact Adhesive: As recommended by liner manufacturer for gluing closed cell neoprene to ductile iron, PVC, LLDPE-R, and HDPE surfaces.

C. Band Clamps: Stainless steel (304 SS) one-half (1/2) inch wide, 0.025 inch thick.

D. Silicone Adhesive: Exterior grade per liner manufacturer's recommendation for adhering geomembrane to PVC and cast iron.

E. Embedment Strips: Per liner manufacturer's recommendation with a minimum embedment depth in the concrete of 1 1/2 inches. Manufactured of HDPE material and leaving an exposed 3" minimum welding surface.

F. Boot Sleeve: Same material as liner unless otherwise shown on Drawings.

G. Safety Ladder Backing Sheet: Same material as liner with one side of the geomembrane sheet being textured unless otherwise shown on Drawings.

2.7 AIR/GAS VENTS

A. As shown on Drawings.

PART 3. EXECUTION

3.1 PREPARATION

A. Verify that the liner subgrade is to the indicated grades as in shown on the Drawings and is acceptable to receive the geomembrane liner.

B. Provide daily written certifications that surface is acceptable for the liner. Placement of liner constitutes acceptance of the surface.

C. Inspect stored liner sheets to verify that sheets have not been damaged in storage or handling.

D. Schedule and coordinate liner activities with earthwork contractor, Owner and Engineer.

E. Have on-site all equipment, personnel and supplies necessary to complete the installation of the liner in a workmanlike manner.

F. Have on the job site accepted shop drawings, panel layout, geomembrane submittals, slack equations/tables, and Drawings and Speci¬fications.

G. Sequence work and have necessary equipment and materials on hand to prevent damage to partially complete liner installation and lagoon surface by weather conditions, including wind, precipitation, and high and low temperatures.

3.2 LINER SYSTEM SUBGRADE PREPARATION

A. Rake all pond surfaces to be lined as necessary so the surface consists of fine granular materials and is smooth and free of sharp rocks and any debris that may affect the liners performance to a depth of three (3) inches.

B. Proof roll the side slopes and pond bottom to create a smooth surface acceptable to the liner installer.

~~C. Install a cushion layer of 6" of sand. Owner may choose to change cushion layer to 12 oz. geotextile as outlined in 01 22 00 Measurement and Payment.~~

D. Install a cushion layer of 12 oz. geotextile as outlined in 31 05 19.13 Geotextile Liner. Owner may choose to change cushion layer as outlined in 01 22 00 Measurement and Payment to 6" of 3/8" minus sand compacted to a minimum of 95% of the dry density.

E. Coordinate preparation of surface with the liner installer. Contractor is responsible for preparing the surface to such a condition that willow the liner installer to certify to the acceptability of the subgrade for the liner system as required by this Section.

3.3 DEPLOYMENT

A. Assign each panel a logical identifying code that matches the approved panel layout. Panels shall be labeled with grease pens during deployment.

B. Use a sequential seam numbering system compatible with panel numbering system and consistent with the approved panel layout.

C. To the maximum extent possible, orient seams parallel to line of slope.

D. Minimize number of field seams in corners, odd shaped geometric locations and outside corners.

E. Slope seams shall extend a minimum of five feet beyond the toe of slope onto the pond floor.

F. Unroll geomembrane using methods that will not damage the geomembrane and will protect the underlying surface from damage.

G. Personnel walking on geomembrane shall not engage in activities or wear shoes that could damage it.

H. Smoking will not be permitted on the geomembrane at any time during the project construction and testing.

I. Limit vehicular traffic on the geomembrane to rubber tired vehicles with a ground pressure of less than 8 psi.

J. Sufficient slack shall be provided in accordance with the field conditions and to prevent bridging or excessive wrinkles over the specified operating temperatures. Bridging or excessive wrinkles will be repaired by the Contractor at no cost to the Owner.

3.4 ~~HDPE~~ FIELD JOINTS

A. Follow manufacturer's instructions.

B. Overlap sheets a minimum of six (6) inches or as recommended by the manufacturer.

C. Clean contact surface of all dirt, dust, moisture or other foreign materials.

D. At least one master seamer as defined under the qualifications portion of this specification shall be provided by the installer to provide supervision over other welders.

E. Extrusion welder and fusion welder equipment shall have gauges to monitor temperature in apparatus.

F. Whenever possible, use the dual hot wedge process for making field joints; otherwise, use the extrusion welding process.

G. Extrusion Welding:

1. Hot-air tack adjacent pieces together using procedures that do not damage the geomembrane.

2. Prepare surface to be welded including abrasion and grinding in accordance with the manufacturer’s recommendations.

3. Purge welding apparatus of heat-degraded extrudate before welding.

4. Apply sufficient molten extrudate along the seam to both contact surfaces to create a homogeneous weld.

5. Maintain resin temperatures as it emerges from the die within 30°F of optimum temperature for extrusion welding.

H. Dual Hot Wedge Welding:

1. Welding equipment shall be self propelled and specifically manufactured to produce a double track seam.

2. Clean seam area of dust, mud, moisture and debris immediately ahead of welder.

3. Protect against moisture build-up between sheets.

4. Monitor and maintain the temperature of the wedge within 30°F of optimum temperature for hot wedge welding.

I. Trial Welds:

1. Prior to making any production welds, trial welds are required to verify equipment and operator performance. No welding equipment or welder shall be allowed to perform production welds until equipment and welders have successfully completed the trial weld.

2. Trial welds shall be completed under the same environmental conditions as production welds.

3. A minimum of two trial welds per day, per welding apparatus and welder, one made prior to the start of work, one at mid-shift, and anytime the welding apparatus is shut off for more than 30 minutes.

4. Test welds are required each day that production welds are to be performed.

5. Trial welds shall be destructively tested and field evaluated as specified in Part 3.4 of this section.

6. Repeat the trial weld, in its entirety, when any of the trial weld samples fail in either peel or shear.

J. Seaming shall not proceed when ambient air temperature or adverse weather jeopardize the integrity of the seam. Installer shall comply with the requirements for adverse condition welding included in their Field Installation Quality Assurance Plan.

3.5 QUALITY ASSURANCE

A. Visually inspect all seams and non-seam areas of the geomembrane for defect, holes, blisters, undispersed raw materials, and any sign of contamination by foreign matter. Repair all suspect locations.

B. Test all double-wedge weld seams in ~~HDPE~~ Geomembrane liner with air pressure test in accordance with ASTM D5820.

C. Test all extrusion welds in ~~HDPE~~ Geomembrane liner with a vacuum box in accordance with ASTM D5641. In lieu of vacuum testing all extrusion welds, spark testing in accordance with ASTM D7240 may be utilized. No additional payment will be made for spark testing extrusion welds and the cost of testing is considered incidental.

D. When air pressure testing is used, pressurize channel between double heat wedge to 30 psi and hold for 5 minutes. Allow a pressure drop of no more than 2 psi in 5 minutes. Record test results along seams and in daily records.

E. When vacuum testing seams, the vacuum box shall be kept stationary at each location for a period of no less than 10 seconds while maintaining a vacuum pressure of 4-8 psi and examining for holes in the seam.

F. Perform destructive tests including tensile and peel tests on all field seams.

1. A minimum of one test per 500 feet of seam length at a selected location acceptable to the Engineer.

2. For each sample taken, the sample will be split into three parts. One sample will be used for an immediate field test, one sample shall be used for independent third-party testing, and one sample will be given to the Engineer.

   a. The Engineer's sample shall be 12 inches by 12 inches.

   b. The sample sizes for field testing shall be as necessary to provide a minimum of five test specimens in accordance with these specifications plus any samples to be retained by the Contractor or Installer.

   c. The sample specimen to be sent to the independent third party testing laboratory shall be 12 inches by 18 inches.

3. Five individual test specimens shall be tested in accordance with ASTM D 6392 for both the field testing and independent third party testing. Results will be assessed based on the following table.

Double Wedge Welds	**60 Mil HDPE**	**45 Mil LLDPE-R[3]**
Shear Strength [1]	120 lbs/in. min.	90 lb
Shear Elongation at Break[2]	50%	
Peel Strength [1]	91 lbs/in. min.	30
Peel Separation	25% max.	

Extrusion Fillet Weld	**60 Mil HDPE**	**45 Mil LLDPE-R**

Shear Strength [1]	120 lbs/in. min.	100 lb
Shear Elongation at Break[2]	50%	
Peel Strength [1]	78 lbs/in. min.	30 lb
Peel Separation	25% max.	

[1] 4 out of 5 specimens must meet or exceed presented value, 5th specimen must meet or exceed 80% of presented value.
[2] Elongation measurements are not required for field testing.
[3] Values are based on 1.0 in. (25 mm) wide strip tensile strength per D7747 for laboratory tested specimens

4. The following laws-of-break patterns as described by ASTM D 6392 are unacceptable:

   a. Double Wedge Welds: AD and AD-Brk>25%

   b. Extrusion Fillet Welds: AD1, AD2 and AD-WLD (unless strength is achieved.)

G. All sampling and testing shall be at the expense of the Contractor. Independent third-party testing shall be performed by a Geosynthetics Accreditation Institute (GAI) accredited testing laboratory.

H. Submit reports and test results to Engineer by the independent testing laboratory and for field testing, indicating observations and results of tests and indicating compliance or noncompliance with Contract Documents.

I. Report immediately all failing tests to Engineer. Areas of repeated testing failure may require removal and replacement of material at no cost to Owner.

J. The frequency of testing may be increased by the Engineer when repeated failed tests have been recorded. Contractor shall be responsible for all costs of added frequency for material testing. GRI GM-14 and GM-25 will be used to establish any increase in testing frequency. However, the minimum testing frequency shall be as established in Paragraph 3.4.F.

K. Repair and test all holes in the geomembrane resulting from destructive sampling in accordance with these specifications.

L. If a seam fails any of the prescribed testing, follow one of two options:

   1. Reconstruct the seam between any two passed seam locations.

   2. Trace the weld to an intermediate location where passing results are achieved.

a. If tracing shows failed results to the end of a seam (within 10 feet), continue tracing on the next seam welded using the same device.

b. If any sample fails, the process shall be repeated to establish the zone in which the seam will be reconstructed.

3.6 REPAIR PROCEDURES

A. Remove any damaged or unacceptable geomembrane and repair in accordance with these specifications.

B. Repair any portion of geomembrane removed for destructive testing.

C. Repair any portion of unsatisfactory seam area failing a destructive or non-destructive test.

D. Contractor shall propose appropriate repair method to the Engineer for approval using one of the following repair methods:

1. Patching. Used to repair large holes, tears, undispersed raw materials and contamination by foreign matter.

2. Abrading and re-welding. Used to repair short section of a seam.

3. Spot Welding. Used to repair pinholes or other minor, localized flaws or where geomembrane thickness has been reduced.

