Date: 12/3/2021

To: Prospective Proposers

Subject: Addendum No. 2
Responses to Pre-Bid Questions & Specification & Drawing Modifications

This addendum forms part of the proposal and contract documents and modifies the original solicitation documents dated 10/13/2021. Acknowledge receipt of this addendum in the space provided below. FAILURE TO DO SO MAY SUBJECT OFFEROR TO DISQUALIFICATION.

Contract Document Modifications:

1. **Bid Proposal Form Revisions** (included with Addendum No. 2)
   a. Revised BB-1: "shall not exceed 3% of base bid" was added to description.
   b. Added BB-16 Contingency Allowance for Base Bid Items
   c. Added BB-17 Electrical Allowance
   d. Added BA-5 Contingency Allowance for Alternate Bid Items

Specification Modifications:

2. Specification 01020 Allowances (included with Addendum No. 2)
3. Specification 11290 Slide Gates and Sluice Gates (included with Addendum No. 2)
4. Specification 11380 Aeration Blowers (included with Addendum No. 2): replace previous subsection with the following:
   a. Part 2, 2.2.A: General: The Screw Blowers:
      1. Kaeser
      2. Approved Substitution
5. Specification 11381 Odor Control System (included with Addendum No. 2): replace previous subsections with the following:
   a. Part 2, 1.A: General: The Drum Scrubber shall be vertical, and shall consist of chemical resistance vessel, including permanganate impregnated activated carbon media, mist/grease eliminator, sump, and all internals. Each system shall follow the following performance requirements:
   b. Part 2, 1.A.1.g: H2S removal efficiency: ≥99% or ≤0.5ppmv in discharge.
   c. Part 2, 1.B.1.a: This specification defines the requirements for a Drum Scrubber-100 cfm, as manufactured by Purafil, Inc., PureAir Filtration, and ECS or approved equal.
   d. Part 2, 1.B.1.c: The Drum Scrubber shall contain five stages of dry-scrubbing media; 3 ft^3 of Odorcarb™ Ultra and 2 ft^3 of Odormix SP as manufactured by Purafil, Inc., or 3ft^3 of PureAir Sulphasorb® XL and 2 ft^3 of CPS Blend as manufactured by PureAir, or approved equal supplied by other media manufacturers meeting the following requirements:

1. Hydrogen sulfide removal capacity of the $3ft^3$ media shall be at least 0.30 g/cc. If media of lesser removal capacity is proposed, additional media shall be required to equal this volume.
2. 2 ft^3 of media shall be activated carbon with impregnated permanganate.
3. Each stage shall measure 1 ft^3, weigh no more than 50 lbs., and be contained in a media bag.

Drawing Modifications:

6. Drawing C0102 Proposed Overall Site Plan
7. Drawing C0112 Proposed Yard Piping
8. Drawing D1101 Proposed Headworks Upper Plan Elev. 30.00 ft
9. Drawing D1102 Proposed Headworks Lower Plan Elev. 5.50 ft
10. Drawing D1301 Proposed Headworks Section Sheet 1 of 2
11. Drawing D1302 Proposed Headworks Section Sheet 2 of 2
12. Drawing D7101 Proposed Disk Filters and UV Disinfection Plan
13. Drawing S1101 Headworks Foundation Plan
14. Drawing S1102 Headworks Upper Level Framing Plan
15. Drawing S1301 Headworks Section and Details Sheet 1 of 1

Questions:

16. Specification 16130: Can Calbond be added as an approved PVC coated conduit manufacturer?
    Answer: Calbond is an acceptable manufacturer.
17. Specification 13421: Can Endress & Hauser & GWF be added as an acceptable flowmeter manufacturer?
    Answer: Yes. Model W400 with 0 X DN installations.
18. Specification 13421: Can Endress & Hauser be added as an acceptable instrumentation analytical equipment manufacturer?
    Controller – CM444
    pH – CPS11D
    ORP – CPS12D
    Amm/Nitrate – CAS40D
    DO – COS61D
    Turbidity insertion – CUS51D
    Turbidity flow through – CUS52D
    Answer: No.
19. Specification 13421: Can Endress & Hauser & GWF be added as an acceptable flowmeter manufacturer?
    Answer: Yes, Endress & Hauser can be added as an acceptable flow meter.
    Answer: No, Winters cannot be added as an acceptable flow meter.

20. Specification 13421: Can Endress & Hauser be added as an acceptable level and Winters pressure instrumentation manufacturer? [Submersible FMX21, Float switch FTS20, Pressure transmitter PMP71B, Ultrasonic level/transmitter FDU90/FMU90, Pressure switch 3WPS, Pressure gage PPC series]
Answer: Yes, Endress & Hauser can be added as an acceptable level instrumentation manufacturer.
21. Specification 11377: Table 11377-02 calls out for minimum diffuser densities for the various zones that are to be aerated. There is no indication of the actual square footage of flat floor area of the various aeration zones. Please provide so we can prepare a compliant equipment proposal to Contractors.
Answer: Refer to drawings D2101 and S2101. Zone 1 area = Zone 4 area = 368.94 ft^2; Zone 2 area = Zone 3 area = 374.94 ft^2.
22. Specification 11290: Part 1.4 - Reference to AWWA C501. C501 was voided by AWWA and replaced by C560. We request that C501 references be removed. The gates on this job are stainless steel or aluminum, so truthfully, even references for C560 can be removed. Only C561 and C562 are applicable.
Answer: The specification will be modified to reference C560, C561, and C562 or the most current AWWA standard.
23. Specification 11290: Part 2.3.C calls for welding in accordance with AWS D1.1. D1.1 is only applicable to standard steel. D1.2 and D1.6 should be references for aluminum and stainless steel. D1.1 can be left in cast there are any accessories provided made of carbon steel.
Answer: The specification will be modified to reference D1.2 and D1.6.
24. Specification 11290: 2.4.B.1.c calls for the "portion of the slide that engages the frame shall have a minimum thickness of 1/2 inch". This is not AWWA nor industry standard. This is a proprietary design used by one manufacturer to try to sole source specs. This sentence eliminates the standard designs of all, except for 1 of the named manufacturers. We request that this requirement be changed to 1/4 inch, instead of 1/2 inch.
Answer: The specification will be changed to allow 1/4 inch.
25. Specification 11290: 2.4.C.1.a calls out "The guide members shall incorporate a tubular cross section along the guides for additional rigidity. Two-piece, sandwich type guides that are bolted together are not acceptable." This sentence eliminates everyone except for one gate manufacturer. None of the other named manufacturers can use our standard, industry approved and proven, designs with this wording in the spec. We request that this wording be removed in the specifications to allow other bidders.
Answer: The specification will be modified to remove the requested wording.

26. Specification 11290: 2.4.C.1.d has 2 issues that are proprietary:
    i. 13 lbs. / ft for the guides is not industry standard. Industry standard is 9-10 lbs. / ft minimum.
    ii. "The portion of the flanged frame, where the anchors penetrate, shall have a minimum thickness of 1/2-inch" This is a proprietary design, specific to one (1) manufacturer, and is not required by AWWA nor industry standards. We request that this requirement be removed to allow other bidders.

    Answer: The specification will be modified to allow 9 lbs./ft minimum.
    Answer: The specification will be changed to allow 1/4 inch where the anchors penetrate the portion of the flanged frame.

27. Specification 11290: The specifications are written solely around stainless steel gates but there is also an aluminum gate on the project. We request that for the aluminum design, it should be in accordance with AWWA C562 as well.
    Answer: See revised Specification 11290.

28. Specification 11290: 2.4.D.1.g calls out "**Gates that require disassembly of any portion of the frame to replace seals are unacceptable**". This is a proprietary design, specific to one (1) manufacturer, and is not required by AWWA nor industry standards. The rest of the manufacturers use guide and frame designs with bolted members that require retainer bars be removed to replace seals. We request that specifications be modified to allow for other manufacturers to bid.
    Answer: See revised Specification 11290.

29. Specification 11290: 2.4.A.1.d calls for anchors to be 316, but 2.4.F calls them out to be 304. Then 2.4.I.1 calls them out to be 316 again. Please clarify required material of construction for the anchors.
    Answer: See revised Specification 11290.

30. Specification 11290: 2.4.G.2.h calls out that adapter plates shall be minimum 3/4" thick. This is not an industry standard. Most manual gates only require 1/2" thick adapter plates. We would like to request to have the specifications modified to ½" thick adapter plates.
    Answer: See revised Specification 11290.

31. Specification 11333: Section 2.4A: Please confirm that a single hopper and hatch is required for the manual bar screen on compactor WC-202 only, and not on both compactors.
    Answer: Yes, a single hopper and hatch are all that's required.

32. Specification 11333: We would like to request for JWC to be an approved manufacturer for the Compactor-Washer. JWC is already approved for the drum screen equipment. Please see attached prequalification submittal from JWC.
    Answer: See Question 36 below.

33. Specification 11334: Section 2.6: What is the required depth and material thicknesses for the manual bar screen channel?
Answer: See revised detail, Sheet D1302.

34. Specification 11381: We would like to request to have ECS named in the odor control system equipment. ECS meets and the specification and does not have any exceptions. Please see attached pre-qualification submittal.
Answer: See Question 37 below.

35. Specification 15800: Part 2.2B, it calls for schedule 10 stainless steel, which would be a stainless-steel pipe. Please clarify if the requirement is a stainless-steel pipe or stainless-steel ductwork. Stainless-steel ductwork is typically at 6" w.g. It would be 20 gauge in thickness up to 30" in diameter. Will this be acceptable?
Answer: In Specifications 15800, page 15800-2, Item 2.2. B. Steel Ducts, revise wording from "All steel ducts shall be 316L stainless steel, Schedule 10." to "All steel ducts shall be 316L stainless steel, minimum 20 ga., with less than 1% leakage."

36. Specification 11333: Can JWC Environmental be pre-qualified manufacturer as an "as-equal" for the compactor-washer?
Answer: Yes, JWC is approved as a compactor-washer manufacturer.

37. Specification 11381: Can ECS Environmental Solutions be added to the named vendors for the odor control system?
Answer: Yes, ECS is approved as an odor control manufacturer.

38. Specification 11215: MTS manufactures our own fiberglass pipe for our products. Can we substitute our filament wound pipe in lieu of the specified commodity pipe? Our pipe is manufactured to ASTM D2996-88. Our manufactured pipe exceeds the requirement of ASTM D2996RTRP 12 EU-3111. We cannot provide the certificate the specified pipe is a commodity pipe.
Answer: Yes.

39. Specification 15139: Section 15139.2.3.B Swing Check Valves, 4-inch and Larger: We request the addition of GA Industries Model 220-DS and Kennedy Model 1106LW. (Kennedy and M&H are the same valve by McWane Corp, No exceptions to specification)
Answer: Specification 15139 will be modified to allow the requested manufactures.

40. Specification 15139: Section 15139.2.5.A ECCENTRIC PLUG VALVE (PLV) A. Resilient-seated cast-iron eccentric plug valves, 3 in. through 72 in (round port or "Ballcentric" type): We request the addition of GA Industries Eco-Centric round port Plug Valve (3"-24") and Crispin/K-Flo Series 800 (2.5"-12") (No exceptions to specification)
Answer: Yes. However, all air service valves must meet the temperature requirements.

41. Specification 15139: Section 15139.2.5.B Resilient-seated cast-iron eccentric plug valves (rectangular port or "cam-centric" type): We request the addition of GA Industries Model 517R8 (24"-48") and Crispin/K-Flo Series 900 (14"-48") (No exceptions to specification)
Answer: Yes. However, all air service valves must meet the temperature requirements.

42. Specification 15139: Section 15139.2.11.F Sewage Combination Air/Vacuum Valve (Force Main High Points, Pump Station Discharge): We request the addition of Bermad Model SW-C50-PMVE
Answer: No, request is denied.

43. Specification 15139: Section 15139.2.2.A.1 GATE VALVES (GTV) Gate Valves, 3 Inches and Larger (Non-Sewage Applications): We request the addition of the Kennedy name, Kennedy/Clow, F-5065 for buried service and F-5070 for above ground service be included in the Specification. (Kennedy and Clow are the same valve by McWane Corp, No exceptions to specification)
Answer: Yes, Kennedy/Clow, F-5065 for buried service and F-5070 for above ground service will be included in Specification 15139.

44. Specification 15139: Section 15139.2.2.A.2 GATE VALVES (GTV) A. Gate Valves, 3 Inches and Larger (Sewage Applications): We request the addition of Kennedy Rotating Disc AWWA C500 Metal Seated Gate Valve (C-500) and Kennedy Resilient Wedge C-509 Gate Valve Fig. 8561A-SS (above-ground service) and Fig. 8571-SS (buried service).
Answer: Yes, Kennedy Rotating Disc AWWA C500 Metal Seated Gate Valve (C-500), Kennedy Resilient Wedge C-509 Gate Valve Fig. 8561A-SS (above-ground service), and Fig. 8571-SS (buried service) will be added to Specification 15139.

45. Specification 11333: Section 11312, 1.3. "Provide Warranty as required under Section 01700 – Construction Closeout."
Question: Required warranty duration for filter equipment is not clear. Please confirm required warranty duration.
Answer: The required warranty duration for filter equipment is 2 years from project substantial completion.

46. Specification 11333: Section 11312, 2.1. "Maximum Allowable Head loss"
Question: The maximum allowable head loss listed does not appear to match head loss shown in drawing set. Please confirm filter system should operate within hydraulic constraints shown in drawing set.
Answer: The filter shall operate within hydraulic conditions shown on Sheet G0003 Hydraulic Profile.

47. Specification 11333: Section 11312, 2.1.B. "Units shall comply with requirements of 30 TAC § 217.190 and 217.193…"
Question: Please confirm if effluent turbidity monitoring is required. If so, please specify requirements for this system.
Answer: Yes, it's required. A flow through or insertion type meter shall be provided. See Specification 13421.

48. Regarding the scope of site fencing, please confirm the new fencing is required only at the new Headworks area and is to connect to the existing fence. Does the new fencing need to match the existing fencing, or follow the fence detail called out on the Plans? Is there any existing fencing replacement required?

Answer: The only new fencing is around the new headworks, old lift station, and proposed Lift Station #35, see revised Drawing C0102 Proposed Overall Site Plan. The fence should be installed per the drawing details. Any existing fence damaged during construction will need to be repaired to as is or better condition.

49. Refer to Bid Item BA-4, demolish and dispose of the existing WWTP, please advise if the associated underground piping and duct banks need to be demolished and removed from the site or they can be cut, plugged, and abandoned in place.
Answer: Yes, the associated underground piping and duct banks need to be demolished and removed from the site.

50. Per the precast cast concrete building manufacturer's feedback, Lonestar Prestress Mfg., the named manufacturer, does not manufacture 20'x38' building. The closest size they have molds and engineering for is 20'x40' (18'-11"x38'-11" interior). The EASI-SPAN roofs are made in 10' sections and cast on steel tables that cannot be modified to accommodate the 8' dimension. Would you please advise if the standard size EASI-SPAN is acceptable? The building foundation would need to be modified accordingly if the standard size is acceptable.
Answer: Lonestar Prestress Mfg. Inc. has verified that the 20 ft x 38 ft x 12 ft building will work with the custom roof developed during the design by Lonestar Prestress. Contact Leo Rowe, 281-598-0286, for any additional information.

51. Typical scope of supply for filtration equipment includes a local control panel that includes PLC, OIT, motor starters, lights and switches, and all other necessary appurtenances for a fully functional system. Section 13413 implies Eurotherm is to provide control panels for the project. Please confirm the intent for filter manufacturer's scope of supply as it relates to control panels/ junction boxes. Who is responsible for providing control panel for filter equipment?
Answer: Eurotherm will be the project System Integrator and provide SCADA and some control panels for the project. If the equipment manufacturer typically provides a local control panel that includes PLC, OIT, motor starters, lights and switches, and all other necessary appurtenances these items should be provided for this project. Coordinate with Eurotherm to make sure the equipment communicates with the SCADA system.
Specification 13400, Section 1.5.C will be revised to delete CPUSA and Prime Controls as possible System Integrators and add the following:

    Eurotherm (Schneider Electric)
    44621 Guilford Drive, Suite 100
    Ashburn, Virginia 20147
    Bryan Sutherland
    Office: 703-724-7396
    Email: Bryan.Sutherland@se.com
    Webpage: www.eurotherm.com

52. Aeration diffuser system specification section 11377, Para. 2.4.D.1.a, notes for that the fine bubble zones "Each diffuser assembly shall consist of a PTFE coated EPDM porous membrane disc diffuser element….". Xylem Sanitaire does NOT offer a PTFE coated diffuser. Is the Sanitaire uncoated EPDM diffuser acceptable?
Answer: The specification will be modified to allow uncoated EPDM diffusers.

53. Appendix A, page 12, under Proposed Products and/or Services, Item A "Product or Service Description." Can you please clarify what you are looking for here, as the scope of supply and equipment specifications are already defined in the Contract Documents?
Answer: Contractor shall be responsible for all scope of work items as identified in the contract documents.

54. Appendix A, page 12, under Proposed Products and/or Services, Item A "Guarantees and Warranties." Can you please clarify what you are looking for here, as the warranty obligations for the Contractor and various equipment manufacturers is defined in the Contract Documents?
Answer: Contractor shall be responsible for all warranty obligations as described in the contract documents.

55. Appendix J, Item 4: Please clarify the following:
    a. How is the "Cost" scoring calculated? Is this a percentage difference between bidders bid amount?
    b. How is the "Proposed Schedule" scoring done?

    Answers:
    a. Cost is factored as a weight of 35% of the proposal.
    b. Proposed schedule is factored as a weight of 15% of the proposal.

56. Under "Additional Information Request from Prospective Bidders," which follows the bid form in the Contract Documents:
    a. Items 4 and 5 ask us to identify several Major subcontractors and include their experience and resumes for superintendents and project managers. This is no problem for work that we self-perform, which is most of it, but including this information for the Electrical subcontractors will be difficult. We likely will not know who has the most competitive pricing and scope until 30 minutes or so before the bid is due. Would you please consider allowing the SUBCONTRACTOR qualifications and resumes to be provided within 48 hours of the bid opening?

    Answer: Yes.

57. Are there any work restrictions in the Pirates Beach neighborhood? Day or Hour limitations? Concrete Truck or Hauling Truck limitations for road use? Larger concrete pours are often scheduled for early morning hours to minimize the impact of heat on the concrete and workers.
Answer: Contractor shall abide by all City Codes and Ordinances pertaining to work time limitations. The City does allow for exceptions for afterhours work depending on the scope of work involved for the request.

58. Reference Drawing C0101: Is the 2.90 acres of City of Galveston property west of the WWTP available for use by the contractor for laydown, parking, or trailers?
Answer: The land surrounding this project site is designated as a nature preserve and wildlife sanctuary. Therefore, the entire 2.9-acre parcel inquired about is not available for use as a laydown yard. However, a small portion of the land adjacent to the WWTP along with two other on-site areas as shown on the attached PDF may be made available upon the Contractor's request.

59. Is this project subject to any Buy American provisions?
Answer: No.

60. Special Conditions to the Agreement, Item 18: What grant moneys are associated with this contract that Contractor may be liable for?
Answer: None.

61. Summary of Work Par. 1.03.E: Bid Alternate descriptions do not match the bid form. Can this be updated?
Answer: Revised 1.03. E Bid Alternate Descriptions is below

    Bid Alternate 1 (BA-1): Add or deduct to replace all below water aeration basin PVC piping with 316L stainless steel piping, complete in place. *Note: This is a contingent item and shall be executed only if authorized in writing by Owner.

    Bid Alternate 2 (BA-2): Decommission the existing Pirates Beach WWTP, which includes draining all tanks, disconnecting all influent piping, and disconnecting all discharge piping, complete in place.

    Bid Alternate 3 (BA-3): Remove and properly dispose of wastewater sludge and associated materials from the Pirates Beach WWTP per TCEQ regulations, complete in place. *Note: This is a contingent item and shall be executed only if authorized in writing by Owner.

