

DOCUMENT 00 90 10

ADDENDUM No. 5

PART 1 GENERAL

1.0 DOCUMENT INCLUDES

- A. Changes to Specifications
- B. Changes to Plan Set
- C. Clarifications and Responses to Questions

1.1 CONSTRUCTION CONTRACT

- A. The Construction Contract is known as: *Mountain Green BNR Wastewater Treatment Plant*
- B. Date of this Addendum: 2/17/2023.
- C. All other provisions in the contract to remain in full force and effect.

PART 2 CHANGES TO BID DOCUMENTS

- 2.0** No Changes.

PART 3 CHANGES TO SPECIFICATIONS

- 3.0** Revised Section 02951SP – Geomembrane Liner

PART 4 CHANGES TO PLAN SET

4.0

- 1) Civil Drawings
 - i. CU-202, CU-203.
- 2) Electrical Drawings
 - i. E-206, E-403.

PART 5 ITEMS OF DISCUSSION

The following is a response to questions received from contractors and suppliers.

5.0 Clarifications and Response to Comments

- 1) Clarification:
Regarding Question 9) on Addendum #3, ALL contractors are required to provide a completed bid form with each schedule of values line item with bid submission.

- 2) Question:

1. Owner Purchase Equipment Lead Times – Please provide the lead times for the owner purchased equipment.

Response:

<u>Equipment</u>	<u>Manufacturer</u>	<u>Lead Time</u>
Screen	Huber	30 Weeks
Grit Removal	Huber	30 Weeks
Filter	Kruger(Veolia)	32 Weeks
UV	EN AQUA	16-20 Weeks
Digester	EDI (Nexom)	8-10 Weeks
Clarifier	WesTech	32 Weeks

- 3) Question:

We have a little bit of a concern with the current route of line 15 (BNR.O to CL). Right now the line is going on the berm between ponds 2&3. This berm is only 15' wide at the top and the line is 10'+ deep through here. The temporary bypass between ponds 1&3 will be located in the center of this berm as well during install. Our concern is that this will be a very difficult installation without affecting the ponds or the bypass line. Would the attached re-rout be an option? We could adjust to an open shoring option on both ends to accommodate install of line #15 as well as change the bypass route the existing pond #3 outlet line.

Response: We agree with this concern and will change the plans to show line 15 going around the cells, rather than between them. See revised sheet CU-202 and CU-203.

- 4) Question:

The profile for the 24" line CU-203 does not match with profile and plan view. I think the Match Sheet was not taken account of. Please clarify.

Response: Profile on CU-203 is the right profile, it just has an extra 50 ft (29+50 – 30+00). See updated sheet attached.

- 5) Question:

Can you provide some clarification regarding buried hardware for MJ Restraints & bell harnesses?

15120.2.10- States all SS316 hardware unless otherwise noted
15110.2.11.3 Fasteners- manufacturer standard hardware

If we are going off 15110.2.11.3 this would be alloy hardware as MFG standard. There is a big price difference between AIS SS316 & AIS alloy, please advise which one is required for buried as we see these two spec call outs.

Response: Following 15110.2.11.3, buried hardware should be bid as AIS alloy.

6) Question:

In regards to the geomembrane liner, some clarifications have been made.

Response: Geomembrane liner shall be an Enviroliner 6040 with a 12 oz Geotextile. This is a single liner system, as such no spark test shall be required. Please see revised Specification 02951SP attached.

7) Question:

1. 16010.3.8 (H)(6) it says that 'buried conduit shall be placed @ 18" below grade, then filled to grade with flowable concrete'. Does this mean all of the underground conduits on site need to be concrete filled?:
2. Concerning specification(s) 16010.2.5 (A)(3) and 16010.2.5 (D)(4). They contradict, with one saying that rigid metal conduit shall be used for underground and under slab installations and the other saying that PVC schedule 40 is to be used. Can this please be clarified?

Response:

1. **Specification 16010 – Remove paragraph 16010.3.8(H)(6) and 16010.3.8(H)(7).**
2. **Consider 16010.2.5(D)(4) as allowing PVC. Section (A)(3) should read 'may' be used...**

8) Question:

Is fire alarm required anywhere? Not seen in plans.

Response: No fire alarm required.

9) Clarification:

The cost of instrumentation and the SCADA control panel shall not be included for bidding purposes. Please include all necessary implementation outside of SKM's provided scope of work in Addendum #4.

Enclosure:

- 1) Section 02951SP – Geomembrane Liner
- 2) Revised Civil Sheets CU-202 and CU-203

3) Revised Electrical Sheets E-206 and E-403

02951SP GEOMEMBRANE LINER

2951.1 GENERAL

2951.1.1 SCOPE

This specification covers the technical requirements for the Manufacturing and Installation of the geomembrane. All materials meet or exceed the requirements of this specification, and all work will be performed in accordance with the procedures provided in these project specifications

2951.1.2 REFERENCES

- A. American Society for Testing and Materials (ASTM)
 - 1. D 1004 Test Method for Initial Tear Resistance of Plastic Film and Sheet
 - 2. D 1238 Standard Test Method for Flow Rates of Thermoplastics by Extrusion Plastometer
 - 3. D 1505 Test Method for Density of Plastics by the Density-Gradient Technique
 - 4. D 1603 Test Method for Carbon Black in Olefin Plastics
 - 5. D 3895 Standard Test Method for Oxidative-Induction Time of Polyolefins by Differential Scanning Calorimetry
 - 6. D 4218 Standard Test Method for Determination of Carbon Black in Polyethylene Compounds
 - 7. D 4833 Standard Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products
 - 8. D 5199 Standard Test Method for Measuring Nominal Thickness of Geotextiles and Geomembranes
 - 9. D 5397 Standard Test Method for Evaluation of Stress Crack Resistance of Polyolefin Geomembranes Using Notched Constant Tensile Load Test
 - 10. D 5596 Standard Test Method for Microscopic Evaluation of the Dispersion of Carbon Black in Polyolefin Geosynthetics
 - 11. D 5994 Standard Test Method for Measuring Core Thickness of Textured Geomembranes
 - 12. D 6392 Standard Test Method for Determining the Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods
 - 13. D 6693 Standard Test Method for Determining Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes
- B. Geosynthetic Research Institute
 - 1. GRI GM 13 Test Properties, Testing Frequency and Recommended Warranty for High Density Polyethylene (HDPE) Smooth and Textured Geomembranes
 - 2. GRI GM 17 Test Properties, Testing Frequency and Recommended Warranty for Linear Low Density Polyethylene (LLDPE) Smooth and Textured Geomembranes

2951.1.3 DEFINITIONS

- A. Lot - A quantity of resin (usually the capacity of one rail car) used in the manufacture of geomembranes. Finished roll will be identified by a roll number traceable to the resin lot used.
- B. Construction Quality Assurance Consultant (CONSULTANT) - Party, independent from MANUFACTURER and INSTALLER that is responsible for observing and documenting activities related to quality assurance during the lining system construction.
- C. ENGINEER- The individual or firm responsible for the design and preparation of the project's Contract Drawings and Specifications.
- D. Geomembrane Manufacturer (MANUFACTURER) - The party responsible for manufacturing the geomembrane rolls.
- E. Geosynthetic Quality Assurance Laboratory (TESTING LABORATORY) - Party, independent from the OWNER, MANUFACTURER and INSTALLER, responsible for conducting laboratory tests on samples of geosynthetics obtained at the site or during manufacturing, usually under the direction of the OWNER.
- F. INSTALLER- Party responsible for field handling, transporting, storing, deploying, seaming and testing of the geomembrane seams.
- G. Panel- Unit area of a geomembrane that will be seamed in the field that is larger than 100 ft².

- H. Patch - Unit area of a geomembrane that will be seamed in the field that is less than 100 ft².
- I. Subgrade Surface - Soil layer surface which immediately underlies the geosynthetic material(s).