4. Capping. Used to repair long lengths of failed seams.

5. Remove the unacceptable seam and replace with new material.

E. Non-destructively test all repair welds using methods specified.

F. Number and log each patch repair and record on record drawings.

3.7 WARRANTY

A. Installer's Warranty

1. The installer shall warrant to the Owner and shall provide to the Owner an executed warranty at the completion of the terms of the contract that the geomembrane is free from installation defects as defined by these specifications and is able to withstand normal weathering and operating conditions for a period of one (1) year from the date the warranty is executed. Warranty shall be executed no earlier than the date with the installation passes the specified leakage test.

B. Manufacturer's Warranty:

1. The manufacturer shall warrant to the Owner and shall provide to the Owner an executed warranty at the completion of the terms of the contract that each geomembrane is free from manufacturing defects, as defined by these specifications and is able to withstand deterioration due to the effects of ozone, ultraviolet or other normal weathering on a pro-rata basis for a period of twenty (20) years from the date the warranty is executed. Warranty shall be executed no earlier than the date the installation passes the specified leakage test.

APPENDIX A: TABLE 31 05 19.16-1 – High Density Polyethylene (HDPE) Geomembrane – Smooth

Properties	Test Method	Test Value							Testing Frequency (minimum)
		30 mils	40 mils	50 mils	**60 mils**	80 mils	100 mils	120 mils	
Thickness (min. ave.)	D5199	Nom.	Nom	Nom.	**Nom.**	Nom.	Nom.	Nom.	Per roll
• Lowest individual of 10 values		-10%	-10%	-10%	**-10%**	-10%	-10%	-10%	
Density mg/l (min.)	D1505 / D792	0.940 g/cc	0.940 g/cc	0.940 g/cc	**0.940 g/cc**	0.940 g/cc	0.940 g/cc	0.940 g/cc	20,000 lb
Tensile Properties *(1)* (min. ave.)	D6693								20,000 lb
• Yield strength	Type IV	63 lb/in.	84 lb/in.	105 lb/in.	**126 lb/in.**	168 lb/in.	210 lb/in.	252 lb/in.	
• Break strength		114 lb/in.	152 lb/in.	190 lb/in.	**228 lb/in.**	304 lb/in.	380 lb/in.	456 lb/in.	
• Yield elongation		12%	12%	12%	**12%**	12%	12%	12%	
• Break elongation		700%	700%	700%	**700%**	700%	700%	700%	
Tear Resistance (min. ave.)	D1004	21 lb	28 lb	35 lb	**42 lb**	56 lb	70 lb	84 lb	45,000 lb
Puncture Resistance (min. ave.)	D4833	54 lb	72 lb	90 lb	**108 lb**	144 lb	180 lb	216 lb	45,000 lb
Stress Crack Resistance *(2)*	D5397 (App.)	300 hr.	300 hr.	300 hr.	**300 hr.**	300 hr.	300 hr.	300 hr.	Per GRI-GM10
Carbon Black Content (range)	D1603 *(3)*	2.0-3.0%	2.0-3.0%	2.0-3.0%	**2.0-3.0%**	2.0-3.0%	2.0-3.0%	2.0-3.0%	20,000 lb
Carbon Black Dispersion	D5596	Note *(4)*	Note *(4)*	Note *(4)*	**Note *(4)***	Note *(4)*	Note *(4)*	Note *(4)*	45,000 lb
Oxidative Induction Time (OIT) (min. ave.) *(5)*									200,000 lb
(a) Standard OIT	D3895	100 min.	100 min.	100 min.	**100 min.**	100 min.	100 min.	100 min.	
—or—									
(b) High Pressure OIT	D5885	400 min.	400 min.	400 min.	**400 min.**	400 min.	400 min.	400 min.	
Oven Aging at 85°C *(5), (6)*	D5721								Per each formulation
(a) Standard OIT (min. ave.) - % retained after 90 days	D3895	55%	55%	55%	**55%**	55%	55%	55%	
—or—									
(b) High Pressure OIT (min. ave.) - % retained after 90 days	D5885	80%	80%	80%	**80%**	80%	80%	80%	
UV Resistance *(7)*	GM 11								Per each formulation
(a) Standard OIT (min. ave.)	D3895	N.R. *(8)*	N.R. *(8)*	N.R. *(8)*	**N.R. *(8)***	N.R. *(8)*	N.R. *(8)*	N.R. *(8)*	
—or—									
(b) High Pressure OIT (min. ave.) - % retained after 1600 hrs *(9)*	D5885	50%	50%	50%	**50%**	50%	50%	50%	

(1) *Machine direction (MD) and cross machine direction (XMD) average values should be on the basis of 5 test specimens each direction.*
Yield elongation is calculated using a gage length of 1.3 inches.
Break elongation is calculated using a gage length of 2.0 inches.

(2) *The yield stress used to calculate the applied load for the SP-NCTL test should be the manufacturer's mean value via MQC testing.*

(3) *Other methods such as D 4218 (muffle furnace) or microwave methods are acceptable if an appropriate correlation to D 1603 (tube furnace) can be established.*

(4) *Carbon black dispersion (only near spherical agglomerates) for 10 different views:*
9 in Categories 1 or 2 and 1 in Category 3

(5) *The manufacturer has the option to select either one of the OIT methods listed to evaluate the antioxidant content in the geomembrane.*

(6) *It is also recommended to evaluate samples at 30 and 60 days to compare with the 90-day response.*

(7) *The condition of the test should be 20 hr. UV cycle at 75°C followed by 4 hr. condensation at 60°C.*

(8) *Not recommended since the high temperature of the Std-OIT test produces an unrealistic result for some of the antioxidants in the UV exposed samples.*

(9) *UV resistance is based on percent retained value regardless of the original HP-OIT value.*

(App. A Tables from Geosynthetic Research Institute)

APPENDIX A: TABLE 31 05 19.16-2 - Linear Low-Density Polyethylene (LLDPE-R) Geomembrane

Properties	Test Method	Test Value				Testing Frequency (minimum)
		60 mils	45 mils	36 mils	30 mils	
Thickness (min. ave.)	D5199					
• Nominal (mils)		60	**45**	36	30	per roll
• Min ave. (mils)		54	**40**	32	27	
Weight	D5216					per roll
• Nominal (lb/1000 ft^2)		262	**210**	168	144	
• Min. Ave. (lb/1000 ft^2)		250	**189**	151	126	
Grab Tensile	D7004					
• Strength (lb.) min. ave.	(each direction)	275	**250**	225	200	30,000 lb
• Elongation (%) min. ave.	(each direction)	22	**22**	22	22	30,000 lb
Tongue Tear (lb) min. ave.	D5884 (each direction)	80	**70**	60	50	30,000 lb
Index Puncture (lb) min. ave.	D4833	90	**85**	80	75	30,000 lb
Ply Adhesion (lb) min. ave.	D6636	20	**20**	20	20	30,000 lb
Oxidative Induction Time (OIT) (min. ave.) *(5)*						
(b) Standard OIT	D8117	100	**100**	100	100	formulation
—or—						
(b) High Pressure OIT	D5885	400	**400**	400	400	
Oven Aging at 85°C *(5), (6)*	D5721					
(c) Standard OIT (min. ave.) - % retained after 90 days	D8117	35	**35**	35	35	formulation
—or—						
(d) High Pressure OIT (min. ave.) - % retained after 90 days	D5885	60	**60**	60	60	
UV Resistance *(7)*	D7238					
(c) Standard OIT (min. ave.)	D8117	N/R[5]	N/R[5]	N/R[5]	N/R[5]	formulation
—or—						
(d) High Pressure OIT (min. ave.) - % retained after 1600 hrs *(9)*	D5885	35	35	35	35	

(1) Alternatively, an acceptable ply adhesion is to have a film tearing bond occur within the sheet material.

(2) The manufacturer has the option to select either one of the OIT methods listed to evaluate the antioxidant effectiveness in the geomembrane.

(3) It is also recommended to evaluate samples at 30 and 60 days to compare with the 90 day response.

(4) UV resistance is based on percent retained value regardless of the original HP-OIT value.

(5) The condition of the test should be 20 hr. UV cycle at 75°C followed by 4 hr. condensation at 60°C.

(6) Not recommended since the high temperature of the Std-OIT test produces an unrealistic result for some of the antioxidants in the UV exposed samples.

(App. A Tables from Geosynthetic Research Institute)

SECTION 40 05 59
STAINLESS STEEL SLIDE GATES AND WEIR GATES
Addendum 1

PART 1 GENERAL

1.1 SECTION INCLUDES

A. This section covers stainless steel slide gates, stop gates, weir gates and operators as shown on the plans~~, listed in the gate schedules~~ and as specified herein.

B. The equipment provided under this section shall be fabricated, assembled, erected, and placed in proper operating condition in full conformity with the drawings, specifications, engineering data, instructions and recommendations of the equipment manufacturer.

C. Gates and operators shall be supplied with all the necessary parts and accessories indicated on the drawings, specified, or otherwise required for a complete, properly operating installation, and shall be the latest standard product of a manufacturer regularly engaged in the production of fabricated gates.

~~D. Refer to the gate schedule on Sheet 00-G-018 in the Contract Drawings.~~

1.2 REFERENCES

A. ASTM International ASTM A276 – Stainless steel bars and shapes

B. American Water Works Association (AWWA) C561 - latest edition

C. ASTM D4020 – Standard Specification for Ultra-High-Molecular-Weight Polyethylene Molding and Extrusion Materials

1.3 DEFINITIONS

A. A weir gate is a downward opening slide gate with flow over the top.

1.4 DESIGN REQUIREMENTS

A. Gate configuration, components and accessories shall be of the size and type shown on the drawings ~~and gate schedule~~ and specified herein.

B. Gates shall be designed for continuous immersion in raw wastewater.

C. Except as modified or supplemented herein, all gates and operators shall conform to the applicable requirements of AWWA-C561 standards.

D. Leakage: Gates shall be substantially watertight under the design head conditions. Under the design seating head, the leakage shall not exceed 0.05 US gallons per minute per foot of seating perimeter. Under the design unseating head, leakage shall not exceed 0.05 US gallons per minute per foot of perimeter.

1.5 SUBMITTALS

A. Submit in accordance with Section 01 33 00 and Divisions 43, 46 with the following additional information:

1. Fabrication drawings with full dimensions, construction and installation details, and materials used on all parts of the gate, operator, lift, and appurtenances. General arrangement drawings and cut sheets are not considered acceptable drawings.

2. Plan, cross section, and details showing proposed mounting for each size and typical application of gate.

3. Applicable operation and maintenance information as specified in Section 01 73 00.

4. Complete engineering design calculations in compliance with AWWA standards, latest edition.

1.6 WARRANTY

A. Equipment supplied under this section shall be warranted to be free from defects in workmanship, design and materials for a period of one (1) year from the date of Substantial Completion. If any part of the equipment should prove to be defective during the warranty period, the Manufacturer shall replace the part at no expense to the Owner.