    Bid Alternate 4 (BA-4): Demolish and dispose of the existing Pirated Beach WWTP facilities, including all tankage, above ground piping, structures, the blower building and miscellaneous appearances, and cap all below ground abandoned piping two feet below ground, complete in place.

    Bid Alternate 5 (BA-5): Contingency Allowance (10% of Total Alternates) to be used as approved by Owner. *Note: This is a contingent item and shall be executed only if authorized in writing by Owner.

62. Can an allowance be provided for building permit costs?
Answer: Building permits are required for the project; however, the permit fees are waived for City projects.

63. Can an allowance be provided for the CenterPoint charges for the new electrical service? We cannot get estimates from CenterPoint prior to bid and an allowance ensures the City pays only for the actual cost from CenterPoint.
Answer: Yes, the Bid Proposal Form has been updated to include an electrical allowance line item.

64. Can record drawings of the existing WWTP facilities be provided?
Answer: There are no record drawings for the existing facility.

65. Reference 01578: What is the acceptable discharge point for the dewatering systems, and is any pretreatment of discharge required?
Answer: The land surrounding this project site is designated as a nature preserve and wildlife sanctuary. Water from dewatering efforts shall be discharged upon City property in such a manner that it does not cause ponding and/or pooling adjacent to existing structures and shall be filtered prior to discharging into native vegetation along the natural drainage path of the land.

66. Reference 02468: Is any load testing or bearing capacity testing required for the Auger Cast Piles? If so, please provide a specification.
Answer: The following modifications will be made to Specification 02468 - Auger Cast Piles:
    a. Add Section 1.06.B Testing Agency Qualifications: Qualified according to ASTM C1077, ASTM D3740, and ASTM E329 for testing indicated.
    b. Change Section 1.08 A to read: "It may be necessary to lower or raise the bottom of piles from planned depth shown on the drawings. Changes in the planned depth shall be made only upon approval of the Architect/Engineer. Maintain a record of actual founding depths."

67. Reference 07110, par. 3.9 – please clarify dampproofing and waterproofing requirements:
    a. Is Asphalt Dampproofing applied to exterior surface of ALL below grade concrete walls, regardless of whether specifically indicated on the drawings?
    b. Is Cementitious Slurry Capillary Waterproofing applied to ALL exterior exposed concrete walls, regardless of whether specifically indicated on the drawings? Walls only?
    c. Where is the Polymer Modified Cement Waterproofing applied to exterior exposed surfaces of water retaining structures? Only if specifically called out on the drawings? Does this apply to the interior surfaces above the waterline, as well as exterior of structures?

    Answers:
        a. Asphalt damp proofing need only be applied to below grade of exterior walls of building enclosures. Since the Blower/MCC Building is totally above grade, there should not be any asphalt damp proofing required unless there is a project change.
        b. Crystalline waterproofing is typically applied to the interior of below grade walls to stop water penetration through concrete walls or sometimes to above

grade on exterior exposed concrete walls. The precast building specified for this project contains a vapor barrier; therefore, crystalline waterproofing is not required.

c. Polymer modified cement waterproofing applied to exterior exposed surfaces of water retaining structures is also not required. The precast building specified for this project contains a vapor barrier; therefore, polymer modified cement waterproofing is not required.

68. Reference 07190: Where does the liquid water repellant go? Can you provide a schedule?
Answer: The liquid water repellant is typically applied to precast concrete or masonry walls where the material is somewhat porous, and the wall is constructed in a single wythe. The precast building specified for this project contains a vapor barrier; therefore, liquid water repellant is not required.

69. Reference 09928, par. 3.4.A: What are the limits of the Raven 405 or equivalent 100% Solids coating system for the Cast-in-Place concrete structures? All interior surfaces above the waterline? below the waterline? Floors? Underside of deck/sidewalks? etc.?
Answer: Coat all interior surfaces from 1 foot below the waterline all the way to top of structure, including the underside of the concrete deck and walkways.

70. Reference 10700 and Drawing S7102:
    a. Please confirm the dimensions of the Sunshade. Drawing S7102 appears to indicate a 36’ x approx. 24’ shade over just the UV area, and the specs call for 36’ x 52’ to cover the UV and filter area.
    b. Please confirm the height of the shade: is the 20’ height from ground level?
    c. Can a design for the foundation poles be provided?
    d. Par. 2.3.D: is the structure powder coated galvanized or powder coated stainless steel? What grade stainless?

    Answers:
    a. Drawing S7102 will be modified to match specifications.
    b. 37.5 ft length x 37 ft wide x 20 ft height. Height taken at lowest point of shade to ground.
    c. This information must be provided by the sunshade manufacturer.
    d. 316 SS

71. Reference Detail 5 and 6, sheet D0002: Please confirm supports are 316SS.
Answer: Yes, it's 316SS.

72. There is a specification for domestic hot/cold water pipe insulation and HVAC pipe insulation. Is there any insulation required for process or NPW piping? If so, please provide a specification.
Answer: Specification 15719 Plumbing Piping Insulation, which includes domestic hot/cold water piping, will be applicable for above ground NPW piping. Specification Section 1.2 will be modified to show NPW piping (above ground). Process piping insulation is not included.

73. Reference S3301: The monorail beam is called out as stainless steel. Can you confirm this is 316SS? Also, is the monorail support structure steel or stainless steel, and if SS, what grade SS?
Answer: Monorail beam is grade 316 stainless steel (per Structural Steel Note 3 on S0001). Remaining steel framing in the building to be galvanized steel. Dielectric isolation to be provided between dissimilar metals per Structural Steel Note 14 on S0001.

74. Please confirm that there is no fire sprinkler system required for the building.
Answer: No fire sprinkler system is required for the Blower/MCC building.

75. Would you please advise on the plant current ADF, wet weather flow and 2-hour peak flow rate for the bypass pumping system?
Answer: ADF: 0.30 MGD; WWF: 1.0 MGD; Peak 2-hr: 0.90 MGD

76. Would you please provide a coating schedule for the high solids epoxy coating system? The Spec's require cast-in-place concrete structures, precast concrete manholes, and cast-in-place concrete manholes to be coated with high solids epoxy coating system. Please confirm that all concrete structures need to be coated or just the wetted surfaces of the aeration basins, clarifiers, sludge holding tank, and mix box need to be coated. Additionally, please confirm if all manholes need to be coated or just the sanitary sewer manholes need to be coated.
Answer: Yes, the identified structures need to be coated, except for electrical manholes. Refer to Question 54.

77. Spec 09928 calls for high solids epoxy coating on the existing lift station, please provide more details of the existing lift station, concrete surface condition, and wet well dimensions.
Answer: No work is to be done at existing lift station. The specification will be modified.

78. Would you please provide a specification for the packaged lift station wet well? Or it should be built per manufacturer's recommendation? Does the package lift station wet well require high solids epoxy coating, or coal tar epoxy coating?
Answer: Wet well to be constructed per manufacturer's recommendations. Concrete wet wells to be coated per specification 009928.

79. Spec 11226:
    a. 3.1.B. Please change the wording from …"The UV manufacturer shall furnish power and data cabling between the UV modules and the PDDC" to "The Contractor shall furnish power and data cabling between the UV modules and the PDDC."
    b. 3.1.C. Please delete this requirement. The UV system does not require an air blower or electric hoist.

    Answers:
    a. The specification will be revised as requested.
    b. The specification will be revised as requested.

80. Spec 11320:
    a. 1.1.B: Note: The Equipment shall be designed to operate together and shall be provided by two manufacturers - Hydro will supply the grit unit per section 11320 in combination with the Classifier per section 11321 supplied by Wemco.
    b. 1.3 Warranty per section 01700. 01700-1.05.D. states warranties are to be per the "special conditions" which do not outline a warranty timeline. The grit equipment scope will include a two (2) year warranty from substantial completion. Please confirm the warranty requirements.
    c. 2.1.A: The upstream pipe shall be 16" diameter and shall connect to an inlet distribution box designed to feed (2) Grit King units, each with 12" diameter inlet pipe. The Grit King units shall have 24" wide effluent channels that feed a common 30" wide effluent channel with 14" diameter drop-pipe. Booster pumps, if needed, shall be sourced, and supplied by others.
    d. 2.1.B.1: Each unit shall remove 95% of all grit (S.G. 2.65) 106 micron and larger at a peak flow of 2.25 MGD (please delete 24MGD)
    e. 2.4.D: Note that there are no recommended spare parts for the grit removal unit as there are no moving internal parts.
    f. 3.3.A: Note that the Equipment shall be assembled and installed by others. Hydro will inspect for approval during startup.

    Answers:
    a. Yes, this is acceptable.
    b. Stated warranty is acceptable.
    c. Yes, this is acceptable.
    d. The manufacturer to verify if a booster pump is required and if needed coordinate with contractor on who will provide booster pump.
    e. If there are no moving parts no spare parts are required.
    f. The specification will be modified to indicate assembly by others.

81. Spec 11321:
    a. 1.1.C: Note: The Equipment shall be designed to operate together and shall be provided by two manufacturers - Hydro will supply the grit unit per section 11320 in combination with the Classifier per section 11321 supplied by Wemco.
    b. 2.1.A Please change the material of construction from type 314 to type 316SS in the table.
    c. 2.4.C. Please change the motor HP to 2HP "…and shall be no more than 2HP"

    Answers:
    a. Acceptable
    b. The specification will be modified to require 316SS
    c. The specification will be modified to no more than 2HP

82. Spec 15139: Section 15139-2.5.A & C allows for plug valves to be cast iron. Hydro's intent is to quote 316SS DeZurik valve in lieu of cast iron. Please confirm.
    Answer: Yes, this is acceptable.

83. Sheet S1301 calls out Top of the Headworks elevated slab is 25.35'. Sheet D1302 calls out top of the Headworks elevated slab is 30'. Please confirm the elevation of the Headworks elevated slab.
Answer: The top of headworks elevation is 30.0 ft (see revised Sheet S1301).

84. Environmental Improvements, Inc. represents Aquarius Technologies for fine bubble and coarse bubble products. The City of Galveston currently uses Aquarius Technologies fine bubble membranes at its Main WWTP. We would like to request they be added to the approved bidders list for section 11377 Aeration System.
Answer: Yes, this is approved.

END OF ADDENDUM NO. 2

Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

I hereby certify receipt of this addendum and have incorporated its information or changes in preparation of my submittal.

_____	_____
Authorized Signature	**Date**
_____	_____
Printed Name	**Company Name**

A COPY OF THE ADDENDUM MUST BE SIGNED & RETURNED WITH YOUR PROPOSAL!

BID PROPOSAL

Proposal amount for Base Bid shall be shown in both words and figures. In the event of a discrepancy, the amount shown in words shall govern. In the event of a discrepancy between the unit price and total line extended, the unit price shall govern.

City of Galveston Pirates Beach Wastewater Treatment Plant (WWTP) Replacement Project – BASE BID:

Item No.	Description of Work	Unit	QTY	Unit Price	Total Amount Bid
BB-1	**Mobilization**, **Temporary Facilities and Controls**, complete in place, in full accordance with the Technical Specifications and the Construction Drawings; **shall not exceed 3% of base bid**.	LS	1	$	$
BB-2	**Project Sign**, complete in place and with all associated appurtenances, in full accordance with the Technical Specifications and the Construction Drawings.	EA	1	$	$
BB-3	**Trench Safety including Trench Safety Plan and all necessary shoring**, complete in place and in full accordance with the Technical Specifications.	LF	500	$	$
BB-4	**6-inch Concrete Access Road and Driveway Pavement**, complete in place, in full accordance with the Technical Specifications and the Construction Drawings.	SY	600	$	$
BB-5	**Headworks, Biological Treatment Unit, Effluent Filters, UV Disinfection, Odor Control, Package Lift Station including structures, equipment, pumps, piping, supports, valves, meters, elevated and platforms,** complete in place and with all associated appurtenances, in full accordance with the Technical Specifications and the Construction Drawings.	LS	1	$	$
BB-6	**All Electrical, Controls, Instrumentation, MCCs and Emergency Generator**, complete in place and with all associated appurtenances, in full accordance with the Technical Specifications and the Construction Drawings.	LS	1	$	$
BB-7	**One Wemco Grit King Grit Units and a Grit Washer, or pre-approved equivalent*,** for the hydraulically induced vortex grit removal system to be provided by Grit King and the grit washer, complete as specified.	LS	1	$	$
BB-8	**One Enaqua Ultraviolet (UV) System, or pre-approved equivalent*,** for the non-contact UV disinfection system, complete as specified.	LS	1	$	$
BB-9	**Two Kaeser Blowers, or pre-approved equivalent*,** for the rotary screw blowers, complete as specified.	LS	1	$	$
BB-10	**Miscellaneous Site Work including clearing, grubbing, hydromulch seeding, final grading, landscaping, 4-inch concrete scour protection, 6-inch gravel road, SWPPP, SWPPP implementation and fencing,** complete in place, in full accordance with the Technical Specifications and the Construction Drawings	LS	1	$	$

* NOTE:

1. Items noted on the Proposal form as "or pre-approved equivalent" must receive City approval prior to being acceptable.
2. Equivalent products must be submitted by the question deadline established in Appendix J. Section 6 - Key Events Schedule.
3. Any acceptance or rejection of the equivalent product or process will be included in the final addenda.
4. The process for proposing an equivalent product is described in Section 01630 Product Options and Substitutions **except** for the timing in para. 1.06.C. Submission for pre-approval of an equivalent product or process must be by the question deadline established in Appendix J. Section 6 - Key Events Schedule.

Item No.	Description of Work	Unit	QTY	Unit Price	Total Amount Bid
BB-11	**All other components associated with Pirates Beach WWTP Replacement construction**, complete in place and with all associated appurtenances, in full accordance with the Technical Specifications and as shown on the Construction Drawings.	LS	1	$	$
BB-12	**Additional Structural Concrete**, complete in place, in full accordance with the Technical Specifications and to the limits authorized in writing by Owner. ***Note: This is a contingent item and shall be executed only if authorized in writing by Owner.**	CY	100	$	$
BB-13	**Additional Select Fill**, complete in place, in full accordance with the Technical Specifications and to the limits authorized in writing by Owner. ***Note: This is a contingent item and shall be executed only if authorized in writing by Owner.**	CY	100	$	$
BB-14	**Additional 6-inch Concrete Pavement**, complete in place, in full accordance with the Technical Specifications and to the limits authorized in writing by Owner. ***Note: This is a contingent item and shall be executed only if authorized in writing by Owner.**	SY	100	$	$
BB-15	**Bypass pumping**, including all equipment, materials, and fuel, complete in place, in full accordance with the Technical Specifications and as directed by the Owner. ***Note: This is a contingent item and shall be executed only if authorized in writing by Owner.**	WK	10	$	$
BB-16	Contingency Allowance (10% of Total Base Bid) to be used as approved by Owner. ***Note: This is a contingent item and shall be executed only if authorized in writing by Owner.**	LS	1	$	$
BB-17	**Electrical Allowance** to be used for payment of the electrical service provider to bring power to the site for the new WWTP facility (actual cost with no mark-up).	EA	1	$50,000.00	$50,000.00

TOTAL AMOUNT for Pirates Beach WWTP Replacement Project – BASE BID (Items BB-1 through BB-17):

_____ **(Use Words)**

$ _____ **(Use Figures)**

**Total amount specified for BASE BID shall include all costs, commissions, overhead, permits, and payments required and necessary to facilitate Contractor's completion of the work as specified.*

Pirates Beach WWTP Replacement Project – BID ALTERNATES:

Item No.	Description of Work	Unit	QTY	Unit Price	Total Amount Bid
BA-1	**Add or deduct to replace all below water aeration basin PVC piping with 316L stainless steel piping**, complete in place. ***Note: This is a contingent item and shall be executed only if authorized in writing by Owner.**	LS	1	$	$

Item No.	Description of Work	Unit	QTY	Unit Price	Total Amount Bid
BA-2	**Decommission the existing Pirates Beach WWTP**, complete in place. ***Note: This is a contingent item and shall be executed only if authorized in writing by Owner.**	LS	1	$	$
BA-3	**Remove and properly dispose of wastewater sludge and associated materials** from the Pirates Beach WWTP per TCEQ regulations, complete in place**. *Note: This is a contingent item and shall be executed only if authorized in writing by Owner.**	Tons	400	$	$
BA-4	**Demolish and dispose of the existing Pirates Beach WWTP facilities**, including all tankage, piping, structures, the blower building and miscellaneous appearances, complete in place. ***Note: This is a contingent item and shall be executed only if authorized in writing by Owner.**	LS	1	$	$
BA-5	Contingency Allowance (10% of Total Alternates) to be used as approved by Owner. ***Note: This is a contingent item and shall be executed only if authorized in writing by Owner.**	LS	1	$	$

City of Galveston Pirates Beach WWTP Replacement Project – BID SUMMARY:

BS-1	TOTAL AMOUNT for BASE BID (Items BB-1 through BB-17)	$	(A)
BS-2	TOTAL AMOUNT for BID ALTERNATES (Items BA-1 through BA-5)	$	(B)
BS-3	Subtotal of Accepted Alternate Bid Items (To be completed by OWNER)	$	(C)
BS-4	Total Amount Bid for the Project (To be completed by OWNER)	$	(A+C)

City of Galveston Pirates Beach WWTP Replacement Project – BID CERTIFICATION:

_____

Company

_____

Name and Title of Authorized Representative

_____

Signature **Date**

SECTION 01020

ALLOWANCES

CONDITIONS OF THE CONTRACT AND DIVISION 1, as indexed, apply to this Section.

PART 1 - GENERAL

1.1 SCOPE

A. The Contractor shall include in his proposal the allowances stated in this and following Sections of the Project Manual. Allowance may pertain to purchase and delivery only, or to purchase, delivery, and installation, or to services only, or to contingency fund.

B. If the allowance is stated for purchase and delivery only, all of the Contractor's handling costs on site, overhead, profit, and other expenses contemplated for the allowance material and equipment shall be included in the base proposal.

C. If the allowance is stated for purchase, delivery, and installation, all of the Contractor's handling costs on site, overhead, profit, and other expenses contemplated for the allowance material and equipment shall be included in the allowance.

D. If the allowance is stated for services only, all of the Contractor's handling costs on site, overhead, profit, and other expenses contemplated for the services shall be included in the allowance.

E. If the allowance is stated for contingency, all of the Contractor's handling costs on site, overhead, profit, and other expenses contemplated for the allowance material and equipment shall be included in the allowance.

F. The Contractor shall purchase the allowance materials and equipment as directed by the Engineer/Architect in writing. The Engineer/Architect will have obtained the necessary forms and signatures to accomplish this. If the actual cost of the required work is more or less than all the allowance estimates, the Contract Sum will be adjusted accordingly by Change Order.

G. The Engineer/Architect cannot certify applications for payment of any allowance item unless a fully executed Allowance Authorization is on file with the Owner, Engineer/Architect, and Contractor.

1.2 CONDITIONS

A. Unexpended balance of allowance sums shall revert to the Owner in the final settlement of the Contract.

PART 2 - ALLOWANCES

2.1 ITEMS

A. Contingency:..... 10% of base bid and any alternates listed separately. Contractor shall include in the Base Proposal the sum listed as a contingency to cover the cost of "Items not shown on the Contract Documents". Contractor shall proceed with the work in question only after receiving written directions executed by the Owner and the Engineer/Architect. Owner will not be obligated to pay the cost of any work performed without prior written authorization. The Contractor's overhead and profit relative to this contingency allowance sum and work performed in accordance herewith, shall be included in the contingency allowance sum.

END OF SECTION

SECTION 11290

SLIDE GATES AND SLUICE GATES

PART 1 - G E N E R A L

1.1 SECTION INCLUDES

A. This section includes the requirements for the provision of all supervision, labor, materials, tools, equipment and related items to furnish and install slide gates, sluice gates, hand gates, stop logs, and gate operators, as shown on the drawings and described herein. See the table of gates in Part 2.

B. The Contractor shall be responsible for additional design and costs associated with modifying applicable structure(s) to accommodate equipment with dimensions other than those shown on the drawings. This requirement includes equipment supplied by "Acceptable Manufacturers" that may differ from the dimensions shown on the drawings. All designs must be approved by the Owner's Representative.