2951.1.4 SUBMITTALS POST-AWARD

1. Section 01 33 00; Submission Procedures
2. Product Data:
 - a. Provide specification sheets for geomembrane
 - b. Provide mill test reports for geomembrane roll stock used to make liner
 - c. Provide shop test reports for each fabricated panel produced
 - d. Provide field test reports for all welds completed in the field

2951.1.5 QUALITY ASSURANCE

- A. The OWNER will engage and pay for the services of a Geosynthetic Quality Assurance Consultant and Laboratory to monitor geomembrane installation.

2951.1.6 QUALIFICATIONS

1. The Geomembrane Installer shall have at least three years experience in the installation of the geomembrane. The Geomembrane Installer shall have installed at least 500,000 m² (5,000,000 ft²) geomembrane during the last three years.
2. Geomembrane Installer shall be certified by the geomembrane manufacturer and follow manufacturer's installation specifications

2951.1.7 MATERIALS

Geomembrane:

1. Geomembrane material
 - Enviro Liner 6040 coextruded material with one white and one black surface and a black core layer.
2. Surface: Smooth, no striations, gels, pinholes or bubbles.
3. Thickness (ASTM D 5199): Avg. thickness must exceed value with no individual reading lower than 10% below the average: 1.00 mm (40 mil; 0.040 inches).
4. Maximum Membrane Density (ASTM D792 or ASTM D1505): ≤ 0.939 g/cc.
5. Minimum Tensile Properties (ASTM D638 or ASTM D6693): Machine direction and perpendicular to machine direction average values on the basis of five (5) test specimens each direction:
 - a. Break Strength: 31 kN/m (180 lb/in).
 - b. Break Elongation: 1000% calculated from a gauge length of 38mm (1.5").
6. Minimum Trapezoidal Tear Resistance (ASTM D4533): 400 N (90 lb).
7. Minimum Puncture Resistance (ASTM D4833): 298 N (67 lb).
8. Total Pigment Content: $>2.0\%$
 - a. Includes both carbon black and white pigments (when present)
 - b. Measured by Carbon Black content test ASTM D6370 (or D4218)
9. Carbon Black Dispersion (ASTM D5596):
 - a. Measured on black layers only
 - b. Carbon Black dispersion for 10 different views:
 - c. Minimum nine views in categories 1 or 2 and 1 view in Category 3.
10. High Pressure Oxidative Induction Time (ASTM D5885):
 - a. Minimum 2000 minutes.
11. Stress Crack Resistance under Constant Load (ASTM D5397): Minimum 1000 hours.
12. UV Resistance (ASTM D4329) MATERIAL LABELING, DELIVERY, STORAGE AND HANDLING
 - a. Minimum 90% strength retained after 30,000 hours testing
 - i. Testing performed on 0.75mm (30 mil) specimen
 - ii. Irradiance of 0.90 w/m at a wavelength of 310 nm
 - iii. Alternating 10 hour UV cycles at 60C followed by 2 hour condensation cycles at 50C
13. Axi-Symmetric Break Resistance (ASTM D5617)
 - a. Minimum: 50%
14. Methane Permeability (ASTM D1434 tested on EL 6030)
 - a. Transmission Rate: $<2.11 \times 10^{-4}$ m³/(m² • day)

15. Solvent Vapour Transmission (ASTM D814 tested on EL 6040):
 - a. ASTM Fuel C: $\leq 10 \text{ g}/(\text{m}^2 \cdot \text{hr})$
 - b. Ethanol: $\leq 10 \text{ g}/(\text{m}^2 \cdot \text{hr})$
 - c. Methanol: $\leq 10 \text{ g}/(\text{m}^2 \cdot \text{hr})$
 - d. ASTM IRM 903: $\leq 10 \text{ g}/(\text{m}^2 \cdot \text{hr})$
 16. Shop Seam Properties (ASTM D6392):
 - a. Shear Strength: 10.5 kN/m (60 lb/in).
 - b. Peel Strength: 8.8 kN/m (50 lb/in).
 17. Field Seam Properties (ASTM D6392):
 - a. Shear Strength: 7.9 kN/m (45 lb/in).
 - b. Peel Strength: 7.0 kN/m (40 lb/in).
- A. Labeling Roll – Each roll of geomembrane delivered to the site shall be labeled by the MANUFACTURER. The label will identify:
 - a. manufacturer's name
 - b. product identification
 - c. thickness
 - d. length
 - e. width
 - f. roll number
 - B. Labeling Boot Sleeves– Geomembrane boot sleeves delivered to the site shall be labeled by the MANUFACTURER. The label will identify:
 - a. manufacturer's name
 - b. product identification
 - c. thickness
 - e. diameter
 - B. Delivery- Boot sleeves and rolls of liner will be prepared to ship by appropriate means to prevent damage to the material and to facilitate off-loading.
 - C. Storage- The on-site storage location for geomembrane material, provided by the CONTRACTOR to protect the geomembrane from punctures, abrasions and excessive dirt and moisture for should have the following characteristics:
 - a. level (no wooden pallets)
 - b. smooth
 - c. dry
 - d. protected from theft and vandalism
 - e. adjacent to the area being lined
 - D. Handling- Materials are to be handled so as to prevent damage.

2951.1.8 WARRANTY

1. Section 01 78 10: Warranties
2. Provide a manufacturer's pro-rated weathering warranty for Enviro Liner 6040
3. Twenty five (25) years for black-surfaced geomembrane in manufacturer's approved application.
4. Fifteen (15) years for white-surfaced geomembrane in manufacturer's approved applications.

2951.1.9 EQUIPMENT

- A. Welding equipment and accessories shall meet the following requirements:
 1. Gauges showing temperatures in apparatus such as extrusion welder or fusion welder shall be present.
 2. An adequate number of welding apparatus shall be available to avoid delaying work.
 3. Power source must be capable of providing constant voltage under combined line load.

2951.1.10 DEPLOYMENT

- A. Assign each panel a simple and logical identifying code. The coding system shall be subject to approval and shall be determined at the job site.
- B. Visually inspect the geomembrane during deployment for imperfections and mark faulty or suspect areas.
- C. Deployment of geomembrane panels shall be performed in a manner that will comply with the following guidelines:

1. Geomembranes shall be installed according to site-specific specifications, and GSE Conductive should be installed with the Conductive layer down.
Note: A spark tester or ohm meter can be used to determine Conductive layer.
 2. Unroll geomembrane using methods that will not damage geomembrane and will protect underlying surface from damage (spreader bar, protected equipment bucket).
 3. Place ballast (commonly sandbags) on geomembrane which will not damage geomembrane to prevent wind uplift.
 4. Personnel walking on geomembrane shall not engage in activities or wear shoes that could damage it. Smoking will not be permitted on the geomembrane.
 5. Do not allow heavy vehicular traffic directly on geomembrane. Rubber-tired ATV's and trucks are acceptable if wheel contact is less than 8 psi.
 6. Protect geomembrane in areas of heavy traffic by placing protective cover over the geomembrane.
- D. Sufficient material (slack) shall be provided to allow for thermal expansion and contraction of the material.

2951.1.11 FABRICATION

1. Set Up
 - a. Carefully transfer rolls of geomembrane from storage to unwinding rack.
 - b. The floor or table must be clean, dry, and free of foreign objects that could damage the liner.
 - c. Pull panels to specified length, after double-checking dimensions on the work order.
 - d. Ensure seaming equipment is in good repair and functioning properly. Ensure equipment is adjusted to the material.
 - e. Follow documented welding procedures.
2. Qualification Seams
 - a. Prepare and test qualification seams at the frequency required in ASTM D7982
 - b. The qualification seam must be run using the same material and equipment that will be used for fabrication.
 - c. Machine conditions and operator used for fabrication must be the same as those used for the qualification weld.
 - d. Qualification seam must be tested in shear and peel and meet the specified requirements for the material as stated in the materials section.