1.7 QUALITY ASSURANCE

A. The gate manufacturer shall have a minimum of five (5) years of experience producing equipment substantially similar to that required and shall be able to submit documentation of at least fifteen (15) independent installations using the same size or larger equipment as detailed below. Each installation must have been in satisfactory operation for at least five (5) years.

B. The contract documents represent the minimum acceptable standards for the equipment. All equipment shall conform fully in every respect to the requirements of the respective parts and sections of the drawings and specifications. The entire unit shall be Manufacturer's standard product, but shall be modified, redesigned, furnished with special features or accessories, made of materials or provided with finishes as may be necessary to conform to the quality mandated by the technical and performance requirements of the specification.

C. Fabrication shall be done in compliance with all applicable ASTM standards or equivalent international standards.

D. The manufacturer's shop welds, welding procedures, and welders shall be qualified and certified in accordance with the requirement of the latest edition of American Welding Society (AWS) Sections D1.1, 1.2, and 1.6.

E. The Contractor or Subcontractor responsible for the installation of the gates shall have five or more years of experience in the installation of similar type gates.

F. All fully assembled gates shall be shop inspected, tested for operation and leakage, and adjusted before shipping. There shall be no assembling or adjusting on the job sites other than for the lifting mechanism.

1.8 DESIGN REQUIREMENTS

A. Gate configuration, components, and accessories shall be of the size and type shown on the Drawings ~~and gate schedule~~ and specified herein.

B. Gate, frame, and yoke design shall be such that the flexural stress does not exceed 10,000 pounds per square inch (psi) or that the minimum safety factor is 5-to-1 based on the ultimate strength of the material used.

C. Gate shall be designed for continuous immersion in raw wastewater. Fluid temperature is expected to range from 35^{o}F to 90^{o}F.

D. Except as modified or supplemented herein, gate and operators shall conform to the applicable requirements of AWWA-C561 standards.

E. Leakage: Gate shall be substantially watertight under the design head conditions. Under the design seating and unseating heads, the leakage shall not exceed 0.05 US gallons per minute per foot of seating perimeter.

PART 2 PRODUCTS

2.1 MANUFACTURER

A. In order to ensure uniform quality, ease of maintenance and minimal parts storage, all gates supplied under this section shall be supplied by a single manufacturer unless noted otherwise.

1. Whipps
2. Golden Harvest, Inc.
3. RW Gate Company
4. Waterman
5. Rodney Hunt
6. Approved Equal

2.2 MATERIALS AND CONSTRUCTION

A. General Design

1. Gates shall be either self-contained or non-self-contained of the rising stem or non-rising configuration as indicated on the drawings ~~gate schedule~~.

2. All parts of the gate shall have a minimum thickness of ¼-inch.

B. Frame

1. Gate frame shall conform to the safety factors specified in AWWA C561.
2. Gate frame shall be designed for embedding, in-channel, or face mounting as showing on the drawings ~~or gate schedule.~~
3. The gate frame shall be stainless steel and designed for maximum rigidity.
4. The frame configuration shall be of the flush-bottom type and shall allow the replacement of the top and side seals without removing the gate frame from the wall.
5. Lifting Lugs shall be provided on frame styles.
6. Frame shall be single piece construction; bolted frames are not acceptable. Wraparound gussets shall be provided where frame stresses require additional reinforcement.

C. Slide

1. Gate slide shall conform to the safety factors specified in AWWA C561 but shall, in no case, be less than ¼-inch thick. The slide shall consist of a stainless-steel plate that is reinforced with horizontal and vertical stiffeners. The stem connector clips or stem block pocket shall be welded to the slide. Horizontal reinforcement members welded to side vertical members. The slide shall consist of stainless-steel plate reinforced to limit its deflection. The limits of deflection shall be:
    a. Slide Gate: L/720 of the gate's span under the design head or 1/16 inch, whichever is less.
    b. Weir Gate: L/720 of the gate's span under the design head or 1/16 inch, whichever is less.

D. Guides and Seals

1. The guides shall be provided with ultra-high molecular weight polyethylene seats on both sides of the slide and shall be of such length as to retain and support at least two thirds (2/3) of the vertical height of the slide in the fully open position.
2. Guide frame shall not weigh less than 13 pounds per foot.
3. Slide gate shall incorporate a flush-bottom seal that is attached to the bottom frame invert member. The seal shall be of the materials listed in “Materials of Construction” and shall meet the material test requirements specified in AWWA C561.
    a. The design of the seal shall be such as to provide resistance against leakage, as specified in AWWA C561.
4. Top and side seals shall be self-adjusting ultra-high-molecular-weight polyethylene (UHMWPE) with compression cord and securely fastened to the

frame with formed stainless-steel retainers and shall be replaceable and adjustable in the field without disassembly of the frame and removing the gate from the installed position. The corners of the seals shall be vulcanized. Bottom seal to be UHMWPE.

a. When required for shutoff purposes, a neoprene top seal shall be mounted to the top member.

E. Yoke and Pedestal

1. The yoke, to support the operating bench stand, shall be formed by two structural members welded at the top of the guides to provide a one-piece rigid frame.

2. Self-contained gates shall be provided with a yoke to support the operating bench stand. The yoke shall be formed by two structural members welded at the top of the guides to provide a one-piece rigid frame. The maximum deflection of the yoke shall be L/360 of the gate's span.

2.3 LIFTING ASSEMBLIES

A. Stem and Couplings

1. The operating stem shall be of stainless steel designed to transmit in compression at least two times the rated output of the operating manual mechanism with a 40-pound effort on the crank. The operating stem shall be rising and shall be designed to withstand both tension and compression loads. For manual actuators the tension and compression design loads shall be those caused by the application of an 80-lb effort on the crank or handwheel or a 100-pound-foot torque on a wrench nut. The tension design load shall not exceed one-fifth of the ultimate tensile strength of the stem material. The compression design load shall be less than the critical buckling load as determined by AWWA C561.

2. Threads: Stems shall have rolled or American Standard general purpose full depth dual lead Acme type threads with a maximum roughness of 16 micro-inches. The stem shall be supported by angle guides or cast iron stem guides with a two-piece cast bronze guide collar, spaced to provide an L/R ratio of 200 or less.

3. Where a hydraulic, pneumatic or electric operator is used, the stem design force shall not be less than 1.25 times the output thrust of the hydraulic or pneumatic cylinder with a pressure equal to the maximum working pressure of the supply, or 1.25 times the output thrust of the electric motor in the stalled condition.

4. Coupling: Stem lengths requiring more than one piece shall be joined together by stainless steel or bronze solid couplings. The couplings shall be threaded and keyed, threaded and bolted, or bolted only when one of the pieces is made of tubing and shall be of greater strength than the stem.

5. Gates having a width equal to or greater than two times their height shall be provided with two lifting mechanisms connected by a tandem shaft. The connection shaft shall be provided with a cover for safety.

6. Rising-stem gates with manual actuators shall be provided with a stop collar to be field adjusted according to the manufacturer's instructions at the time of gate installation to prevent over-closing the gate.

B. Stem Guides

1. Stem guides shall be fabricated from stainless steel. Stem guides shall be equipped with a UHMWPE bushing. Guides shall be adjustable and spaced in accordance with the manufacturer's recommendation. The L/R ratio shall not be greater than 200.

2. Stem guide brackets shall be provided as required to meet the stem design requirements specified in this section and may be mounted on the gate guides or yoke or may be wall mounted. Wall-mounted guides shall provide lateral adjustment between the wall and the guide bracket and between the guide bracket and the guide for field alignment. Guides which are mounted on the gate assembly shall be designed and fabricated to ensure proper alignment. Stem guide assemblies and their anchor bolts shall be designed to maintain the alignment under operating loads. Stem guides shall be equipped with a UHMWPE bushing with maximum diametral clearance of 1/8-inch.

C. Stem Cover

1. Rising stem gates shall be provided with a clear polycarbonate stem cover. The stem cover shall have a cap and condensation vents and a clear Mylar position indicating tape. The tape shall be field applied to the stem cover after the gate has been installed and positioned.

2.4 LIFTING MECHANISM

A. Operators of the types listed in the drawings ~~schedule~~ shall be provided by the gate manufacturer.

B. Electric actuators are specified in Division 26.

C. Each manual operator shall be designed to operate the gate under the maximum specified seating and unseating heads by using a maximum effort of 40 pounds on the crank, and shall be able to withstand, without damage, an effort of 80 pounds.

D. Gearboxes shall be provided when required to maintain the operating force below 40 pounds. All bearings and gears shall be totally enclosed in a weather tight housing. Operator housing shall be cast steel or cast iron. The pinion shaft of crank-operated mechanisms shall be supported by roller bearings. The operating shaft shall be fitted with a 2-inch square operating nut and removable crank. The crank shall be fitted with a corrosion-resistant rotating handle. The maximum crank radius shall be 15 inches and the maximum handwheel diameter shall be 24 inches.

2.5 ACCESSIBILITY

A. Crank or handwheel shall be located 36 inches to 42 inches above the walking surface. When required provide enclosed chain and sprocket drive to lower the actuator.

B. When crank is not accessible from the walkway provide horizontal extension and supports.

C. Grease zerks that are not easily accessible shall be extend to an easily accessible location.

2.6 MATERIALS

Part	Material
Slide, Spigot, Frame, Stiffeners, Yoke, Guide angles	Stainless Steel, AISI 304L
Side and Top seals	Ultra High Molecular Weight Polyethylene (UHMWPE), ASTM D4020
Invert seal	Ultra High Molecular Weight Polyethylene (UHMWPE) ASTM D4020
Bearing bars, Guides, Stem guide liner	Ultra-High Molecular Weight Polyethylene (UHMWPE) ASTM D4020
Bottom seal	Ultra-High Molecular Weight Polyethylene (UHMWPE), ASTM D4020
Threaded stem, Stem guides, tandem shafts, extension shafts	Stainless Steel, AISI 304L
Seal retainer	Stainless Steel, AISI 304L
Fasteners	Stainless Steel, ASTM F593/F594, Alloy Group 1
Pedestal/wall bracket	Stainless Steel, AISI 304L or Cast Iron ASTM A126, Class B or Mild Steel, ASTM A36/A36M
Stem cover	Polycarbonate ASTM A-707
Lift and stop nut	Manganese Bronze ASTM B584, UNS-C86500

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify the gates and all appurtenances meet the requirements of these Specifications.

3.2 INSTALLATION

A. The Contractor shall employ qualified competent personnel for the installation and testing.

B. Unless otherwise specified, gates shall be installed in accordance with manufacturer's instructions and AWWA C561.

C. Place concrete so that no voids occur around the frames or thimble, if present.

D. Securely anchor all materials embedded in concrete. Anchor bolts shall be carefully placed in templates for proper gate alignment. Use epoxied anchor where risk of spalling exists.