C. All equipment of the same type specified under this section shall be provided by a single manufacturer/supplier.

D. Manufacturer/supplier shall be responsible for the manufacture, warranty, service, and operation of all equipment specified herein. Moreover, manufacturer/supplier shall, in addition to the Contractor, assume responsibility for the proper function of all equipment, following installation.

1.2 SUBMITTALS

A. Contractor shall provide all submittals in accordance with the requirements of Section 01300 – Submittals, and Section 01340 – Shop Drawings, Product Data and Samples.

B. Submit complete descriptive product data for all equipment to be provided, including but not limited to, fabrication and installation drawings, electrical, instrumentation and controls component requirements and drawings, pertinent design calculations, and any other related information necessary to facilitate Owner and Owner's Representative review.

C. Submit the manufacturer's affidavit of compliance with the provision of AWWA Specification C560 cast-iron slide gates, or C561 fabricated stainless steel slide gates, or C562 fabricated aluminum slide gates (latest edition) and these specifications.

D. Operation and Maintenance Manuals. Provide complete operation and maintenance manuals for all equipment, in accordance with the requirements of Section 01730 – Operation and Maintenance Data.

1.3 WARRANTY

Provide equipment warranty in accordance with the requirements of Section 01700 – Contract Closeout.

1.4 REFERENCES

A. AWWA Specification C-560
B. AWWA Specification C-561
C. AWWA Specification C-562
D. ASTM B209 6061-T6
E. ASTM 1056
F. ASTM A276
G. ASTM B221 6061-T6
H. ASTM D2000

I. ASTM D1248
J. ASTM D3935 D707
K. ASTM B584 C86500

PART 2 - P R O D U C T S

2.1 DESIGN CRITERIA

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

B. Gates and operators shall be furnished with all 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 cast or fabricated gates.

C. All gates shall be furnished with the option to utilize an electric nut driver and provide two nut drivers.

D. Furnish and install gates per the requirements of the following table and as specified herein:

Designation	Location	Material	Quantity and Gate Type	Design Head Seating (S)/ Unseating (U)	Self-Contained?	Stem & Operator Type	Opening Size	Invert Elevation	Top of Wall Elevation
SG-400	Aeration Basin	Aluminum	1, Rectangular surface-mounted slide gate with surface-mounted floor invert	19.75 ft S and 19.75 ft U	N	Rising stem with floor stand and hand crank	4 ft x 4 ft	2.58	26.58

2.2 ACCEPTABLE MANUFACTURERS

A. Provide equipment from one of the following acceptable manufacturers for metal gates:

1. Golden Harvest, Inc.
2. Fontaine Aquanox (by ISE Metal Inc.)
3. RW Gate
4. Whipps, Inc.
5. HydroGate
6. Or approved substitution.

B. If applicable, all equipment substitution requests shall be made in accordance with the requirements of Section 01600 – Materials and Equipment.

2.3 QUALITY ASSURANCE

A. Manufacturer shall have a minimum of 5 years' experience in the production of similar items.

B. Except as modified or supplemented herein, all gates and operators shall be manufactured in conformance to the applicable requirements of AWWA specifications called out in paragraph 1.2 C. above.

C. Manufacturer's shop welds, welding procedures and welders shall be qualified and certified in accordance with the requirement of the latest edition of ANSI/AWS D1.1, D1.2, D1.6 or ASME Section 9.

D. Fully assembled gate(s) shall be shop inspected, adjusted and tested for operation and leakage prior to shipping.

E. Slide gates and the weir gates shall meet or exceed AWWA specifications called out in paragraph 1.2 C. above. (latest edition) leakage rate standards.

2.4 PRODUCT DESCRIPTION

A. Material of Construction

1. All stainless steel referenced in this specification shall be Type 304, ASTM A240 or ASTM A276 unless otherwise indicated herein.

a. All welded stainless-steel components shall be constructed of Type 304L stainless steel.
b. All structural stainless steel used in the construction of slides and frames shall have a minimum material thickness of 1/4-inch.
c. All non-welded stainless-steel components, excluding anchor bolts and assembly bolts, shall be Type 304 or Type 304L stainless steel.
d. Anchor bolts and assembly bolts shall be Type 316 stainless steel.

B. Slide.

1. The slide shall consist of a stainless steel or aluminum plate that is reinforced with stiffeners to withstand the specified head conditions. The slide shall engage the frame a minimum of 1-inch on each side.

a. The slide shall be reinforced with plates or channel shaped members to restrict deflection to 1/16-inch or less at the design head.
b. The stiffeners shall be welded to the slide plate in the horizontal and vertical positions.
c. The portion of the slide that engages the frame shall have a minimum thickness of 1/4-inch.
d. On rising stem gates, a stem connector shall be welded to the slide as a means of connecting the operating stem. The bottom portion of the stem shall be affixed to the stem connector with a minimum of two attachment bolts.

e. On non-rising stem gates, the slide shall be arranged to allow travel of the stem along the length of the slide.

C. Gate Frame.

1. The frame shall be constructed of stainless steel or aluminum plate, with the guide section formed into a C channel shape or similar to house the seal, and shall be reinforced to withstand the specified operating conditions.

a. The guides shall be of a one-piece design with gussets that extend along the outside and top to accommodate unseating head. The guide members shall incorporate a tubular cross section along the guides for additional rigidity. Two-piece, sandwich type guides that are bolted together are also acceptable.
b. The mounting configuration of the frame shall be as shown on the Contract Drawings.
c. Wall mounted frames shall be of the flanged frame type. Flat frames shall only be provided on gates with frames that will be embedded in the concrete wall or mounted inside existing channels.
d. The guide portion of flanged frame gates shall have a minimum weight of 9 lbs./ft. The portion of the flanged frame, where the anchors penetrate, shall have a minimum thickness of 1/4-inch.
e. The guide extension portion of the frame shall have a minimum weight of 6 lbs./ft. Angles are not considered acceptable guide extensions.
f. Lifting lugs shall be provided on all frame styles.
g. On self-contained gates, the side frame shall extend above the operating floor and the operating mechanism shall be mounted to the yoke. When shown, the frame may extend to or below the operating floor and a floor stand may be mounted on the yoke.

h. Yoke members shall be C channel shaped structural members. Angles are not considered acceptable yoke members.

D. Gate Seals.

1. The seal system shall consist of self-adjusting UHMWPE seals with a nitrile or EPDM compression cord.

a. The UHMWPE seals shall be arranged to ensure that there is no metal-to-metal contact between the slide and frame.
b. The compression cord shall be contained by the UHMWPE seal so that it shall not be in contact with the slide.
c. Seal system shall be self-adjusting for the life of the gate. Adjustable wedging devices such as wedges, wedge bars and pressure pads are not acceptable.
d. On upward-opening gates, rubber side seals and/or top seals such as J-bulb seals or similar rubber seals are not acceptable in lieu of UHMWPE seals.
e. On downward opening gates, rubber side seals and/or invert seals such as J-bulb seals or similar rubber seals are not acceptable in lieu of UHMWPE seals.
f. The invert seal on upward opening gates shall use a compressible EPDM seal located in the invert of the frame.
1) The invert seal shall be of a flush bottom arrangement.
2) The invert seal shall be mechanically fastened with stainless steel bolts.
3) Invert seals attached solely by the use of adhesives are not acceptable.
g. All seats and seals shall be secured with assembly bolts. All seals shall be field removable and field replaceable without the need to remove the gate frame from the wall.
h. Anchor bolts shall not penetrate the seats or seals and anchor bolts shall not prevent the removal or replacement of seats or seals.
i. The seal system shall have been shop tested with a minimum 30,000 cycle operating test in an abrasive environment to confirm the ability of the seals to withstand the abrasive condition with negligible deterioration and to confirm that the leakage restriction requirement is still possible.
1) The shop test shall have been performed on a stainless-steel sluice gate and the test results shall have been certified by the manufacturer in writing.
2) A copy of the test shall be provided to the Engineer.

E. Gate Stem.

1. The operating stem shall be of stainless steel and shall be designed to transmit in compression at least 2 times the rated output of the manual operating mechanism with an 80 lbs. effort.
2. The stem shall have a slenderness ratio (L/r) less than 200.
3. The threaded portion of the stem shall have a minimum diameter of 1-1/2 inches.
a. The threads shall have machine rolled, full depth ACME threads.
b. Stub threads are not acceptable.
4. Stems provided in multiple pieces shall be provided with couplings.
a. Couplings shall be bronze or stainless steel and shall be internally threaded and keyed or bored and bolted.
5. Stem guides shall be constructed of stainless steel with UHMWPE bushings.
6. Gates with rising stems shall be provided with a clear plastic stem cover.
a. The stem cover shall be butyrate and shall have a cap and condensation vents.
b. Clear mylar indicating tape shall be provided for field application after the gate has been installed and positioned.
7. Stop collars shall be provided to limit the downward travel on gates with manual operating mechanisms.
a. Stop collars shall be bronze and shall be internally threaded and provided with a stainless-steel set screw.

F. Fasteners. All necessary attaching nuts, bolts, studs and anchors shall be ASTM A276 Type 316 stainless steel and shall be furnished by the gate manufacturer.

G. Gate Operator.

1. Operating mechanisms shall be provided by the gate manufacturer.
2. Manual operators shall be yoke mounted on self-contained gates or floor stand mounted when shown in the Contract Documents.
    a. Manual operators shall be of the bevel gear type suitable for operation with a portable operator.
    b. Gear ratios shall be selected by the gate manufacturer to ensure that the maximum operating effort is 40 lbs at the design head.
    c. Minimum gear ratio shall be 2:1.
    d. Gearboxes shall have ductile iron housings, a bronze lift nut, steel gears and a stainless-steel input shaft.
    e. Ball or roller bearings shall support the lift nut and input shaft.
    f. The housing shall be grease lubricated and permanently sealed.
    g. Handwheels shall be provided. Handwheels shall have a maximum diameter of 24 inches.
    h. Adaptor plates shall be utilized to attach the operating mechanism to the yoke. Adaptor plates shall be stainless steel and shall have a minimum thickness of 1/2-inch.
3. Interconnected gearboxes and multiple stems shall be provided to ensure proper operation of wide gates.
    a. Interconnected gearboxes are required on all upward opening gates when the opening width is greater than 60 inches and the height of the slide is less than half of the width.
    b. Interconnected gearboxes are required on all downward opening gates when the opening width is greater than 48 inches and the height of the slide is less than half of the width.
    c. Interconnected gearboxes shall consist of a stainless-steel interconnecting shaft with flexible couplings on each end and stainless-steel hardware. Aluminum shafts are not acceptable.
    d. Gates with interconnected gearboxes, driven by an electric motor operator, shall be provided with a shroud to cover the interconnecting shaft.
    e. The shroud shall be removable.
    f. The shroud shall be constructed of stainless steel and shall have a minimum thickness of 20 gauge.

H. Floorstands and Wall Brackets

1. Floorstands shall be mounted to the concrete, mounted to a wall bracket or mounted on the yoke of a self-contained gate as shown on the Contract Drawings.
2. All floorstands and wall brackets shall be fabricated from stainless steel.
    a. The base plate, adaptor plate and gussets shall be minimum 1/2-inch thick.

I. Anchorage

1. Anchor bolts shall be 316 stainless steel, fully threaded and shall have a minimum diameter of 1/2-inch.
    a. Anchor bolts shall be of the epoxy type.

J. Finish

1. All heat tint and slag from the welding process shall be passivated in accordance with ASTM A380. If bead blasting is used, the entire slide and entire frame shall be bead blasted.

2. All ferrous components shall be suitably prepared and then shop coated with primer. Finish coating shall be applied by the Contractor. The ductile iron operator housing shall be finish coated by the Contractor with a suitable paint that complies with the Painting section.

K. Spare Parts. Provide spare parts in accordance with requirements of Section 01070 – Contract Closeout.

PART 3 - E X E C U T I O N

3.1 DELIVERY AND STORAGE

A. Deliver, handle, store, and protect all equipment in accordance with the requirements of Section 01600 – Materials and Equipment.

B. Deliver, handle, store, and protect all equipment in full accordance with manufacturer/supplier recommendations and/or instructions.

3.2 FACTORY TEST AND CERTIFICATION

A. All equipment to be supplied as specified herein shall be tested at the factory for correct operation. Field tests for all equipment shall be made over the components complete operating range, from shutoff to maximum capacity. Results of all performance tests, as well as all data taken at the time of testing, shall be submitted for Owner and Owner's Representative review.

B. Certification of all factory testing data and results shall be submitted for Owner and Owner's Representative review.

3.3 INSTALLATION

A. Install all equipment in full accordance with manufacturer/supplier recommendations and/or instructions.

B. Prior to grouting completion, equipment alignment and installation shall be checked and approved by the manufacturer's factory representative. All grout required shall be the non-shrink type cement mortar. The installation shall be rechecked and approved by the manufacturer's factory representative following grouting completion.

C. Tighten all anchor bolts following grouting.

D. Following the completion of each gate installation, gates shall be operated through at least two complete open-close cycles.

E. Gates shall be leak-tested by the Contractor, per the requirements specified herein.

3.4 INSPECTION AND TESTING

A. Equipment shall be completely assembled, installed, painted, and approved by the both the manufacturer's factory representative and the Owner's Representative.

B. Following installation approval, equipment shall be placed in operation under the supervision of manufacturer's factory representative. Manufacturer's factory representative shall subsequently provide written certification of proper equipment installation and operation to Owner and Owner's Representative.

3.5 START-UP AND TRAINING

A. Perform equipment start-up in accordance with the requirements of Section 01655 – Starting of Systems.

B. Provide field instruction/training regarding equipment operation in accordance with the requirements of Section 01661 – Instruction of Operation and Maintenance Personnel.

END OF SECTION

SECTION 11380

AERATION BLOWERS

PART 1 - G E N E R A L

1.1 SECTION INCLUDES

A. This section includes the requirements for the provision of the Aeration Blowers B-301, and B-302. Blowers B-301, and B-302 shall be located in the blower building. All aeration blowers shall be of the rotary screw blower type.

B. The Contractor shall be responsible for additional design and costs associated with modifying applicable structure(s) to accommodate equipment with dimensions other than those shown on the drawings. This requirement includes equipment supplied by "Acceptable Manufacturers" that may differ from the dimensions shown on the drawings. All designs must be approved by the Owner's Representative.

C. All equipment specified under this section shall be provided by a single manufacturer/supplier.

D. Manufacturer/supplier shall be responsible for the manufacture, warranty, service, and operation of all equipment specified herein. Moreover, manufacturer/supplier shall, in addition to the Contractor, assume responsibility for the proper function of all equipment, following installation.

E. Blowers are to be installed in an indoor, non-conditioned space. The space shall be adequately ventilated to dissipate heat. The installation location is in Galveston, Texas, in close proximity to the Gulf of Mexico. Normal corrosion potential in a sub-tropical coastal environment is to be assumed. Provide equipment suitable for this location/environment.

1.2 SUBMITTALS

A. Contractor shall provide all submittals in accordance with the requirements of Section 01300 – Submittals, and Section 01340 – Shop Drawings, Product Data and Samples.

B. Submit complete descriptive product data for all equipment to be provided, including but not limited to, fabrication and installation drawings, electrical, instrumentation and controls component requirements and drawings, pertinent design calculations, and any other related information necessary to facilitate Owner and Owner's Representative review.

C. Shop Drawings/Product Data. At a minimum, provide the following:

1. Make, model, weight, and horsepower of major items of equipment.
2. Complete equipment performance curve, including at least three specified performance points. The specified performance points shall correspond to the required points in the provided data sheets. At a minimum, flowrate, pressure, temperature, package power and efficiency shall be included at these specified performance points.
3. Complete catalog information, descriptive literature, specifications, and identification of materials of construction.
4. Any exceptions to the specifications.
5. Detailed structural, mechanical, and electrical drawings showing the equipment dimensions, size, and locations of connections, piping load limits, and weights of associated equipment.
6. Process and instrumentation diagrams showing all major components and all instruments in the blower package.
7. Wiring diagram showing the wiring of the entire package including all required connections and any optional connections.
8. If the manufacturer is supplying any loose accessory equipment, then outline drawings of the loose shipped accessories shall be provided.

9. Blowers are not foreseen to require any special foundations or anchoring and the need for a special mounting platform / slab is not foreseen. However, if the manufacturer does have any special requirement, these must be clearly stated with details of the static forces acting on foundation and static pad loadings etc.
10. Lifting equipment for minimum clearance lifts. Vendor is to review building drawings to confirm adequate headroom for placement and removal of blowers in their enclosures.
11. Complete motor nameplate data, as defined by NEMA, motor manufacturer, and including any motor modifications. See Sections 16222 and 16223 pertaining to AC Electric Motors for additional submittal requirements.
12. Factory finish system.

D. Quality Control Submittals. At a minimum, provide the following:

1. Certified CAGI/ISO 1217, Annex C (latest edition) test results, including all electronic data taken for each unit.
2. Location of U. S. factory authorized service centers, and parts inventory location for major components.
3. Special shipping, storage and protection, and handling instructions.
4. Manufacturer's printed installation instructions.
5. Manufacturer's Certificate of Proper Installation.
6. Millwright's certification of proper field alignment.
7. Suggested spare parts list to maintain the equipment in service for a period of 2 years. Include a list of special tools required for checking, testing, parts replacement, and maintenance with current price information.
8. Provide special tools, with equipment for use prior to and during startup and for future maintenance per Specification 01700 Contract Closeout. Also provide spare parts suggested in the quantities suggested to have on hand.

E. Operation and Maintenance Manuals. Provide complete operation and maintenance manuals for all equipment, in accordance with the requirements of Section 01730 – Operation and Maintenance Data.

1.3 WARRANTY

A. Provide equipment warranty in accordance with the requirements of Section 01700 – Contract Closeout.

B. Parts availability shall be guaranteed from the manufacturer for 10 years after purchase. Should replacement parts not be available from the manufacturer, said manufacturer must replace all parts needed to bring the unit to a working condition or replace the entire blower package with a complete equal performance solution.

C. Extended Compression Element Warranty – 60 months from start-up or 66 months from shipping.

PART 2 - P R O D U C T S

2.1 DESIGN CRITERIA

A. See the data sheet for the blowers B-401, 402, attached.

2.2 ACCEPTABLE MANUFACTURERS

Provide equipment from one of the following acceptable manufacturers:

A. Screw Blowers:

1. Kaeser
2. Approved Substitution

2.3 QUALITY ASSURANCE

A. The Manufacturer shall have been in the business of manufacturing/design of blowers for a minimum of 5 years, and in the design of screw blowers for 5 years through direct experience, or through the purchase of design technology.

B. Certified Blower Test.

1. Each blower is tested hence each main drive motor has been tested for functional performance and shall not require a routine test on the motor only.

a. Each blower shall be tested in accordance with CAGI/ ISO 1217, Annex C (latest edition). Performance shall provide kW (HP) input to the package and a volumetric flow measurement at the maximum rated pressure and flow of the package according to published performance data. Measurement of flow is at the outlet of the package, net of all losses. Measurement of power will be at package input connections via the two-watt meter method. Package power consumption shall be considered during the test which will include the main drive motor power, Variable Speed Drive (VSD) losses, inlet filter & check valve pressure drop losses, oil cooler & oil pump.

b. Performance Tests shall be conducted using the job motor, job base frame and job controls system. Any exceptions required must be outlined in detail at the time of quotation. Measured package power must be within the allowable limit of ISO 1217.

c. Blower net delivered flow rate must be guaranteed with no negative tolerance other than those allowed in ISO 1217 and the discharge pressure shall be measured with no negative tolerance.

d. The capacity of the blower shall be defined as per paragraph 5.6 of the ISO 1217 Ed. 4 Test Code. The design discharge pressure shall be measured on the discharge side of the blower at the discharge flange.

e. The power computation shall be calculated as per paragraph 5.7 of the ISO 1217 Ed. 4 of the Test Code. Blower performance test shall be done by measuring delivered flow at the discharge flange of the blower unit, after check valve and discharge silencer.

2. A functional control check shall be performed on the control panel & all the on-skid instruments.

3. The measured blower performance shall be provided in a performance report and a statement of conformity will be supplied assuring all measurements were taken in accordance to ISO 1217 procedures and requirements.