2951.1.12 FIELD QUALITY ASSURANCE

- A. MANUFACTURER and INSTALLER shall participate in and conform to all terms and requirements of the Owner's quality assurance program. CONTRACTOR shall be responsible for assuring this participation.
- B. Quality assurance requirements are as specified in this Section and in the Field Installation Quality Assurance Manual if it is included in the contract.
- C. Field Testing
 1. Non-destructive testing may be carried out as the seaming progresses or at completion of all field seaming.
 - a. Vacuum Testing
 - 1) Shall be performed in accordance with ASTM D 5641, Standard Practice for Geomembrane Seam Evaluation by Vacuum Chamber.
 - b. Air Pressure Testing
 - 1) Shall be performed in accordance with ASTM D 5820, Standard Practice for Pressurized Air Channel Evaluation of Dual Seamed Geomembranes.
 - c. Spark Testing
 - 1) Shall be performed accordance with ASTM D 7240 Standard Practice for Leak Location using Geomembranes with an Insulating Layer in Intimate Contact with a Conductive Layer via Electrical Capacitance Technique (Conductive Geomembrane Spark Test).
 - d. Other approved methods.
 2. Destructive Testing (performed by CONSULTANT with assistance from INSTALLER)
 - a. Location and Frequency of Testing
 - 1) Collect destructive test samples at a frequency of one per every 500 lineal feet of seam length.
 - 2) Test locations will be determined after seaming.

- 3) Exercise Method of Attributes as described by GRI GM-14 (Geosynthetic Research Institute, <http://www.geosynthetic-institute.org>) to minimize test samples taken.
- b. Sampling Procedures are performed as follows:
 - 1) INSTALLER shall cut samples at locations designated by the CONSULTANT as the seaming progresses in order to obtain field laboratory test results before the geomembrane is covered.
 - 2) CONSULTANT will number each sample, and the location will be noted on the installation as-built.
 - 3) Samples shall be twelve (12) inches wide by minimal length with the seam centered lengthwise.
 - 4) Cut a 2-inch wide strip from each end of the sample for field-testing.
 - 5) Cut the remaining sample into two parts for distribution as follows:
 - a) One portion for INSTALLER, 12-inches by 12 inches
 - b) One portion for the Third Party laboratory, 12-inches by 18-inches
 - c) Additional samples may be archived if required.
 - 6) Destructive testing shall be performed in accordance with ASTM D 6392, Standard Test Method for Determining the Integrity of Non-Reinforced Geomembrane Seams Produced Using Thermo-Fusion Methods.
 - 7) INSTALLER shall repair all holes in the geomembrane resulting from destructive sampling.
 - 8) Repair and test the continuity of the repair in accordance with these Specifications.
3. Failed Seam Procedures
 - a) If the seam fails, INSTALLER shall follow one of two options:
 - 1) Reconstruct the seam between any two passed test locations.
 - 2) Trace the weld to intermediate location at least 10 feet minimum or where the seam ends in both directions from the location of the failed test.
 - b) The next seam welded using the same welding device is required to obtain an additional sample, i.e., if one side of the seam is less than 10 feet long.
 - c) If sample passes, then the seam shall be reconstructed or capped between the test sample locations.
 - d) If any sample fails, the process shall be repeated to establish the zone in which the seam shall be reconstructed.

2951.1.13 REPAIR PROCEDURES

- A. Remove damaged geomembrane and replace with acceptable geomembrane materials if damage cannot be satisfactorily repaired.
- B. Repair any portion of unsatisfactory geomembrane or seam area failing a destructive or non-destructive test.
- C. INSTALLER shall be responsible for repair of defective areas.
- D. Agreement upon the appropriate repair method shall be decided between CONSULTANT and INSTALLER by 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. Flap Welding- Used to extrusion weld the flap (excess outer portion) of a fusion weld in lieu of a full cap.
 6. Remove the unacceptable seam and replace with new material.
- E. The following procedures shall be observed when a repair method is used:
 1. All geomembrane surfaces shall be clean and dry at the time of repair.
 2. Surfaces of the polyethylene which are to be repaired by extrusion welds shall be lightly abraded to assure cleanliness.
 3. Extend patches or caps at least 6 inches for extrusion welds and 4 inches for wedge welds beyond the edge of the defect, and around all corners of patch material.
- F. Repair Verification
 1. Number and log each patch repair (performed by CONSULTANT).
 2. Non-destructively test each repair using methods specified in this Specification.

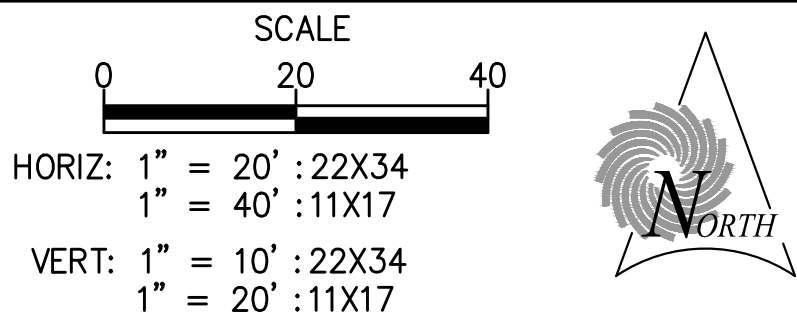
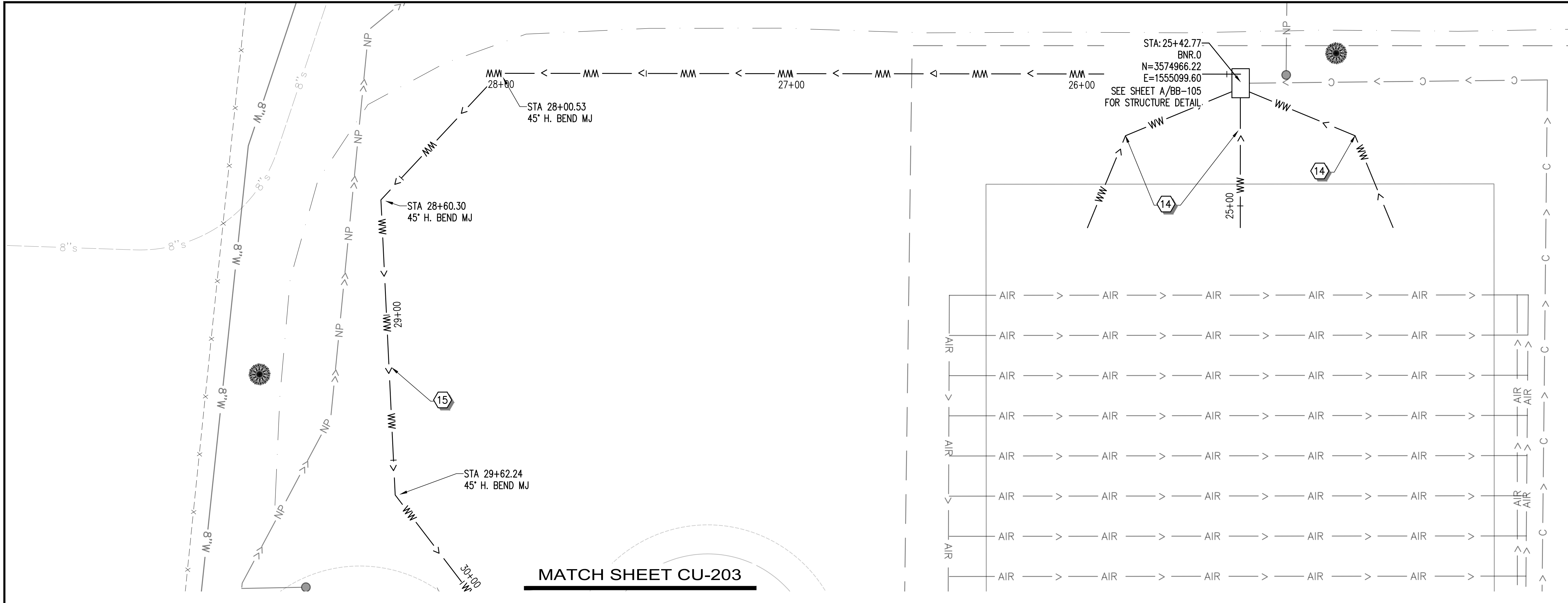
2951.1.14 METHOD OF MEASUREMENT

- A. The Geomembrane liner furnishing and installation shall per square foot, as measured parallel to the liner surface, including designed anchor trench material and its based upon net lined area.
- B. Net lined area is defined to be the true area of all surfaces to be lined plus designed burial in all anchor trenches, rubsheets, and sacrificial layers.
- C. Prices shall include full compensation for furnishing all labor, material, tools, equipment, and incidentals.
- D. **12 oz NW Geotextile** will be included in the cost of the liner and will not be a separate bid item.
- E. Prices also include doing all the work involved in performing geomembrane installation completely as shown on the Drawing, as specified herein, and as directed by the ENGINEER.