E. Verify that each guide is securely installed, and the gate operates smoothly. After gates have been properly installed, adjusted, and properly lubricated, each slide shall be operated for one complete cycle, open-close-open or close-open-close. Check for proper alignment and for indications of binding throughout a complete cycle. Gates showing excessive leakage shall be removed, remedied, and reinstalled until the excess leakage is no longer present.

F. Adjust and lubricate gate after installation.

G. After installation, perform a field leakage test to verify that the gate performs within the allowable leakage requirements of these Specifications.

H. Touch-up factory coatings damaged during shipping and construction.

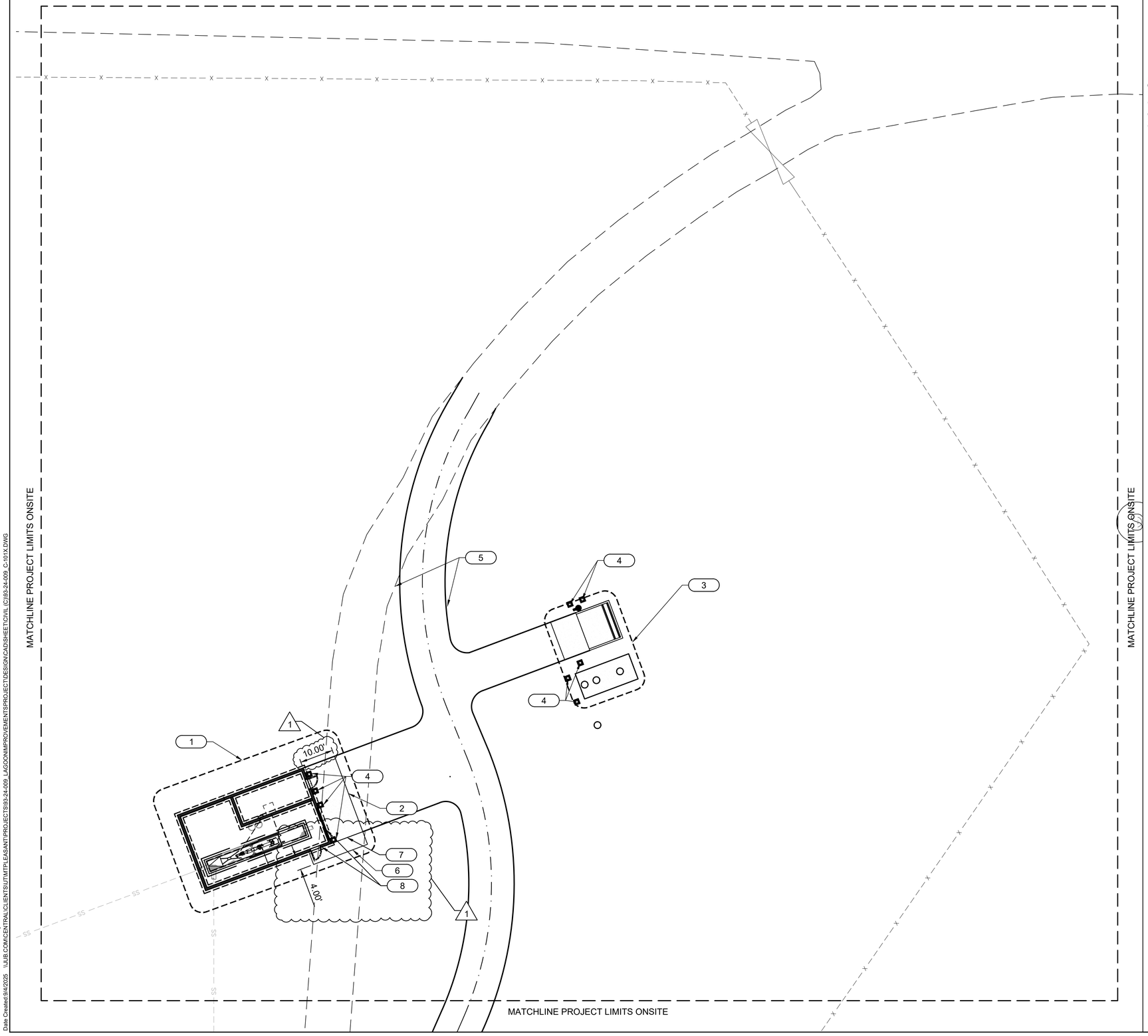
3.3 FIELD SERVICE

A. One trip, one day: Inspection training and leakage testing.

END OF SECTION

MATCHLINE PROJECT LIMITS ONSITE

MATCHLINE PROJECT LIMITS ONSITE



MATCHLINE PROJECT LIMITS ONSITE

MATCHLINE PROJECT LIMITS ONSITE

CIVIL UTILITY KEYED NOTES

1. HEADWORKS BUILDING, SEE SHEET D-102.
2. 6" THICK CONCRETE APRON WITH #5 AT 12" O.C. EACH WAY. PROVIDE MINIMUM 3" OF COVER FROM BOTTOM OF SLAB.
3. SEPTAGE RECEIVING STATION, SEE SHEET D-302.
4. BOLLARD PER C-02160, SHEET CZ-901.
5. ACCESS ROAD BY OTHERS.
6. 4" THICK CONCRETE SIDEWALK.
7. ½" FILLER WITH #5 SMOOTH DWL AT 36" O.C. APPLY DEBONDING AGENT.
8. #5 SMOOTH DWL AT 24" O.C. APPLY DEBONDING AGENT. EXTEND 4" INTO FOUNDATION AND 30" INTO SLAB.

0 15 30

SCALE IN FEET

J-U-B ENGINEERS, INC.

J-U-B ENGINEERS, INC.
392. E. Winchester St., Suite 300
Salt Lake City, UT 84107
Phone: 801.547.0393
www.jub.com

Subconsultant:

BID

REGISTERED PROFESSIONAL ENGINEER
#7279300-2202
GARY MICHAEL VANCE
9/26/25
STATE OF UTAH

SET

NO.	DESCRIPTION	BY	APP'D	DATE
	REVISION			
1	ADDENDUM	CIH	BWP	9/26/2025

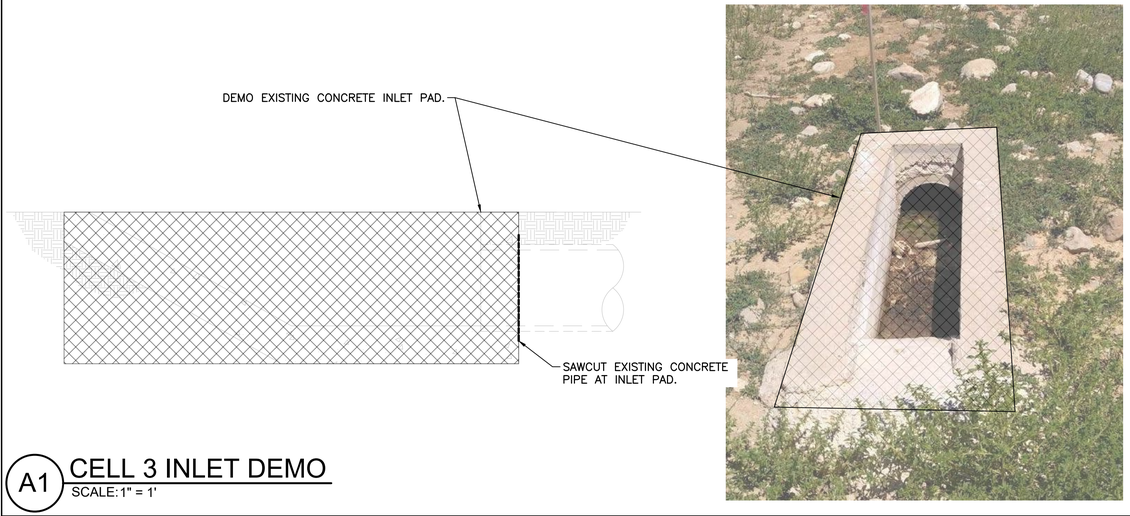
LAGOON IMPROVEMENTS PROJECT
MT PLEASANT CITY

HEADWORKS SITE LAYOUT

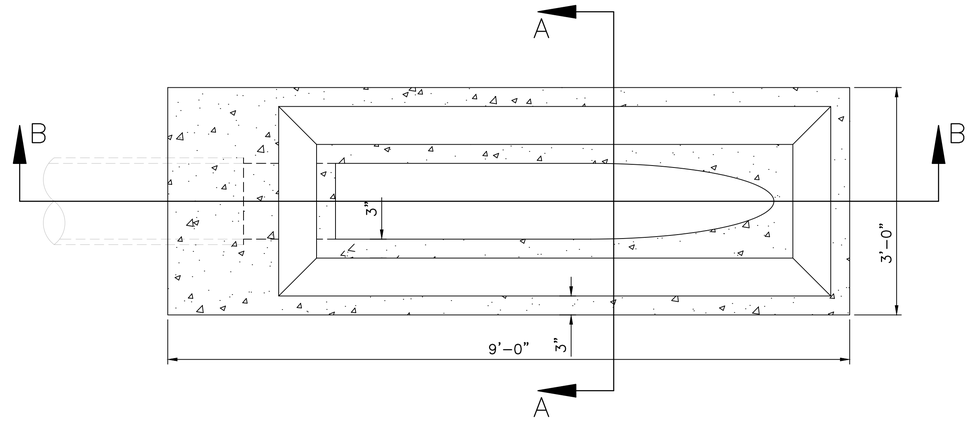
FILE : 93-24-009_C-101X
JUB PROJ. # :93-24-009
DRAWN BY: CIH
DESIGN BY: BWP
CHECKED BY: BWP
ONE INCH
AT FULL SIZE, IF NOT ONE INCH, SCALE ACCORDINGLY
LAST UPDATED: 9/26/2025

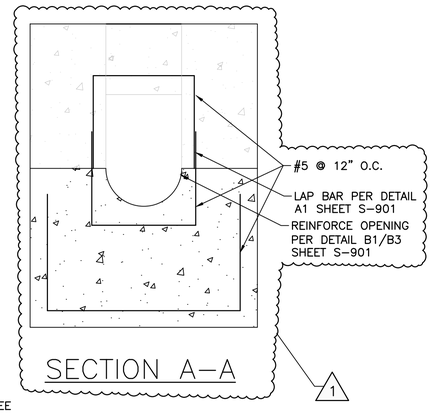
DRAWING:
C-101

Plot Date:9/26/2025 10:57 AM Plotted By: Braxton Porter
Date Created:9/4/2025 \\JUB.COM\CENTRAL\CLIENTS\UT\MTPLEASANT\PROJECTS\93-24-009_LAGOONIMPROVEMENTSPROJECT\DESIGN\CAD\SHEET\CIVIL (C)\93-24-009_C-101X.DWG