4. Test results of the motors and blowers shall be supplied along with the Instruction / Operation & Spare parts manuals.

2.4 PRODUCT DESCRIPTION

A. Screw Blowers:

1. The blowers shall be variable speed, motor driven, single-stage, air cooled rotary screw type complete with integral gearbox and accessories as described. Rotary positive displacement lobe blowers are not acceptable.

2. Materials:

1) Casing: Ductile iron.
2) Seals: Labyrinth or carbon ring type.
3) Base and Motor Pedestal: Structural and formed steel.
4) Casing, Head plates, Gear Cover, End Cover: Ductile iron.

3. Casing: The blower casing shall be of one-piece construction, with separate head plates, and shall be made of close-grained ductile or cast iron suitably ribbed to prevent distortion under the specified operating conditions.
4. Rotors and Shafts: The rotors shall be of the screw involute type and shall operate without rubbing or liquid seals or lubrication. The impellers shall be statically and dynamically balanced by removing metal from the impeller body. Each impeller/shaft shall be supported by cylindrical roller bearings and fixed to control the axial location of the impeller/shaft in the unit. A double sealing arrangement shall be provided to prevent lubricant from contaminating the air stream.
5. Compensator: A stainless steel compensator shall be installed at the blower element discharge to ensure vibrations from the downstream piping are not transmitted to the blower compression element & vice versa.
6. Timing Gears: The impellers shall be timed by a pair of carburized and ground steel spur gears, mounted on the shafts with a tapered fit, and secured by a locknut or wedge rings.
7. Lubrication: There will be provided a positive oil seal at each bearing, designed to prevent lubricant from leaking into the air stream. The timing gears and the bearings shall be oil lubricated.
8. Drive System: The blower shall be mounted in a horizontal position as shown on the drawings. A suitable guard meeting OSHA specification shall be supplied.
9. Drive Motor: Provide TEFC motor, sized for horsepower as shown in data sheets, in accordance with Section 16222 – AC Electric Motors Less Than 100 HP, or Section 16223 – AC Electric Motors 100 HP and Above, as applicable. Motor rating will be 460-volt, 3 phase, 60 hertz.

B. OIL SYSTEM

1. The bearings and gears in the compressor element and gearbox shall be lubricated and cooled with oil which is at a temperature at ambient plus maximum 68 deg F.
2. The blower shall have a complete oil system generally comprised of the following:
    a. Oil sump
    b. Oil Breather
    c. Oil Pump, mechanically coupled to drive gearbox
    d. Air cooled oil cooler
    e. Oil filter
    f. Instrumentation (Pressure & Temperature)
3. Oil is circulated by pump from the oil reservoir through oil cooler, oil filter and oil manifold to the compressor element and gear box.
4. A by-pass valve shall open if the oil pressure rises above a set value.

C. BASE FRAME & ACOUSTIC ENCLOSURE

1. The blower shall be mounted on a sturdy industrial grade steel base frame with forklift slots allowing the unit to be placed on any level floor capable of taking the weight of the unit, no foundation or fixation should be required. The forklift slots shall be designed in the way that the blower can be manipulated by use of a manual pallet-jack or optional lifting device using a lifting beam allowing the use of an overhead crane.
2. The complete assembled blower / gearbox / motor unit should be mounted with vibration dampers in a 6-sided sheet metal acoustic enclosure which incorporates air inlet baffling to reduce the sound level under 80dB(A).
3. All service points to the blower should be easily accessible via the use of large door panels that should be easily mounted / dismounted.
4. The enclosure shall be strengthened with proper support structure to eliminate any damage during transport or during operation.
5. The electrical enclosure shall be UL listed according to UL 508A
6. Unit ventilation inlet grating and process air inlet grating shall be strictly separated. Both channels shall have a dedicated grating enabling a ducted channel for one, both or none of the flows, depending on the installation.
7. Unit ventilation outlet shall be at the roof top, enabling a ducted channel if preferred.
8. The dimensions for the enclosure shall not exceed 70 inches tall, by 60 inches wide, by 65 inches long.

2.5 CONTROL PANELS

A. Master Control Panel: A master control panel is required to allocate blower output. See Section 13413 – Control Panels and Section 13405 – Control System Operation. The master control panel shall receive D.O. and flow inputs via the basin sensor controllers. It shall then call upon the blowers to provide the required amount of air by providing output signals to be used for starting and stopping blowers, and controlling flow through speed control. The master control panel shall receive flow rates from the blowers and make corrections as needed to match the required flow rate demand and maintain discharge header pressure. The master control panel shall include an Ethernet switch, see Section 13417, Data Networking Equipment. Provide one local freestanding master control panel for the blowers.

B. Controls shall be mounted in a NEMA 12 stainless steel cabinet in accordance with Section 16160, Cabinets and Enclosures and Section 13400, Instrumentation and Control General Provisions.

C. The following instrumentation for control will be provided as a minimum for each blower:

1. Hand-off-auto (HOA) selector switch.
2. Local Start-Stop pushbuttons.
3. Blower outlet pressure transmitter.
4. Blower outlet temperature transmitter.
5. Oil pressure transmitter
6. Oil temperature transmitter
7. Shutdown relay connected to blower temperature, pressure.
8. Warning relay connected to blower temperature, pressure
9. Shutdown relay connected to oil temperature, pressure.
10. Warning relay connected to oil temperature, pressure
11. Alarm light for each item that can result in warnings or shutdown.
12. Dry contact for common alarm function for each blower for remote monitoring.
13. Elapsed run time meter for each motor. The elapsed run time meter shall be 6-digit, non-resettable, and sealed against dirt and moisture, 120 VAC, with indication of blower run time in hours with 1/10 hour increments.
14. Run-Off indicating lights.

D. Control points available for integration into future SCADA system through an ethernet connection shall include:

1. Dirty Inlet Filter Alarm (differential pressure across filter)
2. Outlet pressure gauge.
3. Outlet temperature gauge.
4. Run-Off indicating lights.
5. Blower Speed indicator.
6. Bearing oil temperature.
7. Bearing oil pressure.
8. Provide alarm point for each item that can result in shutdown.

E. Blower Start Up

1. Manufacture may choose the method for blower start up to be used as part of the supplied control methodology. The method may include the use of a blow off valve so that the blower starts in an unloaded condition, or the blower may start in a loaded condition utilizing the VFD to overcome the initial resistance.

2.6 ACCESSORIES

A. Each unit shall be furnished with the following accessory items:

1. Dry-type inlet filter with pressure differential transmitter, chamber type inlet and discharge silencers, flex connectors between blowers and silencers, OSHA certified belt guard (if belt driven), spring-type relief valves, discharge pressure transmitter, flanged check valve, butterfly valve and other related items to

provide a complete blower system. Inlet filter to housing to be factory installed as part of blower package; not to be shipped loose.

2. Inlet air filter/silencer to be rated for 120 percent of design volume. Filter elements to be cleanable and replaceable. Filter and silencer to be adequately supported independently of blower.
3. Suitable flanged, reinforced flexible rubber isolation connection for both inlet and outlet or as required by the drawings.
4. Ammeter calibrated in both scfm and amps; supplied with a suitable current transformer.
5. PLC control shall generate flow rate based on test curve data, inlet and outlet pressure and temperatures.
6. Pressure transducers for intake calibrated for gauge pressure readings in the appropriate range.
7. Temperature transducers for intake and discharge calibrated for degrees Fahrenheit readings in the appropriate range.

2.7 COATING

A. Provide manufacturer's standard coating for equipment being placed in corrosive environments. Refer to sections 09928 – Protective Coatings for Wastewater Systems.

PART 3 - E X E C U T I O N

3.1 DELIVERY AND STORAGE

A. Deliver, handle, store, and protect all equipment in accordance with the requirements of Section 01600 – Materials and Equipment.

B. Deliver, handle, store, and protect all equipment in full accordance with manufacturer/supplier recommendations and/or instructions.

3.2 FACTORY TEST AND CERTIFICATION

A. All equipment to be supplied as specified herein shall be tested at the factory for correct operation. Field tests for all equipment shall be made over the components complete operating range, from shutoff to maximum capacity. Results of all performance tests, as well as all data taken at the time of testing, shall be submitted for Owner and Owner’s Representative review.

B. Certification of all factory testing data and results shall be submitted for Owner and Owner’s Representative review.

3.3 INSTALLATION

Install all equipment in full accordance with manufacturer/supplier recommendations and/or instructions.

3.4 INSPECTION AND TESTING

A. The Equipment Manufacturer shall furnish an experienced service representative to inspect the final installation of the equipment. The services of the representative shall be provided for a minimum of one (1), eight-hour (8-hr.) day for each unit. If there are difficulties in operation of the equipment due to the manufacturer's fabrication, additional service shall be provided at no extra cost to the Owner.

B. Equipment shall be completely assembled, installed, painted, and approved by the manufacturer's factory representative. The equipment shall also be approved by the Owner’s Representative.

C. Following installation approval, equipment shall be placed in operation under the supervision of manufacturer’s factory representative. Manufacturer’s factory representative shall subsequently provide written certification of proper equipment installation and operation to Owner and Owner’s Representative.

3.5 START-UP AND TRAINING

A. Perform equipment start-up in accordance with the requirements of Section 01655 – Starting of Systems.

B. Provide field instruction/training regarding equipment operation in accordance with the requirements of Section 01661 – Instruction of Operation and Maintenance Personnel.

Aeration Blower Data Sheet

Project: Galveston Pirates Beach WWTP

Service Tag Number: B-401, 402	
Name: Aeration Blower 1, 2	
Manufacturer:	Atlas Copco
	Aerzen
	Kaeser
	Gardner Denver/Robuschi

Service Conditions

Fluid: Air

Design Point	Capacity %* SCFM	Outlet Flow (scfm)+	Discharge Pressure After Check Valve (psig)	Inlet Temp (ºF)	RH (%)	Package Power (kW) ++	Blower Discharge Temperature (ºF)
1	max = 100	*	10.2	110	95	*	*
2	*	760	10.2	110	95	*	*
3	*	600	10.2	110	95	*	*
4	*	230	10.2	110	95	*	*
5	min	*	10.2	110	95	*	*

+Flow rate, scfm at 14.7 psia pressure, 68 ºF temperature & 36 % RH.

++Package power means power consumed by the main drive motor plus all accessories including Variable Speed Drive (VSD) losses

Max discharge pressure required: 10.2 psig			
Inlet Temperatures:	Max 110 deg F	Min 45 deg F	
Site elevation:	11 ft		
Relative Humidity:	95%		
Use following values for calculations:		MW 28.96	k 1.395 Cp 0.2497
Bower Location:	■ Indoor	□ Heated	
	□ Outdoor	■ Unheated	
Electrical Code Classification: Unclassified			

Performance Data

Blower Type:	Rotary Screw Positive Displacement Blower
RPM at Max Air Demand:	By manufacturer*
Surge Pressure at Inlet conditions:	By manufacturer*
HP of Blower:	50 HP max single blower, 100 HP max total*
RPM of Blower at Max Air Demand Max Temp:	By manufacturer*
RPM of Blower at Design Demand Max Temp:	By manufacturer*
Surge Pressure at Max Air Demand Max Temp:	By manufacturer*
Surge Pressure at Design Demand Max Temp:	By manufacturer*
Cooling System Required? (Y/N):	Y* (for installation in sound enclosure)
Type of Motor:	TEFC*

Aeration Blower Data Sheet

Design and Materials	
Blower Housing:	By manufacturer*
Impellers:	By manufacturer*
Bearings:	By manufacturer*
Lubrication:	Oil
Blower Enclosure:	16 gauge* steel mounted on a I-beam skid

Drive Motor Specifications:
Manufacturer: To be integral with blower
Rated HP: 50 HP max single blower, 100 HP max total*
RPM (maximum sustainable): By manufacturer*
RPM (maximum peak): By manufacturer*
Frame: By manufacturer*
Phase/Hz/Volts: 3/60/460

Controls:
Variable Frequency Drive: To be coordinated by Contractor
PLC: Yes manufacturer standard
Instruments: All normally required by manufacturer as part of his blower package, but no less than inlet and outlet sensors for pressure and temperature, oil temperature and pressure, motor temperature sensors, power monitoring sensors, and sensors for any external cooling system that may be required.

Weights and Measurements:
Total Unit Weight (lbs.): By manufacturer* 3800 lb MAX

Other Details and Information: Provide inlet filters as required with the blower. Provide harmonic filters. Provide field instruments for a complete integrated package (9 thermal flow meters, 2 modulating butterfly valves, 6 luminescent DO probes, two ORP probes, two analytical transmitters for the 8 DO and ORP probes, two sun shields for the analytical transmitters.) Provide carrier for blower package to allow it to be hoisted by an overhead crane. Carrier must be able to pick up blower and operate in a clear zone of 7.5 ft (hook height off floor), combined weight of carrier and blower package to weigh no more than 2.5 tons. Provide pallet jack for moving and positioning blower packages for removal by overhead crane. Provide had truck for moving blowers to and from installed position to staging area for lifting by overhead crane.

* Vendor Confirmed or Supplied Information.

END OF SECTION

SECTION 11381

ODOR CONTROL SYSTEM

PART 1 - G E N E R A L

1. SECTION INCLUDES

   A. This section includes the requirements for the provision of one (1) odor control systems consisting of a Drum Scrubber, internal structural members, media with support grating, grease/mist eliminator, internal piping, electrical controls, valves, fan, and all necessary accessories.

   B. The Contractor shall be responsible for additional design and costs associated with modifying applicable structure(s) to accommodate equipment with dimensions other than those shown on the drawings. All designs must be approved by the Owner's Representative.

   C. All equipment specified under this section shall be provided by a single manufacturer/supplier.

   D. Manufacturer/supplier shall be responsible for the manufacture, warranty, service, and operation of all equipment specified herein. Moreover, manufacturer/supplier shall, in addition to the Contractor, assume responsibility for the proper function of all equipment, following installation.

2. SUBMITTALS

   A. Contractor shall provide all submittals in accordance with the requirements of Section 01300, Submittals, and Section 01340, Shop Drawings, Product Data and Samples.

   B. Submit complete descriptive product data for all equipment to be provided, including but not limited to, fabrication and installation drawings, electrical, instrumentation and controls component requirements and drawings, pertinent design calculations, and any other related information necessary to facilitate Owner and Owner's Representative review.

   C. Shop Drawings/Product Data. At a minimum, provide the following:

      1. The odor control Manufacturer shall show evidence of at least five similar-sized design installations in satisfactory operation in wastewater treatment plant facilities for at least 3 years.
      2. If FRP vessel is proposed, the manufacturer shall submit detailed description of the laminate and the type of reinforcing to be used and a letter from the resin manufacturer stating:
         a. That the laminate and reinforcing material used will provide chemical resistance at least equal to the published chemical resistance for the resin for the intended application.
         b. That the resin will meet the performance requirements stated and is suitable for the service conditions specified herein and the fabrication technique proposed.
      3. If LDPE vessel in provided, the manufacturer shall proved a quality certificate in compliance of material used.
      4. Detailed shop drawings showing weights and dimensions of equipment, all nozzles and manways, wall thicknesses, laminate make-up, fabrication techniques, and construction materials.
      5. A description of the proposed quality control program that will be used during the manufacturing of the scrubber. Include the resume of the quality control manager.
      6. A schedule for the scrubber's fabrication along with the location of the fabrication site.
      7. Written instructions as to the recommended methods for unloading, storing, and installing the scrubbers and recommended lifting and handling procedures.
      8. Submit listing of previous installations and references to the Owner's Representative. The proposed vessel fabricator must demonstrate an experience record of at least 5 years with the manufacture of vessels for industrial service.
      9. Submit written installation procedures.

10. Submit certification indicating the quality control, testing, and inspection has been completed and standards specified herein have been met prior to shipment to the jobsite.
11. Schematic of the system, showing all components and controls.
12. Electrical data for all equipment.
13. Information and data for all instrumentation and controls and for the control panel, including wiring and interconnection diagram.
14. Control panel layout drawing and fabrication details.
15. Complete listing of physical and chemical process parameters required for proper operation of the system.
16. In addition, the following data for motors shall be provided:
    a. Motors:
    b. Name and manufacturer
    c. Type and model
    d. Bearing type and lubrication
    e. Horsepower rating and service factor
    f. Temperature rating
    g. Full load rotative speed
    h. Net weight
    i. Efficiency at rated load
    j. Full load current
    k. Overall dimensions
17. Submit certification indicating the quality control, testing, and inspection has been completed and standards specified herein have been met prior to shipment to the jobsite.
18. Schematic of the system, showing all components and controls.
19. Electrical data for all equipment.
20. Information and data for all instrumentation and controls and for the control panel, including wiring and interconnection diagram.
21. Control panel layout drawing and fabrication details.

D. Operation and Maintenance Manuals. Provide complete operation and maintenance manuals for all equipment, in accordance with the requirements of Section 01730, Operation and Maintenance Data.

3. WARRANTY

Provide equipment warranty in accordance with the requirements of Section 01700, Contract Closeout.

4. REFERENCE STANDARDS

A. American National Standards Institute (ANSI)

B. American Society for Testing and Materials (ASTM)

C. Anti-Friction Bearing Manufacturers Association (AFBMA)

D. Hydraulic Institute

E. Institute of Electrical and Electronic Engineers (IEEE)

F. National Electric Code (NEC

G. National Electrical Manufacturers Association (NEMA)

H. Steel Structures Painting Council (SSPC)

PART 2 - P R O D U C T S

1. DESIGN CRITERIA

A. General: The Drum Scrubber shall be vertical, and shall consist of chemical resistance vessel, including permanganate impregnated activated carbon media, mist/grease eliminator, sump, and all internals. Each system shall follow the following performance requirements:

1. Headworks

a. Duty: Continuous air supply and odor source

b. Location: Outdoors

c. Inlet air temperature: 40-110 °F

d. Inlet relative humidity: 70-100%

e. Contaminants: H_2S, organic sulfur compounds, and other raw sewage odor constituents

f. Design airflow rate: 100 cfm

g. H_2S removal efficiency: ≥99% or ≤0.5ppmv in discharge

B. Materials & Construction:

1. DRUM SCRUBBER

a. This specification defines the requirements for a Drum Scrubber-100 cfm, as manufactured by Purafil, Inc., PureAir Filtration, and ECS or approved equal.

b. The Drum Scrubber consists of dry-scrubbing media contained in a 55-gallon, linear, medium density, UV stabilized polyethylene or FRP drum with a blower mounted on top of a FRP lid.

c. The Drum Scrubber shall contain five stages of dry-scrubbing media; 3 ft^3 of Odorcarb™ Ultra and 2 ft^3 of Odormix SP as manufactured by Purafil, Inc., or 3ft3 of PureAir Sulphasorb® XL and 2 ft^3 of CPS Blend as manufactured by PureAir, or approved equal supplied by other media manufacturers meeting the following requirements:

1. Hydrogen sulfide removal capacity of the 3ft^3 media shall be at least 0.30 g/cc. If media of lesser removal capacity is proposed, additional media shall be required to equal this volume.

2. 2 ft^3 of media shall be activated carbon with impregnated permanganate.

3. Each stage shall measure 1 ft^3, weigh no more than 50 lbs, and be contained in a media bag.

d. The Drum Scrubber shall be designed to operate at 99.5+% gas removal efficiencies.

e. The airflow capacity shall be 100 cfm at 6 iwg including 2 iwg of external static pressure. The unit includes an outlet damper which can be used to vary the airflow.

f. The configuration shall be arranged so that the contaminated air shall flow into the bottom inlet plenum and be drawn upwards through the media bed. Treated air shall discharge out the top of the vessel through a centrifugal air ventilator.

g. All components of the Drum Scrubber shall include:

1. 55-gallon, medium density, UV stabilized polyethylene drum and FRP lid

2. 5 ft^3 of dry scrubbing media or as determined by manufacturer

3. Centrifugal Aluminum blower with slide gate damper
4. Fernco 4” Inlet
5. Silencer on outlet
6. Rain hood
7. Mist/Grease Eliminator with 2 Fernco Fittings
8. NEMA 4x Control Panel with Motor Starter
9. Skid Mounted

2. DRUM

a. The drum material shall be linear, medium density, UV stabilized polyethylene, 3/16" in thickness.

b. The drum shall have a minimum capacity of 55 gallons and measure 22" in diameter and 36" in height.

c. Latches shall be stainless steel and rubber.

d. Fasteners shall be stainless steel.

e. The drum shall contain enough media to meet design requirements.

f. The media shall be supported by a system of thermoplastic packing to provide maximum diffusion.

g. The inlet shall have a 4" FERNCO flexible coupling, or equal.

h. The drum shall have a 0.75" diameter drainpipe.

i. A polymedia filter shall be used to separate the packing from the different media.