2951.1.15 BASIS OF PAYMENT

- A. When shown in the Bid Schedule as a separate item, the accepted quantities will be paid for at the contract unit price for:

PAYMENT ITEM	UNIT
Geotextile	Square Yard
Geomembrane Liner	Square Yard

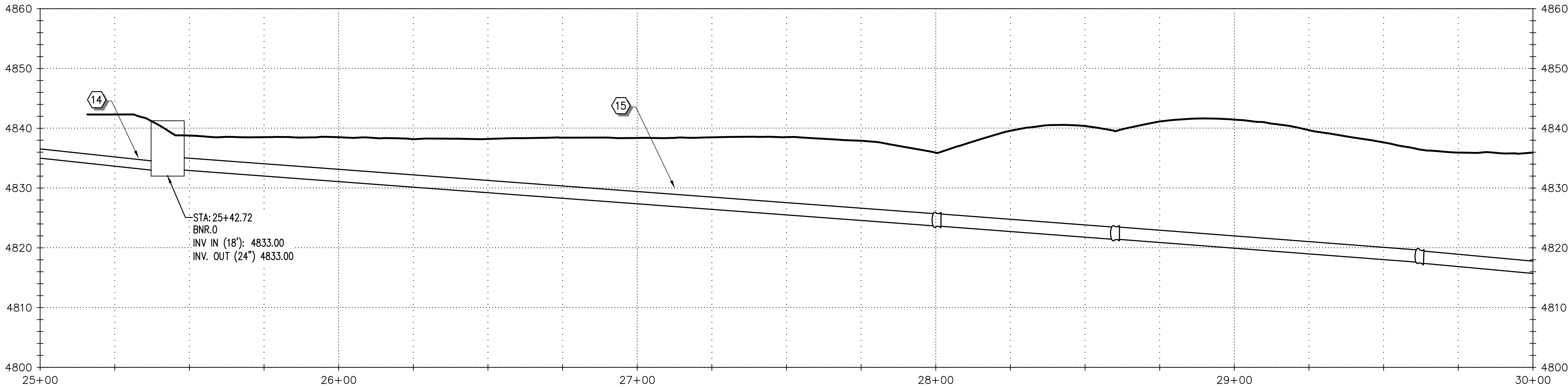


PIPE IDENTIFICATION LABELS

#	DIA.	FROM	TO	TYPE	PROFILE
1	18	MH#2	MH#3	WASTEWATER	CU-200
2	18	MH#3	MH#4	WASTEWATER	CU-200
3	24	MH#4	MH#5	WASTEWATER	CU-200
4	24	MH#5	HWV	WASTEWATER	CU-200
5	24	HWV	LS WW	WASTEWATER	CU-200
6	8	LS WW	LS VV	WASTEWATER	CU-200
7	8	LS VV	LS MV	WASTEWATER	CU-200
8	12	LS MV	BNR.V	WASTEWATER	CU-200
9	12	BNR.V	HOB	WASTEWATER	CU-201
10	24	HOB	RAS.J	WASTEWATER	CU-201
11	30	RAS.J	BNR.T	WASTEWATER	CU-201
12	20	BNR.T	BNR.H	WASTEWATER	CU-201
13	12	BNR.H	BNR.B	WASTEWATER	CU-201
14	18	BNR.B	BNR.O	WASTEWATER	CU-202
15	24	BNR.O	CL	WASTEWATER	CU-202
16	24	CL	POB	DECANT	CU-300
17	24	POB	MH EFF	EFFLUENT	CU-304
18	18	CL	HOB	RAS/WAS	CU-301
19	18	HOB	RAS.J	RAS	CU-303
20	14	HOB	ADG	WAS	CU-306
21	6	ADG	HOB	SLUDGE	CU-308
22	10	ADG	MHS#5	DECANT	CU-307
23	12	CL	MH#5	WASTEWATER	CU-401
24	3	POB	HOB	NON POTABLE	-
25	8	WM	POB	CULINARY WATER	-
26	8	POB	HOB	CULINARY WATER	-

ABBREVIATION LIST

MH#4	EX. MANHOLE #4
MH#5	EX. MANHOLE #5
HWV	HEADWORKS VAULT
LS WW	LIFT STATION WET WELL
LS VV	LIFT STATION VALVE VAULT
LS MV	LIFT STATION METER VAULT
BNR.V	BNR VALVE
HOB	HEADWORKS OPERATION BUILDING
BNR.T	BNR TEE
BNR.H	BNR HEADER
BNR.B	BNR BASIN
BNR.O	BNR OUTLET
MH WW	WASTEWATER MANHOLE
CL	CLARIFIER
MH DC	CLARIFIER DECANT MANHOLE
POB	PLANT OPERATIONS BUILDING
MH EFF	EFFLUENT MANHOLE
ADG	AEROBIC DIGESTER
MH DG	DIGESTER MANHOLE
MHS #	PROP. MANHOLE SEWER
RAS.J	RAS/BNR JUNCTION