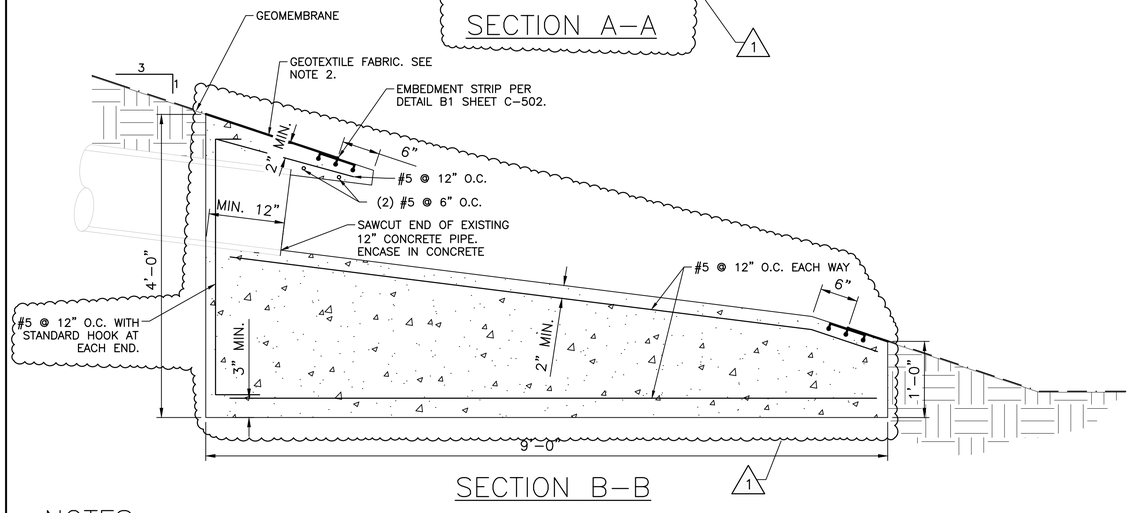


A1 CELL 3 INLET DEMO
SCALE: 1" = 1'





SECTION A–A

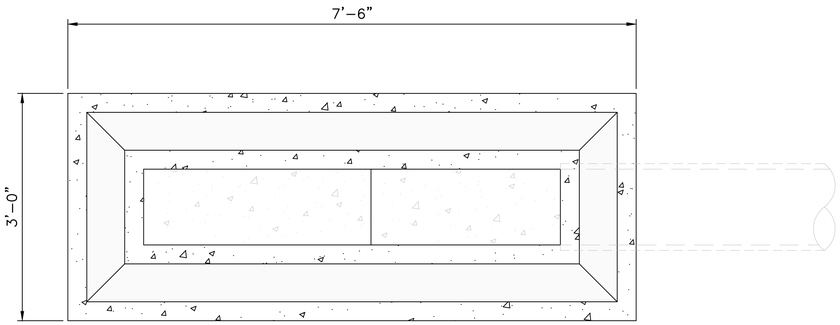


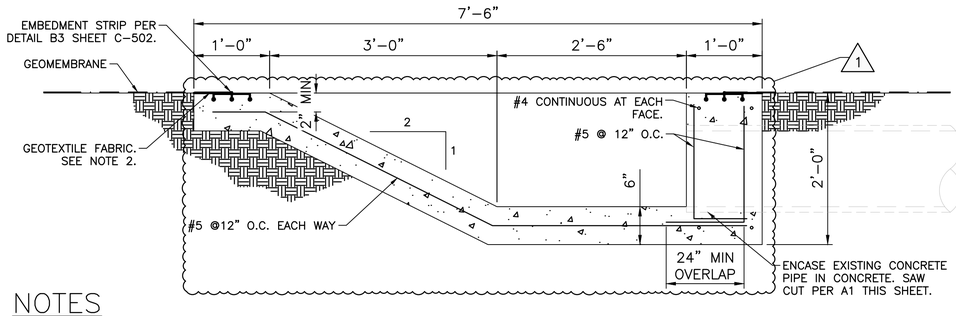
SECTION B–B

NOTES

1. ALL CONCRETE SURFACES THAT MAY CONTACT LINER SHALL BE STEEL TROWEL FINISHED SMOOTH WITH ROUND (1" RADIUS) AND SMOOTH EDGES.
2. PROVIDE 12oz NON WOVEN GEOTEXTILE BETWEEN CONCRETE AND LINER. GLUE GEOTEXTILE TO CONCRETE.
3. CORNERS OF LINER TO CONCRETE ANCHORS TO BE MITER CUT (45°±) AND EXTRUSION WELDED PRIOR TO PLACING IN CONCRETE.
4. PLACE EMBEDMENT STRIP IN SLAB AT TIME OF POURING TO FORM A CONTINUOUS WELDABLE SURFACE.

D3 CELL 3 OUTLET STRUCTURE
SCALE: 1" = 1'





NOTES

1. ALL CONCRETE SURFACES THAT MAY CONTACT LINER SHALL BE STEEL TROWEL FINISHED SMOOTH WITH ROUND (1" RADIUS) AND SMOOTH EDGES.
2. PROVIDE 12oz NON WOVEN GEOTEXTILE BETWEEN CONCRETE AND LINER. GLUE GEOTEXTILE TO CONCRETE.
3. CORNERS OF LINER TO CONCRETE ANCHORS TO BE MITER CUT (45°±) AND EXTRUSION WELDED PRIOR TO PLACING IN CONCRETE.
4. PLACE EMBEDMENT STRIP IN SLAB AT TIME OF POURING TO FORM A CONTINUOUS WELDABLE SURFACE.

D1 CELL 3 INLET STRUCTURE
SCALE: 1" = 1'

J-U-B ENGINEERS, INC.

J-U-B ENGINEERS, INC.
392. E. Winchester St., Suite 300
Salt Lake City, UT 84107
Phone: 801.547.0393
www.jub.com

Subconsultant:

BID

REGISTERED PROFESSIONAL ENGINEER
#7279300-2202
GARY MICHAEL VANCE
9/26/25
STATE OF UTAH

SET

NO.	DESCRIPTION	BY	APP.	DATE
1	ADDENDUM 1			9/26/2025

REVISION

LAGOON IMPROVEMENTS PROJECT
MT PLEASANT CITY

LAGOON LINER DETAILS

FILE:	93-24-009_C-501X
JUB PROJ. #:	93-24-009
DRAWN BY:	CIH
DESIGN BY:	BWP
CHECKED BY:	BWP

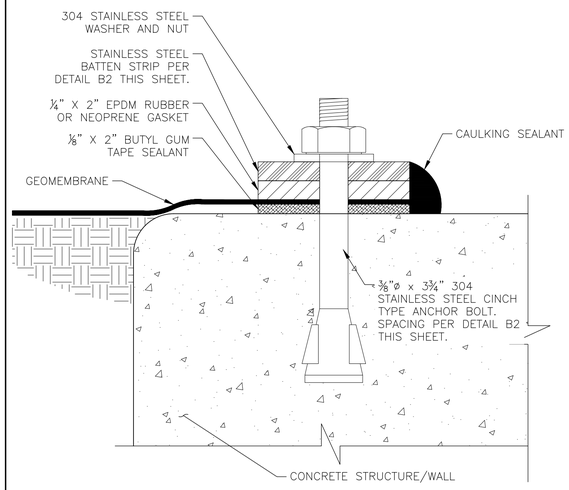
ONE INCH
AT FULL SIZE, IF NOT ONE INCH, SCALE ACCORDINGLY

LAST UPDATED: 9/26/2025

DRAWING:

C-501

Plot Date:9/26/2025 11:17 AM Plotted By: Braxton Porter
Date Created:9/26/2025 \\JUB.COM\CENTRAL\CLIENTS\UT\MTPLEASANT\PROJECTS\93-24-009_LAGOONIMPROVEMENTS\PROJECT\DESIGN\CAD\SHEET\CIVIL (C)\93-24-009_C-501X.DWG

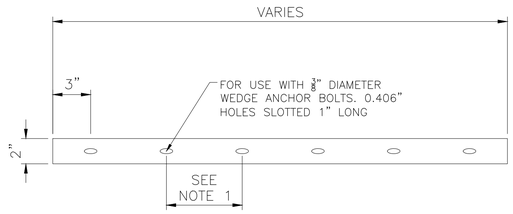


NOTES

1. CAULKING SEALANT SHALL BE PERMANENTLY ELASTIC, UV STABLE, AND COMPATIBLE WITH HDPE AND METAL SUBSTRATES IN SUBMERGED CONDITIONS.

B1 STEEL BATTON WITH CONCRETE ANCHOR

SCALE:NTS

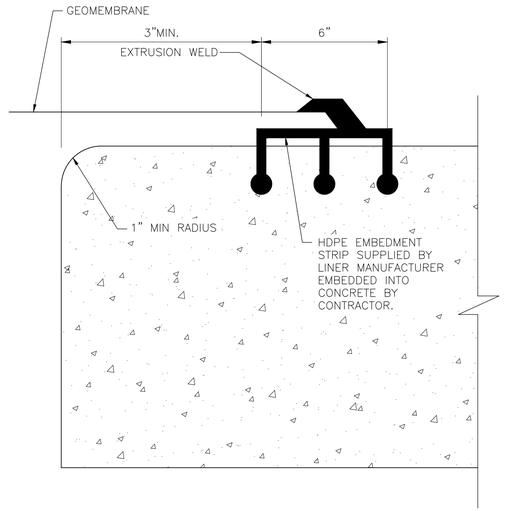


NOTES

1. HOLE SPACING TO BE 6" OC UNDER WATER AND 12" OC ABOVE WATER.
2. BATTEN BAR SHALL BE ¼" STAINLESS STEEL TYPE 304.

B2 TYPICAL STEEL BATTON

SCALE:NTS

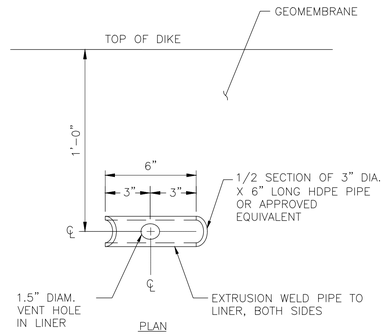


NOTES

1. MITER CUT AND EXTRUSION WELD EMBEDMENT STRIP AT CORNERS PRIOR TO PLACEMENT IN CONCRETE.

B2 HDPE EMBEDMENT STRIP

SCALE:NTS

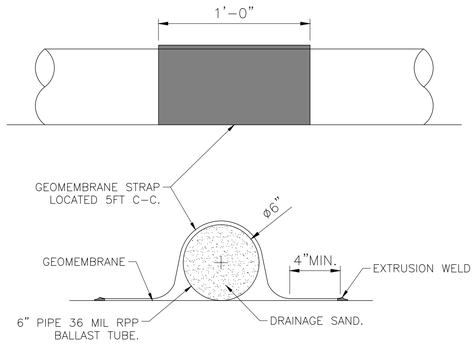


NOTES

1. AIR/GAS VENTS SHALL BE LOCATED AROUND PERIMETER OF ALL LAGOON SIDES AND IN ALL CORNERS OF LAGOON AT ±50' C-C SPACING AS SHOWN ON LINER PLAN.