3. BLOWER SECTION

a. The blower be sized to deliver 100 cfm at 6 inches of water column.

b. The blower shall consist of a direct drive motor-fan assembly.

c. The motor shall be a 1/2 hp, 3450 RPM, 115 volt / 1 phase/ 60 Hz TEFC motor.

d. The motor shall be pre-wired with a 6 ft UL approved grounded power cord.

4. CHEMICAL MEDIA

a. Provide manufacturer media necessary to meet design requirements.

b. Media must be Non-Hazardous before and after it is spent.

c. Only UL certified media will be accepted in this MDPE vessel with companies that contain additional product liability on their systems.

d. All media must have proof that is made and produced in the United States for additional verification of product performance.

e. The general contractor is responsible for all design cost changes, engineer review time, and testing verification for media not listed and previously approved.

5. MIST/GREASE ELIMINATOR/PRE-FILTER

a. The mist eliminator shall be designed to remove 99% of water vapor (>4 micron diameter)

b. The mist eliminator shall be located at the air inlet and include a Trap Guard drain.

c. The mist eliminator pad shall be 2 inches in thickness at a minimum and shall consist of six layers of Kimre 16/96 general purpose polypropylene mesh, or equal.

d. In line mist eliminator will be provided in a low-density polyethylene housing, or equal.

e. Pressure taps and gages shall be installed and include a magnehelic type as manufactured by Dwyer (Series 2000), or approved equal, to indicate when filter requires cleaning.

f. Fernco fittings shall be provided on both sides of transitions, 4" diameter, or equal.

6. CONTROL PANEL/MOTOR STARTER

a. NEMA 4X, 316 stainless steel enclosure

b. Motor starter: FVNR, ATL, with overload heaters, a NEMA style starter sized accurately for 1/2 h.p. 115/1/60 hz VAC motor.

c. Main circuit breaker, magnetic, with front-panel operating handle.

d. Fan fail contact for future SCADA.

e. Operator interface and display:

1. "Hand-Off-Auto" selector switch

2. Indicating lamps (all lamps are push-to-test style):

i. "Fan Off"

ii. "Fan Running"

iii. "Fan Fail"

PART 3 - E X E C U T I O N

1. DELIVERY AND STORAGE

A. Deliver, handle, store, and protect all equipment in accordance with the requirements of Section 01600, Materials and Equipment.

B. Deliver, handle, store, and protect all equipment in full accordance with manufacturer/supplier recommendations and/or instructions.

2. FACTORY TEST AND CERTIFICATION

A. All equipment to be supplied as specified herein shall be tested at the factory for correct operation. Field tests for all equipment shall be made over the components complete operating range, from shutoff to maximum capacity. Results of all performance tests, as well as all data taken at the time of testing, shall be submitted for Owner and Owner's Representative review.

B. Certification of all factory testing data and results shall be submitted for Owner and Owner's Representative review.

3. INSTALLATION

A. Install all equipment in full accordance with manufacturer/supplier recommendations and/or instructions.

B. Provide the required nutrient solution for initial operation.

C. Set anchor bolts in accordance with the manufacturer's recommendations. Use antiseize compound on all stainless steel bolts.

4. INSPECTION AND TESTING

A. Equipment shall be completely assembled, installed, painted, and approved by the both the manufacturer's factory representative and the Owner's Representative.

B. GENERAL:

1. The Contractor shall be responsible for all costs associated with odor control system testing.

C. Functional Testing:

1. Using non-odorous ambient air, the entire odor control system shall be operated for not less than 24 continuous hours in order to demonstrate the mechanical and electrical integrity of the system. Any mechanical or electrical breakdowns, unusual vibrations, or control sequencing problems shall be considered sufficient cause to reject the test. Inability to successfully complete the functional testing in five tries shall be considered cause for the construction manager to reject the odor control system. Contractor shall balance all air flows prior to system performance testing.

D. PERFORMANCE TESTING:

1. The performance tests shall be conducted after sufficient acclimation time and at such time as all anticipated odorous air streams are present in the scrubber inlet. The time of the tests and detailed test procedure shall be submitted for approval prior to the testing period.

2. During testing, scrubber air flow rates shall be held constant. Changes in scrubber system operating conditions shall not be permitted. All fine-tuning of operating conditions shall be performed prior to testing.

3. Design operating conditions shall be maintained for a minimum of 4 hours. During this time, all pertinent operating parameters shall be monitored and recorded and sufficient sampling and analysis shall be conducted to demonstrate that flow rates are at design conditions.

4. Hydrogen sulfide concentration shall be measured in each scrubber inlet and outlet. Inlet and outlet levels shall be measured once every 30 minutes using a portable H2S analyzer such as Interscan, Jerome or equal.

5. Results: A description of the performance tests shall be submitted. The hydrogen sulfide compound removal efficiency shall be as specified in the design and performance requirements. Should scrubber system performance not meet any of the above requirements, that system shall have failed the performance test. The Manufacturer shall make any additions or modifications to that scrubber system as may be necessary, at no additional cost to the Owner, and the performance tests for that system shall be repeated in its entirety.

6. Demonstrate with a Final Acceptance Test that these Specifications have been met by the equipment as installed. As a minimum, perform the following tests.

a. That rotating equipment has been properly installed and is in correct alignment.

b. That units operate without overheating or overloading any parts and without objectionable vibration.

c. That there are no mechanical defects in any of the parts.

d. That the controls perform satisfactorily as to sequence control, correct start and stop elevations, and proper high-level alarm functions.

E. Following installation approval, equipment shall be placed in operation under the supervision of manufacturer's factory representative. Manufacturer's factory representative shall subsequently

provide written certification of proper equipment installation and operation to Owner and Owner's Representative.

5. START-UP AND TRAINING

A. Perform equipment start-up in accordance with the requirements of Section 01655, Starting of Systems.

B. Provide field instruction/training regarding equipment operation in accordance with the requirements of Section 01661, Instruction of Operation and Maintenance Personnel.

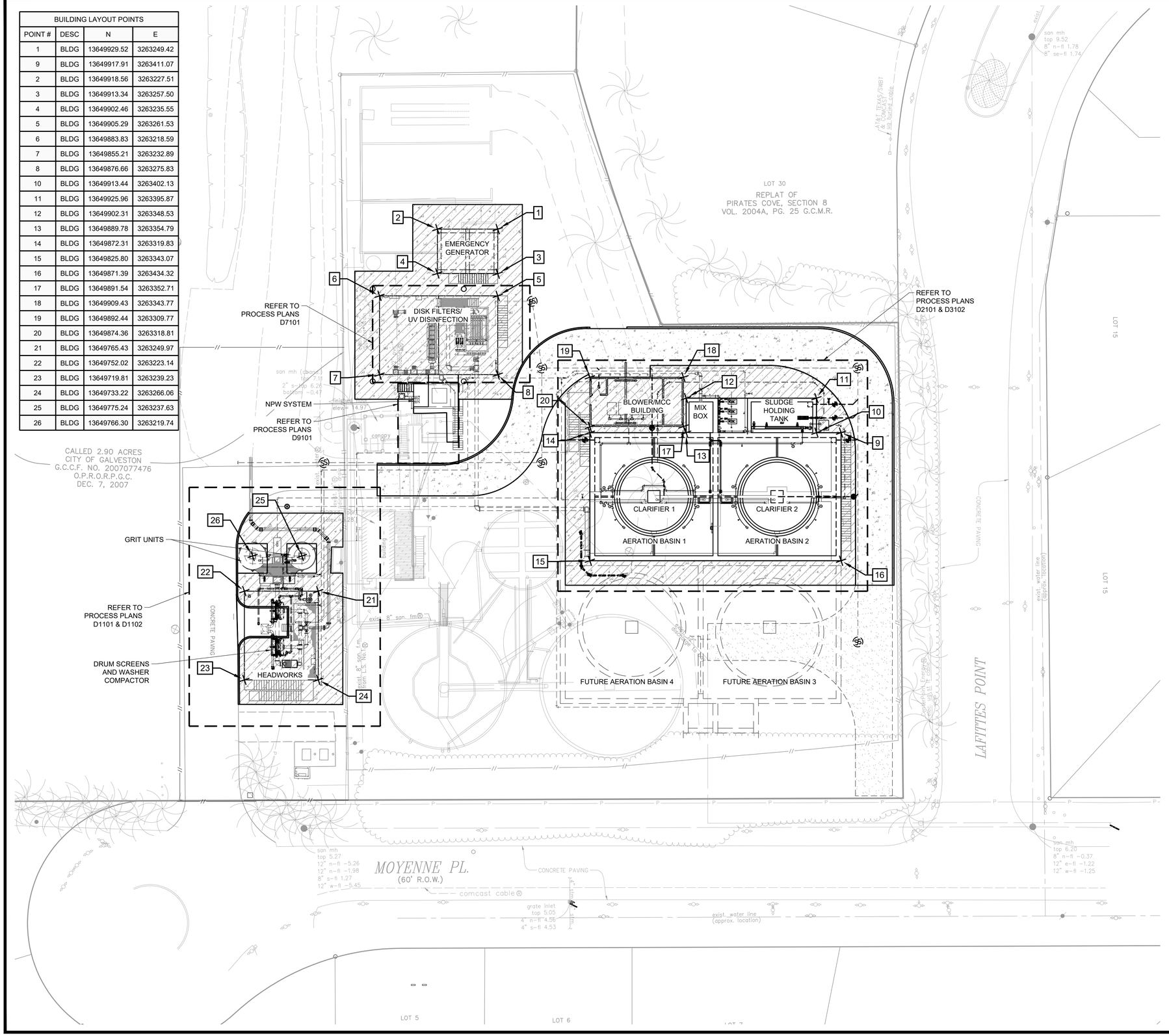
C. The system manufacturer's representative shall be present at the job site for the following time period for Start Up; travel time excluded:

1. One day for inspection and certification of the installation.

2. One-half day to train Owner's staff in operation of the system.

END OF SECTION

BUILDING LAYOUT POINTS			
POINT #	DESC	N	E
1	BLDG	13649929.52	3263249.42
9	BLDG	13649917.91	3263411.07
2	BLDG	13649918.56	3263227.51
3	BLDG	13649913.34	3263257.50
4	BLDG	13649902.46	3263235.55
5	BLDG	13649905.29	3263261.53
6	BLDG	13649883.83	3263218.59
7	BLDG	13649855.21	3263232.89
8	BLDG	13649876.66	3263275.83
10	BLDG	13649913.44	3263402.13
11	BLDG	13649925.96	3263395.87
12	BLDG	13649902.31	3263348.53
13	BLDG	13649889.78	3263354.79
14	BLDG	13649872.31	3263319.83
15	BLDG	13649825.80	3263343.07
16	BLDG	13649871.39	3263434.32
17	BLDG	13649891.54	3263352.71
18	BLDG	13649909.43	3263343.77
19	BLDG	13649892.44	3263309.77
20	BLDG	13649874.36	3263318.81
21	BLDG	13649765.43	3263249.97
22	BLDG	13649752.02	3263223.14
23	BLDG	13649719.81	3263239.23
24	BLDG	13649733.22	3263266.06
25	BLDG	13649775.24	3263237.63
26	BLDG	13649766.30	3263219.74



GENERAL NOTES

1. ELEVATIONS ARE REFERENCED TO NAVD-88 VERTICAL DATUM.
2. HORIZONTAL AND VERTICAL CONTROL POINTS ARE PROVIDED ON SURVEY CONTROL SHEET (V0001).

LEGEND

- PROP 6" CONCRETE PAVEMENT
- PROP 4" SCOUR PROTECTION CONC
- PROP 6" GRAVELSURFACE

PLAN NORTH

Pirates Beach Wastewater Treatment Plant Replacement Galveston, Texas

CITY OF GALVESTON 1839

Lockwood, Andrews & Newnam, Inc.
A LEO A DALY COMPANY
2925 Briarpark Drive
Suite 400
Houston, TX 77042
Tel 713-266-6900
www.lan-inc.com

KEY PLAN

REVISIONS

NO.	DESCRIPTION	DATE
1	ADDENDUM 2	12/03/21

FILE LOG

ACTIVITY	BY
Manager	WES
Design	JTH
Draw	SEM
Check	PW

STAMP

STATE OF TEXAS
PAUL WOOD
95029
LICENSED PROFESSIONAL ENGINEER
09/28/2020

Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

0 20 40
SCALE: 1"=20'

Project No. 120-11918-000
Date: September 28, 2020

PROPOSED OVERALL SITE PLAN

C0102

13 OF 114

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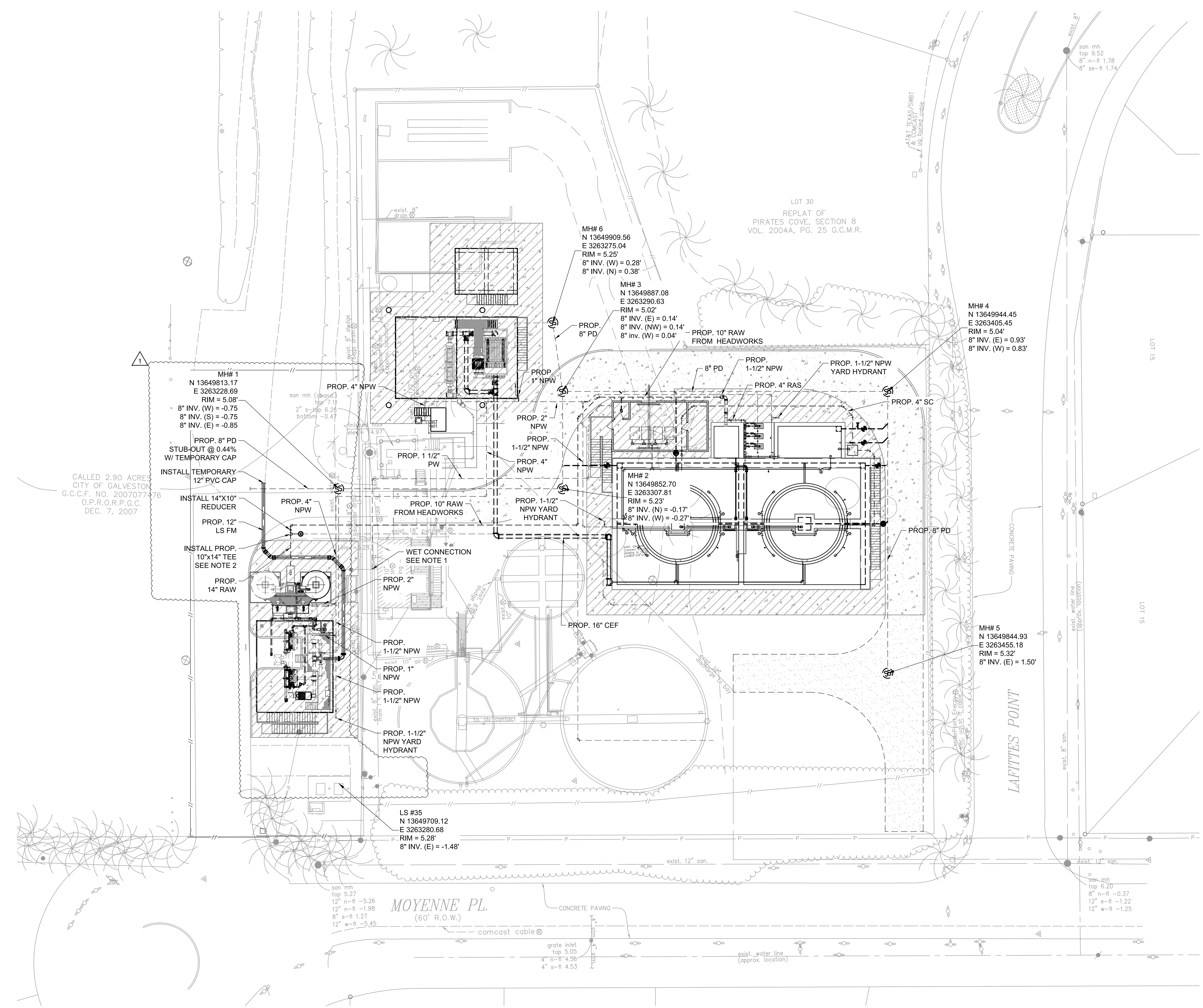

1 **PROPOSED YARD PIPING PLAN**

SCALE: 1" = 20'

CONSTRUCTION NOTES:

1. CONNECT PROPOSED 1 ½" POTABLE WATER TO EXISTING 8" POTABLE WATER. REMOVE AND DISPOSE OF EXISTING 1 ½" POTABLE WATER AS REQUIRED FOR INSTALLATION OF PROPOSED LINE.
2. INSTALL 10" PLUG VALVE AND BLIND FLANGE FOR FUTURE 10" RAW.
3. FOR ADDITIONAL INFORMATION ON NON-POTABLE WATER PIPING AND APPURTENANCES, REFER TO PI&D DRAWINGS.