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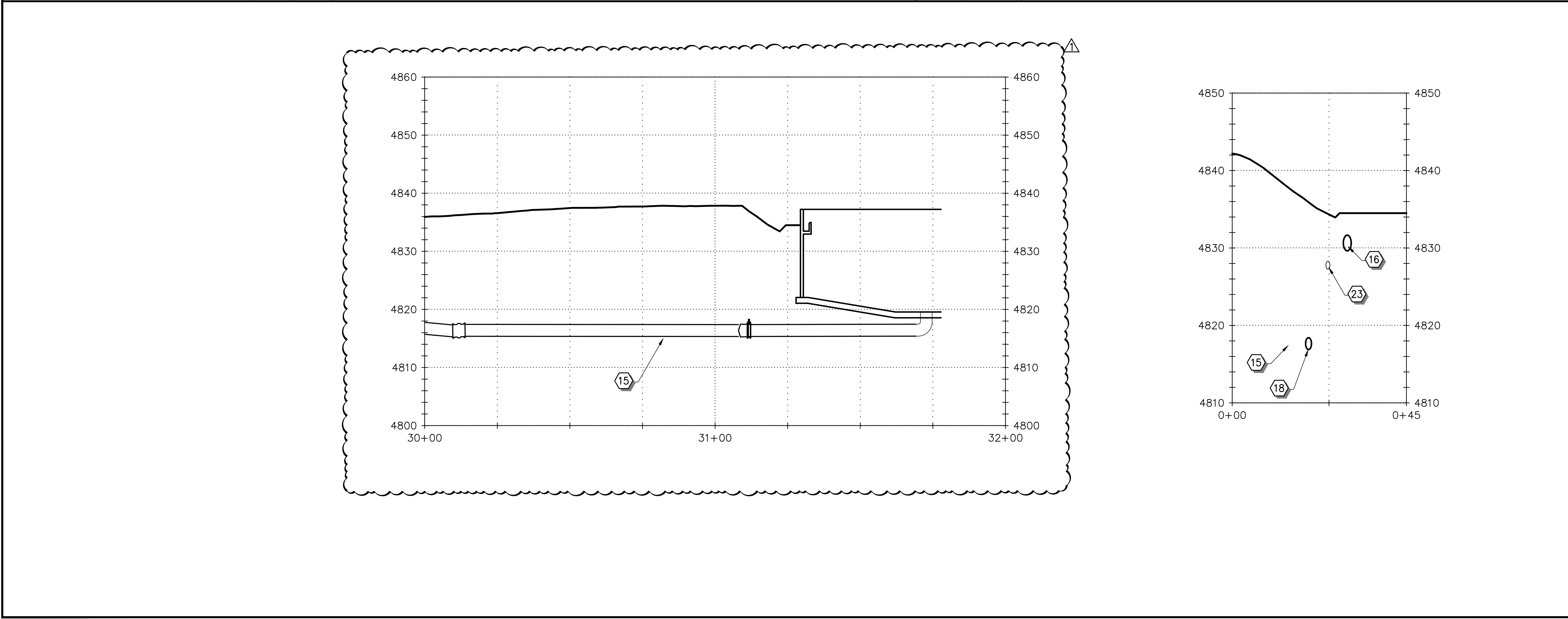
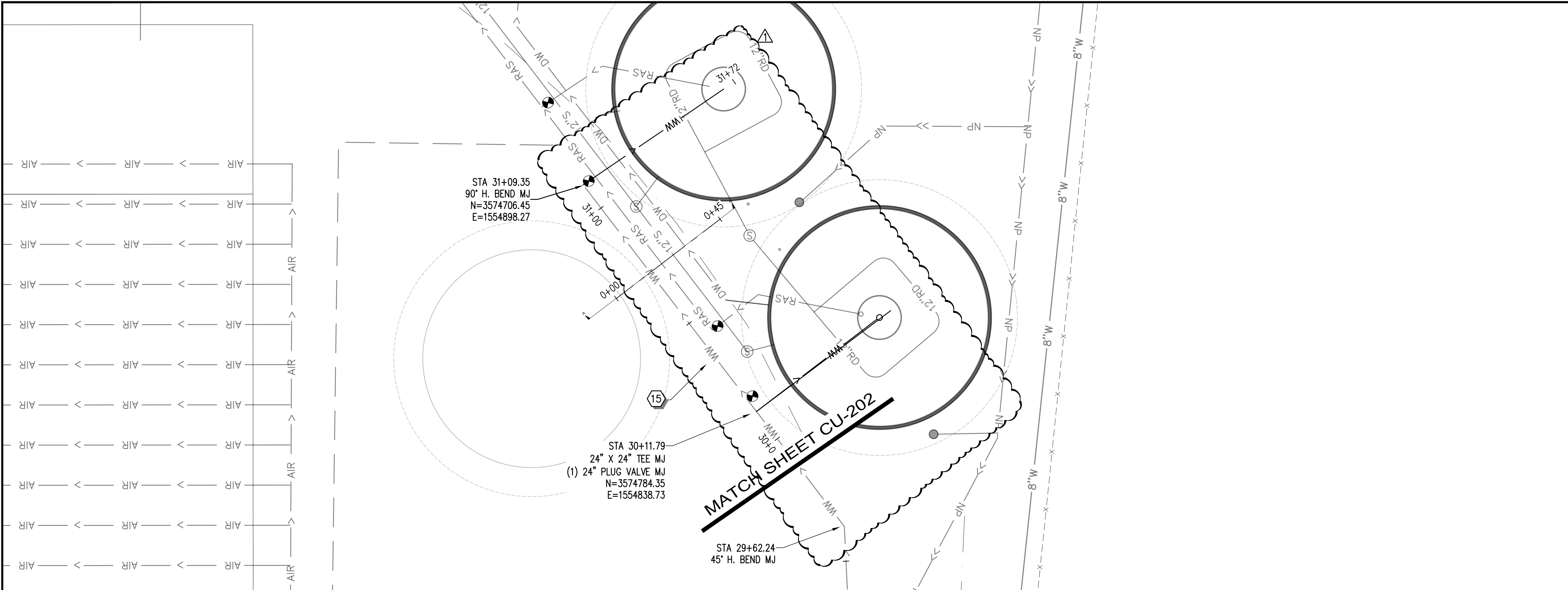
PROFESSIONAL ENGINEER
12-23-22
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MOUNTAIN GREEN SEWER IMPROVEMENT DISTRICT

BNR WWTP 2022
CIVIL UTILITIES
PROCESS PIPING – BNR.O TO CL

DESIGNED CL	DRAWN TR	CHECKED RW	SHEET NO. 50 of 249	CU-202
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SCALE

0 20 40

HORIZ: 1" = 20' :22X34
1" = 40' :11X17

VERT: 1" = 10' :22X34
1" = 20' :11X17

NORTH

#	DIA.	FROM	TO	TYPE	PROFILE
1	18	MH#2	MH#3	WASTEWATER	CU-200
2	18	MH#3	MH#4	WASTEWATER	CU-200
3	24	MH#4	MH#5	WASTEWATER	CU-200
4	24	MH#5	HWV	WASTEWATER	CU-200
5	24	HWV	LS WW	WASTEWATER	CU-200
6	8	LS WW	LS VV	WASTEWATER	CU-200
7	8	LS VV	LS MV	WASTEWATER	CU-200
8	12	LS MV	BNR.V	WASTEWATER	CU-200
9	12	BNR.V	HOB	WASTEWATER	CU-201
10	24	HOB	RAS.J	WASTEWATER	CU-201
11	30	RAS.J	BNR.T	WASTEWATER	CU-201
12	20	BNR.T	BNR.H	WASTEWATER	CU-201
13	12	BNR.H	BNR.B	WASTEWATER	CU-201
14	18	BNR.B	BNR.O	WASTEWATER	CU-202
15	24	BNR.O	CL	WASTEWATER	CU-202
16	24	CL	POB	DECANT	CU-300
17	24	POB	MH EFF	EFFLUENT	CU-304
18	18	CL	HOB	RAS/WAS	CU-301
19	18	HOB	RAS.J	RAS	CU-303
20	14	HOB	ADG	WAS	CU-306
21	6	ADG	HOB	SLUDGE	CU-308
22	10	ADG	MHS#5	DECANT	CU-307
23	12	CL	MH#5	WASTEWATER	CU-401
24	3	POB	HOB	NON POTABLE	-
25	8	WM	POB	CULINARY WATER	-
26	8	POB	HOB	CULINARY WATER	-

ABBREVIATION LIST

MH#4

EX. MANHOLE #4

MH#5

EX. MANHOLE #5

HWV

HEADWORKS VAULT

LS WW

LIFT STATION WET WELL

LS VV

LIFT STATION VALVE VAULT

LS MV

LIFT STATION METER VAULT

BNR.V

BNR VALVE

HOB

HEADWORKS OPERATION BUILDING

BNR.T

BNR TEE

BNR.H

BNR HEADER

BNR.B

BNR BASIN

BNR.O

BNR OUTLET

MH WW

WASTEWATER MANHOLE

CL

CLARIFIER

MH DC

CLARIFIER DECANT MANHOLE

POB

PLANT OPERATIONS BUILDING

MH EFF

EFFLUENT MANHOLE

ADG

AEROBIC DIGESTER

MH DG

DIGESTER MANHOLE

MHS #

PROP. MANHOLE SEWER

RAS.J

RAS/BNR JUNCTION

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12-23-22
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MOUNTAIN GREEN SEWER IMPROVEMENT DISTRICT