D1 EXPOSED AIR/GAS VENT

SCALE:NTS



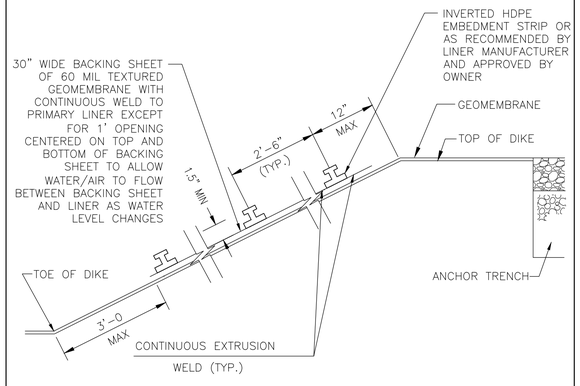
NOTES

1. BALLAST TUBES SHALL BE AT THE TOE OF THE DIKE AS SHOWN IN THE LINER PLAN.
2. FOR NON-CONTINOUS TUBING A MIN TUBE LENGTH OF 6-FT AND MAXIMUM SPACING FROM TUBE END TO END IS 5-FT

1

D2 BALLAST TUBE

SCALE:NTS

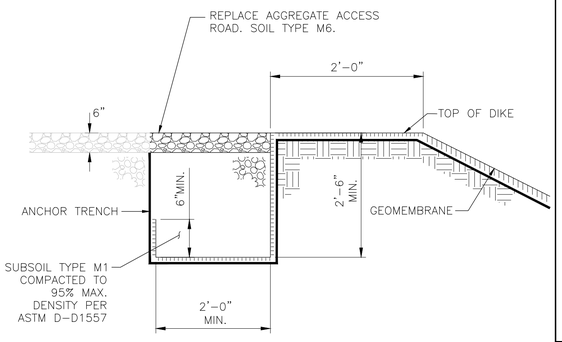


NOTES

1. SAFETY LADDERS SHALL BE LOCATED AROUND LAGOON INTERIOR PERIMETER AT ±100' C-C SPACING AS SHOWN ON LINER PLAN.
2. ATTACH RUNGS TO BACKING SHEET OFF-SITE UNDER CONTROLLED ENVIRONMENTAL CONDITIONS.

D3 LAGOON SAFETY LADDER

SCALE:NTS



D4 LINER ANCHOR TRENCH

SCALE:NTS

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Subconsultant:

BID

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#7279300-2202
GARY MICHAEL VANCE
9/26/25
STATE OF UTAH

SET

NO.	DESCRIPTION	BY	APR. DATE
1	ADDENDUM 1		9/26/2025

REVISION

LAGOON IMPROVEMENTS PROJECT
MT PLEASANT CITY

LAGOON LINER DETAILS

FILE : 93-24-009_C-501X
JUB PROJ. # :93-24-009
DRAWN BY: BWP
DESIGN BY: BWP
CHECKED BY: GV
ONE INCH
AT FULL SIZE, IF NOT ONE INCH, SCALE ACCORDINGLY
LAST UPDATED: 9/25/2025

DRAWING:
C-502

Plot Date:9/26/2025 8:41 AM Plotted By: Braxton Porter
Date Created:9/4/2025 \\JUB.COM\CENTRAL\CLIENTS\UT\MTPLEASANT\PROJECTS\93-24-009_LAGOONIMPROVEMENTS\PROJECT\DESIGN\CAD\SHEET\CIVIL (C)\93-24-009_C-501X.DWG

POWER CONDUIT SCHEDULE

P001		WIRE AND CONDUIT BY UTILITY		
P002	1	P:	3 – #1	1–1/2"
		N:	1 – #1	
		G:	NONE	
P100	1	P:	3 – #1	1–1/2"
		N:	1 – #1	
		G:	1 – #8	
P101	1	P:	3 – #1	1–1/2"
		N:	1 – #1	
		G:	1 – #8	
P102	1	P:	3 – #12	3/4"
		N:	NONE	
		G:	1 – #12	
P103	1	P:	3 – #10	3/4"
		N:	NONE	
		G:	1 – #10	
P104	1	P:	3 – #6	1"
		N:	1 – #6	
		G:	1 – #10	
P105	1	P:	2 – #12	3/4"
		N:	NONE	
		G:	1 – #12	
P301	1	PULLSTRING		1"

CONTROL CONDUIT SCHEDULE

C002	1	2 - #16 TSP G: 1 - #14	3/4"
C003	1	3 - #16 TSP G: 1 - #14	3/4"
C102	1	4 - #14 G: 1 - #14	3/4"
C103	1	6 - #14 G: 1 - #14	3/4"
C108	1	16 - #14 G: 1 - #14	1"
C201	1	MANUFACTURERS CABLE	1"
C202	1	ANTENNA CABLE	1"

LIGHTING FIXTURE SCHEDULE

TYPE	MANUFACTURER	CATALOG NUMBER	DESCRIPTION	SOURCE			ELECTRICAL		NOTES
				LUMENS	CCT	CRI	WATTS	VOLTS	
F1	LITHONIA	FEM L48 10000LM IMAFD WD MVOLT GZ10 50K 80CRI	GASKETED INDUSTRIAL, 48" LINEAR, ACRYLIC, DEEP FROSTED LENS, WIDE DISTRIBUTION, 0-10V DIMMING	10000	5000K	80	62	120-277	1,3
F2	LITHONIA	WST LED P1 30K VW 120 PE DDBXD	LED WALL PACK, DIE CAST ALUMINUM HOUSING, GLASS LENS, WIDE DISTRIBUTION, PHOTOELECTRIC CELL BUTTON TYPE, DARK BRONZE FINISH.	1500	3000K	70	12	120	2,4
F3	APPLETON RED SKY LITELUME HIGH5LED BEGHELLI VERSALED	CJLCL32CBU RND2-35-120-277-5K-120-H2-CG-GRY-PND LL-JJEP-40-50-UNV-GY HMAR-4-A-C-P-ND-5Y-FG-OPCM HZCAS150 HT HO DIM WT50 120-277V HLVP3-F-CSM 40L QT 50K 120D CGWG	EXPLOSION PROOF, HAZARDOUS LOCATION. CEILING MOUNT, 3/4" NPT HUB.	5150-5600	5000K	70	20-35	120-277	1

KEYED NOTES:

1- MOUNT AT 12'-2" A.F.F. UNLESS OTHERWISE NOTED; FIELD COORDINATE EXACT LOCATION.

2- WALL MOUNT AT 8'-4" A.F.F. UNLESS OTHERWISE NOTED; SEE ARCHITECTURAL DRAWINGS.

3- FIXTURE BY LITHONIA, METALUX, DAY-BRITE, ORACLE, COLUMBIA, HIGH5LED, HE WILLIAMS OR BEGHELLI. EQUAL DISTRIBUTION, LUMENS, AND SPECIFICATIONS.

4- FIXTURE BY LITHONIA, MCGRAW-EDISON, GARDCO, LSI, BEACON, LUMINOS GLOBAL, LUMARK OR RAYON. EQUAL DISTRIBUTION, LUMENS, AND SPECIFICATIONS.

PANEL H

VOLTAGE:	480/277 V 3Ø 4W						BUS AMPS:	125				
ENCLOSURE:	NEMA 1						MLO					
CIRCUIT BREAKER TYPE:	BOLT-ON						MOUNTING:	SURFACE				
INTERRUPTING CAPACITY:	10 KAIC						COVER TYPE:	HINGED COVER				
							LOCATION:	AS INDICATED				

BRANCH CIRCUIT BREAKER				CONNECTION	DESCRIPTION	PHASE			DESCRIPTION	CONNECTION	BRANCH CIRCUIT BREAKER			
NOTES	#	AMP	P.	LOAD (VA)		A	B	C		LOAD (VA)	P.	AMP	#	NOTES
	1	20	3	2161	INFLUENT SCREEN	4422.6			TRANSFORMER TL	2262	3	25	2	
	3	--	--	2161	------		3254.6		------	1094	--	--	4	
	5	--	--	2161	------			4086.6	------	1926	--	--	6	
	7	25	3	5000	HEATER UH-1	10000			HEATER UH-2	5000	3	25	8	
	9	--	--	5000	------		10000		------	5000	--	--	10	
	11	--	--	5000	------			10000	------	5000	--	--	12	
	13	20	3		SPARE	0			SPARE		1	20	14	
	15	--	--		------		0		SPARE		1	20	16	
	17	--	--		------			0	SPARE		1	20	18	
	19	20	3		SPARE	0			SPARE		1	20	20	
	21	--	--		------		0		SPARE		1	20	22	
	23	--	--		------			0	SPARE		1	20	24	
					PHASE SUBTOTALS (VA)	14423	13255	14087						
					PHASE TOTALS (KVA)	14.4	13.3	14.1						
					PHASE TOTALS @ 277V (AMPS)	52.1	47.9	50.9						

NOTES:

GEN PROVIDE WITH INTEGRAL SURGE PROTECTION

1

2

3

PANEL L

VOLTAGE:	208/120 V 3Ø 4W						BUS AMPS:	125				
ENCLOSURE:	NEMA 1						MAIN BREAKER AMPS	50				
CIRCUIT BREAKER TYPE:	BOLT-ON						MOUNTING:	SURFACE				
INTERRUPTING CAPACITY:	10 KAIC						COVER TYPE:	HINGED COVER				
							LOCATION:	AS INDICATED				

BRANCH CIRCUIT BREAKER				CONNECTION	DESCRIPTION	PHASE			DESCRIPTION	CONNECTION	BRANCH CIRCUIT BREAKER			
NOTES	#	AMP	P.	LOAD (VA)		A	B	C		LOAD (VA)	P.	AMP	#	NOTES
	1	20	1	150	RTU	1070			SPLIT HEAT PUMP	920	2	25	2	
	3	20	1	150	FLUME FLOW LEVEL TRANSMITTER		1070		------	920	--	--	4	
	5	20	1	210	INFLUENT SCREEN RM LIGHTING			1386	ROOFTOP EXHAUST FAN REF-1	1176	1	20	6	
	7	20	1	124	ELEC RM LIGHTING	652			DOSING PUMP	528	1	20	8	
	9	20	1	24	EXTERIOR LIGHTING		24		SPARE		1	20	10	
	11	20	1	540	RECEPTACLES			540	SPARE		1	20	12	
	13	20	1	540	RECEPTACLES	540			SPARE		1	20	14	
	15	20	1		SPARE		0		SPARE		1	20	16	
	17	20	1		SPARE			0	SPARE		1	20	18	
	19	20	1		SPARE	0			SPARE		1	20	20	
	21	20	1		SPARE		0		SPARE		1	20	22	
	23	20	1		SPARE			0	SPARE		1	20	24	
					PHASE SUBTOTALS (VA)	2262	1094	1926						
					PHASE TOTALS (KVA)	2.3	1.1	1.9						
					PHASE TOTALS @ 120V (AMPS)	18.9	9.1	16.1						