PLAN
NORTH

Pirates Beach Wastewater Treatment Plant Replacement Galveston, Texas

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FILE LOG

ACTIVITY	BY
Manager	WES
Design	JTH
Draw	JTH
Check	PW

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STATE OF TEXAS
PAUL WOOD
95029
LICENSED
PROFESSIONAL ENGINEER
09/28/2020

Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

0 20 40
SCALE: 1"=20'

Project No. 120-11918-000
Date: September 28, 2020

PROPOSED YARD PIPING PLAN

C0112

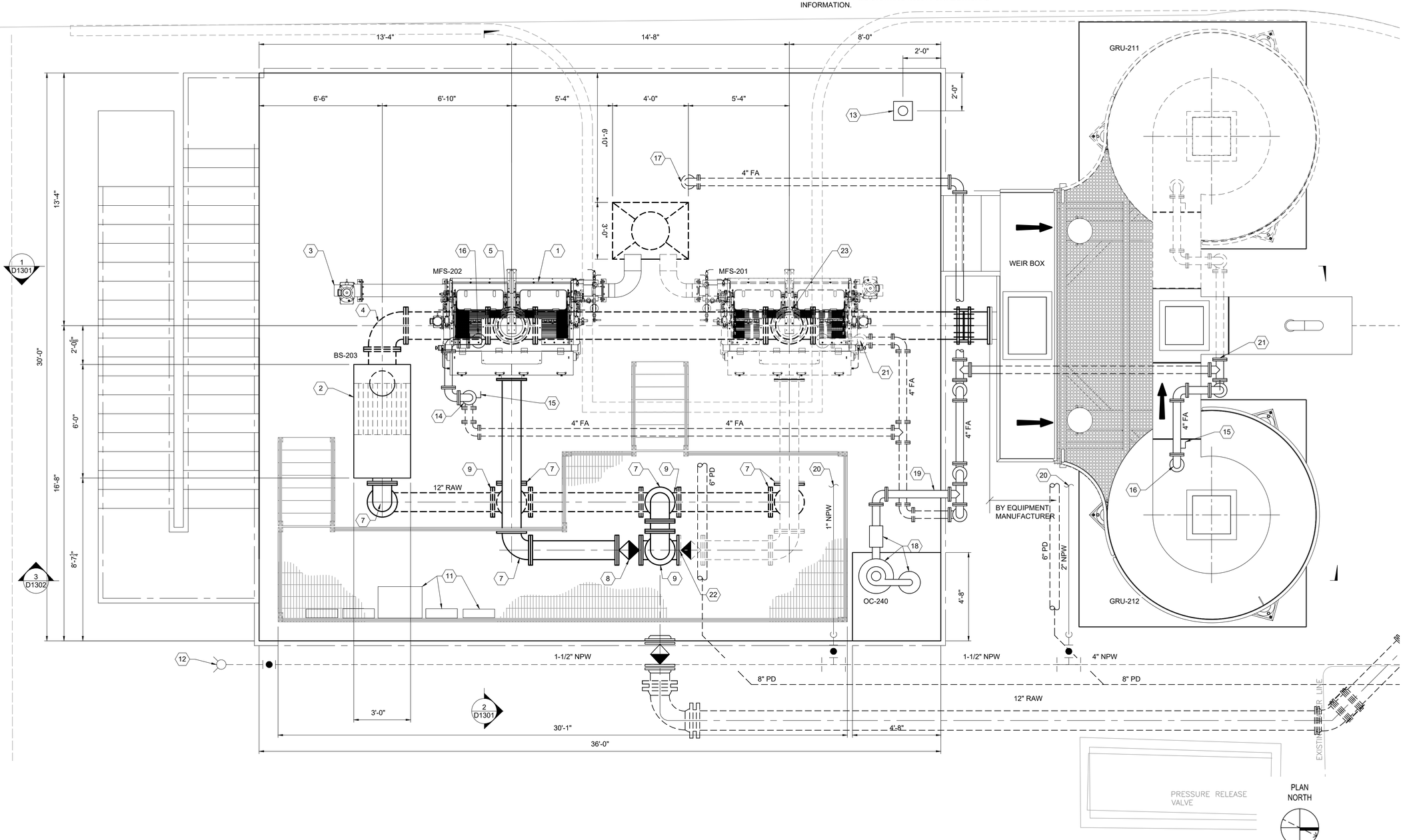
File:P:\120\120-11918-000\4-0-Production-Working\4-1-BIM-CAD\Civil\C0112.dwg Plotted:12/1/2021 2:16 PM By:Thomas-Harris, Jordon

KEY NOTES: (#)

1. INSTALL DRUM SCREEN (TYP. OF 2).
2. INSTALL MANUAL BAR SCREEN W/ COVER.
3. INSTALL COMPACTOR.
4. INSTALL 16"x90° BEND ON SCREEN DISCHARGE.
5. INSTALL 16" TEE ON SCREEN DISCHARGE (TYP. OF 2).
6. NOT USED
7. INSTALL 12"x90° BEND (TYP. OF 9).
8. INSTALL 12" BALLCENTRIC PLUG VALVE (TYP. OF 2).
9. INSTALL 12" TEE (TYP OF 3).
10. NOT USED
11. ELECTRICAL EQUIPMENT, SEE ELECTRICAL DRAWINGS.
12. 1-1/2" NON-POTABLE WATER YARD HYDRANT W/ CURB STOP & VALVE BOX. SEE CIVIL DETAILS.
13. PORTABLE DAVIT CRANE & SOCKET BASE. MOUNT TO CONCRETE SLAB PER MANUFACTURERS RECOMMENDATION'S.
14. CAST HOLE W/ STAINLESS STEEL SLEEVE & MECHANICAL LINK SEAL IN CONCRETE SLAB FOR 4" ODOR CONTROL PIPING PENETRATION.
15. ODOR CONTROL VOLUME DAMPER (TYP OF 4).
16. 4" EQUIPMENT FLANGE - COORDINATE LOCATION WITH EQUIPMENT SUPPLIER.
17. 4" ODOR CONTROL PIPING TO DUMPSTER. SUPPORT PIPING FROM COMPACTOR CHUTE.
18. ODOR CONTROL EQUIPMENT - SEE SPECIFICATION SECTION 11381.
19. 4" ODOR CONTROL PIPING - SEE SPECIFICATION SECTION 15800.
20. NON-POTABLE WATER SUPPLY TO HEADWORKS AREA. SEE DRAWING P&ID DRAWING N0651 FOR ADDITIONAL INFORMATION.
21. 4" BLIND FLANGE
22. 12" BLIND FLANGE
23. 14" BLIND FLANGE

CONSTRUCTION NOTES:

1. MFS-201 AND GRU-211 TO BE INSTALLED DURING FUTURE EXPANSIONS.



1 HEADWORKS PROPOSED PLAN

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

Pirates Beach Wastewater Treatment Plant Replacement Galveston, Texas

CITY OF GALVESTON 1839

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KEY PLAN

REVISIONS

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1	ADDENDUM 2	12/03/21

FILE LOG

ACTIVITY	BY
Manager	WES
Design	JTH
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STATE OF TEXAS
PAUL WOOD
95029
LICENSED PROFESSIONAL ENGINEER
09/28/2020

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Texas Registered Engineering Firm F-2614

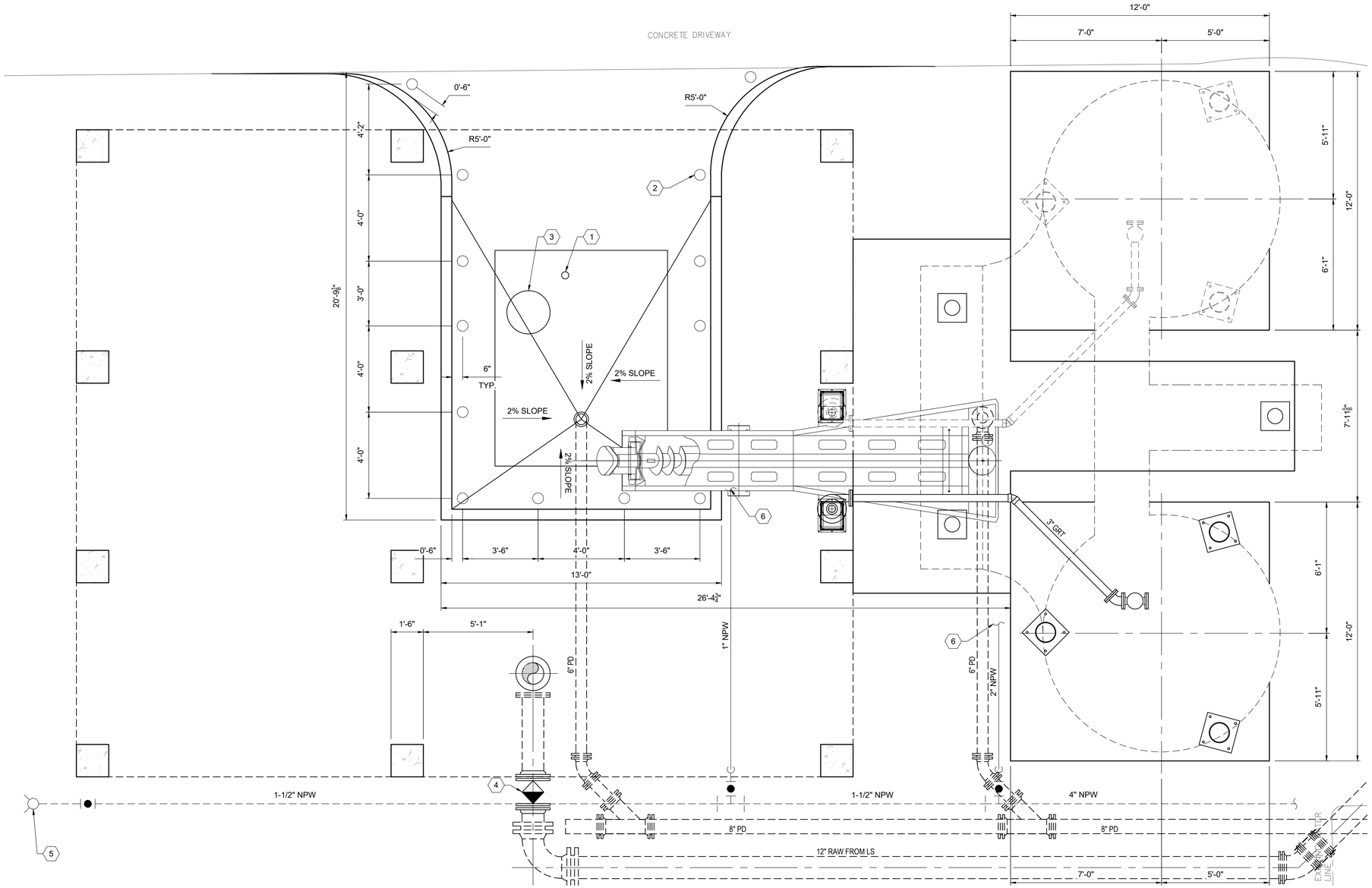
SCALE: 3/8"=1'-0"

Project No. 120-11918-000
Date: September 28, 2020

PROPOSED HEADWORKS UPPER PLAN ELEV. 30.00'

D1101

19 OF 114



2 PROPOSED HEADWORKS LOWER PLAN - ELEV 5.50'

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

PLAN NORTH

CONSTRUCTION NOTES:

KEY NOTES: ⟨#⟩

1. 4" ODOR CONTROL PIPING TO DUMPSTER. PROVIDE FOUR FEET OF FLEXIBLE HOSING INTO DUMPSTER.
2. 6" BOLLARD, SEE DETAIL 1, SHEET C0006.
3. SCREENINGS COMPACTOR CHUTE. CONTRACTOR TO INSTALL BRACING FROM CONCRETE COLUMNS.
4. INSTALL 12" FULL PORT PLUG VALVE W/ BURIED SERVICE ACTUATOR & VALVE BOX.
5. 1-1/2" NON-POTABLE WATER YARD HYDRANT W/ CURB STOP & VALVE BOX. SEE CIVIL DETAILS.
6. NON-POTABLE WATER SUPPLY TO HEADWORKS AREA. SEE DRAWING P&ID DRAWING N0651 FOR ADDITIONAL INFORMATION.

Pirates Beach Wastewater Treatment Plant Replacement Galveston, Texas

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Manager	WES
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Draw	SAL
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STATE OF TEXAS
PAUL WOOD
95029
LICENSED PROFESSIONAL ENGINEER
09/28/2020

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Texas Registered Engineering Firm F-2614

0 2' 4' 6'
SCALE: 3/8"=1'-0"

Project No. 120-11918-000
Date: September 28, 2020

PROPOSED HEADWORKS LOWER PLAN ELEV. 5.50'

D1102

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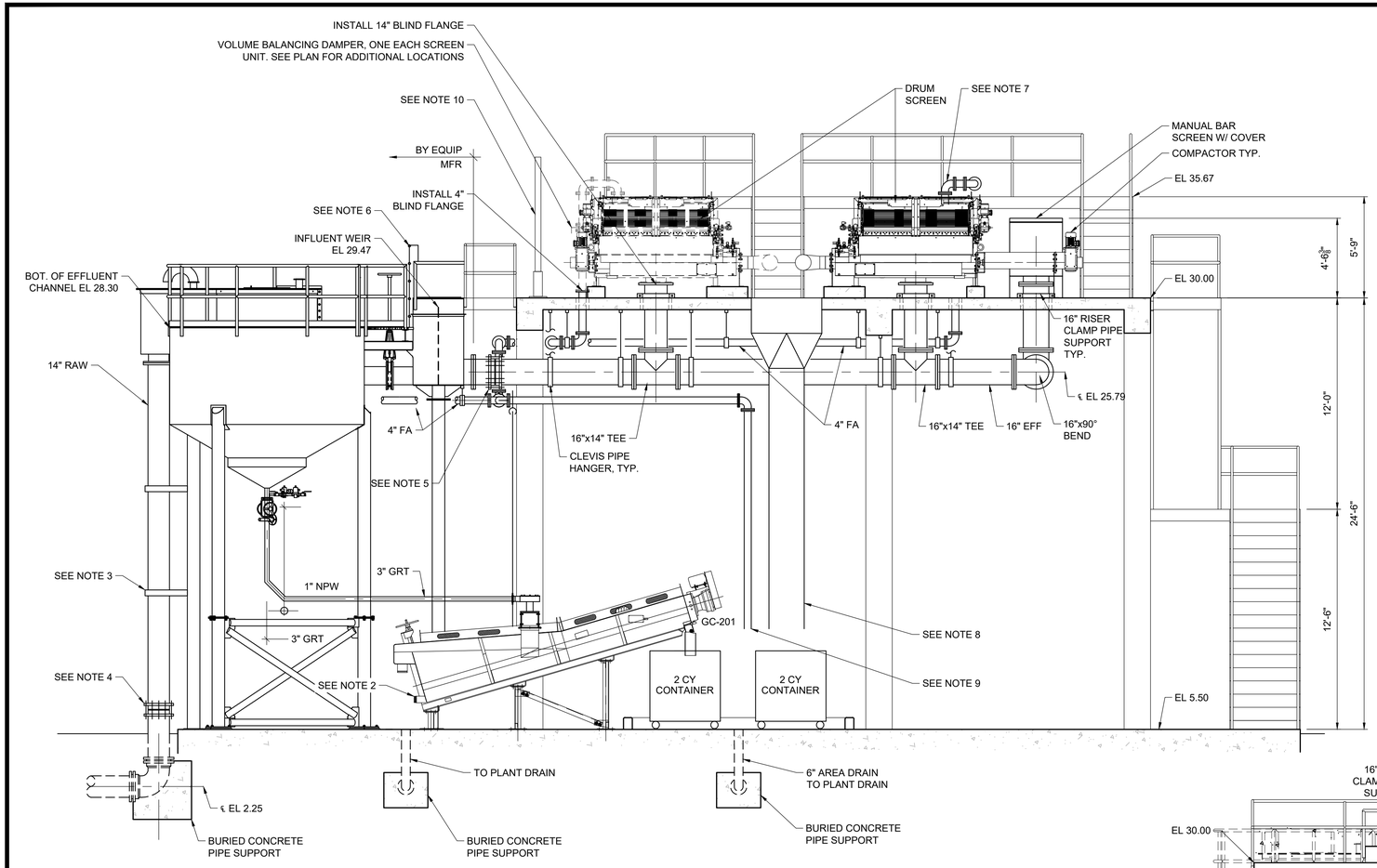
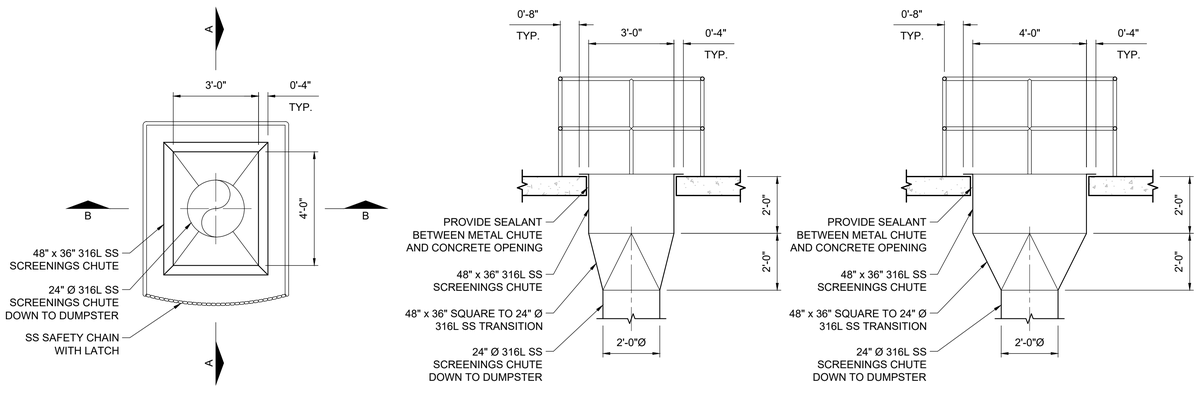


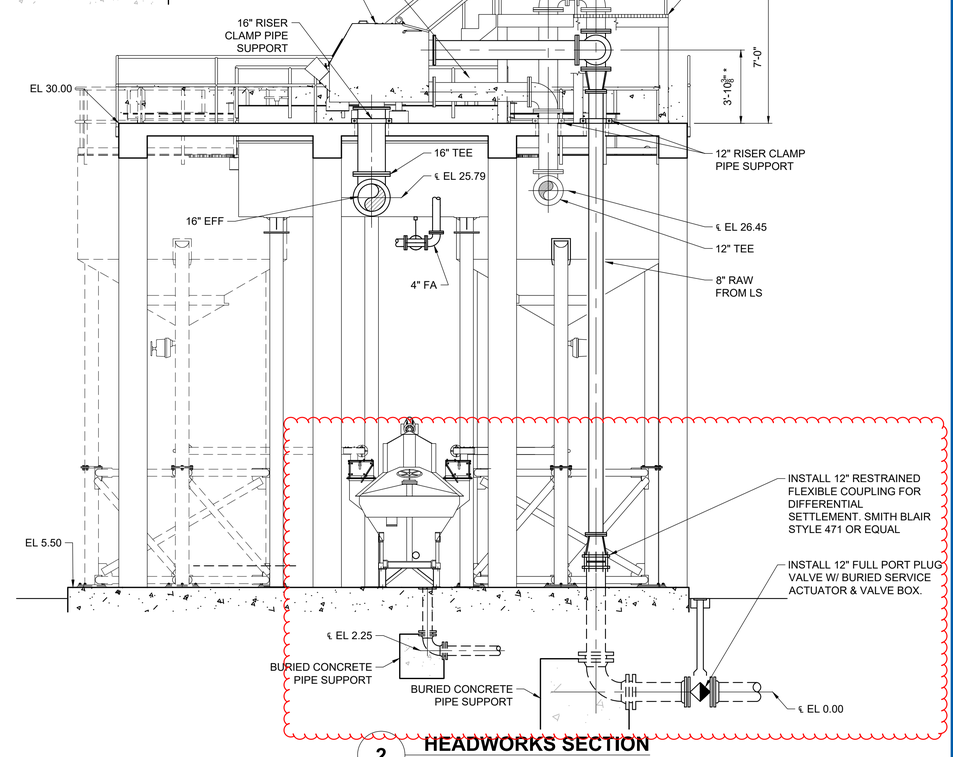
1 HEADWORKS SECTION

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



3 DISCHARGE CHUTE DETAILS

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



2 HEADWORKS SECTION

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

CONSTRUCTION NOTES:

1. CONTRACTOR TO COORDINATE PIPE PENETRATIONS SHOWN WITH STRUCTURAL DRAWINGS. PROVIDE CAST HOLE W/ STAINLESS STEEL SLEEVE IN LOCATIONS SHOWN. VERIFY PIPE SIZES, LOCATIONS, AND EQUIPMENT DEPENDANT PIPE PENETRATION LOCATIONS PRIOR TO STARTING WORK.
2. CONTRACTOR TO COORDINATE GRIT CLASSIFIER EFFLUENT CONNECTION TO PLANT DRAIN WITH MANUFACTURER.
3. EFFLUENT PIPE & SUPPORTS TO BE SUPPLIED BY CONTRACTOR.
4. INSTALL 14" RESTRAINED FLEXIBLE COUPLING FOR DIFFERENTIAL SETTLEMENT. SMITH BLAIR STYLE 471 OR EQUAL.
5. INSTALL 16" RESTRAINED FLEXIBLE COUPLING FOR DIFFERENTIAL SETTLEMENT. SMITH BLAIR STYLE 471 OR EQUAL.
6. CONTRACTOR TO COORDINATE ACCESS TO LOWER LEVEL OF GRIT UNIT WITH EQUIPMENT SUPPLIER.
7. 4" ODOR CONTROL PIPING CONNECTION TO DRUM SCREEN UNIT. CONTRACTOR TO COORDINATE CONNECTION W/ SCREEN MANUFACTURER.
8. CONTRACTOR TO INSTALL SCREENINGS CHUTE BRACING FROM CONCRETE COLUMNS.
9. CONTRACTOR TO INSTALL ODOR CONTROL PIPING BRACING FROM CONCRETE COLUMNS.
10. PORTABLE DAVIT CRANE & SOCKET BASE, SEE SPECIFICATIONS. MOUNT TO CONCRETE SLAB PER MANUFACTURERS RECOMMENDATIONS.
11. * DENOTES DIMENSION TO BE COORDINATED WITH EQUIPMENT MFR.