BNR WWTP 2022
CIVIL UTILITIES
PROCESS PIPING – BNR.O TO CL

CONDUIT AND CONDUCTOR SCHEDULE									
CONDUIT TAG	DESCRIPTION	ROUTING		CONDUIT		CONDUCTORS (CU) PER C.		VOLTAGE	REMARKS OR REFERENCE DRAWING
		FROM	TO	QTY	SIZE	(QTY) & SIZE	GND		
HEADWORKS BUILDING									
P2001	FEEDER TO MCC--HB	SB--002	MCC--HB	2	3"	(4) #350 kcmil	1	480	
P2002	FEEDER TO TRANSFORMER T2	SB--002	XFMR T2	1	2"	(3) #4/0 AWG	#4	480	
P2003	FEEDER TO PANEL LP2A	XFMR T2	PANEL LHB	1	2-1/2"	(4) #4/0 AWG	#4	480	
P2004	POWER TO PLANT SCADA PLC--HB	LHB	PLC--HW	1	3/4"	(4) #12 AWG	#12	120	
P2005	POLYMER SKID POWER	LHB	POLYMER SKID	1	3/4"	(2) #12 AWG	#12	120	
P2006	FEEDER TO DEWATERING CONTROL PANEL #1	MCC--HB	DEWATERING PANEL #1	1	3/4"	(3) #6 AWG	#10	480	
P2007	POWER TO FLOC MIXER #1	DEWATERING PANEL #1	FLOC MIXER #1	1	3/4"	(3) #12 AWG	#12	480	
P2008	POWER TO SCREW PRESS #1	DEWATERING PANEL #1	SCREW PRESS #1	1	3/4"	(3) #12 AWG	#12	480	
P2009	POWER TO SLUDGE FEED PUMP #1	DEWATERING PANEL #1	SLUDGE FEED PUMP #1	1	3/4"	(3) #12 AWG	#12	480	
P2010	POWER TO CONVEYOR #1	DEWATERING PANEL #1	CONVEYOR #1	1	3/4"	(3) #12 AWG	#12	480	
P2011	POWER TO CONVEYOR #2	DEWATERING PANEL #1	CONVEYOR #2	1	3/4"	(3) #12 AWG	#12	480	
P2012	FEEDER TO DEWATERING CONTROL PANEL #2 (FUTURE)	MCC--HB	DEWATERING PANEL #2	1	3/4"			480	CONDUIT ONLY. STUB WITH PULL STRING AND CAP FOR FUTURE USE
P2013	POWER TO FLOC MIXER #2	DEWATERING PANEL #2	FLOC MIXER #2	1	3/4"			480	CONDUIT ONLY. STUB WITH PULL STRING AND CAP FOR FUTURE USE
P2014	POWER TO SCREW PRESS #2	DEWATERING PANEL #2	SCREW PRESS #2	1	3/4"			480	CONDUIT ONLY. STUB WITH PULL STRING AND CAP FOR FUTURE USE
P2015	POWER TO SLUDGE FEED PUMP #2	DEWATERING PANEL #2	SLUDGE FEED PUMP #2	1	3/4"			480	CONDUIT ONLY. STUB WITH PULL STRING AND CAP FOR FUTURE USE
P2016	CONDUIT DELETED								
P2017	FEEDER TO DIGESTER BLOWER #1	MCC--HB	DIGESTER BLOWER #1	1	1-1/4"	(3) #1 AWG	#6	480	
P2018	CONDUIT DELETED								
P2019	FEEDER TO DIGESTER BLOWER #2	MCC--HB	DIGESTER BLOWER #2	1	1-1/4"	(3) #1 AWG	#6	480	
P2020	CONDUIT DELETED								
P2021	FEEDER TO DIGESTER BLOWER #3 (FUTURE)	MCC--HB	DIGESTER BLOWER #3 (FUTURE)	1	1-1/4"			480	CONDUIT ONLY. STUB WITH PULL STRING AND CAP FOR FUTURE USE
P2022	POWER TO RAS PUMP #1	MCC--HB	RAS PUMP #1	1	3/4"	(3) #12 AWG	#12	480	
P2023	POWER TO RAS PUMP #2	MCC--HB	RAS PUMP #2	1	3/4"	(3) #12 AWG	#12	480	
P2024	POWER TO RAS PUMP #3 (FUTURE)	MCC--HB	RAS PUMP #3 (FUTURE)	1	3/4"			480	CONDUIT ONLY. STUB WITH PULL STRING AND CAP FOR FUTURE USE
P2025	FEEDER TO GRIT REMOVAL CONTROL PANEL #1	MCC--HB	GRIT REMOVAL #1 CONTROL PANEL	1	3/4"	(3) #10 AWG	#10	480	
P2026	POWER TO GRIT COLLECTOR DRIVE MOTOR #1	GRIT REMOVAL #1 CONTROL PANEL	GRIT COLLECTOR DRIVE MOTOR #1	1	3/4"	(3) #10 AWG	#10	480	
P2027	POWER TO GRIT REMOVAL DRIVE PUMP #1	GRIT REMOVAL #1 CONTROL PANEL	GRIT REMOVAL DRIVE PUMP #1	1	3/4"	(3) #10 AWG	#10	480	
P2028	POWER TO BLOWER #1	GRIT REMOVAL #1 CONTROL PANEL	BLOWER #1	1	3/4"	(3) #10 AWG	#10	480	
P2029	POWER TO STIRRER DRIVE #1	GRIT REMOVAL #1 CONTROL PANEL	STIRRER DRIVE #1	1	3/4"	(3) #10 AWG	#10	480	
P2030	POWER TO GRIT SCREW DRIVE #1	GRIT REMOVAL #1 CONTROL PANEL	GRIT SCREW DRIVE #1	1	3/4"	(3) #10 AWG	#10	480	
P2031	FEEDER TO GRIT REMOVAL CONTROL PANEL #2	MCC--HB	GRIT REMOVAL #2 CONTROL PANEL	1	3/4"			480	CONDUIT ONLY. STUB WITH PULL STRING AND CAP FOR FUTURE USE
P2032	POWER TO GRIT COLLECTOR DRIVE MOTOR #2	GRIT REMOVAL #2 CONTROL PANEL	GRIT COLLECTOR DRIVE MOTOR #2	1	3/4"			480	CONDUIT ONLY. STUB WITH PULL STRING AND CAP FOR FUTURE USE
P2033	POWER TO GRIT REMOVAL DRIVE PUMP #2	GRIT REMOVAL #2 CONTROL PANEL	GRIT REMOVAL DRIVE PUMP #2	1	3/4"			480	CONDUIT ONLY. STUB WITH PULL STRING AND CAP FOR FUTURE USE