NOTES:

GEN PROVIDE WITH INTEGRAL SURGE PROTECTION

1

2

3

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Subconsultant:

HEATH
Engineering Company

PROFESSIONAL ENGINEER
11573207-2202
ROBERT J. HILLYER
9/5/25
STATE OF UTAH

NO.	DESCRIPTION	DATE	BY	APPR.
1	ADDENDUM 1	9/25/25	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

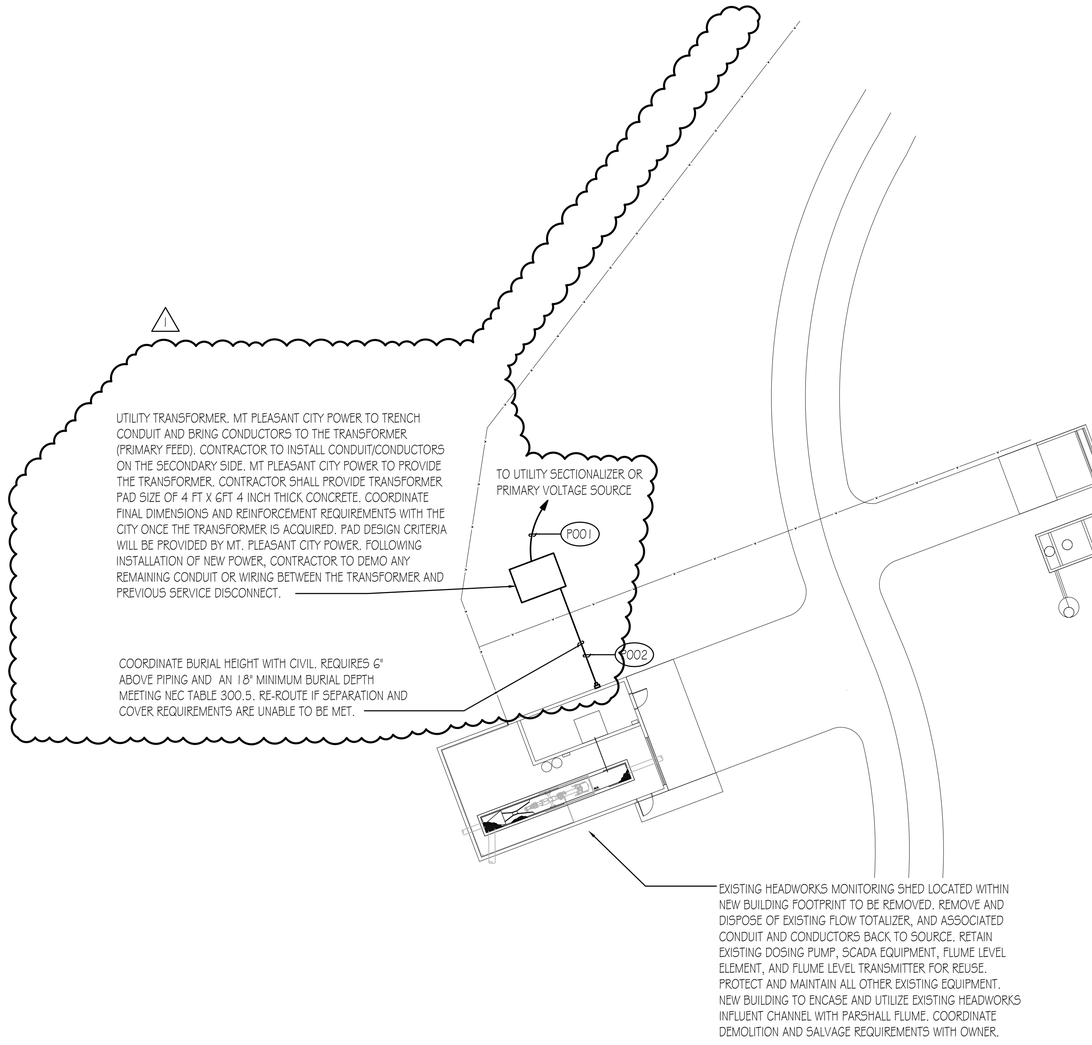
REVISION

LAGOON IMPROVEMENTS PROJECT
MT PLEASANT CITY

ELECTRICAL (E)
NEW HEADWORKS BUILDING
ELECTRICAL SYMBOL LEGEND

FILE : .
JUB PROJ. # : #########
DRAWN BY: KJB
DESIGN BY: RJK
CHECKED BY: RJK
ONE INCH
AT FULL SIZE, IF NOT ONE INCH, SCALE ACCORDINGLY
LAST UPDATED: 8/20/2025

DRAWING:
E-002



1 E-100

SITE ELECTRICAL PLAN

SCALE: 1"=15'-0"

15 7.5 0 15 30

N

J-U-B ENGINEERS, INC.

J-U-B ENGINEERS, INC.
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NO.	DESCRIPTION	DATE	BY	APP.
REVISION				
1	ADDENDUM 1	9/25/25	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

LAGOON IMPROVEMENTS PROJECT
MT PLEASANT CITY

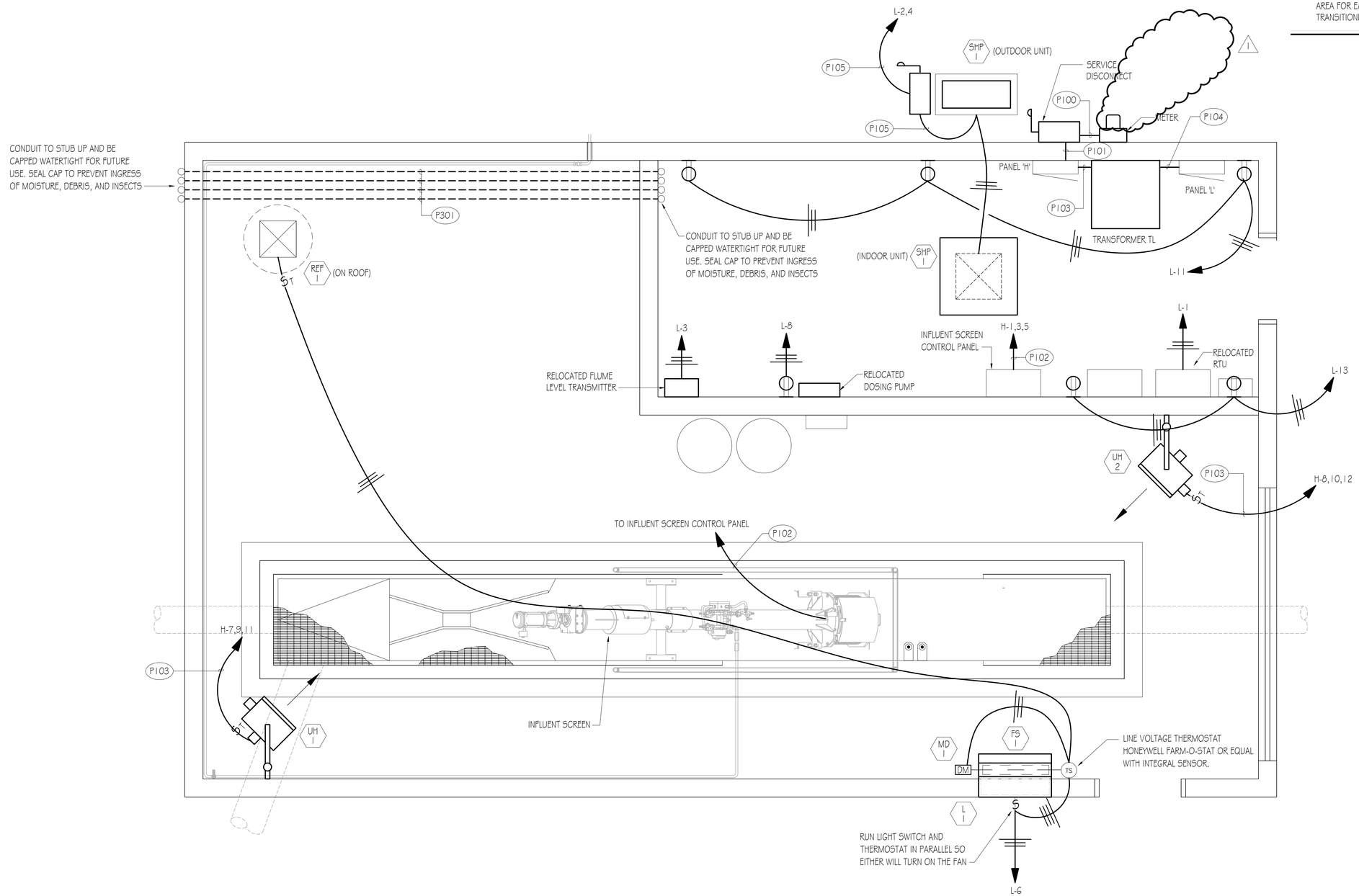
ELECTRICAL (E)
NEW HEADWORKS BUILDING
SITE PLAN

FILE : -
JUB PROJ. # : #########
DRAWN BY: KJB
DESIGN BY: RJK
CHECKED BY: RJK
ONE INCH
AT FULL SIZE, IF NOT ONE INCH, SCALE ACCORDINGLY
LAST UPDATED: 8/20/2025

DRAWING:
E-100

GENERAL NOTE:

A. PROVIDE EXPLOSION PROOF SEAL OFF WITHIN CLASSIFIED AREA FOR EACH EQUIPMENT CONDUIT BEFORE TRANSITIONING TO UNCLASSIFIED AREA.



1 / E-110 **BUILDING POWER PLAN**

SCALE: 1/2"= 1'-0"

2 0 5

N

J-U-B ENGINEERS, INC.