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KEY PLAN

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NO.	DESCRIPTION	DATE
1	ADDENDUM 2	12/03/21

FILE LOG

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Manager	WES
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0 4' 8'
SCALE: 1/4"=1'-0"

Project No. 120-11918-000
Date: September 28, 2020

PROPOSED HEADWORKS SECTION SHEET 1 OF 2

D1301 | 21 OF 114

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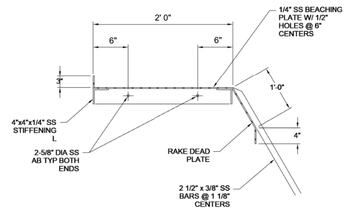
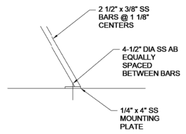
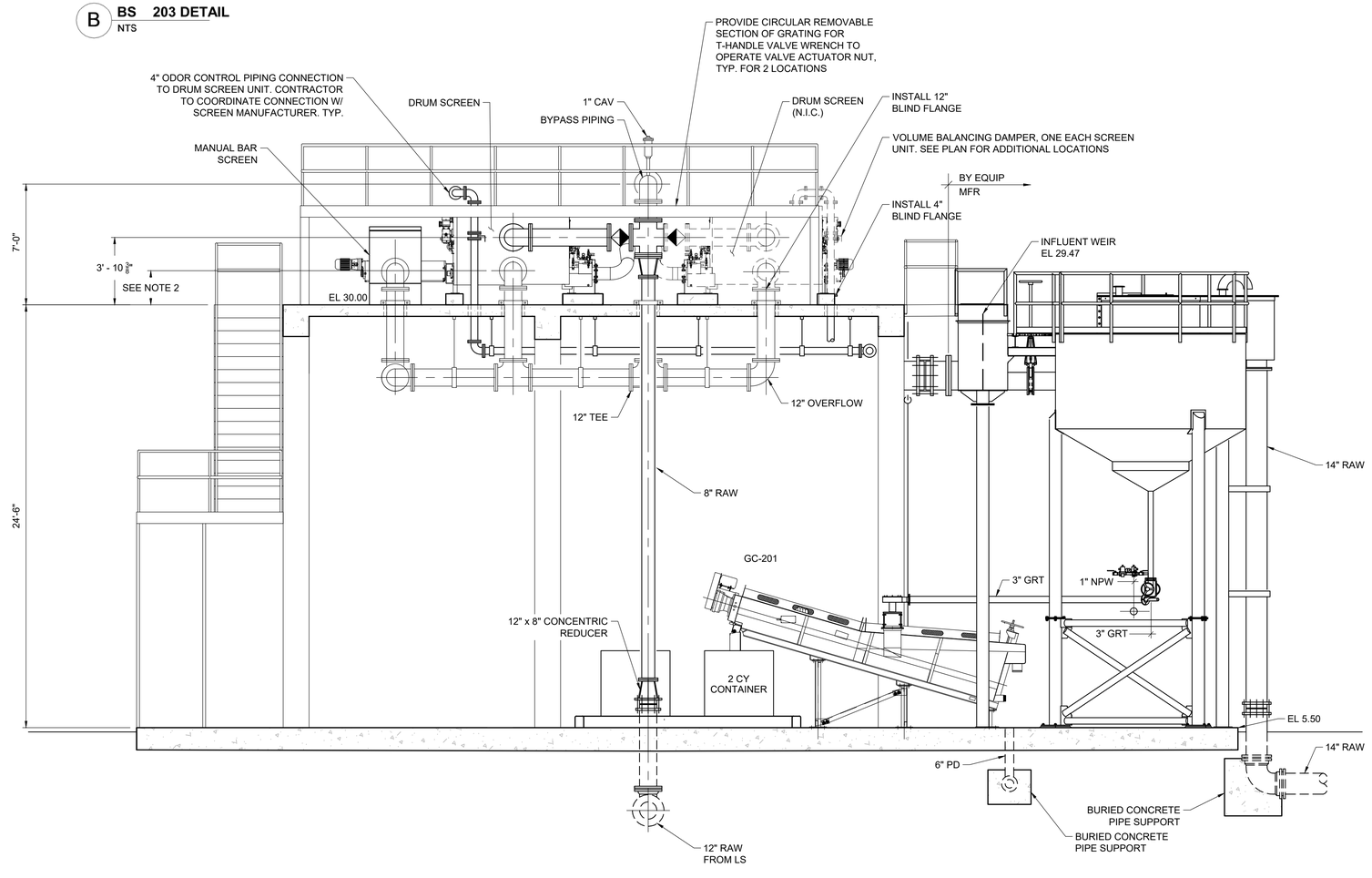


A **BS 203 DETAIL**
NTS



B **BS 203 DETAIL**
NTS



3 **HEADWORKS SECTION**
SCALE: 1/4" = 1'-0"

CONSTRUCTION NOTES:

1. CONTRACTOR TO COORDINATE PIPE PENETRATIONS SHOWN WITH STRUCTURAL DRAWINGS. PROVIDE CAST HOLE W/ STAINLESS STEEL SLEEVE IN LOCATIONS SHOWN. VERIFY PIPE SIZES, LOCATIONS, AND EQUIPMENT DEPENDANT PIPE PENETRATION LOCATIONS PRIOR TO STARTING WORK.
2. CONTRACTOR TO VERIFY DRUM SCREEN INFLUENT AND BYPASS PIPING ELEVATIONS WITH EQUIPMENT MANUFACTURER PRIOR TO ORDERING PIPING.

Pirates Beach Wastewater Treatment Plant Replacement Galveston, Texas

CITY OF GALVESTON 1839

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KEY PLAN

REVISIONS

NO.	DESCRIPTION	DATE
1	ADDENDUM 2	12/03/21

FILE LOG

ACTIVITY	BY
Manager	WES
Design	JTH
Draw	SAL
Check	PW

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STATE OF TEXAS
PAUL WOOD
95029
LICENSED PROFESSIONAL ENGINEER
09/28/2020

Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

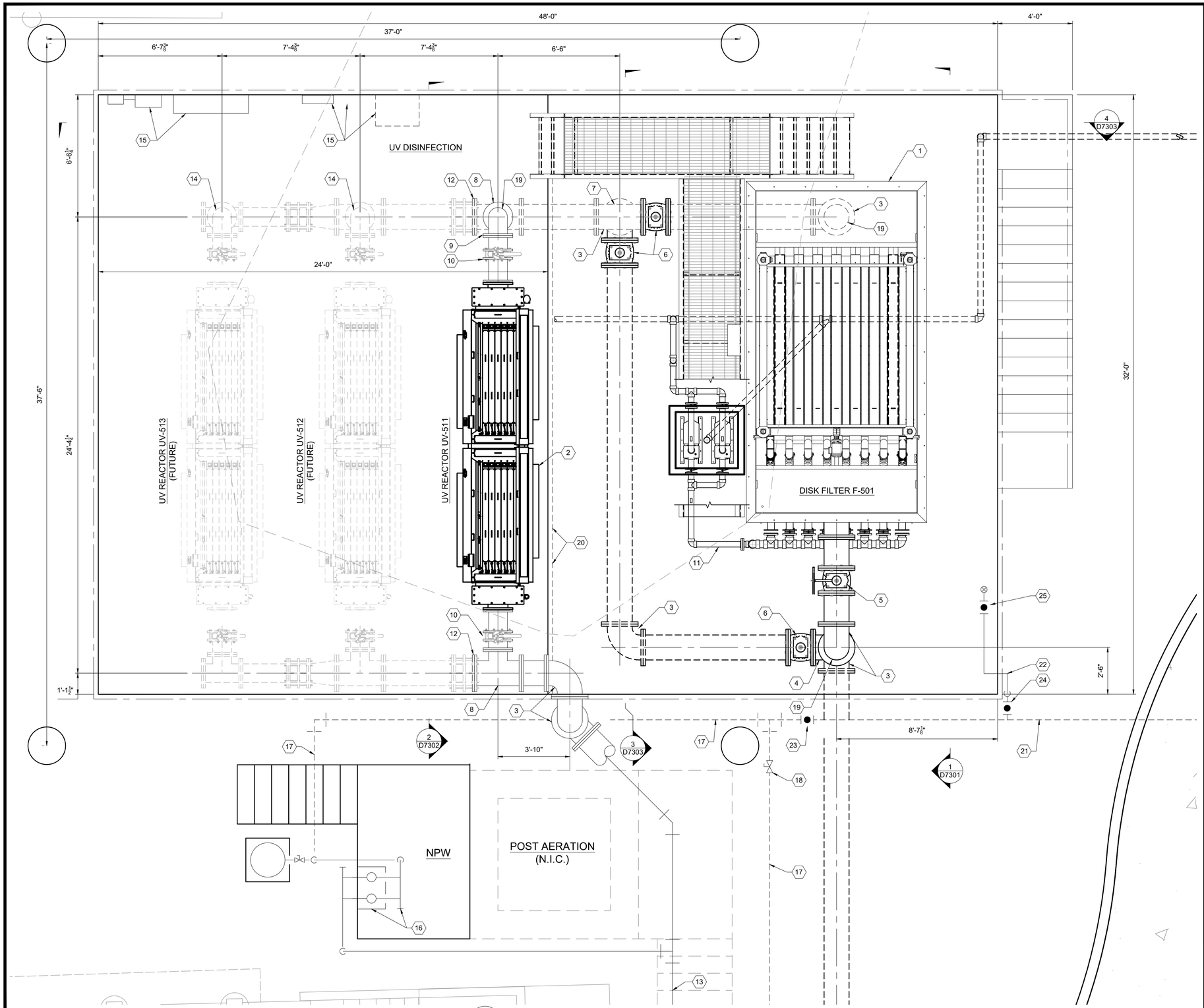
0 4" 8"
SCALE: 1/4"=1'-0"

Project No. 120-11918-000
Date: September 28, 2020

PROPOSED HEADWORKS SECTION SHEET 2 OF 2

D1302

22 OF 114



1 **DISK FILTER AND UV DISINFECTION**
SCALE: 3/8" = 1'-0"

CONSTRUCTION NOTES:

1. CONTRACTOR TO COORDINATE PIPE PENETRATIONS SHOWN WITH STRUCTURAL DRAWINGS. VERIFY PIPE SIZES, LOCATIONS, AND EQUIPMENT DEPENDANT PIPE PENETRATION LOCATIONS PRIOR TO STARTING WORK.

KEY NOTES: (#)

1. INSTALL DISK FILTER, SEE MANUFACTURER'S DRAWING FOR DETAILS.
2. INSTALL UV DISINFECTION, SEE MANUFACTURER'S DRAWINGS FOR DETAILS.
3. INSTALL 16"x90° BEND.
4. INSTALL 16" TEE IN VERTICAL OF INFLUENT PIPING FOR BYPASS.
5. INSTALL 16" RESILIENT WEDGE GATE VALVE W/ CHAIN WHEEL.
6. INSTALL 16" RESILIENT WEDGE GATE VALVE W/ 2" NUT OPERATOR & 316 SS FLOOR BOX. FLOOR BOX SHALL BE TRUMBULL OR EQUAL.
7. INSTALL 16" TEE.
8. INSTALL 16"x12" TEE.
9. INSTALL 12"x90° BEND.
10. INSTALL 12" FLANGED BUTTERFLY VALVE.
11. INSTALL BACKWASH PIPING. SEE MANUFACTURER'S SPECS AND DRAWINGS.
12. INSTALL 16" BLIND FLANGE.
13. 16" DI TO EXISTING EFFLUENT SPLITTER BOX. SEE SHEET D9101 FOR CONTINUATION.
14. PROVIDE CAST HOLE W/ SS SLEEVE FOR FUTURE PIPING PENETRATION. CONTRACTOR TO PROVIDE TEMPORARY AFFIXED STEEL PLATE COVER OVER HOLE, PAINTED SAFETY YELLOW. SEE COATINGS SPECIFICATION FOR PAINT.
15. ELECTRICAL EQUIPMENT, SEE ELECTRICAL DRAWINGS.
16. SEE SHEETS D9101 AND D9301 FOR NON-POTABLE WATER SYSTEM DETAILS.
17. INSTALL 4" BURIED NON-POTABLE WATER PIPING.
18. INSTALL 4" NON-POTABLE WATER GV W/ VALVE BOX.
19. INSTALL 16" WALL PIPE.
20. HANDRAIL AT WEST EDGE OF ELEVATED DISK FILTER STRUCTURE SHALL BE PERFORATED METAL SCREENING TYPE. SEE SPECIFICATIONS.
21. INSTALL 2" BURIED NON-POTABLE WATER PIPING.
22. INSTALL 1" NON-POTABLE WATER PIPING.
23. INSTALL 2" NON-POTABLE WATER CURB STOP W/ VALVE BOX.
24. INSTALL 1" NON-POTABLE WATER CURB STOP W/ VALVE BOX.
25. INSTALL 1" BALL VALVE AND ¾" HOSE BIBB.

PLAN NORTH

Pirates Beach Wastewater Treatment Plant Replacement Galveston, Texas

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KEY PLAN

REVISIONS (##)

NO.	DESCRIPTION	DATE
1	ADDENDUM 2	12/03/21

FILE LOG

ACTIVITY	BY
Manager	WES
Design	JTH
Draw	SAL
Check	PW

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STATE OF TEXAS
PAUL WOOD
95029
LICENSED
PROFESSIONAL ENGINEER
09/28/2020

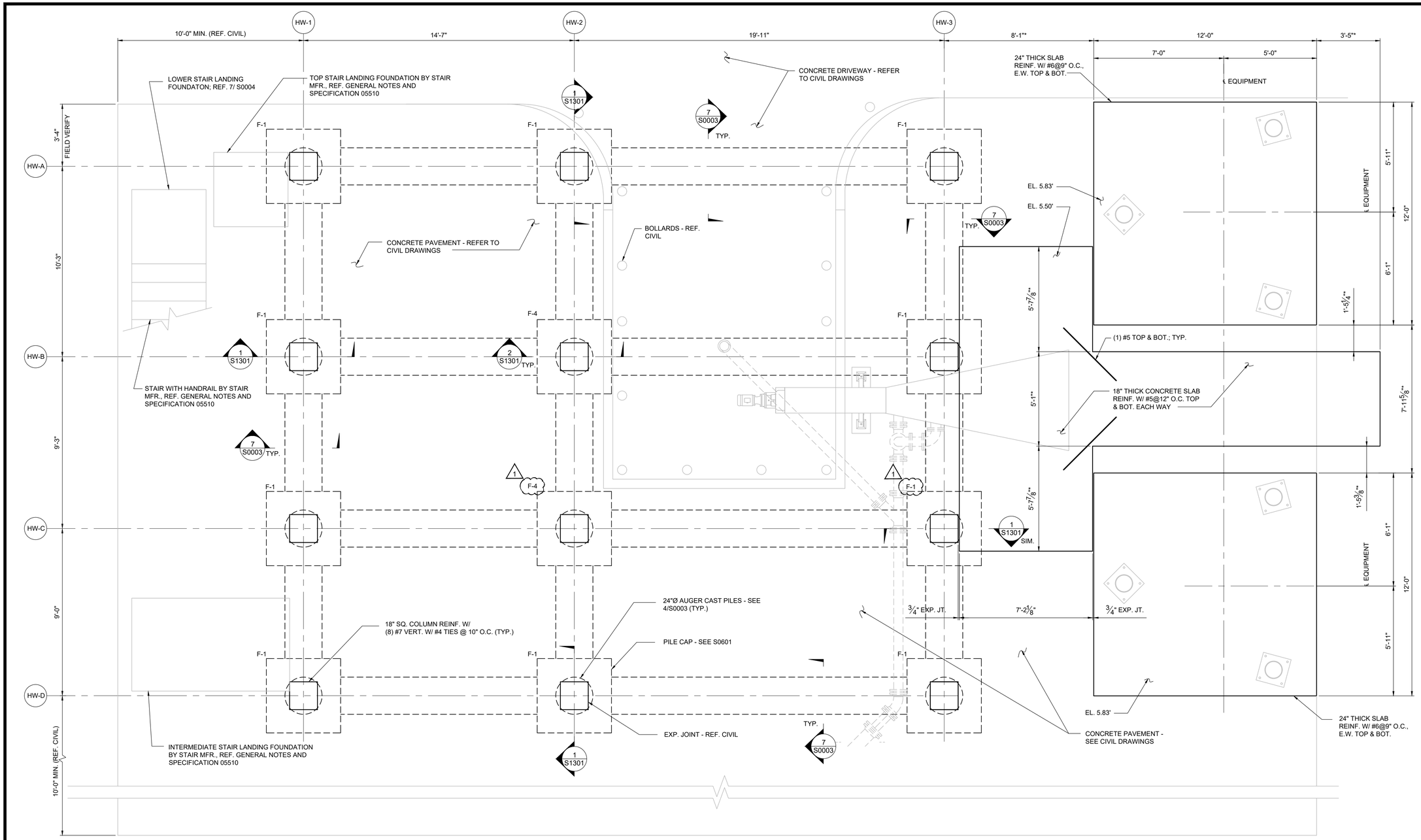
Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

0 2' 4' 6'
SCALE: 3/8"=1'-0"

Project No. 120-11918-000
Date: September 28, 2020

PROPOSED DISK FILTERS AND UV DISINFECTION PLAN

D7101



1 HEADWORKS - FOUNDATION PLAN

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

GENERAL NOTES:

1. FOUNDATION CONSTRUCTION SHALL BE IN STRICT ACCORDANCE WITH THE GENERAL NOTES AND PROJECT SPECIFICATIONS.
2. FOR GENERAL NOTES, REFERENCE SHEET S0001.
3. FOR STANDARD DETAILS, REFERENCE SHEET S0002 THRU S0004.
4. TOP OF PAVEMENT ELEVATION EQUALS +5.50'.
5. THE TOP OF AUGER CAST PILE ELEVATION EQUALS EL. +0.83', UNLESS NOTED OTHERWISE. THE BOTTOM OF AUGER CAST PILE ELEVATIONS IS SCHEDULED ON SHEET S0601. REFER TO THE TYPICAL AUGER CAST PILE DETAILS ON SHEET S0003.
6. THE TOP OF THE PILE CAP ELEVATION EQUALS +3.50'.
7. PILE CAP MARKS ARE SHOWN ON PLAN. REFER TO THE PILE CAP SCHEDULE ON SHEET S0601 FOR PILE CAP SIZE; LENGTH, SIZE, AND QUANTITY OF AUGER CAST PILES; AND REINFORCING STEEL REQUIREMENTS.
8. PROVIDE 3/4" EXPANSION JOINT MATERIAL WITH FLEXIBLE SEALANT AT ALL ABUTMENTS OF CONCRETE PAVEMENT AND/OR SIDEWALKS, INCLUDING AROUND ALL COLUMNS AND PLINTHS.
9. REFER TO THE CIVIL, PROCESS, AND ELECTRICAL DRAWINGS FOR ADDITIONAL INFORMATION NOT SHOWN OR ADDRESSED HEREIN AND FOR SIZE AND LOCATION OF ANY REQUIRED SLEEVES, BLOCKOUTS, EMBEDDED ITEMS, ETC. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE LOCATIONS AND DETAILS FOR THESE ITEMS PRIOR TO FABRICATION AND CONSTRUCTION OF THE STRUCTURE.
10. HOUSEKEEPING PADS SHALL BE PROVIDED BENEATH ALL EQUIPMENT. TOP OF PAD ELEVATIONS VARY. VERIFY THE SIZE, HEIGHT, AND LOCATION OF ALL HOUSEKEEPING PADS WITH THE MECHANICAL, ELECTRICAL OR PLUMBING SUBCONTRACTORS. SEE DETAIL 3/S0003.
11. VERTICAL SURFACES OF ALL EXPOSED CONCRETE SHALL RECEIVE A SMOOTH RUBBED FINISH.
12. SECTIONS OR DETAILS DESIGNATED AS "TYPICAL SECTION" OR "TYPICAL DETAIL" APPLY GENERALLY TO THE DRAWINGS IN ALL AREAS WHERE CONDITIONS ARE SIMILAR TO THOSE DESCRIBED IN THE SECTIONS AND DETAILS, UNLESS OTHERWISE NOTED OR DETAILED.
13. PROVIDE ADDITIONAL REINFORCING AT OPENINGS PER CONCRETE GENERAL NOTES AND DETAIL 4/S0002
14. THE CENTERLINE OF THE COLUMN SHALL BE LOCATED ON GRIDLINES, UNLESS NOTED OTHERWISE. OTHER COLUMN DIMENSIONS SHOWN ARE TO CENTERLINE OF MEMBER, UNLESS NOTED OTHERWISE.
15. * DENOTES DIMENSION TO BE VERIFIED WITH THE EQUIPMENT MANUFACTURER AND COORDINATED BY THE CONTRACTOR.