P2034	POWER TO BLOWER #2	GRIT REMOVAL #2 CONTROL PANEL	BLOWER #2	1	3/4"			480	CONDUIT ONLY. STUB WITH PULL STRING AND CAP FOR FUTURE USE
P2035	POWER TO STIRRER DRIVE #2	GRIT REMOVAL #2 CONTROL PANEL	STIRRER DRIVE #2	1	3/4"			480	CONDUIT ONLY. STUB WITH PULL STRING AND CAP FOR FUTURE USE
P2036	POWER TO GRIT SCREW DRIVE #2	GRIT REMOVAL #2 CONTROL PANEL	GRIT SCREW DRIVE #2	1	3/4"			480	CONDUIT ONLY. STUB WITH PULL STRING AND CAP FOR FUTURE USE
P2037	DEWATERING FLOW METER #1	DEWATERING PANEL #1	HB--M--DM--001	1	3/4"	(2) #12 AWG	#12	120	
P2038	DEWATERING FLOW METER #2	DEWATERING PANEL #2	DEWATERING FLOW METER #2	1	3/4"				CONDUIT ONLY. STUB WITH PULL STRING AND CAP FOR FUTURE USE
P2039	14" VALVE POWER	LHB--11	HB--V--APV--101	1	3/4"	(2) #12 AWG	#12	120	
P2040	14" FLOW METER POWER	LHB--10	AB--M--AM--001	1	3/4"	(2) #12 AWG	#12	120	
P2041	18" VALVE POWER	LHB--24	HB--V--BPV--001	1	3/4"	(2) #12 AWG	#12	120	
P2042	18" FLOW METER POWER	LHB--26	HB--M--BM--001	1	3/4"	(2) #12 AWG	#12	120	
P2043	POWER TO POLYMER SKID	LHB--14	POLYMER SKID	1	3/4"	(2) #12 AWG	#12	120	
P2044	CHEMICAL PUMP POWER	LHB	CHEMICAL ROOM JB--1	1	3/4"	(4) #12 AWG	#12	120	COORDINATE LOCATION OF REQUIREMENTS OF CHEMICAL PUMPS
P2045	DIGESTER VALVE #1 POWER	LHB	DIGESTER VALVE 1	1	1"	(2) #12 AWG	#12	240	
P2046	DIGESTER VALVE #2 POWER	LHB	DIGESTER VALVE 2	1	1"	(2) #12 AWG	#12	240	
P2047	EAST ZONE MANHOLE FLOW METER POWER	LHB	EAST ZONE MANHOLE FLOW METER	1	1"	(2) #12 AWG	#12	120	
P2048	MANHOLE #1 FLOW METER POWER	LHB	MANHOLE #1 FLOW METER	1	1"	(2) #12 AWG	#12	120	
P2049	DIGESTER D.O. #1 POWER	LHB	DIGESTER #1 POWER	1	1"	(2) #12 AWG	#12	120	
P2050	DIGESTER D.O. #2 POWER	LHB	DIGESTER #2 POWER	1	1"	(2) #12 AWG	#12	120	
P2051	DIGESTER D.O. #3 POWER (FUTURE)	LHB	DIGESTER #3 POWER	1	1"			120	CONDUIT ONLY. STUB WITH PULL STRING AND CAP FOR FUTURE USE
P2052	DIGESTER D.O. #4 POWER (FUTURE)	LHB	DIGESTER #4 POWER	1	1"			120	CONDUIT ONLY. STUB WITH PULL STRING AND CAP FOR FUTURE USE
P2053	DIGESTER VALVE #3 POWER (FUTURE)	LHB	DIGESTER VALVE 3	1	1"			240	CONDUIT ONLY. STUB WITH PULL STRING AND CAP FOR FUTURE USE
P2054	DIGESTER VALVE #4 POWER (FUTURE)	LHB	DIGESTER VALVE 4	1	1"			240	CONDUIT ONLY. STUB WITH PULL STRING AND CAP FOR FUTURE USE
EXISTING CONDUITS									
P001	POWER TO SCREEN, PRESS, COMPRESSOR	MCC--HB	SCREEN/PRESS CONTROL PANEL	1	1"	(6) #10 AWG	#10	480	POWER TO HW SCREEN / WASH COMPACTOR / COMPRESSOR
P001A	POWER TO SCREEN DRIVE MOTOR	SCREEN/COMPACTOR CTRL PANEL	SCREEN DRIVE MOTOR	1	3/4"	(3) #10 AWG	#10	480	
P001B	POWER TO PRESS DRIVE MOTOR	SCREEN/COMPACTOR CTRL PANEL	PRESS DRIVE MOTOR	1	3/4"	(3) #10 AWG	#10	480	
P001C	POWER TO COMPRESSOR	SCREEN/COMPACTOR CTRL PANEL	COMPRESSOR	1	3/4"	(3) #10 AWG	#10	480	
P001D	SCREEN/PRESS HEAT TRACING	SCREEN/COMPACTOR CTRL PANEL	SCREEN/PRESS HEAT TRACING	1	3/4"	(2) #12 AWG	#12	120	INSTALL PER VENDOR DRAWINGS.
P021	FEEDER TO HW LIFT PUMP #1	MCC--HB	LIFT PUMP #1 DISCONNECT SWITCH DS 021	1	1"	(3) #10 AWG (4) #12 AWG	#10	480	LIFT PUMP POWER MOISTURE/TEMP SENSOR
P021A	POWER TO HW LIFT PUMP #1	DISCONNECT 021	LIFT PUMP #1	1	2"				EXISTING MANUFACTURER SUPPLIED CABLE
P022	FEEDER TO HW LIFT PUMP #2	MCC--HB	LIFT PUMP #2 DISCONNECT SWITCH DS 022	1	1"	(3) #10 AWG (4) #12 AWG	#10	480	LIFT PUMP POWER MOISTURE/TEMP SENSOR
P022A	POWER TO HW LIFT PUMP #2	DISCONNECT 022	LIFT PUMP #2 DISCONNECT SWITCH	1	2"				EXISTING MANUFACTURER SUPPLIED CABLE
P023	FEEDER TO HW LIFT PUMP #3	MCC--HB	LIFT PUMP #3 DISCONNECT SWITCH DS 023	1	1"	(3) #10 AWG (4) #12 AWG	#10	480	LIFT PUMP POWER MOISTURE/TEMP SENSOR
P023A	POWER TO HW LIFT PUMP #3	DISCONNECT 032	LIFT PUMP #3	1	2"				EXISTING MANUFACTURER SUPPLIED CABLE
P024	POWER TO EX. FLOW METER	LP2x	FIT--024	1	1"	(2) #12 AWG	#12	120	INSPECT EXISTING CONDUCTORS. REPLACE AS NEEDED.