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Subconsultant:

HEATH Engineering Company

PROFESSIONAL ENGINEER
11573207-2202
ROBERT J. HILLYER
9/5/25
STATE OF UTAH

NO.	DESCRIPTION	DATE	BY	APPR.
1	ADDENDUM 1	9/25/25	-	-

REVISION

LAGOON IMPROVEMENTS PROJECT MT PLEASANT CITY

ELECTRICAL (E) NEW HEADWORKS BUILDING POWER PLAN

FILE : .
JUB PROJ. # : ##########
DRAWN BY: KJB
DESIGN BY: RJK
CHECKED BY: RJK

ONE INCH
AT FULL SIZE, IF NOT ONE INCH, SCALE ACCORDINGLY

LAST UPDATED: 8/20/2025

DRAWING:

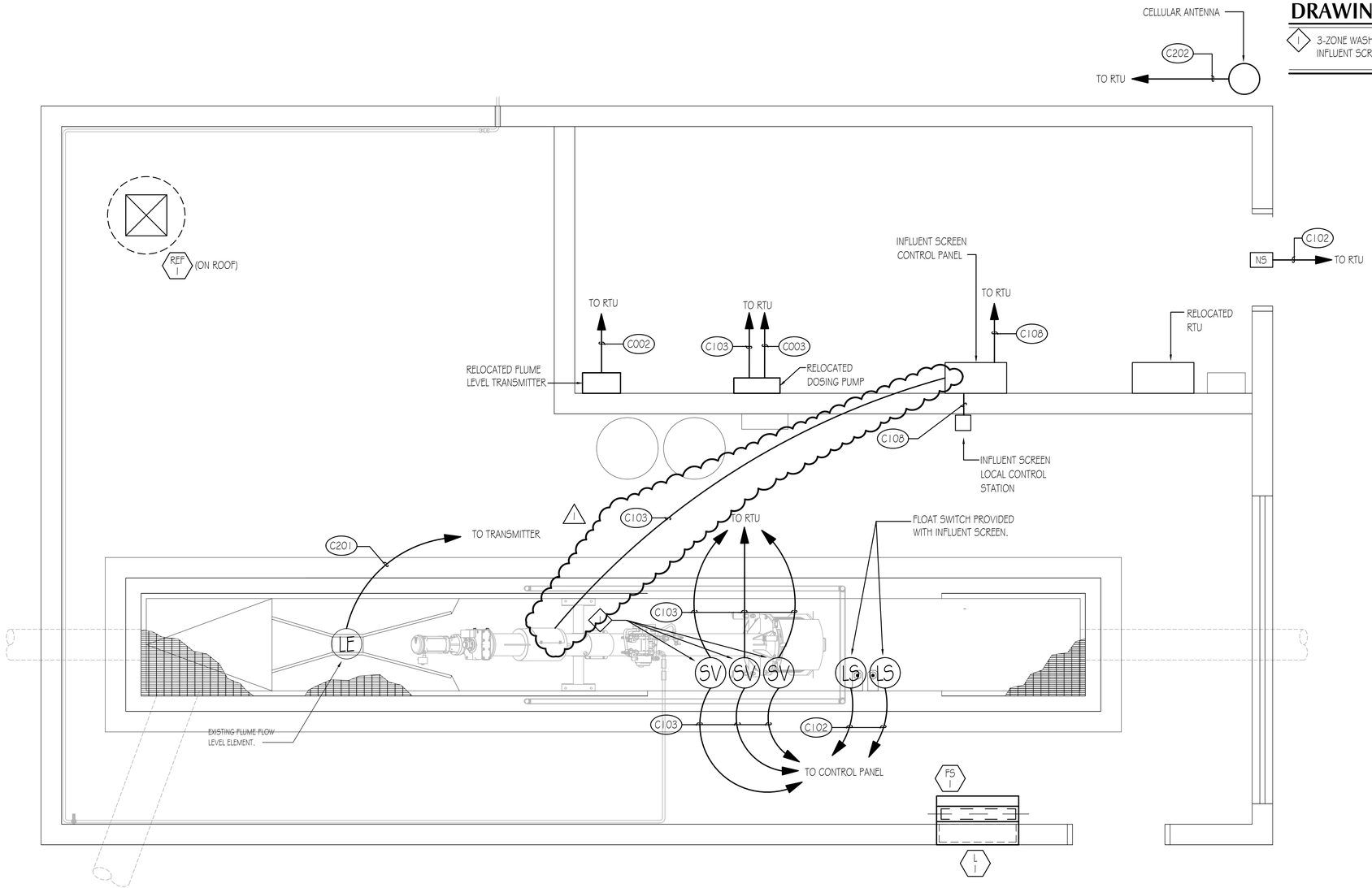
E-110

GENERAL NOTE:

A. PROVIDE EXPLOSION PROOF SEAL OFF WITHIN CLASSIFIED AREA FOR EACH EQUIPMENT CONDUIT BEFORE TRANSITIONING TO UNCLASSIFIED AREA.

DRAWING NOTES

1. 3-ZONE WASH SYSTEM SOLENOID VALVE PROVIDED WITH INFLUENT SCREEN



1 E-111 **BUILDING CONTROLS PLAN**

SCALE: 1/2" = 1'-0"

2 0 5

N

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J-U-B ENGINEERS, INC.
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Salt Lake City, UT 84107
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Subconsultant:

HEATH
Engineering Company

PROFESSIONAL ENGINEER
11573207-2202
ROBERT J. HILLYER
9/5/25
STATE OF UTAH

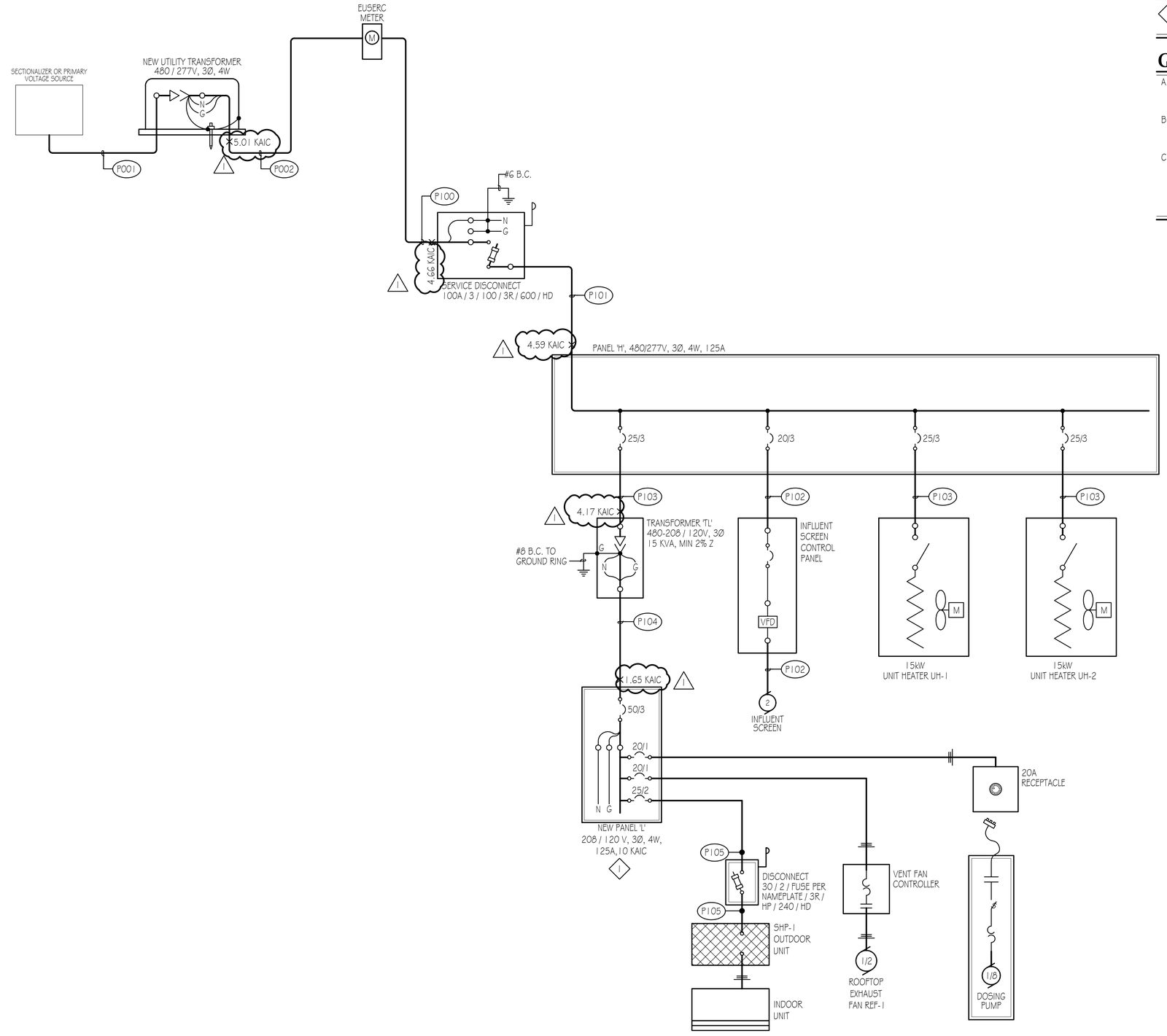
NO.	DESCRIPTION	BY	APPR.	DATE
REVISION				
1	ADDENDUM 1	-	-	9/25/25

LAGOON IMPROVEMENTS PROJECT
MT PLEASANT CITY

ELECTRICAL (E)
NEW HEADWORKS BUILDING
CONTROLS PLAN

FILE : . .
JUB PROJ. # : #########
DRAWN BY: KJB
DESIGN BY: RJK
CHECKED BY: RJK
ONE INCH
AT FULL SIZE, IF NOT ONE INCH, SCALE ACCORDINGLY
LAST UPDATED: 8/20/2025

DRAWING:
E-111



POWER ONE-LINE DIAGRAM

1 / E-14 SCALE: NONE

DRAWING NOTES

1. SEE PANEL SCHEDULE FOR ADDITIONAL LOADS

GENERAL NOTES

A. THERE ARE NO HAZARDOUS (CLASSIFIED) LOCATIONS WITHIN THIS PROJECT.

B. COMPLETED WIRING INSTALLATION SHALL BE FREE FROM SHORT CIRCUITS AND GROUND FAULTS.

C. SERVICE EQUIPMENT SHALL BE MARKED IN THE FIELD WITH THE AVAILABLE FAULT CURRENT IN ACCORDANCE WITH NEC 110.24. ALSO REFER TO SPECIFICATION 26 05 07-ELECTRICAL POWER SYSTEM STUDIES FOR FAULT CURRENT EQUIPMENT MARKING REQUIREMENTS.

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Subconsultant:

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ROBERT J. HILLYER
9/5/25
STATE OF UTAH

NO.	DESCRIPTION	DATE	BY	APPR.
1	ADDENDUM 1	9/25/25	-	-

LAGOON IMPROVEMENTS PROJECT
MT PLEASANT CITY

ELECTRICAL (E)
NEW HEADWORKS BUILDING
ELECTRICAL ONE-LINE DIAGRAM

FILE : -
JUB PROJ. # : ##########
DRAWN BY: KJB
DESIGN BY: RJK
CHECKED BY: RJK
ONE INCH
AT FULL SIZE. IF NOT ONE INCH, SCALE ACCORDINGLY
LAST UPDATED: 8/20/2025

DRAWING:
E-601