PLAN NORTH

Pirates Beach Wastewater Treatment Plant Replacement Galveston, Texas

CITY OF GALVESTON 1839

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KEY PLAN

REVISIONS

NO.	DESCRIPTION	DATE
1	ADDENDUM NO. 2	12/3/2021

FILE LOG

ACTIVITY	BY
Manager	WES
Design	JNS
Draw	TMP
Check	JDJ

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STATE OF TEXAS
JENNIFER N. SAVAGE
111686
LICENSED PROFESSIONAL ENGINEER
09/28/2020

Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

0 2' 4' 6'
SCALE: 3/8"=1'-0"

Project No. 120-11918-000
Date: September 28, 2020

HEADWORKS FOUNDATION PLAN

S1101

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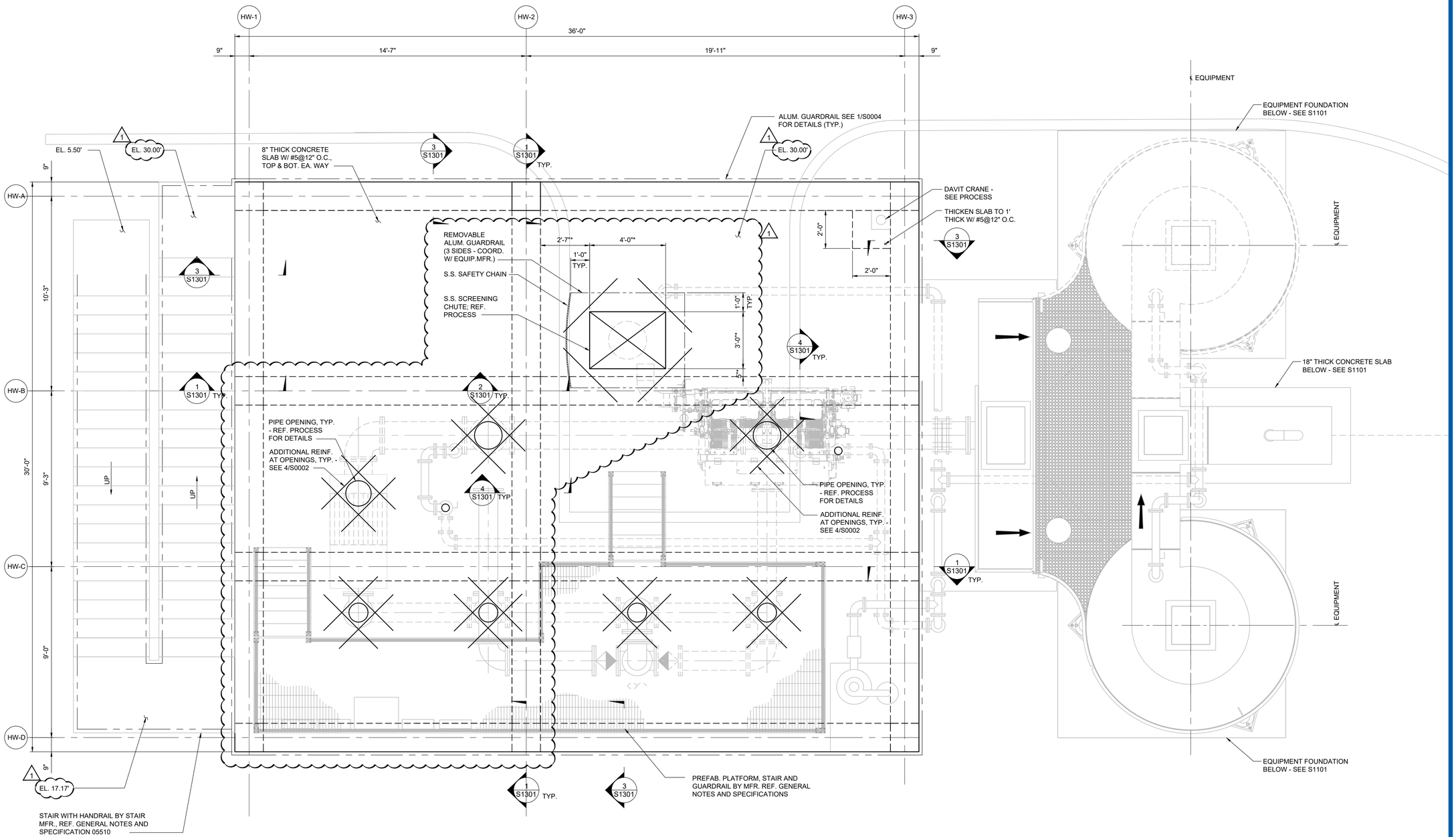
File:P:\120\120-11918-0004-0-Production-Working\4-1-BIM-CAD\Structural\S1101.DWG Plotted:12/1/2021 5:55 AM By:Parks, Tom



1 HEADWORKS - UPPER LEVEL PLAN

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

GENERAL NOTES:

1. CONCRETE FRAMING CONSTRUCTION SHALL BE IN STRICT ACCORDANCE WITH THE GENERAL NOTES AND PROJECT SPECIFICATIONS.
2. FOR GENERAL NOTES, REFERENCE SHEET S0001.
3. FOR STANDARD DETAILS, REFERENCE SHEET S0002 THRU S0004.
4. TOP OF CONCRETE SLAB ELEVATION EQUALS +30.00'.
5. REFER TO THE CIVIL, PROCESS, AND ELECTRICAL DRAWINGS FOR ADDITIONAL INFORMATION NOT SHOWN OR ADDRESSED HEREIN AND FOR SIZE AND LOCATION OF ANY REQUIRED SLEEVES, BLOCKOUTS, EMBEDDED ITEMS, ETC. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE LOCATIONS AND DETAILS FOR THESE ITEMS PRIOR TO FABRICATION AND CONSTRUCTION OF THE STRUCTURE.
6. VERTICAL SURFACES OF ALL EXPOSED CONCRETE SHALL RECEIVE A SMOOTH RUBBED FINISH.
7. SECTIONS OR DETAILS DESIGNATED AS "TYPICAL SECTION" OR "TYPICAL DETAIL" APPLY GENERALLY TO THE DRAWINGS IN ALL AREAS WHERE CONDITIONS ARE SIMILAR TO THOSE DESCRIBED IN THE SECTIONS AND DETAILS, UNLESS OTHERWISE NOTED OR DETAILED.
8. PROVIDE ADDITIONAL REINFORCING AT OPENINGS PER CONCRETE GENERAL NOTES AND DETAIL 4/S0002. THE CENTERLINE OF THE COLUMN SHALL BE LOCATED ON GRIDLINES, UNLESS NOTED OTHERWISE. OTHER COLUMN DIMENSIONS SHOWN ARE TO CENTERLINE OF MEMBER, UNLESS NOTED OTHERWISE.
10. * DENOTES DIMENSION TO BE VERIFIED WITH THE EQUIPMENT MANUFACTURER AND COORDINATED BY THE CONTRACTOR.

PLAN NORTH

Pirates Beach Wastewater Treatment Plant Replacement Galveston, Texas

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KEY PLAN

REVISIONS

NO.	DESCRIPTION	DATE
1	ADDENDUM NO. 2	12/3/2021

FILE LOG

ACTIVITY	BY
Manager	WES
Design	JNS
Draw	TMP
Check	JDJ

STAMP

STATE OF TEXAS
JENNIFER N. SAVAGE
111686
LICENSED PROFESSIONAL ENGINEER
09/28/2020

Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

0 2' 4' 6'
SCALE: 3/8"=1'-0"

Project No. 120-11918-000
Date: September 28, 2020

HEADWORKS UPPER LEVEL FRAMING PLAN

S1102

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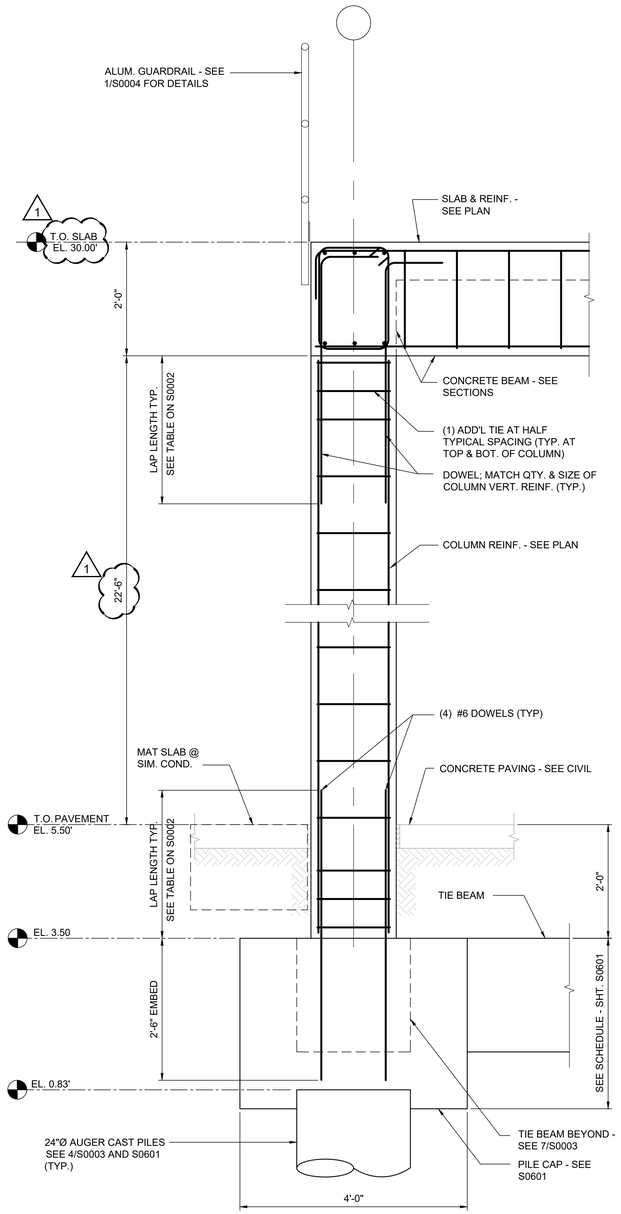
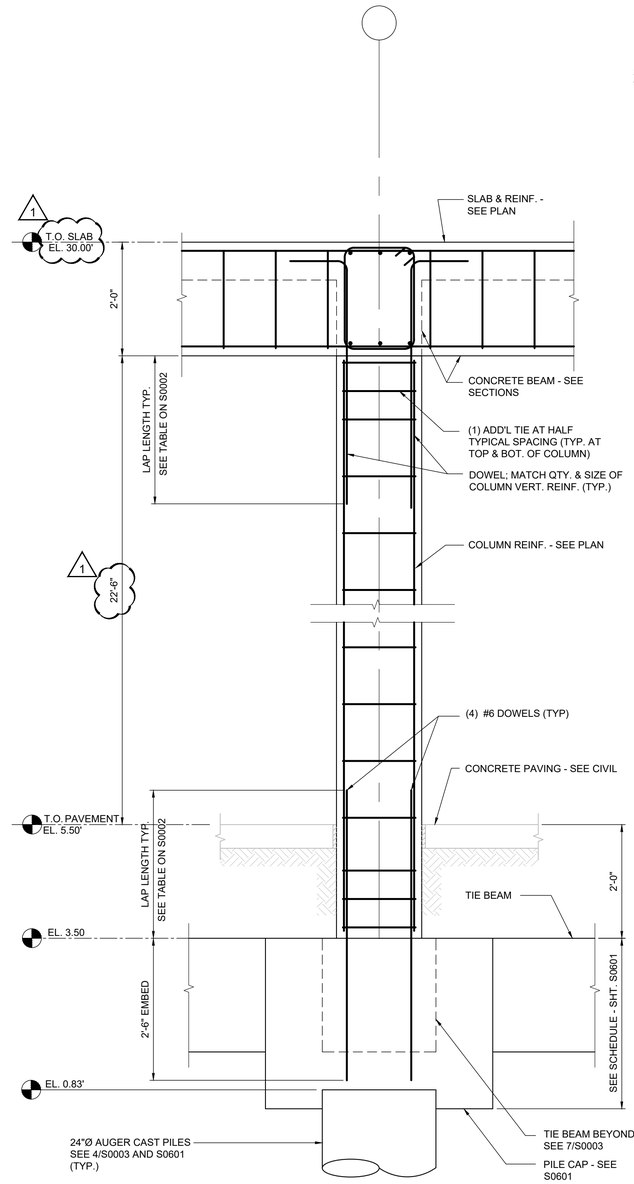
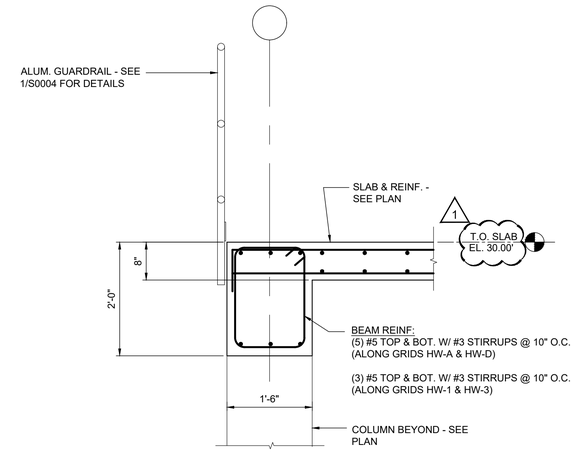


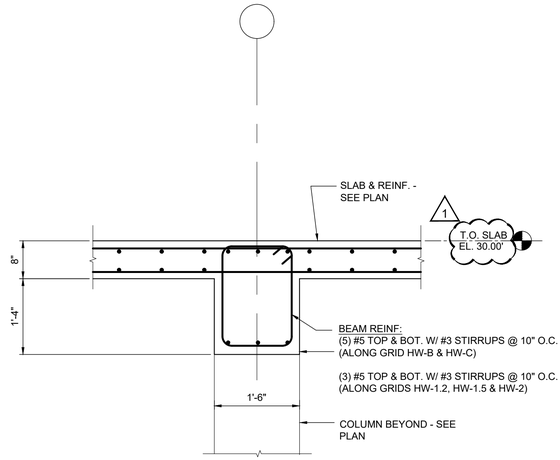
1 SECTION
SCALE: 3/4" = 1'-0"



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



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



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

Pirates Beach Wastewater Treatment Plant Replacement Galveston, Texas

CITY OF GALVESTON 1839

Lockwood, Andrews & Newnam, Inc.
A LEO A DALY COMPANY
2925 Briarpark Drive
Suite 400
Houston, TX 77042
Tel 713-266-6900
www.lan-inc.com

KEY PLAN

REVISIONS

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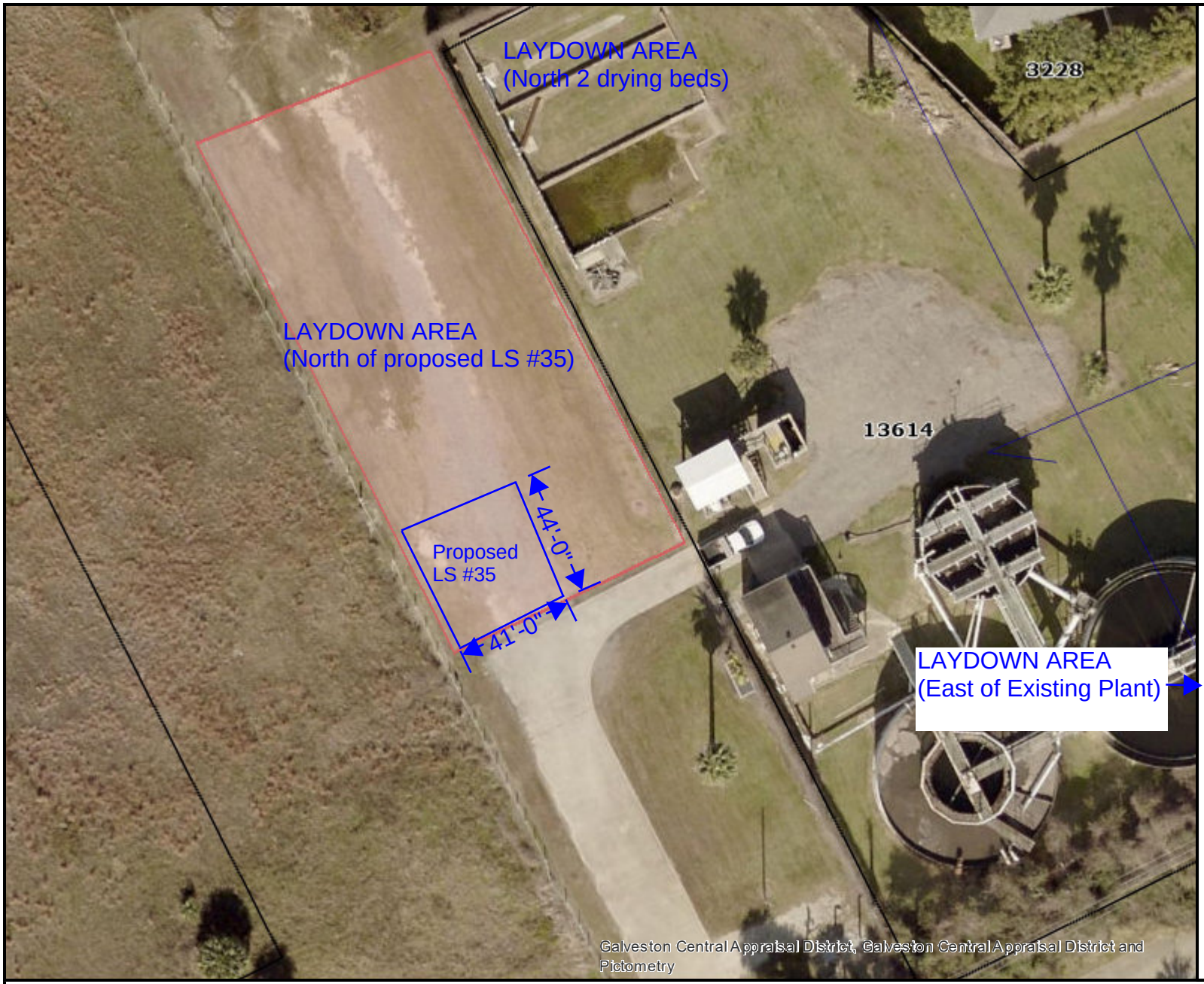
0 1' 2' 3'
SCALE: 3/4"=1'-0"

Project No. 120-11918-000
Date: September 28, 2020

HEADWORKS SECTIONS AND DETAILS SHEET 1 OF 1

S1301

47 OF 114



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Public Works Internal Map - Available Area for Laydown

Printed on: 11/29/2021
By: City of Galveston
Web App User

Coordinate System: NAD 1983 StatePlane Texas South Central FIPS 4204 Feet
Units: Foot US

N

0 1 in = 40 feet 0.012 mi

Approximate Scale

Source Credits: City of Galveston - Utilities; City of Galveston, USGS, et al. - Basemap; HGAC - Airport; Galveston Central Appraisal District (GCAD) - Street Centerlines, Railroad Lines, Parcels & Lot Lines; GCAD & Pictometry - 2018 Aerial & Building Footprints

- Parcel
- Lot Lines

Water

- Water Valve
- Fire Hydrant
- Water Plant
- Fire Lead
- HP Transmission
- LP Transmission
- Distribution

Sanitary Sewer

- Abandoned
- Sanitary Manhole
- Service Cleanout
- Lift Station
- Force Main
- Existing Sanitary Main
- Abandoned Sanitary Main

Storm Sewer

- Inlet
- Junction
- Outlet
- Manhole (Storm)
- Storm Main