SHEET NOTES:

1. CONDUIT SHOWN TO EQUIPMENT LOCATION ONLY. CONTRACTOR SHALL PROVIDE FLEXIBLE CONDUIT STUBS TO EQUIPMENT, FITTINGS, MOUNTING HARDWARE AND ALL ACCESSORIES REQUIRED FOR A COMPLETE AND OPERABLE SYSTEM.
2. ROUTE CONDUIT AS NECESSARY BASED ON FIELD CONDITIONS AND TO AVOID OBSTACLES.
3. LENGTHS SHOWN IN CONDUIT SCHEDULE ARE APPROXIMATE. CONTRACTOR SHALL VERIFY ACTUAL LENGTHS PRIOR TO CONSTRUCTION.

2

1

REV NO.

ADDENDUM #5

ADDENDUM #3

COMMENT

2-15-23

2-3-23

DATE

REGISTERED PROFESSIONAL ENGINEER

23-Dec-2022

No. 362066

J. RANDALL KNAPP

STATE OF UTAH



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MOUNTAIN GREEN SEWER IMPROVEMENT DISTRICT

BNR WWTP 2022

CONDUIT AND CONDUCTOR SCHEDULE

SEI NO.

DESIGNED

DRAWN

CHECKED

SHEET NO.

S08242

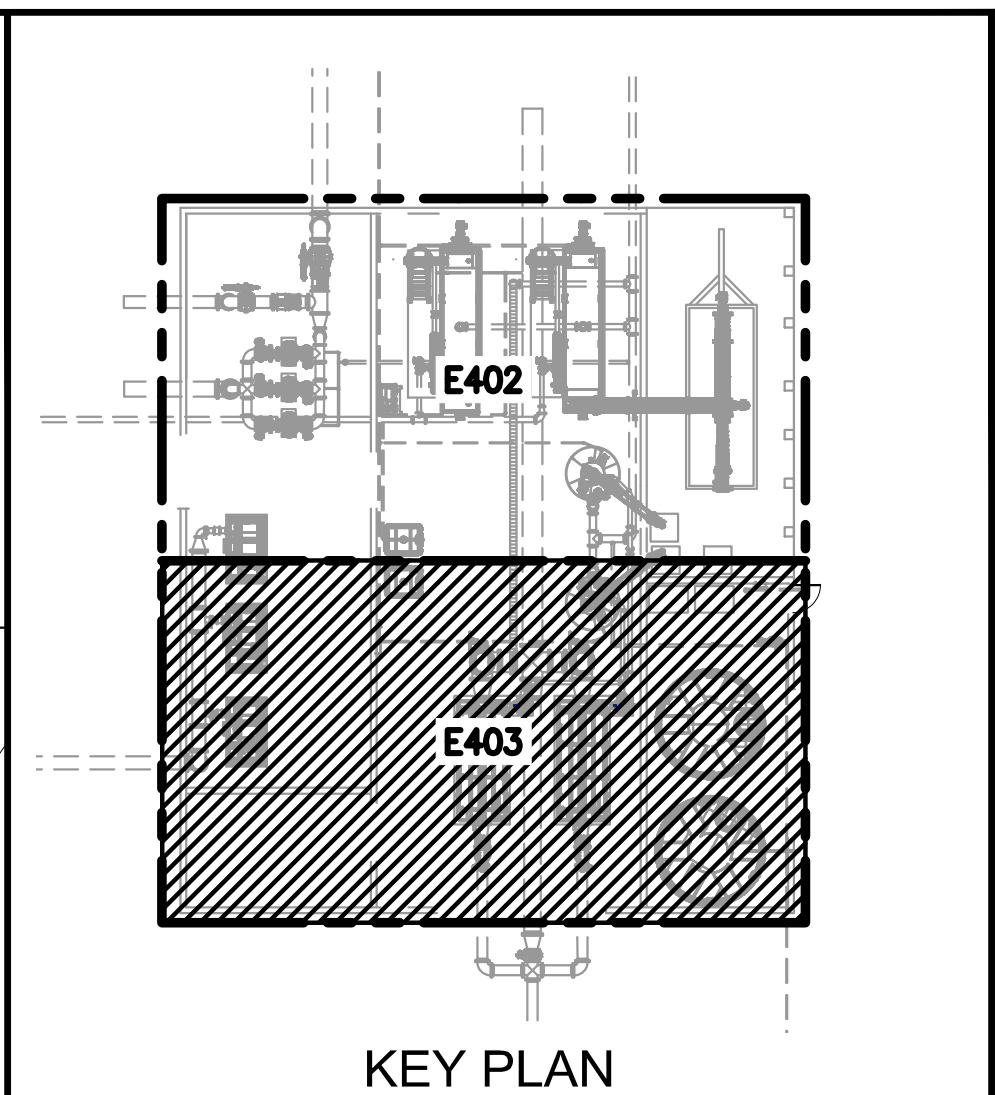
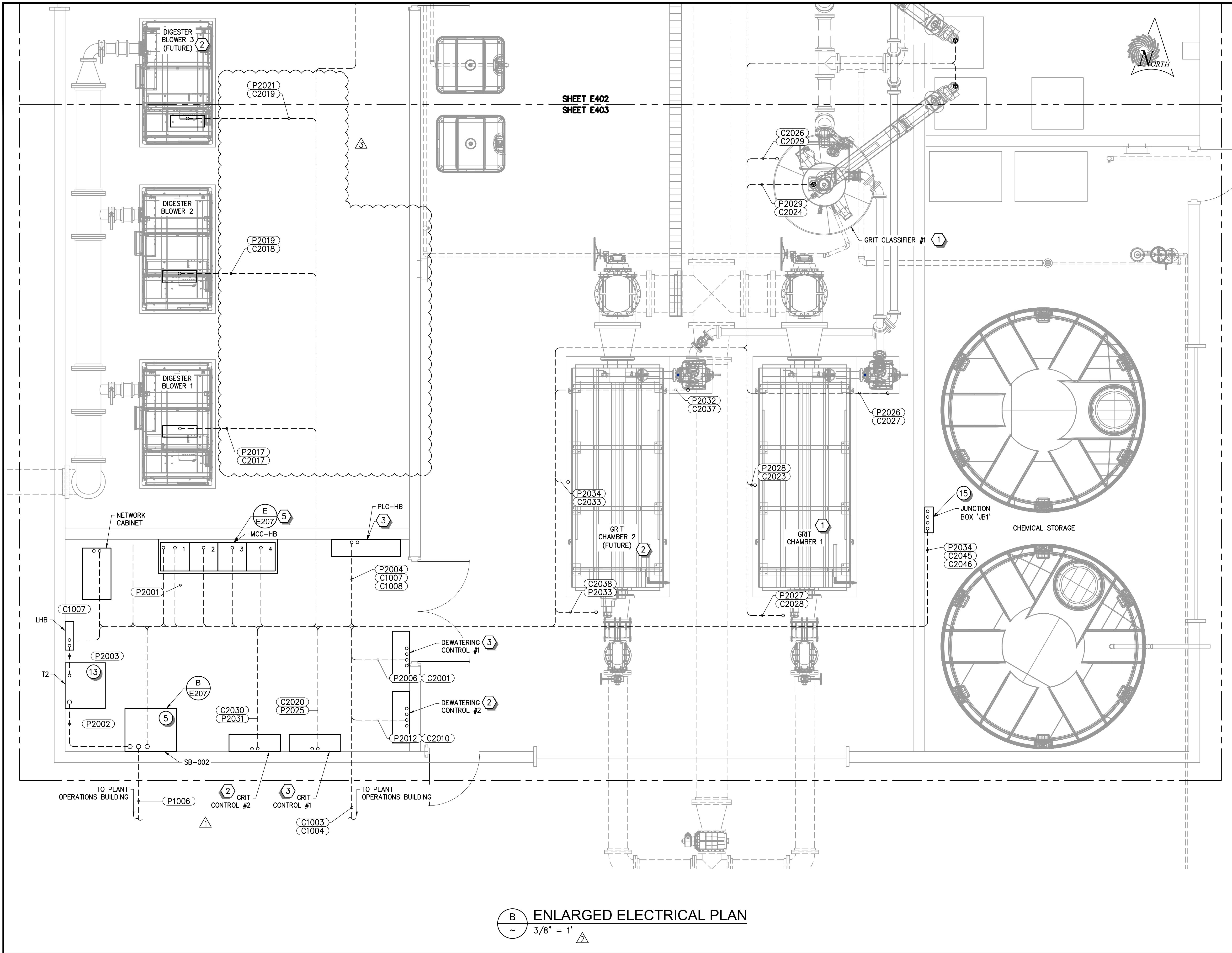
JRK

JRK

JRK

167 of 249

E-206



- KEY PLAN**
- SHEET NOTES:**
- CONTRACTOR TO COMPLY WITH GENERAL ELECTRICAL REQUIREMENTS ON DRAWING E100.
 - ALL CONDUITS ARE NOT SHOWN FOR CLARITY. REFER TO CONDUIT AND CONDUCTOR SCHEDULE FOR ADDITIONAL INFORMATION.
 - CONDUITS SHOWN ARE SCHEMATIC ONLY. CONTRACTOR SHALL FIELD ROUTE AS NECESSARY TO AVOID OBSTACLES AND OTHER EQUIPMENT.
 - REFER TO DRAWING E204-E208 FOR CONDUIT AND CONDUCTOR SCHEDULE.
 - REFER TO DRAWING E210 FOR ELECTRICAL EQUIPMENT SCHEDULE.
 - ALL CONDUCTORS SHALL BE ROUTED IN CABLE TRAY, CONDUIT SUSPENDED FROM CEILING, OR BE INSTALLED IN SURFACE MOUNTED CONDUIT. FLEX CONDUIT MAY BE USED TO STUB TO EQUIPMENT AS PERMITTED BY NEC.
 - VERIFY LOCATION OF EQUIPMENT SHOWN. COORDINATE WITH EQUIPMENT SUPPLIER FOR STUB UP LOCATIONS.

- KEY NOTES**
- FOR ALL VENDOR SUPPLIED EQUIPMENT, COORDINATE CONDUIT STUB UP LOCATIONS WITH EQUIPMENT SUPPLIER PRIOR TO INSTALLATION.
 - FUTURE EQUIPMENT. STUB AND CAP CONDUIT FLUSH WITH FINISHED FLOOR FOR FUTURE USE AS SHOWN.
 - CONTROL PANEL PROVIDED BY EQUIPMENT SUPPLIER AND INSTALLED BY CONTRACTOR. COORDINATE WITH MANUFACTURER FOR ADDITIONAL REQUIREMENTS.
 - REFER TO SCADA AND INSTRUMENTATION PLANS FOR RTU EQUIPMENT DETAILS.
 - REFER TO CONDUIT SCHEDULE FOR MCC-HB CONDUIT DETAILS.

3	ADDENDUM #5	2-15-23
2	ADDENDUM #4	2-7-23
1	ADDENDUM #3	2-3-23
REV NO.	COMMENT	DATE

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MOUNTAIN GREEN SEWER IMPROVEMENT DISTRICT				
BNR WWTP 2022				
HP POWER AND CONTROL PLAN				
SEI NO. S08242	DESIGNED JRK	DRAWN JRK	CHECKED JRK	SHEET NO. 182 of 249
				E-403

B ENLARGED ELECTRICAL PLAN
~ 3/8" = 1' ~

P:\Mountain Green WWTP - Final Design\Electrical\Wwg\Electrical HB Power & Control Plan.dwg Feb 15, 2023 2:55pm rknap